



LP RANGE IP65



USER MANUAL

SM3.6kWLLL65/SM3.6kWPLL65
SM6.0kWLLL65/SM6.0kWPLL65
SM7.2kWLLL65/SM7.2kWPLL65
SM8.0kWLLL65/SM8.0kWPLL65
SM10.0kWLLL65/SM10.0kWPLL65
SM12.0kWLLL65/SM12.0kWPLL65

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LEGAL INFORMATION

Warning Notice System

This manual includes important safety warnings that help ensure your safety and prevent damage to the equipment. These warnings are clearly identified with symbols, which are categorised according to the level of risk associated with each potential hazard. It is essential to read and adhere to these warnings carefully.



DANGER

Indicates an immediate hazard that, if not avoided, will result in serious injury or death. This is the highest level of risk.



WARNING

Indicates a potential hazard that could result in serious injury or death if not avoided. It is slightly less severe than "DANGER".



CAUTION

Highlights a potential hazard that could cause minor injuries or property damage if not avoided.



NOTICE

Provides helpful information that does not indicate any hazard.

Qualified Personnel

The Sunsynk LP IP65 described in this manual must only be installed, operated, and maintained by qualified personnel. Qualified personnel are individuals who have received formal training in electrical systems and photovoltaic (PV) installations. They must be familiar with local electrical codes and regulations and capable of identifying potential risks associated with handling high-voltage equipment.

To ensure safe and efficient installation, Sunsynk strongly recommends engaging an installer approved by Sunsynk. These installers undergo specific training on Sunsynk products, ensuring they possess the necessary knowledge for secure and optimal installation, commissioning, and operation.

Improper installation or operation of the Sunsynk LP IP65 by unqualified personnel may lead to personal injury, property damage, or voiding of the warranty.



WARNING

- Always use only components and accessories that are recommended or approved by Sunsynk.
- Follow all procedures outlined in this manual for safety instructions, installation, commissioning, operation, and maintenance.
- Ensure compliance with local and national safety codes and regulations.
- Operate the product only within the specified environmental conditions as outlined in this manual.

Proper Use of Sunsynk Products

The Sunsynk LP IP65 is designed for use in energy storage and management in photovoltaic systems. To ensure safe and reliable operation, it is imperative to follow the instructions provided in this manual. Failure to do so may lead to unsafe operation, product damage, or invalidation of the warranty.

Warranty

For warranty details, please refer to the Warranty Statement supplied by Sunsynk.

Under our company's guidance, customers may return products for maintenance or replacement of equivalent value. Customers are responsible for shipping and associated costs. Any replaced or repaired product retains the remaining warranty period. If a product or component is replaced by the company during the warranty period, ownership rights of the replacement belong to the company.

Factory warranty does not cover damages resulting from:

- Transportation mishaps
- Incorrect installation or commissioning
- Failure to follow operation, installation, or maintenance instructions
- Attempts to modify, alter, or repair products
- Incorrect usage or operation
- Inadequate equipment ventilation
- Non-compliance with safety standards or regulations
- Natural disasters or force majeure (e.g., floods, lightning, overvoltage, storms, fires, etc.)

Normal wear or minor failures that do not affect product functionality are not considered defects. External scratches, stains, or mechanical wear do not indicate product defects.

Trademarks

All names and logos identified in this document are the property of Sunsynk. Unauthorised use of Sunsynk trademarks is strictly prohibited. All other trademarks mentioned remain the property of their respective owners.

Disclaimer of Liability

This document is the property of Sunsynk. Any reproduction, modification, or distribution of this manual without prior written consent from Sunsynk is strictly prohibited.

The content of this manual has been thoroughly reviewed for accuracy and is consistent with the product described. However, due to ongoing product improvements and updates, Sunsynk cannot guarantee complete consistency. Any necessary corrections or updates will be included in subsequent editions of this manual.

Retention of This Manual

This manual contains essential information for the assembly, installation, commissioning, and maintenance of the Sunsynk LP IP65. It must be retained for future reference and made accessible to all qualified personnel involved in the operation and maintenance of this product.

SAFETY

General Safety Information

- This device should only be used in accordance with the instructions within this manual and in compliance with local, regional and national laws and regulations. Only allow this device to be installed, operated, maintained or repaired by other person(s) who have also read and understood this manual. Ensure the manual is included with this device should it be passed to a third party.
- **DO NOT** allow minors, untrained personnel, or person(s) suffering from a physical or mental impairment that would affect their ability to follow this manual, install, maintain or repair this device.
- Any untrained personnel who might get near this device while it is in operation **MUST** be informed that it is dangerous and instructed carefully on how to avoid injury.

Safety Instructions



DANGER

HIGH LIFE RISK DUE TO FIRE OR ELECTROCUTION.


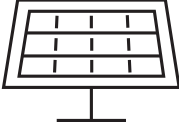



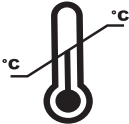






The LP IP65 can only be installed by a qualified licensed electrical contractor. This is not a DIY product.

Ensure to follow the safety warnings listed below:

- Be sure to read this manual thoroughly before installation.
- Do not attempt to install the inverter by yourself. Installation work must be carried out in compliance with national wiring standards and by suitably qualified personnel only.
- Do not turn on the power until all installation work is complete.
- Do not disassemble the inverter. If you need to repair or maintenance, contact a professional service centre.
- 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.
- Disconnect all wires before performing any maintenance or cleaning to reduce the risk of electric shock.
- 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 authorised contractor for repairs.

Symbols/Safety Signs

Symbol	Description	Symbol	Description
	Risk of danger.		Warning: hot surface.
 	Risk of electric shock. DO NOT touch the terminal or remove the shell within 5 minutes after disconnecting all power.		Do not disassemble or alter the inverter in any way.
	The Inverter is heavy and can cause injury if not handled safely.		ONLY qualified personnel should install or perform maintenance work on the units.
	Be careful when touching the inverter! It is an electrical product with risk of electric shock and heating.		Warranty void if seal is broken.
	Do not place near open fire or incinerate. Do not use near heaters or hot temperature sources.		Avoid unsuitable shoes for installing and operating the inverter.
	Do not step, stand, or climb on this surface.		Do not drop, deform, or impact the inverter.
	Do not step or put any objects onto the inverter.		Three-phase.
	Protective conductor terminal or earth ground terminal.		Keep out of reach of children, animals, and insects.
	Single-phase.		Inverter DC to AC.
	Do not submerge the inverter in water or expose it to moisture or liquid.		Net weight in kilograms.
	Do not expose the product to sunlight.		Indicates that this product is recyclable.
	Max. PV input current.		Direct Current.
	Charging.		Discharging.

Symbol	Description	Symbol	Description
	BATTERY INPUT Battery Discharge Voltage, Battery Discharge Current, Input Voltage Type, Battery Discharge Power.		PV INPUT PV Input Voltage, Number of MPPT's, MPPT Input Current & Max PV ISC.
	AC OUTPUT Output Voltage, Input Voltage Type, AC Output Rated Current, Max AC Current, Output Frequency, Max AC ISC, Power Factor & AC Output Rated Power.		CONTINUOUS OUTPUT CURRENT Maximum Continuous Output Current, Output Frequency and Voltage, & AUX (programmable AC output on battery SOC).
	Follow the indicated temperatures.		TEMPERATURE Ambient, Min & Max.
	MANUAL DOWNLOAD Download the latest version of the instruction manual by scanning the QR code.		WARRANTY REGISTRATION Scan the QR code to access our website and sign up for the manufacturer's warranty.
	Do not dispose the device, accessories, and packaging with regular waste. Follow local ordinances or contact the manufacturer for disposal guidance.		Refer to the operating instructions. Contact the supplier within 24 hours if there is anything wrong. In case of leakage contact with eyes or skin, immediately clean with water and seek help from a doctor.
	CE mark is attached to the solar inverter to verify that the unit follows the provisions of the European Low Voltage and EMC Directives.		The UKCA marking is used for products placed on the market in Great Britain (England, Scotland and Wales). The UKCA marking applies to most products for which the CE marking could be used.

Product Disposal

DO NOT dispose of this product with domestic waste!

Electrical devices should be disposed of in accordance with regional directives on electronic and / or electronic-waste disposal. In case of further questions, please consult your supplier. In some cases, the supplier can take care of disposal.

PRODUCT INTRODUCTION

The LP 3.6/6/7.2/8/10/12kW IP65 is a highly efficient power management solution that helps users achieve 'parity' targets by optimizing power flow from multiple sources such as solar, mains power (grid), and generators. It intelligently manages the distribution of power based on demand, ensuring effective use of available energy when needed by the utilities.

INTERACTIVE

- Easy and simple to understand LCD display.
- Supporting Wi-Fi or GSM monitoring.
- Built-in MPPT trackers.
- Smart settable 3-stage MPPT charging for optimised battery performance.

COMPATIBLE

- Compatible with main electrical grid voltages.
- 230V single-phase, pure sine wave inverter.

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 the application.

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

- Power shedding (home / office / factory).
- UPS (Uninterrupted Power Supply).
- Remote locations with solar.
- Building sites.
- Telecommunication.

BOX CONTENTS

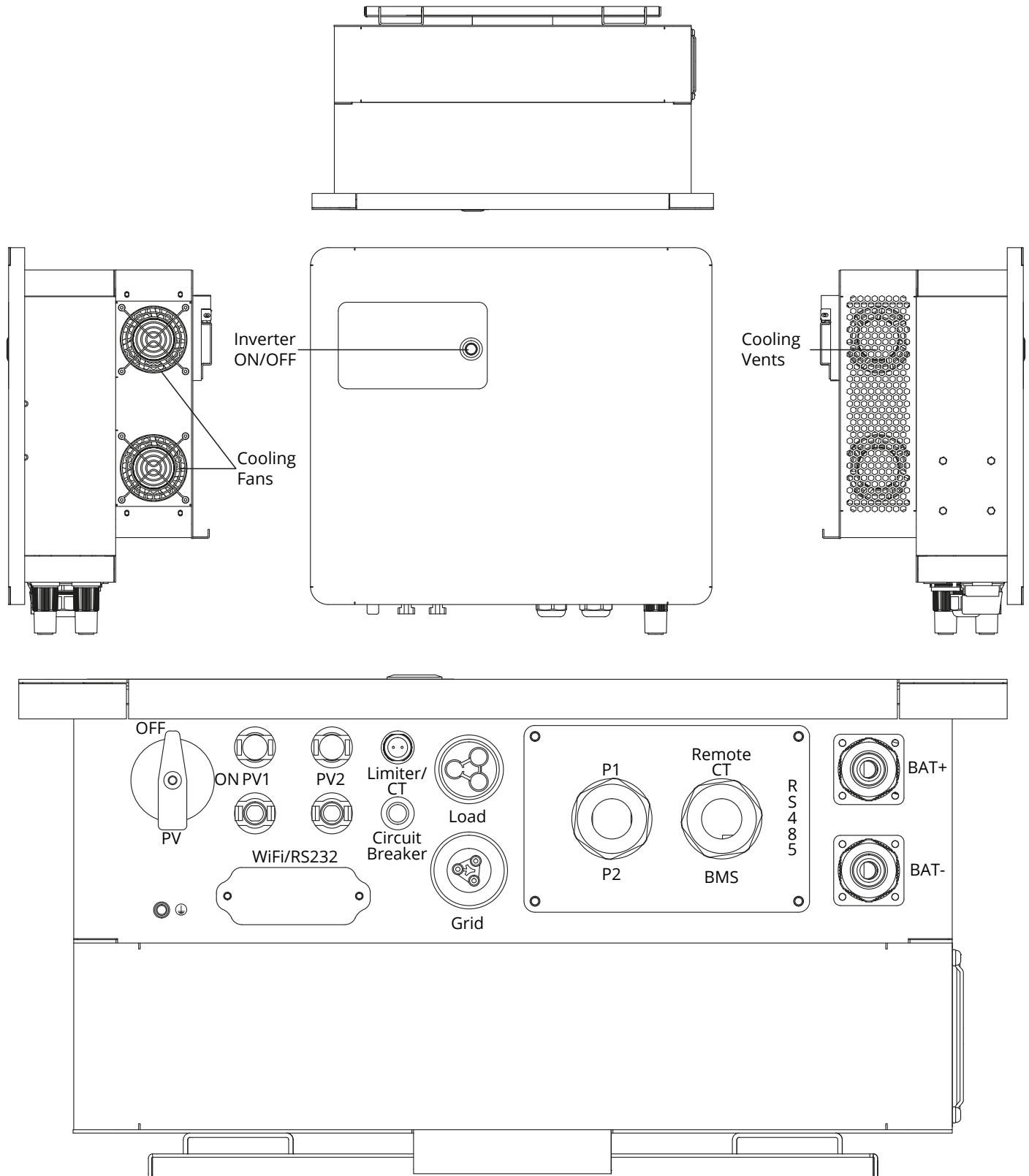
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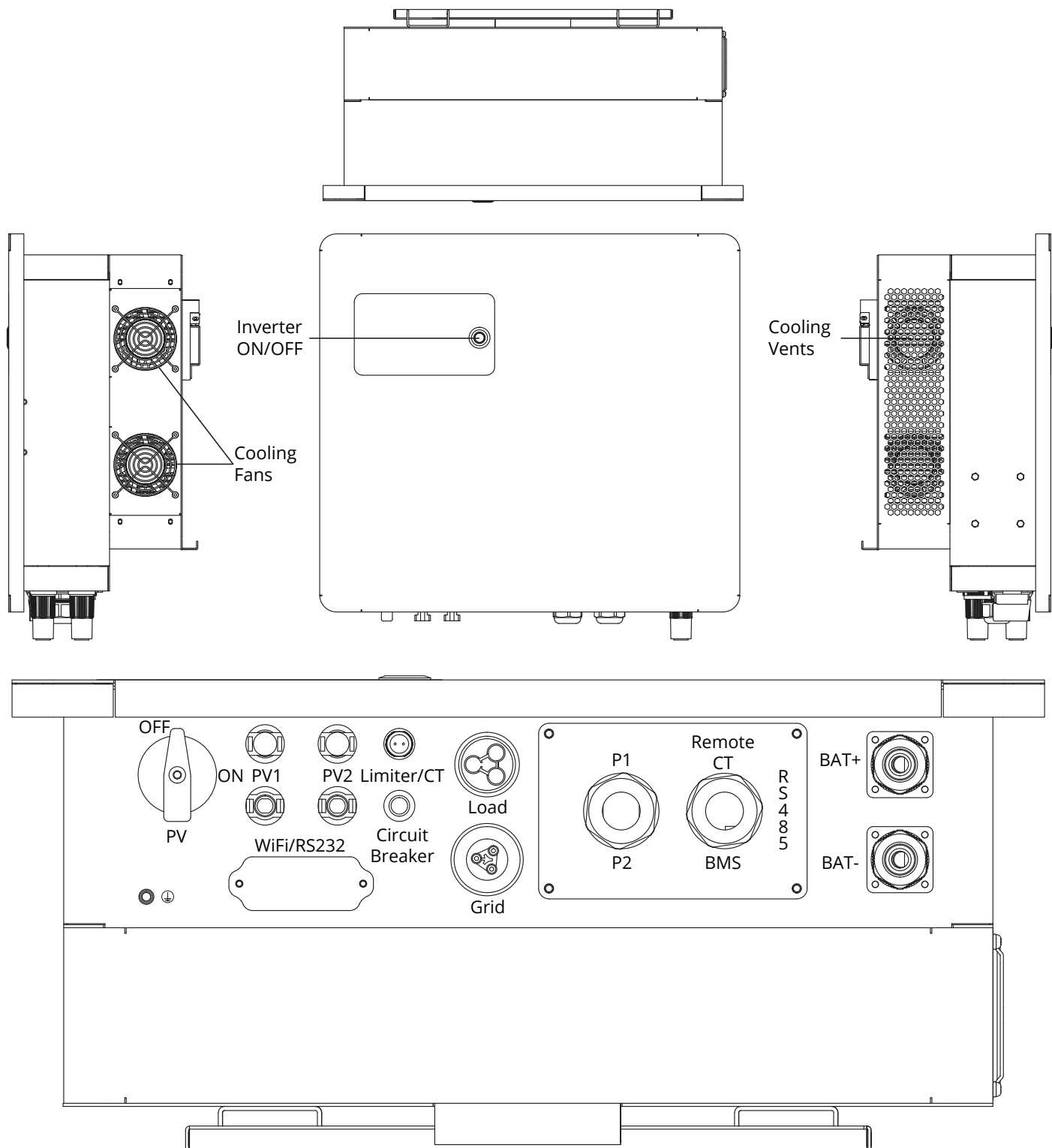
- LP 3.6/6/7.2/8/10/12kW IP65 (main unit)
- Screw pack
- CT Coil (2 pin AERO - female connector)
- 2 x MC4 connectors
- Wall mounting bracket
- Data logger (Sunsynk Wi-Fi)
- 1x3 pin AC Load connector (female)
- 1x3 pin AC Grid connector (male)
- 2x Battery Connectors

TECHNICAL SPECIFICATION

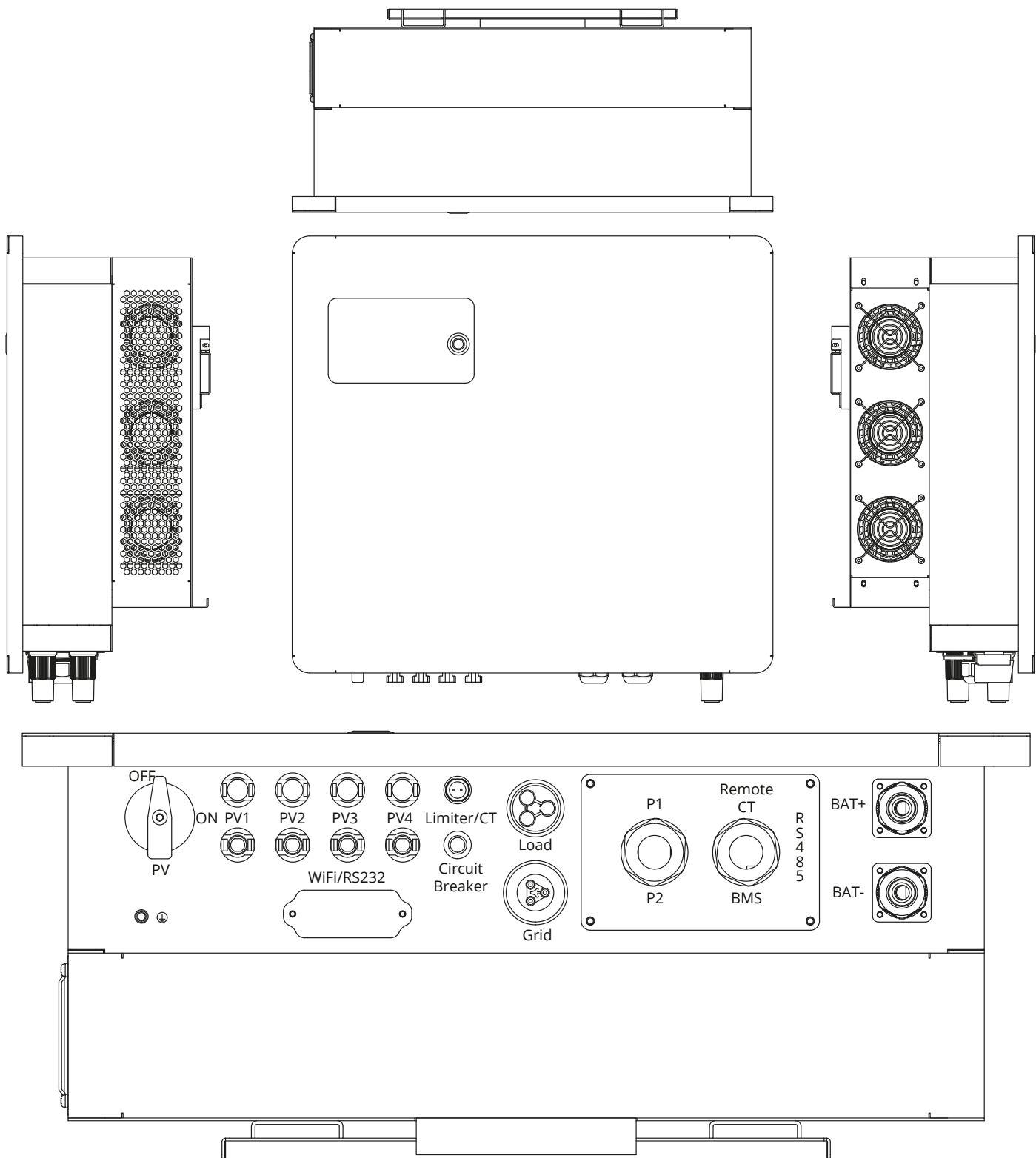
- Pure sine wave inverter with a maximum input power of 7.2kW for the 3.6kW model, 9kW for the 6kW model, 10kW for the 7.2kW model, 12kW for the 8kW model, 15kW for the 10kW model, and 18kW for the 12kW model.
- MPPT charge controller feature.
- Bi-directional inverter that can rapidly charge the external batteries.

