User Manual

for S6 Series Grid Tie Inverter

Applicable models

S6-GU250K-EHV-US-M12
S6-GU300K-EHV-US-M12
S6-GU350K-EHV-US-M12
S6-GU350K-EHV-US-M16

PE-MN-0001-R00 Date: 02, 2025

Important notes

- Product specifications are subject to change without notice. Every effort has been made to ensure that this document complete, accurate and up-to-date. Individuals reviewing this document and installers or service personnel are cautioned, however, that Solis reserves the right to make changes without notice and shall not be responsible for any damages, including indirect, incidental or consequential damages caused by reliance on the material presented including, but not limited to, omissions, typographical errors, arithmetical errors or listing errors in the material provided in this document.

- Solis accepts no liability for customers' failure to comply with the instructions for correct installation and will not be held responsible for upstream or downstream systems Solis equipment has supplied.

- The customer is fully liable for any modifications made to the system; therefore, any hardware or software modification, manipulation, or alteration not expressly approved by the manufacturer shall result in the immediate cancellation of the warranty.

- Given the countless possible system configurations and installation environments, it is essential to verify adherence to the following:
  - There is sufficient space suitable for housing the equipment.
  - Airborne noise produced depending on the environment.
  - Potential flammability hazards.

- Solis will not be held liable for defects or malfunctions arising from:
  - Improper use of the equipment.
  - Deterioration resulting from transportation or particular environmental conditions.
  - Performing maintenance incorrectly or not at all.
  - Tampering or unsafe repairs.
  - Use or installation by unqualified persons.

- This product contains lethal voltages and should be installed by qualified electrical or service personnel having experience with lethal voltages.

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1.1 Product Description

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

This manual covers the three phase inverter models listed below:

S6-GU250K-EHV-US-M12, S6-GU300K-EHV-US-M12, S6-GU350K-EHV-US-M12, S6-GU350K-EHV-US-M16

Figure 1.1 Front view

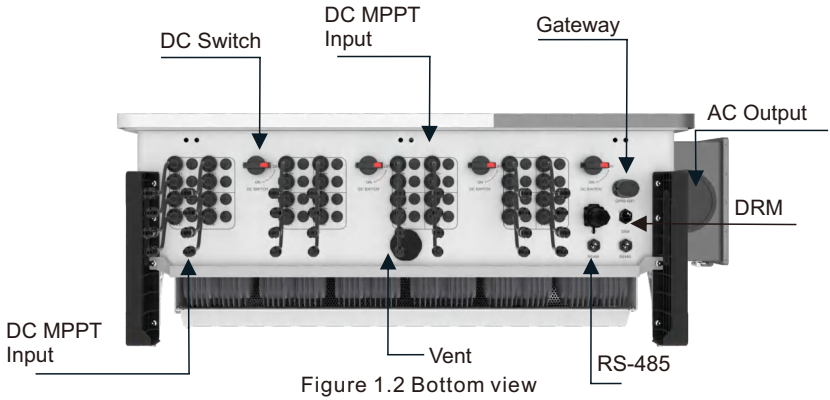


Figure 1.2 Bottom view

1.2 Front Panel LED

Figure 1.3 Front Panel Display

1.3 LED Status Indicator Lights

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

- POWER LED (red) indicates the power status of the inverter.
- OPERATION LED (green) indicates the operation status.
- ALARM LED (yellow) indicates the alarm status.
- BLUETOOTH LED (blue) indicates connection status.

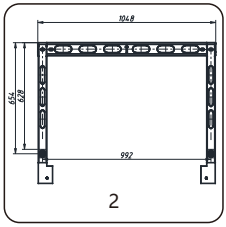
Light	Status	Description
POWER	ON	The inverter detects DC power.
	OFF	No DC power or low DC power.
OPERATION	ON	The inverter is operating properly.
	OFF	The inverter has stopped producing power.
	FLASHING	The inverter is initializing| Updating software
ALARM	ON	Alarm or fault condition is detected.
	OFF	No fault or alarm is detected.
BLUETOOTH	ON	Bluetooth connection with a device established.
	OFF	No Bluetooth connection with any devices.

Figure 1.4 Status Indicator LED

1.4 Unpacking

The inverter ships with all accessories in one carton.
When unpacking, please verify all the parts listed below are included:


1



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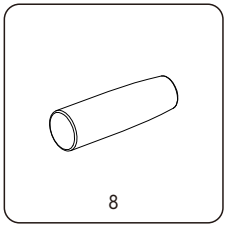

8

Part #	Description	Quantity	Remarks
1	Inverter	1	
2	Mounting Bracket	1	
3	Fastening screw	2	Hexagon bolt M6*12
4	Fastening screw, hex nut and flat gasket	4	Hexagon bolt M10*40
5	DC connector	12	Staubli Electrical Connectors AG PV-KBT4/13II-UR PV-KST4/13II-UR
6	2 pin port	3	
7	RJ45 connector	1	
8	Handle	4	

Inverter packing list

1.5 Inverter Circuit Diagram

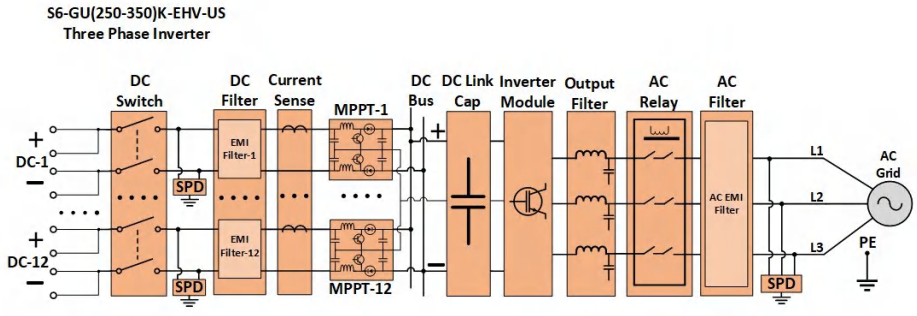


Figure 1.5 Inverter Circuit Diagram

1.6 Tools Required for Installation

Technician Screwdriver


Torqx T20 Screwdriver


Wire Strippers
12AWG to 6AWG


Wire Strippers
20AWG to 10AWG


LUG Crimping Tool


Channel Locks


Multimeter (AC/DC amps)


Drill and Impact Driver


Torque Screwdriver


MC4 Crimping Tool


Smart Phone


Heat Gun

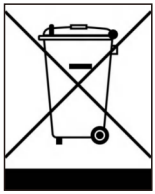
1.7 Storage

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, dry environment, free of dust and debris. The recommended storage temperature range is 40~176°F, with a humidity level of 0 to 95% (non-condensing).
- Do not stack more than two (2) 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.

1.8 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 .



SAVE THESE INSTRUCTIONS – This manual contains important instructions for Models S6-GU250K-EHV-US-M12, S6-GU300K-EHV-US-M12 , S6-GU350K-EHV-US-M12 and S6-GU350K-EHV-US-M16, that shall be followed during installation and maintenance of the inverter.

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.

CAUTION
Risk of electric shock from energy stored in the inverter's capacitors.
Do not remove cover until 20 minutes have passed after disconnecting all sources of supply, and this can only be performed 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 . 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

This inverter is designed to accept only photovoltaic (PV) arrays as its DC input. Connecting any other DC power source may result in inverter damage.

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 applications.

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, see power down instructions in Section 7.2.

2.4 Protection Circuitry and Controls

To meet relevant codes and standards, the Solis U.S. and Canada three phase inverter line is equipped with protective circuitry and controls. These include Arc Fault Circuit Interrupter (AFCI) and Anti-Islanding Protection.

Arc Fault Circuit Interrupter AFCI:

Edition 2011 of the National Electrical Code®, Section 690.11, requires that all PV plants attached to a building are fitted with a means of detecting and interrupting serial electric arcs in the PV wiring and array. An electric arc with a power of 300W or greater must be interrupted by the AFCI in the time specified by UL 1699B. A triggered AFCI fault may only be reset manually. After clearing the source of the fault, the AFCI can be deactivated via the inverter front panel interface.

Anti-Islanding Protection:

Anti-Islanding is a condition where the inverter ceases to produce power 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 inverter's operating in parallel and the grid.

NOTE
For additional installation details, watch the installation video in the link below
https://www.youtube.com/watch?v=GOULU5jD_-4

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.

CAUTION, HOT SURFACE
- The temperature of the inverter heat-sink can reach 167°F.

- The ambient temperature and relative humidity should meet the following requirements.

- The load bearing structure shall meet the following requirements.

Made of non-inflammable materials

Max. load bearing capacity ≥ 4 times of inverter weight

- If multiple inverters are installed on site, a minimum clearance shall be kept according to Figure 3.2 and 3.3.
- The LED status indicator lights 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.

NOTE
Nothing should be stored on or placed against the inverter.

3.1.1.1 Examples of correct and incorrect installations

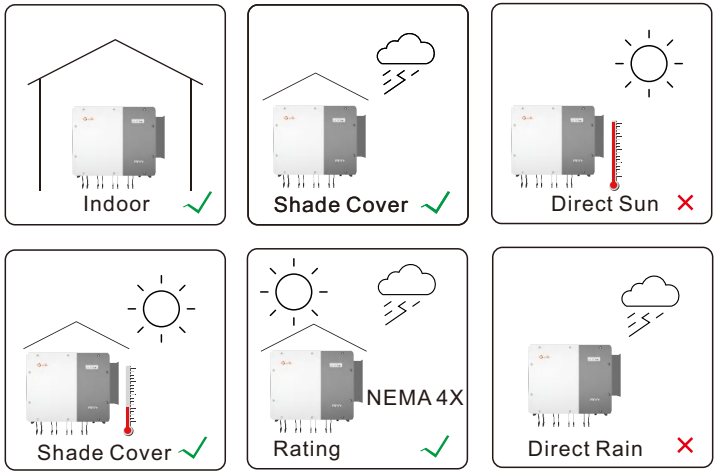


Figure 3.1 Recommended Installation locations

3.1.2 Other environmental considerations

3.1.2.1 Consult technical data

Consult the specifications section (section 11) for additional environmental conditions (protection rating, temperature, humidity, altitude, etc.).

3.1.2.2 Vertical wall installation

This model of Solis inverter should be mounted vertically.

3.1.2.3 Avoiding direct sunlight

Installation of the inverter in a location exposed to direct sunlight should to be avoided.
Sun Shade covers are available from Solis for various inverter models.
Direct exposure to sunlight could cause:

- Power output limitation (with a resulting decreased energy production by the system).
- Premature wear of the electrical/electromechanical components.
- Premature wear of the mechanical components (gaskets) and user interface.

Figure 3.2 Clearance distances requirement for the inverter

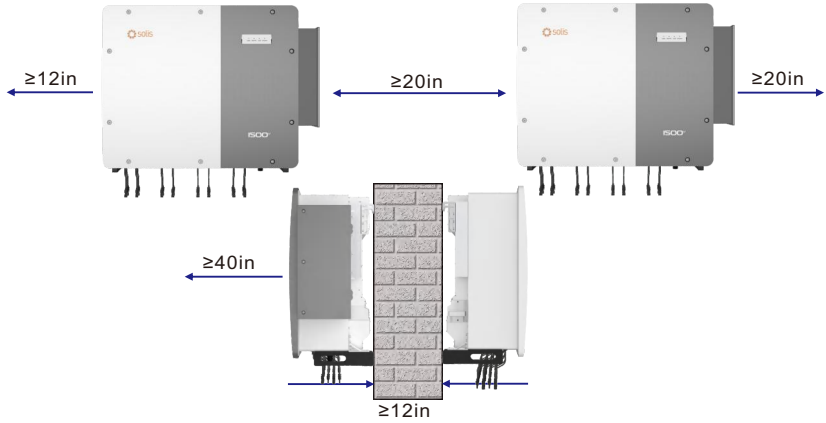


Figure 3.3 Distances required between inverters when multiple inverters are installed

3.1.2.4 Air circulation

Avoid installing the inverter in confined spaces where airflow is restricted. To prevent overheating, always ensure that the air flow around the inverter is not blocked.

3.1.2.5 Flammable substances

Do not install near flammable substances. Maintain a minimum distance of three (3) meters (10 feet) from such substances.

3.1.2.6 Living area

Do not install in a living area where the prolonged presence of people or animals is expected. Depending on where the inverter is installed (for example: the type of surface around the inverter, the general properties of the room, etc.) and the quality of the electricity supply, the sound level from the inverter can be quite high.

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 around 135kg/297lb (see Figure 3.4).

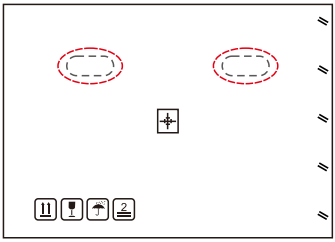


Figure 3.4 Handles used to move the inverter shown circled in red

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 3.5).

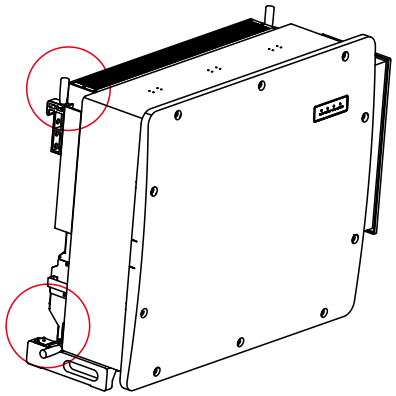


Figure 3.5 Inverter handles

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. When installers are carrying the inverter, please use 4 handles to secure safety. Lifting force of each handle shall not exceed 1.5 times of the inverter weight.

In case of using hoisting to lift the inverter, fix the hoisting cable to the hanger shown in the graph. Please make a reasonable selection of hoisting equipment considering the inverter weight of 135kg/297lb.

Figure 3.6 Hoisting sketch

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 3.7.

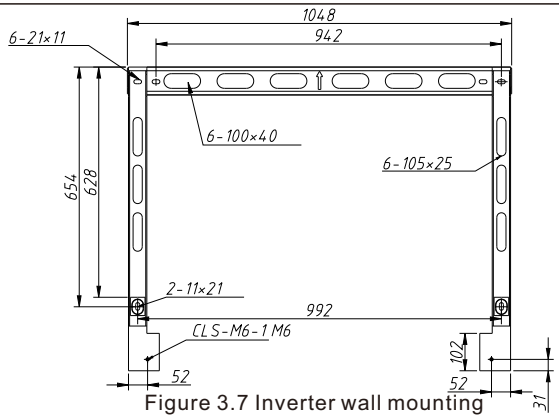


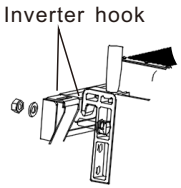
Figure 3.7 Inverter wall mounting

3.3.1 Wall mounting

Inverter shall be mounted vertically. The steps to mount the inverter are listed below.

1. Refer to Figure 3.7, 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 3.6 in.
2. Make sure the bracket is horizontal, and the mounting holes are marked correctly. Drill the holes into wall at your marks.
3. Use the suitable mounting screws to attach the bracket on the wall.
4. Lift the inverter and hang it on the bracket, and then slide down to make sure they match perfectly.

Torque:22.1-25.8 ft.lbs



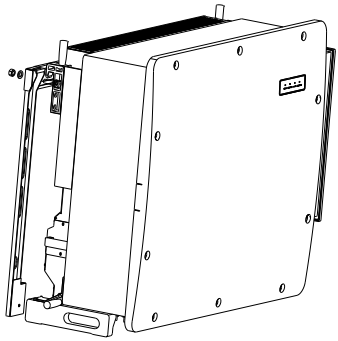


Figure 3.8 Install the inverter

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

Torque:1.5-2.2 ft.lbs

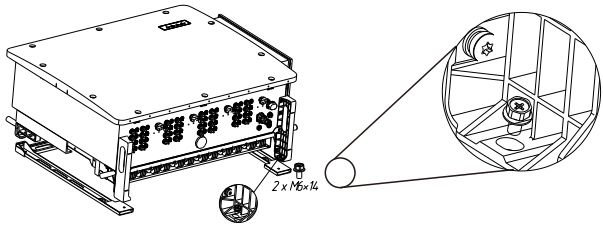


Figure 3.9 Fix the inverter

3.4 Electrical Connections

Inverter design uses PV style quick-connect terminal. The top cover does not need 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 and national standards.

