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This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations. Keep this manual for future reference.

This manual provides safety and installation guidelines as well as information on tools and wiring.

⚠

1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
2. --To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
3. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
4. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
5. – Only qualified personnel can install this device with battery.
6. charge a frozen battery.
7. For optimum operation of this inverter/charger, please follow required spec to select appropriate cable size. It's very important to correctly operate this inverter/charger.
8. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this manual for the details.
10. Fuses are provided as over-current protection for the battery supply.
11. pGROUNDING INSTRUCTIONS -This inverter/charger should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.

This is a multi-function inverter, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support in a single package. The comprehensive LCD display offers user-configurable and easy-accessible button operations such as battery charging current, AC or solar charging priority, and acceptable input voltage based on different applications.

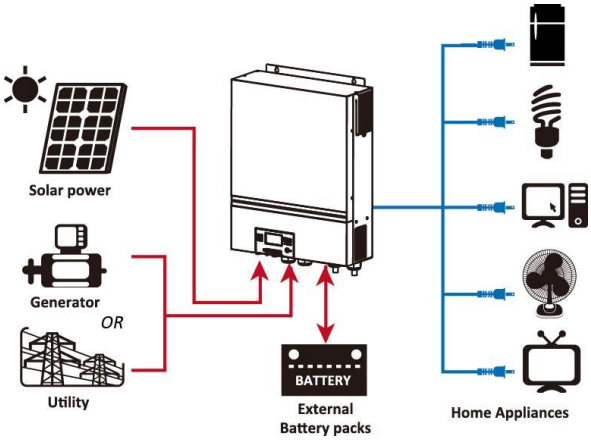
- Pure sine wave inverter
- Configurable color with the built-in RGB LED bar
- Built-in Wi-Fi for mobile monitoring (APP is required)
- Supports USB On-the-Go function
- Built-in anti-dusk kit
- Detachable LCD control module with multiple communication ports for BMS (RS485, CAN-BUS, RS232)
- Configurable input voltage ranges for home appliances and personal computers via LCD control panel
- Configurable AC/PV output usage timer and prioritization
- Configurable AC/Solar charger priority via LCD control panel
- Configurable battery charging current based on applications via LCD control panel
- Compatible to utility mains or generator power
- Auto restart while AC is recovering
- Overload / Over temperature / short circuit protection
- Smart battery charger design for optimized battery performance
- Cold start function

The following illustration shows basic application for this unit. It also includes the following devices to have a complete running system:

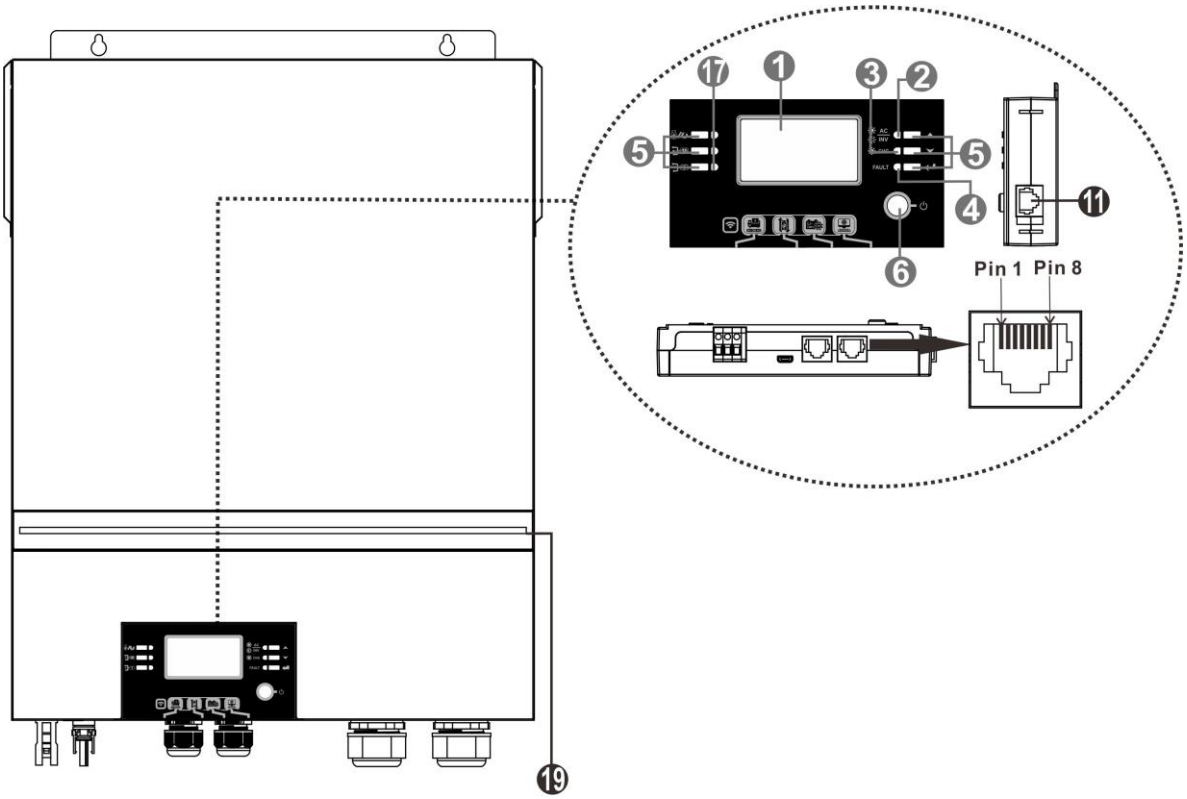
- Generator or Utility mains.
- PV modules

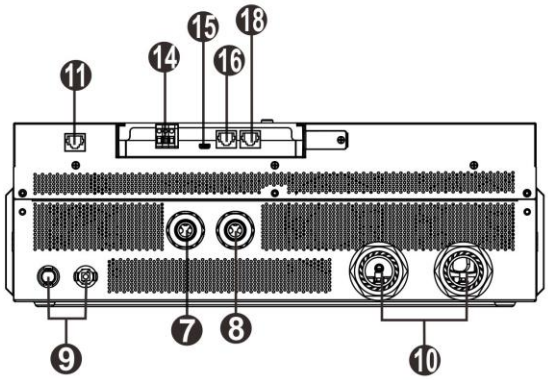
Consult with your system integrator for other possible system architectures depending on your requirements.

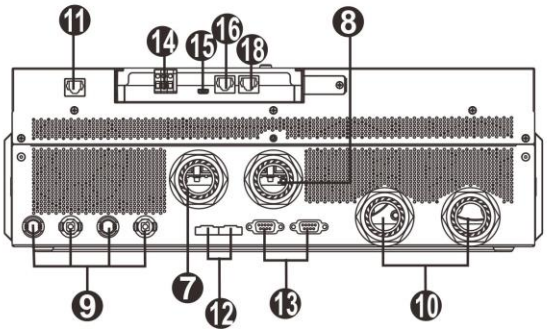
This inverter can power various appliances in home or office environment, including motor-type appliances such as tube light, fan, refrigerator and air conditioners.



Depending on different power situations, this hybrid inverter is designed to generate continuous power from PV solar modules (solar panels), battery, and the utility. When MPP input voltage of PV modules is within acceptable range (see specification for the details), this inverter is able to generate power to feed the grid (utility) and charge battery. Galvanic isolation designed between PV/DC and AC output, so that user could connect any type of PV array to this Hybrid inverter. See Figure 1 for a simple diagram of a typical solar system with this hybrid inverter.







For parallel installation and operation, please check *Appendix I.*

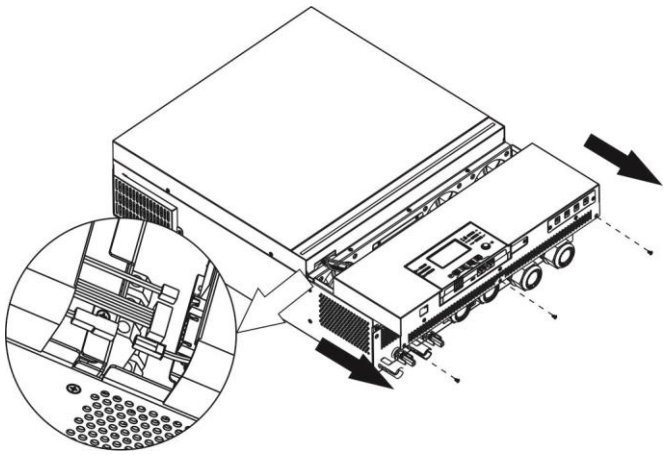
1. LCD display
2. Status indicator
3. Charging indicator
4. Fault indicator
5. Function buttons
6. Power on/off switch
7. AC input connectors
8. AC output connectors (Load connection)
9. PV connectors
10. Battery connectors
11. Remote LCD module communication port
12. Current sharing port
13. Parallel communication port
14. Dry contact
15. USB port as USB communication port and USB function port
16. BMS communication port: CAN, RS-485 or RS-232
17. Output source indicators (refer to OPERATION/Operation and Display Panel section for details) and USB function setting reminder (refer to OPERATION/Function Setting for the details)
18. RS-232 communication port
19. RGB LED bar (refer to LCD Setting section for the details)

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

Inverter unit | Manual | software CD | RS-232 cable | Parallel communication cable (only for 7.2KW model) | Current sharing cable (only for 7.2KW model)

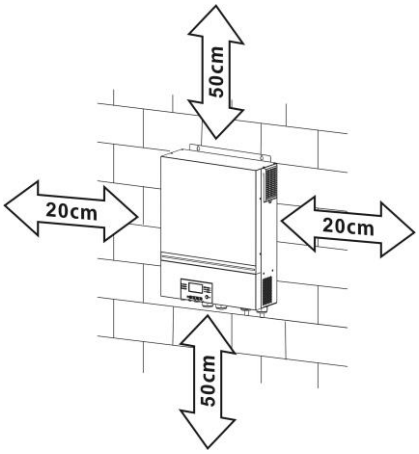
DC Fuse

Before connecting all wirings, please take off bottom cover by removing two screws. When removing the bottom cover, be carefully to remove three cables as shown below.



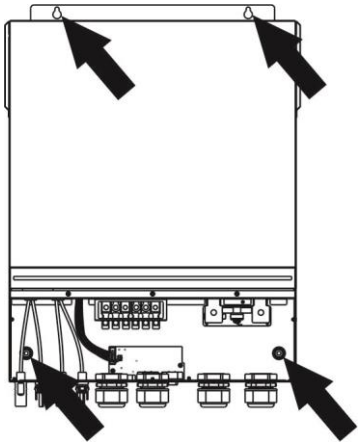
Consider the following points before selecting where to install:

- Do not mount the inverter on flammable construction materials.
- Mount on a solid surface
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- The ambient temperature should be between 0°C and 55°C to ensure optimal operation.
- The recommended installation position is to be adhered to the wall vertically.
- Be sure to keep other objects and surfaces as shown in the right diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



⚠

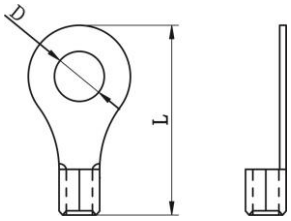
Install the unit by screwing four screws. It’s recommended to use M4 or M5 screws.



For safety operation and regulation compliance, it’s requested to install a separate DC over-current protector or disconnect device between battery and inverter. It may not be requested to have a disconnect device in some applications, however, it’s still requested to have over-current protection installed. Please refer to typical amperage in below table as required fuse or breaker size.

All wiring must be performed by a qualified personnel.

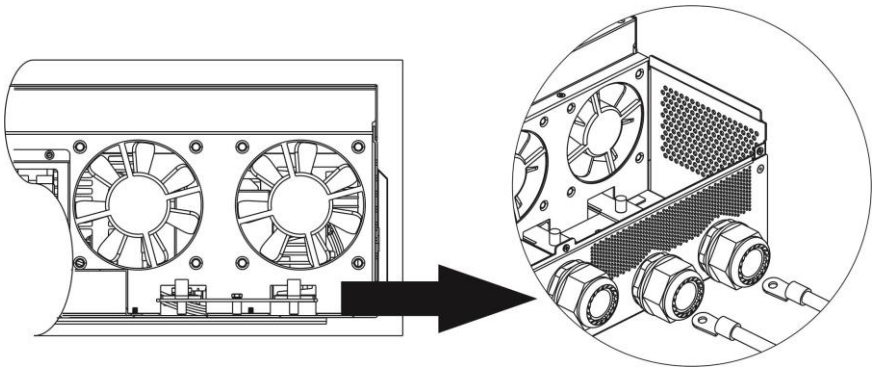
It's very important for system safety and efficient operation to use appropriate cable for battery connection. To reduce risk of injury, please use the proper recommended cable and terminal size as below.



3.6KW	167A	250AH	1*1/0AWG	50	8.4	47	5 Nm
7.2KW	164.8A		1*1/0AWG	50	8.4	47	

Please follow below steps to implement battery connection:

1. Assemble battery ring terminal based on recommended battery cable and terminal size.
2. Insert the ring terminal of battery cable flatly into battery connector of inverter and make sure the nuts are tightened with torque of 5 Nm. Make sure polarity at both the battery and the inverter/charge is correctly connected and ring terminals are tightly screwed to the battery terminals.



⚠	Installation must be performed with care due to high battery voltage in series.

⚠	Do not place anything between the flat part of the inverter terminal and the ring terminal. Otherwise, overheating may occur. Do not apply anti-oxidant substance on the terminals before terminals are connected tightly. Before making the final DC connection or closing DC breaker/disconnector, be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).

Before connecting to AC input power source, please install a AC breaker between inverter and AC input power source. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input.

There are two terminal blocks with "IN" and "OUT" markings. Please do NOT mis-connect input and output connectors.

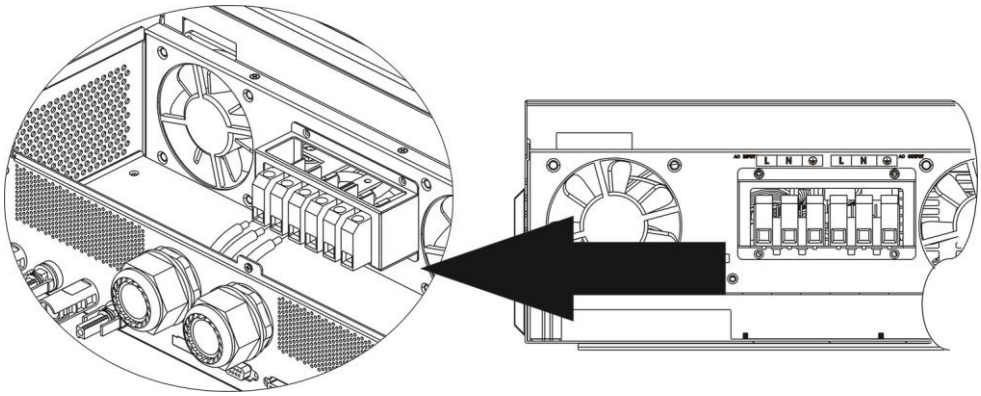
All wiring must be performed by a qualified personnel.

It's very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

3.6KW	12AWG	1.2~ 1.6Nm
7.2KW	8 AWG	1.4~ 1.6Nm

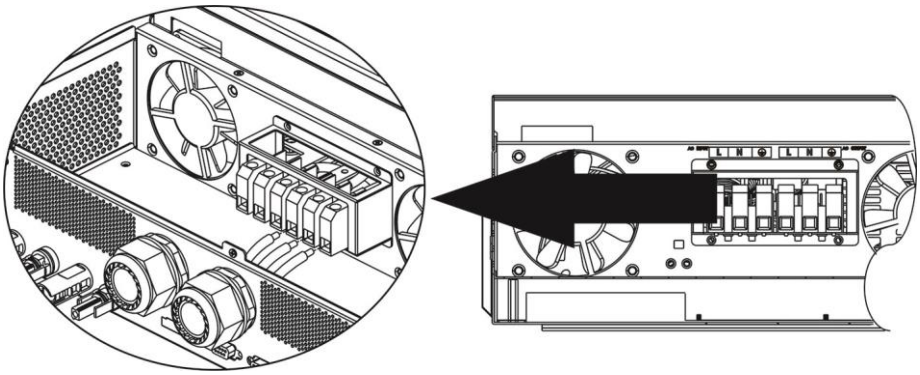
Please follow below steps to implement AC input/output connection:

1. Before making AC input/output connection, be sure to open DC protector or disconnector first.
2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N 3 mm.
3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor (⏚ first.
   ⏚



⚠	Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

4. Then, insert AC output wires according to polarities indicated on terminal block and tighten terminal screws. Be sure to connect PE protective conductor (⏚ first.
   ⏚



5. Make sure the wires are securely connected.

Be sure to connect AC wires with correct polarity. If L and N wires are connected reversely, it may cause utility short-circuited when these inverters are worked in parallel operation.

Appliances such as air conditioner requires at least 2~3 minutes to restart because it's required to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it's equipped with time-delay function before installation. Otherwise, this inverter/charger will be trigger overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

Before connecting to PV modules, please install DC circuit breakers between inverter and PV modules.

Please use 600VDC/30A circuit breaker.

The overvoltage category of the PV input is II.

Please follow the steps below to implement PV module connection:

Because this inverter is non-isolated, only three types of PV modules are acceptable: single crystalline and poly crystalline with class A-rated and CIGS 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. When using CIGS modules, please be sure NO grounding.

It's required to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.

: Check the input voltage of PV array modules. This system is applied with two strings of PV array. Please make sure that the maximum current load of each PV input connector is 18A.

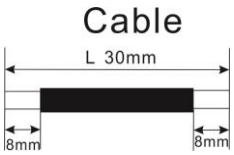
Exceeding the maximum input voltage can destroy the unit!! Check the system before wire connection.

Disconnect the circuit breaker and switch off the DC switch.

: Assemble provided PV connectors with PV modules by the following steps.

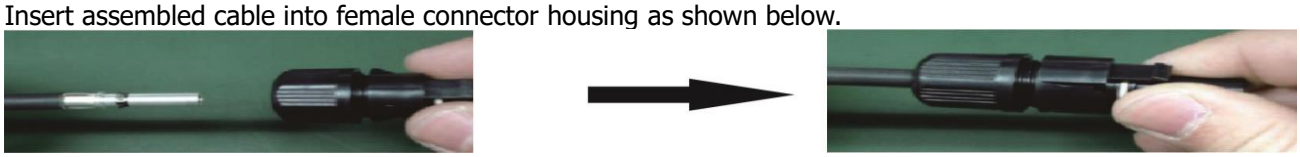
Female connector housing	
Female terminal	
Male connector housing	
Male terminal	
Crimping tool and spanner	

Strip one cable 8 mm on both end sides and be careful NOT to nick conductors.



Insert striped cable into female terminal and crimp female terminal as shown below.

Insert assembled cable into female connector housing as shown below.

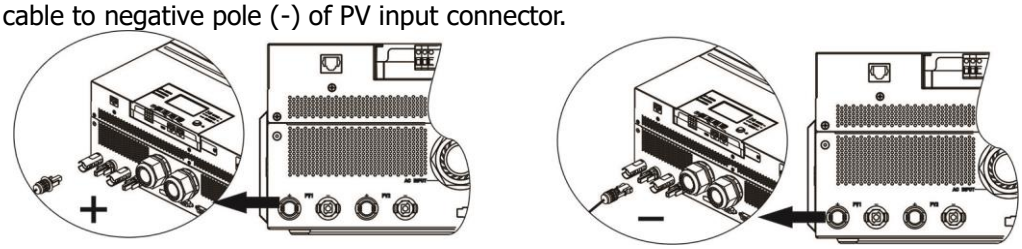


Insert striped cable into male terminal and crimp male terminal as shown below.

Insert assembled cable into male connector housing as shown below.

Then, use spanner to screw pressure dome tightly to female connector and male connector as shown below.

: Check correct polarity of connection cable from PV modules and PV input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of PV input connector. Connect negative pole (-) of connection cable to negative pole (-) of PV input connector.