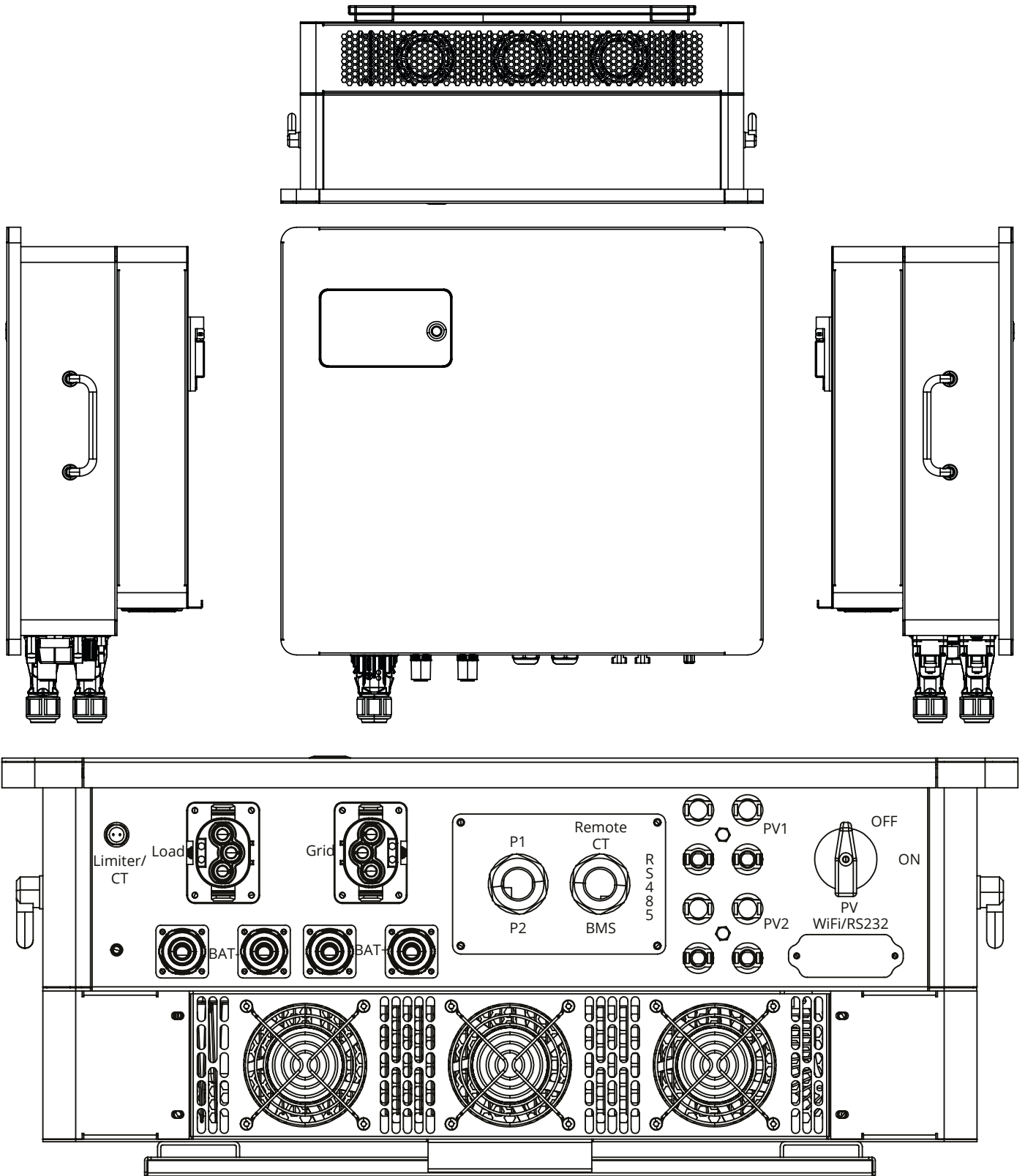
SM3.6kWLLL65 / SM3.6kWPLL65





SM7.2kWLLL65 / SM7.2kWPLL65 and SM8.0kWLLL65 / SM8.0kWPLL65





Model	SM(X.X)kWLL65 / SM(X.X)kWPLL65					
	3.6	6.0	7.2	8.0	10.0	12.0
Battery Input Parameters						
Supported Battery Type	LiFePO4 or Lead-Acid					
Battery Input Voltage Range	40~60V					
Max. Charge Voltage	60V (Configurable)					
Max. Charge Current (Configurable)	60A	120A	135A	150A	180A	220A
Max. Discharge Current (Configurable)	80A	130A	165A	180A	220A	260A
Battery Capacity (Recommended)	100~2000Ah					
Charge for LiFePO4 Battery Pack	Communicating with BMS of the Battery Pack					
PV String Input Parameters						
Max. DC Input Power	7200W	9000W	10000W	12000W	15000W	18000W
DC Input Voltage	500V					
MPPT Voltage Range	120~450V					
Start-Up Voltage	150V					
Max. Input Current	15A x 2 = 30A (2 MPPT Channels)	18A x 2 = 36A (2 MPPT Channels)	23A x 2 = 46A (2 MPPT Channels)	28A x 2 = 56A (2 MPPT Channels)	30A x 2 = 60A (2 MPPT Channels)	
AC Output Parameters (Back-Up)(Feed to Essential Load)						
Max. Output Power	3600W	6000W	7200W	8000W	10000W	12000W
Max. Output Apparent Power	3600VA	6000VA	7200VA	8000VA	10000VA	12000VA
Peak Output Apparent Power	7200VA	12000VA	14400VA	16000VA	20000VA	24000VA
Max. Output Current	16A	27A	33A	36A	45A	55A
Nominal Output Voltage	220/230/240Vac Single-Phase (Configurable)					
Nominal Output Frequency	50/60Hz (+/-0.2%) (Configurable)					
Max. Bypass Current	40A		42A		63A	
Shift Time (Bypass and Inverter)	10ms					
Output THDv (Resistor Load)	<3%					
AC Input Parameter (On-Grid)(Bypass to Essential Load & Charge the Battery/Feed to Home Load)						
Max. Input Power (Bypass to Essential Load/Charge the Battery)	3600W	6000W	7200W	8000W	10000W	12000W
Max. Output Power (Feed to Home Load)	3600W	6000W	7200W	8000W	10000W	12000W
Max. Apparent Input Power (Bypass to Essential Load/Charge the Battery)	3600VA	6000VA	7200VA	8000VA	10000VA	12000VA

Model	SM(X.X)kWLL65 / SM(X.X)kWPLL65					
	3.6	6.0	7.2	8.0	10.0	12.0
AC Input Parameter (On-Grid)(Bypass to Essential Load & Charge the Battery/Feed to Home Load)						
Max. Apparent Output Power (Feed to Home Load)	3600VA	6000VA	7200VA	8000VA	10000VA	12000VA
Nominal Input/Output Voltage	220/230/240Vac Single-Phase (Auto Adjusted to Fit Home Grid)					
Nominal Input/Output Frequency	50/60Hz (Auto Adjusted to Fit Home Grid)					
Max. Bypass Current	40A		42A		63A	
Shift Time (Bypass and Inverter)	10ms					
Efficiency						
Max. Efficiency	97.6%					
Max. Battery to Load Efficiency	94.0%					
Europe Efficiency	97.6%					
MPPT Efficiency	99.9%					
Protection						
Integrated	Battery Over-Charge Protection, Battery Low-Voltage Protection, Over-Temperature Protection, Output Overload Protection, Output Short Circuit Protection, Output Over-Voltage Protection					
Compliances						
Grid Regulation	Approvals and certifications are subject to change without prior notice. Please confirm the current status with Sunsynk before placing an order.					
EMC/Safety Regulation						
General Information						
Operating Temperature Range	-20°C ~ +50°C (>35°C Derating)					
Protection Degree	IP65					
Dimension	450x435x230mm	500x484x228mm	550x535x235mm		620x585x255mm	
Weight	22kg	26.5kg	27kg		36kg	

INSTALLATION

Selecting the Mounting Area

DO NOT INSTALL IN THE FOLLOWING AREAS:

- Areas with high salt content, such as the marine environment. It will deteriorate the metal parts and possibly lead to water / dampness penetrating the unit.
- Areas filled with mineral oil or containing splashed oil or steam such as in kitchens. This will deteriorate plastic parts of the unit, causing those parts to fail or allow water /damp to penetrate the unit.
- Areas that generate substances that adversely affect the equipment, such as sulphuric gas, chlorine gas, acid, or alkali. These can cause the copper pipes and brazed joints to corrode and fail to conduct electricity reliably.
- Areas that can cause combustible gas to leak, which contains suspended carbon-fibre, flammable dust or volatile inflammability such as paint thinner or gasoline.
- Areas where there may be gas leaks and where gas may settle around the unit, as this is a fire risk.
- Areas where animals may urinate on the unit or ammonia may be generated.
- High altitude areas (over 4000 metres above sea level).
- Environments where precipitation or humidity are above 95%.
- Areas where the air circulation is too low.

ALSO CONSIDER:

- Installing the indoor unit, outdoor unit, power supply cable, transmission cable and remote control cable at least 1 metre away from any television or radio receiver. This will prevent TV reception interference or radio noise. This will also prevent radio signal interference from external units that might interfere with the Wi-Fi or GSM monitoring.
- If children 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 floor is higher than 1600mm.
- For proper heat dissipation, allow a clearance of approximately 500mm to the side, 500mm above and below the unit and 1000mm to the front of the unit.

Mounting the Inverter

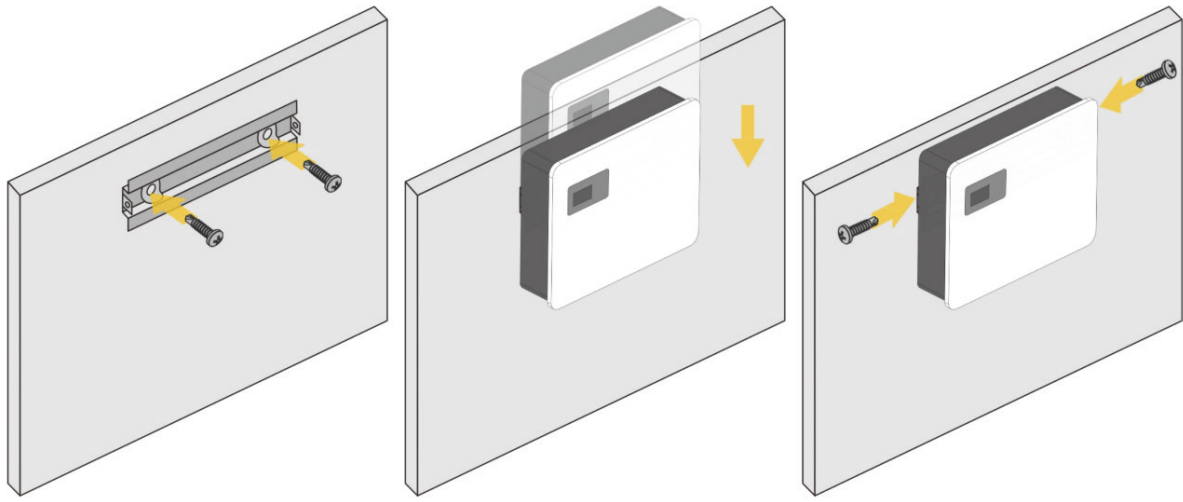
- Select a location that provides adequate support for the weight of the inverter.
- Install this inverter so that the LCD screen is eye-level for easy operation.
- An appropriate ambient temperature lies between -20 ~ 50°C for optimal operation. Battery charging temperature range lies between 0°C ~ 50°C.
- Ensure other objects and surfaces are outside of the recommended spaces (500mm each side / above and below / front) to guarantee heat dissipation and easy access to the wiring / cabling.



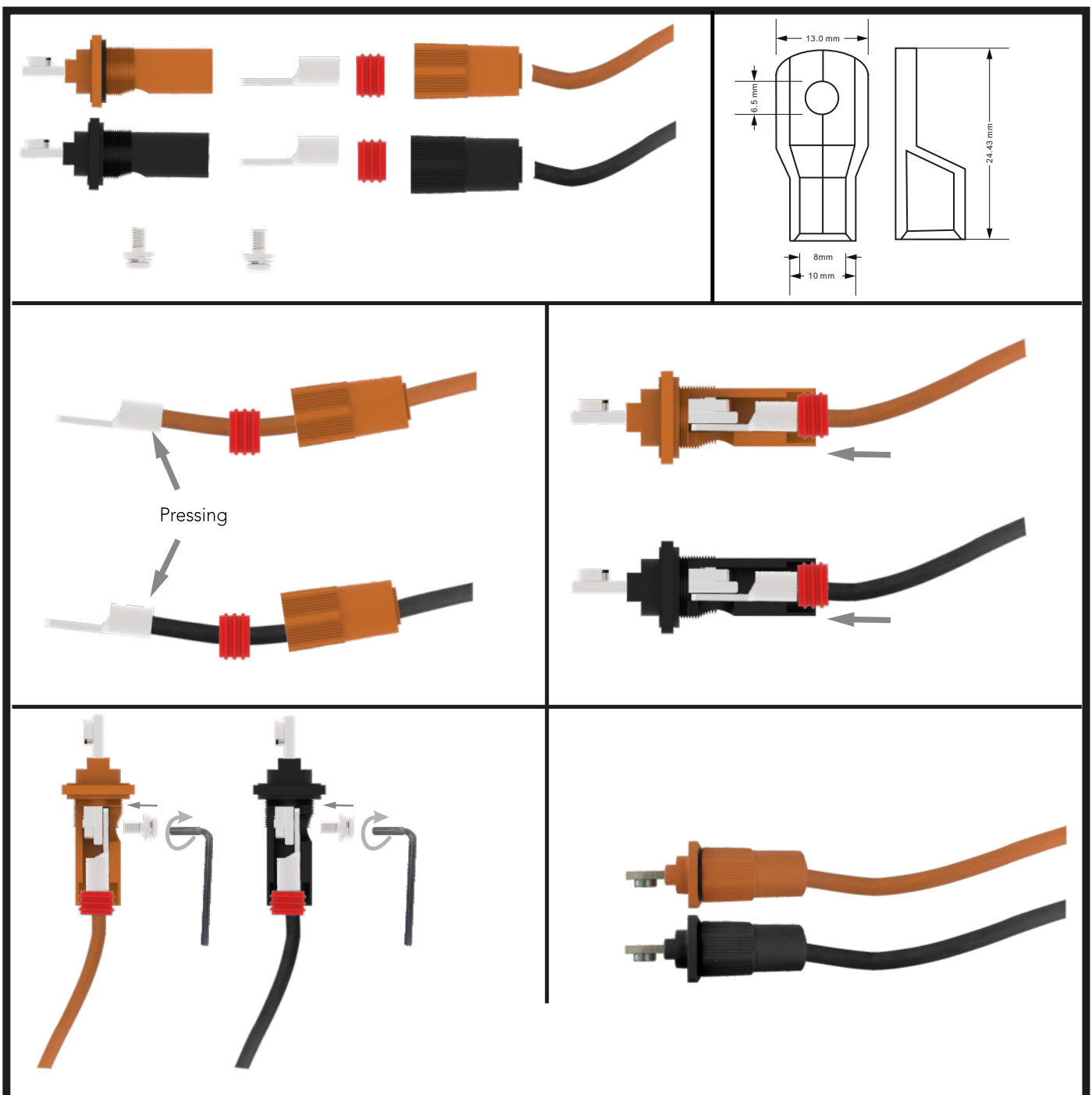
CAUTION

Risk of Injury (Heavy Object)

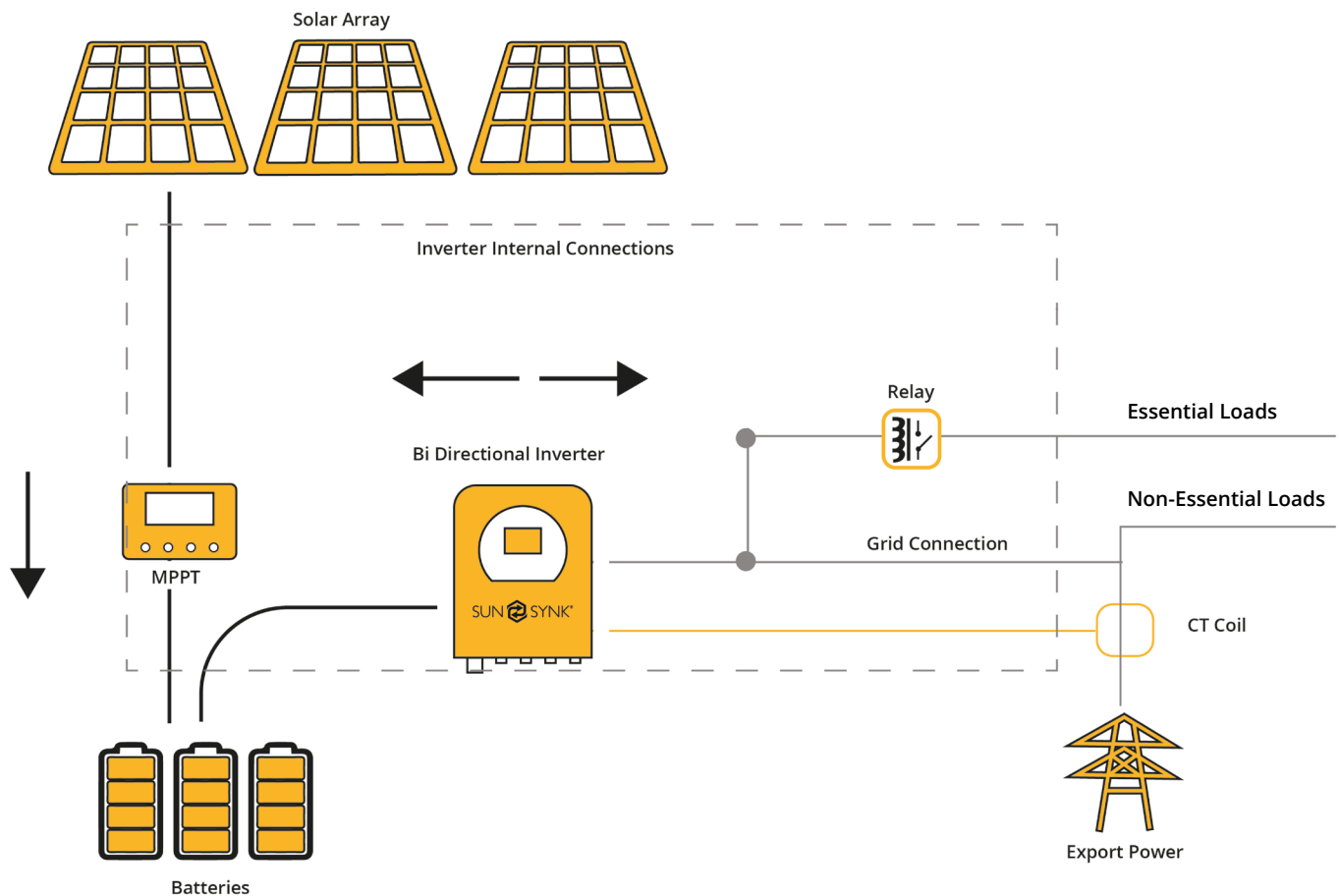
The inverter is heavy. Ensure the unit is handled carefully during installation, especially when mounting or removing it from the wall. Always use proper lifting techniques, and where possible, have two people assist with the mounting process to avoid injury.



Battery Cable Connection



Flow Diagram



Connecting to the Mains / Grid

1. Connect the LP IP65 Hybrid Inverter to the electrical grid via the **grid ports**, using a suitable RCD and a 40A fuse for the 3.6kW model, a 50A fuse for the 6kW, 7.2kW and 8kW models, and a 63A fuse for the 10kW and 12kW models on the consumer board.
2. Now, connect only the essential loads to the **load ports** (output) to a secondary consumer board, considering the maximum limit of 3.6/6/7.2/8/10/12kW according to the LP IP65 variant.
3. Ensure the main consumer unit and the secondary consumer unit are correctly grounded to the LP IP65.

Wiring the PV Panels

- The LP IP65 models all include two MPPT controllers, with the 3.6kW variant supporting a maximum input current of 30A (2 x 15A), the 6kW variant supporting 36A (2 x 18A), the 7.2kW variant supporting 46A (2 x 23A), both the 8kW and 10kW variants supporting 56A (2 x 28A), and the 12kW variant supporting 60A (2 x 30A).
- Before connecting to PV modules, install a separate DC circuit breaker between the inverter and PV array.
- 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.
- Also, the open-circuit voltage (Voc) of the PV modules does not exceed the maximum input voltage of the inverter. Also, the Voc of the PV array should be higher than the minimum starting voltage of the inverter.
- Connect the PV panels into the MC4 connectors.

CT Coil and Load Power Settings



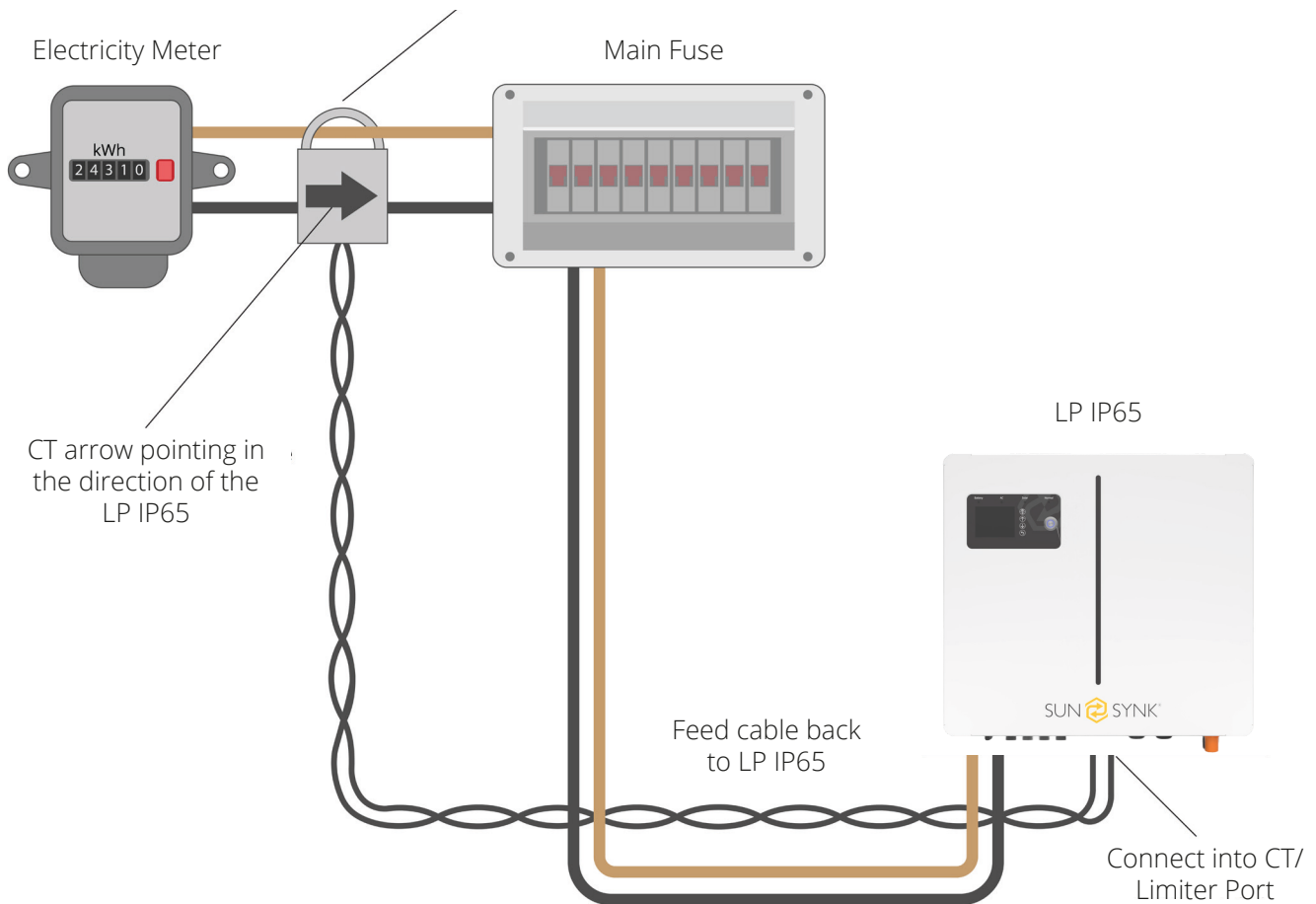
WARNING

Always ensure the inverter is fully powered off and verified safe before connecting or extending the CT. Making connections while the inverter is live can cause severe damage and void warranties. Under no circumstances should live connections be made.

The CT coil is one of the most important parts of the LP IP65. This device reduces the power of the inverter to prevent feeding power to the grid. This 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.

Fit around positive cable feeding the building BETWEEN the meter and main fuse.



Parallel Operation

In order to connect LP IP65 inverters to operate in parallel, you need to set up the work mode configuration for each of the inverter. Basically, you have to set which inverter will be the master and which will be the slaves, and then make the connections described in section External Battery and Parallel Connections.



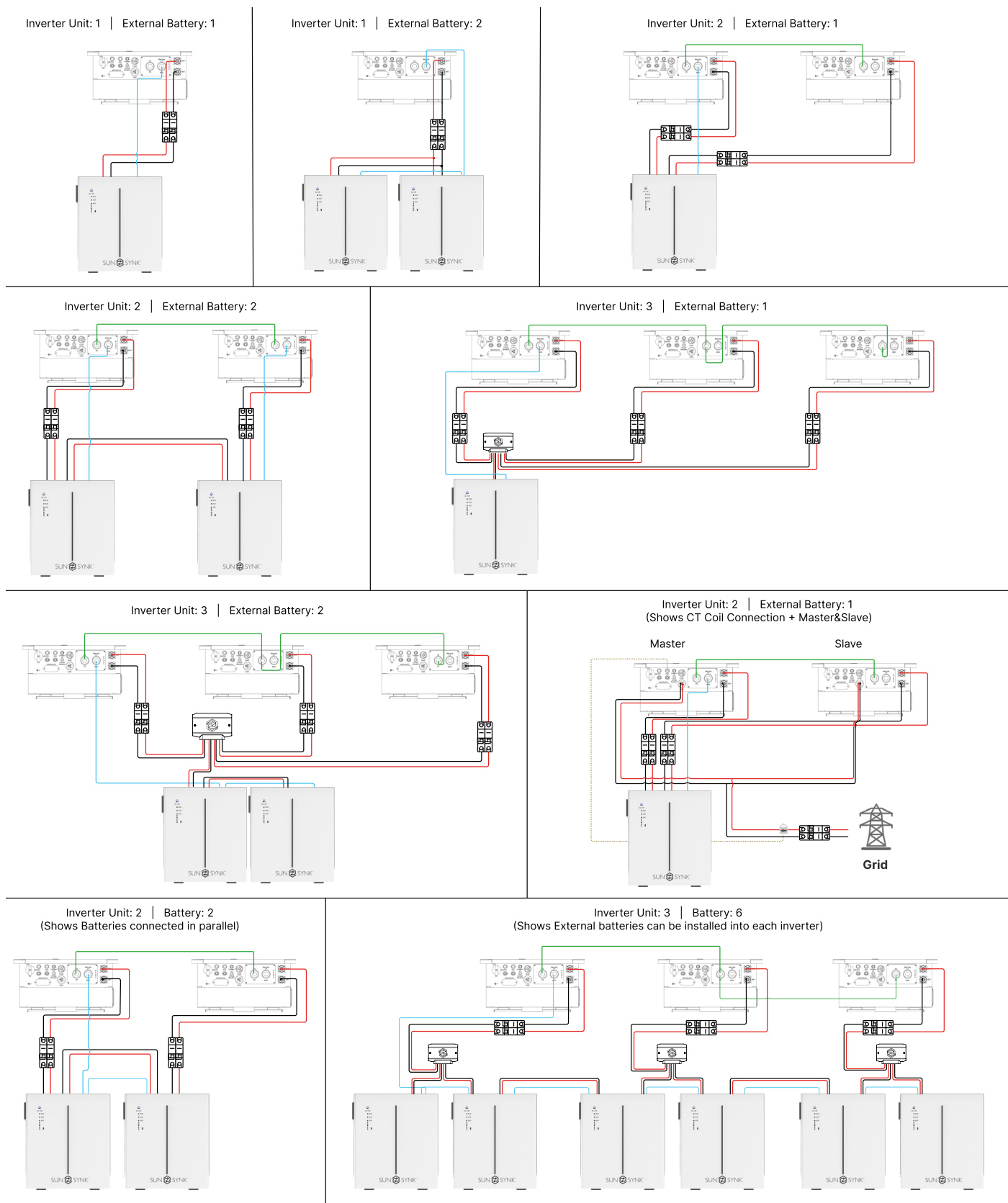
WARNING

To ensure the proper functioning of the parallel operation, it is important first to establish the work mode for both the Master and Slave inverters and then make the necessary wiring connections.

