



# Solis Three Phase Inverter

(50-125)K **Installation and Operation Manual**

(For Mexico)

Ver 1.0

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

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.



Comply with CA Rule 21/  
Certified to UL 1741 SA

Ginlong Technologies Co., Ltd.

# Contents

1. Introduction	4
1.1 Product Description	4
1.2 Unpacking and storage	5
1.3 Storage	6
1.4 Notice for Disposal	6
2. Safety instructions	7
2.1 Safety symbols	7
2.2 General safety instructions	7
2.3 Notice for use	8
2.4 Protection Circuitry and Controls	8
3. Installation	9
3.1 Environmental considerations	9
3.1.1 Select a location for the inverter	9
3.1.2 Installation environment requirements	11
3.2 Product handling	11
3.3 Mounting the Inverter	12
3.3.1 Wall mounting	13
3.3.2 Rack mounting	14
3.4 Electrical Connections	17
3.4.1 Grounding	18
3.4.2 Connect PV side of inverter	20
3.4.3 Connect grid side of inverter	22
3.4.4 Meter Connection(optional)	26
4. Communication & Monitoring	28
4.1 RS485 and PLC communication connection	28
4.2 Logic interface connection	30
5. Commissioning	31
5.1 Selecting the appropriate grid standard	31
5.1.1 Verifying grid standard for country of installation	31
5.2 Changing the grid standard	31
5.2.1 Procedure to set the grid standard	31
5.3 Setting a custom grid standard	32
5.4 Preliminary checks	33
5.4.1 DC Connections	33
5.4.2 AC Connections	33
5.4.3 DC configuration	33
5.4.4 AC configuration	34
6. Start and Shutdown	35
6.1 Start-up procedure	35
6.2 Shutdown procedure	35
7. Normal operation	36
7.1 Main Menu	36

# Contents

7.2 Information	36
7.2.1 Lock screen	38
7.3 Settings	38
7.3.1 Set Time	38
7.3.2 Set Address	38
7.4 Advanced Info - Technicians Only	39
7.4.1 Alarm Message	39
7.4.2 Running Message	39
7.4.3 Version	40
7.4.4 Daily Energy	40
7.4.5 Monthly Energy	40
7.4.6 Yearly Energy	41
7.4.7 Daily Records	41
7.4.8 Communication Data	41
7.4.9 Warning Message	41
7.5 Advanced Settings - Technicians Only	42
7.5.1 Selecting Standard	42
7.5.2 Grid ON/OFF	44
7.5.3 Clear Energy	44
7.5.4 Reset Password	44
7.5.5 Power control	44
7.5.6 Calibrate Energy	45
7.5.7 Special Settings	45
7.5.8 STD Mode settings	45
7.5.9 Restore Settings	56
7.5.10 HMI Update	56
7.5.11 Internal EPM Set	57
7.5.11 External EPM Set	59
7.5.12 Restart HMI	59
7.5.13 Debug Parameter	60
7.5.14 Fan Test	60
7.5.15 DSP Update	61
7.5.16 Compensation Set	61
7.5.17 I/V Curve	62
7.6 AFCI function	63
7.6.1 Enable the AFCI function	63
7.6.2 Arc Fault	63
8. Maintenance	64
8.1 Anti-PID Function	64
8.2 Fan Maintenance	65
9. Troubleshooting	66
10. Specifications	70

# 1. Introduction

## 1.1 Product Description

Solis Three phase Inverters convert DC power from the photovoltaic(PV) array into alternating current(AC) power that can satisfy local loads as well as feed the power distribution grid.

This manual covers the three phase inverter model listed below:

**Solis-124K-HV-5G, Solis-125K-HV-5G, Solis-50K-LV-5G, Solis-60K-LV-5G, S5-GC124K-HV, S5-GC125K-HV, S5-GC50K-LV, S5-GC60K-LV**

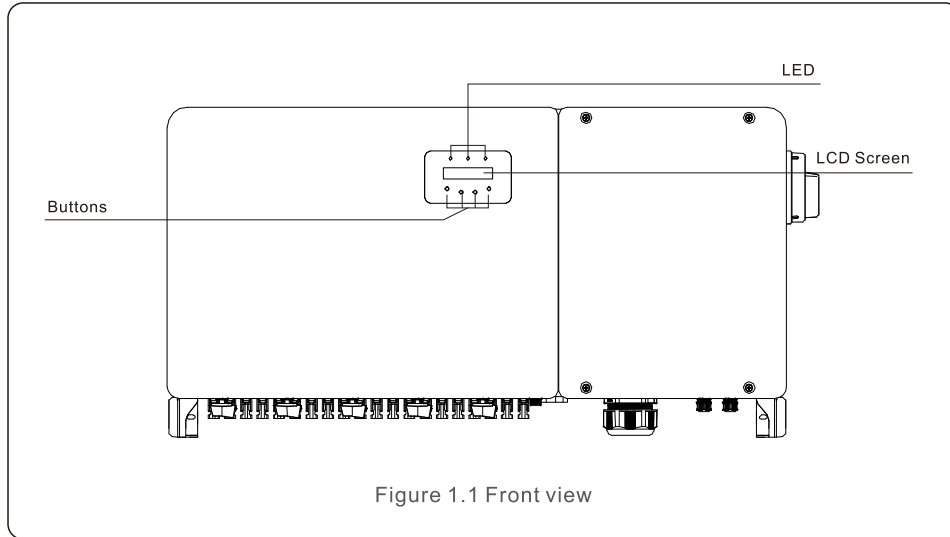


Figure 1.1 Front view

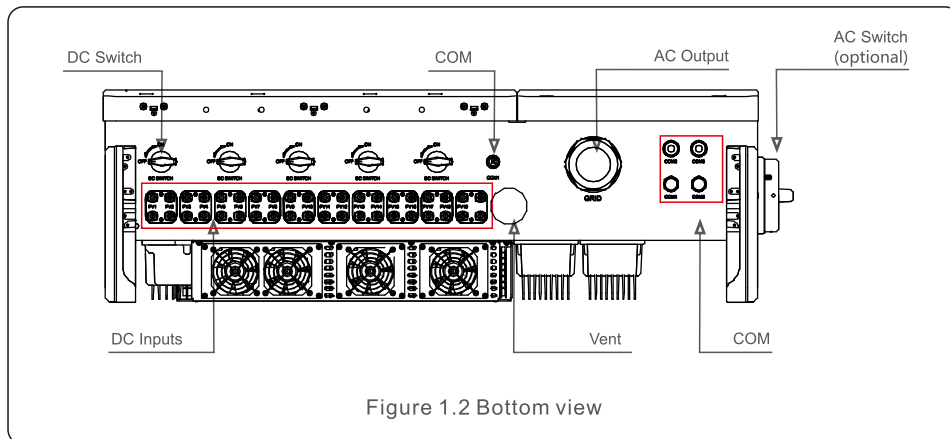


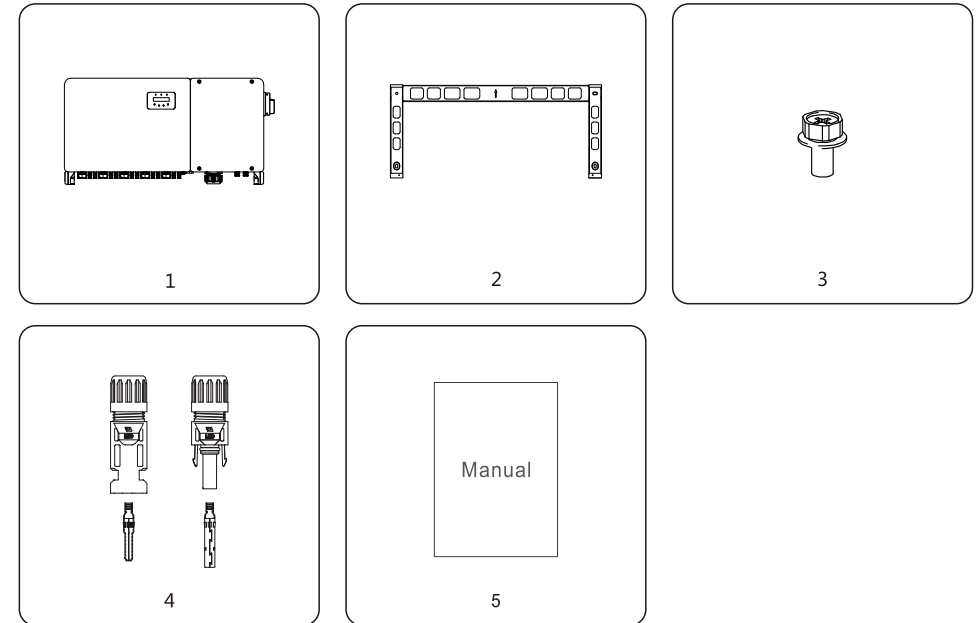
Figure 1.2 Bottom view

# 1. Introduction

## 1.2 Unpacking and storage

The inverter ships with all accessories in one carton.

When unpacking, please verify all the parts listed below are included:



Part #	Description	Number	Remarks
1	Inverter	1	
2	Mounting Bracket	1	
3	Fastening screw	2	Hexagon bolt M6*12
4	DC connector	12, 16, 20	50K-LV x12 60K-LV x16 (124-125)K x20
5	User manual	1	

Inverter packing list

# 1. Introduction

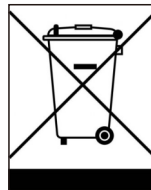
## 1.3 Storage

If the inverter is not 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 in a clean and dry place, free of dust and dirt. The storage temperature must be between -40 - 70°C and humidity should be between 0 to 95%, non-condensing.
- Do not stack more than four (4) inverters high on a single pallet.
- Keep the box(es) away from corrosive materials to avoid damage to the inverter enclosure.
- Inspect the packaging regularly. If packing is damaged (wet, pest damages, etc.), repackage the inverter immediately.
- Store inverters on a flat, hard surface -- not inclined or upside down.
- After 100 days of storage, the inverter and carton must be inspected for physical damage before installing. If stored for more than 1 year, the inverter needs to be fully examined and tested by qualified service or electrical personnel before using.
- Restarting after a long period of non-use requires the equipment be inspected and, in some cases, the removal of oxidation and dust that has settled inside the equipment will be required.

## 1.4 Notice for Disposal

This product shall not be disposed of with household waste. They should be segregated and brought to an appropriate collection point to enable recycling and avoid potential impacts on the environment and human health. Local rules in waste management shall be respected .



# 2. Safety Instructions

Improper use may result in electric shock hazards or burns. This product manual contains important instructions that are required to be followed during installation and maintenance. Please read these instructions carefully before use and keep them in an easily locatable place for future reference.

## 2.1 Safety symbols

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



### WARNING

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



### NOTE

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



### CAUTION, RISK OF ELECTRIC SHOCK

Symbol indicates important safety instructions, which if not correctly followed, could result in electric shock



### CAUTION, HOT SURFACE

Symbol indicates safety instructions, which if not correctly followed, could result in burns.

## 2.2 General safety instructions



### WARNING

Do not connect PV array positive (+) or negative (-) to ground – doing so could cause serious damage to the inverter.



### WARNING

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



### WARNING

To reduce the risk of fire, branch circuit over-current protective devices (OCPD) are required for circuits connected to the Inverter.



### CAUTION

The PV array (solar panels) supplies a DC voltage when exposed to light.

## 2. Safety Instructions



### CAUTION

Risk of electric shock from energy stored in the inverter's capacitors. Do not remove cover until five (5) minutes after disconnecting all sources of supply have passed, and this can only be done by a service technician. The warranty may be voided if any unauthorized removal of cover occurs.



### CAUTION

The inverter's surface temperature can reach up to 167°F (75°C). To avoid risk of burns, do not touch the surface when the inverter is operating. Inverter must be installed out of the reach of children.



### WARNING

The inverter can only accept a PV array as a DC input. Using any other type of DC source could damage the inverter.

### 2.3 Notice for use

The inverter has been constructed according to applicable safety and technical guidelines. Use the inverter in installations that meet the following requirements ONLY:

- 1). The inverter must be permanently installed.
- 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 system design must meet inverter specifications.
- 5). The inverter can only be used for industrial.

To start-up the inverter, the Grid Supply Main Switch (AC) must be turned on, BEFORE the DC Switch is turned on. To stop the inverter, the Grid Supply Main Switch (AC) must be turned off before the DC Switch is turned off.

### 2.4 Protection Circuitry and Controls

To meet relevant codes and standards, the Solis three phase inverter line is equipped with protective circuitry and controls.

#### Anti-Islanding Protection:

Islanding is a condition where the inverter continues to produce power even when the grid is not present. Circuitry, along with firmware, has been designed to determine if the grid is present by adjusting the output frequency of the inverter. In the case of a 60Hz resonant system where the inverter is partially isolated from the grid, the inverter programming can detect if there is a resonant condition or if the grid is actually present. It can also differentiate between inverters operating in parallel and the grid.

## 3. Installation

### 3.1 Environmental considerations

#### 3.1.1 Select a location for the inverter

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



### 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.

- The temperature of the inverter heat-sink can reach 167°F (75°C).
- The inverter is designed to work in an ambient temperature range between -13°F to 140°F (-25 - 60°C).
- If multiple inverters are installed on site, a minimum clearance of 20 inches should be kept between each inverter and all other mounted equipment. The bottom of the inverter should be at least 20 inches above of the ground or floor (see Figure 3.1).
- The LED status indicator lights and the LCD located on the inverter's front panel should not be blocked.
- Adequate ventilation must be present if the inverter is to be installed in a confined space.

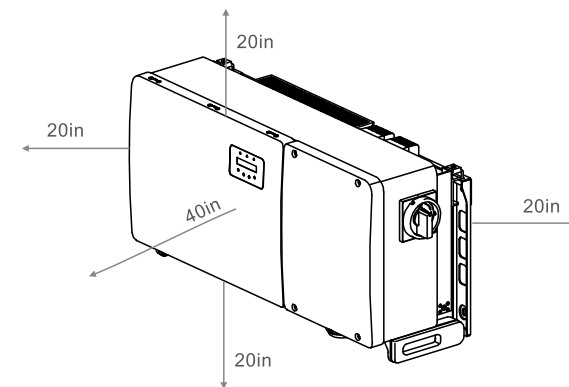


Figure 3.1 Distances required between inverters



### NOTE

Nothing should be stored on or placed against the inverter.

## 3.1.1.1 Examples of correct and incorrect installations

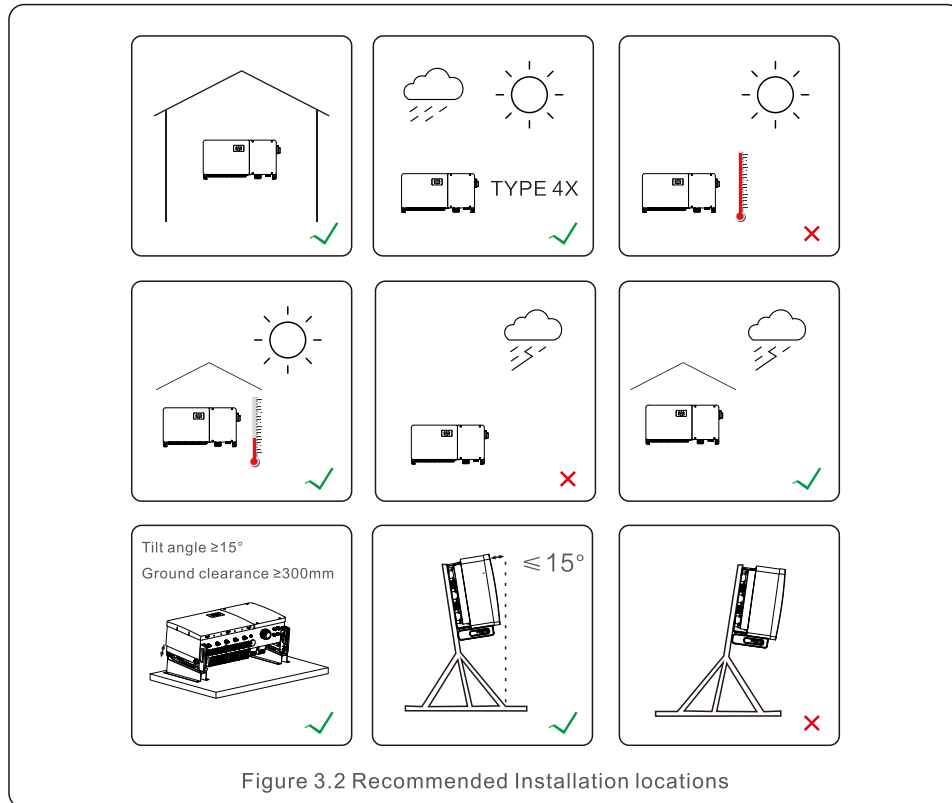


Figure 3.2 Recommended Installation locations

### 3.1.1.1 Wall and Framework Installation

- The installation of the inverter needs to consider the local weather conditions, and take measures such as rain and snow protection if necessary.
- The installation angle between inverter and wall should be less than 15°.
- Please ensure the distance between the waterproof joint and the installed roof is greater than the local maximum snow thickness. The distance should be larger than the 300mm.
- Bind and fix the cables 300~350mm away from the DC and AC terminals, communication waterproof connectors to prevent the cables from sagging and causing the waterproof connectors to loosen.

