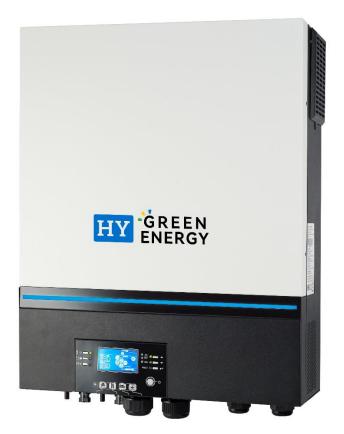
User Manual



7.2KW SOLAR INVERTER / CHARGER

Table of Contents

ABOUT THIS MANUAL	1
Purpose Scope	
SAFETY INSTRUCTIONS	
Features	
Basic System Architecture	
Product Overview	
SPECIFICATIONS	5
Table 1 Line Mode Specifications	5
Table 2 Inverter Mode Specifications	
Table 3 Charge Mode Specifications	7
Table 4 General Specifications	8
INSTALLATION	9
Unpacking and Inspection	
Preparation	
Mounting the Unit	
Battery Connection	
AC Input/Output Connection PV Connection	
Final Assembly	
Wiring system of inverter	
Remote Display Panel Installation	
Communication Connection	
Dry Contact Signal	
BMS Communication	
OPERATION	23
Power ON/OFF	23
Inverter Turn-on	
Operation and Display Panel	
LCD Display Icons	
LCD Display	
Operating Mode Description	
Operation Modes	
Faults Reference Code	
Warning Indicator	
BATTERY EQUALIZATION	
TROUBLE SHOOTING	53
Appendix I: Parallel function	54
Appendix II: BMS Communication Installation	68
Appendix III: The Wi-Fi Operation Guide in Remote Panel	74

ABOUT THIS MANUAL

Purpose

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.

Scope

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

SAFETY INSTRUCTIONS

WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

- 1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
- 2. **CAUTION** --To reduce risk of injury, charge only deep-cycle lithium ion 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. CAUTION Only qualified personnel can install this device with battery.
- 6. **NEVER** 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. GROUNDING 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.
- 12. NEVER cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
- 13. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for maintenance.
- 14. WARNING: Because this inverter is non-isolated, only three types of PV modules are acceptable: single crystalline, 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.
- 15. **CAUTION:** It's required to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.



INTRODUCTION

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.

Features

- Pure sine wave inverter
- Feed-in to the grid function
- 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



Basic System Architecture

The following illustration shows basic application for this unit. It also required 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.

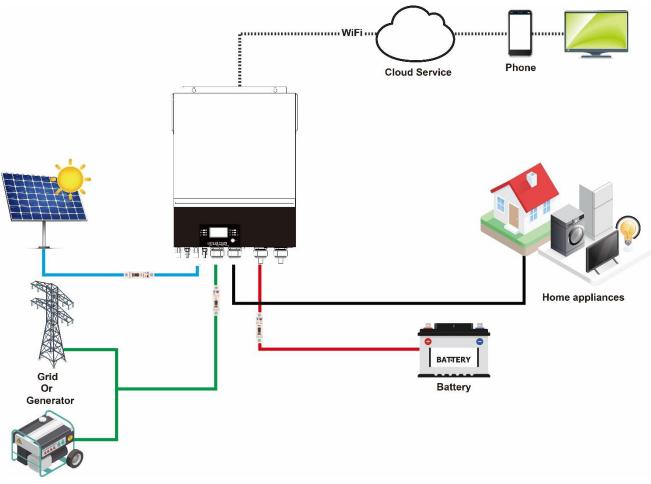
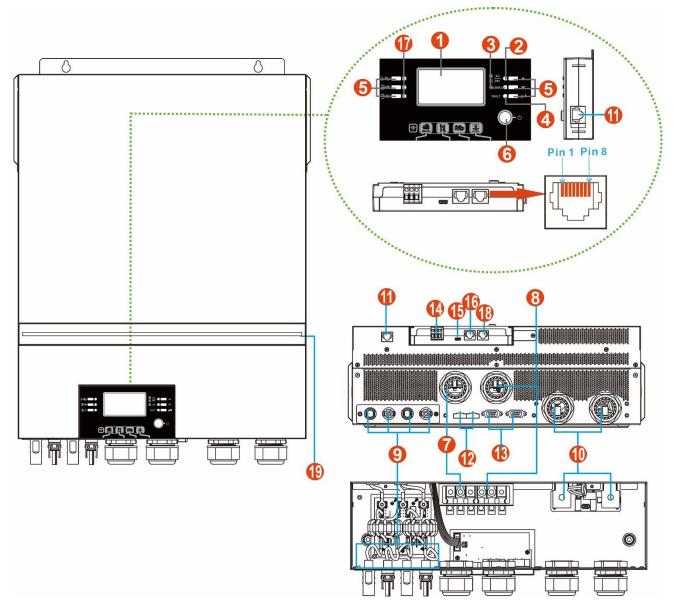


Figure 1 Basic hybrid PV System Overview



Product Overview



NOTE: 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 (Grid connection)
- 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
- 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)



SPECIFICATIONS

Table 1 Line Mode Specifications

Input Voltage Waveform			
	Sinusoidal (utility or generator)		
Nominal Input Voltage	230Vac		
	170Vac±7V (UPS)		
Low Loss Voltage	90Vac±7V (Appliances)		
Low Loss Return Voltage	180Vac±7V (UPS);		
	100Vac±7V (Appliances)		
High Loss Voltage	280Vac±7V		
High Loss Return Voltage	270Vac±7V		
Max AC Input Voltage	300Vac		
Max AC Input Current	60A		
Nominal Input Frequency	50Hz / 60Hz (Auto detection)		
Low Loss Frequency	40±1Hz		
Low Loss Return Frequency	42±1Hz		
High Loss Frequency	65±1Hz		
High Loss Return Frequency	63±1Hz		
Output Short Circuit Protection	Line mode: Circuit Breaker (70A)		
-	Battery mode: Electronic Circuits		
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)		
Transfer Time	10ms typical (UPS);		
	20ms typical (Appliances)		
	Output Power ↑		
Output power de-rating: When AC input voltage under 170V the output power will be de-rated.	Rated Power 50% Power 90V 170V 280V Input Voltage		



Table 2 Inverter Mode Specifications

MODEL	7.2KW	
Rated Output Power	7200W	
Output Voltage Waveform	Pure Sine Wave	
Output Voltage Regulation	230Vac±5%	
Output Frequency	60Hz or 50Hz	
Peak Efficiency	93%	
Overload Protection	100ms@≥180% load;5s@≥120% load; 10s@105%~120% load	
Surge Capacity	2* rated power for 5 seconds	
Optional 12V DC Output		
DC Output	12 VDC ± 7%, 100W	
High DC Cut-off Voltage	66Vdc	
Low DC Cut-off Voltage	44Vdc	
Nominal DC Input Voltage	48Vdc	
Cold Start Voltage	46.0Vdc	
Low DC Warning Voltage		
@ load < 20%	46.0Vdc	
@ 20% ≤ load < 50%	42.8Vdc	
@ load ≥ 50%	40.4Vdc	
Low DC Warning Return Voltage		
@ load < 20%	48.0Vdc	
@ 20% ≤ load < 50%	44.8Vdc	
@ load ≥ 50%	42.4Vdc	
Low DC Cut-off Voltage		
@ load < 20%	44.0Vdc	
@ 20% ≤ load < 50%	40.8Vdc	
@ load ≥ 50%	38.4Vdc	
High DC Recovery Voltage	64Vdc	
High DC Cut-off Voltage	66Vdc	
DC Voltage Accuracy +/-0.3V@ no load		
THDV	<5% for linear load,<10% for non-linear load @ nominal voltage	
DC Offset	≦100mV	



Table 3 Charge Mode Specifications

Utility Charging Mo						
	oue					
MODEL	(1150)	7.2KW				
Charging Current (80A				
@ Nominal Input Vol	Flooded					
	Battery	58.4Vdc				
	AGM / Gel	56.4Vdc				
-	Battery					
Floating Charging		54Vdc				
Overcharge Protec	_	66 Vdc				
Charging Algorithr		3-Step				
		Battery Voltage, per cell Charging Currer				
			10, 70			
		2.43vdc (2.35Vdc) 2.25Vdc				
		- 100)%			
Chausing Cume						
Charging Curve		50	%			
		minimum 10mins, maximum 8hrs Current				
		Tim	е			
		Bulk Absorption Maintenance (Constant Current) (Constant Voltage) (Floating)				
Solar Input						
MODEL		7.2KW				
Rated Power		8000W				
Max. PV Array Ope	en Circuit	500Vdc				
Voltage	tere Dever					
PV Array MPPT Vol		90Vdc~450Vdc 18A x 2				
Max. Input Curren	L					
Start-up Voltage		80V +/- 5Vdc				
		PV Current				
		18A				
Power Limitation		9A				
		75° 85° MPPT temperature				



Table 4 General Specifications

MODEL	7.2KW		
Safety Certification	CE		
Operating Temperature Range	-10°C to 50°C		
Storage temperature	-15°C~ 60°C		
Humidity	5% to 95% Relative Humidity (Non-condensing)		
Dimension (D*W*H), mm	147.4x 432.5 x 553.6		
Net Weight, kg	18.4		

Table 5 Parallel Specifications

Max parallel numbers	6		
Circulation Current under No Load Condition	Max 2A		
Power Unbalance Ratio	<5% @ 100% Load		
Parallel communication	CAN		
Transfer time in parallel mode	Max 50ms		
Parallel Kit	YES		

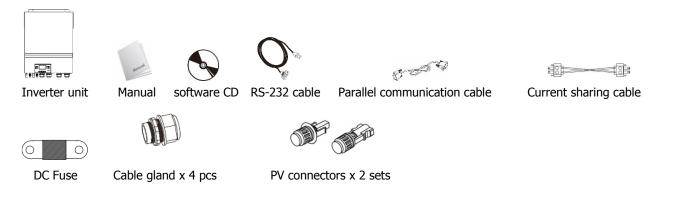
Note: Parallel feature will be disabled when only PV power is available.



INSTALLATION

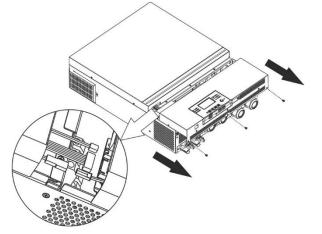
Unpacking and Inspection

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:



Preparation

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



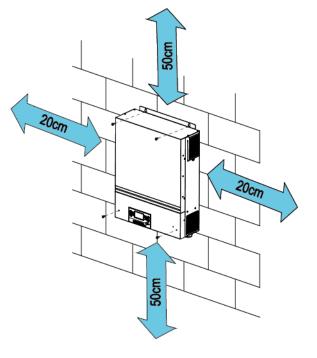
Mounting the Unit

Consider the following points before selecting where to install:

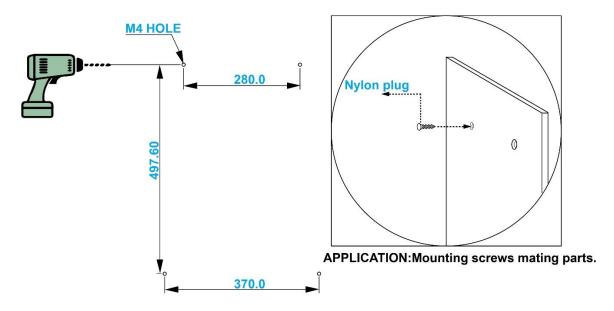
- Do not mount the inverter on flammable construction materials.
- Mount on a solid surface
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- The ambient temperature should be between 0°C and 55°C to ensure optimal operation.
- The recommended installation 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.

