



PV Grid Tie Inverter

Solis Three Phase Inverter

Installation and Operation Manual (For Mexico)

For model Solis-25K-LV, Solis-30K-LV, Solis-50K-HV,
Solis-60K-HV



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Please adhere to the actual products in case of any discrepancies in this user manual.

If you encounter any problem on the inverter, please find out the inverter S/N
and contact us, we will try to respond to your question ASAP.

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Comply with CA Rule 21/
Certified to UL 1741 SA

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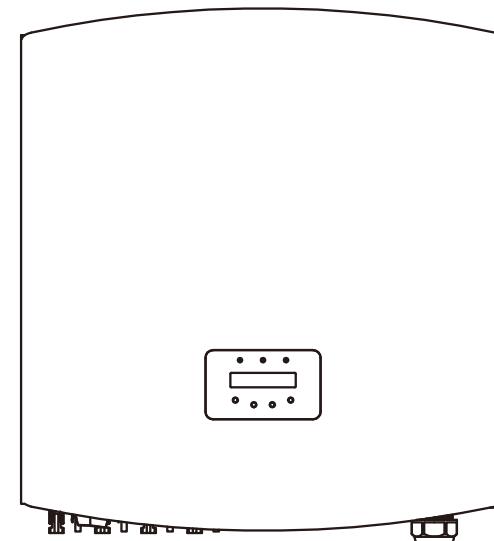
1. Introduction

1.1 Product Description

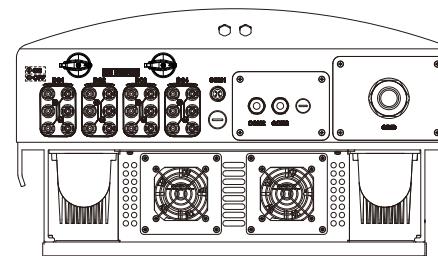
Solis three phase series PV inverters convert direct current (DC) power from the photovoltaic (PV) array into alternating current (AC) power to satisfy local loads as well as feed the power distribution grid.

There are 4 models for Solis three phase inverter:

Solis-25K-LV Solis-30K-LV Solis-50K-HV Solis-60K-HV



▲ Figure 1.1 Front view

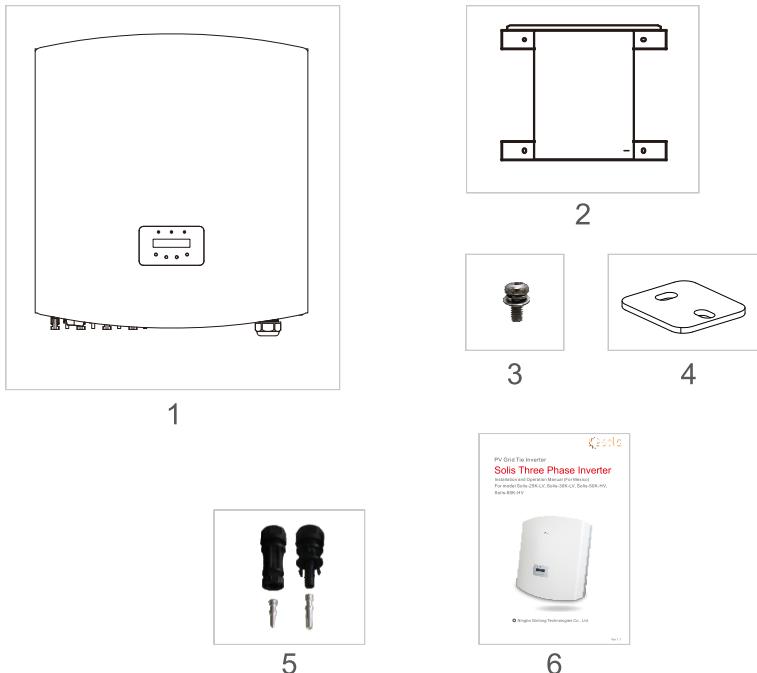


▲ Figure1.2 Bottom view (The number of DC inputs vary among different models)

1. Introduction

1.2 Packaging List

Please check according to following table, to see whether all the parts were included in the packaging:



| Part NO. | Description | Number |
|----------|-----------------------|--|
| 1 | PV grid tie Inverter | 1 |
| 2 | Wall mounting bracket | 1 |
| 3 | Locking screws | 4 |
| 4 | Locking sheet | 2 |
| 5 | DC connectors | (25-30)K-LV 6 pairs 50K-HV 8pairs 60K-HV 12pairs |
| 6 | Manual | 1 |

▲ Table 1.1 Material list

2. Safety Instructions

Improper use may result in potential electric shock hazards or burns. This manual contains important instructions that should be followed during installation and maintenance. Please read these instructions carefully before use and keep them for future reference.

2.1 Safety Symbols

Safety symbols used in this manual, which highlight potential safety risks and important safety information, are listed as follows:



WARNING:

WARNING symbol indicates important safety instructions, which if not correctly followed, could result in serious injury or death.



NOTE:

NOTE symbol indicates important safety instructions, which if not correctly followed could result in some damage or the destruction of the inverter.



CAUTION :

CAUTION, RISK OF ELECTRIC SHOCK symbol indicates important safety instructions, which if not correctly followed, could result in electric shock.



CAUTION:

CAUTION, HOT SURFACE symbol indicates safety instructions, which if not correctly followed, could result in burns.

2.2 General Safety Instructions



WARNING:

DC input and AC output must be electrically isolated before operation. DO NOT connect PV array positive (+) or negative (-) to the ground. To do so may cause serious damage to the inverter.



WARNING:

Electrical installations must be done in accordance with the local and national regulatory and electrical safety standards.

2. Safety Instructions



WARNING:

To reduce the risk of fire, over-current protective devices (OCPD) are required for circuits connected to the Inverter. The recommended rated trip current of OCPD is show in 5.3.4.



CAUTION:

Risk of electric shock. Do not remove cover. Refer maintenance servicing to qualified and accredited service technician.



CAUTION:

The PV array (Solar panels) supplies a DC voltage when it is exposed to light.



CAUTION:

Risk of electric shock from energy stored in capacitors of the Inverter. Do not remove cover until 5 minutes after disconnecting all sources of supply. Service technician only. Warranty may be voided if any unauthorized removal of cover.



CAUTION:

The surface temperature of the inverter can exceed 75°C (167F).

To avoid risk of burns, DO NOT touch the surface when inverter is operating.

The inverter must be installed out of reach of children.

2.3 Notice For Use

The inverter was designed in accordance with relevant safety regulations to meet end user's demands. The usage of inverter and installation should meet the following requirement:

1. Secure inverter installation is required.
2. The inverter must be connected to a separate grounded AC group, to which no other electrical equipment is connected.
3. The electrical installation must meet all the applicable regulations and standards.
4. The inverter must be installed according to the instructions stated in this manual.

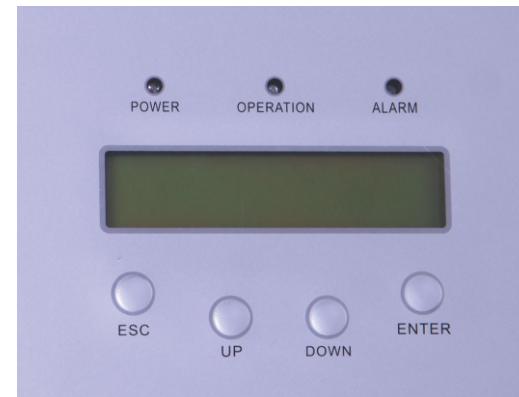
3. Overview

5. The inverter must be installed according to the correct technical specifications.

6. To startup the inverter, the Grid Supply Main Switch (AC) must be switched on, before the solar panel's DC isolator switched on. To stop the inverter, the Grid Supply Main Switch (AC) must be switched off before the solar panel's DC isolator switched off.

7. DC input voltage of inverter must less than its maximum input voltage of inverter.

3.1 Inverter Interface Instructions



▲ Figure 3.1 Front Panel Display

3.2 LED Status Indicator Lights

There are three LED status indicator lights on the front panel of the inverter.

On the Left: POWER LED indicates the power status of the inverter.

In the Middle: OPERATION LED (green) indicates the operation status.

On the Right: ALARM LED (yellow) indicates the alarm status.

Please see Table 3.1 for details.

3. Overview

| Light | Status | Description |
|-------------|----------|---|
| ● POWER | ON | The inverter can detect DC power. |
| | OFF | No DC power or low DC power. |
| ● OPERATION | ON | The inverter is operating properly. |
| | OFF | The inverter has stopped supplying power. |
| | FLASHING | The inverter is initializing. |
| ● ALARM | ON | Alarm or fault condition is detected. |
| | OFF | The inverter is operating properly. |

▲ Table 3.1 Status indicator

3.3 Keypad

There are four keys in the front panel of the Inverter (from left to right): ESC, UP, DOWN and ENTER keys. The keypad is used for:

- Scrolling through the displayed options (the Up and the Down keys).
- Access to modify the adjustable settings (the ESC and the ENTER keys).

3.4 LCD

The two-line Liquid Crystal Display (LCD) is located on the front panel of the Inverter, which displays the following information:

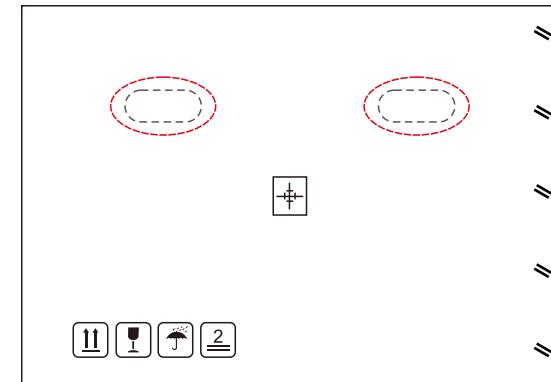
- 1. Inverter operation status and data;
- 2. Service messages for operator;
- 3. Alarm messages and fault indications.