## 3.1.2 Installation environment requirements

### • Avoid Direct Sunlight

Installation of the inverter in a location exposed to direct sunlight should be avoided. Direct exposure to sunlight could cause: Inverter temperature rises. Output power limitation (Leads to a reduction of system generation).

### • Please ensure the ventilation and well heat dissipation

Do not install the inverter in a small, closed room where air cannot freely circulate. To prevent overheating, please ensure that the air flow around the inverter is not blocked.

### • Do not install the inverter near flammable substances

Do not install the inverter near flammable substances. Please ensure the distance between inverter and those flammable objects is larger than 3 meters.

### • Avoid installation in living areas

Do not install the inverter in the living area where the prolonged presences of people or animals are expected. There may be produced some noises when the inverter is operating, so a living area installation is not recommended.

Regarding other environment conditions, (for example: Ingress Protection, Temperature, Humidity, and Altitude, etc.), please refer to 10 Specification Part.

## 3.2 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 3.3).

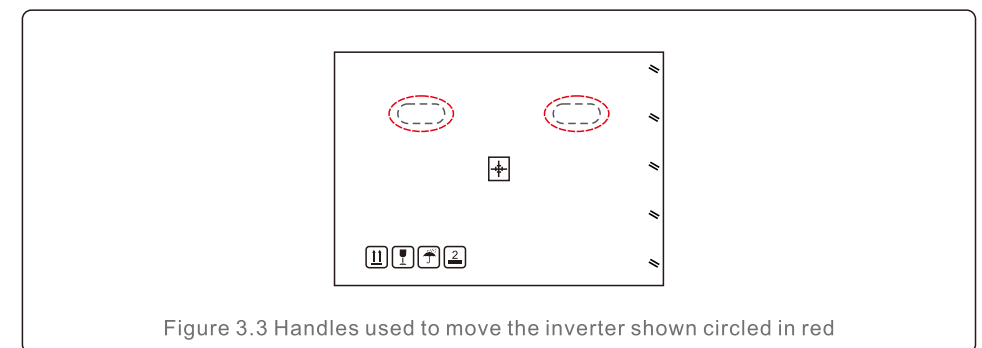


Figure 3.3 Handles used to move the inverter shown circled in red

2. Two people are required to remove the inverter from the shipping box. Use the handles integrated into the heat sink to remove the inverter from the carton (see Figure 3.4).

# 3. Installation

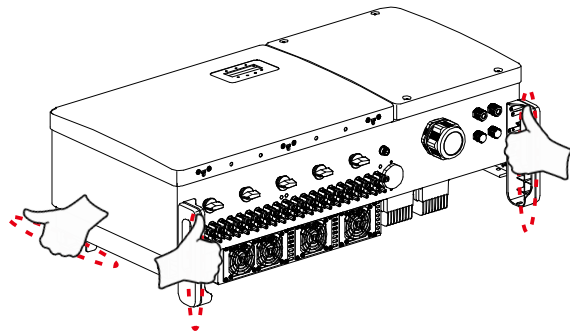


Figure 3.4 Inverter handles



### WARNING

Due to the weight of the inverter, contusions or bone fractures could occur when incorrectly lifting and mounting the inverter. When mounting the inverter, take the weight of the inverter into consideration. Use a suitable lifting technique when mounting.

## 3.3 Mounting the Inverter

The inverter can be mounted to the wall or metal array racking. The mounting holes should be consistent with the size of the bracket or the dimensions shown in Figure 3.5.

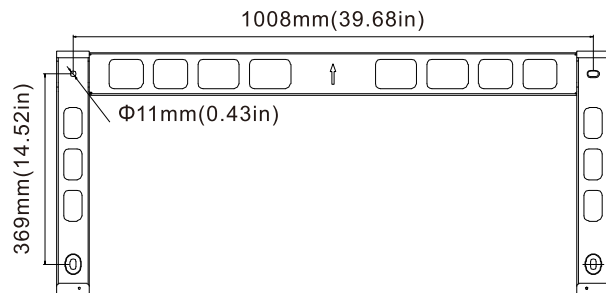


Figure 3.5 Inverter wall mounting

# 3. Installation

## 3.3.1 Wall mounting

Refer to figure 3.6 and figure 3.7 Inverter shall be mounted vertically.

The steps to mount the inverter are listed below.

1. Refer to Figure 3.6, drill holes for mounting screws based on the hole diameter of bracket using a precision drill keeping the drill perpendicular to the wall. Max depth is 3.54in.
2. Make sure the bracket is horizontal. And the mounting holes (in Figure 3.6) are marked correctly. Drill the holes into wall at your marks.
3. Use the suitable mounting screws to attach the bracket on the wall.

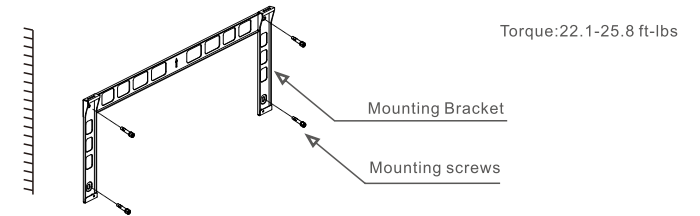


Figure 3.6 Inverter wall mounting

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

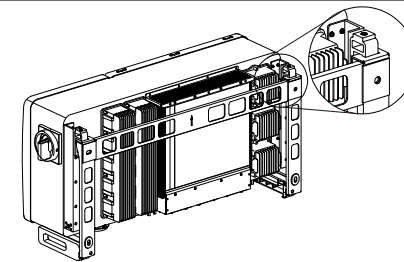


Figure 3.7 Install the inverter

5. Use screws in the packaging to fix the inverter to the mount bracket.

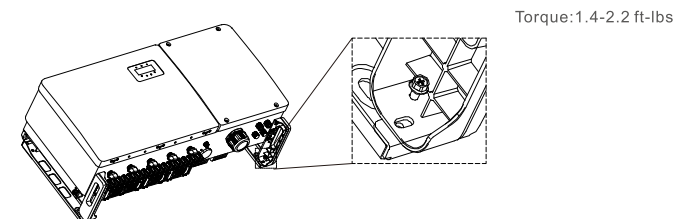


Figure 3.8 Fix the inverter

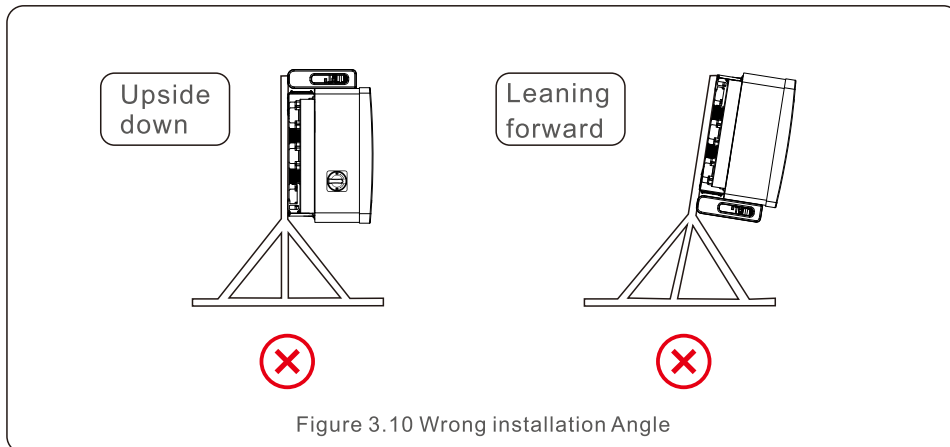
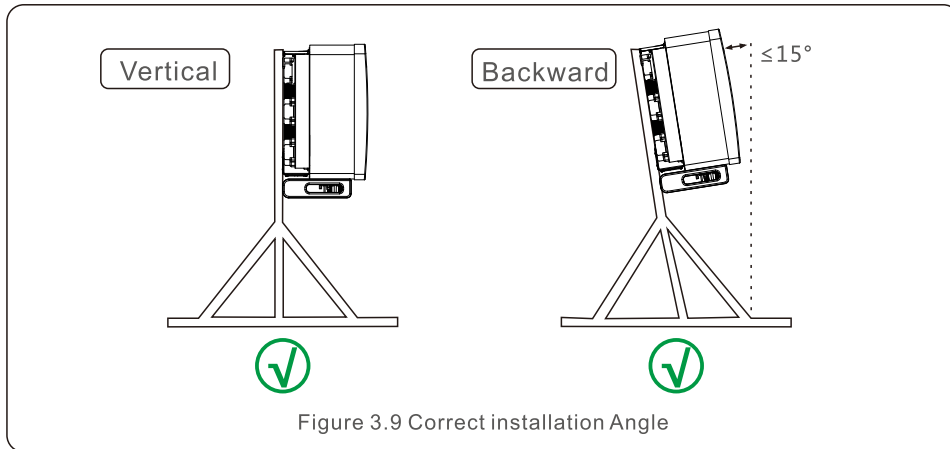
# 3. Installation

## 3.3.2 Rack mounting

The steps to mounted to the rack are listed below:

1. Select a location for the inverter
  - With an TYPE4X protection rating, the inverter can be installed both outdoors and indoors.
  - When the inverter is running, the temperature of the chassis and heat sink will be higher. Do not install the inverter in a location that you accidentally touch.
  - Do not install the inverter in a place where it is stored in a flammable or explosive material.
2. Installation angle

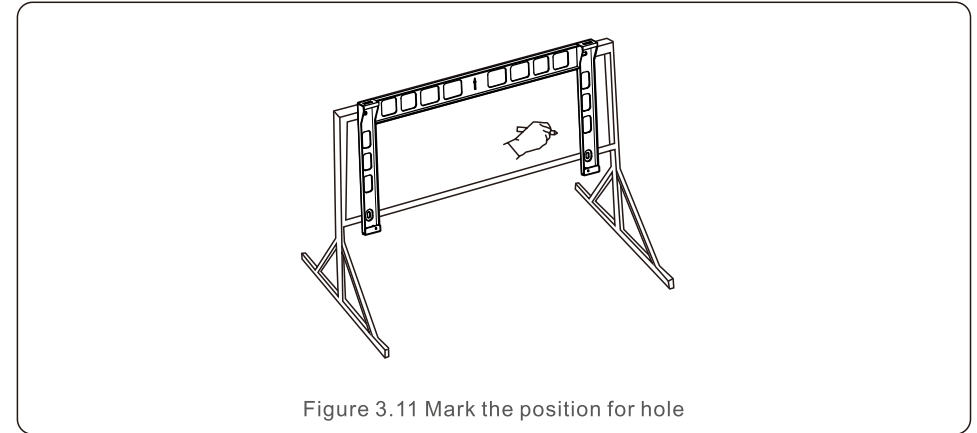
Please install the inverter vertically. If the inverter cannot be mounted vertically, it may be tilted backward to 15 degrees from vertical.



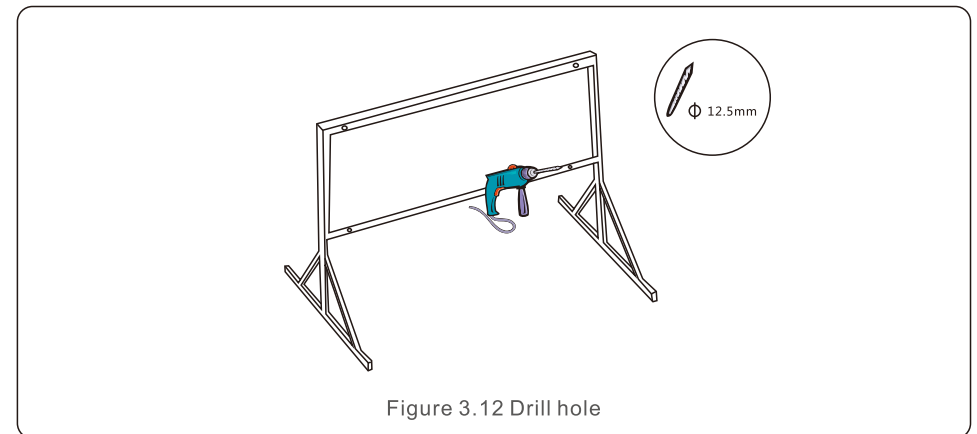
# 3. Installation

## 3. Install mounting plate

- 1) Remove the bracket and fasteners from the packaging. Mark the position for hole, drilling according to the hole positions of the bracket.



- 2) Drill the marked holes. It is recommended to apply anti-corrosive paint at the hole for corrosion protection.





# 3. Installation

3) Align the mounting plate with the holes, insert the combination bolt (M10X40) through the mounting plate into the hole. Secure the bracket to the metal frame firmly with the supplied fastener. Torque the nut to 25.8ft-lbs.

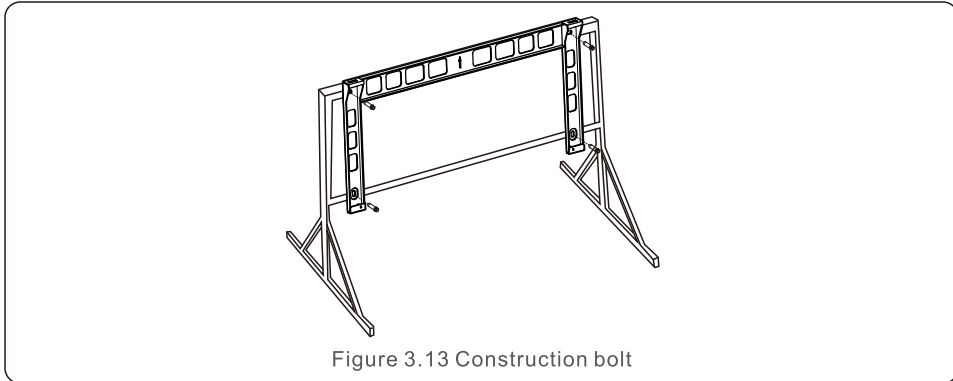


Figure 3.13 Construction bolt

4) Lift the inverter above the bracket and then slide down to make sure they match perfectly.

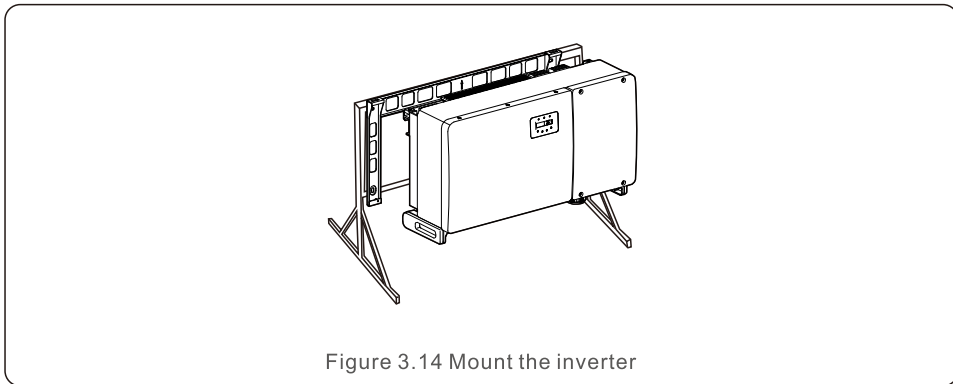


Figure 3.14 Mount the inverter

# 3. Installation

## 3.4 Electrical Connections

Inverter design uses PV style quick-connect terminal. The top cover needn't be opened during DC electrical connection. The labels located the bottom of the inverter are described below in table 3.1. All electrical connections are suitable for local or national standard.

