User Manual

SG2KTL-S/SG2K5TL-S/SG3KTL-S/SG3K6TL-S/SG4KTL-S/SG3KTL-D/SG3K6TL-D/SG4K6TL-D/SG5KTL-D

PV Grid-Connected Inverter

SG2_2.5_3_3.6_4_4.6_5KTL-UEN-Ver22-201511 Version：2.2

About This Manual

This manual applies to inverter SG2KTL-S, SG2K5TL-S, SG3KTL-S, SG3K6TL-S, SG4KTL-S, SG3KTL-D, SG3K6TL-D, SG4K6TL-D and SG5KTL-D. We hope that the device will meet your satisfaction when you use it with your PV plant system.

Purpose

The purpose of this manual is to provide detailed product information and instructions for the use of SG2KTL-S, SG2K5TL-S, SG3KTL-S, SG3K6TL-S, SG4KTL-S, SG3KTL-D, SG3K6TL-D, SG4K6TL-D and SG5KTL-D 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.

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 I

1 Safety Instructions 1

1.1 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 LED Indicator Panel 9

2.3 Technical Description 10

2.3.1 Circuit Description 10

2.3.2 Functions Description 10

2.3.3 Temperature-related Power Derating 11

3 Unpacking and Storage 15

3.1 Unpacking and Inspection 15

3.2 Identifying Inverter 16

3.3 Delivery Contents 17

3.4 Storage of Inverter 18

4 Securing Inverter to the Wall 19

4.1 Selecting Installation Location 19

4.2 Moving Inverter to Installation Site 22

4.3 Installation Procedure 22

5 Electrical Connection 27

5.1 General Safety Instruction 27

5.2 Terminals Description 28

5.3 Overview of Electrical Connection 28

5.4 Connecting Inverter to AC Grid 29

5.4.1 AC Side Requirements 30
5.4.2 Assembling AC Cables to Connector 30
5.4.3 AC Wiring Procedure 32
5.5 Connecting Inverter to PV Arrays 33
5.5.1 PV Inputs Configuration 34
5.5.2 Assembling DC Cable to Connector 37
5.5.3 DC Wiring Procedure 39
5.6 Grounding of Inverter 40
5.6.1 Second Protective Earth Terminal 41
6 Communication 42
6.1 Communication System 42
6.2 Distance between the inverter and the smartphone/router 42
6.2.1 Linear distance 42
6.2.2 Inverter and smartphone / router on different floors 43
6.2.3 Inverter and smartphone / router on the same floor, in different rooms 44
6.3 SolarInfo Home APP 45
6.3.1 Acquisition and installation 45
6.3.2 SolarInfo Home APP Online Registration 48
6.3.3 Check the running information and connect inverter to your router in "[Direct visit]"mode. 49
6.3.4 Check the running information in "Remote [Login]"mode. 51
7 Commissioning 52
7.1 Verify before Commissioning 52
7.2 Commissioning Procedure 52
8 Disconnecting, Dismantling and Disposing of the Inverter 54
8.1 Disconnecting the Inverter 54
8.2 Dismantling the Inverter 55
8.3 Disposing of the Inverter 55
9 Troubleshooting and Maintenance 56
9.1 Troubleshooting 56
9.1.1 LED Indicator Troubleshooting 56

9.1.2 Troubleshooting of Faults in the smartphone application interface . 57
9.2 Fault Repair 61
9.3 Routine Maintenance 62
10 FAQ for SolarInfo WiFi Installation and Configuration 63
10.1 FAQ Index Table 63
10.2 Question Description and Solution 63
11 Appendix 71
11.1 Technical Data 71
11.1.1 Single MPPT Inverter Data 71
11.1.2 Double MPPTs Inverter Data 74
11.2 Exclusion of Liability 79
11.3 About Us 80

1 Safety Instructions

1.1 IMPORTANT SAFETY INSTRUCTIONS

SG2KTL-S,SG2K5TL-S,SG3KTL-S,SG3K6TL-S,SG4KTL-S,SG3KTL-D,SG3K6TL-D, SG4K6TL-D and SG5KTL-D 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 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.**

⚠ 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 LED indicator 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.**

Servicing 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

SG2KTL-S,SG2K5TL-S,SG3KTL-S,SG3K6TL-S,SG4KTL-S,SG3KTL-D,SG3K6TL-D, SG4K6TL-D and SG5KTL-D (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.

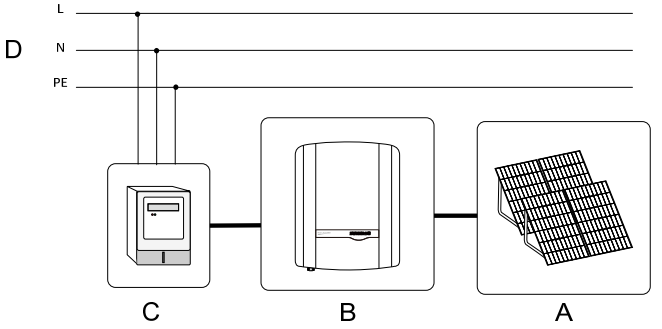


Fig. 2-1 Application of Inverter to the PV Power System

Item	Description	Remark
A	PV strings	Monocrystalline silicon; polycrystalline silicon and thin-film of protection class II without grounding
B	Inverter	SG2KTL-S, SG2K5TL-S, SG3KTL-S, SG3K6TL-S, SG4KTL-S, SG3KTL-D, SG3K6TL-D, SG4K6TL-D and SG5KTL-D
C	Metering device	Meter cupboard with power distribution system
D	Utility grid	TT, TN

NOTICE

For TT utility grid, N line voltage to ground must be less than 30V.

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

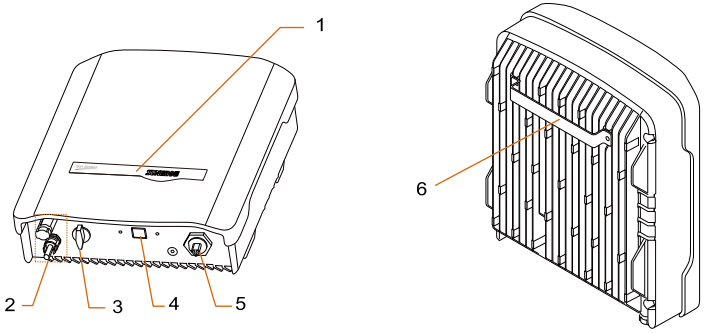
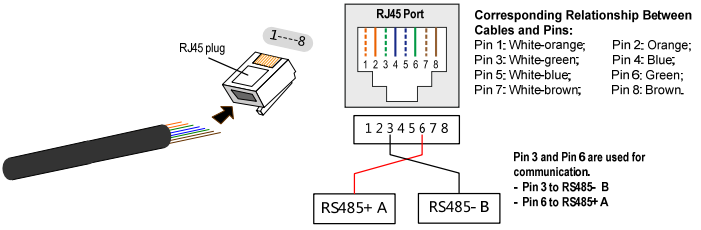


Fig. 2-2 Product Description

Item	Name	Description
1	LED indicator panel	Indicate the working statues of the inverter.
2	DC terminals	There is a pair or two pairs of DC terminals between PV arrays and inverter.
3	DC switch (Optional)	Optional component. It is designed for safely disconnecting DC current.
4	RS485 terminal	It is provided for connecting LCD display panel, WiFi or ZE100.
5	AC terminal	Inverter feeds power to utility grid via this terminal.
6	Mounting rack	It is used to hang inverter onto the backplate.

RS485 Communication Connection :Use the Ethernet crimper to crimp the cables and connect cables to RJ45 plug according to TIA/EIA 568B.

Pin 3 and Pin 6 are used for communication, please do not use Pin1,2,4 and 5.



When the LCD display panel is connected to the inverter, you can perform the operation of LCD display to select the country and set the protection parameters according to the permissible range of the utility grid company, refer to the User Manual of LCD module.

When the WiFi module is connected to the inverter, the communication connection between the inverter and mobile smartphone can be established via SolarInfo WiFi. Then you can use the smartphone APP to select the country and set the protection parameters according to the permissible range of the utility grid company, refer to "6 Communication" or the User Manual of WiFi.

ZE100 mainly provides the following functions: zero export, LCD display and so on.

2.2.2 Dimensions and Weight of Inverter

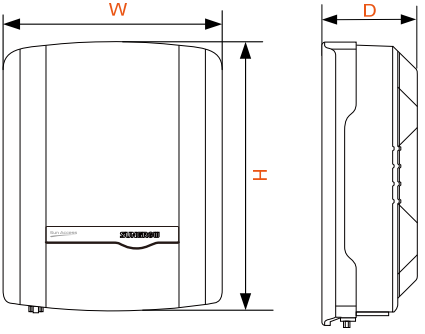


Fig. 2-3 Dimensions of Inverter

Tab. 2-1 Dimensions Value

Type	W(mm)	H(mm)	D(mm)	Net weight(kg)
SG2KTL-S/SG2K5TL-S/ SG3KTL-S/SG3K6TL-S	300	370	125	9
SG4KTL-S/SG3KTL-D/ SG3K6TL-D/SG4K6TL-D/ SG5KTL-D	360	390	133	11

2.2.3 LED Indicator Panel

As a human-computer interaction interface, the LED indicator on the inverter front panel indicates the working statues of the inverter.

Fig. 2-4 LED Indicator Panel

Name	Description
LED indicator	User can observe the indicator's flashing color to get the current state of inverter. Detailed definition is shown in Tab. 2-2.

Tab. 2-2 Description of LED Indicator

State		Description
Green& Red	Flicker once in turn every 1 second	Non-running or Non-fault (For example, the inverter is in standby state.)
Green	Flicker once every 0.2 seconds to 2 seconds (The greater the inverter current power, the faster the green light flashing)	Inverter is running.
Red	Flash every 2s	Ground fault
	Two short flashes every 2s in interval	Grid side fault
	Three short flashes every 2s in interval	ISO fault
	Four short flashes every 2s in interval	Relay fault
	Five short flashes every 2s in interval	Leakage current sensor self-detection fault
	Flash every 0.3s	Other fault

The red and green LEDs will be on at the same time when the inverter is in the upgrade status. If the red and green LEDs are on at the same time in other status, please contact the service provider for troubleshooting.

2.3 Technical Description

2.3.1 Circuit Description

Fig. 2-6 and Fig. 2-6 show the main circuit of inverter.

The inverter boost circuits raise DC input voltage. The MPP trackers 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 WiFi interface for communication.