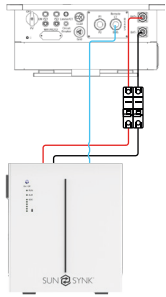
If you make the connection prior to changing the work mode, an F15 error will be displayed on the Fault Codes page. In the event of this error, please maintain the connection and proceed to the settings to modify the work mode as presented above, and wait approximately 3-4 minutes. After that, the device should return to its normal working condition, with the error cleared.

External Battery and Parallel Connections

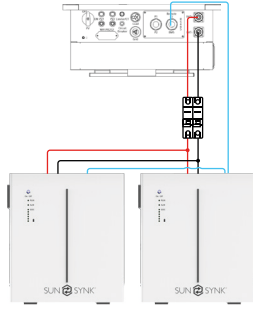
SM3.6kWLL65 / SM3.6kWPLL65



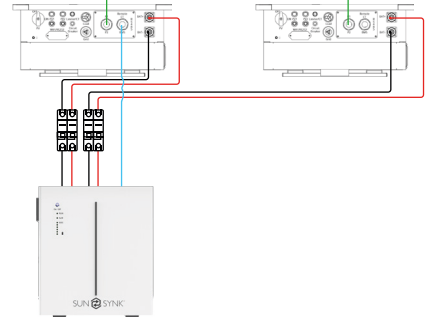
Inverter Unit: 1 | External Battery: 1



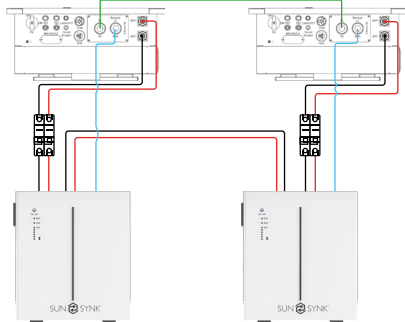
Inverter Unit: 1 | External Battery: 2



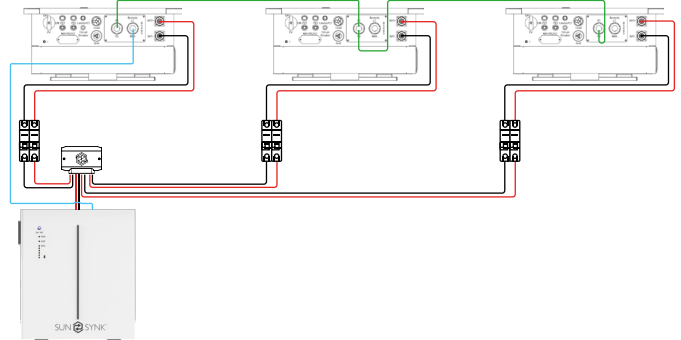
Inverter Unit: 2 | External Battery: 1



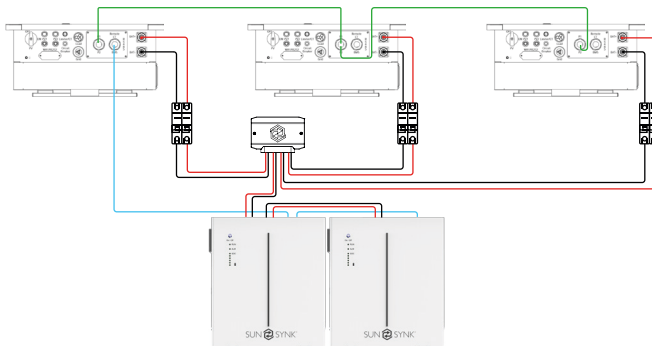
Inverter Unit: 2 | External Battery: 2



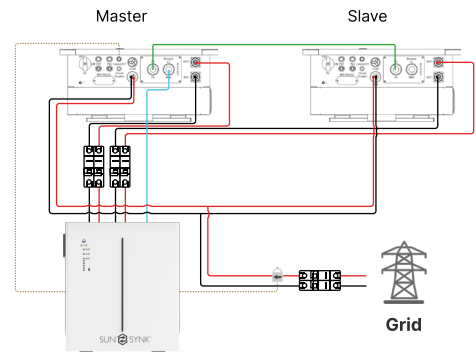
Inverter Unit: 3 | External Battery: 1



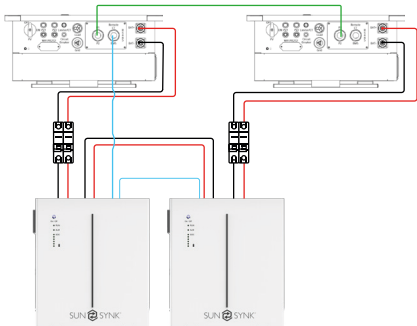
Inverter Unit: 3 | External Battery: 2



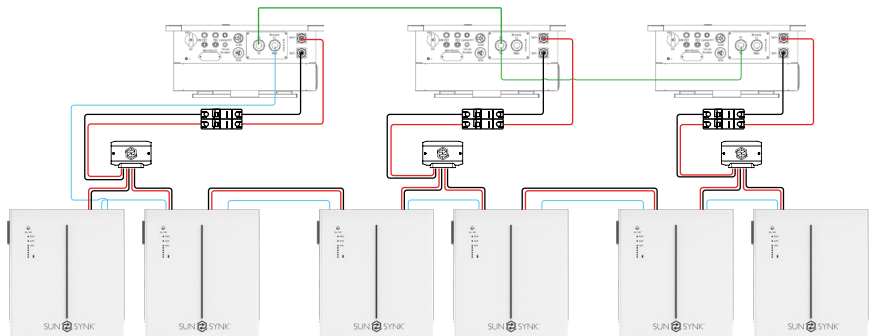
Inverter Unit: 2 | External Battery: 1
(Shows CT Coil Connection + Master&Slave)



Inverter Unit: 2 | Battery: 2
(Shows Batteries connected in parallel)

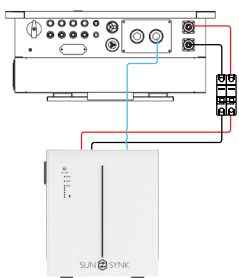


Inverter Unit: 3 | Battery: 6
(Shows External batteries can be installed into each inverter)

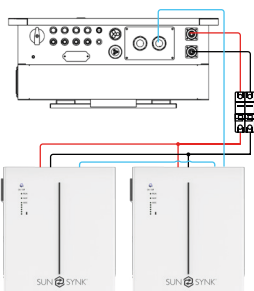


SM7.2kWLL65 / SM7.2kWPLL65 and SM8.0kWLL65 / SM8.0kWPLL65

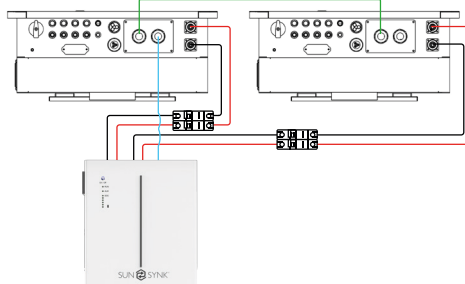
Inverter Unit: 1 | Battery: 1



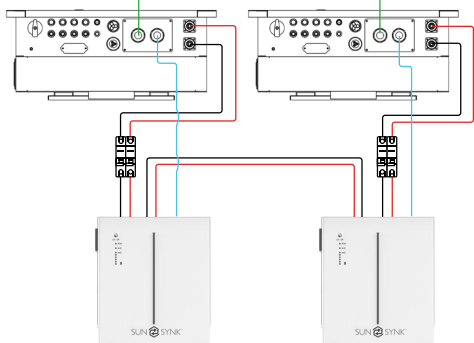
Inverter Unit: 1 | Battery: 2



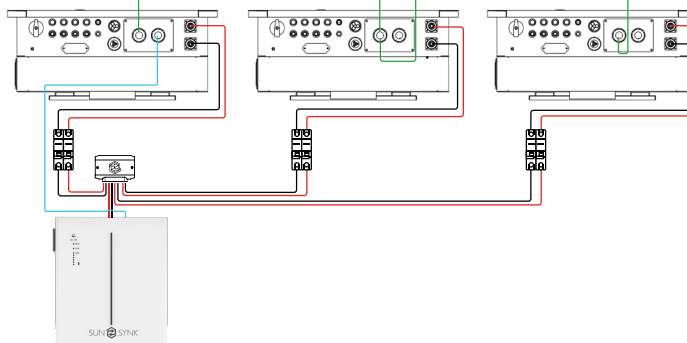
Inverter Unit: 2 | Battery: 1



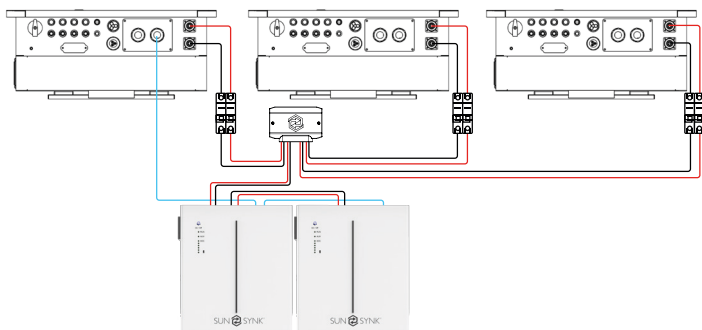
Inverter Unit: 2 | Battery: 2



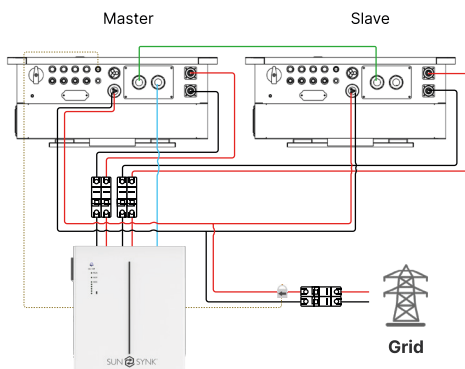
Inverter Unit: 3 | Battery: 1



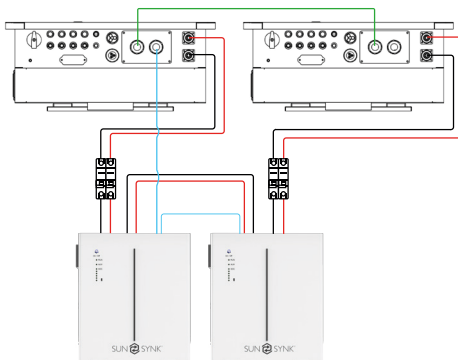
Inverter Unit: 3 | Battery: 2



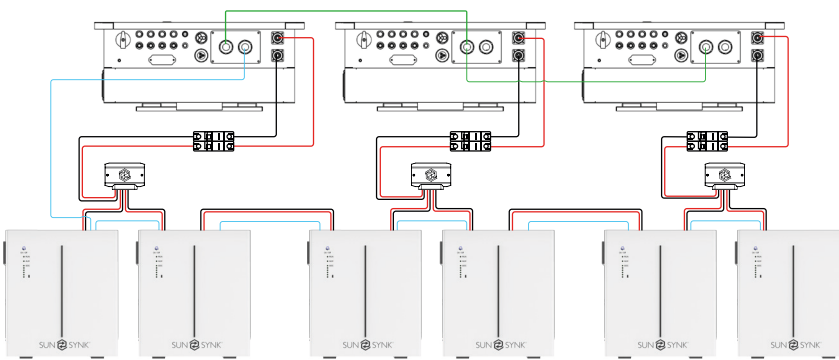
Inverter Unit: 2 | Battery: 1
(Shows CT Coil Connection + Master&Slave)



Inverter Unit: 2 | Battery: 2
(Shows Batteries connected in parallel)

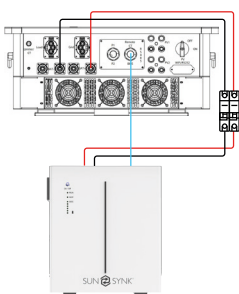


Inverter Unit: 3 | Battery: 6
(Shows External batteries can be installed into each inverter)

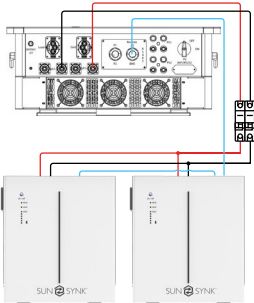


SM10.0kWLL65 / SM10.0kWPLL65 and SM12.0kWLL65 / SM12.0kWPLL65

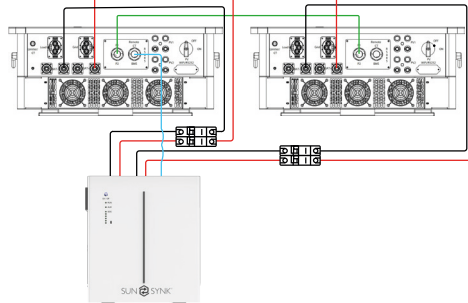
Inverter Unit: 1 | Battery: 1



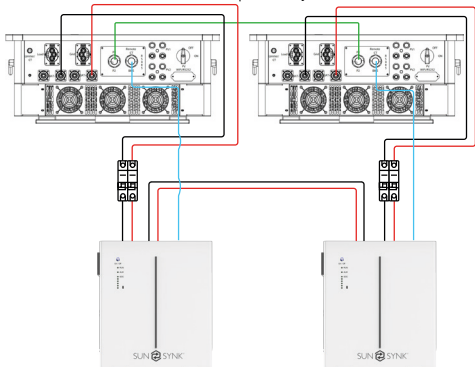
Inverter Unit: 1 | Battery: 2



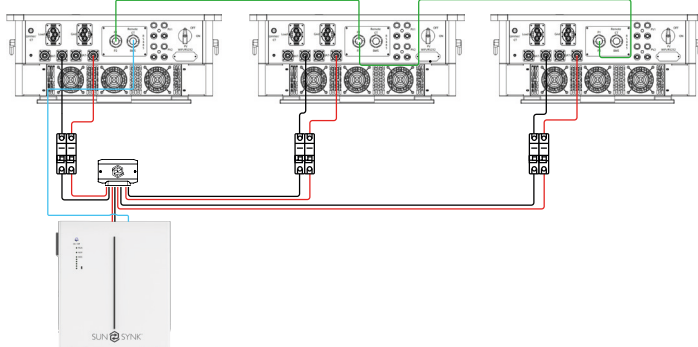
Inverter Unit: 2 | Battery: 1



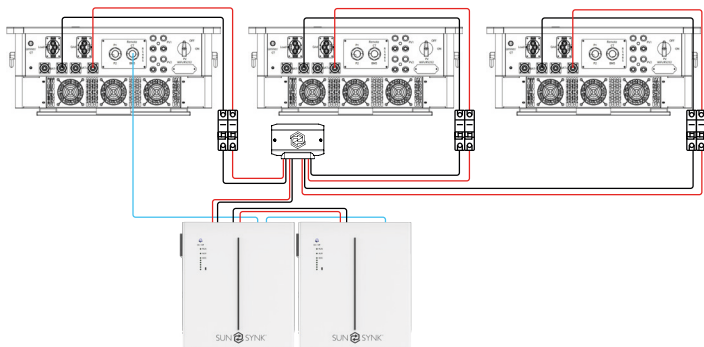
Inverter Unit: 2 | Battery: 2



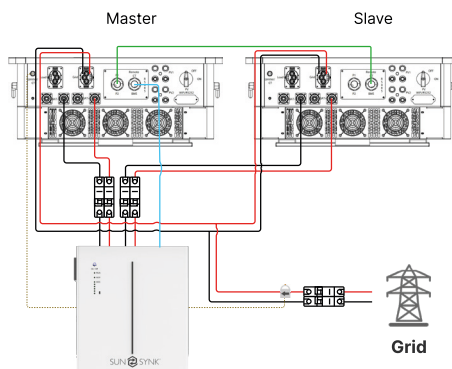
Inverter Unit: 3 | Battery: 1



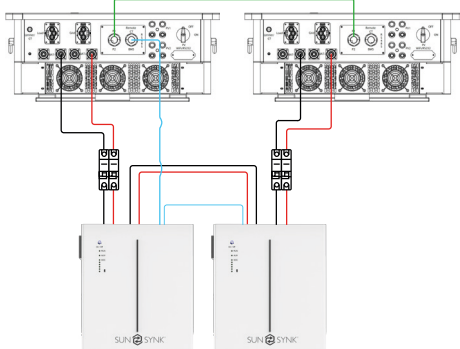
Inverter Unit: 3 | Battery: 2



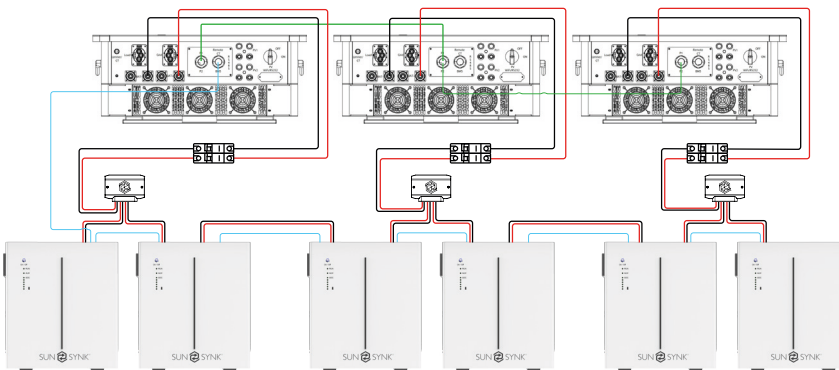
Inverter Unit: 2 | Battery: 1
(Shows CT Coil Connection + Master&Slave)



Inverter Unit: 2 | Battery: 2
(Shows Batteries connected in parallel)

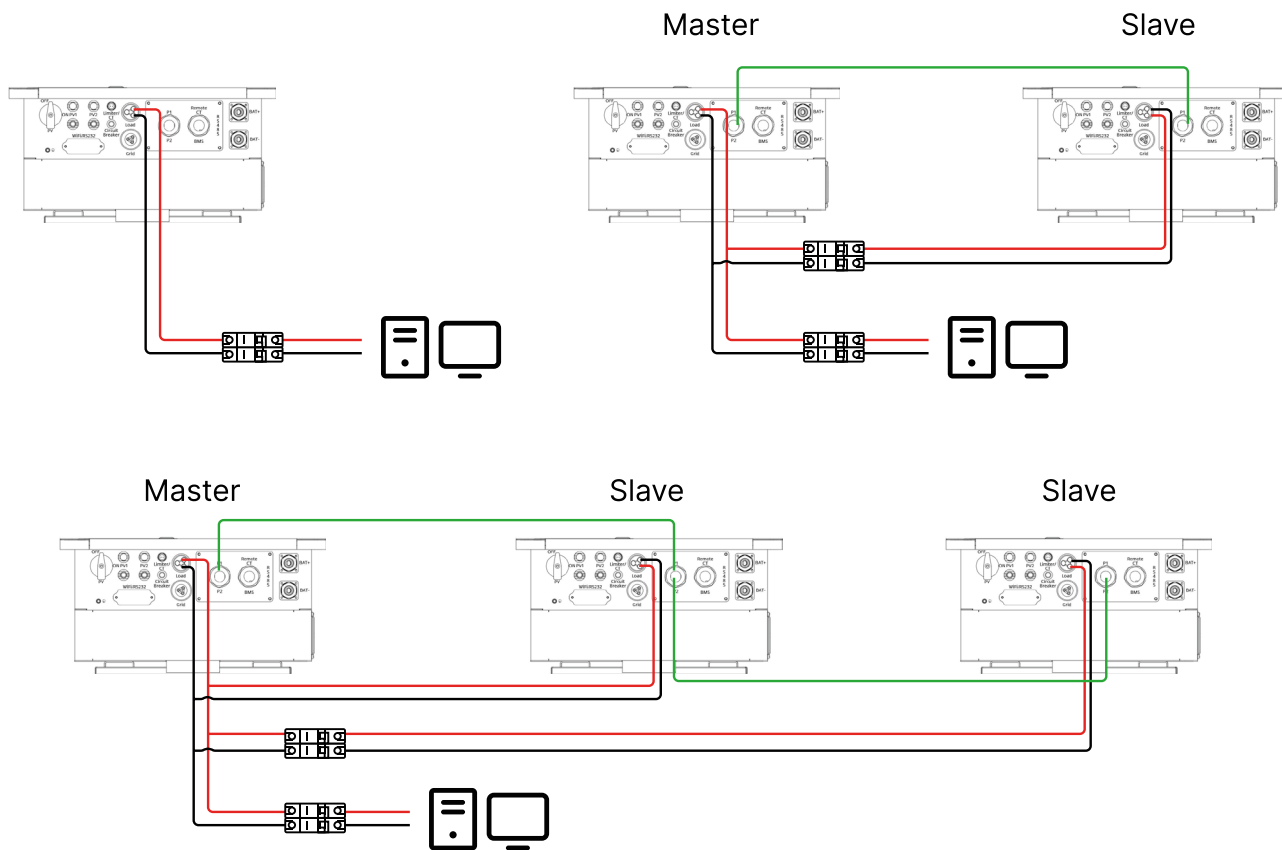


Inverter Unit: 3 | Battery: 6
(Shows External batteries can be installed into each inverter)