Parts	Connection	Cable size	Torque
DC terminal	PV strings	12-10 AWG	NA
Ground terminal	AC ground	3-1 AWG	7.4-8.9 ft-lbs
Grid terminal	Grid	350 MCM AWG (Max 185mm <sup>2</sup> )	7.4-14.6 ft-lbs
RS-485 terminal	Communication cable	350 MCM AWG (Max 185mm <sup>2</sup> )	0.44 ft-lbs
RJ45 terminal	Communication cable	Network cable	NA
COM terminal	Wi-Fi/Cellular stick	NA	NA
DC surge protection device	NA	NA	NA

Table 3.1 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 connector and connect to the Inverter.

# 3. Installation

## 3.4.1 Grounding

To effectively protect the inverter, two grounding methods must be performed.  
Connect the AC grounding cable (Please refer to section 3.4.3)  
Connect the external grounding terminal.

To connect the grounding terminal on the heat sink, please follow the steps below:

- 1) Prepare the grounding cable: recommend to use the outdoor copper-core cable. The grounding wire should be at least half size of the hot wires.
- 2) Prepare OT terminals: M10.



**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 3.15).

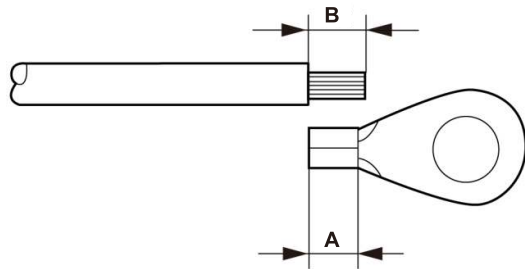


Figure 3.15 Suitable length



**Important:**

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

# 3. Installation

- 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 3.16).

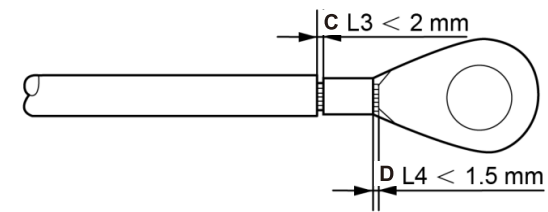


Figure 3.16 Strip wire



**Important:**

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

- 5) Remove the screw from the heat sink ground point.
- 6) Connect the grounding cable to the grounding point on the heat sink, and tighten the grounding screw, Torque is 7.4-8.9 ft-lbs(see figure 3.17).

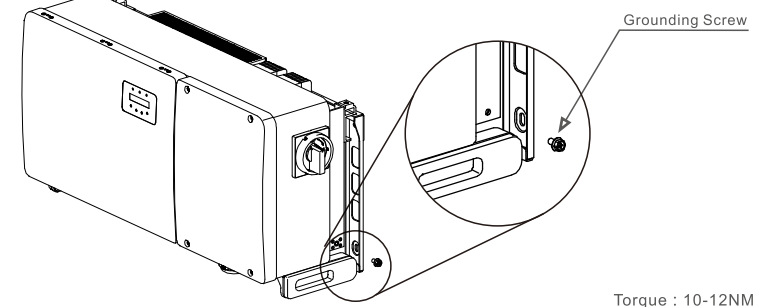


Figure 3.17 Fixed cable



**Important:**

For improving anti-corrosion performance, after ground cable installed, apply silicone or paint.

# 3. Installation

# 3. Installation

## 3.4.2 Connect PV side of inverter



**WARNING**

Before connecting the inverter, make sure the PV array open circuit voltage is within the limit of the inverter. Otherwise, the inverter could be damaged.



**WARNING**

DO NOT connect the PV array positive or PV array negative cable to ground. This can cause serious damage to the inverter!



**WARNING**

MAKE SURE the polarity of the PV array output conductors matches the DC- and DC+ terminal labels before connecting these conductors to the terminals of the inverter.



**WARNING**

Please use the original DC MC4 terminals, otherwise the unqualified DC connectors may cause damages to the inverter.

Please see table 3.1 for acceptable wire size for DC connections. Wire must be copper only. 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.
2. Insert the wire into the connector cap nut and contact pin.

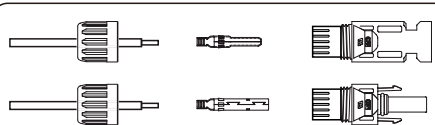


Figure 3.18 Disassemble the Connector Cap nut

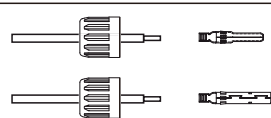


Figure 3.19 Insert the Wire into the Connector Cap nut and contact pin

3. Crimp the contact pin to the wire using a proper wire crimper.
4. Insert metal connector into top of connector, and tighten nut with torque 3-4 Nm.

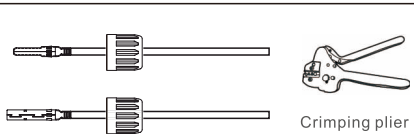


Figure 3.20 Crimp the contact pin to the wire

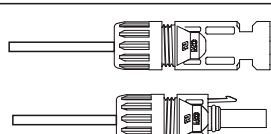


Figure 3.21 Connector with Cap nut Screwed on

5. Measure PV voltage of DC input with multimeter, verify DC input cable polarity (see figure 3.22), and ensure each string voltage is in range of inverter operation. Connect DC connector with inverter until hearing a slight clicking sound indicating successful connection. (see figure 3.23)

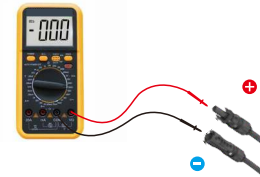


Figure 3.22 Multimeter measurement

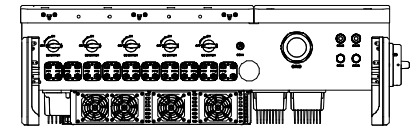


Figure 3.23 Connect the DC Connectors to the Inverter

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



**Caution:**

If DC inputs are accidentally 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.

Requirements for the PV modules per MPPT input:

- All PV modules must be of the same type and power rating.
- Please ensure the PV strings are evenly connected to the inverter and try to utilize all the MPPT trackers.
- All PV modules must be aligned and tilted identically.
- The open-circuit voltage of the PV array must never exceed the maximum input voltage of the inverter, even at the coldest expected temperature. (see section 10 "Specifications" for input current and voltage requirements)
- Each string connected to a single MPPT must consist of the same number of series-connected PV modules.

# 3. Installation

# 3. Installation

## 3.4.2.1 DC connection high voltage danger notice



**CAUTION**  
RISK OF ELECTRIC SHOCK

Do not touch an energized DC conductor. There are high voltages present when PV modules are exposed to light causing a risk of death due to an electric shock from touching a DC conductor!

Only connect the DC cables from the PV module to the inverter as described in this manual.



**CAUTION**  
POTENTIAL DAMAGE TO THE INVERTER DUE TO OVERVOLTAGE

The DC input voltage of the PV modules must not exceed the maximum rating of the inverter. (see section 10 “Specifications”)

Check the polarity and the open-circuit voltage of the PV strings before connecting the DC cables to the inverter.

Confirm proper string length and voltage range before connecting DC cable to the inverter.

## 3.4.3 Connect grid side of inverter



**WARNING**  
An over-current protection device must be used between the inverter and the grid.

1. Connect the three (3) AC conductors to the three (3) AC terminals marked “L1”, “L2” and “L3”. Refer to local code and voltage drop tables to determine the appropriate wire size and type.
2. Connect the grounding conductor to the terminal marked “PE” (protective earth, the ground terminal).

### Over-Current Protection Device (OCPD) for the AC side

To protect the inverter's AC connection line, we recommend installing a device for protection against over-current and leakage, with the following characteristics noted in Table 3.2:



**NOTE**  
Use AL-CU transfer (bi-metallic) terminal or anti-oxidant grease with aluminum cables and terminals.

Inverter	Rated voltage(V)	Rated output current (Amps)	Current for protection device (A)
Solis-124K-HV-5G	480	149.2	200
Solis-125K-HV-5G	480	150.4	200
Solis-50K-LV-5G	220	131.2	200
Solis-60K-LV-5G	220	157.5	200
S5-GC124K-HV	480	149.2	200
S5-GC125K-HV	480	150.4	200
S5-GC50K-LV	220	131.2	200
S5-GC-60K-LV	220	157.5	200

Table 3.2 Rating of grid OCPD

## 3.4.3.1 Connecting the inverter to the utility grid

All electrical installations must be carried out in accordance with the local standards and the National Electrical Code® ANSI/NFPA 70 or the Canadian Electrical Code® CSA C22.1. The AC and DC electric circuits are isolated from the enclosure. If required by section 250 of the National Electrical Code®, ANSI/NFPA 70, the installer is responsible for grounding the system. The grid voltage must be within the permissible range. The exact operating range of the inverter is specified in section 10 “Specifications”.

## 3.4.3.2 Wiring procedure



**CAUTION**  
RISK OF ELECTRIC SHOCK. Prior to starting the wiring procedure, ensure that the three-pole circuit breaker is switched off and cannot be reconnected.



**NOTE**  
Damage or destruction of the inverter's electronic components due to moisture and dust intrusion will occur if the enclosure opening is enlarged.



**CAUTION**  
Risk of fire if two conductors are connected to one terminal. If a connection of two conductors to a terminal is made, a fire can occur. NEVER CONNECT MORE THAN ONE CONDUCTOR PER TERMINAL.



**NOTE**  
Use M10 crimp terminals to connect to the inverter AC terminals.

# 3. Installation

# 3. Installation

Cable specification		Copper-cored cable
Traverse cross sectional area (mm <sup>2</sup> )	Range	35~185
	Recommended	70
Cable outer diameter (mm)	Range	38~56
	Recommended	45

1) Strip the end of AC cable insulating jacket about 300mm then strip the end of each wire.

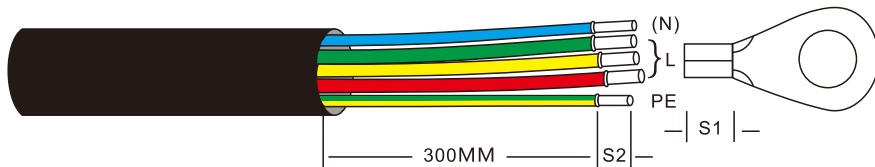


Figure 3.24 Strip AC cable



**NOTE**

S2 (insulation stripping length) is 2mm-3mm longer than S1. (OT cable terminal crimping 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.



**NOTE:**

If choosing aluminum alloy cable, you must use copper aluminum transfer terminal in order to avoid direct contact between copper bar and Aluminum alloy cable. (Please select a copper aluminum transfer terminal based on your cable specification).

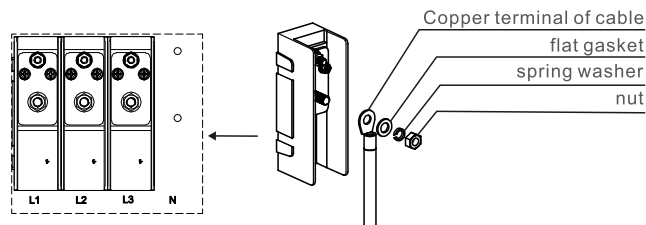


Figure 3.25 Copper aluminum transfer terminal

- 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.

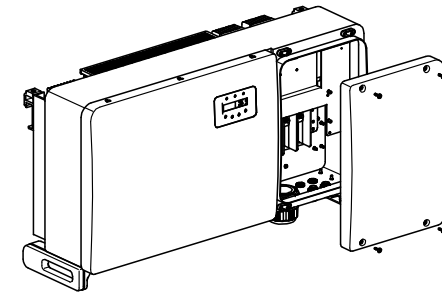


Figure 3.26 Remove the junction box cover

5. Insert the cable through the nut, sheath, and AC terminal cover. If using conduit, remove plastic nut to expose hole for conduit connection. Connect the cable to the AC terminal block. Tighten the screws on the terminal block. The torque is 7.3-14.7 ft.lbs.

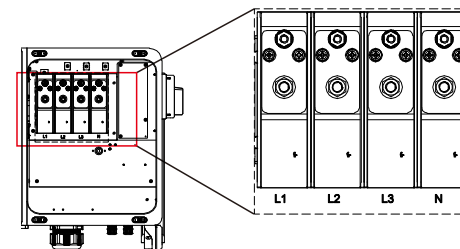


Figure 3.27 Wiring with Neutral

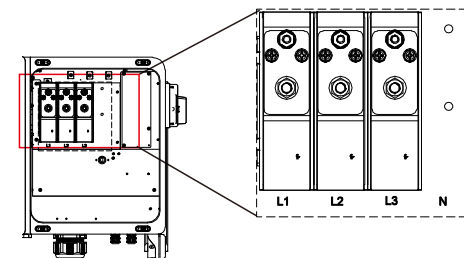


Figure 3.28 Wiring without Neutral

# 3. Installation

# 3. Installation

## 3.4.4 Meter Connection(optional)

The inverter can work with a three phase smart meter to achieve Export Power Management function and/or 24hour consumption monitoring function.



**NOTE**

To achieve Export Power Management function, the smart meter can be installed on either grid side or load side.  
 To achieve 24hour consumption monitoring function, the smart meter can only be installed on grid side.

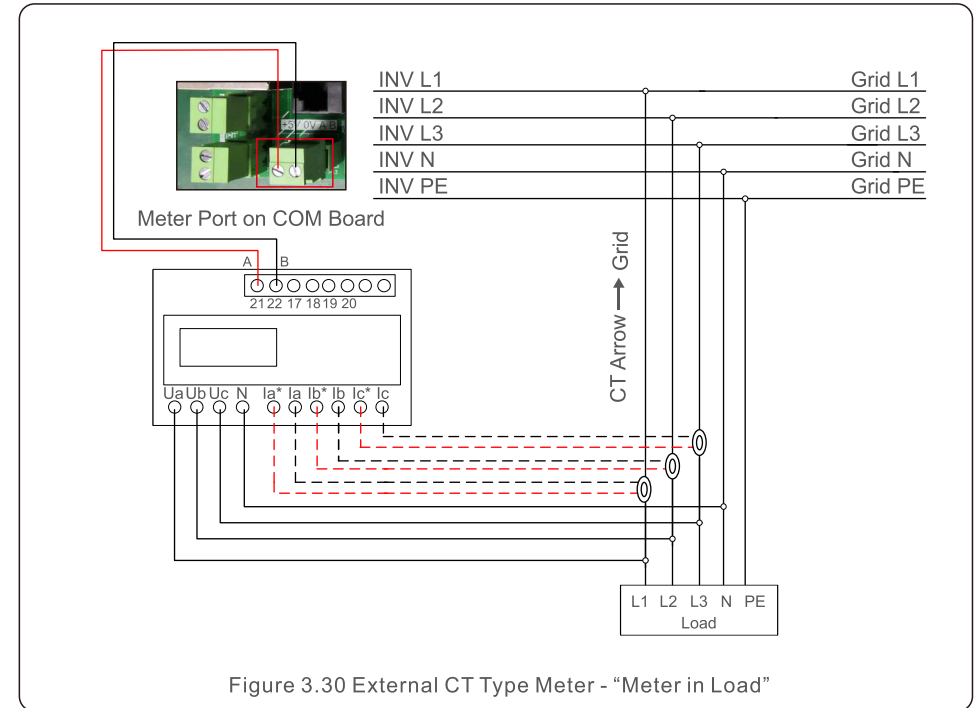
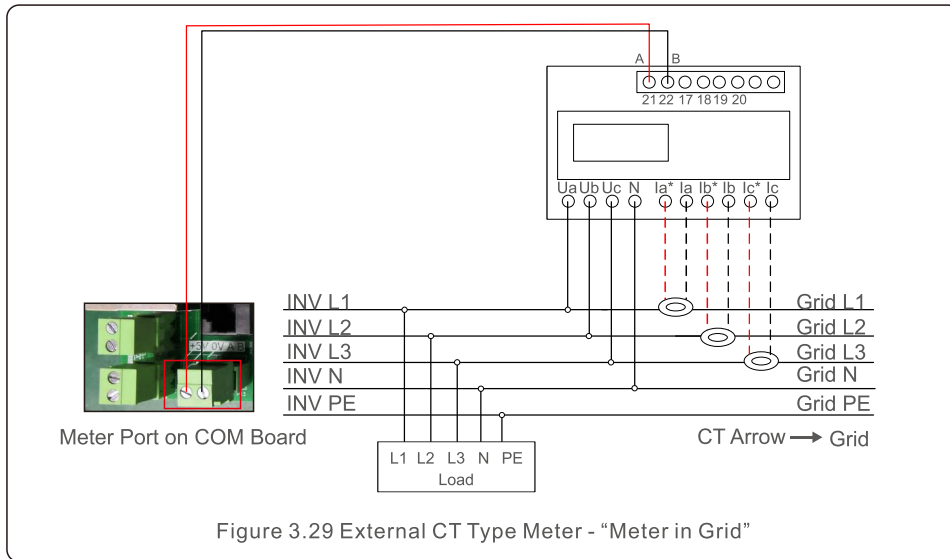
Two types of meters are supported:

External CT Type Meter - 300A/5A CTs are supplied(DTSD1352-External CT Type).