▲ SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

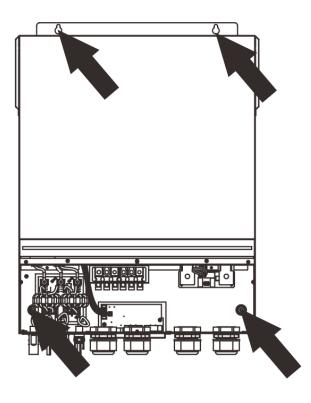
Wall fixing tools and demansions for the inverter:







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





Battery Connection

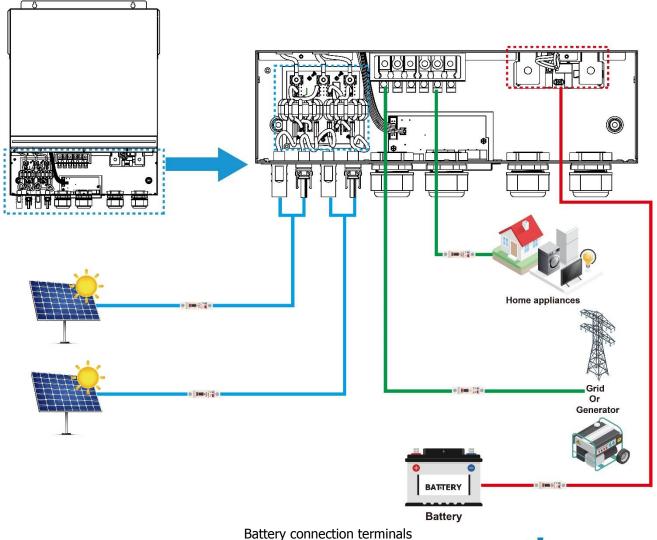
CAUTION: For safety operation and regulation compliance, it's requested to install a separate DC overcurrent protector or disconnect device between battery and inverter. It may not be requested to have a disconnect device in some applications, however, it's still requested to have over-current protection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

WARNING! All wiring must be performed by a qualified personnel.

WARNING! 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. **Recommended battery cable and terminal size:**

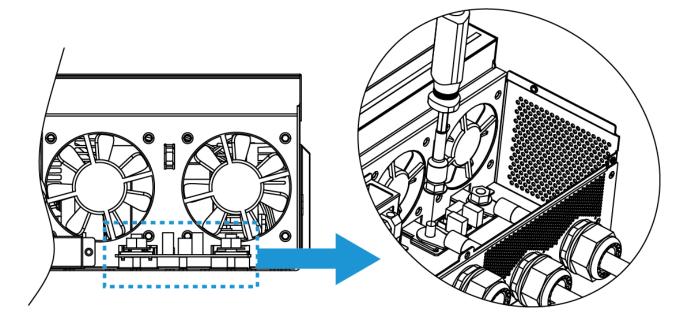
Model	Typical	Battery	Wire Size	Cable mm ²	Ring Te Dimen		Torque
	Amperage	capacity		(each)	D (mm)	L (mm)	value
7.2KW	164.8A	250AH	1*1/0AWG	50	8.4	47	5 Nm



HY GREEN ENERGY Please follow below steps to implement battery connection:

- 1. Assemble battery ring terminal based on recommended battery cable and terminal size.
- 2. Fix two cable glands into positive and negative terminals.
- 3. 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.





WARNING: Shock Hazard

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

CAUTION!! Do not place anything between the flat part of the inverter terminal and the ring terminal. Otherwise, overheating may occur.

CAUTION!! Do not apply anti-oxidant substance on the terminals before terminals are connected tightly. **CAUTION!!** 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 (-).

AC Input/Output Connection

CAUTION!! Before connecting to AC input power source, please install a **separate** 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.

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



WARNING! All wiring must be performed by a qualified personnel.

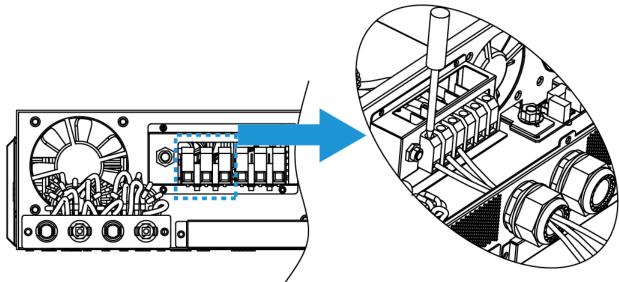
WARNING! It's very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

Suggested cable requirement for AC wires

Model	Gauge	Torque Value
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. Fix two cable glands into input and output sides.
- 4. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor () first.
 - Ground (yellow-green) L→LINE (brown or black) N→Neutral (blue)



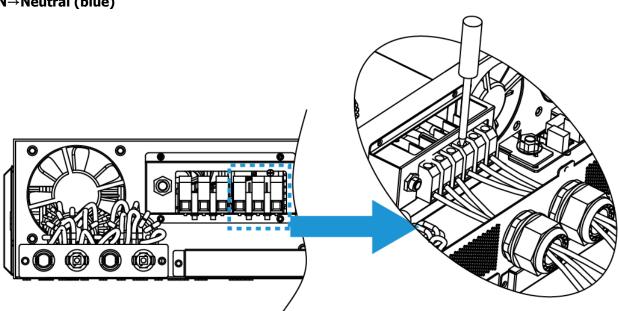
A WARNING

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



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

Ground (yellow-green) L→LINE (brown or black) N→Neutral (blue)



6. Make sure the wires are securely connected.

CAUTION: Important

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.

CAUTION: 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.



PV Connection

CAUTION: Before connecting to PV modules, please install **separately** DC circuit breakers between inverter and PV modules.

NOTE1: Please use 600VDC/30A circuit breaker.

NOTE2: The overvoltage category of the PV input is II. Please follow the steps below to implement PV module connection:

WARNING: 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.

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

Step 1: 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.

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

Step 2: Disconnect the circuit breaker and switch off the DC switch.

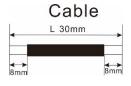
Step 3: Assemble provided PV connectors with PV modules by the following steps.

Components for PV connectors and Tools:

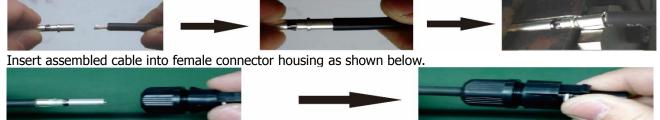
Female connector housing	
Female terminal	
Male connector housing	
Male terminal	
Crimping tool and spanner	

Prepare the cable and follow the connector assembly process:

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







Insert assembled cable into male connector housing as shown below.

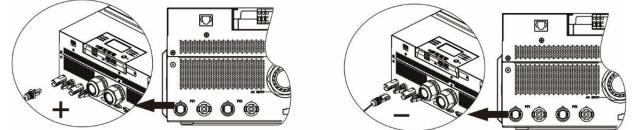




Then, use spanner to screw pressure dome tightly to female connector and male connector as shown below.



Step 4: 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.



WARNING! 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.

4 6 10 12	Conductor cross-section (mm ²)
4~6 10~12	4~6

Never directly touch the terminals of inverter. It might cause lethal electric shock.

Recommended Panel Configuration

When selecting proper PV modules, please be sure to consider the following parameters:

1. Open circuit Voltage (Voc) of PV modules not to exceed maximum PV array open circuit voltage of the inverter.

2. Open circuit Voltage (Voc) of PV modules should be higher than the start-up voltage.

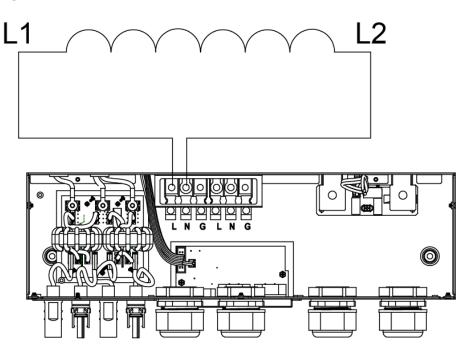
INVERTER MODEL	7.2KW
Max. PV Array Power	8000W
Max. PV Array Open Circuit Voltage	500Vdc
PV Array MPPT Voltage Range	90Vdc~450Vdc
Start-up Voltage (Voc)	80Vdc



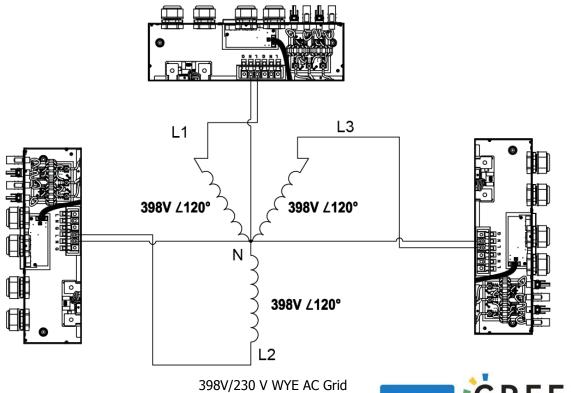
Recommended solar panel configuration:

	panel comgaration			
Solar Panel Spec.	SOLAR INPUT 1	SOLAR INPUT 2		
(reference)	Min in series: 3pcs, per input		Q'ty of panels	Total Input Power
- 545Wp	Max. in series: 8pcs,	per input		
- Vmp: 42.25Vdc	3pcs in series	х	3pcs	1635W
- Imp: 12.90A	х	3pcs in series	3pcs	1635W
- Voc: 51.10Vdc	8pcs in series	x	8pcs	4360W
- Isc: 13.65A	x	8pcs in series	8pcs	4360W
- Cells: 144	4pcs in series	4pcs in series	8pcs	4360W
	8pcs in series	8pcs in series	16pcs	8720W

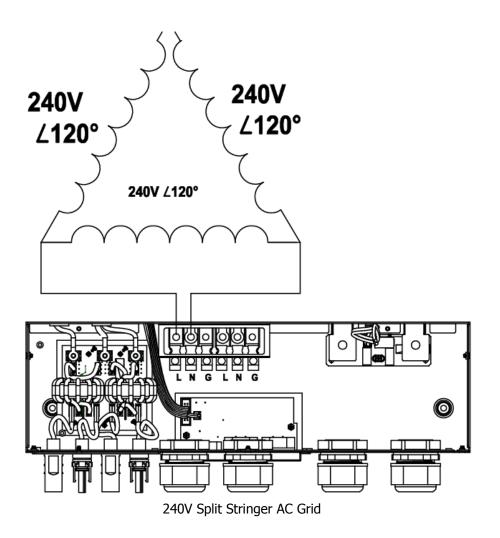
Public grid configuration allowed:



240V/120V Split Phase AC Grid



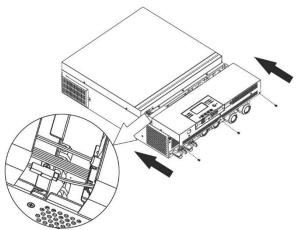




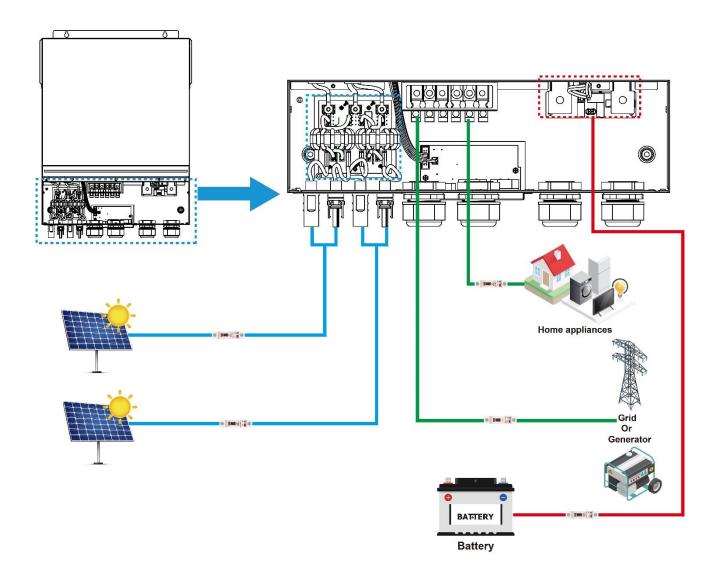


Final Assembly

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



Wiring system of inverter

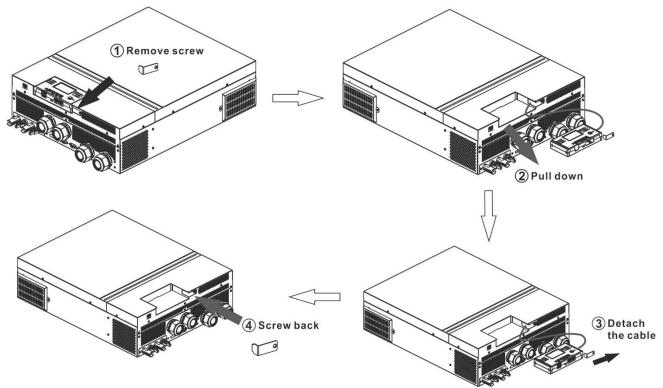




Remote Display Panel Installation

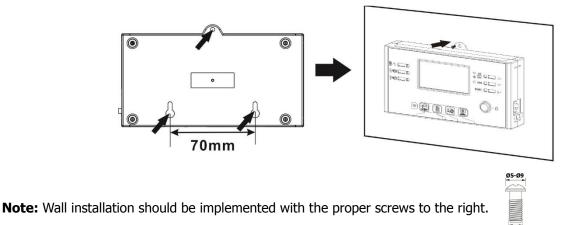
The LCD module can be removable and installed in a remote location with an optional communication cable. Please take the follow steps to implement this remote panel installation.

