User Manual

Commercial Energy Storage
Three Phase High Voltage
Hybrid Inverter

Applicable Models:
S6-EH3P30K03-NV-YD-H-US
S6-EH3P30K03-LV-YD-H-US
S6-EH3P40K04-NV-YD-H-US
S6-EH3P50K04-NV-YD-H-US
S6-EH3P60K04-NV-YD-H-US

Version 2.1 Release Date: 2025/09/15

Important Notes

- Product specifications are subject to change without notice. Every attempt has been made to make 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.

Table of Contents

Table of Contents

Table of Contents

1. Introduction

1.1 Inverter Description

This Solis hybrid inverter series is designed for commercial solar plus energy storage applications where the power grid is 480V, 240V, 220V or 208V three phase.
The inverter is able to maximize self-consumption while also providing backup power whenever grid power is lost. It can also utilize peak-shaving and time charging modes. The inverter is able to connect directly to a generator as well. The Solis S6 series consists of the following inverter models: 30kW, 40kW, 50kW, 60kW,and 30kW-LV (LV = “Low Voltage” 240V, 220V or 208V)

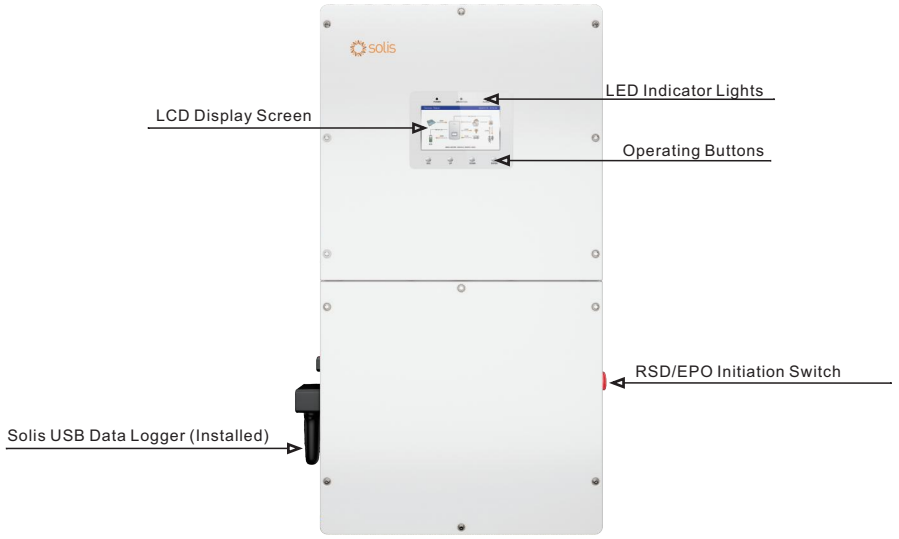


Figure 1.1 Frontal View

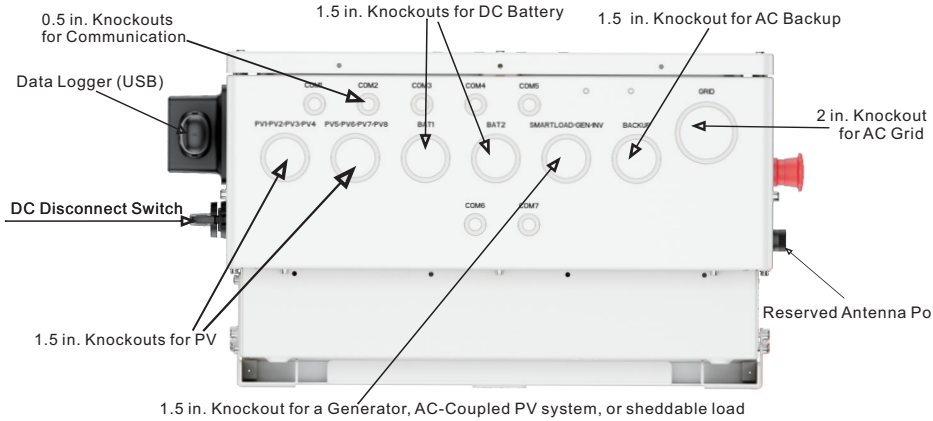


Figure 1.2 Bottom View (Wire Box)

1. Introduction

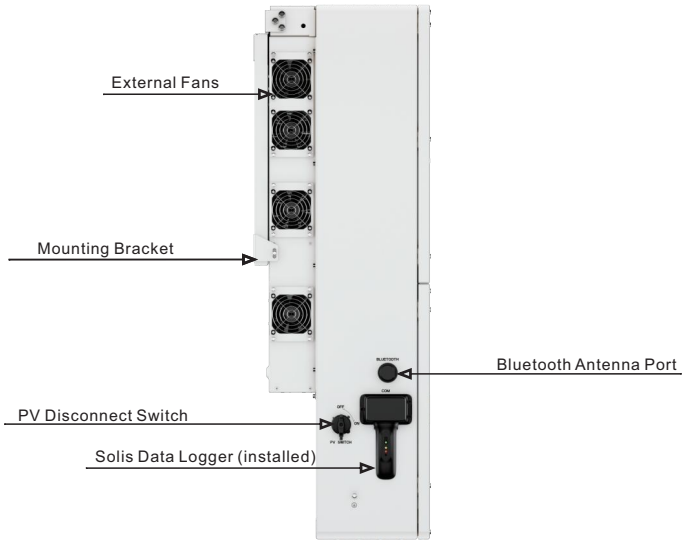


Figure 1.3 Right Side View

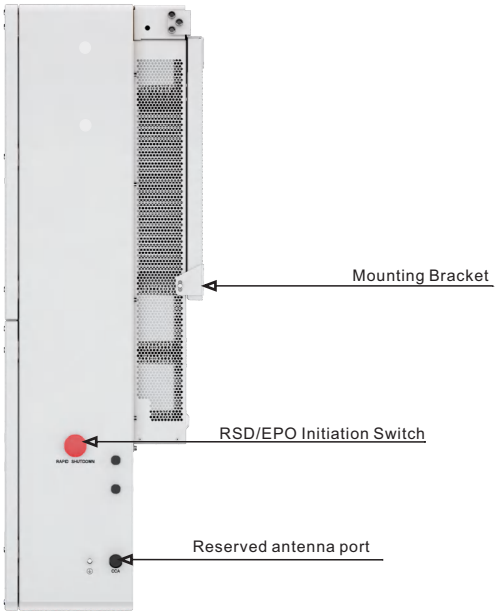


Figure 1.4 Left Side View

1. Introduction

Figure 1.5 Back View

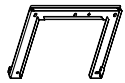
Figure 1.6 Top View

1. Introduction

1.2 Components Included with the Inverter

If any of these items are missing, please contact your local Solis distributor or the Solis service team.


Inverter x1


Back plate x1


Fastening screw x4


Expansion Bolt x5


S2-WL-ST Stick x1


CAN cable(3m) x1


Handle x2


Eastron ESCT-T24
Split-Core CTs x3


RJ45 connector x11


Meter(SDM630MCT-ETL) x1

NOTE

The CT cable lengths are 4 meters (13.12 ft.) and they cannot be extended.
If the installation requires an extension, an external meter must be installed.

1.3 Tools Required for Inverter Installation


Technician Screwdriver


Phillips Screwdriver


Wire Strippers 12AWG to 6AWG

Heavy Duty Wire Stripper


Ferrule Crimping Tool


Channel Locks


Multimeter (AC/DC amps)


Hex Screw Tips:
3MM,5MM,7MM,8MM


Torque Wrench Screwdriver


Smart Phone
(for commissioning)


SZF 3-1,0X5,5-Screwdriver

1. Introduction

1.4 Inverter Storage

- If the inverter is not installed immediately, please abide by the storage instructions and environmental conditions listed below.
- Use the original box to repackage the inverter, seal with adhesive tape with the desiccant inside the box.
- Store the inverter in a clean and dry place, free of dust and dirt. The storage temperature must be between -22~158°F and humidity should be between 0 to 100%, non-condensing.
- Do not stack more than two (2) inverters high on a single pallet. Do not stack more than 2 pallets high.
- Keep the box(es) away from corrosive materials to avoid damage to the inverter enclosure.
- Inspect the packaging regularly. If packaging is damaged (wet, pest damages, etc.), repackage the inverter immediately.
- Store inverters on a flat, hard surface -- not inclined or upside down.
- Do not remove the desiccant packet that is included with the inverter. It is included to ensure that any residual moisture is absorbed quickly.
- 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.
- Perform an annual visual inspection of the inverter box for signs of damage
- If the inverter has been removed from the box and then replaced, put desiccant packets in the inverter wire box to ensure the internal components stay dry
- Do not store the inverter outside or in a place that does not have environmental controls.

2. Safety & Warning

2.1 Safety

The following types of safety instructions and general information appear in this document as described below:

DANGER
"Danger" indicates a hazardous situation which if not avoided, will result in death or serious injury.

WARNING
"Warning" indicates a hazardous situation which if not avoided, could result in death or serious injury.

CAUTION
"Caution" indicates a hazardous situation which if not avoided, could result in minor or moderate injury.

NOTE
"Note" provides tips that are valuable for the optimal operation of your product.

WARNING: Risk of fire
Despite careful construction, electrical devices can cause fires.
- Do not install the inverter in an area containing flammable materials or gases.
- Do not install the inverter in a potentially explosive atmosphere.

2.2 General Safety Instructions

WARNING
Only devices in compliance with SELV (EN 69050) may be connected to the RS485 and USB interfaces.

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
Do not touch any internal parts until 5 minutes after disconnection from the utility grid, PV array, and battery.

2. Safety & Warning

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

CAUTION
Risk of electric shock, do not remove the cover. There are no serviceable parts inside, refer servicing to qualified and accredited service technicians.

CAUTION
The PV conductors are energized with high voltage DC when the PV modules are exposed to sunlight.

CAUTION
The surface temperature of the inverter can reach up to 75 (167°F). To avoid risk of burns, do not touch the surface of the inverter while it is operating. The inverter must be installed out of direct sunlight exposure.

NOTE
PV modules used with inverter must have an IEC 61730 Class A rating.

WARNING
Operations must be accomplished by a licensed electrician or a person authorized by Solis.

WARNING
Installer must wear personal protective equipment during the entire installation process in case of electrical hazards.

WARNING
The AC Backup Port of the inverter cannot be connected to the grid.

WARNING
Please refer to the product manual of the battery before installation and configuration to the inverter.

Systems using this product shall be designed and built in accordance with the NEC & local electrical codes & standards.

2. Safety & Warning

2.3 Notice for Use

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

1. Permanent installation is required.

2. The electrical installation must be compliant with all local and national regulations & standards.

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

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

2.4 Notice for Disposal

This product shall not be disposed of with household waste. It must be segregated and brought to an appropriate disposal facility to ensure proper recycling.

This it to be done in order to avoid negative impacts on the environment and human health. The inverter contains materials that should not end up in a landfill.

Local waste management rules shall be observed and respected.

2.5 Protection Circuitry and Controls

To meet relevant codes and standards, the Solis U.S. three phase inverter line is equipped with protective circuitry and controls. These include Arc Fault Circuit Interrupter (AFCI) & 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. After five arc fault detections in 24 hours, an AFCI-induced shutdown will be triggered. If this event occurs, the inverter must be manually reset. After clearing the source of the fault, the inverter can be powered back on and allowed to resume normal operation.

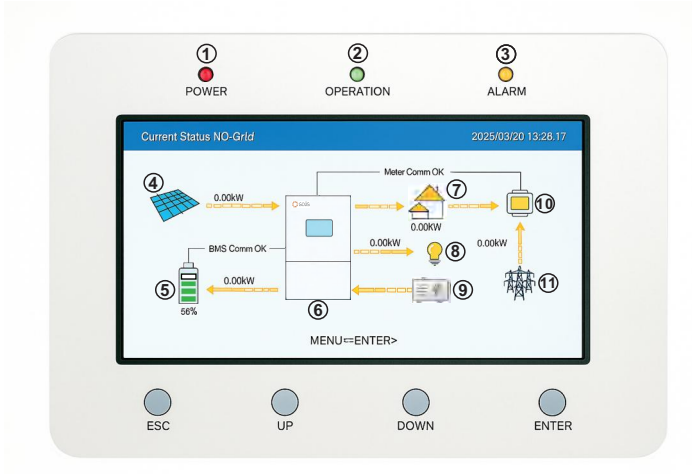
Anti-Islanding Protection:

Anti-Islanding is a condition where the inverter cease 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 inverters operating in parallel and the grid.

NOTE:
All Solis inverters come with AFCI and Anti-Islanding protections integrated and enabled by default. The settings cannot be disabled or modified.

3. Overview

3.1 LCD Display Screen and Indicator Lights



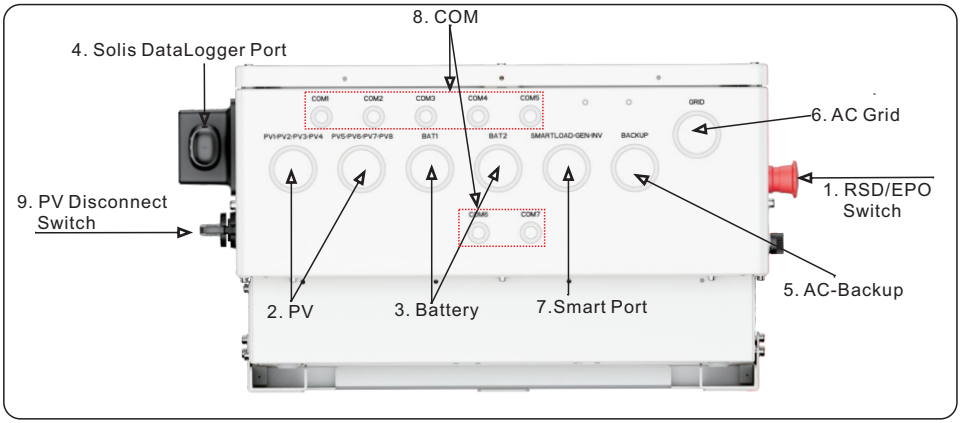
#	Name	Description
1	Power LED	This LED is always red when the inverter has adequate AC or DC voltage. This LED does not indicate any problems.
2	Operation LED	This LED is always green when the inverter is operating normally and producing AC power.
3	Alarm LED	This LED is will light up yellow any time the inverter has an alarm code.
4	PV Icon	Represents PV power being generated in DC kW.
5	Battery Icon	Represents the battery connected to the inverter charging and discharging in DC kW and state-of-charge (SOC)
6	Inverter Icon	Represents the Solis hybrid inverter in the system.
7	Load Icon	Represents the grid-side building load consumption & power being exported to or imported from the grid in AC kW.
8	Backup Icon	Represents backup load consumption on the backup-side of the system in AC kW.
9	Generator Icon	Represents generator power being produced in AC kW.
10	Meter/CT Icon	Represents the energy meter monitoring the consumption power & import/export power to/from the grid in AC kW.
11	Grid Icon	Represents the grid and power being imported from/exported to the utility (grid) in AC kW.

NOTE:

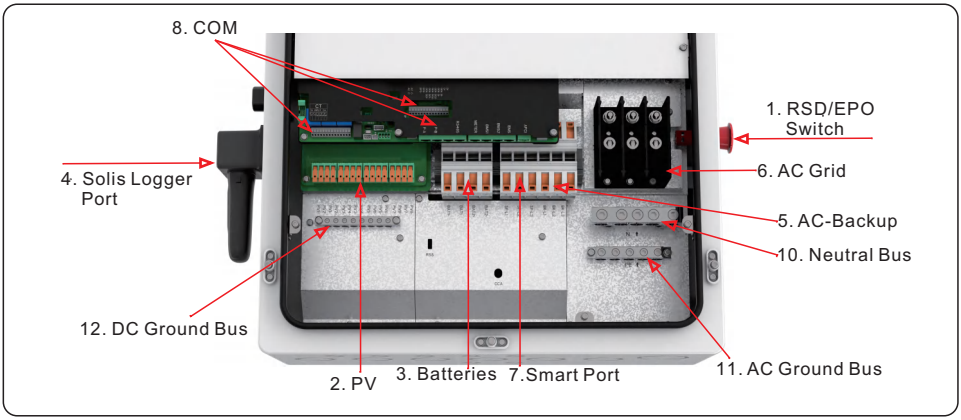
The screen will turn off after a few minutes to conserve energy. Press any button to wake the screen up. Press the Enter button to access the main menu.

3. Overview

3.2 Inverter Wire Box and Connection Points



Name	Description
1. RSD/EPO Initiation Switch	Disables the internal rapid shutdown (RSD) transmitter, initiating rapid shutdown. Engaging this switch disables all AC output from the inverter. Does not turn off battery.
2. PV	PV string conductors should be connected here
3. Battery	Battery conductors should be connected here
4. Solis Datalogger Port	Port (USB) for connecting Solis data loggers only
5. AC-Backup	AC conductors to backup loads panel should be connected here
6. AC-Grid	AC conductors to the main service panel should be connected here
7. Smart Port	AC conductors to a generator, AC-coupled PV system, or sheddable load connect here
8. Communication (COM)	RS485, CAN, parallel inverter, and other communication cables get connected here
9. PV Disconnect Switch	Disconnects the PV array to the inverter power train. Does not turn off battery.
10. Neutral Bus Bar	Common bus bar for all neutral conductors to terminate (not grounded)
11. AC Ground Bus Bar	Common bus bar for all AC ground conductors to terminate
12. DC Ground Bus Bar	Common bus bar for all DC ground conductors to terminate

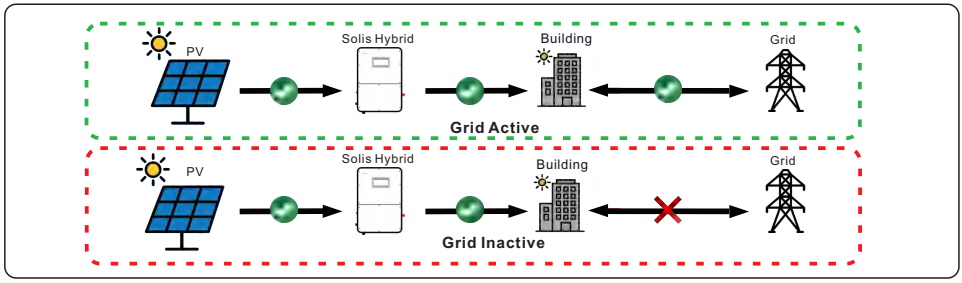


4. Operating Modes

4.1 PV-Only

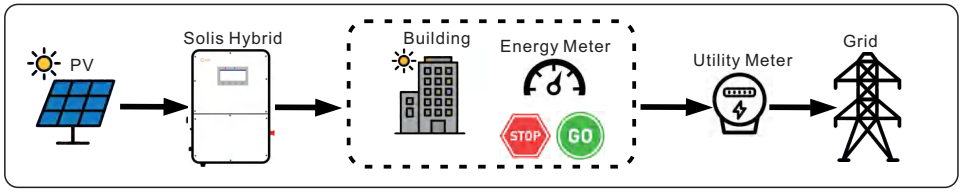
4.1.1 Grid-Tie PV String Inverter

This inverter can be as a PV-only grid-tied string inverter. Only the PV/backup/ grid ports would be utilized. The inverter does have a feature allowing it to provide backup power with only PV. However, an overload condition will occur if load consumption exceeds the available power from the PV. This feature is great for short-duration (1-2) hour outages during the day with load consumption kept low. Batteries can always be added in the future, keeping the initial installation cost low. Overload faults occurrences and recover times are as follows: First - 30 seconds, Second - 3 minutes, Third, Fourth, Fifth - 10 minutes, Sixth - hard reset is required, no automatic recovery.



4.1.2 Export Power Control

The inverter offers the ability to manage export power. During the system commissioning process, export power control can be enabled. An export power limitation can then be set to the desired kW value. The inverter will then regulate how much power gets sold back to the utility company.



Each Solis hybrid comes with an energy meter, which gets installed externally to the inverter. The energy meter uses three CTs for three-phase, which measure the power being consumed and imported by the building. The hybrid uses the data from this meter to determine whether or not it needs to curtail the PV power to meet the export power limitation. Export power control can be enabled with or without a battery being installed.

Zero-Net Export

The inverter can be set to not export any active power to the utility. This does not end up being zero exportas there is some power that leaks back to the utility each time there is a change in load demand. However, the *net import/export* will be near zero kWh each day when programmed for zero export.

NOTE:

The exported power cannot be kept to exactly zero. Solis export power control function is based on the measurements taken by the provided CTs or an external energy meter. Due to the sampling interval limitation, when there are sudden changes in load consumption small amounts of power will be exported. For stricter zero export applications, it is recommended to install an external backflow trip device. Solis does not sell this device.

4. Operating Modes

4.2 Energy Storage

4.2.1 Overview of Energy Storage Modes

The S6 hybrid is capable of providing AC power to loads using PV and battery power in the event of a grid failure. This is known as ***backup power***. The amount of backup power that each S6 hybrid model can provide is equal to the amount of on-grid power that it can provide. For example, an 60K model can provide up to 60kW of continuous backup power.

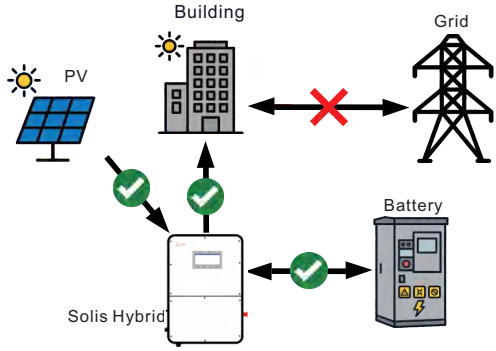


Figure 4.1 Backup power with Solis S6 hybrid

If the primary purpose of the energy storage system is to store as much of the PV power as possible so that it can be used later to offset the consumption of grid power, this is known as energy arbitrage. *Time-of-use*, *self-consumption*, and *peak-shaving* are all examples of ***energy arbitrage***. Typically, the battery will cycle daily as it charges with PV during the day and then discharges in the evening to cover building load demand.

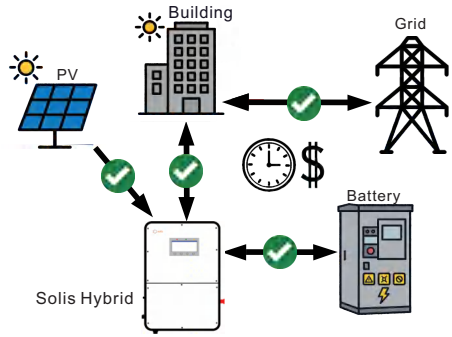


Figure 4.2 Energy arbitrage with Solis S6 hybrid

The S6 hybrid can also operate in an entirely remote system where there is no grid present at all. This is called ***off-grid*** mode. It is very similar to backup in that the inverter will supply AC power to loads with PV and battery power only. However, backup mode is only for grid-connected systems.

NOTE:
The inverter is able to provide off-grid/backup power with only PV and no battery. However, the load consumption must remain less than the available PV power or else an overload fault will occur and the system will shutdown for five minutes.

4. Operating Modes

4.2.2 Energy Arbitrage

The three-phase hybrid inverter has multiple operating modes which can be programmed so that the performance of the system is tailored to the specific needs of each individual system owner.
The backup power function of the inverter can be enabled or disabled independently of the energy arbitrage modes:(1) Self-Use (2) Selling first (3) Off grid (4) Peak-Shaving (Professional Setting)

Self-Use Mode(Self-Consumption)

Self-Use is the default energy storage mode. PV power will always supply the building loads first. Any excess PV power gets stored in the battery. If the battery is fully charged, the remaining power can be exported if the system is configured to allow it. If not, the PV power will be curtailed.

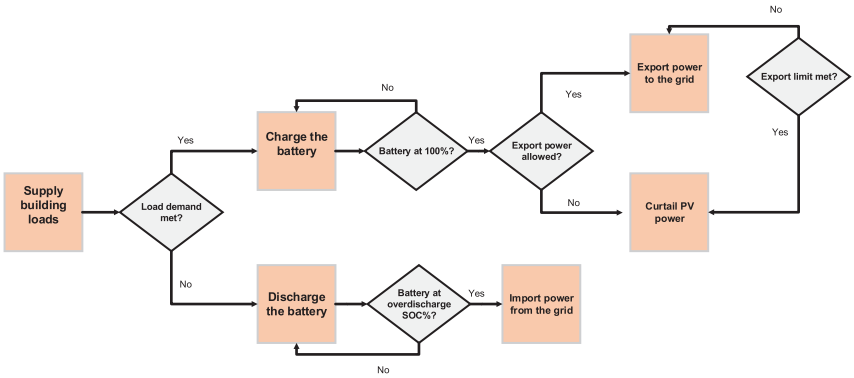


Figure 4.3 Self-Use Mode logic diagram

Selling Fisrt Mode(Export Priority)

This mode can be thought of as export priority mode. The system will first supply the loads with PV power and then it will seek to export the excess PV power, up to the set limit. Once the limit is reached, the remaining power will be stored in the battery. If the battery is fully charged, the PV will at that point be curtailed. This mode is for those who receive an equal rate for power exported or who have a much higher ratio of PV power generated to power consumed.

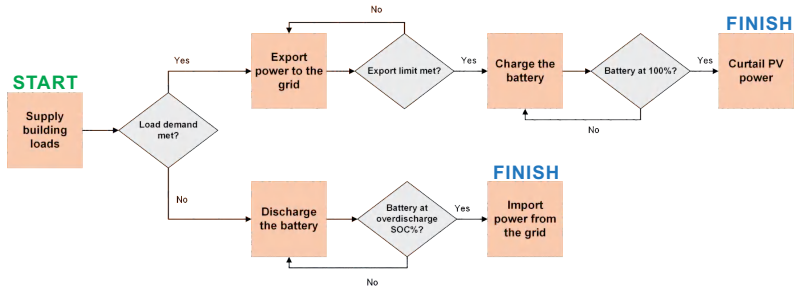


Figure 4.4 Selling first Mode logic diagram

4. Operating Modes

Off-Grid Mode

There is a dedicated mode specifically for 100% off-grid systems which are not electrically connected to the grid at all. This mode should not to be confused with backup mode, which occurs only for grid-tied systems. The logic for Off-Grid mode is the same as Self-Use mode. However, there is no export power control since there is no grid and a generator is often used in place of the grid to supplement the PV and batteries. When PV meets the load and there is still excess energy, this portion of PV charges the battery. If the battery has not reached the generator's "Off SOC" setting, the generator will continue to charge it. Furthermore, the battery must be connected to the inverter when the generator function is in use.

