



Hybrid Parity (Super) Inverter



INSTALLER MANUAL

3.6kW/5.5kW/8.8kW PLUS PARALLEL VERSION

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3.6kW / 5.5kW



8.8kW

1. SAFETY



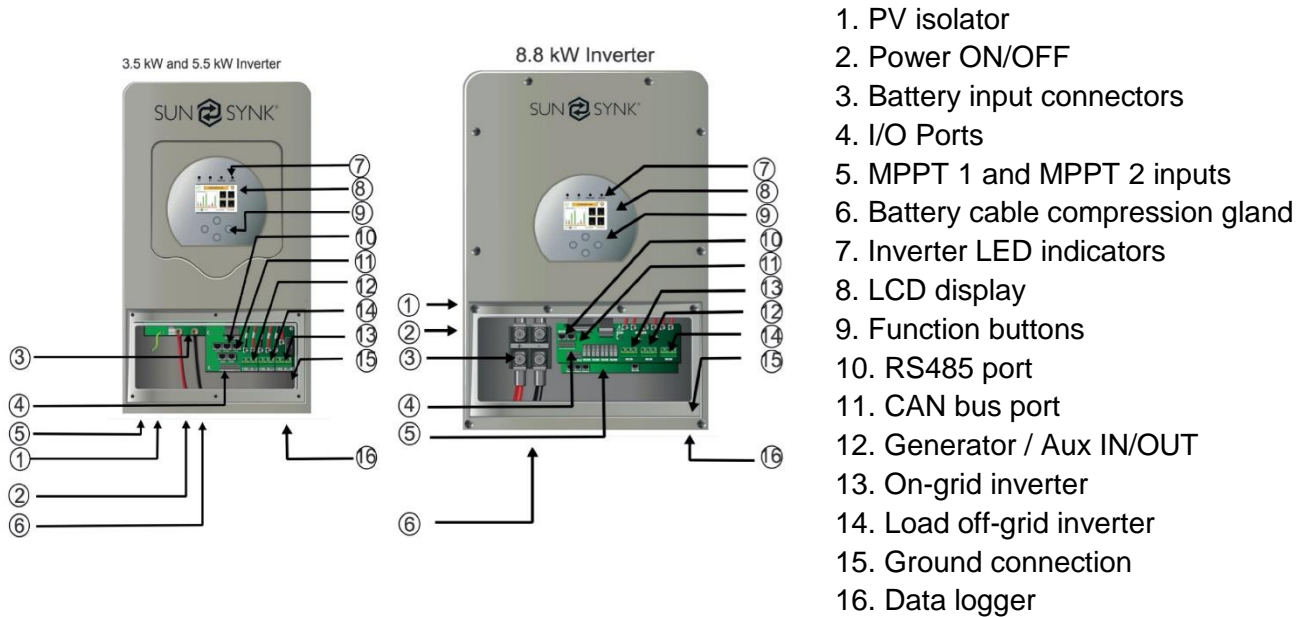
CAUTION

WARNING !!! HIGH LIFE RISK DUE TO FIRE OR ELECTROCUTION.

The Sunsynk Parity Hybrid Inverter can only be installed by a qualified licensed electrical contractor. This is not a DIY product.

- Be sure to read this manual thoroughly before installation.
Do not attempt to install the inverter by yourself. Installation work must be performed following national wiring standards by authorized personnel only. Do not turn on the power until all installation work is complete.
- Always use an individual power supply line protected by a circuit breaker and operating on all wires with a distance between contacts of at least 3mm for this unit.
- The unit must be correctly grounded and the supply line must be equipped with a suitable breaker and RCD to protect people.
- The unit is not explosion-proof, so it should not be installed in an explosive atmosphere.
- Never touch electrical components immediately after the power supply has been turned off since the system can still have residual energy, so electric shock may occur. Therefore, after turning off the power, always wait 5 minutes before touching electrical components.
- This unit contains no user-serviceable parts. Always consult an authorized contractor for repairs.

1.1. System Overview



The Sunsynk Hybrid Parity Inverter is a highly efficient power management tool that allows the user to hit those 'parity' targets by managing power flow from multiple sources such as solar, main electrical grids, and generator, and then effectively storing and releasing electric power as the utilities require.

INTERACTIVE

- Easy and simple to understand display
- Supporting Wi-Fi or GSM monitoring
- Visual power flow screen
- Built-in 2 strings of MPP trackers
- Smart settable 3-stage MPPT charging for optimized battery performance
- Auxiliary load function
- Parallel / multi invert function grid-tied and off-grid

COMPATIBLE

- Compatible with main electrical grid voltages or power generators
- Compatible with wind turbines
- 220V single phase, pure sinewave inverter
- Self-consumption and feed-in to the grid
- Auto restart while AC is recovering
- Auto earth bond feature (Via a relay)

CONFIGURABLE

- Fully programmable controller
- Programmable supply priority for battery or grid
- Programmable multiple operation modes: on-grid/off-grid & UPS
- Configurable battery charging - current/voltage based on applications by LCD setting
- Configurable AC / solar / generator charger priority by LCD setting

SECURE

- Overload/over-temperature/short-circuit protection
- Smart battery charger design for optimized battery protection
- Limiting function installed to prevent excess power overflow to grid

APPLICATIONS

- Marine (vessel power management)
- Power shedding (home/office/factory)
- UPS (fuel-saving systems)
- Remote locations with solar and wind generators
- Building sites
- Military locations
- Telecommunication

2. TECHNICAL SPECIFICATION

■ SUN-3.6K-SG01/03LP1-EU and SUN-5K-SG01/03LP1-EU

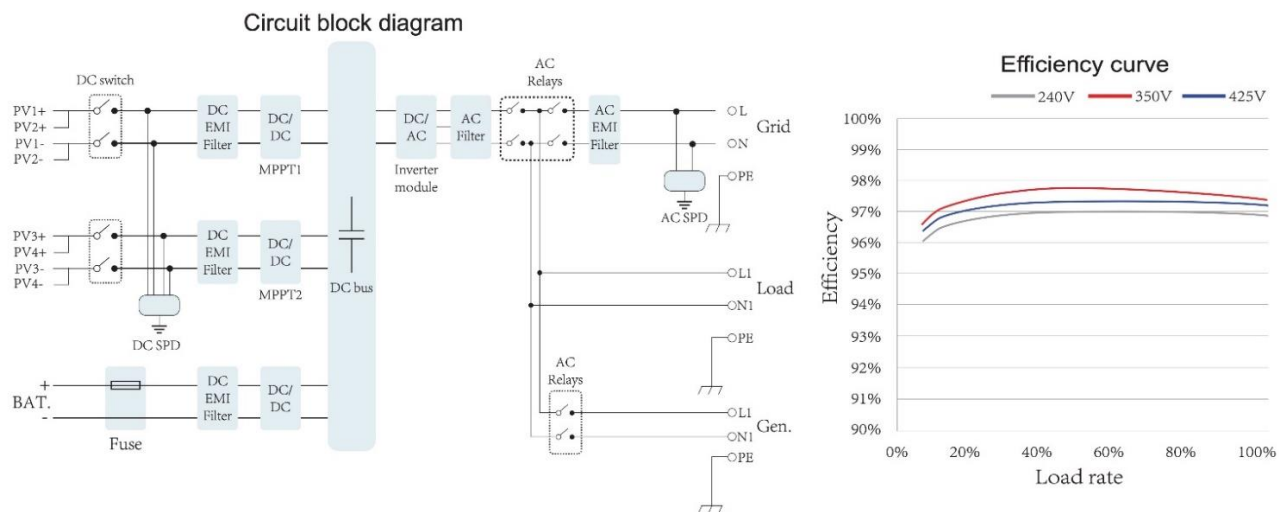
Model	SUN-3.6K-SG01/03LP1-EU	SUN-5K-SG01/03LP1-EU
Battery Input Data		
Battery Type	Lead-acid or Lithium-ion	
Battery Voltage Range (V)	40~60V	
Max. Charging Current (A)	90A	120A
Max. Discharging Current (A)	90A	120A
Charging Curve	3 Stages/Equalisation	
External Temperature Sensor	Optional	
Charging Strategy for Li-Ion Battery	Self-Adaptation to BMS	
PV String Input Data		
Max. DC Input Power (W)	4680W	6500W
PV Input Voltage (V)	370V (100V~500V)	
MPPT Range (V)	125~425V	
Full Load DC Voltage Range (V)	240~425V	
Start-up Voltage (V)	150V	
PV Input Current (A)	11A+11A	
No. of MPPT Trackers	2	
No. of Strings Per MPPT Tracker	1+1	
AC Output Data		
Rated AC Output and UPS Power (W)	3600W	5000W
Max. AC Power (W)	3960W	5500W
Peak Power (off-grid)	2 times of rated power, 10 S	
AC Output Rated Current (A)	15.7A	21.7A
Max AC Output Current (A)	18A	25A
Max Continuous AC Passthrough (A)	35A	
Power Factor	0.8 leading to 0.8 lagging	
Output Frequency and Voltage	50/60Hz; 220/230/240Vac (single phase)	
Grid Type	Single Phase	
Current Harmonic Distortion	THD<3%(Linear load<1.5%)	
Efficiency		
Max. Efficiency	97.60%	
MPPT Efficiency	96.50%	
Euro Efficiency	99.90%	
Protection		
PV Input Lightning Protection	Integrated	
Anti-islanding Protection	Integrated	
PV String Input Reverse Polarity Protection	Integrated	
Insulation Resistor Detection	Integrated	
Residual Current Monitoring Unit	Integrated	
Output Over Current Protection	Integrated	
Output Shorted Protection	Integrated	
Output Over Voltage Protection	Integrated	
Certifications and Standards		
Grid Regulation	VDE 0126, AS4777, NRS2017, G98, G99, IEC61683, IEC62116, IEC61727, RD1699:2011, XP C15-712-3:2019-05	
Safety Regulation	IEC62109-1, IEC62109-2	
EMC	EN61000-6-1, EN61000-6-3	
General Data		
Operating Temperature Range (°C)	-25~60°C, >45°C Derating	
Cooling	Fan	
Noise (dB)	<30	
Communication with BMS	RS485; CAN	
Weight (kg)	20.5	
Size (Length x Width x Height)	580 x 330 x 208 mm	
Protection Degree	IP65	
Installation Style	Wall-mounted	
Warranty	5 years	

SUN-5K-SG01LP1-US, SUN-6K-SG01LP1-US, SUN-7.6K-SG01LP1-US/EU, SUN-8K-SG01LP1-US/EU

Model	SUN-5K- SG01LP1-US	SUN-6K- SG01LP1-US	SUN-7.6K- SG01LP1-US/EU	SUN-8K- SG01LP1-US/EU
Battery Input Data				
Battery Type	Lead-acid or Lithium-ion			
Battery Voltage Range (V)	40~60V			
Max. Charging Current (A)	120A	135A	190A	190A
Max. Discharging Current (A)	120A	135A	190A	190A
Charging Curve	3 Stages/Equalisation			
External Temperature Sensor	Optional			
Charging Strategy for Li-Ion Battery	Self-Adaptation to BMS			
PV String Input Data				
Max. DC Input Power (W)	6500W	7800W	9880W	10400W
PV Input Voltage (V)	370V (100V~500V)			
MPPT Range (V)	125~425V			
Start-up Voltage (V)	150V			
PV Input Current (A)	11A+11A	18A+9A	18A+18A	18A+18A
No. of MPPT Trackers	2			
No. of Strings Per MPPT Tracker	1+1	2+1	2+2	2+2
AC Output Data				
Rated AC Output and UPS Power (W)	5000W	6000W	7600W	8000W
Max. AC Power (W)	5500W	6600W	8360W	8800W
Peak Power (off-grid)	2 times of rated power, 10 S			
AC Output Rated Current (A)	20.8A	25A	31.7A/33A	33.4A/35A
Max AC Output Current (A)	24A	28.8A	36.4A/38A	38.3A/40A
Max Continuous AC Passthrough (A)	48A	80A	90A	90A
Output Frequency and Voltage	50/60Hz; 120/240Vac(split phase), 208Vac(2/3), 230Vac(single phase)			
Grid Type	Split phase, 2/3 phase, Single phase			
Current Harmonic Distortion	THD<3%(Linear load<1.5%)			
Efficiency				
Max. Efficiency	97.60%			
MPPT Efficiency	96.50%			
Euro Efficiency	99.90%			
Protection				
PV Arc Fault Detection	Integrated (Except European Type)			
PV Input Lightning Protection	Integrated			
Anti-islanding Protection	Integrated			
PV String Input Reverse Polarity Protection	Integrated			
Insulation Resistor Detection	Integrated			
Residual Current Monitoring Unit	Integrated			
Output Over Current Protection	Integrated			
Output Shorted Protection	Integrated			
Output Over Voltage Protection	Integrated			
Certifications and Standards				
Grid Regulation	UL1741, IEEE1547, RULE21, VDE0126, AS4777, NRS2017, G98,G99, IEC61683, IEC62116, IEC61727			
Safety Regulation	IEC62109-1, IEC62109-2			
EMC	EN61000-6-1, EN61000-6-3, FCC 15 Class B			
General Data				
Operating Temperature Range (°C)	-25~60°C, >45°C Derating			
Cooling	Fan			
Noise (dB)	<30			
Communication with BMS	RS485; CAN			