Step 1. 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.

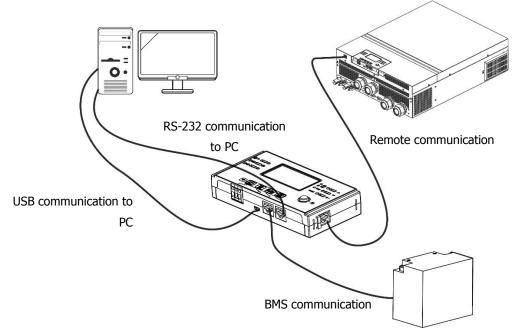




Step 2. Prepare your mounting holes in the marked locations as shown in the illustration below. The LCD module then can be securely mounted to your desired location.



Step 3. After LCD module is installed, connect LCD module to the inverter with an optional RJ45 communication cable as shown below.





Communication Connection

Serial Connection

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.

Wi-Fi Connection

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.



Dry Contact Signal

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



BMS Communication

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.

OPERATION

Power ON/OFF

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.



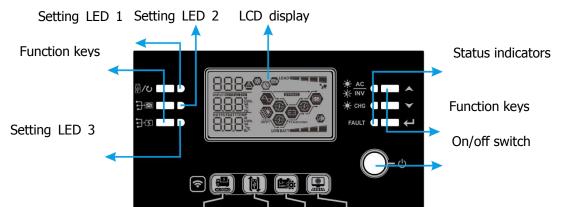
Inverter Turn-on

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.

Operation and Display Panel

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.



Indicators

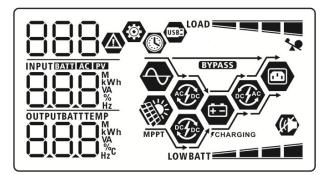
LED Ind	icator	Color	Solid/Flashing	Messages
Setting LED 1		Green	Solid On	Output powered by utility
Setting LED 2		Green	Solid On	Output powered by PV
Setting	LED 3	Green	Solid On	Output powered by battery
Status			Solid On	Output is available in line mode
indicators	-¢- INV	Green	Flashing	Output is powered by batter in Rettery mode
			23	ENERGY

	- Ċ- CHG Green		Solid On	Battery is fully charged
	-µ- Chù	Green	Flashing	Battery is charging.
	FAULT Re	AULT Red	Solid On	Fault mode
			Flashing	Warning mode

Function Keys

Function	Кеу	Description
₽ / U	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
} • +	〕 が	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

LCD Display Icons



Icon	Function description
Input Source Information	
AC	Indicates the AC input.
PV	Indicates the PV input
INPUT EATHERSTERST Who Via Hz	Indicate input voltage, input frequency, PV voltage, charger current, charger power, battery voltage.
Configuration Program and I	Fault Information
8 88	Indicates the setting programs.
888@	Indicates the warning and fault codes. Warning: BBM flashing with warning code. Fault: Fault: Ighting with fault code
Output Information	
	Indicate output voltage, output frequency, load percent, load in VA, load in Watt and discharging current.
	24 HY ENERGY

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 Constant Current mode / Constant Voltage mode 2 ~ 2.083V/cell Bottom two bars will be on and the other three bars will flash in turns. Bottom two bars will be on and the other two bars will flash in turns. Voltage mode 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% 2.017V/cell BATT Load < 50% 1.852V/cell LOW BATT Load < 50% 2.058V/cell BATT Load < 50% 1.892V/cell LOW BATT Load < 50% 1.892V/cell 1.975V/cell BATT 2.058V/cell BATT Load < 50% 1.892V/cell LOW BATT	Battery Informa	ation			
ATT battery mode and charging status in line mode. When battery is charging, it will present battery charging status. Status Status Battery voltage LCD Display <2V/Cell			Indicates battery	v level by 0-24	%, 25-49%, 50-74% and 75-100% ir
Status Battery voltage LCD Display Constant Current mode / Constant Voltage mode 2 ~ 2.083V/cell 4 bars will flash in turns. Bottom bar will be on and the other three bars will flash in turns. Voltage mode 2.083 ~ 2.167V/cell Bottom three bars will be on and the other two bars will flash in turns. Floating mode. Battery voltage LOD Display In battery mode, it will present battery capacity. Bottom three bars will be on. In battery mode, it will present battery capacity. Load >50% 1.85V/cell ~ 1.933V/cell BATT 1.85V/cell ~ 1.932V/cell BATT 1.85V/cell ~ 2.017V/cell BATT 1.85V/cell ~ 2.058V/cell BATT 1.892V/cell ~ 1.975V/cell BATT 1.932V/cell ~ 1.975V/cell BATT 1.932V/cell ~ 2.058V/cell BATT 0%~24% 25%~49% 1.0AD 10AD 0%~24% 25%~49% 1.0AD 10AD 0%~24% 25%~49% 1.0AD 10AD 0%~24% 10AD 1.0AD 10AD 0%~24% 10AD 1.0AD	BATT		battery mode and charging status in line mode.		
<2V/cell	When battery is c	harging, it will	present battery ch	narging status.	
Constant Current mode / Constant 2 ~ 2.083V/cell Bottom bar will be on and the other three bars will flash in turns. Voltage mode 2.083 ~ 2.167V/cell Bottom two bars will be on and the other two bars will flash in turns. Floating mode. Batteries are fully charged. 4 bars will be on. In battery mode, it will present battery capacity. LOW BATT Load >50% Battery Voltage LOW BATT Load >50% 1.85V/cell LOW BATT Load >50% 1.85V/cell LOW BATT Load < 50%	Status		ge		
Constant 2 ~ 2.033//cell will flash in turns. Current mode / Constant 2.083 ~ 2.167V/cell Bottom two bars will be on and the other two bars will flash in turns. Voltage mode > 2.167 V/cell Bottom two 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 LOW BATT Load >50% 2.167V/cell BATT Entery top		<2V/cell			
Current mode/ Constant 2.083 ~ 2.167V/cell Bottom two bars will be on and the other two bars will flash in turns. Voltage mode > 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. LOW BATT Load Percentage Battery Voltage LCD Display < 1.85V/cell		2 ~ 2.083V/c	ell		
> 2.167 V/cell will flash. Floating mode. Batteries are fully charged. 4 bars will be on. In battery mode, it will present battery capacity. Load Percentage Load Percentage Battery Voltage LCD Display 1.85V/cell LOWBATT 1.85V/cell LOWBATT 1.85V/cell BATT 1.85V/cell BATT 1.85V/cell BATT 1.85V/cell BATT 1.85V/cell BATT 1.85V/cell BATT 1.933V/cell BATT 2.017V/cell BATT 2.018V/cell 2.058V/cell BATT 2.058V/cell BATT 2.058V/cell 0AD 10AD 0AD 0%~25%~49% LOAD 10AD 0AD 10AD 0AD 10AD 0AD 10AD 0AD </td <td>-</td> <td>2.083 ~ 2.16</td> <td>7V/cell</td> <td>Bottom two</td> <td>bars will be on and the other two</td>	-	2.083 ~ 2.16	7V/cell	Bottom two	bars will be on and the other two
In battery mode, it will present battery capacity. Load Percentage Battery Voltage LCD Display <pre> LCD Display </pre> <pre> LOWBATT </pre> <pre> LCD Display </pre> <pr< td=""><td>Voltage mode</td><td>> 2.167 V/ce</td><td>11</td><td></td><td>e bars will be on and the top bar</td></pr<>	Voltage mode	> 2.167 V/ce	11		e bars will be on and the top bar
Load Percentage Battery Voltage LCD Display Load >50% ASV/cell ~ 1.933V/cell BATT ASV/cell ~ 2.017V/cell BATT S2.017V/cell BATT S2.058V/cell Indicates overload. Indicates unit connects to the mains. Indicates unit connects to the PV panel. Indicates unit connects to the PV panel. Indicates the utility	Floating mode.	Batteries are fu	lly charged.	4 bars will be	e on.
< 1.85V/cell	n battery mode,	it will present l	battery capacity.		
Load >50% 1.85V/cell ~ 1.933V/cell BATT 1.933V/cell ~ 2.017V/cell BATT 1.933V/cell 2.017V/cell BATT 1.933V/cell Load < 50%	Load Percentage	2	Battery Voltage		LCD Display
Load >50% 1.933V/cell ~ 2.017V/cell BATT Image: Some set of the set of			-		
1.933V/cell ~ 2.017V/cell BATT > 2.017V/cell BATT Load < 50%	l oad >50%		1.85V/cell ~ 1.9	33V/cell	BATT
< 1.892V/cell	Luau ~ JU 70		1.933V/cell ~ 2.	017V/cell	BATT
Load < 50%			> 2.017V/cell		BATT
Load < 50%			< 1.892V/cell		LOWBATT
1.975V/cell BATT > 2.058V/cell BATT > 2.058V/cell BATT > 2.058V/cell BATT Indicates overload. Indicates overload. Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100% 0%~24% 00AD 0%~24% 25%~49% Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100% 0%~24% 00AD 0%~24% 25%~49% Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100% 0%~24% 00AD 0%~24% 25%~49% IOAD IOAD 10AD 00AD 10AD 10AD 00%~24% 25%~49% IOAD 10AD 10AD 10AD	load < 50%		1.892V/cell ~ 1.975V/cell		BATT
DATT Indicates overload. Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100% LOAD 0% LOAD LOAD DO% LOAD LOAD LOAD DO% Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100% LOAD LOAD LOAD Indicates the LOAD Indicates unit connects to the mains. Indicates load is supplied by utility power. Indicates the solar charger circuit is working. Indicates the	Luau < 50 /0		1.975V/cell ~ 2.058V/cell		BATT
Indicates overload. Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100% 0%~24% 25%~49% IOAD IOAD Indicates unit connects to the mains. Indicates unit connects to the PV panel. INDICATES IOAd is supplied by utility power. Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.			> 2.058V/cell		BATT
OAD 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 50%~74% 10AD LOAD LOAD Mode Operation Information Indicates unit connects to the mains. Indicates unit connects to the mains. Indicates unit connects to the PV panel. Indicates unit connects to the PV panel. Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the solar charger circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.	Load Information	on	1		
0%~24% 25%~49% LOAD LOAD 50%~74% 75%~100% LOAD LOAD 50%~74% 75%~100% LOAD LOAD Mode Operation Information LOAD Indicates unit connects to the mains. Indicates unit connects to the PV panel. Indicates load is supplied by utility power. Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.		*	Indicates overloa	ad.	
0%~24% 25%~49% LOAD LOAD 50%~74% 75%~100% LOAD LOAD Mode Operation Information LOAD Indicates unit connects to the mains. Indicates unit connects to the mains. Indicates unit connects to the PV panel. Indicates load is supplied by utility power. Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.	040		Indicates the load level by 0-24%, 25-49%, 50-74% and 75-100%.		
Image: Solution formation Top Solution Mode Operation Information Indicates unit connects to the mains. Indicates unit connects to the PV panel. Indicates unit connects to the PV panel. Indicates load is supplied by utility power. Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.			0%~2	24%	25%~49%
LOAD LOAD Mode Operation Information Indicates unit connects to the mains. Indicates unit connects to the PV panel. Indicates unit connects to the PV panel. Indicates load is supplied by utility power. Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.			LOAD		
Mode Operation Information Indicates unit connects to the mains. Indicates unit connects to the PV panel. Indicates unit connects to the PV panel. Indicates load is supplied by utility power. Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.			50%~	74%	75%~100%
Indicates unit connects to the mains. Indicates unit connects to the PV panel. Indicates unit connects to the PV panel. Indicates load is supplied by utility power. Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.			LOAD		
Indicates unit connects to the PV panel. BYPASS Indicates load is supplied by utility power. Indicates the utility charger circuit is working. Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.	Mode Operation	n Informatior	1		
BYPASS Indicates load is supplied by utility power. Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.	2		Indicates unit co	nnects to the	mains.
Indicates the utility charger circuit is working. Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.			Indicates unit co	nnects to the	PV panel.
Indicates the solar charger circuit is working. Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.	BYPASS		Indicates load is	supplied by ut	tility power.
Indicates the DC/AC inverter circuit is working. Indicates unit alarm is disabled. Indicates USB disk is connected.	ACTOC		Indicates the utility charger circuit is working.		
Indicates unit alarm is disabled. Indicates USB disk is connected.	······································		Indicates the solar charger circuit is working.		
Indicates USB disk is connected.	······································		Indicates the DC/AC inverter circuit is working.		
	(K)		Indicates unit alarm is disabled.		
Indicates timer setting or time display	USBE		Indicates USB disk is connected.		
			Indicates timer s	etting or time	display