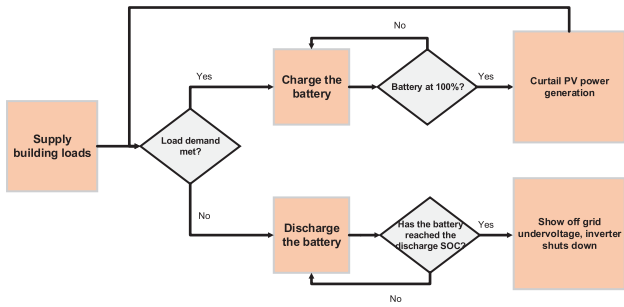


Figure 4.5 Off-Grid Mode logic diagram

NOTE:

To utilize off-grid mode, the inverter must not be connected to the grid at all. There cannot be any conductors landed in the grid terminals.

Peak-Shaving Mode

Peak-shaving mode is ideal for those who pay a variable rate for energy based on the amount of consumed power (kw). This mode limits the power imported from the grid. The inverter will only discharge the battery when the power imported from the grid exceeds a specified amount (kW).

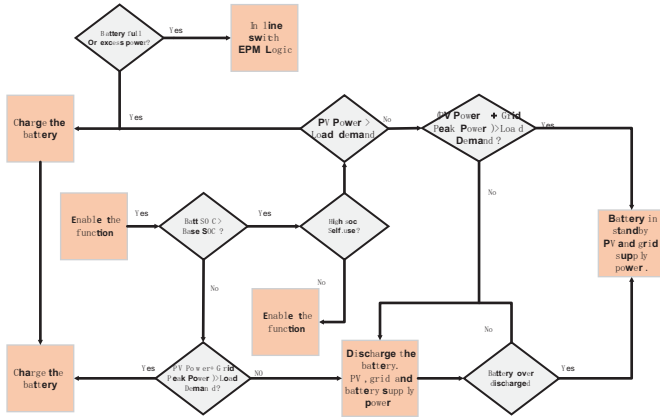


Figure 4.6 Peak-Shaving Mode logic diagram

4. Operating Modes

4.3 DC Coupling vs AC Coupling

4.3.1 DC-Coupling

DC-coupling is the recommended configuration for this inverter. This is because DC-coupling allows the full potential of this inverter to be utilized, maximizing the efficiency of the PV-to-battery charging.

In a DC-coupled system, the PV also gets connected to the inverter in addition to the battery. The inverter will charge the battery directly with DC power from the PV. Typically, DC-coupling is done when additional PV is being added or when the system is new and being installed with energy storage.

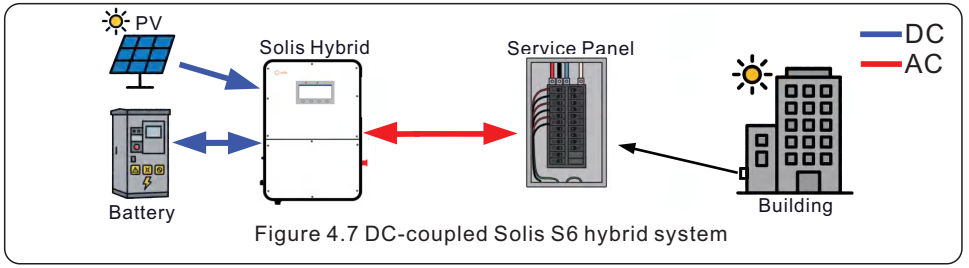


Figure 4.7 DC-coupled Solis S6 hybrid system

The next section explains how the S6 hybrid can be AC-coupled. The next several sections following it will all focus on DC-coupling methods..

4.3.2 AC-Coupling at Grid Port

The Solis S6 hybrid can be DC-coupled or AC-coupled to a building to add energy storage. In an AC-coupled system the energy storage is connected to the AC-side of the system. Typically, the battery and Solis hybrid pairing get connected in parallel with an existing PV system. The battery will charge with PV power from the existing PV system. When AC-coupling with the S6 hybrid, new PV can either be added or not be added to the S6 hybrid, it is up to the system designer. The hybrid would just need to be installed with a compatible high-voltage battery and then be connected to the load center in parallel with the existing PV system.

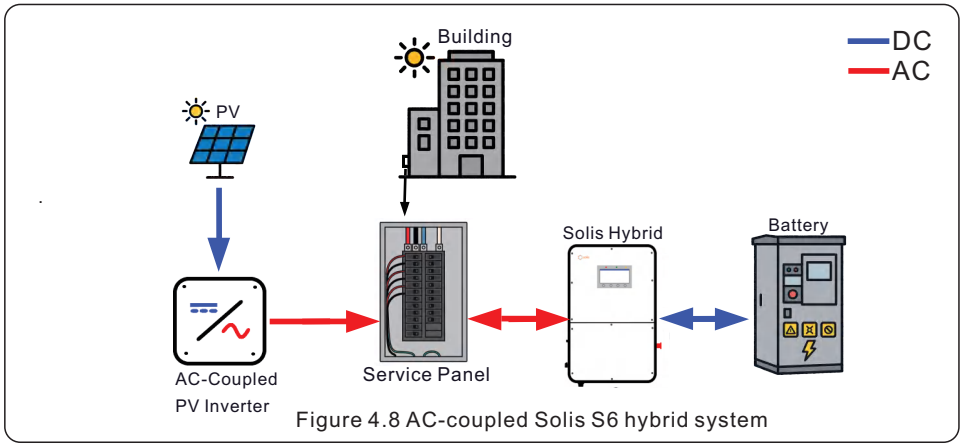


Figure 4.8 AC-coupled Solis S6 hybrid system

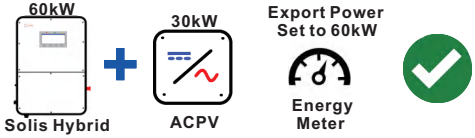
The ability to be AC-coupled makes the Solis S6 hybrid ideal for system retrofits. The hybrid can be installed in place of the old PV inverter but with energy storage added.

4. Operating Modes

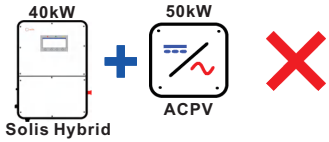
4.3.3 AC-Coupling at the Smart Port

An existing PV system can be AC-coupled (ACPV) to the Smart Port for backup support during outages. ACPV output must be less than the Solis hybrid inverter's rated power."ACPV" refers to any AC-coupled PV system, while "PV" refers to DC-side connections on the S6.The ACPV breaker must be relocated into the backup load center so it remains energized during outages.When grid-connected, monitor grid-side consumption: if combined Solis + ACPV power exceeds the inverter rating, an overload alarm may occur.

The ACPV system connected to the smart port of the system must be smaller than or the same size as the Solis hybrid inverter. Export power must be set so that the maximum export power is equal to the Solis inverter nameplate power rating.



Do not connect an ACPV system to the smart port of the system that is larger than the nameplate power rating of the Solis inverters. If there are multiple Solis inverters, then the combined total power.



It is recommended to install an external contactor switch in series between the Smart Port and the ACPV when connecting the grid-tied inverter to the Smart Port of the inverter. The Smart Port relay cannot be turned off at zero current, which will affect the relay's lifespan.

Suggested Specifications:

Circuit breaker/contactor, three-phase four-wire, rated current above 100A, supporting internal DO control turn-off of the inverter). When it is necessary to stop the AC couple function, first control the external switch to be disconnected, and then cut off the smartload port relay at zero current."

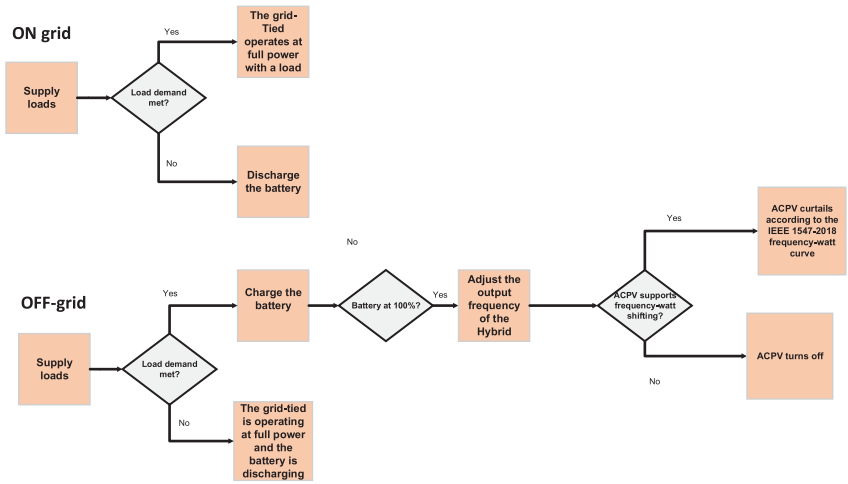


Figure 4.9 AC-Coupling (ACPV) with Backup Operating Logic

4. Operating Modes

Frequency Shifting

There is no direct communication between the Solis S6 hybrid and the AC-coupled PV system. The inverter uses frequency-shifting to modulate the output of the ACPV system. The inverter uses the frequency-watt curve outlined in the IEEE 1547-2018 standard. When in backup mode, the S6 hybrid will begin to shift the AC frequency when it detects that the power supplied by all of the PV, including the ACPV, is greater than the power demanded (consumed). This change in frequency will be detected by the ACPV system. If the ACPV system also supports the IEEE 1547-2018 frequency-watt curve, then its output power will reduce according to that curve. If the ACPV system does not support frequency-watt, then it will shut off as the frequency shifts and then turn back on once the S6 hybrid corrects the frequency.

NOTE:

The maximum output power of the existing PV inverter must be less than the maximum output power of the Solis hybrid inverter. AC coupling can be done on either the grid side or the smart port side. However, if it is on the smart port side, then the max.output power of the existing PV inverter must be less than the maximum output power of the Solis hybrid inverter.

4.4 Backup Power Inverter Paralleling

Up to six hybrid inverters can be installed together in parallel on the backup side of the system . The backup ports of each inverter would terminate in separate overcurrent protection devices within the backup load center.

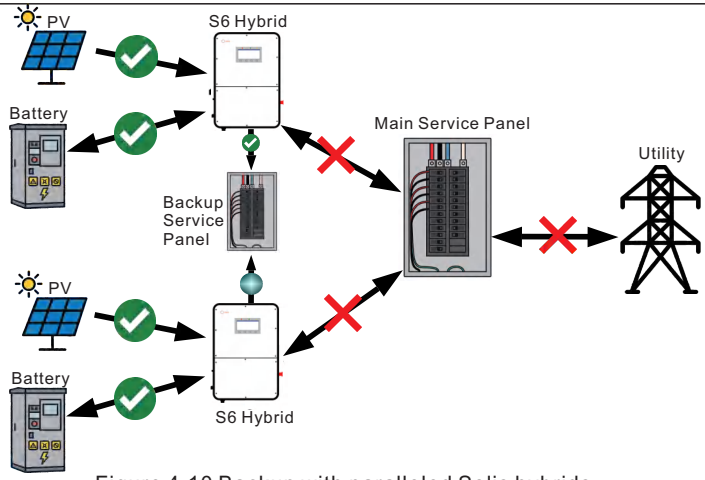


Figure 4.10 Backup with paralleled Solis hybrids

It should first be determined what the maximum continuous current needs to be in order to meet the energy demand of the home. Up to six S6 hybrid inverters can be installed in parallel with PV and batteries to provide continuous backup power. For example, three 60kW hybrids in parallel can provide up to 216.6A (72.2A x 3) of power to the loads in backup mode.

For a system with backup, the average daily power consumed should be less than or equal to the average daily PV power produced on any given day of the year. Otherwise, an overload condition may occur, causing the system to go down temporarily. The chart in Figure 4.16 shows how much continuous backup power can be produced depending on how many inverters are installed in parallel and what size they are.

4. Operating Modes

Solis Model	Total Maximum Continuous Backup Current					
	1 unit	2 units	3 units	4 units	5 units	6 units
30kW	36.1A	72.2A	108.3A	144.4A	180.5A	216.6A
30kW (208V)	72.2A	144.4 A	216.6 A	288.8 A	361A	433.2 A
40kW	48.1 A	96.2 A	144.3 A	192.4 A	240.5 A	288.6 A
50kW	60.1 A	120.2 A	180.3 A	240.4 A	300.5 A	360.6 A
60kW	72.2 A	144.4 A	216.6 A	288.8 A	361A	433.2 A

Figure 4.11 Backup power chart based on Solis model and number of paralleled units

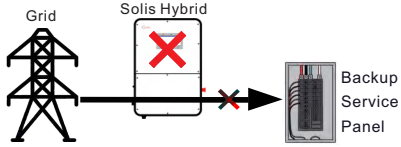
Surge Capacity & Passthrough Power

The **surge capacity** is how much power the inverter can generate for a small amount of time, usually one hundred milliseconds to ten seconds maximum. Each Solis model has different ratings for passthrough power and surge capacities. Installing multiple inverters in parallel increases the surge capacity and passthrough power.The chart in Figure 4.13 shows the surge capacities and passthrough power ratings for each model.The surge capacity for 10 Second is 150% of the rated continuous output current. For example, 72.2A x 150% = 108.8A for 100 milliseconds. The surge capacity for 10 seconds is 150% of the rated continuous output current.

There will be times when the loads on the backup side consume more power than the inverter is able to provide with PV and battery power. The **passthrough power** is the amount of power that the can pass through the inverter from the grid to the loads when there is not enough PV and battery power available. The passthrough current rating of the 30kW is 72.2A and the rating for both the 60kW and 30kW 208V models is 142.2A.In the event of an inverter failure, the backup loads will lose power. It is strongly recommended to install an external bypass switch to protect the loads from this type of event. The inverter does not automatically bypass and there is no integrated bypass switch.

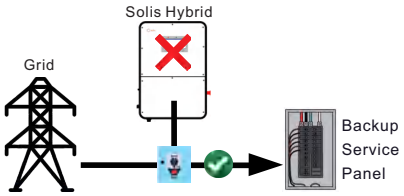
Solis Model	600s Surge Current	60s Surge Current	10s Surge Current	2s Surge Current
30kW	43.32A	50.54A	54.15A	57.76A
30kW (208V)	86.64A	101.84A	108.3A	115.54A
40kW	57.72A	67.34A	72.15A	76.96A
50kW	72.12A	84.14A	90.15A	96.16A
60kW	86.64A	101.84A	108.3A	115.54A

Figure 4.12 Surge Current Ratings based on Surge Duration



Inverter failure without a bypass switch

If the inverter fails grid power is not able to make it through the inverter to the loads connected to the backup side. If a firmware upgrade is pushed, the backup loads will also lose power until the update is done.



Inverter failure with an external bypass switch

With a bypass switch the loads are able to get power directly from the grid even if the inverter is nonoperational. Solis does not supply the external bypass switch, it must be procured from a third-party.

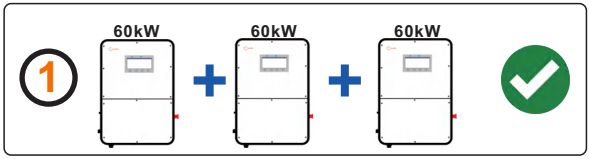
Figure 4.13 Passthrough Power with and without an External Bypass Switch

4. Operating Modes

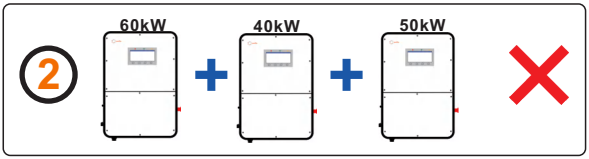
4.4.1Paralleling Limitations and Restrictions

There are a few limitations to installing multiple inverters in parallel for backup power. Please note that these caveats do not apply when only paralleling on the grid-side. The restrictions shown below are only with respect to paralleling the backup-sides together. All inverters in the same system must be on the same firmware version. Please install one Solis data logger per inverter.

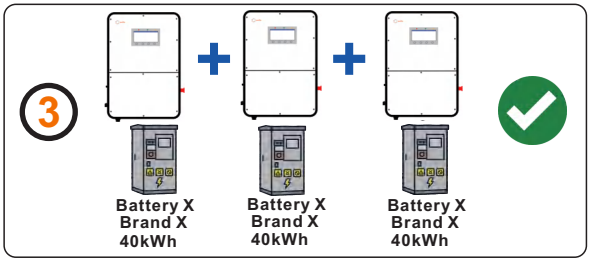
1. Paralleled inverters must be the same size (model number).



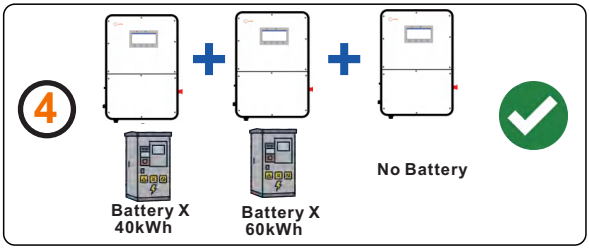
2. Do not parallel inverters that are different sizes. Again, this rule only applies to systems with backup power.



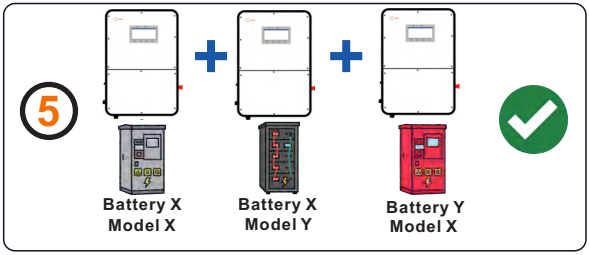
3. Paralleled inverters should have the same capacity (kWh), brand, and model of battery connected for maximum system efficiency. However, mixing and matching different batteries in the same system is acceptable.



4. Supports different capacities, but the capacity difference should be within 50% range. To ensure balanced charging and discharging in parallel, it is recommended that the battery capacity remain consistent.



5. Supports different brands, different models of the same brand, and different batteries connected to the same inverter.



NOTE:
CTs can be connected directly to the inverter without needing to install an energy meter. This only works for 1 inverters. When three or more inverters are being installed, the Eastron energy meter must be installed. The hardware limit for CT mode is set at 300A.

4. Operating Modes

NOTE:
In an off grid parallel system, if the battery capacity is limited and some are connected to the battery while others are not, it is recommended that the battery be connected to the host

4.4.2 Power Control System (PCS)

The Solis S6 hybrid inverter is UL 3141 PCS certified. This means that the inverter is able to regulate the current and limit the loading on the bus bars and conductors. The PCS can limit the power flow as to not exceed any busbar rating limits. With PCS, the 120% rule for breaker sizing becomes irrelevant, you can go up to the busbar rating. For the S6-EH3P30K03-LV-YD-H-US model, the maximum controlled current on the busbar is 72.2A (30kW).

S6-EH3P(30-60)K-NV-YD-H-US
Solis Hybrid Inverter

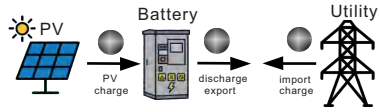
Eastron ESCT-T24
Split-Core CTs

Figure 4.14 Components of a Solis commercial PCS system

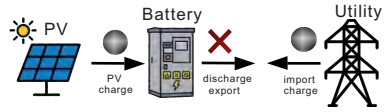
NOTE:
Every S6 hybrid comes with a set of three Eastron Split-Core CTs. The Rogowski Coils are optional accessory components that must be purchased separately with Eastron SDM630-MCT-OCS.

Solis Power Control System (PCS) Operating Modes

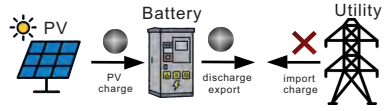
1. Unrestricted Mode: This mode should be used when PCS is not required. The system is permitted to charge the batteries with grid power and can discharge-export battery power to the grid.
This mode is enabled by default.



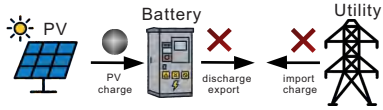
2. Import Only Mode: The system is permitted to charge the battery with grid power but is prohibited from discharge-exporting battery power to the grid.



3. Export Only Mode: The system is permitted to discharge-export battery power to the grid but prohibits the use of grid power to charge the battery.



4. No Exchange Mode:. The system is only permitted to charge with PV power and can only discharge to cover loads. The system is prohibited from discharging battery power to the grid.



4. Operating Modes

4.5 External Automatic AC Bypass Switch

This Solis hybrid does not have the ability to automatically bypass the inverter should the inverter fail. To ensure protection of the loads connected to the backup side, it is strongly advised to install a third-party external AC bypass switch. These switches can be expensive, but it essential to install one so that the loads are never without power should there be an equipment failure.

4.5.1 Requirements for an External Automatic AC Bypass Switch

Any AC bypass switch that meets the following criteria is compatible with this inverter:

1. Must be rated for at least 200A since the passthrough power goes up to 144.4A
2. Must have UL 98 certification for spring-loaded transfer
3. Must be rated for 480VAC or 208VAC depending on the model of Solis inverter installed

4.5.2 Examples of Compatible Automatic AC Bypass Switches

ASCO (Schneider Electric)
Series 7000 ATS (600A, 480V)
Bypass-Isolation Switch

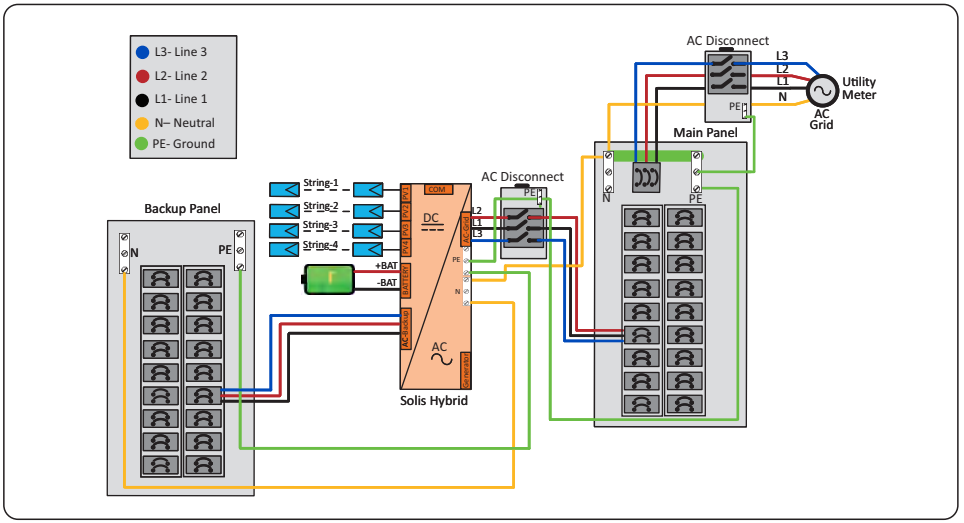
Eaton – Contactor-based ATS
(400A, 277/480V)

Russelectric (Siemens)
RTS03 (400 A, 277/480 V)

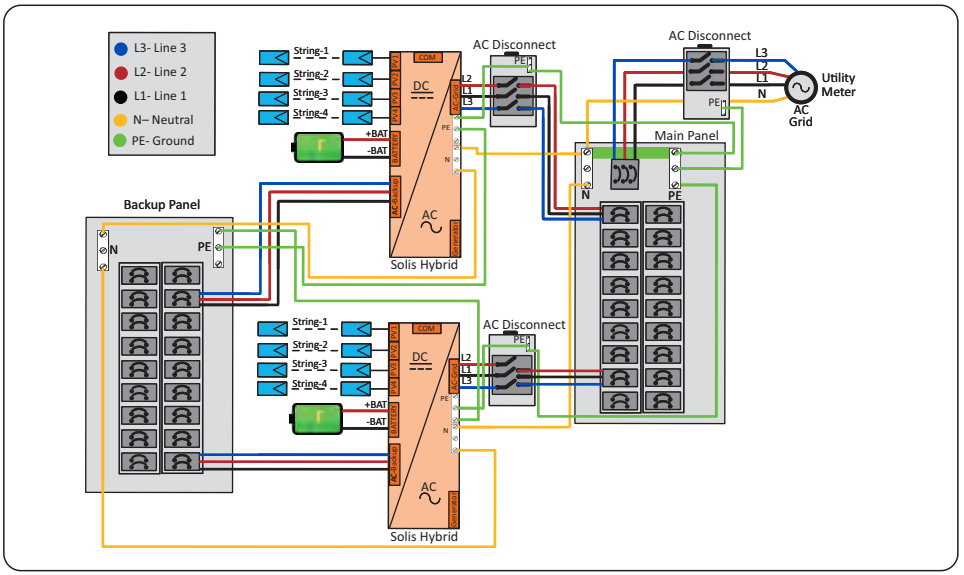
4. Operating Modes

4.6 Wiring Diagrams

4.6.1 Backup System with One Solis Hybrid Inverter



4.6.2 Backup with Multiple Solis Hybrid Inverters



5. Installation

5.1 Select a Location to Install the Inverter

When selecting a location for the inverter, the following criteria should be considered:

Exposure to direct sunlight may cause output power derating due to overheating. It is recommended to avoid installing the inverter in direct sunlight. The ideal location is one where the ambient temperature does not exceed 40°C (140°F)

It is also recommended to install the inverter somewhere the rain and snow will not land directly on it. The ideal installation location is on a north-facing wall under an eave.