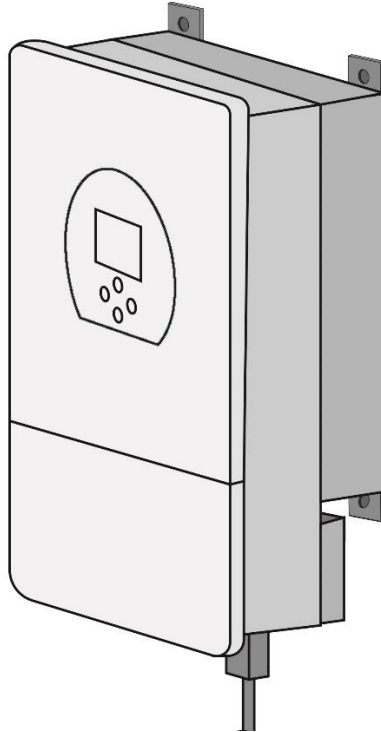
Weight (kg)	32
Size (Length x Width x Height)	670 x 420 x 233 mm
Protection Degree	IP65
Installation Style	Wall-mounted
Warranty	5 years

2.1. System Diagram



3. INSTALLATION

3.1. Selecting the mounting area



DO NOT install the inverter in the following areas:

- Areas with high salt content, such as the marine environment. It will deteriorate metal parts, causing the parts to fail or the unit to leak water.
- Areas filled with mineral oil or containing a large amount of splashed oil or steam, such as a kitchen. It will deteriorate plastic parts, causing the parts to fail or the unit to leak water.
- Areas that generates substances that adversely affect the equipment, such as sulfuric gas, chlorine gas, acid, or alkali. It will cause the copper pipes and brazed joints to corrode, which can cause refrigerant leakage.
- Areas that can cause combustible gas to leak, which contains suspended carbon-fiber or flammable dust, or volatile inflammable such as paint thinner or gasoline.
- Areas where there may be gas leaks and settles around the unit. It can cause fires.
- Areas where animals may urinate on the unit or ammonia may be generated.
- High altitude areas above 2000 meters above sea level.
- Environments where precipitation or humidity are above 95%
- Areas where the air circulation is too low.

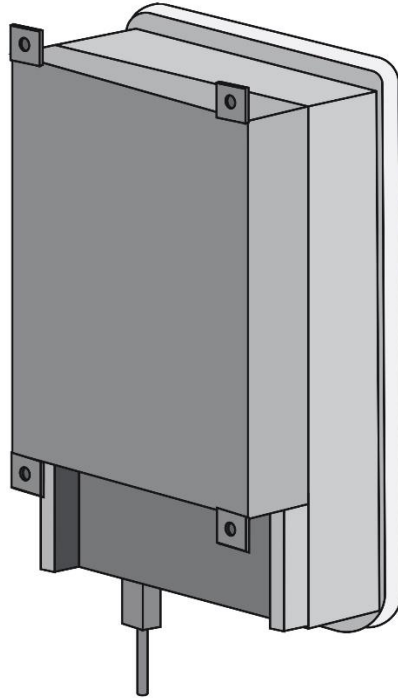
ALSO CONSIDER:

- Install the indoor unit, outdoor unit, power supply cable, transmission cable, and remote control cable at least 1m away from a television or radio receivers. This will prevent TV reception interference or

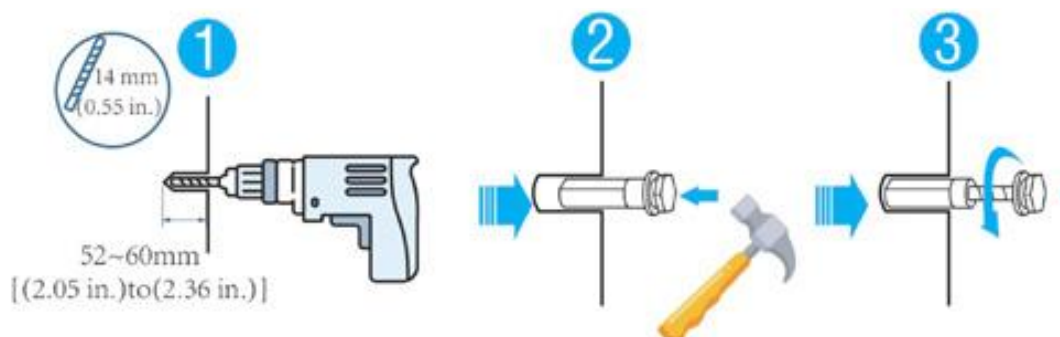
radio noise. Even if they are installed more than 1m apart, it is still possible to receive noise under some signal conditions.

- If children under 10 years old may approach the unit, take preventive measures so that they cannot reach and touch the unit.
- Install the indoor unit on the wall where the height from the floors is higher than 1600mm.

3.2. Mounting the inverter



- Select installation locations that adequate to support the weight of the converter.
- Install this inverter at eye-level to allow the LCD to be read anytime.
- An appropriate ambient temperature is between -25 ~ 60°C to ensure optimal operation.
- Be sure to keep other objects and surfaces as shown in the figure to guarantee sufficient heat dissipation and have enough space to remove wires.
- For proper air circulation to dissipate heat, allow a clearance of approximately 50cm to the side.



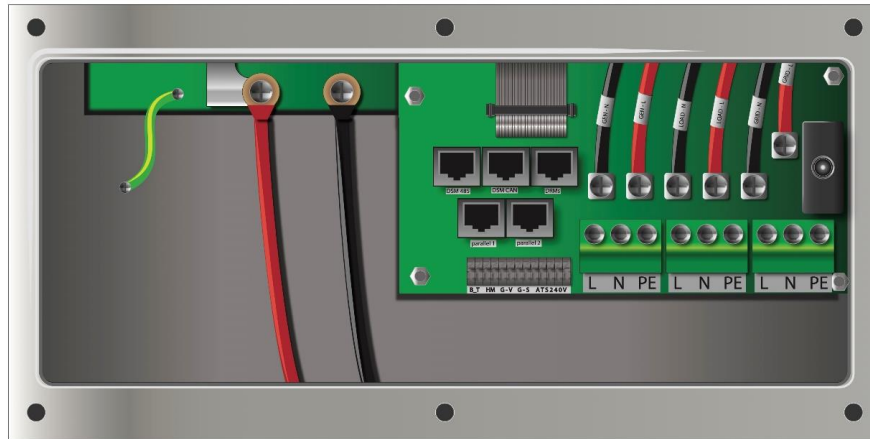


Risk of injury when lifting and from falling inverter

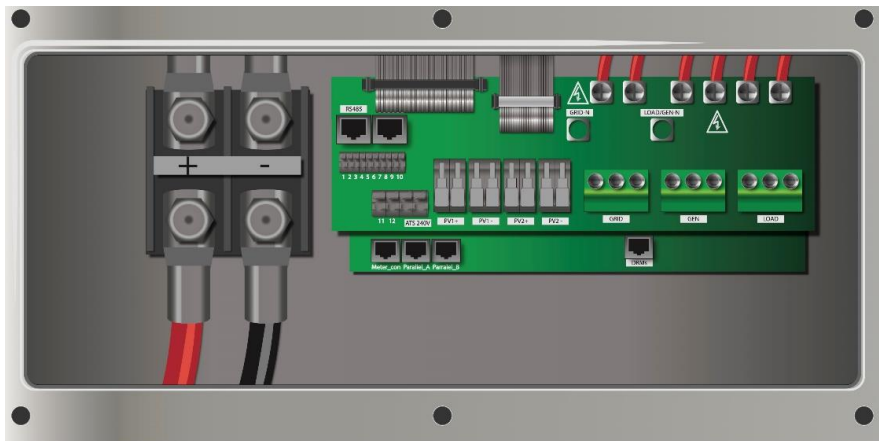
Remember that this inverter is heavy (See section 2 “Technical Data”)! Please be careful when removing the inverter from the packaging and mounting it onto the wall.

3.3. Battery Connection

■ Battery connection of the 3.6kW/5.5kW model



■ Battery connection of the 8kW model



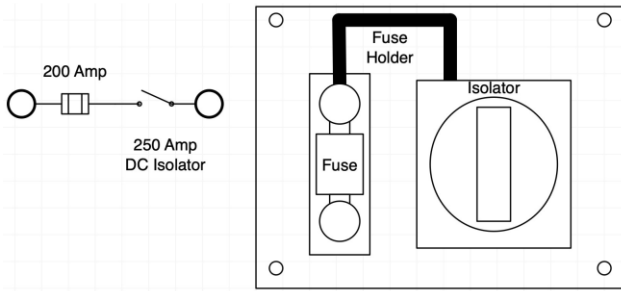
For safe operation and compliance, an individual DC overcurrent protector or disconnection device is required for the connection of the battery and the inverter. It is recommended to utilize a suitable fuse and DC isolator (see next page). In some applications, switching devices may not be required but overcurrent protectors are still required.

A minimum battery cable size of 35mm diameter and 50mm diameter is recommended for the 5.5 kW and 8.8kW inverter, respectively.

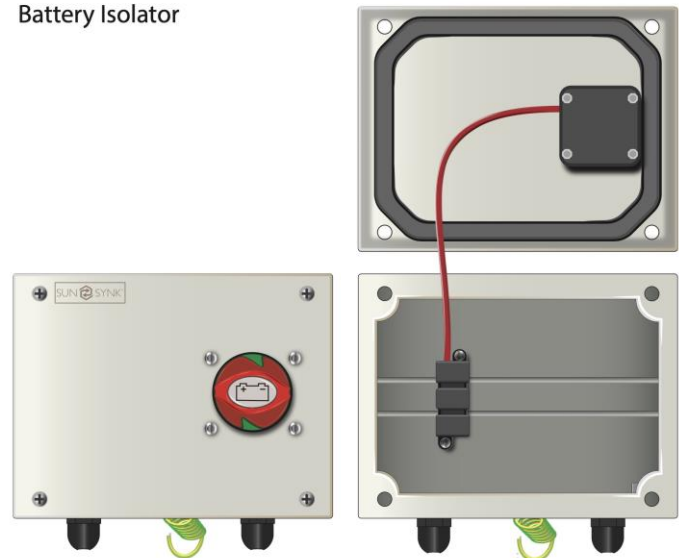
CAUTION

Before making the final DC connection or closing the DC breaker/disconnection device, ensure that the inverter is wired properly. Reverse polarity connection on the battery will damage the inverter.

Recommended DC Surge Protector:



Battery Isolator



3.3.1 Connecting a Lithium Battery

When connecting a Lithium battery, follow the connection steps bellow and then check section 4.13 "Setting Up a Lithium Battery" for setting it up in the inverter:

1. Connect a properly power cable following the battery manufacturer specification and recommend safety devices.
2. Connect communication cable properly following the battery manufacturer specification.
3. Connect to the inverter correctly.



3.4. AC Connection – Single Inverter or Multi Inverter System



CAUTION

All wiring and cable sizing must be following the country wiring regulations and code of practices.

NOTES

- Depending on the battery type, the inverter should be capable of controlling the batteries BMS. Therefore, you need to set the protocol of the BMS on both the battery and the inverter.
- WHEN USING MORE THAN ONE BATTERY, THE FIRST BATTERY WILL BE THE MASTER, AND THE OTHER BATTERIES WILL BE THE SLAVES. PLEASE, CHECK THE BATTERY MANUFACTURER SPECIFICATION FOR PROPER OPERATION.
- To verify if the battery is actually communicating access the Li BMS menu as detailed in section 4.13 “Setting Up a Lithium Battery” and check whether the values are realistic or not. It is important that the charge and discharge limits in that page match the numbers expected for the number of batteries physically connected.

