
User Manual

**SG3KTL-M/SG4KTL-M/
SG5KTL-M**

PV Grid-Connected Inverter



About This Manual

This manual applies to inverter SG3KTL-M, SG4KTL-M and SG5KTL-M. We hope that the device will meet your satisfaction when you use it with your PV plant system.

Aim

The purpose of this manual is to provide detailed product information and instructions for the use of SG3KTL-M, SG4KTL-M and SG5KTL-M PV grid-connected inverter.

Related Documents

The manual cannot include complete information about the PV system. You will get the additional information about other devices at www.sungrowpower.com or via the webpage of device manufacturer.

Target Group

The manual is aimed at technical personnel who are responsible for inverter installation and commissioning in the PV power system and the end customer who will perform daily LCD operation.

How to Use This Manual

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

The contents of the manual will be periodically updated or revised due to the product development. It is probably that there are changes of manual in the subsequent inverter edition. The latest manual can be acquired via visiting web page at www.sungrowpower.com.

Symbols Explanation

This manual contains important safety and operational instructions that must be accurately understood and followed during the installation and maintenance of the equipment.

To ensure optimum use of this manual, note the following explanations of symbols used.

DANGER

DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE indicates a situation which, if not avoided, could result in equipment or property damage.



NOTE indicates additional information, emphasized contents or tips to help you solve problems or save time.

Symbols on the Inverter Body



Wait at least 10 minutes after disconnecting the inverter from the utility grid and the PV input before touching any inner live parts.



Hot surface! Do not touch device hot surface when the device is running.



Read over the user manual before any work on the inverter!



The installation and service of the inverter unit can only be performed by qualified personnel.

Contents

About This Manual	1
1 Safety Instructions	1
IMPORTANT SAFETY INSTRUCTIONS	1
2 Product Introduction	6
2.1 Intended Usage	6
2.2 Product Description	7
2.2.1 Product Appearance	7
2.2.2 Dimensions and Weight of Inverter	8
2.2.3 LCD Display Panel	8
2.3 Technical Description	10
2.3.1 Circuit Description	10
2.3.2 Functions Description	10
3 Inverter Workflow	12
4 Unpacking and Storage	14
4.1 Unpacking and Inspection	14
4.2 Identifying Inverter	15
4.3 Delivery Contents	16
4.4 Storage of Inverter	17
5 Securing Inverter to the Wall	18
5.1 Selecting Installation Location	18
5.2 Moving Inverter to Installation Site	21
5.3 Installation Procedure	22
6 Electrical Connection	27
6.1 General Safety Instruction	27
6.2 Terminals Description	28
6.3 Overview of Electrical Connection	29
6.4 Connecting Inverter to AC Grid	30

6.4.1 AC Side Requirements	30
6.4.2 Assembling AC Cables to Connector	33
6.4.3 AC Wiring Procedure	35
6.5 Connecting Inverter to PV Arrays.....	36
6.5.1 DC Input Configuration Mode.....	36
6.5.2 Assembling DC Cable to Connector.....	39
6.5.3 DC Wiring Procedure.....	41
6.6 Grounding of Inverter	43
6.7 Communication Cable Connection.....	44
6.7.1 Communication System	44
6.7.2 Communication Connection	47
7 Commissioning	51
7.1 Verify before Commissioning	51
7.2 Commissioning Procedure	51
8 Disconnecting, Dismantling and Disposing of the Inverter	53
8.1 Disconnecting the Inverter	53
8.2 Dismantling the Inverter.....	54
8.3 Disposing of the Inverter	54
9 Troubleshooting and Maintenance	55
9.1 LED Indicator Troubleshooting.....	55
9.2 Troubleshooting of Faults in LCD Screen	55
9.3 Maintenance.....	59
9.3.1 Routine Maintenance	59
9.3.2 Fan Cleaning and Replacement.....	60
10 Operation of LCD Menu	61
10.1 Button Function	61
10.2 Overview of LCD Menu.....	62
10.3 The Default Screen	63
10.4 Adjusting Contrast.....	63
10.5 Current Running Information Checking.....	64
10.6 Historical Information Checking	65

10.6.1	Running Record Checking.....	65
10.6.2	Fault Record Checking.....	66
10.7	Language Setting	67
10.8	Time Setting	68
10.9	Energy Deviation Adjustment.....	69
10.10	Load Default.....	70
10.11	Firmware Version Checking	71
10.12	Running Parameters Setting	72
10.13	Protective Parameters Setting	73
10.14	Communication Parameters Setting	75
10.14.1	Address Setting	75
10.14.2	Wireless Address Setting.....	76
10.14.3	PV Configuration Mode Setting.....	78
10.15	Inverter Start/Stop	79
11	Appendix	80
11.1	Technical Data	80
11.1.1	Electrical Specifications.....	80
11.1.2	PV Input Specification.....	82
11.1.3	Temperature Derating Curve.....	82
11.2	Exclusion of Liability.....	83
11.3	About Us	84

1 Safety Instructions

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

SG3KTL-M, SG4KTL-M and SG5KTL-M inverter are designed and tested in accordance with the international safety requirements. But as with all electrical and electronic equipments, certain precautions should be observed during installation, operation and maintenance work.

NOTICE

There is a risk of inverter damage or personnel injury!

Various plug-in interfaces are provided on the bottom of the inverter. Do not open the enclosure at any time. Loss of any or all warranty rights may follow if otherwise.

Operation or work performed incorrectly can result in damage to:

- The life and well-being of the operator or a third party
- The inverter and other properties that belong to the operator or a third party

To reduce the risk of injury and ensure the normal operation of the inverter, you must read over and follow all the instructions, cautions and warnings.

WARNING

All installation and electrical work must only be performed by qualified personnel. They have

- **been trained specially;**
- **already completely read through and understood the manual and other related documents;**
- **been familiar with safety requirements for electrical system.**

Technical personnel mentioned above may perform the following work:

- Secure the inverter to the wall
- Connect the inverter to the PV power system
- Connect other devices to the PV power system

- Commission the inverter
- Maintain and service the inverter

Before Installation

CAUTION

There is a risk of injury if the product is mishandled!

- **Always follow the instructions in the manual when moving and positioning the inverter.**
- **The weight of the equipment can cause injuries, serious wounds, or bruising if mishandled.**

During Installation

Prior to securing the inverter to the wall, it is crucial to make certain that the inverter is not electrically connected.

CAUTION

System performance can be impaired by poor ventilation!

The equipment requires well ventilation during operation. It is essential to keep the unit upright and nothing covering the heat sink to let the equipment interior well cool down.

During Electrical Connection

DANGER

Lethal voltage exists!

PV arrays will produce electrical energy when exposed to sunlight and thus can cause an electrical shock hazard.

- **Wiring of the PV arrays should only be performed by qualified personnel.**
- **PV modules should be covered by opaque materials during wiring.**

DANGER

All cables must be firmly attached, undamaged, properly insulated and adequately dimensioned.

During Inverter Operation

DANGER

There is a risk of inverter's damage or personal injury!

Do not disconnect DC connectors while the inverter is under AC load! First de-energize the equipment from the dual power sources and then verify that there is no voltage existing.

CAUTION

There is a risk of burns!

Avoid touching device hot parts (such as the heat sink) during operation. Only the LCD display panel and the optional DC switch can be touched during inverter operation.

Maintenance and Service

NOTICE

- **Any malfunction that may impair the inverter safety operation must be repaired immediately before the inverter is restarted.**
- **Inverter contains no customer serviceable parts inside. Please contact local authorized personnel if any service work is required.**



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

 DANGER

There is a risk of inverter damage or personal injury due to incorrect service work!

Always keep in mind that the inverter is power supplied by dual power source: PV arrays and utility grid.

Before any service work, observe the following procedures.

- **Disconnect the inverter from the utility grid side first and then PV arrays;**
- **Wait at least 10 minutes for inner capacitors to discharge completely;**
- **Verify that no voltage and current existing with appropriate testing devices.**

 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.

Do not open the enclosure when the inverter is under voltage. There is a high likely risk of explosion in very specific cases of malfunction. The enclosure will protect persons and property from such an explosion, only if it is correctly sealed.

NOTICE

There is a risk of inverter damage if it is improperly serviced.

Use accessories and spare parts approved by the inverter manufacturer only. Never modify the inverter or other components of the inverter. The loss of any or all warranty rights may follow if otherwise.

NOTICE

There is a risk of inverter damage due to electrostatic discharge!

The printed circuit boards contain components sensitive to electrostatic discharge. Wear a grounding wrist band when handling the boards. Avoid unnecessary touch of the boards during replacement.

Others

NOTICE

The selected country settings can be changed by qualified personnel only!

Alternation of the country settings may cause a breach to the type-certificate marking

WARNING

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

- **must be clearly visible;**
- **must not be removed, covered or pasted.**

WARNING

These regulations should also be followed:

- **the regulations related to the electricity fed into grid;**
- **the safety instructions related to PV arrays;**
- **the safety instructions related to other electrical devices.**

2 Product Introduction

2.1 Intended Usage

SG3KTL-M, SG4KTL-M and SG5KTL-M (They will be referred to as inverter hereinafter unless otherwise specified), single-phase without transformer string inverter, is a crucial unit between the PV arrays and the utility grid in the small-scaled PV power system.

Inverter is dedicated to converting direct current power generated by the PV modules into alternating current, which conforms to parameters of local utility grid, and feeds the alternating current into the utility grid. An example about intended usage of the inverter is shown in Fig. 2-1.

NOTICE

Where the positive or negative terminal of PV strings needs to be grounded, inverter cannot be connected to PV modules of this type.

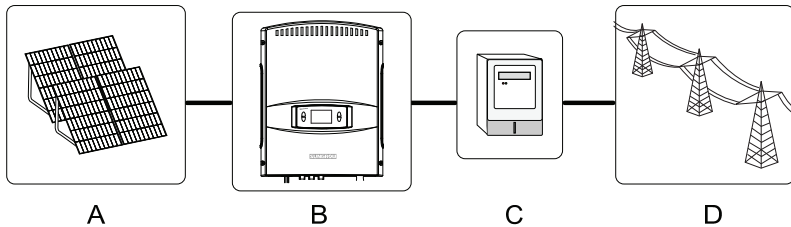


Fig. 2-1 Application of Inverter to the PV Power System

Item	Description	Remark
A	PV strings	monocrystalline silicon; polycrystalline silicon and thin-film of protection class II without grounding
B	Inverter	SG3KTL-M, SG4KTL-M or SG5KTL-M.
C	Metering device	meter cupboard with power distribution system
D	Utility grid	TT, TN-C, TN-S, TN-C-S

NOTICE

Any other or additional usage other than the intended usage is not permitted.

Inverter only accepts PV modules of Protection Class II as its input.

Inverter may only be connected to utility grid via distribution board. Local loads (home appliance, lights, motor loads, etc.) cannot be connected between the inverter and AC circuit breaker on the distribution board.

2.2 Product Description

2.2.1 Product Appearance

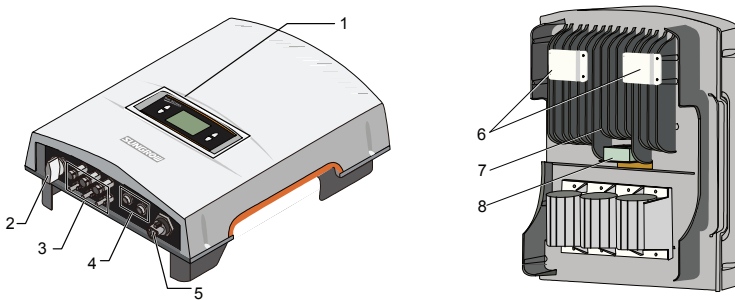


Fig. 2-2 Product Description

Item	Name	Description
1	LCD display panel	Inverter operation data view and parameters configuration.
2	DC switch (Optional)	Optional component. It is designed for safely disconnecting DC current.
3	DC terminals	There are three pairs of DC terminals between PV arrays and inverter.
4	Communication terminals	One 5-pin terminal and one RJ45 plug-in terminal.
5	AC terminal	Inverter feeds power to utility grid via this terminal.
6	Mounting ear	It is used to hang inverter onto the backplate.
7	Heat sink	It is used to cool down the unit temperature during operation.
8	Fan	External fan used for air ventilation (SG3KTL-M without fan).

2.2.2 Dimensions and Weight of Inverter

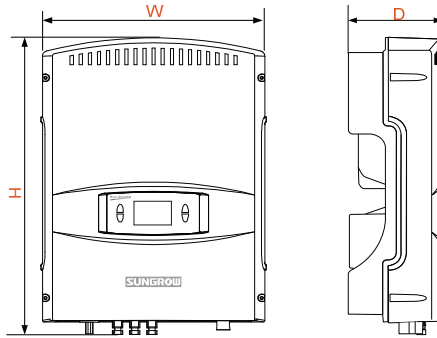


Fig. 2-3 Dimensions of Inverter

Tab. 2-1 Dimensions Value

Type	W(mm)	H(mm)	D(mm)	Net weight(kg)
SG3KTL-M/SG4KTL-M/ SG5KTL-M	420	555	179	24

2.2.3 LCD Display Panel

As a human-computer interaction interface, LCD display panel comprises LED indicators, buttons and LCD display screen on inverter front panel.

- LEDs indicate the working status of the inverter
- The current running information shown on the LCD display
- Malfunction records shown on the LCD display
- Inverter configuration by pressing the buttons

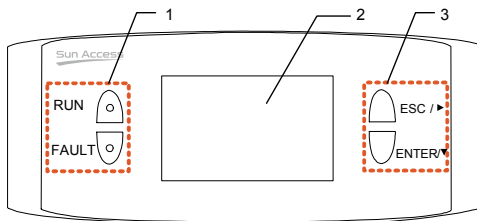


Fig. 2-4 LCD Display Panel

Item	Name	Description
1	LED indicators	They are "RUN" and "FAULT". User can observe the two indicators to get the current state of inverter. Detailed definition is shown in Tab. 2-2.
2	LCD screen	LCD screen can display the current state of the inverter, current running information, historical information and parameters to be set.
3	Buttons	User can operate the LCD menu of the inverter via the two buttons. Detailed function is shown in 10.1 .

Tab. 2-2 Description of LED Indicators

Name	State	Description
"RUN"	On	Inverter is feeding AC power to the utility grid.
"FAULT"	Off	
"RUN"	Off	A malfunction happens; or protection function triggers.
"FAULT"	On	
"RUN"	Off	Inverter is not energized; or there is communication error between DSP and LCD.
"FAULT"	Off	

2.3 Technical Description

2.3.1 Circuit Description

Fig. 2-5 shows the main circuit of inverter.