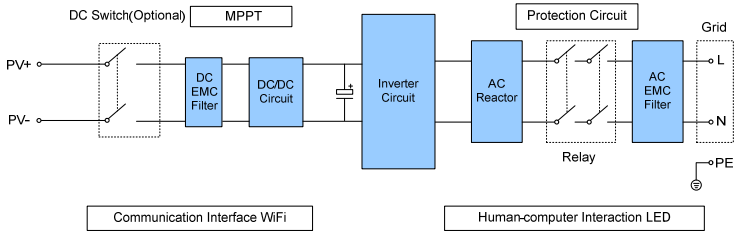


Fig. 2-5 Main Circuit Diagram of single MPPT inverter

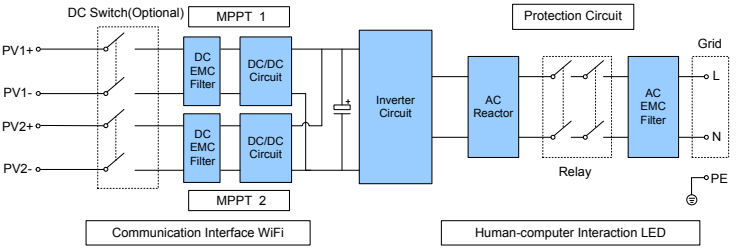


Fig. 2-6 Main Circuit Diagram of double MPPTs inverter

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.

- Parameters configuration

  Inverter provides various parameters configuration for optimal operation. You can choose the type of country by APP, if you need a more professional setting, please contact Sungrow.

- Communication interface

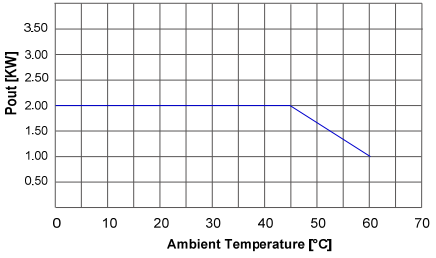
  WiFi module for connecting other monitoring devices to the PV system is included.

- 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

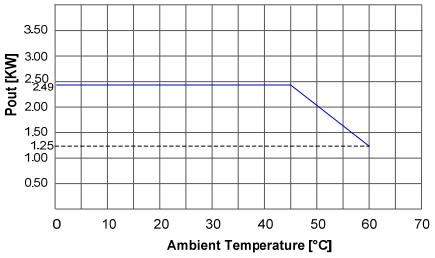
2.3.3 Temperature-related Power Derating

The following graph shows the automatic reduction in output power in relation to ambient temperature.

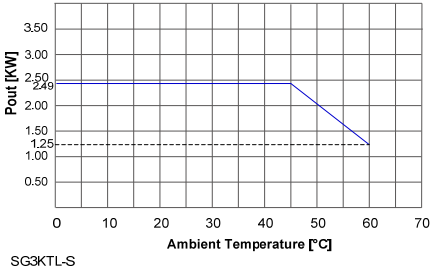
SG2KTL-S



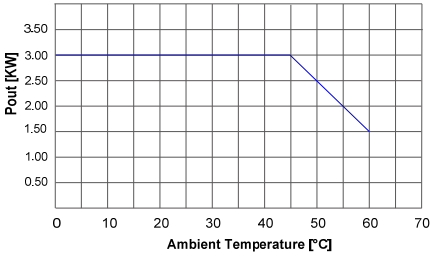
SG2K5TL-S



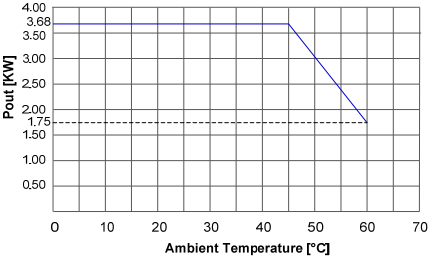
SG2K5TL-S



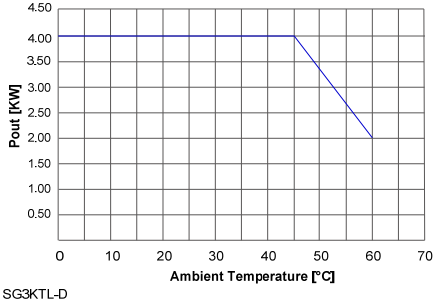
SG3KTL-S



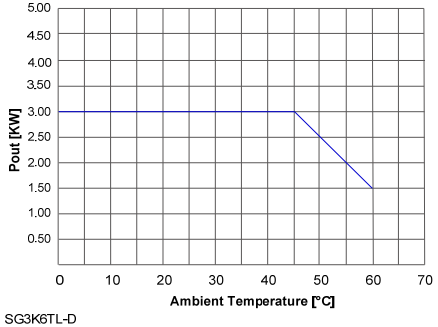
SG3K6TL-S



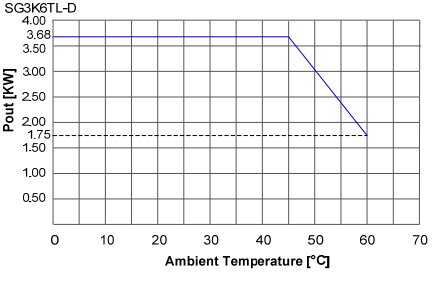
SG4KTL-S

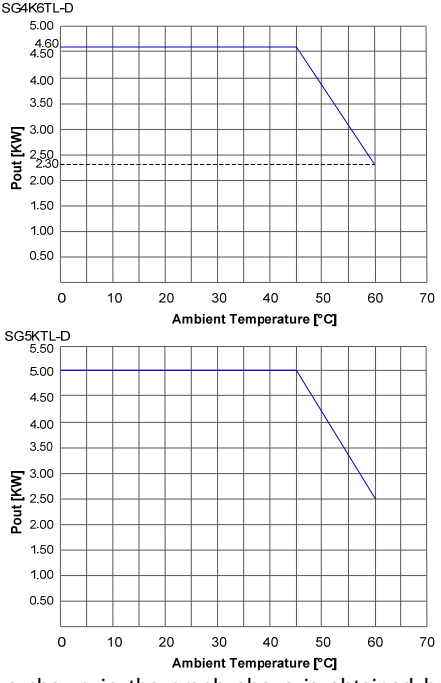


SG3KTL-D



SG3K6TL-D





*The derating curve shown in the graph above is obtained by the test in high temperature environmental chamber.

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3 Unpacking and Storage

3.1 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.

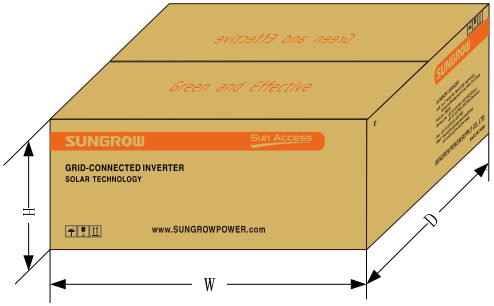


Fig. 3-1 Single Inverter Packing

* The dimensions shown in the image here is for reference only.

Item	W	H	D
SG2KTL-S/SG2K5TL-S/SG3KTL-S/ SG3K6TL-S	500mm	210mm	385mm
SG4KTL-S/SG3KTL-D/SG3K6TL-D/ SG4K6TL-D/SG5KTL-D	530mm	215mm	445mm

3.2 Identifying Inverter

Two nameplates are attached to one side of the inverter and the carton respectively. They provide 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.

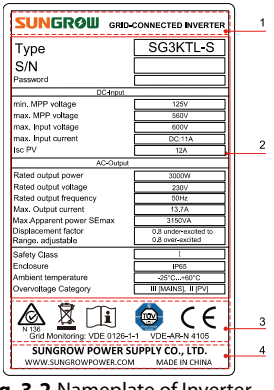


Fig. 3-2 Nameplate of Inverter

* 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. 3-1 Description of Icons on the Nameplate

Icon	Description
	Do not dispose of the inverter with the household waste.
	Refer to the corresponding instructions.
N 136	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.

3.3 Delivery Contents

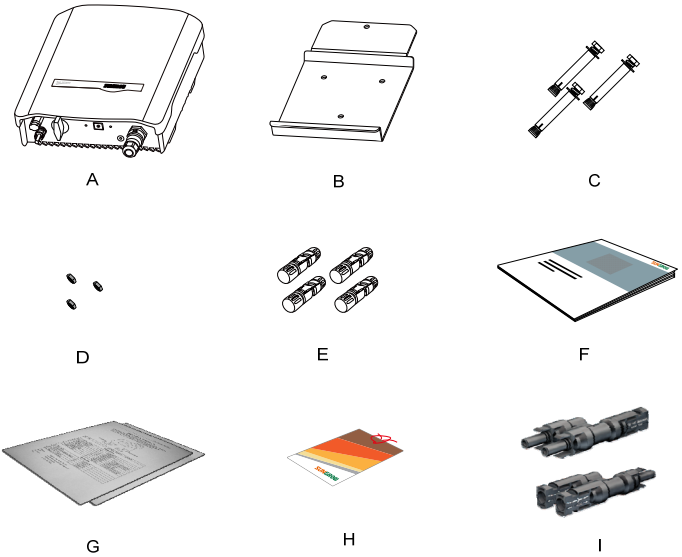


Fig. 3-3 Delivery Contents

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	Nut for fastening the backplate onto metal frame
E	PV input connectors, including positive and negative connectors
F	Quick user manual and CD
G	Packing list and product test report
H	Quality certificate
I	T-type terminals. It is only for SG3K6TL-S.

If you choose to fix the backplate to the metal frame, remove the enclosure of the expansion screws (C) and use nut (D) together to fix the backplate.

3.4 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 -30 °C and +85 °C. And the storage relative humidity should be always between 0 and 100%.
- 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.

4 Securing Inverter to the Wall

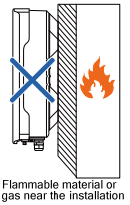
4.1 Selecting Installation Location

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

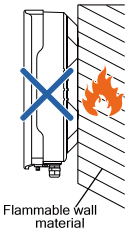
1. Take the load capacity of the wall into account. The wall (such as concrete wall or metal structure) should be strong enough to hold the weight of the inverter over a long period of time.

2. Install the unit where is accessible to install, electrical connect and service.

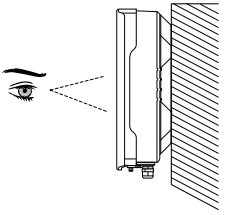
3. Do not install the inverter where contains flammable materials or flammable gas in the vicinity of the unit installation site.