4. Product handling and storage

4.1 Product handling

Refer to Figure 4.1 and below for instruction on handling the inverter.

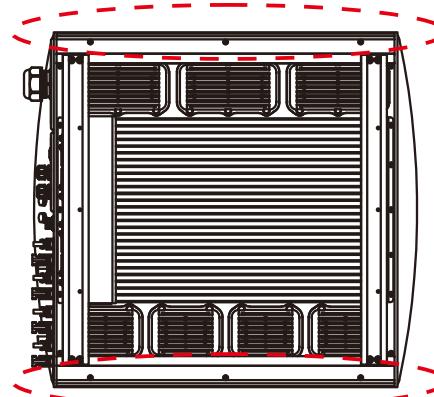
1. The red marks below indicate perforations used to form handles for carrying the carton with the inverter. The inverter requires 2 people to lift and carry.



▲ Figure 4.1 move the inverter

2. Two people are required to remove the inverter from the carton.

Handles are formed into the heatsink for ease of handling the inverter. See figure 4.2 below.



▲ Figure 4.2 Inverter handles

4. Installation

4.2 Product Storage

If the inverter is not to be installed immediately, storage instructions and environmental conditions are below:

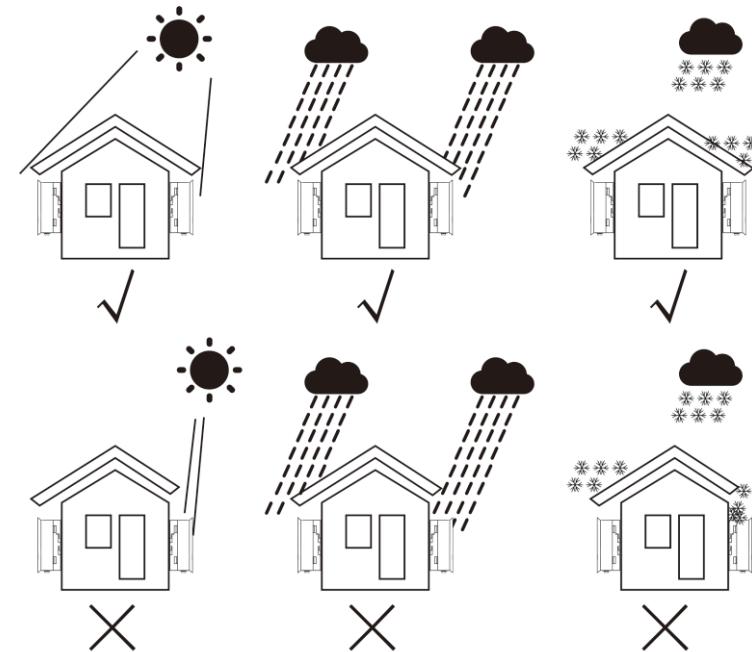
- Use the original box to repack the inverter, seal with adhesive tape with the desiccant inside the box.
- Store the inverter(s) in a clean and dry place, free of dust and dirt.
- Storage temperature must be between -40°C and 70°C and the humidity should be between 0 and 100% non-condensing.
- Stack no more than two (2) inverters high.
- Keep box(es) away from corrosive materials to avoid damage to the inverter enclosure.
- Inspect packaging regularly. If packaging is damaged(wet, pest damage, etc), repack the inverter immediately.
- Store the inverter(s) on a flat, hard surface - not inclined or upside down.
- After long-term storage, the inverter needs to be fully examined and tested by qualified service or technical personnel before using.
- Restarting after a long period of non-use requires the equipment to be inspected and, in some cases, the removal of oxidation and dust that has settled inside the equipment will be required.

5. Installation

5.1 Select a Location for the Inverter

When selecting a location for the inverter, consider the following:

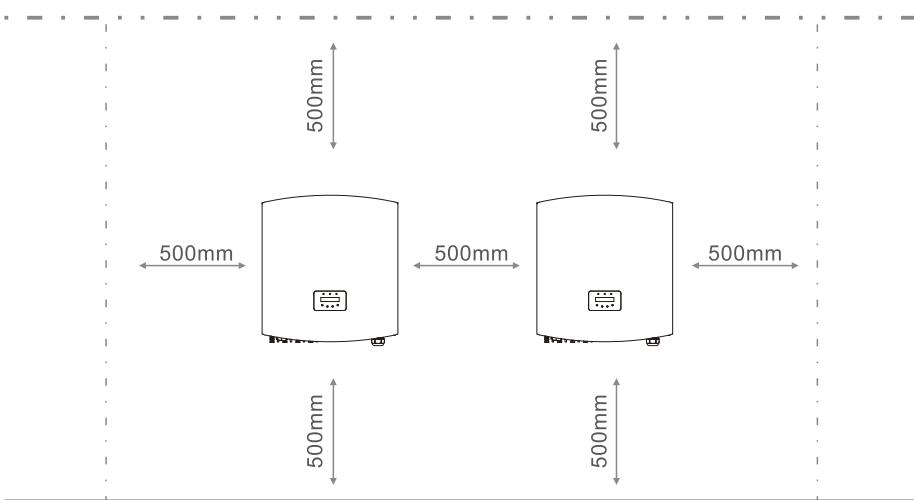
- The temperature of the inverter heat sink can reach 75C.
- The inverter is designed to work in a temperature range of -25 – 60C ambient.
- If multiple inverters are installed on site, a minimum clearance of 500mm should be kept between each inverter and any other mounted equipment. The bottom of the inverter must be at least 500mm from the ground or floor. See figure 5.2.
- The LED status indicator lights and the LCD on the front panel should not be blocked.
- Adequate ventilation must be present if the inverter is installed in a confined space.
- Inverter is rated IP65. Choose the installation location accordingly.



▲ Figure 5.1 Recommended installation position

5. Installation

- A sun shade is recommended to minimise direct sun exposure where ambient temperature may exceed 40°C.
- Install on a vertical surface or structure capable of bearing the weight.
- Must install vertically within +/- 5. If the inverter is tilted from the vertical plane heat dissipation can be inhibited. This may reduce system performance or reduce service life of the inverter.



▲ Figure 5.2 Inverter mounting clearance

- A minimum of 500mm clearance is required top, bottom, left and right of the inverter (isolator enclosures excepted) for air flow and cooling.
- Visibility of the LED status indicator lights and LCD display screen should be considered.



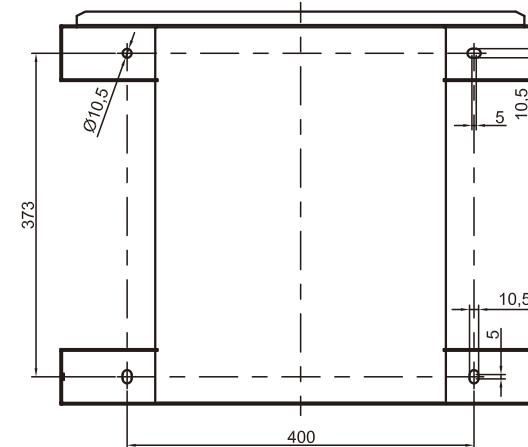
NOTE:

The inverter must be installed out of reach of children.

5. Installation

5.2 Mounting the Inverter

The inverter can be mounted to the wall or metal strut of module. The mounting holes should be consistent with the size of the bracket or the dimensions shows below.



▲ Figure 5.3 The dimensions of the mounting bracket (in mm)

The inverter should be mounted in a vertical position. The steps of mounting are as follows:

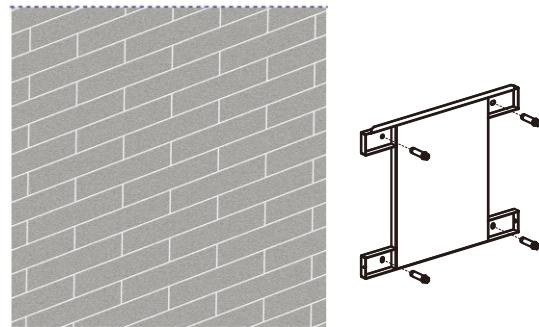
1. According to the figure 5.2, select the mounting height of the bracket and mark the mounting holes. For brick walls, the position of the holes should be suitable for the expansion bolts.
2. MAKE SURE the bracket is horizontal and the mounting holes A, B, and C (in Figure 5.3) are in the correct points. Drilling the holes on the wall according the marks.
3. Using the expansion bolts to fix the bracket to the wall (as shown as Figure 5.4).



WARNING:

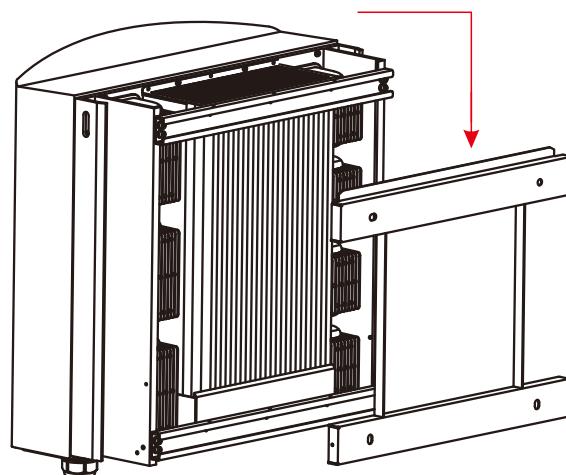
The inverter must be mounted vertically on a vertical wall. Use suitable expansion screws or bolts to attach the bracket to the wall or rack as shown in figure 5.4.