Customer can place the order for a suitable meter from Solis Sales Reps.

Below are the connection diagrams of different meters connecting to different locations.

Detailed settings please refer to Section 7.5.11



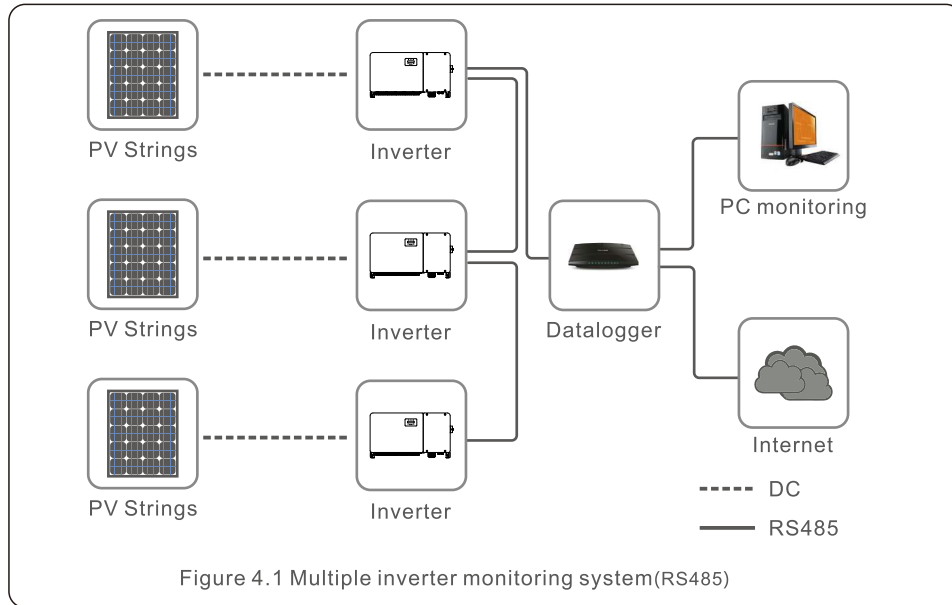
# 4. Comm. & Monitoring

There are 5 communication terminals on the inverters.  
 COM1 is a 4-pin connector reserved for WiFi/Cellular datalogger.  
 COM2 - COM3 are used for RS485 communication between inverters.  
 Both RJ45 and terminal block are provided for use.  
 COM4 or COM5 can be used for DRM connection.  
 Detailed connection please refer to 4.2 section.

## 4.1 RS485 and PLC communication connection

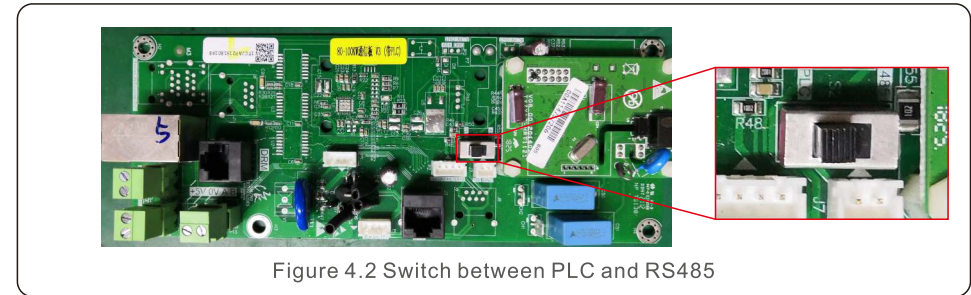
### Monitoring system for multiple inverters

Multiple inverters can be monitored through RS-485 daisy chain configuration.



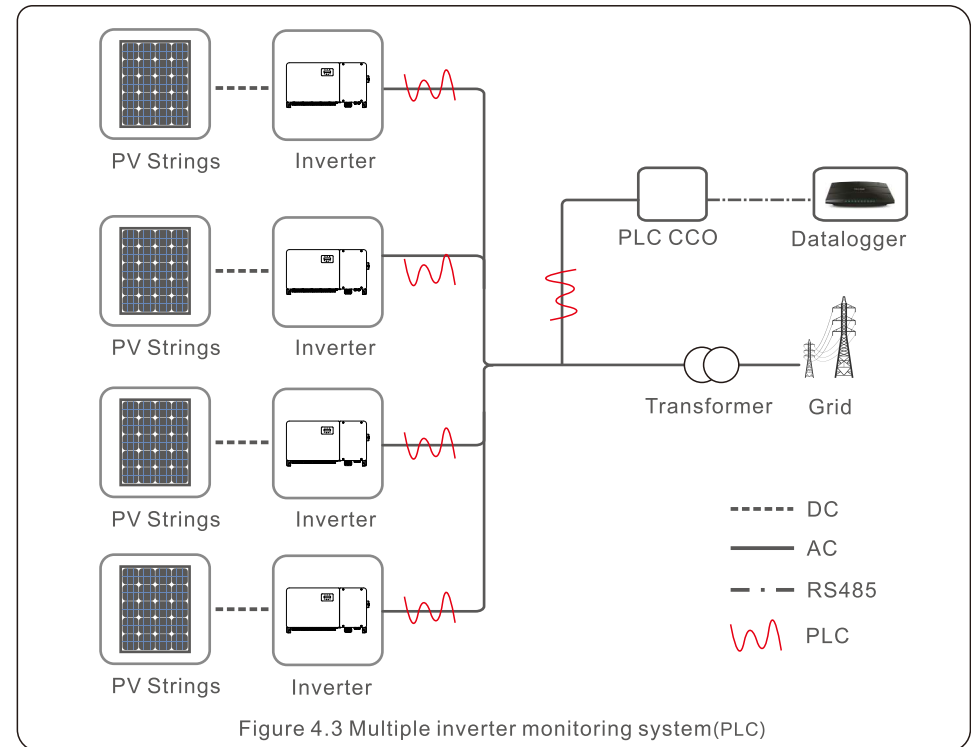
**NOTE**  
 One of the RS485 and PLC communication methods is available.  
 For the models with additional PLC communication, switching between PLC communication and RS485 communication can be realized by flipping the switch on the communication board as indicated in figure 4.2. Only one communication method is available during operating. Standard model without PLC communication doesn't have this switch.

# 4. Comm. & Monitoring



**WARNING**  
 Must power off the inverter on both AC and DC before switch the communication method.

PLC is available for multiple inverter monitoring.



# 4. Comm. & Monitoring

## 4.2 Logic interface connection

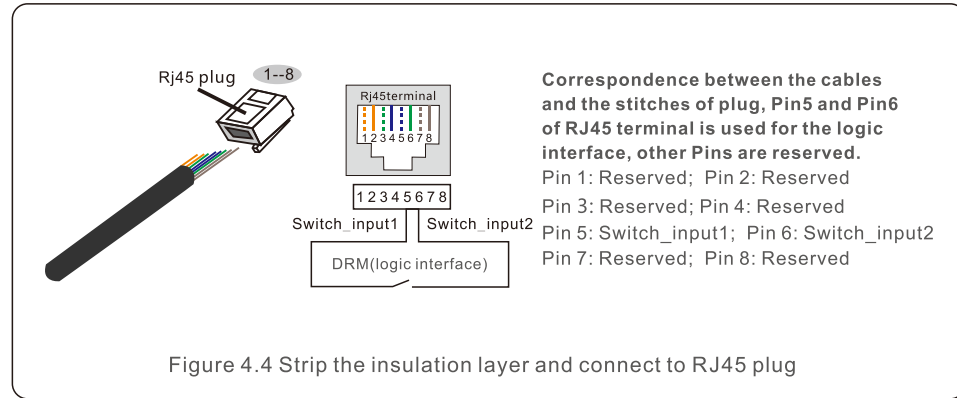
Logic interface is required by some local regulations that can be operated by a simple switch or contactor(Not available in South Africa).

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.
- 2.Use the network wire stripper to strip the insulation layer of the communication cable. According to the standard line sequence of figure 4.3 connect the wire to the plug of RJ45, and then use a network cable crimping tool to make it tight.



3.Connect RJ45 to DRM (logic interface) .

After wire connection, please refer chapter 7.5.8.1 to enable the logic interface function.

# 5. Commissioning

## 5.1 Selecting the appropriate grid standard

### 5.1.1 Verifying grid standard for country of installation

Solis inverters are used worldwide and feature preset standards for operating on any grid. Although the grid standard is set at the factory, it is essential the grid standard be verified for the country of installation before commissioning.

The menu for changing the grid standard or for creating a custom standard is accessible as described in Section 6.7 and below.

**WARNING**  
 Failure to set the correct grid standard could result in improper operation of the inverter, inverter damage or the inverter not operating at all.

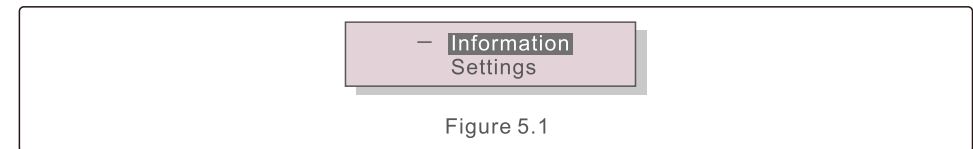
## 5.2 Changing the grid standard

### 5.2.1 Procedure to set the grid standard

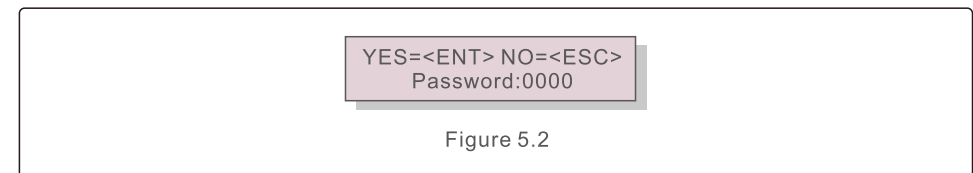
**NOTE**  
 This operation is for service technicians only. The inverter is customized according to the local grid standard before shipping. There should be no requirement to set the standard.

**NOTE**  
 The "User-Def" function can only be used by the service engineer. Changing the protection level must be approved by the local utility.

- 1). From the main screen on the display, select ENTER. There are 4 sub-menu options, use the UP/DOWN arrows to highlight ADVANCED SETTINGS. Press enter to select.



- 2). The screen will show that a password is required. The default password is "0010", press the DOWN key to move cursor, press the UP key to change the highlighted digit.





# 5. Commissioning

3). Use the UP/DOWN keys to highlight the SELECT STANDARD option. Press enter to select.

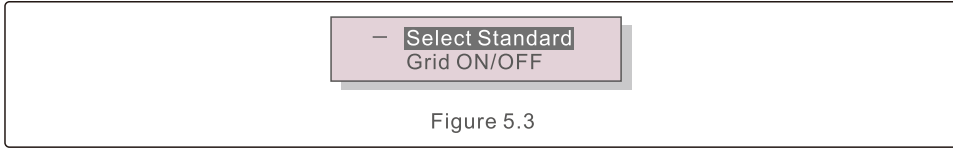


Figure 5.3

4). Select the grid standard for the country of installation.

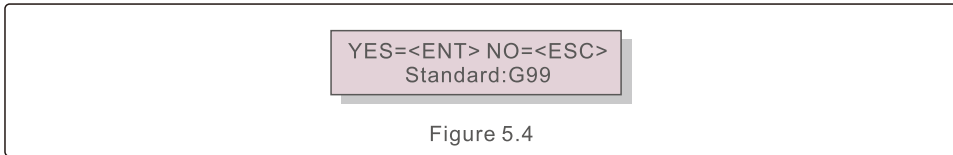


Figure 5.4

Press the UP or DOWN key to select the standard. Press the ENTER key to confirm the setting. Press the ESC key to cancel changes and return to the previous menu.

## 5.3 Setting a custom grid standard



### WARNING

- Failure to set the correct grid standard could result in improper operation of the inverter, inverter damage or the inverter not operating at all.
- Only certified personnel should set the grid standard.
- Only set the grid configuration that is approved by your location and national grid standards.

1). Please refer to section 6.7 “Advanced Settings” for procedures to create a custom grid configuration for User-Def menu option.

# 5. Commissioning

## 5.4 Preliminary checks



### WARNING

High Voltage.  
AC and DC measurements should be made only by qualified personnel.

### 5.4.1 DC Connections

Verify DC connections.

- 1). Lightly tug on each DC cable to ensure it is fully captured in the terminal.
- 2). Visually check for any stray strands that may not be inserted in the terminal.
- 3). Check to ensure the terminal screws are the correct torque.

### 5.4.2 AC Connections

Verify AC connections.

- 1). Lightly tug on each AC cable to ensure it is fully captured in the terminal.
- 2). Visually check for any stray strands that may not be inserted in the terminal.
- 3). Check to ensure the terminal screws are the correct torque.

### 5.4.3 DC configuration

Verify DC configuration by noting the number of panels in a string and the string voltage.

#### 5.4.3.1 VOC and Polarity

Measure VOC, and check string polarity. Ensure both are correct and VOC is in specification.



### WARNING

Input voltages higher than the maximum value accepted by the inverter (see “Specifications” in section 10) may damage the inverter. Although Solis inverters feature reverse polarity protection, prolonged connection in reverse polarity may damage these protection circuits and/or the inverter.

#### 5.4.3.2 Leakage to ground

Measure leakage to ground to check for a DC ground fault.

# 5. Commissioning

## 5.4.3.2.1 Detection of leakage to ground

Solis inverters are transformer-less and do not have an array connection to ground. Any measurement of a fixed voltage between ground and either the positive or negative string wiring indicates a leakage (ground fault) to ground and must be corrected prior to energizing the inverter or damage to the inverter may result.

## 5.4.4 AC configuration

Verify AC configuration.

### 5.4.4.1 Measure Vac and frequency

Measure VAC and verify voltage is within local grid standards.

- 1). Measure each phase to ground (L-G).
- 2). Measure phases to the other phases in pairs (L-L). PHA to PH B, PH B to PH C and PH C to PHA.
- 3). If the meter is equipped, measure the frequency of each phase to ground.
- 4). Ensure each measurement is within local grid standards and the inverter specifications as noted in section 10 "Specifications".

### 5.4.4.2 Phase rotation test

A phase rotation test is recommended to ensure the phases have been connected in the appropriate order. Solis inverters do not require a specific phase rotation connection. However, the local utility may require a specific phase rotation or a record of the phase configuration of the installation.

# 6. Start and Shutdown

## 6.1 Start-up procedure

To start-up the inverter, it is mandatory that the steps below are followed in the exact order outlined.