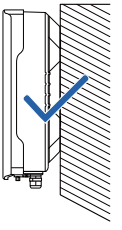
4. Do not install the unit on wall of flammable materials. (Except the wooden wall)



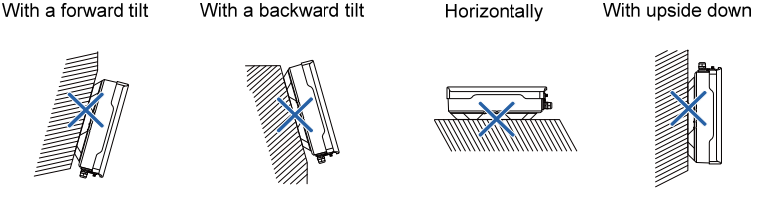
5. Install the unit at eye level for easy button operation and display read.



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.



NOTICE

The inverter can not be installed horizontally, it could result in equipment damage if otherwise.

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

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

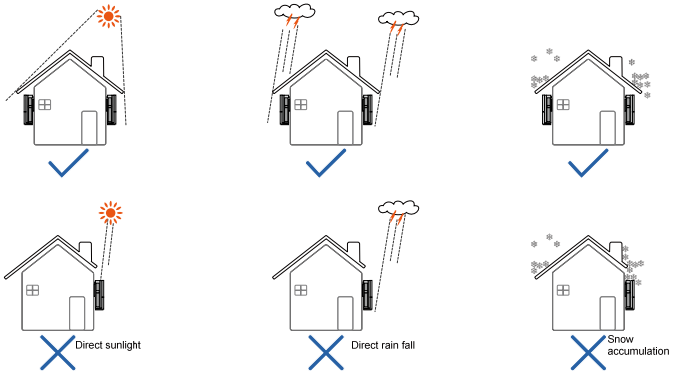
Max. ambient temperature:
+60°C

10. The relative humidity of chosen installation site should never exceed 100%. Moisture may result in corrosion and damage to the internal device components.

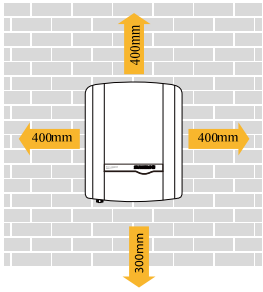
Min. ambient temperature:
-25°C

Max. relative humidity:
100%

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.

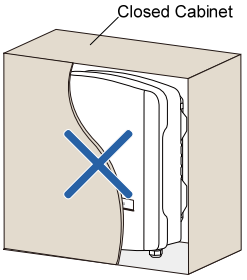


12. Take enough space for convection into consideration during installation. For details, see "6.2 Distance between the inverter and the smartphone/router".



Please install the inverter in well-ventilation places.

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



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

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

4.2 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.

4.3 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.

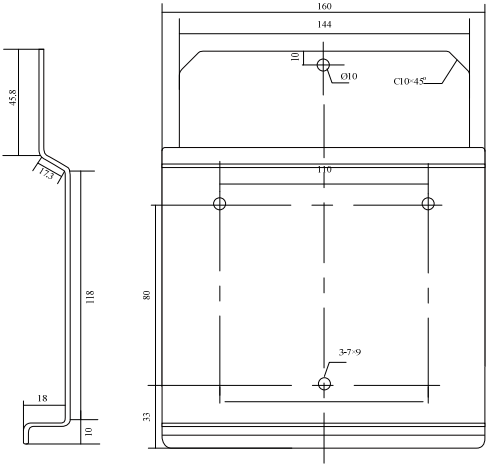


Fig. 4-1 Fastener(unit: mm)

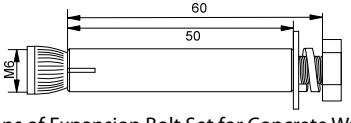


Fig. 4-2 Dimensions of Expansion Bolt Set for Concrete Wall (unit: mm)

Please select the appropriate length of the expansion screw according to the thickness of the wall insulation layer. The dimensions shown in the image here is for reference only.

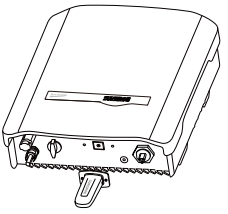
In the following, we will introduce how to secure the inverter to the wall using the provided backplate.

Concrete Wall

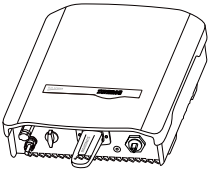
Step 1 Remove the backplate and expansion bolts from the packaging.

Step 2 WiFi connection.(If you purchase WiFi module)

1. Plug SolarInfo WiFi into the corresponding terminal under the inverter.



2. Fasten the screws with appropriate torque.

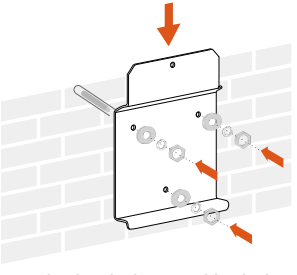


Step 3 Screw a M5 screw onto the chosen concrete wall.

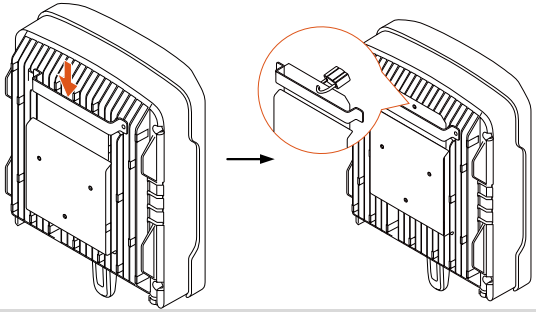
DANGER

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

Step 4 Fasten the backplate to the wall with the supplied expansion bolt set. The torque for fastening the nut should be at least 10 N·m.



Step 5 Hang the inverter onto the backplate and lock the device.



The lock is an optional accessory. Users need to purchase it.

Metal Frame

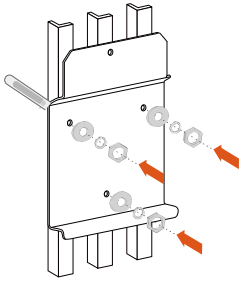
Step 1 Remove the supplied backplate from the packaging.

Step 2 WiFi connection. (If you purchase WiFi module)

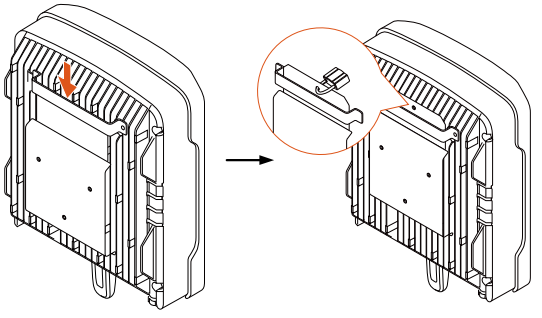
Step 3 Screw a M5 screw onto the chosen mental frame.

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.

Step 4 Choose the best installation site according to the abovementioned requirements. Fasten the backplate to the mental framel with the supplied expansion bolt(remove the enclosure) and nut. The torque for fastening the nut should be at least 10 N·m.



Step 5 Hang the inverter onto the backplate and lock the device.



5 Electrical Connection

5.1 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**

5.2 Terminals Description

All electrical terminals are located at the bottom of unit. Fig. 5-1 shows the connection area.

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

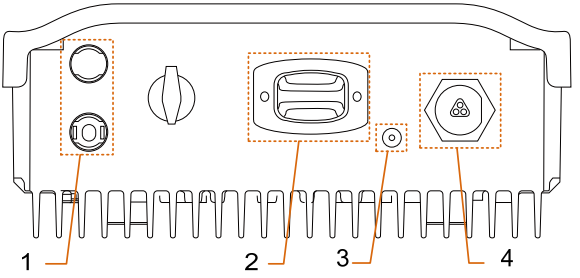


Fig. 5-1 Terminals Description

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

Tab. 5-1 Terminals Specification

Item	Terminals	Description
1	DC	MC4 terminals for PV input.
2	WiFi	---
3	PE	A second PE terminal
4	AC	AC terminals to the power grid.

5.3 Overview of Electrical Connection

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

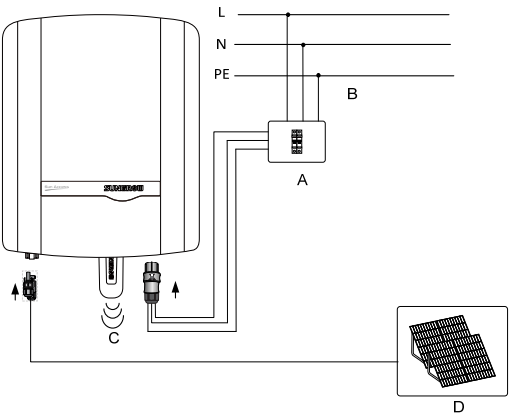


Fig. 5-2 Electrical Connection Diagram

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 WiFi	It is used for wireless communication.
D	PV arrays	**-S series:** one input area with one pair of terminals.
		-D series: two input areas with two pairs of terminals.

NOTICE

If there are several inverters connect to the grid in parallel, each phase of the transformer can at most connect 10 inverters. Please contact Sungrow for a technical evaluation if more than 10 inverters are connected.

5.4 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.

An appropriately sized AC circuit breaker is suggested as the protection equipment in AC connection, as shown in Fig. 5-2.

5.4.1 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
SG2KTL-S	25A
SG2K5TL-S	25A
SG3KTL-S	25A
SG3K6TL-S	25A
SG4KTL-S	32A
SG3KTL-D	25A
SG3K6TL-D	25A
SG4K6TL-D	32A
SG5KTL-D	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.

5.4.2 Assembling AC Cables to Connector

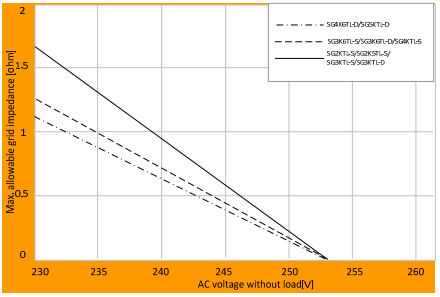
Inverter is equipped with water-proof direct plug-in connectors for AC connection, which match AC terminals at the bottom of the inverter.

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

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(mm^2)		Outer cable diameter(mm)	
	Range	Recommended Value	Range	Recommended Value
SG2KTL-S	4…6	4	10…14	14
SG2K5TL-S	4…6	4	10…14	14
SG3KTL-S	4…6	4	10…14	14
SG3KTL-D	4…6	4	10…14	14
SG3K6TL-S	4…6	6	10…14	14
SG3K6TL-D	4…6	6	10…14	14
SG4KTL-S	4…6	6	10…14	14
SG4K6TL-D	4…6	6	10…14	14
SG5KTL-D	4…6	6	10…14	14

NOTICE

The AC cables can be Hard-line&flexible wires.