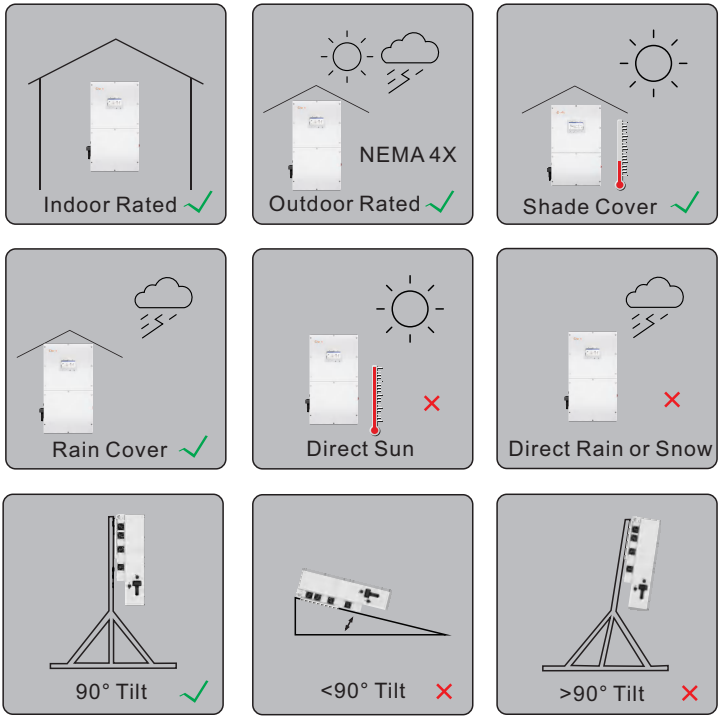


Figure 5.1 Recommended Installation locations

WARNING: Risk of Fire

Despite careful installation, electrical equipment can cause fires.

- Do not install the inverter in an area that contains flammable materials, liquids, or gases.
- Do not install the inverter in a potentially explosive environment.
- The structure on which the inverter is being mounted must be fireproof.

5. Installation

5.1.4 Avoiding direct sunlight

Installation of the inverter in a location exposed to direct sunlight should to be avoided.

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.

5.1.5 Air circulation

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

5.1.6 Flammable substances

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

5.1.7 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.

5.2 Inverter Handling

Please review the instruction below for handling the inverter:

1. The red circle below denotes the carrying handle cutout on the inverter box. Push in the cutouts on both ends of the box to form handles for moving the inverter.

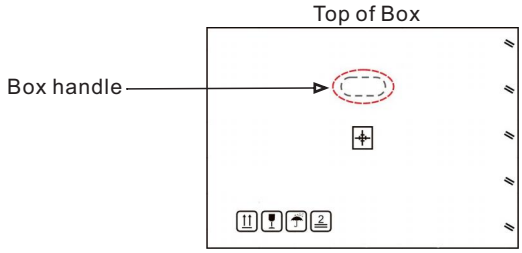


Figure 5.2 Handles for moving the inverter shown circled in red - one per side

2. Two people are required to carry and move the inverter while it is in the box.
3. When removing the inverter from the box, two people must use the handles integrated into the heat sink.
4. When setting the inverter down, do it slowly and gently. This ensures that the internal components and the outer chassis do not take any damage. Do not drop the inverter on any side from a height greater than 4 inches from the ground or it will cause damage.

5. Installation

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

WARNING: Risk of Shock

Despite careful installation, electrical devices present a shock hazard.

- Install the equipment out of reach of children if children may be present.
- Ensure that the equipment covers are always in place whenever the equipment is not being serviced.
- Never service live equipment. Always turn the equipment off first. Use a multimeter to verify that conductor voltages are zero.

CAUTION: Hot Surface

- The temperature of the inverter heat sink can reach 167°F. Do not touch the heat sink while the inverter is operating.

The ambient temperature and relative humidity of the installation environment must meet the following requirements:

Maximum Temperature	Minimum Temperature	Max. Relative Humidity	Maximum Altitude
140°F 60°C	-13°F -25°C	100% Non-Condensing	8202 feet 2500 meters

Figure 5.3 Installation environment conditions

Load bearing structure requirements:

Made of nonflammable materials

Max. load bearing capacity ≥ 4 times of inverter weight of **195.77 lbs**

Figure 5.4 Load bearing structure

5.2.1 Clearances

- If multiple inverters are installed on site, a minimum clearance of 31.5 inches should be kept between each inverter and all other mounted equipment. The bottom of the inverter should be at least 20 inches above of the ground or floor (see Figure 5.5 on page 23).
- 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.

5.2.2 Consult technical data

- Consult the technical specifications sections at the end of this manual for additional environmental condition requirements (temperature range, altitude, etc.)

5.2.3 Angle of installation

- This model of Solis inverter must be mounted vertically (90° degrees not greater or less than 90° degrees straight up).

5. Installation

5.3 Inverter Dimensions & Weight

The inverter weighs about 195.77 pounds (88.8Kg) outside of the box.

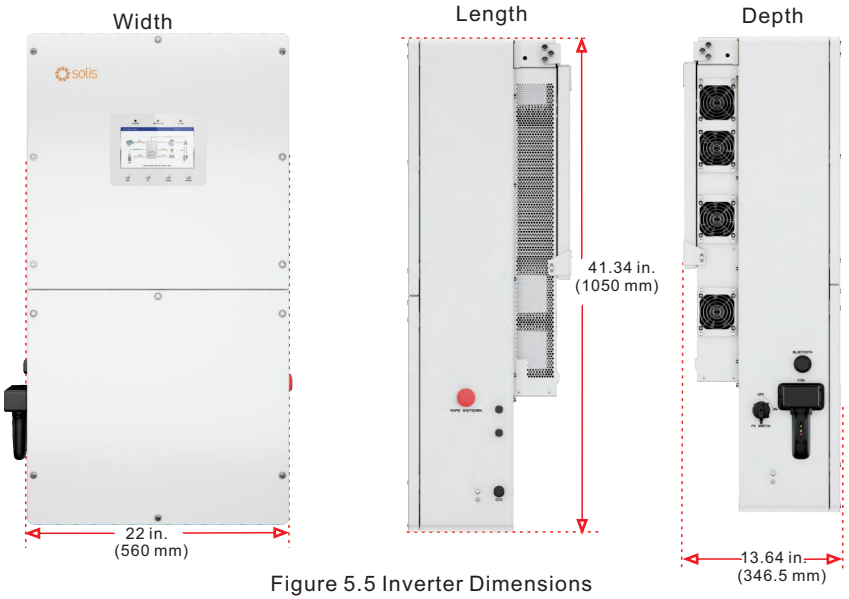


Figure 5.5 Inverter Dimensions

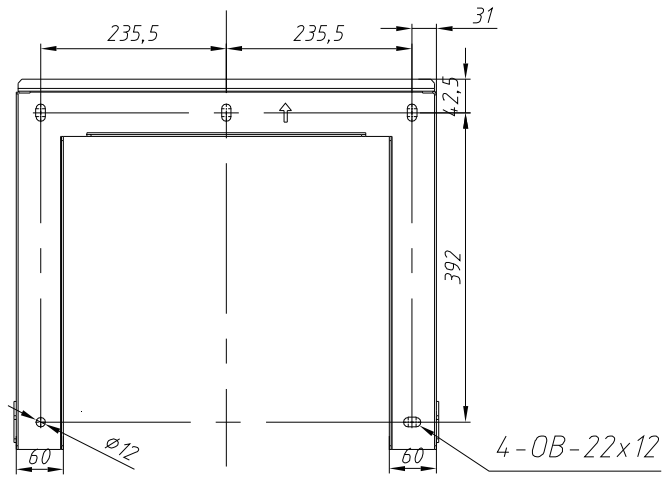


Figure 5.6 Inverter Bracket Dimensions

5. Installation

5.4 Mounting the Inverter

- Mount the inverter on a wall or structure capable of bearing the weight of the machine
- The inverter must be mounted upright on a vertical structure with a tilt of 90°. A tilt greater or less than 90° may cause the inverter output power to derate.
- To prevent overheating, be sure that the inverter has adequate air flow around it. A minimum clearance of 31.5 inches (800mm)should be kept between inverter & other equipment. There must be 20 inches (508mm) of clearance between the bottom of the inverter and the ground. Between the sides of the inverter and everything else, there must be a miniumum of19.67 inches of clearance.

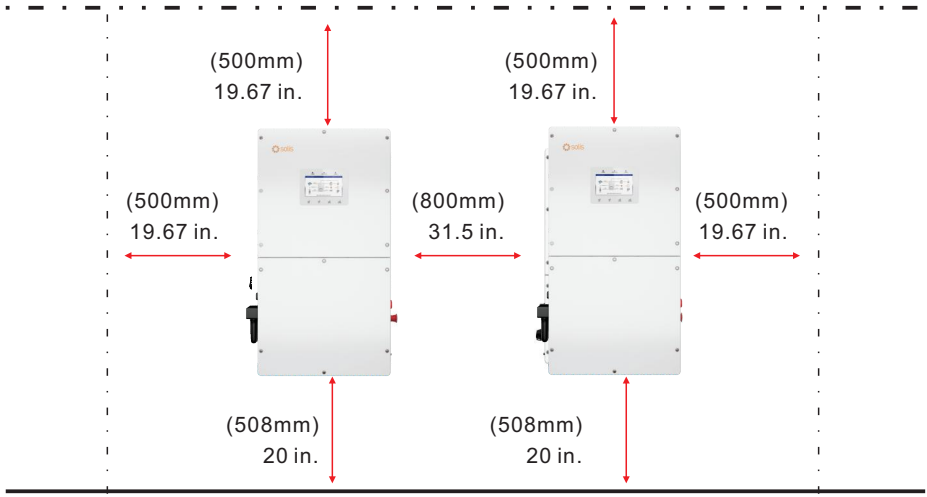


Figure 5.7 Inverter Mounting Clearances

- Visibility of the LCD screen should be considered. Ideally, the screen would be at eye-level.
- Adequate ventilation around the inverter must be provided.

NOTE:
Nothing should be stored directly on top, underneath, or against the inverter.

- When the inverter is mounted on the wall, it sticks out approximately one foot.
- Keep this in mind when selecting the installation location for the inverter. The exact dimensions of the inverter and the mounting bracket are on the next page.

Once a suitable location has been found according to Figures 5.3 and 5.4, use figures 5.6 and 5.7 to mount the bracket to the wall. You may drill additional holes in the bracket if you need to you need to. The steps for mounting the inverter are listed below:

1. Place the bracket on the wall or inverter rack. The arrow in the middle of the bracket points up. With a pencil or marker, mark the mounting holes. Fasten the bracket to the wall**. If you are mounting the inverter to a wall, be sure the fasteners go into studs**.

5. Installation

NOTE:

The inverter must be mounted vertically at a 90° angle.

Four fasteners must be used to ensure the bracket does not come off the wall. At least two must embed in a wall stud to bear the inverter weight.

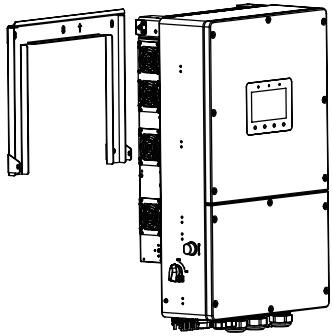


Figure 5.8 Wall mount bracket

2. Lift up the inverter and align the back two hooks on the heat sync with the two tabs on the inverter mounting bracket. Lower the inverter hooks down onto the mounting bracket tabs and ensure the hooks have a solid bite before releasing the inverter. Then install the two set screws that are included with the inverter for stabilization.

Inverter handles

1. The inverter comes with two black handles that are removable and only required for safely lifting the inverter.
2. The position of handrails installation as the red mark in figure 3.3.
3. Whenever lifting the inverter or setting it down, do sp slowly and gently. This ensures that the internal components and the outer chassis do not take any damage.
4. Two people are required to remove the inverter as it is very heavy. Be sure to use the black handles.
5. Remove the handles by unscrewing them once the inverter has been mounted.

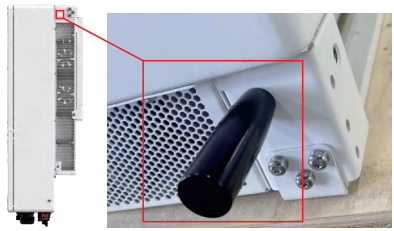


Figure 5.9 Inverter handle

5. Installation

NOTE:
The inverter must be mounted vertically at a 90° angle.
Four fasteners must be used to ensure the bracket does not come off the wall. At least two must embed in a wall stud to bear the inverter weight.

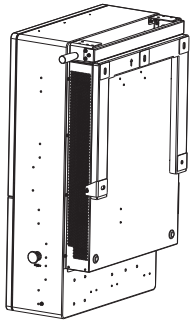


Figure 5.11 Inverter on mounting bracket and set screws

WARNING:
The inverter is very heavy. Please use proper lifting techniques to avoid potential injury. It is recommended that two people lift the inverter together.

5. Installation

5.5 Maximum Conductor Sizes & Torque Specs

5.5.1 Max. Conductor Sizes and Torque Specifications

Terminal	Conductor Size Range	Torque Specifications
PV	10-8 AWG	N/A Spring Clamp
Battery	12-2 AWG	
Backup	12-2 AWG	
Smart Port	12-2 AWG	
AC Ground	2-2/0 AWG	6.5-8 N.m. (4.8-5.9 ft-lbs)
DC Ground	6-1 AWG	6.5-8 N.m. (4.8-5.9 ft-lbs)
Grid	2-2/0 AWG	13-15 N.m. (8-11 ft-lbs)
Neutral	6-2/0 AWG	10-12 N.m. (7.4-8.9 ft-lbs)

Figure 5.12 Max. Conductor Size and Torque Spec Chart

Inverter Terminal Operation Tool Guide

The inverter Grid terminals require a 8mm Hex tip with torque wrench. The AC ground terminals require an 5mm Hex, the PE ground terminals require an 3mm Hex, and the neutral bus uses a 7mm Hex. The PV terminals can be operated with fingers only. The battery, backup, and smart port terminals require a Phillips screwdriver. The communication terminals require a small flathead screwdriver.

Conductor, conduit, and overcurrent protection device sizing shall be done in accordance with the NEC and local electrical codes & standards.

5. Installation

5.6 Equipment Grounding & Neutrals

Within the inverter wire box there are two ground bars for the equipment grounding conductors to terminate. The bar under the PV terminals is the DC ground bus. The bar under the grid terminals is the AC ground bus. All equipment grounding conductors (EGCs) must be terminated in these bars.

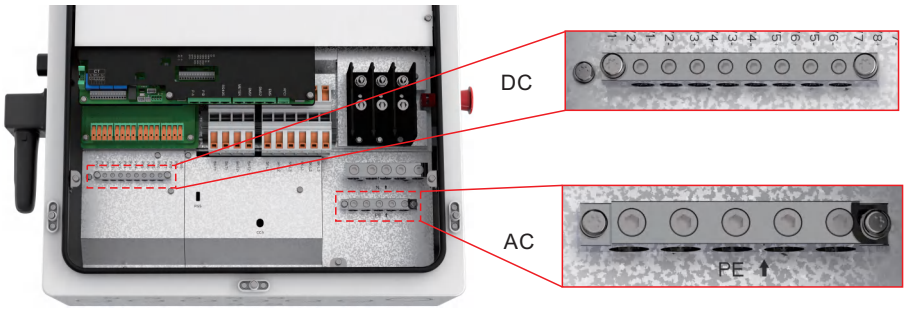


Figure 5.13 Internal Grounding Conductor Terminal Location

Steps for connecting grounding and neutral conductors to the ground & neutral bus bars:

1. Strip ½ inch of insulation off the end of the ground conductor.
2. Use an 8mm Hex tip to loosen the terminal screw in the ground bar
3. Insert the stripped end of the grounding conductor into the now open terminal.
4. Tighten the screw to a torque of 6.5-8 N.m. (4.8-5.9 ft-lbs). Do not over tighten the screw.
5. Give the conductor a gentle tug test.
6. Follow the same steps for connecting the neutral conductors to the neutral bar. Use the same torque value of 10-12 N.m. (7.4-8.9 ft-lbs). The neutral bus requires a 7mm hex tip instead.

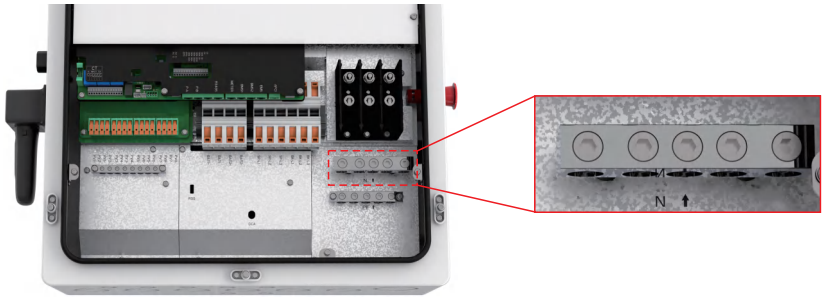


Figure 5.14 Internal Neutral Conductor Terminal Location

IMPORTANT:
For multiple inverters in parallel , all units must be connected to the same ground point to eliminate the possibility of a voltage potential existing between inverter grounds.

5. Installation

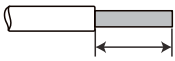
5.7 PV Cable Installation

DANGER:
Before installing the PV cables, be sure that the PV array is disconnected.
Use a multimeter to verify that the PV string voltages are low before proceeding.

Please verify the following before connecting the PV strings to the inverter:

- Ensure the DC voltage of the PV strings will not exceed the maximum DC input voltage (1000Vdc). Violating this condition will void the inverter warranty.
- Ensure the polarity of the PV strings are correct (ex: positive is positive).
- Ensure the PV string voltages going to the same MPPT are equal or within 10VDC.
- Ensure the PV resistance to ground is higher than 20K ohms.
- Ensure that the Isc of the strings will not exceed the maximum DC input current.

Select a suitable PV cable and remove 1/2 inch of insulation from the ends of each wire using wire strippers. Please refer to the table below for specific specifications.



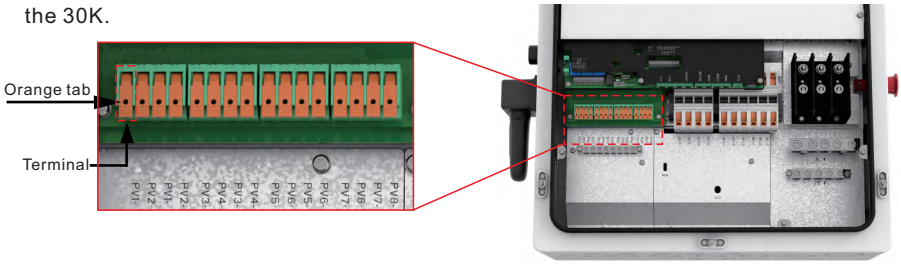
Cable type	Cross section（AWG）	
	Range	Recommended value
Industry generic PV cable	12~8 AWG (4.0~8.0mm²)	10AWG（6.0mm²）

Tubular Crimp Terminals

It is recommended to use European-style tubular crimp terminals on the conductor ends. The crimping length of the tubular terminal should be about ½ inch (12–14 m)
If using tubular terminals with insulated caps, ensure there is no interference between adjacent terminals. Otherwise, the selected terminal type may not be compatible.

5. Installation

Note: Each MPPT has two PV string inputs. For example, MPPT1 is PV1 and PV2. There are four MPPTs in the 60K and three in the 30K.



1. Strip ½ inch of sheath off the ends of each PV cable.
2. Pull up on the orange lever above the PV terminal, this opens the terminal gate.
3. Insert the end of the PV cable into the now open terminal.
4. Release the orange level and the terminal gate will clamp down on the PV cable.
5. Give the PV cable a gentle tug test to ensure that the connection is tight.
6. If the connection feels loose, repeat steps 1-5 again but push the cable deeper into the terminal before releasing the lever.

Figure 5.15 PV Cable Connection

CAUTION:

If the DC conductors are accidently connected in reverse or if the inverter is not working properly, do NOT turn off the DC switch. Otherwise, it may cause a DC arc and damage to the inverter or a fire.

The steps for corrective actions are as follows:

*Use a DC amp clamp multimeter to measure the DC string current.

*If the current is above 0.5A, please wait for the irradiance on the PV array to diminish until the current drops below 0.5A.

*Once the current is below 0.5A, you are allowed to open the DC switch and and then disconnect the PV strings from the inverter.

* In order to completely eliminate the potential for failure, leave the PV strings disconnected until the cause of the reverse polarity is corrected.

5. Installation

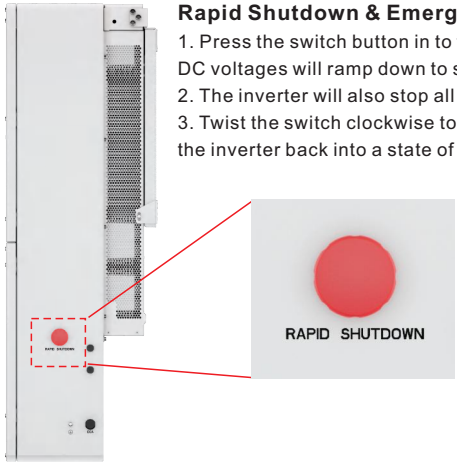
5.8 Rapid Shutdown & Emergency Power Off

5.8.1 Integrated Rapid Shutdown Transmitter & Switch

Important Note

The inverter can be ordered with an internal rapid shutdown transmitter. This transmitter brand must match the receivers that are being installed with the PV modules. **Not abiding by this will void the inverter warranty.**

The internal transmitter generates a PLC signal when it receives AC power. This signal travels up the PV strings to the receivers that are connected to the PV modules. When the receivers get this signal, they turn on and allow the string voltage to ramp up. When the receivers lose this signal, they turn off. When the receivers are off, each PV module only puts out less than 1VDC.Pressing in this switch cuts power to the internal RSD transmitter. Engaging the switch will also cause the inverter to stop producing power. The inverter will enter a standby state in which it will not energize the backup ports or connect to the grid. It will not generate any power at all or interact with the battery until the switch is disengaged.



Rapid Shutdown & Emergency Power Off Initiation Process

1. Press the switch button in to turn off the internal transmitter. The PV string DC voltages will ramp down to safety-level within 30 seconds.
2. The inverter will also stop all AC power output to both grid and backup.
3. Twist the switch clockwise to turn the internal transmitter back on and bring the inverter back into a state of normal operation.

Note:

Rapid shutdown will only initiate if receivers have been installed in the PV array connecting to the PV modules directly.

Without the receivers the inverter can achieve emergency power off but it cannot achieve rapid shutdown..

Figure 5.16 Rapid Shutdown & Emergency Power Off Initiation Switch

Additional Details About Rapid Shutdown

1. With rapid shutdown receivers installed, the PV string voltages should be very low. Depending on the receiver type, you should be measure between 0.6 and 0.7Vdc per module. Example: x10 modules = 6V-7V for the whole string
2. If the PV string voltages are low, check that the AC breaker is turned on so that the inverter is getting AC voltage and that the rapid shutdown switch is popped out. Give the switch a twist clockwise to verify that is popped out.
3. The DC switch does not have to be turned on for the receivers to get the PLC signal from the internal transmitter. However, if an external DC switch is installed, ensure that it is turned on or else the receivers will not be able to get the PLC signal from the transmitter.

5. Installation

Please see the Master Compatibility sheet on the Solis US website for details on which internal transmitter options are available for this Solis hybrid inverter.

5.8.2 Photovoltaic Rapid Shutdown System (PVRSS) Certification

The Solis S6 hybrid is PVRSS-certified with several brands that manufacture rapid shutdown equipment. The certification includes the inverter, the PLC transmitter, and the receivers. The transmitter is located within the inverter, the receivers are installed with the PV modules. To avoid violating the PVRSS certification, the same brand of receivers must be installed as the internal transmitter. (Ex: Tigo transmitter with Tigo TS4-A-F receivers). There can be no mixing of different brands without violating both the PVRSS certifiaction and the rapid shutdown equipment warranty. For this reason, please be sure to check the Compatibility Sheet and only install equipment that is matched under the same brand. The only exceptiown to this is Midnite Solar receivers, which can be used with either Tigo or APS transmitters.

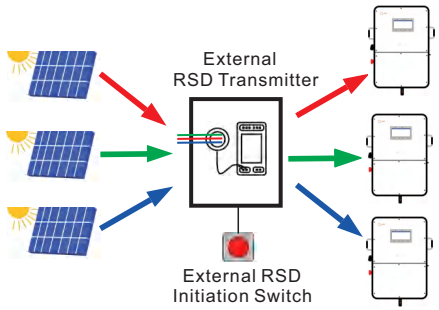
Figure 5.17 Components Listed in a Photovoltaic Rapid Shutdown System (PVRSS) Certification

Batteries and PV modules are not listed (specified) in the PVRSS certification. The transmitter can come integrated inside of the inverter, but it must be ordered with the correct internal transmitter. Alternatively, the transmitter can be installed externally in a separate enclosure.

Serial Number	Brand	Transmitter	Receiver
1	Tigo	RSS Transmitter Din Rail	TS4-A-2F
2			TS4-A-F
3	APS	Transmitter-PLC-1P	RSD-D-15
4			RSD-S-PLC

5.8.3 Multiple Inverters with One External Transmitter

If multiple inverters will be installed in parallel, it is ideal to use a single external rapid shutdown transmitter. This prevents cross-talk from occurring because there will only be one transmitter for all of the PV strings in the system. Run all of the strings through the external rapid shutdown enclosure first and then to each inverter.



Note: Hybrid inverters shown here do not have internal transmitters.

