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# User Manual

SG2.5KTL-S/SG3KTL-S/SG3.5KTL-S/SG4KTL-S/SG4.6  
KTL-D/SG5KTL-D

## PV Grid-Connected Inverter





# About This Manual

This manual applies to inverter SG2K5TL-S, SG3KTL-S, SG3K5TL-S, SG4KTL-S, 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 SG2K5TL-S, SG3KTL-S, SG3K5TL-S, SG4KTL-S, 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](http://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](http://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.

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# 1 Safety Instructions

## 1.1 IMPORTANT SAFETY INSTRUCTIONS

SG2K5TL-S, SG3KTL-S, SG3K5TL-S, SG4KTL-S, 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.
- PV modules should be covered by opaque materials during wiring.

### DANGER

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

## During Inverter Operation

### DANGER

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

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

### CAUTION

**There is a risk of burns!**

**Avoid touching device hot parts (such as the heat sink) during operation. Only the 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

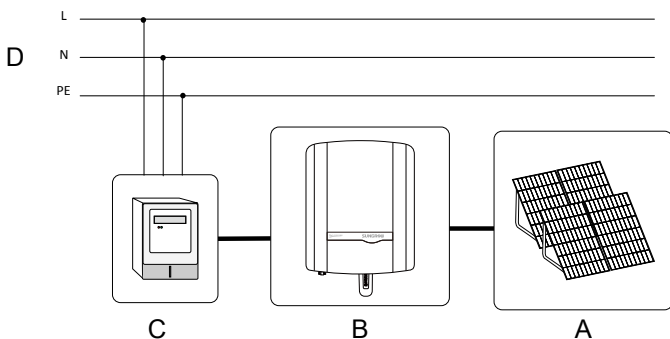
### 2.1 Intended Usage

SG2K5TL-S, SG3KTL-S, SG3K5TL-S, SG4KTL-S, 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	SG2K5TL-S, SG3KTL-S, SG3K5TL-S, SG4KTL-S, SG4K6TL-D and SG5KTL-D.
C	Metering device	Meter cupboard with power distribution system

Item	Description	Remark
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

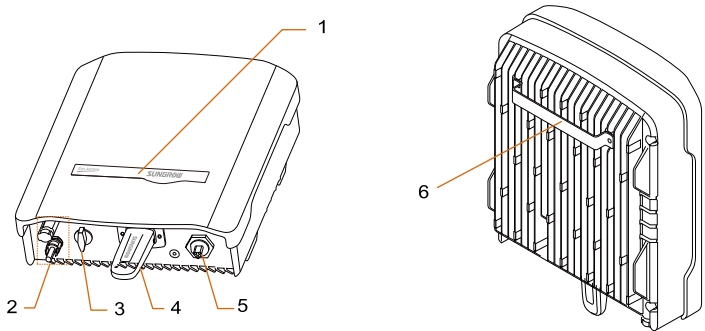


Fig. 2-2 Product Description

Item	Name	Description
1	LED indicator panel	Indicate the working statues of the inverter.
2	DC terminals	There are 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	WiFi	SolarInfo WiFi.
5	AC terminal	Inverter feeds power to utility grid via this terminal.
6	Mounting rack	It is used to hang inverter onto the backplate.

2.2.2 Dimensions and Weight of Inverter

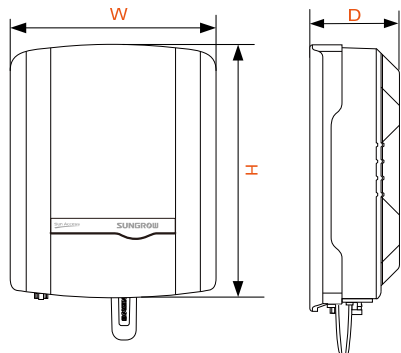


Fig. 2-3 Dimensions of Inverter

Tab. 2-1 Dimensions Value

Type	W(mm)	H(mm)	D(mm)	Net weight(kg)
SG2K5TL-S/SG3KTL-S/ SG3K5TL-S/SG4KTL-S	300	370	125	9
SG4K6TL-D/SG5KTL-D	360	390	133	13

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.)

State	Description	
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	Flicker once every 0.3 second	A malfunction happens, or protection function triggers.

