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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.

Solis Three Phase Inverter

(25~50kW) Installation and Operation Manual

Ver 1.3

Ginlong (Ningbo) Technologies Co., Ltd.

Contents

1.1 Product Description

Solis 5G three phase inverter is suitable for utility-scale PV projects .
Three phase 5G series contains 7 model which is listed below:
Solis-25K-5G, Solis-30K-5G, Solis-33K-5G, Solis-36K-5G,
Solis-40K-5G, Solis-40K-HV-5G, Solis-50K-HV-5G

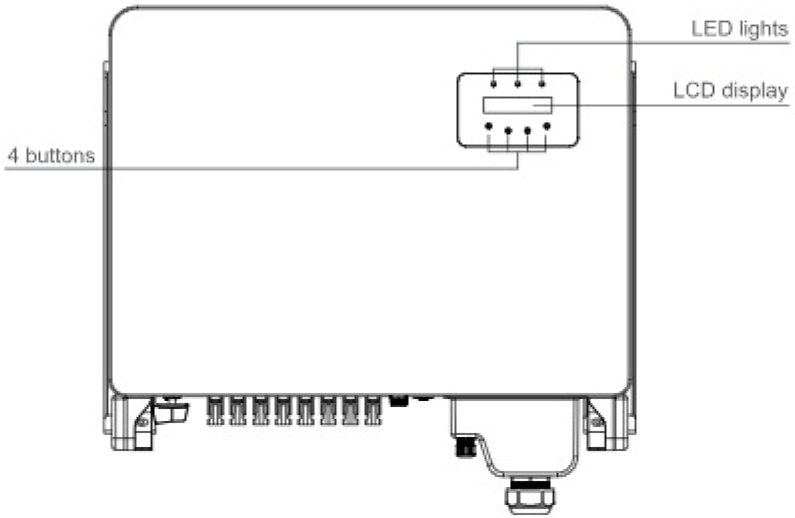


Figure 1.1 Front view

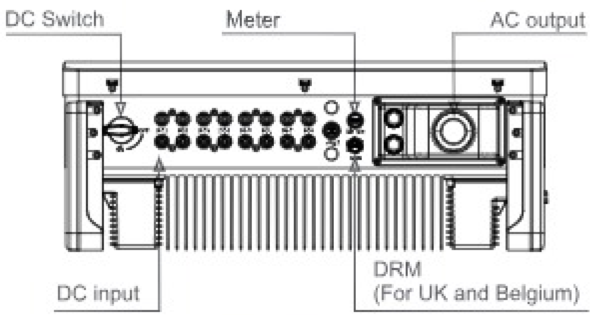
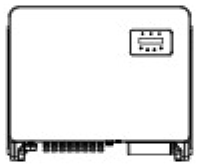


Figure 1.2 Bottom view

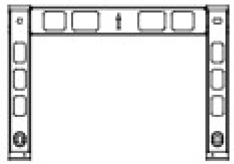
1. Introduction

1.2 Packaging

When you receive the inverter, please ensure that all the parts listed below are included:

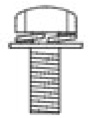


Inverter x1

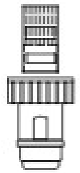


Back plate x1

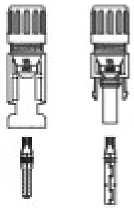
Cross screws x4



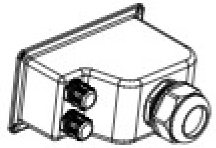
Hex screws x2



RJ45 connector x1
(For UK and Belgium)



DC connectors
(25-33)K x6, (36-50)K x8



AC terminal cover x1

User manual x1

If anything is missing, please contact your local Solis distributor.

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:
Please don't connect PV array positive(+) or negative(-) to ground, it could cause serious damage to the inverter.

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

WARNING:
To reduce the risk of fire, over-current protective devices (OCPD) are required for circuits connected to the Inverter.
The DC OCPD shall be installed per local requirements. All photovoltaic source and output circuit conductors shall have disconnects that comply with the NEC Article 690, Part II. All Solis three phase inverters feature an integrated DC switch.

CAUTION:
Risk of electric shock. Do not remove cover. There is no user serviceable parts inside. Refer servicing to qualified and accredited service technicians.

2. Safety Instructions

CAUTION:
The PV array (Solar panels) supplies a DC voltage when they are exposed to sunlight.

CAUTION:
Risk of electric shock from energy stored in capacitors of the Inverter.
Do not remove cover for 15 minutes after disconnecting all power sources (service technician only). Warranty may be voided if the cover is removed without unauthorized.

CAUTION:
The surface temperature of the inverter can exceed 75℃ (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 has been constructed according to the applicable safety and technical guidelines. Use the inverter in installations that meet the following specifications only:

1.Permanent installation is required.

2.The electrical installation must meet all the applicable regulations and standards.

3.The inverter must be installed according to the instructions stated in this manual.

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

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

3. Overview

3.1 Front Panel Display

Figure 3.1 Front Panel Display

3.2 LED Status Indicator Lights

	Light	Status	Description
①	POWER	ON	The inverter can detect DC power.
		OFF	No DC power or low DC power.
②	OPERATION	ON	The inverter is operating properly.
		OFF	The inverter has stopped to supply power.
		FLASHING	The inverter is initializing.
③	ALARM	ON	Alarm or fault condition is detected.
		OFF	The inverter is operating without fault or alarm.

Table 3.1 Status Indicator Lights

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 DOWN keys);
- Access to modify the adjustable settings (the ESC and ENTER keys).

3.4 LCD

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

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

4. Product handing and storage

4.1 Product handling

Please review the instruction below for handling the inverter:

1. The red circles below denote cutouts on the product package. Push in the cutouts to form handles for moving the inverter (see Figure 4.1).

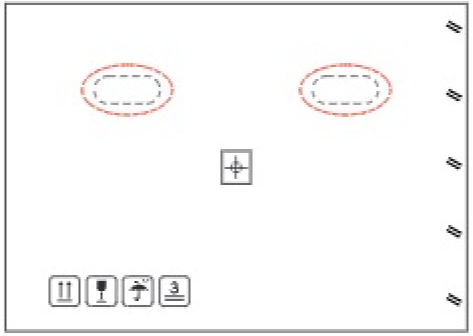


Figure 4.1 move the inverter

2. Open the carton, then two people handle both sides of inverter through the area denoted dotted line. (see figure 4.2).

