

PV Grid Tie Inverter

# Solis Three Phase Inverter

For model Solis-40K, Solis-50K, Solis-50K-HV,  
Solis-60K-HV, Solis-70K-HV  
Installation and Operation Manual



Ningbo Ginlong Technologies Co., Ltd.

No. 57 Jintong Road, Binhai Industrial Park, Xiangshan, Ningbo,  
Zhejiang, 315712, P.R.China.

Tel: +86 (0)574 6578 1806

Fax: +86 (0)574 6578 1606

Email: info@ginlong.com

Web: www.ginlong.com

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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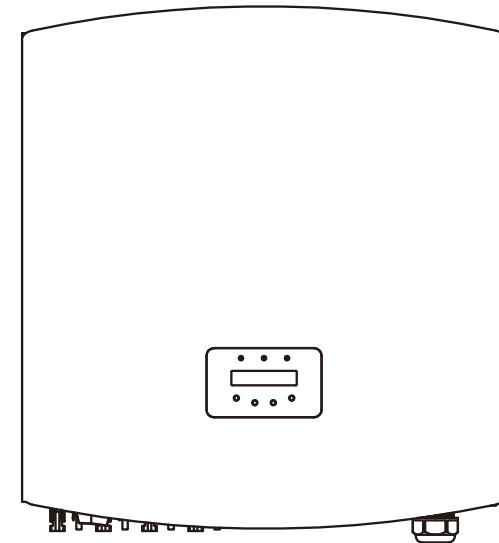
# 1. Introduction

## 1.1 Product Descriptions

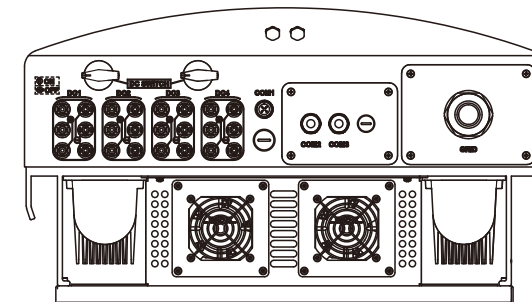
Solis three phase series PV inverters is able to transfer DC power from PV panels into AC power and feed into grid.

There are 6 models for Solis three phase inverter:

**Solis-40K Solis-50K Solis-50K-HV**  
**Solis-60K-HV Solis-70K-HV**



▲ Figure 1.1 Front view



▲ Figure 1.2 Bottom view

# 1. Introduction

# 2. Safety Instruction

## 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	2
4	DC connectors	40K 50K-HV 8 pairs 50K 60/70K-HV 12pairs
5	AC M4 washer	1
6	Manual	1

▲ Table 1.1 Material list

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 Instruction



### 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

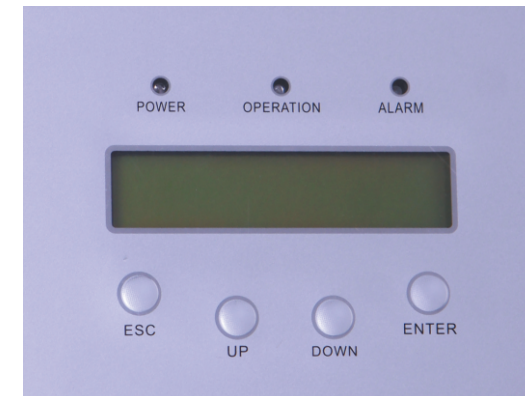
The inverter was designed in accordance with relevant safety regulation to meet end user's demand. The usage of inverter and installation should meet the following requirement:

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 in the front panel of the inverter. In the Left: POWER LED indicates the power status of the inverter. In the Middle: OPERATION LED (green) indicates the operation status. In 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-lines Liquid Crystal Display (LCD) is located at the front panel of the Inverter, which shows the following information:

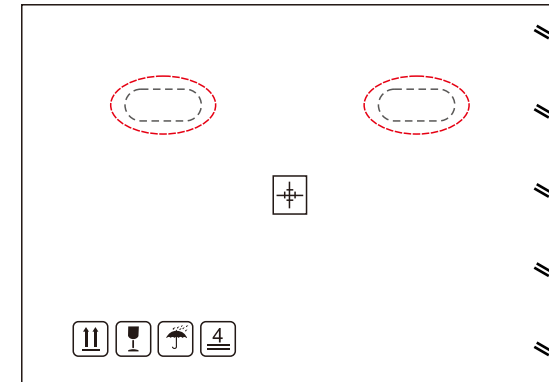
- 1.Inverter operation status and data;
- 2.Service messages for operator;
- 3.Alarm messages and fault indications.

## 4. Product handing and storage

### 4.1 Product Handing

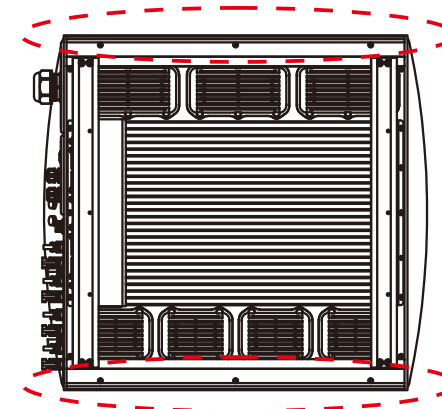
Please refer below to handing the product:

1.The red mark is used for handle the product with package. The product need two persons to carry (as shown in figure 4.1).



▲ Figure 4.1 move the inverter

2.After open the package, it's recommend two person to get the inverter out of package. Please handle the side of heat-sink when carry the inverter (as shown in figure 4.2).



▲ Figure 4.2 carry out the inverter

## 4. Installation

### 4.2 Product Storage

If the inverter is not for using at present, it should be stored under the specific environment:

- Please use the original box to repackage the inverter, and retain the desiccant.
- Packing boxes should be sealed with adhesive tape.
- Please store the inverter in a clean and dry place, and keep it without the erosion of dust and vapor.
- Storage temperature should be kept at  $-25^{\circ}\text{C}$ - $60^{\circ}\text{C}$  , and the relative humidity should be kept between 0 to 95%.And kept no condensation.
- The maximum cumulative number of layers should not be more than 4 when stack of multiple inverters.
- Please avoid the chemical corrosive substances,because it maybe corrod the inverter.
- The regular inspection is needed during the storage. If found the rat bite etc.,should replace the packing material in time.
- The packing box should not be inclined or upside down.
- After long-term storage, the inverter needs to be fully examined and tested by professional person before using.