LCD Setting

General Setting

After pressing and holding "←" button for 3 seconds, the unit will enter the Setup Mode. Press "▲" or "▼"

button to select setting programs. Press " \leftarrow " button to confirm you selection or " \bigcirc / \circlearrowright " button to exit.

Setting Pro Program	Description	Selectable option	
00	Exit setting mode	Escape	
		Utility first (default)	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.
01	Output source priority: To configure load power source priority	Solar first	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	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
		SbU	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)	60A (default)	Setting range is from 10A to 80A. Increment of each click is 10A.



		Appliances (default)	If selected, acceptable AC input voltage range will be within 90-280VAC.
03	AC input voltage range	8PL	
	ne input forage range		If selected, acceptable AC input voltage range will be within 170-280VAC.
		υρς	
		AGM (default)	Flooded
		User-Defined	If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 26, 27 and 29.
		USE	
		Pylontech battery	If selected, programs of 02, 26, 27 and 29 will be automatically set up. No need for further setting.
		PYL	
05	Battery type	WECO battery	If selected, programs of 02, 12, 26, 27 and 29 will be auto- configured per battery supplier recommended. No need for further adjustment.
		J3u	
		Soltaro battery	If selected, programs of 02, 26, 27 and 29 will be automatically set up. No need for further setting.
		SOL	
		LIb-protocol compatible battery	Select " LIb" if using Lithium battery compatible to Lib protocol. If selected, programs of 02, 26, 27 and 29 will be
		116	automatically set up. No need for further setting. GREEN
	1	27	ENERGY

	1		
		3 rd party Lithium battery	If selected, programs of 02, 26,
		05 🐵	27 and 29 will be automatically
			set up. No need for further
		_	setting. Please contact the
			battery supplier for installation procedure.
			Restart enable
		Restart disable (default)	
	Auto restart when overload	86 👁	05 👁
06	OCCURS		
		174	1745
		Restart disable (default)	Restart enable
07	Auto restart when over		0,0
07	temperature occurs		
			LLC
		643	645
		50Hz (default)	60Hz
			09 🐵
09	Output frequency		00
	/		
		50.	60 _{Hz}
		220V	230V (default)
		· · · · · · · · · · · · · · · · · · ·	
		·U	10
		220	חרר
10	Output voltage		
		240V	
		200	
		C'HU'	
	Maximum utility charging	2A	30A (default)
	current		
	Note: If setting value in	111-1	1.11.1
11	program 02 is smaller than	UEI	UEI
	that in program in 11, the		30,
	inverter will apply charging current from program 02		
	for utility charger.	click is 10A.	en 10A to 80A. Increment of each
		46V (default)	Setting range is from 44V to 51
		-	Increment of each click is 1V.
	Setting voltage point back to utility source when	15 🐵	
12	selecting "SBU" (SBU		
	priority) in program 01.	BATT	
	phoney) in program or.		
	phoney) in program or.	46,	GREEN

[
13	Setting voltage point back to battery mode when selecting "SBU" (SBU priority) in program 01.	Battery fully charged	54V (default)
		If this inverter/charger is work mode, charger source can be Solar first	king in Line, Standby or Fault
16	Charger source priority: To configure charger source priority	Solar and Utility (default)	Solar energy and utility will charge battery at the same time.
		Only Solar 15 🐵 050 If this inverter/charger is work	Solar energy will be the only charger source no matter utility is available or not.
		_	lar energy will charge battery if it's
18	Alarm control	Alarm on (default)	Alarm off
		60N	60F
19	Auto return to default display screen	Return to default display screen (default)	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.
		ESP	



		Stay at latest screen	If selected, the display screen will
		¦□ ⊗	stay at latest screen user finally
		·	switches.
		FED	
		Backlight on (default)	Backlight off
		20 🐵	20 🐵
20	Backlight control		
		100	110F
		Alarm on (default)	Alarm off
		22 🐵	80 <u>6</u>
22	Beeps while primary source		
22	is interrupted		
		800	ROF
		Bypass disable (default)	Bypass enable
	Overload bypass:	23 🐵	23 🐵
23	When enabled, the unit will transfer to line mode if		
	overload occurs in battery mode.		
		699	698
		Record enable (default)	Record disable
25	Record Fault code		
25			
		FEN	FdS
		default: 56.4V	If self-defined is selected in
			program 5, this program can be
	Bulk charging voltage	26 ®	set up. Setting range is from
26	(C.V voltage)		48.0V to 61.0V. Increment of each click is 0.1V.
		default: 54.0V	If self-defined is selected in program 5, this program can be
			set up. Setting range is from
27	Floating charging voltage	ει u	48.0V to 61.0V. Increment of
			each click is 0.1V.
		יטרכ	GREEN
		30	ENERGY

		Single: This inverter is used	Parallel: This inverter is operated
		in single phase application.	in parallel system.
		C8 ¥	C8 ¥
		51.6	P8:
		inverter to be operated in spe	in 3-phase application, set up cific phase
	AC output mode *This setting is only	L1 phase:	L2 phase:
28	available when the inverter	28 👁	28 👁
	is in standby mode (Switch off).		
		38 (365
		L3 phase:	
		28 🐵	
		383	
	Low DC cut-off voltage:	default: 44.0V	If self-defined is selected in
	 If battery power is only power source available, 		program 5, this program can be
	 inverter will shut down. If PV energy and battery power are 		set up. Setting range is from 42.0V to 48.0V. Increment of
			each click is 0.1V. Low DC cut-off
29	available, inverter will charge battery without		voltage will be fixed to setting
	AC output.		value no matter what percentage
	 If PV energy, battery power and utility are all 		of load is connected.
	available, inverter will transfer to line mode		
	and provide output		
	power to loads.	Battery equalization	Battery equalization disable
			(default)
		30 🐵	ົ⊇ຕ໌ ⊚
		00	50
30	Battery equalization		
		133	892
			' is selected in program 05, this
		program can be set up.	
		default: 58.4V	Setting range is from 48.0V to
			61.0V. Increment of each click is 0.1V.
31	Battery equalization voltage	ρυ	0.14.
			•1
			HY GREEN ENERGY
		31	ENERGY

		60min (default)	Setting range is from 5min to	
			900min. Increment of each click	
33	Battery equalized time		is 5min.	
55				
		60		
		120min (default)	Setting range is from 5min to 900	
		74 ©	min. Increment of each click is 5	
34	Battery equalized timeout	·	min.	
		120		
		30days (default)	Setting range is from 0 to 90	
		35 🐵	days. Increment of each click is 1	
35	Equalization interval		day	
		304		
	Equalization activated immediately	Enable	Disable (default)	
		36 🕲	36 [©]	
		860	835	
36				
		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 "Eq". If "Disable" is sel	ected, it will cancel equalization	
			qualization time arrives based on	
		program 35 setting. At this tim main page.	ne, " EP " will not be shown in LCD	
	Reset all stored data for PV generated power and output load energy	Not reset(Default)	Reset	
		37 🐵	37 🐵	
37				
		ОЦЦ	1.51	
		UFF	155	
38	Solar energy feeds to the grid	Solar feeds to the grid disable(default)	Solar feeds to the grid enable	
	(It's requested to enter		30 ~	
	password)			
			0HE	
		664		



		Disable (Default)	If selected, battery discharge protection is disabled.
41	Maximum battery discharging current	30A Ч¦∞ 300 150A Ч¦∞	The setting range is from 30 A to 200 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 after 5-minute operation in battery mode.
		150	
51	On/Off control for RGB LED *It's necessary to enable this setting to activate RGB LED lighting function.	Enabled (default)	Disable
		LEN	692
52	Brightness of RGB LED	Low	Normal (default)
		LO	NO-
		High	
		H I	
53	Lighting speed of RGB LED	Low 53 🚳	Normal (default)
		LO	REEN
		33	ENERGY

		High	
		53 👁	
		H	
		Scrolling	Breathing
54	RGB LED effects	Solid on (Default)	<u>6+E</u>
		54 © 50L	
55	Color combination of RGB LED to show energy source and battery charge/discharge status: • Grid-PV-Battery	C01: (Default) Violet-White-Sky blue Pink-Honey	C02: • White-Yellow-Green • Royal blue-Lime yellow
	 Battery charge/discharge status 	CO I	503
93	Erase all data log	Not reset (Default)	Reset
		Π⊦٤	FSE
		3 minutes	5 minutes
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 10 minutes (default)	S 20 minutes SЧ [®]
		1 0 ₃₄	

		30 minutes 60 minutes 94 94
		30 60
95	Time setting – Minute	For minute setting, the range is from 0 to 59.
96	Time setting – Hour	For hour setting, the range is from 0 to 23.
97	Time setting– Day	For day setting, the range is from 1 to 31.
98	Time setting– Month	For month setting, the range is from 1 to 12.
99	Time setting – Year	For year setting, the range is from 17 to 99.

Function Setting

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.

1. USB Function Setting

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



Procedure	LCD Screen
Step 1: Press and hold ** 少し with the seconds to enter USB function setting mode. Step 2: Press ** 少し with the selectable setting programs (detail descriptions in Step 3)	UPC ⊗ ⊜ SEŁ LOC

Stop 3: Plance select of	sotting program by	v following the procedure
Step 3: Please select s	setting program b	y following the procedure.

Program#	Operation Procedure LCD Screen		
₩/ ひ.	This function is to upgrade inverter firmware. If firmware upgrade is needed, please check with		
Upgrade	your dealer or installer for detail instructions.		
firmware			
	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		
Re-write	dealer or installer for detail instructions.		
internal			
parameters			
	By pressing "宁岱" button to export data log from the inverter to USB disk. If		
	the selected function is ready, LCD will display "ーロリ". Press "例/ひ" button		
~ /	to confirm the selection again.	F92	
子 步:	• Press " button to select "Yes", LED 1 will flash once every second		
Export data log	during the process. It will only display LOG and all LEDs will be on after this action is complete. Then, press ^{い優ノひ} " button to return to main screen.	985 NO	
	• Or press " $\mathfrak{P}^{\mathfrak{P}}$ " button to select "No" to return to main screen.		

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

Error message for USB On-the-Go functions:

Error Code	Messages	
UO I	No USB disk is detected.	
50U	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.



2. Timer Setting for Output Source Priority

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

Procedure	LCD Screen
Step 1: Press and hold "Definition for 3 seconds to enter Timer Setup Mode for output source priority.	US6 👁
Step 2: Press ^w (ひ", ^w) () or ^w) () button to enter the selectable programs (detail descriptions in Step 3).	SUB SBU

Step 3: Please select setting program by following each procedure.