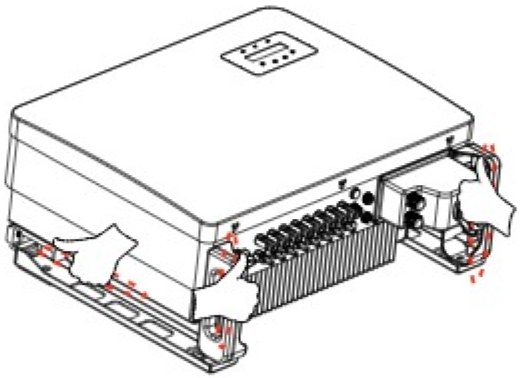


Figure 4.2 Inverter handles

NOTE:
Be careful to lift the inverter. The weight is around 45kg.

4. Product handing and storage

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 repackage 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℃ and 70℃ and the humidity should be between 0 and 100% non-condensing.
- Stack no more than three (3) 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), repackage 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

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

WARNING: Risk of fire

Despite careful construction, electrical devices can cause fires.

- Do not install the inverter in areas containing highly flammable materials or gases.
- Do not install the inverter in potentially explosive atmospheres.

- Do not install in small closed spaces where air can not circulate freely. To avoid overheating, always make sure the flow of air around the inverter is not blocked.
- Exposure to direct sunlight will increase the operational temperature of the inverter and may cause output power limiting. Ginlong recommends inverter installed to avoid direct sunlight or raining.
- To avoid over heating ambient air temperature must be considered when choosing the inverter installation location. Ginlong recommends using a sun shade minimizing direct sunlight when the ambient air temperature around the unit exceeds 104°F/40°C.

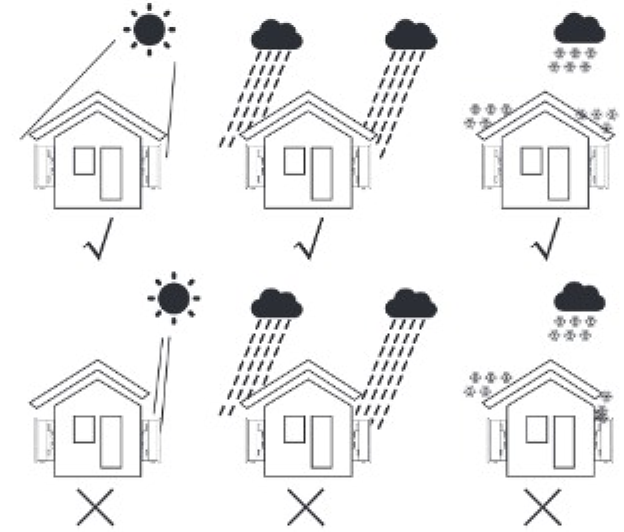
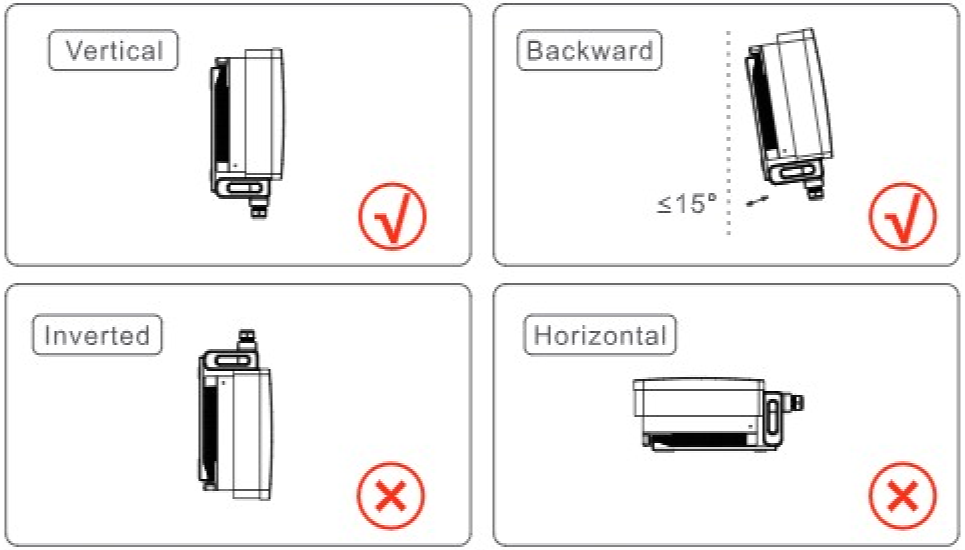


Figure 5.1 Recommended Installation locations

NOTE:

Nothing should be stored on or placed against the inverter.



- Install on a vertical surface or structure capable of bearing the weight.
- Please install the inverter vertically. If the inverter cannot be mounted vertically, it may be tilted backward to 15 degrees from vertical.
- For 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.
- Visibility of the LED status indicator lights and LCD display screen should be considered.

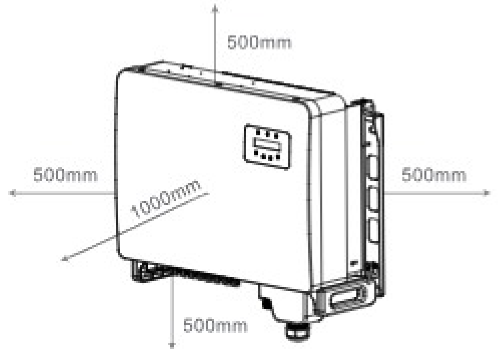


Figure 5.2 Inverter Mounting clearance

5.2 Mounting the Inverter

Back hanging plate size:

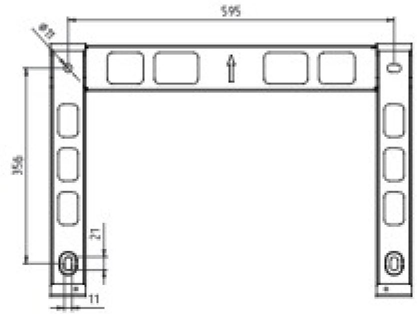


Figure 5.3 Inverter wall mounting

Refer to figure 5.4 and figure 5.5. Inverter shall be mounted vertically.
The steps to mount the inverter are listed below.