## 5. Installation

### 5.1 Select a Location for the Inverter

To select a location for the inverter the following criteria should be considered:

- Do not install the inverter in unventilated confined space. To avoid poor performance or damage inverter, air flow is needed.
- Exposure to direct sunlight will increase the operational temperature of the inverter and may cause output power limiting. Ginlong recommend inverter installed to avoid direct sunlight or raining.
- Shaded or sheltered positions are recommended for maximum performance and service life.



▲ 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.



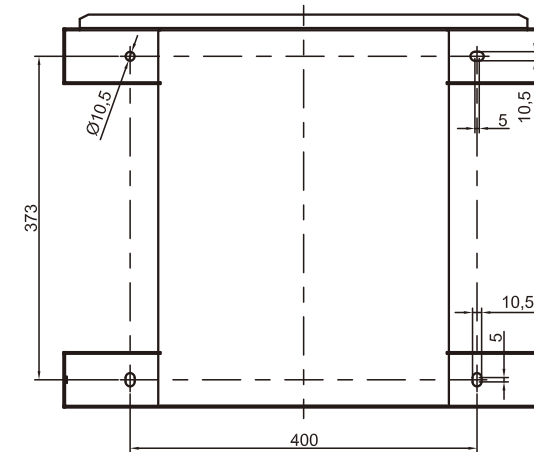
**NOTE:**

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

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).

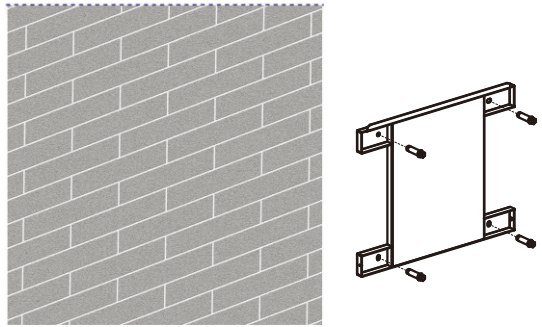


**WARNING:**

The inverter must be mounted vertically on a vertical wall. Using the suitable expansion screws or bolts to fix the bracket to the wall or bracket (as shown as Figure 5.4).

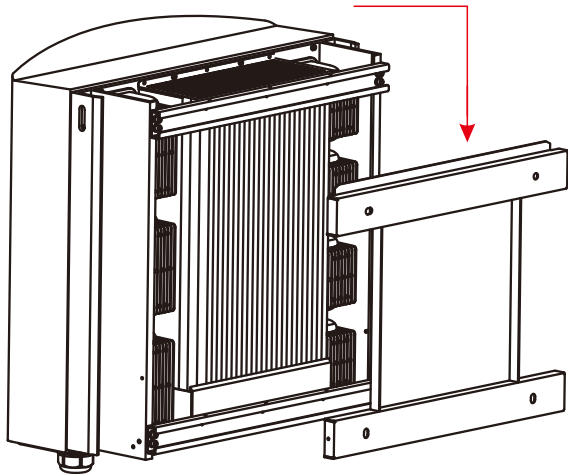


# 5. Installation



▲ Figure 5.4 Fix the bracket to the wall

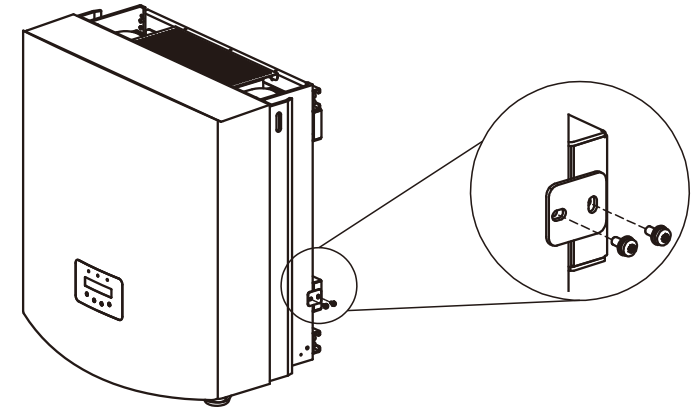
4. Lift up the inverter, and make the holes on the back bracket of inverter align to the convex on the mounting bracket. Then fix the inverter to the bracket slowly until it mounts well (in figure 5.5).



▲ Figure 5.5 Fix the inverter to the bracket

# 5. Installation

Use screws in the packaging to fix the bottom of 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 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 1 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. Installation

## 5.3.1 Protective ground wire connection(PE)

Ginlong recommend 2 ground protection methods: Through grid terminal to connect ground and external heat sink to connect ground.

If AC terminal is used to connect ground, please refer to the contents of 5.3.2.

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

- 1) Prepare the grounding cable: recommend to use the 16~35mm<sup>2</sup> outdoor copper-core cable.
- 2) Prepare OT terminals: M6.



### Important:

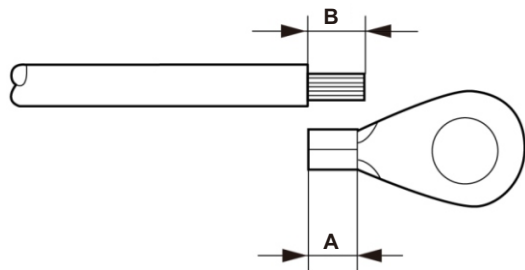
For multiple inverters parallel system, all inverters should be connected to each other to ensure the electric potential connections such as grounding wire connecting.



### 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 Ginlong will not be responsible for any damage caused by lightning.