Cable	Connection	Cable size	Torque
DC terminal	PV strings	8-6 AWG	NA
Ground terminal	AC ground	1/0AWG-250 MCM	7.4-8.9 ft.lbs
Grid terminal	Grid	4/0 AWG-1000 MCM (Max 1000MCM)	25-33 ft.lbs
RS-485 terminal	Communication cable	22-18 AWG	0.44 ft.lbs
COM terminal	Wi-Fi/Cellular stick	NA	NA

Table 3.1 Electrical connection specification

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

1. Switch the Grid Supply Main Switch or Circuit Breaker (AC) OFF and LOTO the AC Switch or Circuit Breaker.
2. Switch the DC Switch OFF.
3. Connect the inverter to the grid.
4. Assemble PV connector and connect to the Inverter.

3.4.1 Grounding

To effectively protect the inverter, two grounding methods must be performed.

1. Connect the AC grounding cable (refer to section 3.4.3)
2. 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. Cable ampacity of the ground conductor should be more than half the ampacity ratings of AC phase L1,L2,L3 conductors.
2. Prepare OT terminals: M10.

NOTE

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.

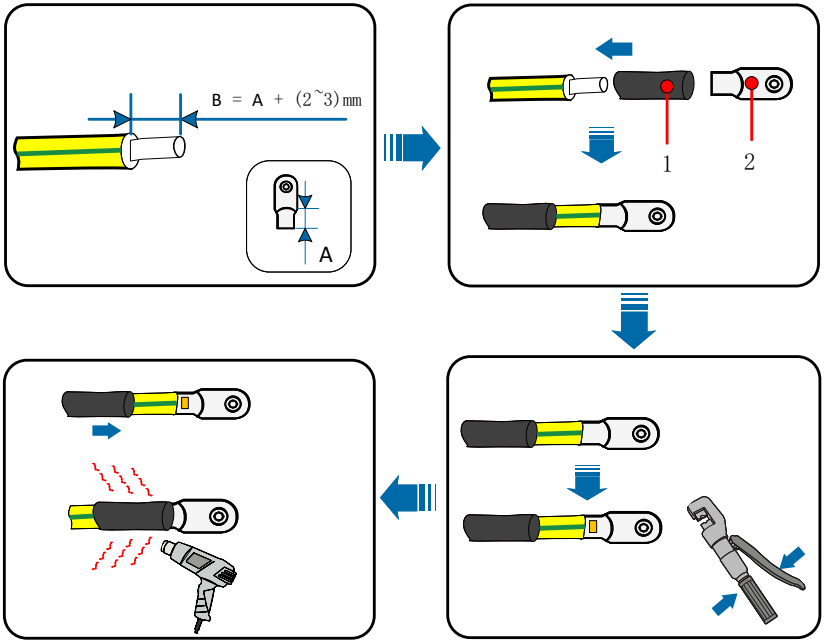


Figure 3.10 Suitable length

NOTE

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

4. Insert the stripped wire into the OT terminal crimping area and use the hydraulic clamp to crimp the terminal to the wire.

NOTE

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.

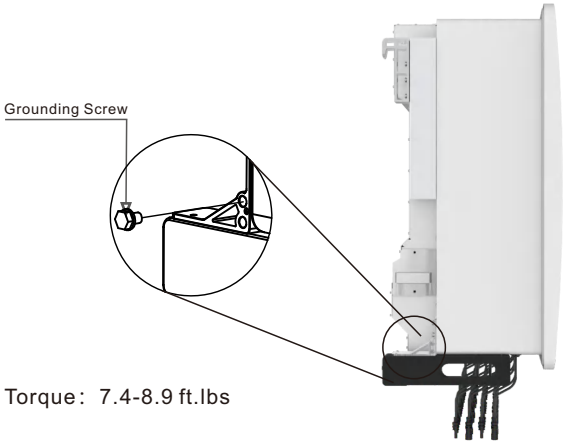


Figure 3.11 Fixed cable

NOTE

To reduce corrosion, apply silicone or paint to the screw after ground cable has been installed.

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.

NOTE
The inverter has a DC fuseless design with internal overcurrent protection. It is not needed to install any external DC string fuses or DC circuit breakers. If customers want to have redundant protection, they can choose to install external DC overcurrent protection devices with ≥1.56 times of the string Isc. External DC overcurrent protection devices shall comply with UL 1741.

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.

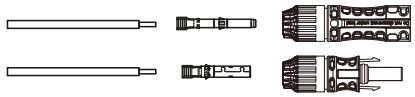


Figure 3.12 Disassemble the Connector Cap nut

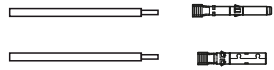


Figure 3.13 Insert the Wire into the Connector Cap nut and contact pin

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.

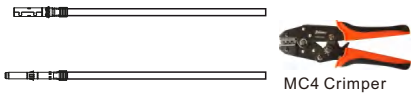


Figure 3.14 Crimp the contact pin to the wire

Figure 3.15 Connector with Cap nut Screwed on

5. Measure the DC voltage of each PV string with multi-meter, confirm the polarity of PV strings are correct (see figure 3.16), 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 3.17)

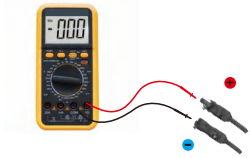


Figure 3.16 Multimeter measurement

Figure 3.17 Connect the DC Connectors to the Inverter

Cable type	Traverse area (mm²)		Outside diameter of cable (mm)
	Range	Recommended value	
PV Wire UL 4703 Listed	10.0~16.0 (8~6AWG)	10.0 (8AWG)	7.6~9.0

Caution

If DC inputs are accidently reversely connected or inverter is faulty or not working properly, it is NOT recommended to turn off the DC switch under Normal operating condition and only under Emergency operating conditions the switch can be used to turn OFF the DC inputs and disconnect PV strings. Under Normal operating condition the proper actions are:

- Use a clip-on amp-meter to measure the DC string current.
- If it is above 0.5A, please wait for the solar irradiance to drop 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.

Requirements for the PV modules per MPPT input:

- All PV modules must be of the same type and power rating.
- 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 11 “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.
- Short circuit current of all strings connected to a single MPPT must not exceed the Max. Short Circuit rating of MPPT input. (see section 11 “Specifications” for Max. Short Circuit Current) .

3.4.2.1 DC connection high voltage danger notice

CAUTION
Risk of electrical 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 over-voltage.

The DC input voltage of the PV modules must not exceed the maximum rating of the inverter. (see section 11 “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).

NOTE
The AC output neutral is not bonded to the ground.
The neutral wire is not necessary for the installation.

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 referenced in Table 3.2 (The OCPD shall comply with National Electrical Code® , ANSI/NFPA 70 or the Canadian Electrical Code® CSA C22.1).

3.4.3.1 Aluminum Cable Requirements

When Aluminum cable is selected, use copper to aluminum adapter terminal to avoid direct contact between the copper bar and the aluminum cable. When using aluminum/copper wire rated lug, no additional adapters are required.

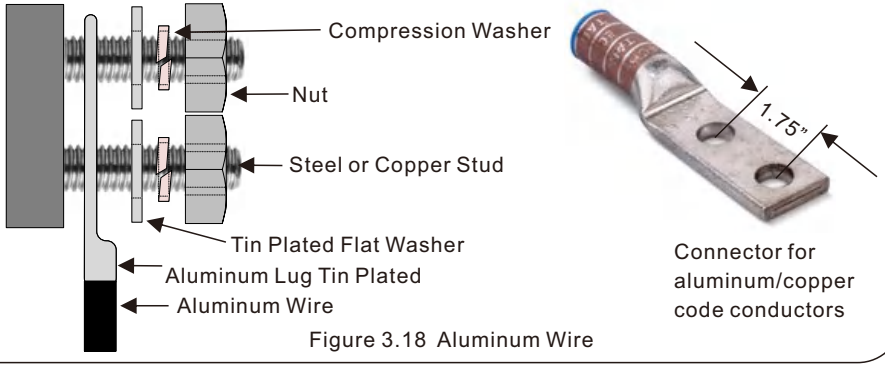


Figure 3.18 Aluminum Wire

NOTE

Direct contact between the copper bar and the aluminum cable will cause electro mechanical corrosion, compromising the reliability of the electrical connection.

NOTE

Inverter OCPD must be selected in accordance with National Electrical Code® ANSI/NFPA 70 or the Canadian Electrical Code® CSA C22.1. Operating ambient temperature and humidity must be factored and considered when selecting OCPD for the inverter output.

Inverter	Rated voltage(VAC)	Max. output current (Amps)	Recommended current range for OCPD (A)
S6-GU250K-EHV-US-M12	600	240.6	300-350
S6-GU300K-EHV-US-M12	690	251.0	350
S6-GU350K-EHV-US-M12	800	252.6	350
S6-GU350K-EHV-US-M16	800	252.6	350

Table 3.2 Rating of grid OCPD

3.4.3.2 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 11 “Specifications”.

3.4.3.3 Wiring procedure

CAUTION

RISK OF ELECTRIC SHOCK. Prior to starting the wiring procedure, ensure that the three-pole circuit breaker is switched off and are LOTO.

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.

NOTE

The DC switch of inverter only disconnects the PV without locking function. When installing and using this equipment, an additional disconnect with a lock function is required.

Cable specification		AC Phase L1-L3 wire	Ground wire
Conductor gage AWG/ (mm)^2	Range	4/0- 1000kcmil (120~500)	1/0-250 (70~150)
	Recommended (CU)	400kcmil (240)	3/0 (95)
Conduit diameter Inch/ (mm)	Range	3" (92)	Same Conduit
	Recommended	3" (92)	Same Conduit

NOTE
Cable ampacity of ground wire should be more than half of cable ampacity of AC phase L1,L2,L3 wire.

1. Strip Length: It is important that the strip length matches the terminal , and enables the correct wire placement in the terminal prior to crimping. Visual appearance of wire brush strands present in inspection window sight hole see Figure 3.20 for reference. For proper wire crimping, follow lug manufacturer guidelines.

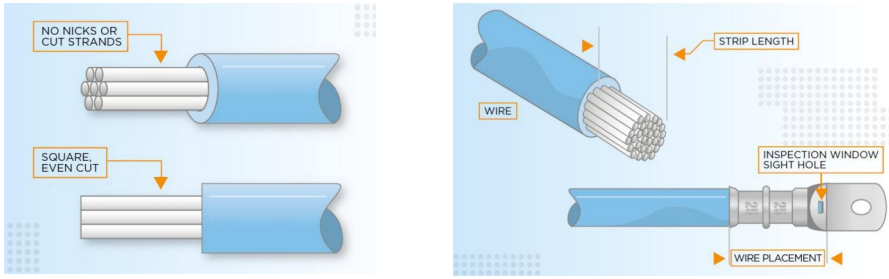
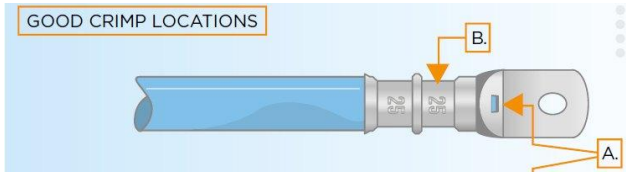


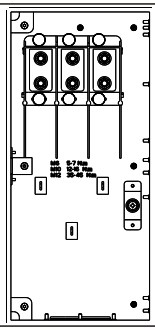
Figure 3.19 AC Cable Striping

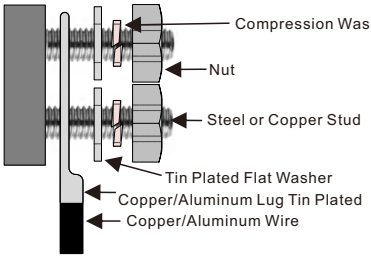


A. Wire seen in correct position through site hole.

B. Correct die reference embossed upon crimp area, relates to terminal reference and wire size.

Figure 3.20 AC Wire Crimping





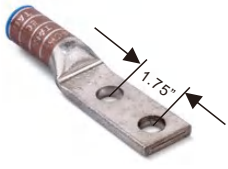


Figure 3.21 Connecting to AC terminals

3. LOTO the AC breaker disconnect to ensure it does not close unexpectedly.

4. Remove the 3 screws on the inverter junction box and open the junction box cover.

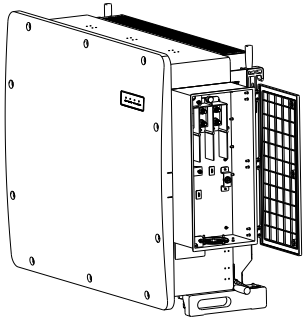


Figure 3.22 Remove the junction box cover

5. Insert the cable through the nut, sheath, and AC terminal cover. Connect the cable to the AC terminal block and tighten the nuts using a torque socket wrench. The torque is 25-33 ft.lbs.

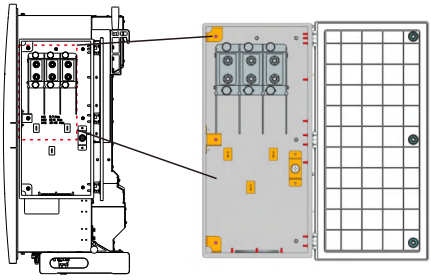


Figure 3.23 AC L1,L2,L3 terminals

There are 4 communication terminals on the inverter.
GPRS WIFI is a 4-pin connector reserved for WiFi/Cellular datalogger.
2 x RS-485 ports are for RS-485 communication between inverters.
DRM port is for DRM connection.

4.1 RS-485 communication connection

Monitoring system for multiple inverters

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

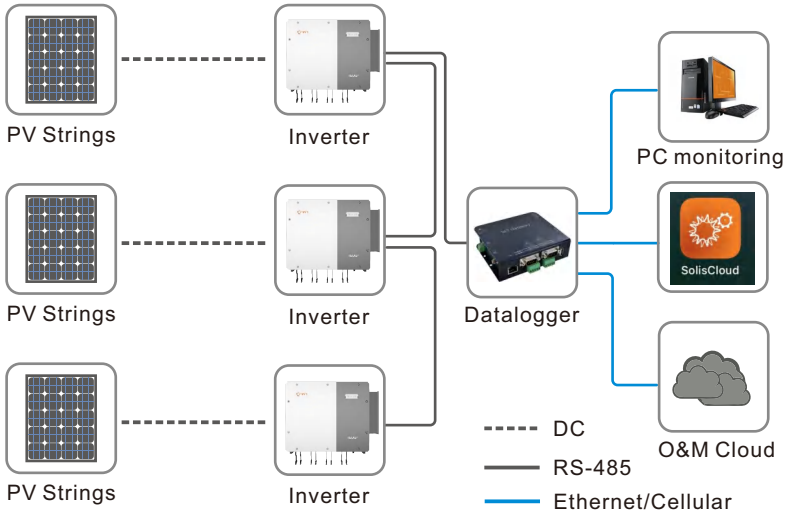


Figure 4.1 Multiple inverter monitoring system(RS-485)

Figure 4.2 2xRS-485 ports communication ports IN/OUT.