1. Refer to Figure 5.4, the holes for expansion bolt based on the hole diameter of bracket (M10*70) , using the percussion drilling with the 10mm drill need to stay vertically on the wall. And the drill hole must be vertically on the wall. And all drill holes' depth is 60mm.
2. Make sure the bracket is horizontal. And the mounting holes (in Figure 5.4) are marked correctly. Drill the holes into wall at your marks.
3. Use the suitable expansion screws to fix the bracket on the wall.

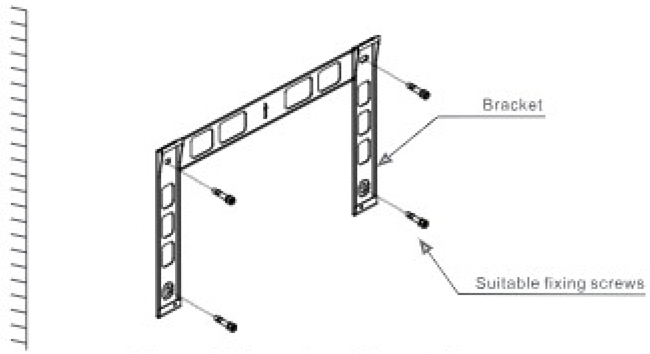


Figure 5.4 Inverter wall mounting

5. Installation

WARNING:
The inverter must be mounted vertically.

4. Lift the inverter and hang it on the bracket, and then slide down to make sure they match perfectly.

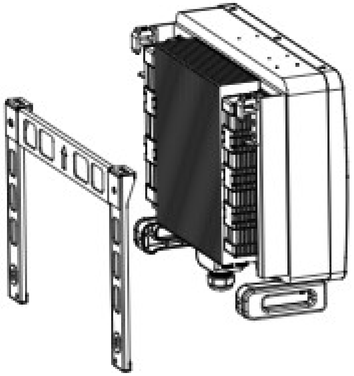


Figure 5.5 Install the inverter

5. If the installation position is high, the inverter cannot be directly mounted on the mounting plate, and the hoisting rope is hoisted through the two lifting holes.
(The rope needs to meet the load-bearing requirements of this product) .

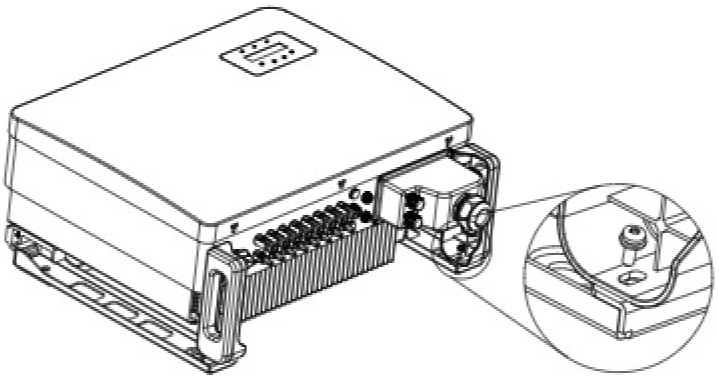


Figure 5.6

5.3 Electrical Connections

Inverter designs quick-connect terminal, so top cover needn't open during electrical connection. The sign meaning located the bottom of inverter, as shown below in table 3.1. All electrical connections are suit for the local or national standard.

DC 1 ~ DC 8	DC input terminal
ON	Switch on the DC switch
OFF	Switch off the DC switch
COM1	COM port for monitoring
METER	COM port for Meter
DRM	COM port for DRM

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.
2. Switch the DC Isolator OFF.
3. Connect the inverter to the grid.
4. Assemble PV input connector to the Inverter.

5.3.1 Grounding

Solis requires 2 ground protection methods: Through grid terminal connection and external heat sink connection.
When connect the AC terminal grounding cable, please refer to the contents of 5.3.3.
When connect the heat sink grounding cable, please follow the steps below:

1. Prepare the grounding cable: recommend to use the ≥ 16mm^2 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.

3. Strip the ground cable insulation to a suitable length(see Figure 5.12).

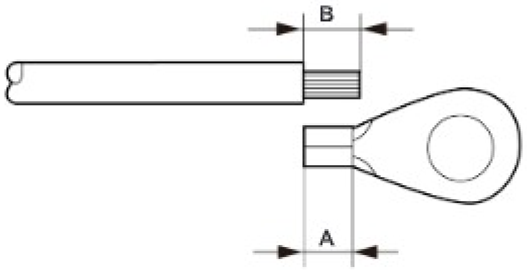


Figure 5.12 Suitable length

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 (see Figure 5.13).

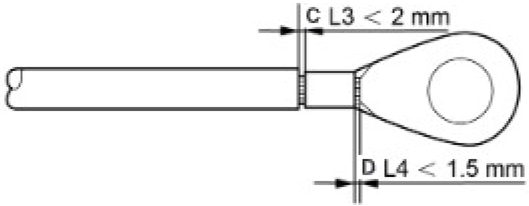


Figure 5.13 Strip wire

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

5. Installation

5. Remove the screw from the heat sink ground point.
6. Connect the grounding cable to the grounding point on the heat sink,and tighten the grounding screw, Torque is 3-4Nm(see figure 5.14).

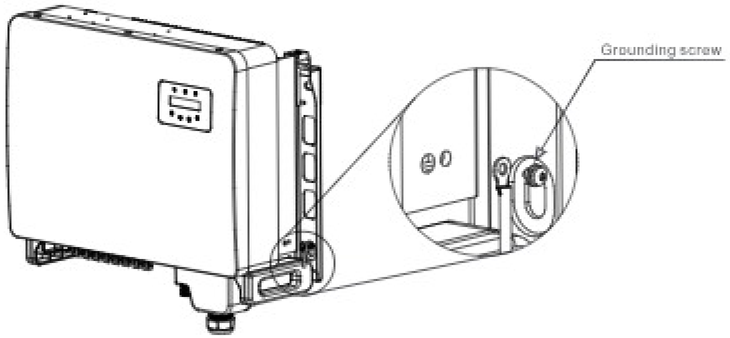


Figure 5.14 Fixed cable

Important:
For improving anti-corrosion performance,
after ground cable installed, apply silicone or paint is preferred to protect.

5.3.2 Connect PV side of inverter

Before connecting inverter, please make sure the PV array open circuit voltage is within the limit of the inverter.

Before connection, please make sure the polarity of the output voltage of PV array matches the “DC+” and “DC-” symbols.