- 3) Using the wire stripper to strip the grounding cable insulation at the suitable length. (as shown as Figure 5.7)



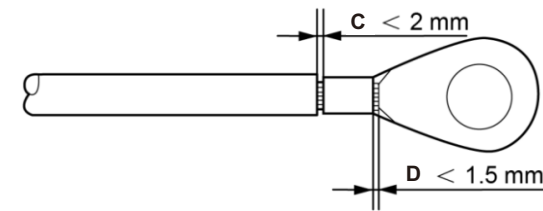
▲ Figure5.7 suitable length



### Important:

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

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



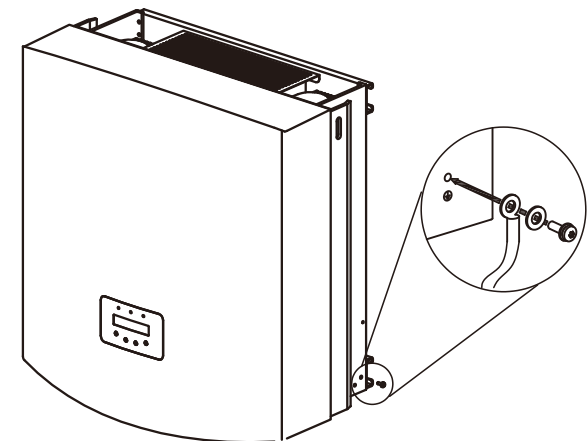
▲ Figure5.8 strip wire



### Important:

After pressing, the terminal conductor cavity was formed and the cavity can coat the cable. Cable conductors and terminals should be connected closely.

- 5) Release the screw down the screws at the ground position.
- 6) Use the screws of the ground position to fix grounding cable, and use 10mm socket wrench to fasten the screw, fastening torque is 3Nm (as shown as 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

## 5.3.2 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.



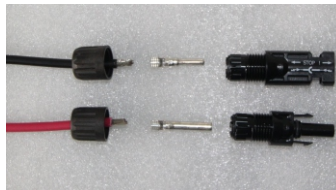
▲ Figure 5.10 DC+ Connector



▲ Figure 5.11 DC- Connector

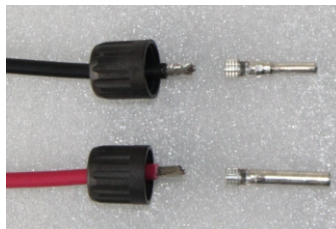
The steps of assembling the DC connectors are listed as follows:

i) Strip off the DC wire for about 7mm, Disassemble the connector cap nut . (see Figure 5.12)



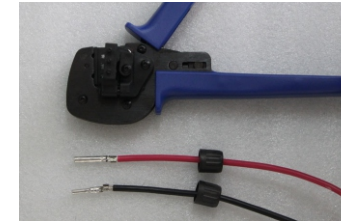
▲ Figure 5.12 Disassemble the Connector Cap nut

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



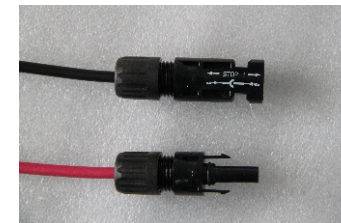
▲ Figure 5.13 Insert the Wire into the Connector Cap nut and contact pin

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



▲ Figure 5.14 Crimp the contact pin to the wire

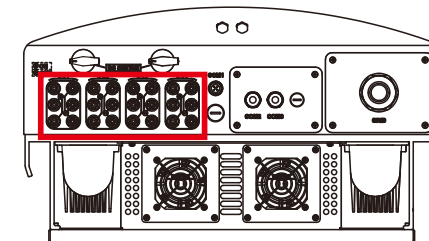
iv) Insert the contact pin to the top part of the connector and screw up the cap nut to the top part of the connector, Torque using 2.5-3Nm (as shown in Figure 5.15).



▲ Figure 5.15 Connector with Cap nut Screwed on

Cable type	Traverse area (mm <sup>2</sup> )		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) Then connect the DC connectors to the inverter. Small click will confirm connection (as shown as shown as 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, 16-35mm<sup>2</sup> 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<sup>2</sup> cable.



**NOTE:**

There is no need to connect N to AC side for Ginlong three-phase inverter , and the ground wire can be connected nearby 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 <sup>2</sup> )	Range	16~35	25~35
	Recommended	25	35
Cable outer diameter (mm)	Range	22~32	
	Recommended	27	

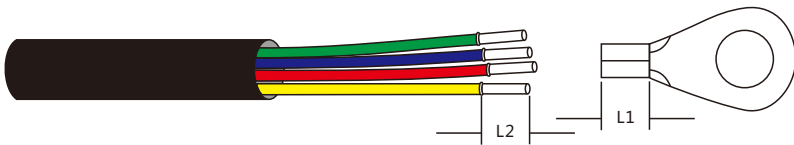


**NOTE:**

Please 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



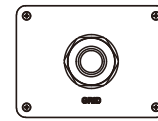
**NOTE:**

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

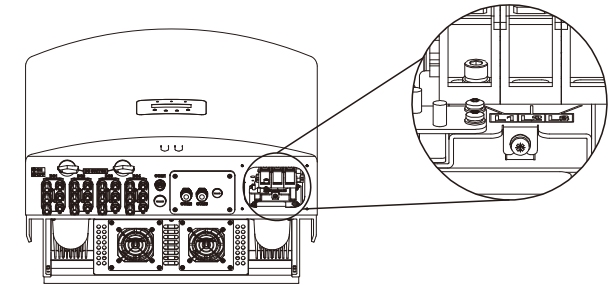
# 5. Installation

B) Strip the insulation of the wire core, and pass the cable crimping area of the OT terminal, then use a hydraulic clamp to press it strictly. The wire must be coated with heat shrinkable tube or insulating tape . When coated with the heat shrinkable tube, Please sleeve the heat shrinkable tube before fix the OT terminal.

C) Disassemble the 4 screws on the AC terminal cover and take out the cover (in figure 5.18). Disassemble the screw under terminal rack and Pull out the terminal ( in figure 5.19).