5.18 Multiple Inverters with a Single External RSD Transmitter

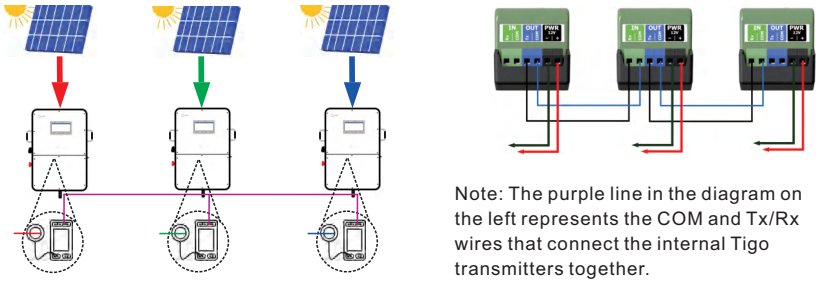
5. Installation

5.8.4 Cross-Talk

Cross-talk occurs when competing PLC signals sent from different transmitters reach the same RSD receivers. This causes the receivers to randomly cycle on and off at various times. Cross-talk must be avoided to ensure proper inverter operation and to eliminate risk of damage to the system components. If multiple transmitters must be used, then it is important to keep the PV leads going from each inverter to the arrays separated by one foot minimum. Tigo transmitters can be physically wired together in a daisy-chain. Be sure to understand what kind of cross-talk protection the transmitter uses so that the system can be designed to eliminate any chance of cross-talk happening. If an external rapid shutdown transmitter is going to be used and the inverter has an integrated transmitter, then the integrated transmitter must be disabled to prevent cross-talk.

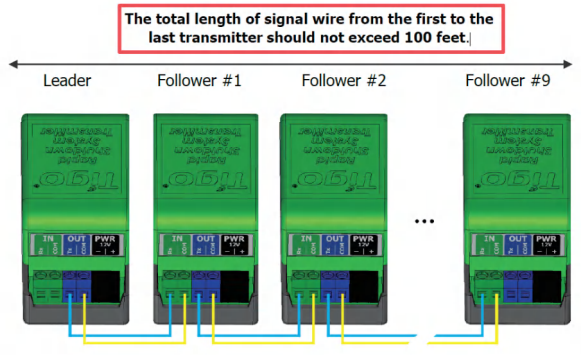
5.8.5 Multiple Inverters with Multiple Integrated Tigo Transmitters

Tigo transmitters can be daisy-chained together with two wires. This allows the transmitters to synchronize such that cross-talk between transmitters is eliminated. With this type of installation, an external RSD transmitter box is not required. Link the internal transmitters together so that the PLC signals become synchronized. Engaging the RSD initiation switch on the inverter wire box will initiate rapid shutdown for all of the inverters.



Note: The purple line in the diagram on the left represents the COM and Tx/Rx wires that connect the internal Tigo transmitters together.

5.19 Multiple Inverters with Multiple Internal Tigo Transmitters



5.20 Transmitter daisy-chaining cable length limitation

IMPORTANT:
Tigo TS4-A-O optimizer has not been tested and certified with this inverter.

5. Installation

5.8.6 External Rapid Shutdown & Emergency Power Off Switch

If the inverter is being installed where it is inaccessible to first responders, an external rapid shutdown switch must be installed somewhere accessible. Any 2-wire normally closed switch will work.

Steps for Installing an External RSD & EPO Initiation Switch

1. Install the external RSD switch and run two wires between it and the inverter
2. Connect one end of the two wires pins 7 (RSD+) and 8 (RSD-)
3. Connect the other end of the two wires to the external RSD switch
4. This is a normally-closed set of terminals. Be sure to use a normally closed switch.

Note: the RSD switch on the inverter wire box will still initiate rapid shutdown. Be sure the transmitter is on by giving the switch a clockwise twist when you are ready to energize the system.

IMPORTANT:

Installing module-level power electronics (MLPE) not listed on Compatibility List will void the inverter warranty and the MLPE warranties. The external switch does not require compatibility matching, any normally closed switch will work with this inverter to initiate rapid shutdown.

NOTE:

Only remove the jumper when installing an external rapid shutdown switch. In all other cases, do not remove the jumper, as it may cause the inverter to stop.

The external rapid shutdown initiation switch is sold separately. Please contact your local supplier for help with procurement. Solis recommends using an IMO switch.

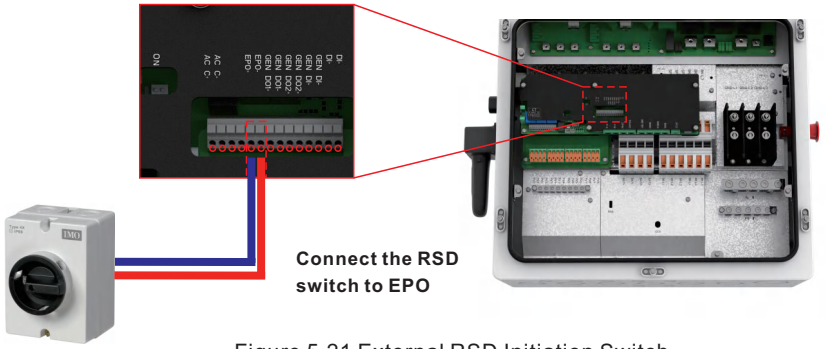


Figure 5.21 External RSD Initiation Switch

5. Installation

5.9 Battery Installation

DANGER:

Before installing the battery cables, be sure that the battery is turned off.
Use a multimeter to verify that the battery voltage is 0Vdc before proceeding.
Consult the battery product manual for instructions on how to turn it off.

NOTE:

The condition for battery fully charging:
For this series of product, the compatible battery voltage should from 150-800V, but if you want the battery fully charging, you should know the condition(as the below table) for that. When the battery voltage between 400V-500V, the charging current can reach to the maximum value: 70A, and when battery voltage between 500V-800V, the single channel charging capacity can reach to the 35KW. For an example. for 60K model, two batteries charging power can reach to 60kw.

S6-EH3P(30-60)K-NV-YD-H-US			
NO.	Battery voltage(V)	Battery Current(A)	Battery Power(KW)
1	150	30	4.5
2	200	38	7.6
3	300	54	16.2
4	400	70	28
5	500	70	35
6	550	64	35
7	600	58	35
8	700	50	35
9	800	44	35

5.9.1 Location of Battery Terminals

The inverter has two sets of inputs for two different batteries. The ports are labeled BAT1+ (battery 1 positive), BAT1- (battery 1 negative), BAT2+ (battery 2 positive), and BAT2- (battery 2 negative). It is crucial to not accidentally reverse polarity and connect a positive cable to a negative port or vice versa. These terminals can be a bit tricky to operate. The next page explains the correct process in detail.

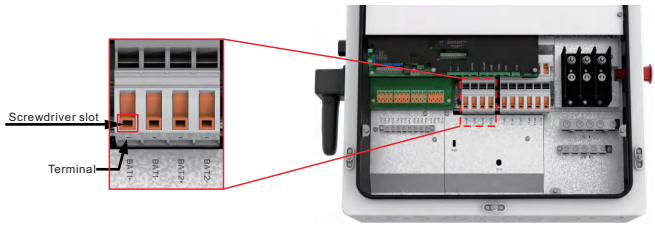


Figure 5.22 Location of the battery terminals

5. Installation

5.9.2 How to Operate the Battery Terminals

First, run the battery conductors into the inverter wire box. Strip 0.5" of insulation from the ends of each conductor. Use a small Phillips screwdriver to operate the terminals. You will insert the screwdriver into the screwdriver slot. Pulling up on the screwdriver until you feel a click opens the terminal. Pulling down on the screwdriver until you feel a click closes the terminal.

Tubular Crimp Terminals
It is recommended to use European-style tubular crimp terminals with a crimping length of 25 mm. Please reference page 37 for details.

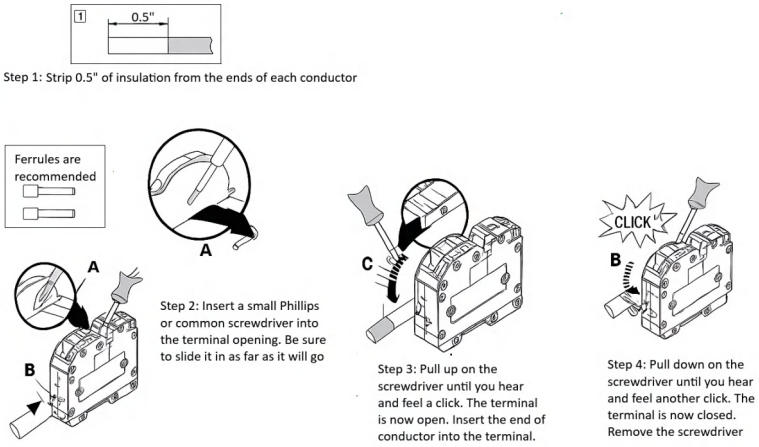


Figure 5.23 How to operate the Battery, Backup, and Smart Port terminals

Battery Compatibility

This inverter only works with specific battery models. Please consult the Battery Compatibility Sheet on the Solis US website for which battery models this inverter will support. **Installing a battery that is not on the list will void the inverter warranty.** The inverter has two battery inputs and so can connect to two battery stacks at the most, unless the battery allows for paralleling stacks.

NOTE:
Before connecting the battery, please carefully read the product manual of the battery and perform the installation exactly as the battery manufacturer specifies in the manual

NOTE:
The suggested specification of the external battery circuit breaker for each battery is 100A. Ensure that the battery has an integrated breaker or install one.

5. Installation

5.10 AC Wiring

The inverter has two AC outputs: (1) to a backup distribution panel and (2) to the main service panel that is connected directly to the utility. In normal grid-tied operation, the inverter can export excess PV power to the grid (sell back). Or, it can be configured for zero export. If utility power fails the Grid-side of the inverter shuts off. The backup-side of the inverter stays energized as long as there is enough PV and battery power to support the loads. The inverter can be connected to other Solis hybrids in parallel to provide additional support to the backup loads.The smart port is an optional port only to be used with either (1) a generator (2) an AC-coupled PV system or (3) a sheddable load while in backup mode.

Tubular Crimp Terminals

It is recommended to use European-style tubular crimp terminals with a crimping length of 25 mm. Please reference page 37 for details.

5.10.1 AC Terminals

Figure 5.24 AC terminals: Backup, Grid, & Smart Port

Backup: This port remains energized with PV/ battery whenever the grid fails. Loads connected to the backup get power directly from the grid whenever there is not enough power available from PV/battery.
Grid: The inverter connects to the utility through this port. Excess PV power can be exported to the grid and the inverter can import power from the grid to charge the battery and support home loads.
Smart Port: This port is for connecting either a generator, an AC-coupled PV system, or a large load that can be shed during a grid outage if there is not enough power to support it (such as an EV charger)

AC Current Ratings for Sizing Over-Current Protection (OCPD)

To protect the inverter, we recommend installing a device for protection against over-current and leakage, based on the following current ratings noted in Figure 5.23

Inverter Model	Grid/Backup Max. Output Current	Grid Max. Pass--through Current	Max. Smart Port Input Current	Backup Max Surge Current (2 seconds)
S6-EH3P30K-NV-YD-H-US	72.2A	144.4A	72.2A	115.5A
S6-EH3P30K-LV-YD-H-US	36.1A	72.2A	36.1A	57.7A
S6-EH3P40K-NV-YD-H-US	48.1A	96.2A	48.1A	78A
S6-EH3P50K-NV-YD-H-US	60.1A	120.2A	60.1A	96.1A
S6-EH3P60K-NV-YD-H-US	72.2A	144.4A	72.2A	115.5A

Figure 5.25 Current ratings AC inputs/outputs

5. Installation

5.10.2 How to Operate the AC terminals: Backup, Smart Port, and Grid Conductors

Follow the same steps outlined on page 43 for instructions on how to operate the Backup and Smart Port terminals. The Grid terminals are a little bit different. Use the neutral bus bar for all neutrals cables.

Backup

Install a dedicated loads panel or reroute an existing panel to the backup terminals of the inverter. Any breakers in this panel will be backed up when the grid fails. It is also essential to install an external AC automatic bypass switch to protect the loads from equipment failure. Without this switch, the loads connected to the backup side of the inverter will lose power if the inverter fails or shuts off.

Grid

The grid ports allow the inverter to become grid-tied by connecting to the utility side of the system. The max. conductor size that will fit in the Grid terminals is 2/0.

1. Use a 8mm Allen key torque wrench to loosen the Grid terminals
2. Insert the stripped ends of the conductors into the terminals
3. Tighten the grid terminals to between 13-15 N.m. (8-11 ft-lbs)

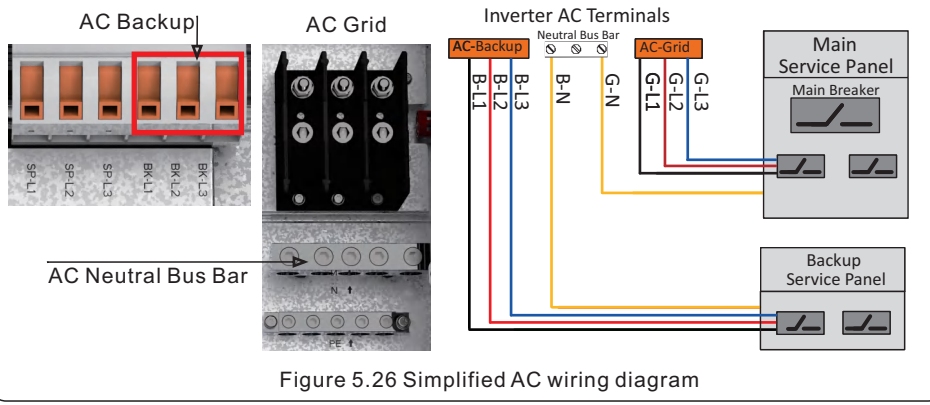


Figure 5.26 Simplified AC wiring diagram

5.10.3 CT Direct Connection (for 1-2 inverters)

The split-core CTs provided with the inverter must be installed for full functionality. The CTs are used to measure import/export/consumption power so the inverter can balance energy properly. Contact your Solis sales representative if you need to procure Rogowski coils.

Included CT Model: ESCT-T50-300A/5A
CT Cable: Size – 2 .3mm2 , Length - 4m

Install the CTs on theL1/L2/L3 conductors at the utility interconnection point. The arrows on the CTs must point towards the grid. Open the CT and fit it around the conductor with the arrow pointing towards the grid. Close the CT and then run the black and wires to the inverter comm pin 1 to 6 . Insert the wires into the appropriate terminals as shown below.

CT Wire	14 PIN Communication Terminal Block
White	Pin 1 (From Left to Right)
Black	Pin 2 (From Left to Right)
White	Pin 3 (From Left to Right)
Black	Pin 4 (From Left to Right)
White	Pin 5 (From Left to Right)
Black	Pin 6 (From Left to Right)

5. Installation

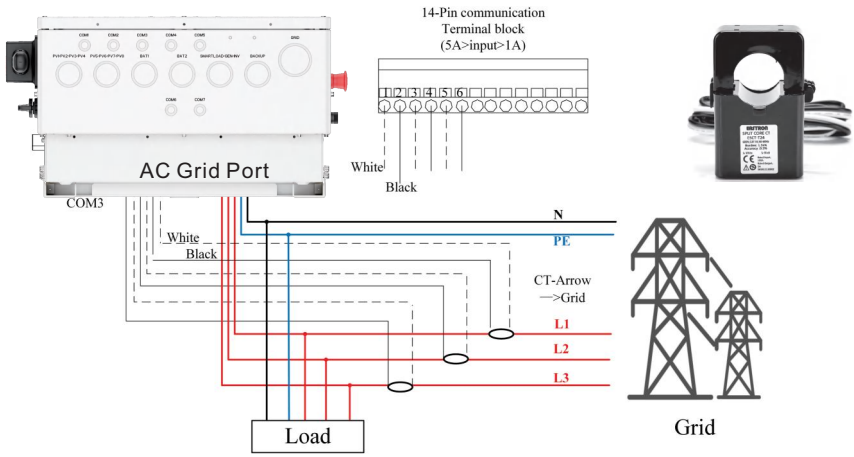


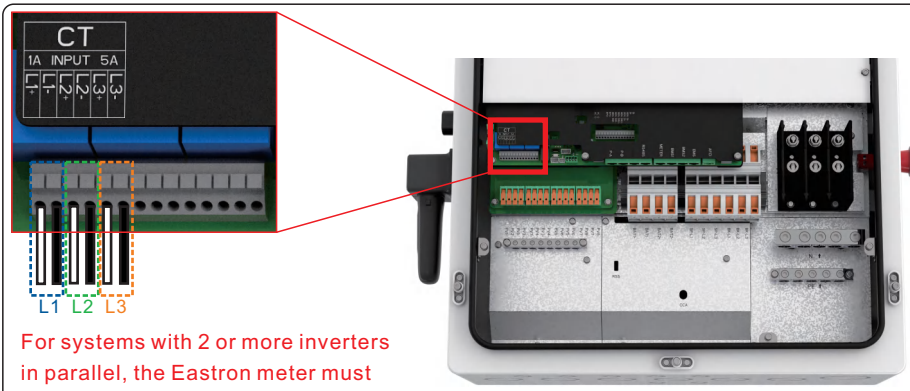
Figure 5.27 CT Installation Location

Rogowski Coil CT Option

Rogowski coils can be purchased separately with SDM630-MCT-OCS. Compatible coils are shown in the table below, other coils are not supported.

Coil code	Reference Rated Current	Class	Window Size (mm)	Coil Length (mm)
ESCT-RC60	500A	0.5	50	200

Rogowski Coil Manual



For systems with 2 or more inverters in parallel, the Eastron meter must be installed. CTs only will not work.

Figure 5.28 Connecting the CT wires to the inverter

To remove the CT wire, use a small flathead screwdriver to push in the button above the CT wire terminal. While holding the screwdriver with the button pressed in remove the wire.

5. Installation

Load Requirements for the Backup Side and Smart Port

These requirements apply to loads being connected to the backup side of the inverter or to the Smart Port when using it for load shedding.

1. Resistive and RCD loads

a. For single-phase resistive loads, it should not exceed 100% of the single-phase power

b. For RCD loads, it should not exceed 60% of the inverter's rated power.

2. Motor-based load

a. When directly driving a motor load, it is necessary to pay attention to whether the starting impact power does not exceed the power and time limit of the inverter's overload curve.

b. When using a frequency converter or soft-start type motor load, the power should not exceed 60% of the inverter's rated power.

3. RLC load

a. The total load capacity shall not exceed the rated power of the inverter, the peak current at the moment of load switching (peak inrush current) shall not exceed twice the rated current of the inverter, and the minimum power factor shall not be less than 0.8.

b. If a mixed load is adopted, apart from the RLC load, the motor load and the RCD load need to be proportionally reduced.

4. Isolation transformer

a. If starting with a transformer, it is necessary to pay attention to the inrush current not exceeding 1.6 times the rated current and the inrush power not exceeding the overload curve limit requirements. Otherwise, a soft starter needs to be added to the transformer.

5. Installation

5.11 Smart Port: Generator, AC-Coupling, Load Shed

The inverter has a set of terminals called the “Smart Port”. Here you can connect either a generator, an AC-coupled PV system, or a large load such as an AC-EV charger that can be controlled while in backup mode. The smart port input for the 60kW and 30kW 208V model is rated for 72.2A max. The input fo r the 30kW model is 36A.

5.11.1 Smart Port Location

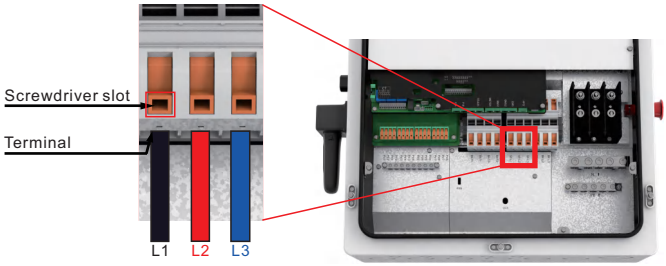


Figure 5.29 Inverter smart ports

5.11.2 Smart Port Wiring

1. Bring the AC cables for the generator, load, or AC-coupled system into the inverter wire box.
2. Strip ½ inch of insulation from the ends of each conductor.
3.Insert a Phillips screwdriver into slot above the smart port terminal. Pull up on the screwdriver until you feel a click, the terminal is now open.
4. Insert the stripped end of each conductor into the correct terminal. Pull down on the screwdriver until you feel another click, the terminal is now closed (locked).
5. Connect a neutral conductor to the neutral bus bar and a ground conductor to the ground bus bar. Use the hex tool to tighten the terminal to between 13 and 15 N.m.
6. Give each cable a gentle tug test to ensure they are not loose.

The wiring diagrams in Figure 5.27 show the three different uses for the smart port.

The smart port is rated for 72.2A (60kW & 30kW-LV models) and 36A (30kW model).

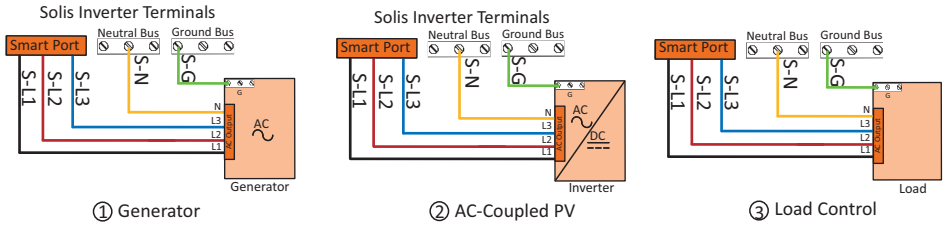


Figure 5.30 Smart Port use case wiring diagrams

NOTE:

Can't connect to the generator when connected to the power grid, and cannot connect to the power grid when connected to the generator.

5. Installation

5.12 Inverter Communication

5.12.1 Communication Terminal Blocks

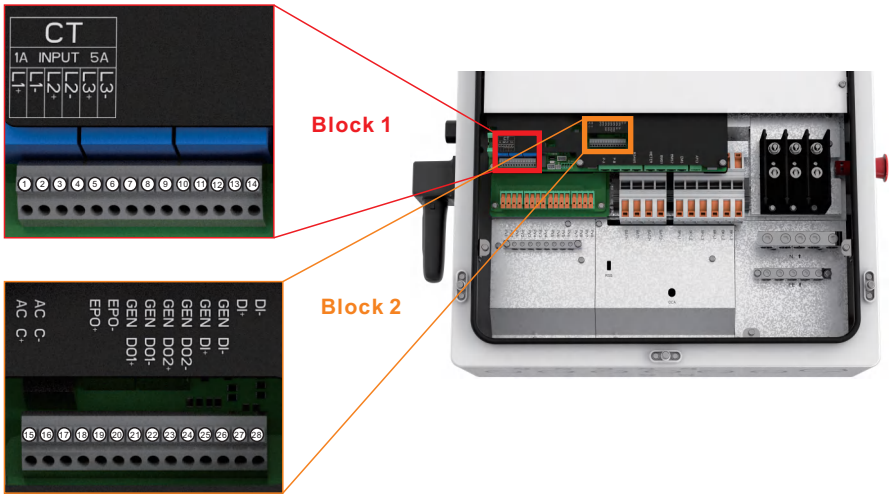


Figure 5.31 Inverter communication terminal (pin) locations and pin numbers

There are two blocks each consisting of 14 pins for inverter communication. Also, there are nine RJ45 ports for communication. There are pins and ports for battery, RS485, meter CTs, external rapid shutdown, generator start/stop, emergency power off, and parallel inverter comms.
The tables on the next page explain the purpose of each pin and port.

Communication Block 1

NO.	Port	Function	Acceptable Wire Size Range
1	CT_L1+	L1 (Phase A) CT	22-16 AWG
2	CT_L1-		
3	CT_L2+	L2 (Phase B) CT	
4	CT_L2-		
5	CT_L3+	L3 (Phase C) CT	
6	CT_L3-		
7	Reserved	Not for use	
8			
9	Reserved		
10	Reserved		
11	Reserved		
12	Reserved		
13	Reserved		
14	Reserved		

5. Installation

Communication Block 2

NO.	Port	Function	Acceptable Wire Size Range
15	AC+	The DO port requires an external contactor to control the switching of an external circuit.	22-16 AWG
16	AC-		
17	Reserved	Not for use	
18	Reserved		
19	EPO+	Emergency stop external switch	
20	EPO-		
21	GEN DO1+	Generator dry contact start/stop	
22	GEN DO1-		
23	GEN DO2+		
24	GEN DO2-		
25	GEN DI+	Dry contact open: Connect to the generator. Dry contact closed: Connect to the grid.	
26	GEN DI-		
27	DI+	With a low-level external signal (0V): Connect to the generator. With a high-level external signal (5V/ 12V): Connect to the grid.	
28	DI-		

Installing the communication wires:

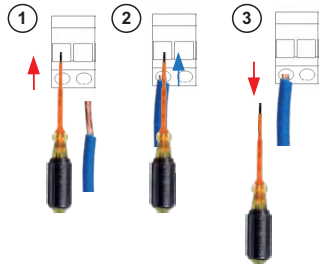
First, strip ¼ inch off the end of the com wire.

1. With a technician screwdriver push and hold the small grey block above the terminal hole to open the terminal.

2. Insert the stripped com wire into the open terminal.

3. Release pressure on the screwdriver and the terminal will clamp down on the wire.

4. Finally, give the cable a gentle tug to ensure that it is firmly secured. If it is not, repeat steps 2-5 but push the wire deeper into the terminal before releasing the screwdriver.