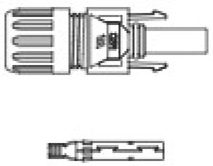


Figure 5.15 DC+ Connector

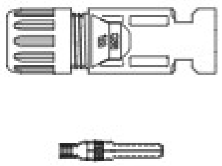


Figure 5.16 DC- Connector

Please use appropriate DC cable for PV system.

Cable type	Cross section（mm²）	
	Range	Recommended value
Industry generic PV cable (model:PV1-F)	4.0~6.0 (12~10AWG)	4.0（12AWG)

The steps to assemble the DC connectors are listed as follows:

1. Strip off the DC wire for about 7mm, Disassemble the connector cap nut. (see Figure 5.17)
2. Insert the wire into the connector cap nut and contact pin. (see Figure 5.18)
3. Crimp the contact pin to the wire using a proper wire crimper. (see Figure 5.19)
4. Insert metal connector into top of connector, and tighten nut with torque 3-4 Nm (see figure 5.20).

5. Installation

5. Measure PV voltage of DC input with multimeter, verify DC input cable polar (see figure 5.17), and ensure each string of PV voltage in range of inverter operation. Connect DC connector with inverter until hearing a slight clicking sound indicates connection succeed. (see figure 5.18)

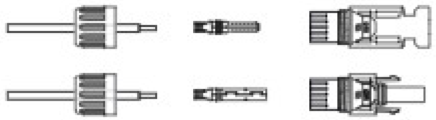


Figure 5.17 Disassemble the Connector Cap nut

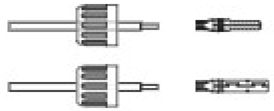


Figure 5.18 Insert the Wire into the Connector Cap nut and contact pin

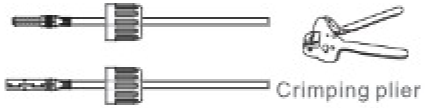


Figure 5.19 Crimp the contact pin to the wire

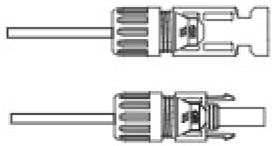


Figure 5.20 Connector with Cap nut Screwed on

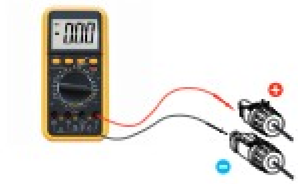


Figure 5.21 Multimeter measurement

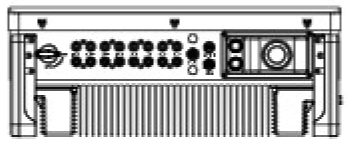


Figure 5.22 Connect the DC Connectors to the Inverter

Caution:
If DC inputs are accidently reversely connected or inverter is faulty or not working properly, it is NOT allowed to turn off the DC switch as it will damage the inverter and even leads to a fire disaster.
The correct actions are:
*Use a clip-on ammeter to measure the DC string current.
*If it is above 0.5A, please wait for the solar irradiance reduces until the current decreases to below 0.5A.
*Only after the current is below 0.5A, you are allowed to turn off the DC switches and disconnect the PV strings.
Please note that any damages due to wrong operations are not covered in the device warranty.

5. Installation

5.3.3 Connect grid side of inverter

For the AC connection, 10-35mm^2 cable is required to be used.
Please make sure the resistance of cable is lower than 1.5ohm.

Cable specification		Copper-cored cable
Traverse cross sectional area (mm^2)	Range	10~35
	Recommended	25
Cable outer diameter (mm)	Range	22~32
	Recommended	27

NOTE:
For reliable connection, recommend customer select corresponding Euro type connectors based on wiring specification to connect the terminal.

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

1. Strip the end of AC cable insulating jacket about 80mm then strip the end of each wire. (as shown in figure 5.23)

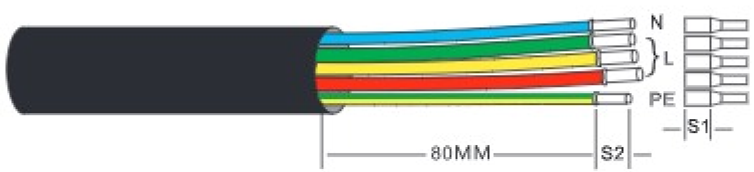


Figure 5.23 Strip AC cable

NOTE:
S2 (insulation stripping length) should be as long as S1
(AC terminal cable compression area).

2. Strip the insulation of the wire past the cable crimping area of the OT terminal, then use a hydraulic crimp tool to crimp the terminal. The crimped portion of the terminal must be insulated with heat shrinkable tube or insulating tape.
3. Leave the AC breaker disconnected to ensure it does not close unexpectedly.
4. Remove the 4 screws on the inverter junction box and remove the junction box cover .
5. Insert the cable through the nut, sheath, and AC terminal cover. Connect the cable to the AC terminal block in turn, using a socket wrench. Tighten the screws on the terminal block. The torque is 3~4Nm (as shown in Figure 5.24).

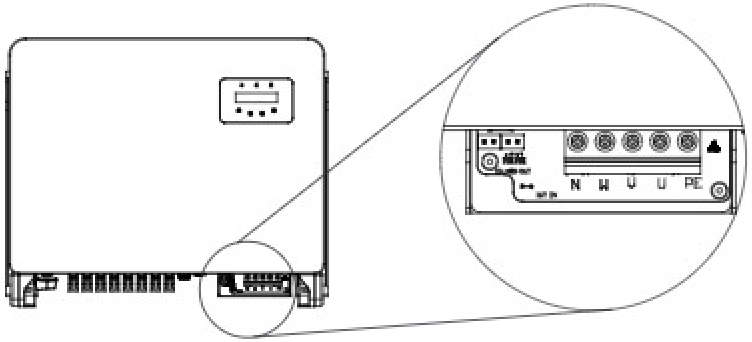


Figure 5.24 wiring

5.3.4 Inverter monitoring connection

The inverter can be monitored via Wi-Fi or GPRS. All Solis communication devices are optional (Figure 5.25). For connection instructions, please refer to the Solis Monitoring Device installation manuals.