- Withstand ambient temperature;
- Layout type (inside wall, underground, free air etc.);

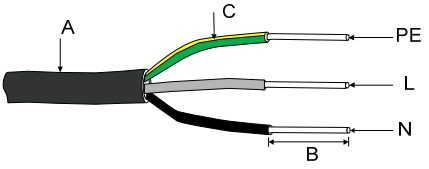
- UV resistance and so on.

5.4.3 AC Wiring Procedure

Step 1 Loosen all four screws on the AC terminal lid and remove the lid.

Step 2 Unscrew Thread-Lock Sealing Nut, pull out the Waterproof Sealing Insert from the opening.

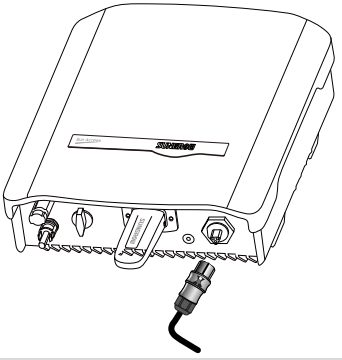
Step 3 Strip off insulation layer of all AC cables. The length of strip insulation is approximate 18mm.



No.	Description	Remark
A	Protective layer	Accepted cable external diameter ranges from 10mm to 14mm.
B	Length of insulation to be stripped off	18 mm
C	Insulation layer	-

Step 4 Lead the AC cable through the Thread-Lock Sealing Nut, and the cable gland.

Step 5 Fix all cables to the corresponding terminals according to markings on the connector with a screwdriver, especially the "PE" cable.



NOTICE

L and N line must not be swapped, otherwise it may permanently destroy the inverter.

Step 6 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 7 Pull cables outward to check whether they are firmly installed.

Step 8 Fix all four screws to the AC terminal lid. Insert the Waterproof Sealing Insert back to AC opening and tighten the Thread-Lock Sealing Nut firmly to the cable gland.

Step 9 Make sure the AC and DC circuit breaker are disconnected.

Step 10 Connect phase cable and "N" cable to AC circuit breaker.

Step 11 Connect AC circuit breaker to utility grid.

Step 12 Make sure all AC cables are firmly installed.

5.5 Connecting Inverter to PV Arrays

⚠ DANGER

Lethal voltage exists!

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

⚠ WARNING

Before connecting the PV arrays to the inverter, make sure that the impedances between the positive terminal of the PV string and Earth and the impedances between the negative terminal of the PV string and Earth are larger than 200Kohm.

NOTICE

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

- **Make sure that the maximum short circuit current of each DC input is less than inverter allowable limit.**
- **Make sure that the maximum open voltage of each string is less than 600V. Voltage over 600V can damage the inverter.**

If the input line is changed, such as input line falls off, etc. You need to reset the work mode.

5.5.1 PV Inputs Configuration

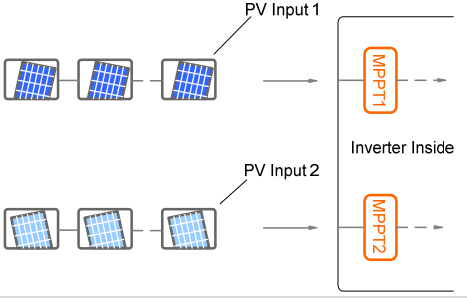
For -S series inverters, there's one input area with one MPP tracker. They can be configured in parallel mode only.

For –D series inverters, there're two PV input areas, each owning its MPP tracker. The two PV inputs can be configured in independent mode or parallel mode.

PV Configuration Mode-Independent Mode

For independent mode, the two PV inputs work independently, each with its own MPPT. Therefore the two PV inputs can be different from each other in PV module types, numbers of PV panels in PV string, tilt angles and orientation angle of PV modules.

As shown in the following diagram, the inverter should be configured to independent mode due to different orientation angle between the two PV inputs.



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

Type	Area	Total DC Input Power Limit	Open-circuit Voltage Limit for Each Input	Short-circuit Current Limit for Each Input
SG3KTL-D	DC1	3300W	600V	12A
	DC2			12A
SG3K6TL-D	DC1	3900W	600V	12A
	DC2			12A

Type	Area	Total DC Input Power Limit	Open-circuit Voltage Limit for Each Input	Short-circuit Current Limit for Each Input
SG4K6TL-D	DC1	4900W	600V	12A
	DC2			12A
SG5KTL-D	DC1	5400W	600V	12A
	DC2			12A

Only the current is limited for a single input and the power is not limited.

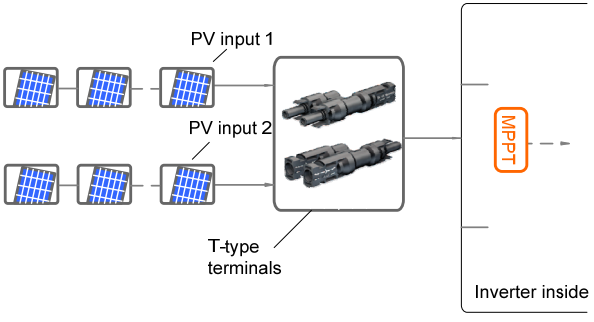
Connect DC1 to the PV string with lower voltage and connect DC2 to the PV string with higher voltage.

PV Configuration Mode-Parallel Mode

For parallel mode, all PV strings with the same type, the same number of PV panels, identical tilt and identical orientation in series can be connected to the same single input area.

- SG3K6TL-S

Connect the 2 PV strings in parallel using T-type terminals and then connect them to inverter DC input.



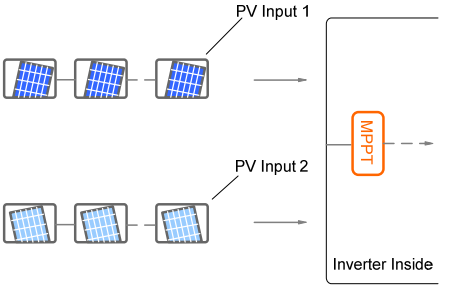
Type	Total DC Input Power Limit	Open-circuit Voltage Limit	Short-circuit Current Limit
SG3K6TL-S	3900 W	600V	20A

When there are two PV strings connecting to SG3K6TL-S, the configuration of the two PV strings must be the same.

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

- SG4KTL-S

As shown in the following diagram.



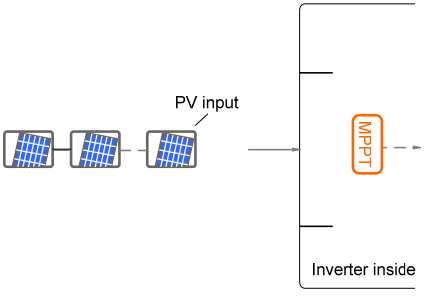
Type	Total DC Input Power Limit	Open-circuit Voltage Limit	Short-circuit Current Limit
SG4KTL-S	4300 W	600V	20A

The two input terminals of SG4KTL-S should be connected, and the configuration of the two PV strings must be the same.

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

- SG2KTL-S/SG2K5TL-S/ SG3KTL-S

As shown in the following diagram.



Type	Total DC Input Power Limit	Open-circuit Voltage Limit	Short-circuit Current Limit
SG2KTL-S	2300W	600V	12A
SG2K5TL-S	2800W	600V	12A
SG3KTL-S	3300 W	600V	12A

5.5.2 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
SG2KTL-S/SG2K5TL-S/ SG3KTL-S	2.5...6mm^2	5…8mm	600 V	Same with short-circuit current.
SG3K6TL-S/SG4KTL-S	2.5...6mm^2	5…8mm	600 V	Same with short-circuit current.
SG3KTL-D/SG3K6TL-D /SG4K6TL-D/SG5KTL-D	2.5...6mm^2	5…8mm	600 V	Same with short-circuit current.

NOTICE

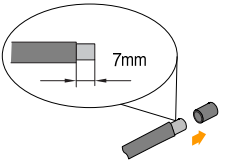
The DC cables must be flexible wires.

DC Connector Assembling Procedure:

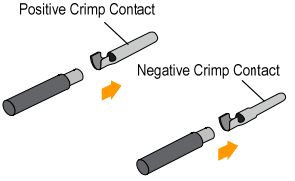
DANGER

Make sure that all the DC and AC cables to the inverter are not live before you start the electrical work.

Step 1 Strip off 7mm insulation layer from all DC cables.



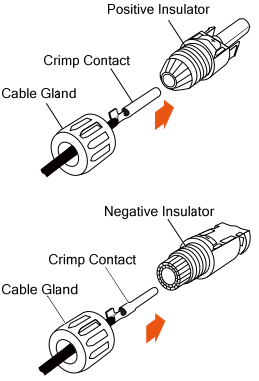
Step 2 Assemble cable ends with crimp contacts by crimping pliers.



Step 3 Lead cable through cable gland.

Step 4 Insert the crimp contact into the insulator until it snaps into place. Then pull gently to check if it is correctly engaged.

Step 5 Screw the cable gland to front insulator with tightening torque 2.5…3 N·m.



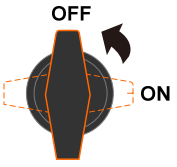
For further assembly and connection instruction, please visit the webpage of the device manufacturer.

Step 6 Make sure the connection cable of PV string for the correct polarity.

NOTICE

The inverter will not function properly if the DC polarities are reversed.

Step 7 Disconnect the DC switch.



Step 8 Configure PV configuration mode according to actual PV conditions. Please refer to "5.5.1 PV Inputs Configuration".

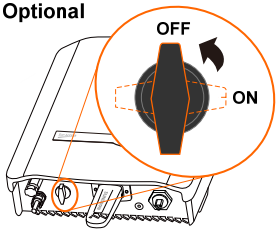
5.5.3 DC Wiring Procedure

DANGER

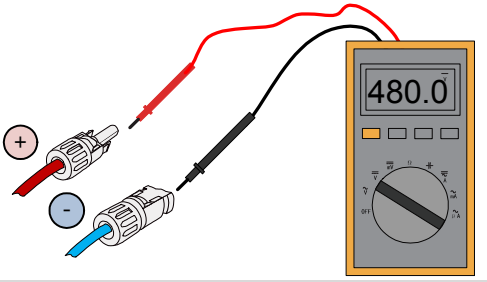
Make sure that none of the DC or AC cables connected to the inverter is live before the electrical work.