■ Bottom view of the 3.6kW/5.5kW model

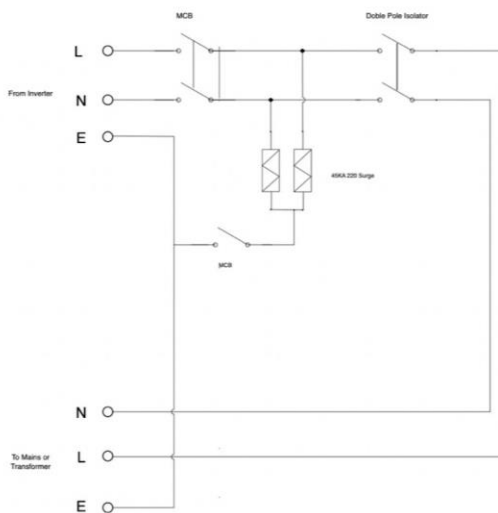


■ Bottom view of the 8kW model

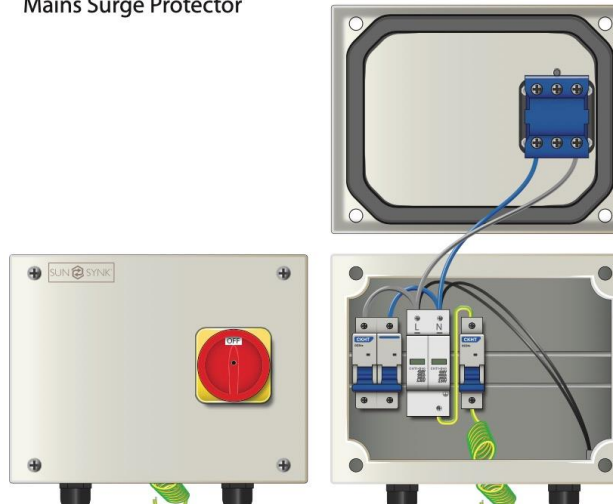


GEN/AUX	Connection for a generator
GRID	This works like a conventional grid-tied inverter. It is both an in and out connection for non-essential load and supply
LOAD	Connection of essential loads such as lighting, security systems, and internet

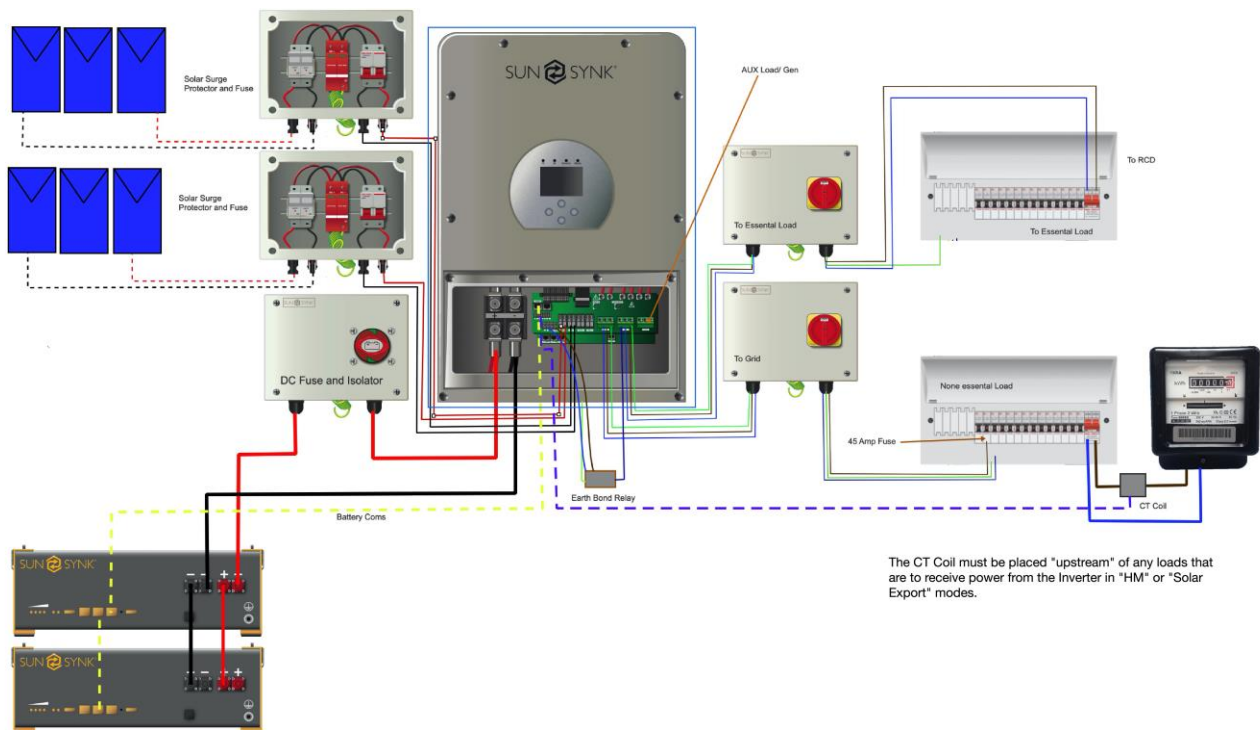
■ Recommended AC Surge Protector



Mains Surge Protector

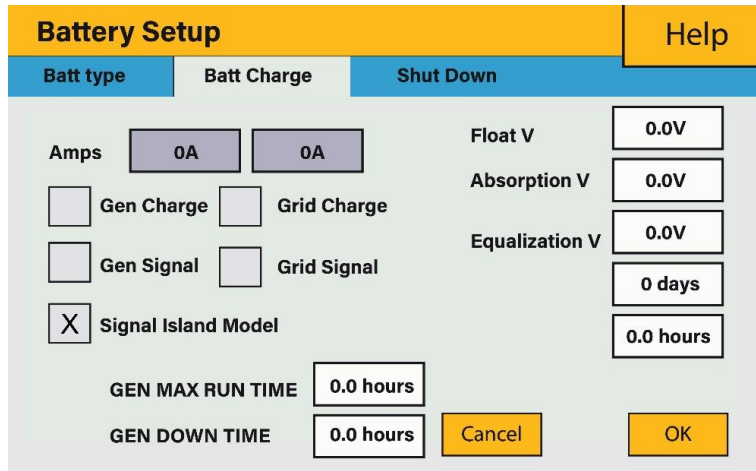


Please ensure you use suitable protection devices. Switchgear and fuses must be following the local wiring standards. A figure of the complete system is presented below.



If an earth bond is required between neutral and earth and your system is a hybrid system then you can have a permanent earth wire since this can cause faults with an RCD before the inverter.

Since the inverter is a true hybrid then the bond must only be made when the inverter is operating in Islanding Mode. To accommodate this, Sunsynk provides an AC output, which is connected to the A/T/S connections whenever the inverter is running on Island Mode. Therefore, you can simply connect the coil of an AC relay to the ATS 240 connections. Next, you need to select Signal Island Mode on the battery charge menu (click on the gear icon -> battery icon), as shown in the figure below.



Battery Setup		Help		
Batt type	Batt Charge	Shut Down		
Amps	0A	0A	Float V	0.0V
<input type="checkbox"/> Gen Charge	<input type="checkbox"/> Grid Charge	Absorption V	0.0V	
<input type="checkbox"/> Gen Signal	<input type="checkbox"/> Grid Signal	Equalization V	0.0V	
<input checked="" type="checkbox"/> Signal Island Model			0 days	
			0.0 hours	
GEN MAX RUN TIME	0.0 hours			
GEN DOWN TIME	0.0 hours	Cancel		OK

NOTE

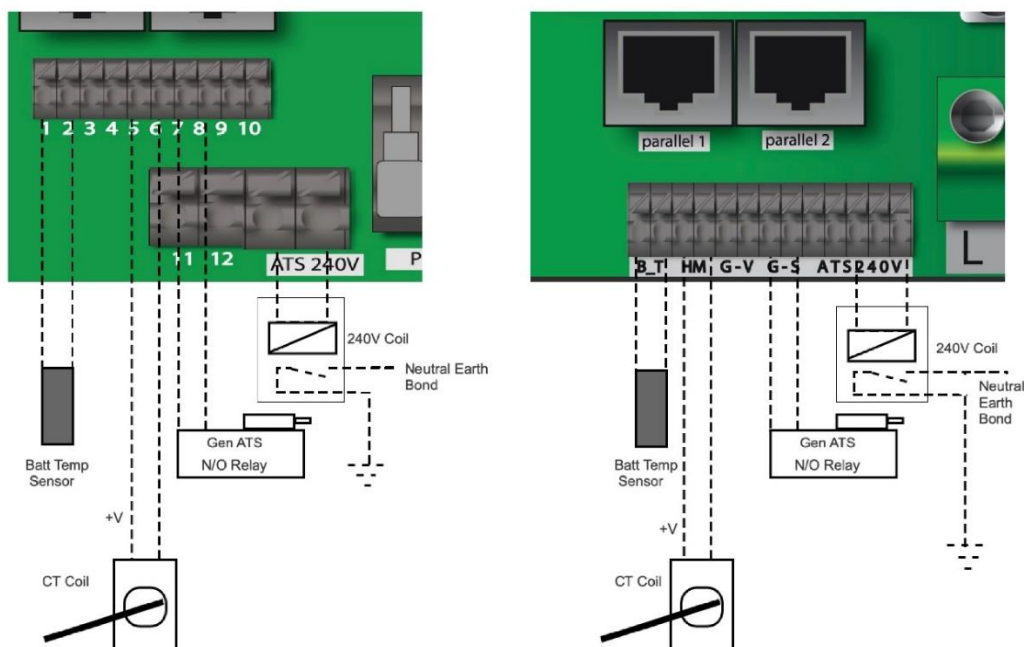
The grid may still be present, but the inverter is not draining power from it since the unit is working in Island Mode.

You can test that there is a voltage when the inverter is disconnected from the grid by using a simple multimeter.

3.5. Installing the CT Coil

The CT coil is one of the most important parts of the Sunsynk Parity inverter. This device reduces the power of the inverter to prevent feeding power to the grid. This feature is also known as "Zero Export".

- Fit the coil (sensor) around the live cable on the main fuse feeding the building and run the cable back to the inverter. This cable can be extended up to an extra 10m using a similar cable.
- Connect the other end of the CT coil into the inverter terminals marked as CT coil



IMPORTANT !!!

See below for information to determine if the CT coil is connected the correct way around:

1. First of all, ensure that the CT is measuring some power flowing into the house/inverter by switching off the "Time Of Use" setting and disconnecting the PV panels.
2. Next, click on the "Battery Gauge", (5) to show the "System Status" screen below.
3. Ensure that the "CT" or "HM" power value is positive and in black color. If it shows a negative value then either turn the CT coil 180° or swap the CT coil wires around where they connect to the inverter.

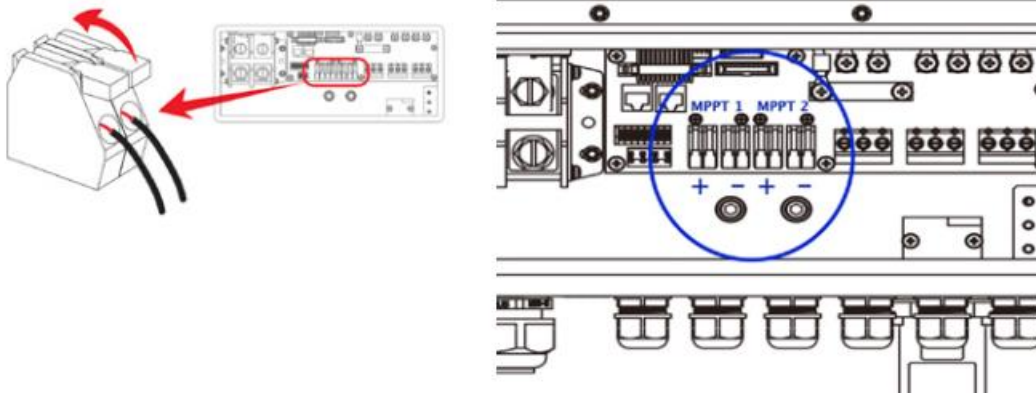
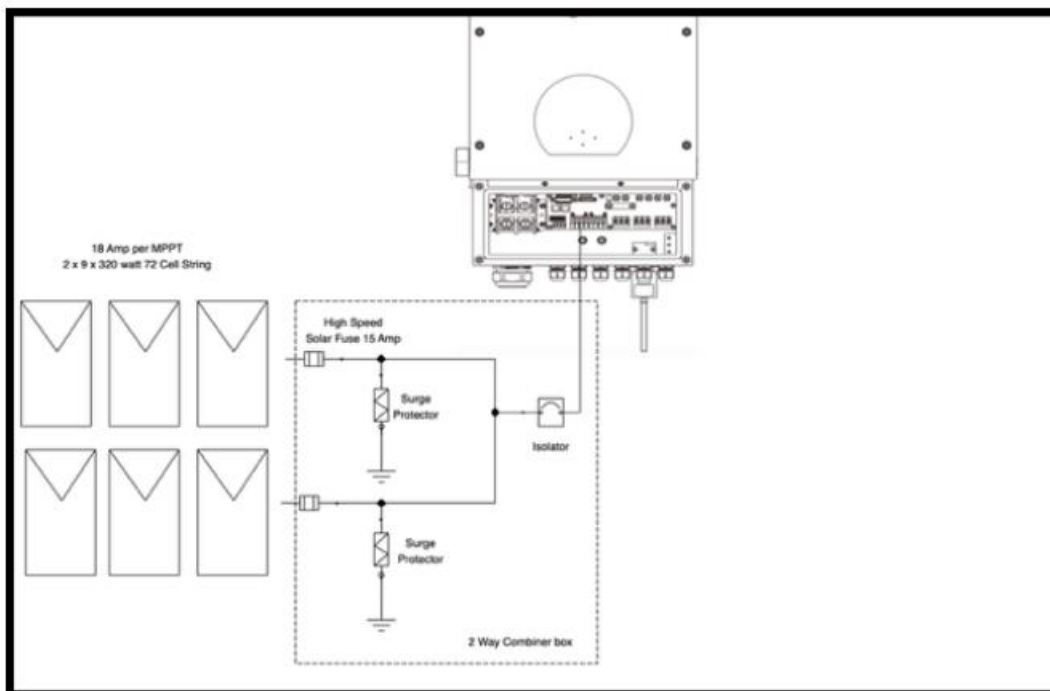
0 Watts 0.00 V 0.00 Amps 0.0 C	0 watts 0 Hz 0 Volts 0.0 Amps CT:0Watts LD: 0Watts	0 Watts 0.00 Volts 0.0 Amps
Battery	Grid Power	Solar Power 1
0 watts 0 Hz 0 Volts 0.0 Amps DC:100.0 C AC:100.0 C	0 Watts 0.00 Volts 0.0 Amps	0 Watts 0.00 Volts 0.0 Amps
Inverter Power	Load Power	Solar Power 2

IMPORTANT !!!