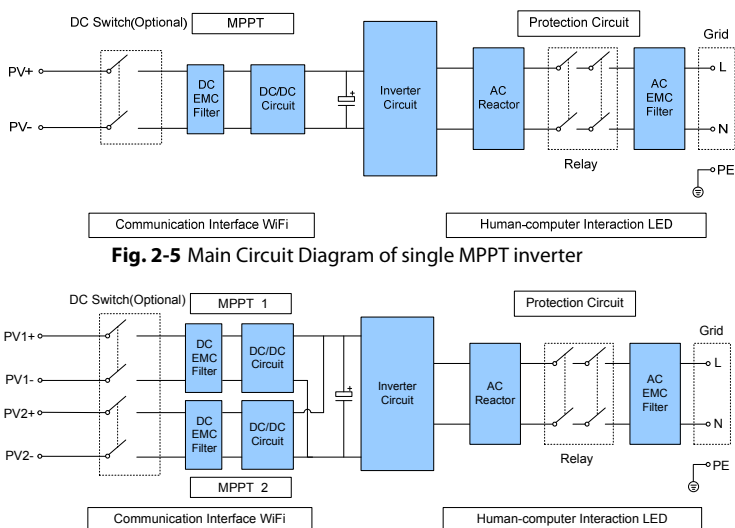
## 2.3 Technical Description

### 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.



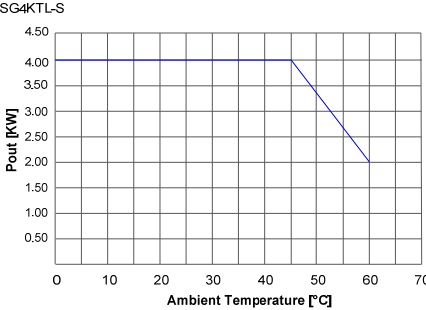
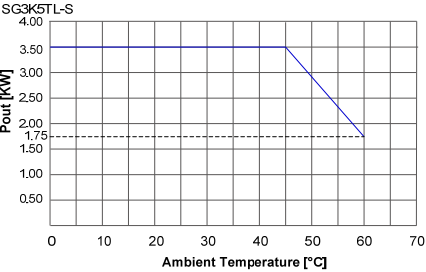
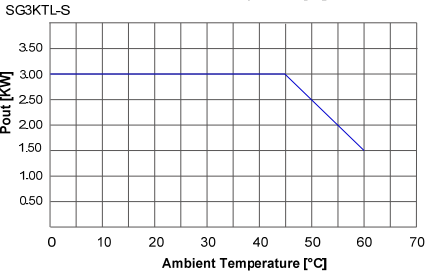
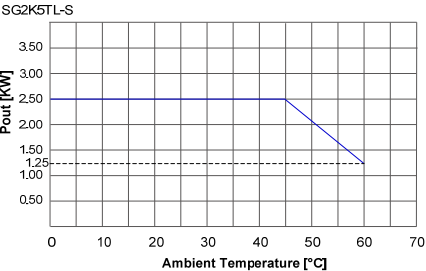
### 2.3.2 Functions Description

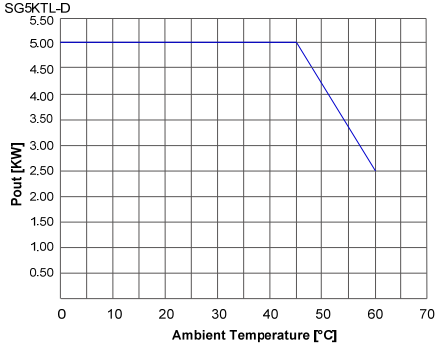
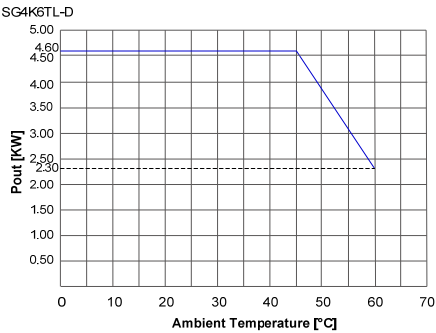
Inverter functions can be grouped as the following:

- **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.





## 3 Unpacking and Storage

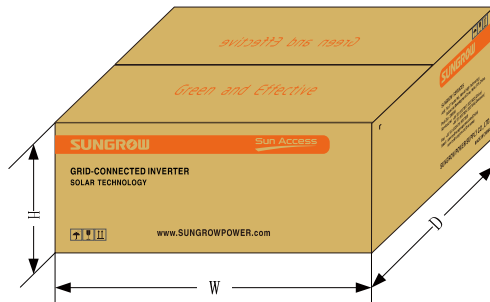
### 3.1 Unpacking and Inspection

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
SG2.5KTL-S/SG3KTL-S/SG3.5KTL-S/ SG4KTL-S	500mm	210mm	385mm
SG4.6KTL-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.

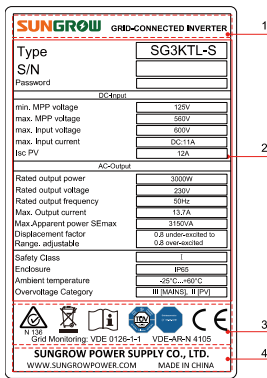


Fig. 3-2 Nameplate of Inverter

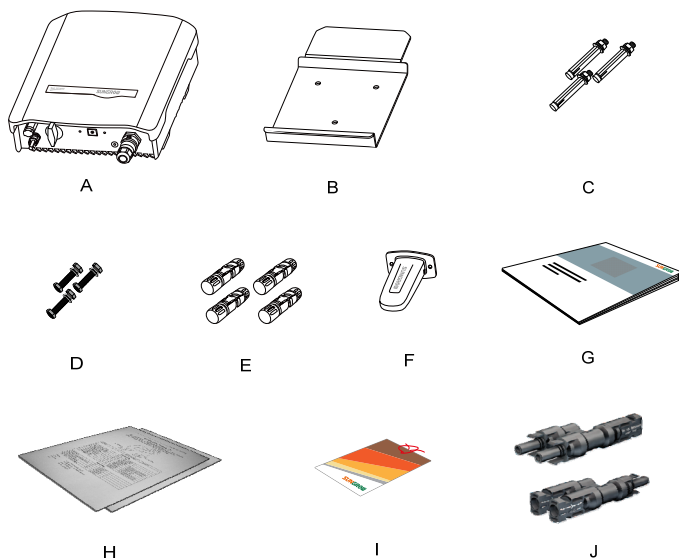
\* Image shown here is for reference only. Actual product you receive may differ.

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.
	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	Fastener set for installing the inverter onto metal frame
E	PV input connectors, including positive and negative connectors
F	WiFi(Optional), for wireless communication
G	Quick user manual and CD
H	Packing list and product test report
I	Quality certificate
J	T-type terminals. It is only for SG3.5KTL-S/SG4KTL-S.