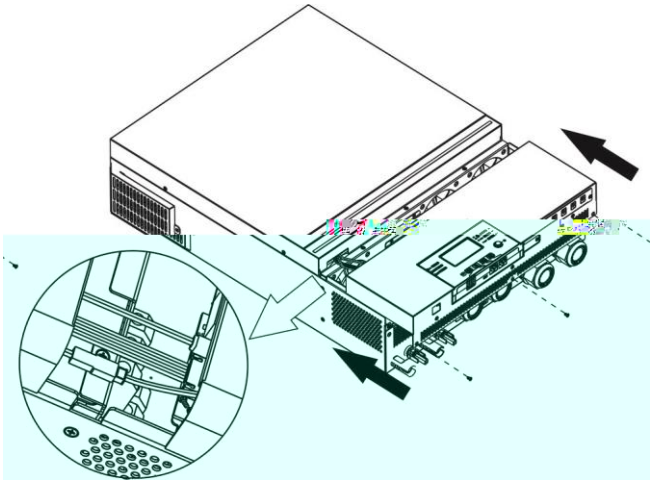


For safety and efficiency, it's very important to use appropriate cables for PV module connection. To reduce risk of injury, please use the proper cable size as recommended below.

Conductor cross-section (mm^2)	AWG no.
4~6	10~12

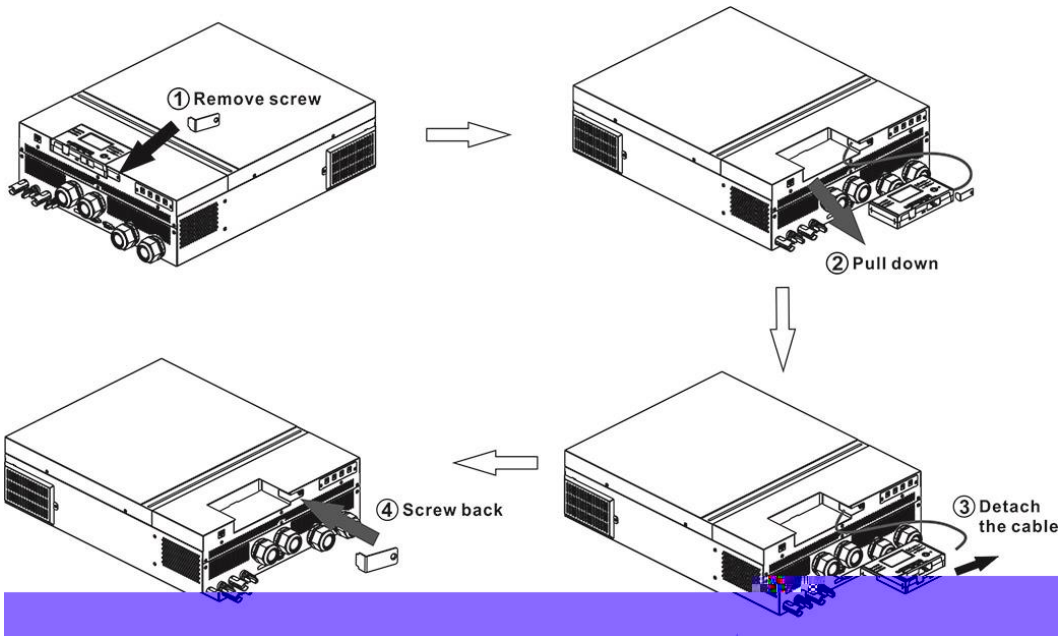
directly touch the terminals of inverter. It might cause lethal electric shock.

After connecting all wirings, re-connect three cables and then put bottom cover back by screwing two screws as shown below.

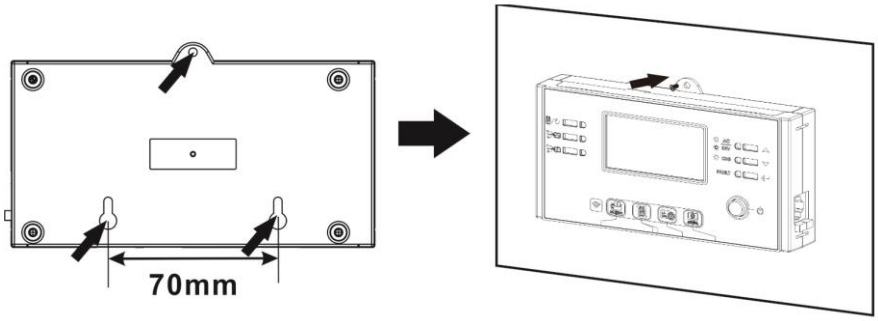


The LCD module can be removable and installed in a remote location with an optional communication cable. Please take the follow steps to implement this remote panel installation.

Remove the screw on the bottom of LCD module and pull down the module from the case. Detach the cable from the original communication port. Be sure to replace the retention plate back to the inverter.

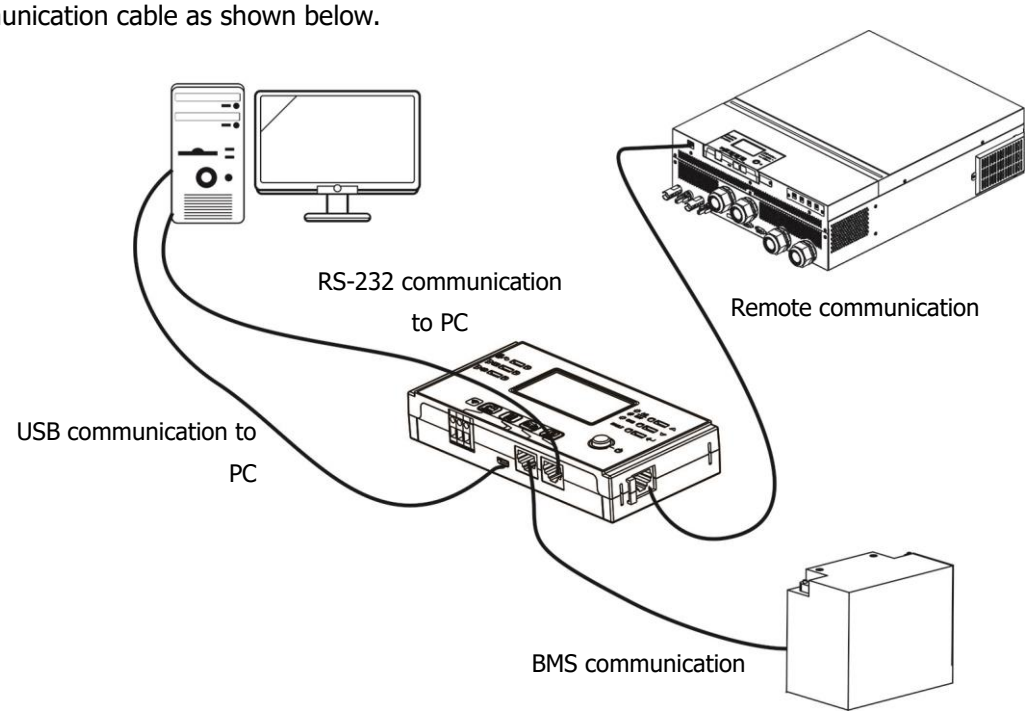


Prepare your mounting holes in the marked locations as shown in the illustration below. The LCD module then can be securely mounted to your desired location.



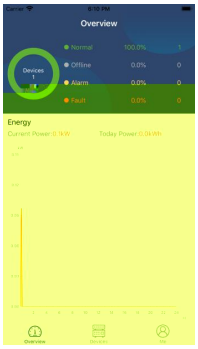
Wall installation should be implemented with the proper screws to the right.

After LCD module is installed, connect LCD module to the inverter with an optional RJ45 communication cable as shown below.



Please use the supplied serial cable to connect between the inverter and your PC. Install the monitoring software from the bundled CD and follow the on-screen instructions to complete your installation. For detailed software operation, refer to the software user manual on the bundled CD.

This unit is equipped with a Wi-Fi transmitter. Wi-Fi transmitter can enable wireless communication between off-grid inverters and monitoring platform. Users can access and control the monitored inverter with downloaded APP. You may find "WatchPower" app from the Apple® Store or "WatchPower Wi-Fi" in Google® Play Store. All data loggers and parameters are saved in iCloud. For quick installation and operation, please check Appendix III.

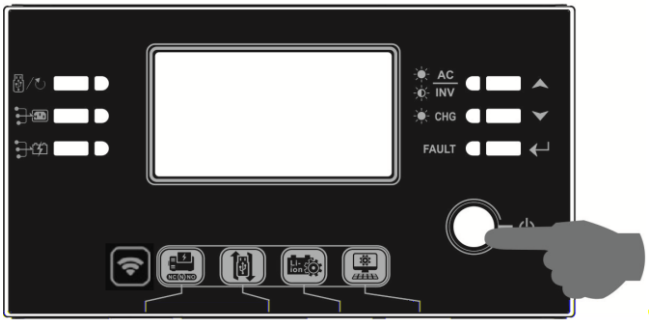


There is one dry contact (3A/250VAC) available on the rear panel. It could be used to deliver signal to external device when battery voltage reaches warning level.

Unit Status	Condition			Dry contact port:	
				NC & C	NO & C
Power Off	Unit is off and no output is powered.			Close	Open
Power On	Output is powered from Battery power or Solar energy.	Program 01 set as USB (utility first) or SUB (solar first)	Battery voltage < Low DC warning voltage	Open	Close
			Battery voltage > Setting value in Program 13 or battery charging reaches floating stage	Close	Open
		Program 01 is set as SBU (SBU priority)	Battery voltage < Setting value in Program 12	Open	Close
			Battery voltage > Setting value in Program 13 or battery charging reaches floating stage	Close	Open

It is recommended to purchase a special communication cable if you are connecting to Lithium-Ion battery banks. Please refer to *Appendix II- BMS Communication Installation* for details.

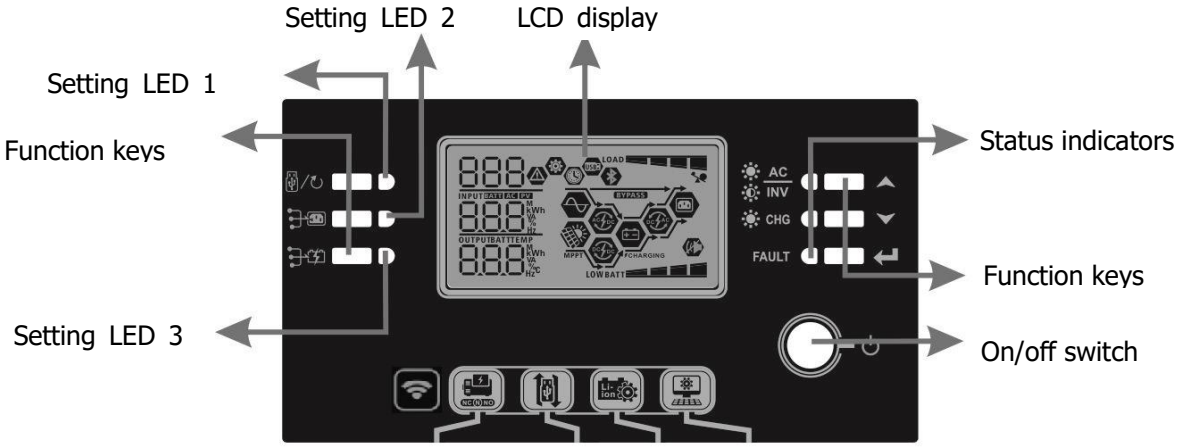
Once the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the display panel) to turn on the unit.



After this inverter is turned on, WELCOME light show will be started with RGB LED BAR. It will slowly cycle through entire spectrum of nine colors (Green, Sky blue, Royal blue, Violet, Pink, Red, Honey, Yellow, Lime yellow) about 10-15 seconds. After initialization, it will light up with default color.

RGB LED BAR can light up in different color and light effects based on the setting of energy priority to display the operation mode, energy source, battery capacity and load level. These parameters such as color, effects, brightness, speed and so on can be configured through the LCD panel. Please refer to LCD settings for the details.

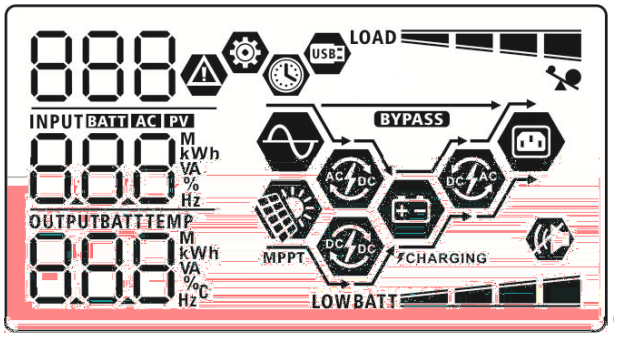
The operation and the LCD module, shown in the chart below, includes six indicators, six function keys, on/off switch and a LCD display to indicate the operating status and input/output power information.



		Green	Solid On	Output powered by utility
		Green	Solid On	Output powered by PV
		Green	Solid On	Output powered by battery
	AC INV	Green	Solid On	Output is available in line mode
			Flashing	Output is powered by battery in battery mode

	CHG	Green	Solid On	Battery is fully charged
			Flashing	Battery is charging.
	FAULT	Red	Solid On	Fault mode
			Flashing	Warning mode

	ESC	Exit the setting
	USB function setting	Select USB OTG functions
	Timer setting for the Output source priority	Setup the timer for prioritizing the output source
	Timer setting for the Charger source priority	Setup the timer for prioritizing the charger source
+		Press these two keys at the time to switch RGB LED bar for output source priority and battery discharge/charge status
	Up	To last selection
	Down	To next selection
	Enter	To confirm/enter the selection in setting mode



AC	Indicates the AC input.
PV	Indicates the PV input
INPUT BATT AC PV M kWh VA % Hz	Indicate input voltage, input frequency, PV voltage, charger current, charger power, battery voltage.
	Indicates the setting programs.
	Indicates the warning and fault codes. Warning: flashing with warning code. Fault: lighting with fault code
OUTPUTBATTTEMP M kWh VA % °C Hz	Indicate output voltage, output frequency, load percent, load in VA, load in Watt and discharging current.

BATT	Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.

When battery is charging, it will present battery charging status.

Status	Battery voltage	LCD Display
Constant Current mode / Constant Voltage mode	<2V/cell	4 bars will flash in turns.
	2 ~ 2.083V/cell	Bottom bar will be on and the other three bars will flash in turns.
	2.083 ~ 2.167V/cell	Bottom two bars will be on and the other two bars will flash in turns.
	> 2.167 V/cell	Bottom three bars will be on and the top bar will flash.
Floating mode. Batteries are fully charged.		4 bars will be on.

In battery mode, it will present battery capacity.

Load Percentage	Battery Voltage	LCD Display
Load >50%	< 1.85V/cell	LOW BATT
	1.85V/cell ~ 1.933V/cell	BATT
	1.933V/cell ~ 2.017V/cell	BATT
	> 2.017V/cell	BATT
Load < 50%	< 1.892V/cell	LOW BATT
	1.892V/cell ~ 1.975V/cell	BATT
	1.975V/cell ~ 2.058V/cell	BATT
	> 2.058V/cell	BATT

	Indicates overload.
LOAD	Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100%.

0%~24%	25%~49%
LOAD	LOAD
50%~74%	75%~100%
LOAD	LOAD

	Indicates unit connects to the mains.
MPPT	Indicates unit connects to the PV panel.
BYPASS	Indicates load is supplied by utility power.
AC DC	Indicates the utility charger circuit is working.
DC DC	Indicates the solar charger circuit is working.
DC AC	Indicates the DC/AC inverter circuit is working.
	Indicates unit alarm is disabled.
USB	Indicates USB disk is connected.
	Indicates timer setting or time display

After pressing and holding "↵" button for 3 seconds, the unit will enter the Setup Mode. Press "▲" or "▼" button to select setting programs. Press "↵" button to confirm you selection or "⏻/↻" button to exit.

00	Exit setting mode	Escape 00 ESC	
01	Output source priority: To configure load power source priority	Utility first (default) 01 USb	Utility will provide power to the loads as first priority. Solar and battery energy will provide power to the loads only when utility power is not available.
		Solar first 01 SUb	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, Utility energy will supply power to the loads at the same time.
		SBU priority 01 SbU	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12.
02	Maximum charging current: To configure total charging current for solar and utility chargers. (Max. charging current = utility charging current + solar charging current)	10A 02 10A	20A 02 20A

		30A 02 30A	40A 02 40A
		50A 02 50A	60A (default) 02 60A
		70A 02 70A	80A 02 80A
03	AC input voltage range	Appliances (default) 03 APL	If selected, acceptable AC input voltage range will be within 90-280VAC.
		UPS 03 UPS	If selected, acceptable AC input voltage range will be within 170-280VAC.
05	Battery type	AGM (default) 05 AGn	Flooded 05 FLd
		User-Defined 05 USE	If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 26, 27 and 29.
		Pylontech battery 05 PYL	If selected, programs of 02, 26, 27 and 29 will be automatically set up. No need for further setting.

05	Battery Type	WECO battery (only for 48V model) 05 uEC	If selected, programs of 02, 12, 26, 27 and 29 will be auto-configured per battery supplier recommended. No need for further adjustment.
		Soltaro battery (only for 48V model) 05 SOL	If selected, programs of 02, 26, 27 and 29 will be automatically set up. No need for further setting.
06	Auto restart when overload occurs	Restart disable (default) 06 LHd	Restart enable 06 LHE
07	Auto restart when over temperature occurs	Restart disable (default) 07 tHd	Restart enable 07 tHE
09	Output frequency	50Hz (default) 09 50 Hz	60Hz 09 60 Hz
10	Output voltage	220V 10 220 V	230V (default) 10 230 V
		240V 10 240 V	
11	Maximum utility charging current Note: If setting value in program 02 is smaller than that in program in 11, the inverter will apply charging	2A 11 UtI 2 A	10A 11 UtI 10 A

	current from program 02 for utility charger.	20A 11 Uti 20 A	30A (default) 11 Uti 30 A
		40A 11 Uti 40 A	50A 11 Uti 50 A
		60A 11 Uti 60 A	70A 11 Uti 70 A
		80A 11 Uti 80 A	
12	Setting voltage point back to utility source when selecting "SBU" (SBU priority) in program 01.	24V model:	
		22.0V 12 BATT 22.0 V	22.5V 12 BATT 22.5 V
		23.0V (default) 12 BATT 23.0 V	23.5V 12 BATT 23.5 V
		24.0V 12 BATT 24.0 V	24.5V 12 BATT 24.5 V
		25.0V 12 BATT 25.0 V	25.5V 12 BATT 25.5 V

		48V model:	
		44V 12 BATT 44 V	45V 12 BATT 45 V
		46V (default) 12 BATT 46 V	47V 12 BATT 47 V
		48V 12 BATT 48 V	49V 12 BATT 49 V
		50V 12 BATT 50 V	51V 12 BATT 51 V
13	Setting voltage point back to battery mode when selecting "SBU" (SBU priority) in program 01.	24V model:	
		Battery fully charged 13 BATT FUL V	24V 13 BATT 24.0 V
		24.5V 13 BATT 24.5 V	25V 13 BATT 25.0 V
		25.5V 13 BATT 25.5 V	26V 13 BATT 26.0 V

13	Setting voltage point back to battery mode when selecting "SBU" (SBU priority) in program 01.	26.5V 13 BATT 26.5 V	27V (default) 13 BATT 27.0 V
		27.5V 13 BATT 27.5 V	28V 13 BATT 28.0 V
		28.5V 13 BATT 28.5 V	29V 13 BATT 29.0 V
		29.5V 13 BATT 29.5 V	30V 13 BATT 30.0 V
		30.5V 13 BATT 30.5 V	31V 13 BATT 31.0 V
		48V model:	
		Battery fully charged 13 BATT FUL V	48V 13 BATT 48 V
		49V 13 BATT 49 V	50V 13 BATT 50 V

13	Setting voltage point back to battery mode when selecting "SBU" (SBU priority) in program 01.	51V 13 BATT 51 V	52V 13 BATT 52 V
		53V 13 BATT 53 V	54V (default) 13 BATT 54 V
		55V 13 BATT 55 V	56V 13 BATT 56 V
		57V 13 BATT 57 V	58V 13 BATT 58 V
		59V 13 BATT 59 V	60V 13 BATT 60 V
		61V 13 BATT 61 V	62V 13 BATT 62 V
16	Charger source priority: To configure charger source priority	If this inverter/charger is working in Line, Standby or Fault mode, charger source can be programmed as below:	
		Solar first 16 CSO	Solar energy will charge battery as first priority.

