SUNGROW

User Manual

SG2K-S / SG3K-S / SG3K-D /

SG4K-D / SG5K-D / SG6K-D /

SG8K3-D

PV Grid-Connected Inverter

SG2_3_4_5_6_8.3K-UEN-Ver16-202003 Version：1.6

About This Manual

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

Applicability

This manual is applicable to the following inverter types:

- SG2K-S
- SG3K-S
- SG3K-D
- SG4K-D
- SG5K-D
- SG6K-D
- SG8K3-D

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

Target Group

This manual is intended for:

- qualified personnel who are responsible for the installation and commissioning of the inverter; and
- inverter owners who will have the ability to interact with the inverter.

How to Use This Manual

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

Contents may be periodically updated or revised due to product development. The information in this manual is subject to change without notice. The latest manual can be acquired at www.sungrowpower.com.

Symbols

Safety instructions will be highlighted with the following symbols.

Symbol	Explanation
	Indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.
	Indicates a hazard with a medium level of risk that, if not avoided, could result in death or serious injury.
	Indicates a hazard with a low level of risk that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a situation that, if not avoided, could result in equipment or property damage.
	Indicates additional information, emphasized contents or tips that may be helpful, e.g. to help you solve problems or save time.

Contents

1 Safety

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

Incorrect operation or work may cause:

- injury or death to the operator or a third party; or
- damage to the inverter and other property safety of the operator or a third party.

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

1.1 General Safety

PV Panels

Please follow the safety instructions related to the PV strings.

DANGER

Lethal voltage!

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

Only qualified personnel can perform the wiring of the PV panels.

Utility Grid

Please follow the regulations related to the utility grid.

NOTICE

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

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

1.2 Inverter

There is a warning label on the inverter body.

	Disconnect the inverter from all the external power sources before service!
	Do not touch live parts until 10 minutes after disconnection from the power sources.
	There is a danger from a hot surface that may exceed 60°C.
	Danger to life due to high voltages! Only qualified personnel can open and service the inverter.
	Check the user manual before service!

DANGER

Danger to life from electric shocks due to live voltage

- Do not open the enclosure at any time. Unauthorized opening will void guarantee and warranty claims and in most cases terminate the operating license.
- When the enclosure lid is removed, live components can be touched which can result in death or serious injury due to electric shock.

Danger to life from electric shock due to damaged inverter

- Only operate the inverter when it is technically faultless and in a safe state.
- Operating a damaged inverter can lead to hazardous situations that can result in death or serious injuries due to electric shock.

WARNING

All the warning labels and nameplate on the inverter body:

- must be clearly visible; and

- must not be removed, covered or pasted.

⚠ WARNING

Risk of inverter damage or personal injury

Do not pull out the PV connectors and AC connector when the inverter is running. Disconnect the AC circuit breaker and set the DC load-break switch of the inverter to OFF. Wait 10 minutes for the internal capacitors to discharge. Verify that there is no voltage or current before pulling any connector.

⚠ CAUTION

Risk of burns due to hot components!

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

NOTICE

Only qualified personnel can perform the country setting.

Unauthorized alteration of the country setting may cause a breach of the type-certificate marking.

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

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

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

1.3 Skills of Qualified Personnel

Qualified personnel must have the following skills:

- training in the installation and commissioning of the electrical system, as well as the dealing with hazards;
- knowledge of the manual and other related documents; and
- knowledge of the local regulations and directives.

2 Product Introduction

2.1 Intended Use

The single-phase string inverters without transformer are the crucial units between the PV strings and the utility grid in a PV power system.

The inverter converts DC power from the PV array into grid-compliant AC power and feeds it into the utility grid.

WARNING

Any use other than the intended use is not permitted.

The inverter must only be operated with PV strings of protection class II in accordance with IEC 61730, application class A. It is not permitted for the positive pole or the negative pole of the PV strings to be grounded. This can cause the inverter to be destroyed.

Damages to the product due to a faulty or damaged DC installation are not covered by warranty.

The intended use example is shown in **Fig. 2-1**.

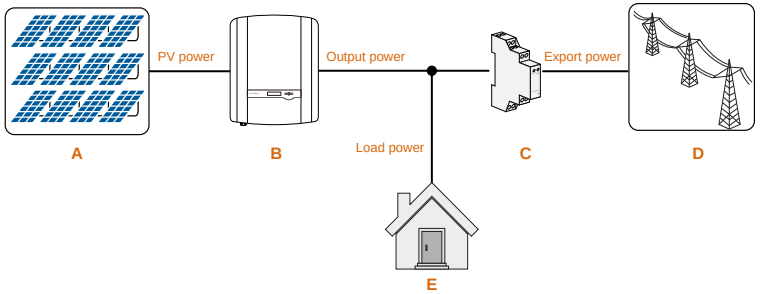


Fig. 2-1 Application in a PV Power System

Item	Description	Remarks
A	PV strings	Monocrystalline silicon, polycrystalline silicon and thin-film without grounding.
B	Inverter	SG2K-S, SG3K-S, SG3K-D, SG4K-D, SG5K-D, SG6K-D and SG8K3-D.

Item	Description	Remarks
C	Sungrow single-phase or three-phase meter (optional)	Measures the export power and communicates with the inverter via an RS485 connection.
D	Utility grid	Grid earthing system types: TT, TN.
E	Household load	Devices that consume energy.

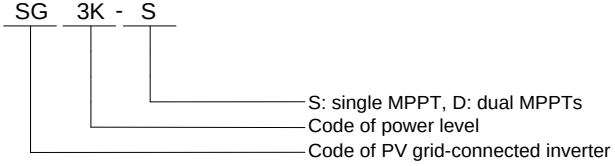
NOTICE

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

2.2 Inverter

Type Description

The type description is as follows (take SG3K-S as an example):



Tab. 2-1 Power Level Description

Type	Nominal Output Power	Nominal Grid Voltage
SG2K-S	2000 W	220 Vac / 230 Vac / 240 Vac (single phase)
SG3K-S	3000 W	
SG3K-D	3000 W	
SG4K-D	4000 W	
SG5K-D	5000 W	
SG6K-D	6000 W	
SG8K3-D	8300 W	

Appearance

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

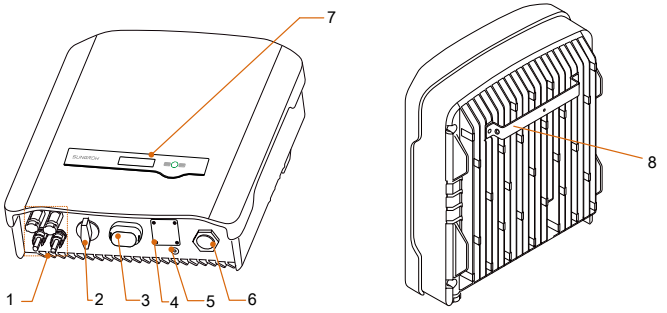


Fig. 2-2 Inverter Appearance (SG5K-D for reference)

Item	Name	Description
1	PV terminals	Positive and negative DC input connectors. One or two or three pairs, depending on inverter type.
2	DC switch	To disconnect the DC current safely.
3	RS485 terminal	Can be connected to Wi-Fi communication module.
4	Meter | DRM terminal	Left connector is intended for energy meter, right connector is reserved.
5	Second PE terminal	For reliable grounding.
6	AC terminal	To feed power into the utility grid.
7	LCD panel	The display and two buttons can be used to access current operating data or change inverter settings.
8	Mounting rack	For mounting the inverter to the wall mounting bracket.

Dimensions and Weight

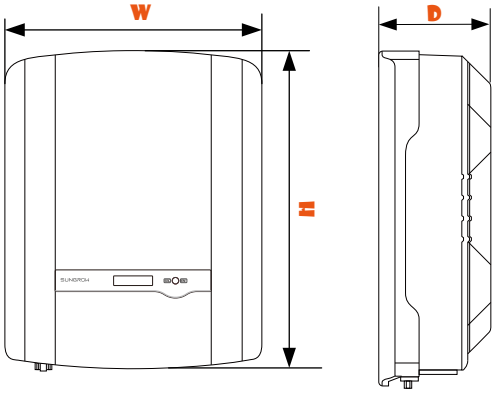


Fig. 2-3 Dimensions of the Inverter

Tab. 2-2 Dimensions and Weight

Type	W (mm)	H (mm)	D (mm)	Weight (kg)
SG2K-S / SG3K-S	300	370	125	8.5
SG3K-D / SG4K-D / SG5K-D / SG6K-D	360	390	133	11.5
SG8K3-D	360	390	148	15.5

LCD Panel

The LCD panel with a screen, an indicator and two buttons is on the front of the inverter.

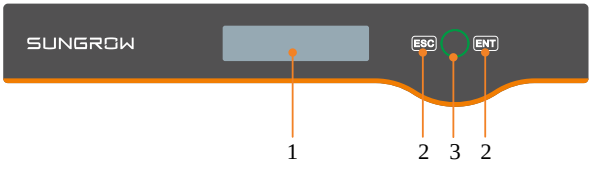


Fig. 2-4 LCD Display Panel

No.	Name	Description
1	LCD screen	Display and access current operating data or change inverter settings.
2	Buttons	ESC / ENT. View or set parameters via the buttons. For detailed functions, see **Tab. 6-1**.

No.	Name	Description
3	Indicator	Green / red. User can observe the colour and blinking frequency to get the current state of the inverter. For detailed definition, see **Tab. 6-2**.

2.3 Energy Meter (Optional)

The Sungrow Energy Meter is installed next to the main switch to detect the electrical measured values at the grid-connected point. It communicates with the inverter via an RS485 connection. The dimensions are shown below.

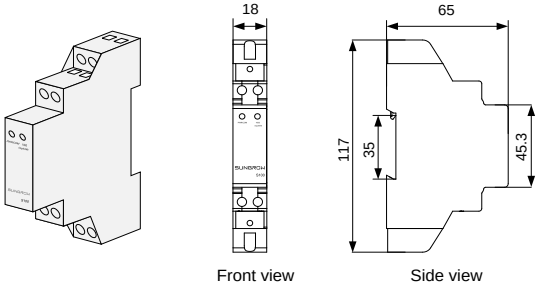


Fig. 2-5 single-phase Meter Dimensions (unit: mm)

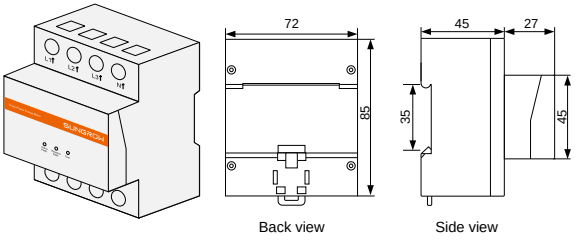


Fig. 2-6 Three-phase Meter Dimensions (unit: mm)

- The single-phase Energy Meter and the three-phase Energy Meter are optional and delivered separately. The meter figures in this document have been created for the single-phase Energy Meter unless otherwise specified.
- More detailed information on the Energy Meter can be found in the respective Quick Installation Guide.

2.4 Function Description

2.4.1 Basic Function

- Conversion function

  Inverter converts the DC power into the AC power, which conforms to the grid requirement of its installation country.

- Data storage

  Inverter archives essential data including running information and error records.

- Parameter configuration

  Inverter provides various parameter configurations for optimal operation. You can set the country via the App or the cloud server, if you need a more professional setting, please contact Sungrow.

- Communication interface

  You can choose the RS485 terminal for connecting a communication module to the PV system, such as a Wi-Fi module. Refer to the quick guide for the Wi-Fi module for details.

  - It is recommended to use the communication module from Sungrow. Using a device from other companies may lead to communication failure or other unexpected damage.
  - Further information on the communication module can be found in the respective Quick Installation Guide.

- Earth fault alarm

  If an earth fault occurs, the error code will be displayed on the LCD screen. The buzzer inside the inverter will beep to signal an external alarm.

- Protective function

  The protective functions are integrated in the inverter, including short circuit protection, grounding insulation resistance surveillance, residual current

protection, anti-islanding protection, DC overvoltage / over-current protection, etc.

2.4.2 Reactive Power Regulation

The inverters are capable of operating in the following power factor range. Any operational point, as a result of the following definitions/curves, will be reached at maximum in 10 seconds.

PF Mode

The power factor is equal to 1, adjusted in factory, with tolerance to work from 0.98 leading (inductive) to 0.98 lagging (capacitive).

The power factor can be set via the LCD menu. For details, see "**7.5.5 PF Setting**".