Connect the inverter to PV array as the following procedures:

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



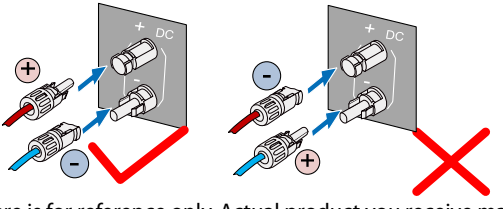
Step 2 Check the connection cable of PV string for the correct polarity and that the open-circuit voltage does not exceed the inverter input limit 550V, even under the lowest operating temperature. Refer to module specification supplied by module manufacturer for detailed information.



NOTICE

- **Check the positive and negative polarity of the PV cells. After confirmation, you can insert the DC connectors into the input terminals on the bottom of the inverter.**
- **For the same MPPT, reverse connection of a single string is prohibited. A permanent failure of the system or inverter may follow if otherwise.**

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



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

5.6 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.

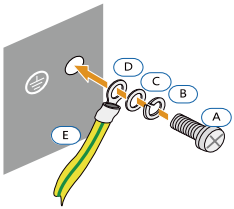
All non-current carrying exposed metal parts of the equipment and other enclosures in the PV power system should be grounded (e.g., PV arrays frame and inverter enclosure).

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

5.6.1 Second Protective Earth Terminal

The inverter is equipped with second protective earth terminal as specified in EN 50178. There is a second PE terminal at the bottom of the inverter. Users may choose to connect PE connection.

Second PE Connection



Item	Description	Remark
A	Screw	M4×12mm
B	Lock washer	-
C	Washer	-
D	Cable socket	-
E	Yellow-green cable	16mm^2(5AWG)

Fig. 5-3 Connection of the Second PE Connection

*The connection parts are not included in the delivery scope.

6 Communication

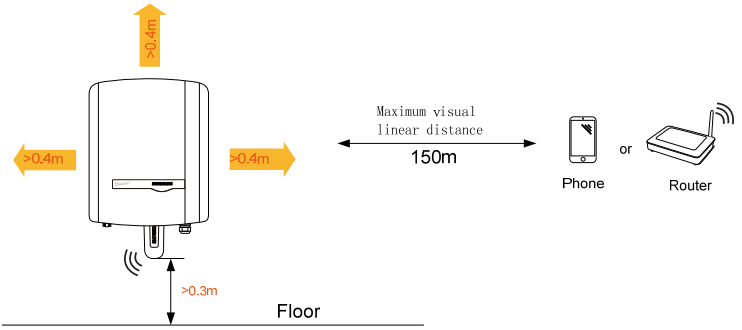
6.1 Communication System

The communication connection between the inverter and mobile smartphone/router can be established via SolarInfo WiFi. If you have problems, please refer to "10 FAQ for SolarInfo WiFi Installation and Configuration".

6.2 Distance between the inverter and the smartphone/router

6.2.1 Linear distance

If there are no obstructions between the inverter and smartphone/router, the maximum linear distance between them can be 150m.



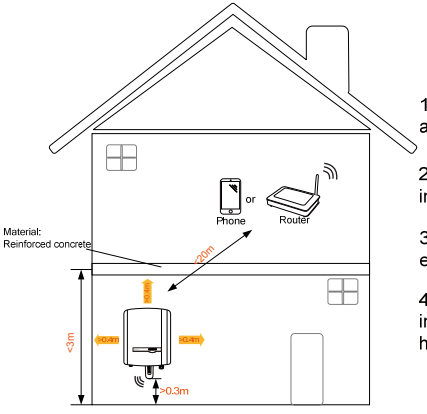
If smartphone is connected to the router, the effective distance between them depends on the technical parameters of the route and the external environment.

Impacts of common materials on the wireless signal

Material	Wireless signal strength	Possible Environment
Wood		Compartment
Plaster\Asbestos		Wall
Glass		Window
Water		Aquarium, pool
Brick wall		Partition
Marble		Floor
Reinforced concrete		Floor panels, wall
Metal		Iron sheet
cordless smartphones, microwave ovens		

6.2.2 Inverter and smartphone / router on different floors

Inverter can be located inside the same house with the smartphone or router, yet the distance between them must not be more than one floor.



1. Ensure the distance between the device and floor is no less than 0.3m.

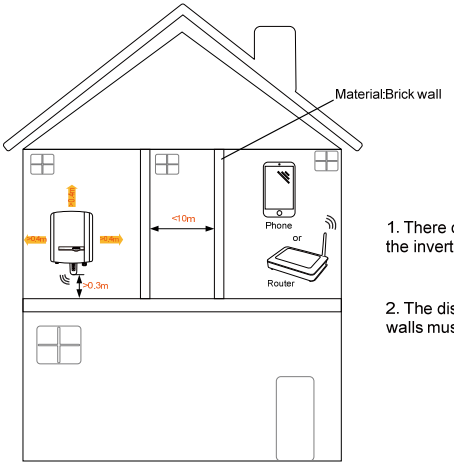
2. Ensure the space surrounding the inverter is not less than 40mm.

3. Ensure the storey height does not exceed 3m.

4. Ensure the linear distance between the inverter and phone/router within the same house does not exceed 20m.

Image shown here is for reference only. The inverter can be installed indoors or outdoors.

6.2.3 Inverter and smartphone / router on the same floor, in different rooms



1. There can be two vertical walls between the inverter and phone/router.

2. The distance between the two vertical walls must be less than 10m.

1. Keep the inverter in parallel with the external antenna of the router.
2. The WiFi module can not be blocked by metal.
3. In order to avoid wireless electromagnetic interference, please keep the inverter away from equipment such as cordless smartphones, microwave ovens and so on.
4. Do not install the inverter in confined environment, such as the basement.

6.3 SolarInfo Home APP

6.3.1 Acquisition and installation

Download the SolarInfo Home APP and install it into your smartphone. You can select the APP version for iOS or Android.

For iphone(iOS)

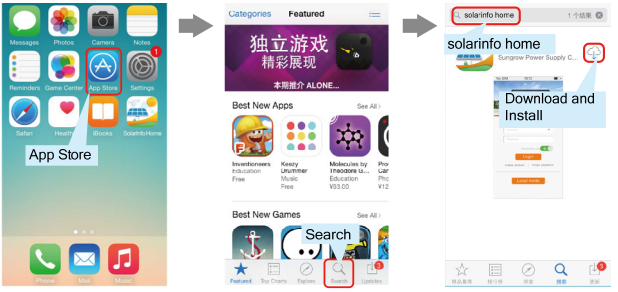
Scenario 1

The address for downloading SolarInfo Home APP is https://itunes.apple.com/us/app/solarinfo-home/id906260039?l=zh&ls=1&mt=8. You can also use your smartphone to scan the OR code as shown on the right to download and install it.

For iOS

Scenario 2

Search SolarInfo Home in your APP Store to download and install it.



For other smartphone(Android)

Scenario 1

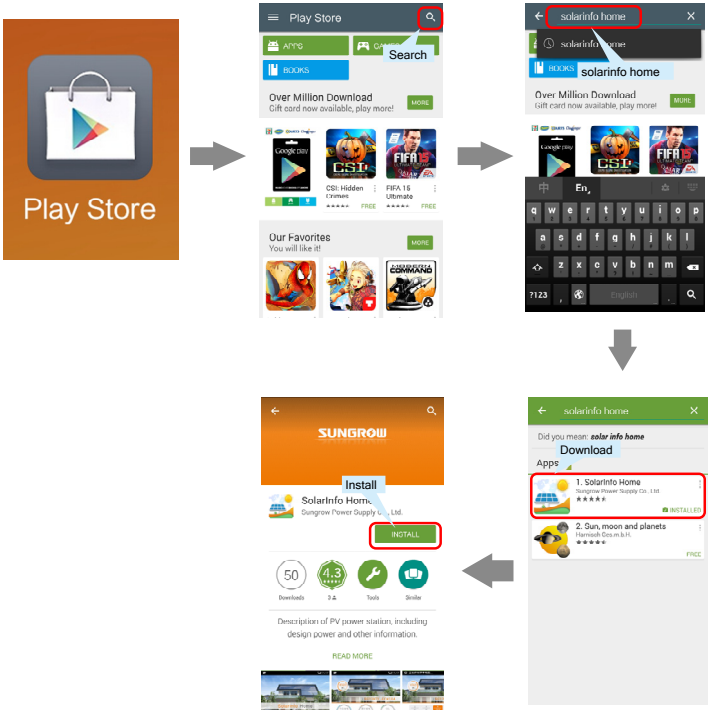
The address for downloading SolarInfo Home APP is

https://play.google.com/store/apps/details?id=com.sungrow.home.or Http://www.solarinfobank.com/app/SolarInfoHome_v1.0.apk.You can also use your smartphone to scan the following OR codes to download and install it.

For Android

Scenario 2

Search SolarInfo Home in your PlayStore to download and install it.



To perform the operations in the following sections, make sure the distances between the smartphone and the inverters, inverters and the routers are within the valid range.

SolarInfo Home APP supports two kinds of operation:"Remote [Login]"and "[Direct visit]".

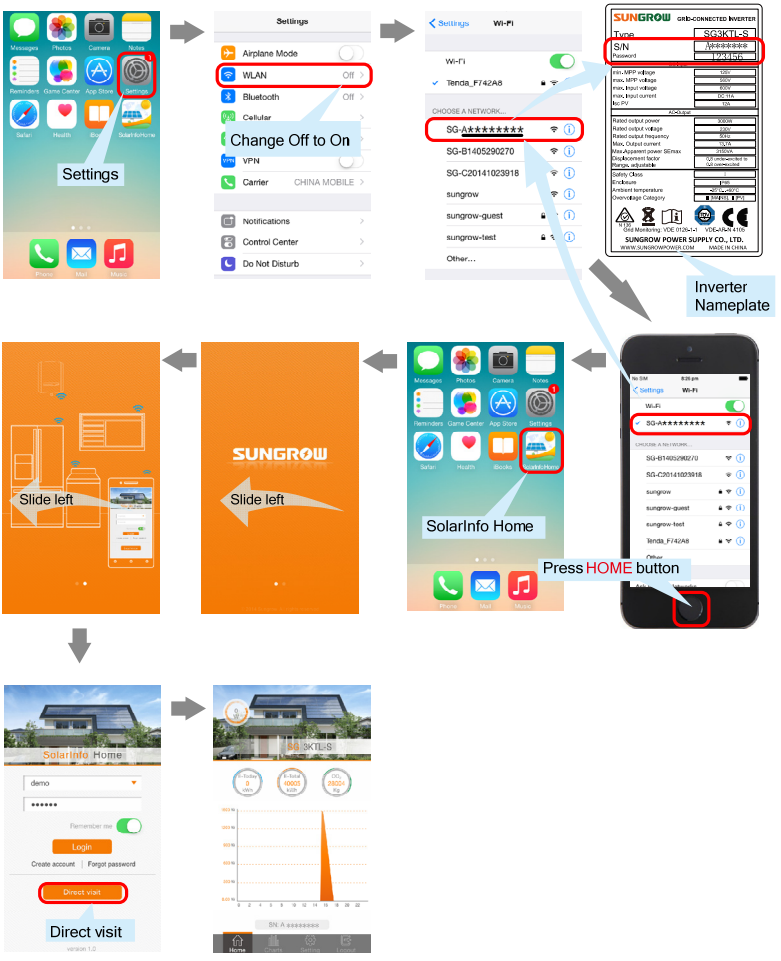
In "Remote [Login]" mode, you need configure the inverter to connect it to your router and complete registration. Then you can log into SolarInfo Home via the Internet to check the device running information anywhere.