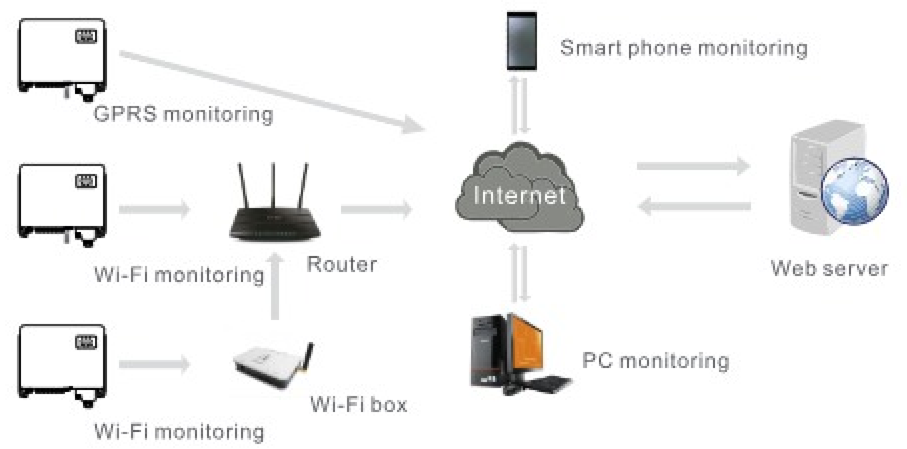


Figure 5.25 Wireless communication function

Monitoring system for multiple inverters

Multiple inverters can be monitored by RS-485 daisy chain configuration. (See figure 5.26).

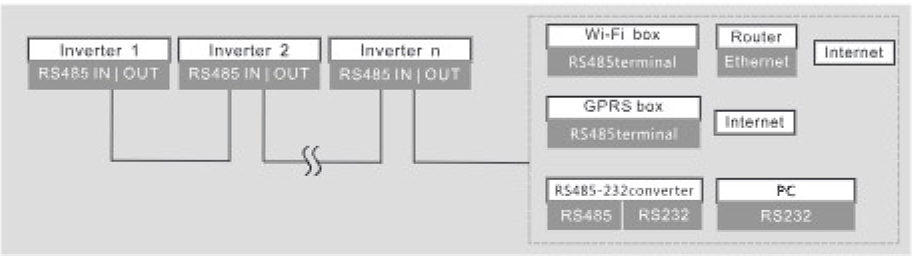


Figure 5.26 Multiple inverter monitoring system

5.3.4.1 RS485 Connection

Install the RS485 communication cables through the terminal block as shown in Figure 5.27. Recommended cable cross sectional area is 0.2 - 1.5mm², the cable outer diameter is 5mm -10mm, the cable length shall not exceed 3m.

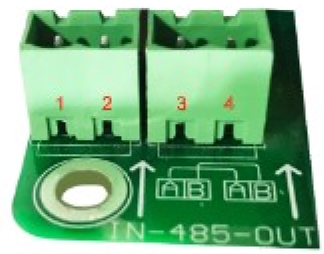


Figure 5.27 RS485 Terminal Definition

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 5.2 Port definition

Terminal block connection

a. Use a wire stripper to peel off the insulation layer of the communication cables to a certain length as shown in Figure 5.28.

b. Screw off the covers of "COM2" and "COM3" on the inverter as shown in Figure 5.29.

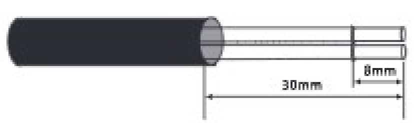


Figure 5.28

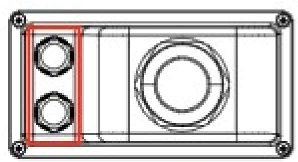


Figure 5.29

c. Insert the communication cables into the "COM2" and "COM3" ports.

d. Fasten the cables onto the pluggable terminals provided in the accessory package.

e. Match the pluggable terminals to the terminal block in the inverter and press to fasten it.

After cable installation, please remember to fasten the screws of the AC terminal cover in case of water damage.

5.3.5 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 25-50kW Three phase inverters.

Inverter	Rated voltage(V)	Rated output current (Amps)	Current for protection device (A)
Solis-25K-5G	380	36.0	50
Solis-30K-5G	380	43.3	63
Solis-33K-5G	380	47.6	63
Solis-36K-5G	380	51.9	80
Solis-40K-5G	380	57.7	80
Solis-40K-HV-5G	480	48.1	63
Solis-50K-HV-5G	480	60.1	80

Table 5.3 Rating of grid OCPD

5. Installation

5.3.6 Logic interface connection (For UK and Belgium)

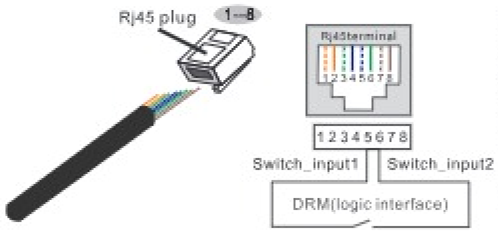
Logic interface is required by Logic interface is required by local regulations in UK and Belgium that can be operated by a simple switch or contactor. When the switch is closed the inverter can operated normally. When the switch is opened, the inverter will reduce it's output power to zero within 5s. Pin5 and Pin6 of RJ45 terminal is used for the logic interface connection.

Please follow below steps to assemble RJ45 connector.

1.Insert the network cable into the communication connection terminal of RJ45. (As shown in figure 5.30)

Figure 5.30 RJ45 communication connection terminals

2.Use the network wire stripper to strip the insulation layer of the communication cable. According to the standard line sequence of figure 5.31 connect the wire to the plug of RJ45, and then use a network cable crimping tool to make it tight.



Correspondence between the cables and the stitches of plug, Pin5 and Pin6 of RJ45 terminal is used for the logic interface, other Pins are reserved.

Pin 1: Reserved; Pin 2: Reserved

Pin 3: Reserved; Pin 4: Reserved

Pin 5: Switch_input1; Pin 6: Switch_input2

Pin 7: Reserved; Pin 8: Reserved

Figure 5.31 Strip the insulation layer and connect to RJ45 plug

3.Connect RJ45 to DRM (logic interface) .

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 initialize. 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 30-300 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. Turn off the ac switch.
2. Put the DC SWITCH on the inverter in the position of "OFF".

7. Operation

In normal operation, LCD screen alternatively shows inverter power and operation status (see Figure 7.1). The screen can be scrolled manually by pressing the UP/DOWN keys. Pressing the ENTER key gives access to Main Menu.