Q(p) Mode

The Q(p) mode is not applicable to SG2K-S. This mode is disabled by default. You can enable this function via the cloud server www.isolarcloud.com.hk. Then, after any change in active power, the inverter is able to adjust the reactive power automatically according to the following power factor curve.

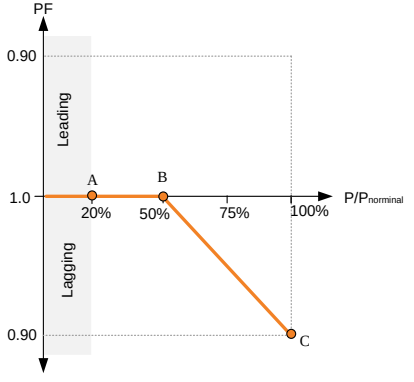


Fig. 2-7 Power Factor Curve

- The power factor curve can only be enabled when the grid voltage surpass the activation voltage, adjustable value between 100 % and 110 % of nominal voltage level, with pre-defined value at factory of 104 % of nominal voltage.

- The power factor curve can only be disabled when the voltage goes back to a value below the shutdown voltage level, adjustable value between 90 % and 100 % of nominal voltage level, with default voltage level at 100 % adjusted at factory.

2.4.3 Regular Operational Voltage Range

For Country Brazil (Code “BRA”)

The inverters can operate within the voltage limits defined in the following table.

Tab. 2-3 Disconnection related to Voltage

Voltage Level at Grid-connected Point (% related to Local Nominal Voltage)	Maximum Time to Disconnect (1)
V < 80 %	0.4 s
80 % <= V <= 110 %	Normal operation (2)
V > 110 %	0.2 s

When the voltage level is out of the operational levels shown in the table, the inverter will disconnect from the grid.

If a disturbance lasts less than the required disconnection time, the inverter can reconnect to the grid if the voltage level goes back to normal levels after the disturbance.

Remarks:

(1) The maximum time to disconnect refers to the interval between the abnormal voltage level and the action of inverter (disconnect from the grid).

(2) When the grid voltage is higher than (110 % $V_{nominal}$ - 5) V, the inverter will reduce the active power export to grid according to the following equation:

$$\Delta P = P_{nominal} \times R$$

Where:

- ΔP is the variation of active power export to grid (in %) related to the nominal power.
- $P_{nominal}$ is the nominal grid power.
- R is the desired reduction in active export power (expressed in % of Volt), adjusted in -20 % per Volt.

For Country Mexico (Code “MX”)

The inverters can operate within the voltage limits defined in the following table.

Tab. 2-4 Disconnection related to Voltage

Voltage Level at Grid-connected Point (% related to Local Nominal Voltage)	Maximum Time to Disconnect (1)
V < 95 %	0.16 s (2)
95 % <= V <= 105 %	Normal operation
V > 105 %	0.16 s (2)

When the voltage level is out of the operational levels shown in the table, the inverter will disconnect from the grid.

If a disturbance lasts less than the required disconnection time, the inverter can reconnect to the grid if the voltage level goes back to normal levels after the disturbance.

Remarks:

(1) The maximum time to disconnect refers to the interval between the abnormal voltage level and the action of inverter (disconnect from the grid).

(2) After the low / high voltage, the inverter will only reconnect to the grid again when the grid voltage returns to normal operation range, respecting the reconnection waiting time of 300 seconds.

2.4.4 Regular Operational Frequency Range

For Country Brazil (Code "BRA")

Nominal frequency of Brazilian grid is 60 Hz.

The inverters can operate within the frequency limits defined in the following table.

Tab. 2-5 Disconnection related to Frequency

Grid Frequency Level	Maximum Time to Disconnect (1)
f < 57.5 Hz	0.2 s
57.5 Hz <= f <= 62 Hz	Normal operation (2)
f > 62 Hz	0.2 s (3)

When the frequency level is out of the operational levels shown in the table, the inverter will disconnect from the grid.

Remarks:

(1) The maximum time to disconnect refers to the interval between the abnormal frequency level and the action of inverter (disconnect from the grid).

(2) After the low frequency, the inverter will only reconnect to the grid again when the frequency returns to 59.9 Hz, respecting the reconnection waiting time of 300 seconds. When the grid frequency is more than *60.5 Hz* and less

than 62 Hz, the inverter will reduce the active power export to grid according to the following equation:

$$\Delta P = [f_{grid} \times (f_{nominal} + 0.5)] \times R$$

Where:

- ΔP is the variation of active power export to grid (in %) related to the active power export to gird at the moment frequency surpass 60.5 Hz.
- f_{grid} is the grid frequency.
- $f_{nominal}$ is the nominal grid frequency.
- R is the desired reduction in active export power (expressed in % of Hz), adjusted in -40 % per Hz.
- P_{max}, at the time of exceeding the mains frequency of 60.5 Hz, value is frozen.

Please see the following figure for the curve of PV system responding to frequency changes.

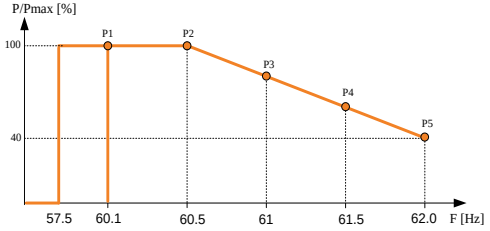


Fig. 2-8 Power Reduction Curve for Over-frequency

- If the grid frequency suddenly reduces after this reduction power procedure begins, the inverter will remain with the minimum export power (P_{max} - ΔP_{max}) during the frequency increase process. The inverter will only increase the export active power if the grid frequency returns to 60 Hz +/- (0.05 Hz) for at least 300 seconds.
- When returning back to normal, the export power will increase at most 20 % per minute (20 % of Nominal Power (P_{max})) until its normal back again with full power.

(3) After the high frequency, the inverter will only reconnect to the grid again when the grid frequency returns to 60.1 Hz, respecting the reconnection waiting time of 300 seconds. The export power will grow in a rate up to 20 % per minute of P_{max} per minute.

For Country Mexico (Code “MX”)

Nominal frequency of Mexican grid is 60 Hz.

The inverters can operate within the frequency limits defined in the following table.

Tab. 2-6 Disconnection related to Frequency

Grid Frequency Level	Maximum Time to Disconnect (1)
f < 59.3 Hz	0.16 s (2)
59.3 Hz <= f <= 60.5 Hz	Normal operation
f > 60.5 Hz	0.16 s (2)

When the frequency level is out of the operational levels shown in the table, the inverter will disconnect from the grid.

Remarks:

(1) The maximum time to disconnect refers to the interval between the abnormal frequency level and the action of inverter (disconnect from the grid).

(2) After the low / high frequency, the inverter will only reconnect to the grid again when the grid frequency returns to normal operation range, respecting the reconnection waiting time of 300 seconds.

3 Unpacking and Storage

3.1 Unpacking and Inspection

The inverter is thoroughly tested and strictly inspected before delivery. Damage may still occur during shipping. Conduct a thorough inspection after receiving the device.

1. Check the packaging for any visible damage.
2. Check the inner contents for damage after unpacking.
3. Check the delivery contents for completeness according to the packaging list.
4. Contact SUNGROW or the distributor in case of any damaged or missing components.

It is the best choice to store the inverter in the original packaging. So, do not dispose of it.

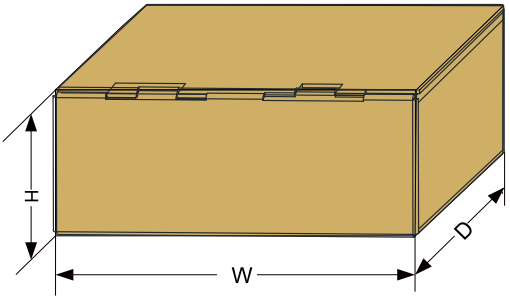


Fig. 3-1 Single Inverter Packaging

Inverter Type	W (mm)	H (mm)	D (mm)
SG2K-S / SG3K-S	500	235	375
SG3K-D / SG4K-D / SG5K-D / SG6K-D	530	235	435
SG8K3-D	530	250	435

3.2 Identifying the Inverter

The nameplate clearly identifies the product. It is attached to the side of the inverter.

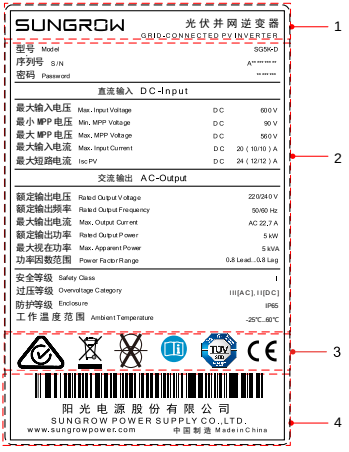


Fig. 3-2 Nameplate of Inverter

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

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

Tab. 3-1 Description of Icons on the Nameplate

Icon	Description
	Regulatory compliance mark.
	Do not dispose of the inverter together with household waste.
	The inverter does not have a transformer.
	Refer to the corresponding instructions.

Icon	Description
	TÜV mark of conformity.
	CE mark of conformity.
	INMETRO mark.

3.3 Delivery Contents

Standard Delivery

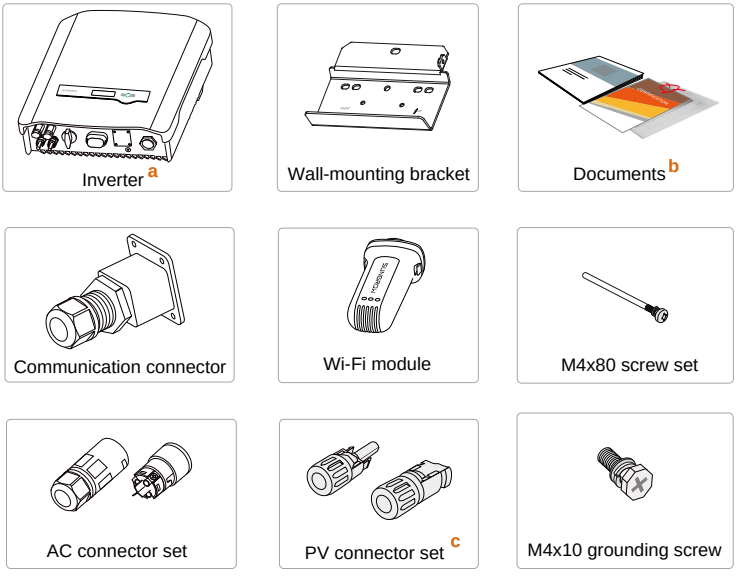


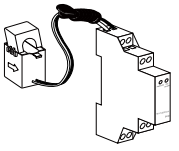
Fig. 3-3 Delivery Contents

a) The inverter figures in this document have been created for SG5K-D unless otherwise specified.

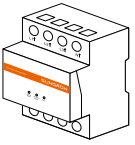
b) The documents include the Quick User Manual, quality certificates, packaging list and product test reports.

c) One or two or three pairs, depending on inverter type.

Optional Accessory



Single-phase meter and cables



Three-phase meter and cables

The single-phase Energy Meter and the three-phase Energy Meter are optional. The meter figures in this document have been created for the single-phase Energy Meter unless otherwise specified.

3.4 Storage of Inverter

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

- Store the inverter in the original packaging with the desiccant inside.
- The storage temperature should be always between -30°C and +85°C, and the storage relative humidity should be always between 0 and 100 %, non-condensing.
- When storing inverters, do not stack more than 8 inverter packages on top of each other.
- The packaging should be upright.
- If the inverter has been stored more than half a year, the qualified personnel should thoroughly check and test it before using.

4 Mechanical Mounting

4.1 Safety during Mounting

DANGER

Make sure there is no electrical connection before installation.

In order to avoid electric shock or other injury, be sure there is no electricity or plumbing installations before drilling holes.

CAUTION

Risk of injury due to improper handling

- **The weight may cause injuries, serious wounds, or bruise.**
- **Always follow the instructions when moving and positioning the inverter.**

System performance loss due to bad ventilation!

- **The inverter requires good ventilation during operation. Keep it upright and with nothing covering the heat sinks.**

NOTICE

Wear gloves to avoid scratches when mounting the inverter.

4.2 Location Requirements

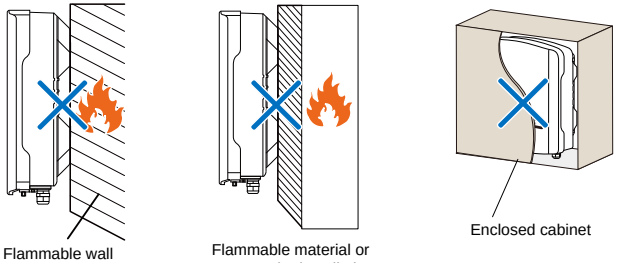
The inverter with IP65 can be installed indoors or outdoors.