Figure 4.3 RS-485 Cable assembly

Figure 4.4 RS-485 Inverter cable connection

4.2 PLC （Power Line Communication) connection

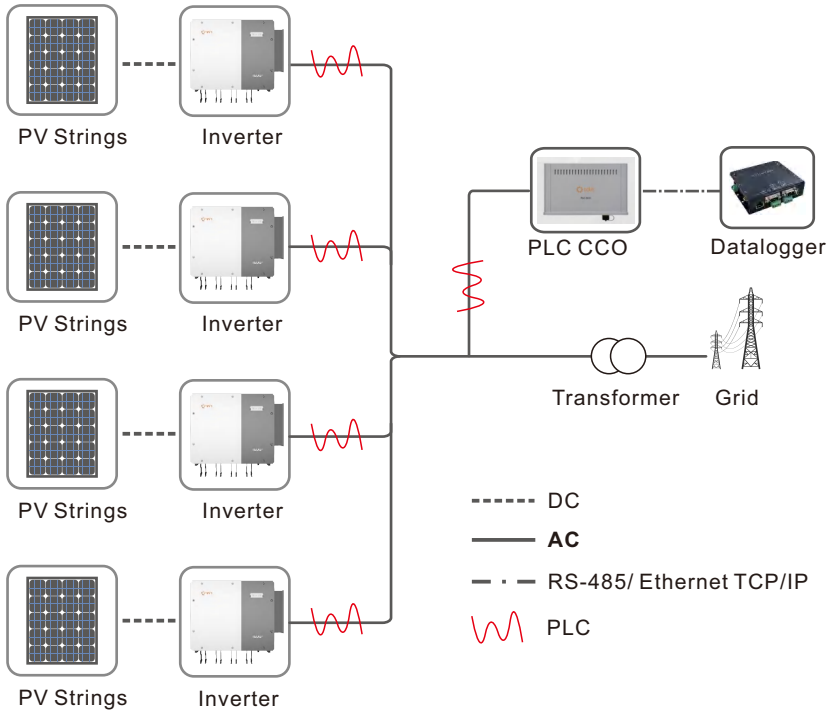


Figure 4.5 Multiple inverter monitoring system(PLC)

5.1 Pre-Commissioning Steps

- Visually inspect each piece of equipment in the system closely.
- Check all conduit and cable connection points to ensure they are tight.
- Verify that all system components have adequate space for ventilation.
- Follow each cable to ensure that they are all terminated in the proper places.
- Ensure that all warning signs and labels are affixed on the system equipment.
- Verify that the inverter is secured to the wall or the rack and is not loose or wobbly.
- Have an Android or Apple mobile phone with Bluetooth capability.
- Install the SolisCloud app on the mobile phone.
  There are three ways to download and install the latest app:
  1. You can visit **www.soliscloud.com**
  2. You can search "**Soliscloud**" in Google Play or App Store.
  3. You can scan this QR code to download **Soliscloud**.
- Register a new account with SolisCloud.

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 Summary of Commissioning Procedure

Once the equipment has been fully installed and an account for SolisCloud has been registered, the commissioning process can begin.

Step 1: Verify the DC and AC voltages

Step 2: Connect to the inverter with the SolisCloud app

Step 3: Conduct preliminary checks in section 5.4

Step 4: Configure the initial settings: time, grid standard, work mode, inverter address and others see Section 6 Settings

Step 5: Turn the inverter on

5.3 Selecting the appropriate grid standard

5.3.1 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 is accessible as described in Section 6.0 .

5.4 Preliminary checks

WARNING
High Voltage.
Only qualified personnel should perform AC and DC measurements.

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. Visually inspect the MC4 connector and make sure that the metal pin is correctly installed inside the MC4 housing.

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 11) 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.

5.4.3.2.1 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.
To measure leakage to ground, perform the following steps:

1. Ensure that neither negative nor positive DC conductors are connected to the ground strip.
2. Measure each string positive connection to ground.
3. Measure each string negative connection to ground.
4. Verify the voltage is “floating”(slowly discharging toward 0V), not a consistent voltage to ground. Make sure you notice the units of the measurement. mV is not the same as V.

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). PH A to PH B, PH B to PH C and PH C to PH A.
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 11 “Specifications”.

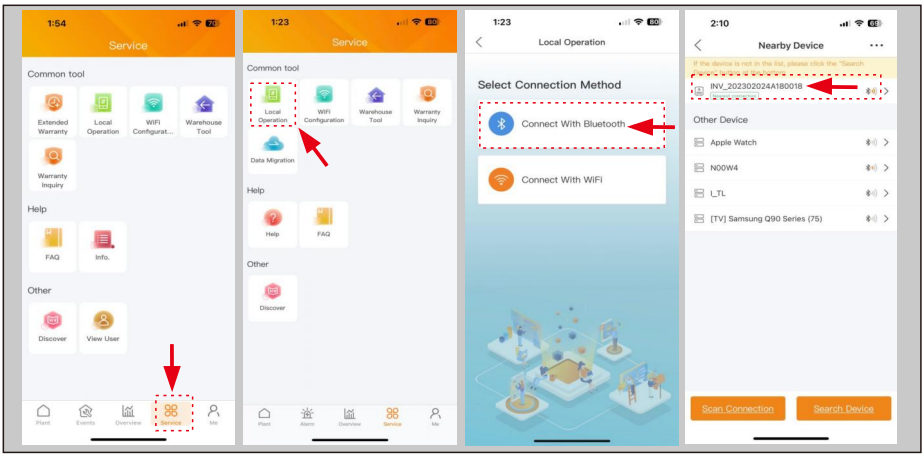
5.4.4.2 Phase rotation test

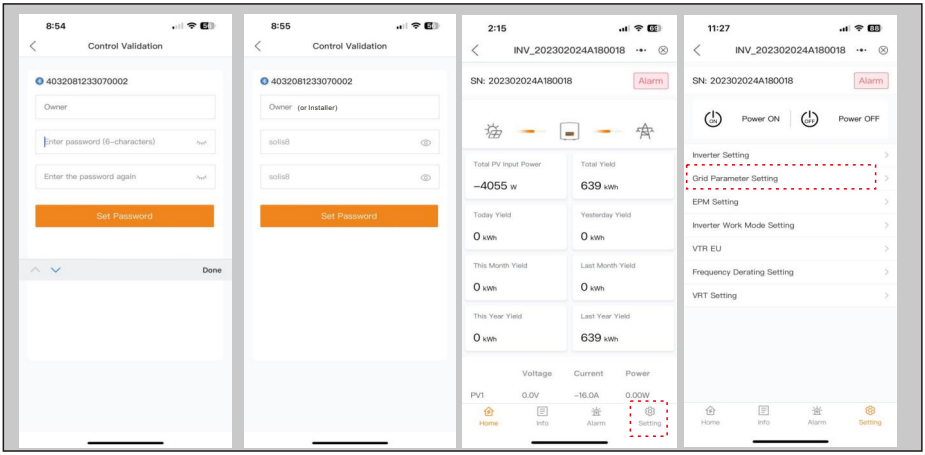
A phase rotation test is recommended to ensure the phases have been connected in the appropriate order. Solis inverters do not require a specific phase rotation connection. However, the local utility may require a specific phase rotation or a record of the phase configuration of the installation.

6.1 Connection to SolisCloud

6.1.1 Connect inverter with SolisCloud application

Turn your phone Bluetooth ON and then open the SolisCloud app. Tap *Service,* then tap ***Local Operation***, and then tap ***Connect with Bluetooth***.

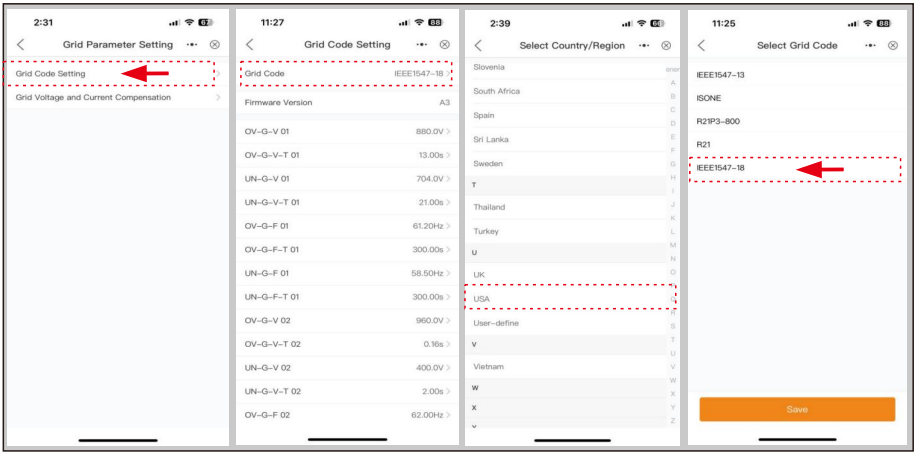


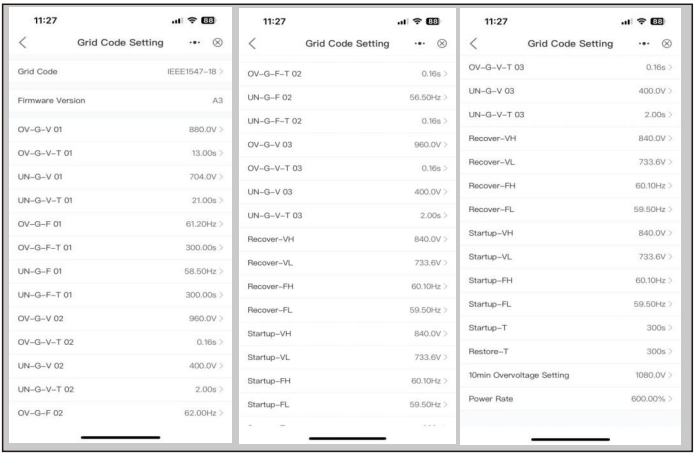


The name of the inverter Bluetooth network will display as “INV_” and then the inverter serial number. Tap on inverter to connect to it. The next screen will prompt you to create a six-character password. The password must be exactly six characters. Once you set the password, tap ***Set Password***. It is highly recommended to save this password somewhere in case anyone ever returns to the site in the future. You should then see the message “Connection succeeded’ and then you will be at the main interface page.

6.1.2 Select Inverter Grid Code

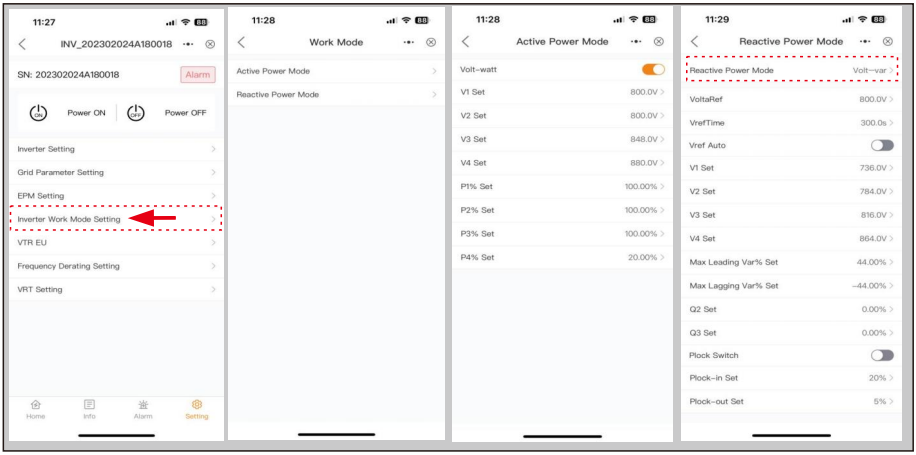
Tap on ***Setting*** in the bottom right corner, then tap ***Grid Parameter Setting*** .
Tap ***Grid Code Setting Check*** . For inverters installed in US and Canada select IEEE1547-2018 grid code standard and tap ***SAVE***.
Grid Code Protection settings can be changed within the ***Grid Code Setting*** menu.

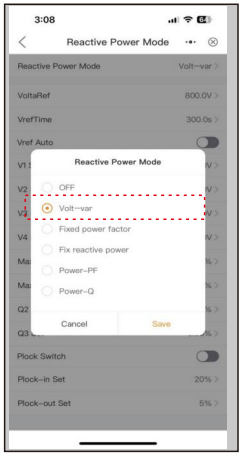




6.1.3 Inverter Work Mode Setting

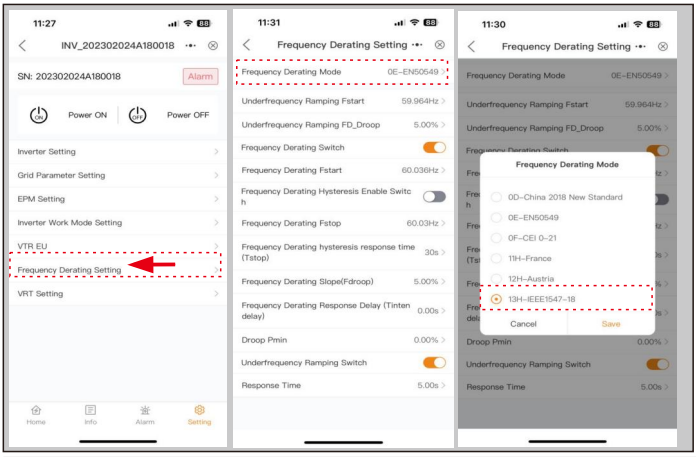
Tap on ***Inverter Work Mode Setting***. Select the desired work mode, ***Active Power Mode*** or ***Reactive Power Mode*** or both. To activate the function ***Active Power Mode*** the Volt-Watt button must be activated (orange). Voltage and power setting can be adjusted in the same menu. To select ***Reactive Power Mode*** tap on Volt-var function and select the desired reactive power mode and tap on ***SAVE***. Voltage and reactive power setting can be change in the same menu.





6.1.4 Frequency Derating (Droop) Setting

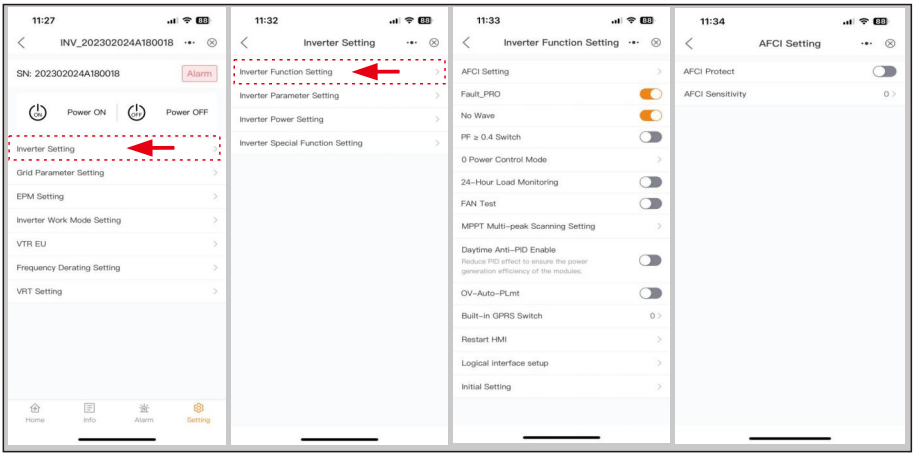
Tap on ***Frequency Derating Setting***. Select ***Frequency Derating Mode*** standard.
Select the ***13H-IEEE1547-18*** standard from the menu and tap on ***SAVE***.
Frequency Derating (Droop) Settings can be changed in the same menu.



6.2 Inverter Setting

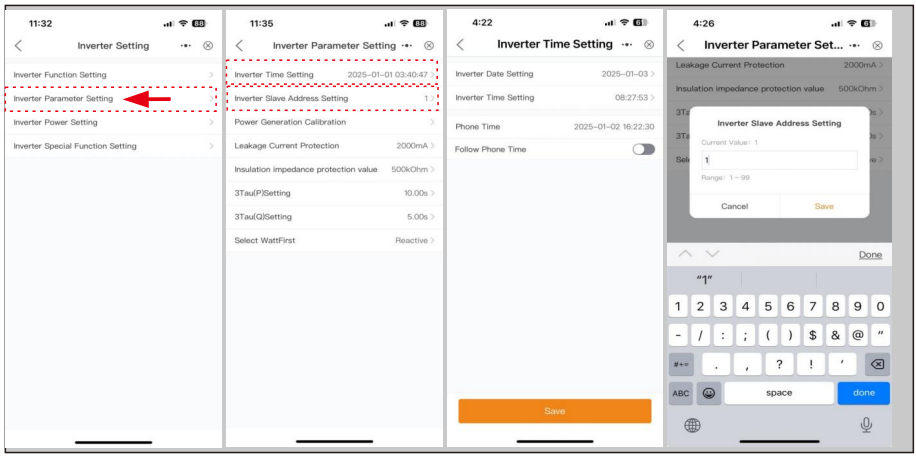
6.2.1 Inverter Function Setting

Tap on ***Inverter Setting*** . Under Inverter Setting menu there are several inverter settings that can be adjusted. Select ***Inverter Function Setting*** .Special inverter function can be set under this settings.