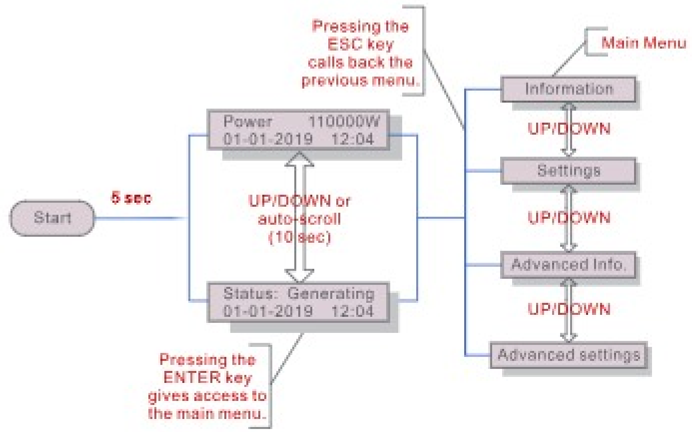


Figure 7.1 Operation Overview

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 three Phase 5G 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_DC01: 0000.0V I_DC01: 0000.0A	10 sec	V_DC01: Shows input DC voltage. I_DC01: Shows input DC current.
V_A: 000.0V I_A: 000.0A	10 sec	V_A: Shows the grid's voltage value. I_A: Shows the grid's current value.
V_C: 000.0V I_C: 000.0A	10 sec	V_C: Shows the grid's voltage value. I_C: Shows the grid's current value.
Status: Generating Power: 0000W	10 sec	Status: Shows instant status of the Inverter. Power: Shows instant output power value.
Rea_Power: 0000Var App_Power: 0000VA	10 sec	Rea_Power: Shows the reactive power of the inverter. App_Power: Shows the apparent power of the inverter.
Grid Frequency F_Grid 00.00Hz	10 sec	F_Grid: Shows the grid's frequency value.
Total Energy 0000000 kwh	10 sec	Total generated energy value.
This Month: 0000kwh Last Month: 0000kwh	10 sec	This Month: Total energy generated this month. Last Month: Total energy generated last month.
Today: 00.0kwh Yesterday: 00.0kwh	10 sec	Today: Total energy generated today. Yesterday: Total energy generated yesterday.
Inverter SN 00000000000000	10 sec	Display series number of the inverter.
Work Mode: NULL DRM NO.:08	10 sec	Work Mode: Shows current working mode. DRM NO.: Shows DRM Number.
I_PV01: +05.0A I_PV02: +04.9A ... I_PV08: +05.2A	10 sec	I_PV01 : Shows input 01 current value. I_PV02 : Shows input 02 current value. ... I_PV08 : Shows input 08 current value.

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.

NEXT=<ENT> OK=<ESC>
01-01-2019 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 three monitor. 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".

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

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 Records 8.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.

Alm000: OV-G-V
T: 00-00 00:00 D:0000

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.1,2,etc.
Screens can be scrolled manually by pressing the UP/DOWN keys.

7.4.3 Version

The screen shows the model version of the inverter. And the screen will show the software ver by pressing the UP and DOWN at the same time.(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: 2019-01-01

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.

2019-01-01: 051.3kWh
2019-01-01: 061.5kWh

Figure 7.9 Daily energy

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

7.4.5 Monthly Energy

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

YES=<ENT> NO=<ESC>
Select: 2019-01

Figure 7.10 Select month for monthly energy

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

2019-01: 0510kWh
2019-01: 0610kWh

Figure 7.11 Month energy

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

7.4.6 Yearly Energy

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

YES=<ENT> NO=<ESC>
Select: 2019

Figure 7.12 Select year for yearly energy

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

2018: 0017513kWh
2017: 0165879kWh

Figure 7.13 Yearly energy

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

7.4.7 Daily records

The screen shows history of changing settings. Only for maintance personel.

7.4.8 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

7.4.9 Warning Message

The display shows the 100 latest warn messages (see Figure 7.15). Screens can be scrolled manually by pressing the UP/ DOWN keys. Press the ESC key to return to the previous menu.

Msg000:
T: 00-00 00:00 D:0000

Figure 7.15 Warning Message

7. Operation

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 Update 11. External EPM set 12. Restart HMI
13. Debug Parameter 14.DSP Update 15.Compensation Set 16.I/V Curve

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:G59/3

Figure 7.16

Press the UP/DOWN keys to select the standard (G59/3, UL-480V, VDE0126, AS4777-15, AS4777-02, CQC380A, ENEL, UL-380V, MEX-CFE, C10/11 and "User-Def" function).
Press the ENTER key to confirm the setting.
Press the ESC key to cancel changes and returns to previous menu.

NOTE:
This function is for technicians use only.

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

→ OV-G-V1: 400V
OV-G-V1-T: 1.0S

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
Startup-T:10---600S	Restore-T:10---600S

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.

NOTE

For different countries, the grid standard needs to be set as different according to local requirements. If there is any doubt, please consult Solis service technicians for details.

7.5.2 Grid ON/OFF

This function is used to start up or stop the power generation of Solis Three Phase 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 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. Operation

7.5.4 Reset Password

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

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

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).

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, wrong operation will prevent the inverter from reaching maximum power.

7.5.8 STD Mode settings

There are 5 setting under STD. Mode settings.

1. Working Mode Set   2. Power Rate Limit   3. Freq Derate Set

4. 10mins Voltage Set   5.Power Priority   6.Initial Settings

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

7.5.9 Restore Settings

There are 5 items in initial setting submenu.

Restore setting could set all item in 7.5.7 special setting to default.

The screen shows as below:

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

Figure 7.21 Restore Settings

Press the Enter key to save the setting after setting grid off.

Press the ESC key to return the previous mean.

7.5.10 HMI Update

This function is used for updating the LCD program.

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

7.5.11 External EPM Set

This function is turned on when the EPM is external.

YES=<ENT> NO=<ESC>
Fail Safe Set:ON

Figure 7.22 Set the Fail Safe ON/OFF

7.5.12 Restart HMI

The function is used for restart the HMI.

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

7.5.13 Debug Parameter

This function is used for manufacturer maintenance personnel only.

7.5.14 DSP Update

The function is used for update the DSP.

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

7.5.15 Compensation Set

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

7. Operation

7.5.16 I/V Curve

This function is used to scan the I/V characteristic curves of each PV strings.