Program#	Operation Procedure	LCD Screen
₩/ฃ	Press " ^[] / ^O " 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.	US6 © 00 23
- Ja	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.	56U © 00 23

Press " $\textcircled{0}^{/}$ " button to exit the Setup Mode.

3. Timer Setting for the Charger Source Priority

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

Procedure	LCD Screen
Step 1: Press and hold "It's button for 3 seconds to enter Timer Setup Mode for charging source priority.	650 @ 500
Step 2: Press ^w (ジグ, * 子) の * 子 (ジン) button to enter the selectable programs (detail	050
descriptions in Step 3).	

Step 3: Please select s	setting program	by following	each procedure
	setting program	by following	cach procedure.

Program#	Operation Procedure	LCD Screen
₽ / 2	Press " $^{\bullet}$ " button to set up Solar First Timer. Press " $^{\bullet}$ " button to select staring time. Press " \bigstar " or " \checkmark " button to adjust values and press " \bigstar " to confirm. Press " $^{\bullet}$ " button to select end time. Press " \bigstar " or " \checkmark " button to adjust values, press " \bigstar " button to confirm. The setting values are from 00 to 23, with 1-hour increment.	CSO ♥ 00 23



J.	Press "♪ " button to set up Solar & Utility Timer. Press " Dutton to select staring time. Press " ▲ " or " ▼ " button to adjust values and press " ↓ " to confirm. Press " D " 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.	500 © 00 23
7 2	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 ""/" U" button to exit the Setup Mode.

LCD Display

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.

Selectable information	LCD display
Input voltage(or Solar energy feed to grid power)/Output voltage (Default Display Screen)	If solar energy not feeds to grid: Input Voltage=230V, output voltage=230V LOAD INPUT OUTPUT If solar energy feeds to grid: Solar energy feed to grid power=700W, output voltage=230V LOAD INPUT IN
Input frequency	Input frequency=50Hz



PV voltage	PV1 voltage=260V
	PV2 voltage=260V
PV current	PV1 current = 2.5A
	PV2 current = 2.5A
PV power	PV1 power = 500W
	PV2 power = 500W



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



	Output frequency=50Hz
Output frequency	
	Load percent=70%
Load percentage	
	When connected load is lower than 1kVA, load in VA will present xxxVA like below chart.
Load in VA	$\begin{array}{c} & & & & & & & & & & & & & & & & & & &$
	OUTPUT USO KA When load is lower than 1kW, load in W will
	present xxxW like below chart.
Load in Watt	OUTPUT W OUTPUT W When load is larger than 1kW (≥1KW), load in W will present x.xkW like below chart.
	Battery voltage=25.5V, discharging current=1A
Battery voltage/DC discharging current	
	41 HY GREEN ENERGY

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



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.

Operating Mode Description

Operation mode	Description	LCD display
Standby mode Note: *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge battery without AC output.	No charging at all no matter if grid or PV power is available.	PV power and Grid is available.



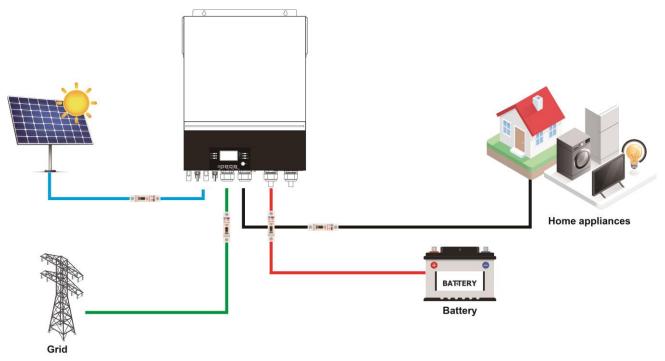
Operation mode	Description	LCD display
Standby mode Note: *Standby mode: The inverter is not turned on yet but at this time, the inverter can charge battery without AC output.	No charging at all no matter if grid or PV power is available.	Power from PV energy only and feed PV energy to grid when battery is not connected. LCD will flash "FED".
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.	No charging at all no matter if grid or PV power is available.	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.



Operation mode	Description	LCD display
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. Power from utility. Power is only generated from PV energy and feeds PV energy to grid when battery is not connected. It will show "FED" flashing in the LCD. LOAD NPUT FIXE W OUTPUT OUTPUT OUTPUT OUTPUT COURSE RATE PV energy charges battery, provides power to the load and feeds remaining energy to the grid. It will show "FED" flashing in the LCD. LOAD NPUT FIXE NOT FI
Battery Mode	The unit will provide output power from battery and/or PV power.	Power from battery and PV energy.
	45	FCHARGING GREEN ENERGY

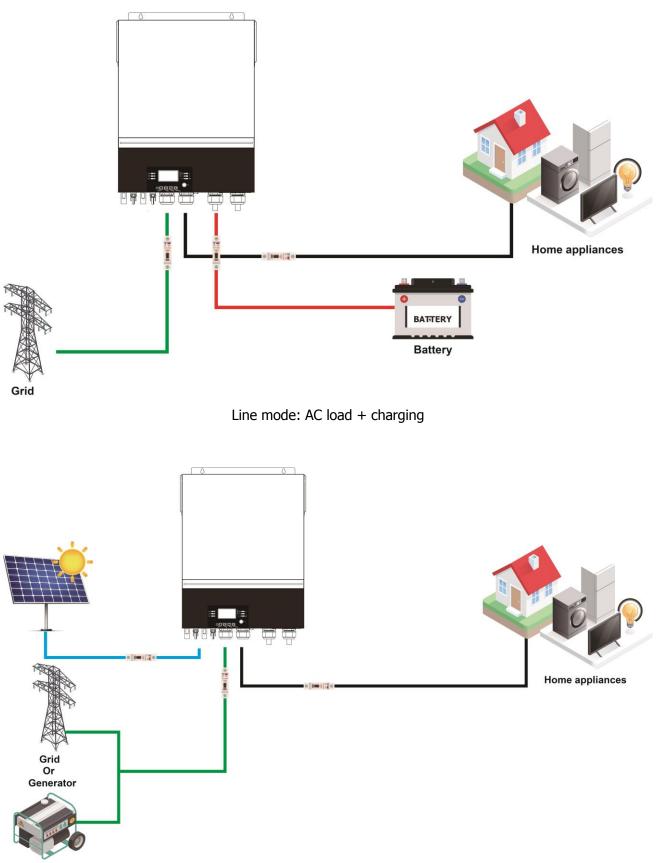
Operation mode	Description	LCD display
Battery Mode	The unit will provide output power from battery and/or PV power.	Power from battery only. Power from PV energy only.

Operation Modes



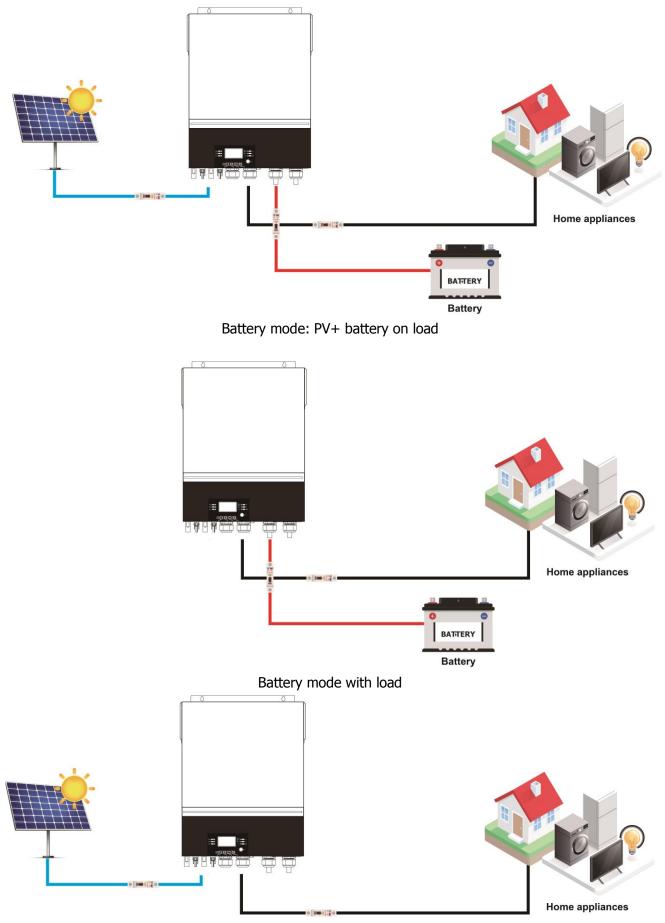
Line mode: AC+PV joint charging





PV+AC combined load without battery

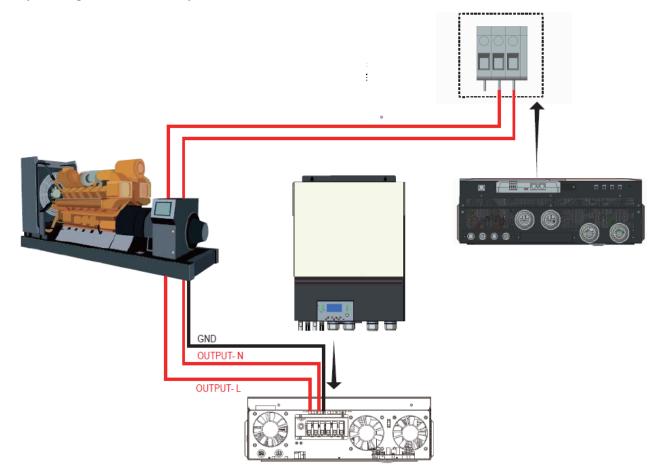




PV independent load



To sync the generator to the system, follow the recommendation circuit:





Faults Reference Code

Fault Code	Fault Event	Icon on
01	Fan is locked when inverter is off.	F8 }
02	Over temperature	1882
03	Battery voltage is too high	F83
04	Battery voltage is too low	1204
05	Output short circuited.	F85
06	Output voltage is too high.	F85
07	Overload time out	F87
08	Bus voltage is too high	F88
09	Bus soft start failed	F89
10	PV over current	F 10
11	PV over voltage	F
12	DCDC over current	513
13	Battery discharge over current	F 13
51	Over current	FS
52	Bus voltage is too low	1852
53	Inverter soft start failed	FS3
55	Over DC voltage in AC output	1755
57	Current sensor failed	[FS]
58	Output voltage is too low	FS8



Warning Indicator

Warning Code	Warning Event	Audible Alarm	Icon flashing
01	Fan is locked when inverter is on.	Beep three times every second	
02	Over temperature	None	8 20
03	Battery is over-charged	Beep once every second	830
04	Low battery	Beep once every second	[]Ч ⊗
07	Overload	Beep once every 0.5 second	
10	Output power derating	Beep twice every 3 seconds	[]@
15	PV energy is low.	Beep twice every 3 seconds	15 @
16	High AC input (>280VAC) during BUS soft start	None	15@
32	Communication failure between inverter and remote display panel	None	32@
69	Battery equalization	None	29 @
6P	Battery is not connected	None	5 9@



BATTERY EQUALIZATION

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.

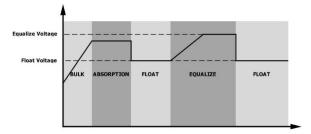
• How to Apply Equalization Function

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.

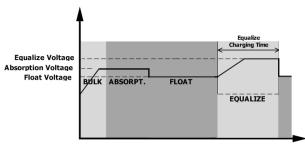
• When to Equalize

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.

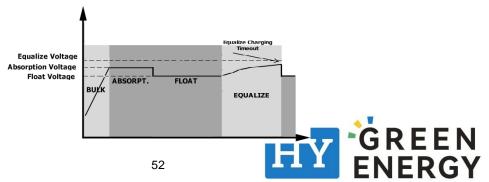


• Equalize charging time and timeout

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.