In "[Direct visit]" mode, you can connect your smartphone to the inverter directly via WiFi to check the device running information anywhere.

6.3.2 SolarInfo Home APP Online Registration

6.3.3 Check the running information and connect inverter to your router in "[Direct visit]"mode.

1. Check the running information



2.Select the country you are in and connect inverter to your router

Congratulation !
You have completed all configuration.
You can check the device running information anywhere via the Internet by the following steps.

6.3.4 Check the running information in "Remote [Login]"mode.

If you want to check the running information via Internet in "Remote [Login]" mode, please follow the steps below.

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.

After setting the Country parameter, please proceed to set other parameters of the inverter in accordance with the specific requirements of the local grid. Before commissioning, please check thoroughly if the set parameters meet the local grid requirement.

Sungrow Power Supply Co., Ltd. assumes no liability for direct or indirect damages arising from the setted parameters exceeding the permissible range of the utility grid company.

7.2 Commissioning Procedure

Step 1 Make sure all the above mentioned items meet the requirements.

Step 2 Connect the external AC circuit breaker.

Step 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-link 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.

Step 4 Observe the status of LED indicator.

State		Description
Green& Red	Flicker once in turn every 1 second	Non-running or Non-fault (For example, the inverter is in standby state.)
Green	Flicker once every 0.2 seconds to 2 seconds (The greater the inverter current power, the faster the green light flashing)	Inverter is running.
Red	Flash every 2s	Ground fault
	Two short flashes every 2s in interval	Grid side fault
	Three short flashes every 2s in interval	ISO fault
	Four short flashes every 2s in interval	Relay fault
	Five short flashes every 2s in interval	Leakage current sensor self-detection fault
	Flash every 0.3s	Other fault

The red and green LEDs will be on at the same time when the inverter is in the upgrade status. If the red and green LEDs are on at the same time in other status, please contact the service provider for troubleshooting.

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.

Step 1 Disconnect the external AC circuit breaker and prevent it from reconnecting.

Step 2 Rotate DC switch to the "OFF" position and then turn off the upstream DC circuit break or pull off the MC4 terminal.

NOTICE

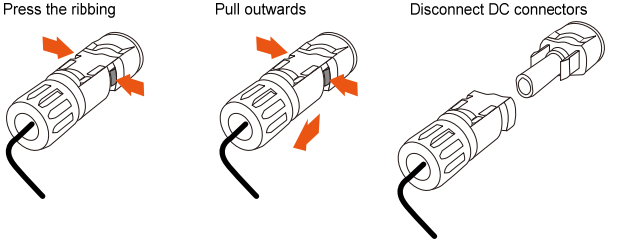
Please strictly follow the sequence of the above procedures. Inverter will not work normally if otherwise.

Step 3 Wait about ten minutes until the capacitors inside the inverter are discharged.

Step 4 Measure to confirm that the inverter AC output at the AC circuit breaker is voltage free.

Step 5 Pull AC connector out of the inverter.

Step 6 Release the locking part of DC connectors by pressing on the ribbing of the locking hooks with nipper pliers and pull it outwards.



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 4 in reverse steps.

If necessary, remove the backplate from the wall.

NOTICE

If the inverter will be reinstalled in the future, please refer to "3 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, LED indicators, 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 Troubleshooting

9.1.1 LED Indicator Troubleshooting

See "Tab. 2-2Description of LED Indicator" for the definition of LED's status.

Type of fault	Troubleshooting
LED indicator cannot be lit.	1. Disconnect the AC circuit breaker. 2. Rotate the optional DC switch to the "OFF" position. 3. Check the polarity of DC input.
Green indicator goes out.	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 5 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.

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

Telesmartphone: +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

9.1.2 Troubleshooting of Faults in the smartphone application interface

When faults occur, "Fault" state can be shown in the smartphone application interface.

If you purchase LCD module and connect it to the inverter, when the date on the screen of Eshow can not be refreshed in real time, please disconnect the external AC circuit breaker firstly and then turn off the upstream DC circuit break or pull off the MC4 terminal. Reassemble the inverter front cover and restart inverter.

If the fault still exists, check whether communication cable of the Eshow is firmly connected; If the communication cable is firmly connected, a fault has occurred in the internal communication of the inverter. However, the inverter continues feeding into the grid. Contact Sungrow Service Dept..

Fault Code	Description	Troubleshooting
002	The grid voltage exceeds inverter allowable upper limit.	1. Check the voltage of the grid. 2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution. 3. If the grid voltage is within the permissible range, contact Sungrow Service Dept..
003	Grid transient voltage exceeds the permissible range	1. This is a short-term fault due to grid condition. Wait a moment for inverter recovery. 2. If the fault still exists, please contact Sungrow Service Dept..
004	The grid voltage is below inverter's allowable lower limit.	1. Check the grid voltage. 2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution. 3. If the grid voltage is within the permissible range, contact Sungrow Service Dept..
005	The grid voltage is too low.	1. This is a short-term fault due to grid condition. Wait a moment for inverter recovery. 2. If the fault still exists, please contact Sungrow Service Dept..
006	The AC output current exceeds inverter allowable upper limit.	1. The inverter will resume if the output current falls below the protection value. 2. If the fault still exists, please contact Sungrow Service Dept..

Fault Code	Description	Troubleshooting
007	Transient AC overcurrent	1. The inverter will self-recover after several seconds. 2. If the fault still exists, please contact Sungrow Service Dept..
008	The grid frequency exceeds inverter allowable upper limit.	1. Check the grid frequency. 2. If the grid frequency exceeds the permissible range of inverter protection parameters, ask utility grid company for solution. 3. If the grid frequency is within the permissible range, contact Sungrow Service Dept..
009	The grid frequency is below the inverter allowable lower limit.	
010	Islanding	1. Check whether AC circuit breaker is triggered. 2. Check whether AC cables are all firmly connected. 3. Check whether grid is not in service. 4. If all conditions are OK and this fault still occurs in the LCD screen, contact Sungrow Service Dept..
011	The DC component of AC current exceeds inverter limit.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
012	A failure current is detected.	1. Check the PV strings for ground fault. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
014	The average grid voltage exceeds the permissible range for over 10 minutes.	1. Check whether the inverter selected country code is the country you are in. 2. Wait a moment for inverter recovery. 3. Check the voltage of the grid. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution. 4. If the fault occurs repeatedly, contact Sungrow Service Dept..
015	The grid voltage exceeds the permissible range	1. Check the model of the AC cables. 2. Wait a moment for inverter recovery. 3. If the grid voltage exceeds the permissible range, ask utility grid company for solution. 4. If the fault occurs repeatedly, contact Sungrow Service Dept..
016	The bus voltage or power is high.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
019	The transient bus voltage is high.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..

Fault Code	Description	Troubleshooting
020	The bus voltage is high.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
021	PV1 input overcurrent is detected	Check the layout and the wiring of PV1 input.
022	PV2 input overcurrent is detected	Check the layout and the wiring of PV2 input.
036	The temperature of radiator is too high	1. Check whether the placement of inverter is correctly. 2. Check whether the inverter operating ambient temperature is more than the range indicated in the specification. 3. Check whether AC output power exceeds the nominal power. 4. If the fault still exists, please contact Sungrow.
037	The internal temperature of inverter is too high	
038	Relay fault is detected	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
039	The insulation resistance is low. (ISO-flt)	1. Check whether there is a reliable inverter grounding line. 2. Check whether the positive and negative of PV panels is short-circuited with ground lead. 3. Wait a moment for inverter recovery. 4. If the fault occurs repeatedly, contact Sungrow Service Dept..
041	Leakage current self-test abnormality	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
047	The PV configuration mode set in the smartphone application interface is not in accordance with the configuration in the connection cabinet.	1. Disconnect the inverter. 2. Re-select PV configuration mode and re-connect PV strings.
048	Sampling channel failure	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
053	Auxiliary DSP detects grid voltage exceeds set protection value	1. Check the grid voltage. 2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution. 3. If the grid voltage is within the permissible range, contact Sungrow Service Dept..

Fault Code	Description	Troubleshooting
054	Auxiliary DSP detects grid frequency exceeds set protection value	1. Check the grid frequency. 2. If the grid frequency exceeds the permissible range of inverter protection parameters, ask utility grid company for solution. 3. If the grid frequency is within the permissible range, contact Sungrow Service Dept..
056	Auxiliary DSP detects leakage current exceeds set protectino range	1. Check whether there is a grounded fault of the PV string. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
057	Auxiliary DSP AC current sampling channel anomaly	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
058	Auxiliary DSP detects AC current DC injection exceeds inverter set protection range	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
059	Main and auxiliary DSP communication anomaly	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
060	Main and auxiliary DSP sampling difference	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
070	Fans are defective	Stop the inverter and disconnect the AC & DC cables. Check whether the fan duct has been blocked. If not, replace fans.
074	Communication fault of LCD	1. Check whether communication cable of the Eshow is firmly connected. 2. If the communication cable is firmly connected, a fault has occurred in the internal communication of the inverter. However, the inverter continues feeding into the grid. Contact Sungrow Service Dept..
087	Arc self-detection anomaly warn	Wait a while. Contact Sungrow if device is still in self-detection warn state.
088	Arc anomaly fault	1. Stop the inverter and disconnect the AC & DC cables. Check cable connection for aging and looseness. Re-power on and remove the arc warn manually. 2. Contact Sungrow if this fault still occurs.
089	Arc detection OFF warn	Remove the warn by enable arc detection function or keep the warn by closing arc detection function.