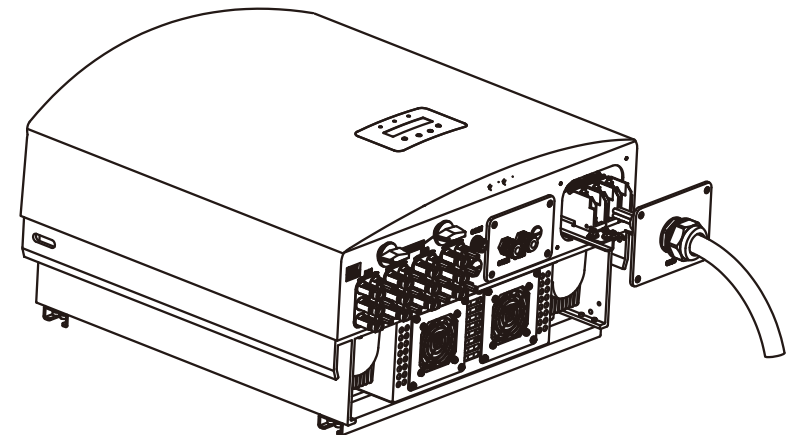


▲ Figure 5.18 Cover



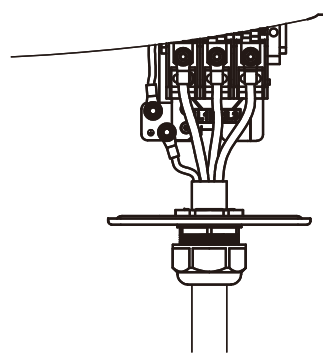
▲ Figure 5.19 Disassemble AC terminal cover

D) Insert the cable through cup 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).



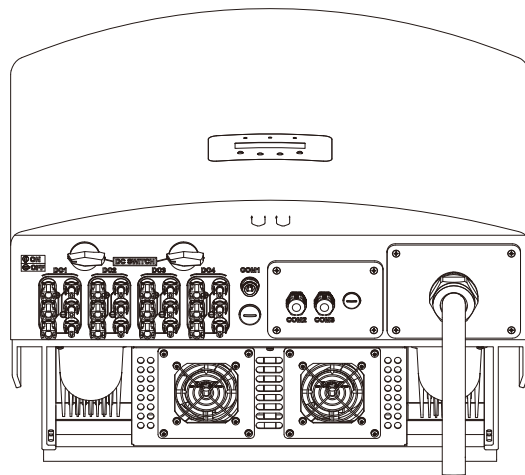
▲ Figure 5.20a Connect cable to AC terminal

# 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. Lock the 4 screws of AC terminal and tight the cap nut of AC terminal (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, please use chamotte or similar 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, Ginlong Solis recommends installing breakers that will protect against overcurrent. The following table defines OCPD ratings for the Ginlong Solis 40-70kW Three phase inverters.

Inverter	Rated voltage(V)	Rated output power (kW)	Current for protection device (A)
Solis-40K	400V	40	60
Solis-50K	400V	50	80
Solis-50K-HV	480/500V	50	80
Solis-60K-HV	480/500V	60	80
Solis-70K-HV	540V	70	90

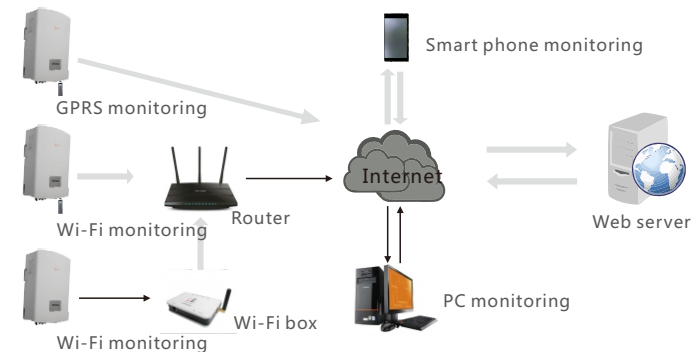
▲ Table 5.2 Rating of grid OCPD

## 5.3.5 Inverter monitoring connection

There are 3 communication terminals for Ginlong 40-70kW inverter. COM1-COM3 are all for RS485 communication. COM1 is 4-pin connector which matches with the Ginlong Wi-Fi or GPRS wireless communication products.

COM2 and COM3 are RJ45 and terminal block for RS485 connection, which is used for communicating connection between inverter and data logger.

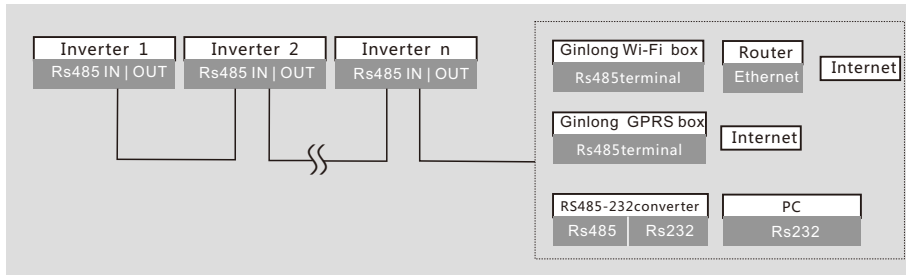
Figure 5.22 is the internet monitoring solution. Please refer to related instructions of Ginlong communication products.



▲ Figure 5.22 monitoring solution

## Monitoring system for multiple inverters

The multi-inverters can be monitored by in series of Rs485 (As shown in figure 5.23).



▲ Figure 5.23 Multi-inverters monitoring system

### 5.3.5.1 RS485 Communication connection

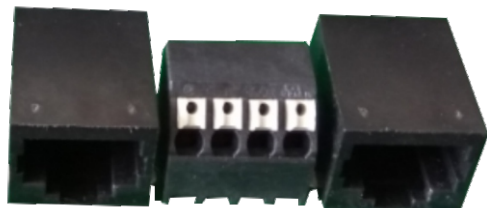
Connection RS485 through terminal block.

Rs485 communication cable connection supports two ways Terminal board connection. (in figure 5.24)

The cross sectional area of the cable which on the communication side is recommended 0.2-1.5mm<sup>2</sup>, The outer diameter of the cable is 5mm-10mm.

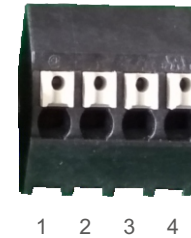
Rj45 port connection (in figure 5.25).

CAT 5E outdoor screen (cable outer diameter < 9mm, internal resistance ≤ 1.5Ω / 10m) and shielding RJ45 crystal head are recommended.