TROUBLE SHOOTING

Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do	
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)	 Re-charge battery. Replace battery. 	
No response after power on.	No indication.	 The battery voltage is far too low. (<1.4V/Cell) Battery polarity is connected reversed. 	 Check if batteries and the wiring are connected well. Re-charge battery. Replace battery. 	
	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.	
Mains exist but the unit works in battery mode.	Green LED is flashing.	Insufficient quality of AC power. (Shore or Generator)	 Check if AC wires are too thin and/or too long. 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.	
	E. H. J. 65	Output short circuited.	Check if wiring is connected well and remove abnormal load.	
	Fault code 05	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	
	Fault code 02	Internal temperature of inverter component is over 100°C.	temperature is too high.	
	Fault code 03	Battery is over-charged.	Return to repair center.	
Buzzer beeps continuously and		The battery voltage is too high.	Check if spec and quantity of batteries are meet requirements.	
red LED is on.	Fault code 01	Fan fault	Replace the fan.	
	Fault code 06/58	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	 Reduce the connected load. Return to repair center 	
	Fault code 08/09/53/57	Internal components failed.	Return to repair center.	
	Fault code 51	Over current or surge.	Restart the unit, if the error	
	Fault code 52	Bus voltage is too low.	happens again, please return	
	Fault code 55	Output voltage is unbalanced.	to repair center.	
	Fault code 56	Battery is not connected well or fuse is burnt.	If the battery is connected well, please return to repair center.	



Appendix I: Parallel function

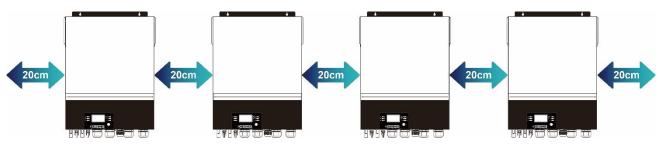
1. Introduction

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 is 66KW/66KVA.
- 2. Maximum six units work together to support three-phase equipment. Maximum four units support one phase.

2. Mounting the Unit

When installing multiple units, please follow below chart.



NOTE: 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.

3. Wiring Connection

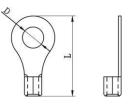
WARNING: It's REQUIRED to connect battery for parallel operation.

The cable size of each inverter is shown as below:

Recommended battery cable and terminal size for each inverter:

Wire	e Size	Cable mm ²	Ring Terminal Dimensions		Torque value	
		(each)	D (mm) L (mm)		-	
1*1/	1*1/0AWG 50		8.4	47	5 Nm	

Ring terminal:



WARNING: 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.

Recommended AC input and output cable size for each inverter:

Model	AWG no.	Torque
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.

CAUTION!! 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.



Recommended breaker specification of battery for each inverter:

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.

Recommended breaker specification of AC input with single phase:

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

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

Note 2: 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

Recommended battery capacity

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

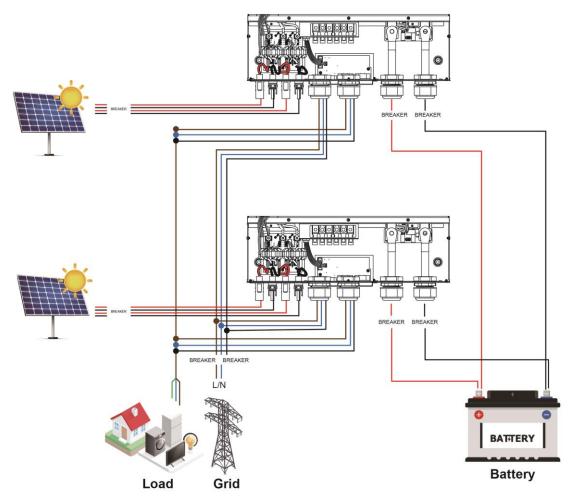
WARNING! Be sure that all inverters will share the same battery bank. Otherwise, the inverters will transfer to fault mode.

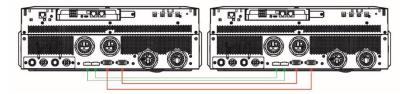


4-1. Parallel Operation in Single phase

Two inverters in parallel:

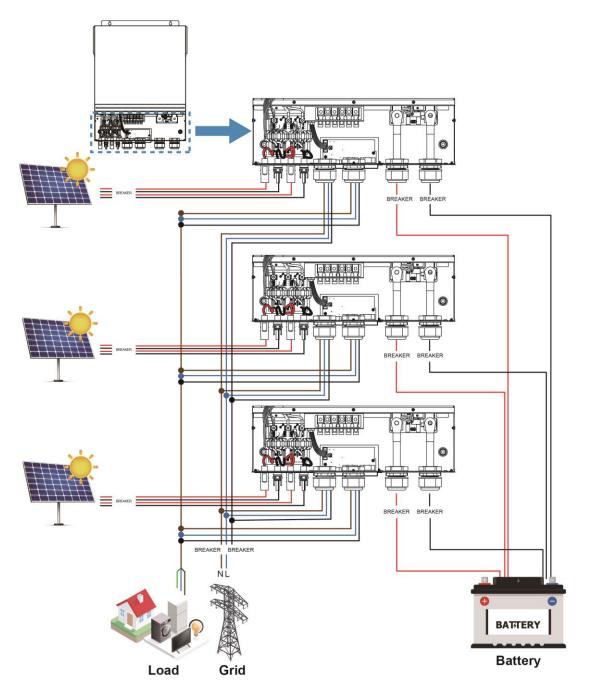
Power Connection

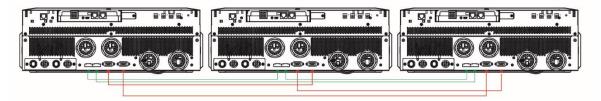






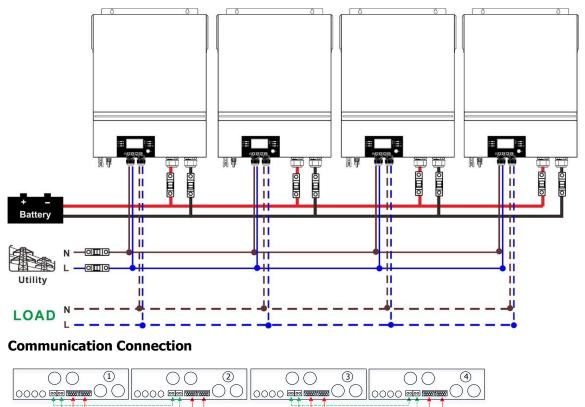
Power Connection







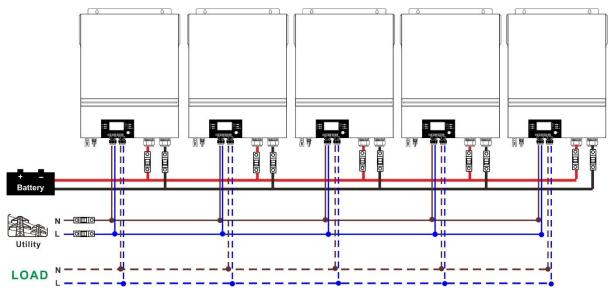
Power Connection



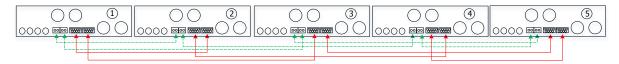


Five inverters in parallel:

Power Connection

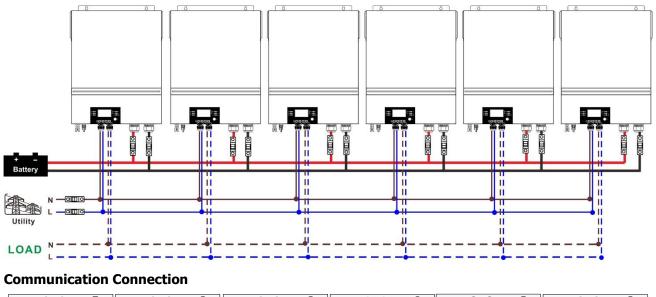


Communication Connection



Six inverters in parallel:

Power Connection



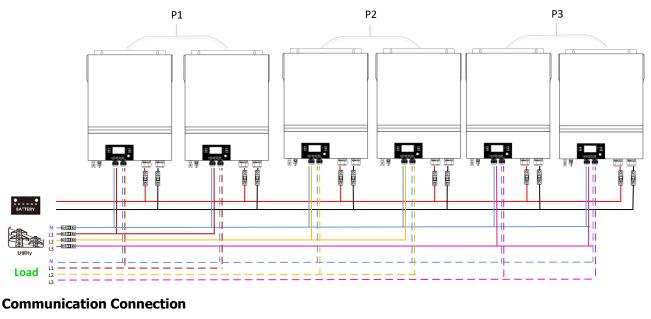


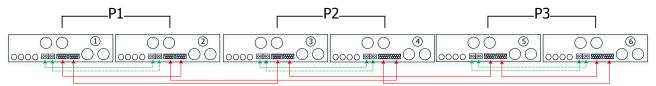


4-2. Support 3-phase equipment

Two inverters in each phase:

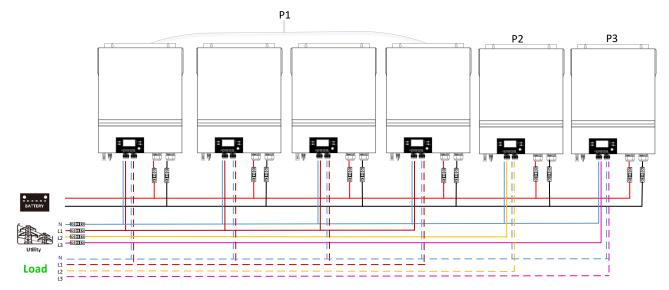
Power Connection

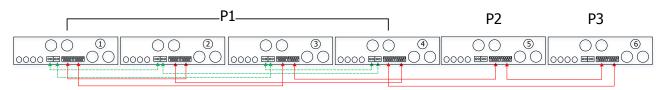




Four inverters in one phase and one inverter for the other two phases:

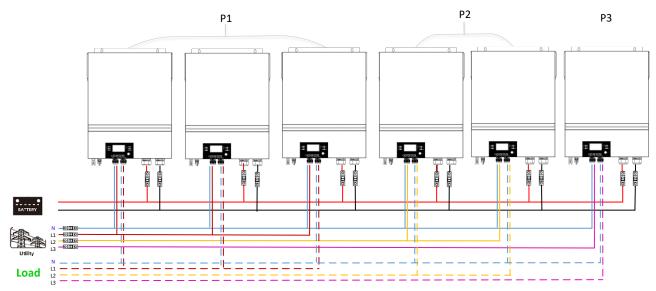
Power Connection



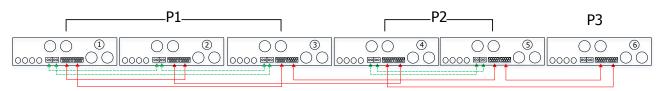




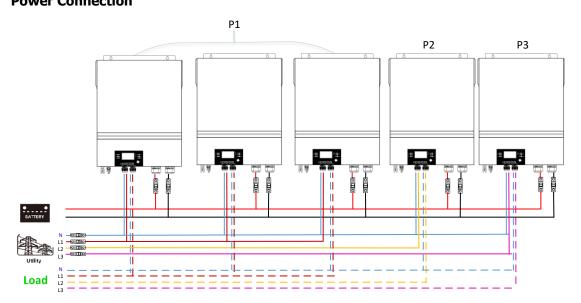
Three inverters in one phase, two inverters in second phase and one inverter for the third phase: **Power Connection**

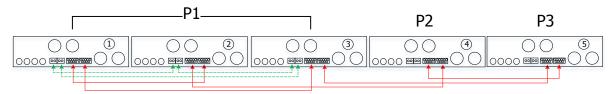


Communication Connection



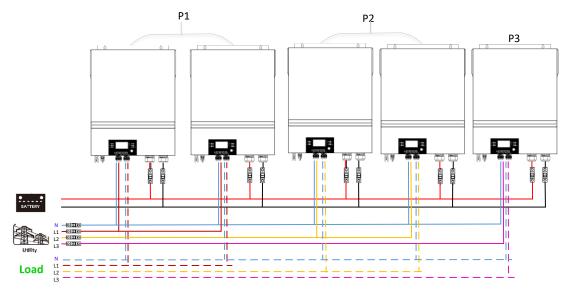
Three inverters in one phase and only one inverter for the remaining two phases: **Power Connection**