- 1). Ensure the commissioning checks in Section 5 have been performed.
- 2). Switch the AC switch ON.
- 3). Switch the DC switch ON. If the PV array (DC) voltage is higher than the inverter's start-up voltage, the inverter will turn on. The red DC POWER LED and LCD will be continuously lit.
- 4). Solis inverters are powered from the DC side. When the inverter detects DC power that is within start-up and operating ranges, the inverter will turn on. After turn-on, the inverter will check internal parameters, sense and monitor AC voltage, hertz rate and the stability of the supply grid. During this period, the green OPERATION LED will flash and the LCD screen will show INITIALIZING. This tells the operator that the inverter is preparing to generate AC power.
- 5). After the locally mandated delay (300 seconds for IEEE-1547 compliant inverters), the inverter will start generating AC power. The green OPERATION LED will light continuously and the LCD screen will show GENERATING.



### CAUTION

The inverter's surface temperature can reach up to 75°C (167° F). To avoid risk of burns, do not touch the surface when the inverter is in the operational mode. Additionally, the inverter must be installed out of the reach of children.

## 6.2 Shutdown procedure

To stop the inverter, it is mandatory that the steps below are followed in the exact order outlined.

- 1). Select "Grid Off" in the Advanced Setting of Inverter LCD.
- 2). Turn off the AC Switch between Solis inverter and Grid.
- 3). Wait approximately 30 seconds (during this time, the AC side capacitors are dissipating energy). If the inverter has DC voltage above the start-up threshold, the red POWER LED will be lit. Switch the DC switch OFF.
- 4). Confirm all LED's switch OFF (~one (1) minute).

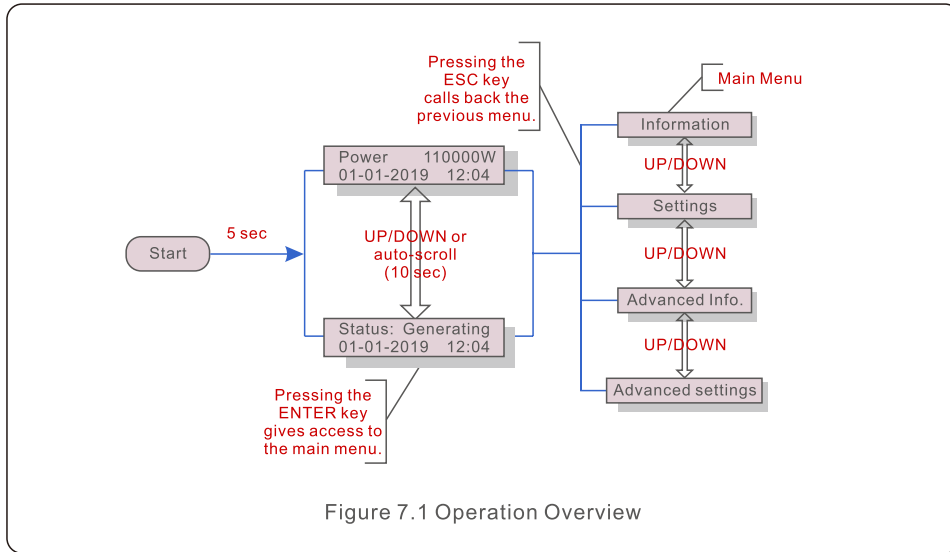


### CAUTION

Although the inverter DC disconnect switch is in the OFF position and all the LED's are OFF, operators must wait five (5) minutes after the DC power source has been disconnected before opening the inverter cabinet. DC side capacitors can take up to five (5) minutes to dissipate all stored energy.

# 7. Normal 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.



## 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 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.

# 7. Normal operation

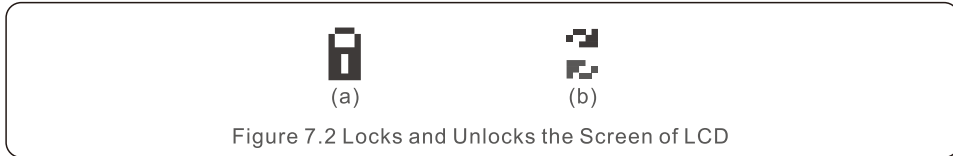
Display	Duration	Description
VPV_Total: 1000.0V IPV_Total: +99.0A	10 sec	VPV_Total: Shows input voltage total. IPV_Total: Shows input current total.
V_A: 345.7V I_A: 109.0A	10 sec	V_A: Shows the grid's voltage value. I_A: Shows the grid's current value.
V_C: 345.0V I_C: 109.8A	10 sec	V_C: Shows the grid's voltage value. I_C: Shows the grid's current value.
Status: Generating Power: 1488W	10 sec	Status: Shows instant status of the Inverter. Power: Shows instant output power value.
Rea_Power: 000Var App_Power: VA	10 sec	Rea_Power: Shows the reactive power of the inverter. App_Power: Shows the apparent power of the inverter.
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.
Work Mode: Volt-watt DRM NO.:08	10 sec	Work Mode: Shows current working mode. DRM NO.: Shows DRM Number.
I_DC01: +05.0A I_DC02: +04.9A ... I_DC20: +05.2A	10 sec	I_DC01 : Shows input 01 current value. I_DC02 : Shows input 02 current value. ... I_DC20 : Shows input 20 current value.

Table 7.1 Information list

# 7. Normal 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.



## 7.3 Settings

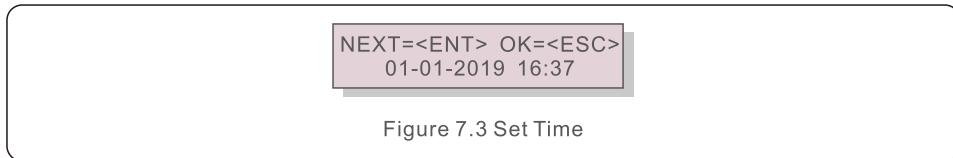
The following submenus are displayed when the Settings menu is selected:

### 1.Set Time

### 2.Set Address

#### 7.3.1 Set Time

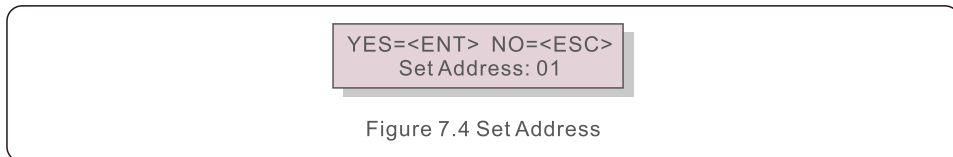
This function allows time and date setting. When this function is selected, the LCD will display a screen as shown in Figure 7.3.



Press the UP/DOWN keys to set time and date. 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".



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. Normal operation

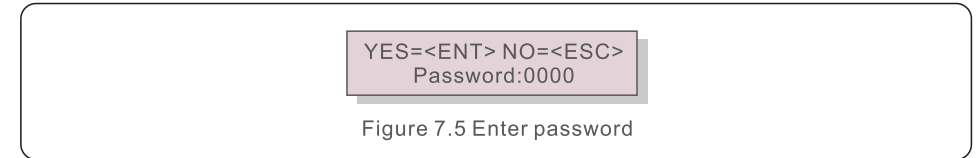
## 7.4 Advanced Info - Technicians Only



### 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:



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

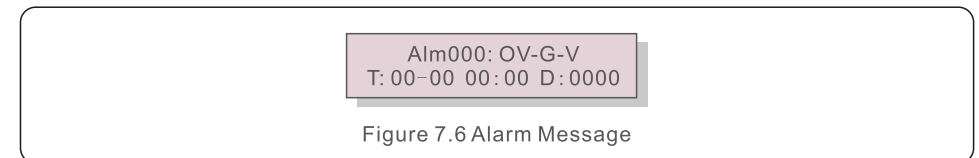
### 7. Daily Records

### 8.Communication Data

### 9. Warning Message

#### 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.



#### 7.4.2 Running Message

This function is for maintainece 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. Press UP/DOWN key to move one date from another.

# 7. Normal operation

## 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

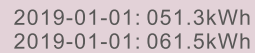
The function is for checking the energy generation for selected day.



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

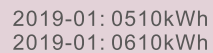
The function is for checking the energy generation for selected month.



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

# 7. Normal operation

## 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

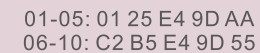
Press UP/DOWN key to move one date from another.

## 7.4.7 Daily Records

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

## 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. Normal operation

# 7. Normal operation

## 7.5 Advanced Settings - Technicians Only



**NOTE:**

To access 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. Internal EPM Set
12. External EPM Set
13. Restart HMI
14. Debug Parameter
15. Fan Test
16. DSP Update
17. Compensation Set
18. 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:G99

Figure 7.16

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

Below is the setting range for "User-Def". Using this function, the limits can be changed manually. (These voltage values are the phase voltage)

OV-G-V1: 220---374V	OV-G-F1: 50.1-65Hz
OV-G-V1-T: 0.01---300S	OV-G-F1-T: 0.01---300S
OV-G-V2: 220---374V	OV-G-F2: 50.1-65Hz
OV-G-V2-T: 0.01---300S	OV-G-F2-T: 0.01---300S
UN-G-V1: 110---277V	UN-G-F1: 45-59.9Hz
UN-G-V1-T: 0.01---300S	UN-G-F1-T: 0.01---300S
UN-G-V2: 110---277V	UN-G-F2: 45-59.9Hz
UN-G-V2-T: 0.01---300S	UN-G-F2-T: 0.01---300S
Startup-T: 10-600S	Restore-T: 10-600S

Table 6.2 Ranges for User-Def (124-125)K-HV

OV-G-V1: 120---180V	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: 120---180V	OV-G-F2: 51-53Hz(61-63Hz)
OV-G-V2-T: 0.1---1S	OV-G-F2-T: 0.1---9S
UN-G-V1: 55---121V	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: 55---121V	UN-G-F2: 47-59Hz(57-59Hz)
UN-G-V2-T: 0.1---1S	UN-G-F2-T: 0.1---9S
Startup-T: 10-600S	Restore-T: 10-600S

Table 6.3 Ranges for User-Def (50-60)K-LV



**NOTE**

The initial value of the User-Def standard is for reference only. It does not represent a correct value suitable for use.



**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. Normal operation

## 7.5.2 Grid ON/OFF

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

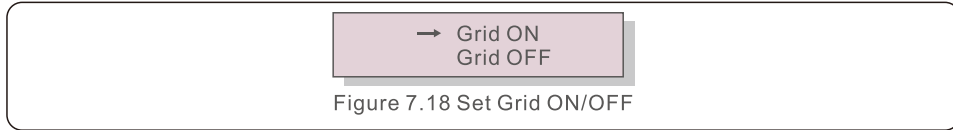
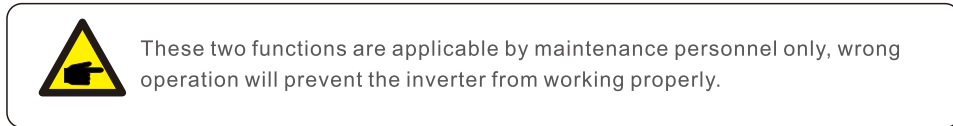


Figure 7.18 Set Grid ON/OFF

## 7.5.3 Clear Energy

Clear Energy can reset the history yield of inverter



## 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).

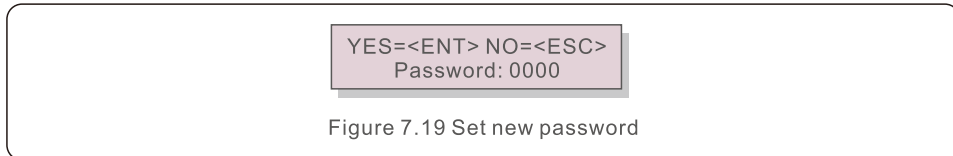


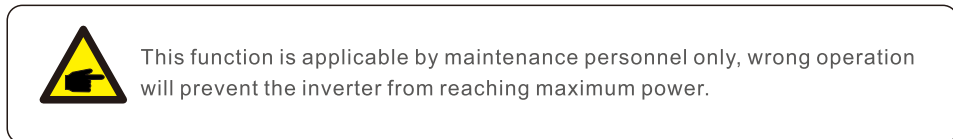
Figure 7.19 Set new password

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



# 7. Normal operation

## 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.

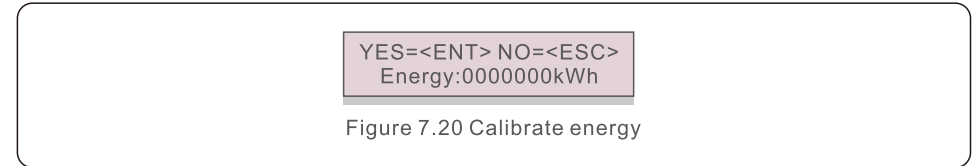
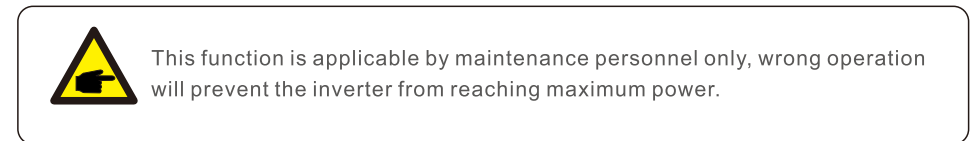


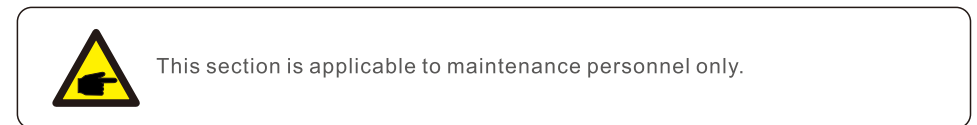
Figure 7.20 Calibrate energy

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



## 7.5.8 STD Mode Settings



Selecting "STD Mode. Settings" displays the sub-menu shown below:

- 1. Working Mode Set
- 2. Power Rate Limit
- 3. Freq Derate Set
- 4. 10mins Voltage Set
- 5. Power Priority
- 6. Initial Settings
- 7. Voltage PCC Set

### 6.7.8.1 Working Mode Set

There are TWO situations with different grid standards selected.

# 7. Normal operation

7.5.8.1.1 With UL Standard selected



**NOTE**

The following modes are for "UL-600V".

Solis US version inverters have Seven working modes:

1. NULL
2. Volt-watt
3. Volt-Var
4. Fixed-PF
5. Reac-power
6. Power-PF
7. VgWatt-UL

Based on UL1741SA, working mode 1,3,4,7 can be used by grid operator.

**1.NULL**

Description: Inverter is not under any working mode.

**2. Volt-Watt (Not Required)**

Description: Inverter will change the active output power based on voltage change.

Note: This Setting is NOT required by UL1741SA Standards.



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

**3. Volt-Var (Default)**

Description: Inverter will change the reactive output power based on voltage change.

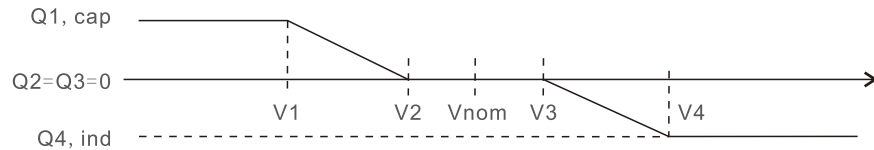


Figure 7.21 Volt-Var curve for Q (V)

# 7. Normal operation

Default Settings for UL1741SA:

Q1: (0-60%) Default +30%    Q4: (-60%-0%) Default -30%

Rated 600V Grid

V1:(277-346V) Default 303V    V2: (277-346V) Default 340V

V3:(346-415V) Default 349V    V4: (346-415V) Default 381V

Voltage1 : 303V  
Voltage2 : 340V

Figure 7.22 Volt-VAR

**4.Fixed-PF**

Description: Inverter will output power with fixed power factor.

Setting Range: -0.8 to +0.8

Default value is PF = 1

YES=<ENT> NO=<ESC>  
Power Factor: +1.00

Figure 7.23 Fixed-PF

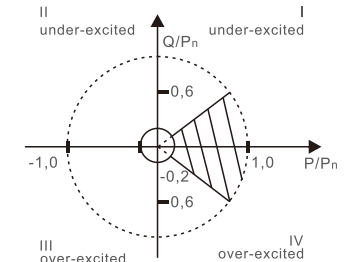


Figure 7.24 PF Range

**5. Reac-power (Not Required)**

Description: Inverter will generate reactive power based on changing output power.