### 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 +75 °C. And the storage relative humidity should be always between 0 and 95%.
- It is very important to keep the packaging away from chemicals. Otherwise it will lead to corrosion.
- During the storage time, check periodically for visible damages by rats. Replace the packaging if necessary.
- If there is more than one inverter to be stored, the maximum layers for original paper packaging are five.



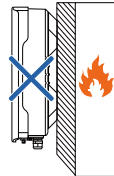
After long-term storage or decommissioning, local installer or Service Dept. of Sungrow should perform a comprehensive test before connecting the inverter into PV power system.

## 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.



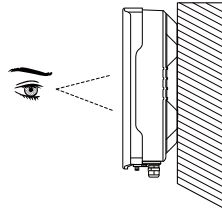
Flammable material or gas near the installation

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

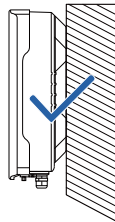


Flammable wall material

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

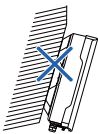


6. It is suggested that the inverter be installed vertically with upside up for good heat dissipation.

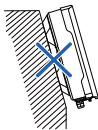


7. Never install the inverter horizontally, or with a forward tilt or with a backward tilt or even with upside down.

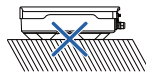
With a forward tilt



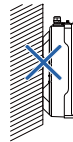
With a backward tilt



Horizontally



With upside down



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

9. The ambient temperature should range from  $-25^{\circ}\text{C}$  to  $60^{\circ}\text{C}$ . The power output will reduce when the ambient temperature exceeds  $45^{\circ}\text{C}$ .



Max. ambient temperature:  
 **$+60^{\circ}\text{C}$**

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

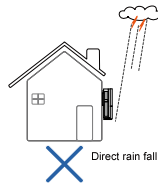
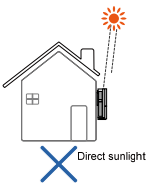
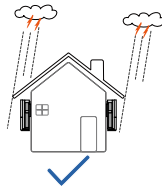
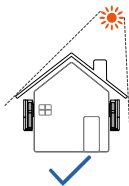


Min. ambient temperature:  
 **$-25^{\circ}\text{C}$**

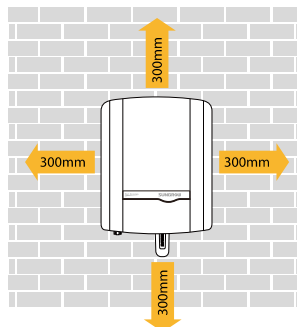


Max. relative humidity:  
**100%**  
**No condensing**

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

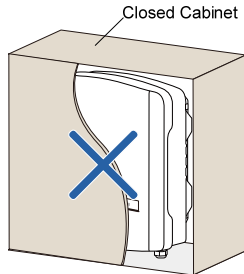


12. Take enough space for convection into consideration during installation.



13. 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.

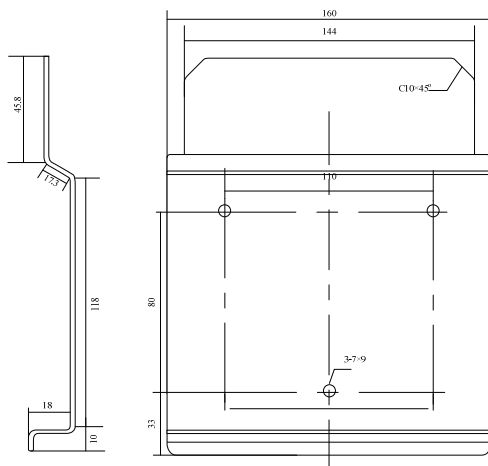
## 4.2 Moving Inverter to Installation Site

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.

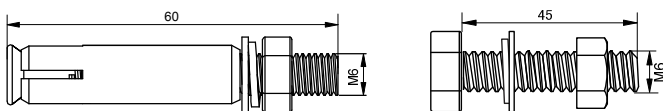
1. Beware of the weight of the inverter.
2. Grasp the equipment with both hands by means of handles.
3. Do not release the equipment unless it has been firmly secured to the wall.

## 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** Fastener(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.

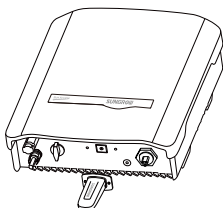
In the following, we will introduce how to secure the inverter to the wall using the provided backplate.

### Concrete Wall

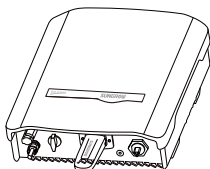
**Step 1** Remove the backplate and expansion bolts from the packaging.

**Step 2** WiFi connection.

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



2. Fasten the screws with appropriate torque.

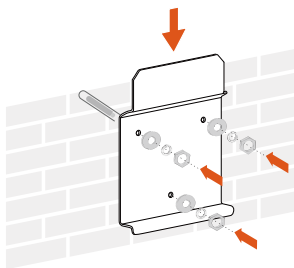


**Step 3** Screw a M5 screw onto the chosen concrete wall.

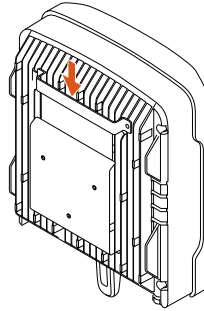
**⚠ DANGER**

**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 Nm.



**Step 5** Hang the inverter onto the backplate.



### Metal Frame

**Step 1** Remove the supplied backplate from the packaging.

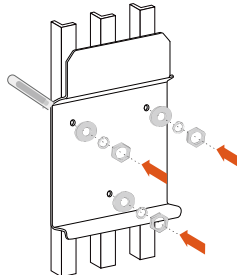
**Step 2** WiFi connection.