5. Installation



▲ Figure 5.4 Fix the bracket to the wall

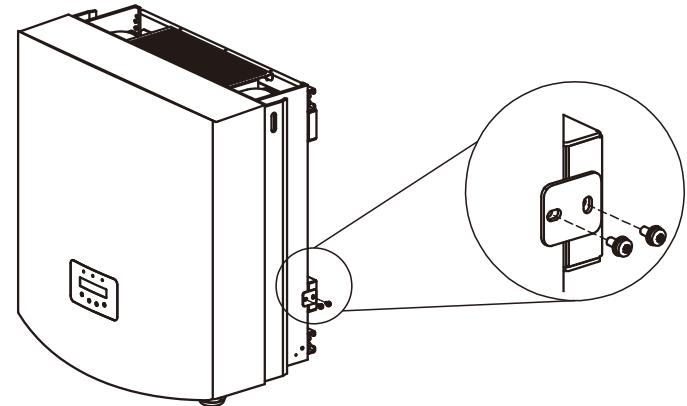
4. Lift up the inverter, and make the slot on the back bracket of inverter align to the lip on the mounting bracket. Then lower the inverter onto the bracket slowly until it is stable (in figure 5.5).



▲ Figure 5.5 Attach the inverter to the bracket

5. Installation

Use screws in the packaging to fix the inverter to the mount bracket(in Figure 5.6).



▲ Figure 5.6 Fix the inverter

5.3 Electrical Connections

The Inverter is designed with quick-connect terminal port for electrical connection without removing the cover. The meanings of the symbols at the bottom of the inverter (see figure 1.2) are listed in Table 5.1. All electrical installations must be in accordance with all local and national standards.

| | |
|-----------|--|
| + | Positive DC input terminal |
| - | Negative DC input terminal |
| DC 1- DC4 | DC input terminal |
| DC SWITCH | Switch of DC input terminals (optional) |
| COM1 | Communication port for Wi-Fi or GPRS stick |
| COM2、COM3 | Rj45 and terminal block for RS485 communication port |
| GRID | Connecting terminal of the Grid |

▲ Table 5.1 Electrical connection symbols

The electrical connection of the inverter must follow the steps listed below:

1. Switch the Grid Supply Main Switch (AC) OFF. Switch the DC Switch OFF.
2. Connect the inverter to PV array.
3. Connect the inverter to the grid.

5. Installation

5.3.1 Protective ground wire connection(PE)

Solis recommends 2 ground protection methods: Through grid terminal connection and external heat sink connection.

If AC terminal is used to connect ground, please refer to the contents of 5.3.3.

If the heat sink is used to connect the ground, please follow the steps below:

- 1) Prepare the grounding cable: recommend to use the 16~35mm² outdoor copper-core cable.
- 2) Prepare OT terminals: M6.

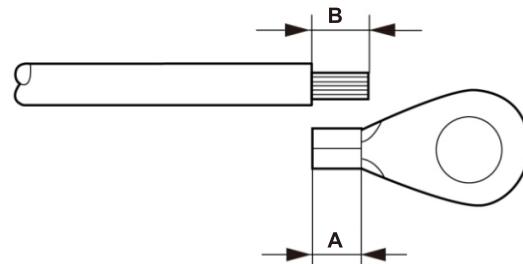
Important:

 For multiple inverters in parallel, all inverters should be connected to the same ground point to eliminate the possibility of a voltage potential existing between inverter grounds.

Warning:

 No matter what kind of grounding connection is adopted, it is strictly forbidden to connect the ground of the inverter with the lightning protection of the building, otherwise Solis will not be responsible for any damage caused by lightning.

- 3) Strip the grounding cable insulation to the suitable length as shown as Figure 5.7.

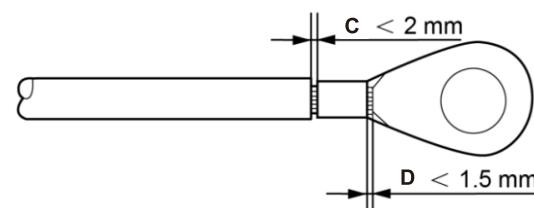


▲ Figure5.7 suitable length

Important:

 B (insulation stripping length) is 2mm~3mm longer than A (OT cable terminal crimping area) 2mm~3mm.

- 4) Insert the stripped wire into the OT terminal crimping area, and use the hydraulic clamp to crimp the terminal to the wire (as shown as Figure 5.8).

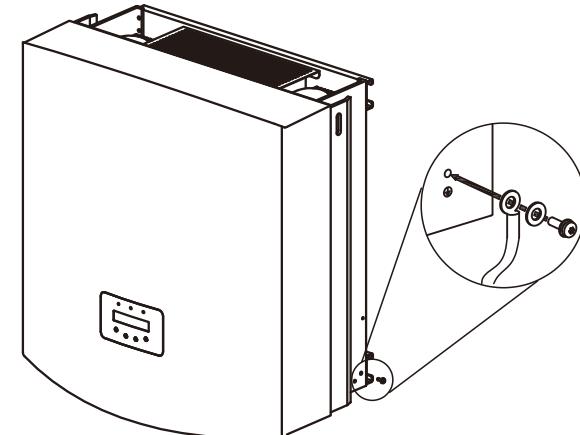


▲ Figure5.8 strip wire

Important:

 After crimping the terminal to the wire, inspect the connection to ensure the terminal is solidly crimped to the wire.

- 5) Remove the screw from the heat sink ground point.
- 6) Use the screw of the ground point to attach the grounding cable. Tighten the screw securely. Torque is 3Nm (as shown as in Figure 5.9).



▲ Figure5.9 fix the cable

Important:

 In order to improve the corrosion resistance of the grounding terminal, we recommend that the External grounding terminal should be coated with silica gel or paint for protection after the installation of the grounding cable.

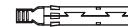
5. Installation

5. Installation

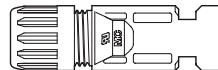
5. Installation

5.3.2 DC side connection

- A) Please make sure the polarity of the output voltage of PV array matches the "DC+" and "DC-" symbols.
- B) Connect the "DC+" and "DC-" to the input terminals; see Figure 5.10 and Figure 5.11.



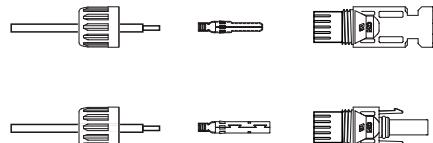
▲ Figure 5.10 DC+ Connector (MC4)



▲ Figure 5.11 DC- Connector (MC4)

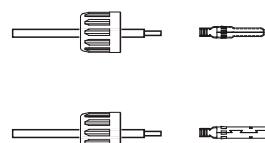
The steps of assembling the DC connectors are listed as follows:

- I) Strip the DC wire about 7mm, Disassemble the connector cap nut .
(see Figure 5.12)



▲ Figure 5.12 Disassemble the Connector Cap nut

- ii) Insert the wire into the connector cap nut and contact pin as shown in Figure 4.12.



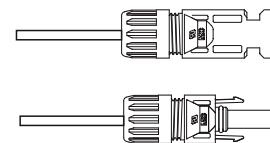
▲ Figure 5.13 Insert the Wire into the Connector Cap nut and contact pin

- iii) Crimp the contact pin to the wire using a proper wire crimp tool as shown in Figure 5.14.



▲ Figure 5.14 Crimp the contact pin to the wire

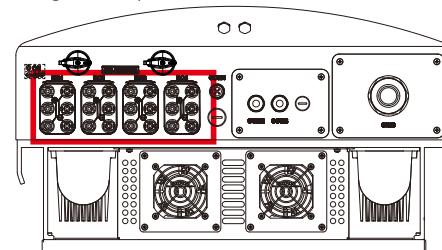
- iv) Insert the contact pin to the connector housing until it locks in place. Screw up the cap nut to the connector housing. Torque to 2.5-3Nm (as shown in Figure 5.15).



▲ Figure 5.15 Connector with Cap nut Screwed on

| Cable type | Traverse area (mm ²) | | Outside diameter of cable (mm) |
|---|----------------------------------|-------------------|--------------------------------|
| | Range | Recommended value | |
| Industry generic PV cable (model:PV1-F) | 4.0~6.0 (12~10AWG) | 4.0 (12AWG) | 5.5~9.0 |

- v) Connect the finished DC cables to the inverter. A small click will confirm connection as shown by the red area in Figure 5.16).



▲ Figure 5.16 Connect the DC Connectors to the Inverter

5. Installation

5.3.3 AC side connection

For all AC connections, 16~35mm² 105 °C cable is accept to be used.

Please make sure the resistance of cable is lower than 1.5 ohm. If the wire is longer than 20m, it's recommended to use 25-35mm cable. Refer to local electrical codes for wire sizing.

NOTE:



Solis three phase inverters integrate neutral connection point. However, with or without neutral connected won't affect the normal operation of inverter itself. Please refer to the local grid requirement for if need neutral cable connected. The ground wire can be connected to the grounding hole on the right side of the inverter heat sink.

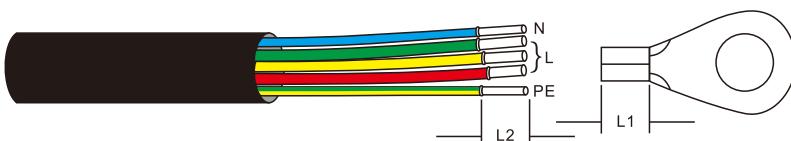
| Cable specification | | Copper-cored cable | Copper clad aluminum / Aluminum Alloy cable |
|--|-------------|--------------------|---|
| Traverse cross sectional area (mm ²) | Range | 16~35 | 25~35 |
| | Recommended | 25 | 35 |
| Cable outer diameter (mm) | Range | 22~32 | |
| | Recommended | 27 | |

NOTE:

Prepare M6 OT terminals.