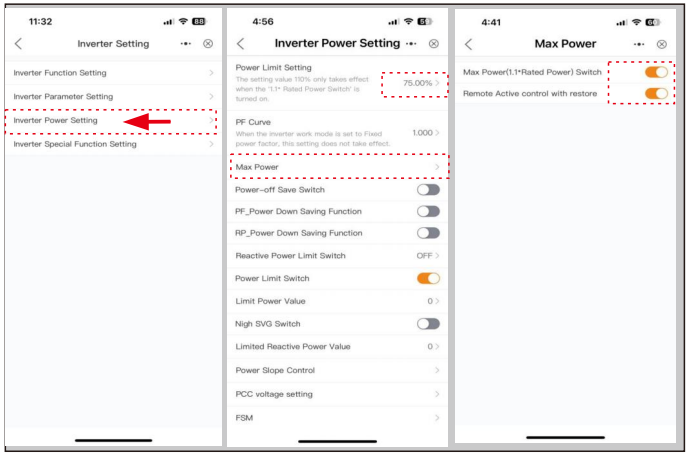
6.2.2 Inverter Parameter Setting

Select ***Inverter Parameter Setting*** .Several inverter function such as date and time, RS-485 address and others can be set under this settings. Follow the screen samples below for all available inverter settings under this menu.



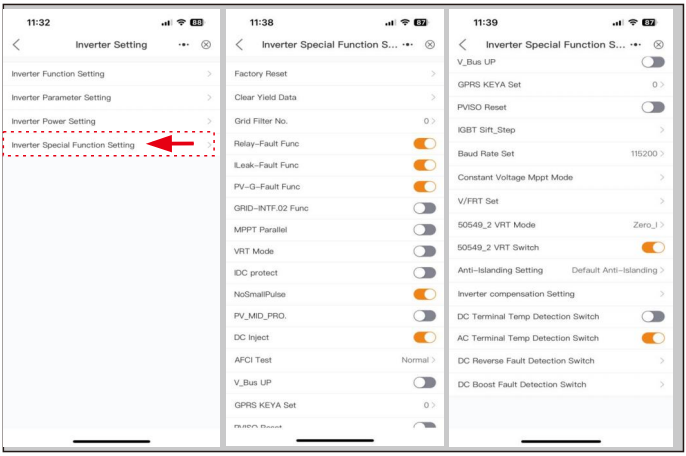
6.2.3 Inverter Power Setting

Select ***Inverter Power Setting*** .Inverter power Derating, Night SVG , Power slope control PF Curve and other power function can be set in this menu. Inverter Power Derating can be set by selecting the desired derated power level in percentage (75% in below example).
Tap ***Max Power,*** select ***Max Power Switch*** and ***Remote Active control with restore*** to ON.



6.2.4 Inverter Special Function Setting

Select ***Inverter Special Function Setting*** .Several inverter special function such as Factory Reset, Grid Filter No. AFCI Test and others can be set under this settings. Follow the screen samples below for all available inverter settings under this menu.



7.1 Start-up procedure

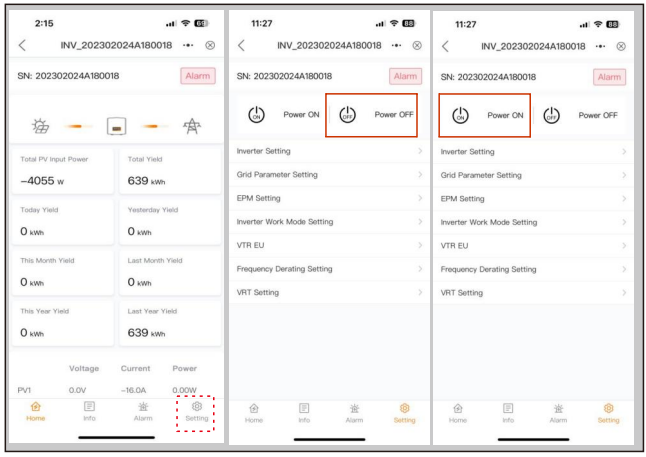
To start-up the inverter, it is mandatory that the steps below are followed in the exact order outlined.

1. Ensure the commissioning checks in Section 5 have been performed.
2. Switch the AC switch **ON**.
3. Switch the DC switches **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** will be continuously lit.
4. Solis Utility inverters are powered from both the DC and AC sides. When the inverter detects DC voltage 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, grid frequency and the stability of the supply grid. During this period, the green **OPERATION LED** will flash. This indicates that the inverter is preparing to generate AC power.
5. After the locally mandated delay (300 seconds for IEEE-1547-2018 compliant inverter), the inverter will start generating AC power. The green **OPERATION LED** will light continuously.

7.2 Shutdown procedure

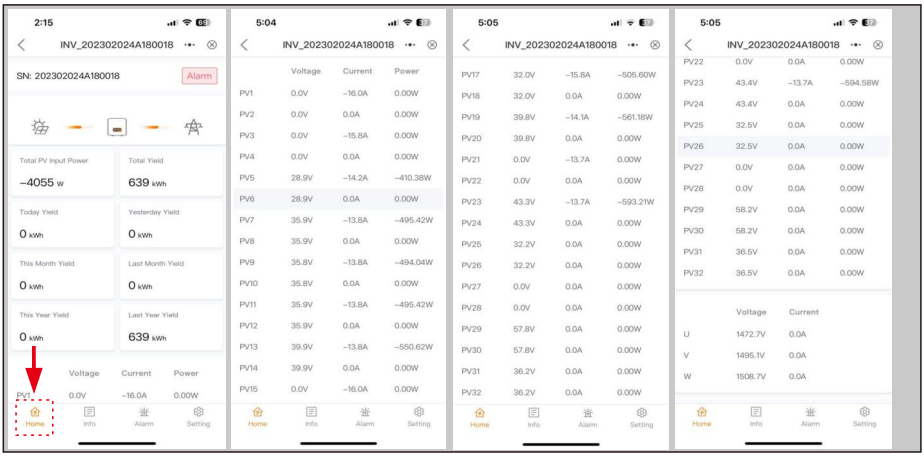
To stop the inverter, it is mandatory that the steps below are followed in the exact order outlined

Connect to the inverter with the SolisCloud application and tap on Setting. Select ***Power OFF*** button to turn off the inverter. To turn the inverter back ON , select ***Power ON*** button.



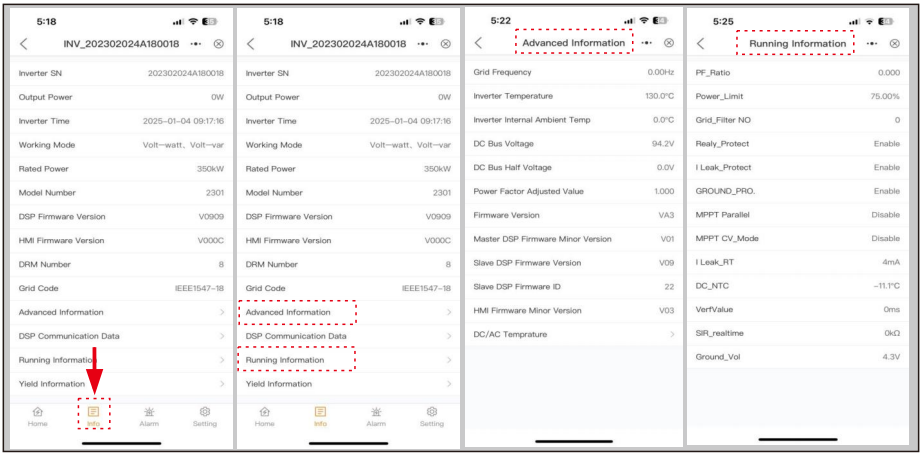
8.1 Inverter APP Home Screen

Inverter generation yield, PV voltage and current and Output voltage and current can be monitored on the Home screen.



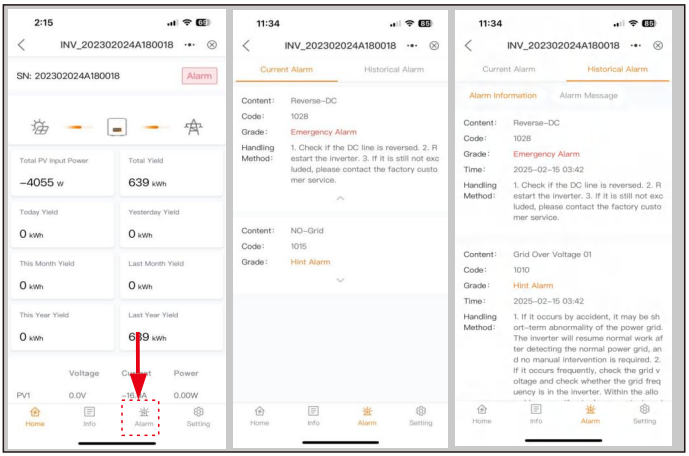
8.2 Inverter Information Screen

Inverter general information such as Serial Number, Output Power, Rated Power, Firmware Version, Grid Code and other critical information is located under the ***Info*** tap.



8.3 Inverter Alarm

Inverter alarm status and log can be viewed under Alarm tab.



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 20 minutes before you do other operations.

9.1 Fan Maintenance

If the fan doesn't work properly, the inverter will not be cooled effectively and it may affect the operation of the inverter.

Instructions below describe the necessary steps to replace a damaged or broken fan.

1. Turn off the "Grid ON/OFF . Follow instruction in section 7.
2. Turn OFF AC Circuit Breaker and LOTO the Circuit Breaker.
3. Turn the DC switches to "OFF" position and LOTO DC switch.
4. Wait for at least 15 minutes.
5. Remove the 2 screws on the fan plate.
6. Pull out the fan module slowly and unplug the power plug of the fan after pulling out around 150mm.
7. Clean fan for any debris and dirt .
8. Connect the electrical wire and reinstall the fan. Restart the inverter.

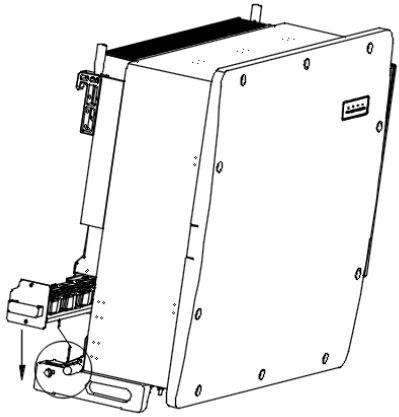


Figure 9.1

10.1 Current Alarm

10.1.1 Running messages

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

10.2 Alarm History

10.2.1 Viewing alarm history

Refer to mobile App Normal operation 8.3 for instructions on viewing Alarm History.

10.3 Error Messages

NOTE

The first step to clearing alarms as listed in Table 10.1, is to reset the inverter. To reset the inverter, turn off the inverter (refer to Section 7.2) and wait for five (5) minutes before restarting it (refer to Section 7.1). If the failure persists, please first contact your local distributor and then Solis Support Service.

If you need to contact Solis Support Service, please call +1(866) 438-8408 or emails us to usservice@solisinverters.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 mobile APP and the status of the screen status indicator lights. Other readings obtained from the Information sub menu (refer to Section 10) will also be helpful.)
5. PV array configuration (e.g. number of panels, panel capacity, number of strings, etc.)
6. Your contact details

10.3.1 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 mobile APP 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 10.1 on the following pages.

Alarms	Cause	Solution
No Information (Blank Screen)	• Input voltage low/missing • Polarity reversed • Main board damaged	**Test – DC switch OFF** • Check PV connections. • Check polarity. • Check voltage >200V. **Test – DC Switch ON.** • Check voltage >200V • If DC voltage is "0" replace inverter.
Initializing (Inverter stuck in this mode)	• Inverter is waiting for driving signal	**Test – DC switch OFF** • Check PV connections. • Check polarity. • Check voltage >200V. **Test – DC Switch ON** • Check voltage >200V. • A cable may have been damaged or loosened in shipping replace inverter.
OV-G-V: Over Grid Voltage	• Inverter detects grid voltage as too high	**Test – DC switch OFF** • Check AC at the inverter. • If AC measures high, adjust upper limit with permission from utility. **Test – DC Switch ON, full power** • Check AC at inverter test points. • Compare with LCD. • If AC measures high, cables between inverter and interconnect are too small. • Check ampacity and voltage drop calculations.
UN-G-V: Under Grid Voltage	• Inverter detects grid voltage as too low	**Test – DC switch OFF** • Check AC at the inverter test points. • If AC measures low, adjust lower limit with permission from utility. • Check LCD voltage reading, may be a bad measurement circuit. **Test – DC Switch ON** • Check grid standard. • Replace inverter.
UN-BUS: DC BUS voltage is too low	• Inverter detects low DCV on internal bus	**Test** • Measure DC and AC voltages. • Compare with LCD. • Replace Inverter. • Internal damage. • Wire came loose during shipping.

Table 10.1 Fault messages and descriptions

Alarms	Cause	Solution
OV-G-F: Over Grid Frequency	• Inverter detects grid Frequency as too high	**Test – DC switch OFF** • Check frequency at the inverter test points. • If Frequency measures high, adjust upper limit with permission from utility. • Check LCD reading, may be a bad measurement circuit. **Test – DC Switch ON** • Check grid standard. • Replace inverter.
NO-GRID	• Inverter does not detect the grid	**Test – DC switch OFF** • Check AC at the inverter test points. • L-L, L-GND. • Check LCD reading, may be a bad measurement circuit. **Test – DC Switch ON** • Check grid standard. • Replace inverter.
OV-DC: DC voltage is too high	• Inverter detects High DC Voltage	**Test – DC switch OFF** • Check DC at the inverter test points. • If DC Voltage is high, check string configuration. **Test – DC Switch ON** • Check LCD reading, may be a bad measurement circuit. • Replace inverter.
OV-BUS: DC BUS voltage is too high	• Inverter detects High DC Voltage on internal bus	**Test** • Measure DC and AC voltages. • Compare with LCD. • Replace Inverter. • Internal damage. • Wire came loose during shipping.
GRID-INTF: Grid unstable	• Inverter detects grid instability, internal fault current high	**Test – With DC Switch OFF** • Measure AC voltage. • Test AC line for THD. • Test – With DC Switch ON. **Test AC line for THD** • Multiple inverters/turn one off. • **Set Grid Filter Set from 00 to 02.** • Internal damage. • Wire came loose in shipping.

Table 10.1 Fault messages and descriptions

Alarms	Cause	Solution
INI-FAULT: Initialization Protection	• Master and Slave DSP have different values	**Reset Inverter** • DC switch OFF. • Wait until all lights/LCD turn off. • DC switch ON. • Replace inverter.
OV-TEM: Temperature Protection	• Inverter detects high ambient temperature >60C	**Inspect installation** • Check heatsink for obstructions/ventilation. • Is inverter in direct sunshine. • Measure ambient temperature near inverter. • If temp is in range replace inverter.
PV ISO-PRO 01/02: Ground Protection	• Inverter detects low DC insulation resistance	**Inspect installation** • Reset inverter. • Note weather conditions when alarm occurs. • Measure insulation resistance. • If normal, measure in SAME weather as alarm. • Physically check cables. • Change Riso limit from 500k to 50k. • Replace inverter.
ARC-FAULT	• Inverter detects arc in DC circuit	**Inspect installation** • Check cable with string tester. • Physically check cables. • Inspect panel junction boxes. • Inspect cable connections. • Reset inverter. • Replace inverter.
Screen OFF with DC applied	• Inverter internally damaged	• Do not turn off the DC switches as it may damage the inverter. • Please wait for sunset and confirm the string current is less than 0.5A with a clip-on ampmeter and then turn off the DC switch. String current above 0.5A is under load. • 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.
Reve-DC	• One of the DC string is reversely connected • OR different number of modules are connected to the string inputs (Threshold varies between different conditions)	• Please check the inverters' PV string polarity, if there are strings reversely connected wait for the night when the solar irradiance is low and the PV string current down below 0.5A. Turn off the two DC switches and fix the polarity issue. • If string polarity is correct, please confirm that all the PV strings have the same number of modules. If not, please modify the system configuration.