Note: This Setting is NOT required by UL1741SA Standards.



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



# 7. Normal operation

## 6. P-factor (Not Required)

Description: Inverter will change power factor based on changing output power.

Note: This Setting is NOT required by UL1741SA Standards.



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

## 7. VgWatt-UL

Description: Inverter will change the active output power based on voltage change.

Note: This is the Volt-Watt Setting for UL1741SA Standards.

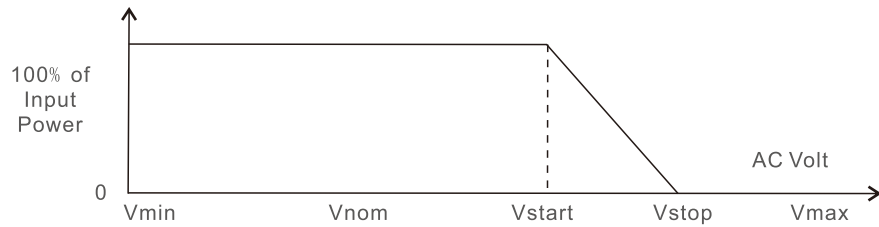


Figure 7.25 Volt-Watt characteristic

Default Settings for UL1741SA:

Rated 600V Grid

V1: less than V2

V2: less than Vstart

V3 (Vstart): (346-415V) Default 381V

V4 (Vstop): (381-450V) Default 415V

P1: 100% P2: 100% P3: 100% P4: 0%

Voltage1: 318V  
P-Limit1: 100%

Figure 7.26 VgWatt-UL

# 7. Normal operation

7.5.8.1.2 With Rule21 Standard selected



## NOTE

The following modes are for "R21P3-600".

Solis US version inverters have Ten working modes:

1. NULL
2. Volt-watt
3. Volt-Var
4. Fixed-PF
5. Reac-power
6. Power-PF
7. VgWatt-UL

Based on Rule21, working mode 1,2,3,4 can be used by grid operator.



## NOTE

The other three working mode "P1-V-Watt", "P1-V-Var" and "P1-V-P&V-Q" are NOT applicable for settings.

## 1. NULL (Mode Reset)

Description: Inverter is not under any working mode.

## 2. Volt-Watt

Description: Inverter will change the active output power based on voltage change.

Note: This is the Volt-Watt Setting for Rule21 Standards.

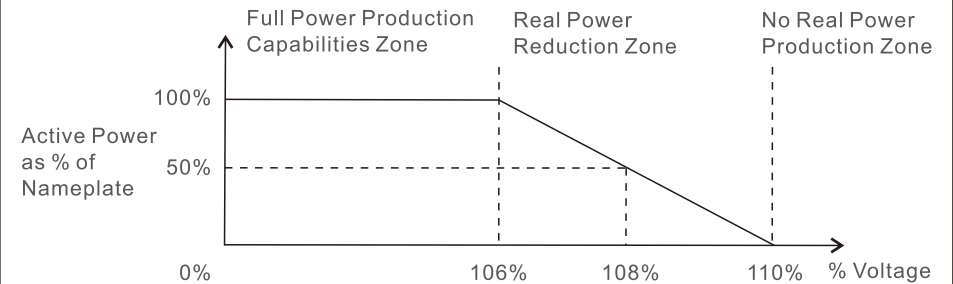


Figure 7.27 Volt-Watt characteristic

# 7. Normal operation

Default Settings for Rule21 Standards:

Rated 600V Grid

V1: less than Vstart

V2 (Vstart): (346-415V) Default 367V

V3 (Vstop): (381-450V) Default 381V

V4: larger than Vstop

P1:100% P2:100% P3: 0% P4:0%

### 3. Volt-Var

Description: Inverter will change the reactive output power based on voltage change.

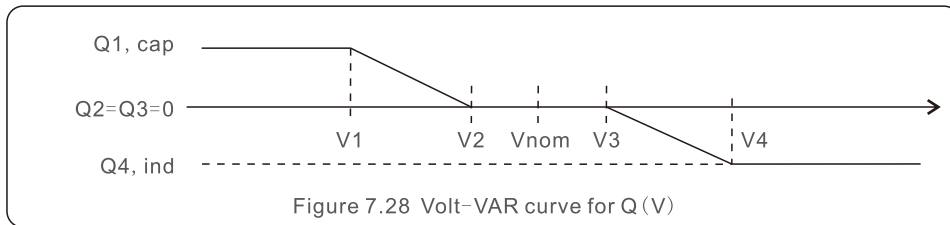


Figure 7.28 Volt-Var curve for Q (V)

Default Settings for Rule21 Standard:

Q1: (0-60%) Default +30%    Q4: (-60%-0%) Default -30%

Rated 600V Grid

V1:(277-346V) Default 318V    V2: (277-346V) Default 335V

V3:(346-415V) Default 357V    V4: (346-415V) Default 370V

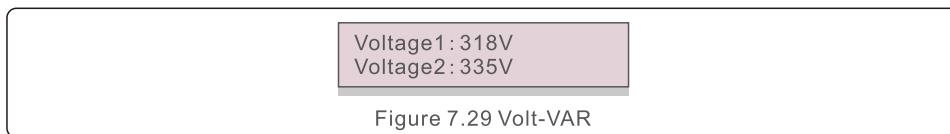


Figure 7.29 Volt-Var

### 4.Fixed-PF

Description: Inverter will output power with fixed power factor.

Setting Range: -0.8 to +0.8

Default value is PF = 1

# 7. Normal operation

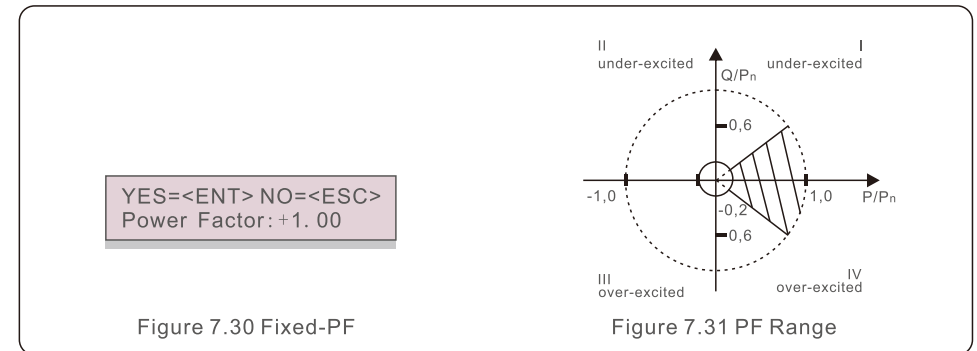


Figure 7.30 Fixed-PF

Figure 7.31 PF Range

### 5. Reac-power (Not Required)

Description: Inverter will generate reactive power based on changing output power.

Note: This Setting is NOT required by Rule21 Standards.

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

### 6. P-factor (Not Required)

Description: Inverter will change power factor based on changing output power.

Note: This Setting is NOT required by Rule21 Standards.

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

### 7. VgWatt-UL (Not Required)

Description: Inverter will change the active output power based on voltage change.

Note: This Setting is NOT required by Rule21 Standards.

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

# 7. Normal operation

## 8. Enable both Volt-Var and Volt-Watt modes

Description: Rule21 requires both Volt-var and Volt-watt modes can be enabled.

To set both modes (Volt-var in high priority)

Step 1: Select and set Volt-watt mode at first.

Step 2: Enter "Working Mode" again and select and set Volt-var mode then.

Step 3: To check the priority, a new mode will appear as "V-Q & V-P" which indicates (Q) Volt-var is in high priority.

YES=<ENT> NO=<ESC>  
Work Mode : V-Q & V-P

Figure 7.32 Work Mode

To set both modes (Volt-watt in high priority)

Step 1: Select and set Volt-var mode at first.

Step 2: Enter "Working Mode" again and select and set Volt-watt mode then.

Step 3: To check the priority, a new mode will appear as "V-P & V-Q" which indicates (P) Volt-watt is in high priority.

YES=<ENT> NO=<ESC>  
Work Mode : V-P & V-Q

Figure 7.33 Work Mode

To reset dual-mode or exit the dual-mode situation

Step 1: Select "Null" mode at first.

Step 2: Enter "Working Mode" again. Redo above dual-mode setting steps to reset OR set other modes to exit dual-mode situation.



### NOTE

To check the Volt-watt and Volt-var priority, simply enter the working modes. V-Q&V-P indicates Volt-Var First V-P&V-Q indicates Volt-Watt First

# 7. Normal operation

## 7.5.8.2 Power Rate Limit

This function is used for change Power Ramp-up rate. When inverter start up or input string MPPT changes, inverter power ramp-up rate is limited in this menu.

**The default setting is stop (disable).**

The setting range from 10% to 600%, means inverter power change rate per minute.

Values are not allowed to change. If they are set, they may not conform to the UL1741SA standard.

Power Rate:016%  
RateP\_Sts-US:STOP

Figure 7.34 Power Rate Limit

## 7.5.8.3 Freq Derate Set

This setting is applicable when UL Standards are selected.

There are 5 derate modes in this menu. When operating under standard UL-1741 limits, modes 00 to 03 are disabled. Mode 04 is used for UL1741SA frequency derating setting.

Mode 08 is used for RULE21 Freq-watt setting. This sets the f start and f stop point.

**Mode 04 :**

Derate Mode: 04  
OV-F-Start: 60. 20Hz

Figure 7.35 Freq Derate Set

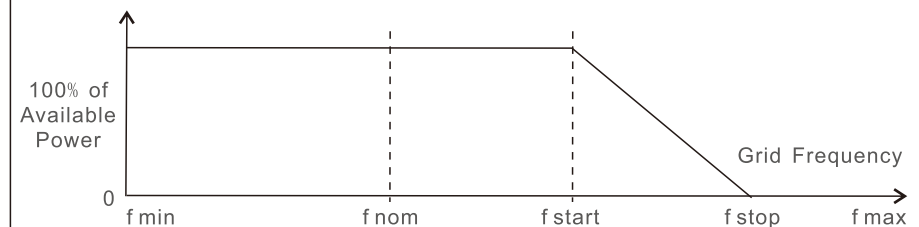


Figure 7.36 Freq-Watt characteristic

Over frequency load shedding Fstart range 60~62Hz, default setting 60.2Hz

Fstop can set the scope: 61-64Hz, the default setting 62Hz.

Press the Enter key to select the mode or frequency.

Press Up/Down to set. Press ESC to save the settings.

# 7. Normal operation

## Mode 08 :

This setting is used to control real power based on the frequency excursion

This setting is applicable when Rule21 Standards are selected.

→ Start Freq: 60.50Hz  
WGradient: 040%

Figure 7.37 Freq-Watt (1)

Start Freq: This is the frequency that active power reduction starts.

WGradient: This is the active power reduction rate in terms of the frequency.

Stop Freq: This is the frequency that stops the correction cycle.

Hysteresis: This indicates whether hysteresis is enabled.

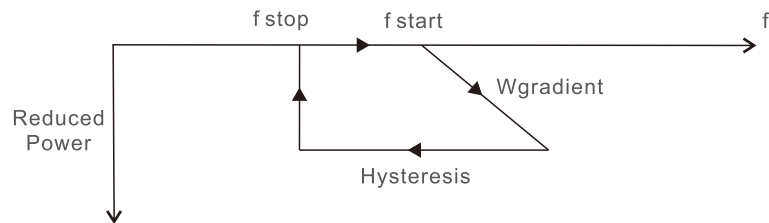


Figure 7.38 Freq-Watt (2)



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

# 7. Normal operation

## 7.5.8.4 10mins Voltage Set

This function is disabled and not used for the US.



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

## 7.5.8.5 Power Priority

This setting is used to set the priority between Active Power Control (Watt) and Reactive Power Control (Var).

YES=<ENT> NO=<ESC>  
Select: Var First

Figure 7.39 Power Priority

Two options are available: Watt First and Var First.



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

## 7.5.8.6 Initial Settings

In initial settings it will reset each work mode from 6.5.8.1 to 6.5.8.4 back to default.

Work Mode Default  
Power Rate Default

Figure 7.40 Initial Settings

## 7.5.8.7 Voltage PCC Set

Set the voltage at the PCC point.

This setting is required by RULE 21 requirements.

PCC: Point of Common Coupling, the point where a Local EPS is connected to an Area EPS.



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

# 7. Normal operation

## 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:

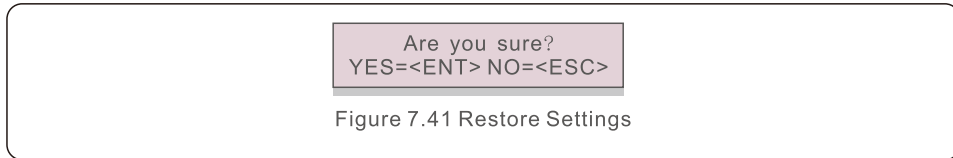
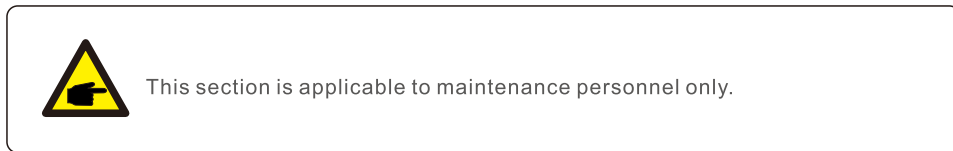


Figure 7.41 Restore Settings

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



Selecting "Updater" displays the sub-menu shown below:

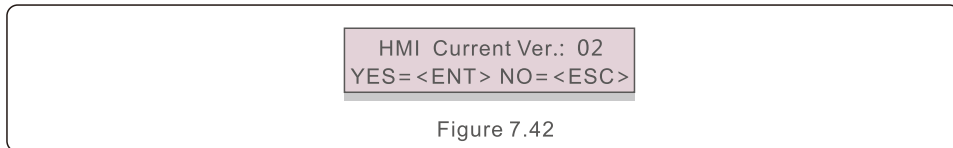


Figure 7.42

Updater is for updating LCD firmware. Press the ENTER key to start the process.  
Press the ESC key to return to the previous menu.

# 7. Normal operation

## 7.5.11 Internal EPM Set

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

- 1. Mode Select 2. Backflow Power 3. Fail safe ON/OFF 4. Backflow Work Mode

### 7.5.11.1 Mode Select

There are 4 settings in this menu as below:

- 1. OFF 2. Meter in Load 3. Meter in Grid 4. Consumption Monitor

**OFF:** Functions are disabled

**Meter in Load:** Solis Smart Meter is connected in the load branch circuit.

**Meter in Grid:** Solis Smart Meter is connected in the grid connection point (The backflow power is default as 0W).

**Consumption Monitor:** Solis Smart Meter is connected in the grid connection point (The backflow power setting is not applicable).

### 7.5.11.2 Backflow Power

The setting is used to define the allowed export power into the grid.  
The setting range is between 00000W to 29900W.

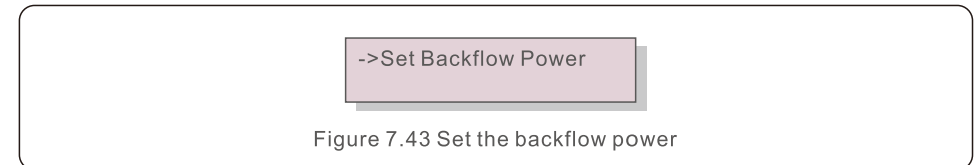


Figure 7.43 Set the backflow power

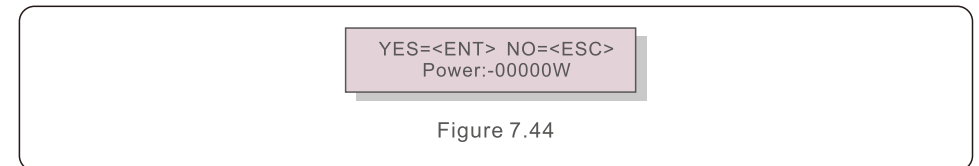


Figure 7.44

Press the UP/DOWN keys to set data. Press the ENTER key to set backflow power.  
Then press DOWN keys to move the cursor, press UP to change the number.  
Press the ESC key to save the settings and return to the previous menu.