If the CT coil is fitted in the wrong way then this variable will have negative instead of positive values when the power is flowing into the house/inverter. Also, the inverter export limiting function will not work properly.

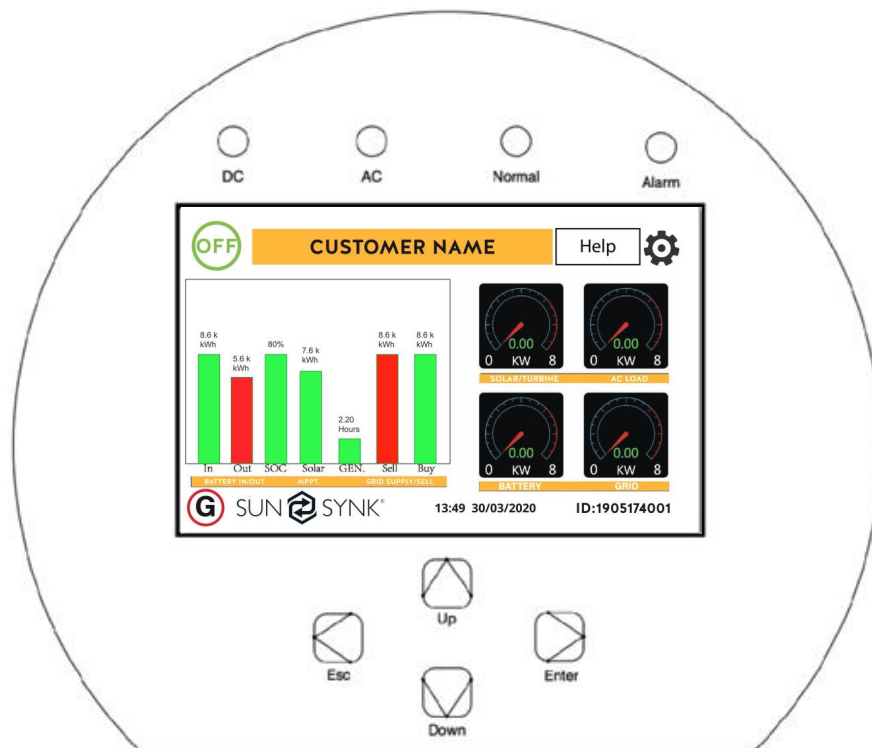
3.5. Connecting the PV

- The inverter has two built-in MPPT controllers, MPPT 1 and MPPT 2, which can connect two arrays of photovoltaic panels in parallel with a maximum current of 18 Amp (as shown below).
- Before connecting to PV modules, install a separate DC circuit breaker between the inverter and PV modules.
- To avoid any malfunction, do not connect any PV modules with possible current leakage to the inverter. For example, grounded PV modules will cause current leakage to the inverter. Open-circuit voltage (Voc) of PV modules does not exceed max. PV array open-circuit voltage open-circuit voltage (Voc) of PV modules should be higher than min. start voltage.



4. OPERATION

4.1. Display



LED indicator		Meaning
DC	Green LED solid light	PV connection normal
AC	Green LED solid light	Grid connection normal
Normal	Green LED solid light	Inverter functioning normally
Alarm	Red LED solid light	Fault

Function Key	Description
Esc	To exit the previous mode
Up	Increase the value of a setting
Down	Decrease the value of a setting
Enter	Confirm setting change (If not pressed each time the setting will not be saved)

4.2. Switching ON/OFF

Once the inverter has been properly installed and the batteries are connected, press the on/off button (located on the left side of the case) to turn-on the system.

When the system is connected without a battery but connected with either PV or grid and the on/off button is switched off, the LCD will still light up (display will show off). In this condition, when switching on the on/off button and selecting no battery, the system can still work.

4.3. Home Page

Press Esc button any page to access the home page:



What this page displays:

- Total daily power into the battery (kWh).
- Total daily power out of the battery (kWh).
- SOC (State of charge of the battery) (%).
- Total daily solar power produced in (kWh).
- Total hourly usage of the generator (Time).
- Total daily power sold to the grid (kWh).
- Total daily power bought from the grid (kWh).
- Real-time solar power in (kW).
- Real-time load power in (kW).
- Real-time battery charge power in (kW).
- Real-time grid power in (kW).
- Serial number.
- Time date.
- Fault condition.
- Access stats pages.
- Access status page.
- Access fault diagnostic page.

4.4. Status Page

To access the Status page, click on the “Battery” or “AC Load” dial on the Home page.

What this page displays:

- Total solar power produced
- MPPT 1 power/voltage/current
- MPPT 2 power/voltage/current
- Grid power
- Grid frequency
- Grid voltage
- Grid current
- Inverter power
- Inverter frequency
- Inverter voltage
- Inverter current
- Load power
- Load voltage
- Battery power charge/discharge
- Battery SOC
- Battery voltage
- Battery current
- Battery temperature

0 Watts 0.00 V 0.00 Amps 0.0 C	0 watts 0 Hz 0 Volts 0.0 Amps CT:0Watts LD: 0Watts	0 Watts 0.00 Volts 0.0 Amps
Battery	Grid Power	Solar Power 1
0 watts 0 Hz 0 Volts 0.0 Amps DC:100.0 C AC:100.0 C	0 Watts 0.00 Volts 0.0 Amps	0 Watts 0.00 Volts 0.0 Amps
Inverter Power	Load Power	Solar Power 2

Solar Column: Shows total PV power at the top and then details of each of the two MPPT’s below L1 & L2 voltage.

Grid Column: Shows grid total power, frequency, voltage, and current. When selling to grid the power is negative. When receiving from the grid the power is positive. If the sign of the grid and HM powers are not the same when the PV is disconnected and the inverter is only taking energy from the grid and using the HM CT connected to Limit-2 then please reverse the polarity of the HM current sensor. **Important:** See section on CT coil.

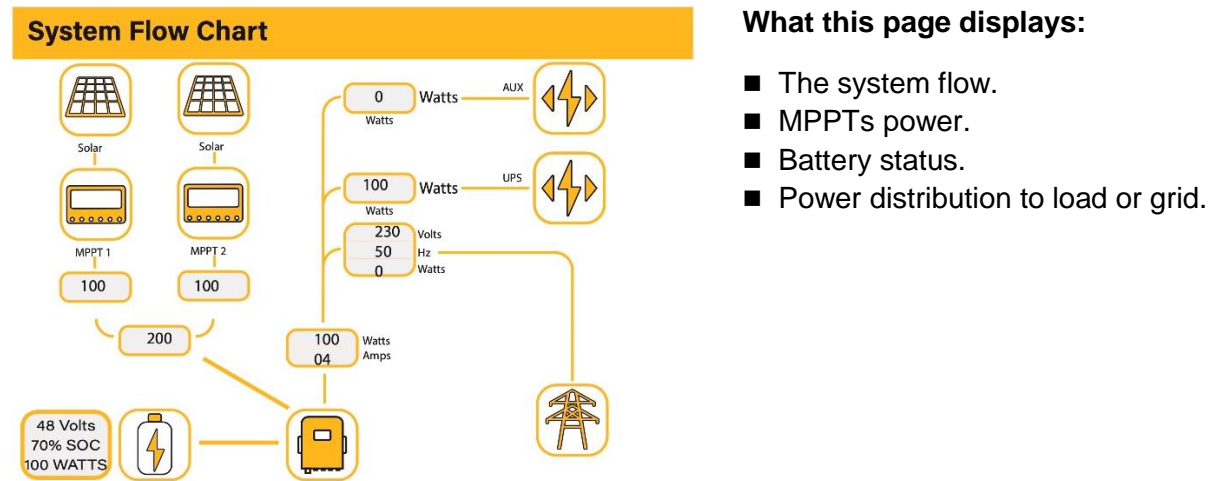
Inverter Column: Showing inverter total power, frequency, L1, L2, voltage, current, and power.

Load Column: Showing total load power, load voltage, and power on L1 and L2.

Battery Column: Showing total power from the battery, battery SOC, battery voltage, battery current (negative means charge, positive means discharge) battery temperature (shows zero if the battery temperature sensor is not connected). DC transformer temperature and AC heatsink temperature (When the temperature reaches 90°C it will show in red and start deteriorating when it reaches 110°C. Next, the inverter will shut down to allow it to cool and reduce its temperature.

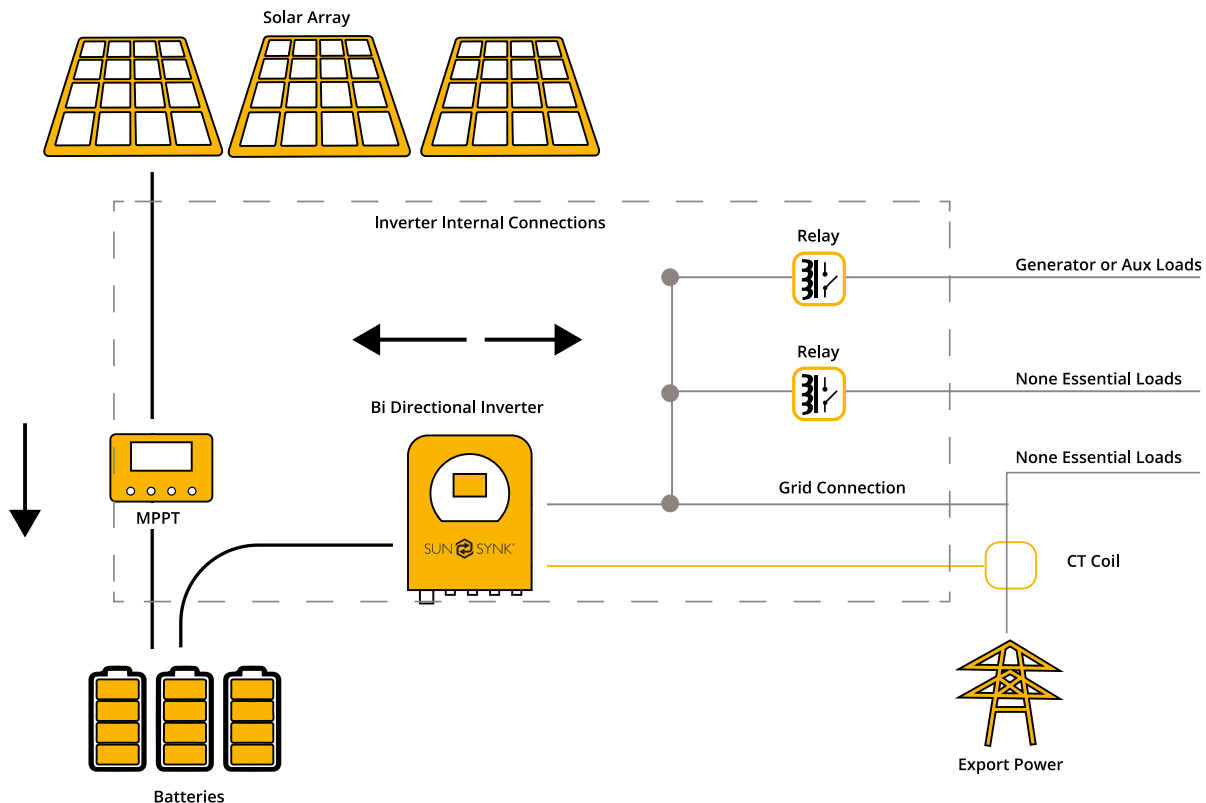
4.5. System Flow Page

Access by clicking on the “Bar Chart ” on the home page



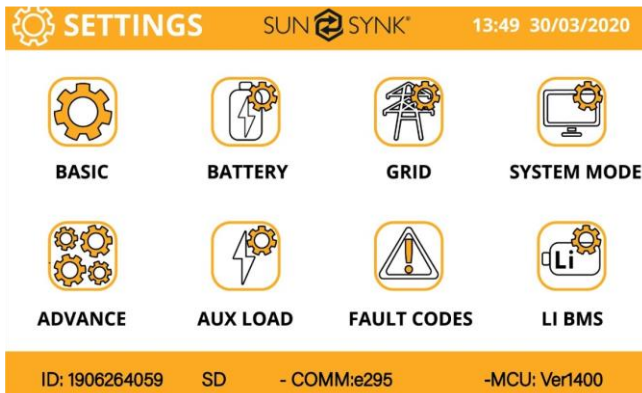
To better understand the functioning of your system, take a look at the figure bellow:

1. The PV modules charge the batteries.
2. When the batteries reach a specific level (programmable) the battery power is fed into the inverter.
3. The inverter can then supply power to the grid (export or no export), load, and auxiliary or smart load.
4. CT coil controls the export power.