Selecting an optimal location for the inverter is critical for its operating safety as well as the expected efficiency and service life. Considerations for the location include:

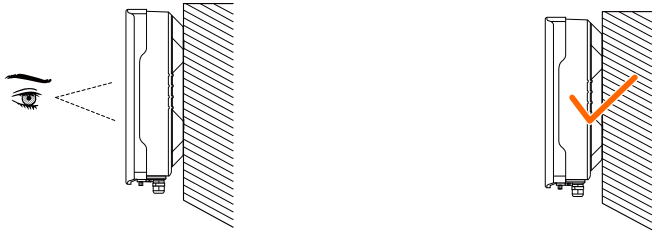
1. The structure should be capable of withstanding a force of four times the weight of the inverter and be suitable for the dimensions of the inverter.
2. Install the inverter where it is convenient for installation, cable connection and service.

3. Do not install the inverter in the living area or bedrooms. The noise during its operation may affect daily life.
4. The location should be not accessible to children.
5. The ambient temperature and relative humidity should meet the following requirements.

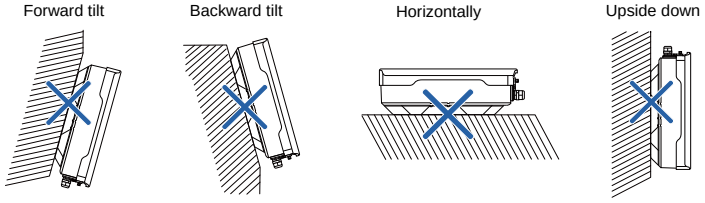
6. Only mount the inverter on a non-flammable surface or a wooden structure. Keep away from flammable materials or gas. Do not enclose the inverter into a tight confinement.



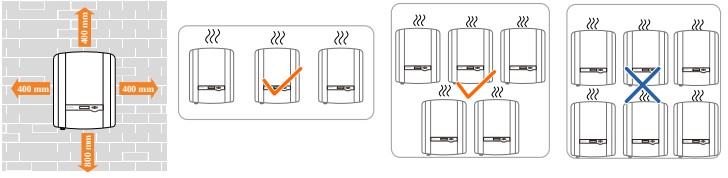
7. The shaded side of the building would be better to prevent the inverter from exposure to the sun, rain, and snow.
8. Install at eye level for easy inspection.
9. Install vertically for good heat dissipation.



10. Never install the inverter horizontally, or with a forward tilt or with a backward tilt or even with upside down. The horizontal installation can result in damage to the inverter.

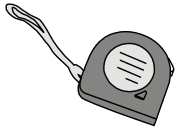
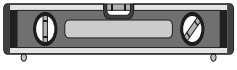
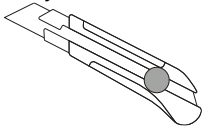
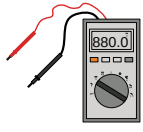
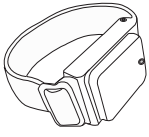


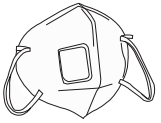
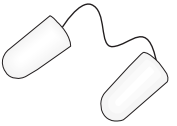
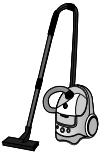
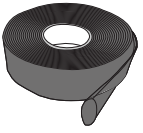
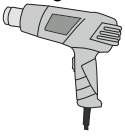
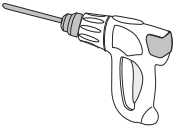
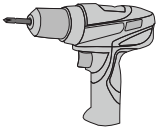
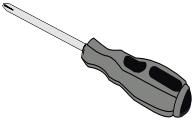
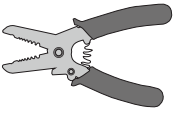
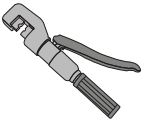
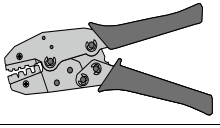
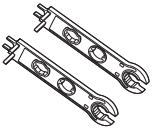
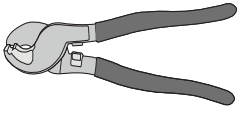
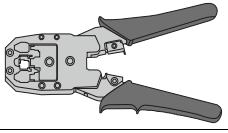
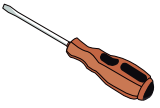
11. Clearance requirement and multiple installation:

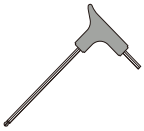
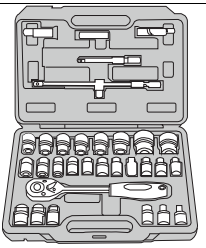


For multi-row installation, the distance between two adjacent rows should be at least 400 mm.

4.3 Tools

General tools (recommended)		
Packaging tape 	Marker 	Measuring tape 
Level 	Utility knife 	Multimeter Measurement range: ≥ 1100Vdc 
Protective clothing 	Wrist strap 	Protective gloves 

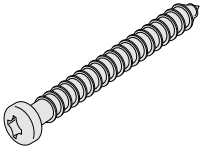
Dust mask 	Earplugs 	Goggles 
Insulated shoes 	Vacuum cleaner 	Heat shrink tubing 
Installation tools (recommended)		
Heat gun 	Hammer drill Drill bit: φ10 	Rubber mallet 
Electric screwdriver 	Phillips screwdriver 	Wire stripper 
Hydraulic plier 	Crimping tool Crimping range: 2.5-6mm² 	Wrench for MC4 terminal 
Wire clipper 	RJ45 crimping tool 	Flat-blade screwdriver 

Torx screwdriver TX30 	Socket wrench Open end: 10mm (for M6 bolts) 13mm (for M8 bolts) 16mm (for M10 bolts) 

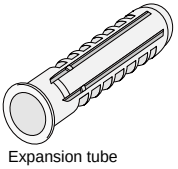
4.4 Installing the Inverter

Inverter is installed on the wall by means of wall-mounting bracket and the expansion plug sets.

The expansion plug set shown below is recommended for the installation. They are not included in the delivery scope.



Stainless steel screw M6



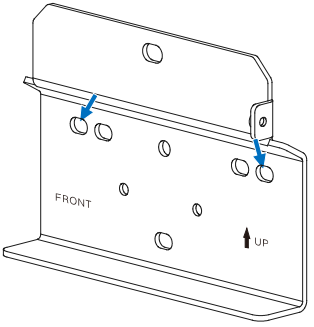
Expansion tube

Fender washer

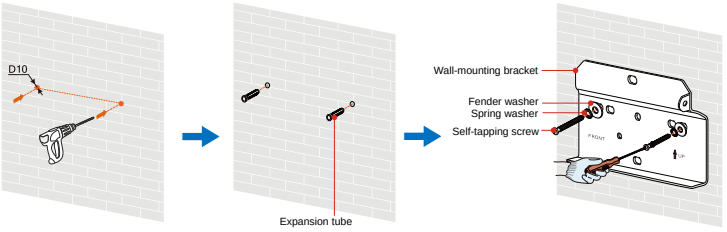
Spring washer

1. Align the wall mounting bracket horizontally on the wall with the arrow upwards. Mark the position of the drill holes. Use at least one hole on the right- and left-hand side of the wall mounting bracket.

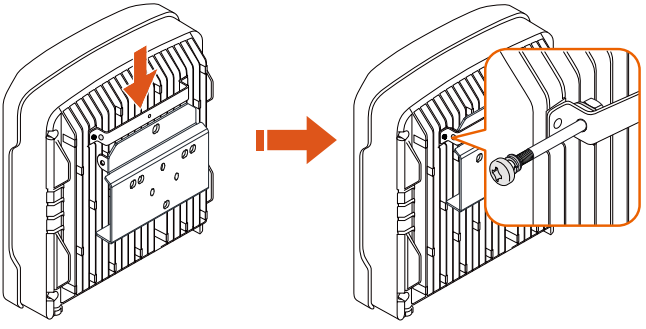
   Tip: When mounting on a post, use the upper and lower central holes of the wall mounting bracket.



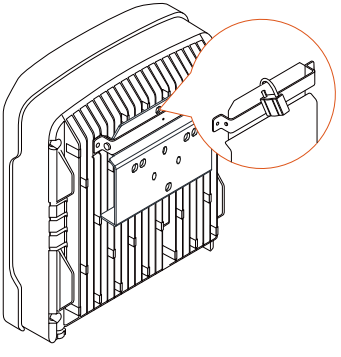
2. Set the wall mounting bracket aside and drill the marked holes. The depth of the holes should be about 70 mm. Install the wall-mounting bracket.



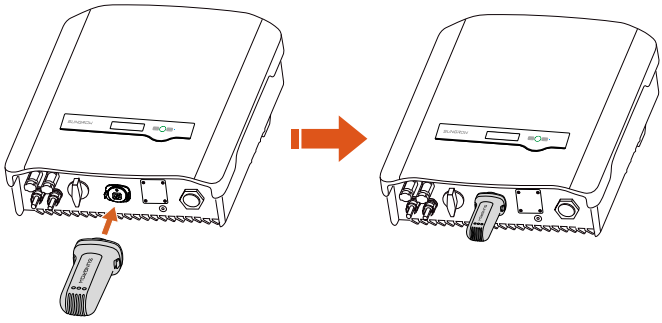
3. Mount the inverter to the bracket, and secure it with an M4x80 screw (torque: 1.5 N·m).



4. To protect the inverter from theft, you can lock it with a padlock. The padlock is purchased by the user if necessary. The hole diameter is about 8 mm.

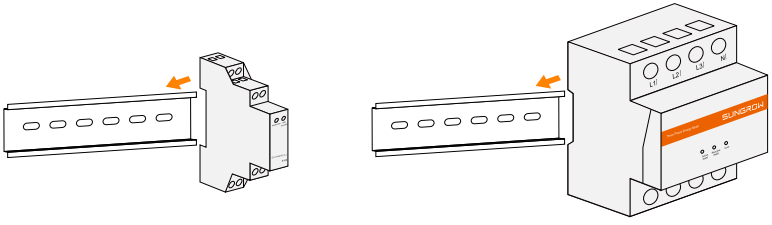


5. Remove the waterproof lid from RS485 terminal and install the communication module to the inverter. The following figure takes the Wi-Fi module as an example. Refer to the manual delivered with the module for details.



4.5 Installing the Energy Meter

The SUNGROW Energy Meter should be installed between the grid and the load. It supports a 35 mm DIN-rail installation, as shown in the following figure.



Single-phase Energy Meter

Three-phase Energy Meter

Fig. 4-1 Installing the Meter to the Rail

5 Electrical Connection

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

DANGER

Danger to life due to a high voltage inside the inverter

- **Make sure that the cables are not live before electrical connection.**
- **Do not turn on the AC circuit breaker until all the electrical connections are completed.**

WARNING

Improper operation during the wiring process can cause fatal injury to the operators or unrecoverable damage to the inverter.

Only qualified personnel can perform the wiring work.

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

NOTICE

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

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

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

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

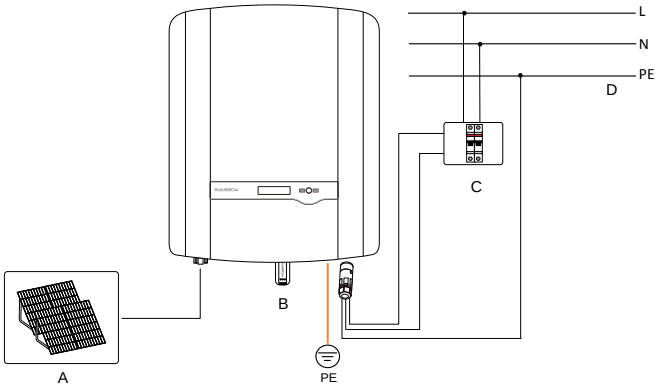


Fig. 5-1 Electrical Connection Diagram

Item	Name	Remarks
A	PV strings	**-S series:** one pair of PV terminals. **-D series:** three pairs for SG8K3-D and two pairs for other –D inverters.
B	Wi-Fi module	RS485 communication.
C	AC circuit breaker	Used as a protective device during electrical connection. User equips this device according to the maximum output voltage and current. The PE wire of the AC terminal must be directly connected to the grounding bar. Do not connect it to protection devices such as the circuit breaker.
D	Utility grid	220 Vac / 230Vac / 240 Vac.