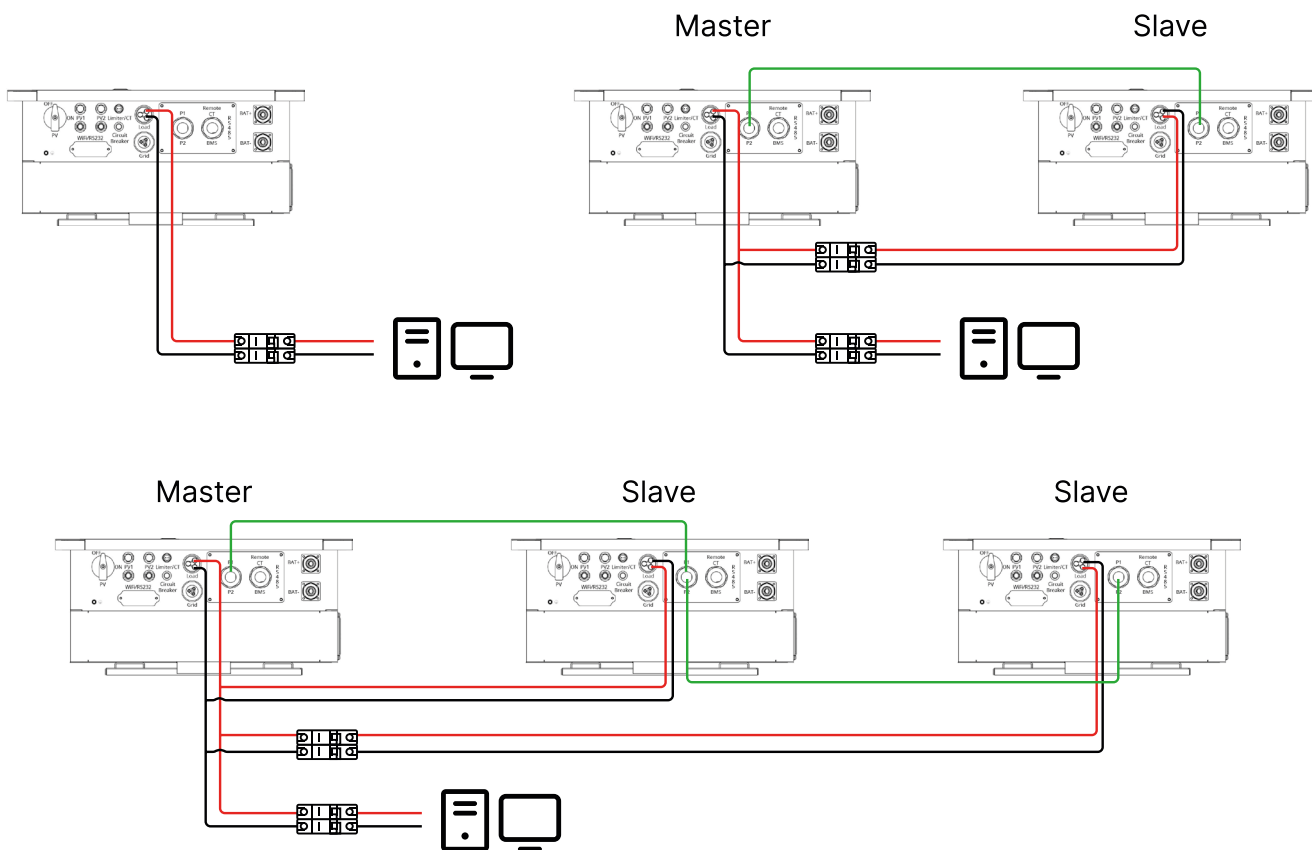


Load Connection

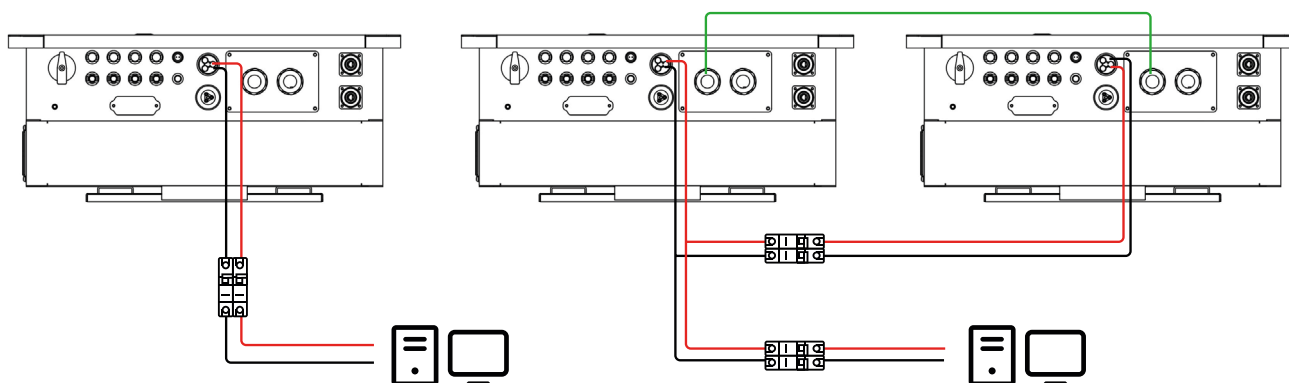
SM3.6kWLL65 / SM3.6kWPLL65



SM6.0kWLL65 / SM6.0kWPLL65



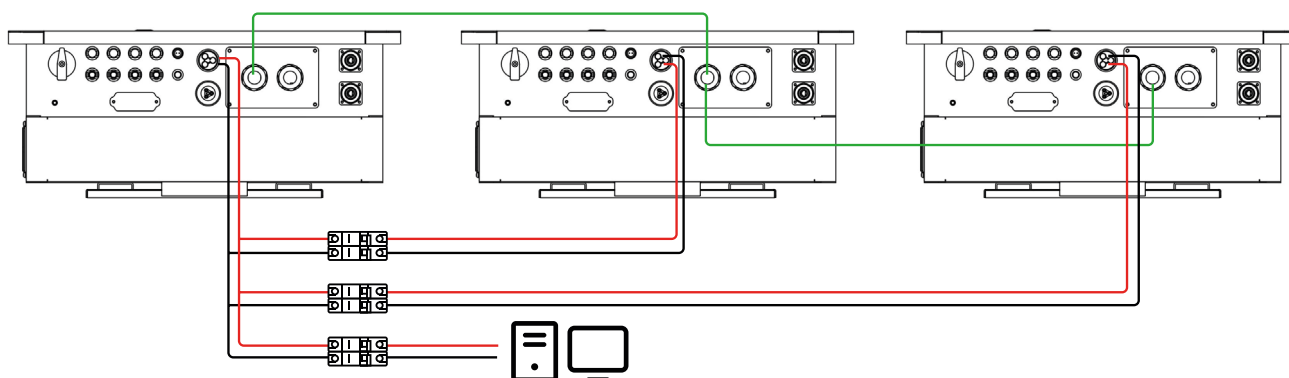
SM7.2kWLLL65 / SM7.2kWPLL65 and SM8.0kWLLL65 / SM8.0kWPLL65



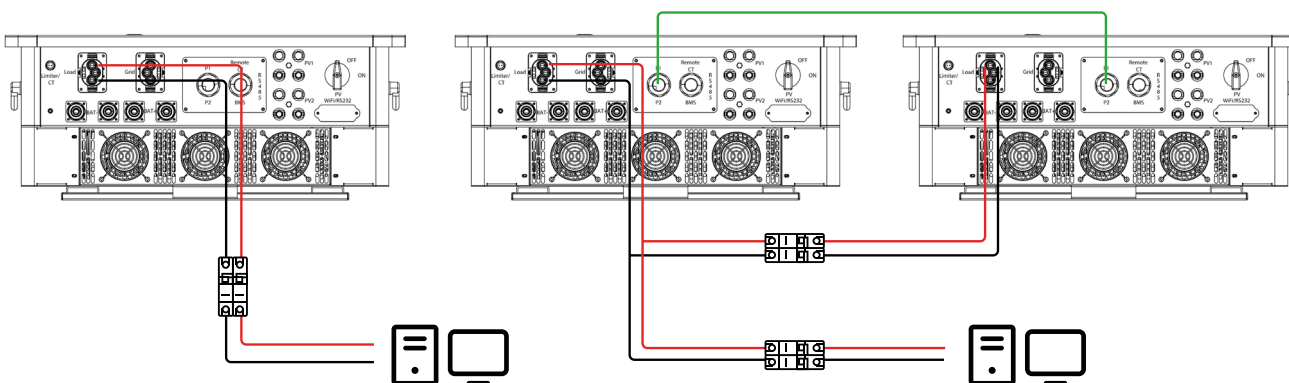
Master

Slave

Slave



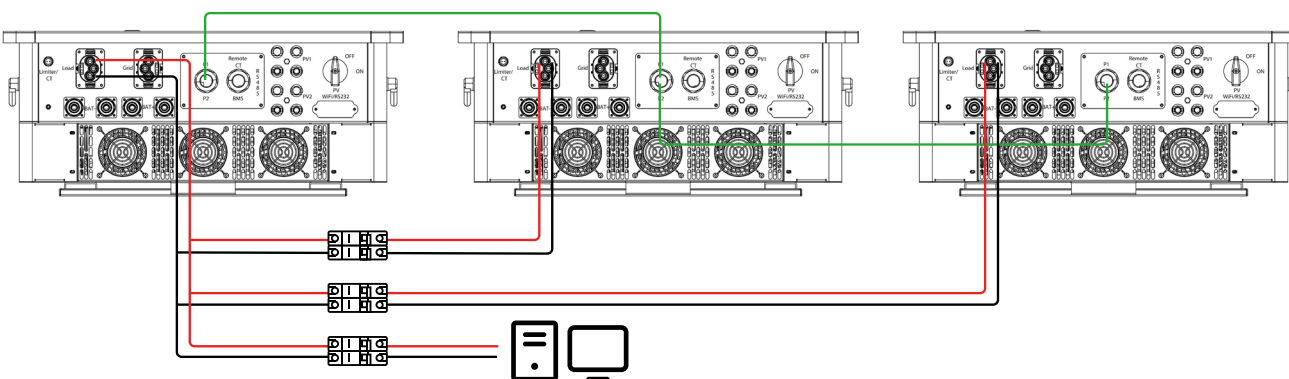
SM10.0kWLLL65 / SM10.0kWPLL65 and SM12.0kWLLL65 / SM12.0kWPLL65