4.6. Setup Page

To access the Setup page click on the gear icon on the right top of the navigation menu.



What this page displays:

- Serial number.
- Software version.
- Time, Date, and MCU.

What you can do from this page:

- Access the real-time programmable timer/system mode (press system mode).
- Access the advanced settings such as paralleling and wind turbine (press advanced).
- Access the auxiliary load/smart load settings (press aux load).
- Access the fault code register (press fault codes).
- Set up Li BMS (press Li BMS).

- Access the basic setup page (press basic setup).
- Access the battery setup page (press battery setup).

4.7. Set Time (Clock)

To set time click on the “Basic” icon and then on “Time”.

What this page displays:

- Time.
- Date.
- AM/PM.

What you can do from this page:

- Adjust / set time.
- Adjust / set date.
- Adjust / set AM/PM.

How to set up (step-by-step):

1. Touch the screen on the variable that you want to change.
2. Change the number up and down using the up and down buttons.
3. Press OK to set the changes.

4.8. Set Company Name / Beeper / Auto dim

To set company name click on the “Basic” icon and then on “Display”.

Basic Setup Help

Time Display Reset

Set Company name

MY COMPANY

Cancel

OK

ABCEFGHIJKLMNOPQRSTUVWXYZ1234567890.-

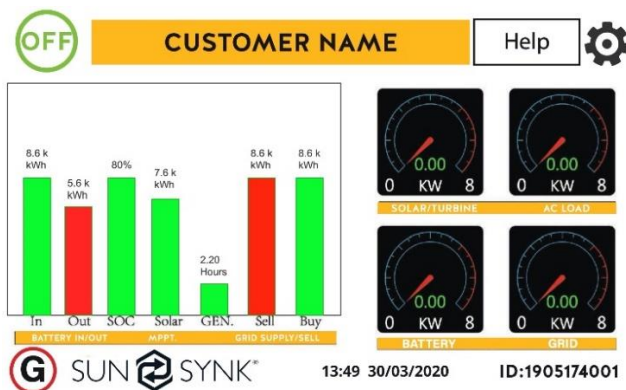
Beeper On / Off ☐ Auto Dim Sec ☐

What this page displays:

- Beeper status (ON/OFF).
- Installers names.

What you can do from this page:

- Set up your company name.
- Switch the beeper ON or OFF.
- Set the LCD backlight to auto dim.



How to change the company name:

Change the letters in each box by moving the arrows up and down and then select ok. This will change the name on the home screen.

Basic Setup Help

Time Display Reset

Set Company name

MY COMPANY

Cancel

OK

ABCEFGHIJKLMNOPQRSTUVWXYZ1234567890.-

Beeper On / Off ☐ Auto Dim Sec ☐

How set the auto dim

Set a number in the auto dim box to dim the LEO after a number of seconds.

How to activate / deactivate the beep:

Mark or unmark the beep box and the press OK to configure it as you prefer.

4.9. Factory reset and Lock Code

To set time click on the “Basic” icon and then on “Reset”.

What this page displays:

- Reset status.
- Whether lock code is used or not.

What you can do from this page:

- Reset the inverter to the factory settings.
- System diagnostics.
- Change or set lock code.

Factory Reset: Reset all parameters of the inverter

Lock out all changes: Enable this menu for setting parameters that require locking and cannot be reset.

*Before performing a successful factory reset and locking the systems, to keep all changes you need to type in a password to enable the setting. The password for factory settings is 9999 and for lock out is 7777.

System self-check: Makes a diagnosis of the system.

Test mode (only for engineers): Performs tests.

4.10. Battery Setup Home Page

To configure battery settings click on the “Battery” icon and then on “Batt type”.

What this page displays:

- Battery capacity in (Ah) Min. AGM battery 200Ah.
- Min. Lithium batt 100Ah.
- Max battery charge current (Amps).
- Max battery discharge current (Amps), which should be 20% of the Ah rating for AGM only. For Lithium, please refer to the battery manufacturer documentation. **Note:** This is a global max. discharge current for both "grid-tied" and "backup" modes of operation and if the current exceeds this value inverter will shut down with an overload fault.
- TEMPCO settings - Temperature coefficient "the error introduced by a change in temperature."

What you can do from this page:

- Use battery voltage for all settings (V).

- Use battery SOC for all settings (%).
- No battery: tick this box if no battery is connected to the system.
- BMS setting.
- Active battery - This feature will help recover a battery that is 100% discharged by slowly changing from the solar array. Until the battery reaches a point where it can charge normally.

IMPORTANT TO PROTECT YOUR BATTERY AND INVERTER

200Ah AGM battery max. charge/discharge current 40Amps
 400Ah AGM battery max. charge/discharge current 80Amps
 100Ah AGM battery max. charge/discharge current 75Amps
 200Ah AGM battery max. charge/discharge current 100Amps

4.11. Generator and Battery Page

To configure battery charging settings click on the “Battery” icon and then on “Batt Charge”.

The screenshot shows the 'Battery Setup' page with tabs for 'Batt type', 'Batt Charge', and 'Shut Down'. The 'Batt Charge' tab is active. It contains several input fields and checkboxes:

- Amps:** Two dropdown menus, both set to '0A'.
- Gen Charge:** A checkbox.
- Grid Charge:** A checkbox.
- Gen Signal:** A checkbox.
- Grid Signal:** A checkbox.
- Signal Island Model:** A checkbox.
- GEN MAX RUN TIME:** A dropdown menu set to '0.0 hours'.
- GEN DOWN TIME:** A dropdown menu set to '0.0 hours'.
- Float V:** A dropdown menu set to '0.0V'.
- Absorption V:** A dropdown menu set to '0.0V'.
- Equalization V:** A dropdown menu set to '0.0V'.
- Equalization Time:** A dropdown menu set to '0 days'.
- Equalization Hours:** A dropdown menu set to '0.0 hours'.

At the bottom right, there are 'Cancel' and 'OK' buttons.

What you can do from this page:

- Generator start voltage/or SOC %.
- Grid power start voltage/or SOC %.
- Float is for AGM battery 55.20V.
- Absorption is for AGM battery 57.60V.
- Float V is the voltage at which a battery is maintained after being fully charged.
- Absorption V the level of charge that can be applied without overheating the battery.
- Equalization V 58.80.
- Equalizing charge/overcharge to remove sulfate crystals that build-up on the plates over time on lead-acid batteries.

What you can do from this page:

- Tick Gen Charge to charge the batteries from the gen I/P.
- Tick Grid Charge to charge the batteries from the grid I/P.
- Tick Gen Charge signal to auto-switch a relay box.
- Tick Grid Charge signal to auto-switch a relay box.

IMPORTANT

Do not run this too often since it will damage the battery.

4.12. Battery Discharge Page

To configure inverter shutdown settings click on the “Battery” icon and then on “Shut Down”.

Battery Setup		Help
Batt type	Batt Charge	Shut Down
Shutdown	41.0V	
Low Batt	45.0V	
Restart	52.0V	
<div>Cancel</div> <div>OK</div>		

What this page displays:

- Inverter shut down the voltage as a voltage or %
- Inverter low battery warning voltage or %
- Restart voltage as a voltage or %

What you can do from this page:

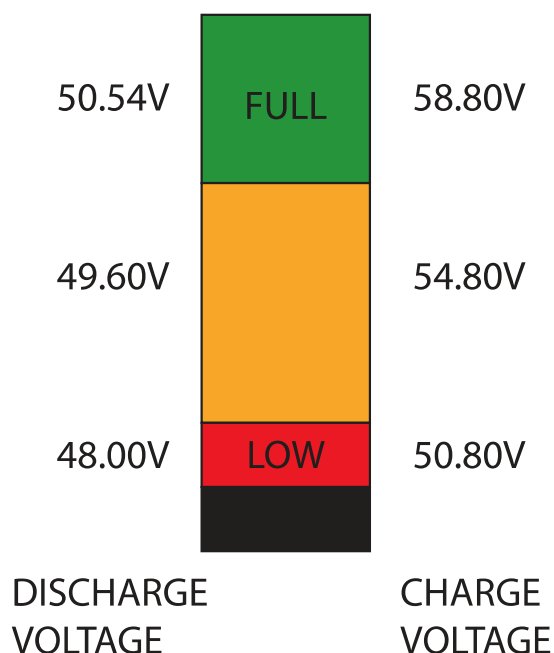
- Adjust battery shut down (voltage or %)
- Adjust low battery warning (voltage or %)
- Adjust restart (voltage or %)

NOTE

Shutdown causes the inverter to enter standby mode. It will not completely shut down the inverter. The total shutdown is below 19V.

The voltage displayed on the Sunsynk Parity Inverter will vary depending on whether the inverter is charging or discharging the batteries.

SUNSYNK PARITY INVERTER CHARGE VOLTAGE



Since the batteries are 48V the figure on the left is x4:

- Fully Charged 50.54V (Discharge Mode)
- Fully Charged 58.50V (Charge Mode)
- 75% Charged 49.60V (Discharge Mode)
- 75% Charged 54.80V (Charge Mode)
- 25% Charged 48.00V (Discharge Mode)
- 25% Charged 50.80V (Charge Mode)
- Completely Discharged 47.50V

Setting the cut-off higher is better for the batteries.

The batteries normally used in the recommended Sunsynk systems are AGM lead acid or lithium battery bank. ('AGM' The Absorbed Glass Matt construction allows the electrolyte to be suspended near the plate's active material. In theory, this enhances both the discharge and recharge efficiency.)

State of Charge

Bulk: Involves about 80% of the recharge in which the charger current is held constant (in a constant current charger), and voltage increases. The properly sized charger will give the battery as much current as it will accept up to charger capacity (25% of battery capacity in Amp hours)

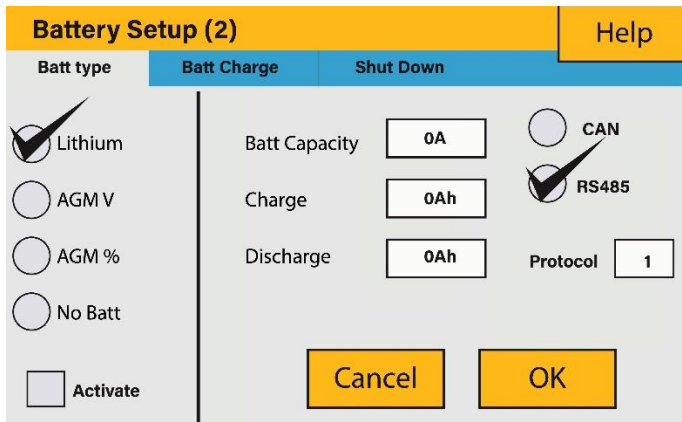
Absorption: Remaining charge equals 20%, approximately. It makes the charger to hold the voltage at the charger's absorption voltage (between 14.1 VDC and 14.8 VDC, depending on charger set points) and decreasing the current until the battery is fully charged.

Float: The charging voltage is reduced to between 13.0 VDC and 13.8 VDC and held constant, while the current is reduced to less than 1% of battery capacity. This mode can be used to maintain a fully charged battery indefinitely.

Equalisation: This is essentially a controlled overcharge (the peak voltage the charger) that attains at the end of the BULK mode (absorption voltage) an equalisation voltage, but technically it's not. Higher capacity wet (flooded) batteries sometimes benefit from this procedure, particularly the physically tall batteries. The electrolyte in a wet battery can stratify over time, if not cycled occasionally. In equalisation, the voltage is brought up above typical peak charging voltage well into the gassing stage and maintained for a fixed (but limited) period. This stirs up the chemistry in the entire battery, "equalising" the strength of the electrolyte, and knocking off any loose sulfating that may be on the battery plates.