▲ Figure 5.24 RJ45 port and Terminal board

Connection steps of RS485 Communication cable.

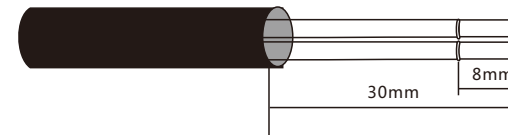


NO.	Port definition	Description
1	RS485A IN	RS485A, RS485 differential signal+
2	RS485A OUT	RS485A, RS485 differential signal-
3	RS485B IN	RS485B, RS485 differential signal+
4	RS485B OUT	RS485B, RS485 differential signal-

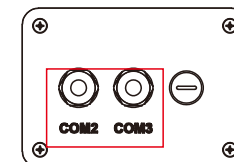
▲ Table 5.3 Port definition

Connection of Terminal board.

a. Please use wire stripper to strip the insulating layer and the steel armor wire core with suitable length.



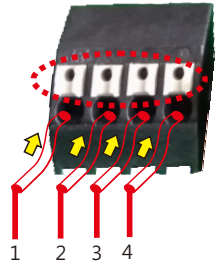
b. Release the locking cap on the COM2 and COM3 cable on the waterproof fixed joint at the bottom of the inverter and remove the plug on the locking cap (in Figure 5.25).



▲ Figure 5.25

## 5. Installation

- c. Pass the cable to locking cap and COM2(RS485 IN)/COM3(RS485 OUT) port which at the bottom of the inverter.
- d. Take down the cable holder from user interface board.
- e. Connect the communication cable to terminal holder.



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

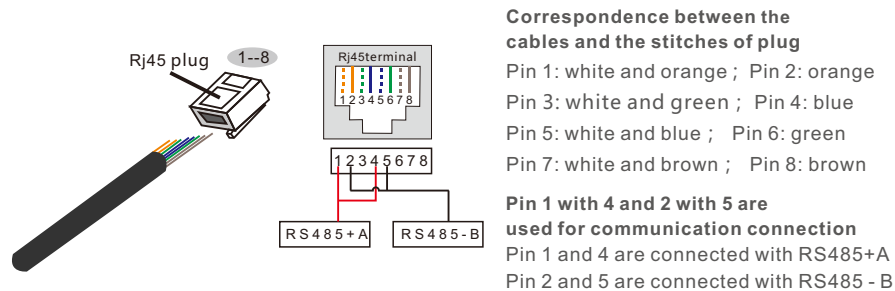
▲ Figure 5.26 Strip the insulation and connect to RS485

- f. Insert the cable to terminal board directly, and press the dotted box in figure 5.26 to take out cable if you want.

Steps for using RJ45 connections of RS485 Communications.

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

According to the standard line sequence TIA/EIA 568B, connect the wire to the plug of RJ45, and then use a network cable crimping tool to make it tight (As shown in figure 5.27).



▲ Figure 5.27 Strip the insulation layer and connect to RJ45 plug

- b. Press the crystal holder with a crimping plier.
  - c. Unscrew the locking cap on the COM2/3 cable waterproof fastening joint and remove the plug on the locking cap.
  - d. Screw the waterproof nut for COM2 and COM3.
- Insert the crystal head into the RJ45 port of the inverter maintenance chamber.



### NOTE:

After connecting, please check the correctness and firmness of the connection. After confirmation, please make a fireproof mud seal for the connector and cable.

## 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 the information of 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.

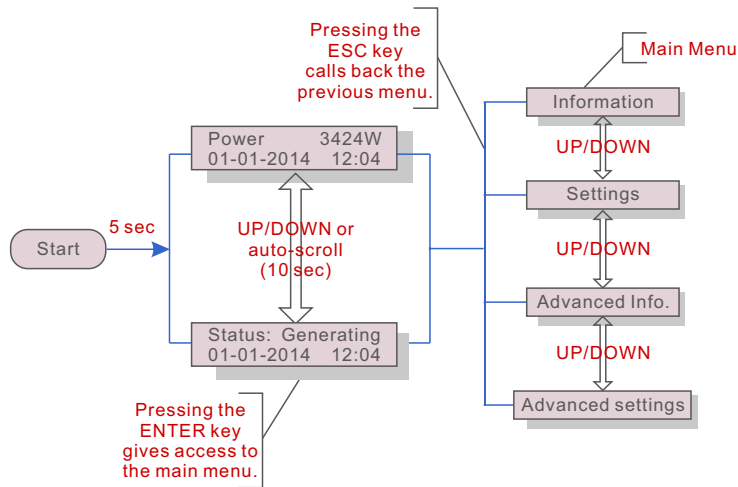
### 6.2 Stop the Inverter

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.  
All the LEDs of the inverter will be off in one minute.
3. Disconnect the input and output cables.

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 Solis Single Phase 4G Inverter main menu provides access to operational data and 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_GridA 230.4V I_GridA 8.1A	10 sec	V_GridA: Shows the grid's voltage value. I_GridA: Shows the grid's current value.
V_GridD 230.4V I_Grid D 8.1A	10 sec	V_GridD: Shows the grid's voltage value. I_GridD: 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 00000000000000	10 sec	Display series number of the inverter.

▲ Table 7.1 Information list

### 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. Operation

# 7. Operation

## 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.



```
NEXT=<ENT> OK=<ESC>
01-01-2016 16:37
```

▲ 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 muti inverters are connected to single monitor. The address number can be assigned from "01" to "99"(see Figure 7.4). The default address number of Solis Single Phase Inverter is "01".



```
YES=<ENT> NO=<ESC>
Set Address: 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.

## 7.4 Advanced Info - Technicians Only



### NOTE:

To access to this area is for fully qualified and accredited technicians only. Enter menu "Advanced Info." and "Advanced settings" (need 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 select the number.

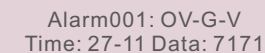
After enter the correct password the Main Menu will display a screen and be able to access to the following information.

- 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

### 7.4.2 Running Message

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

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

# 7. Operation

## 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.

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

▲ Figure 7.12 Month energy