Table 10.1 Fault messages and descriptions

Alarms	Cause	Solution
UN-BUS: DC Bus Undervoltage	• DC BUS Voltage too low for inverter to operate	**Inspect installation** • Check PV DC Input Voltage. • Restart The inverter. • Replace inverter.
DC-INTF: DC input disturbance	• Inverter detect abnormal DC current	**Inspect installation** • Check if there is any damage to DC wiring. • Restart the inverter. • Replace inverter.
G-PHASE: Unbalanced Grid	• 3 phase Grid unbalance	**Inspect installation** • Restart the inverter. • Measure grid current on each phase. Make sure the current is balance. • Check inverter properly connected to the grid.
G-F-FLU: Grid frequency fluctuation	• Abnormal frequency on grid site	**Inspect installation** • Restart the inverter. • Monitor Grid frequency variations.
UN-G-F: Grid under frequency	• Grid frequency is lower than inverter frequency range	**Inspect installation** • Restart the inverter. • Check inverter under frequency settings. • Make sure the settings are within the operating range of the inverter.
OV-G-I: Grid overcurrent	**• The output current of the inverter is too high**	**Inspect installation** • Restart the inverter. • Confirm the grid connection is correct. • Measure output current of the inverter. Make sure it is within inverter specification. • Replace inverter.
PID Repairing: Inverter logic fault	• DSP FW fault • RSD fault	**Inspect installation** • Check RSD transmitter and Power Supply. • Check DC voltages at inverter terminals. • Check Inverter DSP FW version by holding the “Enter” key for 10 seconds. If DSP version reads 00 contact Solis service or replace the inverter.
IGFOL-F: Grid current tracking is abnormal	• Grid current tracking failure	**Inspect installation** • Restart the inverter. • Replace inverter.

Table 10.1 Fault messages and descriptions

Alarms	Cause	Solution
ILeak-PRO: Leakage current protection	• Grid side current leakage protection	**Inspect installation** • Check PV string wire insulation and connect one string at the time to the DC input. • Check AC wire insulation for any damage. • If the error occurs only on a rainy and high humidity day, the problem is due to poor wire insulation on the PV or Grid connection. • Change protection settings to 300mA.
RelayChk-Fail: Relay detection failure	• Relay fault protection	**Inspect installation** • Restart the inverter. • Replace Inverter.
DSP-B-Fault: DSP-B internal protection	• General fault between master DSP and slave DSP	**Inspect installation** • Restart the inverter. • Replace Inverter.
DCInj-Fault: Excessive DC component	• Excessive DC components on the Grid current	**Inspect installation** • Restart the inverter. • Replace Inverter.
ILeak-Check: Leakage current self check protection	• Leakage current sensor self check fault	**Inspect installation** • Restart the inverter. • Replace inverter.
AFCI-Check: AFCI self check protection	• AFCI components self protection failure	**Inspect installation** • Restart the inverter. • Replace inverter.
IGBT-OV-I: IGBT overcurrent	• IGBT overcurrent	**Inspect installation** • Restart the inverter. • Replace inverter.
UN-TEM: Under temperature protection	• Temperature is too low	**Inspect installation** • Check ambient temperature. Make sure it is above -30°C • Restart the inverter. • Replace inverter.

Table 10.1 Fault messages and descriptions

Alarms	Cause	Solution
IG-AD: Abnormal grid current sampling	• Grid current sampling by the inverter is abnormal	**Inspect installation** • Restart the inverter. • Replace Inverter.
DSP-SelfCheck: DSP self-check is abnormal	• DSP Failed to enable self-detection	**Inspect installation** • Restart the inverter. • Replace Inverter.
BoostFal: DC Boost converter fault	• DC Boost converter circuit fault	**Inspect installation** • Restart the inverter. • Replace Inverter.
OV-DCA-I: DC1 average overcurrent	• The lightning protection on the left board is abnormal	**Inspect installation** • Restart the inverter. • Replace Inverter.
OV-DCB-I: DC1 average overcurrent	• The lightning protection on the right board is abnormal	**Inspect installation** • Restart the inverter. • Replace Inverter.
OV-IgTr: Grid current transient overcurrent	• The instantaneous current on the power grid exceeds the overcurrent threshold	**Inspect installation** • Restart the inverter. • Confirm the grid connection is correct. • Measure output current of the inverter. Make sure it is within inverter specification. • Replace inverter.
DRM LINK Fail: DRM link failed	• DRM link is abnormal	**Inspect installation** • Restart the inverter. • Check DRM link cables. • Check if DRM link signal is N.C (normally closed) • Check if DRM cables inside the inverter is connected properly.
PHASE FAULT: Abnormal phase of the grid	• Abnormal phase of the grid	**Inspect installation** • Check grid wiring connected properly. • Check if phase angle of the grid is 120° between phases. • Restart the inverter. • Replace inverter.

Table 10.1 Fault messages and descriptions

11. Specifications

Model	S6-350K-EHV-US-M12
Max. DC input voltage (Volts)	1500
Rated DC voltage (Volts)	1080
Start-up voltage (Volts)	500
Operating DC Input Voltage Range (Volts)	480-1500
Full load MPPT voltage range (Volts)	860-1300
Max. input current (Amps)	12x40
Max short circuit input current (Amps)	12x70
MPPT number/Max input strings number	12/24
Rated output power (Watts)	350000
Max. output power (Watts)	350000
Max. apparent output power (VA)	350000
Rated grid voltage (Volts)	3Φ/PE~800
Rated output current (Amps)	252.6
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%(at rated output power)
Rated grid frequency (Hertz)	60
Max.efficiency	98.9%
CEC efficiency	98.5%
Surge Protection	DC Type II / AC Type II
Integrated AFCI (DC arc-fault circuit protection)	YES
Integrated PID recovery	YES
Dimensions (W*H*D)	1227x995.8x463.8 (mm) / 45.9x37.2x16.3 (inch)
Weight	135kg / 297lb
Topology	Transformerless
Self consumption (night)	< 3W
Operating ambient temperature range	-22 to 140℉ / -30 to +60℃
Storage environment	-40 to 176℉ / -40 to +80℃
Relative humidity	0~100%
Ingress protection	Type 4X
Noise emission	≤65dB(A)
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120ft / 4000m
Compliance	UL 1741, UL 1741SB, UL 1998, UL 1699B IEEE 1547-2018, IEEE1547a-2020,FCC Part 15 (Class A & B), CSA C22.2 107.1-1,Rule 21 Phase II&III
DC connection	MC4 connectors
AC connection	OT Terminal connectors（Max.1000kcmil）
Display	LED, Bluetooth +APP
Communication connections	RS-485, Optional: PLC
Warranty	5 years standard (extend to 20 years)

11. Specifications

Model	S6-350K-EHV-US-M16
Max. DC input voltage (Volts)	1500
Rated DC voltage (Volts)	1080
Start-up voltage (Volts)	500
Operating DC Input Voltage Range (Volts)	480-1500
Full load MPPT voltage range (Volts)	860-1300
Max. input current (Amps)	16x30
Max short circuit input current (Amps)	16x60
MPPT number/Max input strings number	16/32
Rated output power (Watts)	350000
Max. output power (Watts)	350000
Max. apparent output power (VA)	350000
Rated grid voltage (Volts)	3Φ/PE~800
Rated output current (Amps)	252.6
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%(at rated output power)
Rated grid frequency (Hertz)	60
Max.efficiency	98.9%
CEC efficiency	98.5%
Surge Protection	DC Type II / AC Type II
Integrated AFCI (DC arc-fault circuit protection)	YES
Integrated PID recovery	YES
Dimensions (W*H*D)	1227x995.8x463.8 (mm) / 45.9x37.2x16.3 (inch)
Weight	135kg / 297lb
Topology	Transformerless
Self consumption (night)	< 3W
Operating ambient temperature range	-22 to 140℉ / -30 to +60℃
Storage environment	-40 to 176℉ / -40 to +80℃
Relative humidity	0~100%
Ingress protection	Type 4X
Noise emission	≤65dB(A)
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120ft / 4000m
Compliance	UL 1741, UL 1741SB, UL 1998, UL 1699B IEEE 1547-2018, IEEE1547a-2020,FCC Part 15 (Class A & B), CSA C22.2 107.1-1,Rule 21 Phase II&III
DC connection	MC4 connectors
AC connection	OT Terminal connectors（Max.1000kcmil）
Display	LED, Bluetooth +APP
Communication connections	RS-485, Optional: PLC
Warranty	5 years standard (extend to 20 years)

11. Specifications

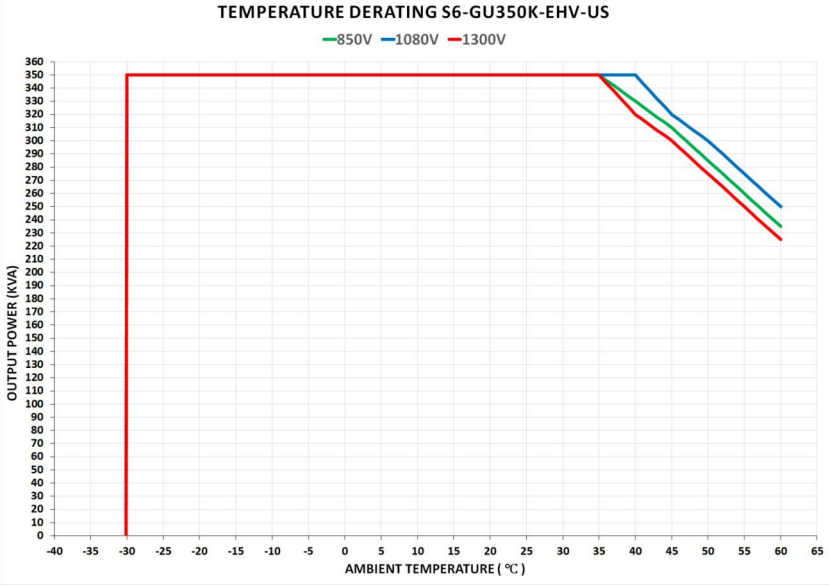
Model	S6-300K-EHV-US-M12
Max. DC input voltage (Volts)	1500
Rated DC voltage (Volts)	1080
Start-up voltage (Volts)	500
Operating DC Input Voltage Range (Volts)	480-1500
Full load MPPT voltage range (Volts)	860-1300
Max. input current (Amps)	12x40
Max short circuit input current (Amps)	12x70
MPPT number/Max input strings number	12/24
Rated output power (Watts)	300000
Max. output power (Watts)	300000
Max. apparent output power (VA)	300000
Rated grid voltage (Volts)	3Φ/PE~690
Rated output current (Amps)	251
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%(at rated output power)
Rated grid frequency (Hertz)	60
Max.efficiency	98.9%
CEC efficiency	98.5%
Surge Protection	DC Type II / AC Type II
Integrated AFCI (DC arc-fault circuit protection)	YES
Integrated PID recovery	YES
Dimensions (W*H*D)	1227x995.8x463.8 (mm) / 45.9x37.2x16.3 (inch)
Weight	135kg / 297lb
Topology	Transformerless
Self consumption (night)	< 3W
Operating ambient temperature range	-22 to 140℉ / -30 to +60℃
Storage environment	-40 to 176℉ / -40 to +80℃
Relative humidity	0~100%
Ingress protection	Type 4X
Noise emission	≤65dB(A)
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120ft / 4000m
Compliance	UL 1741, UL 1741SB, UL 1998, UL 1699B IEEE 1547-2018, IEEE1547a-2020,FCC Part 15 (Class A & B), CSA C22.2 107.1-1,Rule 21 Phase II&III
DC connection	MC4 connectors
AC connection	OT Terminal connectors（Max.1000kcmil）
Display	LED, Bluetooth +APP
Communication connections	RS-485, Optional: PLC
Warranty	5 years standard (extend to 20 years)

11. Specifications

Model	S6-250K-EHV-US-M12
Max. DC input voltage (Volts)	1500
Rated DC voltage (Volts)	1080
Start-up voltage (Volts)	500
Operating DC Input Voltage Range (Volts)	480-1500
Full load MPPT voltage range (Volts)	860-1300
Max. input current (Amps)	12x40
Max short circuit input current (Amps)	12x70
MPPT number/Max input strings number	12/24
Rated output power (Watts)	250000
Max. output power (Watts)	250000
Max. apparent output power (VA)	250000
Rated grid voltage (Volts)	3Φ/PE~600
Rated output current (Amps)	240.6
Power Factor (at rated output power)	>0.99 (0.8 leading - 0.8 lagging)
THDi (at rated output power)	<3%(at rated output power)
Rated grid frequency (Hertz)	60
Max.efficiency	98.9%
CEC efficiency	98.5%
Surge Protection	DC Type II / AC Type II
Integrated AFCI (DC arc-fault circuit protection)	YES
Integrated PID recovery	YES
Dimensions (W*H*D)	1227x995.8x463.8 (mm) / 45.9x37.2x16.3 (inch)
Weight	135kg / 297lb
Topology	Transformerless
Self consumption (night)	< 3W
Operating ambient temperature range	-22 to 140℉ / -30 to +60℃
Storage environment	-40 to 176℉ / -40 to +80℃
Relative humidity	0~100%
Ingress protection	Type 4X
Noise emission	≤65dB(A)
Cooling concept	Intelligent redundant cooling
Max.operation altitude	13120ft / 4000m
Compliance	UL 1741, UL 1741SB, UL 1998, UL 1699B IEEE 1547-2018, IEEE1547a-2020,FCC Part 15 (Class A & B), CSA C22.2 107.1-1,Rule 21 Phase II&III
DC connection	MC4 connectors
AC connection	OT Terminal connectors（Max.1000kcmil）
Display	LED, Bluetooth +APP
Communication connections	RS-485, Optional: PLC
Warranty	5 years standard (extend to 20 years)

Parts	Torque
Cover screws	1.5-1.7 ft.lbs
Ground screws (Cover)	4.4-5.9 ft.lbs
Ground screws (Internal)	7.4-8.9 ft.lbs
AC terminals	25-33 ft.lbs

12.1 Temperature Derating

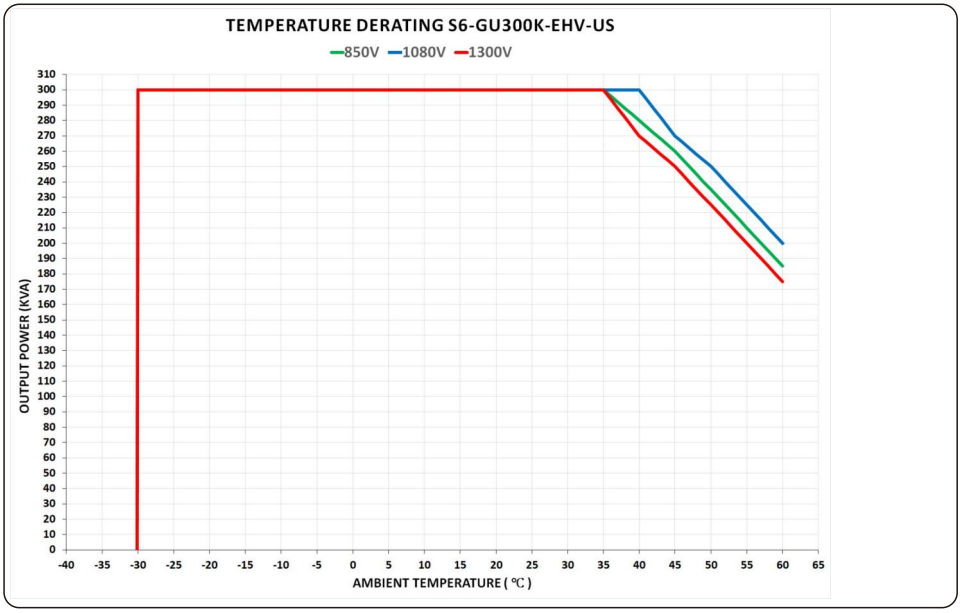


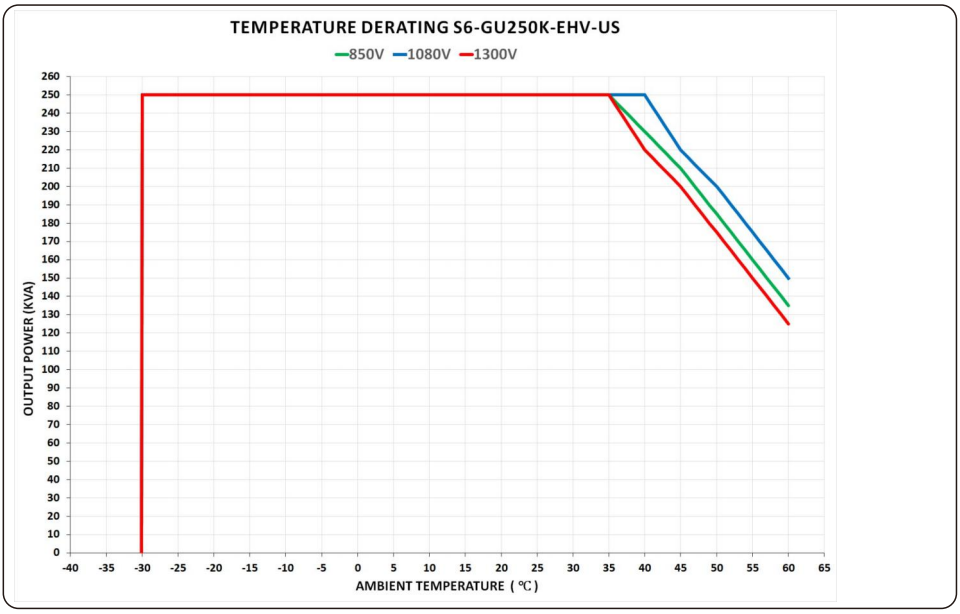
Comments:

A thermal sensor inside the inverter is calibrated to determine ambient temperature.