The steps to assemble the AC grid terminals are listed as follows:

A) Strip the end of AC cable insulating jacket about 90mm then strip the end of each wire . (as shown in figure 5.17)



▲ Figure 5.17 Strip AC cable

NOTE:



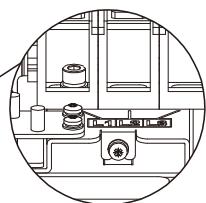
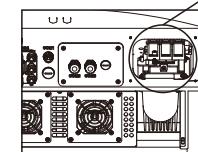
L2 (insulation stripping length) is 2mm-3mm longer than L1 (OT cable terminal crimping area)

5. Installation

B) Strip the insulation of the wire core, insert into the cable crimping area of the OT terminal, then use a hydraulic crimp tool to crimp it firmly. The wire must be covered with heat shrinkable tube or insulating tape . When using the heat shrinkable tube sleeve the heat shrinkable tube over the wire before crimping the OT terminal.

C) Remove the 4 screws on the AC terminal cover and remove the cover (in figure 5.18).

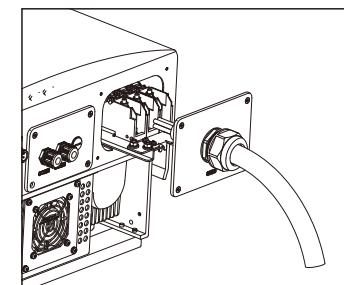
Remove the screw under terminal slide and pull out the terminal (in figure 5.19).



▲ Figure 5.18 Cover

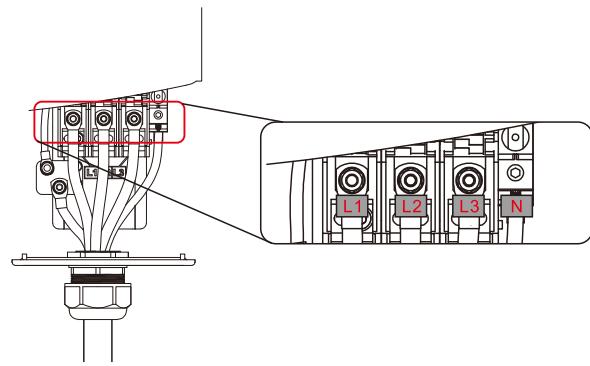
▲ Figure 5.19 Disassemble AC terminal cover

D) Insert the cable through cap nut, water proof bushing and AC terminal cover into the AC terminal and use a socket wrench to tight the screws. The torque is 4-6Nm (as shown in figure 5.20).



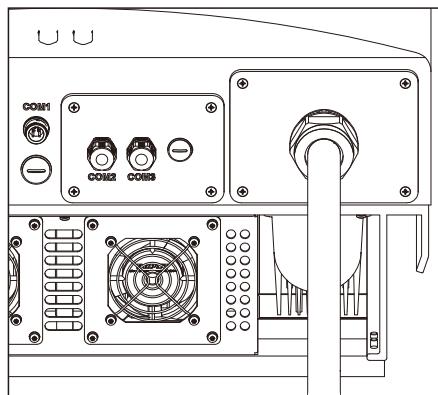
▲ Figure 5.20a Connect cable to AC terminal

5. Installation



▲ Figure 5.20b Connect cable to AC terminal

E) Push the AC terminals along the rail to the inside of the inverter then tighten the screw under rack. Tighten the 4 screws of AC terminal cover and tighten the AC entry cap nut (as shown in figure 5.21).



▲ Figure 5.21 Tighten the AC terminal

NOTE:

After connecting, please check the correctness and firmness of the connection.

After confirmation, use a suitable material to seal all cable connections.



5. Installation

5.3.4 Max. over current protection device (OCPD)

To protect the inverter's AC grid connection conductors, Solis recommends installing breakers that will protect against overcurrent. The following table defines OCPD ratings for the Solis 25-60kW Three phase inverters.

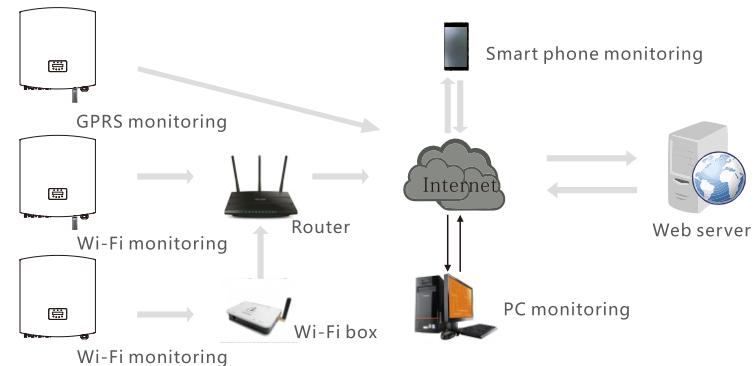
| Inverter | Rated voltage(V) | Rated output current (A) | Current for protection device (A) |
|--------------|------------------|--------------------------|-----------------------------------|
| Solis-25K-LV | 220 | 65.6 | 80 |
| Solis-30K-LV | 220 | 78.8 | 100 |
| Solis-50K-HV | 480 | 60.2 | 80 |
| Solis-60K-HV | 480 | 72.2 | 100 |

▲ Table 5.2 Rating of grid OCPD

5.3.5 Inverter monitoring connection

There are 3 communication terminals for Solis 25-60kW inverter. COM1-COM3 are all for RS485 communication. COM1 is a 4-pin connector which matches with the Wi-Fi or GPRS wireless communication products. COM2 and COM3 are RJ-45 and terminal block for RS485 connection between inverter and datalogger.

Figure 5.22 is the internet monitoring solution. Please refer to related instructions of communication products.

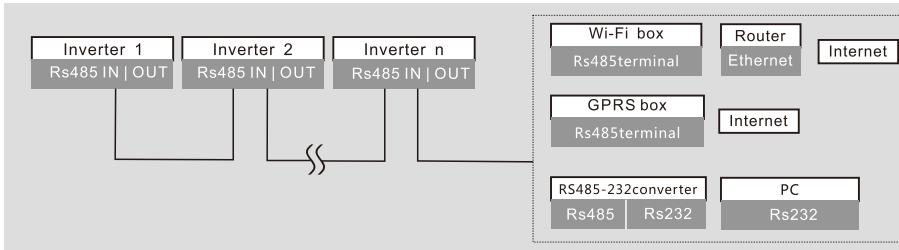


▲ Figure 5.22 monitoring solution

5. Installation

Monitoring system for multiple inverters

Multiple inverters can be monitored by RS-485 daisy chain configuration. (See figure 5.23).



▲ Figure 5.23 Multiple inverter monitoring system

5.3.5.1 RS485 Communication connection

RS-485 connection through terminal block.

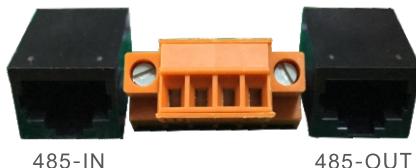
RS-485 communication supports two connections on the terminal board.(See figure 5.23).

The cross sectional area of the cable wire for terminal board connection should be 0.2-1.5mm².

The outer diameter of the cable may be 5mm-10mm.

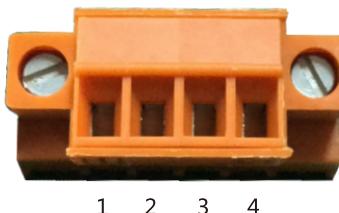
RJ45 port connection (See figure 5.29).

CAT 5E outdoor rated (cable outer diameter<9mm, internal resistance≤1.5Ω/10m) and shielded RJ45 connectors are recommended.



▲ Figure 5.24 RJ45 port and Terminal board

Steps for connecting the RS-485 cable.



▲ Figure 5.25

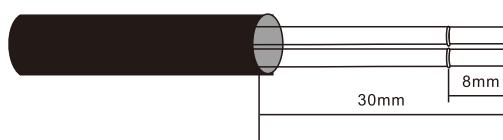
| NO. | Port definition | Description |
|-----|-----------------|------------------------------------|
| 1 | RS485A1 IN | RS485A1,RS485 differential signal+ |
| 2 | RS485B1 IN | RS485B1,RS485 differential signal- |
| 3 | RS485A2 OUT | RS485A2,RS485 differential signal+ |
| 4 | RS485B2 OUT | RS485B2,RS485 differential signal- |

▲ Table 5.3 Port definition

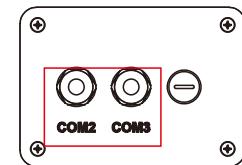
Connection of Terminal board.

a. Strip the insulation and shield to a suitable length. Use diagram below as a guide. (in Figure 5.26).

b. Remove the cap nut from the waterproof cable glands labeled COM2 and COM3 at the bottom of the inverter. Remove the plug from the fitting. (in Figure 5.27).



▲ Figure 5.26

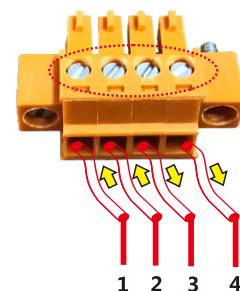


▲ Figure 5.27

c. Pass the cable through the cap nut for each port. COM2(RS485 IN) COM3(RS485 OUT).

d. Pull down the terminal block on user interface board(See Figure 5.25).

e. Firstly insert cable into terminal board, then tighten the screws (dotted area) clockwise with slotted screwdriver; if user need to pull out cable, screws rotates anticlockwise with slotted screwdriver(See Figure 5.28).