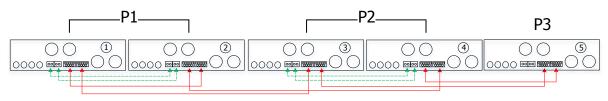




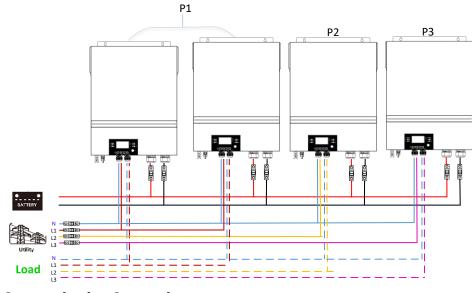
Two inverters in two phases and only one inverter for the remaining phase: **Power Connection**

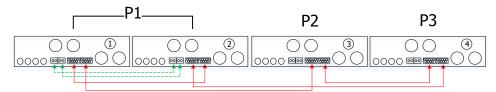


Communication Connection



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

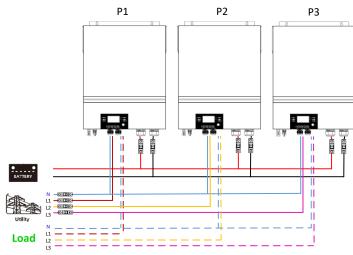




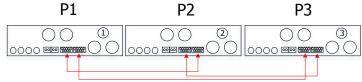


One inverter in each phase:

Power Connection



Communication Connection



WARNING

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

5. PV Connection

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





6. LCD Setting and Display

Setting Program:

Program	Description	Selectable option	on
		Single	When the unit is operated alone, please select "SIG" in program 28.
		SIG	
		Parallel	When the units are used in parallel for single phase application, please select "PAL" in program 28. Please
		PRL	refer to 5-1 for detailed information.
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.	L1 phase:	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 6 inverters
20		381	to support three-phase equipment. It's required to have at least one
		L2 phase:	inverter in each phase or it's up to four inverters in one phase. Please refers to 4-2 for detailed information.
		365	Please select "3P1" in program 28 for the inverters connected to L1
		L3 phase:	phase, "3P2" in program 28 for the inverters connected to L2 phase and "3P3" in program 28 for the inverters connected to L3 phase.
		383	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.



Fault code display:

Fault Code	Fault Event	Icon on
60	Power feedback protection	F68
71	Firmware version inconsistent	
72	Current sharing fault	512
80	CAN fault	F80
81	Host loss	F8 }
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

Code Reference:

Code	Description	Icon on
NE	Unidentified unit master or slave	
HS	Master unit	HS
SL	Slave unit	

7. Commissioning

Parallel in single phase

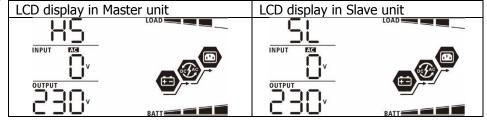
Step 1: Check the following requirements before commissioning:

- 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.

NOET: It's necessary to turn off switch when setting LCD program. Otherwise, the setting cannot be programmed.

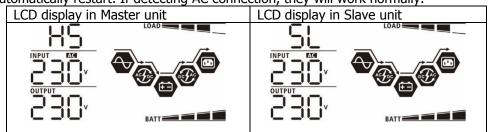
Step 3: Turn on each unit.



NOTE: 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 connection, they will work normally.



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.

Support three-phase equipment

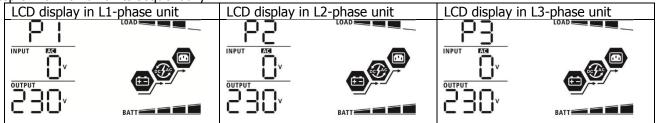
Step 1: Check the following requirements before commissioning:

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

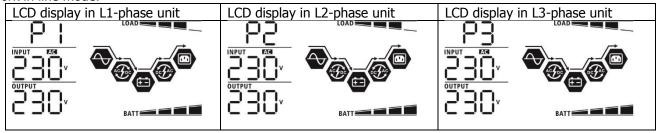
Step 2: Turn on all units and configure LCD program 28 as P1, P2 and P3 sequentially. And then shut down all units.

NOET: It's necessary to turn off switch when setting LCD program. Otherwise, the setting cannot be programmed.

Step 3: Turn on all units sequentially.



Step 4: Switch on all AC breakers of Line wires in AC input. If AC connection is detected and three phases are matched with unit setting, they will work normally. Otherwise, the AC icon \heartsuit will flash and they will not work in line mode.



Step 5: If there is no more fault alarm, the system to support 3-phase equipment 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.

Note 1: To avoid overload occurring, before turning on breakers in load side, it's better to have whole system in operation first.

Note 2: Transfer time for this operation exists. Power interruption may happen to critical devices, which cannot bear transfer time.



8. Trouble shooting

	Situation	
Fault Code	Fault Event Description	Solution
60	Current feedback into the inverter is detected.	 Restart the inverter. Check if L/N cables are not connected reversely in all inverters. For parallel system in single phase, make sure the sharing are connected in all inverters. For supporting three-phase system, make sure the sharing cables are connected in the inverters in the same phase, and disconnected in the inverters in different phases. If the problem remains, please contact your installer.
71	The firmware version of each inverter is not the same.	 Update all inverter firmware to the same version. Check the version of each inverter via LCD setting and make sure the CPU versions are same. If not, please contact your instraller to provide the firmware to update. After updating, if the problem still remains, please contact your installer.
72	The output current of each inverter is different.	 Check if sharing cables are connected well and restart the inverter. If the problem remains, please contact your installer.
80	CAN data loss	1. Check if communication cables are connected well and restart the
81	Host data loss	inverter.
82	Synchronization data loss	2. If the problem remains, please contact your installer.
83	The battery voltage of each inverter is not the same.	 Make sure all inverters share same groups of batteries together. Remove all loads and disconnect AC input and PV input. Then, check battery voltage of all inverters. If the values from all inverters are close, please check if all battery cables are the same length and same material type. Otherwise, please contact your installer to provide SOP to calibrate battery voltage of each inverter. If the problem still remains, please contact your installer.
84	AC input voltage and frequency are detected different.	 Check the utility wiring conncetion and restart the inverter. Make sure utility starts up at same time. If there are breakers installed between utility and inverters, please be sure all breakers can be turned on AC input at same time. If the problem remains, please contact your installer.
85	AC output current unbalance	 Restart the inverter. Remove some excessive loads and re-check load information from LCD of inverters. If the values are different, please check if AC input and output cables are in the same length and material type. If the problem remains, please contact your installer.
86	AC output mode setting is different.	 Switch off the inverter and check LCD setting #28. For parallel system in single phase, make sure no 3P1, 3P2 or 3P3 is set on #28. For upporting three-phase system, make sure no "PAL" is set on #28. If the problem remains, please contact your installer.



Appendix II: BMS Communication Installation

1. Introduction

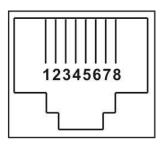
If connecting to lithium battery, it is recommended to purchase a custom-made RJ45 communication cable. Please check with your dealer or integrator for details.

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

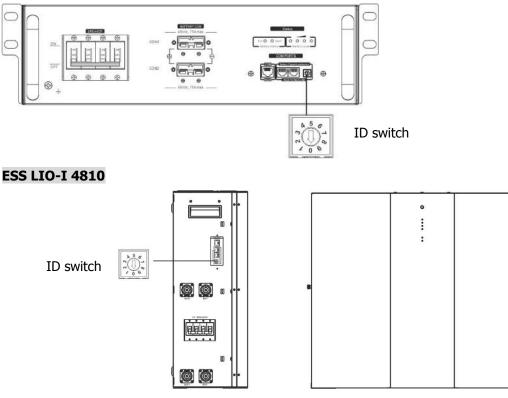
- Re-configure charging voltage, charging current and battery discharge cut-off voltage according to the lithium battery parameters.
- Have the inverter start or stop charging according to the status of lithium battery.

	Definition
PIN 1	RS232TX
PIN 2	RS232RX
PIN 3	RS485B
PIN 4	NC
PIN 5	RS485A
PIN 6	CANH
PIN 7	CANL
PIN 8	GND



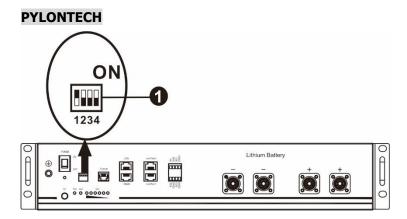


3. Lithium Battery Communication Configuration LIO-4810-150A



ID Switch indicates the unique ID code for each battery module. It's required to assign a unique ID to each battery module for normal operation. We can set up the ID code for each battery module by rotating the PIN number on the ID switch. From number 0 to 9, the number can be random; no particular order. Maximum 10 battery modules can be operated in parallel.

FRGY



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.

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

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

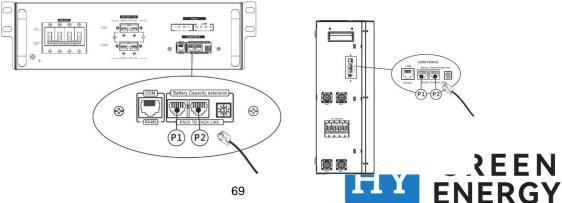
NOTE: The maximum groups of lithium battery is 5 and for maximum number for each group, please check with battery manufacturer.

4. Installation and Operation

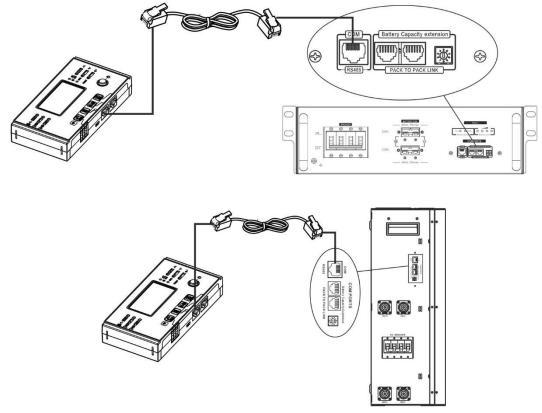
LIO-4810-150A/ESS LIO-I 4810

After ID no. is assigned for each battery module, please set up LCD panel in inverter and install the wiring connection as following steps.

Step 1: Use supplied RJ11 signal cable to connect into the extension port (P1 or P2).



Step 2: Use supplied RJ45 cable (from battery module package) to connect inverter and Lithium battery.



* For multiple battery connection, please check battery manual for the details.

Note for parallel system:

- 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 "LIB" in LCD program 5. Others should be "USE".

Step 3: Turn the breaker switch "ON". Now, the battery module is ready for DC output.



Step 4: Press Power on/off button on battery module for 5 secs, the battery module will start up. *If the manual button cannot be approached, just simply turn on the inverter module. The battery module will be automatically turned on.

Step 5: Turn on the inverter.



Step 6. Be sure to select battery type as "LIB" in LCD program 5.



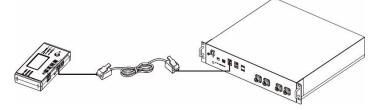
05 👁

LIБ

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

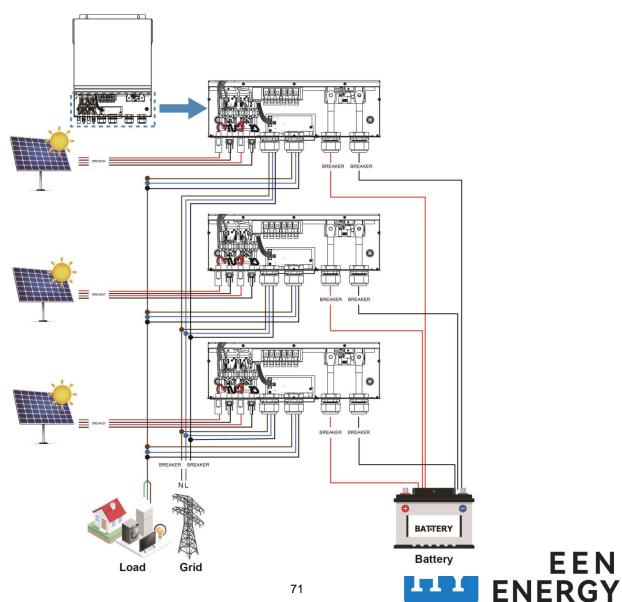
PYLONTECH

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.