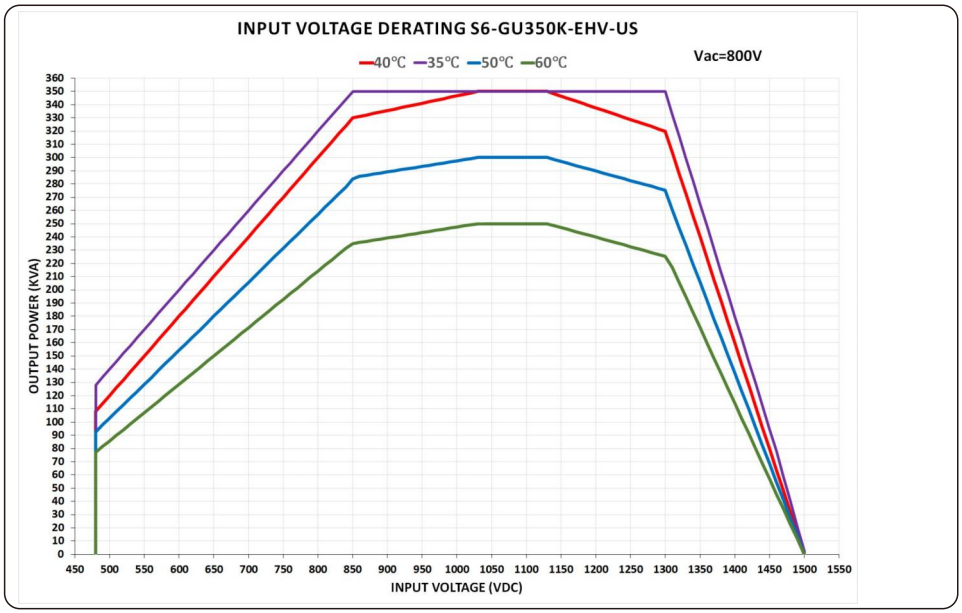
All inverters will begin a sloped derate at 30°C ending at 78% output power at 60°C.

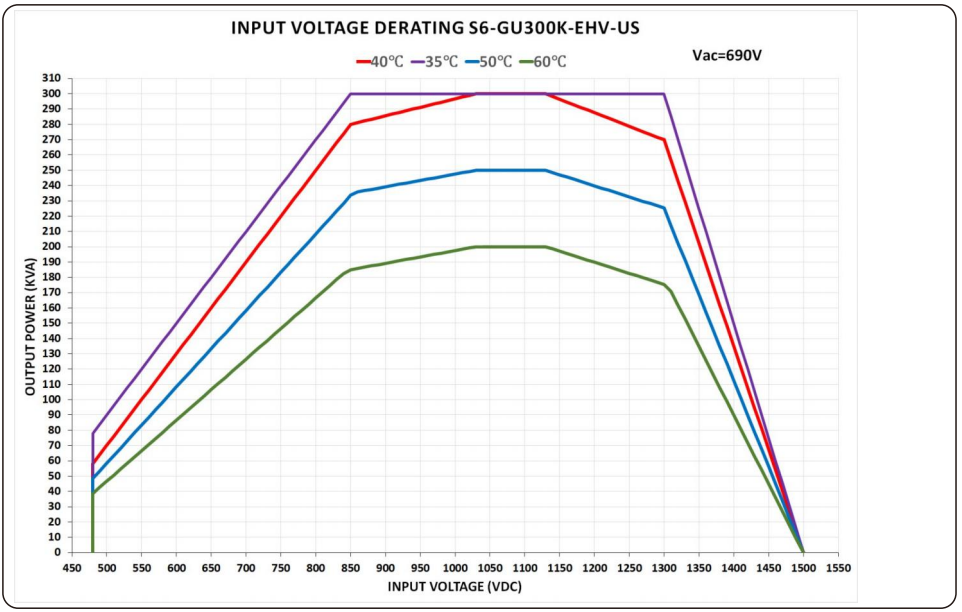
Temperatures above 60°C and below -25°C will derate to 0% output power.

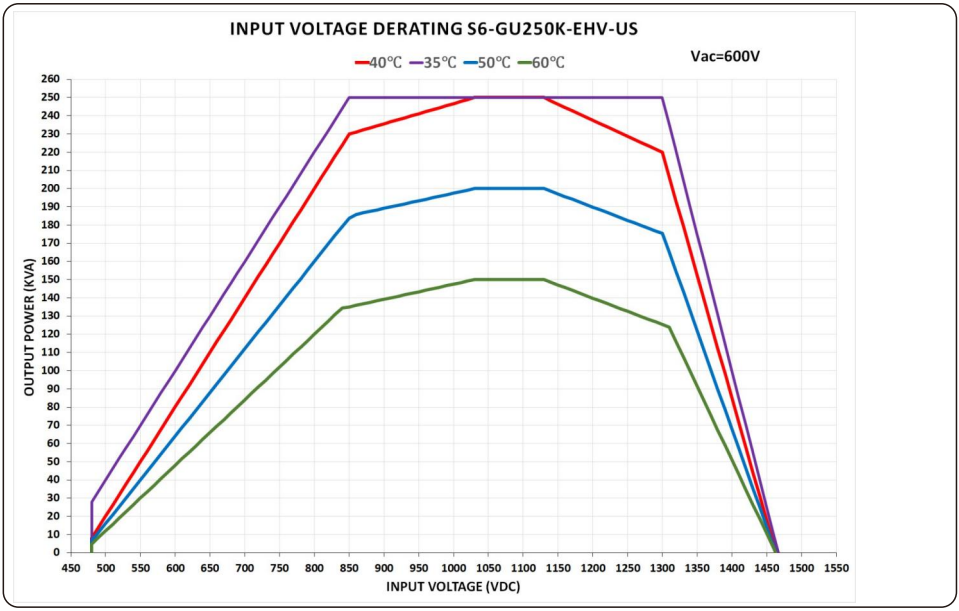

TEMPERATURE DERATING S6-GU300K-EHV-US
850V 1080V 1300V
OUTPUT POWER (KVA)
AMBIENT TEMPERATURE (℃)


TEMPERATURE DERATING S6-GU250K-EHV-US
850V 1080V 1300V
OUTPUT POWER (KVA)
AMBIENT TEMPERATURE (℃)

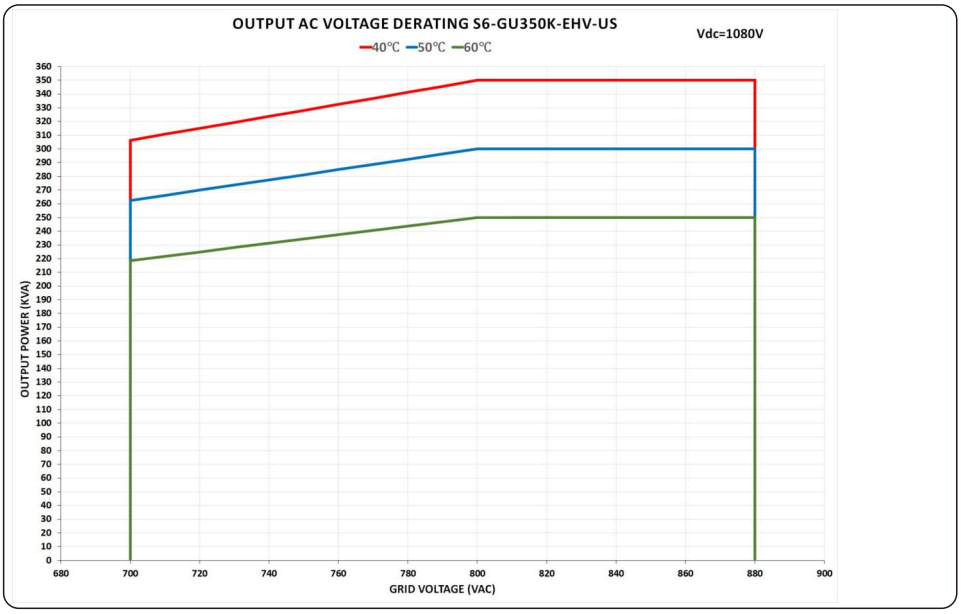
12.2 Input Voltage Derating

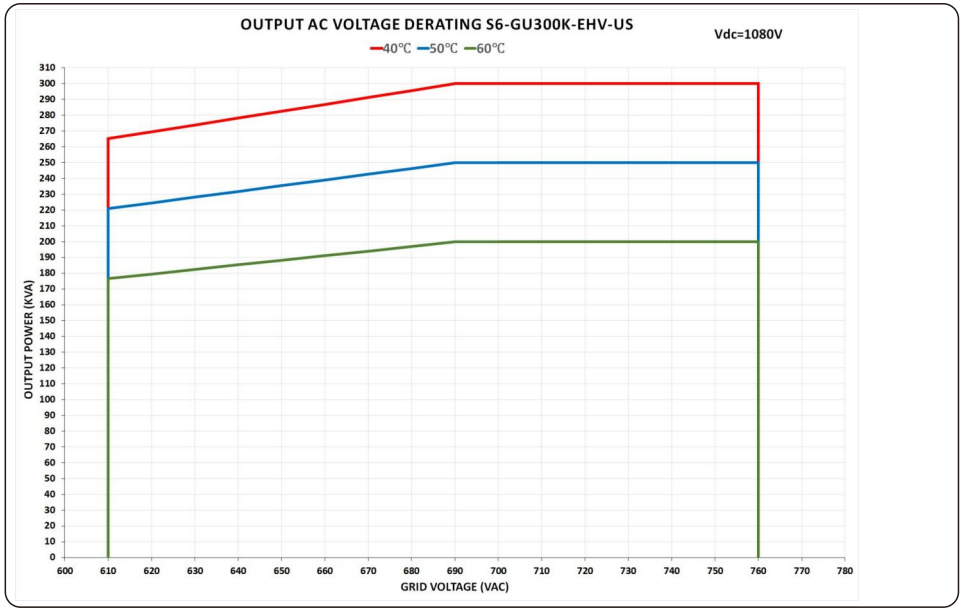


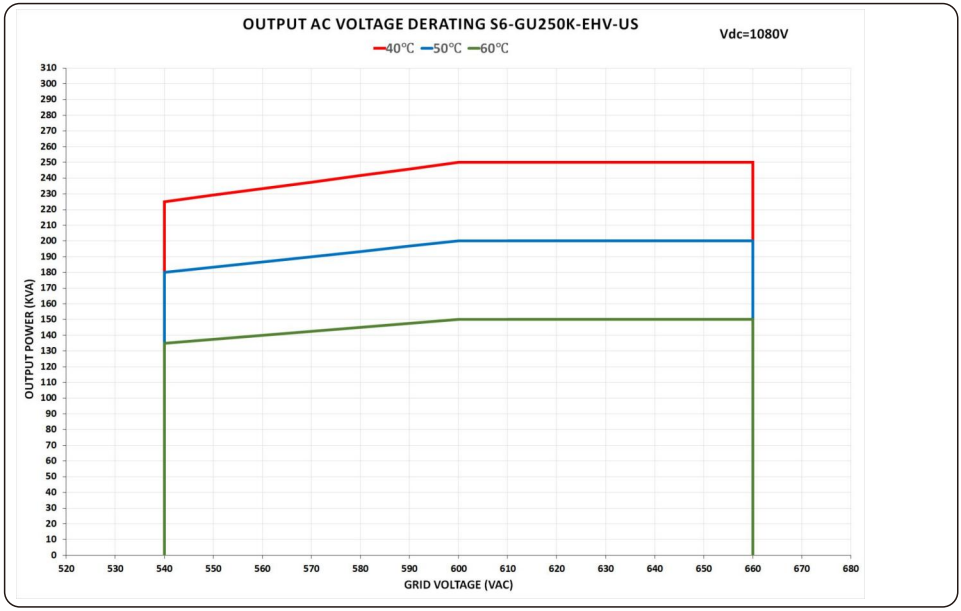




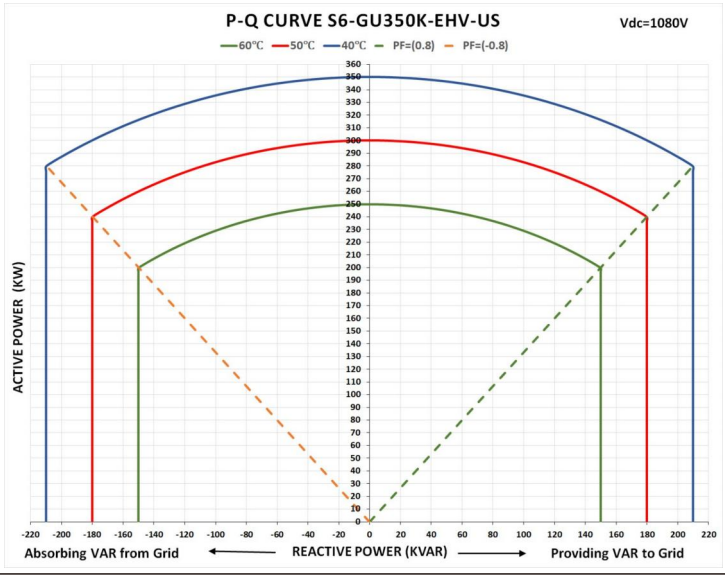
12.3 Output Voltage Derating

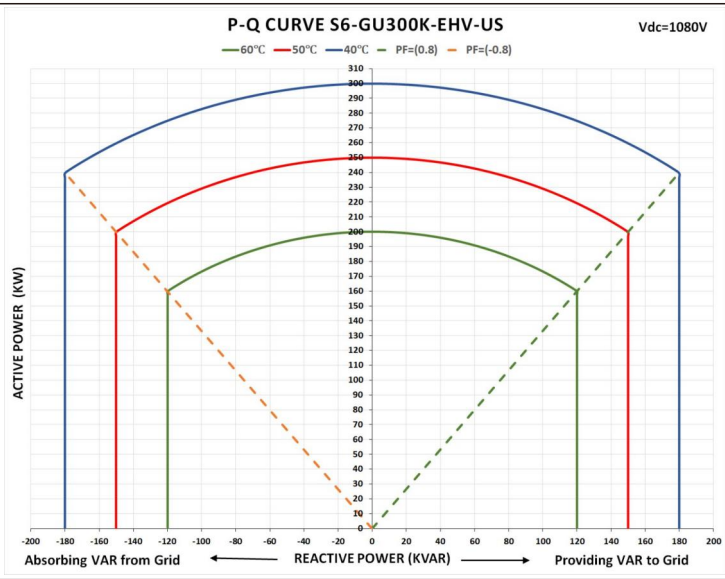


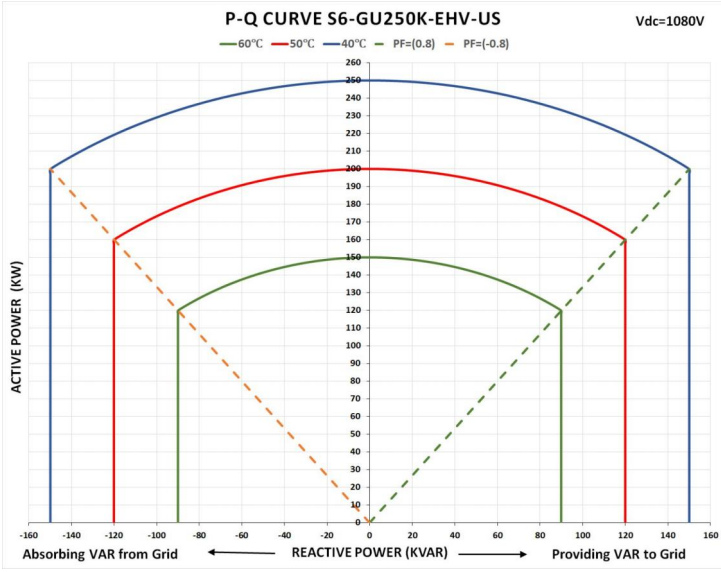

OUTPUT AC VOLTAGE DERATING S6-GU300K-EHV-US
Vdc=1080V
40℃ 50℃ 60℃
OUTPUT POWER (KVA)
GRID VOLTAGE (VAC)


