USER MANUAL

Hybrid Inverter

4.2KW/6.2KW/9.2KW

Inverter/MPPT Controller/AC Charger

Tips: Please read this manual carefully and keep it for future reference or setting needs!

Table of contents

1 About This Manual

1.1 Purpose

This manual describes the operation and troubleshooting of this unit, please read this manual carefully before operation.

1.2 Scope

This manual provides information on safety and operating instructions.

2 Safety Instructions

⚠ **WARNING : This chapter contains important safety and operating instructions.**

1. Before using the unit, read all instructions and cautionary markings in all appropriate sections of this manual.
2. **CAUTION –** To reduce the risk of injury, the default charging method is "deep cycle lead-acid rechargeable battery". If you need to charge other types of batteries (such as lithium batteries), please consult the battery manufacturer before using this inverter/charger to see if it meets the requirements to avoid possible battery explosion, 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 reassembly may result in a risk of electric shock or fire.
4. To reduce the risk of electric shock, disconnect all power wiring or circuit breakers before attempting any maintenance or cleaning. Turning off the (POWER) switch will not reduce this risk.
5. **CAUTION –**Only qualified service personnel can use / install / operate this equipment, and **NEVER** charge a frozen battery.to charge the frozen battery.
6. 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.
7. Be very cautious when working with metal tools on or around batteries. A potential risk exists to throw a tool to spark or short circuit could cause an explosion.
8. 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.
9. 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.
10. NEVER cause AC output and DC input to short-circuit. DO NOT connect to the mains when DC input is short-circuited.
11. **Warning!** Only qualified service personnel are able to use, install, or operate this unit. If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for repair/maintenance.

3 Introduction

This unit is a multi-function hybrid inverter, combining the functions of an inverter, solar charger, AC charger, and battery charger, and supporting uninterrupted power in a single package. The comprehensive LCD offers user-configurable and easily accessible button operations such as battery charging current, AC or solar charging priority, and acceptable input voltage based on different applications.