Master

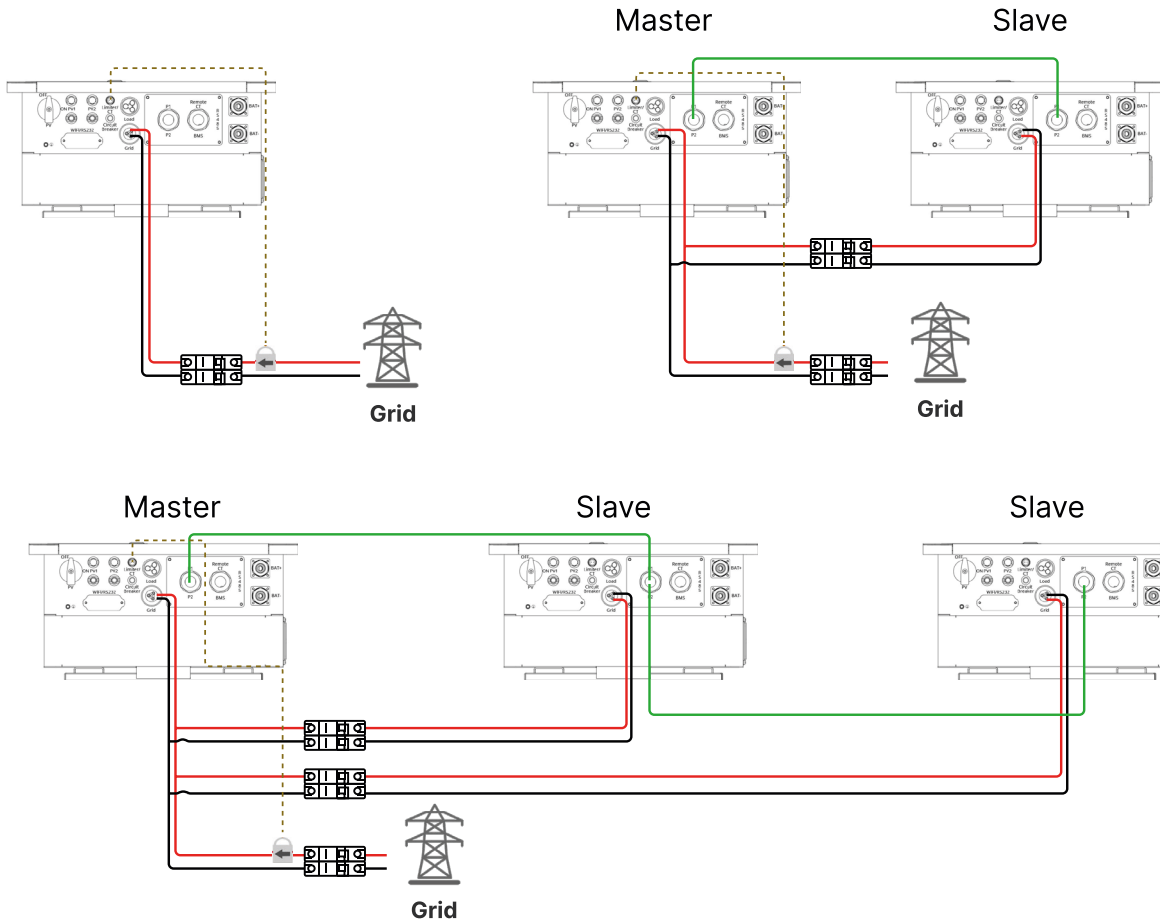
Slave

Slave

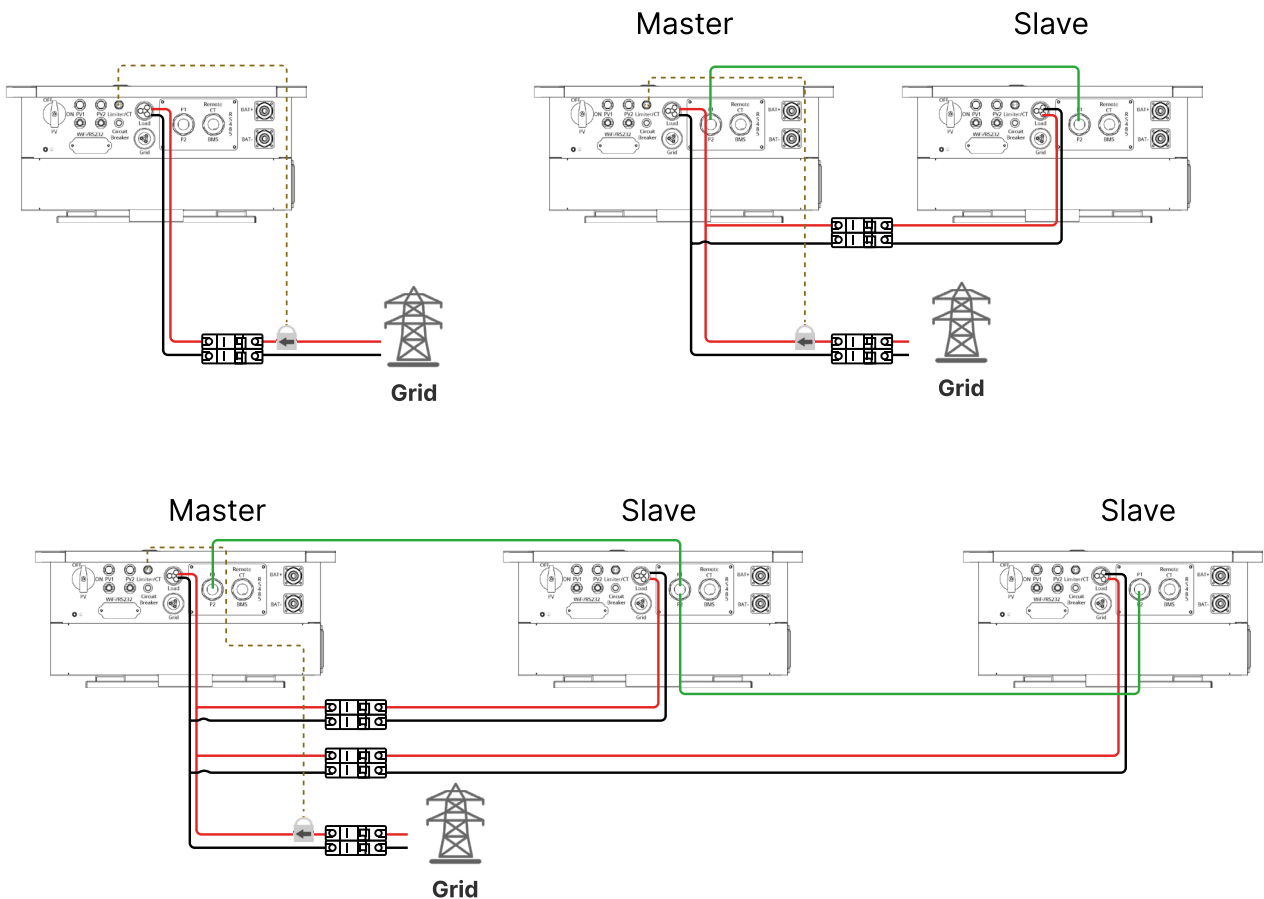


Grid Connection

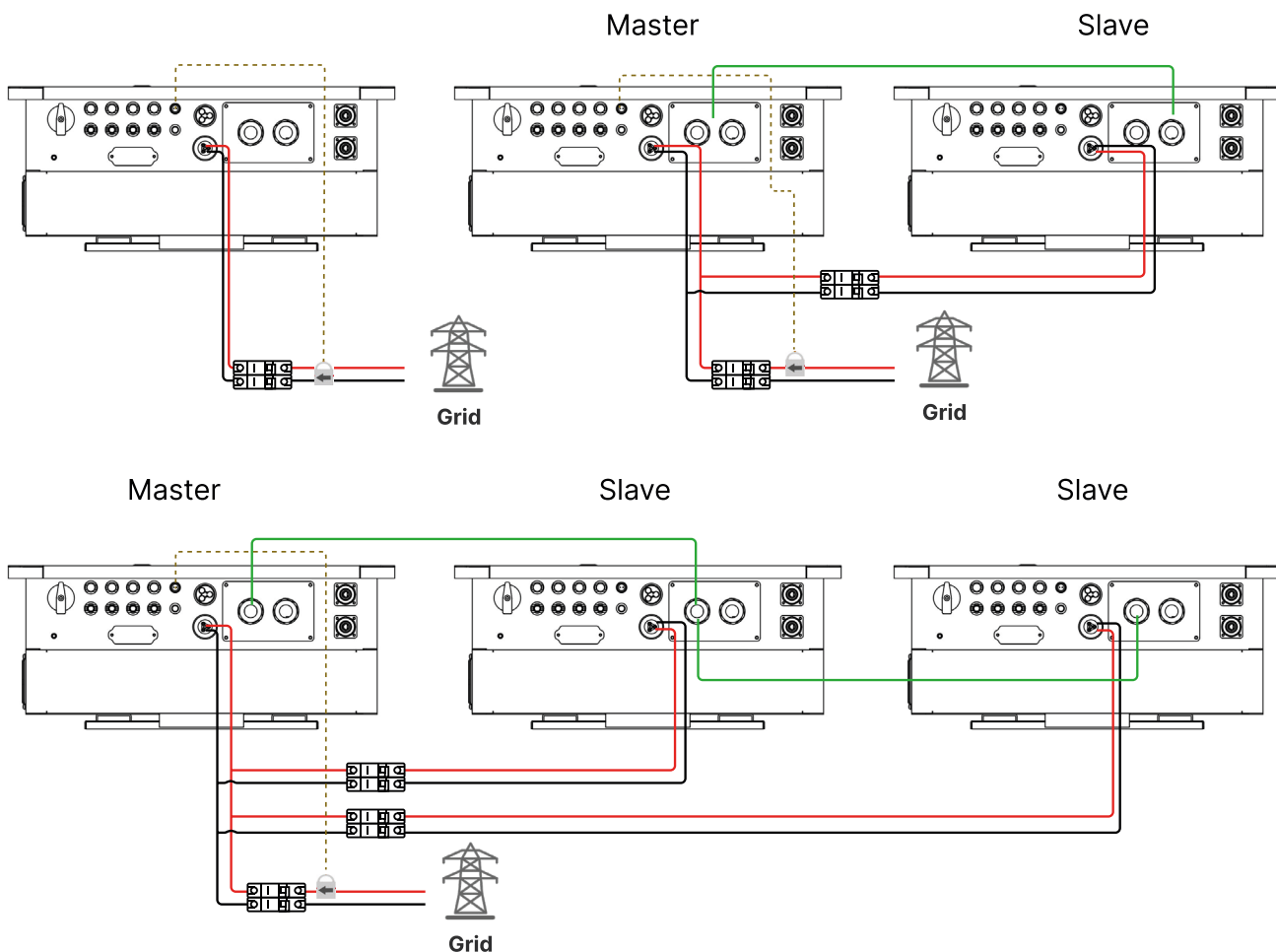
SM3.6kWLL65 / SM3.6kWPLL65



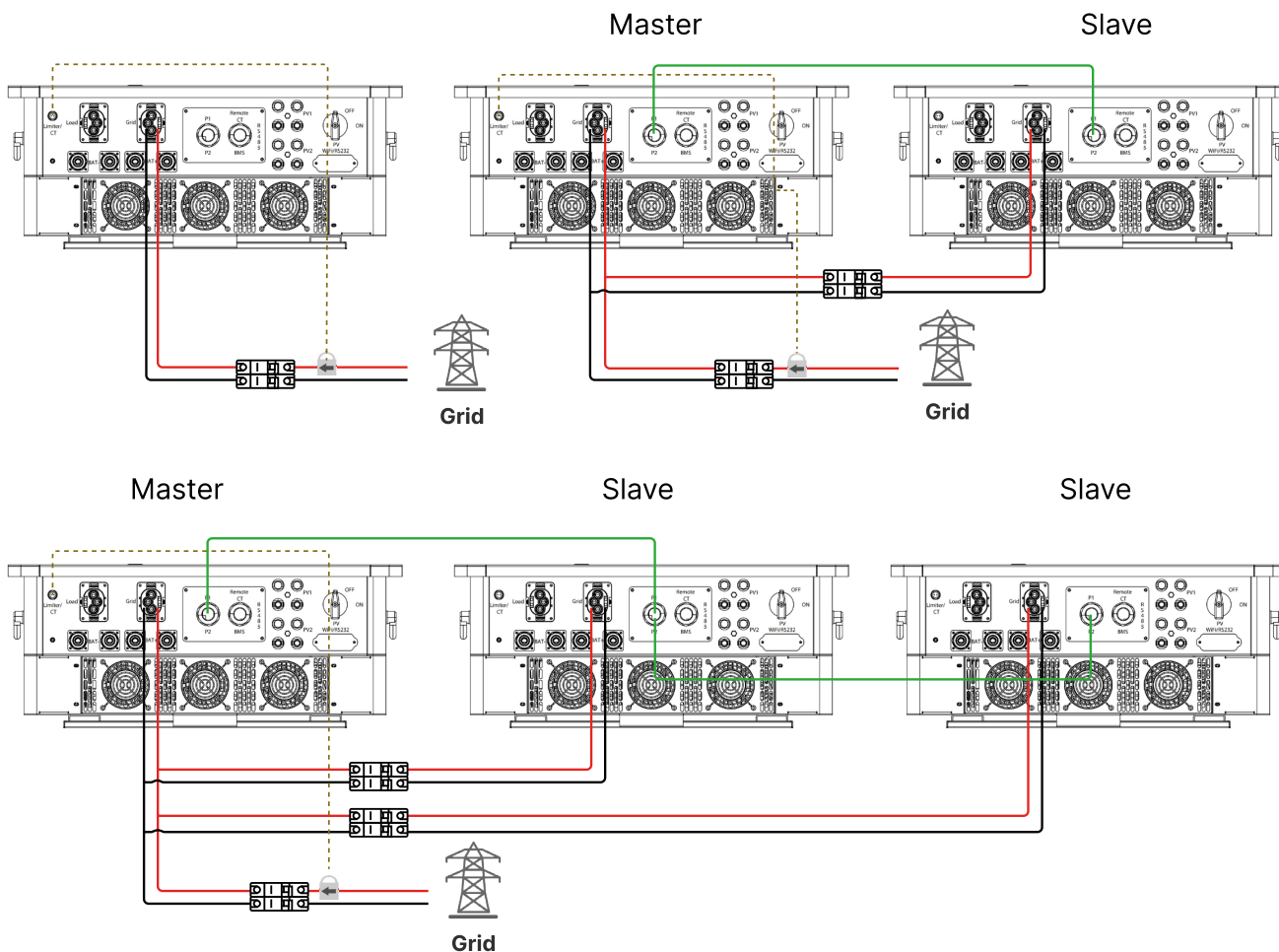
SM6.0kWLL65 / SM6.0kWPLL65



SM7.2kWLL65 / SM7.2kWPLL65 and SM8.0kWLL65 / SM8.0kWPLL65

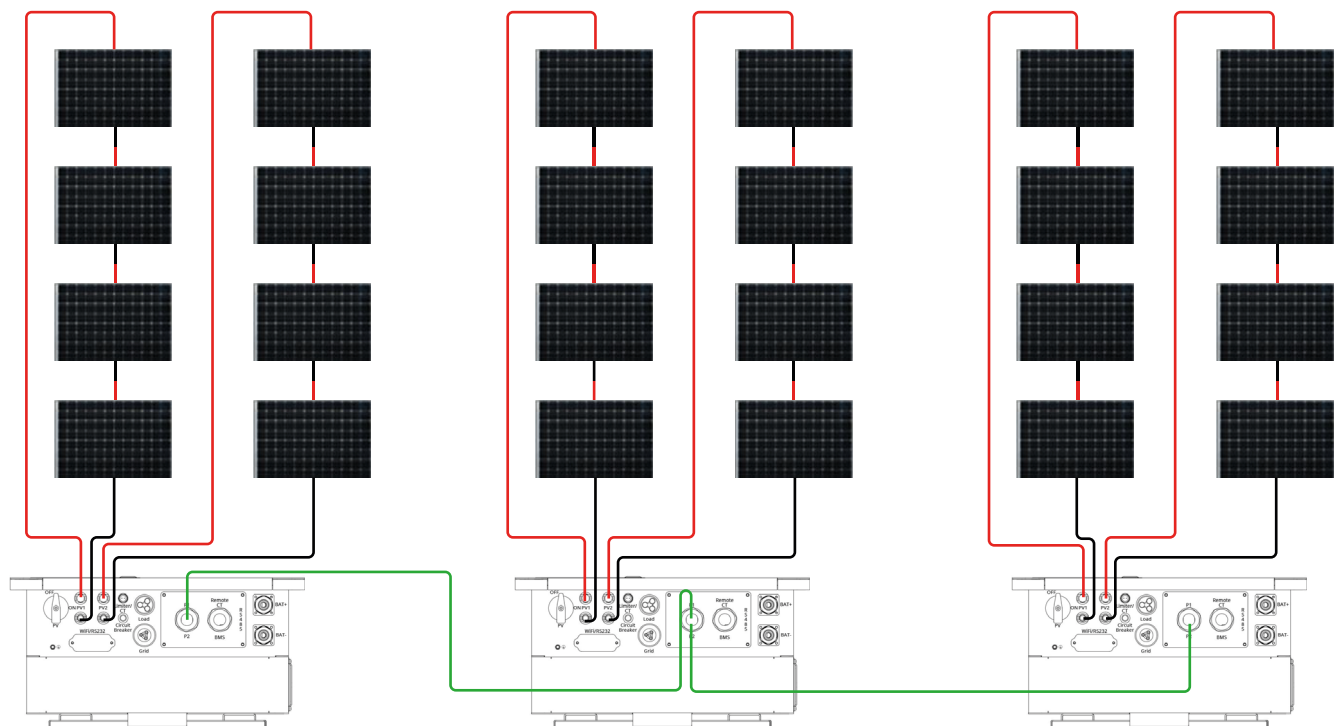
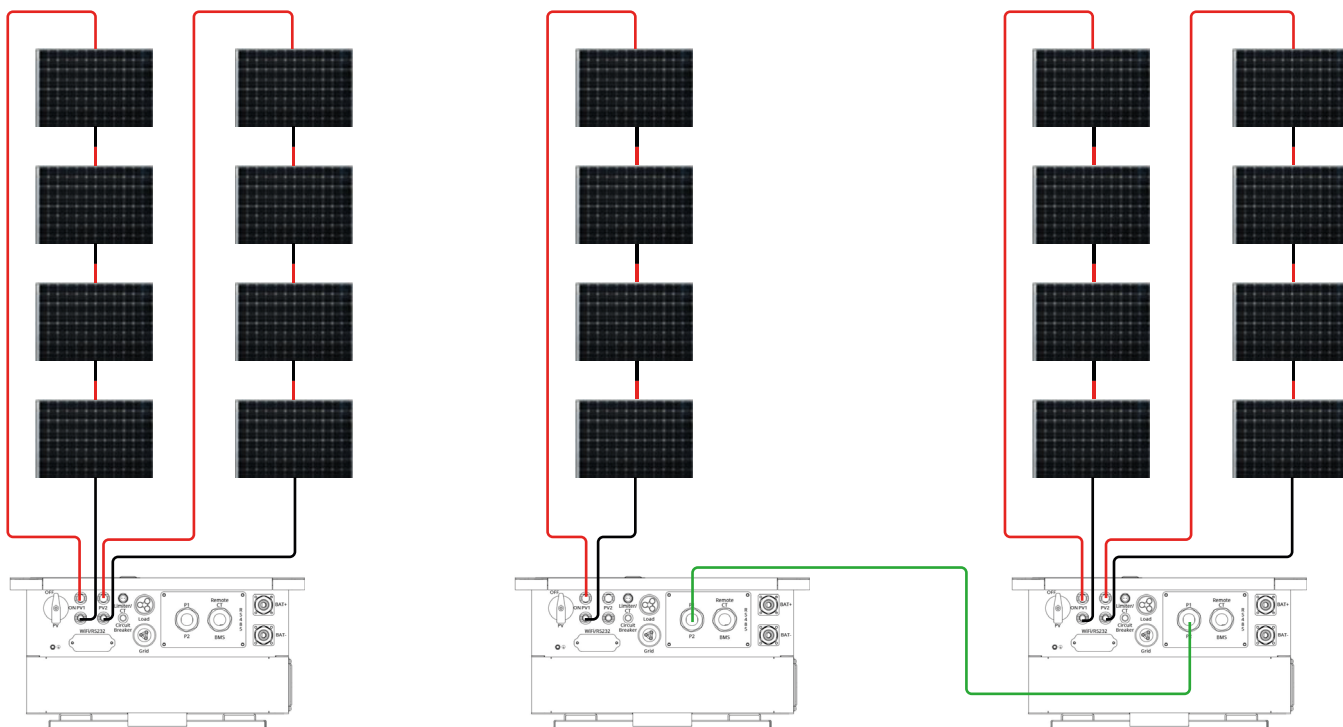


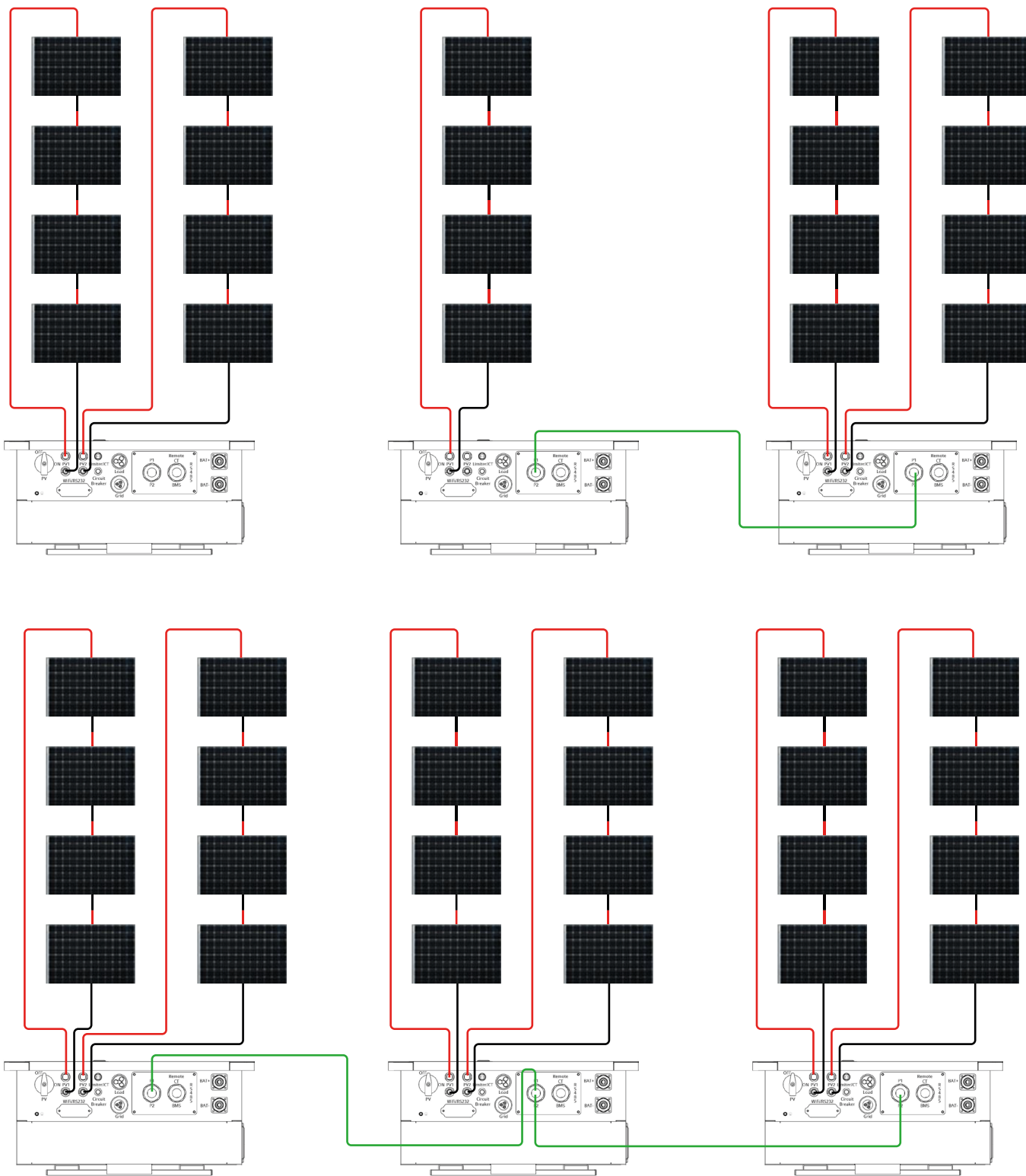
SM10.0kWLL65 / SM10.0kWPLL65 and SM12.0kWLL65 / SM12.0kWPLL65

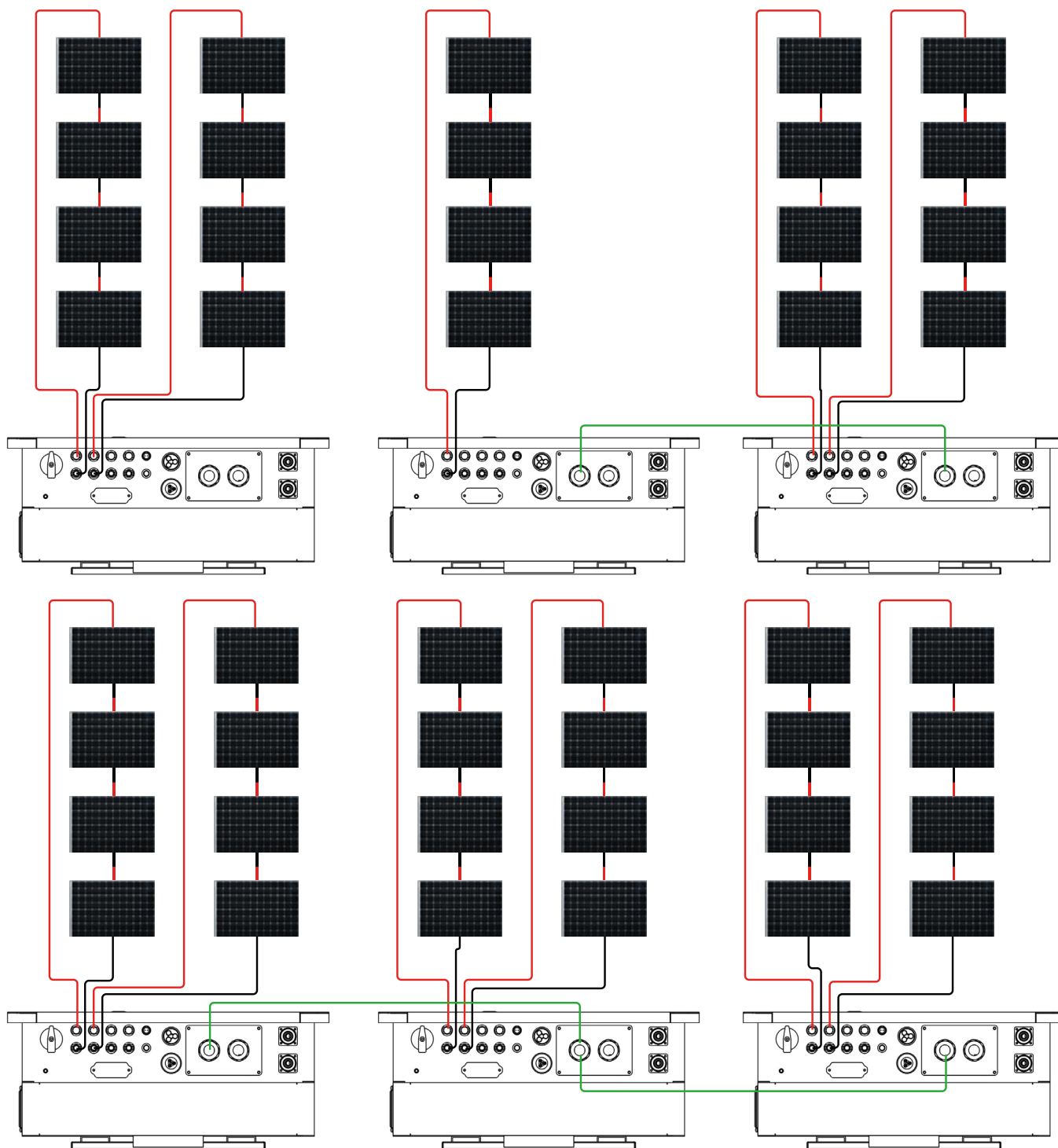


Solar Connection

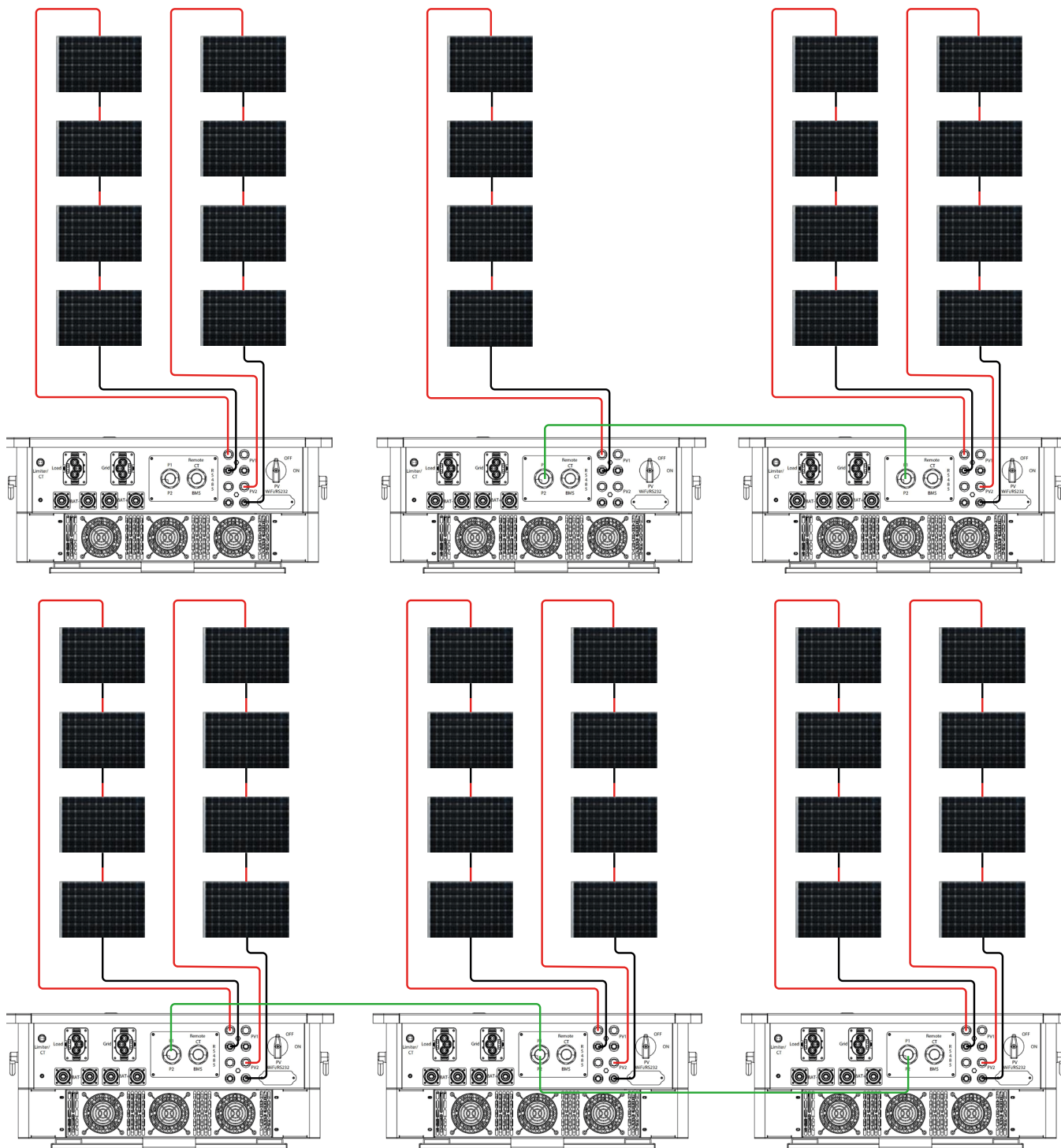
SM3.6kWLL65 / SM3.6kWPLL65







SM10.0kWLLL65 / SM10.0kWPLL65 and SM12.0kWLLL65 / SM12.0kWPLL65



FACTORY SETTINGS

Battery Settings	Default Setting
Low Battery Cut Off	45.0V
Reboot Voltage	50.0V
Maximum Charge Current	50A
Charge from MAIN	YES
Float Charge Voltage	56.0V
Active	ON

System Configuration	Default Setting
Maximum Discharge Current	70A (3.6kW model) 100A (6/7.2/8/10/12kW model)
Maximum Battery Voltage	56.0V
Import Trickle Feed	30W
Export Control	Zero Export
Earth Neutral Bond	Enable
Night Power Saving	Disable

Grid Settings	Default Setting
Maximum Grid Voltage	253V
Minimum Grid Voltage	195.5V
Maximum Grid Frequency	52.0Hz
Minimum Grid Frequency	47.5Hz

System Controller		Default Setting
00:00	6:00	2000W (3.6kW model) 3000W (6/7.2/8/10/12kW model) 52.0V Y
6:00	12:00	2000W (3.6kW model) 3000W (6/7.2/8/10/12kW model) 52.0V Y
12:00	18:00	2000W (3.6kW model) 3000W (6/7.2/8/10/12kW model) 52.0V Y
18:00	23:59	2000W (3.6kW model) 3000W (6/7.2/8/10/12kW model) 52.0V Y

OPERATION

Switching ON/OFF

Before switching on the inverter, ensure that all wiring is complete and the battery connection is secure.

- To turn on the inverter, press the ON/OFF button.
- When the inverter is powered by PV or grid supply but has no battery connected, the LCD screen will still illuminate, even if the ON/OFF button is off. The display will indicate that the system is in standby mode.
- In this state, press the ON/OFF button, then select 'No Battery' from the startup options. The system will begin operating using available PV or grid power only.



NOTICE

The inverter can operate without a battery if either PV or grid input is present. However, battery features such as backup and storage will not be available in this mode.

Display

The LCD display screen is situated on the front of the LP IP65, this is where you can control and operate the system.

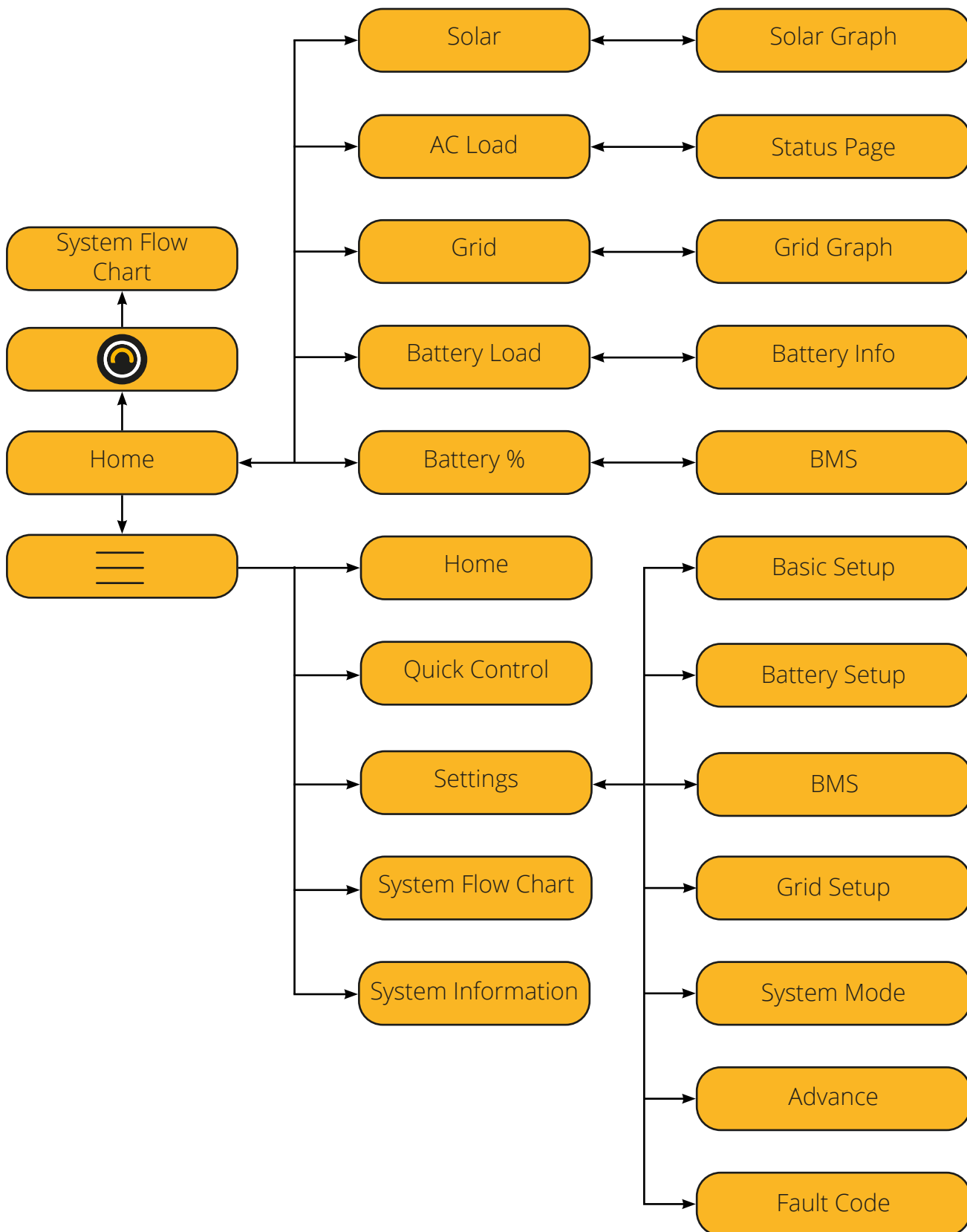


1. **Power** - to turn the system on / off.
2. **Settings / Select** - to operate the settings menu & to select.
3. **Up** - to navigate up.
4. **Down** - to navigate down.
5. **Home / Back** - to go back to the home menu & to navigate backwards.

LED Indicators

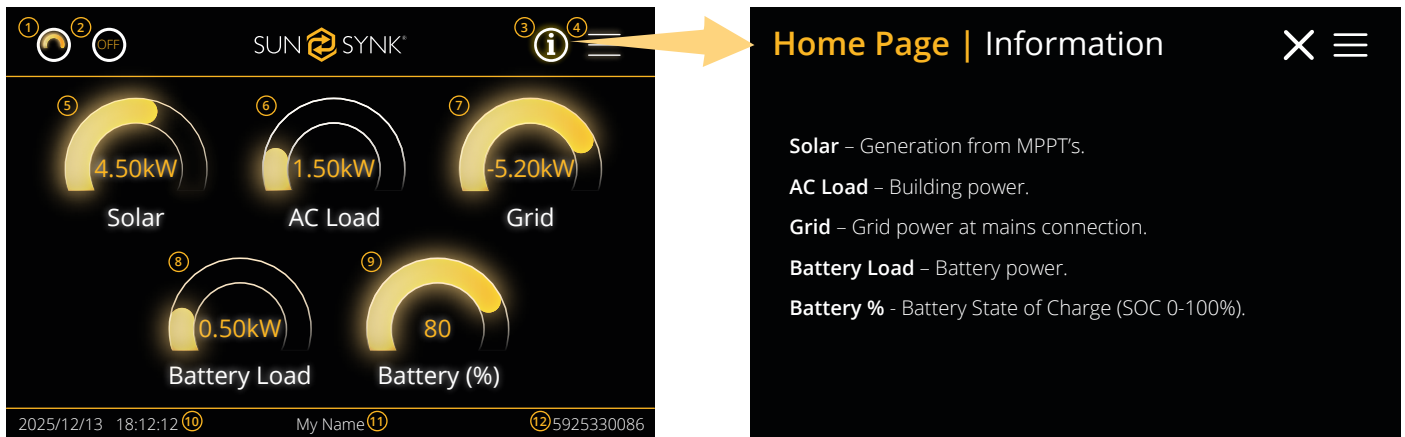
TYPE	INDICATION	DESCRIPTION
BATTERY	GREEN	CHARGING
	BLUE	DISCHARGING
AC	GREEN	AC CONNECTED
	OFF	AC OFF
SOLAR	GREEN	SOLAR ON
	OFF	SOLAR OFF
NORMAL	GREEN	INVERTER RUNNING
	RED	SYSTEM FAULT
	OFF	INVERTER NOT RUNNING

LCD Operation Flow Chart



Home

The Home Screen serves as the central dashboard of the LP IP65 Inverter, providing users with an immediate and intuitive overview of the system's key metrics. From here, users can monitor the most important data, navigate to different sections, and control essential functions with ease.