- 1 RS485A IN (RS485+)
- 2 RS485A OUT (RS485-)
- 3 RS485B IN (RS485+)
- 4 RS485B OUT (RS485-)

▲ Figure 5.28 Strip the insulation and connect to RS485

f. Please insert terminal board into terminal block,then will be clamped automatically.

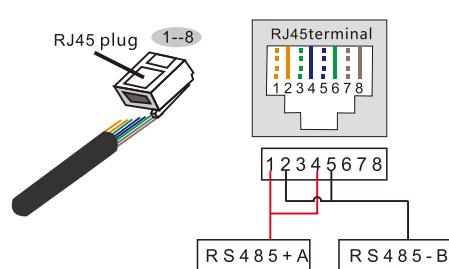
5. Installation

Steps for using RJ45 connections for RS485 Communications.

a. Use the network wire stripper to strip the insulation layer off the communication cable.

Using the standard wire sequence referenced in TIA/EIA 568B, separate the wires in the cable.

Use a network cable tool to trim the wire. Flatten the wire in the order shown in figure 5.29.



▲ Figure 5.29 Strip the insulation layer and connect to RJ45 plug

b. Insert the wire into the RJ45 connector then crimp the connector with the crimping tool.

c. Unscrew the cap nut from the COM2/3 cable glands and remove the plugs.

d. Insert the RJ45 connector into the RJ45 port in the inverter maintenance chamber.

e. Replace the cap nuts for COM2/3 and tighten firmly.



NOTE:

After connecting, check the correctness and firmness of the connection.

After confirmation, seal the connector and cable with a suitable sealant.

6. Start & Stop

6.1 Start the Inverter

To start up the Inverter, it is important that the following steps are strictly followed:

1. Switch the grid supply main Switch (AC) ON first.
2. Switch the DC switch ON. If the voltage of PV arrays are higher than start up voltage, the inverter will turn on. The red LED power will light.
3. When both the DC and the AC sides supply to the inverter, it will be ready to generate power. Initially, the inverter will check both its internal parameters and the parameters of the AC grid, to ensure that they are within the acceptable limits. At the same time, the green LED will flash and the LCD displays INITIALIZING.
4. After 30-180 seconds (depending on local requirement), the inverter will start to generate power. The green LED will be on continually and the LCD displays GENERATING.

WARNING:

 Do not touch the surface when the inverter is operating. It may be hot and cause burns.

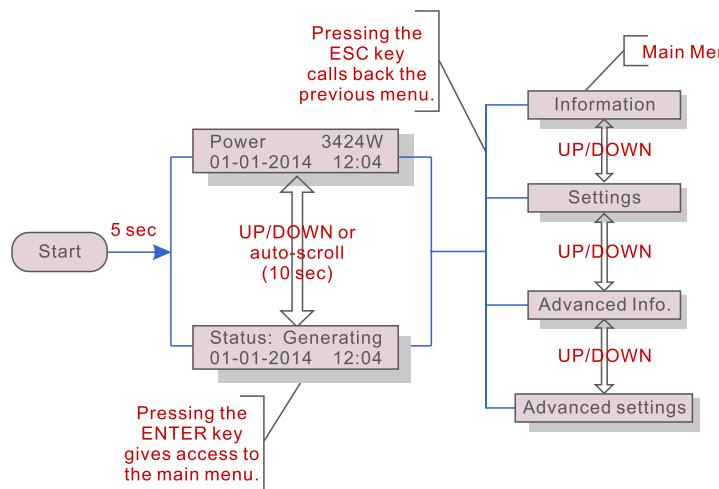
6.2 Stop the Inverter

To stop the Inverter, the following steps must be strictly followed:

1. Switch the Supply Main Switch (AC) OFF.
2. Wait 30 seconds. Switch the DC Switch OFF.
After approximately one minute, all LEDs will turn off.
3. If removing the inverter, disconnect the input and output cables after 5 minutes.

7. Operation

During normal operation, the display alternately shows the power and the operation status with each screen lasting for 10 seconds (see Figure 7.1). Screens can also be scrolled manually by pressing the UP and DOWN keys. Press the ENTER key to access to the Main Menu.



▲ Figure 7.1 Operation Overview

7.1 Main Menu

There are four submenus in the Main Menu (see Figure 7.1):

1. Information.
2. Settings.
3. Advanced Info.
4. Advanced Settings.

7.2 Information

The inverter main menu provides access to operational data and access to operational information. The information is displayed by selecting "Information" from the menu and then by scrolling up or down.

| Display | Duration | Description |
|--|----------|--|
| V_DC1 350.8V I_DC1 5.1A | 10 sec | V_DC1: Shows input 01 voltage value. I_DC1: Shows input 01 current value. |
| V_DC4 350.8V I_DC4 5.1A | 10 sec | V_DC4: Shows input 02 voltage value. I_DC4: Shows input 02 current value. |
| V_A 230.4V I_A 8.1A | 10 sec | V_A: Shows the grid's voltage value. I_A: Shows the grid's current value. |
| V_C 230.4V I_C 8.1A | 10 sec | V_C: Shows the grid's voltage value. I_C: Shows the grid's current value. |
| Status: Generating Power: 1488W | 10 sec | Status: Shows instant status of the Inverter. Power: Shows instant output power value. |
| Grid Frequency F_Grid 50.06Hz | 10 sec | F_Grid: Shows the grid's frequency value. |
| Total Energy 0258458 kwh | 10 sec | Total generated energy value. |
| This Month: 0123kwh Last Month: 0123kwh | 10 sec | This Month: Total energy generated this month. Last Month: Total energy generated last month. |
| Today: 15.1kwh Yesterday: 13.5kwh | 10 sec | Today: Total energy generated today. Yesterday: Total energy generated yesterday. |
| Inverter SN 0000000000000000 | 10 sec | Display series number of the inverter. |
| Work Mode: NULL DRM Number: 08 | 10 sec | Work Mode: The work mode of inverter. DRM Number: Show the number 01-08. |

▲ Table 7.1 Information list

7. Operation

7.2.1 Lock screen

Pressing the ESC key returns to the Main Menu. Pressing the ENTER key locks (Figure 7.2(a)) or unlocks (Figure 7.2 (b)) the screen.



▲ Figure 7.2 Locks and Unlocks the Screen of LCD

7.3 Settings

The following submenus are displayed when the Settings menu is selected:

1. Set Time.
2. Set Address.

7.3.1 Set Time

This function allows time and date setting. When this function is selected, the LCD will display a screen as shown in Figure 7.3.



▲ Figure 7.3 Set Time

Press the UP/DOWN keys to set time and data. Press the ENTER key to move from one digit to the next (from left to right). Press the ESC key to save the settings and return to the previous menu.

7.3.2 Set Address

This function is used to set the address when multiple inverters are connected to single datalogger.

The address number can be assigned from "01" to "99" (see Figure 7.4). The default address number of Solis Three Phase Inverter is "01".



▲ Figure 7.4 Set Address

Press the UP/DOWN keys to set the address. Press the ENTER key to save the settings. Press the ESC key to cancel the change and return to the previous menu.

7. Operation

7.4 Advanced Info - Technicians Only



NOTE:

Access to this menu is for fully qualified and accredited technicians only. Entrance to "Advanced Info" and "Advanced Settings" requires a password.

Select "Advanced Info." from the Main Menu. The screen will require the password as below.

YES=<ENT> NO=<ESC>
Password:0000

▲ Figure 7.5 Enter password

The default password is "0010". Please press "down" to move the cursor, press "up" to change the digit.

After entering the correct password a menu will be displayed allowing access to the following information:

1. Alarm Message
2. Running message
3. Version
4. Daily Energy
5. Monthly Energy
6. Yearly Energy
7. Daily Record
8. DSP Communication Data
9. Warning Message

The screen can be scrolled manually by pressing the UP/DOWN keys. Pressing the ENTER key gives access to a submenu. Press the ESC key to return to the Main Menu.

7.4.1 Alarm Message

The display shows the 100 latest alarm messages (see Figure 7.6). Screens can be scrolled manually by pressing the UP/ DOWN keys. Press the ESC key to return to the previous menu.

Alarm001: OV-G-V
Time: 27-11 Data: 7171

▲ Figure 7.6 Alarm Message

7. Operation

7.4.2 Running Message

This function is for maintenance personnel to get running message such as internal temperature, Standard NO. etc.

Screens can be scrolled manually by pressing the UP/DOWN keys.

7.4.3 Version

The screen shows the model version and the software version of the Inverter (see Figure 7.7).

Model: 08
Software Version: D20001

▲ Figure 7.7 Model Version and Software Version

7.4.4 Daily Energy

The function is for checking the energy generation for selected day.

YES=<ENT> NO=<ESC>
Select: 2015-02-23

▲ Figure 7.8 Select date for daily energy

Press DOWN key to move the cursor to day, month and year, press UP key to change the digit.
Press Enter after the date is fixed.

2015-02-22: 051.3kWh
2015-02-23: 061.5kWh

▲ Figure 7.9 Daily energy

Press UP/DOWN key to move one date from another.

7.4.5 Monthly Energy and Yearly Energy

The two functions are for checking the energy generation for selected month and Year.

YES=<ENT> NO=<ESC>
Select: 2015-02

YES=<ENT> NO=<ESC>
Select: 2015

▲ Figure 7.10 Select month for monthly energy ▲ Figure 7.11 Select year for yearly energy

Press DOWN key to move the cursor, press UP key to change the digit.

Press Enter after the month/year is fixed.

7. Operation

2015-02: 0510kWh
2015-01: 0610kWh

2015: 0017513kWh
2014: 0165879kWh

▲ Figure 7.12 Month energy

Press UP/DOWN key to move one date from another.