### 7.5.11.3 Fail safe ON/OFF

This setting is used to give out an alarm (stop inverter generation as well) when the Meter connection is lost during operation.

It can prevent potential backflow power into the grid when the system loses control.

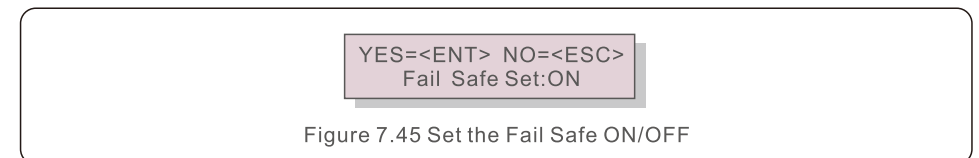


Figure 7.45 Set the Fail Safe ON/OFF

# 7. Normal operation

It is only mandatory to turn on this function when the inverter is installed in UK due to the G100 regulation. For other regions, customers can enable or disable the function as they desire.



**NOTE:**

When the failsafe function is ON and CT/Meter is disconnected somehow, the inverter will stop generation and give "Failsafe" alarm on the LCD. When the failsafe function is OFF and CT/Meter is disconnected somehow, the inverter will keep the output power as the last moment when the CT/Meter is still connected. After a restart, the inverter will output at full power without limit.

## 7.5.11.4 Backflow Work Mode

This submenu is used for set backflow work mode: 01, 02. "01" is the default mode.

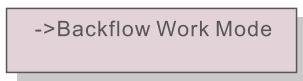


Figure 7.46 Set the Backflow work mode



Figure 7.47

Mode "01", As shown in the figure 7.48, the average limiting mode, the output power of each phase is the average of the three-phase load power, and it is more than the phase of the lowest power in three phases.

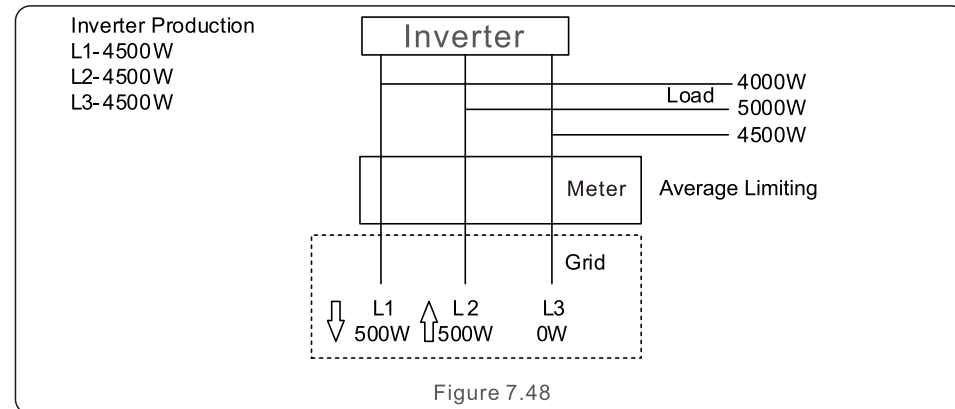


Figure 7.48

# 7. Normal operation

Mode "02", As shown in the figure 7.49 the per phase limiting mode, the inverter only generate the power that equals to one of three-phase load power that is the lowest load power of a certain phase.

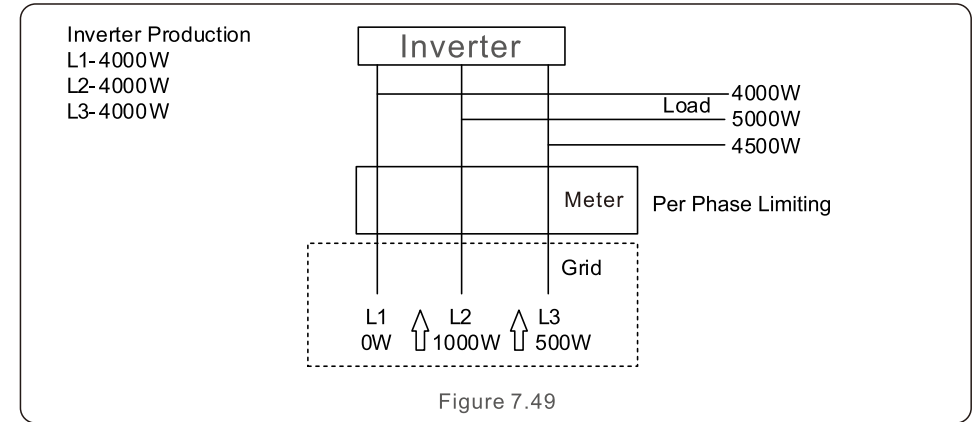


Figure 7.49

## 7.5.12 External EPM Set

This function is turned on when the EPM is external.



Figure 7.50 Set the Fail Safe ON/OFF

## 7.5.13 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. Normal operation

## 7.5.14 Debug Parameter



This section is applicable to maintenance personnel only.

Debug Parameter as shown as below:

```
→ S16DAT1: +0000
   S16DAT2: +0000
```

Figure 7.51

Press the UP/DOWN keys to scroll through items. Press the ENTER key to select.

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

Press the ENTER key to save the setting. Press the ESC key to cancel.

changes and return to the previous menu.

## 7.5.15 FAN Test



This section is applicable to maintenance personnel only.

Selecting “Fan Test” displays the sub-menu shown below:

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

Figure 7.52

Fan Test is a factory test function. Press the ENTER key to start the test.

Press the ESC key to return to the previous menu.

# 7. Normal operation

## 7.5.16 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.

## 7.5.17 Compensation Set

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

Two sections are included: Power Parameter and Voltage Parameter.

The screen shows:

```
YES=<ENT> NO=<ESC>
Power para: 1.000
```

Figure 7.53 Power Rate Limit

Press the Down key to move the cursor.

Press the Up key to change the digit.

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



This setting is used for grid operators, do not change this setting unless specifically instructed to.

## 7.5.18 I/V Curve

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

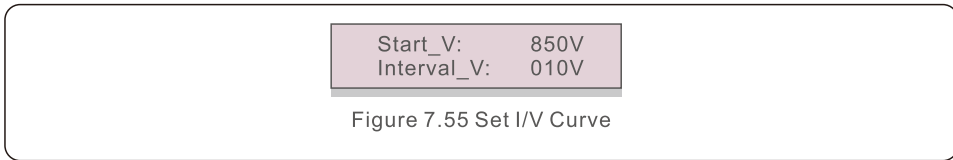
```
→ Set I/V Curve
   I/V Curve Scan
```

Figure 7.54 I/V Curve

# 7. Normal operation

## 7.5.18.1 Set I/V Curve

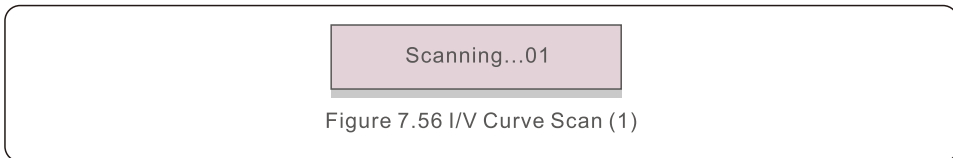
This setting can set the scanning voltage start point and the voltage interval.



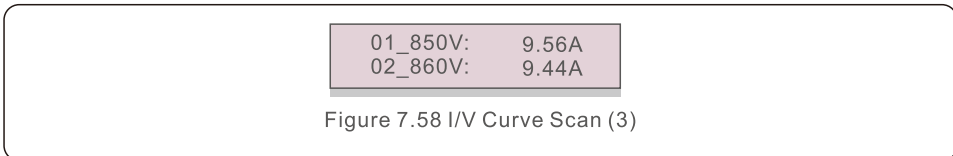
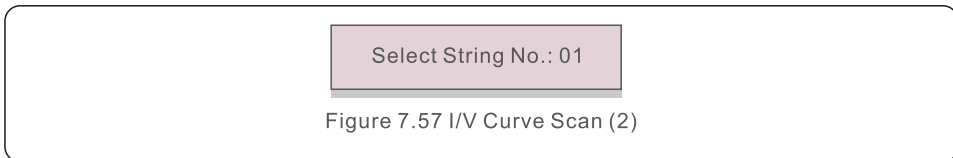
Start\_V: The start voltage of the I/V scan. (Adjustable from 850V-1000V)  
 Interval\_V: The scanning voltage interval. (Adjustable from 001V-100V)  
 In total, 60 data points can be scanned.  
 The max scanning range is from 850-1450V.

## 7.5.18.2 I/V Curve Scan

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



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



# 7. Normal operation

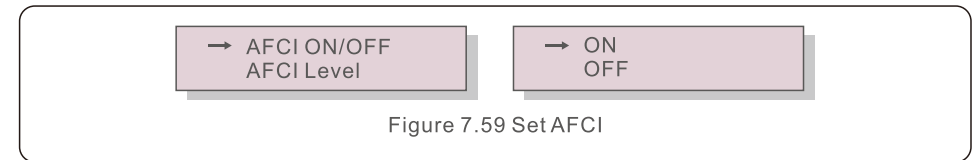
## 7.6 AFCI function


Solis inverters have the built-in AFCI function which can detect the arc fault on the DC circuit and shut down the inverter to prevent a fire disaster.


### 7.6.1 Enable the AFCI function

The AFCI function can be enabled in the following.

Path: Advanced Setting -> Password: 0010 -> Special Settings -> AFCI Set ->  
 AFCI ON/OFF -> ON

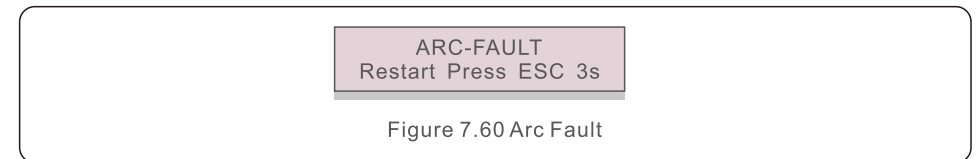


**Warning:**  
 The "AFCI Level" is reserved for Solis technicians ONLY. Do not change the sensitivity otherwise it will lead to frequent false alarms or malfunctions. Solis is not responsible for any further damages caused by unauthorized modifications.

**NOTE:**  
 The setting corresponds to the current status as well which can be used to inspect the ON/OFF state of the AFCI function.

### 7.6.2 Arc Fault

During the normal operation, if an DC arc is detected, the inverter will shut down and give out the following alarm:



Installer needs to thoroughly inspect the DC circuit to ensure all the cables are correctly fastened.

Once the DC circuit issue has been fixed or it is confirmed to be OK, press "ESC" for 3s and wait for the inverter to restart.



# 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 any maintenance or cleaning operation.

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



**NOTE:**

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

## 8.1 Anti-PID Function

Solis Three phase Inverters integrates optional Anti-PID module and it can recover the PID effect during night thus protect the PV system from degradation.

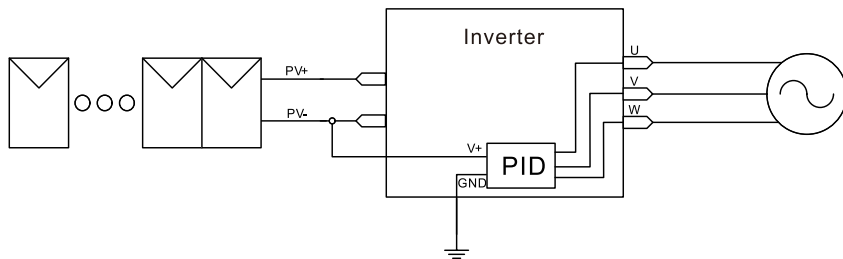


Figure 8.1

The Anti-PID module repairs the PID effect of the PV model at night. When operating, the inverter LCD screen displays "PID-repairing" information, and the red light is on. The Anti-PID function is always ON when AC is applied. If maintenance is required and turn off the AC switch can disable the Anti-PID function.



**WARNING :**

The PID function is automatic. When the DC bus voltage is lower than 50Vdc, the PID module will start creating 450 Vdc between PV- and ground. No need any control or settings

# 8. Maintenance



**NOTE:**

If you need to maintain the inverter at night, please turn off the AC switch first, then turn off the DC switch, and wait 5 minutes before you do other operations.

## 8.2 Fan Maintenance

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

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

1. Turn off the "Grid ON/OFF" switch on the inverter LCD.
2. Disconnect the AC power.
3. Turn the DC switch to "OFF" position.
4. Wait for 15 minutes at least.
5. Remove the 4 screws on the fan plate and pull out the fan assembly slowly.

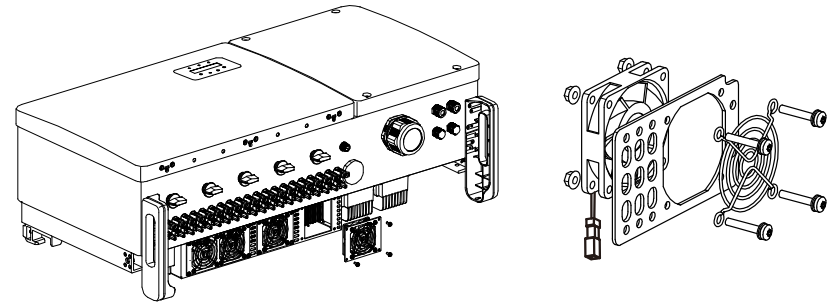


Figure 8.2

6. Disconnect the fan connector carefully and take out the fan.
7. Clean or replace the fan. Assemble the fan on the rack.
8. Connect the electrical wire and reinstall the fan assembly. Restart the inverter.

# 9. Troubleshooting

## 9.1 Current Alarm

### 9.1.1 Running messages

Running messages can be viewed on the screen including any current alarms.

## 9.2 Alarm History

### 9.2.1 Viewing alarm history

Refer to LCD Operation 7.4.9 for instructions on viewing Alarm History.

## 9.3 Error Messages

### NOTE

The first step to clearing alarms as listed in Table 9, is to reset the inverter. To reset the inverter, turn off the inverter (refer to Section 6.2) and wait for five (5) minutes before restarting it (refer to Section 6.1). If the failure persists, please first contact your local distributor and then Ginlong Support Service. If you need to contact Ginlong Support Service at <http://www.ginlong.com/>



Please have the following information available when contacting technical support:

- 1). Inverter serial number
- 2). The inverter distributor/dealer (if available)
- 3). Installation date
- 4). The description of problem (e.g., the alarm message displayed on the screen and the status of the screen status indicator lights. Other readings obtained from the Information sub menu will also be helpful.)
- 5). PV array configuration (e.g. number of panels, panel capacity, number of strings, etc.)
- 6). Your contact details

### 8.3.1 Troubleshooting guide

Solis inverters are designed in accordance with international grid standards, safety standards and electromagnetic compatibility requirements. Before delivery to the customer, the inverter has been subjected to intensive testing to ensure its optimal operation and reliability.

In case of failure, the screen may display an alarm message, stop feeding energy into the grid or both. Typical failure descriptions and their corresponding alarm messages are listed in Table 9 on the following pages.