**Step 3** Screw a M5 screw onto the chosen metal frame.

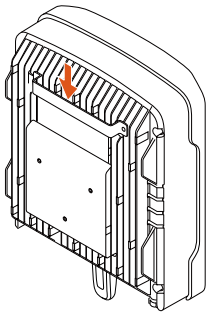


If the shape of the metal frame doesn't fit the holes on the backplate, you need to re-drill holes on the backplate at appropriate position according to the chosen frame.

**Step 4** Choose the best installation site according to the abovementioned requirements. Fasten the backplate to the metal frame with the supplied expansion bolt set. The torque for fastening the nut should be at least 10Nm.



**Step 5** Hang the inverter onto the backplate.



## 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:**

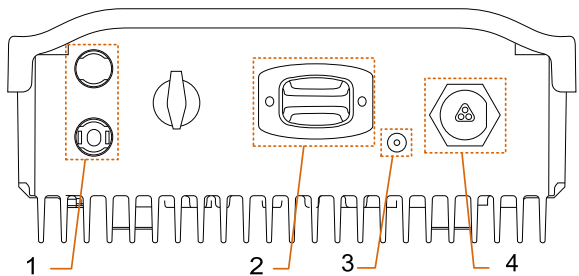
- **The regulations related to the electricity fed into the grid**
- **The safety instructions related to the PV arrays**

## 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

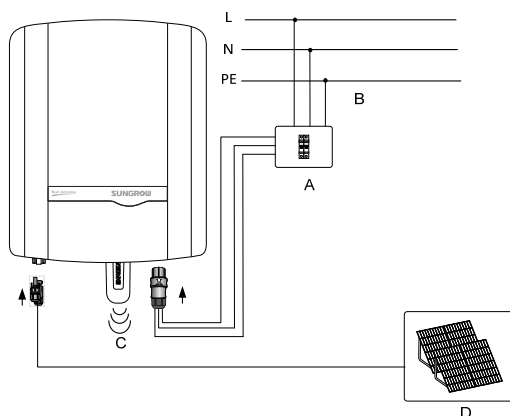
\* Image shown here is for reference only. Actual product you receive may differ.

**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	User can order it from Sungrow for wireless communication.
D	PV arrays	<b>-S series:</b> one input area with one pair of terminals. <b>-D series:</b> two input areas with two pairs of terminals.

## 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
SG2K5TL-S	25A
SG3KTL-S	25A
SG3K5TL-S	25A
SG4KTL-S	32A
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 <sup>2</sup> )		Outer cable diameter(mm)	
	Range	Recommended Value	Range	Recommended Value
SG2K5TL-S	4...6	4	10...14	10
SG3KTL-S	4...6	4	10...14	10
SG3K5TL-S	4...6	6	10...14	10
SG4KTL-S	4...6	6	10...14	10
SG4K6TL-D	4...6	6	10...14	10
SG5KTL-D	4...6	6	10...14	10

### NOTICE

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

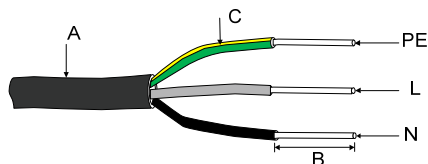
- Withstand ambient temperature;
- Layout type (inside wall, underground, free air etc.);
- UV resistance and so on.

### 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.

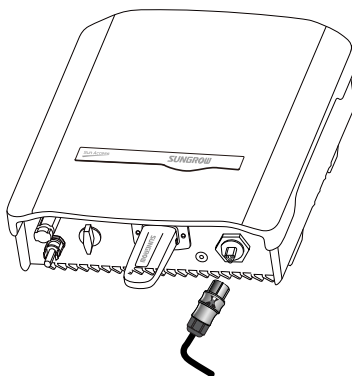
**Step 3** Strip off insulation layer of all AC cables. The length of strip insulation is approximate 18mm.



No.	Description	Remark
A	Protective layer	Accepted cable external diameter ranges from 22mm to 27mm.
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. Cover the PV arrays with opaque materials and then perform the wiring. 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 1000V. Voltage over 1000V can damage the inverter.**



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

### 5.5.1 PV Inputs Configuration

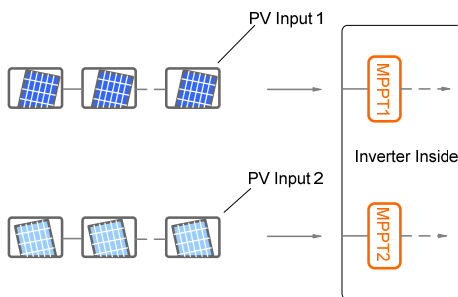
For -S series inverters, there's one input area with one MPP tracker. They can be configured in parallel mode only.

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.