▲ Figure 7.13 Yearly energy

7.4.6 Daily Record

The screen shows history of changing settings. Only for maintenance personnel.

7.4.7 Communication Data

The screen shows the internal data of the Inverter (see Figure 7.14), which is for service technicians only.

01-05: 01 25 E4 9D AA
06-10: C2 B5 E4 9D 55

▲ Figure 7.14 Communication Data

7.4.8 Warn Message

The screen shows the internal data of the Inverter (see Figure 7.15), which is for service technicians only.

Message00:
T: 27-11 D: 7171

▲ Figure 7.15 Warning message

7. Operation

7.5 Advanced Settings - Technicians Only

**NOTE:**

Access to this area is for fully qualified and accredited technicians only.
Please follow 7.4 to enter password to access this menu.

Select Advanced Settings from the Main Menu to access the following options:

1. Select Standard
2. Grid ON/OFF
3. Clear Energy
4. New Password
5. Power Control
6. Calibrate Energy
7. Special Settings
8. STD. Mode Settings
9. Restore Settings
10. HMI Updater
11. Reset HMI
12. Debug Parameter
13. Fan Test
14. Power Parameter

7.5.1 Selecting Standard

This function is used to select the grid's reference standard (see Figure 7.16).

YES=<ENT> NO=<ESC>
Standard:AUS-Q-0.8

▲ Figure 7.16

Selecting the "User-Def" menu will access to the following submenu (see Figure 7.17).

– OV-G-V1: 260V
OV-G-V1-T: 1S

▲ Figure 7.17



These two functions are applicable by maintenance personnel only, wrong operation will prevent the inverter from working properly.

**NOTE:**

The "User-Def" function can be only used by the service engineer and must be allowed by the local energy supplier.

Below is the setting range for "User-Def". Using this function, the limits can be changed manually.

| | |
|---|---------------------|
| OV-G-V1: 305---332V for 480V(140---152V for 220V) | OV-G-F1: 60.2-63Hz |
| OV-G-V1-T: 0.1---9s | OV-G-F1-T: 0.1---9s |
| OV-G-V2: 305---360V for 480V(140---165V for 220V) | OV-G-F2: 61-63Hz |
| OV-G-V2-T: 0.1---1s | OV-G-F2-T: 0.1---9s |
| UN-G-V1: 167---243V for 480V(77---111V for 220V) | UN-G-F1: 57-59.5Hz |
| UN-G-V1-T: 0.1---9s | UN-G-F1-T: 0.1---9s |
| UN-G-V2: 125---243V for 480V(58---111V for 220V) | UN-G-F2: 57-59Hz |
| UN-G-V2-T: 0.1---1s | UN-G-F2-T: 0.1---9s |

Press the UP/DOWN keys to scroll through items. Press the ENTER key to edit the highlighted item. Press the UP/DOWN keys again to change the setting. Press the ENTER key to save the setting. Press the ESC key to cancel changes and returns to the previous menu.

7.5.2 Grid ON/OFF

This function is used to start up or stop the power generation of the inverter. (see Figure 7.18).

– Grid ON
Grid OFF

▲ Figure 7.18 Set Grid ON/OFF

Screens can be scrolled manually by pressing the UP/DOWN keys. Press the ENTER key to save the setting. Press the ESC key to return to the previous menu.

7.5.3 Clear Energy

Clear Energy resets the energy yield history of the inverter.

7. Operation

7. Operation

7.5.4 New Password

This function is used to set a new password for menus "Advanced info." and "Advanced information" (see Figure 7.19).

```
YES=<ENT> NO=<ESC>
Password: 0000
```

▲ Figure 7.19 Set new password

Enter the current password before setting a new password. Press the DOWN key to move the cursor, Press the UP key to change the digit. Press the ENTER key to execute the setting. Press the ESC key to return to the previous menu.

7.5.5 Power Control

Active and reactive power can be set through this menu.

There are 5 item for this sub menu:

1. Set output power
2. Set Reactive Power
3. Out_P With Restore
4. Rea_P With Restore
5. Select PF Curve



This function is applicable for maintenance personnel only, wrong settings will prevent the inverter from reaching maximum power.

7.5.6 Calibrate Energy

Maintenance or replacement could clear or cause a different value for total energy. Use this function to allow user to revise the value of total energy to the same value as before. If the monitoring website is used the data will be synchronous with this setting automatically. (see Figure 7.20).

```
YES=<ENT> NO=<ESC>
Energy:0000000kWh
```

▲ Figure 7.20 Calibrate energy

Press the DOWN key to move the cursor, Press the UP key to revise the value. Press the ENTER key to execute the setting. Press the ESC key to return to the previous menu.

7.5.7 Special settings



This function is applicable by maintenance personnel only.

Special settings have the submenu shown below:

1. Grid Filter Set
2. Relay_Protect Set
3. ILeak_Protect Set
4. GROUND_Protect Set
5. GRID INTF.02 Set
6. MPPT Parallel Mode
7. Cnst. Voltage Mode
8. L/FRT Set
9. IgZero_COMP. Set
10. PI Set
11. IgADCheckPRO Set
12. NoSmallPulse Set

7.5.8 STD. Mode Settings



This function is applicable by maintenance personnel only.

STD. Mode Settings have the submenu shown below:

1. Working Mode Set
2. Power Rate Limit
3. Freq Derate Set
4. 10mins Voltage Set
5. Initial Settings

7. Operation

7.5.9 Restore Settings



This function is applicable to maintenance personnel only.

Restore Settings resets the inverter to factory defaults. Selecting will show the screen below:

Are you sure?
YES=<ENT> NO=<ESC>

▲ Figure 7.21

Press the ENTER key to save the setting. Press the ESC key to return to the previous menu.

7.5.10 HMI Updater



This function is applicable by maintenance personnel only.

HMI Updater have the submenu shown below:

HMI Current Ver.: 02
YES=<ENT> NO=<ESC>

▲ Figure 7.22

Press the ENTER key to save the setting.

Press the ESC key to return to the previous menu.

7.5.11 Reset HMI

This function is using to reset HMI.

7.5.12 Debug Parameter



This function is applicable to maintenance personnel only.

Debug Parameter as shown as below:

– U16DAT1: +0000
U16DAT2: +0000
U16DAT3: +0000
U16DAT4: +0000
U16DAT5: +0000
U16DAT6: +0000
U16DAT7: +0000
U16DAT8: +0000

▲ Figure 7.23

Press the UP/DOWN keys to scroll through items. Press the ENTER key to set, Press the DOWN key to scroll and press the UP key to change the value. Then press the ENTER key to save the setting. Press the ESC key to cancel changes and returns to the previous menu.

7.5.13 Fan Test



This function is applicable to maintenance personnel only.

Fan Test have the submenu shown below:

Are you sure?
YES=<ENT> NO=<ESC>

▲ Figure 7.24

Press the ENTER key to save the setting.

Press the ESC key to return to the previous menu.

7. Operation

7.5.14 Power Parameter

This function is used for calibrate inverter output energy. It will not impact the energy count for inverter with RGM.

The screen shows:

YES=<ENT> NO=<ESC>
Power para:1. 000

▲ Figure 7.25 Power Rate Limit

Press the Down key to move the cursor.

Press the Up key to change the digit.

Please press the Enter to save the setting and press the ESC key to return to the previous menu.



This setting is used for grid operator, don't change setting under this manual.

8. Maintenance

The fan and filter should be regularly cleaned so as to improve the heat dissipation efficiency. Clean with a soft brush.

The other parts of Solis Inverter does not require any regular maintenance.

However, cleaning the dust on heat-sink will help the inverter to dissipate the heat and increase its life time. The dust can be removed with a soft brush.



CAUTION:

Do not touch the inverter's surface when it is operating. Some parts of the inverter may be hot and cause burns. Turn off the inverter (refer to Section 5.2) and wait for a cool-down period before any maintenance or cleaning operation.

The LCD and the LED status indicator lights can be cleaned with a damp cloth if they are too dirty to be read.



NOTE:

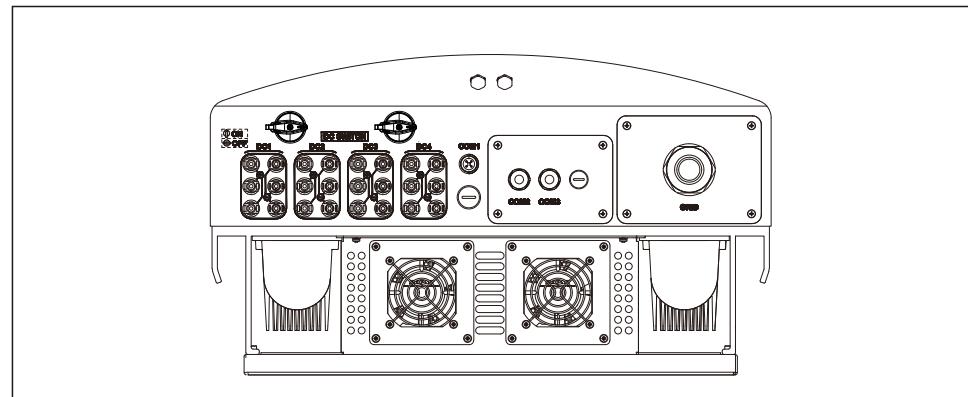
Never use any solvents, abrasives or corrosive materials to clean the inverter.

8.1 Fan Maintenance

If the fan does not work properly, the inverter will not be cooled effectively. and it may affect the effective operation of the inverter .