Fault Code	Description	Troubleshooting
100	The AC output current exceeds inverter protection limit.	1. The inverter will resume if the output current falls below the protection value. 2. If the fault still exists, please contact Sungrow Service Dept..
101	The grid frequency exceeds inverter allowable upper limit.	1. Check the grid frequency. 2. If the grid frequency exceeds the permissible range of inverter protection parameters, ask utility grid company for solution. 3. If the grid frequency is within the permissible range, contact Sungrow Service Dept..
102	The grid frequency is below the inverter allowable lower limit.	
106	The inverter is not grounded	Check whether there is a reliable inverter grounding line, if there is access to the ground, and the fault still exists, please contact Sungrow Service Dept..
200	The bus voltage is high.	1. Wait for inverter recovery after bus voltage lower. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
201	The bus voltage is too low.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
202	PV current overcurrent	1. Wait for inverter recovery after DC current is reduced. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
205	AC output relay abnormal	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept..
307	DC power is too high	Check whether the configuration of PV is in the range indicated in the specification. If the fault occurs repeatedly, contact Sungrow Service Dept..

9.2 Fault Repair

If the inverter can not work normally, you can contact the service provider for troubleshooting.

Visit http://www.sungrowservice.com to fill in and submit the relevant information (such as "Inverter Information", "Customer Information / Service Address", "Attachments" and so on).

9.3 Routine Maintenance

Items	Methods	Period
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.)

10 FAQ for SolarInfo WiFi Installation and Configuration

10.1 FAQ Index Table

No.	Title
1001	Configurable terminal devices cannot find WiFi after installation
1002	Router password is correct or not
1003	Cannot find the assigned Router
1004	Communication strength is weak (Installation notice)
1005	User performs certain advanced operation to the Router
1006	2 Routers nearby have the same SSID
1007	Data cannot be uploaded to the Server after correctly connected to Router
1008	Check the WiFi underlying data when all operations are failed
1009	Router SSID contains special characters and cannot connect to WiFi
1010	WiFi cannot find Router when Router max. rate is set to be 300Mbps
1011	Impacts of materials on the wireless signal

10.2 Question Description and Solution

No. 1001: Configurable terminal devices cannot find WiFi after installation

Applicable: All

Fault type: general

Question description: configuration end cannot find WiFi after installation

Solution:

1) Check if the device begins operation

2) Check if WiFi is installed correctly

3) The configuration end and WiFi should not be too far away. Move them together to check if the search can be done.

4) If all above-mentioned items are checked and the distance is close enough, yet this fault still occurs, it can be verified that the WiFi module is damaged.

No. 1002: Router password is correct or not

Applicable: All

Fault type: general

Question description: the signal strength and other items meet requirement, but WIFi cannot connect to Router

Solution: make sure the router password is correct. Note if there are capital and small letters.

No. 1003: Cannot find the assigned Router

Applicable: All

Fault type: general

Question description: smartphone or laptop cannot find the assigned Router

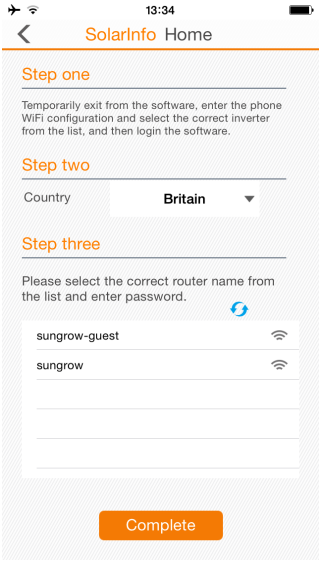
Solution:

1) Click the refresh button on the middle right to refresh

2) Make sure the Router is not far away from the WiFi and there is no iron materials between them

3) Make sure there is no SSID hidden configuration of the Router

4) Router name cannot be started with "SG-"



No. 1004: Communication strength is weak (Installation notice)

Applicable: All

Fault type: Improper installation method

Question description: Signal strength bar is less than one

Solution:

1) Make sure the device is at least 30CM higher than the floor

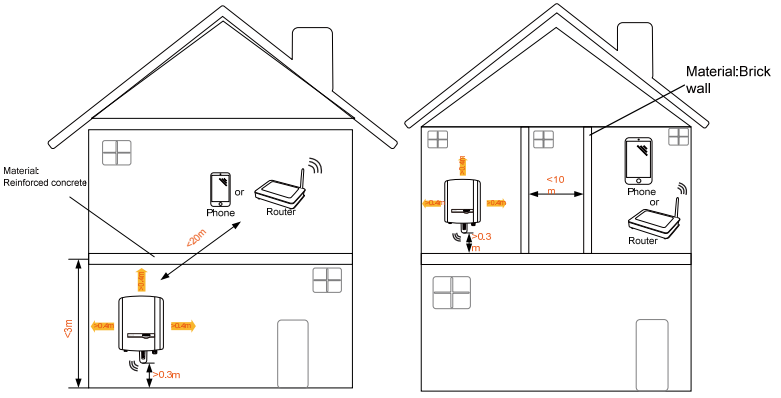
2) Make sure the device is at least 40CM from the wall

3) Make sure the device is installed internally between the PC cell or installation frame and the ground

4) Make sure the device is parallel to the external antenna of the Router and vertical as possible

5) Device is not covered by metal or reinforced concrete.

6) Installation position is shown below:



Prevention measure: operate as described in the figure above.

No. 1005: User performs certain advanced operation to the Router

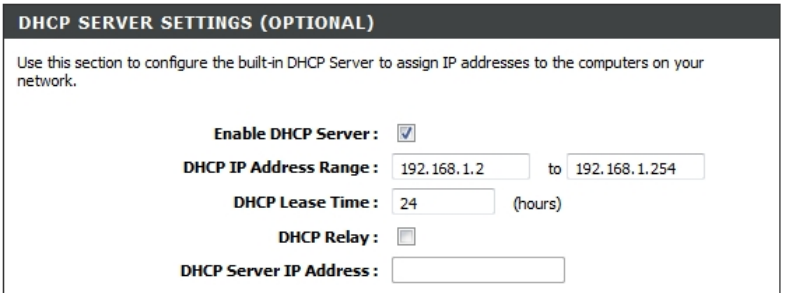
Applicable: All routers

Fault type: Improper operation

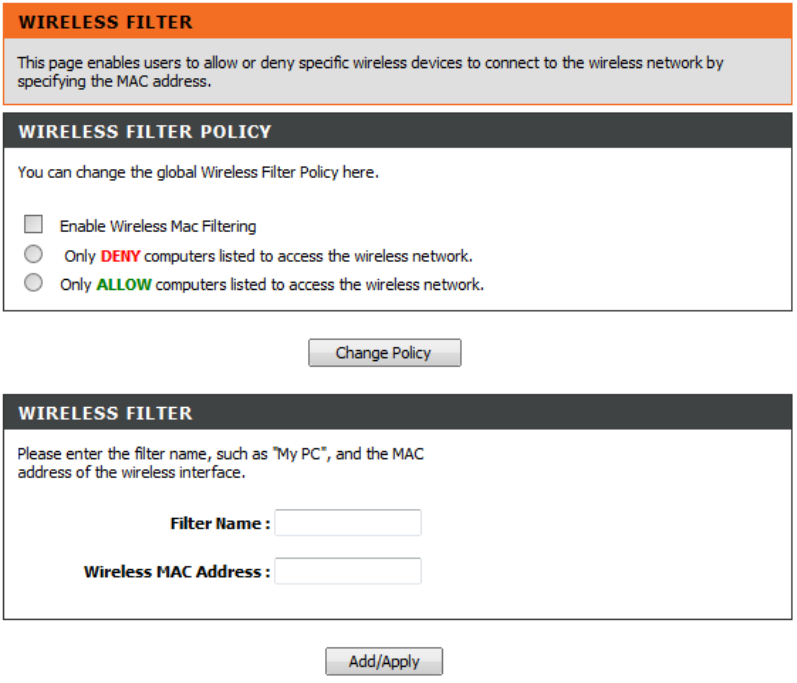
Question description: user perform some advanced settings to the Router, for example, MAC address filtering, IP range limitation, access number limitation, SSID limitation, DHCP enable, hidden of the Router SSID or other advanced settings.

Solution: Check with the user if there are such advanced settings. Cancel these settings if any.

Prevention measure: operate as described above or reset the Router to factory settings.



Check the "Enable DHCP Server"; set the "DHCP IP Address Range" as wide as possible, otherwise the accessed user numbers may decrease and cannot connect to WIFI.



"Wireless filter policy" is to set which devices are allowed to be connected to the Router. Do not set this parameter. You may not able to connect to the Router if otherwise.

This setting may hide the Router SSID and the Router may not be searched later

No. 1006: 2 Routers nearby have the same SSID

Applicable: All

Fault type: 2 routers with the same name

Question description: two routers nearby have the same router name. Cannot connect to the target Router even if the password is correct

Solution: Change the SSID of the Router that can be changed

Prevention measure: User confirmation

No. 1007: Data cannot be uploaded to the Server after correctly connected to Router

Applicable: All

Fault type: No data can be viewed from the Server

Question description: cannot find inverter data when the WiFi is correctly connected to the Router and correctly registered.