IMPORTANT:

Communication cables must be shielded or run outside of conduit and raceways

5. Installation

5.12.2 RJ45 Communication Ports

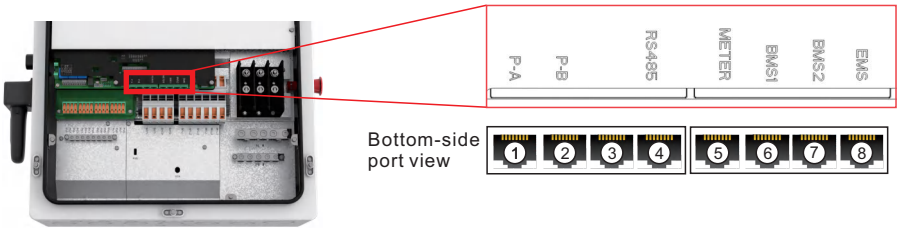
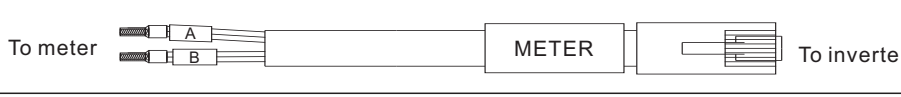


Figure 5.32 Inverter RJ45 communication terminals

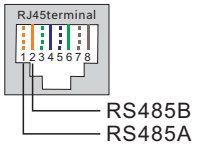
NO.	Port	Function
1	P-A	Parallel inverter comms in
2	P-B	Parallel inverter comms out
3	Reserved	Not for use
4	RS485	RS485 third-party gateway comms
5	METER	External energy meter comms
6	BMS1	Battery BMS1 CAN comms
7	BMS2	Battery BMS2 CAN comms
8	EMS	Energy management system comms

5.12.3 External Energy Meter Communication

If the inverter is to be installed far from the CTs, an external energy meter must be installed. The compatible meter is ESCT-T50-300A/5A. To procure a meter, please contact your Solis Sales rep to order the energy meter with corresponding CTs. Run the Meter RS485 cable through one of the COM ports of the inverter and then connect it to the **METER** port with an RJ45 connector.



NOTE:
Pin definition of the Meter Terminal is following
EIA/TIA 568B.
RS485A on Pin 1 and Pin4:Orange/white
RS485B on Pin 2 and Pin5:Orange



NOTE:
Compatible Smart Meter Pin Definition.
ESCT-T50-300A/5A– Pin 9 is RS485B & Pin 10 is RS485A

5. Installation

5.12.4 Battery Communication Wiring Table

The BMS1 and BMS2 ports are for communication between the battery and the inverter. The Figure below shows which pins on the inverter are for battery communication: CAN-H, CAN-L, RS485A, and RS485B. A standard ethernet patch cable can be used to connect the battery to the inverter. If the battery has pins instead of an RJ45 port, please cut one end off a standard ethernet patch cable and then connect it to the battery according to the pinout shown in Figure 5.33.

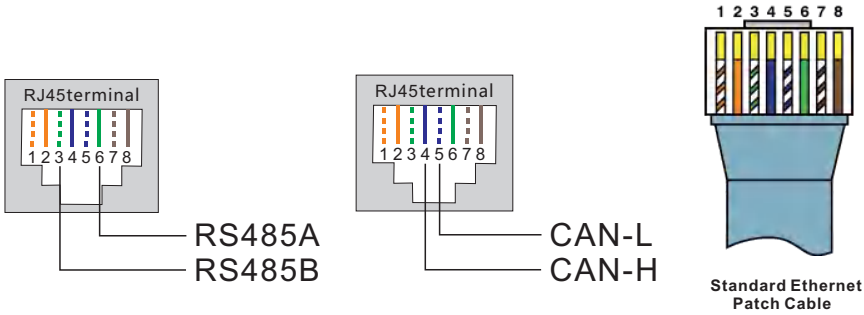


Figure 5.33 Battery Communication CAN/RS485 Wire Colors

IMPORTANT:
Solis cannot guarantee normal operation with any battery that is not on the approved battery list. Please only install batteries from this list.
Installing a battery that is not on the list will void the inverter warranty.

Battery Manual and Battery Firmware
Please be sure to read through the battery manual for proper installation steps. The battery manual should be provided with the battery or it can be downloaded from the battery manufacturers website directly. It is very important to update the firmware of the battery during the installation and commissioning of the system. **Failing to update both the inverter and battery firmware will lead to communication issues** and the alarm codes like CAN_Comm_Fail & No-Battery.

NOTE:
Some alarm codes are being relayed from the battery. These alarms are caused by an issue with the battery itself. The troubleshooting section of this manual explains how to diagnose and treat each alarm. If the alarm says the battery is having a malfunction, please contact the battery manufacturer.

5.12.5 Parallel Inverter Communication

There are two RJ45 ports reserved for communication between Solis S6 hybrids only.
The communication is CAN and is the ports are not able to be used for any other purpose besides daisy-chaining multiple Solis S6 hybrids together.

5. Installation

Steps for connecting daisy-chaining inverters together:

Use a double-ended CAT5 ethernet cable. One should be included with the inverter.

1. Plug one end of the cable into the P-A port of the master inverter
2. Plug the other end of the cable into the P-B port of the slave inverter
3. For three or more inverters follow this method of connecting P-A to P-B.

Note: Do not connect P-A to P-A or P-B to P-B

The addresses will be set during the commissioning process

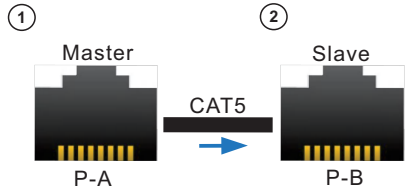


Figure 5.34 Inverter parallel ports and DIP switches

5.12.6 Paralleling Guidelines

In order to ensure normal operation and the safety of the equipment, the following rules must be followed when paralleling mulitple inverters on the backup-side.

1. When connecting inverters in parallel, it is mandatory to match their sizes. For example, pair an 60KW inverter with another 60KW inverter. Do not parallel inverters of different sizes on the backup-side.

2. Before parallel connection, verify that both inverters are operating on the same firmware version. The inverters must never be on different versions of firmware.

3. Up to **six** hybrid inverters can be installed together in parallel on the backup side.

4. The energy meter and the data logger only need to be connected to the master. But to update the firmware, each inverter needs to have its own data logger connected to it.

5. All inverters in the system must be connected to the same ground point to eliminate the possibility of a voltage potential existing between inverter grounds.

6. Each inverter must have its own PV strings connected to it, as per the DC input PV specifications of the inverter. It is ok to have some inverters with only battery and no PV.

7. The inverters support batteries with different energy capacity from different brands, but the capacity difference is suggested less than 50%. E.g., The inverter has two battery ports, if one port connect to a 60kWh battery , then the other port connect to battery capacity should be within 30~90kWh;

8. The inverter backup circuit breakers must be connected in a separate isolated load center that is not electrically connected to the grid.

9. The AC bypass switches for all inverters must all be in the same position always.

10. The parallel settings for each inverter must be configured prior to initiating operation.

11. Prior to initiating full system operation it is essential to verify that each inverter operates normally. Set each inverter one-by-one for single operation, ensure there are no alarms during operation, shut it down, and then go to the next inverter.

NOTE:

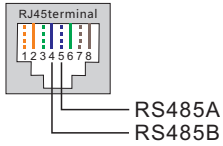
A failure of the main unit will cause the entire system to shut down, but a failure of the slave unit will only cause the inverter to shut down, without affecting the operation of other inverters in the parallel system.

5. Installation

5.12.7 RS485 Port Connection (Optional)

If a 3rd party external device or controller needs to communicate with the inverter, the RS485 port can be used. Communication protocol is supported by Solis inverters.
To acquire latest protocol document, please contact Solis local service team or Solis sales.

NOTE:
Pin definition of the RS485 Port is following EIA/TIA 568B.
RS485A on Pin 5: Blue/White
RS485B on Pin 4: Blue



Third-Party Monitoring with RS485 Modbus

If third-party monitoring is to be installed, connect the third-party gateway to the RS485 port of the inverter. Use pin 4 (blue) for RS485B and pin 5 (blue-white) for RS485A.
The Solis hybrid inverter Modbus map can be downloaded from the Solis website or requested from the Solis service and support team

5.12.8 Emergency Power Off (EPO) External Switch

An external emergency power off switch can be added to the system. Pins 19 (EPO+) and 20 (PTO-) are for both rapid shutdown and emergency power off. Connecting an external switch to these two pins allows the system to be put into EPO mode. After installing an external switch, run a 2-core cable between it and the inverter. Connect the two cores from the switch to pins 19 and 20 as shown below. Initiating EPO for the master inverter will also initiate EPO for the slaves.

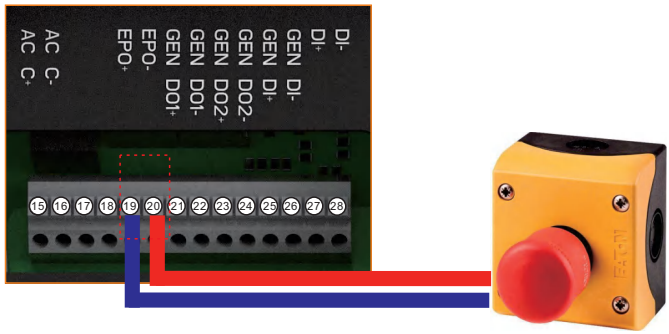


Figure 5.35 External emergency power off switch

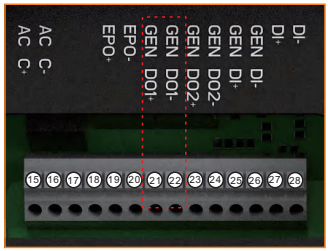
5. Installation

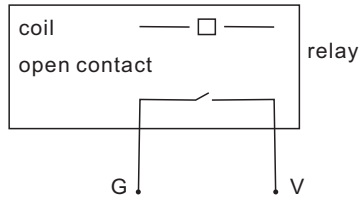
5.12.9 Inverter Bluetooth Network

The Solis S6 hybrid generates a Bluetooth network which allows technicians to directly interface with the inverter using a smart phone or tablet. Once connected, the inverter can be commissioned through the SolisCloud mobile app. The settings for the inverter can be adjusted any time through this app, but the screen works as well. The Bluetooth antenna is internal and there is no need to install one externally to the inverter. The Bluetooth is automatically enabled when the inverter gets power.

5.12.10 Generator Dry Contact Terminal Connection

The two GEN DO1 terminals are for a voltage-free dry contact signal for connecting to a generator's NO relay which starts up the generator whenever necessary.
When generator operation is not required, Pins 21 (GEN DO1+) and 22 (GEN DO1-) are in open circuit. When generator operation is needed, Pins 21 and 22 are in closed circuit.





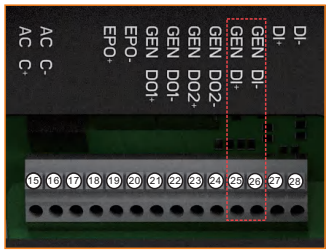
Note:
50mA>Input>10mA

Figure 5.36 Generator dry contact pins GEN DO+ and GEN DO-

5. Installation

5.12.11 Generator DI Terminal Connection

The GEN DI port logic is that when the dry contact is open the external level signal is low (0V). When the signal is 0V the inverter will know it is connected to the generator and not the grid. When the dry contact is closed, the signal is high (5V-12V). The 5-12V signal lets the inverter know that it is connected to the grid and not to a generator. The inverter provides two sets of ports for both generator dry contact and ATS grid present signal.



Note:
50mA>Input>10mA

Figure 5.37 External ATS pins GEN DI+ and GEN DI-

5.12.12 Diesel Generator Wiring

1.The backup PE must be directly connected to the PE copper bar of the power distribution box, rather than the inverter shell.
2.The generator itself needs to be grounded, connected to the electric box, and connected to the inverter generator port.
3. When the generator is working, disconnect the Grid breaker or leakage current protector on the side of the power box immediately.

5.12.13 Generator Communication Diagram

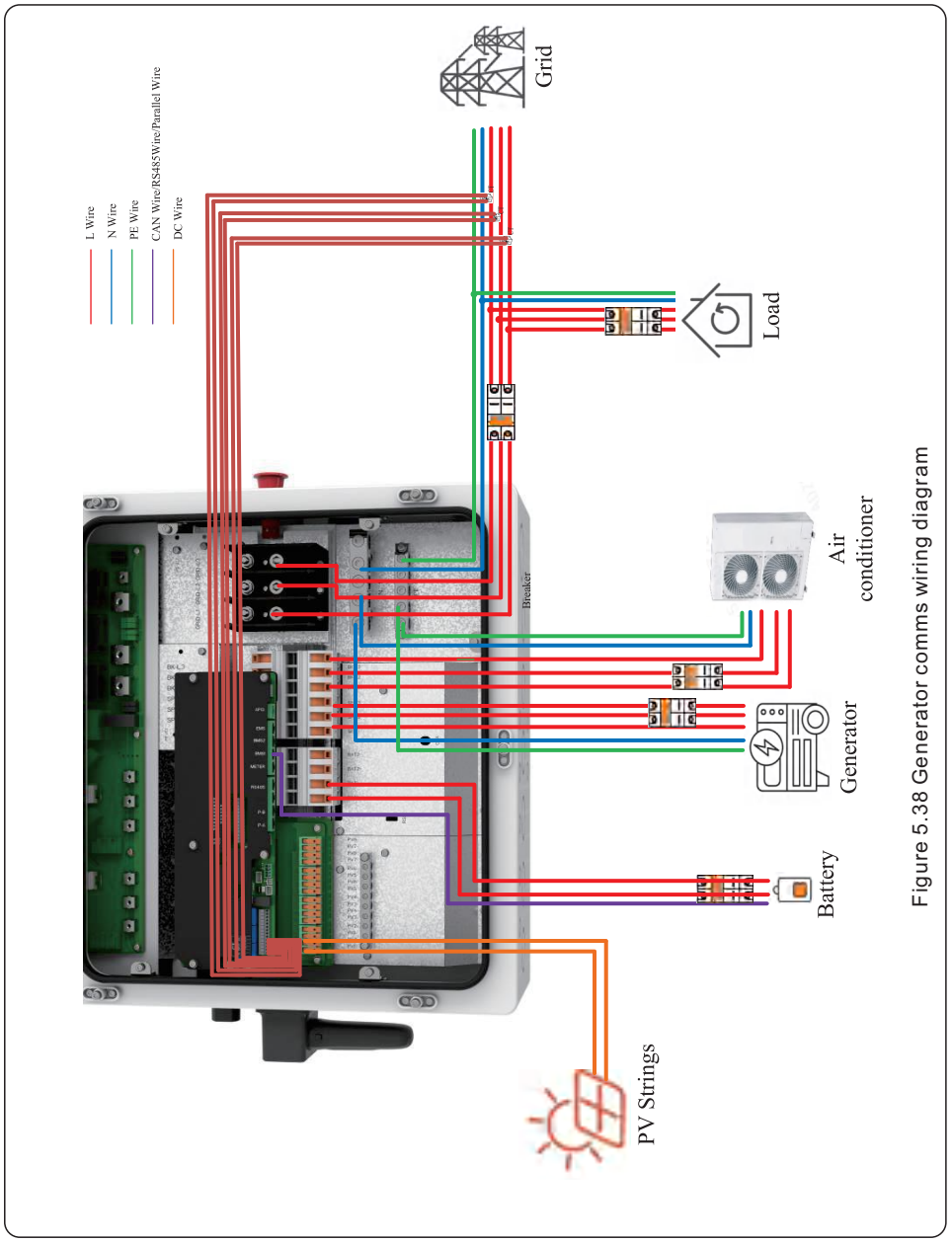


Figure 5.38 Generator comms wiring diagram

5. Installation

5.12.14 Generator Communication

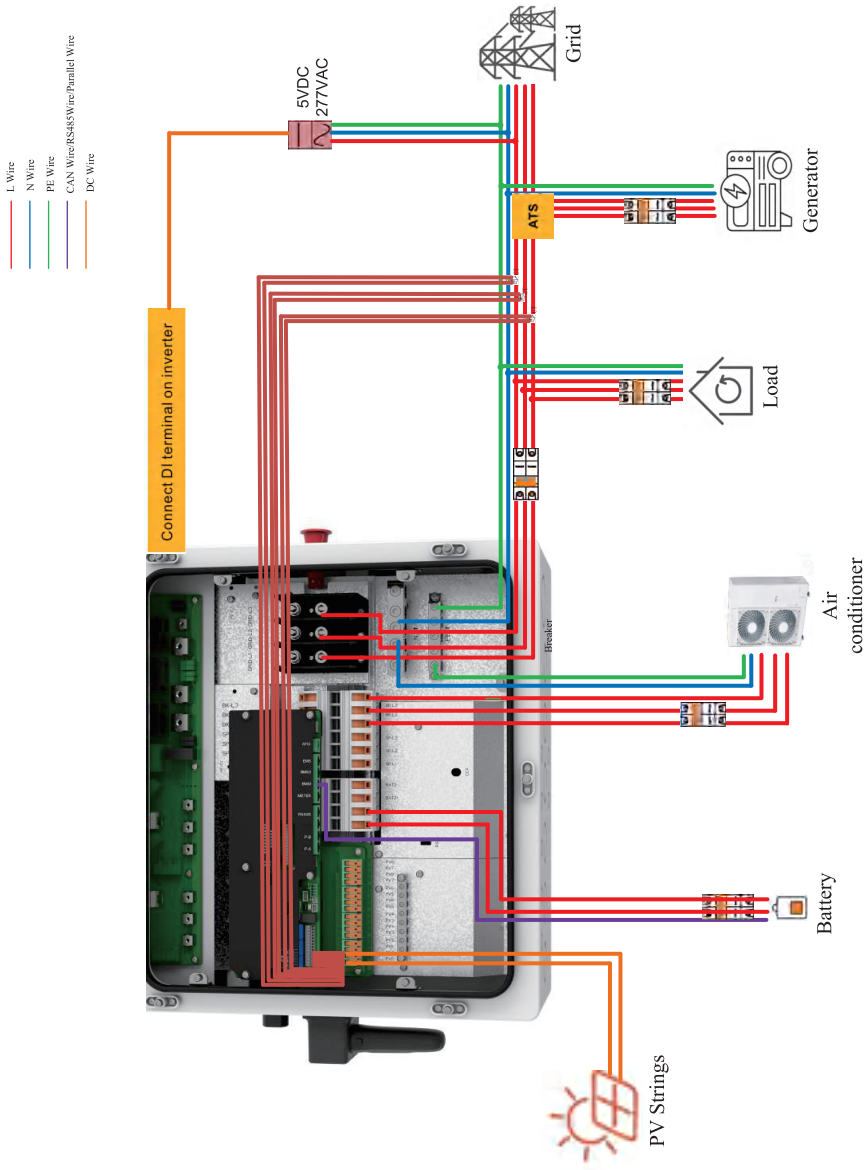


Figure 5.39 Generator with ATS comms wiring diagram

6. Commissioning

6.1 Pre-Commissioning

1. Visually inspect each piece of equipment in the system closely.
2. Check all conduit and cable connection points to ensure they are tight.
3. Verify that all system components have adequate space for ventilation.
4. Follow each conductor from end to end. Confirm that they are all terminated in the proper places.
5. Ensure that all warning signs and labels are affixed on the system equipment.
6. Check that the inverter is secured to the wall and is not loose or wobbly.
7. Prepare a multimeter that can do both AC and DC amps.
8. Use the multimeter to measure the PV string voltages in free air. With RSD the voltages will be low.
9. Land the PV strings, turn on the grid-side breaker and the battery. Keep the inverter DC switch turned off. Measure the PV string voltages again. Verify that the polarities and voltages are correct.
Note: if the PV voltages are still low with the PV strings landed and the grid-side breaker turned on, check the rapid shutdown switch on the side of the inverter. Give it a clockwise twist to pop it out.
10. Check the AC voltages coming from the grid. Check the battery DC voltage and verify polarity.
11. Leave the inverter DC switch turned off for now. Only turn it on once you are ready to put the system into normal operation. Leave the battery on and the AC breaker connected to the grid-side on as well.
12. Download the battery app, register an account, and then be sure to update the battery firmware if there is a new version available. This step is very important and skipping it can lead to comms issues.

The next steps will be to install a Solis logger, download the SolisCloud application, register a new account on SolisCloud, and then configure the inverter settings using the SolisCloud app.
After that is all done, the logger will need to be connected to the Wi-Fi and configured using SolisCloud
Note: Installing a Solis logger is optional. Third-party monitoring can be used instead.

6.2 Solis Loggers

6.2.1 Solis Monitoring with Solis Data Loggers

For remote monitoring and control of the inverter using the Solis monitoring portal, a Solis data logger must be installed The logger gets plugged into the port on the side of the inverter shown in the figure below. First, remove the black plastic protective cap from the port by squeezing in both tabs on either side simultaneously while pulling down on the cap. Insert the logger into the port by pressing up evenly on both sides, **do not twist the logger**. The logger port is USB-A and only supports USB versions of Solis data loggers, not the 4-pin versions. The Solis logger can only report to SolisCloud. If a 3d party monitoring platform is to be used, a 3d party gateway must also be used.

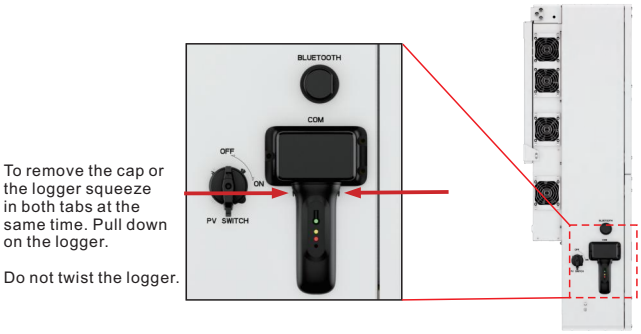


Figure 6.1 Solis data logger installation location

5. Installation

6.2.2 Compatible Solis Loggers

This inverter comes with an S2-WL-ST, which has both a Wi-Fi and a local area network (LAN) option consisting of an RJ45 port for direct connection to a router. However, the inverter is compatible with other Solis loggers S1-W4G-ST (Wi-Fi with cellular backup) and S5-WIFI-ST (Wi-Fi including 5GHz).

Data Logger Model	Communication Type
S1-W4G-ST (USB)	Wi-Fi (2.4 GHz) Cellular: Sprint, Verizon, T-Mobile
S2-WL-ST (USB)	Wi-Fi (2.4 GHz) Local Area Network (LAN)
S5-WIFI-ST (USB)	Wi-Fi (2.4 GHz and 5 GHz)

S1-W4G-ST Manual

S2-WL-ST Manual

S5-WIFI-ST Manual

Figure 6.2 Compatible Solis Data Loggers

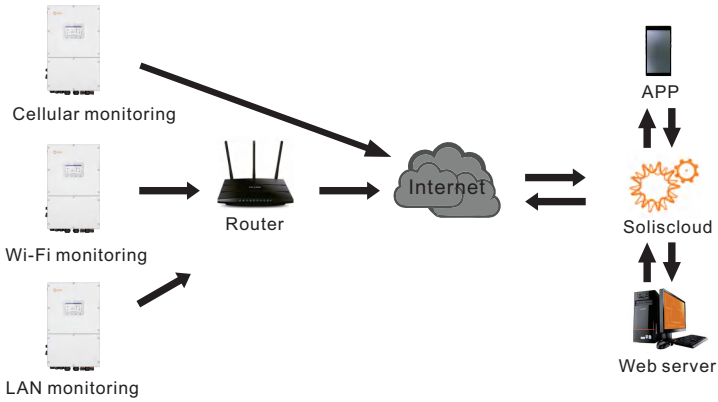


Figure 6.3 Wireless communication function

6.3 SolisCloud

SolisCloud is the monitoring platform where inverters can be monitored remotely. You will need to download the SolisCloud app and then register a new account. Please scan the QR code to pull up the app in the App Store or search “SolisCloud” and then look for the icon shown in the middle of the QR code. There are two account types available: Installer and Owner

Installer: for technicians and anyone that is not the asset owner such as the homeowner where the system is being installed. Installer accounts are for fleet management and are able to remotely control registered plants remotely through SolisCloud.
Owner: for homeowners who typically only have a small number of sites and are only looking to monitor their system(s) and not have any control.

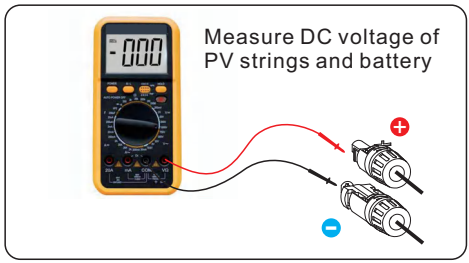
Once the account registration has been completed, log into the SolisCloud app. You will use the app to configure the Wi-Fi settings of the Solis logger and the inverter settings while on-site.

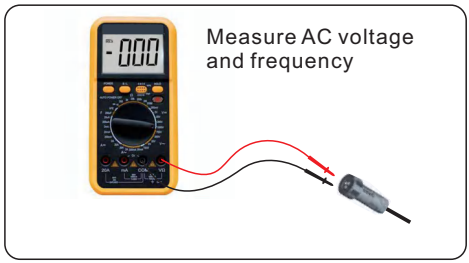
6. Commissioning

6.4 Power ON & OFF Procedures

6.4.1 Power ON Procedure

Step 1: With the DC switch off, energize the PV strings and then measure DC voltage of the PV strings to verify that the voltage and polarity are correct. Turn on the battery and check the battery voltage and polarity as well.





Step 2: Turn on the OCPD for the system and then measure the AC voltages line to line and line to neutral. The backup side of the system will be off until commissioning is complete.Turn the OCPD back off for now.
Step 3: Turn the DC switch on and then the OCPD(AC breaker) for the system.
This inverter can be powered on by PV only, battery only and Grid only.
When the inverter is powered on,the five indicators will be lighted at once.

6.4.2 Power OFF Procedure

Step 1: Turn off the AC breaker or AC disconnect switch to disable AC power to the inverter.
Step 2: Turn off the DC switch of the inverter. Do not turn the DC switch off first.
Step 3: Turn off the battery breaker.
Step 4: Use a multimeter to verify that the battery and AC voltages are 0V.