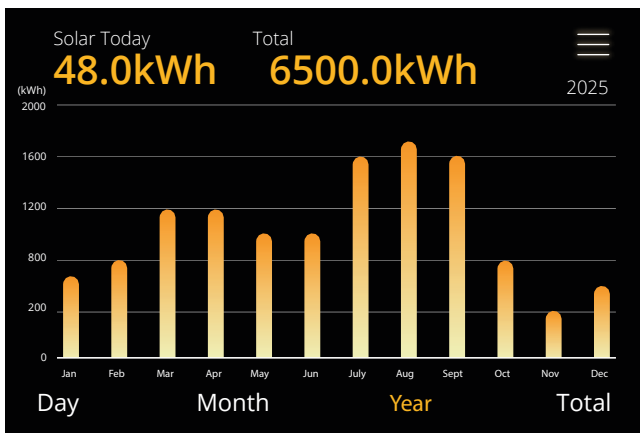
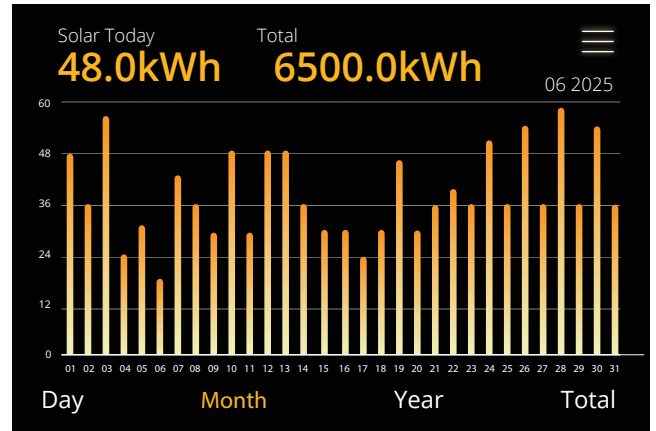
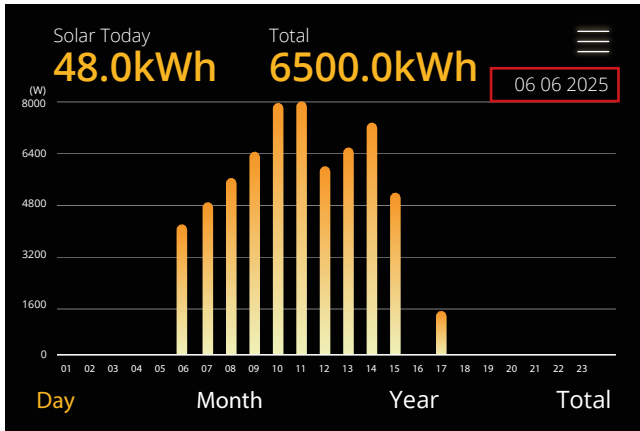


- ① **System Flow Icon:** Tapping this icon opens the System Flow Chart screen, providing a visual map of how power is distributed between solar, battery, grid, and loads.
- ② **System Status Indicator:** Indicates inverter status. The icon shows ON when the inverter is operating normally and OFF when there is a malfunction or alarm.
- ③ **Information Icon:** Opens the Home Page Information screen, which explains each data icon.
- ④ **Menu Icon:** Leads to the main menu, where users can access setup options, smart features, advanced configurations, and more.
- ⑤ **Solar:** Shows real-time energy generation from solar panels. Tap to access the Solar Setup screen, which includes daily, monthly, yearly, and total solar generation stats.
- ⑥ **AC Load:** Displays the amount of power currently being used by the AC loads. Tap to access the AC Load screen for detailed system information including Load, Battery, Grid and Solar.
- ⑦ **Grid:** Indicates the power being drawn from or exported to the grid. Tap to access the Grid screen and view energy import/export graphs over time.
- ⑧ **Battery Load:** Displays the real-time battery power flow. This value shows whether the battery is charging or discharging, in kilowatts. Tapping this icon opens the Battery Information screen where users can see the battery voltage, current, charging/discharging status and state of charge (SOC).
- ⑨ **Battery %:** Indicates the State of Charge (SOC) of the battery, displayed as a percentage (0–100%). Tapping this icon opens the Li BMS (Battery Management System) screen, where users can monitor battery performance in greater detail.
- ⑩ **Date & Time:** Displays the current system date and time in real time (e.g., 01/02/2024 – 13:15:21).
- ⑪ **Username:** Indicates the name of the current user or administrator operating the interface (e.g., “My Name”).
- ⑫ **System ID:** Displays the inverter’s unique system identifier (e.g., 0000000000), useful for system tracking, service, and diagnostics.

Home | Solar

The Solar screen displays the total solar energy produced over various time periods. It provides a clear graphical breakdown of solar generation statistics by day, month, year, and overall system lifetime. On the daily chart, you can click on the date to check the Solar PV (photovoltaic) output for the current week.

Access this screen by tapping the "Solar" icon on the Home screen.



Home | AC Load

The AC Load screen provides a real-time overview of power flow across all major system components, including the battery, grid, solar PV input, inverter output, connected loads, and temperature. This page is designed to give users a full picture of energy usage and system performance.

To access this page, tap the "AC Load" dial on the Home Screen.

Information		
Battery	Grid Power	Solar Power
-1400 Watts 90% (SOC) 52.00 Volts -6.00 Amps 0.0 °C	200 Watts 60.0 Hz 230 Volts -6.4 Amps CT: 4148 Watts Meter 2: 0 Watts	M1: 5750 Watts 110 Volts 5.0 Amps M2: 1800 Watts 60 Volts 0.0 Amps
UPS Power	Load Power	Temp
2200 Watts 232.0 Volts	2000 Watts	IGBT: 68.0°C DC-DC: 65.0°C PV: 66.0°C

COLUMN DESCRIPTIONS

1. Battery Column: Displays total power from the battery, including SOC, voltage, current, and temperature.
 - A negative value indicates discharge.
 - A positive value indicates charging.
 - Temperature reads 0°C if the sensor is disconnected.
 - Displays internal temperatures from DC transformer and AC heatsink.
 - Performance begins degrading at 110°C and shuts down automatically for safety.

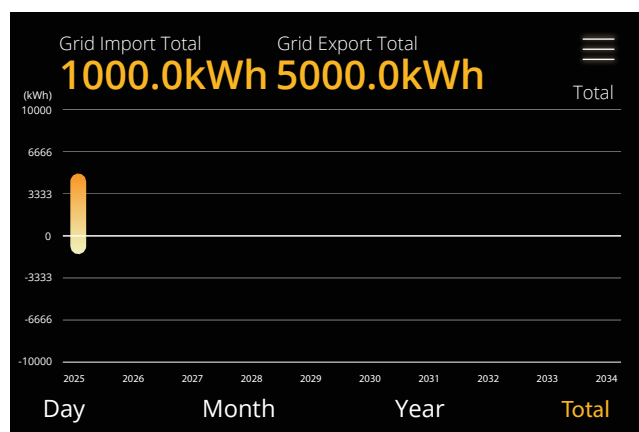
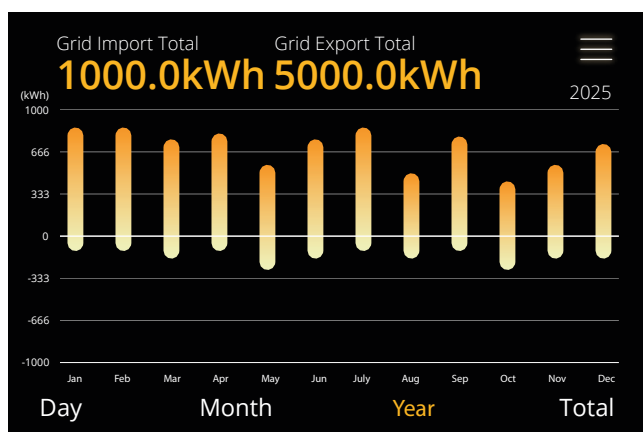
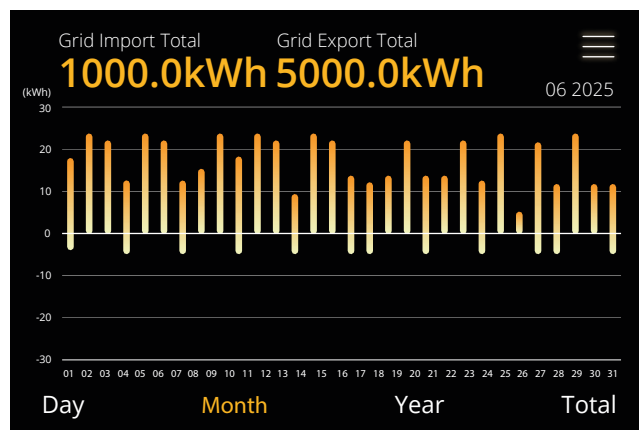
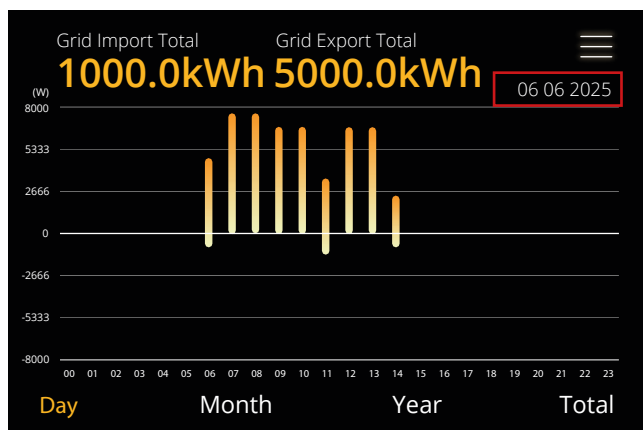
2. Grid Column: Shows power exchange with the grid.
 - Positive = importing power, Negative = exporting power.

- Displays frequency, voltage, current, CT coil value, and meter 2 power.
- Solar Column (MPPT 1 & 2): Shows solar generation statistics for each Maximum Power Point Tracker.
 - Includes power, voltage, and current per MPPT input.
 - UPS Column: Displays UPS output power and voltage delivered to the system.
 - Load Column: Shows the total load power (W) drawn from the inverter.
 - Temp Column: Shows the temperatures of the IGBT, DC-DC converter, and PV components.
 - The system will trigger an error protection and halt operation if the temperature reaches the following values:
 - 83°C for IGBT
 - 105°C for DC-DC Converter
 - 78°C for PV

Home | Grid

The Grid screen provides a graphical overview of energy imported from and exported to the grid. Users can monitor grid activity over different time periods - daily, monthly, yearly, and total system lifetime - to better understand consumption patterns and export performance. On the daily chart, you can click on the date to query the electricity purchase and sales volume of the power grid in the past seven days.

Access this screen by tapping the "Grid" icon on the Home screen.



Home | Battery Load

This page provides real-time insights into battery performance. It displays key parameters such as battery voltage, current, charge status, and the state of charge (SOC).

You can access this screen by tapping the Battery Load icon on the Home screen.

Battery	
Battery Voltage	51.3V
Battery Current	-8.5A
Battery Mode	Charging
Total SOC	89%

Home | Battery %

This page displays detailed information from the Battery Management System (BMS), providing a real-time overview of the battery's status and performance metrics.

To access this page, tap the "Battery %" icon on the Home screen. All data presented is sourced directly from the connected battery's BMS. An additional screen "Alarm Position Information" is accessed by pressing "Alarm Position" on the BMS page. The alarm codes and descriptions found on the "Alarm Position Information" screen only apply to Pylontech batteries.

BMS	
Battery Voltage	51.3V
Battery Current	-8.5A
Battery Temperature	28.7°C
Total SOC	89%
Battery Charge Voltage	54.8V
Battery Discharge Voltage	44.1V
Charge Current Limit	100A
Discharge Current Limit	100A
Alarm Position	0x0000

Sum Data

Alarm Position Information	
Alarm Position	Describe
0x0001	Charge High Current
0x0008	Internal Communication Fail
0x0200	Cell or Module High Voltage
0x0400	Cell or Module Low Voltage
0x0800	Cell High Temperature
0x1000	Cell Low Temperature
0x8000	Discharge High Current

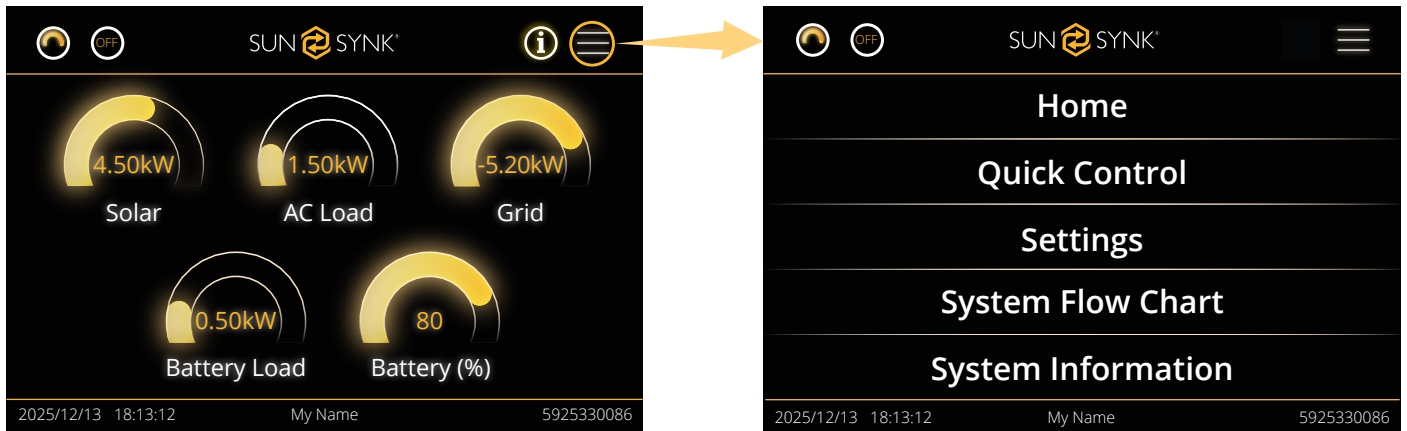
The BMS panel provides a high-level summary of key operational values:

- Battery Voltage: Current voltage across the battery pack (e.g., 52.0V)
- Battery Current: Positive = charging, Negative = discharging (e.g., 30A = charge)
- Battery Temperature: Internal temperature in °C (e.g., 33.0°C)
- Total SOC: State of Charge – current battery level (e.g., 80%)
- Battery Charge Voltage: Target voltage for charging (e.g., 40.0V)
- Battery Discharge Voltage: Target voltage for discharging (e.g., 52.0V)
- Charge Current Limit: Max current allowed when charging (e.g., 40A)
- Discharge Current Limit: Max current allowed when discharging (e.g., 50A)
- Alarm Position: BMS alarm code status (e.g., 0x0000 = no active faults).

Menu

The Menu Screen provides users with access to the core settings and configuration options of the LP IP65 Inverter. From here, users can navigate to important sections like System Setup, Quick Control, and Settings. This screen is essential for managing the system's functionality and viewing system diagnostics.

Access this screen by tapping the "Menu" icon on the Home Screen.



MENU OPTIONS

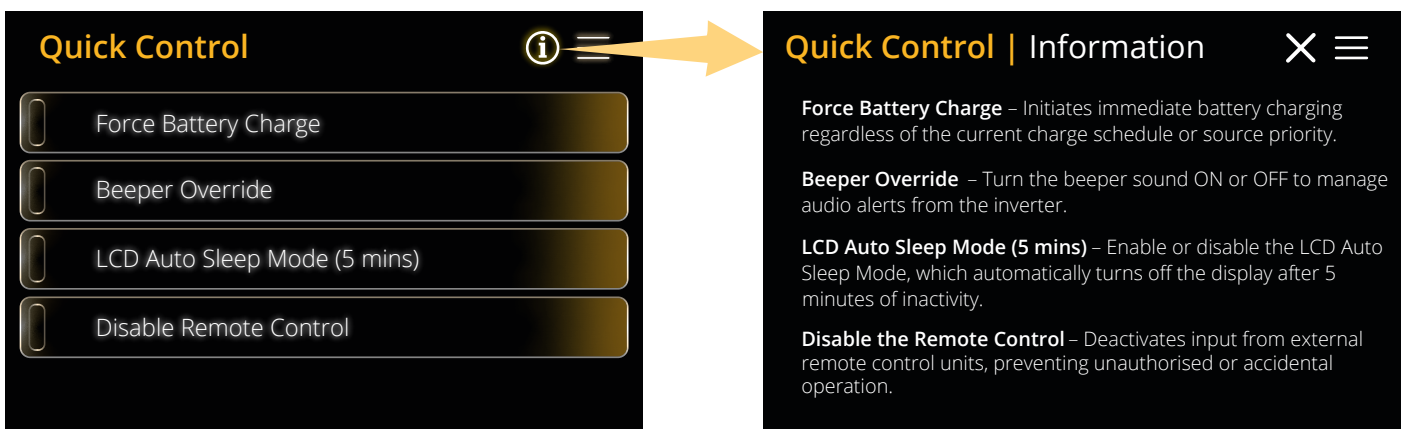
Once you tap the Menu icon, a dropdown screen appears with the following options:

- **Home:** Returns you to the Home Screen where you can view real-time system status and power flow information.
- **Quick Control:** Provides fast access to commonly used control options and system settings.
- **Settings:** Opens the Settings Menu for detailed configuration options, including battery, grid, inverter settings, and more.
- **System Flow Chart:** Displays system flow chart that shows the power generation and distribution process in a graphical format. This is helpful for understanding how energy flows between the inverter, battery, grid, and loads.
- **System Information:** Provides detailed information about system, including version, model, and SN.

Menu | Quick Control

The Quick Control screen provides immediate access to certain inverter functions, allowing users to quickly toggle settings for specific operational needs. This screen enables quick adjustments to the system, ensuring efficient performance and control when needed.

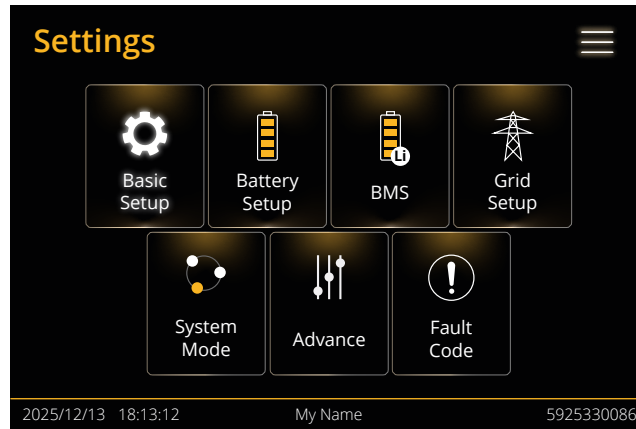
Access this screen by tapping the "Quick Control" option in the Menu.



Menu | Settings

The Settings screen provides access to various configuration and diagnostic menus. Each menu item allows users to navigate to specific areas of the system to customize settings, perform system checks, and adjust operational parameters. This screen is critical for in-depth system management.

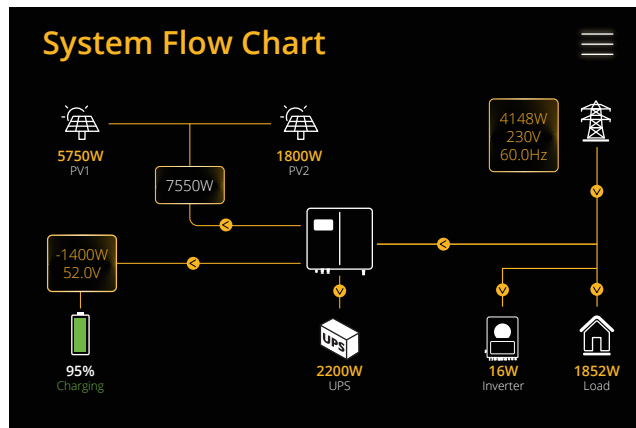
Access this screen by tapping the “Settings” option in the Menu.



Menu | System Flow Chart

The System Flow Chart screen provide visual representations of how energy flows within the system, tailored to specific installation configurations. This chart allow users to understand and monitor how power is distributed among key components of the system, such as solar panels, batteries, inverters, and loads, under operating conditions.

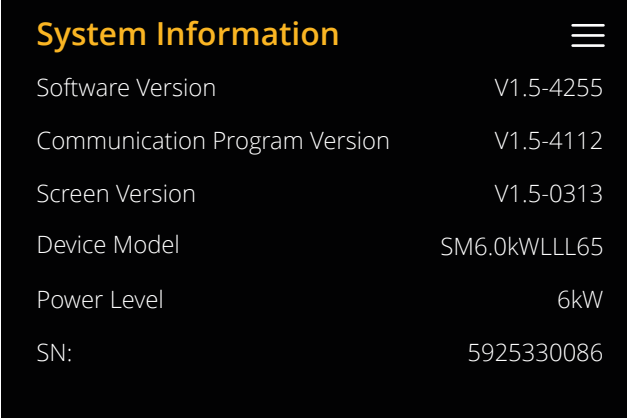
Access this screen by tapping the Home screen icon  or “System Flow Chart” option in the Menu.



Menu | System Information

The System Information screen provides detailed technical data about the inverter. This page is essential for diagnostics, support, and firmware compatibility verification.

You can access this screen by tapping the “System Information” option in the Menu.



System Information	
Software Version	V1.5-4255
Communication Program Version	V1.5-4112
Screen Version	V1.5-0313
Device Model	SM6.0kWLLL65
Power Level	6kW
SN:	5925330086

Settings Page

The Settings Page provides users with direct access to a variety of system configuration options and diagnostic menus. This page serves as the hub for all advanced system settings, allowing users to quickly navigate to different sections for in-depth system management.

Access this page by tapping the “Settings” option from the Menu.



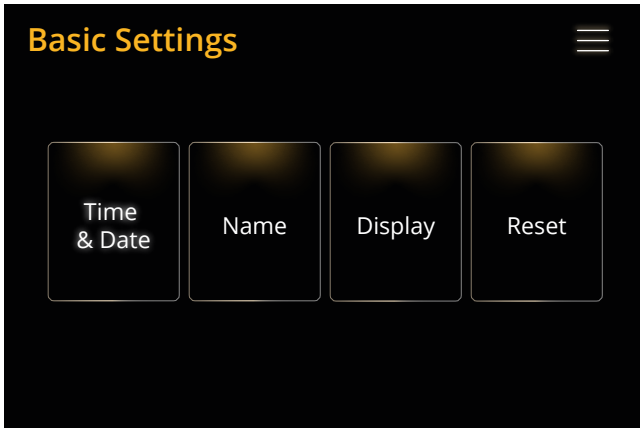
What you can do from this page:

- **Basic Setup Page:** Configure initial system settings, including date & time, name and display.
- **Battery Setup Page:** Adjust battery settings such as charge limits and voltage.
- **BMS Page:** View battery information including charging, and discharging status.
- **Grid Setup Page:** Configure grid settings, such as voltage and frequency.
- **System Mode Page:** Select operating modes and timer settings.
- **Advance Page:** Access advanced system configurations.
- **Fault Code Page:** Access system error logs and fault codes.

Basic Setup

The Basic Setup screen allows users to configure basic system settings for the inverter.

Access this page by tapping the “Basic Setup” option in the Setup Menu.