16	Charger source priority: To configure charger source priority	Solar and Utility (default) 16 SNU	Solar energy and utility will charge battery at the same time.
		Only Solar 16 OSO	Solar energy will be the only charger source no matter utility is available or not.
		If this inverter/charger is working in Battery mode, only solar energy can charge battery. Solar energy will charge battery if it's available and sufficient.	
18	Alarm control	Alarm on (default) [redacted]	Alarm off 18 bOF
19	Auto return to default display screen	Return to default display screen (default) 19 ESP	If selected, no matter how users switch display screen, it will automatically return to default display screen (Input voltage /output voltage) after no button is pressed for 1 minute.
		Stay at latest screen 19 rEP	If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on (default) 20 LON	Backlight off 20 LOF

22	Beeps while primary source is interrupted	Alarm on (default) 22 AON	Alarm off 22 AOF
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) 23 byd	Bypass enable 23 byE
25	Record Fault code	Record enable (default) 25 FEN	Record disable 25 FdS
26	Bulk charging voltage (C.V voltage)	24V model default: 28.2V 26 CV BATT 28.2V	48V model default: 56.4V 26 CV BATT 56.4V
		If self-defined is selected in program 5, this program can be set up. Setting range is from 25.0V to 31.0V for 24V model and 48.0V to 62.0V for 48V model. Increment of each click is 0.1V.	
27	Floating charging voltage	24V model default: 27.0V 27 FLV BATT 27.0V	48V model default: 54.0V 27 FLV BATT 54.0V
		If self-defined is selected in program 5, this program can be set up. Setting range is from 25.0V to 31.0V for 24V model and 48.0V to 62.0V for 48V model. Increment of each click is 0.1V.	
28	AC output mode (only for 7.2KW model) *This setting is only available when the inverter is in standby mode (Switch off).	Single: This inverter is used in single phase application. 28 SIG	Parallel: This inverter is operated in parallel system. 28 PAL

28	AC output mode (only for 7.2KW model) *This setting is only available when the inverter is in standby mode (Switch off).	When the inverter is operated in 3-phase application, set up inverter to be operated in specific phase.	
		L1 phase: 28 3P 1	L2 phase: 28 3P2
		L3 phase: 28 3P3	
29	Low DC cut-off voltage: ● If battery power is only power source available, inverter will shut down. ● If PV energy and battery power are available, inverter will charge battery without AC output. ● If PV energy, battery power and utility are all available, inverter will transfer to line mode and provide output power to loads.	24V model default: 22.0V 29 BATT 22.0 V	48V model default: 44.0V 29 C0U BATT 44.0 V
		If self-defined is selected in program 5, this program can be set up. Setting range is from 21.0V to 24.0V for 24V model and 42.0V to 48.0V for 48V model. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.	
30	Battery equalization	Battery equalization 30 EEN	Battery equalization disable (default) 30 EdS
		If "Flooded" or "User-Defined" is selected in program 05, this program can be set up.	
31	Battery equalization voltage	24V model default: 29.2V 31 EU BATT 29.2 V	48V model default: 58.4V 31 EU BATT 58.4 V
		Setting range is from 25.0V to 31.0V for 24V model and 48.0V to 62.0V for 48V model. Increment of each click is 0.1V.	

33	Battery equalized time	60min (default) 33 60	Setting range is from 5min to 900min. Increment of each click is 5min.
34	Battery equalized timeout	120min (default) 34 120	Setting range is from 5min to 900 min. Increment of each click is 5 min.
35	Equalization interval	30days (default) 35 30d	Setting range is from 0 to 90 days. Increment of each click is 1 day
36	Equalization activated immediately	Enable 36 AEn	Disable (default) 36 AdS
		If equalization function is enabled in program 30, this program can be set up. If "Enable" is selected in this program, it's to activate battery equalization immediately and LCD main page will show "E9". If "Disable" is selected, it will cancel equalization function until next activated equalization time arrives based on program 35 setting. At this time, "E9" will not be shown in LCD main page.	
37	Reset all stored data for PV generated power and output load energy	Not reset(Default) 37 nrt	Reset 37 rSt
41	Maximum discharging current (only for 7.2KW model)	Disable (Default) 41 ddS	If selected, battery discharge protection is disabled.

		30A 41 30	The setting range is from 30 A to 150 A. Increment of each click is 10A. If discharging current is higher than setting value, battery will stop discharging. At this time, if the utility is available, the inverter will operate in bypass mode. If no utility is available, the inverter will shut down output for 5 minutes.
		150A 41 150	
51	On/Off control for RGB LED *It's necessary to enable this setting to activate RGB LED lighting function.	Enabled (default) 51 LEN	Disable 51 LdS
52	Brightness of RGB LED	Low 52 LO	Normal (default) 52 [illegible]
		High 52 HI	
53	Lighting speed of RGB LED	Low 53 LO	Normal (default) 53 [illegible]
		High 53 HI	

54	RGB LED effects	Scrolling 54 SCr	Breathing 54 brE
		Solid on (Default) 54 SOL	
55	Color combination of RGB LED to show energy source and battery charge/discharge status: ● Grid-PV-Battery ● Battery charge/discharge status	C01: (Default) ● Violet-White-Sky blue ● Pink-Honey 55 C01	C02: ● White-Yellow-Green ● Royal blue-Lime yellow 55 C02
93	Erase all data log	Not reset (Default) 93 nrt	Reset 93 rSt
94	Data log recorded interval *The maximum data log number is 1440. If it's over 1440, it will re-write the first log.	3 minutes 94 3	5 minutes 94 5
		10 minutes (default) 94 10	20 minutes 94 20
		30 minutes 94 30	60 minutes 94 60

95	Time setting – Minute	For minute setting, the range is from 0 to 59. 95 min 0
96	Time setting – Hour	For hour setting, the range is from 0 to 23. 96 HOU 0
97	Time setting– Day	For day setting, the range is from 1 to 31. 97 dAY 1
98	Time setting– Month	For month setting, the range is from 1 to 12. 98 mON 1
99	Time setting – Year	For year setting, the range is from 17 to 99. 99 YEA 19

There are three function keys on the display panel to implement special functions such as USB OTG, Timer setting for output source priority and timer setting for charger source priority.

Insert an OTG USB disk into the USB port ( ). Press and hold "/" button for 3 seconds to enter USB Setup Mode. These functions including inverter firmware upgrade, data log export and internal parameters re-write from the USB disk.

	LCD Screen
Press and hold "/" button for 3 seconds to enter USB function setting mode.	UPG SEt LOG
Press "/", "" or "" button to enter the selectable setting programs (detail descriptions in Step 3)..	

Please select setting program by following the procedure.

/↻: Upgrade firmware	This function is to upgrade inverter firmware. If firmware upgrade is needed, please check with your dealer or installer for detail instructions.	
: Re-write internal parameters	This function is to over-write all parameter settings (TEXT file) with settings in the On-The-Go USB disk from a previous setup or to duplicate inverter settings. Please check with your dealer or installer for detail instructions.	
: Export data log	By pressing "" button to export data log from the inverter to USB disk. If the selected function is ready, LCD will display "rdy". Press "/↻" button to confirm the selection again.	LOG rdy
	● Press "" button to select "Yes", LED 1 will flash once every second during the process. It will only display LOG and all LEDs will be on after this action is complete. Then, press "/↻" button to return to main screen. ● Or press "" button to select "No" to return to main screen.	

If no button is pressed for 1 minute, it will automatically return to main screen.

U01	No USB disk is detected.
U02	USB disk is protected from copy.
U03	Document inside the USB disk with wrong format.

If any error occurs, error code will only show 3 seconds. After three seconds, it will automatically return to display screen.

This timer setting is to set up the output source priority per day.

	LCD Screen
Press and hold "" button for 3 seconds to enter Timer Setup Mode for output source priority.	USb Sub SbU
Press "/↻", "" or "" button to enter the selectable programs (detail descriptions in Step 3).	

Please select setting program by following each procedure.

/↻	Press "/↻" button to set up Utility First Timer. Press "" button to select staring time. Press "▲" or "▼" button to adjust values and press "↵" to confirm. Press "" button to select end time. Press "▲" or "▼" button to adjust values, press "↵" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	USb 00 23
	Press "" button to set up Solar First Timer. Press "" button to select staring time. Press "▲" or "▼" button to adjust values and press "↵" to confirm. Press "" button to select end time. Press "▲" or "▼" button to adjust values, press "↵" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	SUb 00 23
	Press "" button to set up SBU Priority Timer. Press "" button to select staring time. Press "▲" or "▼" button to adjust values and press "↵" to confirm. Press "" button to select end time. Press "▲" or "▼" button to adjust values, press "↵" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	SbU 00 23

Press "/↻" button to exit the Setup Mode.

This timer setting is to set up the charger source priority per day.

	LCD Screen
Press and hold "" button for 3 seconds to enter Timer Setup Mode for charging source priority.	CSO SNU OSO
Press "/↻", "" or "" button to enter the selectable programs (detail descriptions in Step 3).	

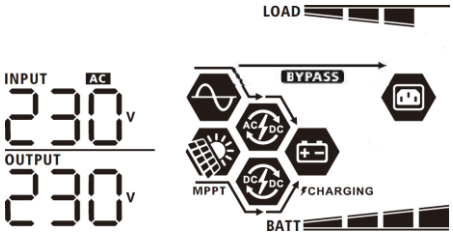
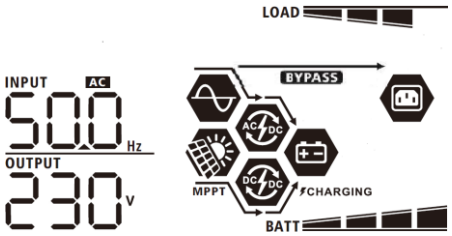
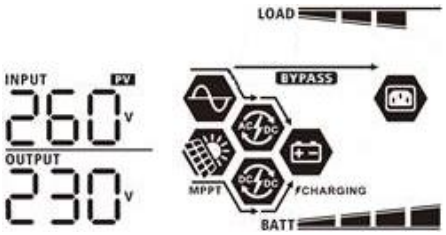
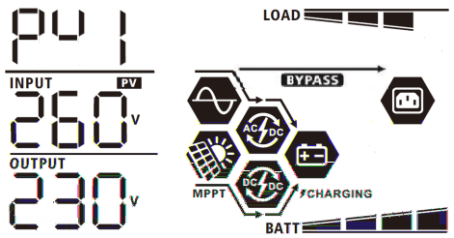
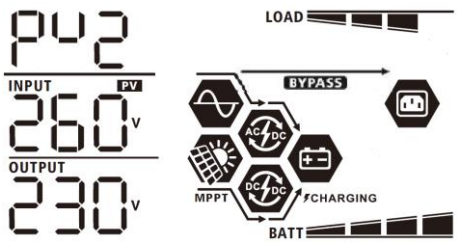
Please select setting program by following each procedure.

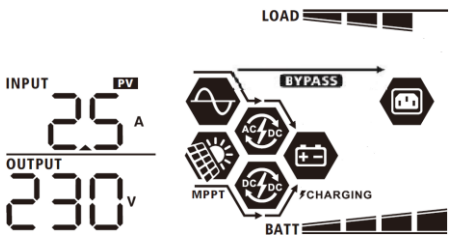
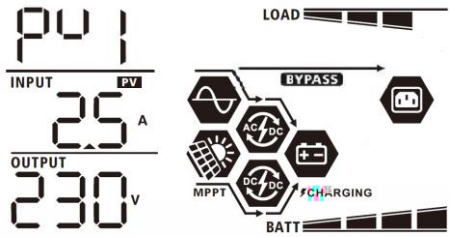
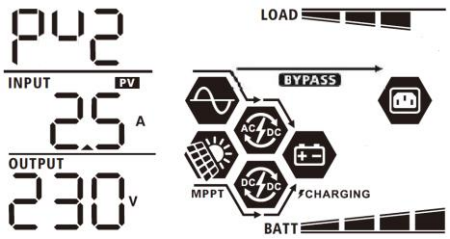
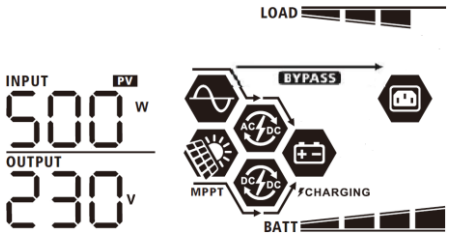
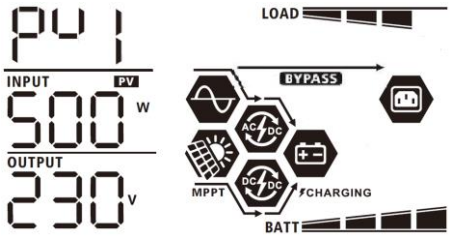
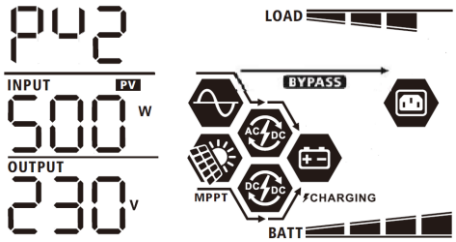
/↻	Press "/↻" button to set up Solar First Timer. Press "" button to select staring time. Press "▲" or "▼" button to adjust values and press "↵" to confirm. Press "" button to select end time. Press "▲" or "▼" button to adjust values, press "↵" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	CSO 00 23
	Press "" button to set up Solar & Utility Timer. Press "" button to select staring time. Press "▲" or "▼" button to adjust values and press "↵" to confirm. Press "" button to select end time. Press "▲" or "▼" button to adjust values, press "↵" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	SNU 00 23

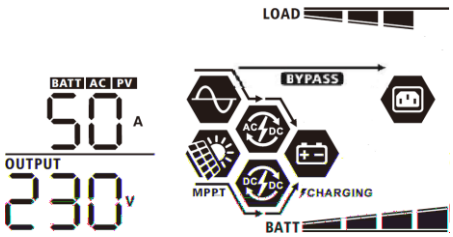
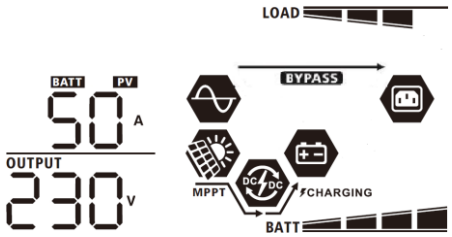
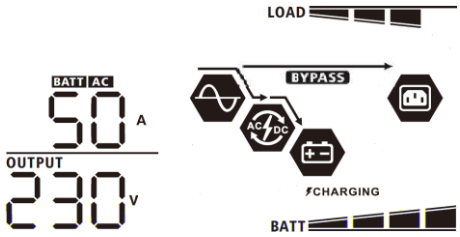
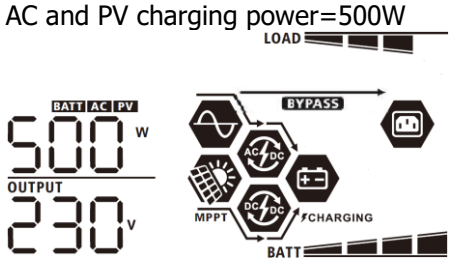
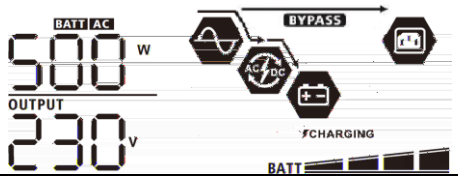
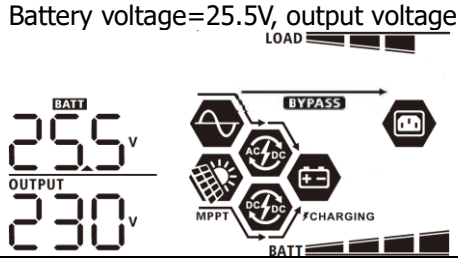
	Press "" button to set up Solar Only Timer. Press "" button to select staring time. Press "▲" or "▼" button to adjust values and press "↵" to confirm. Press "" button to select end time. Press "▲" or "▼" button to adjust values, press "↵" button to confirm. The setting values are from 00 to 23, with 1-hour increment.	050 00 23

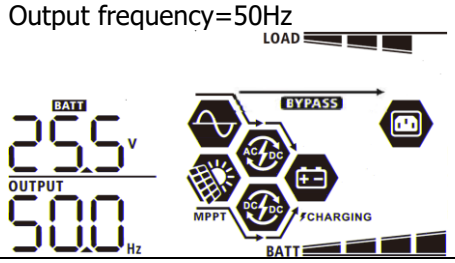
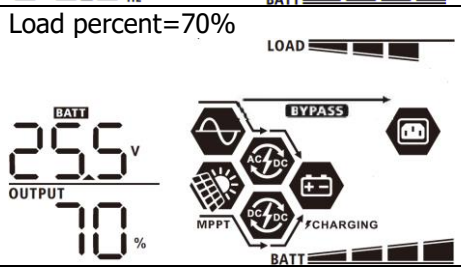
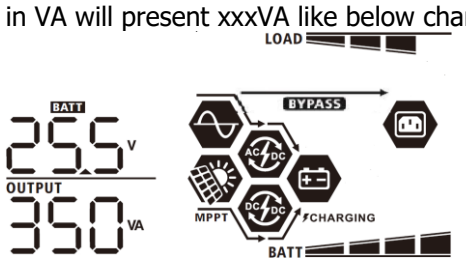
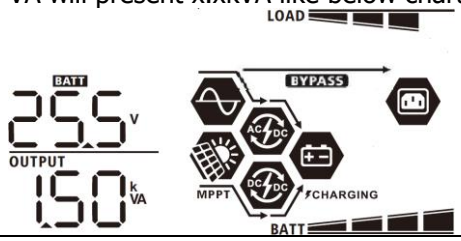
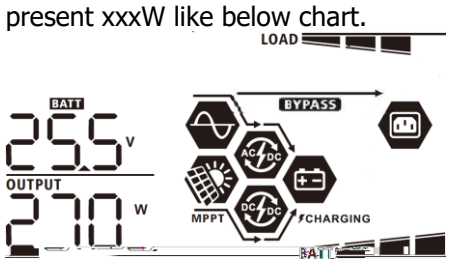
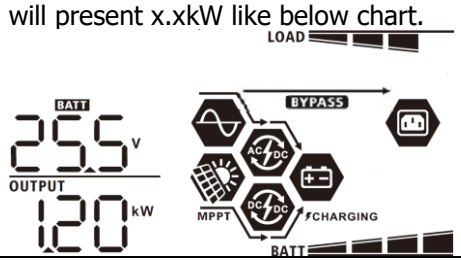
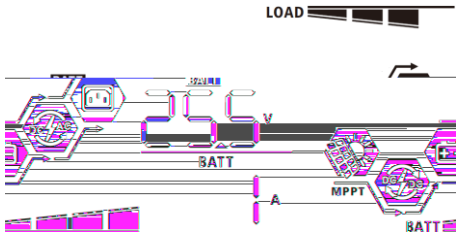
Press "/" button to exit the Setup Mode.