The inverter boost circuits raise input DC voltage. There are two string MPP trackers to ensure the maximum power from PV arrays can be utilized. Then the inverter circuit converts DC power to AC power. Meanwhile inverter is equipped with protective circuit to guarantee its safety operation which can triggers the AC relay if required.

Additionally, inverter provides RS485 and WiFi interface for communication. User can look up running status and set parameters through LCD display panel.

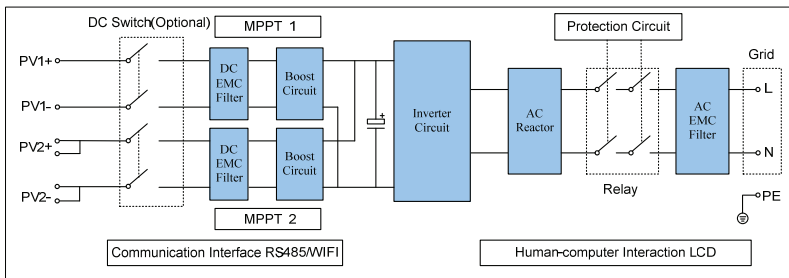


Fig. 2-5 Main Circuit Diagram of inverter



The Main Circuit shown here is for SG4KTL-M and SG5KTL-M, there is only one string of PV arrays in input area 2 of SG3KTL-M.

2.3.2 Functions Description

Inverter functions can be grouped as the following:

- Conversion function
Inverter converts the direct current power into the alternating current power, which conforms to the grid requirement of its installation country.
- Data storage and display
Inverter archives essential data including running information and fault records, and displays them on the integrated LCD display.
- Parameters configuration
Inverter provides various parameters configuration for optimal operation.

- Communication interface
Standard RS485 interface for connecting other monitoring devices to the PV system is included.
- Protection functions include
 - short circuit protection
 - grounding insulation resistance surveillance
 - inverter output voltage surveillance
 - inverter output frequency surveillance
 - residual current protection
 - DC injection of AC output current surveillance
 - anti-islanding phenomena protection
 - ambient temperature surveillance
 - DC over-voltage protection
 - over-current protection
 - over-temperature protection

3 Inverter Workflow

The following diagram shows the inverter installation flow. Please follow these procedures.

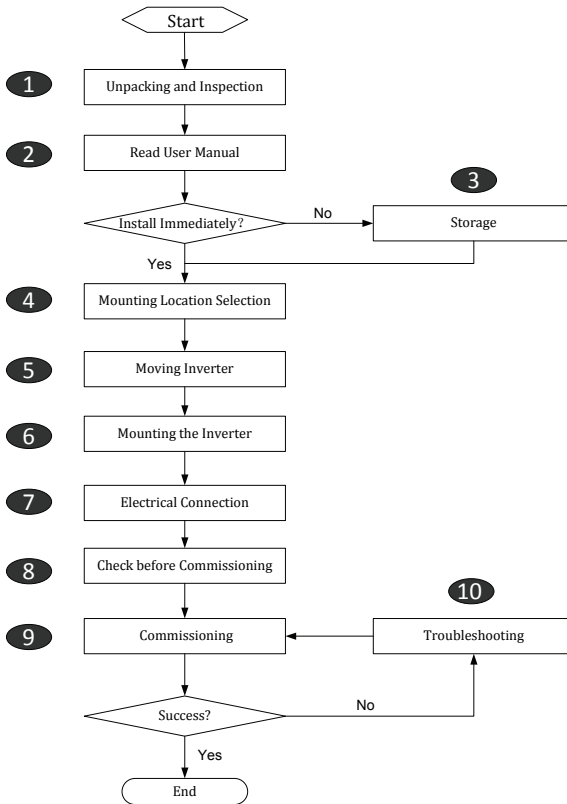


Fig. 3-1 Installation Flow Chart

Tab. 3-1 Description of Installation Flow

Order	Description	Remark
1	Unpacking and inspection	Section 4.1
2	Read this manual, especially the section on "safety instruction"	Chapter 1
3	Store the inverter unit if not installed immediately	Section 4.4
4	Choose the best installation site	Section 5.1
5	Move the inverter to the installation site	Section 5.2
6	Secure the inverter to the selected wall	Section 5.3
7	Electrical connections include DC, AC, ground and communication (optional) connection	Section 6.4 -6.7
8	Examine before commissioning	Section 7.1
9	Start up inverter and configure corresponding parameters	Section 7.2
10	Troubleshooting	Section 9.1

4 Unpacking and Storage

4.1 Unpacking and Inspection

The unit is thoroughly tested and strictly inspected before delivery. Although sturdy packaging is used, damages may still occur during shipping.

- Check the packing for any visible damages upon receiving.
- Check the inner contents for damage after unpacking.
- Check the completeness of the delivery contents according to the supplied packing list.

If there are visible damages to the packaging or the inner contents, or something missing, please contact the unit dealer.

Do not dispose of the original packaging. It is the best choice to store the inverter in the original packaging.



Fig. 4-1 Single Inverter in Original Carton

4.2 Identifying Inverter

Nameplate is attached to the side of the inverter. It provides information on the type of inverter, the most important specifications, marks of certification institutions, website and serial number which are available and identified by Sungrow.

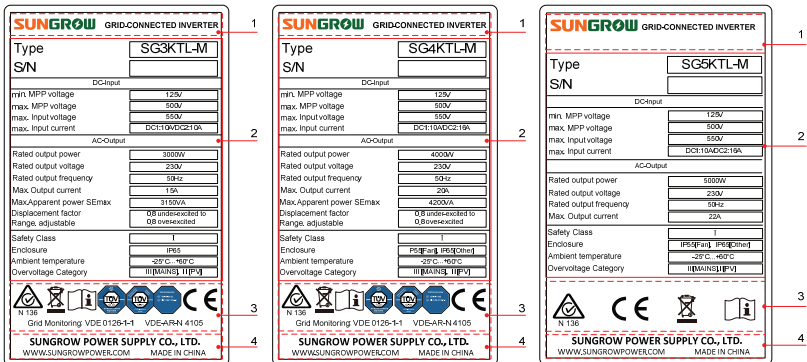


Fig. 4-2 Nameplate of Inverter

* Image shown here is for reference only. Actual product you receive may differ.

Item	Description	Item	Description
1	SUNGROW logo and product type	3	Marks of certification institutions of inverter
2	Technical data of inverter	4	Company name, website and origin

Tab. 4-1 Description of Icons on the Nameplate

Icon	Description
	Don't dispose of the inverter with the household waste.
	Refer to the corresponding instructions.
	C-tick mark of conformity. The inverter is in compliance with directives of C-tick.
	CE mark of conformity. The inverter is in compliance with directives of CE.
	TUV mark of conformity. The inverter is in compliance with directives of TUV.

4.3 Delivery Contents

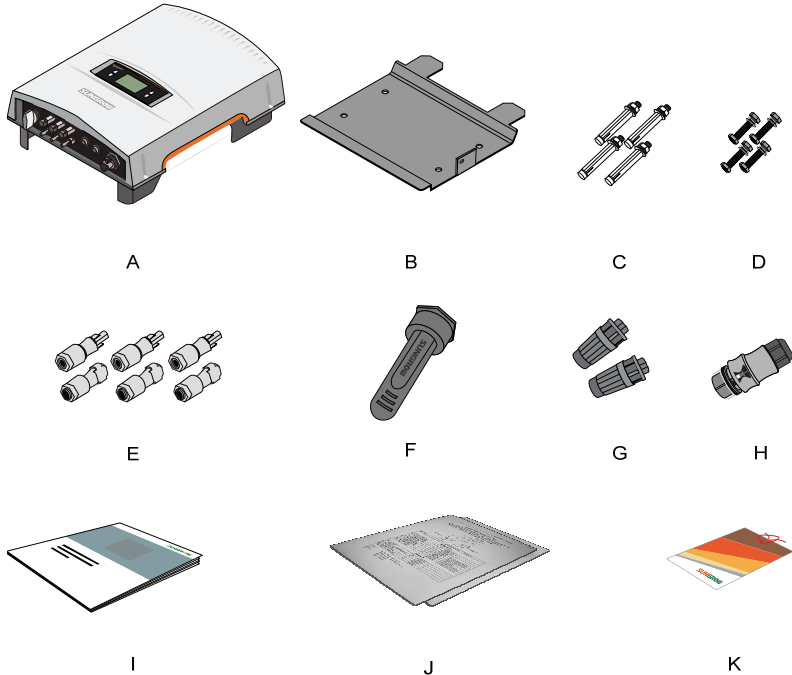


Fig. 4-3 Delivery Contents

Item	Description
A	Inverter unit
B	It is used to mount the inverter onto the wall
C	Expansion bolts for fastening the backplate onto concrete wall
D	Fastener set for installing the inverter onto metal frame
E	PV input connectors, including positive and negative connectors DC connectors types: PV-CF-S 2,5-6 (+), PV-CM-S 2,5-6 (-)
F	WiFi(Optional), for wireless communication
G	RS485 connector and 5-pin communication connector: CHOGORI 203 Series 5-pin
H	AC output connector: RST25i3
I	User Manual, including installation instructions and operation instructions
J	Packing list and product test report
K	Quality certificate

4.4 Storage of Inverter

If you do not install the inverter immediately, you should choose an appropriate location to store it.

- The unit must be stored in original packaging and the desiccant must be left in the packaging.
- The unit must be stored in a clean and dry place to protect against dust and moisture.
- The storage temperature should be always between $-25\text{ }^{\circ}\text{C}$ and $+60\text{ }^{\circ}\text{C}$. And the storage relative humidity should be always 0 and 95%.
- It is very important to keep the packaging away from chemicals. Otherwise it will lead to corrosion.
- During the storage time, check periodically for visible damages by rats. Replace the packaging if necessary.
- If there is more than one inverter to be stored, the maximum layers for original paper packaging are five.



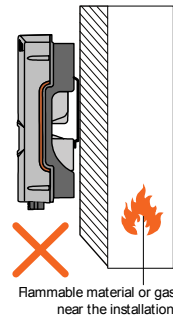
After long-term storage or decommissioning, local installer or Service Dept. of Sungrow should perform a comprehensive test before connecting the inverter into PV power system.

5 Securing Inverter to the Wall

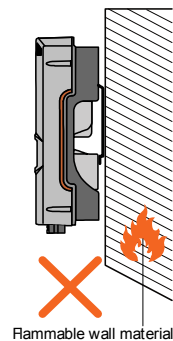
5.1 Selecting Installation Location

Selecting an optimal installation location for the inverter is decisive for its operating safety as well as its expected efficiency and service life.

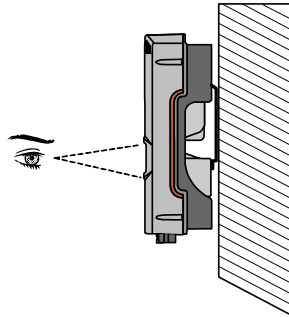
1. Take the load capacity of the wall into account. The wall (such as concrete wall or metal structure) should be strong enough to hold the weight of the inverter over a long period of time.
2. Install the unit where is accessible to install, electrical connect and service.
3. Do not install the inverter where contains flammable materials or flammable gas in the vicinity of the unit installation site.



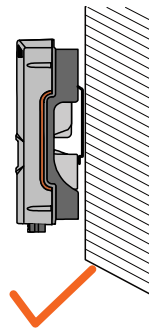
4. Do not install the unit on wall of flammable materials.



5. Install the unit at eye level for easy button operation and display read.

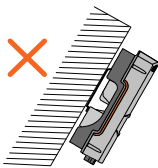


6. It is suggested that the inverter be installed vertically with upside up for good heat dissipation.

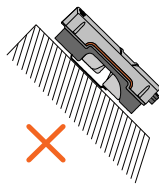


7. Never install the inverter horizontally, or with a forward tilt or with a backward tilt or even with upside down.

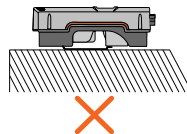
With a forward tilt



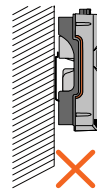
With a backward tilt



Horizontally



With upside down



8. The inverter unit with IP65 can be installed indoors or outdoors.

9. The ambient temperature should range from -25°C to 60°C. The power output will reduce when the ambient temperature exceeds 45°C.



Max. ambient temperature: **+60°C**

10. The relative humidity of chosen installation site should never exceed 95%. Moisture may result in corrosion and damage to the internal device components.

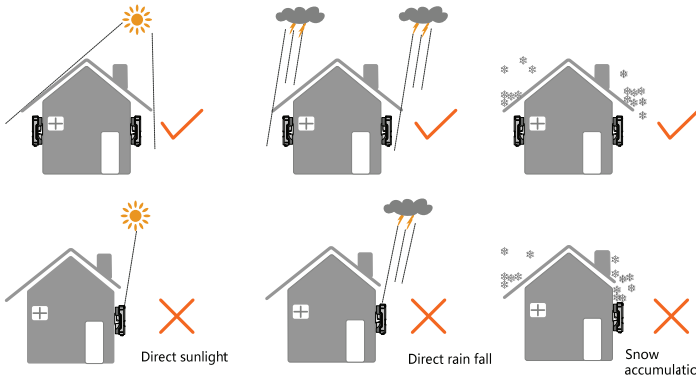


Min. ambient temperature: **-25°C**

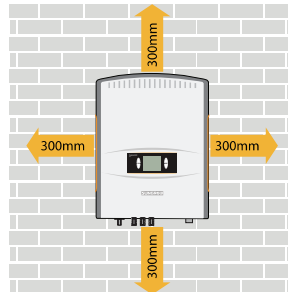


Max. relative humidity: **95%**
No condensing

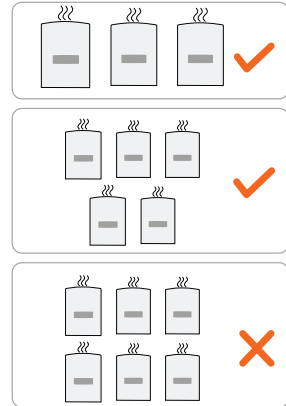
11. Avoid exposing the inverter to direct sunlight, rain or snow to extend its service life despite of IP65 rating. Shaded site of the building would be better.