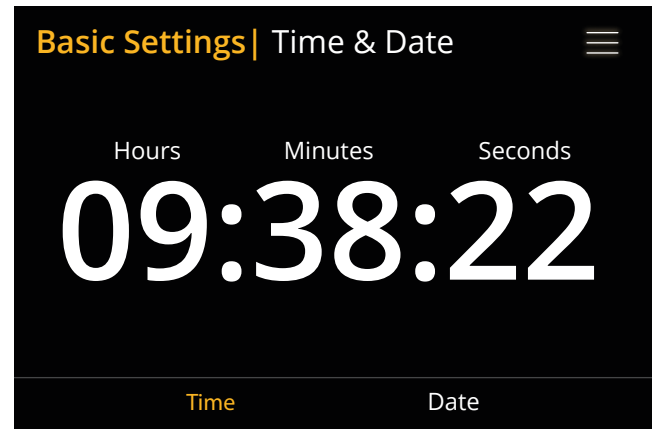
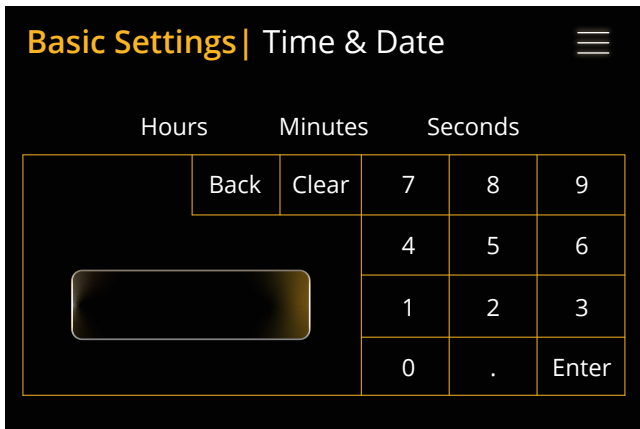
What you can do from this page:

- **Set Time & Date:** Adjust the system's time and date settings.
- **Set System Name:** Customize the name of the inverter system.
- **Set Display Functions:** Configure display brightness.
- **Reset:** Perform factory reset on the inverter.

Basic Setup | Time & Date

The Time & Date screen allows users to configure the current system time and date. This is essential for accurate system logging, scheduling, and synchronization with other devices.

Access this page by tapping the “Time & Date” option under Basic Setup.

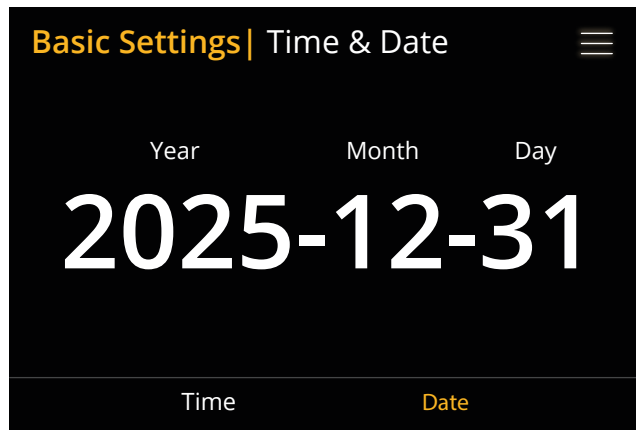


Time Settings:

This screen allows you to set the hours, minutes, and seconds for the clock.

Important: You must set the Hours, Minutes, and Seconds one at a time. This screen is used for each step, but you cannot enter the full time (HHMMSS) at once.

- From the previous menu, select the value you want to change (e.g., Hours).
- On the keypad screen, enter the value for the hour.
- Press the ‘Select’ button to save.
- Repeat this process for Minutes and Seconds until the correct time is set.



Date Settings:

This screen displays the current date in a YYYY-MM-DD format and is used to change the year, month, and day.

Important: You must set the Year, Month, and Day individually. The system will take you to a keypad screen for each step.

To set the date, tap on the Year field. You will be taken to the numeric keypad screen.

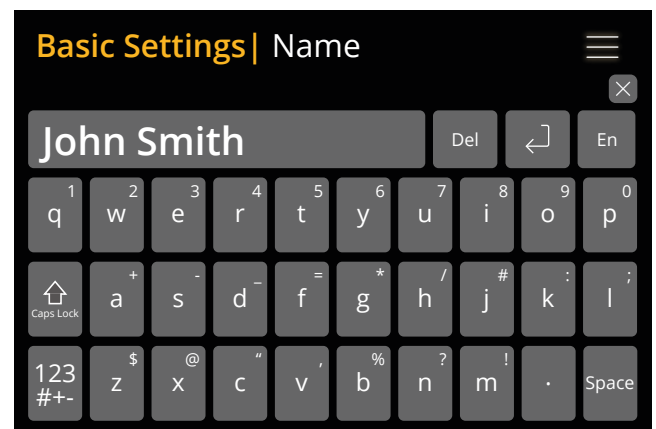
- Enter the full four-digit year (e.g., 2025).
- Press 'Select' to save.

Repeat this process for Month and Day until the correct date is set.

Basic Setup | Name

The Name Setup screen allows users to set or change the system name. This name can be used to identify the inverter in the system's settings or for network identification.

Access this page by tapping the "Name" option under Basic Setup.



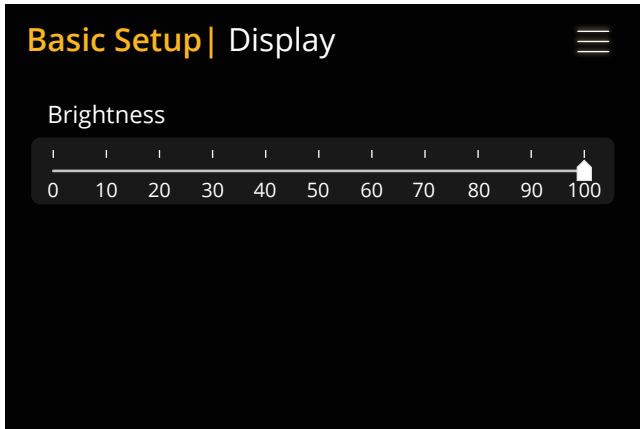
What you can do from this page:

- Set a unique system name (up to ten characters).
- Tap to begin entering the name.
- Use the on-screen keyboard to input the name.
- The system supports both letters and numbers.
- Select characters using the arrow keys below the on-screen keyboard.
- If necessary, edit or clear the existing name by using the keyboard controls.

Basic Setup | Display

The Display Setup screen allows users to configure the brightness of the screen.

Access this page by tapping the “Display” option under Basic Setup.



What you can do from this page:

- **Set the Display Brightness:** Adjust the brightness level of the LCD display from 0% to 100%.

Basic Setup | Reset



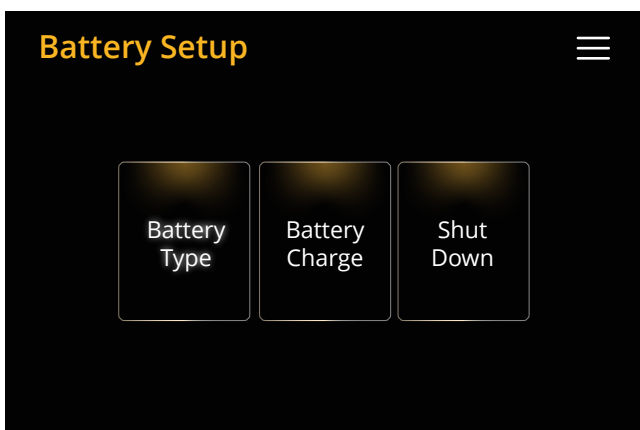
What you can do from this page:

- **Factory Reset:** Reset the inverter to default settings.

Battery Setup

The Battery Setup page allows users to configure key settings related to the battery type, charging parameters, and shutdown settings.

Access this page by tapping the “Battery Setup” option in the Setup Menu.



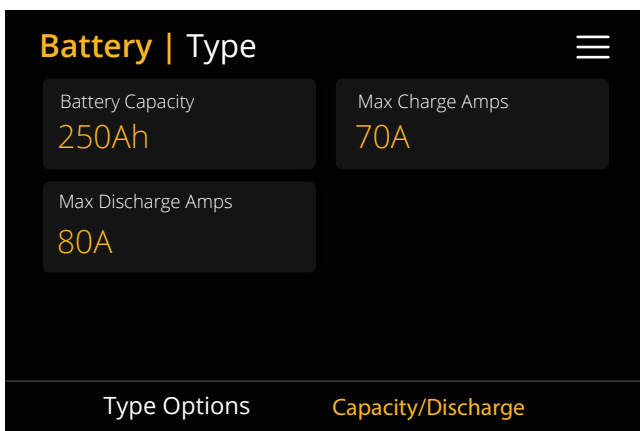
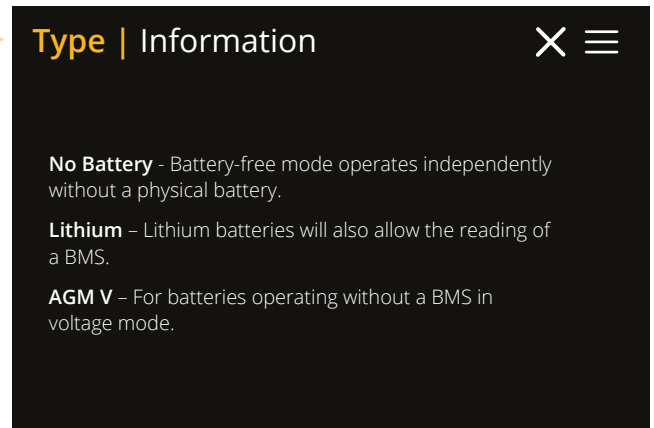
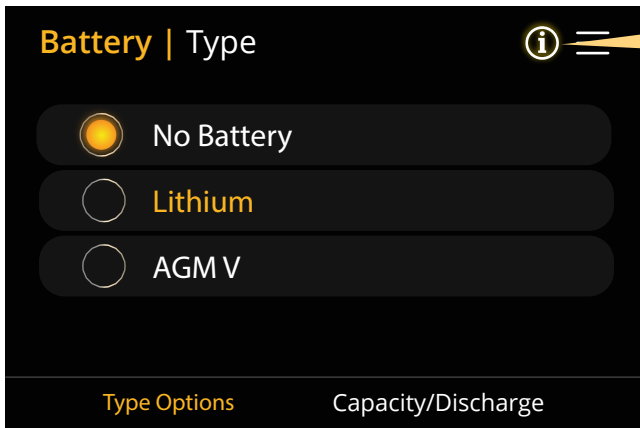
What you can do from this page:

- **Set Up the Battery Type:** Configure the type of battery used (e.g., lithium, lead-acid, etc.).
- **Set Up the Battery Charge:** Adjust the charging parameters, including charge voltage and current settings.
- **Set Up the Shut Down:** Configure shutdown parameters for the battery.

Battery | Type

The Battery Type page allows users to select the appropriate battery type for their system, based on the battery configuration and the type of Battery Management System (BMS) used.

Access this page by tapping the "Type Options" under Battery Setup.



After select the appropriate battery type, access the "Capacity/Discharge" tab under Battery Setup. This page allows users to set up key parameters for battery capacity, charge/discharge current, and communication protocols.

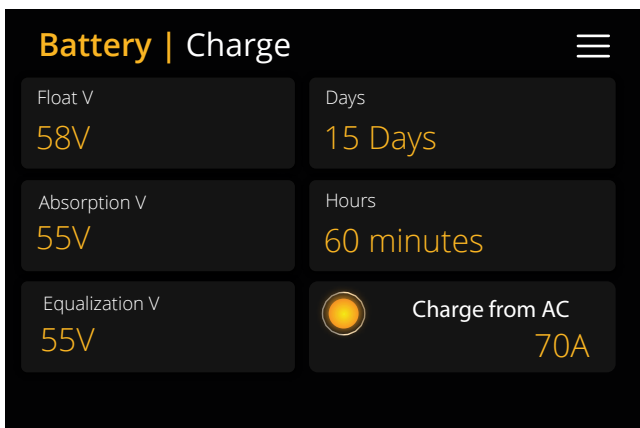
What you can do from this page:

- **Battery Capacity (Ah):** For non-BMS-batteries the range allowed is 0-2000Ah, while for lithium-ion, the inverter will use the capacity value of the BMS.
- **Charge/Discharge Amps:** The Max battery charge/discharge current (60/80A for 3.6kW model, 120/130A for 6kW model, 135/165A for 7.2kW model, 150/180A for 8kW model, 180/220A for 10kW model, and 220/260A for 12kW model).

Battery | Charge

The Battery Charge Configuration page allows users to set the charging parameters of the battery.

Access this page by tapping the " Battery Charge" option under Battery Setup.



The Battery Charge Parameters page allows users to configure specific charge settings for the battery, such as charge rate, float voltage, absorption voltage, and equalization voltage.

What you can do from this page:

- **Equalisation V:** Sets the equalizing voltage to help remove sulphate crystals from lead-acid batteries. For AGM batteries, the standard value is 55.00V.
- **Float V:** Defines the voltage used to maintain the battery once fully charged. For AGM batteries, this is typically 58.00V.

- **Days:** Refers to the interval (in days) between each equalisation charge cycle. This value can be adjusted by the user to control the frequency of equalisation charging.
- **Hours:** Refers to the duration (in hours) of each equalization charge cycle. This value is adjustable, allowing users to specify how long the equalization charge should run.
- **AC Charge Amps:** Indicates that the battery is currently set to charge from an AC source.

Users can manually set or adjust both the interval (in days) and duration (in hours) of the equalization charge, according to system requirements or maintenance schedules.



NOTICE

Do not alter these settings too often on the same battery, as it may damage the battery.

Generator Connection

A generator may be connected to the grid input.

The inverter treats generator input as grid power. Important: In this case, ensure that all power is used for Load only and is not exported, as this could damage the generator.



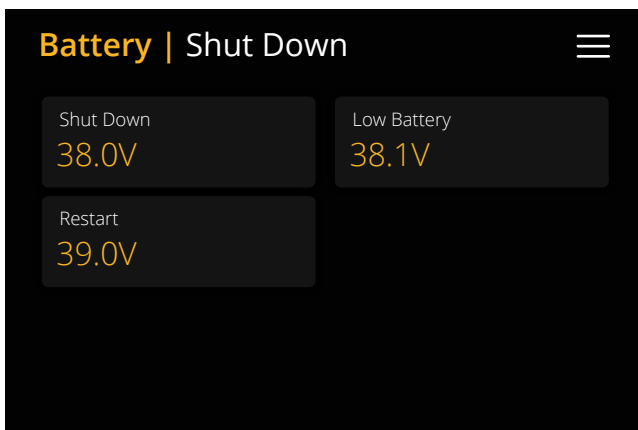
WARNING

The generator must be capable of supplying both the load current and battery charging current simultaneously.

Battery | Shut Down

The Battery Shut Down page allows you to set the thresholds for when the inverter should shut down, alert the user about low battery, or restart. These settings ensure proper battery management and prevent excessive discharge that could harm the battery.

Access this page by tapping the “Shut Down” option under Battery Setup.



What you can do from this page:

- **Shut Down:** This setting indicates that the inverter will shut down if the battery voltage falls below 38.0V.
- **Low Battery:** This setting triggers an alarm when the battery voltage drops below 38.1V.
- **Restart:** The inverter will restart the AC output when the battery voltage reaches 39.0V, ensuring proper functioning once the battery has been sufficiently recharged.



NOTICE

Activating Shutdown causes the inverter to enter standby mode. It does not fully turn off the inverter. The total shutdown occurs only when battery voltage drops below 19V.

The voltage shown on the Sunsynk Inverter varies depending on whether the inverter is charging or discharging the batteries.

Battery Level	Discharge Voltage	Charge Voltage
Fully Charged	50.54V (x4 = 202.16V)	58.80V
75% Charged	49.60V	54.80V (Discharge Mode)
50% Charged	48.60V	50.80V (Discharge Mode)
25% Charged	48.00V	48.00V (Discharge Mode)
0% (Shutdown Trigger)	47.50V	-

*The table shows approximate values for a 48V system. For lithium batteries, values will differ slightly.

*For best performance and battery life, avoid setting the cut-off voltage too low.

The Sunsynk inverter is compatible with AGM Lead Acid and Lithium Battery Banks. Below is a brief explanation of each:

1. AGM (Absorbent Glass Mat):

- A sealed lead-acid battery design with internal mats that absorb and immobilise electrolyte.
- Ideal for deep-cycle applications.

2. Lithium (LiFePO₄):

- Longer lifespan and high efficiency.
- Must use manufacturer-defined charging profiles.

STATE OF CHARGE

1. Bulk Stage:

- Delivers a large current to restore most of the battery's capacity (~80%).
- Continues until voltage reaches the set absorption level.
- The proper charger supplies current based on the battery's Ah rating.

2. Absorption Stage:

- Voltage is held at a higher level to complete the final 20% of the charge.
- Required to fully saturate the battery and avoid sulfation.
- Typical AGM absorption voltage: 14.1V – 14.8V DC (depending on model).

3. Float Stage:

- Voltage is reduced to 13.0V – 13.8V DC to maintain the charge without overcharging.
- Ensures battery is ready for use while preserving lifespan.

4. Equalization (Lead-Acid only):

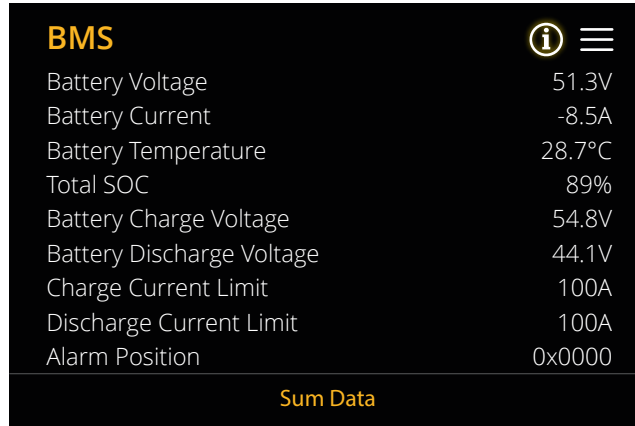
- Periodically increases voltage above normal levels to desulphate the battery plates.
- Not used with lithium batteries.
- AGM batteries benefit from this occasionally if recommended by the manufacturer.



Battery Management System (BMS)

After installing a lithium battery, verify that communication between the battery and the inverter is working properly. To do this:

1. Tap the BMS icon on the screen.
2. Check whether the battery information appears correctly.

If no data or incorrect data is displayed (as shown in the examples below), a communication error has occurred.



BMS		 
Battery Voltage	51.3V	
Battery Current	-8.5A	
Battery Temperature	28.7°C	
Total SOC	89%	
Battery Charge Voltage	54.8V	
Battery Discharge Voltage	44.1V	
Charge Current Limit	100A	
Discharge Current Limit	100A	
Alarm Position	0x0000	
Sum Data		

If a BMS communication issue is detected:

1. Check that the data cable is the correct type (e.g., RS485, CAN, or manufacturer-specific).
2. Ensure the cable is connected properly into the appropriate BMS communication port.

Some battery manufacturers use communication protocols other than RS485 (such as CAN). Refer to the battery manual for exact connection requirements.

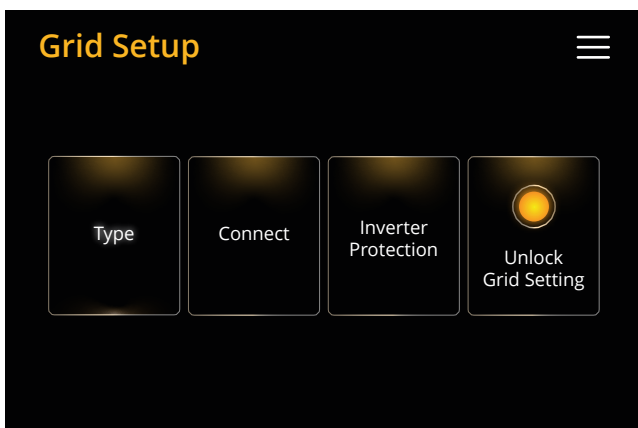
It is crucial to refer to the manuals that manufacturers produce for their batteries. That way, the chance of errors occurring during installation is significantly reduced. The following batteries are compatible with Sunsynk LP IP65 Inverter:

- SUN-BATT-5.32
- SUNSYNK-L5.3
- L051069-A

Grid Setup

The Grid Setup page allows users to configure grid-related parameters, including connection type, protection settings, and advanced reactive power features.

Access this page by tapping the “Grid Setup” icon under the Settings menu.



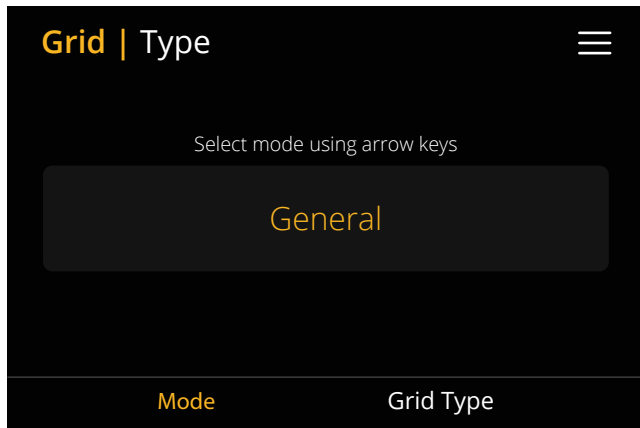
What you can do from this page:

- Set up the Grid Type functions.
- Set up the Grid Connection.
- Set up the Inverter Protection.
- Unlock Grid Settings. The inverters grid settings are automatically locked, so if you need to make changes to the grid settings you will need to select this, and it will ask for the password code. The password is 7777.

Grid | Type

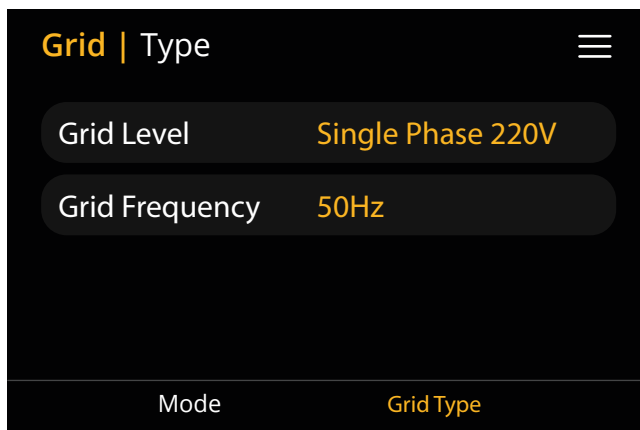
The Grid Type menu allows you to configure how the inverter operates in relation to your local grid standard. You can set the grid compliance mode, grid connection type, and the inverter's output voltage.

Access this page by selecting "Type" from the Grid Setup menu.



Grid Mode Selection

- Use the arrow keys to select a mode. Follow your local grid code and choose the matching grid standard from the menu. *G100: Please ensure the inverter is set to G99/G100 for compliance with local regulations.



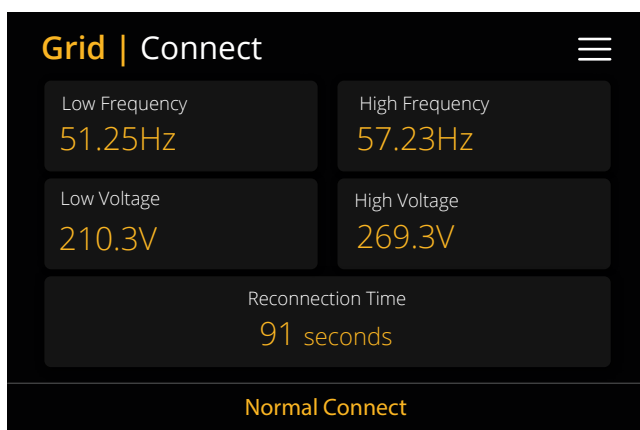
Grid Type

- Select your connection type:
 - Single Phase 220V
 - Single Phase 230V
 - Single Phase 240V
- Select Grid Frequency:
 - 50 Hz
 - 60 Hz

Grid | Connect

The Grid Connect page allows you to configure the parameters for the inverter's connection to the grid, including the allowed voltage and frequency ranges and reconnection time.

Access this page by selecting "Connect" from the Grid Setup menu.



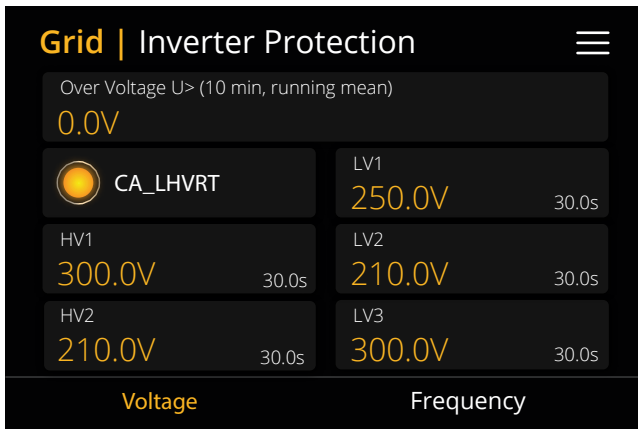
Grid Connection Settings (First Time Connect)

- Set the allowed grid voltage/frequency range for when the inverter first connects to the grid.
- Set the reconnection time.