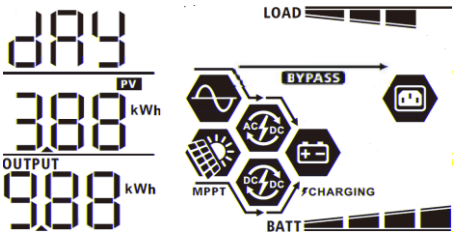
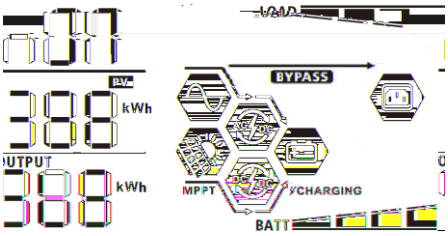
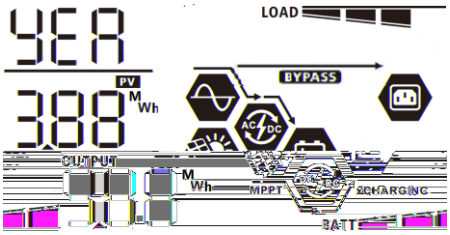
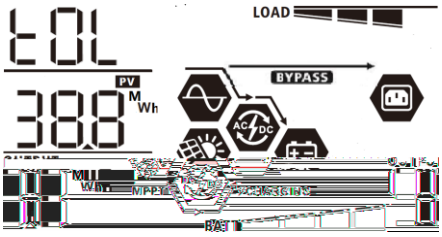
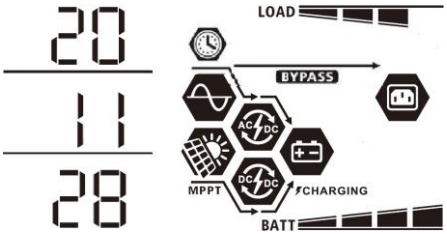
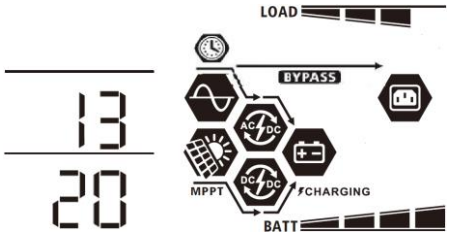
The LCD display information will be switched in turn by pressing the "UP" or "DOWN" button. The selectable information is switched as the following table in order.

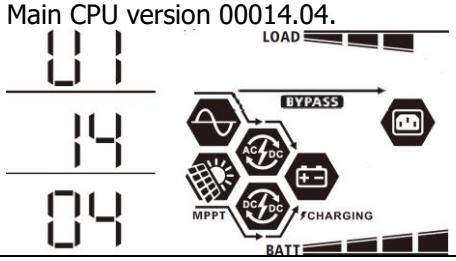
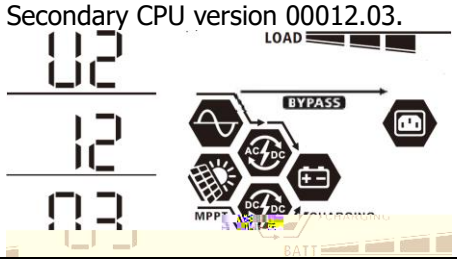
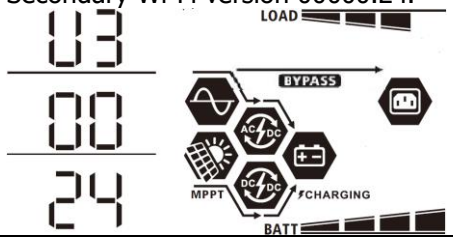
Input voltage/Output voltage (Default Display Screen)	Input Voltage=230V, output voltage=230V 
Input frequency	Input frequency=50Hz 
PV voltage	PV voltage=260V 
	PV1 voltage=260V (dual input model) 
	PV2 voltage=260V (dual input model) 

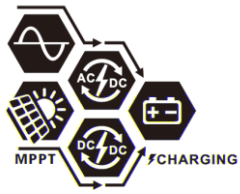
PV current	PV current = 2.5A 
	PV1 current = 2.5A (dual input model) 
	PV2 current = 2.5A (dual input model) 
PV power	PV power = 500W 
	PV1 power = 500W (dual input model) 
	PV2 power = 500W (dual input model) 

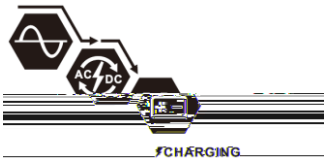
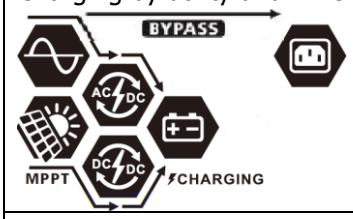
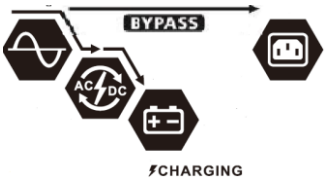
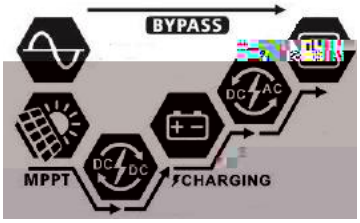
Charging current	AC and PV charging current=50A  PV charging current=50A  AC charging current=50A 
Charging power	AC and PV charging power=500W  PV charging power=500W AC charging power=500W 
Battery voltage and output voltage	Battery voltage=25.5V, output voltage=230V 

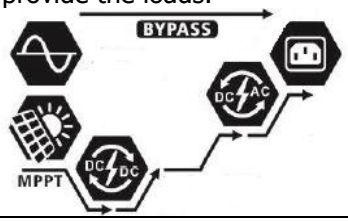
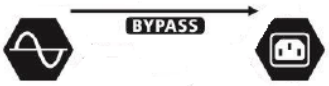
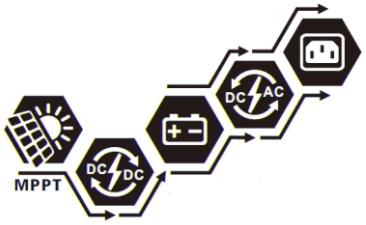
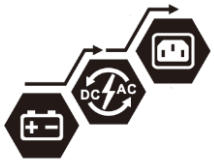
Output frequency	Output frequency=50Hz 
Load percentage	Load percent=70% 
Load in VA	When connected load is lower than 1kVA, load in VA will present xxxVA like below chart.  When load is larger than 1kVA (≥1KVA), load in VA will present x.xkVA like below chart. 
Load in Watt	When load is lower than 1kW, load in W will present xxxW like below chart.  When load is larger than 1kW (≥1KW), load in W will present x.xkW like below chart. 
Battery voltage/DC discharging current	Battery voltage=25.5V, discharging current=1A 

PV energy generated today and Load output energy today	This PV Today energy = 3.88kWh, Load Today energy= 9.88kWh. 
PV energy generated this month and Load output energy this month.	This PV month energy = 388kWh, Load month energy= 988kWh. 
PV energy generated this year and Load output energy this year.	This PV year energy = 3.88MWh, Load year energy = 9.88MWh. 
PV energy generated totally and Load output total energy.	PV Total energy = 38.8MWh, Load Output Total energy = 98.8MWh. 
Real date.	Real date Nov 28, 2020. 
Real time.	Real real time 13:20. 

Main CPU version checking.	Main CPU version 00014.04. 
Secondary CPU version checking.	Secondary CPU version 00012.03. 
Secondary Wi-Fi version checking.	Secondary Wi-Fi version 00000.24. 

Standby mode *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge battery without AC output.	No output is supplied by the unit but it still can charge batteries.	Charging by utility and PV energy. 
		Charging by utility.
		Charging by PV energy.
		No charging.

Fault mode Note: *Fault mode: Errors are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on.	PV energy and utility can charge batteries.	Charging by utility and PV energy.
		Charging by utility. 
		Charging by PV energy.
		No charging.
Line Mode	The unit will provide output power from the mains. It will also charge the battery at line mode.	Charging by utility and PV energy. 
		Charging by utility. 
		If "SUB" (solar first) is selected as output source priority and solar energy is not sufficient to provide the load, solar energy and the utility will provide the loads and charge the battery at the same time. 

Line Mode	The unit will provide output power from the mains. It will also charge the battery at line mode.	If either "SUB" (solar first) or "SBU" is selected as output source priority and battery is not connected, solar energy and the utility will provide the loads. 
		Power from utility. 
Battery Mode	The unit will provide output power from battery and/or PV power.	Power from battery and PV energy. 
		PV energy will supply power to the loads and charge battery at the same time. No utility is available.
		Power from battery only. 
		Power from PV energy only.

01	Fan is locked when inverter is off.	F01
02	Over temperature	F02
03	Battery voltage is too high	F03
04	Battery voltage is too low	F04
05	Output short circuited.	F05
06	Output voltage is too high.	F06
07	Overload time out	F07
08	Bus voltage is too high	F08
09	Bus soft start failed	F09
10	PV over current	F 10
11	PV over voltage	
12	DCDC over current	F 12
13	Battery discharge over current	F 13
51	Over current	F51
52	Bus voltage is too low	F52
53	Inverter soft start failed	F53
55	Over DC voltage in AC output	F55
57	Current sensor failed	F57
58	Output voltage is too low	F58

01	Fan is locked when inverter is on.	Beep three times every second	01
02	Over temperature	None	02
03	Battery is over-charged	Beep once every second	03
04	Low battery	Beep once every second	04
07	Overload	Beep once every 0.5 second	07 LOAD
10	Output power derating	Beep twice every 3 seconds	10
15	PV energy is low.	Beep twice every 3 seconds	15
16	High AC input (>280VAC) during BUS soft start	None	16
32	Communication failure between inverter and remote display panel	None	32
E9	Battery equalization	None	E9
bP	Battery is not connected	None	bP

Equalization function is added into charge controller. It reverses the buildup of negative chemical effects like stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Equalization also helps to remove sulfate crystals that might have built up on the plates. If left unchecked, this condition, called sulfation, will reduce the overall capacity of the battery. Therefore, it's recommended to equalize battery periodically.

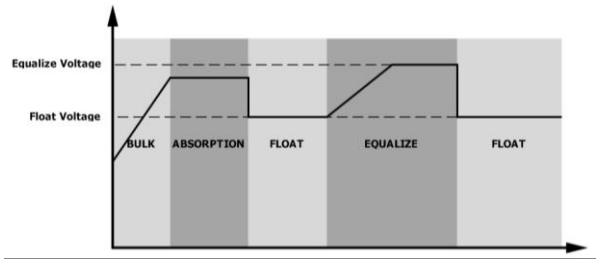
●

You must enable battery equalization function in monitoring LCD setting program 33 first. Then, you may apply this function in device by either one of following methods:

1. Setting equalization interval in program 37.
2. Active equalization immediately in program 39.

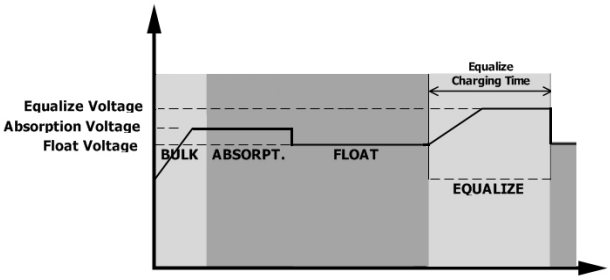
●

In float stage, when the setting equalization interval (battery equalization cycle) is arrived, or equalization is active immediately, the controller will start to enter Equalize stage.



●

In Equalize stage, the controller will supply power to charge battery as much as possible until battery voltage raises to battery equalization voltage. Then, constant-voltage regulation is applied to maintain battery voltage at the battery equalization voltage. The battery will remain in the Equalize stage until setting battery equalized time is arrived.



However, in Equalize stage, when battery equalized time is expired and battery voltage doesn't rise to battery equalization voltage point, the charge controller will extend the battery equalized time until battery voltage achieves battery equalization voltage. If battery voltage is still lower than battery equalization voltage when battery equalized timeout setting is over, the charge controller will stop equalization and return to float stage.

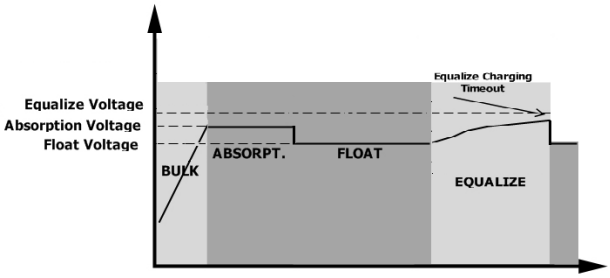


Table 1 Line Mode Specifications

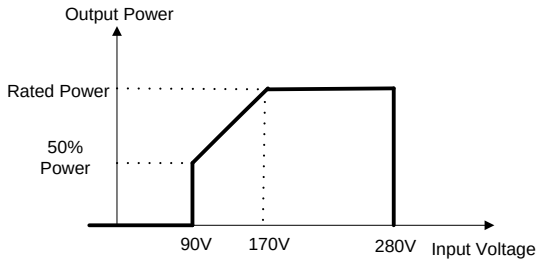
	Sinusoidal (utility or generator)	
	230Vac	
	170Vac±7V (UPS) 90Vac±7V (Appliances)	
	180Vac±7V (UPS); 100Vac±7V (Appliances)	
	280Vac±7V	
	270Vac±7V	
	300Vac	
	40A	60A
	50Hz / 60Hz (Auto detection)	
	40±1Hz	
	42±1Hz	
	65±1Hz	
	63±1Hz	
	Line mode: Circuit Breaker Battery mode: Electronic Circuits	
	>95% (Rated R load, battery full charged)	
	10ms typical (UPS); 20ms typical (Appliances)	
When AC input voltage under 170V the output power will be de-rated.		

Table 2 Inverter Mode Specifications

	3600W	7200W
	Pure Sine Wave	
	230Vac±5%	
	60Hz or 50Hz	
	91%	93%
	100ms@≥205% load;5s@≥150% load; 10s@110%~150% load	
	2* rated power for 5 seconds	
	24Vdc	48Vdc
	23.0Vdc	46.0Vdc
@ load < 20% @ 20% ≤ load < 50% @ load ≥ 50%	23.0Vdc 21.4Vdc 20.2Vdc	46.0Vdc 42.8Vdc 40.4Vdc
@ load < 20% @ 20% ≤ load < 50% @ load ≥ 50%	24.0Vdc 22.4Vdc 21.2Vdc	48.0Vdc 44.8Vdc 42.4Vdc
@ load < 20% @ 20% ≤ load < 50% @ load ≥ 50%	22.0Vdc 20.4Vdc 19.2Vdc	44.0Vdc 40.8Vdc 38.4Vdc
	32Vdc	64Vdc
	33Vdc	66Vdc
	+/-0.3V@ no load	
	<5% for linear load,<10% for non-linear load @ nominal voltage	
	≦100mV	

Table 3 Charge Mode Specifications

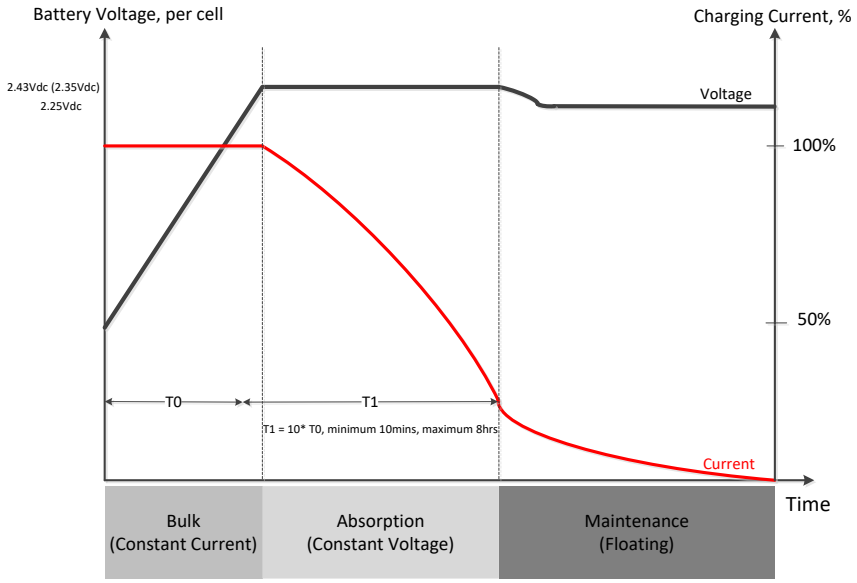
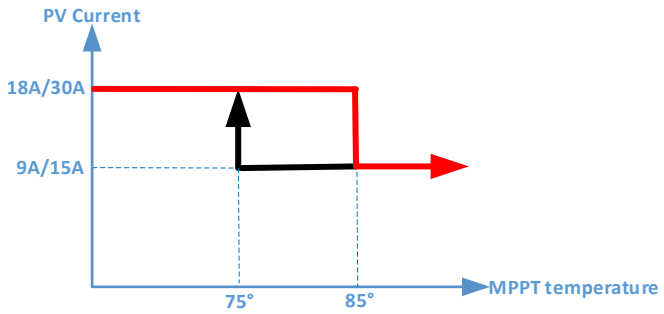
@ Nominal Input Voltage		80A	
		29.2Vdc	58.4Vdc
		28.2Vdc	56.4Vdc
		27Vdc	54Vdc
		33Vdc	66Vdc
		3-Step	
			
		4000W	8000W
		500Vdc	500Vdc
		120Vdc~450Vdc	90Vdc~450Vdc
		18A	18A x 2
		150V +/- 5Vdc	80V +/- 5Vdc
			

Table 4 General Specifications

	CE	
	-10°C to 50°C	
	-15°C~ 60°C	
	5% to 95% Relative Humidity (Non-condensing)	
	147.4x 432.5 x 553.6	
	14.1	18.4

Table 5 Parallel Specifications (7.2KW model only)

	6
	Max 2A
	<5% @ 100% Load
	CAN
	Max 50ms
	YES

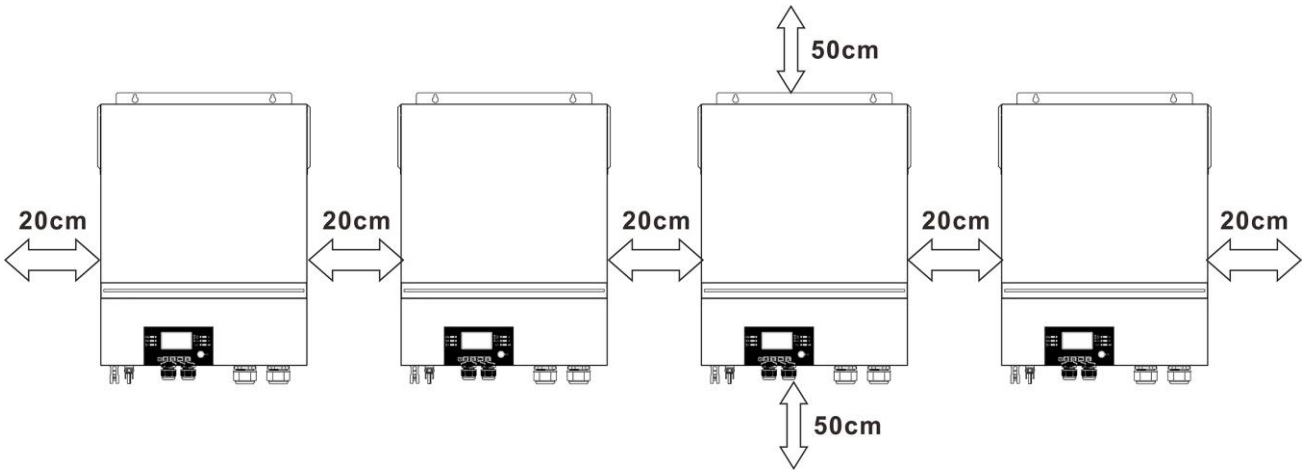
Unit shuts down automatically during startup process.	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low (<1.91V/Cell)	1. Re-charge battery. 2. Replace battery.
No response after power on.	No indication.	1. The battery voltage is far too low. (<1.4V/Cell) 2. Battery polarity is connected reversed.	1. Check if batteries and the wiring are connected well. 2. Re-charge battery. 3. Replace battery.
Mains exist but the unit works in battery mode.	Input voltage is displayed as 0 on the LCD and green LED is flashing.	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well.
	Green LED is flashing.	Insufficient quality of AC power. (Shore or Generator)	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS→Appliance)
	Green LED is flashing.	Set "Solar First" as the priority of output source.	Change output source priority to Utility first.
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.
	Fault code 07	Overload error. The inverter is overload 110% and time is up.	Reduce the connected load by switching off some equipment.
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.
		Temperature of internal converter component is over 120°C. (Only available for 1-3KVA models.)	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	Fault code 02	Internal temperature of inverter component is over 100°C.	
	Fault code 03	Battery is over-charged.	Return to repair center.
Buzzer beeps continuously and red LED is on.		The battery voltage is too high.	