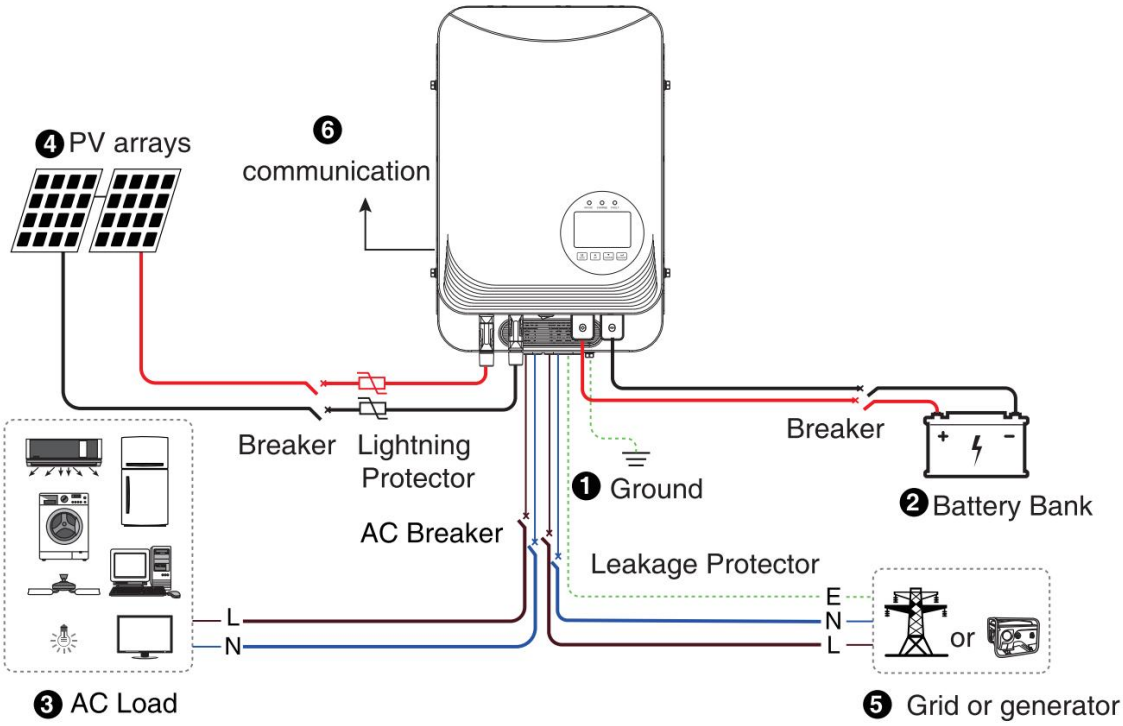
3.1 **Features**

- Pure sine wave output
- Configurable input voltage range
- Configurable battery charging voltage
- Configurable battery float charge voltage
- Configurable battery charging current
- Configurable battery hybrid charging
- Configurable grid and solar charger priority
- Configurable AC output voltage
- Configurable AC output frequency
- Configurable UPS mode conversion priority
- Configurable LCD display page turning mode
- Compatible with power supply or generator,
- Complete protection circuit and monitoring system
- Smart battery charger design with optimize battery performance, and battery equalization mode

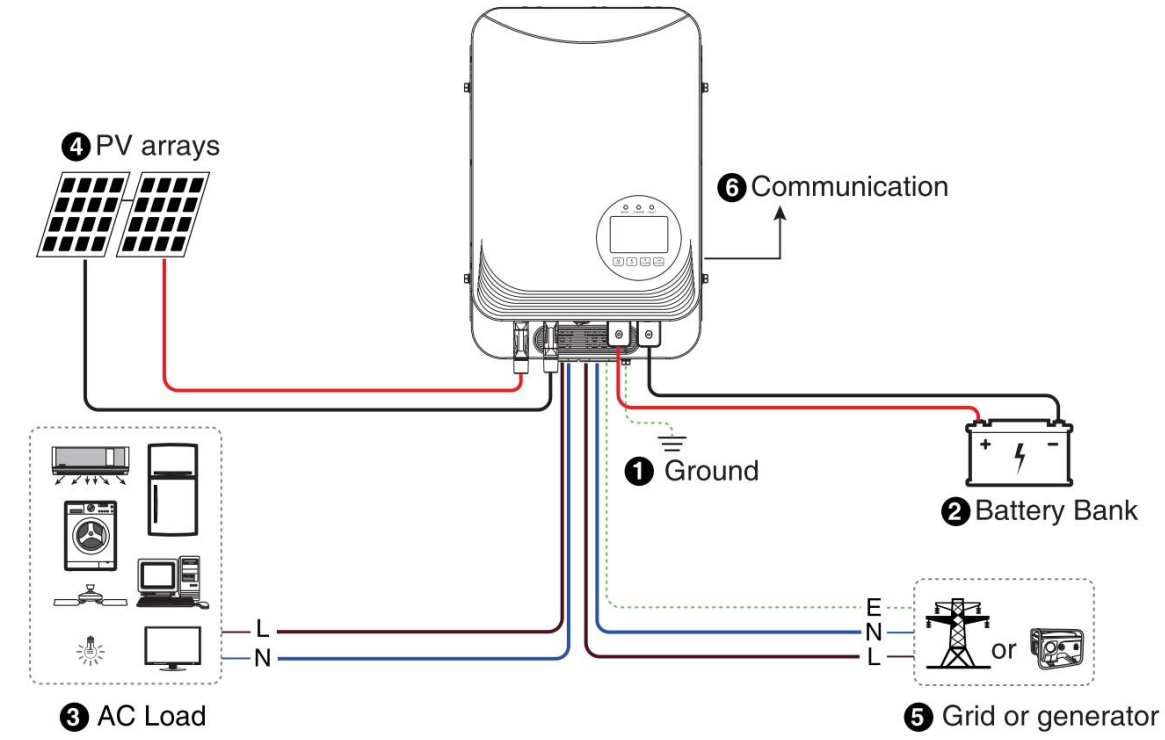
3.2 **Basic System Architecture**

The following illustration shows basic application for this unit. It also required Generator or Utility mains and PV modules to have a complete running system.