→ Set I/V Curve
I/V Curve Scan

Figure 7.23 I/V Curve

7.5.16.1 Set I/V Curve

This setting can set the scanning voltage start point and the voltage interval.

Start_V: 850V
Interval_V: 010V

Figure 7.24 Set I/V Curve

Start_V: The start voltage of the I/V scan. (Adjustable from 300V-1000V)
Interval_V: The scanning voltage interval.(Adjustable from 1-100V)
In total, 60 data points can be scanned.

7.5.16.2 I/V Curve Scan

Press "ENT" to start the I/V curve scan.

Scanning...01

Figure 7.25 I/V Curve Scan (1)

After it is completed, the screen will display "Scan OK" and then enter the following section.

Select String No.: 01

Figure 7.26 I/V Curve Scan (2)

01_850V: 9.56A
02_860V: 9.44A

Figure 7.27 I/V Curve Scan (3)

8. Maintenance

Solis Three Phase 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 6.2) and wait for a cool-down period before 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.

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. 3. 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.
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	
PV ISO-PRO 01/02	PV isolation protection	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.

9. Troubleshooting

Alarm Message	Failure description	Solution
ILeak-PRO 01/02/03/04	Leakage current protection	1. Check AC and DC connection. 2. Check inverter inside cable connection.
RelayChk-FAIL	Relay check fail	1. Restart inverter or contact installer.
DCinj-FAULT	High DC injection current	
Reve-DC	One of the DC string is reversely connected	1. Please check the inverters' PV string polarity, if there are strings reversely connected wait for the night when the solar irradiance is low and the PV string current down below 0.5A. Turn off the two DC switchs and fix the polarity issue.
Screen OFF with DC applied	Inverter internally damaged	1.Do not turn off the DC switches as it will damage the inverter. 2.Please wait for the solar irradiance reduces and confirm the string current is less than 0.5A with a clip-on ammeter and then turn off the DC switches. 3.Please note that any damages due to wrong operations are not covered in the device warranty.

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 15 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 Solis Three Phase Inverter;
2. The distributor/dealer of Solis Three 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 6.2) 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.

Model	Solis-25K-5G
Max. DC input power (Watts)	33000
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	600
Start-up voltage (Volts)	180
MPPT voltage range (Volts)	200...1000
Max. input current (Amps)	26+26+26
Max short circuit input current (Amps)	40+40+40
MPPT number/Max input strings number	3/6
Rated output power (Watts)	25000
Max. output power (Watts)	27500
Max. apparent output power (VA)	27500
Rated grid voltage (Volts)	3/N/PE~400
Rated output current (Amps)	36.0
Power Factor (at rated output power)	0.8leading~0.8lagging
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...62
Max.efficiency	98.8%
EU efficiency	98.3%
MPPT efficiency	>99.5%
Dimensions (W*H*D)	647*629*252 (mm)
Weight	45kg
Topology	Transformerless
Operating ambient temperature range	-25℃. . . +60℃
Ingress protection	IP65
Noise emission (typical)	< 30 dB(A)
Cooling concept	Natural convection
Max.operation altitude	4000m
Designed lifetime	>20 years
Compliance	VDE-AR-N 4105, VDE V 0124, C10/11 VDE V 0126-1-1, UTE C15-712-1, NRS 097-1-2, G98, G99, EN 50549-1/-2, IEC61727, DEWA
Operating surroundings humidity	0...100% Condensing
Connention	MC4 connector
Display	LCD, 2×20 Z.
Communication connections	RS485/Ethernet
Monitoring	WiFi or GPRS
Warranty Terms	5 years standard (extend to 20 years)

Model	Solis-30K-5G
Max. DC input power (Watts)	39000
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	600
Start-up voltage (Volts)	180
MPPT voltage range (Volts)	200...1000
Max. input current (Amps)	26+26+26
Max short circuit input current (Amps)	40+40+40
MPPT number/Max input strings number	3/6
Rated output power (Watts)	30000
Max. output power (Watts)	33000
Max. apparent output power (VA)	33000
Rated grid voltage (Volts)	3/N/PE~400
Rated output current (Amps)	43.3
Power Factor (at rated output power)	0.8leading~0.8lagging
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...62
Max.efficiency	98.8%
EU efficiency	98.3%
MPPT efficiency	>99.5%
Dimensions (W*H*D)	647*629*252 (mm)
Weight	45kg
Topology	Transformerless
Operating ambient temperature range	-25℃. . . +60℃
Ingress protection	IP65
Noise emission (typical)	< 30 dB(A)
Cooling concept	Natural convection
Max.operation altitude	4000m
Designed lifetime	>20 years
Compliance	VDE-AR-N 4105, VDE V 0124, C10/11 VDE V 0126-1-1, UTE C15-712-1, NRS 097-1-2, G98, G99, EN 50549-1/-2, IEC61727, DEWA
Operating surroundings humidity	0...100% Condensing
Connention	MC4 connector
Display	LCD, 2×20 Z.
Communication connections	RS485/Ethernet
Monitoring	WiFi or GPRS
Warranty Terms	5 years standard (extend to 20 years)

Model	Solis-33K-5G
Max. DC input power (Watts)	43000
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	600
Start-up voltage (Volts)	180
MPPT voltage range (Volts)	200...1000
Max. input current (Amps)	26+26+26
Max short circuit input current (Amps)	40+40+40
MPPT number/Max input strings number	3/6
Rated output power (Watts)	33000
Max. output power (Watts)	36300
Max. apparent output power (VA)	36300
Rated grid voltage (Volts)	3/N/PE~400
Rated output current (Amps)	47.6
Power Factor (at rated output power)	0.8leading~0.8lagging
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...62
Max.efficiency	98.8%
EU efficiency	98.3%
MPPT efficiency	> 99.5%
Dimensions (W*H*D)	647*629*252 (mm)
Weight	45kg
Topology	Transformerless
Operating ambient temperature range	-25℃. . . +60℃
Ingress protection	IP65
Noise emission (typical)	< 30 dB(A)
Cooling concept	Natural convection
Max.operation altitude	4000m
Designed lifetime	>20 years
Compliance	VDE-AR-N 4105, VDE V 0124, C10/11 VDE V 0126-1-1, UTE C15-712-1, NRS 097-1-2, G98, G99, EN 50549-1/-2, IEC61727, DEWA
Operating surroundings humidity	0...100% Condensing
Connention	MC4 connector
Display	LCD, 2×20 Z.
Communication connections	RS485/Ethernet
Monitoring	WiFi or GPRS
Warranty Terms	5 years standard (extend to 20 years)