1 39698 r9 29913l41.26 36.24

This inverter can be used in parallel with two different operation modes.

1. Parallel operation in single phase is with up to 6 units. The supported maximum output power for 7.2KW model is 43.2KW/43.2KVA.
2. Maximum six units work together to support three-phase equipment. Maximum four units support one phase.

When installing multiple units, please follow below chart.

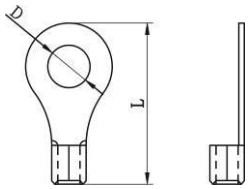


For proper air circulation to dissipate heat, allow a clearance of approx. 20 cm to the side and approx. 50 cm above and below the unit. Be sure to install each unit in the same level.

It's REQUIRED to connect battery for parallel operation.

The cable size of each inverter is shown as below:

1*1/0AWG	50	8.4	47	5 Nm



Be sure the length of all battery cables is the same. Otherwise, there will be voltage difference between inverter and battery to cause parallel inverters not working.

7.2KW	8 AWG	1.4~ 1.6 Nm

You need to connect the cables of each inverter together. Take the battery cables for example: You need to use a connector or bus-bar as a joint to connect the battery cables together, and then connect to the battery terminal. The cable size used from joint to battery should be X times cable size in the tables above. "X" indicates the number of inverters connected in parallel.

Regarding AC input and output, please also follow the same principle.

Please install the breaker at the battery and AC input side. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of battery or AC input.

Model	1 unit*
7.2KW	250A/70VDC

*If you want to use only one breaker at the battery side for the whole system, the rating of the breaker should be X times current of 1 unit. "X" indicates the number of inverters connected in parallel.

Model	2 units	3 units	4 units	5 units	6 units
7.2KW	120A/230VAC	180A/230VAC	240A/230VAC	300A/230VAC	360A/230VAC

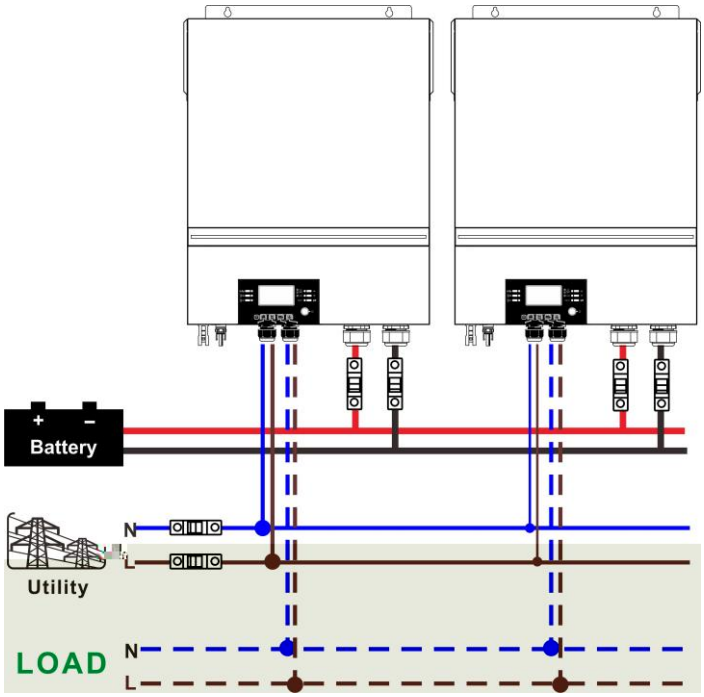
Also, you can use 60A breaker for 7.2KW with only 1 unit and install one breaker at its AC input in each inverter.

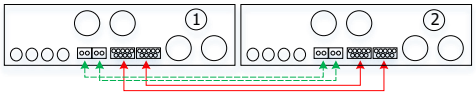
Regarding three-phase system, you can use 4-pole breaker directly and the rating of the breaker should be compatible with the phase current limitation from the phase with maximum units

Inverter parallel numbers	2	3	4	5	6
Battery Capacity	200AH	400AH	400AH	600AH	600AH

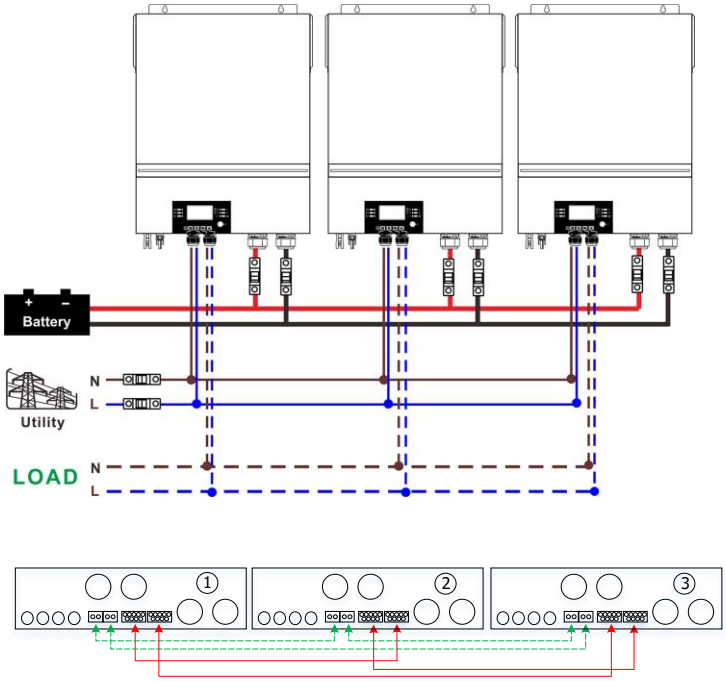
Be sure that all inverters will share the same battery bank. Otherwise, the inverters will transfer to fault mode.

Two inverters in parallel:

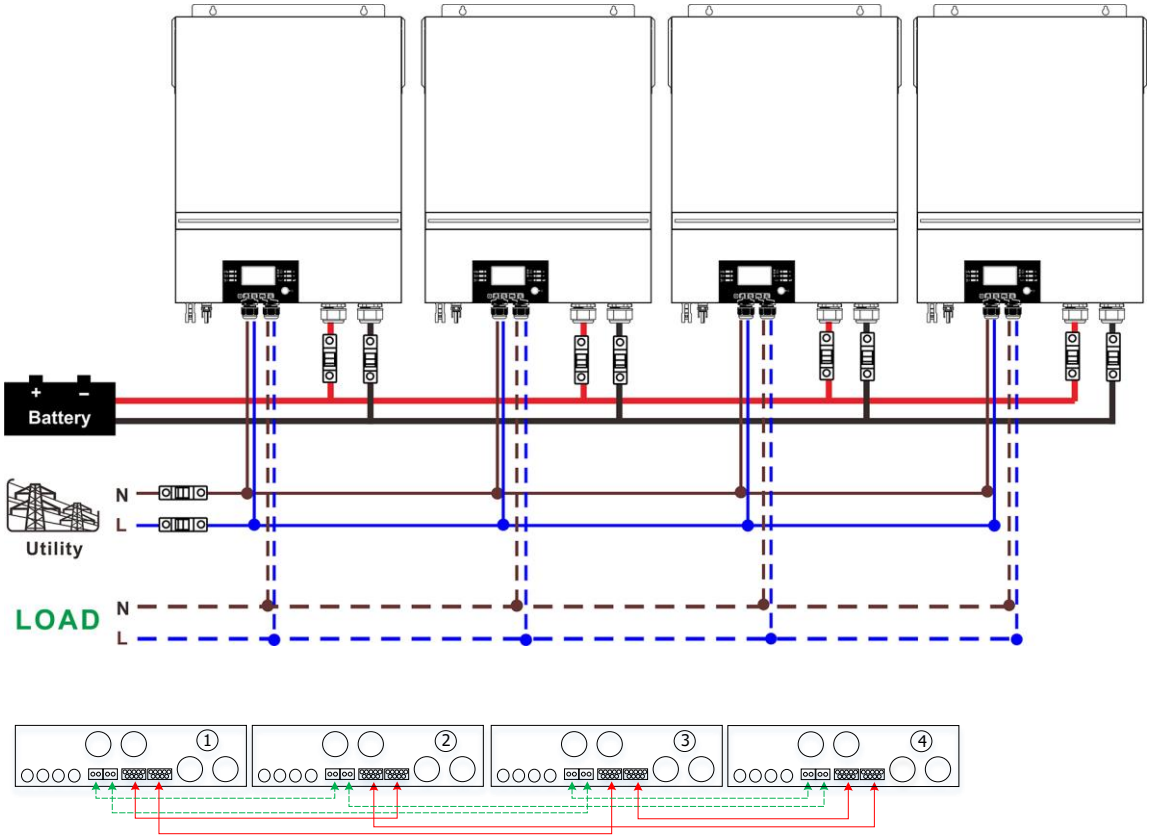




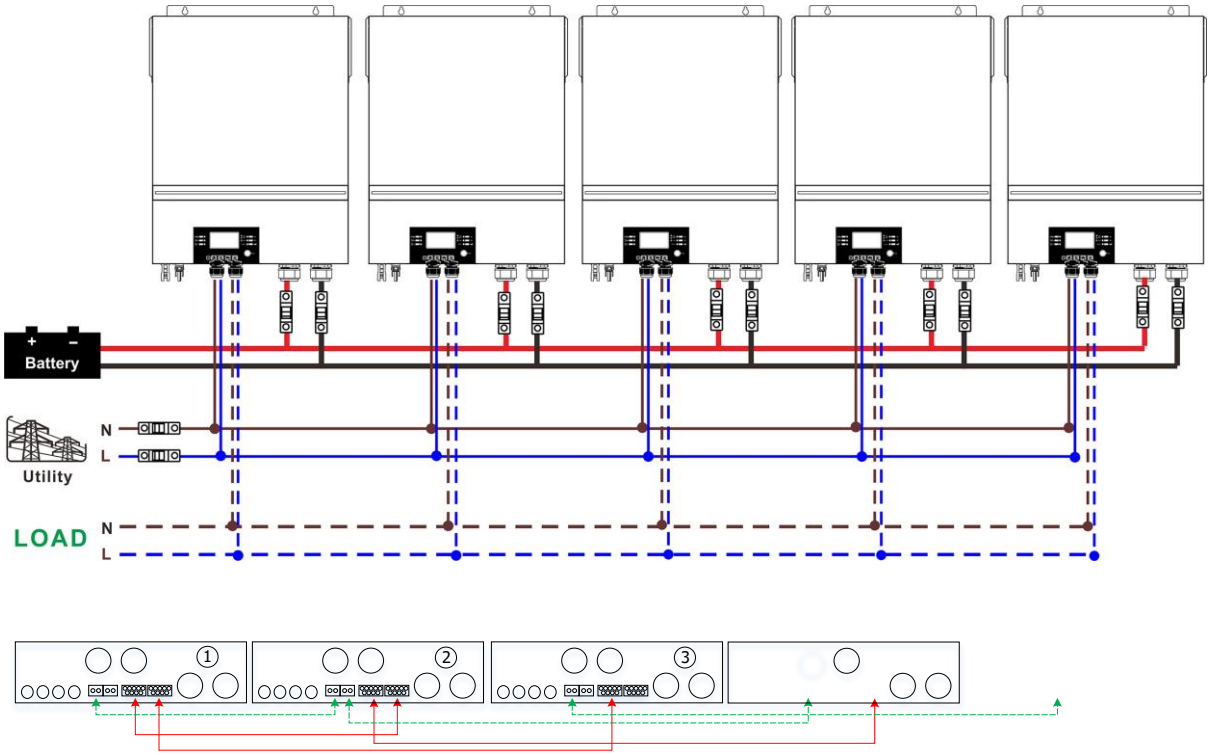
Three inverters in parallel:



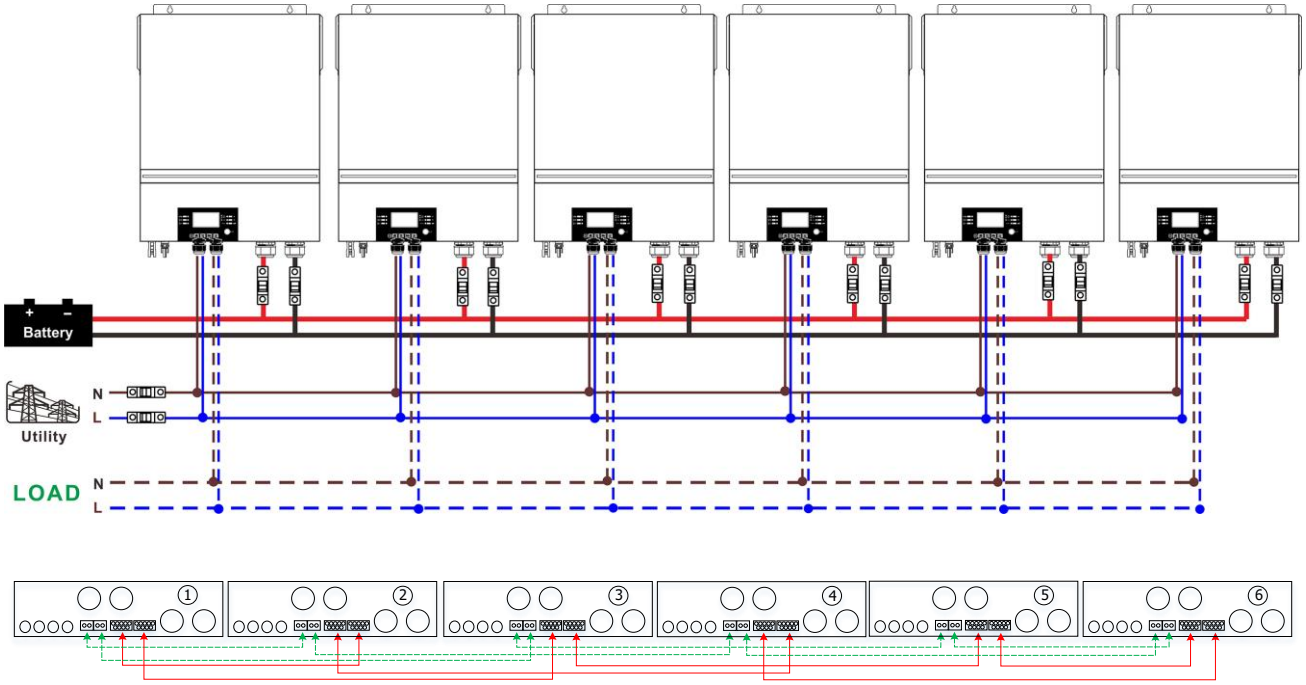
Four inverters in parallel:



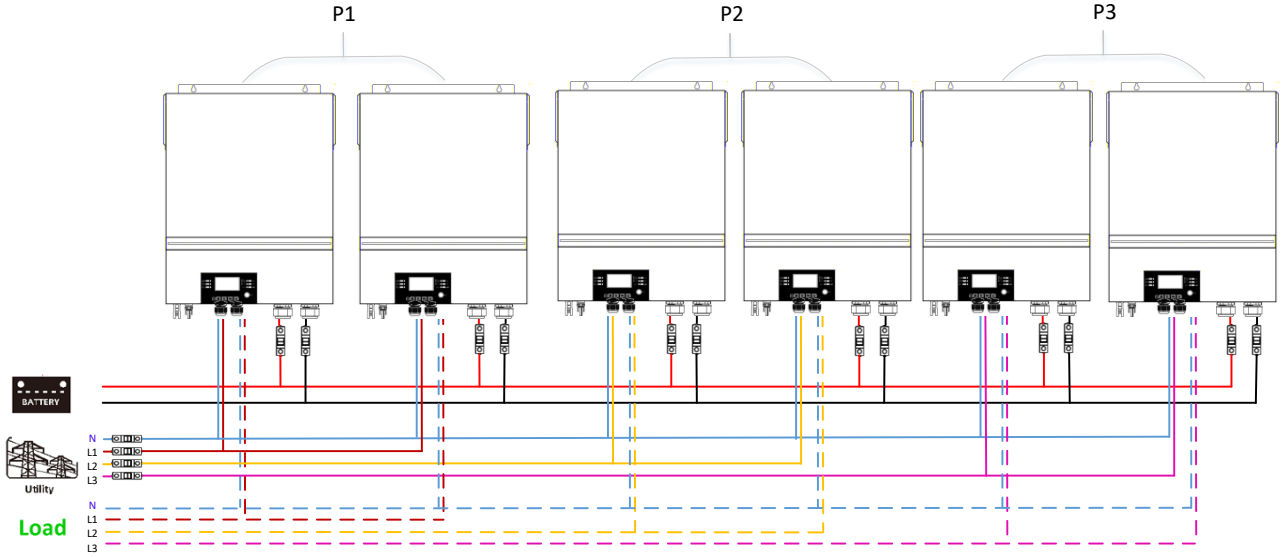
Five inverters in parallel:

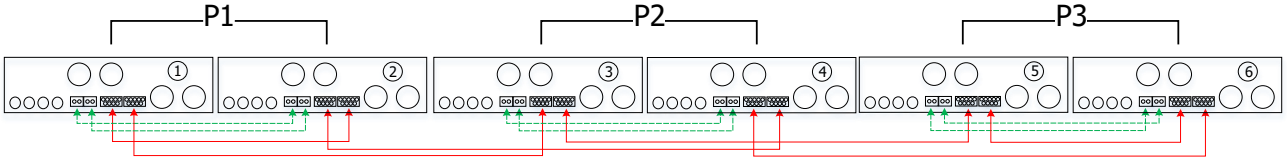


Six inverters in parallel:

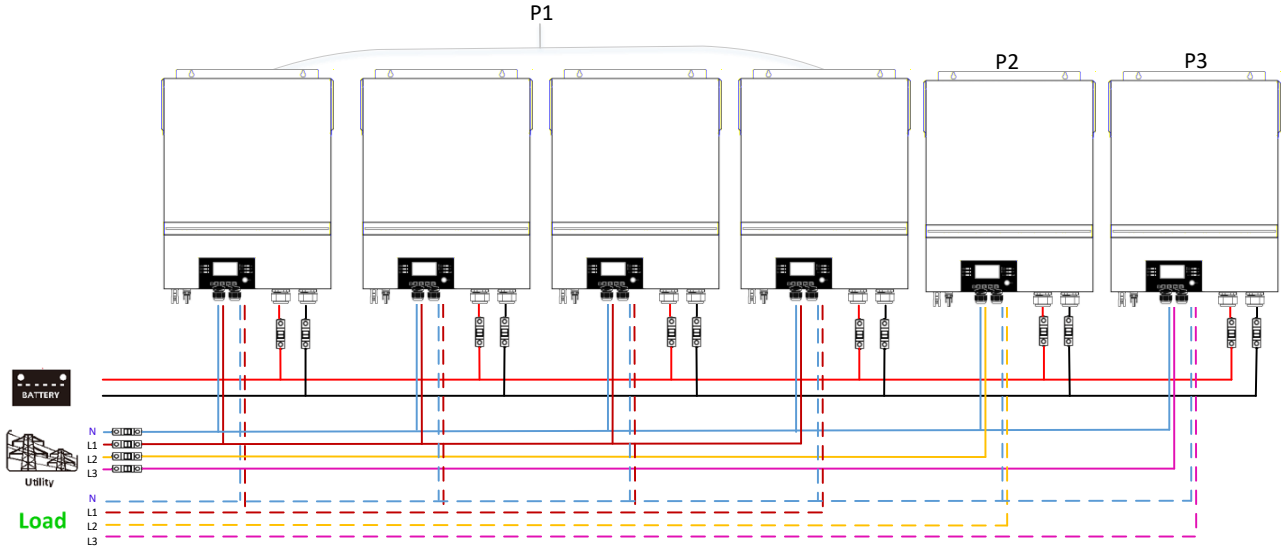


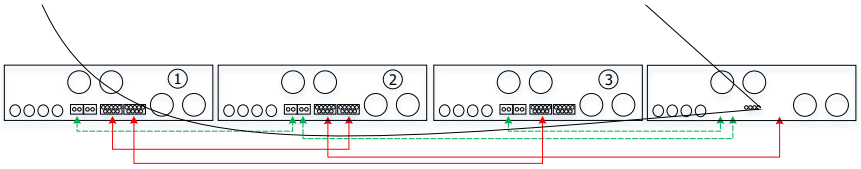
Two inverters in each phase:



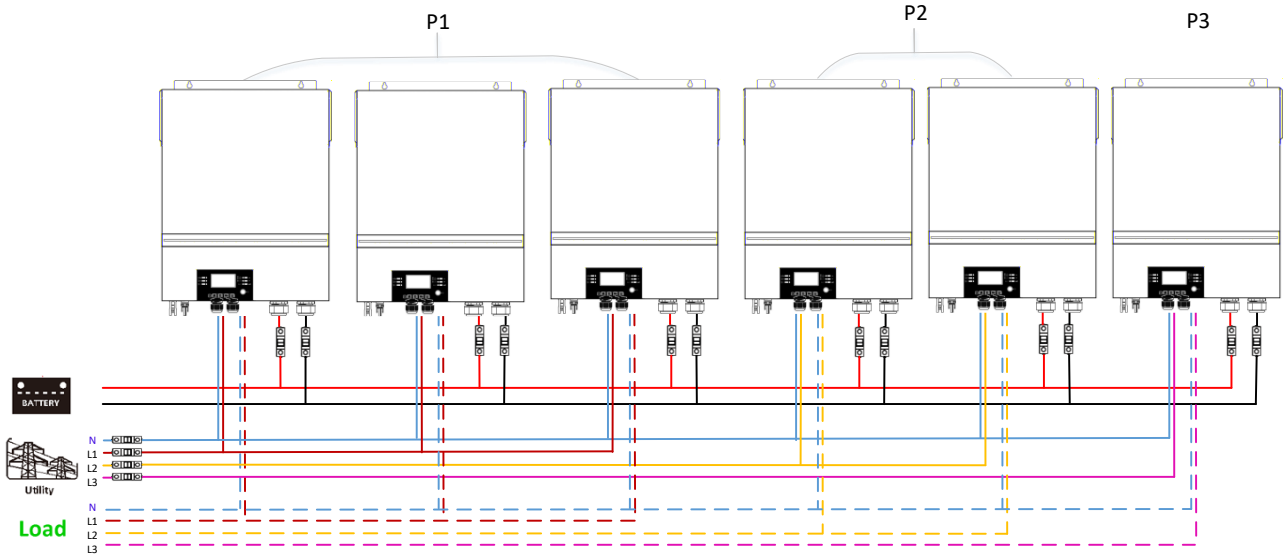


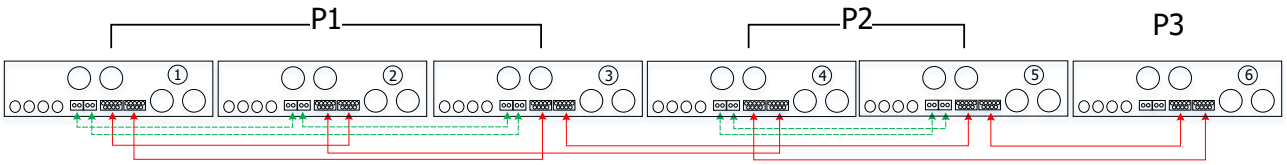
Four inverters in one phase and one inverter for the other two phases:



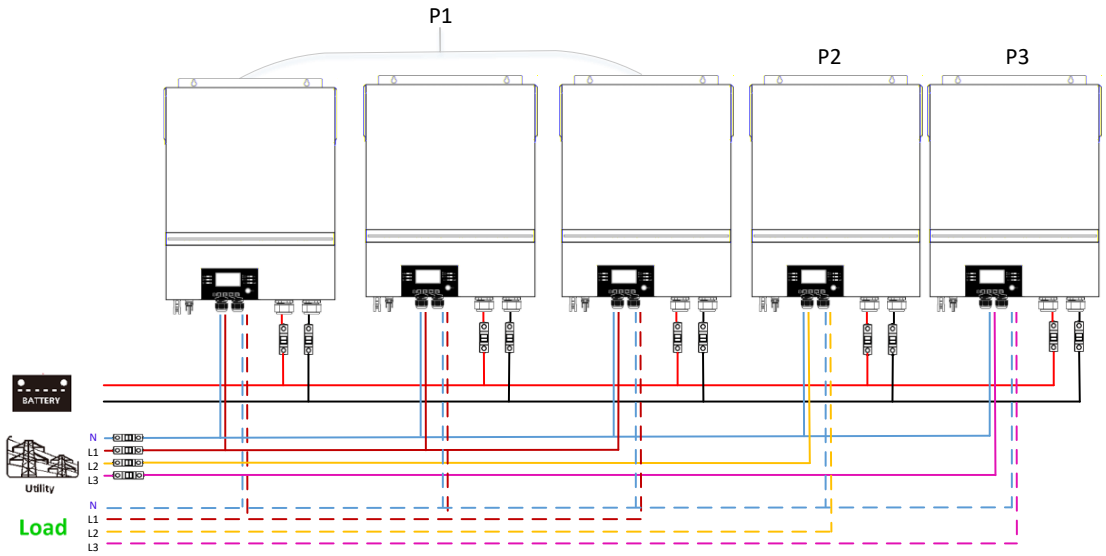


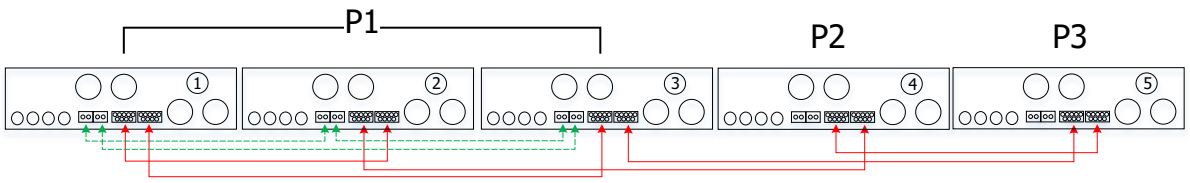
Three inverters in one phase, two inverters in second phase and one inverter for the third phase:



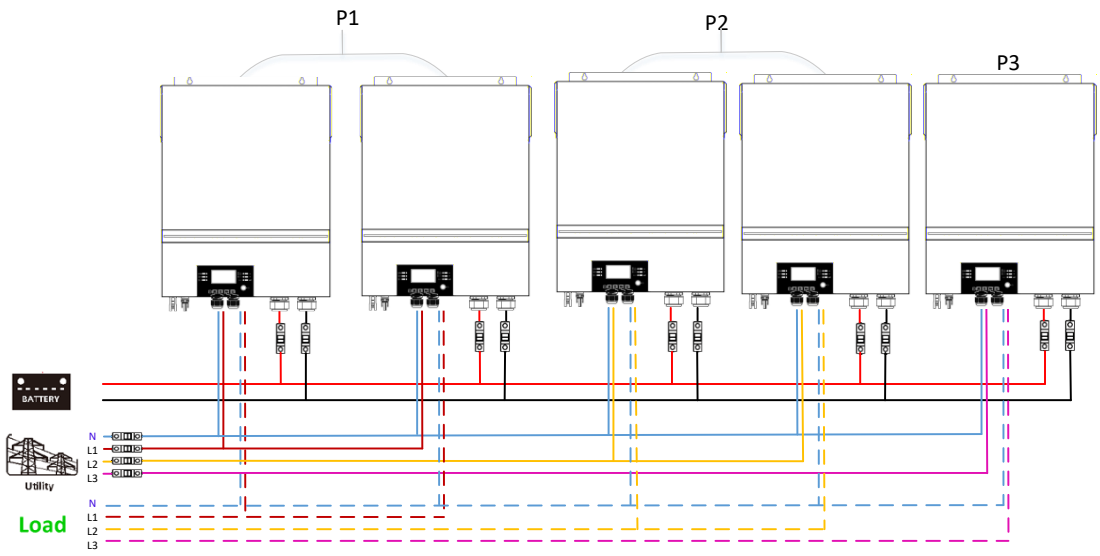


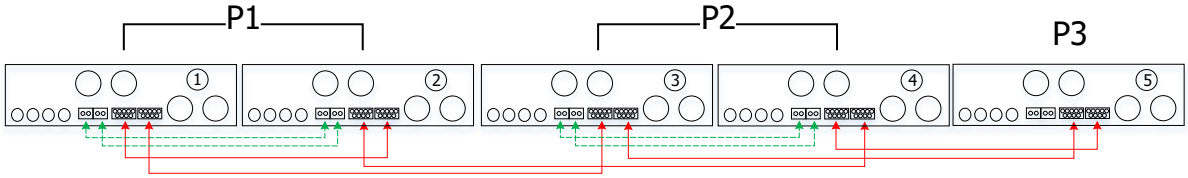
Three inverters in one phase and only one inverter for the remaining two phases:



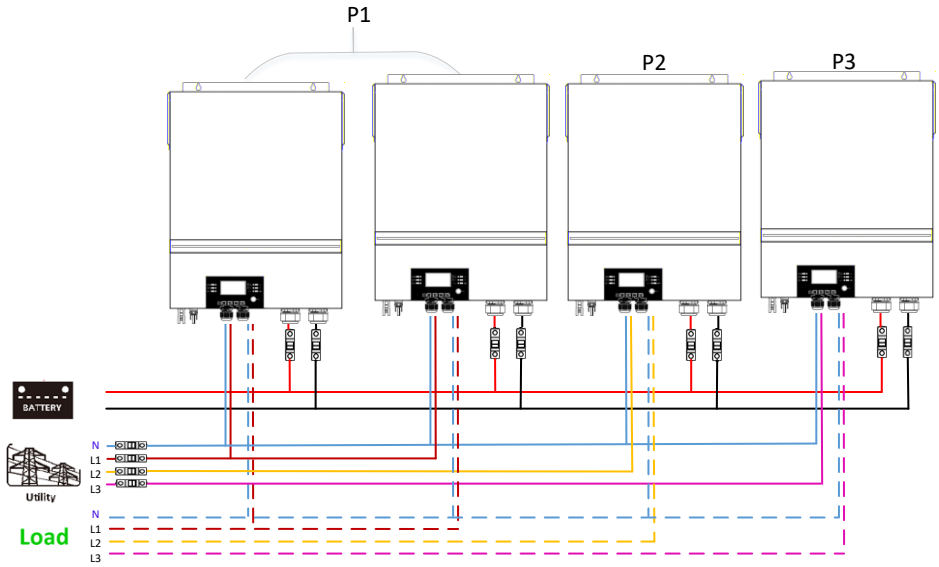


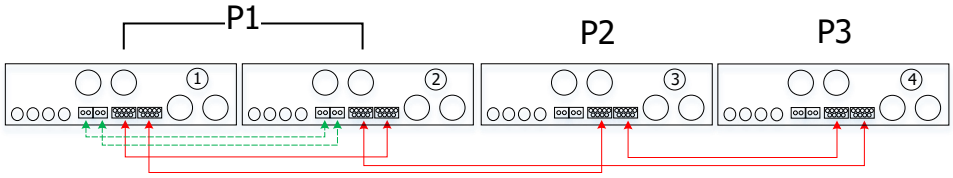
Two inverters in two phases and only one inverter for the remaining phase:



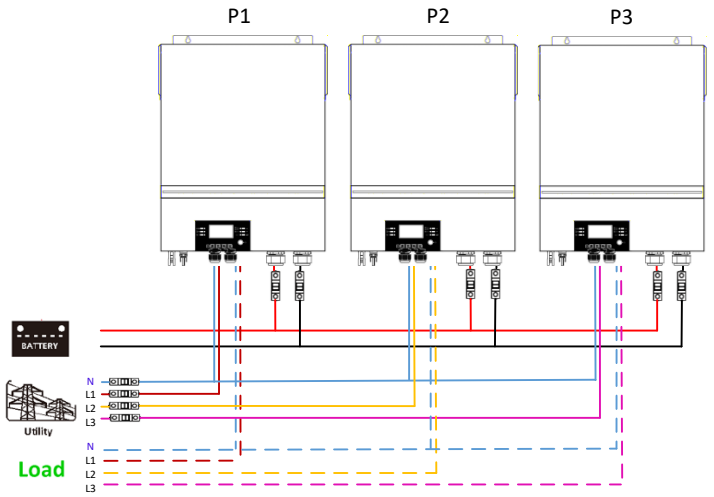


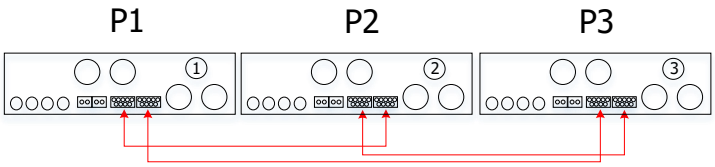
Two inverters in one phase and only one inverter for the remaining phases:





One inverter in each phase:





Do not connect the current sharing cable between the inverters which are in different phases. Otherwise, it may damage the inverters.

Please refer to user manual of single unit for PV Connection.

Each inverter should connect to PV modules separately.

28	AC output mode *This setting is able to set up only when the inverter is in standby mode. Be sure that on/off switch is in "OFF" status.	Single 28 SIG	When the unit is operated alone, please select "SIG" in program 28.
		Parallel 28 PAL	When the units are used in parallel for single phase application, please select "PAL" in program 28. Please refer to 5-1 for detailed information.
		L1 phase: 28 3P1	When the units are operated in 3-phase application, please choose "3PX" to define each inverter. It is required to have at least 3 inverters or maximum 9 inverters to support three-phase equipment. It's required to have at least one inverter in each phase or it's up to four inverters in one phase. Please refers to 5-2 for detailed information. Please select "3P1" in program 28 for the inverters connected to L1 phase, "3P2" in program 28 for the inverters connected to L2 phase and "3P3" in program 28 for the inverters connected to L3 phase. Be sure to connect share current cable to units which are on the same phase. Do NOT connect share current cable between units on different phases.
		L2 phase: 28 3P2	
		L3 phase: 28 3P3	

60	Power feedback protection	F60
71	Firmware version inconsistent	F71
72	Current sharing fault	F72
80	CAN fault	F80
81	Host loss	F81
82	Synchronization loss	F82
83	Battery voltage detected different	F83
84	AC input voltage and frequency detected different	F84
85	AC output current unbalance	F85
86	AC output mode setting is different	F86

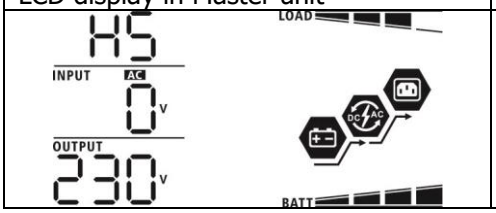
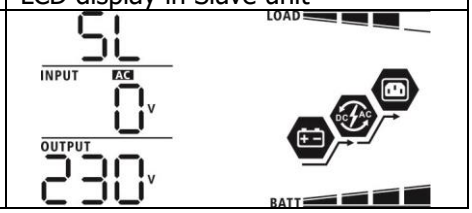
NE	Unidentified unit master or slave	NE
HS	Master unit	HS
SL	Slave unit	SL

Step 1: Check the following requirements before commissioning:

- Correct wire connection
- Ensure all breakers in Line wires of load side are open and each Neutral wires of each unit are connected together.

Step 2: Turn on each unit and set "PAL" in LCD setting program 28 of each unit. And then shut down all units. It's necessary to turn off switch when setting LCD program. Otherwise, the setting cannot be programmed.

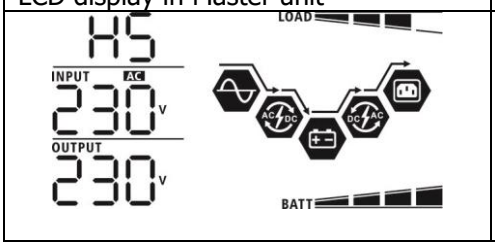
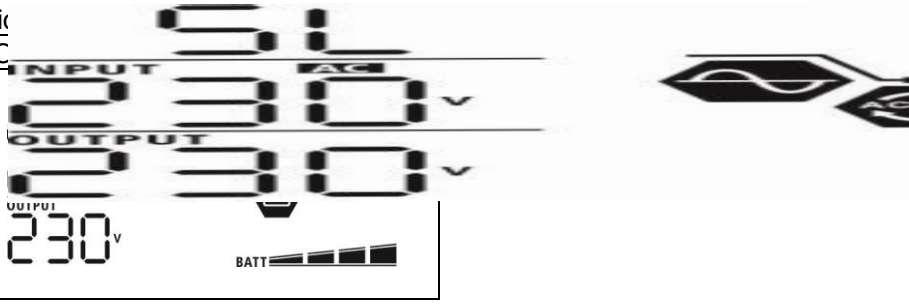
Step 3: Turn on each unit.

LCD display in Master unit	LCD display in Slave unit
	

Master and slave units are randomly defined.

Step 4: Switch on all AC breakers of Line wires in AC input. It's better to have all inverters connect to utility at the same time. If not, it will display fault 82 in following-order inverters. However, these inverters will

automatically restart. If detecting AC connectio

LCD display in Master unit	LC
	

Step 5: If there is no more fault alarm, the parallel system is completely installed.

Step 6: Please switch on all breakers of Line wires in load side. This system will start to provide power to the load.

Step 1: Check the following requirements before commissioning:

- Correct wire connection
- Ensure all breakers in Line wires of load side are open and each Neutral wires of each unit are connected together.

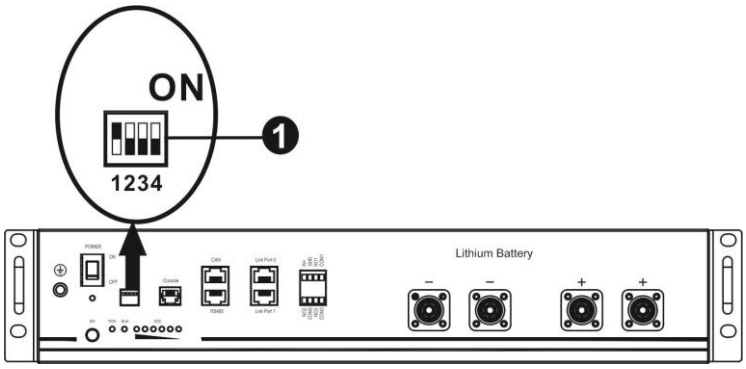
Step 2: Turn on all units and configure LCD program 28 as P1, P2 and P3 sequentially. And then shut down all units.

Code				Solution

If connecting to lithium battery, it is recommended to purchase a custom-made RJ45 communication cable. Please check with your dealer or integrator for details.

This custom-made RJ45 communication cable delivers information and signal between lithium battery and the inverter. These information are listed below:

- Re-configure charging voltage, charging current and battery discharge cut-off voltage according to the lithium battery parameters.
- Have the inverter start or stop charging according to the status of lithium battery.



①Dip Switch: There are 4 Dip Switches that sets different baud rate and battery group address. If switch position is turned to the "OFF" position, it means "0". If switch position is turned to the "ON" position, it means "1".

Dip 1 is "ON" to represent the baud rate 9600.
Dip 2, 3 and 4 are reserved for battery group address.
Dip switch 2, 3 and 4 on master battery (first battery) are to set up or change the group address.

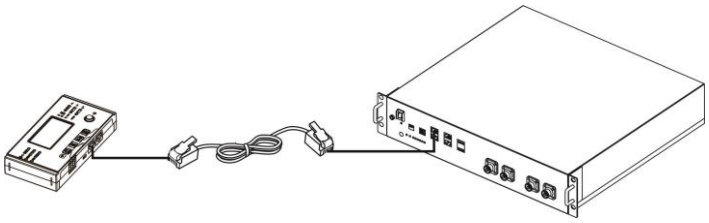
"1" is upper position and "0" is bottom position.