OUTPUT AC VOLTAGE DERATING S6-GU250K-EHV-US
Vdc=1080V
40℃ 50℃ 60℃
OUTPUT POWER (KVA)
GRID VOLTAGE (VAC)

12.4 P-Q Capabilities at Nominal Output Power






P-Q CURVE S6-GU250K-EHV-US
Vdc=1080V
60℃
50℃
40℃
PF=(0.8)
PF=(-0.8)
ACTIVE POWER (KW)
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-160
-140
-120
-100
-80
-60
-40
-20
0
20
40
60
80
100
120
140
160
Absorbing VAR from Grid
REACTIVE POWER (KVAR)
Providing VAR to Grid

12.5 Default Grid Setting for IEEE1547-2018

Parameter	Adjustment Range (pu)	Default (pu)	Description
OV-G-V 01	1.10≤V≤1.21	1.10Vn	Set grid over-voltage protection 01 value
OV-G-V-T 01	0.1≤t≤13 S	13 S	Grid over-voltage protection 01 trip time
OV-G-V 02	1.10≤V≤1.30	1.20Vn	Set grid over-voltage protection 02 value
OV-G-V-T 02	0.1≤t≤5 S	0.16 S	Grid over-voltage protection 02 trip time
UN-G-V 01	0.05≤V≤0.90	0.88Vn	Set grid under-voltage protection 01 value
UN-G-V-T 01	0.16≤t≤50 S	21 S	Grid under-voltage protection 01 trip time
UN-G-V 02	0.05≤V≤0.90	0.5Vn	Set grid under-voltage protection 02 value
UN-G-V-T 02	0.16≤t≤21 S	2 S	Grid under-voltage protection 02 trip time
UN-G-V 03	0.05≤V≤0.50	0.5Vn	Set grid under-voltage protection 03 value
UN-G-V-T 03	0.16≤t≤21 S	2 S	Grid under-voltage protection 03 trip time
OV-G-F 01	60.5≤f≤66 Hz	61.2 Hz	Set grid over-frequency protection 01 value
OV-G-F-T 01	0.16≤t≤1000 S	300 S	Set grid over-frequency protection 01 trip time
OV-G-F 02	60.5≤f≤66 Hz	62 Hz	Set grid over-frequency protection 02 value
OV-G-F-T 02	0.16≤t≤1000 S	0.16 S	Set grid over-frequency protection 02 trip time
UN-G-F 01	50≤f≤59.5 Hz	58.5 Hz	Set grid under-frequency protection 01 value
UN-G-F-T 01	180≤t≤1000 S	300 S	Set grid under-frequency protection 01 trip time
UN-G-F 02	50≤f≤58 Hz	56.5 Hz	Set grid under-frequency protection 02 value
UN-G-F-T 02	0.16≤t≤1000 S	0.16 S	Set grid under-frequency protection 02 trip time
OV-G-V 03	1.10≤V≤1.30	1.20Vn	Set grid over-voltage protection 03 value
OV-G-V-T 03	0.1≤t≤5 S	0.16 S	Grid over-voltage protection 03 trip time
Reconnection Voltage	0.88≤V≤0.95 1.05≤V≤1.06	0.917Vn 1.05Vn	Set grid recovery voltage range after grid fault
Reconnection Frequency	59≤f≤59.9 60.1≤f≤61	59.5Hz 60.1Hz	Set grid recovery frequency range after grid fault
Reconnection Time after Fault	0≤t≤600 S	300 S	Set reconnection time after a fault is cleared
Ramp-up Slew Rate	0.10-100%	100%Pn/S	Set Ramp-up power slew rate during start-up
Reconnect Slew Rate	0.10-100%	0.33%Pn/S	Set Ramp-up power slew rate during reconnect

12.5 Default Grid Setting for IEEE1547-2018

Parameter	Adjustment Range (pu)	Default (pu)	Description
Volt Watt P3Tau	0≤t≤180 S	10 S	Set the time to ramp up to 90% of the new active power target in response to the change in voltage
Volt Var Q3Tau	0≤t≤180 S	5 S	Set the time to ramp up to 90% of the new reactive power target in response to the change in voltage
Dead Band-OF	60.017≤f≤61 Hz	60.036Hz	Set OV frequency start dead band for power derate
Droop-OF	2-5 %	5 %	Set OV frequency derate droop slope
Response Time	0.2≤t≤10 S	5 S	Set frequency derate response time
Dead Band-UF	59≤f≤59.983 Hz	59.964 Hz	Set UN frequency start dead band for power derate
Droop-UF	2-5 %	5 %	Set UN frequency derate droop slope
Droop Pmin	0-100 %	0 %	Set frequency droop P minimum
Volt-Watt	Enabled/ Disabled	Enabled	Set Volt - Watt function
V1	0.90≤V≤1.30	1.00Vn	Set grid voltage V1 limit for Volt-Watt control
P1	100-100 % Pn	100% Pn	Set power P1 for Volt-Watt control
V2	1.00≤V≤1.35	1.00Vn	Set grid voltage V2 limit for Volt-Watt control
P2	0-100 % Pn	100% Pn	Set power P2 for Volt-Watt control
V3	1.05≤V≤1.09	1.06Vn	Set grid voltage V3 limit for Volt-Watt control
P3	0-100 % Pn	100% Pn	Set power P3 for Volt-Watt control
V4	1.06≤V≤1.10	1.10Vn	Set grid voltage V4 limit for Volt-Watt control
P4	0-100 % Pn	20%Pn	Set power P4 for Volt-Watt control
Volt-Var	Enabled/ Disabled	Enable	Set Volt-Var function
V1	0.77≤V≤1.03	0.92Vn	Set grid voltage V1 limit for Volt-Var control
Q1	0-60% Sn	+44% Sn	Set reactive power Q1 for Volt-Var control
V2	0.92≤V≤1.05	0.98Vn	Set grid voltage V2 limit for Volt-Var control
Q2	-60-60% Sn	0% Sn	Set reactive power Q2 for Volt-Var control
V3	0.95≤V≤1.08	1.02Vn	Set grid voltage V3 limit for Volt-Var control
Q3	-60-60% Sn	0% Sn	Set reactive power Q3 for Volt-Var control
V4	0.97≤V≤1.23	1.08Vn	Set grid voltage V4 limit for Volt-Var control
Q4	-60-0% Sn	-44% Sn	Set reactive power Q4 for Volt-Var control
Fixed PF	-0.8 -+0.8	1.0	Set Fixed Power Factor limit
Reactive Power	-60 -60 %	0%	Set Reactive Power level

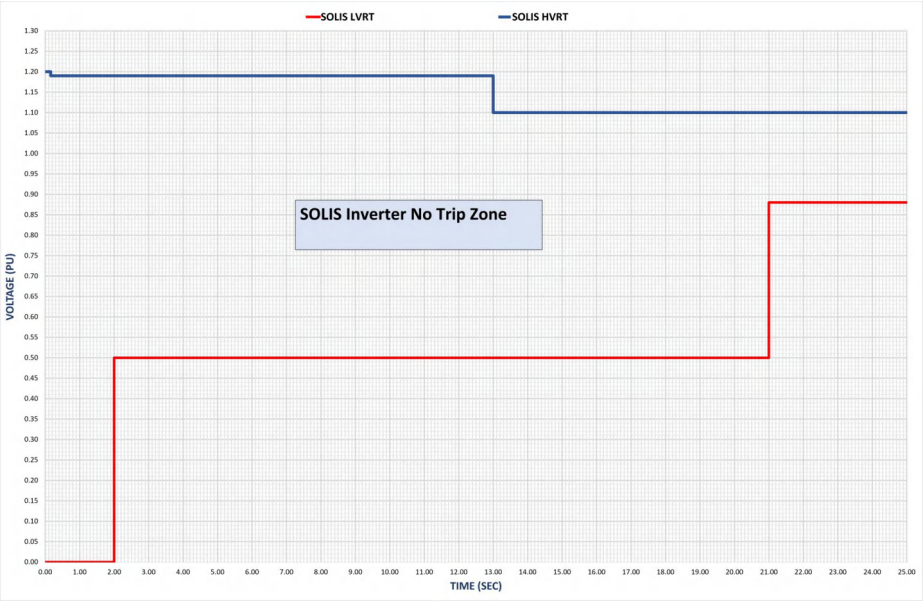
12.5 Default Grid Setting for 800VAC

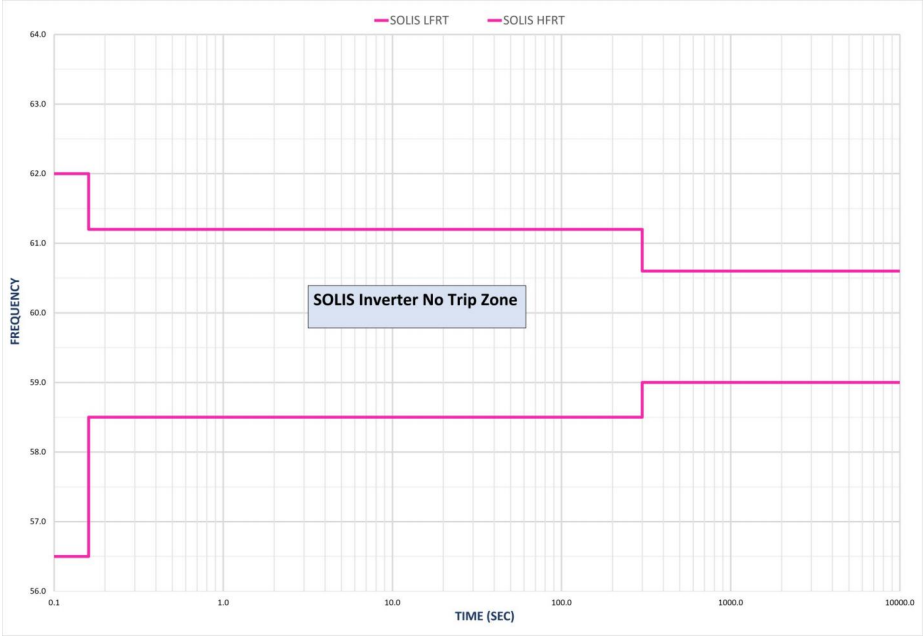
Parameter	Adjustment Range V/pu/S/Hz	Default V/pu/S/Hz
OV-G-V 01	880≤V≤968 1.10≤V≤1.21	880V 1.10Vn
OV-G-V-T 01	0.1≤t≤13 S	13 S
OV-G-V 02	880≤V≤1040 1.10≤V≤1.30	960V 1.20Vn
OV-G-V-T 02	0.1≤t≤5 S	0.16 S
UN-G-V 01	40≤V≤720 0.05≤V≤0.90	704V 0.88Vn
UN-G-V-T 01	0.16≤t≤50 S	21 S
UN-G-V 02	40≤V≤720 0.05≤V≤0.90	400V 0.5Vn
UN-G-V-T 02	0.16≤t≤21 S	2 S
UN-G-V 03	40≤V≤400 0.05≤V≤0.50	400V 0.5Vn
UN-G-V-T 03	0.16≤t≤21 S	2 S
OV-G-F 01	60.5≤f≤66 Hz	61.2 Hz
OV-G-F-T 01	180≤t≤1000 S	300 S
OV-G-F 02	60.5≤f≤66 Hz	62 Hz
OV-G-F-T 02	0.16≤t≤1000 S	0.16 S
UN-G-F 01	50≤f≤59.5 Hz	58.5 Hz
UN-G-F-T 01	180≤t≤1000 S	300 S
UN-G-F 02	50≤f≤58 Hz	56.5 Hz
UN-G-F-T 02	0.16≤t≤1000 S	0.16 S

12.5 Default Grid Setting for 600VAC

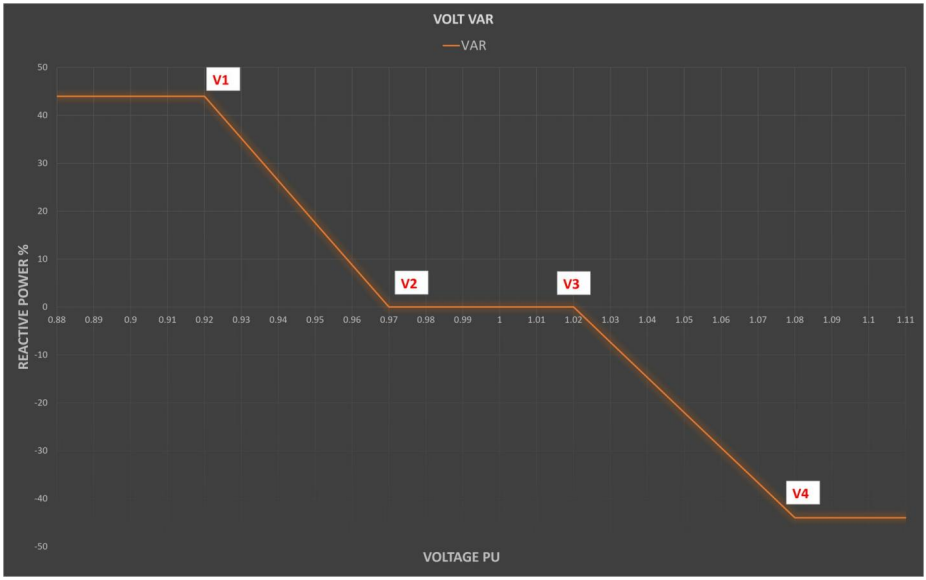
Parameter	Adjustment Range V/pu/S/Hz	Default V/pu/S/Hz
OV-G-V 01	660≤V≤726 1.10≤V≤1.21	660V 1.10Vn
OV-G-V-T 01	0.1≤t≤13 S	13 S
OV-G-V02	660≤V≤780 1.10≤V≤1.30	720V 1.20Vn
OV-G-V-T 02	0.1≤t≤5 S	0.16 S
UN-G-V 01	30≤V540 0.05≤V≤0.90	528V 0.88Vn
UN-G-V-T 01	2.0≤t≤50 S	21 S
UN-G-V02	30≤V≤540 0.05≤V≤0.90	300V 0.5Vn
UN-G-V-T 02	0.16≤t≤21 S	2 S
UN-G-V03	30≤V≤300 0.05≤V≤0.50	300V 0.5Vn
UN-G-V-T 03	0.16≤t≤21 S	2 S
OV-G-F 01	60.5≤f≤66 Hz	61.2 Hz
OV-G-F-T 01	180≤t≤1000 S	300 S
OV-G-F 02	60.5≤f≤66 Hz	62 Hz
OV-G-F-T -T	0.16≤t≤1000 S	0.16 S
UN-G-F 01	50≤f≤59.5 Hz	58.5 Hz
UN-G-F-T 01	180≤t≤1000 S	300 S
UN-G-F 02	50≤f≤58 Hz	56.5 Hz
UN-G-F-T 02	0.16≤t≤1000 S	0.16 S