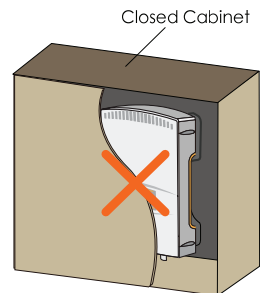
12. Take enough space for convection into consideration during installation.



13. For multiple inverters installation, position the inverters side by side. For multi-row inverters installation, position the inverters in a staggered arrangement.



14. Do not install the inverter in a closed cabinet. Otherwise, the inverter will not operate normally.



15. Do not install the inverter where children can reach.

16. Do not install the inverter in residential area. Noise can be produced during the running of the inverter and may affect your daily life.

5.2 Moving Inverter to Installation Site

If the inverter is to be installed, remove the unit from the packaging and move it to the chosen installation site. During the moving process, the instructions below should be obeyed.

1. Beware of the weight of the inverter.
2. Grasp the equipment with both hands by means of handles.
3. Do not release the equipment unless it has been firmly secured to the wall.

5.3 Installation Procedure

Inverter is installed onto the wall by means of backplate in the packaging. If you don't use the supplied backplate, you can drill holes according to its dimension below.

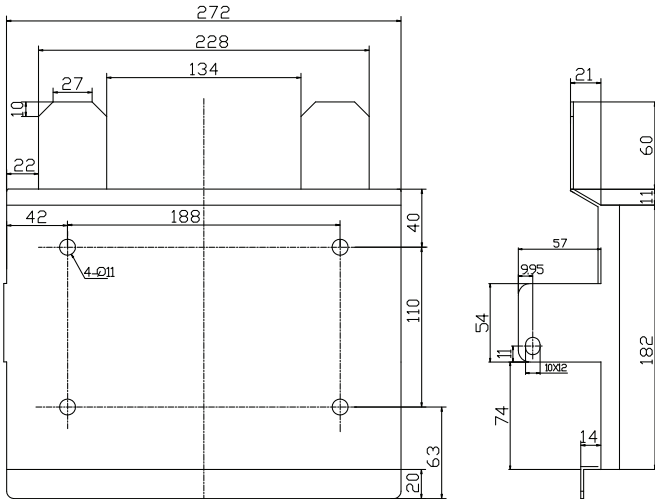


Fig. 5-1 Fastener(unit: mm)

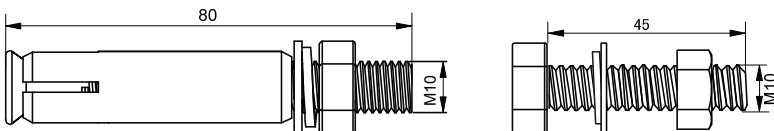


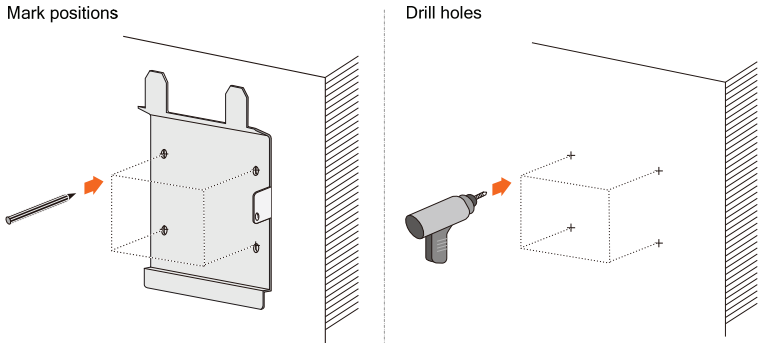
Fig. 5-2 Fastener(unit: mm)

In the following, we will introduce how to secure the inverter to the wall using the provided backplate.

Concrete Wall

1. Remove the backplate and expansion bolts from the packaging.
2. Place the backplate onto the chosen concrete wall and adjust it until it is in a horizontal position.
3. Mark the positions to drill holes using the backplate as the template.

4. Drill holes according to the marks you have made.

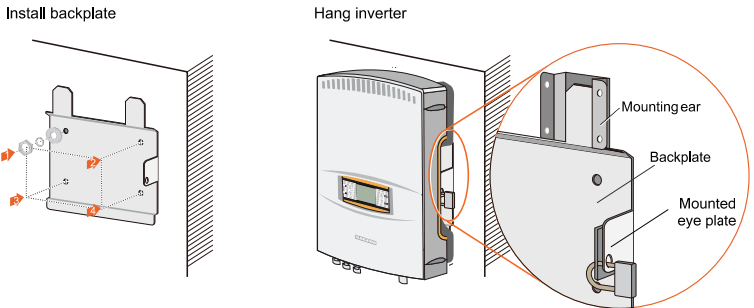


⚠ DANGER

In order to avoid electrical shock or other injury, inspect if there is electricity or plumbing installation before drilling holes.

5. Attach the backplate to the wall with the supplied expansion bolt set. The torque for fastening the nut should be at least 35 Nm.

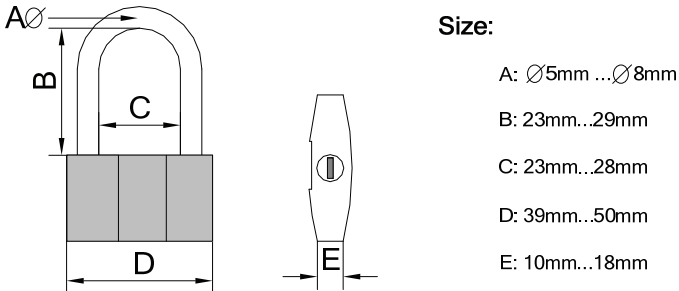
6. Lift up the inverter above the backplate and then slide it down, making sure that the two mounting ears on the back of the inverter and the counterparts of the backplate match perfectly. To protect the inverter from theft, you can lock it to the backplate with a padlock.



Optional Theftproof Function

Put the shackle of the padlock through the mounted eye of the backplate and close the lock.

The padlock should observe the following requirements:



- The theft protection is optional.
- You shall lock the inverter to the mounted eye plate of the backplate with a suitable (stainless, secured shackle and lock cylinder) padlock.
- You must ensure that the key is available at all times for possible service purposes.

Metal Frame

1. Remove the supplied backplate from the packaging.
2. Choose the best installation site according to the abovementioned requirements. Place the backplate onto the chosen metal frame and adjust it until it is in a horizontal position.
3. Mark the positions to drill holes using the backplate as the template.
4. Drill four holes at the marks you have made.



If the shape of the metal frame doesn't fit the holes on the backplate, you need to re-drill holes on the backplate at appropriate position according to the chosen frame.

5. Fasten the backplate against the wall with bolts and nuts, as Fig. 5-3shows.

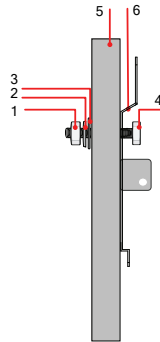


Fig. 5-3 Fasten the Backplate to Metal Frame

Item	Description	Remark
1	Hexagonal socket nut	M10
2	Spring washer	-----
3	Washer	-----
4	Hexagonal bolt	M10*45
5	Metallic wall	-----
6	Backplate	-----

6. Lift up the inverter above the backplate with the help of other people and then slide it down to make sure that the two recesses on the back of the inverter fit perfectly with the backplate, as Fig. 5-4 shows.

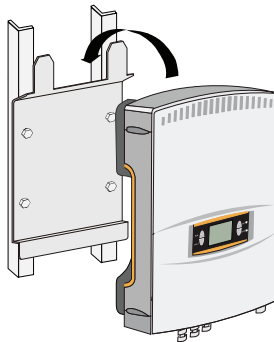
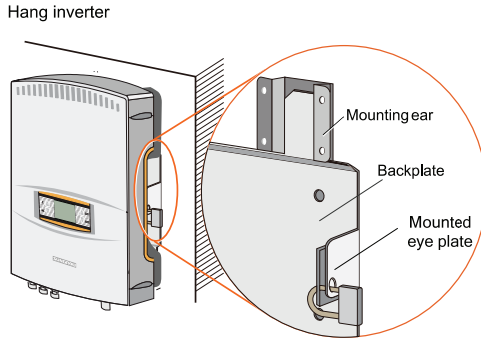


Fig. 5-4 Attach Inverter to the Backplate

To protect the inverter from theft, you can lock it to the backplate with a padlock.



- The theft protection is optional.
- You shall lock the inverter to the mounted eye plate of the backplate with a suitable (stainless, secured shackle and lock cylinder) padlock.
- You must ensure that the key is available at all times for possible service purposes.

6 Electrical Connection

6.1 General Safety Instruction

Once the inverter is firmly attached to the appropriate location, it can be connected into the PV power system.

Prior to any electrical connection, keep in mind that the inverter has dual power supplies. It is mandatory for technical personnel to wear personal protective equipments: helmet, footwear and gloves during the electrical work.

DANGER

Improper operation during the wiring process can cause fatal injury to operator or unrecoverable damages to the inverter.

DANGER

All electrical installations must be in accordance with local and national electrical codes.

DANGER

Only after being approved by the utility company and installed by qualified personnel can you connect the inverter to the utility grid.

DANGER

All cables must be firmly attached, undamaged, properly insulated and adequately dimensioned.

CAUTION

These regulations should also be followed:

- **The regulations related to the electricity fed into the grid**
- **The safety instructions related to the PV arrays**

6.2 Terminals Description

All electrical terminals are located at the bottom of unit. Fig. 6-1 shows the connection area.



Enough space should be kept for electrical connection at the bottom of the inverter when choosing the installation site.

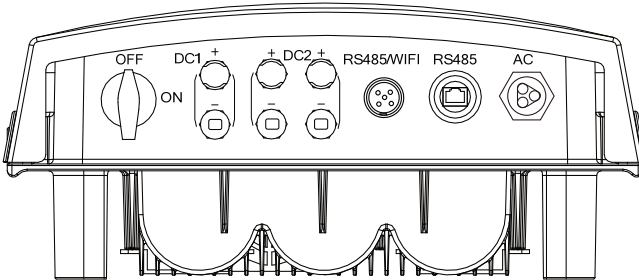


Fig. 6-1 Terminals Description

* Image shown here is for reference only. Actual product you receive may differ.

Tab. 6-1 Terminals Specification

Terminals	SG3KTL-M	SG4KTL-M /SG5KTL-M
DC1	DC1: DC input area 1, one pair of input terminals.	DC1: DC input area 1, one pair of input terminals.
DC2	DC2: DC input area 2, one pair of input terminals.	DC2: DC input area 2, two pairs of input terminals.
RS485/WiFi	Five-pin terminals for RS485 and WiFi communication.	
RS485	RJ 45 terminals for RS485 communication.	
AC	AC terminals to the power grid.	

6.3 Overview of Electrical Connection

Electrical connections of the inverter include DC connection, AC connection and communication connection.

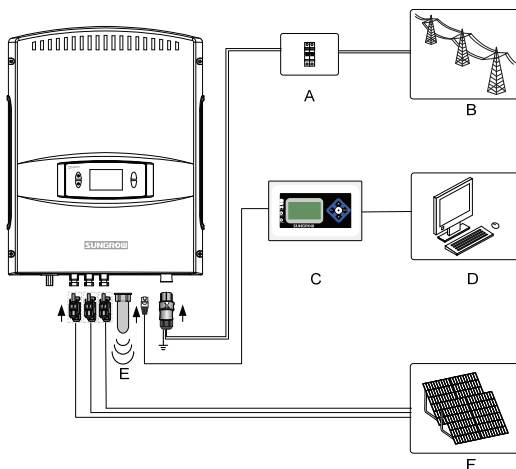


Fig. 6-2 Electrical Connection Diagram

Item	Description	Remark
A	AC circuit breaker	Used as a protective device during electrical connection. User equips this device according to the maximum output voltage and current.
B	Utility grid	Nominal line-to-neutral voltage of the utility grid is 230V.
C	SolarInfo logger	User can order it from Sungrow.
D	Remote PC	User equips this device to monitor the state of the inverter.
E	SolarInfo WiFi	User can order it from Sungrow for wireless communication.
F	PV arrays	SG3KTL-M: two input areas with two pairs of terminals. SG4K/5KTL-M: two input areas with three pairs of terminals.

NOTICE

Don't use the WiFi and PC monitor simultaneously due to their different communication protocols, communication abnormal will occur if otherwise.

6.4 Connecting Inverter to AC Grid

The inverter is connected to the grid via 3 wires (L, N, and PE). Feeding power is always single-phase via AC terminal at the bottom of the unit.

AC cables are equipped with water-proof direct plug-in connector, which match AC terminals.

An appropriately sized AC circuit breaker is suggested as the protection equipment in AC connection, as shown in Fig. 6-2.

6.4.1 AC Side Requirements



Only after being approved by the local grid company can you connect the inverter to the grid.

Prior to connecting the inverter to the utility grid, verify whether the grid voltage and frequency are within the range of inverter output parameters (refer to **Appendix**). Consult the local grid company for solution if otherwise.

AC Side Circuit Breaker

An independent two-pole circuit breaker for the inverter must be installed at the output side to ensure that the inverter can be securely disconnected under load.

Inverter Type	Specification Recommended of AC Circuit Breaker
SG3KTL-M	25A
SG4KTL-M	32A
SG5KTL-M	32A

NOTICE

- **It is not allowed for several inverters to use the same circuit breaker.**
- **It is not allowed to connect loads between the inverter and the circuit breaker.**

Residual Current Device

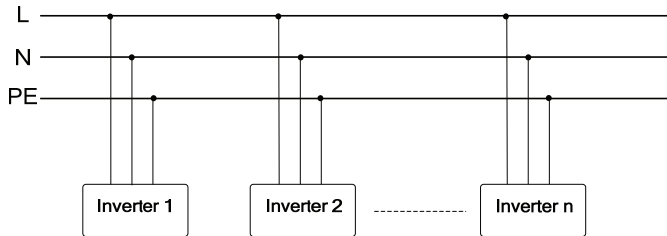
With an integrated universal current-sensitive residual current monitoring unit inside, the inverter is able to distinguish the fault current from normal capacitive leakage current. The inverter will disconnect immediately from the mains when a fault current out of the limit value has been detected.

However if an external RCD or residual current breaker is mandatory, the switch must be triggered at a failure current of 300mA or higher.