Dip 1	Dip 2	Dip 3	Dip 4	Group address
1: RS485 baud rate=9600	0	0	0	Single group only. It's necessary to set up master battery with this setting and slave batteries are unrestricted.
	1	0	0	Multiple group condition. It's necessary to set up master battery on the first group with this setting and slave batteries are unrestricted.
	0	1	0	Multiple group condition. It's necessary to set up master battery on the second group with this setting and slave batteries are unrestricted.
	1	1	0	Multiple group condition. It's necessary to set up master battery on the third group with this setting and slave batteries are unrestricted.
	0	0	1	Multiple group condition. It's necessary to set up master battery on the fourth group with this setting and slave batteries are unrestricted.
	1	0	1	Multiple group condition. It's necessary to set up master battery on the fifth group with this setting and slave batteries are unrestricted.

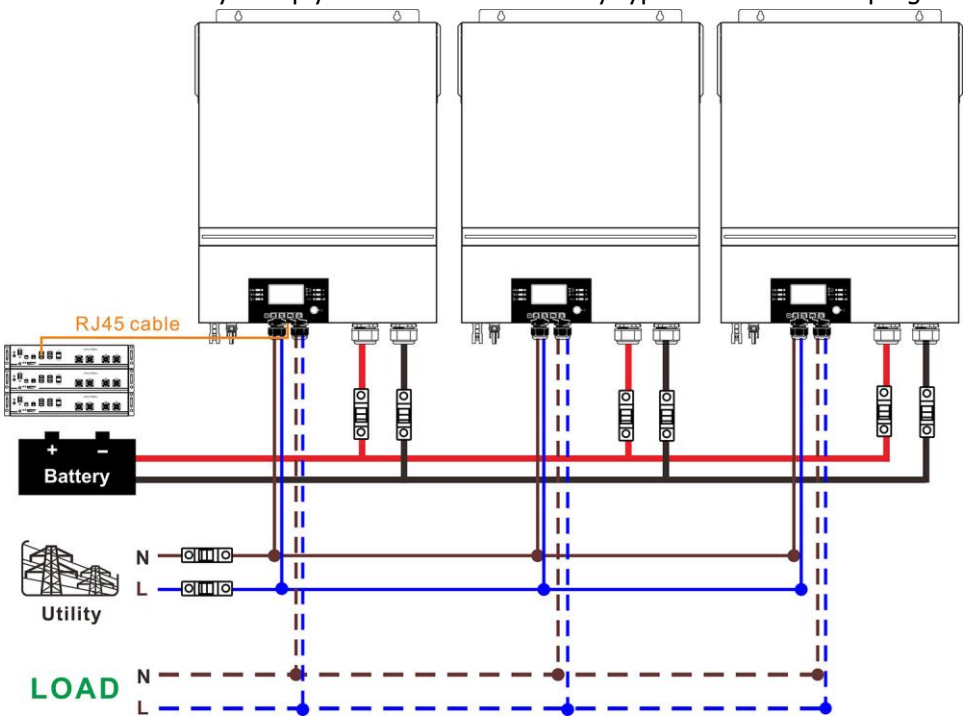
The maximum groups of lithium battery is 5 and for maximum number for each group, please check with battery manufacturer.

After configuration, please install LCD panel with inverter and Lithium battery with the following steps.

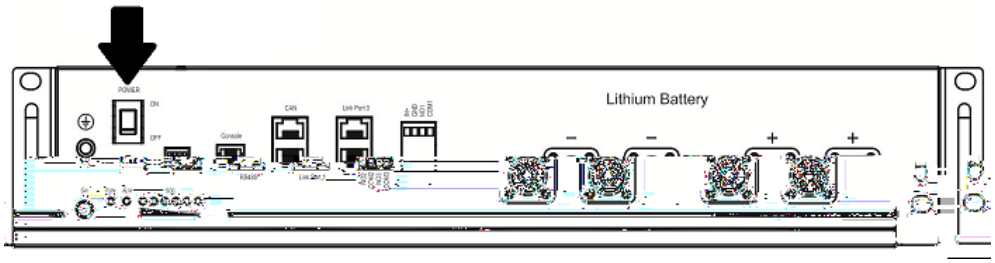
Step 1. Use custom-made RJ45 cable to connect inverter and Lithium battery.



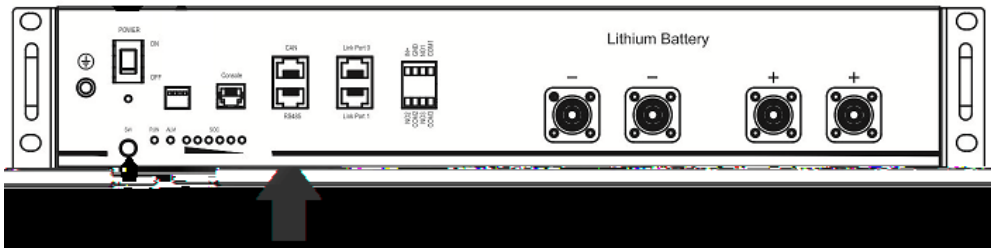
1. Only support common battery installation.
2. Use custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set this inverter battery type to "PYL" in LCD program 5. Others should be "USE".



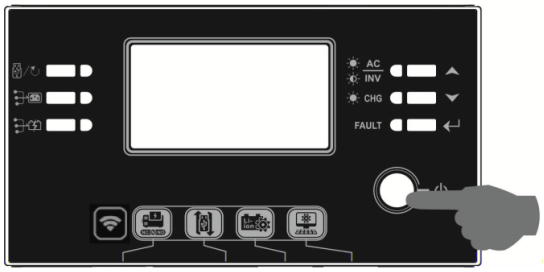
Step 2. Switch on Lithium battery.



Step 3. Press more than three seconds to start Lithium battery, power output ready.



Step 4. Turn on the inverter.

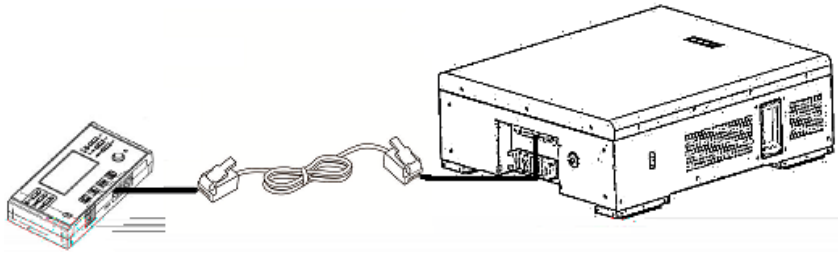


Step 5. Be sure to select battery type as "PYL" in LCD program 5.

If communication between the inverter and battery is successful, the battery icon on LCD display will flash. Generally speaking, it will take longer than 1 minute to establish communication.

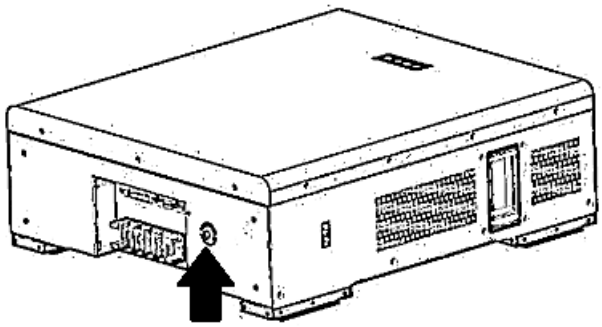
This function is to activate lithium battery automatically while commissioning. After battery wiring and commissioning is successfully, if battery is not detected, the inverter will automatically activate battery if the inverter is powered on.

Step 1. Use a custom-made RJ45 cable to connect inverter and Lithium battery.

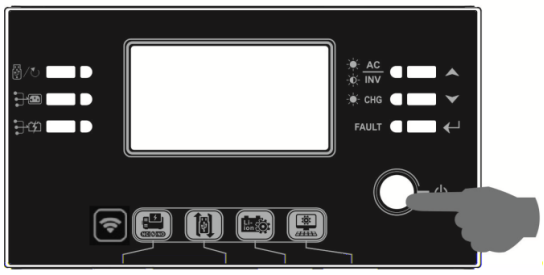


1. Only support common battery installation.
2. Use one custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set battery type of this inverter to "WEC" in LCD program 5. The remaining inverters are set as "USE".

Step 2. Switch on Lithium battery.



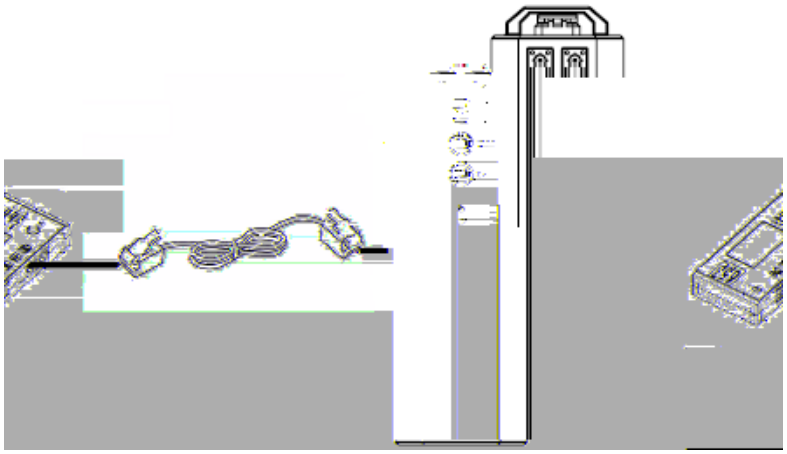
Step 3. Turn on the inverter.



Step 4. Be sure to select battery type as "WEC" in LCD program 5.

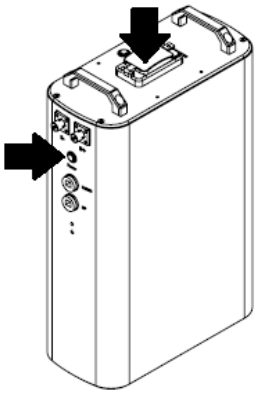
If communication between the inverter and battery is successful, the battery icon on LCD display will "flash". Generally speaking, it will take longer than 1 minute to establish communication.

Step 1. Use a custom-made RJ45 cable to connect inverter and Lithium battery.

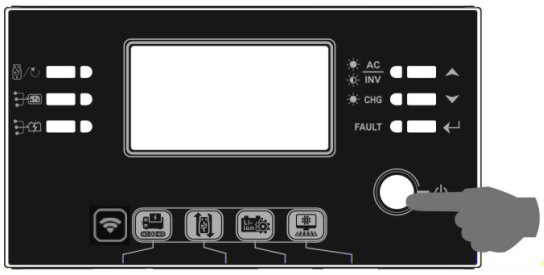


1. Only support common battery installation.
2. Use one custom-made RJ45 cable to connect any inverter (no need to connect to a specific inverter) and Lithium battery. Simply set battery type of this inverter to "SOL" in LCD program 5. The remaining inverters are set as "USE".

Step 2. Open DC isolator and switch on Lithium battery.



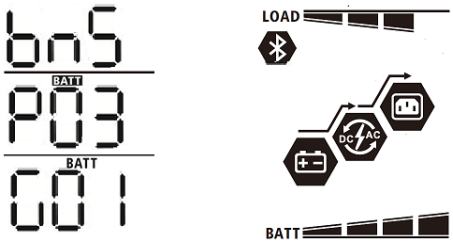
Step 3. Turn on the inverter.



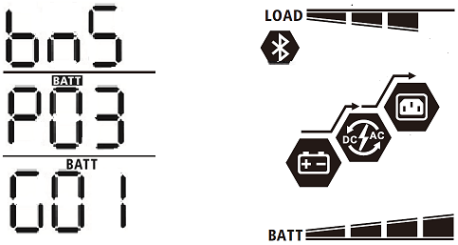
Step 4. Be sure to select battery type as "SOL" in LCD program 5.

If communication between the inverter and battery is successful, the battery icon on LCD display will "flash". Generally speaking, it will take longer than 1 minute to establish communication.

Press "▲" or "▼" button to switch LCD display information. It will show battery pack and battery group number before "Main CPU version checking" as shown below.

Selectable information	LCD display
Battery pack numbers & Battery group numbers	Battery pack numbers = 3, battery group numbers = 1 

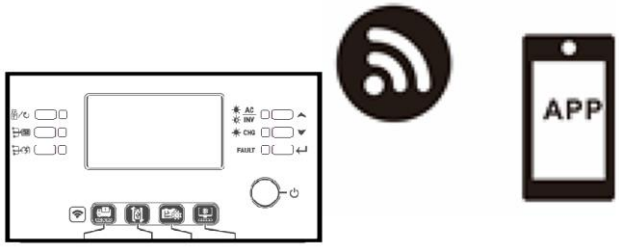
Related information code will be displayed on LCD screen. Please check inverter LCD screen for the operation.

Code	Description	Action
60	If battery status is not allowed to charge and discharge after the communication between the inverter and battery is successful, it will show code 60 to stop charging and discharging battery.	
61	Communication lost (only available when the battery type is setting as "Pylontech Battery", "WECO Battery" or "Soltaro Battery".) ● After battery is connected, communication signal is not detected for 3 minutes, buzzer will beep. After 10 minutes, inverter will stop charging and discharging to lithium battery. ● Communication lost occurs after the inverter and battery is connected successfully, buzzer beeps immediately.	
62	Battery number is changed. It probably is because of communication lost between battery packs.	Press "UP" or "DOWN" key to switch LCD display until below screen shows. It will have battery number re-checked and 62 warning code will be clear. 
69	If battery status is not allowed to charge after the communication between the inverter and battery is successful, it will show code 69 to stop charging battery.	
70	If battery status must to be charged after the communication between the inverter and battery is successful, it will show code 70 to charge battery.	
71	If battery status is not allowed to discharge after the communication between the inverter and battery is successful, it will show code 71 to stop discharging battery.	

Wi-Fi module can enable wireless communication between off-grid inverters and monitoring platform. Users have complete and remote monitoring and controlling experience for inverters when combining Wi-Fi module with WatchPower APP, available for both iOS and Android based device. All data loggers and parameters are saved in iCloud.

The major functions of this APP:

- Delivers device status during normal operation.
- Allows to configure device setting after installation.
- Notifies users when a warning or alarm occurs.
- Allows users to query inverter history data.



iOS system supports iOS 9.0 and above

Android system supports Android 5.0 and above

Please scan the following QR code with your smart phone and download WatchPower App.

Android system

iOS system

Or you may find "WatchPower" app from the Apple® Store or "WatchPower Wi-Fi" in Google® Play Store.

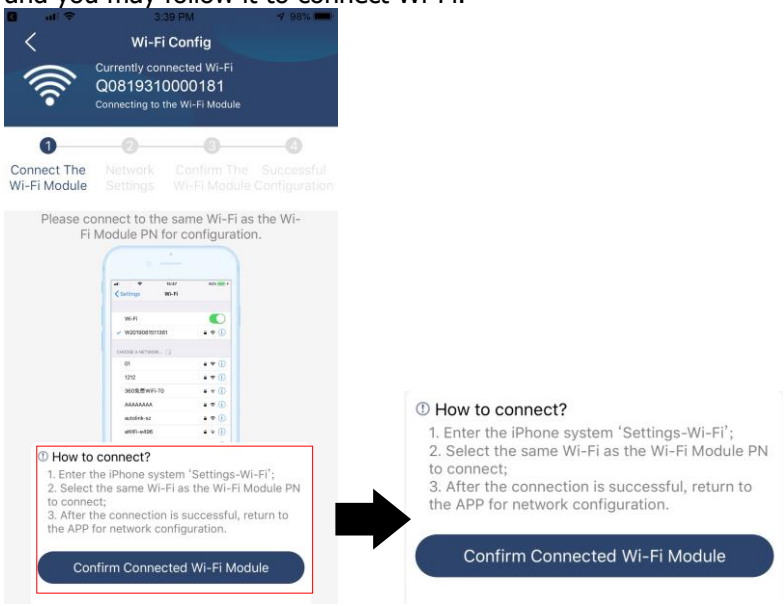
Step 1: Registration at first time

After the installation, please tap the shortcut icon to access this APP on your mobile screen. In the screen, tap "Register" to access "User Registration" page. Fill in all required information and scan the remote box PN by tapping icon. Or you can simply enter PN directly. Then, tap "Register" button.

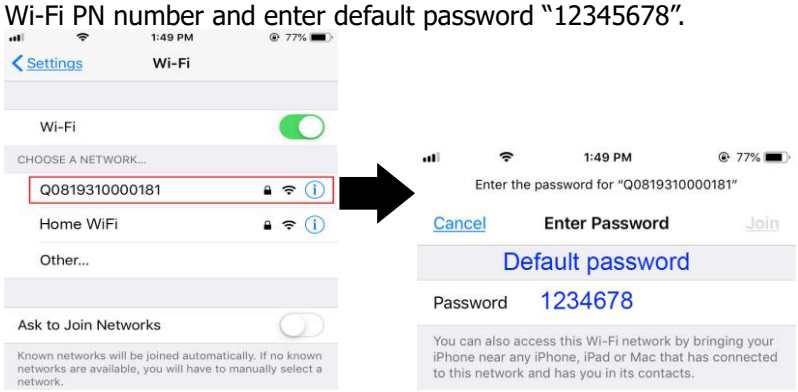
Then, a "Registration success" window will pop up. Tap "Go now" to continue setting local Wi-Fi network connection.

Step 2: Local Wi-Fi Module Configuration

Now, you are in "Wi-Fi Config" page. There are detailed setup procedure listed in "How to connect?" section and you may follow it to connect Wi-Fi.



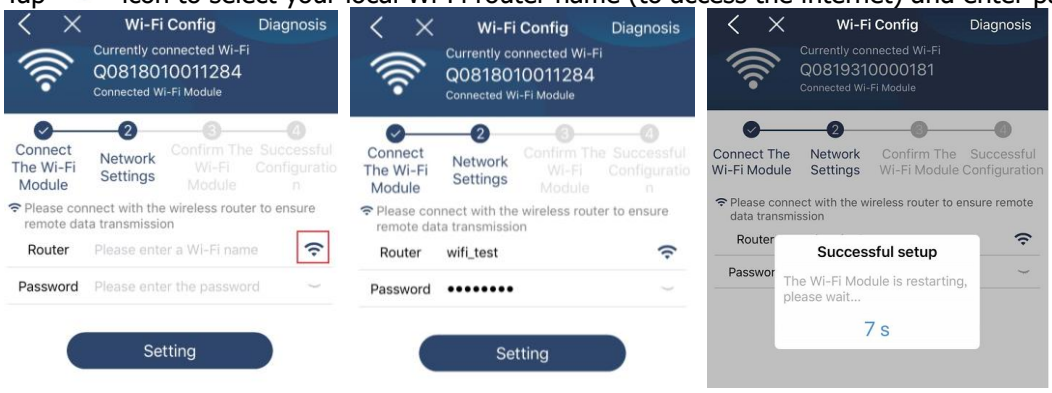
Enter the "Settings→Wi-Fi" and select connected Wi-Fi name. The connected Wi-Fi name is the same to your Wi-Fi PN number and enter default password "12345678".



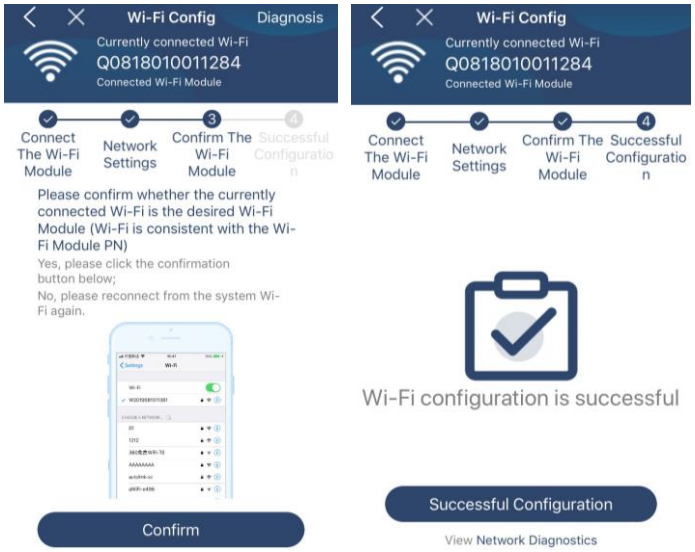
Then, return to WatchPower APP and tap " Confirm Connected Wi-Fi Module " button when Wi-Fi module is connected successfully.