Solution:

1) Make sure Router can correctly connect to Internet

2) Close the Router firewall

3) Check if there is advanced Router configuration

Prevention measure: confirm following the above solutions

No. 1008: Check the WiFi underlying data when all operations are failed

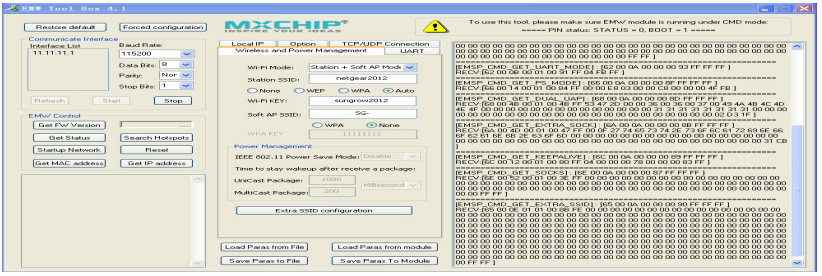
Applicable: All

Fault type: Configuration or WiFi module damage

Question description: Configuration or WiFi module damage

Solution: Read module data by EMW-TOOL software

Prevention measure: strict production inspection and strict configuration operation



No. 1009: Router SSID contains special characters and cannot connect to WiFi

Applicable: All

Fault type: WiFi software bug

Question description: Router SSID contains special characters and cannot connect to WiFi

Solution: modify WiFi software

Prevention measure: modify WiFi firmware

No. 1010: WiFi cannot find Router when Router max. rate is set to be 300Mbps

Fault type: compatibility of mode n

Question description: WiFi cannot find Router when Router max. rate is set to be 300Mbps

Solution: Modify WiFi software

Prevention measure: modify WiFi

No. 1011: Impacts of materials on the wireless signal

Fault type: interference

Question description: wireless transmission device and impacts of materials on the Wireless signal

Material	Wireless signal strength	Possible Environment
Wood		Compartment
Plaster\Asbestos		Wall
Glass		Window
Water		Aquarium, pool
Brick wall		Partition
Marble		Floor
Reinforced concrete		Floor panels, wall
Metal		Iron sheet
cordless smartphones, microwave ovens		

Solution: Make sure there is no abovementioned materials between or near the smartphone or router and the inverter

Prevention measure: Make sure there is no abovementioned materials between or near the smartphone or router and the inverter

11 Appendix

11.1 Technical Data

11.1.1 Single MPPT Inverter Data

SG2KTL-S/ SG2K5TL-S

Technical Specifications	SG2KTL-S	SG2K5TL-S
Input Side Data		
Max. PV input power	2300W	2800W
Max. PV input voltage	600V	600V
Startup voltage	150V	150V
Nominal input voltage	345V	
MPP voltage range	125…560V	125…560V
MPP voltage range for nominal power	210…520V	240…520V
No. of MPPTs	1	
Max. number of PV strings per MPPT	1	1
Max. PV input current	11A	11A
Max. current for input connector	12A	
Short-circuit current of PV input	12A	12A
Output Side Data		
Nominal AC output power	2000W	2490W (cosΦ=1)
Max AC output apparent power	2150VA	2490VA
Max. AC output current	9.5A	11.5A
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)	

Technical Specifications	SG2KTL-S	SG2K5TL-S
THD	<3% (Nominal power)	
DC current injection	<0.5% In	
Power factor	>0.99@default value at nominal power (adj. 0.8 over-excited~0.8 under-excited)	
Protection		
Anti-islanding protection	**Yes**	
AC short circuit protection	**Yes**	
Leakage current protection	**Yes**	
DC switch	**Optional**	
DC fuse	**No**	
Overvoltage protection	**Varistors**	
System Data		
Max. efficiency	98.00%	98.00%
Max. European efficiency	97.00%	97.40%
Isolation method	Transformerless	
Ingress protection rating	IP65	
Night power consumption	<1 W	
Operating ambient temperature range	-25℃…+60℃(> 45℃ derating)	
Allowable relative humidity range	0…100%	
Cooling method	Natural cooling	
Noise level	≤30dB	
Max. operating Altitude	4000m(> 2000m derating)	
Display	LED, Graphic LCD(Optional)	
Communication	WiFi(Optional)	
DC Terminals	MC4	
AC Terminals	Plug and play connector	
Certification	IEC61000-6-2,IEC61000-6-3,AS/NZS3100,AS4777.2,AS4777.3,VDE-AR-N-4105,VDE0126-1-1,CE,G83/2,C10/11,EN50438,CGC	
Mechanical Data		
Dimensions(W×H×D)	300×370×125mm	

Technical Specifications	SG2KTL-S	SG2K5TL-S
Mounting method	Wall bracket	
Weight	9kg	

SG3KTL-S/ SG3K6TL-S/ SG4KTL-S

Technical Specifications	SG3KTL-S	SG3K6TL-S	SG4KTL-S
Input Side Data			
Max. PV input power	3300W	3900W	4300W
Max. PV input voltage	600V	600V	600V
Startup voltage	150V	150V	150V
Nominal input voltage	345V		
MPP voltage range	125…560V	125…560V	125…560V
MPP voltage range for nominal power	280…520V	210…520V	240…520V
No. of MPPTs	1		
Max. number of PV strings per MPPT	1	2	2
Max. PV input current	11A	18A	18A (9A/9A)
Max. current for input connector	12A	20A	12A
Short-circuit current of PV input	12A	20A	20A
Output Side Data			
Nominal AC output power	3000W	3680W	4000W
Max AC output apparent power	3150VA	3680VA	4210VA
Max. AC output current	13.7A	16.0A	18.3A
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% In		
Power factor	>0.99@default value at nominal power (adj. 0.8 over-excited~0.8 under-excited)		
Protection			
Anti-islanding	**Yes**		

Technical Specifications	SG3KTL-S	SG3K6TL-S	SG4KTL-S
protection			
AC short circuit protection	**Yes**		
Leakage current protection	**Yes**		
DC switch	**Optional**		
DC fuse	**No**		
Overvoltage protection	**Varistors**		
System Data			
Max. efficiency	98.00%	98.00%	98.00%
Max. European efficiency	97.50%	97.50%	97.50%
Isolation method	Transformerless		
Ingress protection rating	IP65		
Night power consumption	<1 W		
Operating ambient temperature range	-25℃…+60℃(> 45℃ derating)		
Allowable relative humidity range	0…100%		
Cooling method	Natural cooling		
Noise level	≤30dB		
Max. operating Altitude	4000m(> 2000m derating)		
Display	LED, Graphic LCD(Optional)		
Communication	WiFi(Optional)		
DC Terminals	MC4		
AC Terminals	Plug and play connector		
Certification	IEC61000-6-2,IEC61000-6-3,AS/NZS3100,AS4777.2,AS4777.3,VDE-AR-N-4105,VDE0126-1-1,CE,G83/2,C10/11,EN50438,CGC		
Mechanical Data			
Dimensions(W×H×D)	300 × 370 × 125mm	300 × 370 × 125mm	360 × 390 × 133mm
Mounting method	Wall bracket		
Weight	9kg	9kg	11kg

11.1.2 Double MPPTs Inverter Data

SG3KTL-D/SG3K6TL-D

Technical Specifications	SG3KTL-D	SG3K6TL-D
Input Side Data		
Max. PV input power	3300W	3900W
Max. PV input voltage	600V	600V
Startup voltage	150V	150V
Nominal input voltage	345V	
MPP voltage range	125…560V	125…560V
MPP voltage range for nominal power	150…520V	180…520V
No. of MPPTs	2	
Max. number of PV strings per MPPT (DC1/DC2)	1/1	
Max. PV input current (DC1/DC2)	11A/11A	
Max. current for input connector	12A	
Short-circuit current of PV input (DC1/DC2)	24A(12A/12A)	
Output Side Data		
Nominal AC output power	3000W (cosΦ=1)	3680W (cosΦ=1)
Max AC output apparent power	3150VA	3680VA
Max. AC output current	13.7A	16.0A
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% In	
Power factor	>0.99@default value at nominal power (adj. 0.8 over-excited~0.8 under-excited)	
Protection		
Anti-islanding protection	**Yes**	
AC short circuit protection	**Yes**	
Leakage current	**Yes**	

Technical Specifications	SG3KTL-D	SG3K6TL-D
protection		
DC switch	**Optional**	
DC fuse	**No**	
Overvoltage protection	**Varistors**	
System Data		
Max. efficiency	98.00%	98.00%
Max. European efficiency	97.50%	97.50%
Isolation method	Transformerless	
Ingress protection rating	IP65	
Night power consumption	<1 W	
Operating ambient temperature range	-25℃…+60℃(> 45℃ derating)	
Allowable relative humidity range	0…100%	
Cooling method	Natural cooling	
Noise level	≤30dB	
Max. operating Altitude	4000m(> 2000m derating)	
Display	LED, Graphic LCD(Optional)	
Communication	WiFi(Optional)	
DC Terminals	MC4	
AC Terminals	Plug and play connector	
Certification	IEC61000-6-2,IEC61000-6-3,AS/NZS3100,AS4777.2,AS4777.3, VDE-AR-N-4105,VDE0126-1-1,CE,G83/2,C10/11,EN50438,CG C	
Mechanical Data		
Dimensions(W×H×D)	360×390×133mm	
Mounting method	Wall bracket	
Weight	11kg	

SG4K6TL-D/SG5KTL-D

Technical Specifications	SG4K6TL-D	SG5KTL-D
Input Side Data		
Max. PV input power	4900W	5400W
Max. PV input voltage	600V	600V
Startup voltage	150V	150V
Nominal input voltage	345V	
MPP voltage range	125…560V	125…560V
MPP voltage range for nominal power	220…520V	240…520V
No. of MPPTs	2	
Max. number of PV strings per MPPT (DC1/DC2)	1/1	
Max. PV input current (DC1/DC2)	11A/11A	
Max. current for input connector	12A	
Short-circuit current of PV input (DC1/DC2)	24A(12A/12A)	
Output Side Data		
Nominal AC output power	4600W (cosΦ=1)	5000W (cosΦ=1)
Max AC output apparent power	4600VA	5000VA
Max. AC output current	20A	21.7A
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% In	
Power factor	>0.99@default value at nominal power (adj. 0.8 over-excited~0.8 under-excited)	
Protection		
Anti-islanding protection	**Yes**	
AC short circuit protection	**Yes**	

Technical Specifications	SG4K6TL-D	SG5KTL-D
Leakage current protection	**Yes**	
DC switch	**Optional**	
DC fuse	**No**	
Overvoltage protection	**Varistors**	
System Data		
Max. efficiency	98.00%	98.00%
Max. European efficiency	97.50%	97.50%
Isolation method	Transformerless	
Ingress protection rating	IP65	
Night power consumption	<1 W	
Operating ambient temperature range	-25℃…+60℃(> 45℃ derating)	
Allowable relative humidity range	0…100%	
Cooling method	Natural cooling	
Noise level	≤30dB	
Max. operating Altitude	4000m(> 2000m derating)	
Display	LED, Graphic LCD(Optional)	
Communication	WiFi(Optional)	
DC Terminals	MC4	
AC Terminals	Plug and play connector	
Certification	IEC61000-6-2,IEC61000-6-3,AS/NZS3100,AS4777.2,AS4777.3, VDE-AR-N-4105,VDE0126-1-1,CE,G83/2,C10/11,EN50438,CG C	
Mechanical Data		
Dimensions(W×H×D)	360×390×133mm	
Mounting method	Wall bracket	
Weight	11kg	

For SG5KTL-D, when the national selection is set to Australia ,the nominal AC output power of the inverter is 4600W and the max. AC output current is 20A.

11.2 Exclusion of Liability

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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!

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