4.13. Setting Up a Lithium Battery

To set up a Lithium battery click on the "Battery" icon.



What this page displays:

- This will only display if you select the Lithium battery in the battery option.
- They type of communion protocol.
- Approved batteries.

What you can do from this page:

- Set up your lithium battery.

After installing a lithium battery, check on the communications page by clicking on "Li BMS" icon to see if the BMS information is visible. If some information are not displayed correctly on the page as shown in the figures below, there is a communication error.

Li BMS Help ?	
Sum Data	Details Data
Mean Voltage:50.34V	Charging Voltage :53.2V
Total Current:55.00A	Discharging Voltage :47.0V
Mean Temp :23.5C	Charging current :50A
Total SOC :38%	Discharging current :25A
Dump Energy:57Ah	

Li BMS Help ?	
Sum Data	Details Data
Volt Curr Temp SOC Energy	Charge Fault
1 50.38V 19.70A 30.6C 52.0% 26.0Ah	0.0V 0.0A 0 0 0
2 50.33V 19.10A 31.0C 51.0% 25.5Ah	53.2V 25.0A 0 0 0
3 50.30V 16.90A 30.2C 12.0% 6.0Ah	53.2V 25.0A 0 0 0
4 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
5 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
6 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
7 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
8 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
9 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
10 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
11 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
12 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
13 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
14 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0
15 0.00V 0.00A 0.0C 0.0% 0.0Ah	0.0V 0.0A 0 0 0

Therefore, if a communication error shows up on the display:

1. Check if your data cable is the correct type.
2. Check if you are plugging the cable into the correct sockets. Usually, RS 485 is employed, but some battery manufacturers use others.

NOTE

Some types of lithium battery the BMS cannot be controlled by Sunsynk inverter. In this case, treat the battery as a lead-acid type and set the charging and discharging protocol following the battery manufacturer specification.

It is important to always refer to the documentation of the battery manufacturers when installing the battery. Below there is a list of batteries that has been examined, tested, and approved by Sunsynk.

Brand	Model	RS485 or CAN	Inverter Setup	Notes
Pylon or Equivalent	US2000	CAN	0	
		RS485	5	
	US20000-PLUS	CAN	0	
		RS485	5	
DYNESS	B4850	CAN	0	Short Lione 6&7 at inverter side
	POWERBOX F	CAN	0	
CCGX	48Vxxxx	CAN	0	Need confirm CAN_H CAN_L
SACRED SUN	48Vxxxx	RS485	1	Cut Line 3, 6, 8
SOLAX	48Vxxxx	CAN	0	
KOK	48Vxxxx	RS485	2	
UZ ENERGY	UZ-EB51.2-100-A11	CAN	0	
Topakpower	48Vxxxx	RS485	4	
Hai Ying	HY48050	CAN	0	
Re-Power	LS4850	CAN	0	

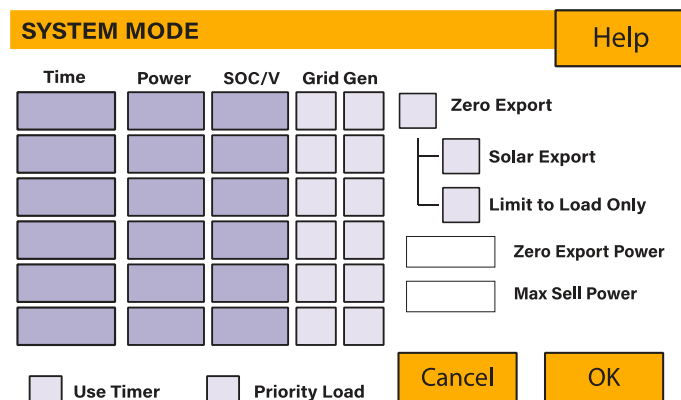
IMPORTANT

When not using communications between battery and inverter, never overcharge your battery bank concerning current and voltage. Many lithium batteries are limited to 100A, some are lower and some are higher. Ensure that voltage and current specifications provided by the battery manufacturer are followed.

- If you're using lead-acid batteries then a good rule of thumb is C X 25, which means that the maximum charge of discharge you can apply to the battery is a quarter of the AH rating of the overall battery array. For example, for a 200AH battery array that could be composed of 4x200 power batteries in series has a maximum charge and discharge of only 50A.
- Also, ensure the cable is thick enough to support the current and proper fuse following the recommendations of the battery manufacturers.

4.14. Program Charge / Discharge Times Page

To program charge and discharge times click on the "System Mode" icon after clicking on the gear icon.



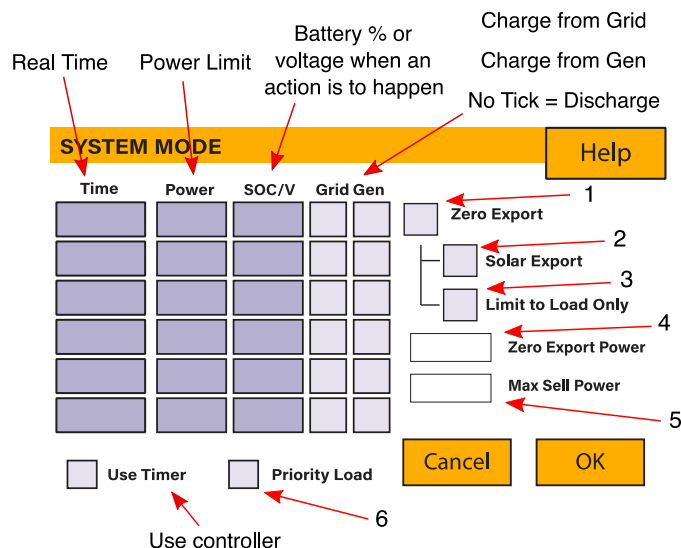
The screenshot shows the "SYSTEM MODE" screen with a yellow header bar. Below the header is a grid with columns labeled "Time", "Power", "SOC/V", and "Grid Gen". To the right of the grid are checkboxes for "Zero Export", "Solar Export", and "Limit to Load Only", and input fields for "Zero Export Power" and "Max Sell Power". At the bottom are checkboxes for "Use Timer" and "Priority Load", and "Cancel" and "OK" buttons.

What this page displays:

- Prevent export power to the grid with "Zero Export".
- Limit power to supply to only all the house loads with "Solar Export".
- Limit power to supply only the loads connected to LOAD port with "Limit to Load only".

What you can do from this page:

- Define a real time to charge or discharge the battery.
- Choose to charge the battery from the grid or generator.
- Limit export power to the grid.
- Define to **charge** the battery from the grid or generator ticking Grid or Gen and define when it needs to occur.
- Define the time to **discharge** to the load or



This annotated version of the "SYSTEM MODE" screen includes red arrows and text labels pointing to various features:

- Arrow 1 points to the "Zero Export" checkbox.
- Arrow 2 points to the "Solar Export" checkbox.
- Arrow 3 points to the "Limit to Load Only" checkbox.
- Arrow 4 points to the "Zero Export Power" input field.
- Arrow 5 points to the "Max Sell Power" input field.
- Arrow 6 points to the "Use Timer" checkbox, with the label "Use controller" below it.
- Other labels include "Real Time", "Power Limit", "Battery % or voltage when an action is to happen", "Charge from Grid", "Charge from Gen", and "No Tick = Discharge".

Concerning the detailed figure above:

1. Tick this box to do not export power back to the grid (the CT coil will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load).
2. Tick this box if you wish to export your solar power back to the grid.
3. Tick this box if you only want to supply power to the load side of the inverter.
4. Zero export power is the amount of power flowing from the grid to the inverter. Set this value to 20 – 100W to force the inverter to always take this amount of power from the grid to minimise nuisance “Reverse Power Detection” tripping of sensitive prepaid electricity meters.
5. This controls the maximum overall power, both to the load and grid ports combined. It is set to low if an over current fault occurs.
6. Tick this box if you wish that the solar panels prioritize power to the load. But, if you untick the solar will prioritize the power to charge the batteries.

Example:

This example shows the battery being charged up to 100% from the grid and PV from 8 AM to 11 AM and then being allowed to supply up to 4kW of battery power to the “essential” loads on the LOAD port until the battery SOC drops to 50%. **Important:** When charging the batteries from the grid or generator please ensure you have set the correct battery charging settings on the battery charge page as shown in Section 4.10 “Battery Setup Home Page”. If “Use Time” is enabled then the inverter will use battery power according to your settings when the grid is present. If this function is not set the batteries WILL ONLY be used for backup when there is no utility grid power.

SYSTEM MODE
Help

Time	Power	SOC/V	Grid	Gen
08.00.	4000.	100%	X	
11.00.	5000.	50%		

☒ Zero Export
☐ Solar Export
☒ Limit to Load Only
 Zero Export Power
 Max Sell Power

☒ Use Timer ☐ Priority Load

Cancel
OK

Example:

This is a zero export power to the grid example.

Power is supplying the non-essential load and maximum power of the inverter is set as 8kW. The inverter is connected to the grid, but no export is performed. It allows small amounts of power to flow from the grid (set as 100W in this case) to prevent any backflow. In this example, the PV generator prioritizes to supply the load first and then to charge the battery secondarily,

4.15. Grid Supply Voltage and Frequency - Grid Supply Page

On the Settings menu click on the “Grid” icon.

What this page displays:

- Grid frequency setting
- Grid type (normally 220V single phase)
- 120V and split phase is for the USA

What you can do from this page:

- Change grid frequency setting (normally 50 Hz)
- Max. grid input voltage set
- Min. grid input voltage set
- Max. grid frequency Hz
- Min. grid frequency Hz

4.16. Advanced Settings for Paralleling Inverters

To configure multi-inverter settings click on the “Advance” icon.

What this page displays:

- If the inverter operates as a master or a slave.
- Modbus Device ID, which must be unique for each inverter connected to the bus/wire.

What you can do from this page:

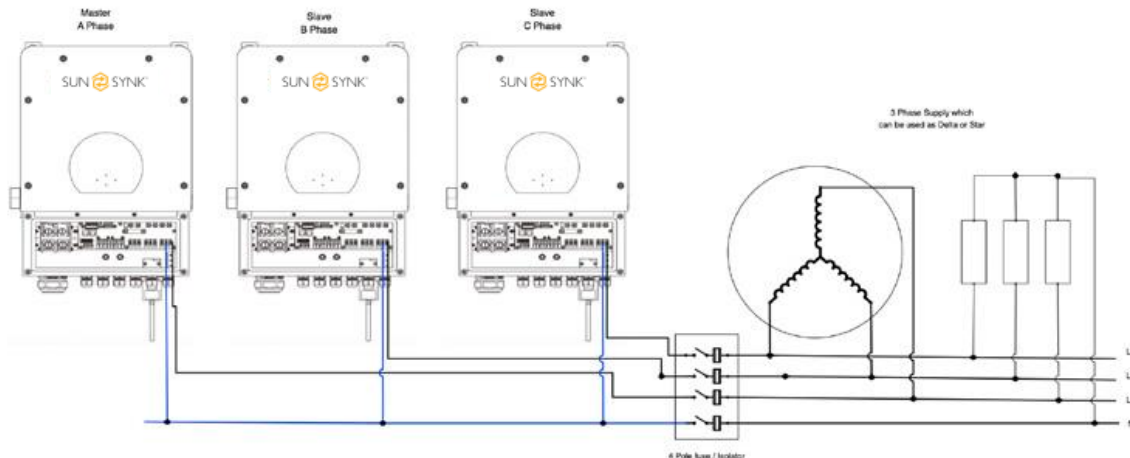
- Set the inverter as a master or slave per bus/wire.
- Set the phase in which the inverter will be paralleled

- Set the Modbus SN for paralleling

The Sunsynk parity inverter can be wired standalone or where more power is required it can be connected in parallel either single or 3 phase configuration. The maximum number of 8.8kW inverters that can be paralleled in a single phase utility grid is three (26.4kW) and the maximum number that can be paralleled in a three phase utility grid is nine (79.2kW).

To parallel six inverters in a three phase utility grid is necessary to set three inverters as master and three as slaves:

- Phase A: Master A and Slave A
- Phase B: Master B and Slave B
- Phase C: Master C and Slave C



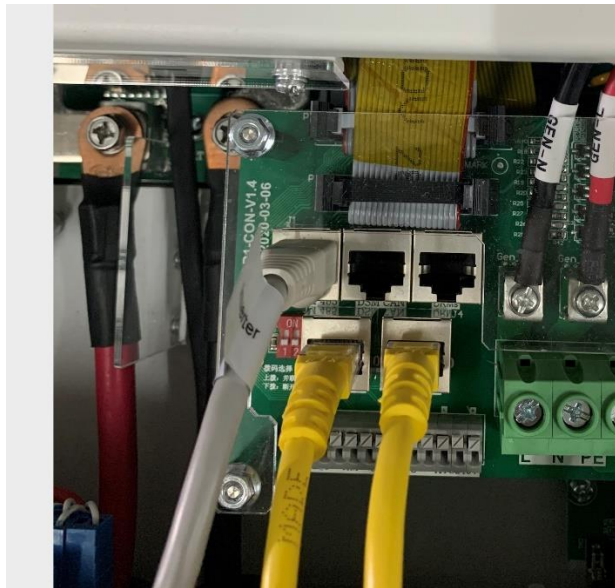
For stability, all the batteries need to be connected in parallel. It is recommended a minimum cable size of 50mm diameter with fuse isolators to each inverter.