Requirements of Inverter Parallel Grid Connection

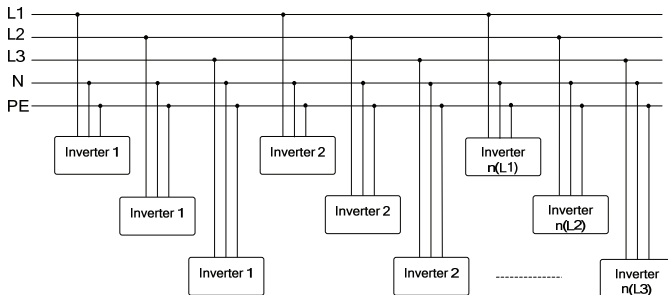
If several inverters are operated in parallel connection with the grid, there are different requirements according to different scenarios.

Scenario 1: Several inverters are operated in parallel connection with the single-phase Low Voltage grid.



Requirements: The sum of all inverters in parallel connection is limited to **ten**.

Scenario 2: Several inverters are operated in parallel connection with the three-phase low-voltage grid.

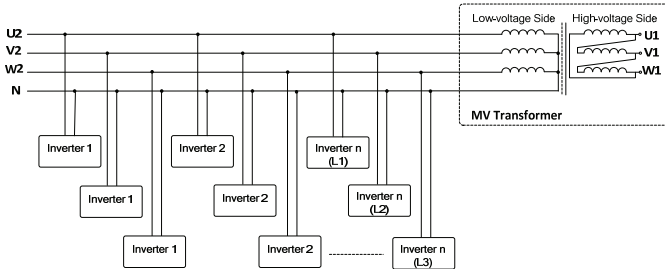


Requirements:

- The sum of all inverters in parallel connection is limited to **thirty**.

$$n(L1)+n(L2)+n(L3) \leq 30.$$
- Inverters should be distributed as equally as possible between the three phases with a maximum unbalanced load of 4.6kVA.

Scenario 3: Several inverters are operated in parallel connection with the low-voltage side of MV transformer. The high-voltage side of MV transformer is connected to the Middle Voltage Grid.



Requirements:

- The sum of all inverters in parallel connection is limited to **thirty**.

$$n(L1)+n(L2)+n(L3)\leq 30.$$
- Inverters should be distributed as equally as possible between the three phases at the low-voltage side with a maximum unbalanced load of 4.6kVA.
- The nominal voltage on the low-voltage side of transformer must meet the inverter output electrical specification. A neutral point is necessary and must lead outward as neutral conductor.

⚠ WARNING

As mentioned in the 1st scenario, the total number of inverters is always less than or equal to ten; in the 2nd and 3rd scenario, the total number of inverters is always less than or equal to thirty. If there are inverters more than the limited value, inverters may not operate normally.

6.4.2 Assembling AC Cables to Connector

Inverter is equipped with water-proof direct plug-in connectors for AC connection, which match AC terminals at the bottom of the inverter.



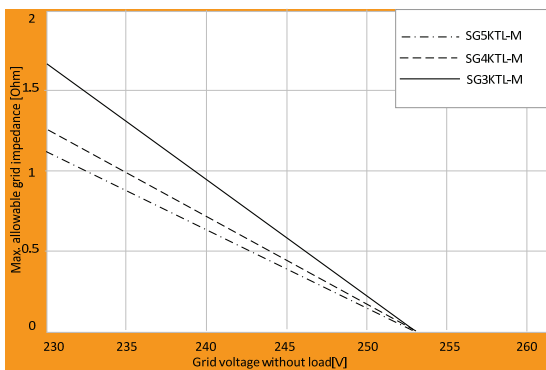
“L”, “N” and “PE” should be equipped with correctly colored cables for distinguishing. Please refer to related standards for specific wiring color.

Inverter is connected to the grid via three wires (L, N and PE). Feeding power is always single-phase via AC terminal at the bottom of the unit.

AC Cable Requirements

Select AC cable specifications and types considering the following facts:

- The grid impedance of the AC cable must correspond to the specification to avoid unintended disconnection from the grid or derating of the output power.



- The cable cross-sectional areas and recommended value are shown in the following table, avoiding power loss in the cables of more than 1% of the nominal power.

Type	Conductor Cross Section(mm2)		Outer cable diameter(mm)	
	Range	Recommended Value	Range	Recommended Value
SG3KTL-M	4...6	4	10...14	10
SG4KTL-M	4...6	4	10...14	10
SG5KTL-M	4...6	6	10...14	10

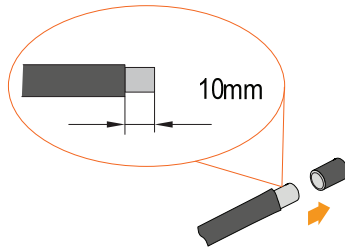
- Withstand ambient temperature;
- Layout type (inside wall, underground, free air etc.);
- UV resistance and so on.

Assembling Procedure

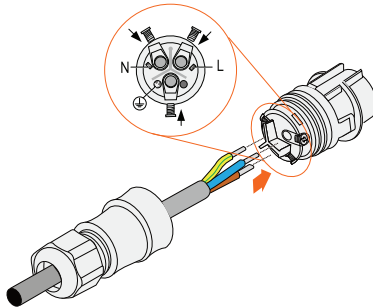
Step 1: Unscrew the water-proof terminal.

Step 2: Insert appropriately sized AC cables through the water-proof terminal.

Step 3: Strip off insulation layer of all AC cables. The length of stripped insulation is approximately 10mm.



Step 4: Fix all cables with screwdriver according to markings on the connector, especially the “PE” cable. If a phase wire is connected to the “PE” terminal, it may permanently destroy the inverter.



Step 5: Pull cables outward to check whether they are firmly installed.

Step 6: Combine the two front-end parts together until they make a clicking sound.

Step 7: Tighten the water-proof terminal in opposite direction.

6.4.3 AC Wiring Procedure

DANGER

Make sure that none of the DC or AC cables connected to the inverter is live before the electrical work.

DANGER

**Danger to human life due to high voltage existing inside the inverter!
Do not turn on the AC side circuit breaker until all inverter electrical connections have completed.**

NOTICE

Assignment of AC cables should be paid attention to, especially the “PE” wire.



No consuming load can be connected to power supply cables from the inverter to the AC circuit breaker.

Ensure that the ground cable is laid as far away from and not directly in parallel to the power supply cable.

Connect the inverter exclusively to TN or TT mains as the following procedures:

- Step 1** Disconnect AC circuit breaker and prevent it from reconnection inadvertently.
- Step 2** Plug AC connector into corresponding AC terminal underneath the inverter.
- Step 3** Connect “PE” cable to the grounding electrode. Where there are multiple inverters in the PV power system, connect “PE” cables of all inverters and the mounting frame of PV arrays to the same copper bus bar, which may establish equipotential connection.
- Step 4** Connect phase cable and “N” cable to the AC circuit breaker.
- Step 5** Check whether the cables are firmly secured.

6.5 Connecting Inverter to PV Arrays

DANGER

Lethal voltage exists!

PV arrays produce electrical energy when exposed to light and can thus create an electrical shock hazard. Wiring of the PV arrays should only be performed by qualified personnel.

6.5.1 DC Input Configuration Mode

The inverter has two PV input area DC1 and DC2 input, each with its MPP tracker. The two PV input can work in independent mode or parallel mode, set by LCD display menu (see "10.14.3 PV Configuration Mode Setting").

You may see technical information "*String inverters' work mode selection criteria and configuration*" in the Sungrow website to decide the PV configuration mode for inverter

NOTICE

There is a risk of inverter damage! The following requirements should be met, otherwise they will lead to loss of any or all warranty rights.

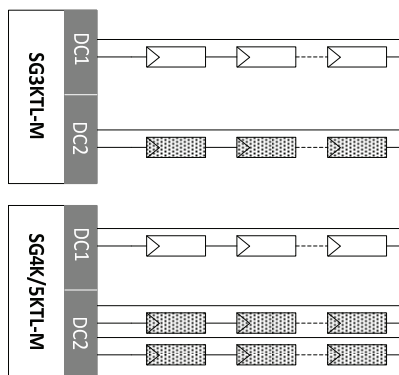
- **Make sure that the maximum short circuit current of each DC input is less than inverter allowable limit.**
- **The PV string should be designed to meet the open-circuit voltage requirement even under the lowest ambient temperature.**
- **The DC input mode you configure must be consistent with the mode set on the LCD display.**



If there is input line modifications, such as input line fall off, modify panels configuration, etc., you need to reset the work mode.

Independent Mode

In independent mode, two DC input areas working independently, as the following diagram shows.



To make sure the maximum DC power can be utilized, PV strings connected to individual input area should have a homogenous structure, i.e. same type, same number, identical tilt and identical orientation.

Prior to connecting inverter to PV inputs, following specifications should be observed:

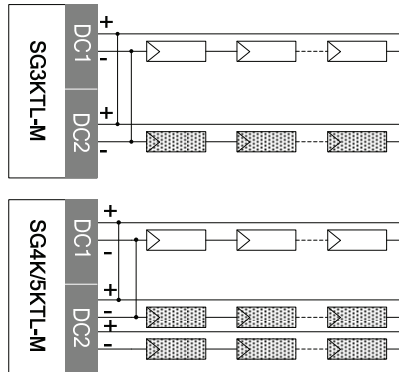
Type	Area	DC Power Limit for Each Input	Total DC Input Power Limit	Open-circuit Voltage Limit for Each Input	Short-circuit Current Limit for Each Input
SG3KTL-M	DC1	1650W	3200W	550V	12A
	DC2	1650W			12A
SG4KTL-M	DC1	2200W	4300W	550V	12A
	DC2	2800W			20A
SG5KTL-M	DC1	2750W	5400W	550V	12A
	DC2	3500W			20A



To avoid input power unbalance of the two inputs or input load-restriction, ensure the two PV input cables are of the same model.

Parallel Mode

In parallel mode, the PV inputs can be connected in parallel as the following diagram shows. One pair of DC terminals in DC1 input and DC2 input must be short-circuited by Y-type cable connector terminal.



* You may need to purchase Y-type cable connector terminals.



To make sure the maximum DC power can be utilized, PV strings connected to individual input area should have a homogenous structure, i.e. same type, same number, identical tilt and identical orientation.

Prior to connecting inverter to PV inputs, following specifications should be observed:

Type	Total DC Input Power Limit	Open-circuit Limit for Each Input	Voltage	Short-circuit Current Limit
SG3KTL-M	3200W	550V		24A
SG4KTL-M	4300W	550V		32A
SG5KTL-M	5400W	550V		32A



To avoid input power unbalance of the two inputs or input load-restriction, ensure the two PV input cables are of the same model.

6.5.2 Assembling DC Cable to Connector

All DC cables are equipped with water-proof direct plug-in connectors, which match the DC terminals at the bottom of the inverter.



The positive and negative connectors are marked with polarity symbols and should be equipped with correctly colored cable.

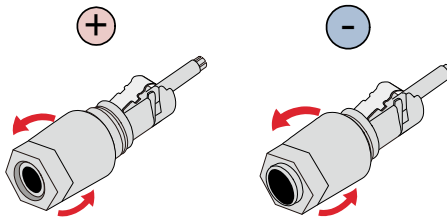
e.g. Red cable should be connected with DC positive terminal while the blue one be connected with the negative.

DC Cable Requirements

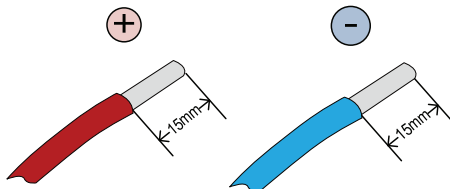
Type	Cross-Section Area Range	Outer Cable Diameters	Max. Withstand Voltage	Max. Withstand Current
SG3KTL-M/ SG4KTL-M/ SG5KTL-M	2.5...6mm ²	5...8mm	550 V	Same with short-circuit current.

DC Connector Assembling Procedure:

Step 1 Unscrew the water-proof terminal in the following direction.

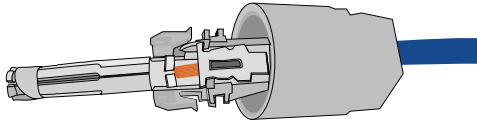


Step 2 Strip off insulation layer of DC cable. The length of stripped insulation is approximately 15mm.



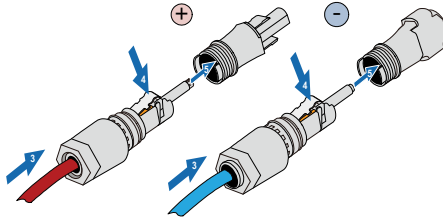
Step 3 Thread appropriately sized DC cable through the water-proof terminal and insert the stripped cable pin into the spring cage.

Step 4 Make sure that the stripped cable pin is correctly positioned.

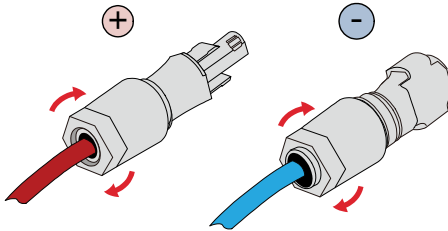


Step 5 Push down and click the spring clamp.

Step 6 Insert and click the cable clamp into the connector.



Step 7 Tighten the water-proof terminal with a torque $\geq 2\text{N}\cdot\text{m}$ via spanner (15).



For further assembly and connection instruction, please visit the webpage of the device manufacturer.

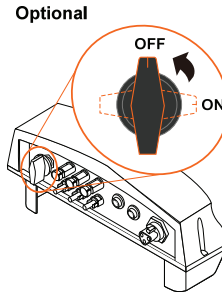
6.5.3 DC Wiring Procedure

⚠ DANGER

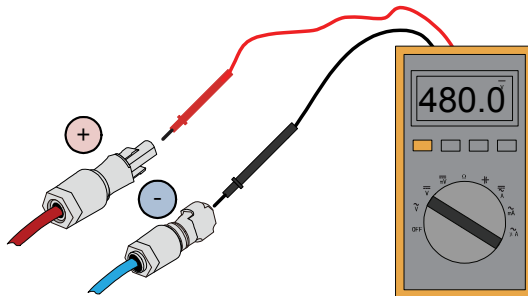
Make sure that none of the DC or AC cables connected to the inverter is live before the electrical work.

Connect the inverter to PV array as the following procedures:

Step 1 Rotate the optional DC switch at the bottom to the "OFF" position.