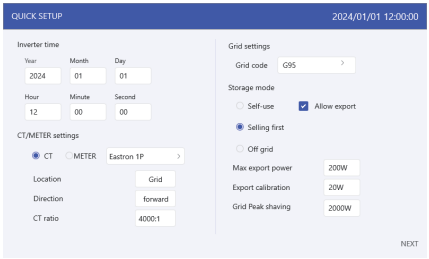
IMPORTANT:
Never turn the DC disconnect switch from on to off position while the inverter is operating. This switch is not a load-break disconnect switch. Not abiding by this will void the inverter warranty.

6. Commissioning

6.5 HMI Commissioning Process

6.5.1 HMI Quick Setting

If this is the first time the inverter has been commissioned, you will need to first go through the Quick Settings. Once this has been done, these settings can be changed later.
Inverter Time -> Meter Setting -> Grid Code -> Storage mode -> Battery Model



1. Inverter time:
Set inverter time and date, default follow the phone.

2. CT/Meter setting:

Select the CT or Meter Solis provide Eastron 3 phase meter, it is self-identifiable.

Set installation location: Grid side / Load side / Grid+PV inverter;
CT direction: When CT installed correctly, select “Forward”; when CT installed direction wrong, the sampling current of CT will be reversed when calculating the power, select “Reversal” to correct it.
Set CT ratio: default 60 (Solis provide ESCT-T50-300A/5A CT), if the user install their own CT, then need to set the CT ratio manually. If the system connected to Meter, then CT ratio need to be set on Meter.

3. Grid code:
Select grid code that meet the local regulations.

4. Storage mode:
ALL modes first priority is to use the available PV power to support loads. The different modes determine what the second priority, or use of the excess PV power, will be.
Self-use / Selling first / Off-grid are exclusive, the user could select only one mode.

5. Battery setting:

Select Battery connection method 1 Batt 1 DC / 1 Batt 2 DC / 2 Batt 1 DC; the connection method please refer to 3.13 Lithium battery wiring.
Select battery brand (if the connected battery is not on the list, please select “General_LiBat_HV”).
Set Max charging/discharging current.
If there are two batteries and share the same settings, please tick the box of “Batt2 Settings follow Batt 1”.

6. Commissioning

Mode	Description
Self-use	PV power flow priority sequence: loads > battery > grid. In this mode, the system stores excess PV power into the battery after the loads are supplied. If “Allow export” turned on, when the battery is charged full, or there is no battery, the excess PV power will be exported(sold)back to the grid. If the system is set to not export any power, then the inverter will curtail the PV power (derate the inverter output power).
Selling first	PV power flow priority sequence: loads > grid > battery. In this mode, the system exports any excess PV power after the loads are supplied. If the export power quota has been met, then the remaining PV power will be stored in the battery. Notice: This mode should not be used if export power set to zero.
Off grid	PV power flow priority sequence: loads > battery. This mode only used when the system are not electrically connected to the grid at all. This mode is like Self-Use Mode, but the PV power will be curtailed if the PV power output is > battery power + load power

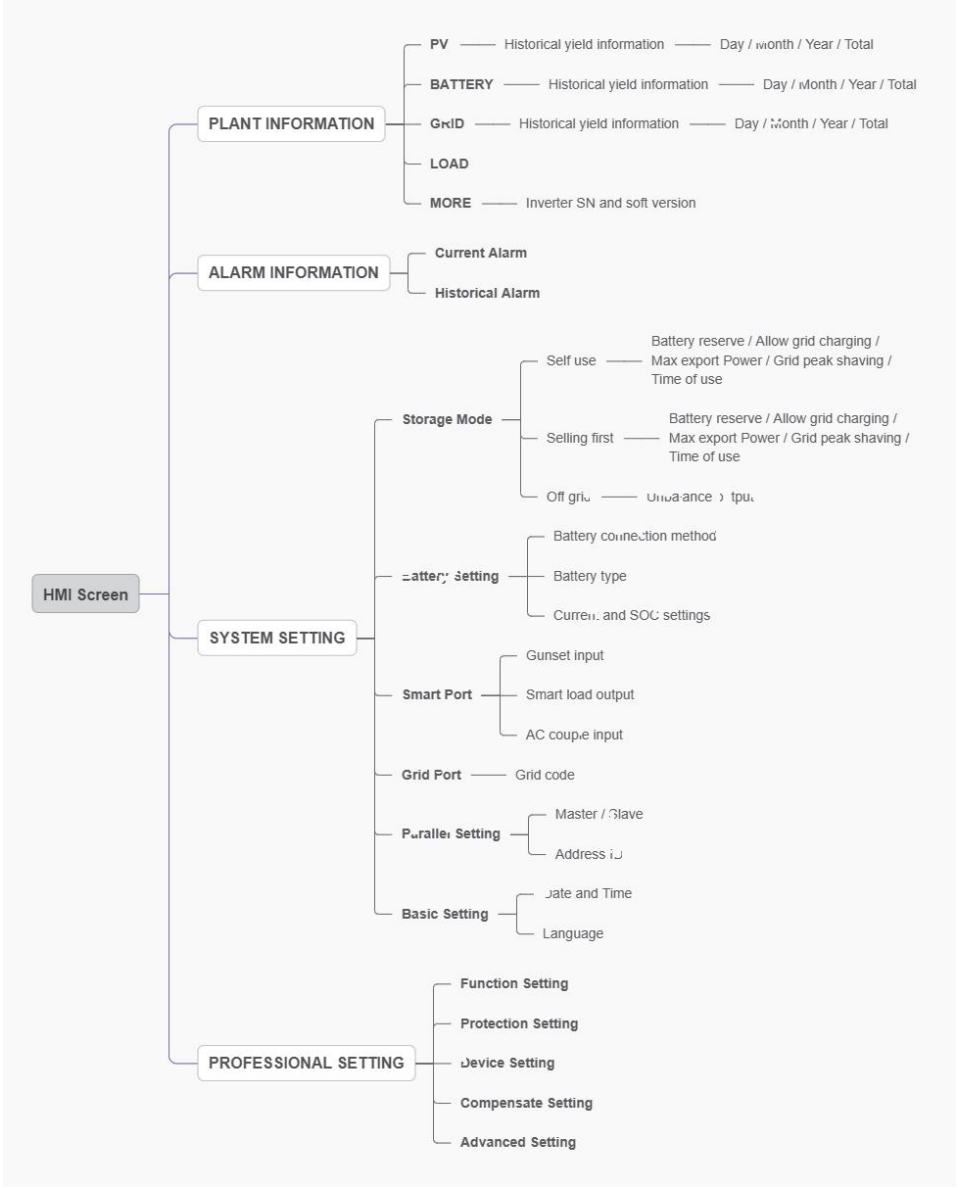
Table 1 Description of modes

Under each mode, user could set other functions based on their requirements.

Settings	Description
Max export power	Default: 1.1 times of rated power. Notice: if feed-in is not allowed, set Max export power to 0.
Export calibration	Range : -500w-500w, default 20w, settable. To compensate the deviation of CT/Meter in practical application.
Grid peak shaving	Default enable, default 2 times of rated power. Limit the power drawn from the grid to prevent from exceeding regulatory requirements or the power line capacity. It works only when the “battery reserve” turned on.

Table 2 Description of mode settings

6. Commissioning

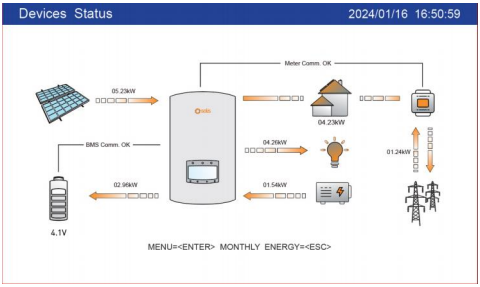


6. Commissioning

6.5.2 Detailed HMI Setting

Step 1: Enter Home page

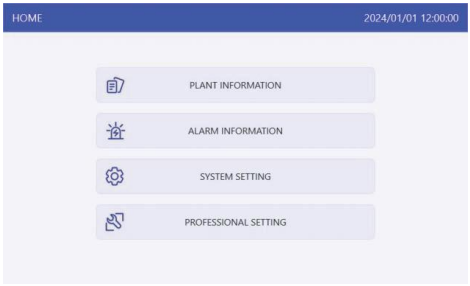
After quick setting, press “ENTER”, the screen displays the home page.

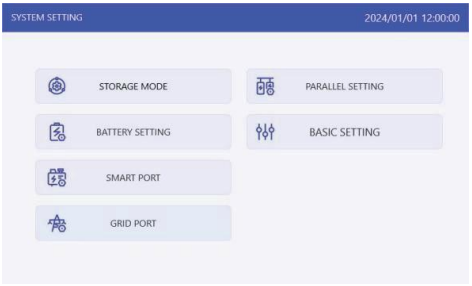


The screen will be automatically turn off after being idle for a few minutes to save power, click any operation button “ESC”/”UP”/”DOWN”/ “ENTER”) to restart the screen, then press “Enter” into the main operation interface.

Step 2: Enter “SYSTEM SETTING” interface

Press“Down” button, then press “ENTER” into the “SYSTEM SETTING” interface.





6. Commissioning

Step 3: Set "Storage Mode"

Use "UP" or "DOWN" key to select the desired mode, then press "ENTER".

The Mode description please refer to 5.4.1.

Settings	Description
Battery reserve	Range: 5~95%, default: 80%, settable. When battery SOC < set battery reserve SOC, battery will stop discharging.
Allow grid charging	Allow grid charging the battery when it enables. Notice: if "Allow Grid Charging" is turned on, the inverter will use grid power to charge the battery only under two circumstances: The battery drains to the Force Charge SOC. When PV power output can't meet the set current value during the charge periods.
Max export power	Default: 1.1 times of rated power. Notice: if feed-in is not allowed, set Max export power to 0.
Export calibration	Range : -500w-500w, default 20w, settable. To compensate the deviation of CT/Meter in practical application.
Grid peak shaving	Default enable, default 2 times of rated power. Limit the power drawn from the grid to prevent from exceeding regulatory requirements or the power line capacity. It works only when the "battery reserve" turned on.

Table 3 Description of storage mode settings

NOTE:

The grid import limit value must be greater than the load that is to be supported. This ensures that the load will operate normally.

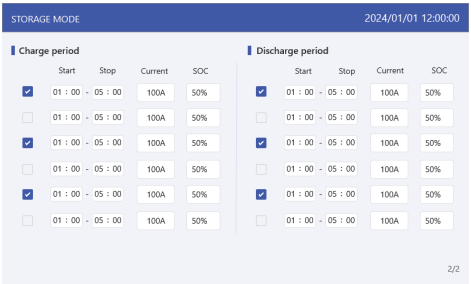
6. Commissioning

Step 4: Set “Time of use” under each mode (Skip this step if no need)

Time of Use is for manual control of the battery charging/discharging. It is for customizing when the battery is allowed to charge and discharge power and at what rate, established by a current(amperage)setting.

1. Charge period: battery charges with set current value until the charging cut-off voltage (settable), checking the box to control whether enable this charging period.

2. Discharge period: battery discharges with set current value until the discharging cut-off voltage (settable), checking the box to control whether enable this discharging period.



NOTE:

The set current value is the maximum current for charging/discharging the battery. However, the actual charging and discharging current may not reach this value due to the influence of other factors, such as the max. charging/discharging power limitation of the inverter, the battery BMS, etc.

6. Commissioning

Step 5: Set "Battery Setting"

Settings	Description
Max charge current	Max charge current, settable.
Max discharge current	Max discharge current, settable.
Over discharge	Range: 5~40%, default 20%, when battery SOC < over discharge, it will stop discharging.
Recovery	Range: set Over discharge value +1% ~ set Over discharge value +20%; when battery SOC > Recovery SOC, it will start charging, reserve the return difference value to avoid the battery repeatedly cross jump between charging and discharging.
Force charge	Range: set Over discharge value +1% ~ set Over discharge value +20%; when battery SOC > Recovery SOC, it will start charging, reserve the return difference value to avoid the battery repeatedly cross jump between charging and discharging.
Max charge SOC	Charge cut-off SOC, battery stops charging when reach the Max. Charge SOC.

Table 4 Description of battery mode settings

NOTICE:

Force charge SOC < Over discharge SOC < Recovery SOC, otherwise the setting might be error.

6. Commissioning

Step 6: Set “Grid Port”

(Skip this step if grid code is already set in quick setting)

Select grid code that meet the local regulations.

Three level of Over-voltage / under-voltage / Over-frequency / under-frequency are default based on grid code, there is no need to set the parameters in manual.

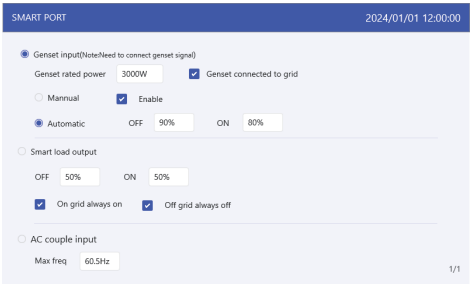
Step 7: Set “Smart Port”

(Skip this step if the system is not connected to generators)

When it is connected to Generator, select “Gunset input”;

When it is connected to smart load like heat pump select “Smart load output”

When it is connected to Grid-tied inverter select “AC coupled”



Genset

The user need to input the “Genset rated power” by manual.

OFF: Generator stops charging SOC, settable, range:35~100%;

ON: Generator start charging SOC; settable, range:1~95%;

AC coupled:

OFF: Grid-tied inverter stops charging SOC, settable, range:35~100%;

ON: Grid-tied inverter start charging SOC; settable, range:1~95%;

6. Commissioning

Step 8: Set parallel system

Set Master and Slave machine,

Set Master ID as: 1

Slave machine ID as: 2

.Slave machine ID as: 3

..... and so on.

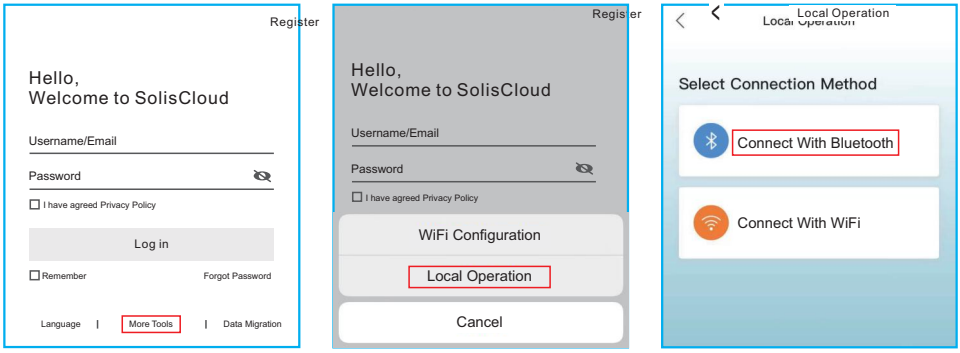
6. Commissioning

6.6 Mobile Application Commissioning

6.6.1 Log in the APP via Bluetooth

Step 1: Connect with Bluetooth.

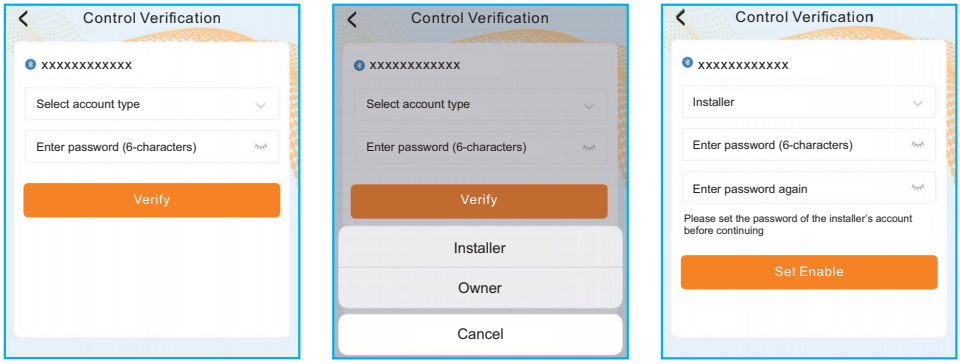
Turn on Bluetooth switch on your mobile phone and then open the Soliscloud APP. Click “More Tools”->”Local Operation”->”Connect with Bluetooth”



Step 2: Select the Bluetooth signal from the inverter. (Bluetooth Name: Inverter SN)

Step 3: Login account.

If you are the installer, please select the account type as Installer. If you are the plant owner, please select the account type as owner. Then set your own initial password for control verification. (The first log-in must be finished by installer in order to do the initial set up)



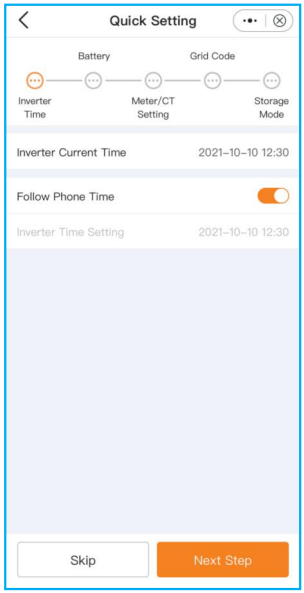
6. Commissioning

6.6.2 APP Quick Setting

If this is the first time the inverter has been commissioned, you will need to first go through the Quick Settings. Once this has been done, these settings can be changed later.

Inverter Time -> Meter Setting -> Grid Code -> Storage mode -> Battery Model

(1)Inverter time:
Set inverter time and date, tap the slider next to “Follow Phone Time”, then tap “Next step” at the bottom right corner.



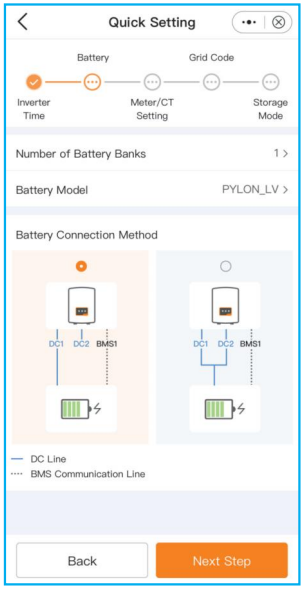
6. Commissioning

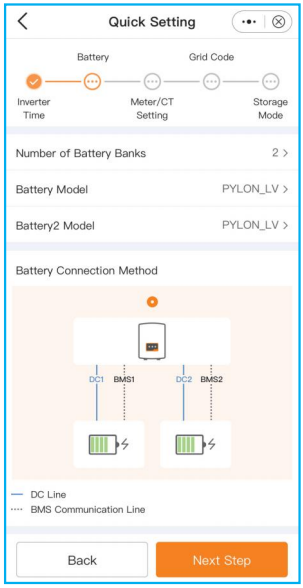
(2) Battery:

•Select the number of battery banks 1-2

•Select the battery model: if the connected battery brand is not on the list, please select “General_LiBat_HV

•Select battery connection method either a single battery and BMS connected to one input or two batteries and one BMS connected to both inputs.





6. Commissioning

(3) CT/Meter setting:

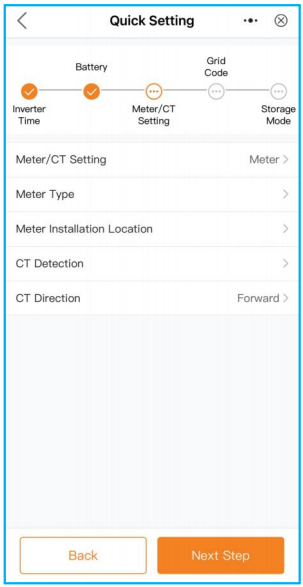
•Select CT or Meter;

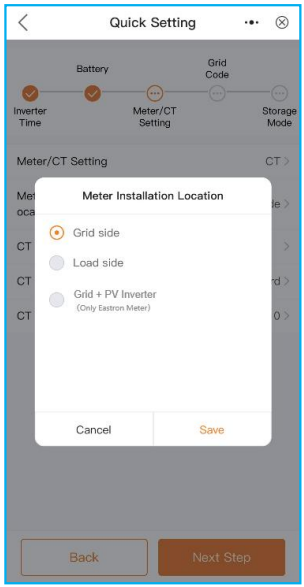
•Set Meter type (the Eastron 3 phase meter is self-identifiable)

•Set Meter installation location: Grid side / Load side / Grid+PV inverter;

•Set CT ratio: default 60 (Solis provide ESCT-T50-300A/5A CT), if the user install their own CT, then they need to set the CT ratio manually. If the system has the Eastron Meter connected, then the CT ratio needs to be set to Meter.

•CT direction: When a CT is installed correctly, select “Forward”. If the CT is found to be installed backwards, select “Reversal” to correct it. Otherwise, if the CT is left backwards then the sampling current of the CT will be reversed when calculating the power.



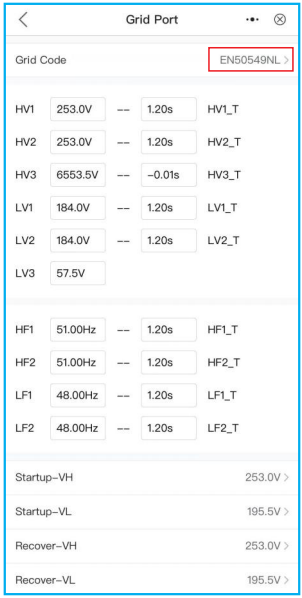


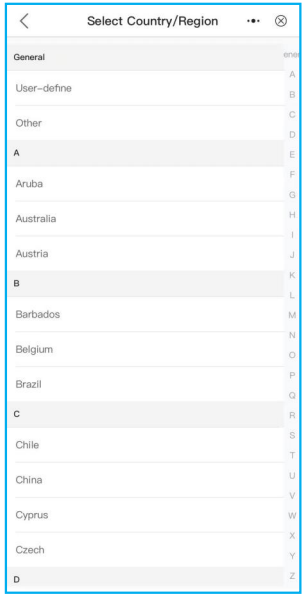
6. Commissioning

(4)Grid code:

Select grid code that meet the local regulations.

Three level of Over-voltage / under-voltage / Over-frequency / under-frequency are default based on grid code, there is no need to set the parameters in manual.



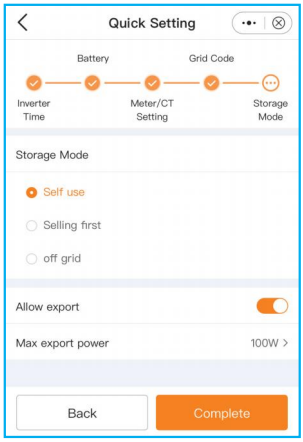


6. Commissioning

(5)Storage mode:

ALL modes first priority is to use the available PV power to support loads. The different modes determine what the second priority, or use of the excess PV power, will be.

Self-use / Selling first / Off-grid are exclusive the user could select only one mode.



Settings	Description
Self-use	PV power flow priority sequence: loads > battery > grid. In this mode, the system stores excess PV power into the battery after the loads are supplied. If the battery is charged full, or there is no battery, the excess PV power will be exported(sold)back to the grid. If the system is set to not export any power, then the inverter will curtail the PV power (derate the inverter output power).
Selling first	PV power flow priority sequence: loads > grid > battery. In this mode, the system exports any excess PV power after the loads are supplied. If the export power quota has been met, then the remaining PV power will be stored in the battery. Notice: This mode should not be used if export power set to zero.
Off grid	PV power flow priority sequence: loads > battery. This mode only used when the system are not electrically connected to the grid at all. This mode is like Self-Use Mode, but the PV power will be curtailed if the PV power output is > battery power + load power.

Table 5 Description of Storage modes

Once quick setting finished, tap “Complete”, the APP enter the homepage.

6. Commissioning

6.6.3 Home Page of the Mobile App Inverter Interface

This screen display energy production and consumption, as well as its flow. It shows the following data:

•Today yield of PV

•Today Imported/Exported of Grid

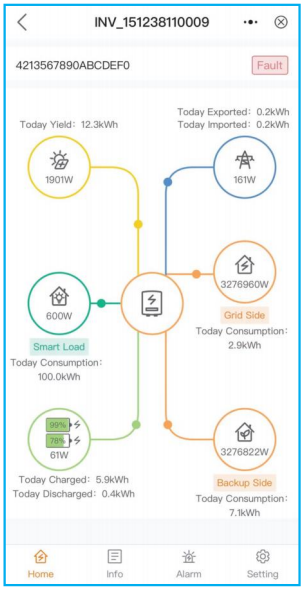
•Today Charged/Discharged of Battery

•Today Consumption of Grid-side load

•Today Consumption of Back-up load

•Today GEN yield.

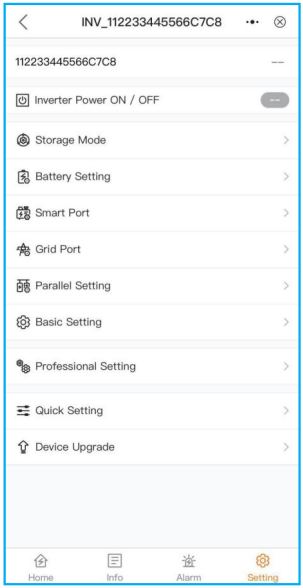
At the bottom of page are four sub menus: Home, Info, Alarm and Settings.