5.1 Terminal Description

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

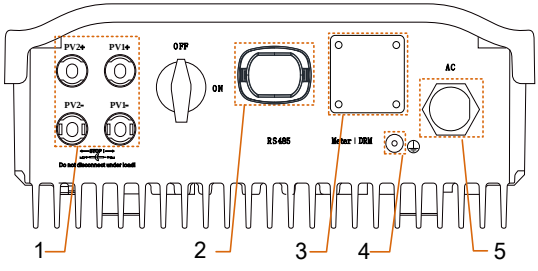


Fig. 5-2 Terminal Description

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

Tab. 5-1 Terminal Descriptions

Item	Terminal	Description
1	PV terminals	MC4 terminals for PV inputs. **-S series:** one pair of PV terminals. **-D series:** three pairs for SG8K3-D and two pairs for the other –D inverter types.
2	RS485 terminal	Can be connected to Wi-Fi communication module.
3	Meter | DRM terminal	Left connector is intended for energy meter, right connector is reserved.
4	Second PE terminal	For reliable grounding.
5	AC terminal	For connection to the utility grid.

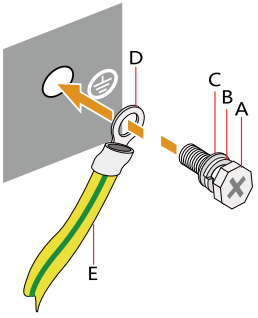
5.2 Grounding the Inverter

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

A second Protective Earth (PE) terminal is equipped at the bottom of the inverter. Be sure to connect this PE terminal for reliable grounding and ensure that the grounding resistance is less than 10 Ohm.

WARNING

Correct grounding connection of the second PE terminal and the AC terminal is mandatory. Not properly connecting both PE will void any or all product warranty.



Item	Description
A	Screw (M4×10 mm)
B	Spring washer
C	Washer
D	Cable socket
E	Grounding cable

Fig. 5-3 Second PE Connection

* The second PE conductor should be of the same cross-sectional area as the original PE conductor in the AC connector. The cable and cable socket are not included in the delivery scope.

5.3 Grid Connection

The inverter is connected to the grid via 3 wires (L, N and PE).

Inverter is equipped with the waterproof direct plug-in connector which matches the AC terminal at the bottom of the inverter.

5.3.1 AC Side Requirements

AC Circuit Breaker

An independent two-pole AC circuit breaker for the inverter must be installed at the output side for safe disconnection. The recommended specifications are as follows:

Inverter Type	Specification
SG2K-S / SG3K-S / SG3K-D	25 A
SG4K-D / SG5K-D / SG6K-D	32 A
SG8K3-D	50 A

NOTICE

In PV systems with multiple inverters, protect each inverter with a separate circuit breaker. This will prevent any residual voltage from being present at the corresponding cable after disconnection.

Residual Current Device

With an integrated universal current-sensitive residual current monitoring unit inside, the inverter will disconnect immediately from the mains power as soon as a fault current with a value exceeding the limit has been detected.

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

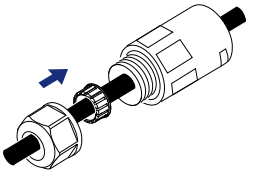
AC Cable Requirements

The recommended specifications are shown in the following table

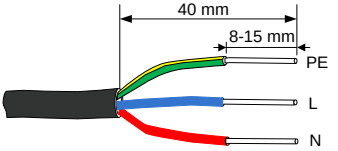
Type	Cross-section (mm²)		Cable diameter (mm)	
	Range	Recommended	Range	Recommended
SG2K-S / SG3K-S / SG3K-D	4…6	4	10…14	14
SG4K-D / SG5K-D / SG6K-D	4…6	6	10…14	14
SG8K3-D	-	6	-	15

5.3.2 Assembling the AC Connector

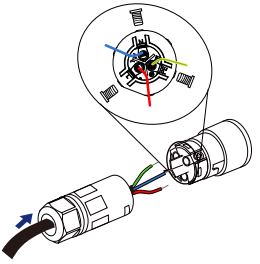
1. Lead the AC cable through the cable gland and the housing.



2. Remove the cable jacket by 40 mm, and strip the wire insulation by 8-15 mm.



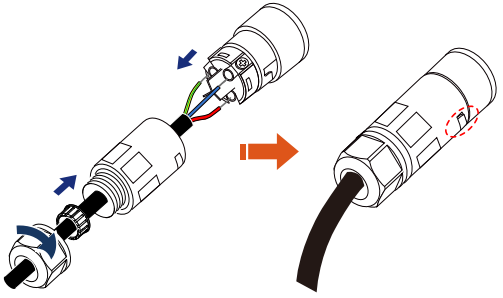
3. Fully insert the conductors to the corresponding terminal and tighten the screws with the torque 0.8 N·m. Pull cables outward to check whether they are firmly installed.



NOTICE

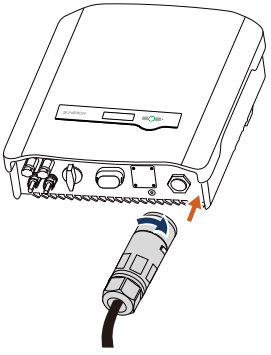
Observe the terminal layout of AC connector. Do not connect the phase lines to "PE" terminal, otherwise the inverter will not function properly and the loss of any or all the warranty rights may follow.

4. Assemble the housing, the terminal block and cable gland. Make sure that the rib of the terminal block and the groove on the housing engage perfectly until a "Click" is heard or felt.



5.3.3 Installing the AC Connector

1. Disconnect the AC circuit breaker and secure it against reconnection.
2. Measure the voltage and frequency of the grid-connected point to ensure that they are within the specified range listed in "**10.1 Technical Data**".
3. Align the AC connector and the AC terminal and mate them together by hand. Tighten the connector to the terminal until a "Click" is heard or felt.



4. Connect the other ends. Connect "PE" conductor to the grounding electrode. Connect "L" and "N" conductors to the AC circuit breaker.
5. Pull all the lines outward to check whether they are firmly installed.

5.4 PV Connection

NOTICE

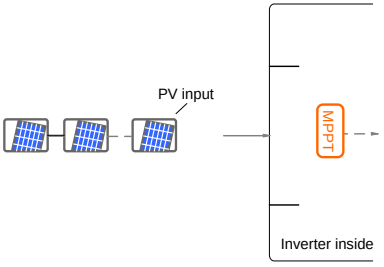
There is a risk of inverter damage! The following requirements should be met. Failure to do so will void guarantee and warranty claims.

- **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 600 V. Voltage over 600 V can damage 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 200 kΩ in any case.**

5.4.1 PV Input Configuration

-S Series

There is one input area with one MPP tracker. Only one input can be connected, as shown in the following figure.



Type	Total PV Input Power Limit	Open-circuit Voltage Limit	Short-circuit Current Limit
SG2K-S	3000 W	600 V	12 A
SG3K-S	4000 W	600 V	12 A

-D Series

For –D inverters except SG8K3-D, there are two pairs of PV terminals, each with its MPP tracker.

The inverter SG8K3-D has three pairs of PV terminals. The PV1 has an independent MPP tracker. The PV2 has two pairs of PV terminals, which are internal paralleled and with one MPP tracker.

The PV1 and PV2 can be configured in independent mode or parallel mode.

NOTICE

For SG8K3-D, the PV strings to PV2 input should have the same PV module type, the same string length, identical tilt and identical orientation.

- Independent Mode

The PV inputs work independently, each with its own MPPT. 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.

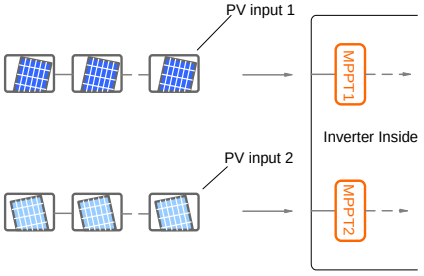


Fig. 5-4 Independent Mode for –D inverters except SG8K3-D

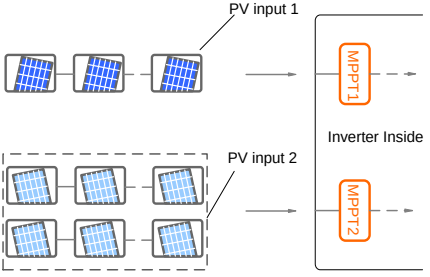


Fig. 5-5 Independent Mode for SG8K3-D

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

Type	Total PV Input Power Limit	Open-circuit Voltage Limit	Short-circuit Current Limit
SG3K-D	4000 W	600 V / 600 V	12 A / 12 A
SG4K-D	5200 W	600 V / 600 V	12 A / 12 A
SG5K-D	6500 W	600 V / 600 V	12 A / 12 A

Type	Total PV Input Power Limit	Open-circuit Voltage Limit	Short-circuit Current Limit
SG6K-D	7800 W	600 V / 600 V	12 A / 12 A
SG8K3-D	10800 W	600 V / 600 V / 600 V	15 A / 15 A / 15 A

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

- Parallel Mode

All PV strings should have the same PV module type, the same string length, identical tilt and identical orientation for optimum results.

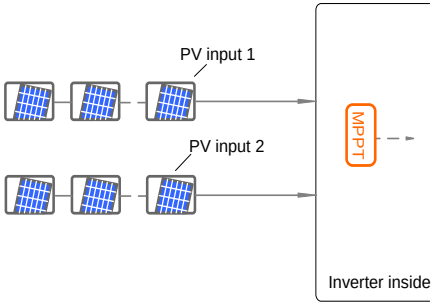


Fig. 5-6 Parallel Mode for –D inverters except SG8K3-D

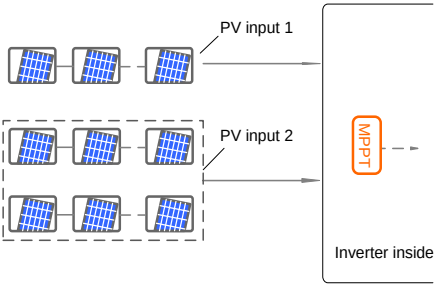


Fig. 5-7 Parallel Mode for SG8K3-D

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

Type	Total PV Input Power Limit	Open-circuit Voltage Limit	Short-circuit Current Limit
SG3K-D	4000 W	600 V	24 A
SG4K-D	5200 W	600 V	24 A
SG5K-D	6500 W	600 V	24 A
SG6K-D	7800 W	600 V	24 A
SG8K3-D	10800 W	600 V	45 A

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

5.4.2 Assembling the PV Connector

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

NOTICE

The PV cables must be multi-core cable.

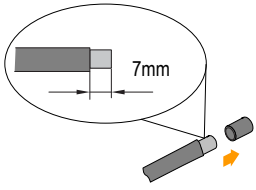
To ensure the protection degree IP65, only use the connectors delivered or connectors with the same protection degree.

The requirements of PV cables are as follows.

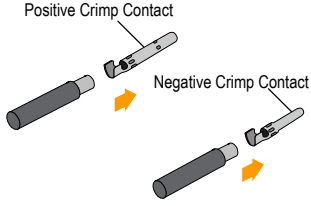
Cross-section	Cable Diameter	Max. Withstand Voltage	Max. Withstand Current
4 mm^2–6 mm^2	6 mm–9 mm	600 V	Equal to or greater than short-circuit current

Procedure:

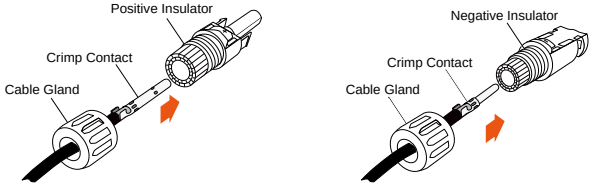
1. Strip the insulation from the cables by 7 mm.



2. Assemble the cable ends by crimping pliers.



3. Lead the cable through cable gland, and insert into the insulator until it snaps into place. Then tighten the cable gland (torque 2.5 N·m to 3 N·m).



4. Make sure that the cable polarity of each PV string is correct before connecting it to the inverter.

NOTICE

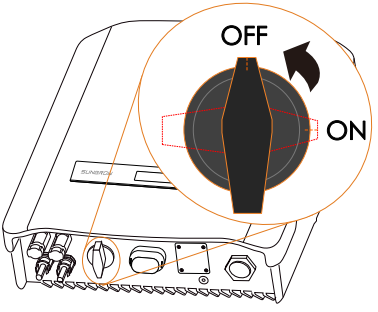
The inverter will not function properly if any PV polarity reversed.