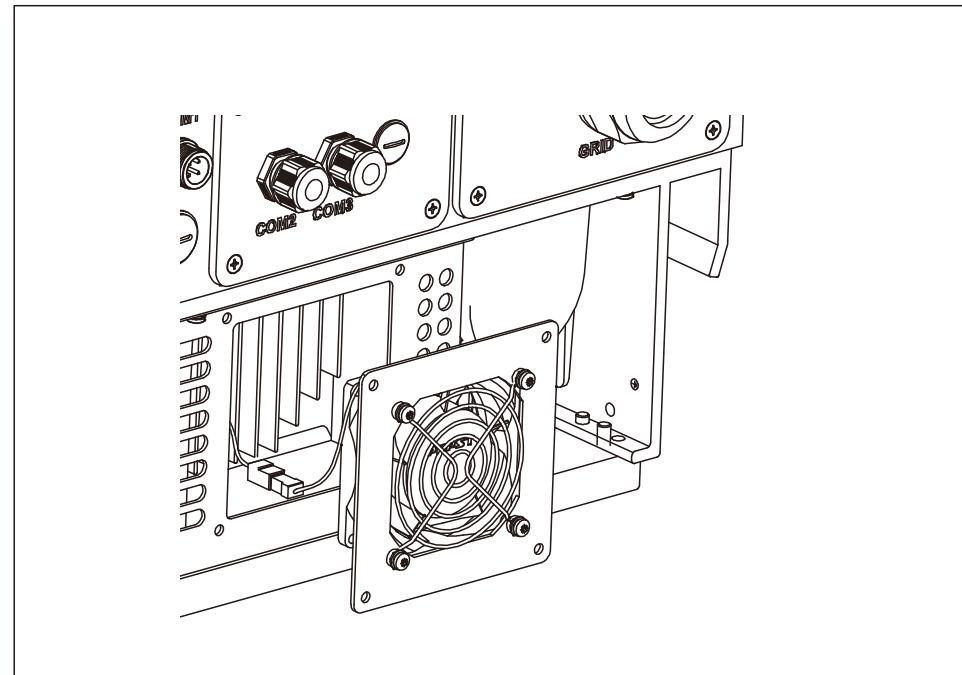
Therefore, it is necessary to clean or replace a broken fan as follows:

1. Disconnect the AC power.
2. Turn the DC switch to "OFF" position.
3. Wait for 10 minutes at least.

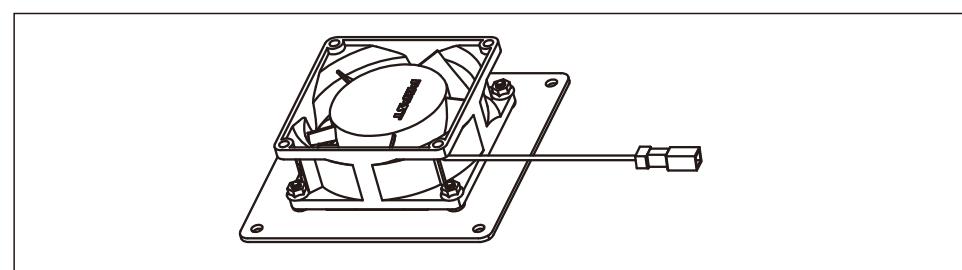


8. Maintenance

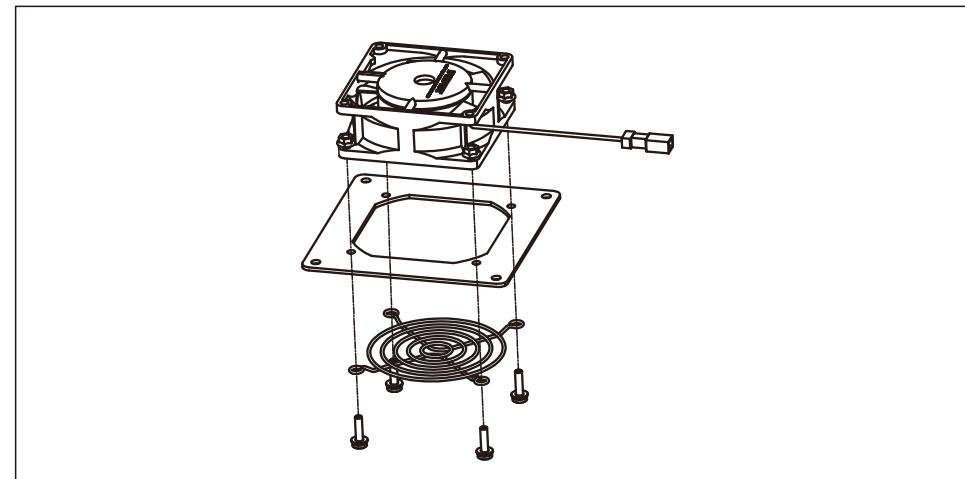
4. Remove the 4 screws on the fan plate and pull out the fan assembly slowly.



5. Disconnect the fan connector carefully and take out the fan.



6. Clean or replace the fan. Assemble the fan on the rack.



7. Connect the electrical wire and reinstall the fan assembly. Restart the inverter.

9. Troubleshooting

The inverter is designed in accordance with the relevant international grid-tie standards along with and safety and electromagnetic compatibility requirements. Before delivering to the customer, the inverter has been subjected to several tests to ensure its optimal operation and reliability.

In case of failure, the LCD screen will display an alarm message. In this case, the inverter may stop feeding into the grid. The failure descriptions and their corresponding alarm messages are listed in Table 9.1:

9. Troubleshooting

| Alarms | Cause | Solution |
|--|--|---|
| No Information (Blank Screen) | <ul style="list-style-type: none"> • Input voltage low/missing • Polarity reversed • Main board damaged | <p>Test – DC switch OFF</p> <ul style="list-style-type: none"> • Check PV connections • Check polarity • Check voltage >120V Single, >350V three <p>Test – DC Switch ON</p> <ul style="list-style-type: none"> • Check voltage >120V Single, >350V three • If DC voltage is "0" replace inverter |
| Initializing (Inverter stuck in this mode) | <ul style="list-style-type: none"> • Inverter is waiting for driving signal | <p>Test – DC switch OFF</p> <ul style="list-style-type: none"> • Check PV connections • Check polarity • Check voltage >120V Single, >350V three <p>Test – DC Switch ON</p> <ul style="list-style-type: none"> • Check voltage >120V Single, >350V three • A cable may have been damaged or loosened in shipping replace inverter |
| OV-G-V: Over Grid Voltage | <ul style="list-style-type: none"> • Inverter detects grid voltage as too high | <p>Test – DC switch OFF</p> <ul style="list-style-type: none"> • Check AC at the inverter • If AC measures high, adjust upper limit with permission from utility <p>Test – DC Switch ON, full power</p> <ul style="list-style-type: none"> • Check AC at inverter test points • Compare with LCD • If AC measures high, cables between inverter and interconnect are too small • Check ampacity and voltage drop calculations |
| UN-G-V: Under Grid Voltage | <ul style="list-style-type: none"> • Inverter detects grid voltage as too low | <p>Test – DC switch OFF</p> <ul style="list-style-type: none"> • Check AC at the inverter test points • If AC measures low, adjust lower limit with permission from utility <p>Test – DC Switch ON</p> <ul style="list-style-type: none"> • Check grid standard • Replace inverter |

| Alarms | Cause | Solution |
|------------------------------------|---|---|
| OV-G-F: Over Grid Frequency | <ul style="list-style-type: none"> • Inverter detects grid Frequency as too high | <p>Test – DC switch OFF</p> <ul style="list-style-type: none"> • Check frequency at the inverter test points • If Frequency measures high, adjust upper limit with permission from utility <p>Test – DC Switch ON</p> <ul style="list-style-type: none"> • Check grid standard • Replace inverter |
| NO-GRID | <ul style="list-style-type: none"> • Inverter does not detect the grid | <p>Test – DC switch OFF</p> <ul style="list-style-type: none"> • Check AC at the inverter test points • L-L, L-GND • Do NOT tell me 240VAC <p>Test – DC Switch ON</p> <ul style="list-style-type: none"> • Check grid standard • Replace inverter |
| OV-DC: DC voltage is too high | <ul style="list-style-type: none"> • Inverter detects High DCV | <p>Test – DC switch OFF</p> <ul style="list-style-type: none"> • Check DC at the inverter test points • If DCV is high, too many panels in the string <p>Test – DC Switch ON</p> <ul style="list-style-type: none"> • Check LCD reading, may be a bad measurement circuit • Replace inverter |
| OV-BUS: DC BUS voltage is too high | <ul style="list-style-type: none"> • Inverter detects High DCV on internal bus | <p>Test</p> <ul style="list-style-type: none"> • Measure DC and AC voltages • Compare with LCD • Replace Inverter • Internal damage • Wire came loose during shipping |
| UN-BUS: DC BUS voltage is too low | <ul style="list-style-type: none"> • Inverter detects low DCV on internal bus | <p>Test</p> <ul style="list-style-type: none"> • Measure DC and AC voltages • Compare with LCD • Replace Inverter • Internal damage • Wire came loose during shipping |

9. Troubleshooting

| Alarms | Cause | Solution |
|---------------------------------------|--|---|
| GRID-INTF: Grid unstable | <ul style="list-style-type: none"> Inverter detects grid instability, internal fault current high | Test – With DC Switch OFF <ul style="list-style-type: none"> Measure AC voltage Test AC line for THD Test – With DC Switch ON Test AC line for THD <ul style="list-style-type: none"> Multiple inverters/turn one off Impedance matching adjustment or box Internal damage Wire came loose in shipping |
| INI-PRO: Initialization Protection | <ul style="list-style-type: none"> Master and Slave DSP have different values | Reset Inverter <ul style="list-style-type: none"> DC switch OFF Wait until all lights/LCD turn off DC switch ON Replace inverter |
| TEM-PRO: Temperature Protection | <ul style="list-style-type: none"> Inverter detects high ambient temperature >60C | Inspect installation <ul style="list-style-type: none"> Check heatsink for obstructions/ventilation Is inverter in direct sunshine Measure ambient temperature near inverter If temp is in range replace inverter |
| GROUND-PRO: Ground Protection | <ul style="list-style-type: none"> Inverter detects low DC insulation resistance | Inspect installation <ul style="list-style-type: none"> Reset inverter Note weather conditions when alarm occurs Measure insulation resistance If normal, measure in SAME weather as alarm Physically check cables Replace inverter |

Table 9.1 Fault messages and descriptions



NOTE:

If the inverter displays any alarm message as listed in Table 9.1; please turn off the inverter (refer to Section 5.2 to stop your inverter) and wait for 5 minutes before restarting it (refer to Section 5.1 to start your inverter). If the failure persists, please contact your local distributor or the service center. Please have ready the following information before contacting us.