Model	Solis-36K-5G
Max. DC input power (Watts)	47000
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	600
Start-up voltage (Volts)	180
MPPT voltage range (Volts)	200...1000
Max. input current (Amps)	26+26+26+26
Max short circuit input current (Amps)	40+40+40+40
MPPT number/Max input strings number	4/8
Rated output power (Watts)	36000
Max. output power (Watts)	39600
Max. apparent output power (VA)	39600
Rated grid voltage (Volts)	3/N/PE~400
Rated output current (Amps)	51.9
Power Factor (at rated output power)	0.8leading~0.8lagging
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...62
Max.efficiency	98.8%
EU efficiency	98.3%
MPPT efficiency	> 99.5%
Dimensions (W*H*D)	647*629*252 (mm)
Weight	45kg
Topology	Transformerless
Operating ambient temperature range	-25℃. . . +60℃
Ingress protection	IP65
Noise emission (typical)	< 30 dB(A)
Cooling concept	Natural convection
Max.operation altitude	4000m
Designed lifetime	>20 years
Compliance	VDE-AR-N 4105, VDE V 0124, C10/11 VDE V 0126-1-1, UTE C15-712-1, NRS 097-1-2, G98, G99, EN 50549-1/-2, IEC61727, DEWA
Operating surroundings humidity	0...100% Condensing
Connention	MC4 connector
Display	LCD, 2×20 Z.
Communication connections	RS485/Ethernet
Monitoring	WiFi or GPRS
Warranty Terms	5 years standard (extend to 20 years)

Model	Solis-40K-5G
Max. DC input power (Watts)	52000
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	600
Start-up voltage (Volts)	180
MPPT voltage range (Volts)	200...1000
Max. input current (Amps)	26+26+26+26
Max short circuit input current (Amps)	40+40+40+40
MPPT number/Max input strings number	4/8
Rated output power (Watts)	40000
Max. output power (Watts)	44000
Max. apparent output power (VA)	44000
Rated grid voltage (Volts)	3/N/PE~400
Rated output current (Amps)	57.7
Power Factor (at rated output power)	0.8leading~0.8lagging
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...62
Max.efficiency	98.8%
EU efficiency	98.3%
MPPT efficiency	> 99.5%
Dimensions (W*H*D)	647*629*252 (mm)
Weight	45kg
Topology	Transformerless
Operating ambient temperature range	-25℃. . . +60℃
Ingress protection	IP65
Noise emission (typical)	< 30 dB(A)
Cooling concept	Natural convection
Max.operation altitude	4000m
Designed lifetime	>20 years
Compliance	VDE-AR-N 4105, VDE V 0124, C10/11 VDE V 0126-1-1, UTE C15-712-1, NRS 097-1-2, G98, G99, EN 50549-1/-2, IEC61727, DEWA
Operating surroundings humidity	0...100% Condensing
Connention	MC4 connector
Display	LCD, 2×20 Z.
Communication connections	RS485/Ethernet
Monitoring	WiFi or GPRS
Warranty Terms	5 years standard (extend to 20 years)

Model	Solis-40K-HV-5G
Max. DC input power (Watts)	52000
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	600
Start-up voltage (Volts)	180
MPPT voltage range (Volts)	200...1000
Max. input current (Amps)	26+26+26+26
Max short circuit input current (Amps)	40+40+40+40
MPPT number/Max input strings number	4/8
Rated output power (Watts)	40000
Max. output power (Watts)	44000
Max. apparent output power (VA)	44000
Rated grid voltage (Volts)	3/N/PE~480
Rated output current (Amps)	48.1
Power Factor (at rated output power)	0.8leading~0.8lagging
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...62
Max.efficiency	98.8%
EU efficiency	98.3%
MPPT efficiency	> 99.5%
Dimensions (W*H*D)	647*629*252 (mm)
Weight	45kg
Topology	Transformerless
Operating ambient temperature range	-25℃. . . +60℃
Ingress protection	IP65
Noise emission (typical)	< 30 dB(A)
Cooling concept	Natural convection
Max.operation altitude	4000m
Designed lifetime	>20 years
Compliance	VDE-AR-N 4105, VDE V 0124, C10/11 VDE V 0126-1-1, UTE C15-712-1, NRS 097-1-2, G98, G99, EN 50549-1/-2, IEC61727, DEWA
Operating surroundings humidity	0...100% Condensing
Connention	MC4 connector
Display	LCD, 2×20 Z.
Communication connections	RS485/Ethernet
Monitoring	WiFi or GPRS
Warranty Terms	5 years standard (extend to 20 years)

10. Specifications

Model	Solis-50K-HV-5G
Max. DC input power (Watts)	65000
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	600
Start-up voltage (Volts)	180
MPPT voltage range (Volts)	200...1000
Max. input current (Amps)	26+26+26+26
Max short circuit input current (Amps)	40+40+40+40
MPPT number/Max input strings number	4/8
Rated output power (Watts)	50000
Max. output power (Watts)	55000
Max. apparent output power (VA)	55000
Rated grid voltage (Volts)	3/N/PE~480
Rated output current (Amps)	60.1
Power Factor (at rated output power)	0.8leading~0.8lagging
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	50/60
Operating frequency range (Hertz)	47...62
Max.efficiency	98.8%
EU efficiency	98.3%
MPPT efficiency	> 99.5%
Dimensions (W*H*D)	647*629*252 (mm)
Weight	45kg
Topology	Transformerless
Operating ambient temperature range	-25℃. . . +60℃
Ingress protection	IP65
Noise emission (typical)	< 30 dB(A)
Cooling concept	Natural convection
Max.operation altitude	4000m
Designed lifetime	>20 years
Compliance	VDE-AR-N 4105, VDE V 0124, C10/11 VDE V 0126-1-1, UTE C15-712-1, NRS 097-1-2, G98, G99, EN 50549-1/-2, IEC61727, DEWA
Operating surroundings humidity	0...100% Condensing
Connention	MC4 connector
Display	LCD, 2×20 Z.
Communication connections	RS485/Ethernet
Monitoring	WiFi or GPRS
Warranty Terms	5 years standard (extend to 20 years)