Each invert will require a fuse isolator with surge protection and each group circuit will require an RCD. If the batteries as supplying power to the main load during the outage then a change over switch will also be required or a split load can be used.

IMPORTANT

- Be careful with bus bar sizes.
- The CT coils used to limit export power must only be connected to the master. Therefore, if six inverters are paralleled, three CT coils will be required.
- Connect a RJ45 communication cable between each inverter; the order is not important since both sockets are the same, so there is no IN or OUT.
- Each phase must only have one master and the others set to slave.
- Each inverter must have a unique Modbus number.
- Each set of inverters must be set to the same phase. For example, when paralleling three inverters in a three phase utility grid all must be set as Master (Phase A, Phase B, Phase C).
- The maximum length of the communication cables is 2 meters (do not exceed this value)
- All batteries must be connected in parallel and the MPPTs must be kept separate.

The picture below shows the data cable between the inverters. It doesn't matter which way round these go, but their length must not exceed 2 meters.

**NOTE**

If the communication is not working correctly between inverters then errors will show up on the display. In this case, please check all settings and data cable.

IMPORTANT

- The load outputs can be connected in parallel.
- The grid input can also be connected in parallel.
- You cannot connect the Aux/Gen port in parallel, because this causes a conflict between the frequency of the generator and the frequency of the grid.

If you need further help please refer to the Sunsynk website where you will find training videos and frequently asked questions www.sunsynk.com. From here you can also update the inverter operating system if required, but generally, if the inverter is working fine we recommend do not upgrade

Some common questions when paralleling inverters:

What is the sequence to install/connect/commission?

First of all, leave the main supplies off. Next, connect all communication cables, set up all LCDs and then, finally, turn-on the main supplies.

What are the indications that the communication and the system are ok or not?

Parallel errors will be shown as fault F46 on the display.

What are the consequences of not setting one inverter in a parallel mode?

It can damage the inverter.

What are the consequences of having more than one master, or none set to master for that matter?

It can damage the inverter. There are cases in which it is possible to have more than one master. For example, as aforementioned, six inverters paralleled in a three phase utility grid (three masters)..

What are the consequences of setting A, B, or C phase wrong on the LCD?

It can damage the inverter. Recommend checking the phase rotation with a meter before switching on.

What are the consequences of factory resetting, power cycling, or firmware updating one inverter in a parallel system?

There is no consequence, but the master inverter will keep controlling the slaves.

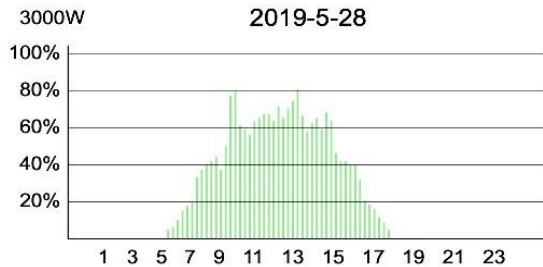
What consequences for changing ALL/ANY settings while operating in parallel mode?

It can damage the inverter and fault F46 will be indicated on the display.

4.17. Solar Power Generated

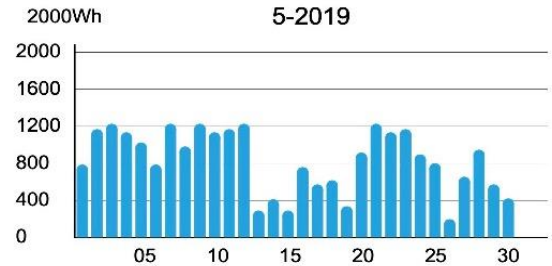
This page shows the daily, monthly, yearly, and total solar power produced. Access this page by clicking on the “Solar/Turbine” icon on the home page.

Return	Day	Month	Year	Total
--------	-----	-------	------	-------



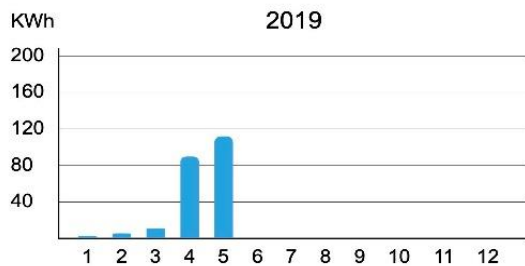
Solar Total Today=0.0KWH Total - 0.0KWH

Return	Day	Month	Year	Total
--------	-----	-------	------	-------



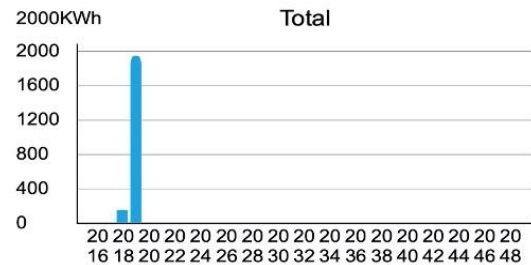
Solar Total Month=0.0KWH Total - 0.0KWH

Return	Day	Month	Year	Total
--------	-----	-------	------	-------



Solar Total Year=0.0KWH Total - 0.0KWH

Return	Day	Month	Year	Total
--------	-----	-------	------	-------

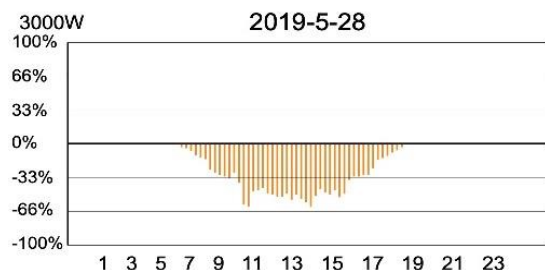


Solar / Turbine Power Total :- 135.20 kWh

4.18. Grid Power

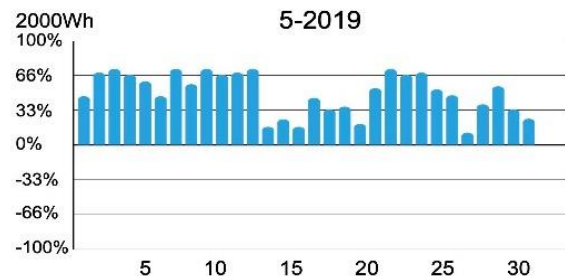
This page shows the daily, monthly, yearly, and total grid power export or consumed. Access this page by clicking on the “Solar/Turbine” icon on the home page.

Return	Day	Month	Year	Total
--------	-----	-------	------	-------

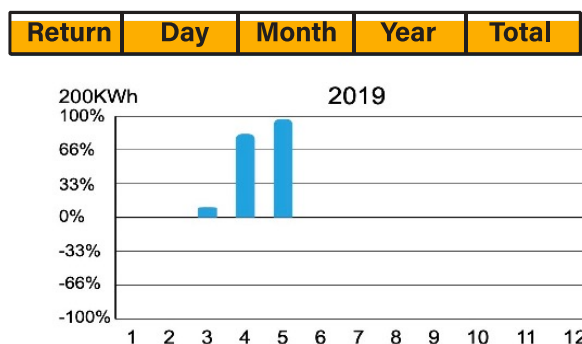


Grid Power Import / Export :- Day

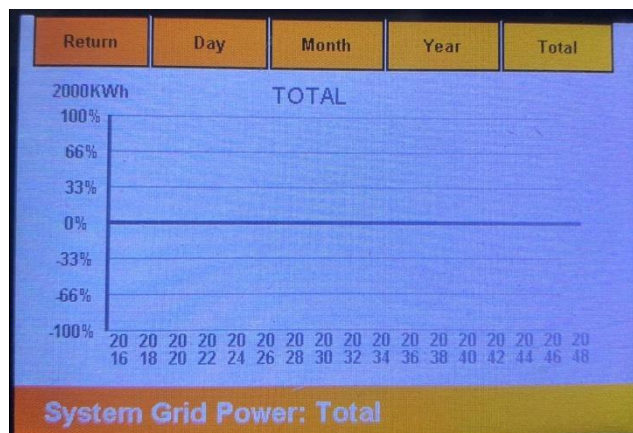
Return	Day	Month	Year	Total
--------	-----	-------	------	-------



Grid Power Import / Export :- Month



Grid Power Import / Export :- Year



4.19. Advanced Settings for Wind Turbine

To configure wind turbine settings click on the “Advance” icon.

Advance (2) Help

Wind Turbine **Multi-inverter**

☐ DC1 for WindTurbine ☐ DC2 for WindTurbine

V1	0V	0.0A
V2	0V	0.0A
V3	0V	0.0A
V4	0V	0.0A
V5	0V	0.0A
V6	0V	0.0A
V7	0V	0.0A
V8	0V	0.0A
V9	0V	0.0A
V10	0V	0.0A
V11	0V	0.0A
V12	0V	0.0A

OK Cancel

What this page displays:

- If one or both of the MPPTs are connected to a wind turbine.

What you can do from this page:

- Select the MPPT to be used as a turbine input.

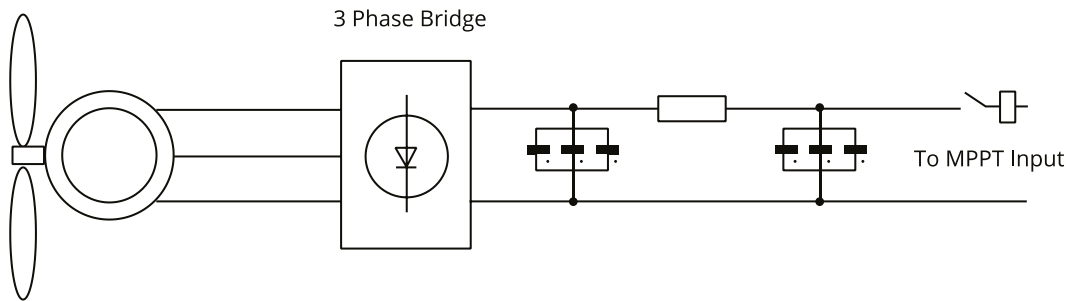
The table below shows the maximum current depending on the voltage of the wind turbine.

Voltage	Max. Current (Amps)	Power (W)
150	23.33	3500
200	17.50	3500
250	14.00	3500
300	11.67	3500
400	8.75	3500

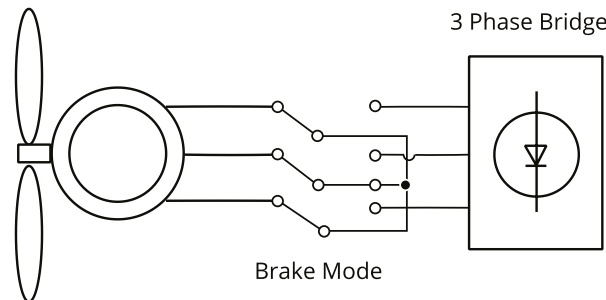
IMPORTANT

- DO NOT use a wind turbine that exceeds 400V.
- **Use a self breaking wind turbine.** Once the batteries are fully charged and the inverter is not exporting any power the load can drop. This can cause the turbine to speed up dramatically, which can be very dangerous and usually happens suddenly. Thus, it is essential to use a self breaking turbine.

Most wind turbines are three-phase PM type. Therefore, either a wind turbine controller or a direct connection to the MPPT via a simple protection circuit will be required.



Dump Load: When the battery (battery bank) is fully charged and the water turbine/wind turbine/solar module is still generating power, a dump load will provide the electricity a path to flow. This can be done using a switch on by the smart load option or utilizing a wind turbine controller with a built-in dump load. Also, the hot water tank controlled via smart load can act as a good dump load, but in very windy conditions it may be necessary to shunt the output.



4.20. Advanced Settings for Auxiliary Load

To configure auxiliary load (previously known as smart load) settings click on the “Aux Load” icon.