```
2015: 0017513kWh
2014: 0165879kWh
```

▲ Figure 7.13 Yearly energy

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

# 7. Operation

## 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

## 7.5 Advanced Settings - Technicians Only



### NOTE:

To 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. Reset 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

### 7.5.1 Selecting Standard

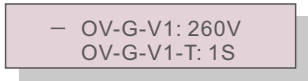
This function is used to select the grid's reference standard (see Figure 7.16).

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

▲ Figure 7.16

# 7. Operation

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



▲ Figure 7.17



**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: 236---335V	OV-G-F1: 50.2-53Hz(60.2-63Hz)
OV-G-V1-T: 0.1---9S	OV-G-F1-T: 0.1---9S
OV-G-V2: 248---341V	OV-G-F2: 51-53Hz(61-63Hz)
OV-G-V2-T: 0.1---1S	OV-G-F2-T: 0.1---9S
UN-G-V1: 173---236V	UN-G-F1: 47-49.5Hz(57-59.5Hz)
UN-G-V1-T: 0.1---9S	UN-G-F1-T: 0.1---9S
UN-G-V2: 132---219V	UN-G-F2: 47-49Hz(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 Solis Single Phase Inverter (see Figure 7.18).



▲ 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. Operation

## 7.5.3 Clear Energy

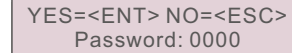
Clear Energy can reset the history yield of inverter



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

## 7.5.4 Reset Password

This function is used to set the new password for menu "Advanced info." and "Advanced information" (see Figure7.19).



▲ Figure 7.19 Set new password

Enter the right password before set new password. 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.

## 7.5.5 Power Control

Active and reactive power can be set through power setting button.

There are 5 item for this sub menu:

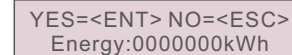
1. Set output power
2. Set Reactive Power
3. Out\_P With Restore
4. Rea\_P With Restore
5. Select PF Curve



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

## 7.5.6 Calibrate Energy

Maintenance or replacement could clear or cause a different value of total energy. Use this function could 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).



▲ 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. Multiple MPPT Set
7. Voltage MPPT Set
8. LVRT Set
9. IgZero\_COMP. Set
10. PI 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

## 7.5.9 Restore Settings



This function is applicable by maintenance personnel only.

Restore Settings have the submenu shown 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 by 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 ,

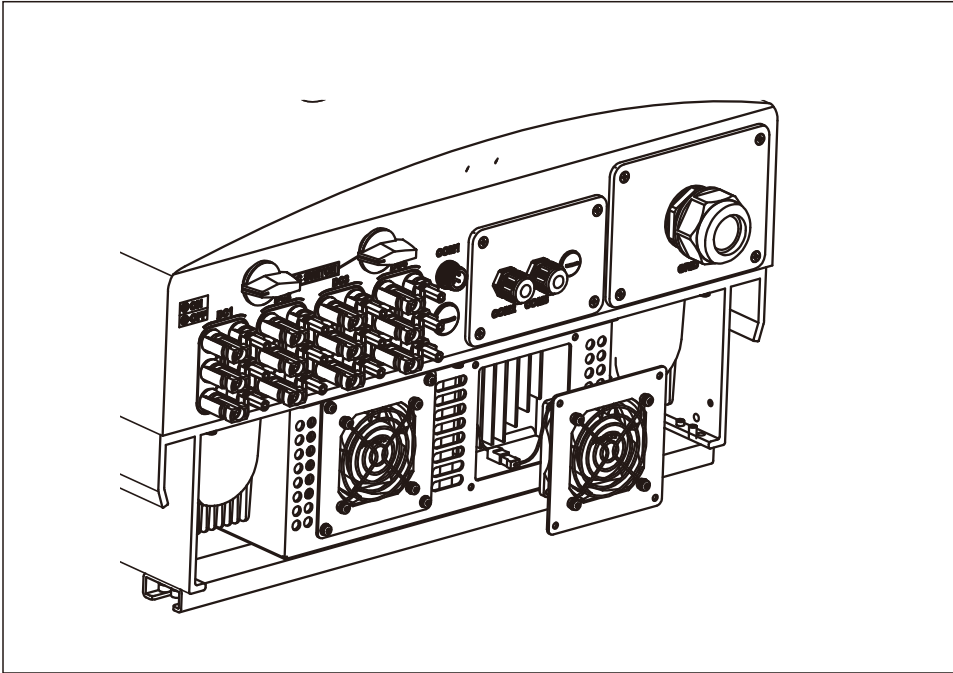
Press the DOWN key to scroll and press the UP key to change the value.

Then press the ENTER key to save the setting. Press the ESC key to cancel changes and returns to the previous menu.

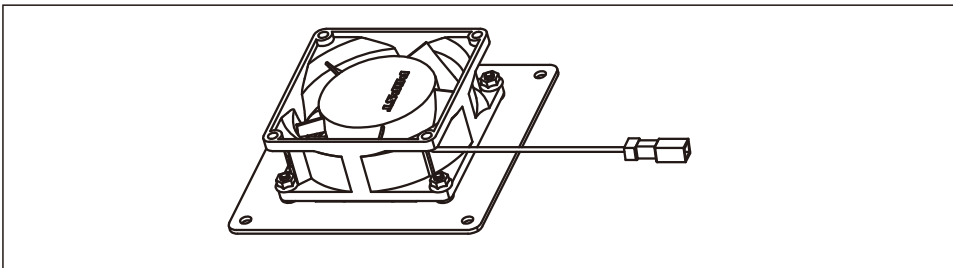


## 8. Maintenance

Release the 4 screws on the fan fixing plate and pull out the fan slowly.

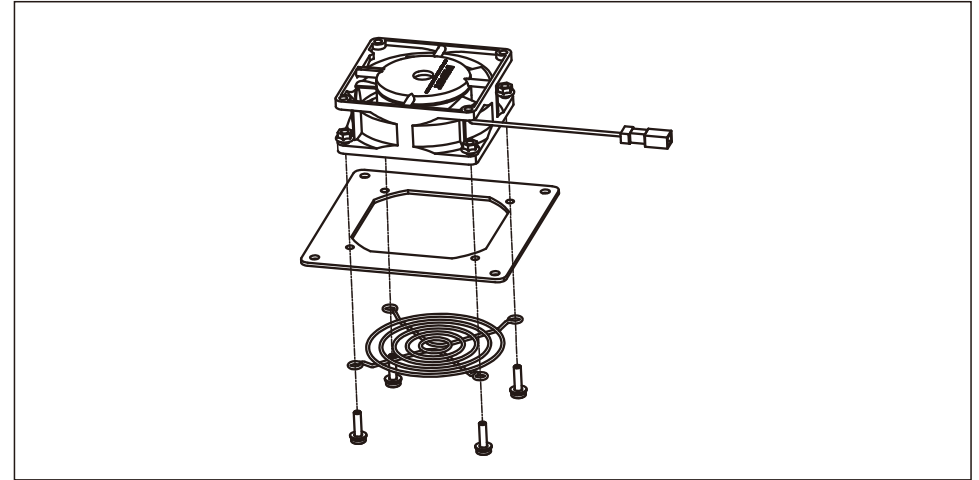


⑦、 Disconnect the fan connector carefully and take out the fan.



## 8. Maintenance

⑧ Clean or replace the fan. Assemble the fan on the rack.



Reinstall and do electrical connection. Restart the inverter.

# 9. Troubleshooting

The inverter is designed in accordance with the most important international grid-tied standards 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:

Alarm Message	Failure description	Solution
No power	Inverter no power on LCD	1.Check PV input connections 2.Check DC input voltage (single phase >120V, three phase >350V) 3.Check if PV+/- is reversed
LCD show initializing all the time	can not start-up	1.Check if the connector on main board or power board are fixed. 2.Check if the DSP connector to power board are fixed.
OV-G-V01/02/03/04	Over grid voltage	1.Resistant of AC cable is too high. Change bigger size grid cable 2.Adjust the protection limit if it's allowed by electrical company.
UN-G-V01/02	Under grid voltage	1.Use user define function to adjust the protection limit if it's allowed by electrical company.
OV-G-F01/02	Over grid frequency	
UN-G-F01/02	Under grid frequency	
G-IMP	High grid impedance	
NO-GRID	No grid voltage	1.Check connections and grid switch. 2.Check the grid voltage inside inverter terminal.
OV-DC01/02/03/04	Over DC voltage	1.Reduce the module number in series