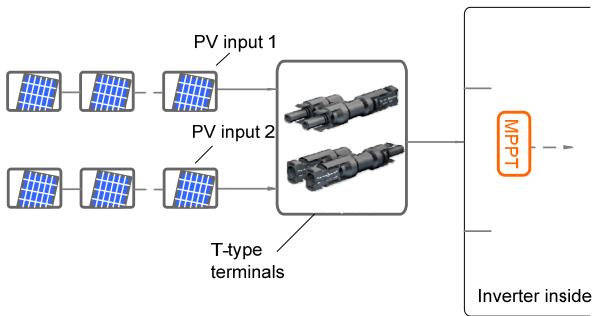
Type	Area	DC Power Limit for Each Input	Total DC Input Power Limit	Open-circuit Voltage Limit for Each Input	Short-circuit Current Limit for Each Input
SG4K6TL-D	DC1	3000W	4900 W	600V	12A
	DC2	3500W			12A
SG5KTL-D	DC1	3000W	5400W	600V	12A
	DC2	3500W			12A

### 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.

- SG3K5TL-S/ SG4KTL-S

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



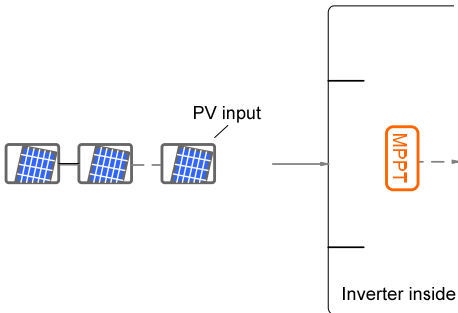
Type	Total DC Input Power Limit	Open-circuit Voltage Limit	Short-circuit Current Limit
SG3K5TL-S	3800 W	600V	20A
SG4KTL-S	4300 W	600V	20A



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

- SG2K5TL-S/ SG3KTL-S

As shown in the following diagram.



Type	Total DC Input Power Limit	Open-circuit Voltage Limit	Short-circuit Current Limit
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
SG2K5TL-S/SG3KTL-S	2.5...6mm <sup>2</sup>	5...8mm	600 V	Same with short-circuit current.
SG3K5TL-S/SG4KTL-S	2.5...6mm <sup>2</sup>	5...8mm	600 V	Same with short-circuit current.
SG4K6TL-D/SG5KTL-D	2.5...6mm <sup>2</sup>	5...8mm	600 V	Same with short-circuit current.

#### NOTICE

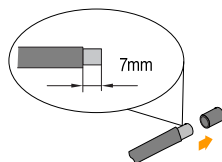
**The DC cables must be flexible wires.**

### DC Connector Assembling Procedure:

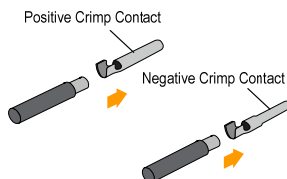
#### DANGER

**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.

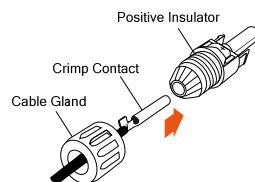


**Step 2** Assemble cable ends with crimp contacts by crimping pliers.

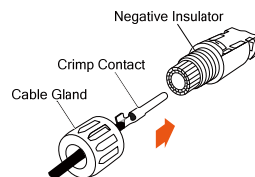


**Step 3** Lead cable through cable gland.

**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.



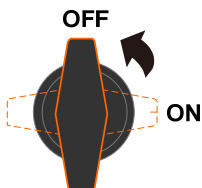
For further assembly and connection instruction, please visit the webpage of the device manufacturer.

**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".

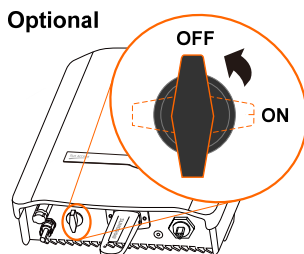
### 5.5.3 DC Wiring Procedure

#### DANGER

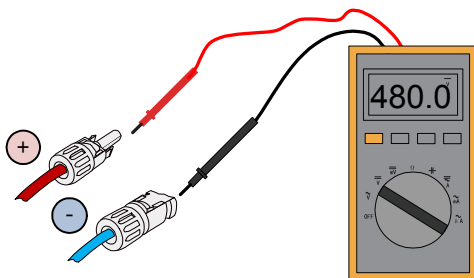
**Make sure that none of the DC or AC cables connected to the inverter is live before the electrical work.**

Connect the inverter to PV array as the following procedures:

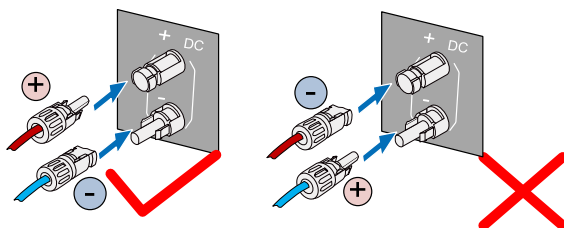
**Step 1** Rotate the optional DC switch at the bottom to the "OFF" position.



**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.



**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.**

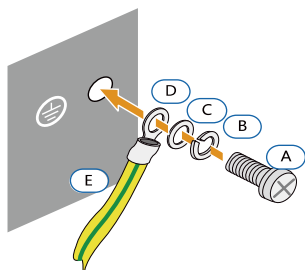
All non-current carrying exposed metal parts of the equipment and other enclosures in the PV power system should be grounded (e.g., PV arrays frame and inverter enclosure).

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 on one side 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	6mm <sup>2</sup> (9AWG)

**Fig. 5-3** Connection of the Second PE Connection

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

## 5.7 Communication

### 5.7.1 Communication System

The communication connection between the inverter and PC can be established via SolarInfo WiFi.

### 5.7.2 Logging into SolarInfo APP through Cellphone

Download the SolarInfo APP and install it into you cellphone. You can select the APP version for iPhone or Android. Then you can login to the SolarInfo Bank system through Internet.