Grid | Inverter Protection

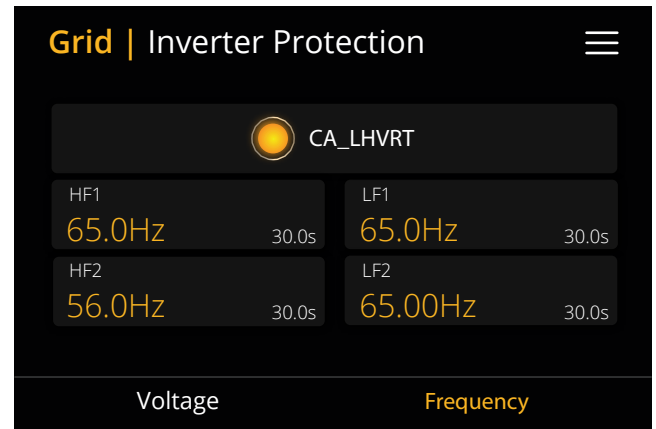
The Inverter Protection page allows you to set the voltage and frequency protection points for the inverter. This helps ensure that the inverter shuts down or disconnects if the grid's parameters fall outside acceptable ranges, protecting both the inverter and connected components.

Access this page by selecting "Inverter Protection" from the Grid Setup menu.



Voltage Protection Settings

- **Overvoltage U >** (running mean value over 10 minutes).
- **CA_LHVRT:** Configuration of over voltage and undervoltage of the grid power. Once enabled, LV1, LV2, LV3, HV1, and HV2 are all effective, and when disabled all are ineffective.
- **HV1 (Over Voltage Protection Level 1):** Set the level 1 overvoltage protection point. It triggers when the grid voltage exceeds the defined value.
- **HV2 (Over Voltage Protection Level 2):** Set the level 2 overvoltage protection point.
- **LV1 (Under Voltage Protection Level 1):** Set the level 1 undervoltage protection point. The inverter disconnects if the grid voltage falls below this level.
- **LV2 (Under Voltage Protection Level 2):** Set the level 2 undervoltage protection point.
- **LV3 (Under Voltage Protection Level 3):** Set the level 3 undervoltage protection point.



Frequency Protection Settings:

- **CA_LHVRT:** Configuration of over frequency and under frequency of the grid power. Once enabled, LF1, LF2, HF1, and HF2 are all effective, and when disabled all are ineffective.
- **HF1 (Over Frequency Protection Level 1):** Set the level 1 over frequency protection point. This setting will disconnect the inverter if the grid frequency exceeds the threshold.
- **HF2 (Over Frequency Protection Level 2):** Set the level 2 over frequency protection point.
- **LF1 (Under Frequency Protection Level 1):** Set the level 1 under frequency protection point.
- **LF2 (Under Frequency Protection Level 2):** Set the level 2 under frequency protection point.

System Mode

System Mode Use Timer

Time Start	Time End	Power	SOC	Grid
02:20	11:19	6000W	65%	<input type="radio"/>
11:19	11:20	6000W	65%	<input checked="" type="radio"/>
11:20	16:20	6000W	100%	<input type="radio"/>
16:20	22:20	6000W	65%	<input type="radio"/>

System 1 System 2

System 1 | Information

Grid Selected – SOC% is the percentage the battery with charge up to.

Grid Unticked – SOC% is the percentage the battery will discharge down to.

Note: System mode timers are ignored when running fully off-grid.

Example:

- During 02:20-11:19, when the battery SOC is higher than 65%, the inverter will discharge the battery until the SOC reaches 65%. The power output will be capped at 6000W.
- During 11:19-11:20, when the battery SOC is lower than 65%, the inverter will use the grid to charge the battery until the battery SOC reaches 65%. It will draw up to 6000W of power.
- During 11:20-16:20, when the battery SOC is lower than 100%, the inverter will not discharge the battery.
- During 16:20-22:20, when the battery SOC is higher than 65%, the inverter will discharge the battery until the SOC reaches 65%.

System Mode

- Limit to Load
- Limit to Grid + Load
- Solar Sell
- Priority Load
- Earth Neutral Bond
- Night Power Saving

Zero Export Power
10W

Max Sell Power
6000W

Max Solar Power
25W

System 1 System 2

System 2 | Information

Limit to Load – PV and battery limited to the load terminal power only.

Limit to Grid + Load – PV and battery limited to the load and grid terminal power.

Priority Load – When battery SOC is low without charge, PV will go to the load before charging the batteries.

Earth Neutral Bond – Bonds earth and neutral terminals for systems requiring an earthed neutral connection.

Night Power Saving – Activates energy-saving measures during night hours by reducing inverter operations.

Advance | Multi-Inverter

This screen allows you to configure multiple Sunsynk inverters to work together in parallel. Use this page when installing a system with more than one inverter connected on the same AC bus.

Advance | Multi-Inverter

Parallel Master Slave

A Phase B Phase C Phase

Modbus SN
2

Multi-Inverter Others

What you can do from this page:

- **Enable Parallel Mode:** Switch ON the parallel function so the inverter can work with others in the system.
- **Primary or Secondary Role:** Select whether this inverter acts as master or slave on the communication bus.
- **Phase Selection:** Choose the correct phase (A, B, or C) that this inverter is connected to in the three-phase system.
- **Set Modbus SN:** Assign a unique Modbus Serial Number to this inverter for communication. Each inverter in the parallel system must have a different number.

The LP IP65 can operate as a standalone unit or in a parallel configuration to increase power capacity. You can set up a parallel system in single-phase or three-phase mode, depending on your installation needs.

PARALLEL SYSTEM LIMITS

- **Single-phase grid:** Up to 3 inverters in total (1 Master + 2 Slaves).
- **Three-phase grid:** Up to 9 inverters, with 3 inverters per phase (1 Master + 2 Slaves per phase). Example:
 - Phase A: Master A and 2 Slaves A
 - Phase B: Master B and 2 Slaves B
 - Phase C: Master C and 2 Slaves C

This setup delivers a balanced 3-phase output with clockwise phase rotation, suitable for both single-phase (220V L-N) and three-phase (380V L-L) loads.

INSTALLATION GUIDELINES

- **Battery bank:** All batteries must be connected in parallel.
- **Cabling:** Use a minimum 50mm² cable with fuse isolators per inverter.
- **Protection:** Each inverter requires:
 - Surge-protected fuse isolator.
 - RCD for each group of inverters.
 - Changeover switch (if powering main loads during outages).
- **CT coils:** Only connect to the Master inverter.
 - Example: For 6 inverters in 3-phase mode, 3 CT coils (one per Master) are needed.
- **Communication:** Use RJ45 cables to connect the inverters.
 - Cables are bidirectional (no IN/OUT).
 - Max length between units: 2 metres.
 - Each inverter must have a unique Modbus SN.
 - One master per phase only.



NOTICE

- Ensure all inverters have the same firmware version before configuring.
- Isolate each inverter's load output with individual load breakers before connecting them to the common parallel breaker.
- Only enable breakers after all units are programmed and tested.
- For three-phase systems, verify phase rotation is clockwise before powering on.



WARNING

To ensure the proper functioning of the parallel operation, it is important first to establish the work mode for both the Master and Slave inverters and then make the necessary wiring connections.

If you make the connection prior to changing the work mode, an F15 error will be displayed on the Fault Codes page. In the event of this error, please maintain the connection and proceed to the settings to modify the work mode as presented above, and wait approximately 3-4 minutes. After that, the device should return to its normal working condition, with the error cleared.

TROUBLESHOOTING & FAQs

Q1: 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, turn on the main supplies.

Q2: What are the indications that the communication and the system are OK or not?

Parallel errors will be shown as fault F29 and F41 on the display.

Q3: What are the consequences of not setting one inverter in a parallel mode?

It can damage the inverter.

Q4: What are the consequences of having more than one Master Inverter or having no inverter set as 'Master'?

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).

Q5: What are the consequences for setting A, B, or C phases wrong while in parallel mode?

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

Q6: What are the consequences of factory resetting, power cycling, or firmware updating one inverter in a parallel system?

It can damage the inverter. Prior to factory reset or firmware update, the inverters must be isolated from each other.

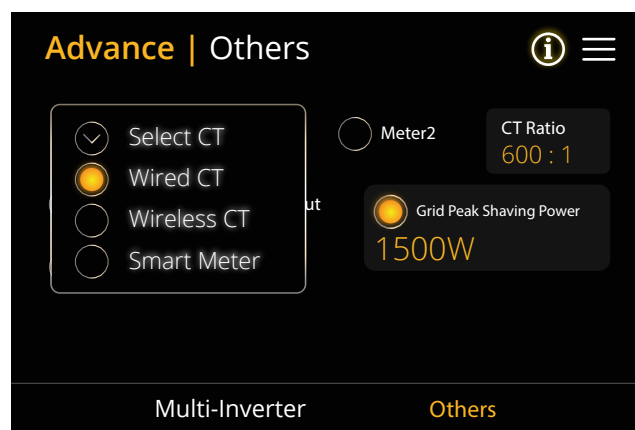
Q7: What consequences for changing ALL/ANY settings while operating in parallel mode?

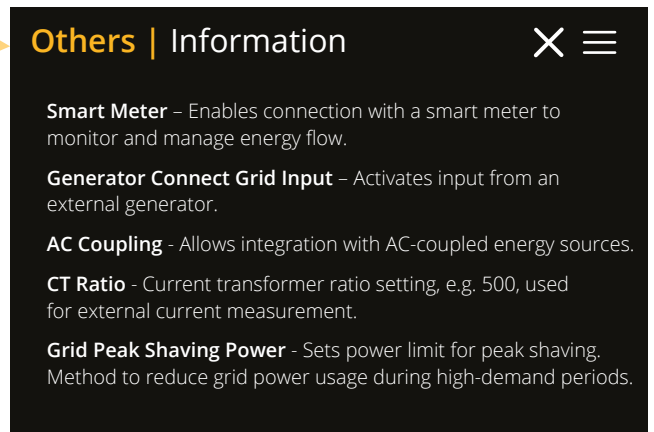
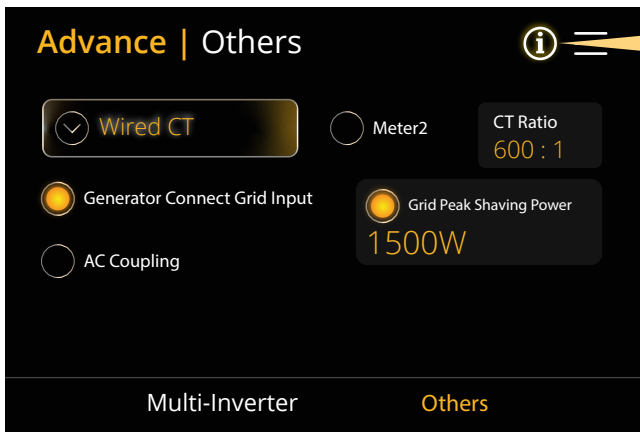
It can damage the inverter.

For support and resources (including training videos), visit: www.sunsynk.com

Advance | Others

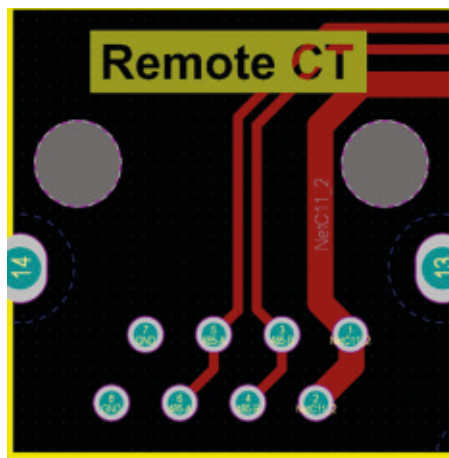
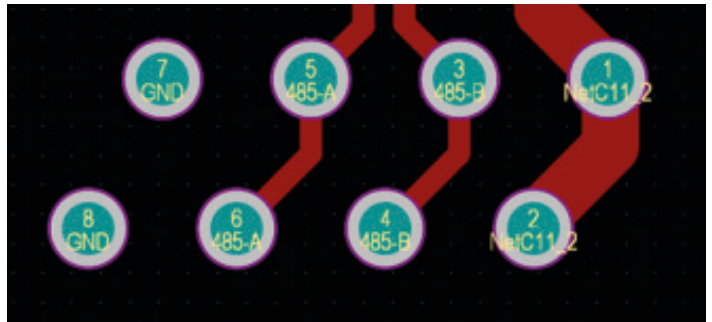
The Others tab includes additional advanced system features, such as smart meter configuration, grid interaction parameters, and special operating modes.





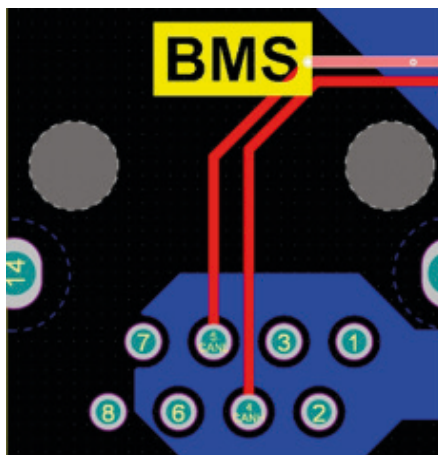
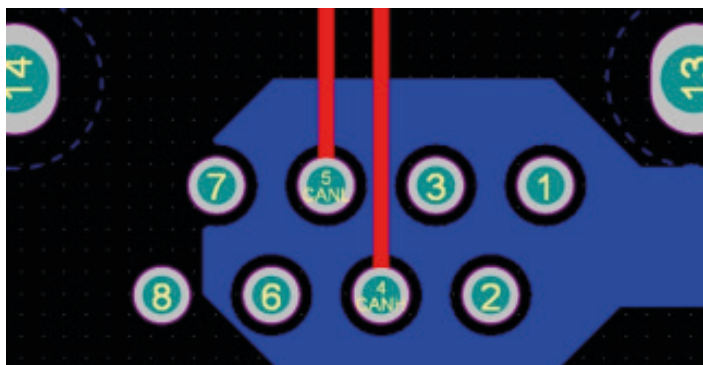
Pinout Connections for Remote CT

NO.	Remote CT (Wireless CT/Smart Meter)
1	12V
2	12V
3	485-B
4	485-B
5	485-A
6	485-A
7	GND_485
8	GND_485



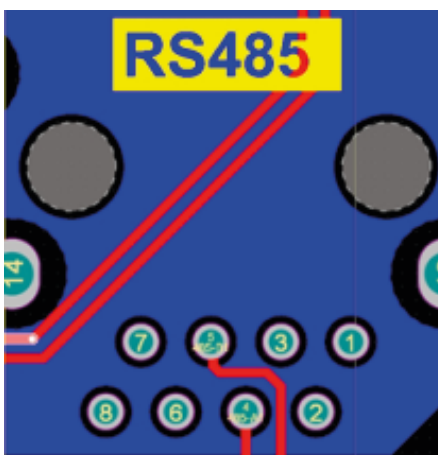
Pinout Connections for BMS

NO.	BMS
1	N/A
2	N/A
3	N/A
4	CANH
5	CANL
6	N/A
7	N/A
8	N/A



Pinout Connections for RS485

NO.	RS485
1	N/A
2	N/A
3	N/A
4	RS485-A1
5	RS485-B1
6	N/A
7	N/A
8	N/A



Error Code	Display Error	Potential Method for Measurement and Fix
F20	DC over current fault of the hardware	DC over current fault: 1. Check 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.
F29	ECAN communicate	1. When in parallel mode, check the parallel communication cable connection and hybrid communication address settings. 2. During the parallel system startup period, inverters will report F29. When all inverters are in ON status, it will disappear automatically; 3. If the fault exists, please contact us for help.
F30	Load current exceeding	1. Try to reduce the load power. 2. Seek help from Sunsynk.
F34	Over Load Protection	1. Reduce appliance power on LOAD side (system will auto-reboot in 2 minutes).
F35	No AC 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.
F37	Battery activation overcurrent	1. System will auto-reboot in 2 minutes.
F39	DC-DC over current	1. Push the power button of the inverter to restart it, system will auto-reboot in 2 minutes.
F40	DC over current	1. If the battery SOC shows 0, turn off the unit and restart it
F41	Parallel system stop	1. Check the hybrid inverter working status. If there's 1 pcs hybrid inverter is in OFF status, the other hybrid inverters may report F41 fault in parallel system. 2. If the fault exists, please contact us for help.
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.
F45	AC line HIGH voltage	1. Grid exceeds 251V, and the inverter switch is off 2. Grid exceeds 251V, and the inverter switch is on, but the battery is drained

Error Code	Display Error	Potential Method for Measurement and Fix
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.
F55	DC busbar voltage is high	User: External Battery Input voltage is high 1. Installer: check inverter's bus voltage might be too high. Observe the battery voltage value on the LCD (the value will be restored automatically if it is normal), if it is not normal for a long period, you have to check the control board or the voltage acquisition part of the motherboard.
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.
F60	Smoke alarm	When the smoke alarm is lifted, use the App to restart the inverter (Refer to the relevant content of the App user manual).
F61	Bus one shutdown	1. Reset the inverter. 2. Seek help from Sunsynk.
F62	DRMs0 stop	Reserved Error code
F63	FAN Error	1. A technician needs to check the internal fan wire or replace fan. 2. Seek help from Sunsynk.
F64	Heat sink high-temperature failure	Heat sink temperature is too high: 1. Check if the working environment temperature is too high. 2. Turn off the inverter for 30 minutes and restart.

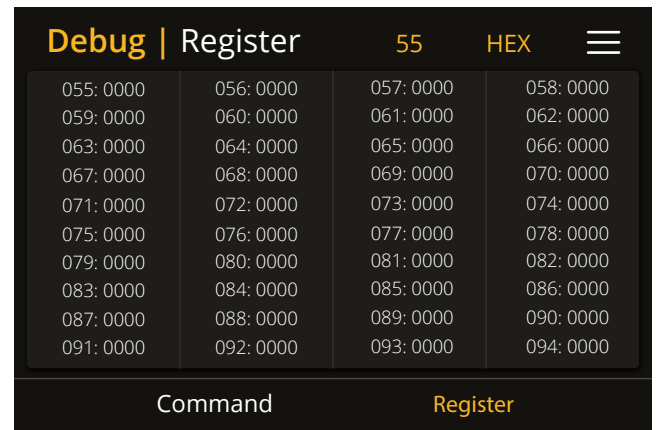
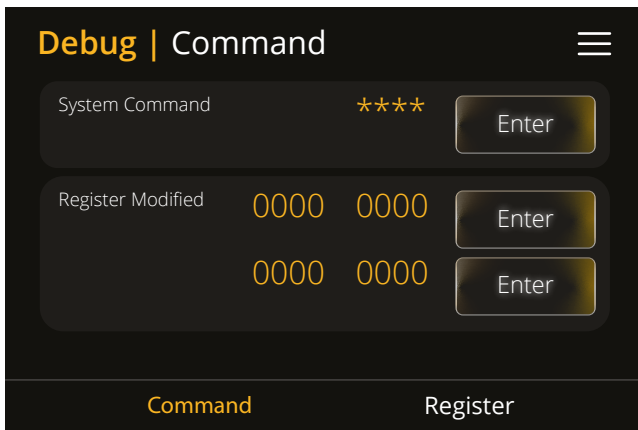
Debug

The Debug Screen provides advanced real-time diagnostic data from the inverter. This screen is useful for technicians and experienced users to observe live system status, flags, and performance readings.

To access the Debug screen:

- On the inverter's front panel, press the following three buttons simultaneously for two seconds → Select + Up + Back.

The Debug screen will appear showing various internal parameters.



What You Can See on the Debug Screen:

- Live inverter flags and variables
- System operation statuses
- Voltage, power and frequency data
- Internal operational counters and state indicators



NOTICE

This screen is primarily intended for technical users. Most values are used for support diagnostics or firmware testing, and do not require user adjustment.

COMMISSIONING

Start-Up / Shutdown Procedure

The inverter must be installed by a qualified and licensed electrical engineer, following the relevant national wiring regulations. Prior to powering on, the installation engineer must complete the following checks:

- Earth Bond Test
- RCD (Residual Current Device) Test
- Earth Leakage Tests
- Ensure the solar panel Voc voltage does not exceed 450V
- Verify battery voltage

Although the maximum allowable PV input voltage is 500V, the 450V limit provides an additional safety margin to protect the system from potential voltage fluctuations or operational variations that could cause damage.

Power ON Sequence:

1. Press the Start Button.
2. Switch on the AC.
3. Switch on the DC (PV Isolator).

Shutdown Sequence:

1. Switch off the DC (PV Isolator).
2. Switch off the AC.
3. Press the Start Button.

Information for Commissioning the Inverter

After you have successfully powered up the inverter, the inverter must be programmed and set up as per the programming feature above.

 <p>Basic Setup</p>	Configure initial system settings.	Adjust the system's time and date settings.	Customize the name of the inverter system and configure display brightness.
 <p>Battery Setup</p>	Adjust battery settings such as charge limits and voltage.	Configure the type of battery used.	Configure shutdown parameters for the battery.
 <p>BMS</p>	View battery information including charging, and discharging status.		Check the battery BMS is communicating with the inverter.
 <p>Grid Setup</p>	Configure grid settings, such as voltage and frequency.	Set up the Grid Type functions, Grid Connection, and Inverter Protection.	See grid setup page.
 <p>System Mode</p>	Select operating modes and timer settings.	Configures whether excess power is sold to the grid or limited to local loads.	
 <p>Advance</p>	Access advanced system configurations.	Configure multiple Sunsynk inverters to work together in parallel.	Allows for the configuration of Grid Peak Shaving power limits and Island Mode for off-grid operation.
 <p>Fault Code</p>	Access system error logs and fault codes.	Familiarise yourself with common fault codes.	

GDFI Fault

Before the inverter connects to the grid, it will check the impedance (effective resistance) of the solar PV+ to ground and the impedance of the solar PV- to ground. If either impedance value is found to be less than 33kΩ, the inverter will prevent grid connection and display an F24 error on the LCD. This is a safety feature designed to protect the system and ensure proper grounding.

MAINTENANCE

The inverter is designed to require minimal maintenance. However, to ensure optimal performance, it is important to follow these maintenance practices:

- **General Cleaning:** At least twice a year, and more frequently in dusty environments (weekly recommended), clean the cooling fans and air ducts to prevent dust accumulation. This will ensure proper ventilation and prevent overheating.
- **Check Fault Codes:** Regularly check the inverter's display for any fault codes. If fault codes are present, they should be addressed immediately to ensure the system operates effectively.
- **Lithium Battery Communication:** Verify that communication with the Lithium battery is functioning correctly. This can be done through the inverter's monitoring system or the battery management system (BMS).
- **Weekly Cleaning:** In environments with high dust accumulation or micro-ants, it is recommended to use micromesh filters. These filters can help keep dust, insects, and other particles out of the inverter's internal components, preventing damage and ensuring proper airflow.

APPENDIX A

If an external residual current device (RCD) is used, a device of type (A / AC, etc) should be employed, with a tripping current of 30mA or higher.

Use of RCDs

Residual current devices (RCDs): An RCD dedicated for an IES may be used to meet the mechanical cable protection requirements and isolation requirements of BS 7671 for the cable from the switchboard to the IES. If an RCD is used, the RCD shall:

1. Disconnect all live conductors (including the actives and neutral).
2. Be of the type specified in the inverter manufacturer's instructions or as labelled on the inverter.

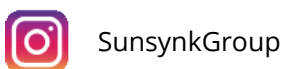
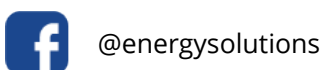
We recommend the use of an RCD on all circuits and sub circuits connected to the Sunsynk inverter. Residual current breaker with overcurrent protection (RCBO).

Earth-leakage protection class	Type A
Earth-leakage sensitivity	30mA
Curve code	C
Network type	AC
Poles description	2P
Earth-leakage protection time delay	Instantaneous

For more information on training videos, software updates, help, and forum posts, please visit:

www.sunsynk.com - Tech Support

Follow Sunsynk on social media for updates:





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