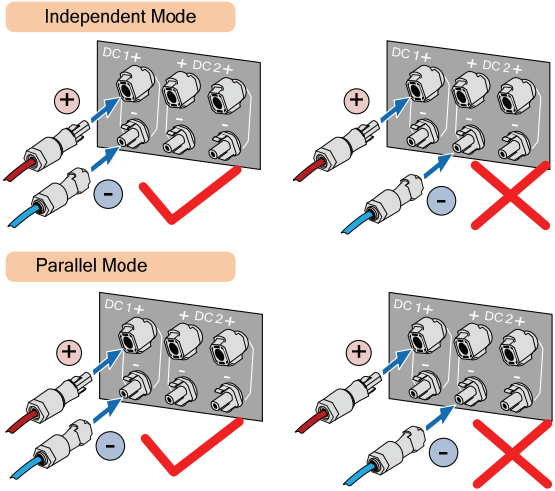
Step 2 Check the connection cable of PV string for the correct polarity and that the open circuit voltage does not exceed the inverter input limit 550V, even under the lowest operating temperature. Refer to module specification supplied by module manufacturer for detailed information.



Step 3 Plug the positive and negative DC connectors into corresponding terminals until there is an audible click.

NOTICE

Please avoid connecting the same PV string to terminals of different input areas. For example, the positive pole of a string is connected to input area DC1 and the negative one is connected to DC2.



* Image shown here is for reference only. Actual product you receive may differ.

Step 4 Connect the other two PV strings with the same procedures if necessary. Unused DC terminals should be sealed.

6.6 Grounding of Inverter

⚠ WARNING

Because of the transform-less design of the inverter, DC positive pole and DC negative pole are not permitted to be grounded. A permanent destroy to the inverter may follows if otherwise.

All non-current carrying exposed metal parts of the equipment and other enclosures in the PV power system should be grounded (e.g., PV arrays frame and inverter enclosure).

Where there is only one inverter in the PV power system, connect the “PE” cable to the installation ground.

Where there are multiple inverters in the PV power system, connect the “PE” cables of all inverters and mounting frame of PV arrays to the same copper bus bar. In this way, they are in equipotential connection.

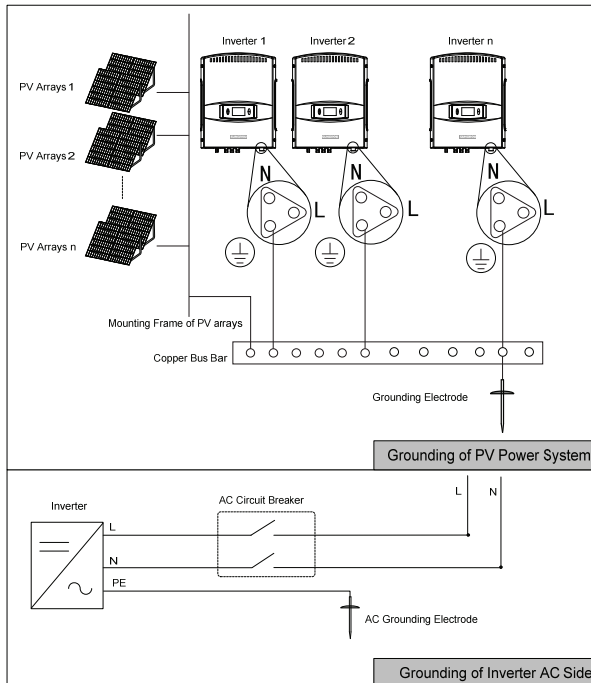


Fig. 6-3 Grounding Inverter

6.7 Communication Cable Connection

6.7.1 Communication System

Inverter provides multiple communication interfaces-RS485, WiFi and 4 dry contacts (optional, you may order it from Sungrow), and various communication methods.

- Where there is only one inverter, the communication connection between the inverter and PC can be established via WiFi or a RS485 cable.
- Where there are more than one inverter, all inverters can be connected to PC in daisy chain. The very first and last inverter in the chain must be terminated with a resistor of 120Ohm. The shielding layer of RS485 cable should be single-point grounded.
- A converter such as RS485-232 converter or SolarInfo Logger, which converts 485 to 232 signal, is needed between the inverter and PC.

The maximum number of inverters connected in the daisy chain depends on converter and other factors. Please refer to converter's manual to obtain the limit.

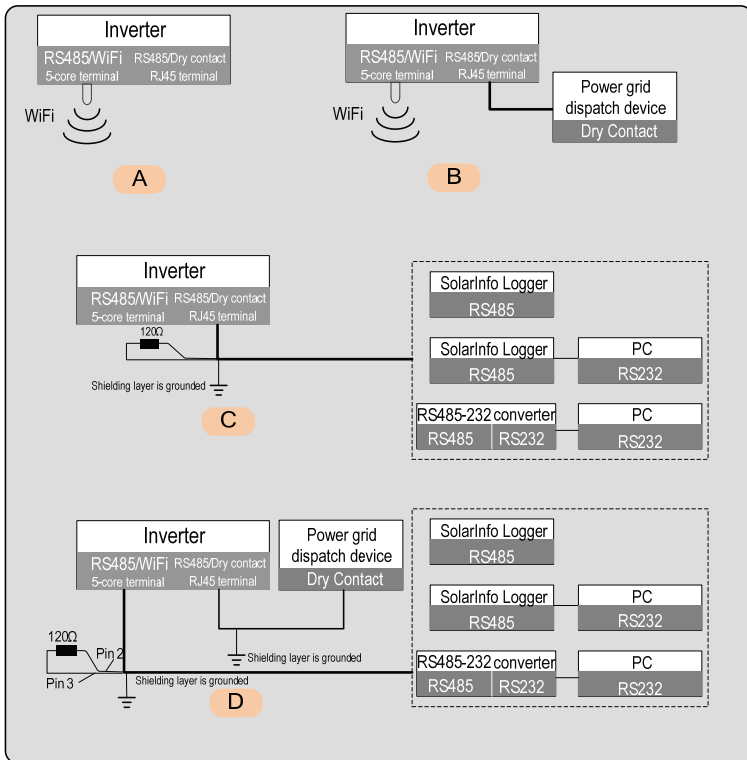
Before communication connection, prepare communication cable and RJ45 plug.

NOTICE

RS485 cable's requirements to ensure quality of communication:

- **Twist-pair type cable**
- **Twist-pair type shielding Ethernet cable**

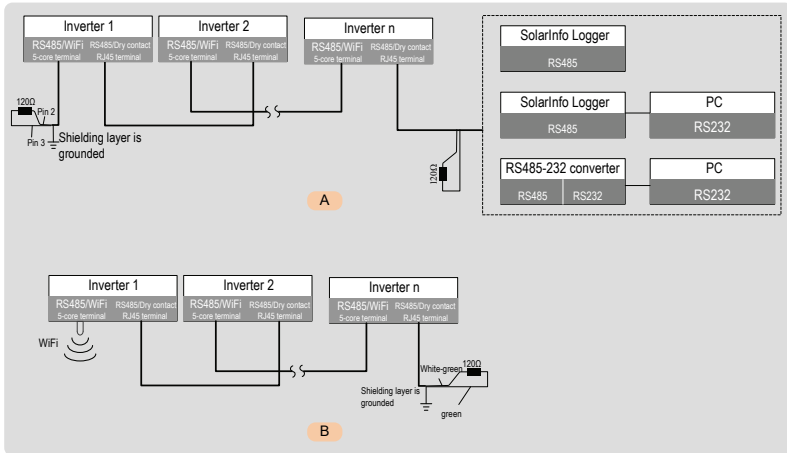
For Single Inverter



No.	Specification
A	Communication via WiFi only
B*	Communication via WiFi and dry contacts
C	Communication via RS485 only
D*	Communication via dry contacts and RS485

*Communication via dry contacts is an optional function. You may order and purchase them from Sungrow.

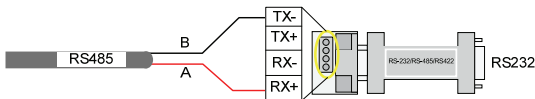
For Multiple Inverters



If the communication system is equipped with SolarInfo Logger, inverters may be dispatched by the power grid via dry contacts or remotely monitored via SolarInfo Bank.



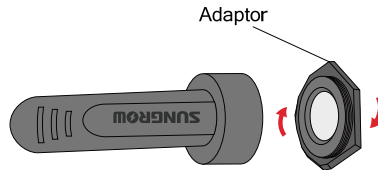
You may order SolarInfo Logger and/or SolarInfo Bank from the Sungrow.



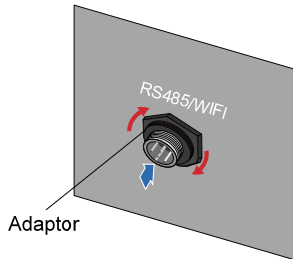
6.7.2 Communication Connection

WiFi connection to 5-pin terminal

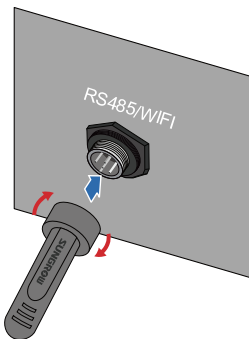
Step 1 Unscrew the adaptor from SolarInfo WiFi in the following direction.



Step 2 Screw the adaptor to RS485/WiFi connector with appropriate torque.



Step 3 Connect SolarInfo Wireless or SolarInfo WiFi to the 5-pin terminal by plugging-in and tightening the cable gland.



NOTICE

Please cut off the power supply of the inverter before plugging WiFi.

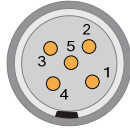


You may order and purchase SolarInfo Wireless or SolarInfo WiFi from Sungrow.

RS485 connection to 5-pin terminal

The 5 pins of the terminal are defined as below.

RS485/WIFI



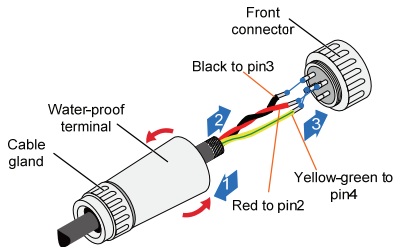
- 1 Vcc(+5V)
- 2 A RS485
- 3 B RS485
- 4 GND
- 5 Null

Connector assembling and connecting procedures:

Step 1 Unscrew the water-proof terminal.

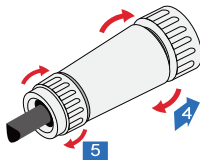
Step 2 Lead the twist-pair shielding cable through cable gland.

Step 3 Weld the cables to the pins.

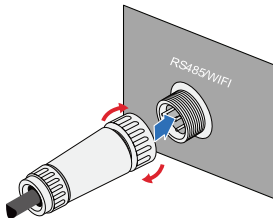


Step 4 Connect the water-proof terminal to the front connector.

Step 5 Tighten the water-proof cable gland.

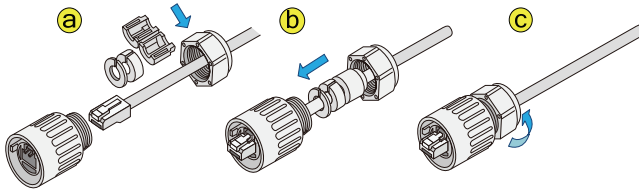


Step 6 Plug in and tighten the connection.



RS485 connection on RJ45 terminal

Step 1 Insert the RJ45 plug into the front plug connector until it makes a clicking sound, install the plastic rings then tighten the cable gland with appropriate torque.

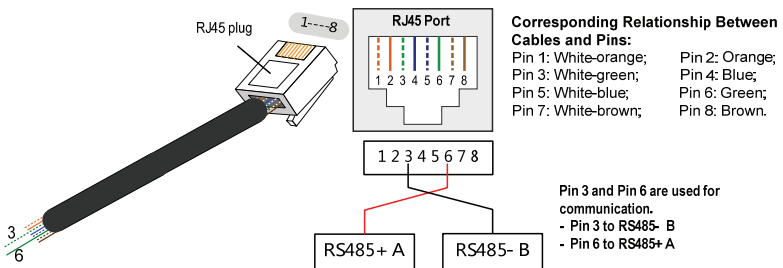


Step 2 Insert connector of one cable end into RS485 5-pin terminal on the bottom of the inverter. Make connector and RS485 terminal engage and rotate clockwise.

Step 3 According to the position of the inverter, repeat step 1...2 to connect the other communication cables.

Step 4 Pull cables outwards to confirm whether they are fastened firmly.

Step 5 As for the wires which connect to the terminating resistor or logging devices, use the Ethernet wire stripper to strip the insulation layer and connect the RS485 A and B cables (3 and 6) to terminating resistor or data logging device or RS 485-232 converter.



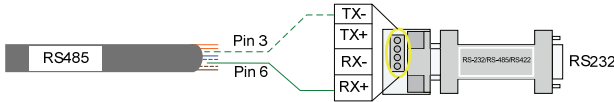
Step 6 Connect the other devices. Communication terminal definition is referred to device manual.

Step 7 Verify the communication connection and configure the communication parameters.



If there is more than one inverter to communicate with a PC or a data logger, it is crucial to configure the communication parameters of each inverter. See "10.14 Communication Parameters Setting".

SolarInfo logger and RS485-232 converter are optional parts and can be ordered from Sungrow.



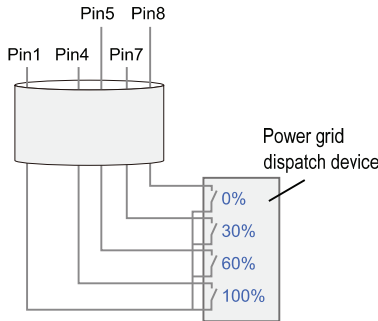
Dry contacts on RJ45 terminal (Optional)

Inverter may perform power derating upon receiving the power limited signal via dry contact communication.



Communication via dry contacts is an optional function. You may order and purchase them from Sungrow.

When short-circuit two specific pins, the inverter will decrease the power output to corresponding percentage. The pins' function definition for power limitation is shown below, e.g. short-circuit Pin 1 and Pin 5, the output power limitation is set as 60%.



The connection procedures of the dry contacts to RJ45 terminal are the same as the RS485 connection to RJ45 terminal.

7 Commissioning

7.1 Verify before Commissioning

Before starting up the inverter, you should check the following items.