The preferred address for downloading SolarInfo APP is

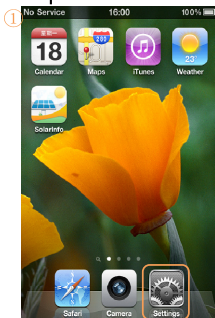
<http://www.solarinfobank.com/app/index>, you can also download the APP for iphone on

<https://itunes.apple.com/us/app/solarinfo-home/id906260039?l=zh&ls=1&mt=8> and download the APP for Android on

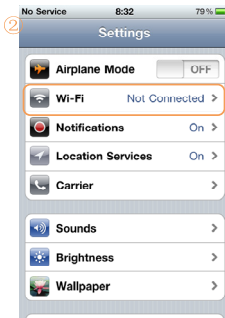
<https://play.google.com/store/apps/details?id=com.sungrow.home>.

**Step 1** Enable the WiFi function of cellphone.

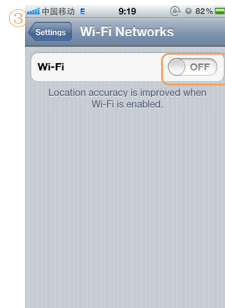
Take iphone for example



Click Settings

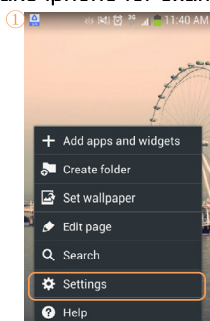


Select Wi-Fi to enable the Wi-Fi function

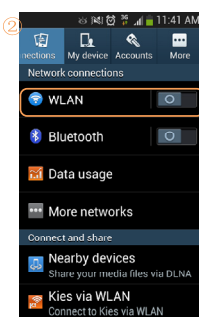


Start WiFi to search wireless networks

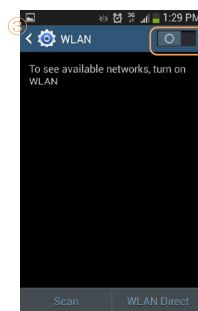
Take iphone for example



Click Settings



Select WLAN to enable the Wi-Fi function



Start WLAN to search wireless networks

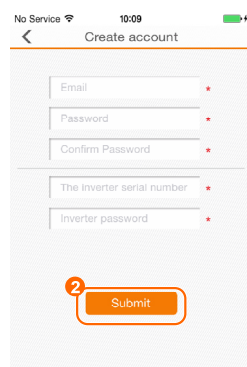
**Step 2** Open the SolarInfo APP. If this is the first time you enter APP and you do not have an account, then you need to register.



Enter SolarInfo Bank



Select to register

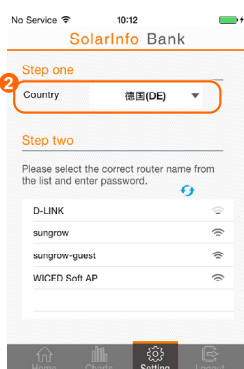


Complete the account information

**Step 3** If the inverter is not configured, you need select the country firstly and then the Country Select will take effect immediately.

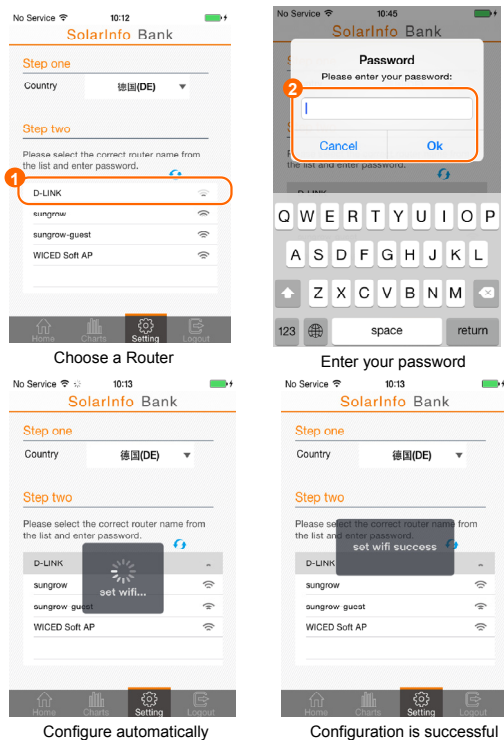


Select to configure

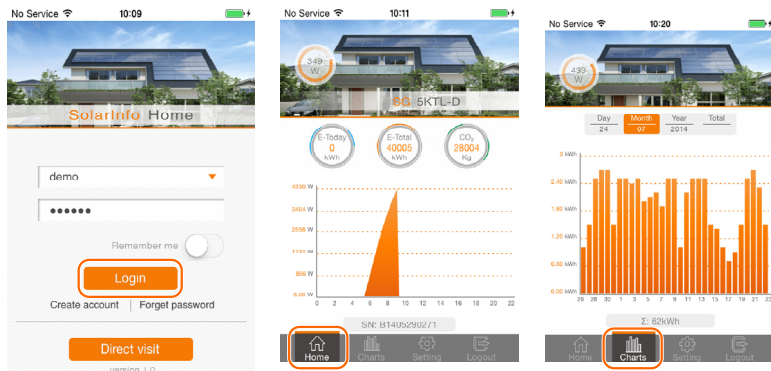


Select the country

**Step 4** Choose a Router, correctly fill in the Password and click [OK]. Then it will configure the inverter automatically according to the national selection.



**Step 5** You can log into SolarInfo APP using the created account in the next time and then you will enter the SolarInfo APP homepage automatically.



The general information of the plant is displayed on upper area of the homepage, including the today energy, total energy and avoided CO2.