1. Serial number of inverter.
2. The distributor/dealer of Solis Three Phase Inverter (if available);
3. Installation date.
4. Description of the problem (i.e. the alarm message displayed on the LCD and the status of the LED status indicator lights. Other readings obtained from the Information submenu (refer to Section 7.2) will also be helpful.);
5. The PV array configuration (e.g. number of panels, capacity of panels, number of strings, etc.);
6. Your contact details.

9. Troubleshooting

10. Specification

| Model | Solis-25K-LV |
|--|---|
| Max. DC input power (Watts) | 30000 |
| Max. DC input voltage (Volts) | 1000 |
| Rated DC voltage (Volts) | 600 |
| Start-up voltage (Volts) | 200 |
| MPPT voltage range (Volts) | 200...850 |
| Max. input current (Amps) | 28.5+28.5 |
| Max short circuit input current (Amps) | 44.5+44.5 |
| MPPT number/Max input strings number | 2/6 |
| Rated output power (Watts) | 25000 |
| Max. output power (Watts) | 25000 |
| Max. apparent output power (VA) | 25000 |
| Rated grid voltage (Volts) | 3/N/PE~220 |
| Rated output current (Amps) | 65.6 |
| Power Factor (at rated output power) | 0.8leading~0.8lagging |
| THDi (at rated output power) | <3% |
| Rated grid frequency (Hertz) | 60 |
| Operating frequency range (Hertz) | 57...62 |
| Max.efficiency | 97.0% |
| EU efficiency | 96.5% |
| MPPT efficiency | >99.5% |
| Dimensions | 630W*700H*357D (mm) |
| Weight | 63kg |
| Topology | Transformerless |
| Operating ambient temperature range | -25°C... 60°C |
| Ingress protection | IP65 |
| Noise emission (typical) | <60 dBA |
| Cooling concept | Force cooling |
| Max.operation altitude | 4000m |
| Designed lifetime | >20 years |
| Grid connection standard | EN50538, G59/3, AS4777, VDE0126-1-1, IEC61727,IEEE1547 |
| Safty/EMC standard | IEC62109-1-/2, AS3100, EN61000-6-1, EN61000-6-3, UL1741 |
| Operating surroundings humidity | 0...100% Condensing |
| Connention | Mc4 connector and Ip67 rated plug |
| Display | LCD,2×20 Z. |
| Communication connections | 4 pins RS485 connector, 2 RJ45 connector, 2 group of terminal block |
| Monitoring | WiFi or GPRS |
| Warranty Terms | 5 Years STD (Extendable to 20 Years) |

10. Specification

| Model | Solis-30K-LV |
|--|---|
| Max. DC input power (Watts) | 36000 |
| Max. DC input voltage (Volts) | 1000 |
| Rated DC voltage (Volts) | 600 |
| Start-up voltage (Volts) | 200 |
| MPPT voltage range (Volts) | 200...850 |
| Max. input current (Amps) | 28.5+28.5 |
| Max short circuit input current (Amps) | 44.5+44.5 |
| MPPT number/Max input strings number | 2/6 |
| Rated output power (Watts) | 30000 |
| Max. output power (Watts) | 30000 |
| Max. apparent output power (VA) | 30000 |
| Rated grid voltage (Volts) | 3/N/PE~220 |
| Rated output current (Amps) | 78.8 |
| Power Factor (at rated output power) | 0.8leading~0.8lagging |
| THDi (at rated output power) | <3% |
| Rated grid frequency (Hertz) | 60 |
| Operating frequency range (Hertz) | 57...62 |
| Max.efficiency | 97.0% |
| EU efficiency | 96.5% |
| MPPT efficiency | >99.5% |
| Dimensions | 630W*700H*357D (mm) |
| Weight | 63kg |
| Topology | Transformerless |
| Operating ambient temperature range | -25°C... 60°C |
| Ingress protection | IP65 |
| Noise emission (typical) | <60 dBA |
| Cooling concept | Force cooling |
| Max.operation altitude | 4000m |
| Designed lifetime | >20 years |
| Grid connection standard | EN50538, G59/3, AS4777, VDE0126-1-1, IEC61727,IEEE1547 |
| Safty/EMC standard | IEC62109-1-/2, AS3100, EN61000-6-1, EN61000-6-3, UL1741 |
| Operating surroundings humidity | 0...100% Condensing |
| Connention | Mc4 connector and Ip67 rated plug |
| Display | LCD,2×20 Z. |
| Communication connections | 4 pins RS485 connector, 2 RJ45 connector, 2 group of terminal block |
| Monitoring | WiFi or GPRS |
| Warranty Terms | 5 Years STD (Extendable to 20 Years) |

10. Specification

| Model | Solis-50K-HV |
|--|---|
| Max. DC input power (Watts) | 60000 |
| Max. DC input voltage (Volts) | 1000 |
| Rated DC voltage (Volts) | 720 |
| Start-up voltage (Volts) | 200 |
| MPPT voltage range (Volts) | 200...1000 |
| Max. input current (Amps) | 22+22+22+22 |
| Max short circuit input current (Amps) | 34.3+34.3+34.3+34.3 |
| MPPT number/Max input strings number | 4/8 |
| Rated output power (Watts) | 50000 |
| Max. output power (Watts) | 50000 |
| Max. apparent output power (VA) | 50000 |
| Rated grid voltage (Volts) | 3/(N)/PE~480 |
| Rated output current (Amps) | 60.2 |
| Power Factor (at rated output power) | 0.8leading~0.8lagging |
| THDi (at rated output power) | <3% |
| Rated grid frequency (Hertz) | 60 |
| Operating frequency range (Hertz) | 57...62 |
| Max.efficiency | 99.0% |
| EU efficiency | 98.72% |
| MPPT efficiency | 99.9% |
| Dimensions | 630W*700H*357D (mm) |
| Weight | 61kg |
| Topology | Transformerless |
| Operating ambient temperature range | -25°C... 60°C |
| Ingress protection | IP65 |
| Noise emission (typical) | <30 dBA |
| Cooling concept | Natural convection |
| Max.operation altitude | 4000m |
| Designed lifetime | >20 years |
| Grid connection standard | EN50438, G99, AS4777, VDE0126-1-1, IEC61727,IEEE1547 |
| Safty/EMC standard | IEC62109-1-/2, AS3100, EN61000-6-2, EN61000-6-4, NB/T 32004,UL1741 |
| Operating surroundings humidity | 0...100% Condensing |
| Connention | Mc4 connector and Ip67 rated plug |
| Display | LCD, 2x20 Z. |
| Communication connections | 4 pins RS485 connector, 2 RJ45 connector, 2 group of terminal block |
| Monitoring | WiFi or GPRS |
| Warranty Terms | 5 Years STD (Extendable to 20 Years) |

10. Specification

| Model | Solis-60K-HV |
|--|---|
| Max. DC input power (Watts) | 72000 |
| Max. DC input voltage (Volts) | 1000 |
| Rated DC voltage (Volts) | 720 |
| Start-up voltage (Volts) | 200 |
| MPPT voltage range (Volts) | 200...1000 |
| Max. input current (Amps) | 28.5+28.5+28.5+28.5 |
| Max short circuit input current (Amps) | 44.5+44.5+44.5+44.5 |
| MPPT number/Max input strings number | 4/12 |
| Rated output power (Watts) | 60000 |
| Max. output power (Watts) | 60000 |
| Max. apparent output power (VA) | 60000 |
| Rated grid voltage (Volts) | 3/(N)/PE~480 |
| Rated output current (Amps) | 72.2 |
| Power Factor (at rated output power) | 0.8leading~0.8lagging |
| THDi (at rated output power) | <3% |
| Rated grid frequency (Hertz) | 60 |
| Operating frequency range (Hertz) | 57...62 |
| Max.efficiency | 99.0% |
| EU efficiency | 98.72% |
| MPPT efficiency | 99.9% |
| Dimensions | 630W*700H*357D (mm) |
| Weight | 63kg |
| Topology | Transformerless |
| Operating ambient temperature range | -25°C... 60°C |
| Ingress protection | IP65 |
| Noise emission (typical) | <60 dBA |
| Cooling concept | Intelligent redundant fan-cooling |
| Max.operation altitude | 4000m |
| Designed lifetime | >20 years |
| Grid connection standard | EN50438, G99, AS4777, VDE0126-1-1, IEC61727,IEEE1547 |
| Safty/EMC standard | IEC62109-1-/2, AS3100, EN61000-6-2, EN61000-6-4, NB/T 32004,UL1741 |
| Operating surroundings humidity | 0...100% Condensing |
| Connention | Mc4 connector and Ip67 rated plug |
| Display | LCD, 2x20 Z. |
| Communication connections | 4 pins RS485 connector, 2 RJ45 connector, 2 group of terminal block |
| Monitoring | WiFi or GPRS |
| Warranty Terms | 5 Years STD (Extendable to 20 Years) |