# 9. Troubleshooting

Alarms	Cause	Solution
No Information (Blank Screen)	<ul style="list-style-type: none"> <li>• Input voltage low/missing</li> <li>• Polarity reversed</li> <li>• Main board damaged</li> </ul>	<p><b>Test – DC switch OFF</b></p> <ul style="list-style-type: none"> <li>• Check PV connections</li> <li>• Check polarity</li> <li>• Check voltage &gt;860V</li> </ul> <p><b>Test – DC Switch ON</b></p> <ul style="list-style-type: none"> <li>• Check voltage &gt;860V</li> <li>• If DC voltage is “0” replace inverter</li> </ul>
Initializing (Inverter stuck in this mode)	<ul style="list-style-type: none"> <li>• Inverter is waiting for driving signal</li> </ul>	<p><b>Test – DC switch OFF</b></p> <ul style="list-style-type: none"> <li>• Check PV connections</li> <li>• Check polarity</li> <li>• Check voltage &gt;860V</li> </ul> <p><b>Test – DC Switch ON</b></p> <ul style="list-style-type: none"> <li>• Check voltage &gt;860V</li> <li>• A cable may have been damaged or loosened in shipping replace inverter</li> </ul>
OV-G-V: Over Grid Voltage	<ul style="list-style-type: none"> <li>• Inverter detects grid voltage as too high</li> </ul>	<p><b>Test – DC switch OFF</b></p> <ul style="list-style-type: none"> <li>• Check AC at the inverter</li> <li>• If AC measures high, adjust upper limit with permission from utility</li> </ul> <p><b>Test – DC Switch ON, full power</b></p> <ul style="list-style-type: none"> <li>• Check AC at inverter test points</li> <li>• Compare with LCD</li> <li>• If AC measures high, cables between inverter and interconnect are too small</li> <li>• Check ampacity and voltage drop calculations</li> </ul>
UN-G-V: Under Grid Voltage	<ul style="list-style-type: none"> <li>• Inverter detects grid voltage as too low</li> </ul>	<p><b>Test – DC switch OFF</b></p> <ul style="list-style-type: none"> <li>• Check AC at the inverter test points</li> <li>• If AC measures low, adjust lower limit with permission from utility</li> </ul> <p><b>Test – DC Switch ON</b></p> <ul style="list-style-type: none"> <li>• Check LCD voltage reading, may be a bad measurement circuit</li> <li>• Check grid standard</li> <li>• Replace inverter</li> </ul>

# 9. Troubleshooting

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

# 9. Troubleshooting

Alarms	Cause	Solution
GRID-INTF: Grid unstable	<ul style="list-style-type: none"> <li>Inverter detects grid instability, internal fault current high</li> </ul>	<p><b>Test – With DC Switch OFF</b></p> <ul style="list-style-type: none"> <li>Measure AC voltage</li> <li>Test AC line for THD</li> <li>Test – With DC Switch ON</li> </ul> <p><b>Test AC line for THD</b></p> <ul style="list-style-type: none"> <li>Multiple inverters/turn one off</li> <li>Impedance matching adjustment or box</li> <li>Internal damage</li> <li>Wire came loose in shipping</li> </ul>
INI-FAULT: Initialization Protection	<ul style="list-style-type: none"> <li>Master and Slave DSP have different values</li> </ul>	<p><b>Reset Inverter</b></p> <ul style="list-style-type: none"> <li>DC switch OFF</li> <li>Wait until all lights/LCD turn off</li> <li>DC switch ON</li> <li>Replace inverter</li> </ul>
OV-TEM: Temperature Protection	<ul style="list-style-type: none"> <li>Inverter detects high ambient temperature &gt;60C</li> </ul>	<p><b>Inspect installation</b></p> <ul style="list-style-type: none"> <li>Check heatsink for obstructions/ventilation</li> <li>Is inverter in direct sunshine</li> <li>Measure ambient temperature near inverter</li> <li>If temp is in range replace inverter</li> </ul>
PV ISO-PRO 01/02: Ground Protection	<ul style="list-style-type: none"> <li>Inverter detects low DC insulation resistance</li> </ul>	<p><b>Inspect installation</b></p> <ul style="list-style-type: none"> <li>Reset inverter</li> <li>Note weather conditions when alarm occurs</li> <li>Measure insulation resistance</li> <li>If normal, measure in SAME weather as alarm</li> <li>Physically check cables</li> <li>Replace inverter</li> </ul>
ARC-FAULT	<ul style="list-style-type: none"> <li>Inverter detects arc in DC circuit</li> </ul>	<p><b>Inspect installation</b></p> <ul style="list-style-type: none"> <li>Check cable with string tester</li> <li>Physically check cables</li> <li>Inspect panel junction boxes</li> <li>Inspect cable connections</li> <li>Reset inverter</li> <li>Replace inverter</li> </ul>
Screen OFF with DC applied	<ul style="list-style-type: none"> <li>Inverter internally damaged</li> </ul>	<ul style="list-style-type: none"> <li>Do not turn off the DC switches as it may damage the inverter.</li> <li>Please wait for sunset and confirm the string current is less than 0.5A with a clip-on ammeter and then turn off the DC switch. String current above 0.5A is under load.</li> <li>Note: Damage due to wrong connections or fire caused by removing string wires or opening fuse holders under load is not covered in the device warranty.</li> </ul>

Table 9.1 Fault messages and descriptions

# 10. Specifications

Model	Solis-124K-HV-5G
Max. DC input voltage (Volts)	1000
Rated DC voltage (Volts)	720
Start-up voltage (Volts)	195
MPPT voltage range (Volts)	180...1000
Max. input current (Amps)	10*26
Max short circuit input current (Amps)	10*40
MPPT number/Max input strings number	10/20
Rated output power (Watts)	124000
Max. output power (Watts)	124000
Max. apparent output power (VA)	124000
Rated grid voltage (Volts)	3/PE, 480
Rated grid output current (Amps)	149.2
Max. output current (Amps)	149.2
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	60
Operating frequency range (Hertz)	59.5...60.5
Max. efficiency	99.0%
EU efficiency	98.5%
Dimensions (W*H*D)	41.9 * 22.3 * 13.6 in(1065 * 567 * 344.5 mm)
Weight	185 lbs(84 kg)
Topology	Transformerless
Self consumption (night)	< 2W
Operating ambient temperature range	-13~140 °F (-25~ 60 °C)
Relative humidity	0~100%
Ingress protection	TYPE 4X
Noise emission (typical)	≤65 dBA
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120 ft (4000 m)
Compliance	UL 1741, IEEE 1547, UL 1699B, UL 1998, FCC, UL 1741SA
DC connection	MC4 connector
AC connection	OT Terminal (max 185 mm <sup>2</sup> )
Display	LCD, 2×20 Z
Communication connections	RS485, Optional: Wifi, GPRS , PLC
Warranty	5 years (extend to 20 years)

# 10. Specifications

Model	Solis-125K-HV-5G
Max. DC input voltage (Volts)	1000
Rated DC voltage (Volts)	720
Start-up voltage (Volts)	195
MPPT voltage range (Volts)	180...1000
Max. input current (Amps)	10*26
Max short circuit input current (Amps)	10*40
MPPT number/Max input strings number	10/20
Rated output power (Watts)	125000
Max. output power (Watts)	125000
Max. apparent output power (VA)	125000
Rated grid voltage (Volts)	3/PE, 480
Rated grid output current (Amps)	150.4
Max. output current (Amps)	150.4
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	60
Operating frequency range (Hertz)	59.5...60.5
Max. efficiency	99.0%
EU efficiency	98.5%
Dimensions (W*H*D)	41.9 * 22.3 * 13.6 in(1065 * 567 * 344.5 mm)
Weight	185 lbs(84 kg)
Topology	Transformerless
Self consumption (night)	< 2W
Operating ambient temperature range	-13~140 °F (-25~ 60 °C)
Relative humidity	0~100%
Ingress protection	TYPE 4X
Noise emission (typical)	≤65 dBA
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120 ft (4000 m)
Compliance	UL 1741, IEEE 1547, UL 1699B, UL 1998, FCC, UL 1741SA
DC connection	MC4 connector
AC connection	OT Terminal (max 185 mm <sup>2</sup> )
Display	LCD, 2×20 Z
Communication connections	RS485, Optional: Wifi, GPRS , PLC
Warranty	5 years (extend to 20 years)

# 10. Specifications

Model	Solis-50K-LV-5G
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	450
Start-up voltage (Volts)	195
MPPT voltage range (Volts)	180...1000
Max. input current (Amps)	6*26
Max short circuit input current (Amps)	6*40
MPPT number/Max input strings number	6/12
Rated output power (Watts)	50000
Max. output power (Watts)	55000
Max. apparent output power (VA)	55000
Rated grid voltage (Volts)	3/(N)/PE, 220
Rated grid output current (Amps)	131.2
Max. output current (Amps)	144.3
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	60
Operating frequency range (Hertz)	59.5...60.5
Max. efficiency	98.5%
EU efficiency	98.1%
Dimensions (W*H*D)	41.9 * 22.3 * 13.6 in(1065 * 567 * 344.5 mm)
Weight	185 lbs(84 kg)
Topology	Transformerless
Self consumption (night)	< 2W
Operating ambient temperature range	-25°C. . . +60°C
Relative humidity	0~100%
Ingress protection	TYPE 4X
Noise emission (typical)	≤65 dBA
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120 ft (4000 m)
Compliance	UL 1741, IEEE 1547, UL 1699B, UL 1998, FCC, UL 1741SA
DC connection	MC4 connector
AC connection	OT Terminal (max 185 mm <sup>2</sup> )
Display	LCD, 2×20 Z
Communication connections	RS485, Optional: Wifi, GPRS , PLC
Warranty	5 years (extend to 20 years)

# 10. Specifications

Model	Solis-60K-LV-5G
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	450
Start-up voltage (Volts)	195
MPPT voltage range (Volts)	180...1000
Max. input current (Amps)	8*26
Max short circuit input current (Amps)	8*40
MPPT number/Max input strings number	8/16
Rated output power (Watts)	60000
Max. output power (Watts)	66000
Max. apparent output power (VA)	66000
Rated grid voltage (Volts)	3/(N)/PE, 220
Rated grid output current (Amps)	157.5
Max. output current (Amps)	173.2
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	60
Operating frequency range (Hertz)	59.5...60.5
Max. efficiency	98.5%
EU efficiency	98.1%
Dimensions (W*H*D)	41.9 * 22.3 * 13.6 in(1065 * 567 * 344.5 mm)
Weight	185 lbs(84 kg)
Topology	Transformerless
Self consumption (night)	< 2W
Operating ambient temperature range	-25°C. . . +60°C
Relative humidity	0~100%
Ingress protection	TYPE 4X
Noise emission (typical)	≤65 dBA
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120 ft (4000 m)
Compliance	UL 1741, IEEE 1547, UL 1699B, UL 1998, FCC, UL 1741SA
DC connection	MC4 connector
AC connection	OT Terminal (max 185 mm <sup>2</sup> )
Display	LCD, 2×20 Z
Communication connections	RS485, Optional: Wifi, GPRS , PLC
Warranty	5 years (extend to 20 years)

# 10. Specifications

Model	S5-GC124K-HV
Max. DC input voltage (Volts)	1000
Rated DC voltage (Volts)	720
Start-up voltage (Volts)	195
MPPT voltage range (Volts)	180...1000
Max. input current (Amps)	10*32
Max short circuit input current (Amps)	10*50
MPPT number/Max input strings number	10/20
Rated output power (Watts)	124000
Max. output power (Watts)	124000
Max. apparent output power (VA)	124000
Rated grid voltage (Volts)	3/PE, 480
Rated grid output current (Amps)	149.2
Max. output current (Amps)	149.2
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	60
Operating frequency range (Hertz)	59.5...60.5
Max. efficiency	99.0%
EU efficiency	98.5%
Dimensions (W*H*D)	41.9 * 22.3 * 13.6 in(1065 * 567 * 344.5 mm)
Weight	201 lbs(91 kg)
Topology	Transformerless
Self consumption (night)	< 2W
Operating ambient temperature range	-13~140 °F (-25~ 60 °C)
Relative humidity	0~100%
Ingress protection	TYPE 4X
Noise emission (typical)	≤65 dBA
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120 ft (4000 m)
Compliance	UL 1741, IEEE 1547, UL 1699B, UL 1998, FCC, UL 1741SA
DC connection	MC4 connector
AC connection	OT Terminal (max 185 mm <sup>2</sup> )
Display	LCD, 2×20 Z
Communication connections	RS485, Optional: Wifi, GPRS , PLC
Warranty	5 years (extend to 20 years)

# 10. Specifications

Model	S5-GC125K-HV
Max. DC input voltage (Volts)	1000
Rated DC voltage (Volts)	720
Start-up voltage (Volts)	195
MPPT voltage range (Volts)	180...1000
Max. input current (Amps)	10*32
Max short circuit input current (Amps)	10*50
MPPT number/Max input strings number	10/20
Rated output power (Watts)	125000
Max. output power (Watts)	125000
Max. apparent output power (VA)	125000
Rated grid voltage (Volts)	3/PE, 480
Rated grid output current (Amps)	150.4
Max. output current (Amps)	150.4
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	60
Operating frequency range (Hertz)	59.5...60.5
Max. efficiency	99.0%
EU efficiency	98.5%
Dimensions (W*H*D)	41.9 * 22.3 * 13.6 in(1065 * 567 * 344.5 mm)
Weight	201 lbs(91 kg)
Topology	Transformerless
Self consumption (night)	< 2W
Operating ambient temperature range	-13~140 °F (-25~ 60 °C)
Relative humidity	0~100%
Ingress protection	TYPE 4X
Noise emission (typical)	≤65 dBA
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120 ft (4000 m)
Compliance	UL 1741, IEEE 1547, UL 1699B, UL 1998, FCC, UL 1741SA
DC connection	MC4 connector
AC connection	OT Terminal (max 185 mm <sup>2</sup> )
Display	LCD, 2×20 Z
Communication connections	RS485, Optional: Wifi, GPRS , PLC
Warranty	5 years (extend to 20 years)

# 10. Specifications

Model	S5-GC50K-LV
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	450
Start-up voltage (Volts)	195
MPPT voltage range (Volts)	180...1000
Max. input current (Amps)	6*32
Max short circuit input current (Amps)	6*50
MPPT number/Max input strings number	6/12
Rated output power (Watts)	50000
Max. output power (Watts)	55000
Max. apparent output power (VA)	55000
Rated grid voltage (Volts)	3/(N)/PE, 220
Rated grid output current (Amps)	131.2
Max. output current (Amps)	144.3
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	60
Operating frequency range (Hertz)	59.5...60.5
Max. efficiency	98.5%
EU efficiency	98.1%
Dimensions (W*H*D)	41.9 * 22.3 * 13.6 in(1065 * 567 * 344.5 mm)
Weight	196 lbs(89 kg)
Topology	Transformerless
Self consumption (night)	< 2W
Operating ambient temperature range	-25°C. . . +60°C
Relative humidity	0~100%
Ingress protection	TYPE 4X
Noise emission (typical)	≤65 dBA
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120 ft (4000 m)
Compliance	UL 1741, IEEE 1547, UL 1699B, UL 1998, FCC, UL 1741SA
DC connection	MC4 connector
AC connection	OT Terminal (max 185 mm <sup>2</sup> )
Display	LCD, 2×20 Z
Communication connections	RS485, Optional: Wifi, GPRS , PLC
Warranty	5 years (extend to 20 years)

# 10. Specifications

Model	S5-GC60K-LV
Max. DC input voltage (Volts)	1100
Rated DC voltage (Volts)	450
Start-up voltage (Volts)	195
MPPT voltage range (Volts)	180...1000
Max. input current (Amps)	6*32
Max short circuit input current (Amps)	6*50
MPPT number/Max input strings number	8/16
Rated output power (Watts)	60000
Max. output power (Watts)	66000
Max. apparent output power (VA)	66000
Rated grid voltage (Volts)	3/(N)/PE, 220
Rated grid output current (Amps)	157.5
Max. output current (Amps)	173.2
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%
Rated grid frequency (Hertz)	60
Operating frequency range (Hertz)	59.5...60.5
Max. efficiency	98.5%
EU efficiency	98.1%
Dimensions (W*H*D)	41.9 * 22.3 * 13.6 in(1065 * 567 * 344.5 mm)
Weight	196 lbs(89 kg)
Topology	Transformerless
Self consumption (night)	< 2W
Operating ambient temperature range	-25°C. . . +60°C
Relative humidity	0~100%
Ingress protection	TYPE 4X
Noise emission (typical)	≤65 dBA
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120 ft (4000 m)
Compliance	UL 1741, IEEE 1547, UL 1699B, UL 1998, FCC, UL 1741SA
DC connection	MC4 connector
AC connection	OT Terminal (max 185 mm <sup>2</sup> )
Display	LCD, 2×20 Z
Communication connections	RS485, Optional: Wifi, GPRS , PLC
Warranty	5 years (extend to 20 years)