## 6 Commissioning

### 6.1 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.

### 6.2 Commissioning Procedure

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

Provided that there is sufficient sunlight:

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



- If inverter's commissioning fails, the red indicator will be lit.
- The fault must be removed before repeating from step1 to step 4.
- If inverter's commissioning succeeds, the green indicator will be lit.

## 7 Disconnecting, Dismantling and Disposing of the Inverter

### 7.1 Disconnecting the Inverter

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

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

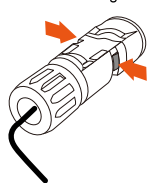
1. Disconnect the external AC circuit breaker and prevent it from reconnecting.
2. Turn off the upstream DC circuit break or cover the PV arrays with opaque materials. Rotate DC switch at the bottom of inverter to the "OFF" position.

#### NOTICE

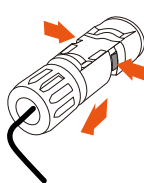
**Please strictly follow the sequence of the above procedures. Otherwise it will cause unrecoverable damage to the inverter.**

3. Wait about ten minutes until the capacitors inside the inverter are discharged.
4. Measure to confirm that the inverter AC output at the AC circuit breaker is voltage free.
5. Pull AC connector out of the inverter.
6. Release the locking part of DC connectors by pressing on the ribbing of the locking hooks with nipper pliers and pull it outwards.

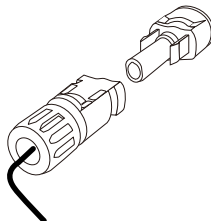
Press the ribbing



Pull outwards



Disconnect DC connectors



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

## 7.2 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.**

## 7.3 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.**

# 8 Troubleshooting and Maintenance

## 8.1 Troubleshooting

### 8.1.1 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:

Telephone: +86 551 6532 7817.

Email: [service@sungrow.cn](mailto: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

### 8.1.2 Troubleshooting of Faults in the phone application interface

When faults occur, “Fault” state can be shown in the phone application interface.

<b>Fault Code</b>	<b>Description</b>	<b>Troubleshooting</b>
0002	The grid voltage exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> <li>1. Check the voltage of the grid.</li> <li>2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> <li>3. If the grid voltage is within the permissible range, contact Sungrow Service Dept..</li> </ol>
0003	Grid transient voltage exceeds the permissible range	<ol style="list-style-type: none"> <li>1. This is a short-term fault due to grid condition. Wait a moment for inverter recovery.</li> <li>2. If the fault still exists, please contact Sungrow Service Dept..</li> </ol>
0004	The grid voltage is below inverter's allowable lower limit.	<ol style="list-style-type: none"> <li>1. Check the grid voltage.</li> <li>2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> <li>3. If the grid voltage is within the permissible range, contact Sungrow Service Dept..</li> </ol>
0005	The grid voltage is too low.	<ol style="list-style-type: none"> <li>1. This is a short-term fault due to grid condition. Wait a moment for inverter recovery.</li> <li>2. If the fault still exists, please contact Sungrow Service Dept..</li> </ol>
0006	The AC output current exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> <li>1. The inverter will resume if the output current falls below the protection value.</li> <li>2. If the fault still exists, please contact Sungrow Service Dept..</li> </ol>
0007	Transient AC overcurrent	<ol style="list-style-type: none"> <li>1. The inverter will self-recover after several seconds.</li> <li>2. If the fault still exists, please contact Sungrow Service Dept..</li> </ol>
0008	The grid frequency exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> <li>1. Check the grid frequency.</li> <li>2. If the grid frequency exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> </ol>
0009	The grid frequency is below the inverter allowable lower limit.	<ol style="list-style-type: none"> <li>3. If the grid frequency is within the permissible range, contact Sungrow Service Dept..</li> </ol>
0010	Islanding	<ol style="list-style-type: none"> <li>1. Check whether AC circuit breaker is triggered.</li> <li>2. Check whether AC cables are all firmly connected.</li> <li>3. Check whether grid is not in service.</li> <li>4. If all conditions are OK and this fault still occurs in the LCD screen, contact Sungrow Service Dept..</li> </ol>
0011	The DC component of AC current exceeds inverter limit.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>

Fault Code	Description	Troubleshooting
0012	A failure current is detected.	<ol style="list-style-type: none"> <li>1. Check the PV strings for ground fault.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
0014	The average grid voltage exceeds the permissible range for over 10 minutes.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. Check the voltage of the grid. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> <li>3. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
0015	The grid voltage exceeds the permissible range	<ol style="list-style-type: none"> <li>1. Check the model of the AC cables.</li> <li>2. Wait a moment for inverter recovery.</li> <li>3. If the grid voltage exceeds the permissible range, ask utility grid company for solution.</li> <li>4. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
0016	The bus voltage or power is high.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
0019	The transient bus voltage is high.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
0020	The bus voltage is high.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
0021	PV1 input overcurrent is detected	Check the layout and the wiring of PV1 input.
0022	PV2 input overcurrent is detected	Check the layout and the wiring of PV2 input.
0036	The temperature of radiator is too high	<ol style="list-style-type: none"> <li>1. Check whether the placement of inverter is correctly.</li> <li>2. Check whether the inverter operating ambient temperature is more than the range indicated in the specification.</li> </ol>
0037	The internal temperature of inverter is too high	<ol style="list-style-type: none"> <li>3. Check whether AC output power exceeds the nominal power.</li> <li>4. If the fault still exists, please contact Sungrow.</li> </ol>
0038	Relay fault is detected	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>