OV-BUS	Over DC bus voltage	1.Check inverter inductor connection 2.Check driver connection
UN-BUS01/02	Under DC bus voltage	
GRID-INTF01/02	Grid interference	1.Restart inverter 2.Change power board
OV-G-I	Over grid current	
IGBT-OV-I	Over IGBT current	
DC-INTF OV-DCA-I	DC input overcurrent	1.Restart inverter 2.Identify and remove the string to the fault MPPT 2.Change power board
IGFOL-F	Grid current tracking fail	1.Restart inverter or contact installer.
IG-AD	Grid current sampling fail	
OV-TEM	Over Temperature	1.Check inverter surrounding ventilation. 2.Check if there's sunshine direct on inverter in hot weather.

# 9. Troubleshooting

Alarm Message	Failure description	Solution
INI-FAULT	Initialization system fault	1.Restart inverter or contact installer.
DSP-B-FAULT	Comm. failure between main and slave DSP	
12Power-FAULT	12V power supply fault	
GROUND-FAULT 01/02	Ground fault	1.Remove all DC input, reconnect and restart inverter one by one. 2.Identify which string cause the fault and check the isolation of the string.
lLeak-FAULT 01/02/03/04	High Grid leakage current	1.Check AC and DC connection 2.Check inverter inside cable connection.
Relay-FAULT	Relay check fault	1.Restart inverter or contact installer.
DCinj-FAULT	High DC injection current	1.Restart inverter or contact installer.
AFCI Check FAULT	AFCI module self check fault	1.Restart inverter or contact installer.
ARC-FAULT	ARC detected in DC circuit	1.Check if there's arc in PV connection and restart inverter.
Fan-FAULT	LCD fan Fault	1.Check if that the fan needs cleaning or replacement

▲ Table 9.1 Fault message and description



**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 keep ready with you the following information before contacting us.

1. Serial number of inverter.
2. The distributor/dealer of Solis Single Phase Inverter (if available);
3. Installation date.
4. The description of 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.

# 10. Specification

Model	<b>Solis-40K</b>
Max power per MPPT (Watts)	16000
Max voltage (Volts)	1100
Startup voltage (Volts)	200
Operating MPPT voltage range (Volts)	200...1000
Max usable input current per MPPT (Amps)	22+22+22+22
Max short circuit input current (Amps)	34.3
Number of MPPT	4
Inputs per MPPT	8
Nominal output power(Watts)	40000
Max. output power(Watts)	44000
Max. apparent output power(VA)	44000
Nominal grid voltage (Volts)	230
Operating voltage range (Volts)	304...460V
Rated output current	58
Output power factor range	0.8leading~0.8lagging
Grid current THD	<3%
Nominal grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...52 or 57...62
Peak efficiency	98.8%
CEC weighted efficiency	98.4%
MPPT efficiency	>99.9%
Rapid shutdown	Optional
Dimensions(cm)	630W*700H*357D
Weight(kg)	61kg
Topology	Transformerless
Ambient operating temperature range	-25°C . . . 60°C
Enclosure type	IP65
Noise emission (typical)	<30 dBA
Cooling concept	Natural convection
Max. operating altitude without derating	4000m
Designed lifetime	>20 years
Compliance	EN50438, G83/2, G59/3, AS4777.2:2015, VDE0126-1-1, IEC61727, VDE N4105
Operating surroundings humidity	0...100% Condensing
Connention	MC- mateable and OT Terminal connect
Display	LCD, 2×20 Z.
Interface	RS 485, WIFI/GPRS (optional)
Warranty Terms	5 Years STD (Extendable to 20 Years)

# 10. Specification

Model	<b>Solis-50K</b>
Max power per MPPT (Watts)	22500
Max voltage (Volts)	1100
Startup voltage (Volts)	200
Operating MPPT voltage range (Volts)	200...1000
Max usable input current per MPPT (Amps)	28.5+28.5+28.5+28.5
Max short circuit input current (Amps)	44.5
Number of MPPT	4
Inputs per MPPT	12
Nominal output power(Watts)	50000
Max. output power(Watts)	55000
Max. apparent output power(VA)	55000
Nominal grid voltage (Volts)	230
Operating voltage range (Volts)	304...460V
Rated output current	72.2
Output power factor range	0.8leading~0.8lagging
Grid current THD	<3%
Nominal grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...52 or 57...62
Peak efficiency	98.8%
CEC weighted efficiency	98.4%
MPPT efficiency	>99.9%
Rapid shutdown	Optional
Dimensions(cm)	630W*700H*357D
Weight(kg)	63kg
Topology	Transformerless
Ambient operating temperature range	-25°C . . . 60°C
Enclosure type	IP65
Noise emission (typical)	<30 dBA
Cooling concept	Intelligent Redundant
Max. operating altitude without derating	4000m
Designed lifetime	>20 years