12.5.1 Default Grid Setting for HVRT, LVRT and FRT

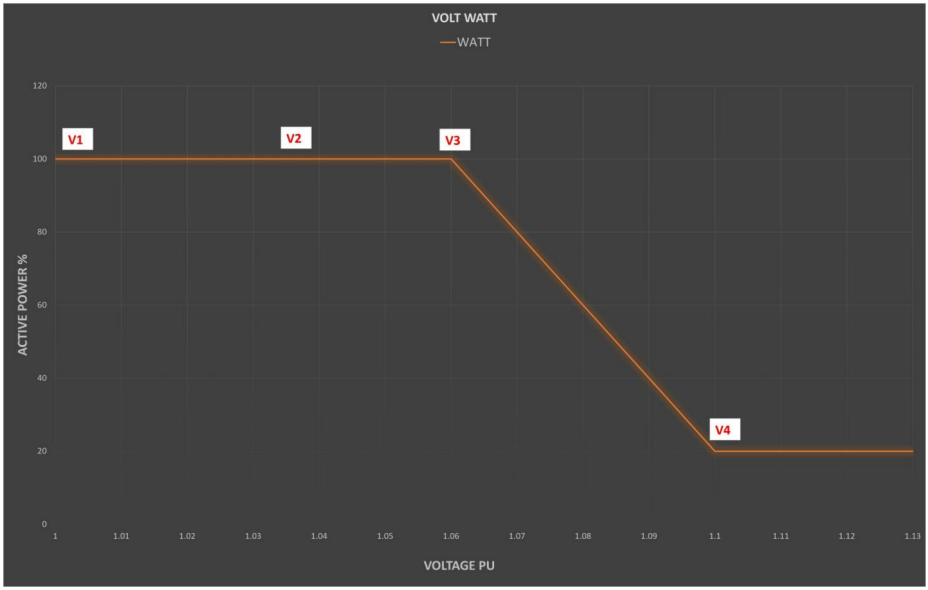




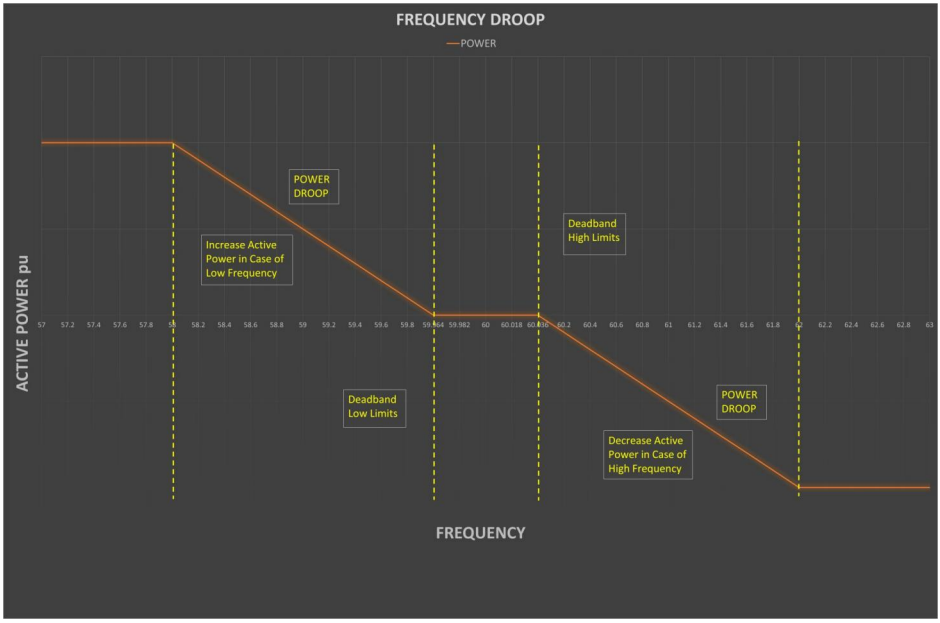
12.5.2 Default Grid Setting for VOLT-VAR



12.5.3 Default Grid Setting for VOLT-WATT



12.5.4 Default Grid Setting for FREQUENCY DROOP



12.7 Product Certificate of Compliance

Certificate of Compliance

Certificate: 80042699 **Master Contract:** 273488

Project: 80205466 **Date Issued:** 2024-08-19

Issued to: Ginlong Technologies Co., Ltd.
No.57, Jintong Road, Xiangshan
Ningbo, Zhejiang, 315712
CHINA

Attention: Ruyi Pan

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only

C US

Issued by: Magic Zhang
Magic Zhang

PRODUCTS

CLASS 5311 09 - POWER SUPPLIES - Distributed Generation Power Systems Equipment
CLASS 5311 89 - POWER SUPPLIES - Distributed Generation Power Systems Equipment - Certified to U.S. Standards

Transformerless Grid Support Utility Interactive PV Inverter, Models Solis-255K-EHV-5G-US, Solis-185K-EHV-5G-US, Solis-255K-EHV-5G-US-PLUS, Solis-185K-EHV-5G-US-PLUS Solis-125K-EHV-5G-US-PLUS, S6-GU350K-EHV-US-M12, S6-GU250K-EHV-US-M12 and S6-GU350K-EHV-US-M16. Wall mounted, permanently connected.

Notes:
For details related to rating, size, configuration, etc., reference should be made to the CSA Certification Record, Certificate of Compliance Annex A or the Descriptive Report.

APPLICABLE REQUIREMENTS

CSA-C22.2 No.107.1-16	-	Power Conversion Equipment
*UL Std No. 1741-Third Edition	-	Inverters, Converters, Controllers and Interconnection System Equipment For Use With Distributed Energy Sources (Third Edition, Dated May 19, 2023)

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12.7 Product Certificate of Compliance

Certificate: 80042699 **Master Contract:** 273488
Project: 80205466 **Date Issued:** 2024-08-19

**UL 1699B	-	Photovoltaic (PV) DC Arc-Fault Circuit Protection (First Edition, Revision Dated May 18, 2021)
**UL1741 CRD	-	Non-Isolated EPS Interactive PV Inverters Rated Less Than 30Kva (Dated April 26, 2010)

*Note: Conformity to UL 1741(Third Edition, Dated May 19, 2023) includes compliance with applicable requirements of IEEE 1547-2003 (R2008), IEEE 1547a-2014, IEEE 1547.1-2005(R2011), IEEE 1547.1a-2015. Grid support function is verified according to UL 1741 Supplement SA8-SA18 with the SRDs of California Electric Rule 21, and also verified according to UL 1741 Supplement SB and IEEE 1547.1-2020 with the SRDs of IEEE 1547-2018 IEEE 1547a-2020 and Hawaiian Electric Co. SRD-V2.0. While the grid support function evaluated according to IEEE 1547.1-2020, the interoperability is verified with IEEE 2030.5-2018 communication protocol.

**Note: The functional safety has been evaluated according to applicable requirement of UL 1998-Edition 3 as required by the product standard.

Notes:

Products certified under Class C531109 have been certified under CSA's ISO/IEC 17065 accreditation with the Standards Council of Canada (SCC). www.scc.ca

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12.7 Product Certificate of Compliance

CSA GROUP™

Supplement to Certificate of Compliance

Certificate: 80042699 **Master Contract:** 273488

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
80205466	2024-08-19	Update report 80042699 with below modifications: 1. Add models S6-GU350K-EHV-US-M12, S6-GU250K-EHV-US-M12 and S6-GU350K-EHV-US-M16 to meet all listed applicable standard requirements and evaluate the Grid support function to comply with HECO SRD V2.0 requirements for all models, firmware number is A3. 2. Add alternate materials, such as PV connector, DC Switch, Internal Fan, External Fan, DC SPD, DC current sensor, DC power Inductor, Filter Capacitor, AC current sensor, Relay, RCMU sensor, AC SPD, Aux power Transformer (T2), IGBT module 3. Update construction for model S6-GU350K-EHV-US-M12, S6-GU250K-EHV-US-M12 and S6-GU350K-EHV-US-M16.
80173204	2023-09-04	Update the report 80042699 to add alternate materials of PV connector, Internal Fan, Y Capacitor, AC Power Inductor and IGBT module.
80101842	2022-08-15	Update the report 80042699 to add models Solis-125K-EHV-5G-US-PLUS and evaluate the Grid support function to comply with UL 1741 Supplement SB according to IEEE 1547.1-2020 with SRDs IEEE 1547-2018 and IEEE 1547a-2020 for all models.
80072246	2021-06-30	Update the report 80042699 to add models Solis-255K-EHV-5G-US-PLUS and Solis-185K-EHV-5G-US-PLUS, and meet requirements of UL 1699B Photovoltaic (PV) DC Arc-Fault Circuit Protection (First Edition, Revision Dated August 22, 2018) for all models. (C/US)
80046894	2020-11-04	Update the report 80042699 to include requirements of UL1741CRD Grid Support Utility Interactive Interoperability Optional Functions: Prevent Enter Service and Limit Active Power (CA Rule 21, Phase 3, functions 2 and 3) (Dated October 22, 2019) for Transformerless Grid Support Utility Interactive PV Inverter, Models Solis-255K-EHV-5G-US and Solis-185K-EHV-5G-US.
80042699	2020-09-15	Transformerless Grid Support Utility Interactive PV Inverter, Models Solis-255K-EHV-5G-US and Solis-185K-EHV-5G-US. (C/US)

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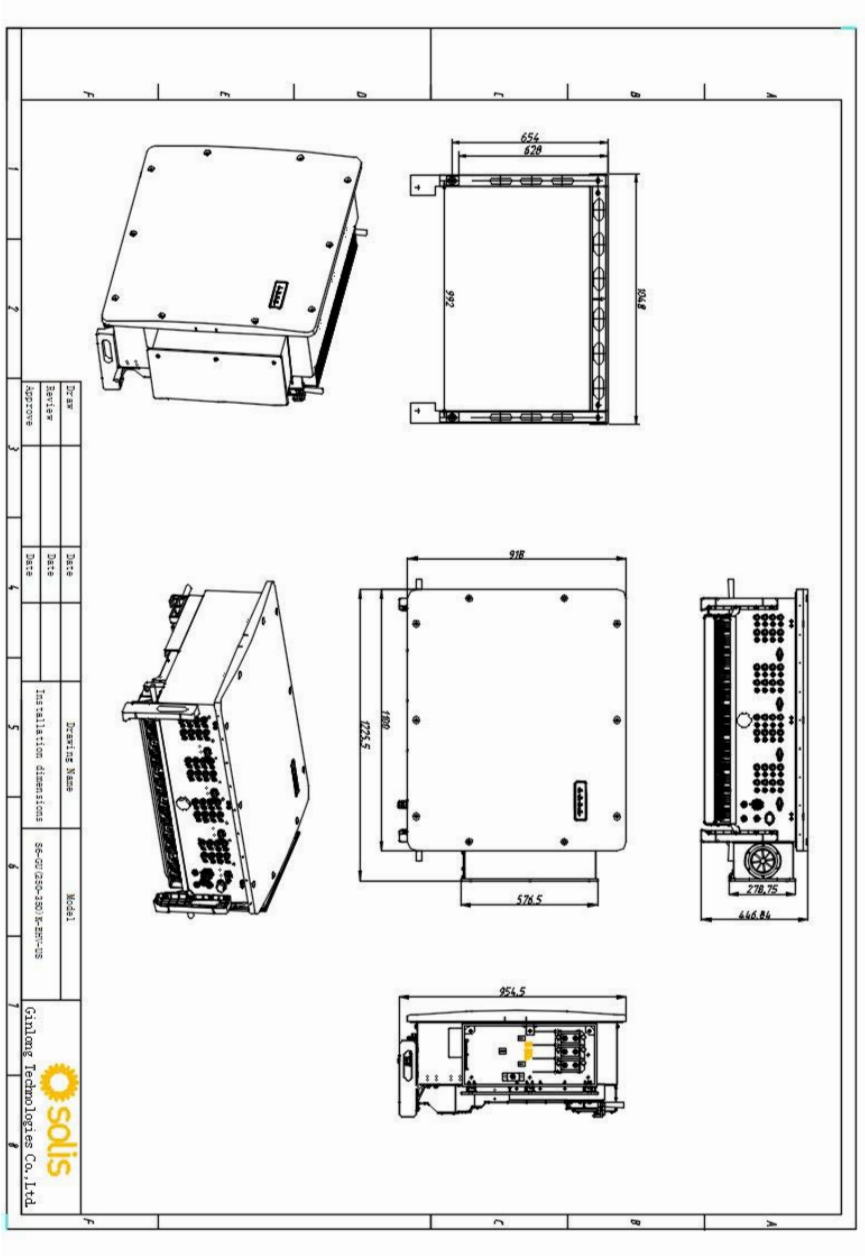
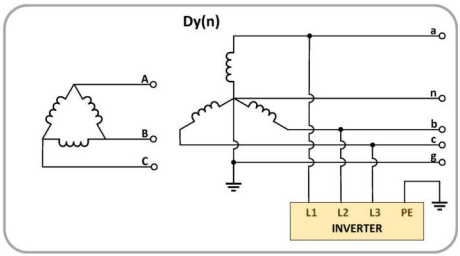
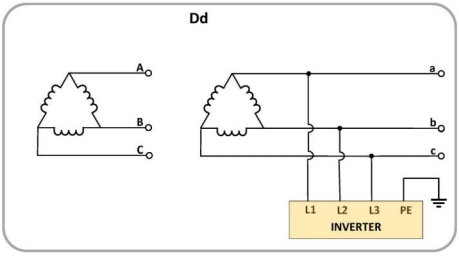
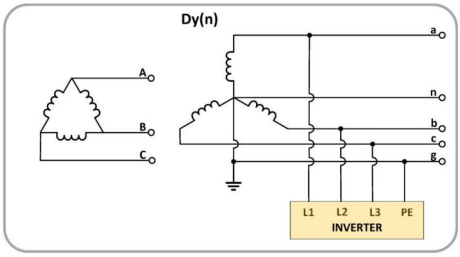
12.8 Mechanical Dimension Drawing

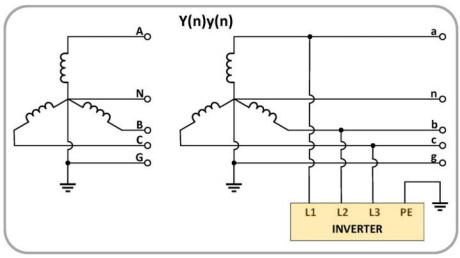


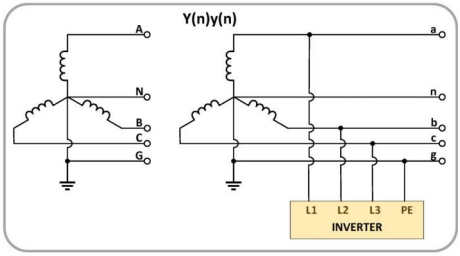
12.9 Medium Voltage Transformer Winding Configuration











Compatible Transformer Winding Configuration				
Y(n)y(n)	Dy(n)	Dd	Y(n)d	Inverter Model
YES	YES	YES	NO	S6-GU250K-EHV-US
YES	YES	YES	NO	S6-GU300K-EHV-US
YES	YES	YES	NO	S6-GU350K-EHV-US

Manufacturer: Ginlong Technologies Co.,Ltd., Ningbo, Zhejiang, P.R.China
Toll-free: 866.438.8408 I Email: sales@ginlong.com I ussales@solisinverters.com
usservice@solisinverters.com
Web: www.ginlong.com I www.solisinverters.com/us

Please adhere to the actual products in case of any discrepancies in this user manual.
Please record the serial number of your inverter and quote this when you contact us.