1. Inverter unit is accessible for operation, maintenance and service.
2. Re-check whether the inverter is firmly secured to the wall.
3. Room for ventilation is provided for one inverter or more than one inverter.
4. Nothing is left on top of the inverter.
5. Inverter and accessories are correctly connected.
6. Cables are routed in safe place or protected against mechanical damages.
7. Specification of AC circuit breaker is reasonable.
8. Terminals unused underneath the inverter are sealed.
9. Warning signs & labels are suitably affixed and durable.

7.2 Commissioning Procedure

1. Make sure all the above mentioned items meet the requirements.
2. Disconnect the external AC circuit breaker.
3. Rotate the optional DC switch to the "ON" position.

Provided that there is sufficient sunlight:

- PV arrays initialize and supply DC power to inverter;
 - DC bus starts to charge and check the state of the utility grid;
 - If the conditions are OK, inverter feeds AC power to grid and enters into the running state.
4. Observe the status of LED indicators and LCD screen.



- If inverter's commissioning fails, "FAULT" indicator will be lit. "State" in the LCD screen will display the type of fault. The fault must be removed before repeating from step1 to step 4.
- If inverter's commissioning succeeds, "RUN" indicator will be lit. "State" in the LCD screen will display "RUN".

8 Disconnecting, Dismantling and Disposing of the Inverter

8.1 Disconnecting the Inverter

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

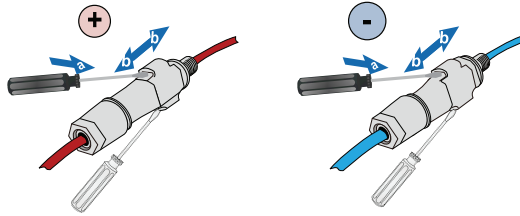
Proceed as follows to disconnect the inverter from the AC and DC power source. Lethal voltages or damages to the inverter will follow if otherwise.

1. Disconnect the external AC circuit breaker and prevent it from reconnecting.
2. Turn off the upstream DC circuit break or cover the PV arrays with opaque materials. Rotate DC switch at the bottom of inverter to the "OFF" position.

NOTICE

Please strictly follow the sequence of the above procedures. Otherwise it will cause unrecoverable damage to the inverter.

3. Wait about ten minutes until the capacitors inside the inverter are discharged.
4. Measure to confirm that the inverter AC output at the AC circuit breaker is voltage free.
5. Pull AC connector out of the inverter.
6. Release the locking part of the DC connectors.
 - Insert the screwdriver SZF1 or phase tester following the positions illustrated below.
 - Leave the screwdriver inserted and remove the connector from the socket.



For further disconnection and conductor reconnection instruction, please visit the webpage of device manufacturer.

8.2 Dismantling the Inverter

Refer to Chapter 6 for the inverter disconnection of all cables in reverse steps.

CAUTION

There is a risk of burn injuries and electric shock!

Wait at least 10 minutes after disconnecting the inverter from the utility grid and the PV input before touching any inner live parts.

Open the theftproof padlock and dismantle the inverter referring to Chapter 5 in reverse steps.

If necessary, remove the backplate from the wall.

NOTICE

If the inverter will be reinstalled in the future, please refer to “4 Unpacking and Storage” for a proper conservation.

8.3 Disposing of the Inverter

Users should take the responsibility for the disposal of the inverter.

NOTICE

Some parts and devices of the inverter, such as, LCD display, batteries, capacitors, may cause environment pollution.

Disposal of the inverter must comply with the related local regulations to avoid the potential pollution.

9 Troubleshooting and Maintenance

9.1 LED Indicator Troubleshooting

See 2.2.3 LCD Display Panel for the definition of LED's status.

Type of fault	Troubleshooting
LED indicators and LCD cannot be lit.	<ol style="list-style-type: none"> 1. Disconnect the AC circuit breaker. 2. Rotate the optional DC switch to the "OFF" position. 3. Check the polarity of DC input.
"RUN" indicator goes out.	<ol style="list-style-type: none"> 1. Disconnect the AC circuit breaker. 2. Rotate the optional DC switch to the "OFF" position. 3. Check the correctness of the inverter electrical connection. Refer to 6 Electrical Connection. 4. Check whether the voltage of DC input exceeds the inverter start-up voltage. 5. If all above conditions are OK, please contact Sungrow.
"Fault" indicator is lit.	<ol style="list-style-type: none"> 1. A fault is not removed yet. 2. Perform troubleshooting according to the fault type in LCD screen. 3. If it cannot be solved, please contact Sungrow.

9.2 Troubleshooting of Faults in LCD Screen

Fault	Cause	Troubleshooting
Vdc1high	The DC input voltage of PV1 exceeds the allowable threshold.	<ol style="list-style-type: none"> 1. Rotate the optional DC switch to the "OFF" position immediately. 2. Measure the open circuit voltage of PV1 string again. Decrease the number of PV modules in PV1 string if the voltage measured is not permissible. 3. Reconnect the DC cables to the inverter and start up the inverter. 4. If the fault still exists, contact Sungrow Service Dept..

Fault	Cause	Troubleshooting
Vdc2high	The DC input voltage of PV2 exceeds the allowable threshold.	<ol style="list-style-type: none"> 1. Rotate the optional DC switch to the "OFF" position immediately. 2. Measure the open circuit voltage of PV2 strings again. Decrease the number of PV modules in PV2 strings if the voltage measured is not permissible. 3. Reconnect the DC cables to the inverter and start up the inverter. 4. If the fault still exists, contact Sungrow Service Dept..
Idc1high	The DC input current of PV1 exceeds the allowable threshold.	<ol style="list-style-type: none"> 1. Rotate the optional DC switch to the "OFF" position immediately. 2. Measure the short-circuit current of PV1 string again. Decrease the number of PV1 strings in serial if the current measured is not permissible. 3. Reconnect the DC cables to the inverter and start up the inverter. 4. If the fault still exists, contact Sungrow Service Dept..
Idc2high	The DC input current of PV2 exceeds the allowable threshold.	<ol style="list-style-type: none"> 1. Rotate the optional DC switch to the "OFF" position immediately. 2. Measure the short-circuit current of PV2 strings again. Decrease the number of PV2 strings in serial if the current measured is not permissible. 3. Reconnect the DC cables to the inverter and start up the inverter. 4. If the fault still exists, contact Sungrow Service Dept..
Vac-low	The grid voltage falls below the allowable minimum grid voltage threshold of the installation country.	<ol style="list-style-type: none"> 1. Check the voltage of the grid. 2. If the grid voltage exceeds the permissible range of inverter protective parameters, ask the utility grid company for solution.
Vac-high	The grid voltage exceeds the allowable maximum threshold of the installation country.	<ol style="list-style-type: none"> 3. If the grid voltage is within the permissible range, contact Sungrow Service Dept..
F-fault	The grid frequency exceeds the permissible range.	<ol style="list-style-type: none"> 1. Check the frequency of the grid. 2. If the grid frequency exceeds the permissible range of inverter protective

Fault	Cause	Troubleshooting
		<p>parameters, ask the utility grid company for solution.</p> <p>3. If the grid voltage is within the permissible range, contact Sungrow Service Dept..</p>
No-grid	Grid is not present.	<p>1. Check whether the AC circuit breaker is triggered.</p> <p>2. Check whether all AC cables are firmly connected.</p> <p>3. Check whether the grid is out of service.</p> <p>4. If all conditions are OK and this malfunction still occurs in the LCD screen, contact Sungrow Service Dept. for solution.</p>
Temp-flt	The ambient temperature of the inverter is too high	<p>1. The installation site may not be optimal.</p> <p>2. Too much dirt on the fans.</p> <p>3. Check the fans for abnormal noise. Replace the broken fan if necessary.</p> <p>4. Heat sink is covered.</p> <p>5. If the fault still exists, contact Sungrow Service Dept..</p>
Samp-flt	Malfunction of the sample circuit.	Contact Sungrow Service Dept. for solution.
Earth-flt	Earth fault.	<p>1. Check the grounding connection of the PV arrays.</p> <p>2. Check the grounding/PE connection of the inverter.</p> <p>3. Contact Sungrow Service Dept. for solution.</p>
Bus-high	The Bus voltage exceeds the limit.	<p>1. Rotate the optional DC switch to the "OFF" position immediately.</p> <p>2. Measure the short-circuit current of PV1 string again. Decrease the number of PV1 strings in serial if the current measured is not permissible.</p> <p>3. Reconnect the DC cables to the inverter and start up the inverter.</p> <p>4. If the fault still exists, contact Sungrow Service Dept..</p>
Relay-flt	Malfunction of the inverter relay.	Contact Sungrow Service Dept. for solution.
RISO-flt	Resistance between the PV panels and the earth is too low.	Rain or moisture may result in this fault. Wait a moment for inverter recovery.

Fault	Cause	Troubleshooting
lac-high	The AC output current is too high.	Power grid exception may cause this fault. Wait a moment for inverter recovery. If the fault occurs repeatedly, contact Sungrow Service Dept. for solution.
Fan-flt	Fan's defect.	Contact Sungrow Service Dept. for solution.
DC inject	DC injection of inverter output current is too high	Contact Sungrow Service Dept. for solution.
HRDW Pro	Malfunction of hardware resulted from overvoltage of the bus, over-current of the output or input current.	Wait a moment for inverter recovery. If the fault continues for an hour, contact Sungrow Service Dept..
Acce-flt	The PV configuration mode set is not in accordance with the configuration of the actual electrical connection.	1. Disconnect the inverter. 2. Re-select the PV configuration mode or re-connect the DC inputs.
Com-err	LCD has failed to communicate with DSP for over 20 times.	1. If this malfunction happens, wait for a while and observe whether the fault can be cleared by the inverter itself. 2. Perform the "Stop" command in the LCD display. 3. Perform the "Start" command to restart the inverter. 4. If the fault still exists, contact Sungrow Service Dept..



Should you have any questions in operating the inverter, please contact us:

Telephone: +86 551 6532 7817.

Email: service@sungrow.cn

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

- Type of the inverter
- Serial number of the inverter
- Fault name (Each fault has a corresponding fault code, for example, 01 represents sampling fault.)
- Brief description of the fault phenomenon

9.3 Maintenance

9.3.1 Routine Maintenance

Items	Methods	Period
Save data	Save the running data, parameters and log to a disk or a file.	Once a month
General state of system	Visual check any damage or deformation of the inverter. Check any abnormal noise during the running of the inverter. Check each parameter of inverter operation. Check if the temperature of the housing is normal. Monitor the system using the thermal imager.	Every 6 months
System clean	Check the temperature and dust of the inverter. Clean the inverter enclosure. Check the humidity and dust of the environment. Meanwhile check whether the filter function of the air inlet is ok. Clean the air inlet and outlet, when necessary.	Six months to a year (it depends on the dust contents in air.)
Electrical connection	Check whether cable connections are loose. Tighten the loose connections. Check whether there is injury in the cables, especially the surface in contact with metal. Check whether the wrap belt of the connection terminals is strip-off.	Six months after commissioning and then once or twice a year.
Fans	Check whether there is crack of the fan blade Check whether there is any abnormal noise of the fan turning. Clean or replace the fans.	Once a year
Safety function	Check the LCD stop and emergency stop circuit of the system. Simulate shutdown and check stop signal communication. Check the warning labels, and replace them if necessary.	Once or twice a year
Software	Software optimization. Check the setting of every parameter.	Once or twice a year

9.3.2 Fan Cleaning and Replacement

DANGER

- **Disconnect the inverter from the grid first and then PV arrays before any maintenance work.**
- **Lethal voltage still exists in the inverter. Please wait at least ten minutes and then perform maintenance work.**
- **Fans' maintenance work may only be performed by qualified electricians.**

Fan Cleaning

There is a fan on the rear of the inverter for ventilation. It is recommended that the fans are cleaned every six months.

Procedure:

1. Disconnect the output and input side.
2. Wait at least ten minutes.
3. Dismantle the inverter in the reversed direction of "Installation procedure".
4. Loosen the two fixed screws on the back of the inverter.
5. Clean the fan with soft brush or vacuum cleaner.
6. Reinstall the inverter.
7. Re-connect the inverter.
8. Restart the inverter.

Fan Replacement

If the fan is overheat or makes an abnormal noise, please replace the fan. This task should only be performed by qualified technician.

10 Operation of LCD Menu

10.1 Button Function

Inverter offers two buttons for user to look up the running information and configure parameters. User should know the button function and operation before any work on the inverter.

Tab. 10-1 Description of Button Function

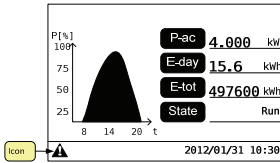
Button	Operation	Description
"ESC/▼"	Press for less than two seconds	Move the arrow upwards/downwards in the screen to increase/decrease the setting value. It is referred to as "Short press ESC/▼" hereinafter.
	Press for more than two seconds	Return to the parent menu or cancel the command. It is referred to as "Long press ESC/▼" hereinafter.
"ENTER/▶"	Press for less than two seconds	Move the arrow left or right in the screen. It is referred to as "Short press ENTER/▶" hereinafter.
	Press for more than two seconds	Enter into the sub-screen or confirm the command. It is referred to as "Long press ENTER/▶" hereinafter.



- When the two buttons are pressed simultaneously for over three seconds, the inverter will stop running and enter into the "key-stop" state.
- The backlight of LCD screen will go out to save power if there is no button operation for one minute. Press any button to reactivate it.

10.3 The Default Screen

The LCD is initialized when the inverter is energized delay 5 seconds and then enters into the default menu.



The default screen displays basic running information.

“P-ac” means the current output power of the inverter.

“E-day” means the energy output the current day.

“E-tot” means the overall accumulative energy output.

“State” shows the inverter’s operation mode.

Current date and time are also displayed.



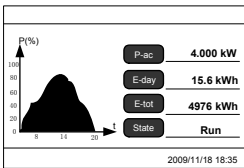
If there is no button operation for two minutes, it will go back to default menu.

Icon	Description
------	-------------

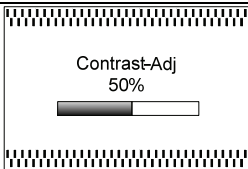
	Fan-flt signal
--	----------------

Fan-flt icon will appear on the lower left corner of the LCD display once a fan-flt signal is detected. Yet no logs will be recorded and the “fault” indicator won’t be lit. The fan-flt icon will disappear after the fan-flt is eliminated.