If the PV connectors are not assembled into place, it may cause an arc or overheat. The loss caused by this issue will void the warranty.

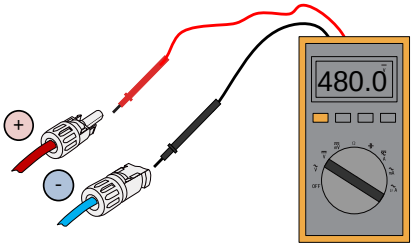
5.4.3 Installing the PV Connector

Connect the inverter to PV strings according to the following procedure.

1. Rotate the DC switch to “OFF”.



2. Check the connection cable of the PV string for the correct polarity and that the open-circuit voltage does not exceed the inverter input limit of 600 V, even under the lowest operating temperature. Refer to the module specification supplied by the module manufacturer for detailed information.

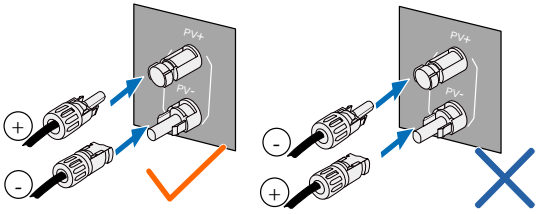


NOTICE

The inverter will not function properly if any PV polarity is reversed.

Check the positive and negative polarity of the PV strings before installation.

3. Plug the positive and the negative PV connectors into corresponding terminal until there is an audible click.



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

4. (**-D series**) Seal the unused PV terminals with the terminal caps.

5.5 RS485 Communication Connection

For the Wi-Fi installation, see the last step in section "**4.4 Installing the Inverter**". More detailed information for the Wi-Fi module can be found in the respective manual.

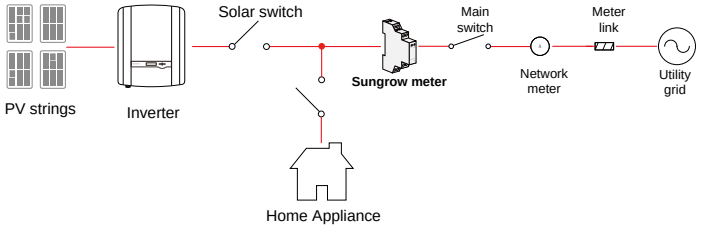
NOTICE

The RS485 terminal can also be used to connect an external RS485 device. For the pin definition and waterproof procedure, please contact SUNGROW.

Failure to comply with the requirements of wiring or waterproofing will void the warranty.

5.6 (Optional) Meter Communication Connection

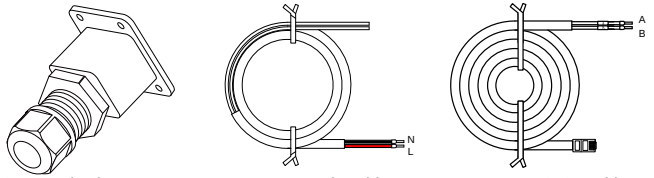
The SUNGROW single-phase energy meter should be installed next to the main switch.



5.6.1 On the Meter Side

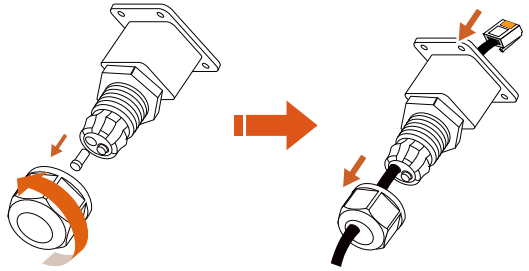
For Single-phase Energy Meter

1. Take out the communication connector from inverter's packaging and the meter (with 1-phase sensor) and the cables from the meter's packaging.



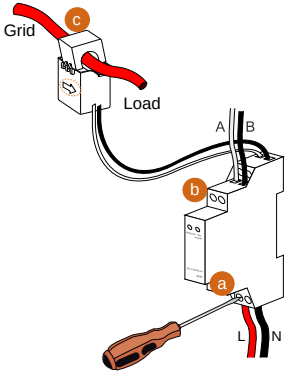
Communication connector | Power supply cable | Meter RS485 cable

2. Unscrew the swivel nut from the cable gland and remove the waterproof plug from the left inlet. Lead the **A** and **B** plugs from inside out through the connector. This will result in the cable with the RJ45 plug on the inside end, and the **A** and **B** plugs on the outside.



3. Connect the cables to the meter.
   - (a) Tighten the power supply wires to terminal **3 (L)** and terminal **6 (N)**.
   - (b) Tighten the RS485 wires to terminal **2** and terminal **5**.
   - (c) Place the 1-phase sensor around the phase wire (**L**) from the main switch.

     The CT clamp of 1-phase sensor can be placed before or after the main switch.



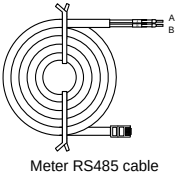
NOTICE

Make sure that the CT clamp of 1-phase sensor is installed in the right direction: the arrow on the sensor must point away from the grid towards the load.

For Three-phase Energy Meter

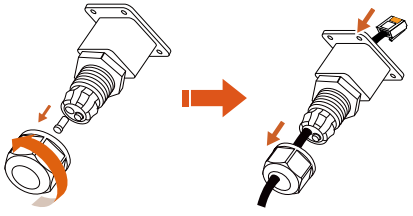
1. Take out the communication connector from inverter's packaging, and the meter and RS485 cable from the meter's packaging.


Communication connector

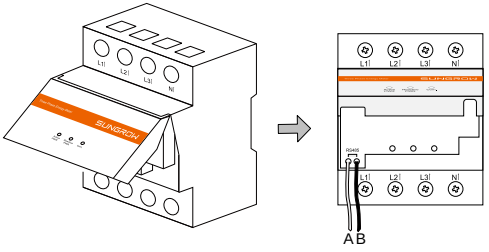


Meter RS485 cable

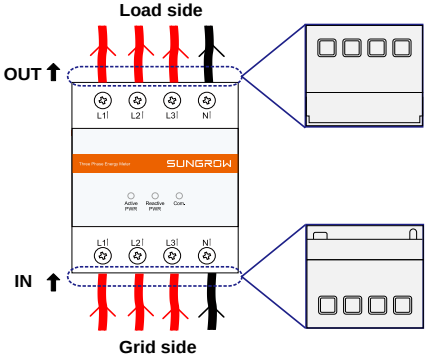
2. Unscrew the swivel nut from the cable gland and remove the waterproof plug from the left inlet. Lead the **A** and **B** plugs from inside out through the communication connector. This will result in the cable with the RJ45 plug on the inside end, and the **A** and **B** plugs on the outside.



3. Connect the **A** and **B** plugs to terminals A and B on the Energy Meter, as shown below.



4. Strip the insulation from the power wires by 10 mm. Then connect the wires to the terminals on the Energy Meter, as shown below. (Cross-section: 10 mm^2 to 25 mm^2)



- The line conductor L1 supplies power to the Energy Meter. At least the line conductor L1 and the neutral conductor must be connected to the Energy Meter.
- Just connect the line conductor L1 and the neutral conductor, then the three-phase Energy Meter can be used as a single-phase meter.

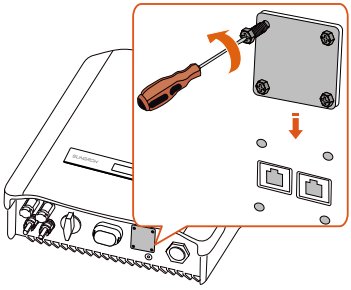
5.6.2 On the Inverter Side

Proceed as follows to connect the RS485 wires to the inverter.

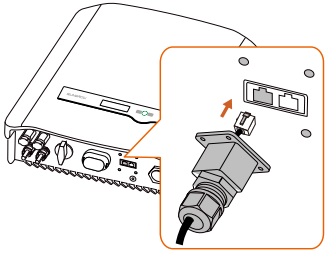
1. Loosen the screws and remove the waterproof lid from the **RS485|DRM** terminal.

   Note:

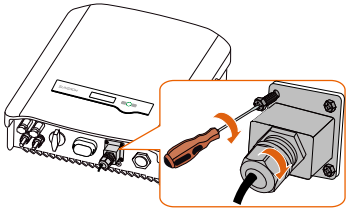
   Retain the screws for later installation.



2. Insert the RJ45 plug into the left (Meter) port until it makes a “click” sound.



3. Secure the waterproof lid to the inverter bottom with four screws, then fasten the cable gland.



6 Commissioning

Proper commissioning is essential for the system, to protect it against fires, injury and electric shock.

6.1 Inspection before Commissioning

Check the following items before starting the inverter:

1. All the installation sites are convenient for operation, maintenance and service.
2. Check and confirm that the inverter is firmly installed.
3. Space for ventilation is sufficient for one inverter or multiple inverters.
4. Nothing is left on the top of the inverter.
5. The inverter and accessories are correctly connected.
6. Cables are routed in a safe place or protected against mechanical damage.
7. The selection of the AC circuit breaker is in accordance to this manual and all applicable local standards.
8. All unused terminals at the bottom of the inverter are properly sealed.
9. Warning signs and labels are suitably affixed and durable.

6.2 Button Function

Inverter offers two buttons with multiple functions. Please refer to the following table before any operation of the inverter.

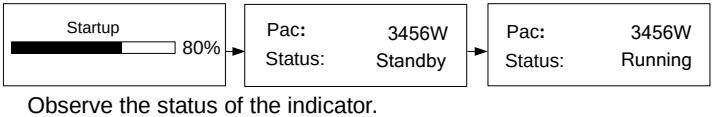
Tab. 6-1 Button function

Button	Operation	Description
ESC		Navigate up / down or change the setting values. Hereinafter referred to as "**Touch ESC**".
	≤1.2 s	
		Return to a previous menu or cancel the settings. Hereinafter referred to as "**Press ESC**".
	> 1.2 s	
ENT	≤1.2 s	Move left or right, or turn pages, or view the active error/warning from the main screen. Hereinafter referred to as "**Touch ENT**".
	> 1.2 s	Enter the sub-menu or confirm a selection or settings. Hereinafter referred to as "**Press ENT**".

6.3 Commissioning Procedure

Make sure all the above mentioned items meet the requirements.

1. Connect the external AC circuit breaker.
2. Rotate the DC switch to "**ON**".
3. If there is sufficient sunlight, the inverter will enter the running state and start to feed AC power to the grid. The LCD screen will be activated 5s later.



4. Observe the status of the indicator.

Tab. 6-2 Indicator Status Description

Status		Description
Green	Steady on.	The inverter is running normally, or with a warning, or with power limitation. Inverter status: Running.
	Flash once every 1s.	The inverter is in the status of standby, startup or Turn off (via LCD menu).
Red	Steady on.	Inverter faults.
	Flash quickly every 0.2s.	Grid faults.
	Flash slowly every 1s.	PV faults.

More detailed information on the indicator of the communication module can be found in the respective Quick Guide.

5. Visit www.isolarcloud.com or iSolarCloud App to view inverter information.

7 LCD Operation

7.1 Button Function

The inverter offers two buttons with multiple functions. Please refer to the following table before any operation of the inverter.

Tab. 7-1 Button function

Button	Operation	Description
ESC	≤1.2 s	Navigate up / down or change the setting values. Hereinafter referred to as "**Touch ESC**".
	> 1.2 s	Return to a previous menu or cancel the settings. Hereinafter referred to as "**Press ESC**".
ENT	≤1.2 s	Move left or right, or turn pages, or view the active error / warning from the main screen. Hereinafter referred to as "**Touch ENT**".
	> 1.2 s	Enter the sub-menu or confirm a selection or settings. Hereinafter referred to as "**Press ENT**".

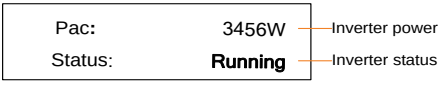
⚠ CAUTION

Risk of burns due to hot components!

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

7.2 Main Screen

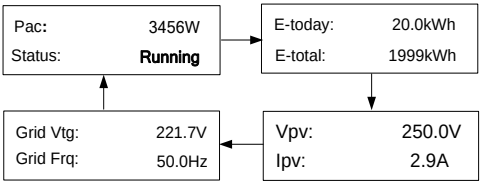
After successful commissioning, the LCD screen will enter the main screen.



If there is no button operation for:

- 1 minute, LCD backlight will be automatically deactivated;
- 2 minutes, system will return to the default screen (main screen).