6. Commissioning

6.6.4 Settings

Under this page, the user could find quick setting and other detailed settings as follows:

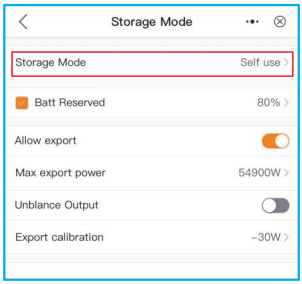


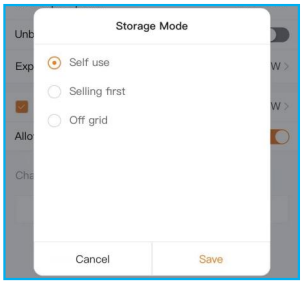
1. Storage mode

a. Select storage mode:

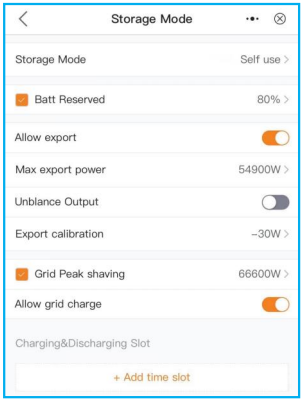
•Self-use / Selling first / Off-grid, these three modes are exclusive, the user could select only one mode. The modes definition could refer to 5.5.2“Quick setting”

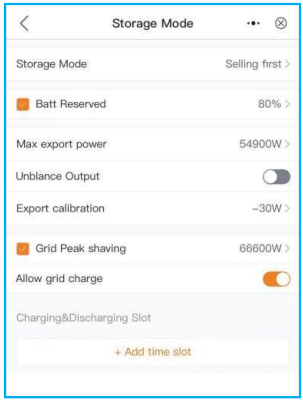
•The Mode description please refer to 5.4.1.

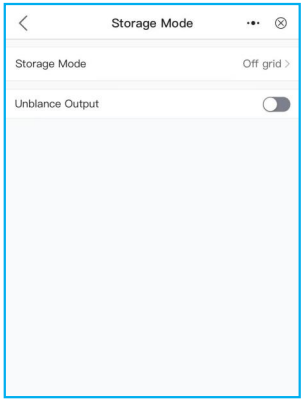




6. Commissioning







Please notice:
“Allow export" can only be set in “Self use” mode;
“Add time slot” can only be set in grid-connected mode (Self use” mode and “ Selling first” mode).

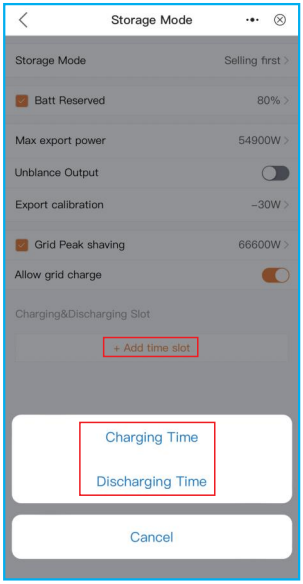
b. Set mode operations:

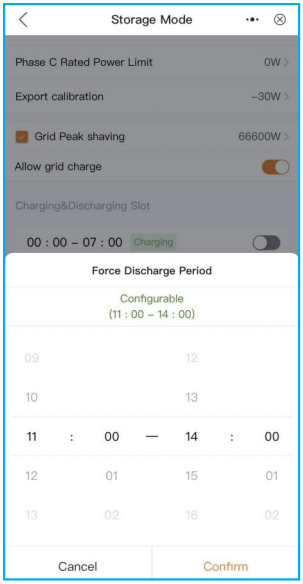
Settings	Description
Battery reserved	Range: 5~95%, default:80%, settable. When battery SOC < set battery reserve SOC, battery will stop discharging.
Allow export	When it enables, the system is allowed to export power to grid.
Max export power	Default: 1.1 times of rated power. Notice: If feed-in is not allowed, set Max export power to 0.
Export calibration	Range : -500w-500w, default 20w, settable. To compensate the deviation of CT/Meter in practical application.
Allow grid charging	Allow grid charging the battery when it enables. Notice: if “Allow Grid Charging” is turned on, the inverter will use grid power to charge the battery only under two circumstances: •The battery drains to the Force Charge SOC. •When PV power output can’t meet the set current value during the charge periods.

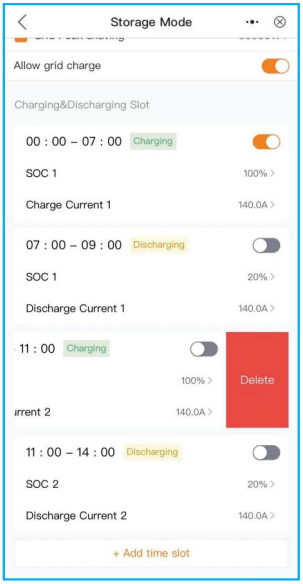
Table 6 Set mode operations

6. Commissioning

c. Add time slot:







Charge SOC: battery charging stops when reach the set SOC;
Discharge SOC: battery discharging stops when reach the set SOC.

NOTICE:

- Slide the switch to on, the battery charge/discharge with set charge/ discharge current by following the set period
- Slide to the left of screen, the user could delete the current period setting.

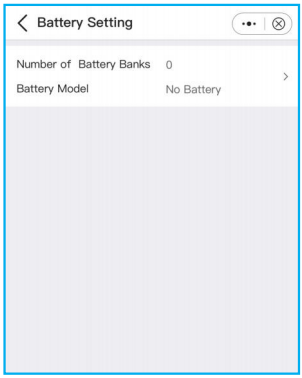
6. Commissioning

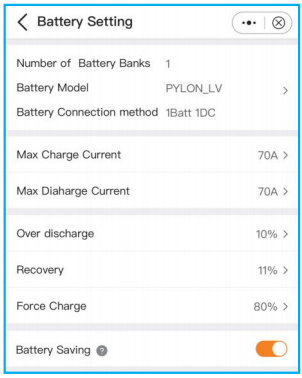
2. Battery setting

a. Set " Number of Battery Banks" and "Battery Model"

b. Set "Battery Connection Method" : 1 Batt 1 DC / 1 Batt 2 DC / 2 Batt 1 DC;

c. Set battery parameters





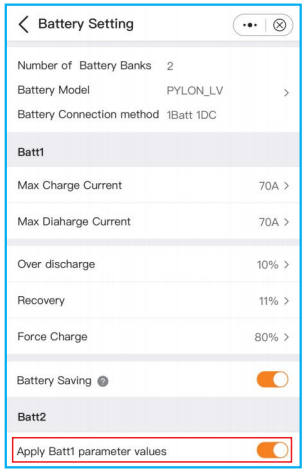
Settings	Description
Max charge current	Max charge current, settable.
Max discharge current	Max discharge current, settable.
Over discharge	Range : 5~40%, default 20%, when battery SOC < over discharge, it will stop discharging.
Recovery	Range : set Over discharge value +1% ~ set Over discharge value +20%; when battery SOC > Recovery SOC, it will start charging, reserve the return difference value to avoid the battery repeatedly cross jump between charging and discharging.
Force charge	Range : 4%~ set Over discharge value, when battery SOC < force charge SOC, the grid will charge the battery.

Table 7 Battery setting

NOTICE:

Force charge SOC < Over discharge SOC < Recovery SOC, otherwise the setting might be error.

d. If two battery banks share the same setting, then turn the “Apply Batt1 parameter values” on. It will match the settings of battery bank 1 automatically.



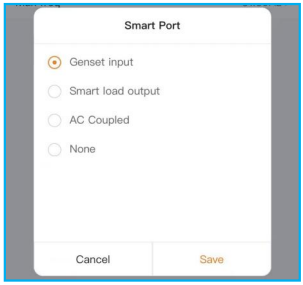
3. Smart port

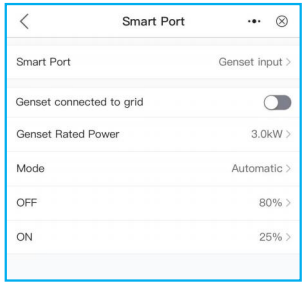
Select smart port type

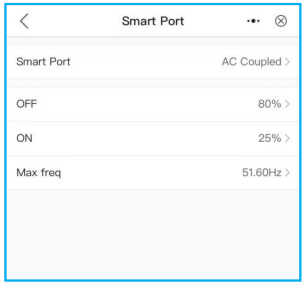
•When it is connected to Generator, select “Gunset input”;

•When it is connected to smart load like heat pump select “Smart load output”

•When it is connected to Grid-tied inverter, select “AC coupled”







Genset Rated Power: manual input.

OFF: Generator stops charging SOC, settable, range:35~100%;

ON Generator start charging SOC; settable, range:1~95%;

AC coupled:

OFF: Grid-tied inverter stops charging SOC, settable, range:35~100%;

ON: Grid-tied inverter start charging SOC; settable, range:1~95%;

6. Commissioning

4. Grid port

Please refer to “5.5.2 APP Quick setting”

5. Parallel setting

When there are ≥ 2 inverters in parallel, turn the slider on

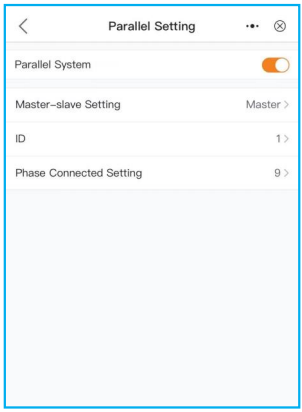
Set Master and Slave machine,

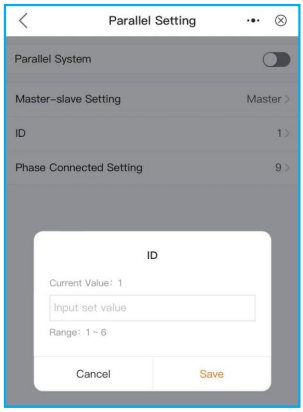
Set Master ID as: 1

Slave machine ID as: 2

.Slave machine ID as: 3

..... and so on.





6. Basic setting

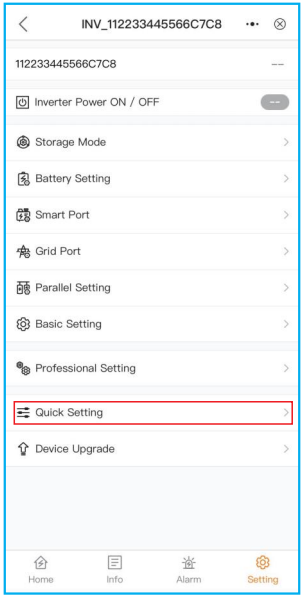
Set inverter time and date, tap the slider next to “Follow Phone Time”, then tap “Save”.

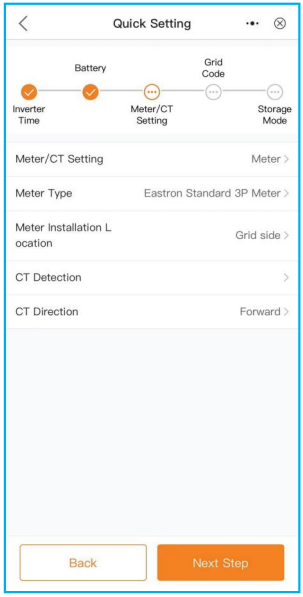
6. Commissioning

7. CT/Meter setting

There are two ways for CT/Meter setting, detailed setting please refer to “5.5.2 APP Quick setting”.

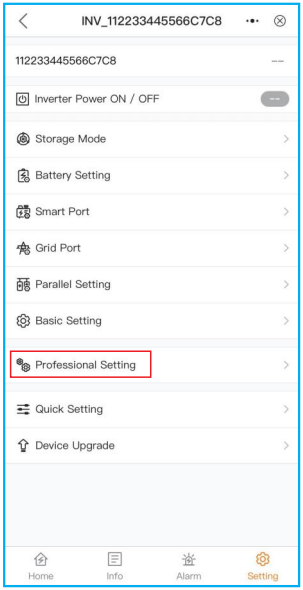
Method 1: Quick setting

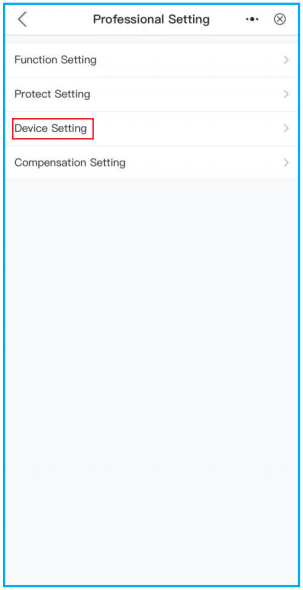


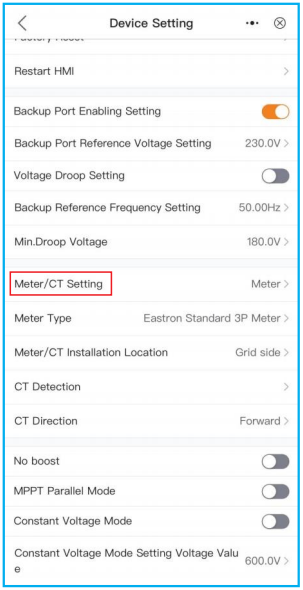


6. Commissioning

Method 2: Setting --- Professional Setting -- Device Setting --Meter/CT Setting

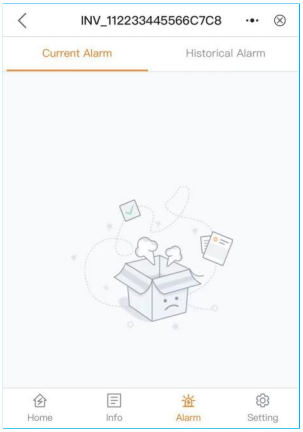






6.6.5 Alarm

The alarm page can display the current alarm and the historical alarms.



6. Commissioning

6.6.6 Information

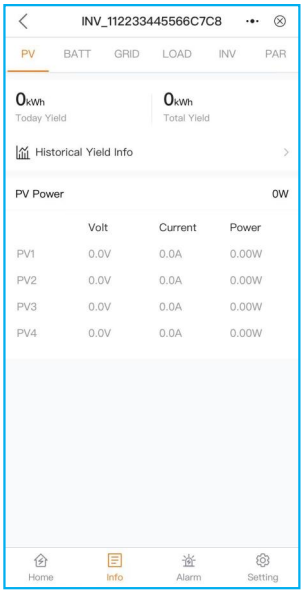
The use could Query information of PV / Battery / GRID / LOAD / INVERTER.
PV : it display each PV module Power/Voltage/Current, as well as historical yield information calculated by monthly / yearly / total, displayed with graphics;

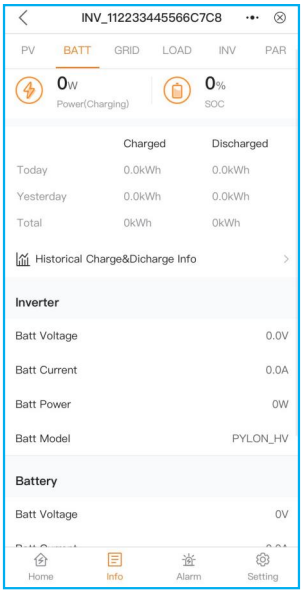
BATT: it display battery Power/Voltage/Current/SOC/SOH/Max.charging current / Max.discharging current, as well as historical battery charging and discharging information calculated by monthly / yearly / total, displayed with graphics;

GRID: it display Active power / voltage/ current of L1/L2/L3, as well as historical exported/imported information calculated by monthly / yearly / total, displayed with graphics;

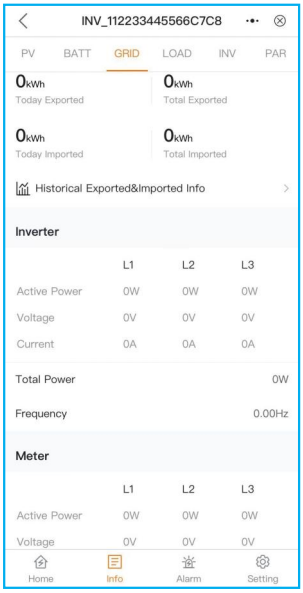
LOAD: it displays power/voltage of grid load, power/voltage/current of backup load;

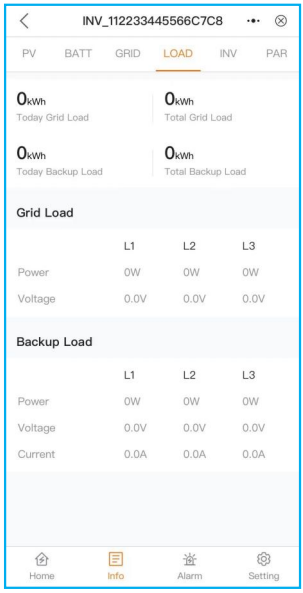
INV: it displays inverter SN/model number, and software version.

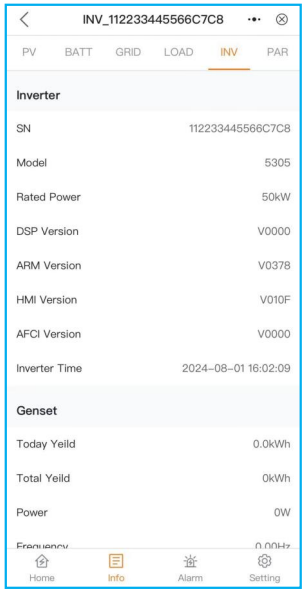




6. Commissioning

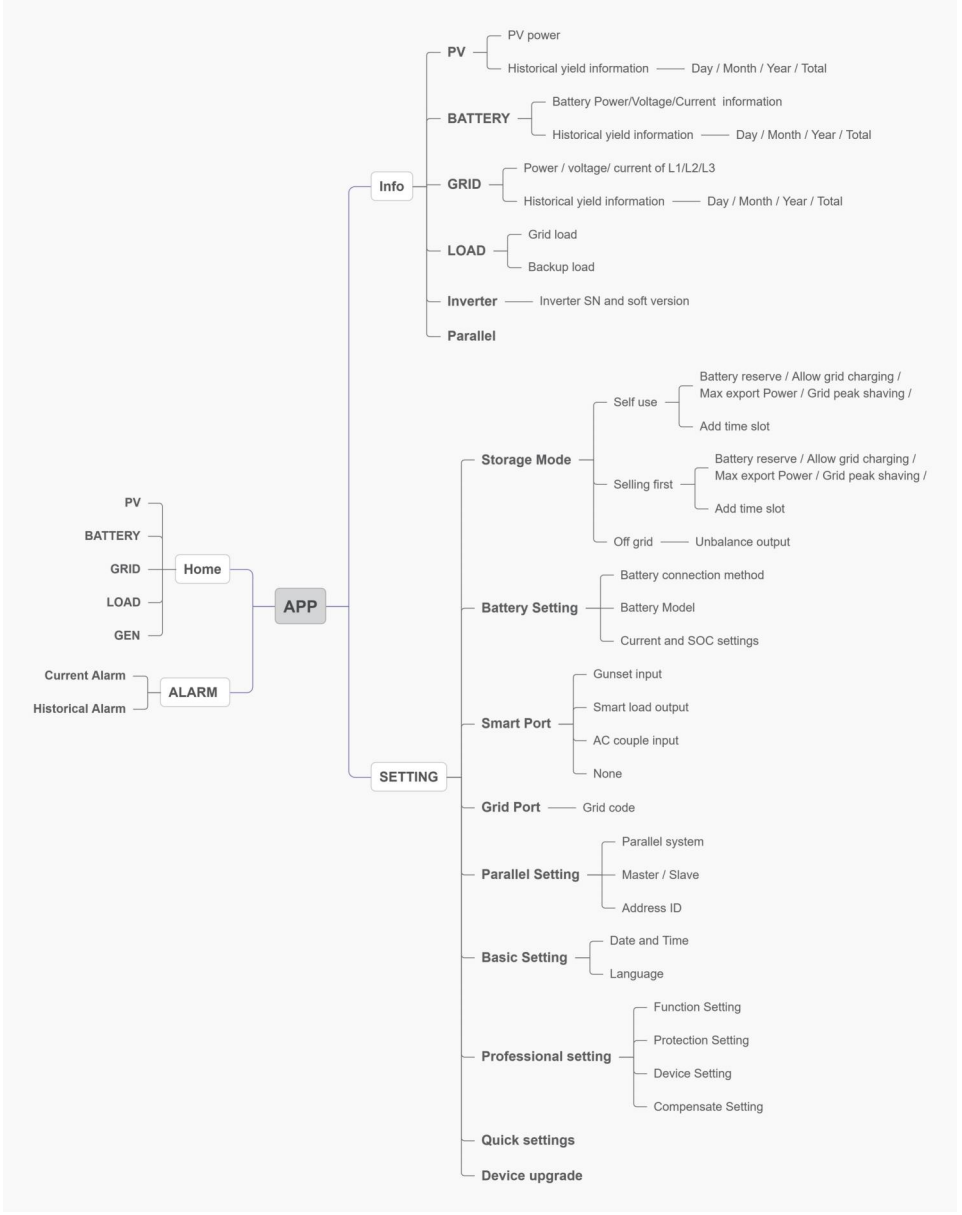






6. Commissioning

6.6.7 APP interface structure



7. Troubleshooting

Solis US Technical Support Contact Information

Phone Number: **+1(866)438-8408**
Email: **usservice@solisinverters.com**

If you are having an issue with your system, please contact Solis Technical Support for assistance. If the inverter is having an issue, it will show it in one of the following ways: (1) the Inverter (circle) LED indicator light will flash orange. (2) the inverter status will be an alarm code (3) an alarm code will display on SolisCloud or (4) the inverter will simply be off. The next several pages explain how to troubleshoot each alarm code. If it is suspected that the issue is coming from the DC side of the system, it is recommended to turn the inverter off so that the PV strings can be more safely tested.

7.1 Inverter Maintenance

Solis S6 hybrid inverter does not require any regular maintenance. However, keeping the heatsink clean will ensure the inverter is able to dissipate heat, increasing the life span of the inverter. Any grease smudges on the inverter chassis can be cleaned off with soap and water.

CAUTION:
Do not touch the surface of the inverter it is operating. Some parts may be hot and could cause a minor burn. Turn off the inverter (refer to Section 6.2) and let it cool down before you do any maintenance or cleaning of it.

The LED status indicator lights can be cleaned with damp cloth if they are too dirtyto be read.

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

The inverter has been designed in accordance with international standards for safety and electromagnetic compatibility requirements. Before being shipped from the manufacturing center, the inverter is subjected to multiple tests to ensure operation reliability.

If you are not able to resolve the alarm code using the troubleshooting steps, or if the alarm code you are seeing is not listed, please contact Solis US Technical support. Use the Bluetooth tool, go to the Info page and then to the Inverter tab. Scroll down and tap Alarm History and then screen shot or write down the alarms as well as the dates and times the alarms were recorded. Please also take note of the inverter model number, serial number, and internal transmitter type.

NOTE:
If the inverter displays any alarm messages listed on the next few pages, please turn off the inverter and wait for 5 minutes before restarting it . If the alarm persists, please contact Solis after-sales service +1(866)438-8408 or email usservice@solisinverters.com

7. Troubleshooting

7.2 Inverter Alarm Codes

Message Name	Information Description	Troubleshooting Suggestion
Off	Control device to shutdown	1. Turn on the device in the ON/OFF Setting.
LmtByEPM	The device's output is under controlled	1. Confirm whether the inverter is connected to an external EPM/meter to prevent reverse current. 2. Confirm whether the inverter is controlled by an external third-party device. 3. Confirm whether the power setting of the inverter power control is limited. 4. Verify settings in section 6.6.7 and check your meter readings.
LmtByDRM	DRM Function ON	1. No need to deal with it.
LmtByTemp	Over temperature power limited	1. No need to deal with it, the device is in normal operation.
LmtByFreq	Frequency power limited	
LmtByVg	The device is in the Volt-Watt mode	1. Due to the requirements of local safety regulations, when the grid voltage is high, the Volt-watt working mode is triggered, which generally does not need to be dealt with. 2. Inverter factory test errors causing this mode to open, if you need to close, you can close this mode in LCD, set the process: Main menu → Advanced Settings → Password 0010 → STD mode settings → Working Mode → Working mode: NULL → Save and exit.
LmtByVar	The device is in the Volt-Var mode of operation	1. Due to the requirements of local safety regulations, when the grid voltage is high, the Volt-watt working mode is triggered, which generally does not need to be dealt with. 2. Inverter factory test errors causing this mode to open, if you need to close, you can close this mode in LCD, set the process: Main menu → Advanced Settings → Password 0010 → STD mode settings → Working Mode → Working mode: NULL → Save and exit.
LmtByUnFr	Under frequency limit	1. No need to deal with it.
Standby	Bypass run	
StandbySynoch	Off grid status to On grid status	
GridToLoad	Grid to load	

7. Troubleshooting

Message Name	Information Description	Troubleshooting Suggestion
Surge Alarm	On-site grid surge	1. Grid side fault, restart the device. If it is still not eliminated, please contact the manufacturer's customer service.
OV-G-V01	Grid voltage exceeds the upper voltage range	1. Confirm whether the power grid is abnormal. 2. Confirm that the AC cable is properly connected. 3. Restart the system and check if the fault persists.
UN-G-V01	Grid voltage exceeds the lower voltage range	
OV-G-F01	Grid frequency exceeds the upper frequency range	
UN-G-F01	Grid frequency exceeds the lower frequency range	
G-PHASE	Unbalanced grid voltage	
G-F-GLU	Grid voltage frequency fluctuation	
NO-Grid	No grid	
OV-G-V02	Grid transient overvoltage	
OV-G-V03	Grid transient overvoltage	1. Restart the system, confirm if that the fault continues.
IGFOL-F	Grid current tracking failure	1. Confirm whether the power grid is abnormal. 2. Confirm that the AC cable is properly connected. 3. Restart the system and check if the fault persists.
OV-G-V05	Grid voltage RMS instantaneous overvoltage fault	
OV-G-V04	Grid voltage exceeds the upper voltage range	
UN-G-V02	Grid voltage exceeds the lower voltage range	
OV-G-F02	Grid frequency exceeds the upper frequency range	
UN-G-F02	Grid frequency exceeds the lower frequency range	
NO-Battery	Battery is not connected	1. Check on information page 1 – Verify the battery voltage is within standards. 2. Measure battery voltage at plug.
OV-Vbackup	Inverting overvoltage	1. Check whether the backup port wiring is normal 2. Restart the system, confirm that the fault continues.
Over-Load	Load overload fault	1. Backup load power is too large, or some inductive load startup power is too large, need to remove some backup load, or remove the inductive load on the backup.