<b>Fault Code</b>	<b>Description</b>	<b>Troubleshooting</b>
039	The insulation resistance is low. (ISO-ft)	<ol style="list-style-type: none"> <li>1. Check whether the positive and negative of PV panels is short-circuited with ground lead.</li> <li>2. Wait a moment for inverter recovery.</li> <li>3. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
041	Leakage current self-test abnormality	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
047	The PV configuration mode set in the phone application interface is not in accordance with the configuration in the connection cabinet.	<ol style="list-style-type: none"> <li>1. Disconnect the inverter.</li> <li>2. Re-select PV configuration mode and re-connect PV strings.</li> </ol>
048	Sampling channel failure	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
053	Auxiliary DSP detects grid voltage exceeds set protection value	<ol style="list-style-type: none"> <li>1. Check the grid voltage.</li> <li>2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> <li>3. If the grid voltage is within the permissible range, contact Sungrow Service Dept..</li> </ol>
054	Auxiliary DSP detects grid frequency exceeds set protection value	<ol style="list-style-type: none"> <li>1. Check the grid frequency.</li> <li>2. If the grid frequency exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> <li>3. If the grid frequency is within the permissible range, contact Sungrow Service Dept..</li> </ol>
056	Auxiliary DSP detects leakage current exceeds set protection range	<ol style="list-style-type: none"> <li>1. Check whether there is a grounded fault of the PV string.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
057	Auxiliary DSP AC current sampling channel anomaly	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
058	Auxiliary DSP detects AC current DC injection exceeds inverter set protection range	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>
059	Main and auxiliary DSP communication anomaly	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept..</li> </ol>

Fault Code	Description	Troubleshooting
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.
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.
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.
102	The grid frequency is below the inverter allowable lower limit.	3. If the grid frequency is within the permissible range, contact Sungrow Service Dept..
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..

Fault Code	Description	Troubleshooting
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..

## 8.2 Routine Maintenance

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

## 9 Appendix

### 9.1 Technical Data

#### 9.1.1 Single MPPT Inverter Data

Technical Specifications	SG2K5TL-S	SG3KTL-S	SG3K5TL-S	SG4KTL-S
<b>Input Side Data</b>				
Max. PV input power	2800W	3300W	3800W	4300W
Max. PV input voltage	600V	600V	600V	600V
Startup voltage	150V	150V	150V	150V
Nominal input voltage	345V			
MPP voltage range	125...560V	125...560V	125...560V	125...560V
MPP voltage range for nominal power	240...520V	280...520V	210...520V	240...520V
No. of MPPTs	1			
Max. number of PV strings per MPPT	1	1	2	2
Max. PV input current	11A	11A	18A	18A
Max. current for input connector	20A			
Short-circuit current of PV input	12A	12A	20A	20A
<b>Output Side Data</b>				
Nominal AC output power	2500W ( $\cos\Phi=1$ )	3000W ( $\cos\Phi=1$ )	3500W ( $\cos\Phi=1$ )	4000W ( $\cos\Phi=1$ )
Max AC output apparent power	2650VA	3150VA	3680VA	4210VA
Max. AC output current	11.5A	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)			

Technical Specifications	SG2K5TL-S	SG3KTL-S	SG3K5TL-S	SG4KTL-S
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			
DC connection protection reverse	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%	98.00%	98.00%
Max. European efficiency	97.40%	97.50%	97.50%	97.50%
Isolation method	Transformerless			
Ingress protection rating	IP65			
Night power consumption	<1 W			
Operating ambient temperature range	-25°C...+60°C( > 45°C derating)			
Allowable relative humidity range	0...100% (No condensing)			
Cooling method	Natural cooling			
Noise level	≤30dB			
Max. operating Altitude	4000m( > 2000m derating)			
Communication	WiFi			
DC Terminals	MC4			
AC Terminals	Plug and play connector (Wieland RST25I3S)			
Certification	IEC61000-6-2,IEC61000-6-3, AS/NZS3100,AS4777.2,AS4777.3 VDE-AR-N-4105, VDE0126-1-1			

Technical Specifications	SG2K5TL-S	SG3KTL-S	SG3K5TL-S	SG4KTL-S
<b>Mechanical Data</b>				
Dimensions(W×H×D)	300×370×125mm			
Mounting method	Wall bracket			
Weight	9kg			

### 9.1.2 Double MPPTs Inverter Data

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	20A	
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)	

Technical Specifications	SG4K6TL-D	SG5KTL-D
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	
DC connection reverse 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	97.50%	97.50%
Isolation method	Transformerless	
Ingress protection rating	IP65	
Night power consumption	<1 W	
Operating ambient temperature range	-25°C...+60°C( > 45°C derating)	
Allowable relative humidity range	0...100% (No condensing)	
Cooling method	Natural cooling	
Noise level	≤30dB	
Max. operating Altitude	4000m( > 2000m derating)	
Communication	WiFi	
DC Terminals	MC4	
AC Terminals	Plug and play connector (Wieland RST25I3S)	
Certification	IEC61000-6-2, IEC61000-6-3, AS/NZS3100, AS4777.2, AS4777.3 VDE-AR-N-4105, VDE0126-1-1	

Technical Specifications	SG4K6TL-D	SG5KTL-D
<b>Mechanical Data</b>		
Dimensions(W×H×D)	360×390×133mm	
Mounting method	Wall bracket	
Weight	13kg	

## 9.2 Exclusion of Liability

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

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

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

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

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

- Decompiling, decoding or destroying the original program, including SolarInfo software and the embedded software, is prohibited.

## 9.3 About Us

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

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

### Contact Information

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

Company:	Sungrow Power Supply Co., Ltd.
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Specifications are subject to changes without advance notice.