When there is no button operation for more than 8 seconds on the main screen, the displayed information will automatically cycle through to provide additional data: Main screen, energy, PV data, utility grid data. The screen will cycle every 2 seconds. Press any button to quit this mode.



* The images shown here are for your reference only. For –D series, all PV input information will be displayed.

Tab. 7-2 Status Description

State	Description
Standby	The inverter waits for sufficient sunlight, then the DC voltage recovers.
Startup	The inverter is initializing and synchronizing with the grid.
Running	After being energized, the inverter tracks the PV strings' maximum power point (MPP) and feeds the AC power to grid. This mode is the normal mode.
Turn off	The inverter will stop running by manual "OFF" via the LCD menu. Set to "ON" if you want to restart the inverter.
Upgrading	The DSP or LCD firmware is upgrading.
Error xxx	If an error occurs, the inverter will automatically stop operation, trigger the AC relay and show "Error xxx" on the LCD with the indicator red (xxx is the error code). Once the error is cleared in recovery time, the inverter will automatically try to resume normal operation. The recovery time can be set via the App.

NOTICE

If the device is in standby mode for more than 10 minutes, please check:

- **Whether the insolation is sufficient and the PV connection is correct.**
- **If no anomaly is found, disconnect and reconnect the DC switch and the main switch to restart.**
- **If it still does not work, contact SUNGROW.**

Viewing the Active Error/Warning

If the status on the main screen is “Error xxx”, **Touch ENT** to view the active error code.

If the inverter is running with a warning, **Touch ENT** to view the active warning code.

Only one error or warning can be displayed on this screen. Refer to “**8.1 Troubleshooting**” for a solution.

Error	010

or

Warning	514

7.3 Menu Structure

For the running information, the power values indicated represent the average value during the time interval.

The energy yields displayed are indicative only. For the actual yields, please refer to the energy meter of the utility grid.

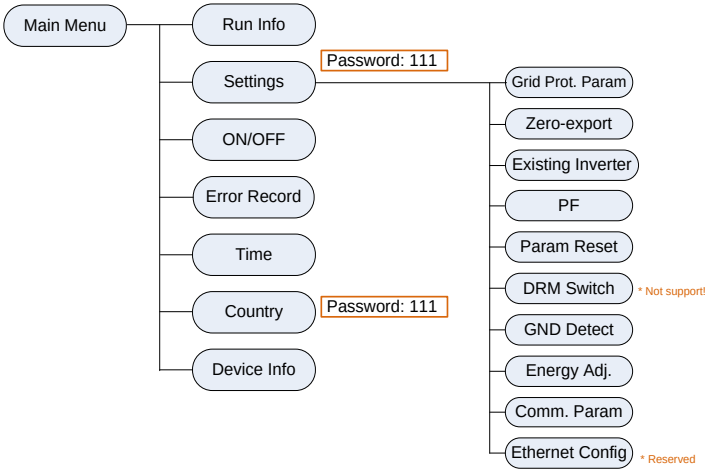


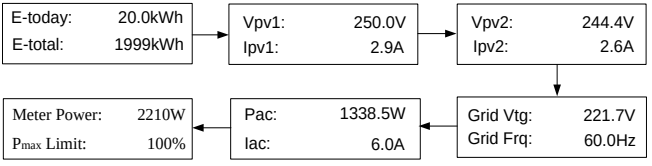
Fig. 7-1 LCD Menu Tree

7.4 Viewing Running Info

Proceed as follows to look through the detailed running information.

Main Screen (Press ENT)→Menu→Run Info (Press ENT)

Scroll pages by touching ENT / ESC.



Meter power:

+ (omitted): The inverter is sourcing power to the grid.
-: The inverter is sinking power from the grid.
P_{max} limit: only indicated for the derating in the event of over-temperature, overvoltage or over-frequency.

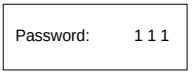
7.5 Advanced Settings

7.5.1 Inputting the Password

The parameter settings are protected with a password. If you want to set the inverter's parameters, you have to input the correct password.

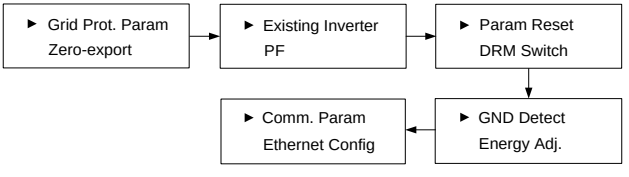
Main Screen (Press ENT)→Menu (Touch ESC)→Settings (Press ENT)

Touch ESC to add the value and **Touch ENT** to move the cursor. Input the password **111**.



Press ENT to confirm the password and enter the submenu.

Touch ESC to navigate down **and Press ENT** to confirm.

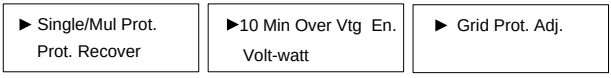


7.5.2 Setting Protective Parameters

Protective parameters are designed for the threshold values that can trigger the protective function of the inverter. The threshold values are compliant with the requirements of local safety standards and the utility grid.

If the protection function is triggered, the inverter will automatically disconnect from the grid with the ”Error xxx” state displayed on the LCD main screen. After the grid voltage or frequency recovers to the specified range, the inverter will start running normally and can reconnect to the grid.

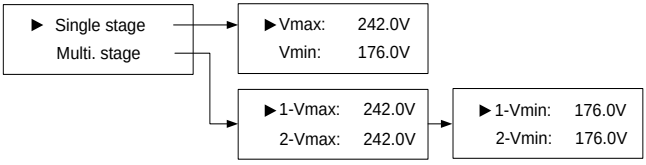
Touch ESC to choose the item and **press ENT** to enter the setting interface.



* The settings for “10 Min Over Vtg En”. and “Volt-watt” are invalid for the country code “BRA”.

Single/Multiple Protection

Touch ESC to change the value and **touch ENT** to move the cursor.
Confirm settings by **pressing ENT**.
Confirm settings and scroll pages by **pressing ENT**.



Tab. 7-3 Protective Parameters Explanation and the Range

Parameter	Explanation	Range (V)
V_{max}	Grid over-voltage	230.0–277.0
V_{min}	Grid under-voltage	176.0–230.0
1-V_{max}	Grid over-voltage 1 (V>)	230.0–277.0
2-V_{max}	Grid over-voltage 2 (V>>)	230.0–277.0
1-V_{min}	Grid under-voltage 1 (V<)	176.0–230.0
2-V_{min}	Grid under–voltage 2 (V<<)	176.0–230.0

Tab. 7-4 Default Protective Parameters

Parameter	Default Value for “BRA”			Default Value for “MX”		
	220 V	230 V	240 V	220 V	230 V	240 V
V_{max} (V)	242.0	253.0	264.0	231.0	241.5	252.0
V_{min} (V)	176.0	184.0	192.0	209.0	218.5	228.0
1-V_{max} (V)	242.0	253.0	264.0	231.0	241.5	252.0

Parameter	Default Value for "BRA"			Default Value for "MX"		
	220 V	230 V	240 V	220 V	230 V	240 V
2-V_{max} (V)	242.0	253.0	264.0	231.0	241.5	252.0
1-V_{min} (V)	176.0	184.0	192.0	209.0	218.5	228.0
2-V_{min} (V)	176.0	184.0	192.0	209.0	218.5	228.0

NOTICE

Too high grid voltage may affect the normal usage and the life of household loads. The loss of any or all the warranty rights may follow if the protection set-point is beyond the specified range.

Protection Recover

Vmax-rec (230.0 V–277.0 V):

Recovery value for over-voltage error. Inverter will start operating when the grid voltage falls below this value.

Vmin-rec (176.0 V–230.0 V):

Recovery value for under-voltage error. Inverter will start operating when the grid voltage is above this value.

► Vmax-rec: 242.0V
Vmin-rec: 176.0V

Tab. 7-5 Default Recovery Parameters

Parameter	Default for "BRA" Grid			Default for "MX" Grid		
	220 V	230 V	240 V	220 V	230 V	240 V
$V_{max\text{-}rec}$ (V)	242.0	253.0	264.0	231.0	241.5	252.0
$V_{min\text{-}rec}$ (V)	176.0	184.0	192.0	209.0	218.5	228.0

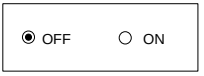
Grid Protection Voltage Adjusting

All Sungrow's inverters are compliant with the local standard related to grid protection requirements. In order to work with unstable utility grids, inverters are equipped with automatic protection voltage adjusting function (disabled by default). This mode can be enabled via the LCD.

OFF: the function is disabled by default. The grid protection voltage cannot automatically adjust.

ON: enables the protection function. The inverter will automatically adjust the protection threshold to a higher value so as to be normally connected to the grid in the event of grid over-voltage. The $V_{max\text{-}rec}$ will be adjusted the same with the V_{max}, with an upper limit value not higher than V_{max}.

If the setting is changed from ***ON*** to ***OFF***, you should set the protection voltage as specified in **Tab. 7-3** according to local protection requirement.



NOTICE

If the grid voltage adjusting function is set to *ON*, the power derating function for over-voltage will be automatically disabled.

If the line voltage or frequency goes outside pre-determined parameters, the inverter must shut down for safety purposes, which means it is not a faulty inverter in these instances. High line voltages may damage home appliances and Sungrow is not held responsible or liable for these issues.

7.5.3 Zero-export Setting

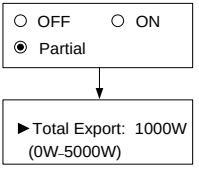
Touch ENT / ESC to select and **press ENT** to confirm.

Touch ESC to change the value and **touch ENT** to move the cursor. **Press ENT** to confirm the settings.

OFF: all the power will be exported to the grid (by default).

ON: no power will be exported to the grid.

Partial: part of the output power will be exported to the grid.



Total Export: the export power upper limit of the whole system.

The range of export power will automatically change:

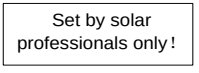
When the existing inverter is disabled: 0 to (rated power of the inverter)

When the existing inverter is enabled:

- The lower limit is the rated power of existing inverter.
- The upper limit is ([rated power of the existing inverter] + rated power of the inverter).

For example, retrofit an existing PV system (rated power: 2000 W) with SG5K-D (rated power: 5000 W). The total export range will be 2000 W – 7000 W.

A prompt will appear when you set it for the second time.



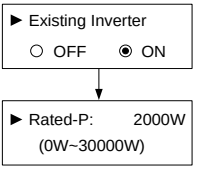
NOTICE

With the password 111, the zero-export setting can only be done at the first time. The later modification can be performed by professionals only, please contact SUNGROW.

7.5.4 Adding the Existing Inverter

Rated-P: rated power of the existing inverter.

This function is **OFF** by default. If the existing inverter is set to **ON**, its rated power is the lower limit for export power setting.



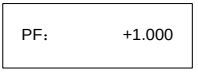
7.5.5 PF Setting

The inverter is capable of operating with fixed power factor.

The PF ranges from 0.8 leading (+) to 0.8 lagging (-).

+ (Leading): the inverter is sourcing reactive power to the grid.

- (Lagging): the inverter is sinking reactive power from the grid.



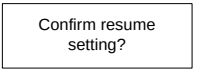
7.5.6 Parameter Reset

NOTICE

All settable parameters will return to the default values once the "Param Reset" operation is performed.

Press ENT to confirm the operation.

Press ESC to discard the operation.



7.5.7 Energy Adjustment

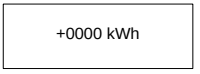
If the accumulative value "E-total" displayed on inverter screen is different from the value indicated on the metering device, you should adjust the energy deviation.

(Energy Adj. value) = (Real measured value) - (E-total reading value)

Touch ESC to add the value and **Touch ENT** to move the cursor. **Press ENT** to confirm the setting.

The "+" can be changed to "-" by **touching ESC**.

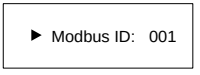
The adjustment rangs from -9999 kWh to +9999 kWh.



7.5.8 Setting Communication Parameter

Touch ESC to set the appropriate value and **touch ENT** to move the cursor. Confirm settings by **pressing ENT**.

Device address range: 1-247.



7.5.9 Ethernet Configuration

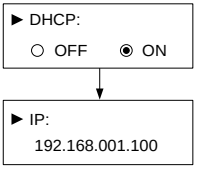
The Ethernet setting is reserved for later usage.

Touch ENT to select and **press ENT** to confirm.

OFF: The IP address should be assigned manually.

ON: Automatically assign an IP address from the home router.