AUX Load
Help

☐ Gen input
 ☐ Gen peak shaving power

1000W

☐ Aux load output
 ☐ MI Zero Export

☐ For Micro inverter input
 ☐ MI Zero Export

Aux Load OFF Batt 95%

Solar Power(W) 1000W

Aux Load ON Batt 100%

Cancel

OK

What this page displays:

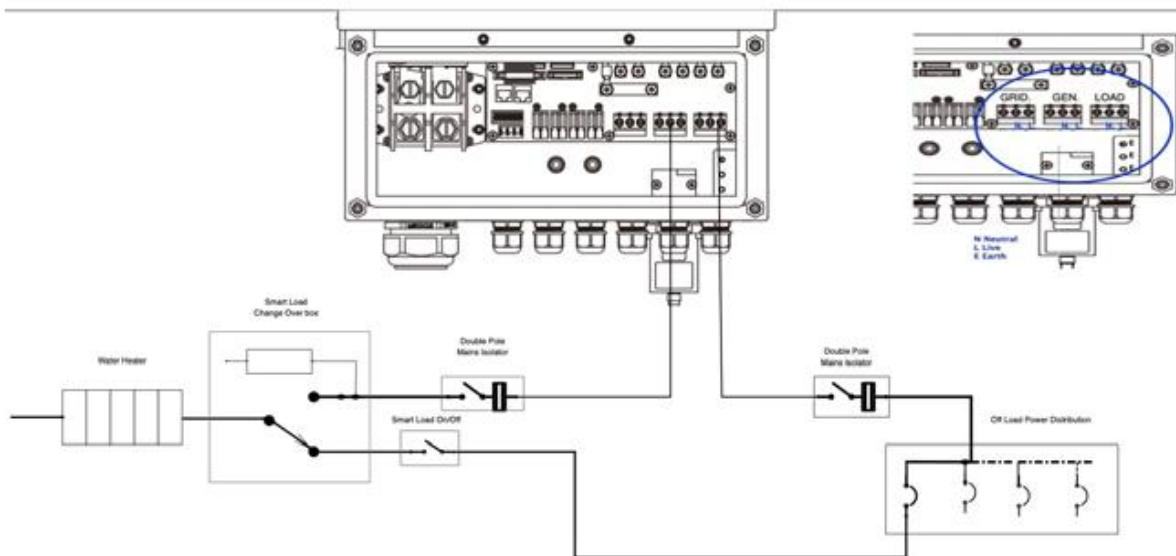
- Use of the Gen (Aux) input or output.

What you can do from this page:

- Set up a generator input.
- Set up an auxiliary (smart) load.
- Set up peak power shaving
- Use an additional inverter or micro

A nice feature is when the batteries are fully charged and the inverter is still producing energy from the PV or the turbine it is possible to direct the energy to another load such as a water heater.

Aux Load off Battery % or Voltage	Battery level when the Aux load switches off
Aux Load on Battery % or Voltage	Battery level when the Aux load switches on.
Solar Power	Power limiter to the maximum power allowed to the Aux load.
Gen Input	Tick this box if using a Generator.
Aux Load Output	Tick this box if using an Aux or Smart Load.
For Micro inverter Input	Tick this box if intending to connect a supplementary inverter or micro inverter (Max. 4kW).
Zero Export	Tick this box to stop exporting power produced by the Aux Load.
Gen Peak Shaving	Tick this box to use peak power shaving.



4.21. Advanced Settings for Peak Power Shaving

To configure auxiliary load (previously known as smart load) settings click on the “Aux Load” icon.

AUX Load
Help

☐ Gen input
 ☐ Gen peak shaving power

1000W

☐ Aux load output

☐ For Micro inverter input
 ☐ MI Zero Export

Aux Load OFF Batt

95%

Solar Power(W)

1000W

Cancel

OK

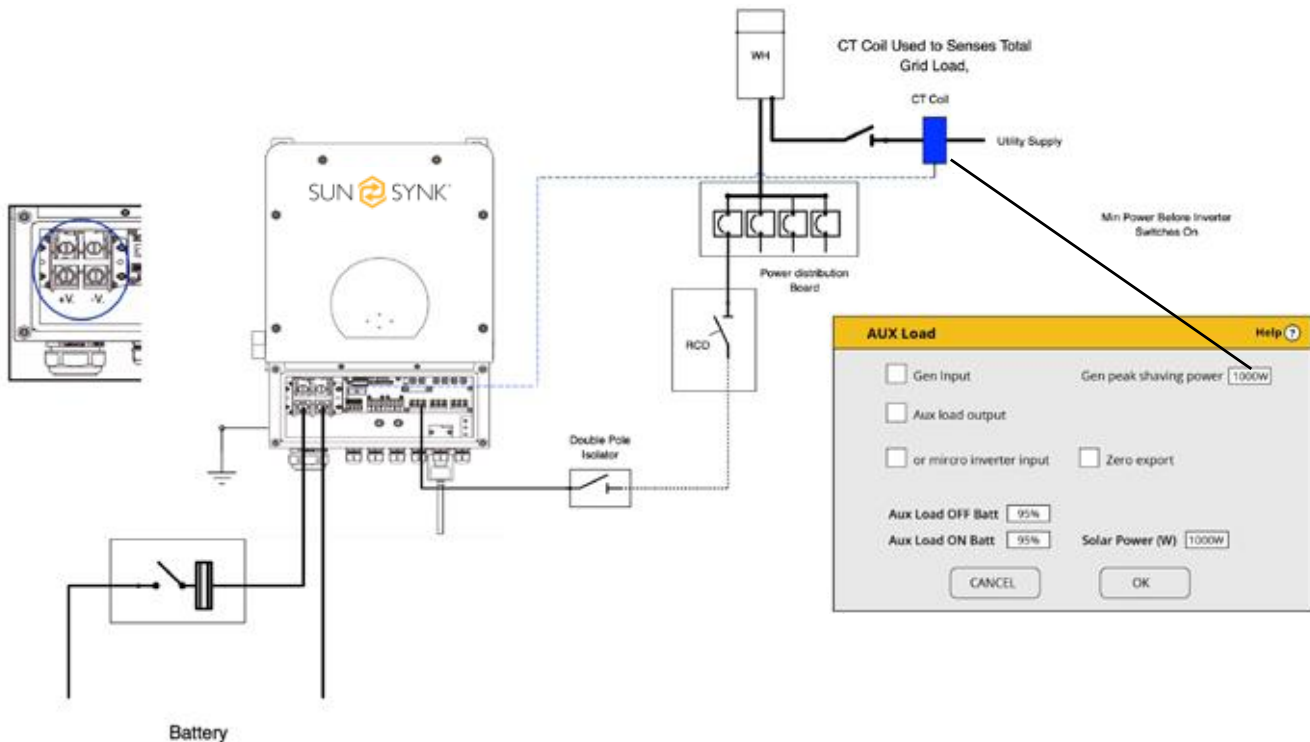
What this page displays:

- Generator peak shaving is ON or OFF.
- Grid peak shaving is ON or OFF.

What you can do from this page:

- Switch on the generator and/or grid peak power saving and set the power shaving value.

Peak Shaving: It is a technique used to reduce electrical power consumption during periods of maximum demand on the utility grid. Thus, one can save substantial amounts of money due to peaking charges.



4.22. Fault Codes

To check fault codes click on the “Fault Codes” icon on the settings menu.

Fault Codes Help ?	
Alarms	Occurred
F56 DC_VoltLow_Fault	2018-10-24 01:07
F56 DC_VoltLow_Fault	2018-10-24 01:07
F56 DC_VoltLow_Fault	2018-10-24 01:00
F56 DC_VoltLow_Fault	2018-10-24 00:55
F56 DC_VoltLow_Fault	2018-10-24 00:43
F56 DC_VoltLow_Fault	2018-10-24 00:10
F56 DC_VoltLow_Fault	2018-10-24 00:08
F56 DC_VoltLow_Fault	2018-10-24 00:07

If any of the fault messages listed in the following table appear on your inverter and the fault has not been removed after restarting, please contact your local vendor or service center. The following information is required:

1. Inverter serial number.
2. Distributor or service center of the inverter.
3. On-grid power generation date.
4. The problem description (including the fault code and indicator status displayed on the LCD) is as detailed as possible.
5. Your contact information.

Error Code	Description	Solutions
F13	Working Mode Change	Inverter work mode changed 1. Reset the inverter. 2. Seek help from Sunsynk.
F18	AC over current fault or hardware	AC Slide over current fault. 1. Check if the backup load power is within the range of the inverter. 2. Restart, and check if it is normal.
F20	DC over current fault of the hardware	DC Over current fault 1. Check if PV module and battery connections. 2. Reset the system.
F23	AC leakage current is trans over current	Leakage current fault 1. Check the PV module and inverter cables.

		2. You may have a faulty PV panel (earth short) 3. Restart inverter
F24	DC insulation impedance failure	PV isolation resistance is too low 1. Check if the connection of PV panels and inverter are firmly connected. 2. Check if the earth bond cable on inverters is connected to the ground.
F26	The bus bar is unbalanced	1. Please wait 5 minutes to see if it returns to normal. 2. Fully reset the inverter.
F35	No at: grid	1. Check if the inverter's connected to the AC grid. 2. Check if the RSCD had not tripped. 3. Check if the switch and fuses between the inverter and grid are all switched on.
F42	AC line low voltage	Grid voltage fault 1. Check if the voltage is in the range of standard voltage in specification this can be adjusted via the grid set up page. 2. Check if grid cables are correctly connected.
F47	AC over frequency	Grid voltage fault 1. Check if the voltage is in the range of standard voltage in specification this can be adjusted via the grid set up page. 2. Check if grid cables are correctly connected.
F48	AC lower frequency	Grid frequency out of range 1. Check if the frequency is in the range of specification 2. You may need to adjust the frequency on the grid set up page.
F56	DC bus bar voltage is too low	Battery low voltage 1. Check if the battery voltage is too low. 2. If the battery voltage is too low use the PV or grid to charge the battery. 3. Check the battery BMS Important: Especially with Lithium batteries, ensure that the batteries Max. discharge current or power

		specification is the same or higher than the inverter specification.
F64	Heat sink high-temperature failure	Heat Sink temp is too high 1. Check if the working environment temperature is too high. 2. Turn off the inverter for 30 minutes and restart.

Fault Information	Instruction	Fault Information	Structure
F01	DC_Inversed_Failure	F33	AC_OverCurr_Fault
F02	DC_Insulation_Failure	F34	AC_Overload_Fault
F03	GFDI_Failure	F35	AC_NoUtility_Fault
F04	GFDI_Ground_Failure	F36	AC_GridPhaseSeque_Fault
F05	EEPROM_Read_Failure	F37	AC_Volt_Unbalance_Fault
F06	EEPROM_Write_Failure	F38	AC_Curr_Unbalance_Fault
F07	GFDI_Fuse_Failure	F39	INT_AC_OverCurr_Fault
F08	GFDI_Relay_Failure	F40	INT_DC_OverCurr_Fault
F09	IGBT_Failure	F41	AC_WU_OverVolt_Fault
F10	AuxPowerBoard_Failure	F42	AC_WU_UnderVolt_Fault
F11	AC_MainContactor_Failure	F43	AC_VW_OverVolt_Fault
F12	AC_SlaveContactor_Failure	F44	AC_VW_UnderVolt_Fault
F13	Working_Mode_change	F45	AC_UV_OverVolt_Fault
F14	DC_OverCurr_Failure	F46	AC_UV_UnderVolt_Fault
F15	AC_OverCurr_Failure	F47	AC_OverFreq_Fault
F16	GFCI_Failure	F48	AC_UnderFreq_Fault
F17	Tz_COM_OC_Fault	F49	AC_U_GridCurr_DcHigh_Fault
F18	Tz_Ac_OverCurr_Fault	F50	AC_V_GridCurr_DcHigh_Fault
F19	Tz_Integ_Fault	F51	AC_W_GridCurr_DcHigh_Fault
F20	Tz_Dc_OverCurr_Fault	F52	AC_A_InductCurr_DcHigh_Fault
F21	Tz_GFDI_OC_Fault	F53	AC_B_InductCurr_DcHigh_Fault
F22	Tz_EmergStop_Fault	F54	AC_C_InductCurr_DcHigh_Fault
F23	Tz_GFCI_OC_Fault	F55	DC_VoltHigh_Fault
F24	DC_Insulation_Fault	F56	DC_VoltLow_Fault
F25	DC_Feedback_Fault	F57	AC_BackFeed_Fault
F26	BusUnbalance_Fault	F58	AC_U_GridCurr_High_Fault
F27	DC_Insulation_ISO_Fault	F59	AC_V_GridCurr_High_Fault
F28	DCIOver_M1_Fault	F60	AC_W_GridCurr_High_Fault
F29	AC_AirSwitch_Fault	F61	AC_A_InductCurr_High_Fault
F30	AC_MainContactor_Fault	F62	AC_B_InductCurr_High_Fault
F31	AC_SlaveContactor_Fault	F63	ARC_Fault
F32	DCIOver_M2_Fault	F64	Heatsink_HighTemp_Fault

NOTE

- The energy storage inverter is designed according to the grid-connected operation.
- The inverter meets the safety and electromagnetic compatibility requirements as established in the main standards. Moreover, before leaving the factory, the inverter undergoes several rigorous tests to ensure that the inverter can operate reliably, as presented in Section 4 “Technical

If you need further help please refer to the Sunsynk website where you will find training videos and frequently asked questions www.sunsynk.com.



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