10.4 Adjusting Contrast



1. Long press “ESC/▼” to enter into the contrast adjustment screen.

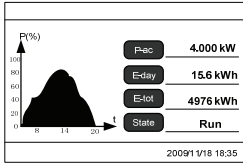


2. Short press “ESC/▼” to increase the setting value and short press “ENTER/►” to decrease the value.

Contrast value ranges from 0 % (min.) to 100 % (max.).

Recommended contrast value is 50%.

10.5 Current Running Information Checking



1. Long press “ENTER/▶” to enter into the general control screen.

DC power input		
	PV1	PV2
Vdc[V]	0.0	0.0
Idc[A]	0.0	0.0
Pdc[W]	0	0

2. Short press “ESC/▼” to view the current running information. Short press “ESC/▼” to turn pages.

DC power input: lifetime input of PV1 and PV2.

V-dc: DC voltage of PV arrays

I-dc: DC current of PV arrays

P-dc: DC power of the PV arrays

Indep mode: Independent mode

P-ac: AC Power output

V-grid: Voltage of utility grid

I-grid: AC current output

F-grid: Frequency of utility grid

Temp: Current temperature of the inverter

Country: The country where the inverter is installed.

E-day: The energy output today.

E-tot: The total energy output of the inverter.

CO2-reduce: Amount of CO2 reduction

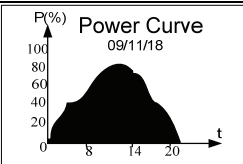
E-month: Accumulative power output in the current month

T-tot: Accumulative running time

T-day: Running time today

P-ac	0000W
V-grid	220.0V
I-grid	18.2A
F-grid	50.0Hz
Temp	49.5°C
Country	GB

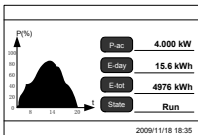
E-day	50kWh
E-tot	4976kWh
CO2-reduce	2976kg
E-month	450kWh
H-tot	1567h
T-day	246min



10.6 Historical Information Checking

10.6.1 Running Record Checking

Inverter archives the running information every fifteen minutes during inverter operation. User can view the historical running records by the following procedures.



1. Long press "ENTER/▶" to enter into the general control screen.

▶ His-inform
Start/Stop
Set-param

2. Short press "ESC/▼" to navigate the arrow-pointer to "His-inform".

3. Long press "ENTER/▶" to enter into its sub-screen.

▶ Run-record
Fault-record

4. Short press "ESC/▼" to navigate the arrow-pointer to "Run-record".

5. Long press "ENTER/▶" to enter into its sub-screen.

P1/2 Run-record T[2]
▶ 2009/11/17(50)
2009/11/16(32)

6. Short press "ESC/▼" to navigate the arrow-pointer to the historical time you want to check.

7. Long press "ENTER/▶" to enter into its sub-screen.

P24/50	2009/11/17	18:35
	PV1	PV2
Vdc[V]	0.0	0.0
Idc[A]	0.0	0.0
Pdc[W]	0	0

8. Short press "ESC/▼" to move to the next screen of the same page. Short press "ENTER/▶" to turn pages.

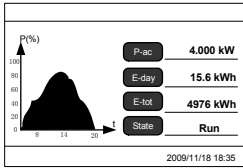
"P24/50": There are totally 50 running records and here is the 24th record.

P24/50	2009/11/17	18:35
P-ac	0000W	
V-grid	220.0V	
I-grid	18.2A	
F-grid	50.0Hz	
Country	GB	

P24/50	2009/11/17	18:35
E-day	15.6kWh	
E-tot	497600kWh	
Temp	49.5°C	
State	Run	

10.6.2 Fault Record Checking

Inverter archives the types of malfunctions and the duration of malfunctions during inverter operation. User can view the historical fault records by the following procedures.



1. Long press "ENTER/▶" to enter into the general control screen.

▶ His-inform
Start/Stop
Set-param

2. Short press "ESC/▼" to navigate the arrow-pointer to "His-inform".

3. Long press "ENTER/▶" to enter into its sub-screen.

Run-record
▶ Fault-record

4. Short press "ESC/▼" to navigate the arrow-pointer to "Fault-record".

5. Long press "ENTER/▶" to enter into its sub-screen.

P1/1 Fault-rec T[2]
1> 2009/11/05 09:15:59
Samp-flt 0001
2> 2009/11/05 09:15:59
Vac-high 261.0V

6. Short press "ESC/▼" to move to the next fault record in the same page. Short press "ENTER/▶" to turn pages.

"P1/1": There are fault records of one page in total and here is the first page.

"T[2]": The total number of fault records is two.



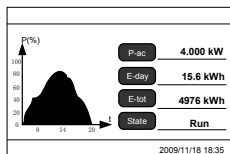
The inverter can only archive at most 20 latest fault records.
Refer to 9 Troubleshooting for fault explanation and troubleshooting.

10.7 Language Setting

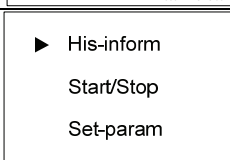
Input the correct password of 1111 to set the inverters' parameters.

There are system parameters, running parameters, protective parameters and communication parameters to be set.

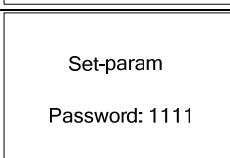
Inverter supports four different languages: English, German, French and Italian. Language can be configured as follows.



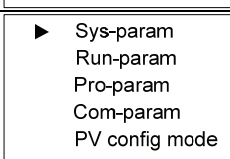
1. Long press "ENTER/▶" to enter into the general control screen.



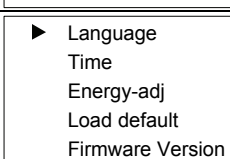
2. Short press "ESC/▼" to navigate the arrow-pointer to "Set-param".
3. Long press "ENTER/▶" to enter into its sub-screen.



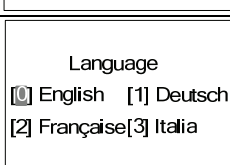
4. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the correct password 1111.
5. Long press "ENTER/▶" to confirm the command.



6. Short press "ESC/▼" to navigate the arrow-pointer to "Sys-param".
7. Long press "ENTER/▶" to enter into its sub-screen.



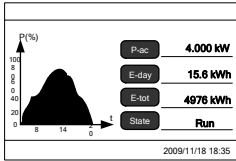
8. Short press "ESC/▼" to navigate the arrow-pointer to "Language".
9. Long press "ENTER/▶" to enter into its sub-screen.



10. Short press "ESC/▼" to navigate the cursor to select the number that represents language.
11. Long press "ENTER/▶" to confirm the selection.

10.8 Time Setting

Deviation from the local time will directly affect the data logging. Perform the “set time” operation if necessary.

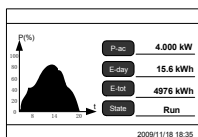


<p>His-inform Start/Stop ▶ Set-param</p>	<p>1. Long press “ENTER/▶” to enter into the general control screen.</p> <p>2. Short press “ESC/▼” to navigate the arrow-pointer to “Set-param”.</p> <p>3. Long press “ENTER/▶” to enter into its sub-screen.</p>
<p>Set-param Password: 1111</p>	<p>4. Short press “ENTER/▶” to move right and short press “ESC/▼” to set the correct password 1111.</p> <p>5. Long press “ENTER/▶” to confirm the command.</p>
<p>▶ Sys-param Run-param Pro-param Com-param PV config mode</p>	<p>6. Short press “ESC/▼” to navigate the arrow-pointer to “Sys-param”.</p> <p>7. Long press “ENTER/▶” to enter into its sub-screen.</p>
<p>Language ▶ Time Energy-adj Load default Firmware Version</p>	<p>8. Short press “ESC/▼” to navigate the arrow-pointer to “Time”.</p> <p>9. Long press “ENTER/▶” to enter into its sub-screen.</p>
<p>Time Date: 09/11/18 Time: 18:35:55</p>	<p>10. Short press “ENTER/▶” to move right and short press “ESC/▼” to set the time.</p> <p>11. Long press “ENTER/▶” to confirm the setting.</p>

10.9 Energy Deviation Adjustment

NOTICE

The energy yields displayed by the LCD panel are indicative only. For the actual yields, please refer to the electric energy meter.



1. Long press "ENTER/▶" to enter into the general control screen.

<p>His-inform</p> <p>Start/Stop</p> <p>▶ Set-param</p>	<p>2. Short press "ESC/▼" to navigate the arrow-pointer to "Set-param".</p> <p>3. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>Set-param</p> <p>Password: 1111</p>	<p>4. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the correct password 1111.</p> <p>5. Long press "ENTER/▶" to confirm the command.</p>
<p>▶ Sys-param</p> <p>Run-param</p> <p>Pro-param</p> <p>Com-param</p> <p>PV config mode</p>	<p>6. Short press "ESC/▼" to navigate the arrow-pointer to "Sys-param".</p> <p>7. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>Language</p> <p>Time</p> <p>▶ Energy-adj</p> <p>Load default</p> <p>Firmware Version</p>	<p>8. Short press "ESC/▼" to navigate the arrow-pointer to "Energy-adj".</p> <p>9. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>Energy-adj</p> <p>+0000kWh</p>	<p>10. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the deviation value.</p> <p>11. Long press "ENTER/▶" to confirm the setting.</p> <p>(Energy-adj value)= (Real measured value)-(E-tot reading value).</p>

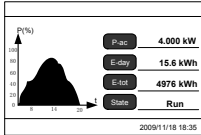


The positive symbol "+" can also be changed into the negative symbol "-". The adjustable range is from -9999 to +9999 kWh

10.10 Load Default

NOTICE

If you perform the “Load default” operation, all running information and historical information will be unrecoverable cleared.



1. Long press “ENTER/▶” to enter into the general control screen.

His-inform

Start/Stop

▶ Set-param

2. Short press “ESC/▼” to navigate the arrow-pointer to “Set-param”.

3. Long press “ENTER/▶” to enter into its sub-screen.

Set-param

Password: 1111

4. Short press “ENTER/▶” to move right and short press “ESC/▼” to set the correct password 1111.

5. Long press “ENTER/▶” to confirm the command.

▶ Sys-param
Run-param
Pro-param
Com-param
PV config mode

6. Short press “ESC/▼” to navigate the arrow-pointer to “Sys-param”.

7. Long press “ENTER/▶” to enter into its sub-screen.

Language

Time

Energy-adj

▶ Load default

Firmware Version

8. Short press “ESC/▼” to navigate the arrow-pointer to “Load default”.

9. Long press “ENTER/▶” to enter into its sub-screen.

Load default

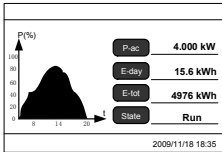
Password:1111

10. Short press “ENTER/▶” to move right and short press “ESC/▼” to input the password 1111.

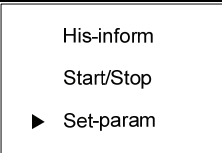
11. Long press “ENTER/▶” to confirm the setting.

10.11 Firmware Version Checking

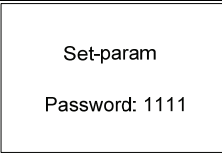
User can only view the firmware version.



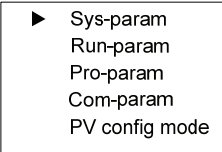
1. Long press "ENTER/▶" to enter into the general control screen.



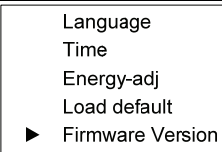
2. Short press "ESC/▼" to navigate the arrow-pointer to "Set-param".
3. Long press "ENTER/▶" to enter into its sub-screen.



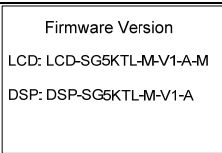
4. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the correct password 1111.
5. Long press "ENTER/▶" to confirm the command.



6. Short press "ESC/▼" to navigate the arrow-pointer to "Sys-param".
7. Long press "ENTER/▶" to enter into its sub-screen.



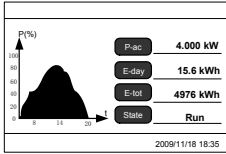
8. Short press "ESC/▼" to navigate the arrow-pointer to "Firmware Version".
9. Long press "ENTER/▶" to enter into its sub-screen.



10. Long press "ENTER/▶" to view the firmware version.

* Image shown here is for reference only. Actual product you receive may differ.

10.12 Running Parameters Setting



<p>His-inform Start/Stop ▶ Set-param</p>	<p>1. Long press "ENTER/▶" to enter into the general control screen.</p> <p>2. Short press "ESC/▼" to navigate the arrow-pointer to "Set-param".</p> <p>3. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>Set-param Password: 1111</p>	<p>4. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the correct password 1111.</p> <p>5. Long press "ENTER/▶" to confirm the command.</p>
<p>Sys-param ▶ Run-param Pro-param Com-param PV config mode</p>	<p>6. Short press "ESC/▼" to navigate the arrow-pointer to "Run-param".</p> <p>7. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>Standby time 010s Recover time 030s Power limit 100% Power factor +1.000</p>	<p>8. Short press "ENTER/▶" to move right and short press "ESC/▼" to configure the running parameters.</p> <p>9. Long press "ENTER/▶" to confirm the setting.</p>



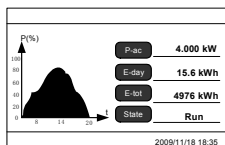
"Standby time" is the time from inverter initializes to feeds power to grid. This parameter ranges from 10s to 255s. The default value is 10s.

"Recover time" is the time from the fault is cleared to inverter recovers to feed power to grid. It ranges from 30s to 300s. The default value is 30s.

10.13 Protective Parameters Setting

These protective parameters are designed as the limit value that can trigger the protective functions of the inverter.

The protective parameters have been configured before delivery and the users do not need to set these parameters. The password, therefore, is only available to the installer through Sungrow to configure parameters.