Step 3: Wi-Fi Network settings

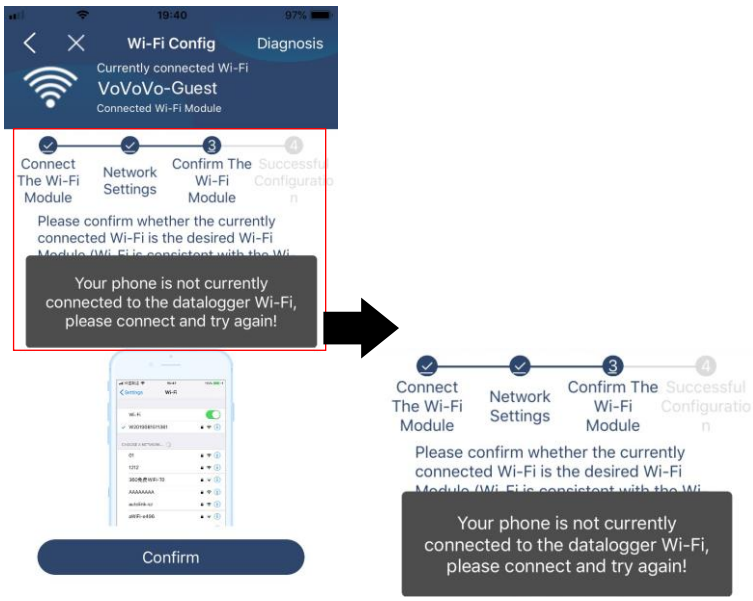
Tap icon to select your local Wi-Fi router name (to access the internet) and enter password.



Step 4: Tap "Confirm" to complete the Wi-Fi configuration between the Wi-Fi module and the Internet.

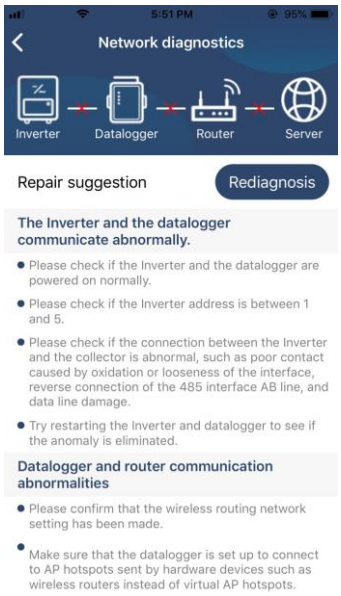


If the connection fails, please repeat Step 2 and 3.

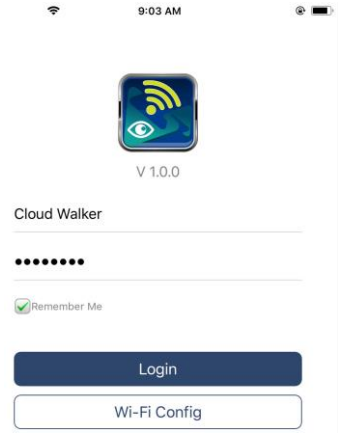


Diagnose Function

If the module is not monitoring properly, please tap "Diagnosis" on the top right corner of the screen for further details. It will show repair suggestion. Please follow it to fix the problem. Then, repeat the steps in the chapter 4.2 to re-set network setting. After all setting, tap "Rediagnosis" to re-connect again.

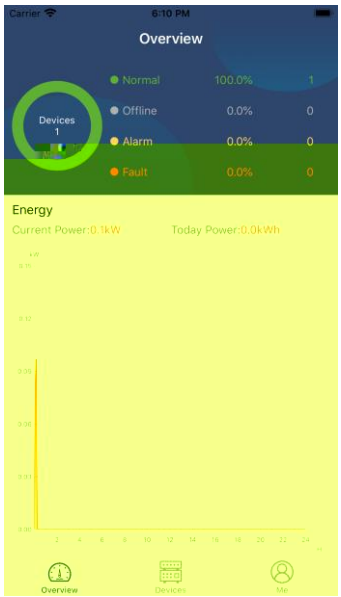


After finishing the registration and local Wi-Fi configuration, enter registered name and password to login.
Note: Tick "Remember Me" for your login convenience afterwards.



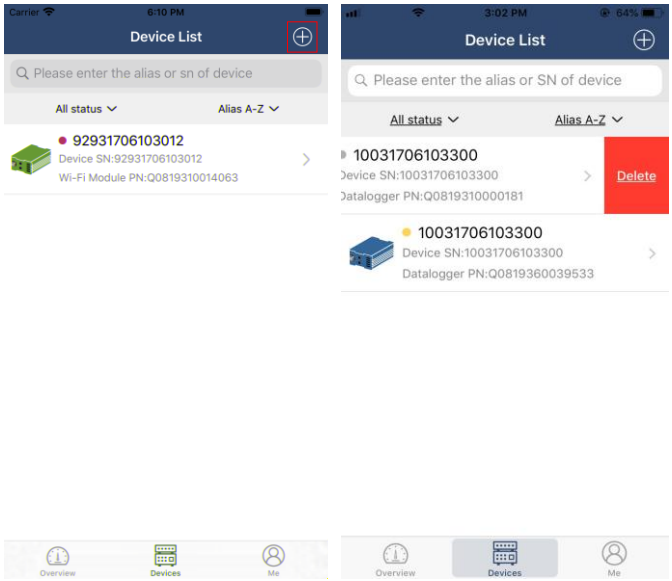
Overview

After login is successfully, you can access "Overview" page to have overview of your monitoring devices, including overall operation situation and Energy information for Current power and Today power as below diagram.

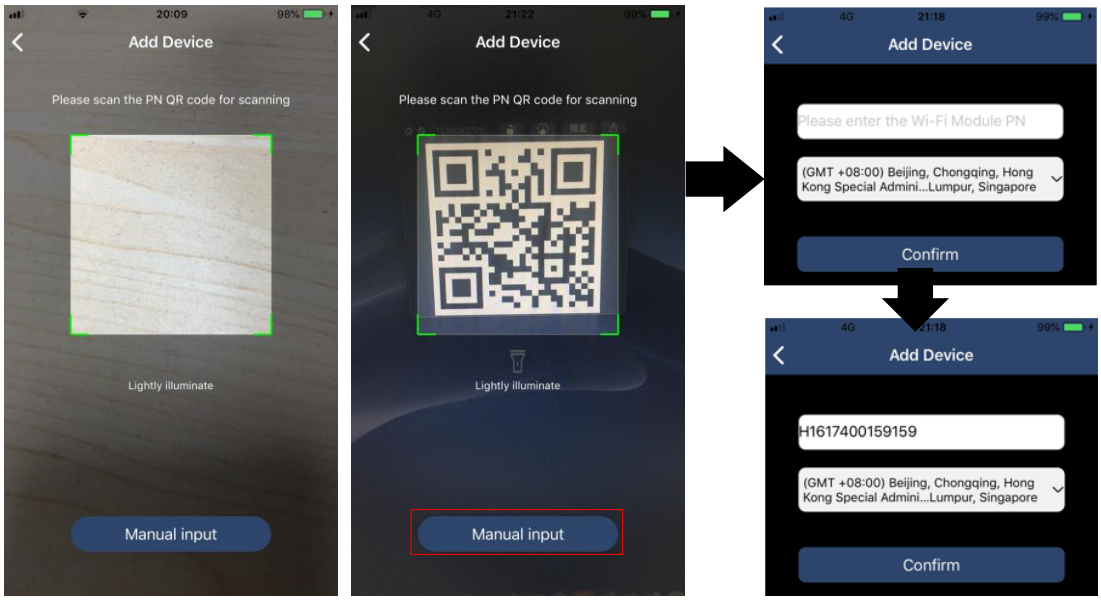


Devices

Tap the icon (located on the bottom) to enter Device List page. You can review all devices here by adding or deleting Wi-Fi Module in this page.



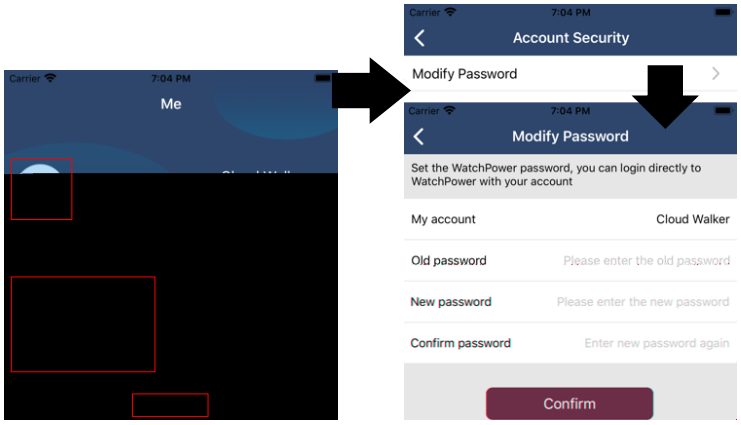
Tap icon on the top right corner and enter part number by scanning bar code to add Wi-Fi module. This part number is printed on the Wi-Fi module's surface, or manually enter it. Tap "Confirm" to add Wi-Fi module in the Device list.



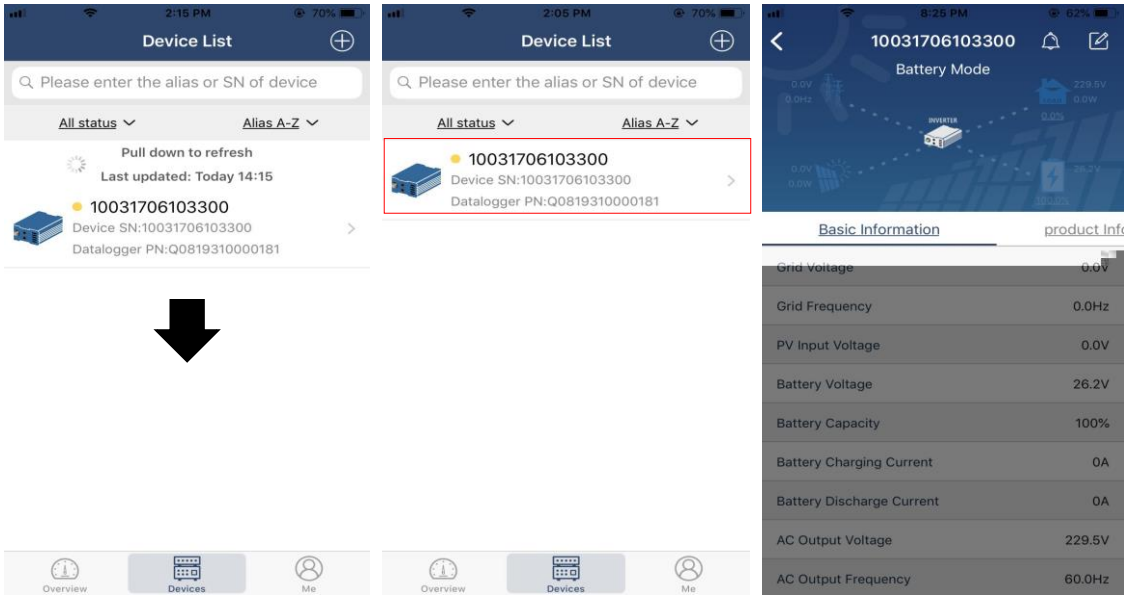
For more information about Device List, please refer to the section 2.4.

ME

In ME page, users can modify "My information", including【User's Photo】,【Account security】, 【Modify password】,【Clear cache】,and【Log-out】, shown as below diagrams.



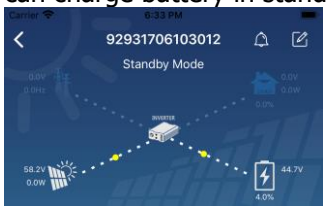
In Device List page, you can pull down to refresh the device information and then tap any device you want to check up for its real-time status and related information as well as to change parameter settings. Please refer to the parameter setting list.



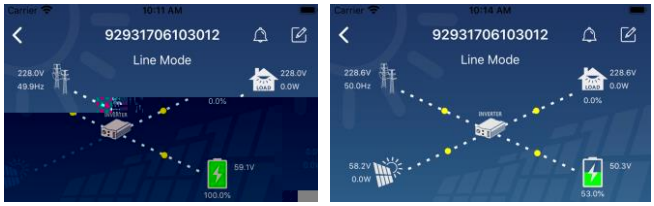
Device Mode

On the top of screen, there is a dynamic power flow chart to show live operation. It contains five icons to present PV power, inverter, load, utility and battery. Based on your inverter model status, there will be 【Standby Mode】,【Line Mode】,【Battery Mode】.

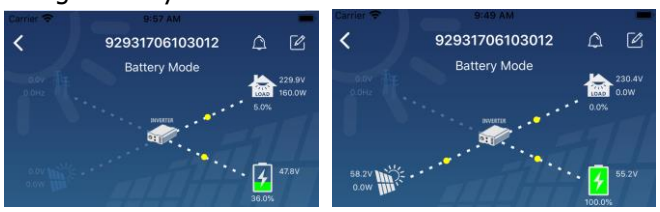
【 】Inverter will not power the load until "ON" switch is pressed. Qualified utility or PV source can charge battery in standby mode.



【 】Inverter will power the load from the utility with or without PV charging. Qualified utility or PV source can charge battery.

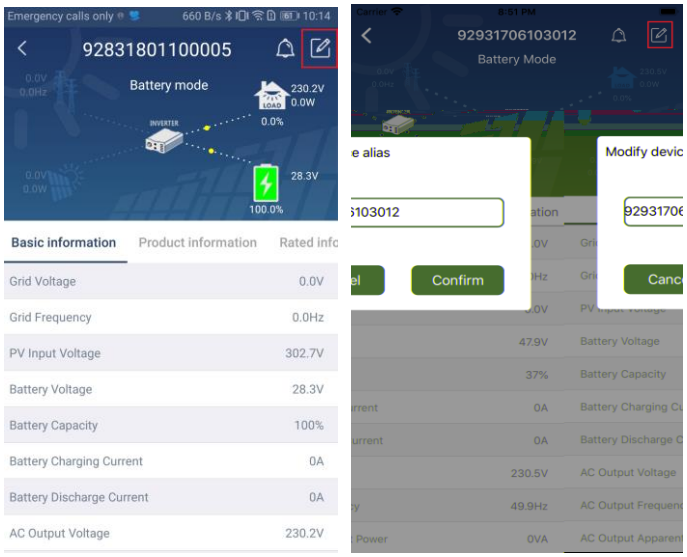


【 】Inverter will power the load from the batter with or without PV charging. Only PV source can charge battery.



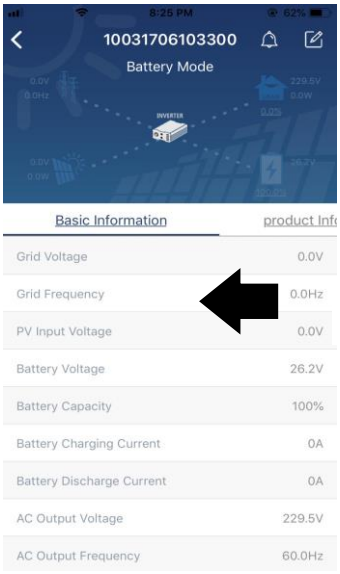
Device Alarm and Name Modification

In this page, tap the icon on the top right corner to enter the device alarm page. Then, you can review alarm history and detailed information. Tap the icon on the top right corner, a blank input box will pop out. Then, you can edit the name for your device and tap "Confirm" to complete name modification.



Device Information Data

Users can check up 【Basic Information】,【Product Information】,【Rated information】,【History】, and 【Wi-Fi Module Information】by swiping left.



Swipe left

【 】displays basic information of the inverter, including AC voltage, AC frequency, PV input voltage, Battery voltage, Battery capacity, Charging current, Output voltage, Output frequency, Output apparent power, Output active power and Load percent. Please slide up to see more basic information.

【 】 displays Model type (Inverter type), Main CPU version, Bluetooth CPU version and secondary CPU version.

【 】displays information of Nominal AC voltage, Nominal AC current, Rated battery voltage, Nominal output voltage, Nominal output frequency, Nominal output current, Nominal output apparent power and Nominal output active power. Please slide up to see more rated information.

【 】displays the record of unit information and setting timely.

【 】displays of Wi-Fi Module PN, status and firmware version.

Parameter Setting

This page is to activate some features and set up parameters for inverters. Please be noted that the listing in "Parameter Setting" page in below diagram may differ from the models of monitored inverter. Here will briefly highlight some of it,【Output Setting】,【Battery Parameter Setting】,【Enable/ Disable items】,【Restore to the defaults】to illustrate.

There are three ways to modify setting and they vary according to each parameter.

a) Listing options to change values by tapping one of it.

b) Activate/Shut down functions by clicking "Enable" or "Disable" button.

c) Changing values by clicking arrows or entering the numbers directly in the column.

Each function setting is saved by clicking "Set" button.

Please refer to below parameter setting list for an overall description and be noted that the available parameters may vary depending on different models. Please always see the original product manual for detailed setting instructions.

Item		Description
Output setting	Output source priority	To configure load power source priority.
	AC input range	When selecting "UPS", it's allowed to connect personal computer. Please check product manual for details.
		When selecting "Appliance", it's allowed to connect home appliances.
	Output voltage	To set output voltage.
	Output frequency	To set output frequency.
Battery parameter setting	Battery type:	To set connected battery type.
	Battery cut-off voltage	To set the battery stop discharging voltage. Please see product manual for the recommended voltage range based on connected battery type.
	Back to grid voltage	When "SBU" or "SOL" is set as output source priority and battery voltage is lower than this setting voltage, unit will transfer to line mode and the grid will provide power to load.
	Back to discharge voltage	When "SBU" or "SOL" is set as output source priority and battery voltage is higher than this setting voltage, battery will be allowed to

		discharge.
	Charger source priority:	To configure charger source priority.
	Max. charging current	It's to set up battery charging parameters. The selectable values in different inverter model may vary. Please see product manual for the details.
	Max. AC charging current:	
	Float charging voltage	
	Bulk charging voltage	It's to set up battery charging parameters. The selectable values in different inverter model may vary. Please see product manual for the details.
	Battery equalization	Enable or disable battery equalization function.
	Real-time Activate Battery Equalization	It's real-time action to activate battery equalization.
	Equalized Time Out	To set up the duration time for battery equalization.
	Equalized Time	To set up the extended time to continue battery equalization.
	Equalization Period	To set up the frequency for battery equalization.
	Equalization Voltage	To set up the battery equalization voltage.
Enable/Disable Functions	LCD Auto-return to Main screen	If enable, LCD screen will return to its main screen after one minute automatically.
	Fault Code Record	If enabled, fault code will be recorded in the inverter when any fault happens.
	Backlight	If disabled, LCD backlight will be off when panel button is not operated for 1 minute.
	Bypass Function	If enabled, unit will transfer to line mode when overload happened in battery mode.
	Beeps while primary source interrupt	If enabled, buzzer will alarm when primary source is abnormal.
	Over Temperature Auto Restart	If disabled, the unit won't be restarted after over-temperature fault is solved.
	Overload Auto Restart	If disabled, the unit won't be restarted after overload occurs.
	Buzzer	If disabled, buzzer won't be on when alarm/fault occurred.
RGB LED Setting	Enable/disable	Turn on or off RGB LEDs
	Brightness	Adjust the lighting brightness
	Speed	Adjust the lighting speed
	Effects	Change the light effects
	Color selection	Adjust color combination to show energy source an battery status
Restore to the default	This function is to restore all settings back to default settings.	