Touch ESC to switch between the DHCP and the IP interfaces.

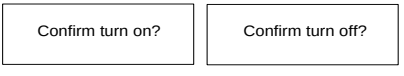


7.6 Starting/Stopping the Inverter

Main Screen (Press ENT)→Menu (Touch ESC)→ON/OFF (Press ENT)

Touch ENT / ESC to select and **press ENT** to confirm.

Confirm your selection by **pressing ENT**.

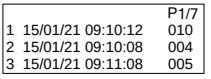


7.7 Viewing the Error Record

Main Screen (Press ENT)→Menu (Touch ESC)→Error Record (Press ENT)

Scroll pages by touching ENT / ESC.

3 records can be displayed on each page and 20 records at most for all.



Press ESC to exit.

7.8 Setting the Time

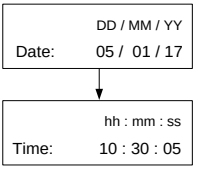
The correct system time is very important. If there is deviation between the system time and the local time, the inverter will not operate normally. The clock is in 24-hour format.

Main Screen (Press ENT)→Menu (Touch ESC)→Time (Press ENT)

DD, MM, and **YY** stand for day, month, and year respectively.

hh, **mm**, and **ss** stand for hour, minute, and second respectively.

Scroll pages by **pressing ENT**.

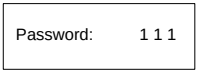


7.9 Setting the Country

To make the protection parameters setting convenient, inverter provides built-in protection parameters for certain countries. The country setting is protected with a password.

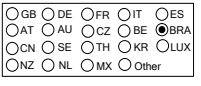
Main Screen (Press ENT)→Menu (Touch ESC)→Country (Press ENT)

Touch ESC to add the value and **Touch ENT** to move the cursor. Input the password **111**.



Touch ENT / ESC to choose the country and **press ENT** to confirm.

If the country selected is not in the list, please choose “Other” and then set the protection parameters manually.

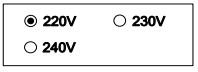


Tab. 7-6 Country Code Description

Code	Full Name	Language	Code	Full Name	Language
GB	Great Britain	English	BRA	Brazil	Portuguese
DE	Germany	German	CN	China	Chinese
FR	France	French	SE	Sweden	English
IT	Italy	Italian	TH	Thailand	English
ES	Spain	English	KR	Korea	English
AT	Austria	German	LUX	Luxemburg	German
AU	Australia	English	NZ	New Zealand	English
CZ	Czech	English	NL	Netherlands	English
BE	Belgium	English	MX	Mexico	Spanish
Other	Country not included above	English	-	-	-

The country code “Other” represents 50 Hz grid and 60 Hz grid. The inverter will automatically choose 50 Hz or 60 Hz according to the local grid frequency.

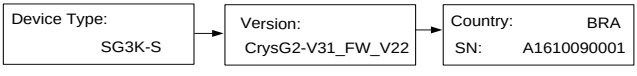
If the country code is set to “BRA” or “MX”, the grid voltage setting will appear. **Touch ENT / ESC** to choose the grid voltage and **press ENT** to confirm.



7.10 Viewing Device Info

Main Screen (Press ENT)→Menu (Touch ESC)→Device Info (Press ENT)

These interfaces show the read-only information.
Scroll pages by **touching ENT / ESC**.
Press ESC to exit.



8 Troubleshooting and Maintenance

8.1 Troubleshooting

8.1.1 LED Indicator

See "**Tab. 6-2 Indicator Status Description**" for the definition.

Fault Type	Troubleshooting
LED indicator cannot be lit.	1. Disconnect the AC circuit breaker. 2. Rotate the DC switch to "OFF". 3. Check the polarity of DC input.
Green indicator goes out.	1. Disconnect the AC circuit breaker. 2. Rotate the DC switch to "OFF". 3. Check 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 the above conditions are OK, please contact SUNGROW.

8.1.2 Errors on the App or LCD Screen

If an error occurs, the "Error" state will be shown on the main screen. We need the following information to provide you with the best assistance:

- inverter type (e.g. string, central, grid-connected, hybrid, transformerless, single phase, triple phase, single MPPT, multiple MPPTs);
- product name;
- serial number of the inverter;
- error code / name; and
- a brief description of the problem.

Code	Description	Troubleshooting
002	Grid over-voltage. The grid voltage exceeds the protective value.	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	Transient over-voltage. The grid transient voltage exceeds the protective value.	1. This is a short-term fault due to grid condition. Wait a moment for inverter recovery. 2. If the fault persists, please contact Sungrow Service Dept.
004	Grid under-voltage. The grid voltage is below the protective 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.
005	Grid under-voltage. The grid voltage is below the protective value, which is lower than the protective value of error 004.	1. This is a short-term fault due to grid condition. Wait a moment for inverter recovery. 2. If the fault persists, please contact Sungrow Service Dept.
006	AC over-current. 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 persists, please contact Sungrow Service Dept.
007	Transient AC overcurrent.	1. The inverter will self-recover after several seconds. 2. If the fault persists, please contact Sungrow Service Dept.
008	Grid over-frequency. The grid frequency exceeds the protective 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.
009	Grid under-frequency. The grid frequency is below the protective value.	

Code	Description	Troubleshooting
010	Grid failure (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	DC injection over-current. The DC current injection of AC current exceeds the upper limit.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
012	Leakage current over-current. The leakage current exceeds the upper limit.	1. Check the PV strings for ground fault. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
014	10-minute grid over-voltage. 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	Grid over-voltage The grid voltage exceeds the protective value, which is higher than the protective value of error 002.	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	Bus transient over-voltage. The transient bus voltage exceeds the protective value.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
020	Bus over-voltage. The bus voltage exceeds the protective value.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.

Code	Description	Troubleshooting
021	PV1 input over-current.	Check the layout and the wiring of PV1 input.
022	PV2 input over-current.	Check the layout and the wiring of PV2 input.
028	PV1 reverse connection.	Check the cable connections of PV1.
029	PV2 reverse connection.	Check the cable connections of PV2.
036	The temperature of radiator is too high.	1. Check whether the ambient temperature shown on the screen is too high. Wait a moment for inverter recovery. 2. Check whether there is enough space for convection. 3. Check whether the inverter is in direct sunlight. 4. Check whether the fan is normal. Replace it if necessary. 5. Clean the air inlets. 6. If the fault persists, please contact Sungrow.
037	The internal temperature of inverter is too high.	
038	Relay fault on the grid side.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
039	The insulation resistance of PV to earth is low. (ISO-flt)	1. Check whether there is a reliable inverter grounding line. 2. Check whether one of the PV strings is short-circuited with ground. 3. Wait a moment for inverter recovery. 4. If the fault occurs repeatedly, contact Sungrow Service Dept.
041	Leakage current sampling fault.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
043	Inner under-temperature fault. The ambient temperature inside the inverter is too low.	The inverter will recover once the ambient temperature rises above -25℃.
044	Open-loop inverter self-test fault.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
045	PV1 boost circuit fault.	
046	PV2 boost circuit fault.	
048	Phase current sampling fault.	

Code	Description	Troubleshooting
053	The slave DSP detects that the grid voltage exceeds the protective 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.
054	The slave DSP detects that the grid frequency exceeds the protective 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	The slave DSP detects that the leakage current exceeds the protective range.	1. Check whether there is a grounded fault of the PV string. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
059	Communication alarm between master DSP and slave DSP.	1. Wait 1 minute for inverter recovery. 2. If the fault persists, contact Sungrow Service Dept.
061	Alarm for no inverter type setting.	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.
084	Warning for reverse cable connection of the Sungrow Meter.	1. Check whether the power cable connections are correct. 2. If “Existing Inverter” is set to “ON” via LCD menu, check and ensure that its rated power is correctly set. 3. For Sungrow single-phase meter, check whether the CT clamp of the 1-phase sensor is correctly placed. Refer to “**5.6.1 On the Meter Side**”.
085	Mismatched software version.	Please contact Sungrow Service Dept.
100	The AC output current exceeds the upper limit.	1. The inverter will resume if the output current falls below the protection value. 2. If the fault persists, please contact Sungrow Service Dept.
101	Grid over-frequency. The grid frequency exceeds the protective value, which is higher than the protective value of error 008.	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

Code	Description	Troubleshooting
102	Grid under-frequency. The grid frequency is below the protective value, which is lower than the protective value of error 009.	permissible range, contact Sungrow Service Dept.
106	Abnormal grounding. Neither the PE terminal on the AC connection block nor the second PE terminal on the enclosure is reliably connected.	Check whether there is a reliable inverter grounding line, if there is access to the ground, and the fault persists, please contact Sungrow Service Dept.
200	Bus hardware over-voltage fault. The bus voltage exceeds the protective value.	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 hardware over-current fault. The PV1 or PV2 current exceeds the protective value.	If the fault occurs repeatedly, contact Sungrow Service Dept.
203	The PV input voltage exceeds the bus voltage.	Check the functionality of the PV connection terminals.
306	Input and output power mismatching fault.	If the fault occurs repeatedly, contact Sungrow Service Dept.
315	PV1 current sampling fault.	Channel sampling anomaly. Contact Sungrow Service Dept.
316	PV2 current sampling fault.	
320	Leakage current sensor fault.	Contact Sungrow Service Dept.
409	Both the ambient temperature sensor and the radiator temperature sensor fail.	If the fault occurs repeatedly, contact Sungrow Service Dept.
503	Ambient temperature sensor open circuit warning.	

Code	Description	Troubleshooting
504	Ambient temperature sensor short circuit warning.	
505	Radiator temperature sensor open circuit warning.	
506	Radiator temperature sensor short circuit warning.	
501	External memory reading/writing warning.	1. Inverter can normally be connected to the grid. 2. Power on the inverter again. If the fault persists, contact Sungrow Service Dept.
514	Abnormal communication warning of the Sungrow Meter. (Inverter can be normally connected to the grid.)	1. Check whether the power cable connections of the meter are correct. 2. Check whether the RS485 connection is correct.

8.2 Routine Maintenance

DANGER

Risk of inverter damage or personal injury due to incorrect service!

Always keep in mind that the inverter is powered by dual sources: PV strings and utility grid.

Before any service work, observe the following procedure.

- **Disconnect the AC circuit breaker and then set the DC load-break switch if the inverter to OFF;**
- **Wait at least 10 minutes for inner capacitors to discharge completely;**
- **Verify that there is no voltage or current before pulling any connector.**

CAUTION

Keep non-related persons away!

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

NOTICE

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.

Unauthorized alterations will void guarantee and warranty claims and in most cases terminate the operating license. SUNGROW shall not be held liable for any damage caused by such changes.

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.

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.	Six months to a year (it depends on the dust contents in air.)

9 System Decommissioning

9.1 Disconnecting the Inverter

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

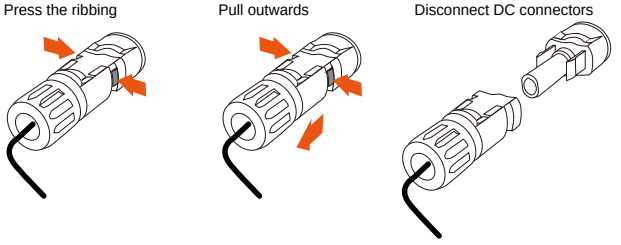
Proceed as follows to disconnect the inverter from the AC and DC power sources. Lethal voltages or damage to the inverter will follow if otherwise.

1. Stop the inverter via the LCD menu. For details, see "**7.6 Starting/Stopping the Inverter**".
2. Disconnect the AC circuit breaker and secure it against reconnection.
3. Rotate the DC switch to "OFF". Disconnect the external DC circuit breaker.

NOTICE

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

4. Wait about **10** minutes until the capacitors inside the inverter completely discharge.
5. Measure to confirm that the AC output at the AC circuit breaker is voltage free.
6. Remove the AC connector. Lay the tool in the location of snap and press the tool down. Then snap can be pushed from the AC terminal.
7. Release the locking part of PV 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 respective component manufacturer.

9.2 Dismantling the Inverter

⚠ CAUTION

Risk of burn injuries and electric shock!

Do not touch any inner live parts until at least 10 minutes after disconnecting the inverter from the utility grid and the PV input.

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

9.3 Disposing of the Inverter

Users take the responsibility for the disposal of the inverter.