7. Troubleshooting

Message Name	Information Description	Troubleshooting Suggestion
BatName-FAIL	Wrong battery brand selection	1. Confirm whether the battery model selection is consistent with the actual one.
CAN Fail	CAN Fail	1. Can failure is a failure of communication between inverter and battery. Check cable conditions. Check to ensure you have it plugged in on the CAN port of the battery and inverter. Check that you are using the right cable. Some batteries require a special battery from the battery manufacturer.
OV-Vbatt	Battery undervoltage detected	1. Verify battery voltage is within standards. Measure battery voltage at inverter connection point. Contact your battery manufacturer for further service.
UN-Vbatt	Battery overvoltage detected	1. Restart the system and check if the fault persists. If it is still not eliminated, please contact the manufacturer's customer service.
Fan Alarm	Fan alarm	1. Check if the internal fan is working correctly or jammed.
OV-DC01 (1020 DATA:0001)	DC 1 input overvoltage	1. Check if the PV voltage is abnormal 2. Restart the system, confirm that the fault continues
OV-DC02 (1020 DATA:0002)	DC 2 input overvoltage	
OV-BUS (1021 DATA:0000)	DC bus overvoltage	1. Restart the system, confirm that the fault continues.
UN-BUS01 (1023 DATA:0001)	DC bus undervoltage	
UNB-BUS (1022 DATA:0000)	DC bus unbalanced voltage	
UN-BUS02 (1023 DATA:0002)	Abnormal detection of DC bus voltage	
DC-INTF. (1027 DATA:0000)	DC hardware overcurrent (1, 2, 3, 4)	1. Check if the DC wires are connected correctly without loose connection.
OV-G-I (1018 DATA:0000)	A phase RMS value overcurrent	1. Confirm that the grid is abnormal. 2. Confirm that the AC cable connection is not abnormal. 3. Restart the system, confirm that the fault continues.
OV-DCA-I (1025 DATA:0000)	DC 1 average overcurrent	1. Restart the system, confirm that the fault continues.
OV-DCB-I (1026 DATA:0000)	DC 2 average overcurrent	
GRID-INTF. (1030 DATA:0000)	AC hardware overcurrent (abc phase)	

7. Troubleshooting

Message Name	Information Description	Troubleshooting Suggestion
DCInj-FAULT (1037 DATA:0000)	The current DC component exceeds the limit	1. Confirm that the grid is abnormal. 2. Confirm that the AC cable connection is not abnormal. 3. Restart the system, confirm that the fault continues.
IGBT-OV-I (1048 DATA:0000)	IGBT overcurrent	1. Restart the system, confirm that the fault continues.
OV-TEM (1032 DATA:0000)	Module over temperature	1. Check whether the surrounding environment of the inverter has poor heat dissipation. 2. Confirm whether the product installation meets the requirements.
RelayChk-FAIL (1035 DATA:0000)	Relay failure	1. Restart the system, confirm that the fault continues.
UN-TEM (103A DATA:0000)	Low temperature protection	1. Check the working environment temperature of the inverter. 2. Restart the system to confirm if the fault continues.
PV ISO-PRO01 (1033 DATA:0001)	PV negative ground fault	1. Check whether the PV strings have insulation problems. 2. Check whether the PV cable is damaged.
PV ISO-PRO02 (1033 DATA:0002)	PV positive ground fault	
12Power-FAULT (1038 DATA:0000)	12V undervoltage failure	1. Check current leakage to ground. Verify your grounding. Verify all wires are in good condition and not leaking current to ground.
ILeak-PRO01 (1034 DATA:0001)	Leakage current failure 01 (30mA)	
ILeak-PRO02 (1034 DATA:0002)	Leakage current failure 02 (60mA)	
ILeak-PRO03 (1034 DATA:0003)	Leakage current failure 03 (150mA)	
ILeak-PRO04 (1034 DATA:0004)	Leakage current failure 04	
ILeak_Check (1039 DATA:0000)	Leakage current sensor failure	
GRID-INTF02 (1046 DATA:0000)	Power grid disturbance 02	1. Confirm whether the grid is seriously distorted. 2. Check whether the AC cable is connected reliably.
OV-Vbatt-H/ OV-BUS-H (1051 DATA:0000)	Battery overvoltage hardware failure / VBUS	1. Check if the battery circuit breaker is tripping. 2. Check if the battery is damaged.
OV-ILLC (1052 DATA:0000)	LLC hardware overcurrent	1. Check whether the backup load is overloaded. 2. Restart the system, confirm that the fault continues.

7. Troubleshooting

Message Name	Information Description	Troubleshooting Suggestion
INI-FAULT (1031 DATA:0000)	AD zero drift overlink	1. Restart the system, confirm that the fault continues.
DSP-B-FAULT (1036 DATA:0000)	The master-slave DSP communication is abnormal	
AFCI-Check (1040 DATA:0000)	AFCI self-test failure	
ARC- FAULT (1041 DATA:0000)	AFCI failure	1. Verify connections are tight within your PV system. Arc fault settings can be changed in advanced settings if further adjustment is necessary.

NOTE:

The reconnection method of after AFCI failure: Automatic reconnection

the AFCI type of each inverter model as:

30K AFCI type: F-I-AFPE-1-4/2-2

40K AFCI type: F-I-AFPE-1-4-2

50K AFCI type: F-I-AFPE-1-4-2

60K AFCI type : F-I-AFPE-1-4-2

7.3 Service Ticket Information

When contacting the Solis Support team, it will speed up the process to obtain the information listed below before making the call. The inverter details can be found on the silver specification label on the side of the inverter. The alarm history can be found by navigating the LCD screen or through the SolisCloud app. Please keep the inverter online so that the service team can look at it remotely.

Item	Supplemental Information
Inverter serial number (SN)	Serial number can be found on the spec label
Inverter Firmware Version	A six character number that can be found in the information section of the inverter interface page - requires Bluetooth connection
Alarm history	Codes found in the Inverter section of the interface
DC voltages	Use a multimeter to measure the voltages
Detailed description of the problem	Frequency of the occurrence and any other relevant details about the issue
Battery serial number and Firmware version	Consult the battery product manual to determine how to collect this information
Is the system reporting to SolisCloud?	Yes/No - if yes, what is the site ID?
Take pictures showing all the cable connections in the system (Videos preferred)	If this is possible, it will help us to troubleshoot

7. Troubleshooting

7.4 Inverter Firmware

Solis inverters have a few different types of firmware that should all be on the latest version. If one site has several inverters installed, they should all be on the same versions to prevent errors.

Solis Inverter Firmware Types:

DSP: Digital Signal Processor

HMI: Human-Machine-Infterface

AFCI: Arc-Fault-Circuit Interruption

To check which version the inverter is currently on, first connect to the inverter with Bluetooth. Go to the Information tab and be sure that you are on the Inverter tab. Scroll to the bottom and look for the DSP and HMI versions. The AFCI and SolisHub current versions can only be upgraded remotely with the assistance of Solis Technical Support.

There are two methods of updating the inverter firmware: (1) remotely (2) locally with Bluetooth,

7.4.1 Remote Firmware Updating

The inverter firmware can be updated remotely but only if the inverter has a Solis data logger connected directly to it. The logger must also be connected to the internet. Once that has been done, please call or email Solis Technical Support to request the firmware be updated remotely.

Please note: Only Solis Technical Support can update inverters ***remotely.*** Installers can only upate firmware locally through the Bluetooth connection using the SolisCloud app.

7.4.2 Local Firmware Updating Through Bluetooth

The recommended method for updating the inverter firmware is locally using the SolisCloud Bluetooth tool. The steps for this process can be found on pages 61-62 (Step 3 of Commissioning). It is highly advisable to upgrade the inverter firmware during the commissioning process before configuring the settings.

IMPORTANT:

If there are multiple inverters in parallel, please connect one data logger to each inverter to ensure that firmware can be updated remotely. Slave firmware cannot be updated through a logger connected to the master. All inverters in the same system must be on the same firmware version.

8. Datasheet

30-60K

SOLARATOR SERIES

Operates Seamlessly with Generators: Experience Uninterrupted Power, Even in Areas with Grid Instability

S6-EH3P(30-60)K-NV-YD-H-US

Three Phase | High Voltage

- High input current (40A) supports larger modules, improving power density and eliminating clipping
- More seamless system operation and resiliency with fast and automated battery charge/discharging
- Compatible with 100-280Ah battery modules, driving down system costs and enhancing flexibility, wide range for generator power as well
- Extremely flexible configurations, storage use mode features and battery options
- Supports 200% oversizing for maximizing PV utilization (60K: 166%)
- Easily add inverter capacity, PV or batteries to scale up as you grow thanks to dual input flexibility
- Stability during and after outages with 160% overload capacity

USA
t: +1 866 438 8408
w: solisinverters.com/us
e: ussales@solisinverters.com
usservice@solisinverters.com

8. Datasheet

DATASHEET S6-EH3P(30-60)K-NV-YD-H-US

Models	30K03	40K04	50K04	60K04
Input DC (PV side)				
Max. usable PV input power	60 kW	80 kW	100 kW	100 kW
Max. input voltage	1000 V			
Rated voltage	600 V			
Start-up voltage	180 V			
MPPT voltage range	150 - 850 V			
Max. input current	40 A / 40 A / 40 A	4 × 40 A		
Max. short circuit current	65 A / 65 A / 65 A	4 × 65 A		
MPPT number / Max. input strings number	3 / 6	4 / 8		
Max input power per MPPT	25 kW (600 V × 40 A)			
Battery				
Battery type	Li-ion			
Battery voltage range	150 - 800 V			
Max. charge / discharge power	33 kW	44 kW	55 kW	60 kW
Max. charge / discharge current	70 A × 2 ①			
Number of battery ports	2			
Max. charge / discharge power of each input	33 kW	35 kW	35 kW	35 kW
Communication	CAN / RS485			
Output AC (Grid side)				
Rated output power	30 kW	40 kW	50 kW	60 kW
Max. apparent output power	30 kVA	40 kVA	50 kVA	60 kVA
Rated grid voltage	3/(N)/PE, 480 V			
Rated grid frequency	60 Hz			
Rated grid output current	36.1 A	48.1 A	60.1 A	72.2 A
Max. output current	36.1 A	48.1 A	60.1 A	72.2 A
Power factor	> 0.99 (0.8 leading - 0.8 lagging)			
THDi	< 3%			
Input AC (Grid side)				
Max. AC passthrough current	72.2 A	96.2 A	120.2 A	144.4 A
Rated input voltage	3/(N)/PE, 480 V			
Rated input frequency	60 Hz			
Input Generator				
Max. input power	30 kW	40 kW	50 kW	60 kW
Max. input current	36.1 A	48.1 A	60.1 A	72.2 A
Rated input voltage	3/(N)/PE, 480 V			
Rated input frequency	60 Hz			
Output AC (Back-up)				
Rated output power	30 kW	40 kW	50 kW	60 kW
Max. apparent output power	1.6 times of rated power with 2 s			
Back-up switch time	< 10 ms			
Rated output voltage	3/(N)/PE, 480 V			
Rated frequency	60 Hz			
Rated output current	36.1 A	48.1 A	60.1 A	72.2 A
Max. imbalance power per phase	33% rated power			
THDv (@linear load)	< 2%			
Efficiency				
Max. efficiency	97.9%			
CEC efficiency	97.4%			
MPPT efficiency	99.9%			
Protection				
Ground fault detection	Yes			
Residual (leakage) current detection	Yes			
Integrated AFCI	Yes			
DC reverse-polarity protection	Yes			
PV DC switch	Yes			
Rapid shutdown NEC 2017	Integrated SunSpec-certified Transmitter			
Compatible RSD receivers	See MLRSD Compatibility Sheet			
Protection class/Over voltage category	I / II			
General Data				
Dimensions (W*H*D)	22 × 41.3 × 13.64 in (560 × 1050 × 346.5 mm)			
Weight	195.77 lbs (88.8 kg)			
Topology	Transformerless			
Self-consumption (night)	< 35 W			
Operating ambient temperature range	-13°F to 140°F (-25°C to 60°C)			
Relative humidity	0 - 100%			
Ingress protection	TYPE 4X			
Cooling concept	Intelligent fan-cooling			
Max. operation altitude	8,202 ft (2500 m)			
Compliance	UL1741SB, IEEE1547-2018, UL1699B, UL1998, FCCPart15ClassB, California Rule21, Hawaii Rule 14H, NEC 690.12-2020, CAN/CSA C22.2107.1-1			
Features				
DC connection	Spring clamp terminals			
Grid AC connection	Screw type terminal block			
Back-up AC connection	Spring clamp terminals			
Battery DC connection	Spring clamp terminals			
Generator AC connection	Spring clamp terminals			
Interface	7.0" LCD display & Bluetooth + APP			
Monitoring platform	SolisCloud (modbus map and API sharing available upon request)			
Revenue grade meter	Integrated ANSI C12.20 option			
Communication	CAN, RS485-115200, Ethernet, Optional: Wi-Fi, Cellular, LAN			

① Supporting parallel 140A input.

9. Appendix

9.1 Default Setting for IEEE1547-2018 (UL-480V-18)

Parameter	Adjustment Range (p.u.)	Default (p.u.)	Description
OV-G-V01	1.10< V ≤1.21	1.10 p.u.	Set grid over-voltage protection 01 value
OV-G-V01-T	0.1-13 S	13 S	Grid over-voltage protection 01 trip time
OV-G-V02	1.20< V ≤1.30	1.20 p.u.	Set grid over-voltage protection 02 value
OV-G-V02-T	0.1-5 S	0.16 S	Grid over-voltage protection 02 trip time
UN-G-V01	0.5≤ V <0.88	0.88 p.u.	Set grid under-voltage protection 01 value
UN-G-V01-T	2.0-50 Sec.	21 S	Grid under-voltage protection 01 trip time
UN-G-V02	0.45≤ V <0.70	0.5 p.u.	Set grid under-voltage protection 02 value
UN-G-V02-T	0.16-21 S	2 S	Grid under-voltage protection 02 trip time
UN-G-V03	0.050< V <0.5	0.5 p.u.	Set grid under-voltage protection 03 value
UN-G-V03-T	0.16-21 S	2 S	Grid under-voltage protection 03 trip time
OV-G-F01	60.5< F <66 Hz	61.2 Hz	Set grid over-frequency protection 01 value
OV-G-F01-T	180-1000 S	300 S	Set grid over-frequency protection 01 trip time
OV-G-F02	61.2< F <66 Hz	62 Hz	Set grid over-frequency protection 02 value
OV-G-F02-T	0.16-1000 S	0.16 S	Set grid over-frequency protection 02 trip time
UN-G-F01	50< F <59 Hz	58.5 Hz	Set grid under-frequency protection 01 value
UN-G-F01-T	180-1000 S	300 S	Set grid under-frequency protection 01 trip time
UN-G-F02	50< F <58 Hz	56.5 Hz	Set grid under-frequency protection 02 value
UN-G-F02-T	0.16-1000 S	0.16 S	Set grid under-frequency protection 02 trip time
Reconnection Voltage	0.88≤ V ≤0.95 1.05≤ V ≤1.06	0.917p.u. 1.05 p.u.	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	0-600 S	300 S	Set reconnection time after a fault is cleared
Ramp-up Slew Rate	0.10-100%	100%W/S	Set Ramp-up power slew rate during start-up
Reconnect Slew Rate	0.10-100%	0.33%W/S	Set Ramp-up power slew rate during reconnect

9. Appendix

Parameter	Adjustment Range (p.u.)	Default (p.u.)	Description
Volt Watt P3Tau	0.5-60 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	1-90 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	60.017-61 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	0.2-10 S	5 S	Set frequency derate response time
Dead Band-UF	59-59.983 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	Hybrid: 0.40≤V≤1.00 Grid-tied:0.90≤V≤1.30	Hybrid: 0.5 p.u. Grid-tied:p.u.	Set grid voltage V1 limit for Volt-Watt control
P1	0-100 % Pn	100% Pn	Set power P1 for Volt-Watt control
V2	Hybrid: 0.60≤V≤1.05 Grid-tied:1.00≤V≤1.35	Hybrid: 0.7 p.u. Grid-tied: p.u.	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	1.06 p.u.	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	1.10 p.u.	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	0.92 p.u.	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	0.98 p.u.	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	1.02 p.u.	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	1.08 p.u.	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	Set Fixed Power Factor limit
Reactive Power	-60 -60 %	0%	Set Reactive Power level

9. Appendix

9.2 Default Setting for California Rule 21 (R21P3-24A)

Parameter	Adjustment Range (pu)	Default (pu)	Description
OV-G-V01	1.10≤V≤1.21	1.10Vn	Set grid over-voltage protection 01 value
OV-G-V01-T	0.1≤t≤13 S	13 S	Grid over-voltage protection 01 trip time
OV-G-V02	1.20≤V≤1.30	1.20Vn	Set grid over-voltage protection 02 value
OV-G-V02-T	0.1≤t≤5 S	0.16 S	Grid over-voltage protection 02 trip time
UN-G-V01	0.05≤V≤0.88	0.88Vn	Set grid under-voltage protection 01 value
UN-G-V01-T	2.0≤t≤50 S	21 S	Grid under-voltage protection 01 trip time
UN-G-V02	0.05≤V≤0.70	0.5Vn	Set grid under-voltage protection 02 value
UN-G-V02-T	0.16≤t≤21 S	2 S	Grid under-voltage protection 02 trip time
UN-G-V03	0.05≤V≤0.50	0.5Vn	Set grid under-voltage protection 03 value
UN-G-V03-T	0.16≤t≤21 S	2 S	Grid under-voltage protection 03 trip time
OV-G-F01	60.5≤f≤66 Hz	61.2 Hz	Set grid over-frequency protection 01 value
OV-G-F01-T	180≤t≤1000 S	300 S	Set grid over-frequency protection 01 trip time
OV-G-F02	61.2≤f≤66 Hz	62 Hz	Set grid over-frequency protection 02 value
OV-G-F02-T	0.16≤t≤1000 S	0.16 S	Set grid over-frequency protection 02 trip time
UN-G-F01	50≤f≤59 Hz	58.5 Hz	Set grid under-frequency protection 01 value
UN-G-F01-T	180≤t≤1000 S	300 S	Set grid under-frequency protection 01 trip time
UN-G-F02	50≤f≤58 Hz	56.5 Hz	Set grid under-frequency protection 02 value
UN-G-F02-T	0.16≤t≤1000 S	0.16 S	Set grid under-frequency protection 02 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

9. Appendix

Parameter	Adjustment Range (pu)	Default (pu)	Description
Volt Watt P3Tau	0.5≤t≤60 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	1≤t≤90 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 OF frequency start dead band for power derate
Droop-OF	2-5 %	5 %	Set OF 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 UF frequency start dead band for power derate
Droop-UF	2-5 %	5 %	Set UF frequency derate droop slope
Droop Pmin	0-100 %	0 %	Set frequency droop P minimum
Volt-Watt	Enabled/ Disabled	Enabled	Set Volt - Watt function
V1	Hybrid: 0.40≤V≤1.00 Grid-tied:0.90≤V≤1.30	Hybrid: 1.00Vn Grid-tied:1.00Vn	Set grid voltage V1 limit for Volt-Watt control
P1	0-100 % Pn	100% Pn	Set power P1 for Volt-Watt control
V2	Hybrid: 0.60≤V≤1.05 Grid-tied:1.00≤V≤1.35	Hybrid: 1.00Vn Grid-tied: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	Hybrid: 0%Pn Grid-tied: 0%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	+30% Sn	Set reactive power Q1 for Volt-Var control
V2	0.92≤V≤1.05	0.97Vn	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	1.03Vn	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	1.07Vn	Set grid voltage V4 limit for Volt-Var control
Q4	-60-0% Sn	-30% 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

9. Appendix

9.3 Frequently Asked Questions

Q1: Why I have "CAN Fail" Alarm on the inverter?
A:"CAN Fail" indicates the CAN communication between inverter and battery is lost.
Please double check if your CAN cable is correctly connected and if your battery is power on.

Q2: Why I have "BATName-Fail" Alarm on the inverter ?
A: Please check in the "Battery Setting->Battery Model" setting and confirm you selected the correct battery option as the nameplate of your battery module.

Q3:Why I have "MET-SLT-Fail" Alarm on the inverter?
A: Please check in the "Meter Setting->Meter Type" setting and confirm you selected the correct meter option corresponding to your smart meter.

Q4:Why the power values on the screen are fluctuating very fast?
A: If your loads are changing drastically, the inverter will adjust its power accordingly. If you confirm the loads are stable while the inverter power is changing very fast, please double check your meter CT's direction and make sure the arrow is towards grid.

Q5: Why I have "OV-ILLC" Alarm on the inverter ?
A: OV-ILLC indicates there is an overcurrent issue on the internal LLC circuit. It could be transient status during extreme condition such as overload. If it happens constantly or too frequent and the extreme conditions have been excluded, please contact Solis service team.

Q6: Why I have "OV-BATT-H" Alarm on the inverter ?
A: OV-BATT-H indicates over voltage issue on the hardware of battery circuit. It could be caused by high battery voltage at full SOC, battery suddenly switching off, etc. If it happens constantly or too frequent and the extreme conditions have been excluded, please contact Solis service team.

Q7: Why I have "No-Battery" Alarm on the inverter?
A: Please double check if the battery power cables have been correctly connected and the battery breaker (on battery or external) has been turn on. If you don't want to connect the battery for now, please select the "No battery" option in "Battery Setting->Battery Model" to prevent the alarm to show up.

9. Appendix

9.4 FCC Instructions

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC WARNING:
Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

9. Appendix

9.5 UL 1741 SB Certification

Certificate

Certificate no. CU 72502345 0001

License Holder:
Ginlong technologies Co., Ltd.
No.57 Jintong Road, Binhai,
(seafront), Industrial Park,
Xiangshan Ningbo
315712 Zhejiang
P.R. China

Manufacturing Plant:
Ginlong technologies Co., Ltd.
No. 188 Jinkai Road, Binhai Industrial
Park, Xiangshan,
Ningbo,
315712 Zhejiang
P.R. China

Report Number:	CN2575YV 001	**Client Reference:**	Zhang Kun
Certification acc. to:	CSA C22.2 No. 107.1-16 UL 1741:2021		

Product Information

Certified Product:	Utility-interactive hybrid inverter
Model Designation:	1) S6-EH3P30K03-LV-YD-H-US , 2) S6-EH3P30K03-NV-YD-H-US , 5) S6-EH3P60K04-NV-YD-H-US
Technical Data:	Other date: See appendix

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Park, Xiangshan,
Ningbo,
315712 Zhejiang
P.R. China

Remarks: Special Remarks:

1.Evaluated to IEEE 1547-2003 and IEEE1547.1-2005.

2.Evaluated to UL 1741 3rd Edition Supplement SB for grid support functions, and IEEE 1547-2018, IEEE 1547a-2020 and IEEE1547.1-2020: Normal Operating Performance Category B; Abnormal Operating Performance III to the following SRDs:
- Hawaiian Electric SRD V2.0.
- California Rule 21:
Generating facility interconnections, (PG&E, SCE, SDG&E).

3.Evaluated to UL 1741 3rd Edition Supplement SB for interoperability functions, and IEEE 1547-2018 and IEEE1547.1-2020: using IEEE 2030.5-2018 protocol.

4.Evaluated to UL 1741 3rd Edition CRD Non-Isolated EPS Interactive PV Inverters Rated Less Than 30kVA.

5.Evaluated to UL 1699B:2018 Ed.1, R 2021 for photovoltaic DC arc-fault circuit interrupter protection integrated in inverter.

6.Programmable Components are involved in safety critical function below, and evaluated according to the applicable requirement of UL 991 3rd Edition and UL 1998 3rd Edition:
- isolation monitor interrupter function.
- battery soft-starting circuit relay contact adhesion monitoring and protection function.
- arc fault interruption function.

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7.The hybrid inverter is evaluated of RAPID SHUTDOWN EQUIPMENT AND SYSTEMS requirements according to section 92 to section 102 of UL 1741:2021 Ed.3, R 05 23 and section 5 of CSA C22.2 No.330-17, after installed with equipment below together:
- PVRSE by ALTENERGY, consisted of shutdown device model RSD-D-15-1500 and transmitter model Transmitter-PLC-1P, certified according to UL 1741 / CSA C22.2 No.330 (CSA certificate: 70218631).
- PVRSE by TIGO, consisted of shutdown device model TS4-A-2F and transmitter model RSS Transmitter Din Rail, Single Core, certified according to UL 1741 / CSA C22.2 No.330 (UL certificate: E469960).

Appendix: 1, 1-168

Date of issue: 2025-06-17 (yr/mo/day)

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C US

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9. Appendix

9.6 Data Collection & Storage

In order to improve our products and provide you with higher quality services, this device has a built-in data logging module for collecting relevant information during operation (such as power generation data, fault data)

Commitment:

1. We will only collect, use and process your device information for the purpose of improving our products and services.
2. We will take all reasonable and feasible measures to ensure that no irrelevant information is collected and we will protect your device information.
3. We will not share, transfer or disclose the collected device information with any company, organization or individual.
4. When we stop operating products or services, we will stop collecting information from your devices.
   information in a timely manner.
5. If you do not want to provide such information, you can notify our company to turn off this function, which will not affect your normal use of other functions of the product.

Solis USA
Tel: +1(866)438-8408
Email: usservice@solisinverters.com
Web: www.solisinverters.com/us

If you encounter any problems with the inverter, please take note of the inverter serial number and then contact us using the phone number or email listed above.

Compliant with CA Rule 21 & HECO Rule 14H
Certified to UL 1741 SA and UL 1741 SB
Certified to UL Std. No. 1741-Second Edition
& CSA-C22.2 No.107.1-16