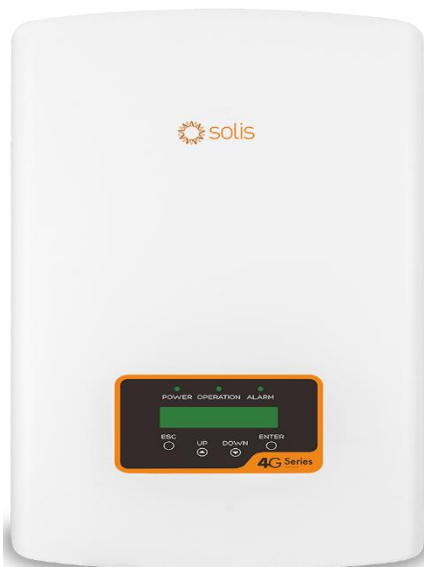


STANDARD OPERATING PROCEDURE

SOLIS - 1 PHASE & 3 PHASE STRING INVERTERS



Solis Inverters converts DC Power from the photovoltaic PV array into alternating Current (AC) power that can satisfy the local loads as well as feed the power distribution of grid.

This Standard Operating Procedure has been made for the EPC installers for effective use of the Solis Inverters on their Solar Plant and get the effective output as per the mentioned basic guidelines below:

- 1 DC input and AC output must be electrically isolated before operation.
- 2 Electrical installations must be done in accordance with the local and national regulatory and electrical safety standards.
- 3 To reduce the risk of fire, over-current protection devices (OCPD) are required for circuits connected to the inverter. Refer *manual* for recommendation
- 4 Inverter must be installed according to the instruction stated in the User Manual.
- 5 Dc input voltage must be less than its maximum input voltage of inverter.
- 6 Store the inverter in a clean and dry place, free of dust and dirt.
- 7 Store the inverter on a flat, hard surface - not inclined or upside down.
- 8 In the site where multiple inverters are installed the minimum clearance of 500 mm should be kept all the sides of inverter.
- 9 Inverter must be installed under the shadow of Canopy/Roof/Structure.
- 10 Adequate ventilation must be provided.
- 11 Crimp the DC pins properly the with cables and properly tight the DC cable.
Connect inverter grounding cable as per recommended. Ground the ACDB box and make
- 12 sure the conductor cable is used of same size of inverter and SPD should be integrated in ACDB box
- 13 For 1 kW - 40 kW inverter only use copper cable ac side, Connect AC cables without any lugs & for 50 kW- 255 kW aluminium cable can be used with bi-metallic ring type lugs.
- 14 Select the Grid-OFF during any parameter change, Like grid code, AC voltage window etc.
- 15 Use proper DC & AC cables routing through cable tray, PVC, Duct.
- 16 To stop the plant generation both AC & DC switches should be OFF, Like during net metering, preventive maintenance etc. .

SAFETY PRIORITIES FOR DC & AC CONNECTIONS

If DC inputs are accidentally reversely connected or the Inverter is faulty or if its 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 0.5 A, please wait for the Solar irradiance (Solar Radiation) reduces until the current decreases to below 0.5 A (Mostly in the Evening).
- Only after the current is below 0.5A, you are allowed to to turn off the DC Switches and disconnect the PV Strings.



DC CONNECTIONS

- All PV Modules must be of same type and same power rating.
- All PV Modules must be aligned and titled identically considering the desired torque as per the PV Module vendor.
- The V_{oc} Open Circuit Voltage of the PV Array must never exceed the maximum input Voltage of the Inverter. Even at the Coldest expected temperature.
- Each Strings connected to a **Same** MPPT must consist of the same number of series-connected PV Modules.



AC CONNECTIONS

Always Connect the Inverters to the Utility Grid as per the local standards.

- Since the inverter is compatible with IT grid (only 3-line wire) connection. So N Neutral connection can be ruled out.
- But if there is tender obligation where neutral cable needs to be connected then customer can connect N line in the N port of AC connection side.
- TT, TN grid connection for the inverter range from 5K to 40K.
- Visually check for any stray strands that may be not inserted in the terminal.
- Check to ensure the terminal screws are at correct torque



PLEASE NOTE that any damages due to **W**rong operations and **W**rong installation practice are not covered in the **device warranty**.

START & SHUTDOWN

START-UP APPROACH

- Firstly and for most :
- Switch the AC Switch ON.
- Switch the **DC Switch*** ON. If the PV Array DC Voltage is higher than the inverter's startup voltage, the inverter will turn on.
- The red DC Power LED and LCD will be continuously lit.
- Solis inverters are powered from the DC side. The inverter detects the DC Power that is within start-up and operating ranges, the inverter will turn on.
- After turning on, the inverter will check internal parameters, sense and monitor AC Voltage, Frequency (Hertz) rate and the stability of the supply grid.



*Switch all the DC SWITCHES ON simultaneously one after the another, if there are more than 1 DC Switch in the particular rating inverter the operation is carried. DELAY in doing so, may damage the inverter and which may not be covered under Warranty.

SHUT-DOWN APPROACH

- Switch AC Switch OFF.
- Wait approximately 30 Seconds
- Switch DC Switch* OFF
- Confirm all LED's switch OFF (~ One 1 Minute)



*Switch all the DC SWITCHES off sequentially, if there are more than 1 DC Switch in the particular rating inverter the operation is carried. DELAY in doing so, may damage the inverter and which may not be covered under Warranty.

REMOVAL APPROACH

- To remove the inverter, First Switch-OFF the AC main (Grid).
- Wait for 30 seconds, Switch-OFF the DC switch.
- Wait for 5 minutes so the inverter discharge completely,
- Remove the DC and AC cables and ground cable.

Electrical Connection of the Solis Inverters must follow the below steps.



- Switch OFF the Grid Main Switch (AC).
- Switch OFF the DC switch.
- Connect the PV array (DC Cables).
- Connect the inverter to the grid (AC Cables).

SEE FOR THE CHECK POINTS BELOW !!

DC (Input)

1. Check The Dc Polarity Positive To Negative.
2. Check The Dc Voltage Between Positive To Negative. (Mppt Voltage)
3. Check The Dc Voltage Between Positive To Earth & Negative To Earth. (Check Dc Earth Fault).



AC (Output)

1. Phase To Phase Voltage (R_Y , Y_B , B_R).
2. Phase Sequence.
(Frequency) (50hz)
3. Phase To Earth (R_E , Y_E , B_E).
4. Earth To Neutral
(Must Be Less Than 5 V)

VOILA !!

You have Success-fully install the Solis Inverter.

For any technical assistance, please contact at

1. On our email id : indiaservice@ginlong.com
2. On our Service Line: **+91 22 497 44021**