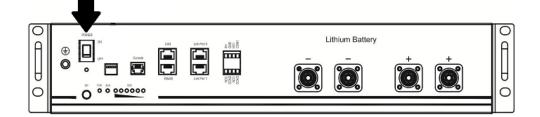
Note for parallel system:

- 3. Only support common battery installation.
- 4. 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".

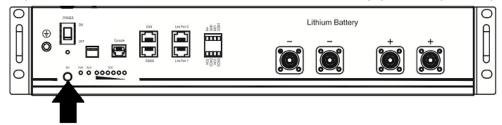




on LCD display will



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.

05 🛛

PYL

If communication between the inverter and battery is successful, the battery icon

flash. Generally speaking, it will take longer than 1 minute to establish communication.

Active Function

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.



on LCD display will

5. LCD Display Information

Press " \bigstar " or " \bigstar " 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

5. Code Reference

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.	
5 🗠	 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 0	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.
59 @	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.	
][]@	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.	
	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. 73	HY GREEN ENERGY

Appendix III: The Wi-Fi Operation Guide in Remote Panel

1. Introduction

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.



2. WatchPower App

2-1. Download and install APP

Operating system requirement for your smart phone:

Android system supports Android 5.0 and above

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



Android

iOS system

system

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

2-2. Initial Setup

Step 1: Registration at first time

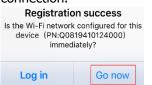
After the installation, please tap the shortcut icon it to access this APP on your mobile screen. In the screen, tap "Register" to access "User Registration" page. Fill in all required information and scan the remote box PN by tapping icon. Or you can simply enter PN directly. Then, tap "Register" button.



V 1.0.0	ati ❤ P+2:18 √ 90%.■
Please enter user name	Please enter user name
Please enter the password	Please enter the password
Remember Me	Please enter the password
Login	Please enter email
	Please enter the phone number
Wi-Fi Config	Please enter the Wi-Fi Module PN

Don't have an account?Please Register

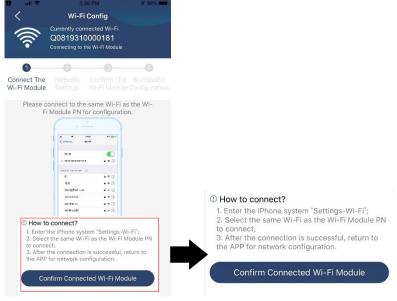
Then, a "Registration success" window will pop up. Tap "Go now" to continue setting local Wi-Fi network connection.



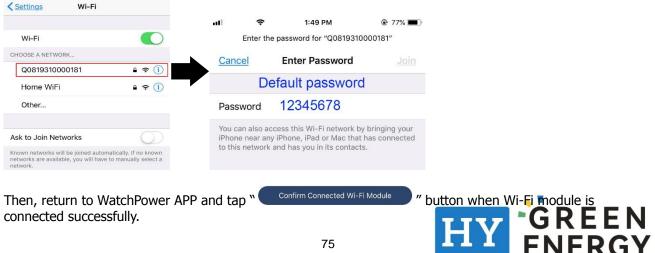
Wi-Fi

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". 1:49 PM 77% .11



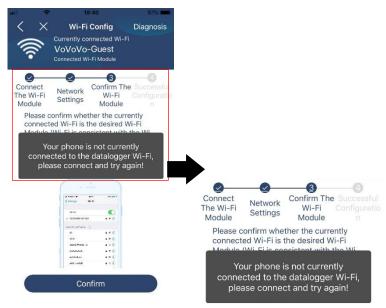
Step 3: Wi-Fi Network settings



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.



al 🗢 5:51 PM @ 95% 페)	aril 🗢 5:51 P	M 💿 95% 💳
K Network diagnostics	K Network dia	gnostics
Inverter Datalogger Router Server	Inverter Datalogger	Router Server
Repair suggestion Rediagnosis	Repair suggestion	Rediagnosis
The Inverter and the datalogger communicate abnormally.		
 Please check if the Inverter and the datalogger are powered on normally. 		
 Please check if the Inverter address is between 1 and 5. 	The diagnosis is	successful!
 Please check if the connection between the inverter and the collector is abnormal, such as poor contact caused by oxidation or looseness of the interface, reverse connection of the 485 interface AB line, and data line damage. 		
 Try restarting the Inverter and datalogger to see if the anomaly is eliminated. 		
Datalogger and router communication abnormalities		
 Please confirm that the wireless routing network setting has been made. 		
 Make sure that the datalogger is set up to connect to AP hotspots sent by hardware devices such as wireless routers instead of virtual AP hotspots. 		

2-3. Login and APP Main Function

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.

Carrier 🗢	r 🗢 6:10 PM 🛛					
	Overvie	w				
			1			
Devices	 Offline 		0			
	 Alarm 		0			
			0			
Energy						
Current Power:0.	1kW Tod	ay Power: <mark>0.0kWh</mark>				
0.15						
0.12						
0.09						
0.06						
0.03						
0.00						
	6 8 10 12	14 16 18 20 2	2 24 H			
Overview	Devices	E	3			

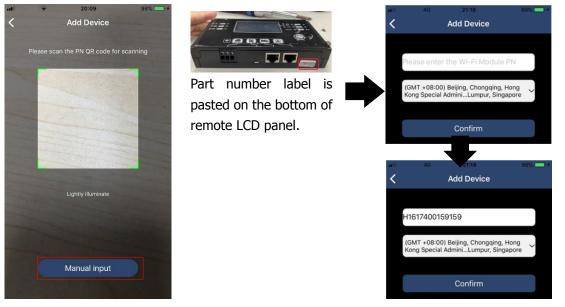


Devices

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.

Add device			Delete	device		
Carrier 🗢 6:10 PM			ul 🗢	3:02 PM		4% (
Device List		\oplus		Device List		\oplus
Q Please enter the alias or sn of	device		Q Please ente	er the alias or S	N of device	
All status 🗸	Alias A-Z 🗸		All status	~	Alias A-Z 🗸	
• 92931706103012 Device SN:92931706103012 Wi-Fi Module PN:Q081931001	4063	>	 10031706103 Device SN:1003170 Datalogger PN:Q08 	06103300	> 1	Delete
			Device	31706103300 SN:100317061033 Iger PN:Q081936(>
	8		Overview	Devices	8)
Dentes	W/G		CASI VIEW	Devices	WIG.	

Tap (f) icon on the top right corner and manually enter part number to add device. This part number label is pasted on the bottom of remote LCD panel. After entering part number, tap "Confirm" to add this device 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.



			Carrier 🗢	7:04 PM Account Security	-
Carrier 🗢	7:04 PM	-	Modify Passw	vord	>
	Ме		Carrier 🗢	7:04 PM Modify Password	-
		Cloud Walker	Set the WatchPe WatchPower wit	ower password, you can logir h your account	directly to
		Owner	My account		Cloud Walker
1 Devices		0 Alarms	Old password	Please enter th	ne old password
Account Security	/	>	New password	Please enter the	e new password
About		>	Confirm passw	ord Enter new	password again
(o) Clear Cache		1.62KB			_
	Log Out			Confirm	

2-4. Device List

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.

Q F	♥ De Please enter the	2:15 PM evice List alias or SN of o	e 70%	ul 🗢	2:05 PM Device List the alias or SN o	70%	att ♥ 5:25 PM 10031706103300 Battery Mode	 € 62% ▲ ▲<!--</th-->
	<u>All status</u> ∽	Alias	<u>A-Z</u> ~	<u>All status</u> ~	Ali	ias A-Z ∽	INVERTER	0.05
	and a strength	own to refresh ated: Today 14:15 6103300	U	Device SM	1706103300 v:10031706103300 er PN:Q0819310000	> 1181		- <mark></mark> 20.27
)31706103300 J:Q081931000018	>				Basic Information	product Info
	Datalogger PN	1:0081931000018					Grid Voltage	0.0V
							Grid Frequency	0.0Hz
	•						PV Input Voltage	0.0V
							Battery Voltage	26.2V
							Battery Capacity	100%
							Battery Charging Current	OA
							Battery Discharge Current	OA
			-				AC Output Voltage	229.5V
	Overview	Devices	8 Me	Overview	Devices	(B) Me	AC Output Frequency	60.0Hz

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].

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



[Line Mode] Inverter will power the load from the utility with or without PV charging. Qualified utility or PV source can charge battery.



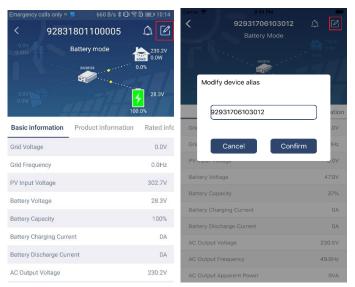


[Battery Mode] Inverter will power the load from the batter with or without PV charging. Only PV source can charge battery.



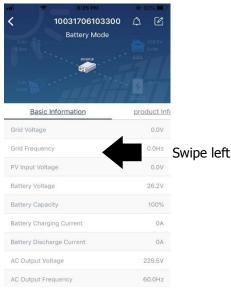
Device Alarm and Name Modification

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.



[Basic Information] 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.

[Production Information] displays Model type (Inverter type), Main CPU version, Bluetooth CPU version and secondary CPU version.



[Rated Information] 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.

(History) displays the record of unit information and setting timely.

[Wi-Fi Module Information] 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.

Parameter setting list:

Item		Description
Output setting Output source		To configure load power source priority.
	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	To set output frequency.
	frequency	
Battery	Battery type:	To set connected battery type.
parameter	Battery cut-off	To set the battery stop discharging voltage.
setting	voltage	Please see product manual for the recommended voltage range
		based on connected battery type.
	Back to grid	When "SBU" or "SOL" is set as output source priority and battery
	voltage	voltage is lower than this setting voltage, unit will transfer to line mode
		and the grid will provide power to load.
	Back to	When "SBU" or "SOL" is set as output source priority and battery
	discharge	voltage is higher than this setting voltage, batter wil Re allower
		⁸¹ ENERGY

	voltage	discharge.
	Charger source	To configure charger source priority.
	priority:	
	Max. charging	
	current	
	Max. AC	It's to set up battery charging parameters. The selectable values in different inverter model may vary.
	charging current:	Please see product manual for the details.
	Float charging	
	voltage	
	Bulk charging	It's to set up battery charging parameters. The selectable values in
	voltage	different inverter model may vary. Please see product manual for the details.
	Battery	Enable or disable battery equalization function.
	equalization	
	Real-time	It's real-time action to activate battery equalization.
	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	To set up the battery equalization voltage.
	Voltage	To set up the battery equalization voltage.
Enable/Disable	LCD Auto-return	If enable, LCD screen will return to its main screen after one minute
Functions	to Main screen	automatically.
	Fault Code	If enabled, fault code will be recorded in the inverter when any fault
	Record	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
	Deene while	battery mode.
	Beeps while	If enabled, buzzer will alarm when primary source is abnormal.
	primary source	
	interrupt Over	If disabled, the unit won't be restarted after over-temperature fault is
	Temperature	solved.
	Auto Restart	501VCd.
	Overload Auto	If disabled, the unit won't be restarted after overload occurs.
	Restart	In disabled, the unit work be restarted after overload occurs.
	Buzzer	If disabled, buzzer won't be on when alarm/fault occurred.
	Enable/disable	Turn on or off RGB LEDs
	Brightness	Adjust the lighting brightness
RGB LED Setting	Speed	Adjust the lighting speed
j	Effects	Change the light effects
	Color selection	Adjust color combination to show energy source an battery status
Restore to the	This function is to r	estore all settings back to default settings.
default		
	•	GREEN