Compliance	EN50438, G83/2, G59/3, AS4777.2:2015, VDE0126-1-1, IEC61727, VDE N4105
Operating surroundings humidity	0...100% Condensing
Connention	MC- mateable and OT Terminal connect
Display	LCD, 2×20 Z.
Interface	RS 485, WIFI/GPRS (optional)
Warranty Terms	5 Years STD (Extendable to 20 Years)



# 10. Specification

Model	<b>Solis-50K-HV</b>
Max power per MPPT (Watts)	16000
Max voltage (Volts)	1100
Startup voltage (Volts)	200
Operating MPPT voltage range (Volts)	200...1000
Max usable input current per MPPT (Amps)	22+22+22+22
Max short circuit input current (Amps)	34.3
Number of MPPT	4
Inputs per MPPT	8
Nominal output power(Watts)	50000
Max. output power(Watts)	55000
Max. apparent output power(VA)	55000
Nominal grid voltage (Volts)	230
Operating voltage range (Volts)	384...576V
Rated output current	57.7
Output power factor range	0.8leading~0.8lagging
Grid current THD	<3%
Nominal grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...52 or 57...62
Peak efficiency	99%
CEC weighted efficiency	98.5%
MPPT efficiency	>99.9%
Rapid shutdown	Optional
Dimensions(cm)	630W*700H*357D
Weight(kg)	61kg
Topology	Transformerless
Ambient operating temperature range	-25°C . . . 60°C
Enclosure type	IP65
Noise emission (typical)	<30 dBA
Cooling concept	Natural convection
Max. operating altitude without derating	4000m
Designed lifetime	>20 years
Compliance	EN50438, G83/2, G59/3, AS4777.2:2015, VDE0126-1-1, IEC61727, VDE N4105
Operating surroundings humidity	0...100% Condensing
Connention	MC- mateable and OT Terminal connect
Display	LCD, 2×20 Z.
Interface	RS 485, WIFI/GPRS (optional)
Warranty Terms	5 Years STD (Extendable to 20 Years)

# 10. Specification

Model	<b>Solis-60K-HV</b>
Max power per MPPT (Watts)	22500
Max voltage (Volts)	1100
Startup voltage (Volts)	200
Operating MPPT voltage range (Volts)	200...1000
Max usable input current per MPPT (Amps)	28.5+28.5+28.5+28.5
Max short circuit input current (Amps)	44.5
Number of MPPT	4
Inputs per MPPT	12
Nominal output power(Watts)	60000
Max. output power(Watts)	66000
Max. apparent output power(VA)	66000
Nominal grid voltage (Volts)	230
Operating voltage range (Volts)	384...576V
Rated output current	69.3
Output power factor range	0.8leading~0.8lagging
Grid current THD	<3%
Nominal grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...52 or 57...62
Peak efficiency	99%
CEC weighted efficiency	98.5%
MPPT efficiency	>99.9%
Rapid shutdown	Optional
Dimensions(cm)	630W*700H*357D
Weight(kg)	63kg
Topology	Transformerless
Ambient operating temperature range	-25°C . . . 60°C
Enclosure type	IP65
Noise emission (typical)	<30 dBA
Cooling concept	Intelligent Redundant
Max. operating altitude without derating	4000m
Designed lifetime	>20 years
Compliance	EN50438, G83/2, G59/3, AS4777.2:2015, VDE0126-1-1, IEC61727, VDE N4105
Operating surroundings humidity	0...100% Condensing
Connention	MC- mateable and OT Terminal connect
Display	LCD, 2×20 Z.
Interface	RS 485, WIFI/GPRS (optional)
Warranty Terms	5 Years STD (Extendable to 20 Years)

# 10. Specification

Model	<b>Solis-70K-HV</b>
Max power per MPPT (Watts)	22500
Max voltage (Volts)	1100
Startup voltage (Volts)	200
Operating MPPT voltage range (Volts)	200...1000
Max usable input current per MPPT (Amps)	28.5+28.5+28.5+28.5
Max short circuit input current (Amps)	44.5
Number of MPPT	4
Inputs per MPPT	12
Nominal output power(Watts)	70000
Max. output power(Watts)	77000
Max. apparent output power(VA)	77000
Nominal grid voltage (Volts)	230
Operating voltage range (Volts)	400...648V
Rated output current	74.8
Output power factor range	0.8leading~0.8lagging
Grid current THD	<3%
Nominal grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...52 or 57...62
Peak efficiency	99%
CEC weighted efficiency	98.5%
MPPT efficiency	>99.9%
Rapid shutdown	Optional
Dimensions(cm)	630W*700H*357D
Weight(kg)	63kg
Topology	Transformerless
Ambient operating temperature range	-25°C. . . 60°C
Enclosure type	IP65
Noise emission (typical)	<30 dBA
Cooling concept	Intelligent Redundant
Max. operating altitude without derating	4000m
Designed lifetime	>20 years
Compliance	EN50438, G83/2, G59/3, AS4777.2:2015, VDE0126-1-1, IEC61727, VDE N4105
Operating surroundings humidity	0...100% Condensing
Connention	MC- mateable and OT Terminal connect
Display	LCD, 2×20 Z.
Interface	RS 485, WIFI/GPRS (optional)
Warranty Terms	5 Years STD (Extendable to 20 Years)