1. Long press "ENTER/▶" to enter into the general control screen.

<p>His-inform</p> <p>Start/Stop</p> <p>▶ Set-param</p>	<p>2. Short press "ESC/▼" to navigate the arrow-pointer to "Set-param".</p> <p>3. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>Set-param</p> <p>Password: 1111</p>	<p>4. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the correct password 1111.</p> <p>5. Long press "ENTER/▶" to confirm the command.</p>
<p>Sys-param</p> <p>Run-param</p> <p>▶ Pro-param</p> <p>Com-param</p> <p>PV config mode</p>	<p>6. Short press "ESC/▼" to navigate the arrow-pointer to "Pro-param".</p> <p>7. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>Pro-param</p> <p>Password: 000000</p>	<p>8. Enquire Sungrow or the dealer about the password.</p>
<p>Country Setting</p> <p>[0]GB [1]DE</p> <p>[2]FR [3]IT</p> <p>[4]ES [5]AT</p> <p>[6]AU [7]CZ</p> <p>[8]BE [9]Other</p>	<p>9. Each abbreviation represents a protective parameter.</p>

Vgrid-max	260V
Vgrid-min	195V
Fgrid-max	50.2Hz
Fgrid-min	49.7Hz

10. If you selected "Other", Long press "ENTER/▶" to enter into its sub-screen to set the protective parameter.

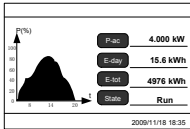
Tab. 10-2 Description of the Protective Parameters

Code	Full Name	Code	Full Name
GB	Great Britain	AT	Austria
DE	Germany	AU	Australia
FR	France	CZ	Czech
IT	Italia	BE	Belgium
ES	Spain	Other	-

10.14 Communication Parameters Setting

The inverter can be remotely monitored and controlled. The communication parameters of the inverter should be configured before connecting to upper computer as follows:

10.14.1 Address Setting



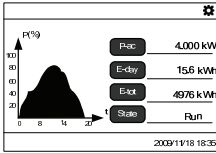
1. Long Press "ENTER/▶" to enter into the general control screen.

<p>His-inform Start/Stop ▶ Set-param</p>	<p>2. Short press "ESC/▼" to navigate the arrow-pointer to "Set-param". 3. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>Set-param Password: 1111</p>	<p>4. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the correct password 1111 5. Long press "ENTER/▶" to confirm the command.</p>
<p>Sys-param Run-param Pro-param ▶ Com-param PV config mode</p>	<p>6. Short press "ESC/▼" to navigate the arrow-pointer to "Com-param". 7. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>Com-param ▶ Address RF address</p>	<p>8. Short press "ESC/▼" to navigate the arrow-pointer to "Address". 9. Long press "ENTER/▶" to confirm the setting.</p>
<p>Com-param Address: 001</p>	<p>10. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the address. 11. Long press "ENTER/▶" to confirm the setting.</p>



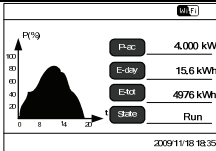
The range of communication address is from 1 to 247.
The Baud rate of serial communication is 9600.

10.14.2 Wireless Address Setting

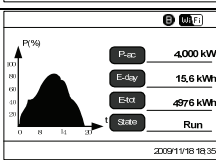


1. WiFi configuration icon will appear on the LCD screen automatically 30s after the LCD is energized.

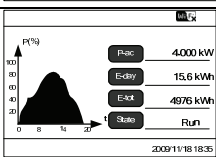
2. If you succeed in configuring WiFi within 15 minutes, WiFi will automatically connect to the Router selected while the configuration icon will disappear.



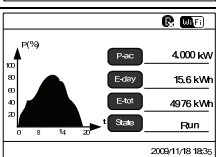
3. The connection is in process if icon located on the upper right corner of the LCD display blinks every 0.5s. icon will stay on if the connection is completed.



4. If WiFi has connected to the router, it will send data to the SolarInfo Bank server after 5minutes. The Bank icon will display on the LCD indicating that WiFi has connected to the Bank.



5. If WiFi is disconnected from the Router or Bank, WiFi connection fail icon or Bank connection fail icon will appear.



If the information of the configured router is incorrect, please disconnect and re-connect DC input to reconfigure parameters.

His-inform

Start/Stop

▶ Set-param

6. Short press "ESC/▼" to navigate the arrow-pointer to "Set-param".

7. Long press "ENTER/▶" to enter into its sub-screen.

Set-param

Password: 1111

8. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the correct password 1111

9. Long press "ENTER/▶" to confirm the command.

Sys-param Run-param Pro-param ▶ Com-param PV config mode	10. Short press "ESC/▼" to navigate the arrow-pointer to "Com-param". 11. Long press "ENTER/▶" to enter into its sub-screen.
Com-param Address ▶ RF address	12. Short press "ESC/▼" to navigate the arrow-pointer to "RF Address". 13. Long press "ENTER/▶" to confirm the setting.
RF address 00 00 00 00	14. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the address. 15. Long press "ENTER/▶" to confirm the setting.

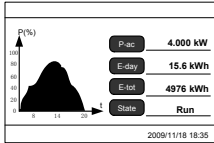
To ensure normal use of the device, before using the device, be sure that:

- The selected Wireless Router can access to Internet normally and it is contained in the SolarInfo WiFi-Compatible Routers List, available at www.sungrowpower.com
- The communication address of the inverter is between 1 and 15. The communication addresses of inverters can be set on the LCD of inverters.
- A WiFi-enabled mobile phone or a laptop computer are connected to this device for parameter setting.

NOTICE

Please cut off the power supply of the inverter before plugging WiFi.

10.14.3 PV Configuration Mode Setting

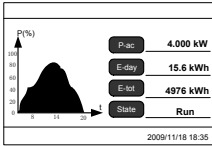


1. Long Press "ENTER/▶" to enter into the general control screen.

<p>His-inform Start/Stop ▶ Set-param</p>	<p>2. Short press "ESC/▼" to navigate the arrow-pointer to "Set-param". 3. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>Set-param Password: 1111</p>	<p>4. Short press "ENTER/▶" to move right and short press "ESC/▼" to set the correct password 1111 5. Long press "ENTER/▶" to confirm the command.</p>
<p>Sys-param Run-param Pro-param Com-param ▶ PV config mode</p>	<p>6. Short press "ESC/▼" to navigate the arrow-pointer to "PV config mode". 7. Long press "ENTER/▶" to enter into its sub-screen.</p>
<p>PV config mode Password: 111111</p>	<p>8. Short press "ESC/▼" to set the correct password 111111. 9. Long press "ENTER/▶" to confirm the command.</p>
<p>PV config mode [0] Independent mode [1] Parallel mode</p>	<p>10. Short press "ESC/▼" to choose PV configuration mode, long press "ENTER/▶" to confirm the settings. 11. The default configuration mode is independent mode.</p>
<p>Are you sure to set it?</p>	<p>12. After you choose PV configuration mode, it will display "Are you sure to set it?" 13. Long press "ENTER/▶" to complete the PV mode configure.</p>

10.15 Inverter Start/Stop

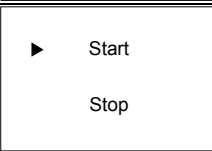
Starting the Inverter



1. Long press "ENTER/▶" to enter into the general control screen.

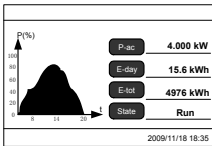


2. Short press "ESC/▼" to navigate the arrow-pointer to "Start/Stop".
3. Long press "ENTER/▶" to enter into its sub-screen.

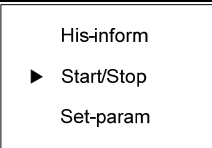


4. Short press "ESC/▼" to navigate the arrow-pointer to "Start".
5. Long press "ENTER/▶" to confirm the command.

Stopping the Inverter



1. Long press "ENTER/▶" to enter into the general control screen.



2. Short press "ESC/▼" to navigate the arrow-pointer to "Start/Stop".
3. Long press "ENTER/▶" to enter into its sub-screen.



4. Short press "ESC/▼" to navigate the arrow-pointer to "Stop".
5. Long press "ENTER/▶" to confirm the command.

11 Appendix

11.1 Technical Data

11.1.1 Electrical Specifications

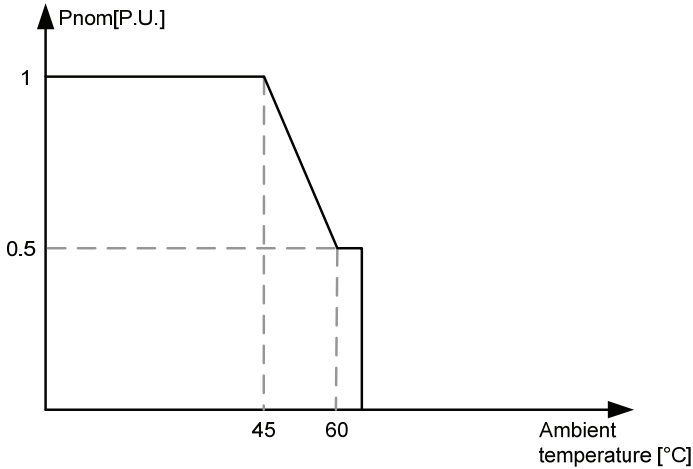
Technical Specifications	SG3KTL-M	SG4KTL-M	SG5KTL-M
Input Side Data			
Max. PV input voltage	550V		
Startup voltage	150V		
Nominal input voltage	370V		
MPP voltage range	125...500V		
MPP voltage range for nominal power	160...500V	170...500V	200...500V
Max. PV input power(DC1/DC2)	3200W(1650W /1650W)	4300W(2200W /2800W)	5400W(2750W /3500W)
Max. PV input current (DC1/DC2)	20A(10A/10A)	26A(10A/16A)	26A(10A/16A)
Max. current for input connector	10A		
Short-circuit current of PV input (DC1/DC2)	24A(12A/12A)	32A(12A/20A)	32A(12A/20A)
No. of MPPTs	2		
Max. number of PV strings per MPPT (DC1/DC2)	1/1	1/2	1/2
Output Side Data			
Nominal AC output power	3000W	4000W	5000W
Max AC output apparent power	3150VA	4200VA	5100VA
Max. AC output current	15A	20A	22A
Nominal AC voltage	230Vac(Single phase)		
AC voltage range	180...276Vac (May vary as per corresponding country's grid standard)		
Nominal grid frequency	50Hz/60Hz		
Grid frequency range	45Hz...55Hz/55Hz...65Hz (May vary as per corresponding country's grid standard)		
THD	<3% (Nominal power)		
DC current injection	<0.5%		
Power Factor	>0.99@default value at nominal power * (adj. 0.8 over-excited~0.8 under-excited)		

Technical Specifications	SG3KTL-M	SG4KTL-M	SG5KTL-M
	*Valid only when the Pro-param on the LCD display is set as DE		
Protection			
Anti-islanding protection	Yes		
DC reverse connection protection	Yes		
AC short circuit protection	Yes		
Leakage current protection	Yes		
DC switch	Optional		
DC fuse	No		
Overvoltage protection	Varistors		
System Data			
Max. Efficiency	97.4%	97.6%	97.6%
Max. European efficiency	96.5%	97.0%	97.0%
Isolation method	Transformerless		
Ingress protection rating	IP65	IP65(Fan IP55)	IP65(Fan IP55)
Night power consumption	<1 W		
Operating ambient temperature range	-25°C...+60°C(up 45°C derating)		
Allowable relative humidity range	0...95% (No condensing)		
Cooling Method	Natural cooling	Forced air cooling	
Max. Working Altitude	4000m(operation with derating above 2000m)		
Display	Graphic LCD		
Communication	RS485(RJ45 connector), WiFi(Optional)		
DC Terminals	SUNCLIX		
AC Terminals	Plug and play connector (Wieland RST25I3S)		
Certification	IEC61000-6-2, IEC61000-6-3, AS/NZS3100, AS4777.2, AS4777.3, VDE-AR-N-4105		
Mechanical Data			
Dimensions(W×H×D)	420×555×179mm		
Mounting method	Wall bracket		
Weight	24kg		

11.1.2 PV Input Specification

Type	Area	DC Power Limit for Each Input	Total DC Input Power Limit	Open-circuit Voltage Limit for Each Input	Short-circuit Current Limit
SG3KTL-M	DC1	1650W	3200W	550V	12A
	DC2	1650W			12A
SG4KTL-M	DC1	2200W	4300W	550V	12A
	DC2	2800W			20A
SG5KTL-M	DC1	2750W	5400W	550V	12A
	DC2	3500W			20A

11.1.3 Temperature Derating Curve



11.2 Exclusion of Liability

The content of these documents is periodically checked and revised where necessary. Discrepancies therefore may exist. Readers are cautioned that Sungrow reserves the right to make changes without notice. Please call us or visit our website at www.sungrowpower.com for the latest information. No guarantee is made for the completeness of these documents. Please contact our company or distributors to get the latest version.

Guarantee or liability claims for damages of any kind are excluded if they are caused by one or more of the following:

- Improper or inappropriate use or install of the product
- Install or operate the product in unintended environment
- Install or operate the product without observing relevant safety regulations in the deployment location
- Ignore the safety warnings or instructions contained in all documents relevant to the product
- Install or operate the product under incorrect safety or protection conditions
- Alter the product or supplied software without authority
- Product malfunctions due to operation attached or neighboring devices running out of the allowed limit values
- Unforeseen calamity or force majeure

The use of supplied software produced by Sungrow Power Supply Co., Ltd. is subject to the following conditions:

- Sungrow Power Supply Co., Ltd. assumes no liability for direct or indirect damages arising from the use of SolarInfo software. This also applies to the provision or non-provision of support activities.
- SolarInfo software used for commercial purposes is prohibited.
- Decompiling, decoding or destroying the original program, including SolarInfo software and the embedded software, is prohibited.

11.3 About Us

Sungrow power supply is a China-leading manufacturer of various power electronics products for renewable energy generation systems. Our products include converters, inverters, battery chargers and other power supplies for distributable generation system in both grid-connected and stand-alone applications. The power rating of Sungrow products covers from several hundred watt to large mega-watt systems.

The pursuit of Sungrow is to help our customers acquire stable and clean power with minimum cost, maximum reliability and enhanced safety.

Contact Information

Should you have any questions or queries about this product, please contact us through the following information. We will be more than happy to assist you!

Company:	Sungrow Power Supply Co., Ltd.
Website:	www.sungrowpower.com
Email:	infor@sungrow.cn ; service@sungrow.cn
Address:	No.2 Tianhu Rd., New & High Technology Industrial Development Zone, Hefei, P. R. China
Zip:	230088
Telephone:	+86 551 6532 7834, +86 551 6532 7845
Fax:	+86 551 6532 7856



Green and Effective

Sungrow Power Supply Co., Ltd.

Add: No.2 Tianhu Rd., New & High Technology Industrial
Development Zone, Hefei, P.R.China.230088
Web: www.sungrowpower.com

E-mail: info@sungrow.cn
Tel: +86 551 6532 7834 / 6532 7845
Fax: +86 551 6532 7856

Specifications are subject to changes without advance notice.