NOTICE

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

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

10 Appendix

10.1 Technical Data

10.1.1 –S Series

Parameters	SG2K-S	SG3K-S
Input Data		
Max. PV input power	3000 W	4000 W
Max. PV input voltage	600 V	
Startup voltage	120 V	
Nominal input voltage	360 V	
MPP voltage range	90 V–560 V	
MPP voltage range for nominal power	210 V–480 V	310 V–480 V
No. of MPPTs	1	
Max. number of PV strings per MPPT	1	
Max. PV input current	10 A	
Max. current for input connector	12 A	
Short-circuit current of PV input	12 A	
Max. inverter backfeed current to PV string	0 A	
Output Data		
Nominal AC output power	2000 W	3000 W
Max AC output apparent power	2000 VA	3000 VA
Max. AC output current	9.1 A	13.7 A
Max. inrush current (peak value / duration)	8 A / 12 ms	
Max. output fault current (peak value / duration)	80 A / 3.2 ms	
Max. output over-current protection	25 A	
Nominal AC voltage	220 Vac / 230 Vac / 240 Vac	
AC voltage range	176 Vac–276 Vac (this may vary with grid standards)	
Nominal grid frequency	50 Hz / 60 Hz	
Grid frequency range	45~55Hz/55~65Hz (this may vary with grid standards)	
Total harmonic distortion (THD)	< 3 % (of nominal power)	
DC current injection	< 0.5 % (of nominal current)	
Power factor	> 0.99 at default value at nominal power (adj. 0.8 leading–0.8 lagging)	
Protection		

Parameters	SG2K-S	SG3K-S
PV reverse connection protection	Yes	
AC short circuit protection	Yes	
Leakage current protection	Yes	
Anti-islanding protection	Yes (frequency shift)	
DC switch	Yes	
Overvoltage category	III [AC], II [DC]	
Overvoltage protection	II [AC]	
Safety protection class	I	
System Data		
Max. efficiency	98.2 %	98.2 %
Max. European efficiency	97.2 %	97.7 %
Isolation method	Transformerless	
Ingress protection rating	IP65	
Pollution degree outside/inside the enclosure	3 / 2	
Power loss in night mode	< 1 W	
Operating ambient temperature	-25℃ to +60℃	
Allowable relative humidity	0–100 % (non-condensing)	
Cooling method	Natural cooling	
Max. operating Altitude	4000 m (derating when > 2000 m)	
Display	Graphic LCD	
Communication	Wi-Fi	
PV connection type	MC4	
AC connection type	Plug and play connector	
Certification	IEC 62109-1, IEC 62109-2, IEC 62116, IEC 61727, EN 61000-6-2, EN 61000-6-3, AS4777.2, ABNT NBR 16149, ABNT NBR 16150, VDE-AR-N-4105, CEI 0-21, VDE0126-1-1, UTE C15-712, VFR-2014, EN50438, C10/11, G83/2, G59/3	
Mechanical Data		
Dimensions (W x H x D)	300 mm x 370 mm x 125 mm	
Mounting method	Wall-mounting bracket	
Weight	8.5 kg	

10.1.2 –D Series

Parameters	SG3K-D	SG4K-D
Input Data		
Max. PV input power	4000 W	5200 W
Max. PV input voltage	600 V	
Startup voltage	120 V	
Nominal input voltage	360 V	
MPP voltage range	90 V–560 V	
MPP voltage range for nominal	160 V–480 V	210 V–480 V

Parameters	SG3K-D	SG4K-D
power		
No. of MPPTs	2	
Max. number of PV strings per MPPT	1	
Max. PV input current	20 A (10 A / 10 A)	
Max. current for input connector	24 A (12 A / 12 A)	
Short-circuit current of PV input	24 A (12 A / 12 A)	
Max. inverter backfeed current to PV string	0 A	
Output Data		
Nominal AC output power	3000 W	4000 W
Max AC output apparent power	3000 VA	4000 VA
Max. AC output current	13.7 A	18.2 A
Max. inrush current (peak value / duration)	8 A / 12 ms	10 A / 12 ms
Max. output fault current (peak value / duration)	80 A / 3.2 ms	100 A / 3.2 ms
Max. output over-current protection	25 A	32 A
Nominal AC voltage	220 Vac / 230 Vac / 240 Vac	
AC voltage range	176 Vac–276 Vac (this may vary with grid standards)	
Nominal grid frequency	50 Hz / 60 Hz	
Grid frequency range	45~55Hz / 55~65Hz (this may vary with grid standards)	
Total harmonic distortion (THD)	< 3 % (of nominal power)	
DC current injection	< 0.5 % (of nominal current)	
Power factor	> 0.99 at default value at nominal power (adj. 0.8 leading–0.8 lagging)	
Protection		
PV reverse connection protection	Yes	
AC short circuit protection	Yes	
Leakage current protection	Yes	
Anti-islanding protection	Yes (frequency shift)	
DC switch	Yes	
Overvoltage category	III [AC], II [DC]	
Overvoltage protection	II [AC]	
Safety protection class	I	
System Data		
Max. efficiency	98.4 %	98.4 %
Max. European efficiency	97.7 %	98.0 %
Isolation method	Transformerless	
Ingress protection rating	IP65	
Pollution degree outside/inside the enclosure	3 / 2	
Power loss in night mode	< 1 W	

Parameters	SG3K-D	SG4K-D
Operating ambient temperature	-25℃ to +60℃	
Allowable relative humidity	0–100 % (non-condensing)	
Cooling method	Natural cooling	
Max. operating Altitude	4000 m (derating when > 2000 m)	
Display	Graphic LCD	
Communication	Wi-Fi	
PV connection type	MC4	
AC connection type	Plug and play connector	
Certification	IEC 62109-1, IEC 62109-2, IEC 62116, IEC 61727, EN 61000-6-2, EN 61000-6-3, AS4777.2, ABNT NBR 16149, ABNT NBR 16150, VDE-AR-N-4105, CEI 0-21, VDE0126-1-1, UTE C15-712, VFR-2014, EN50438, C10/11, G83/2, G59/3	
Mechanical Data		
Dimensions (W x H x D)	300 mm x 370 mm x 133 mm	
Mounting method	Wall-mounting bracket	
Weight	11.5 kg	

Parameters	SG5K-D	SG6K-D
Input Data		
Max. PV input power	6500 W	7800 W
Max. PV input voltage	600 V	
Startup voltage	120 V	
Nominal input voltage	360 V	
MPP voltage range	90 V–560 V	
MPP voltage range for nominal power	260 V–480 V	315 V–480 V
No. of MPPTs	2	
Max. number of PV strings per MPPT (PV1/PV2)	1/1	
Max. PV input current	20 A (10 A / 10 A)	
Max. current for input connector	24 A (12 A / 12 A)	
Short-circuit current of PV input	24 A (12 A / 12 A)	
Max. inverter backfeed current to PV string	0 A	
Output Data		
Nominal AC output power	5000 W	6000 W
Max AC output apparent power	5000 VA	6000 VA
Max. AC output current	22.7 A	27.3 A
Max. inrush current (peak value / duration)	10 A / 12 ms	
Max. output fault current (peak value / duration)	100 A / 3.2 ms	
Max. output over-current protection	32 A	

Parameters	SG5K-D	SG6K-D
Nominal AC voltage	220 Vac / 230 Vac / 240 Vac	
AC voltage range	176 Vac–276 Vac (this may vary with grid standards)	
Nominal grid frequency	50 Hz / 60 Hz	
Grid frequency range	45~55Hz / 55~65Hz (this may vary with grid standards)	
Total harmonic distortion (THD)	< 3 % (of nominal power)	
DC current injection	< 0.5 % (of nominal current)	
Power factor	> 0.99 at default value at nominal power (adj. 0.8 leading–0.8 lagging)	
Protection		
PV reverse connection protection	Yes	
AC short circuit protection	Yes	
Leakage current protection	Yes	
Anti-islanding protection	Yes (frequency shift)	
DC switch	Yes	
Overvoltage category	III [AC], II [DC]	
Overvoltage protection	II [AC]	
Safety protection class	I	
System Data		
Max. efficiency	98.4 %	98.4 %
Max. European efficiency	98.0 %	98.0 %
Isolation method	Transformerless	
Ingress protection rating	IP65	
Pollution degree outside/inside the enclosure	3 / 2	
Power loss in night mode	< 1 W	
Operating ambient temperature	-25℃ to +60℃	
Allowable relative humidity	0–100 % (non-condensing)	
Cooling method	Natural cooling	
Max. operating Altitude	4000 m (derating when > 2000 m)	
Display	Graphic LCD	
Communication	Wi-Fi	
PV connection type	MC4	
AC connection type	Plug and play connector	
Certification	IEC 62109-1, IEC 62109-2, IEC 62116, IEC 61727, EN 61000-6-2, EN 61000-6-3, AS4777.2, ABNT NBR 16149, ABNT NBR 16150, VDE-AR-N-4105, CEI 0-21, VDE0126-1-1, UTE C15-712, VFR-2014, EN50438, C10/11, G83/2, G59/3	
Mechanical Data		
Dimensions (W x H x D)	360 mm x 390 mm x 133 mm	
Mounting method	Wall-mounting bracket	
Weight	11.5 kg	

Parameters	SG8K3-D
Input Data	
Max. PV input power	10800 W
Max. PV input voltage	600 V
Startup voltage	120 V
Nominal input voltage	360 V
MPP voltage range	90 V–540 V
MPP voltage range for nominal power	285 V–480 V
No. of MPPTs	2
Max. number of PV strings per MPPT	1/2
Max. PV input current	12.5 A / 25 A
Max. current for input connector	15 A / 30 A
Short-circuit current of PV input	15 A / 30 A
Max. inverter backfeed current to PV string	0 A
Output Data	
Nominal AC output power	8300 W
Max AC output apparent power	8300 VA
Max. AC output current	37.8 A
Max. inrush current (peak value / duration)	25 A / 12 ms
Max. output fault current (peak value / duration)	93 A / 3.2 ms
Max. output over-current protection	40 A
Nominal AC voltage	220 Vac / 230 Vac / 240 Vac (single-phase)
AC voltage range	176 Vac–276 Vac (this may vary with grid standards)
Nominal grid frequency	50 Hz / 60 Hz
Grid frequency range	45~55Hz / 55~65Hz (this may vary with grid standards)
Total harmonic distortion (THD)	< 3 % (of nominal power)
DC current injection	< 0.5 % (of nominal current)
Power factor	> 0.99 at default value at nominal power (adj. 0.8 leading–0.8 lagging)
Protection	
PV reverse connection protection	Yes
AC short circuit protection	Yes
Leakage current protection	Yes
Low voltage fault ride through (LVFRT)	Yes
Anti-islanding protection	Yes (frequency shift)
DC switch	Yes

Parameters	SG8K3-D
Overvoltage category	III [AC], II [DC]
Overvoltage protection	II [AC], II [DC]
Safety protection class	I
System Data	
Max. efficiency	98.5 %
Max. European efficiency	98.0 %
Isolation method	Transformerless
Ingress protection rating	IP65
Pollution degree outside/inside the enclosure	3 / 2
Power loss in night mode	< 1 W
Operating ambient temperature	-25℃ to +60℃
Allowable relative humidity	0–100 % (non-condensing)
Cooling method	Natural cooling
Max. operating Altitude	4000 m (derating when > 2000 m)
Display	Graphic LCD
Communication	Wi-Fi
PV connection type	MC4
AC connection type	Plug and play connector
Certification	IEC 62109-1, IEC 62109-2, IEC 62116, IEC 61727, EN 61000-6-2, EN 61000-6-3, AS4777.2, ABNT NBR 16149, ABNT NBR 16150, VDE-AR-N-4105, CEI 0-21, VDE0126-1-1, UTE C15-712, VFR-2014, EN50438, C10/11, G83/2, G59/3
Mechanical Data	
Dimensions (W x H x D)	360 mm x 390 mm x 148 mm
Mounting method	Wall-mounting bracket
Weight	15.5 kg

10.2 Quality Assurance

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

Evidence

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

Conditions

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

Exclusion of Liability

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

- If the free warranty period for the whole machine/components have expired.
- If the device is damaged during transport.
- If the device was incorrectly installed, refitted, or used.
- If the device is operated in a very improper environment, as described in this manual.
- If the fault or damage was caused by installation, repairs, modification, or disassembly performed by a service provider or personnel other than this company.
- If the fault or damage was caused by the use of non-standard or non-SUNGROW components or software.
- If the installation and use range are beyond stipulations of relevant international standards.
- If the damage was caused by an abnormal natural environment.

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

Software Licenses

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

Contact Information

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

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

- Type of the inverter
- Serial number of the inverter
- Error code/name
- Brief description of the problem

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