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.

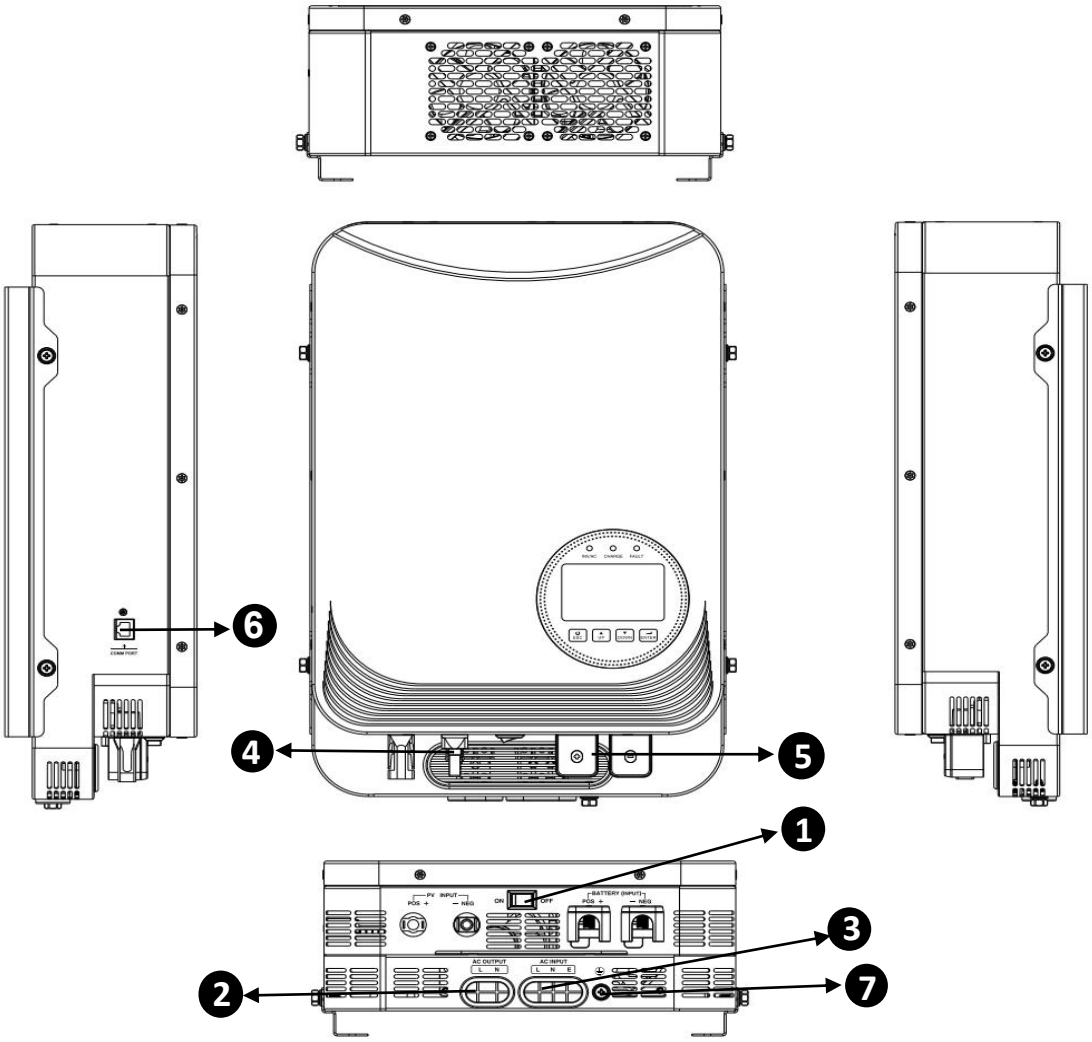


Hybrid inverter assembly diagram



Integrated Combiner Box Hybrid Inverter assembly diagram

3.3 **Product Overview**



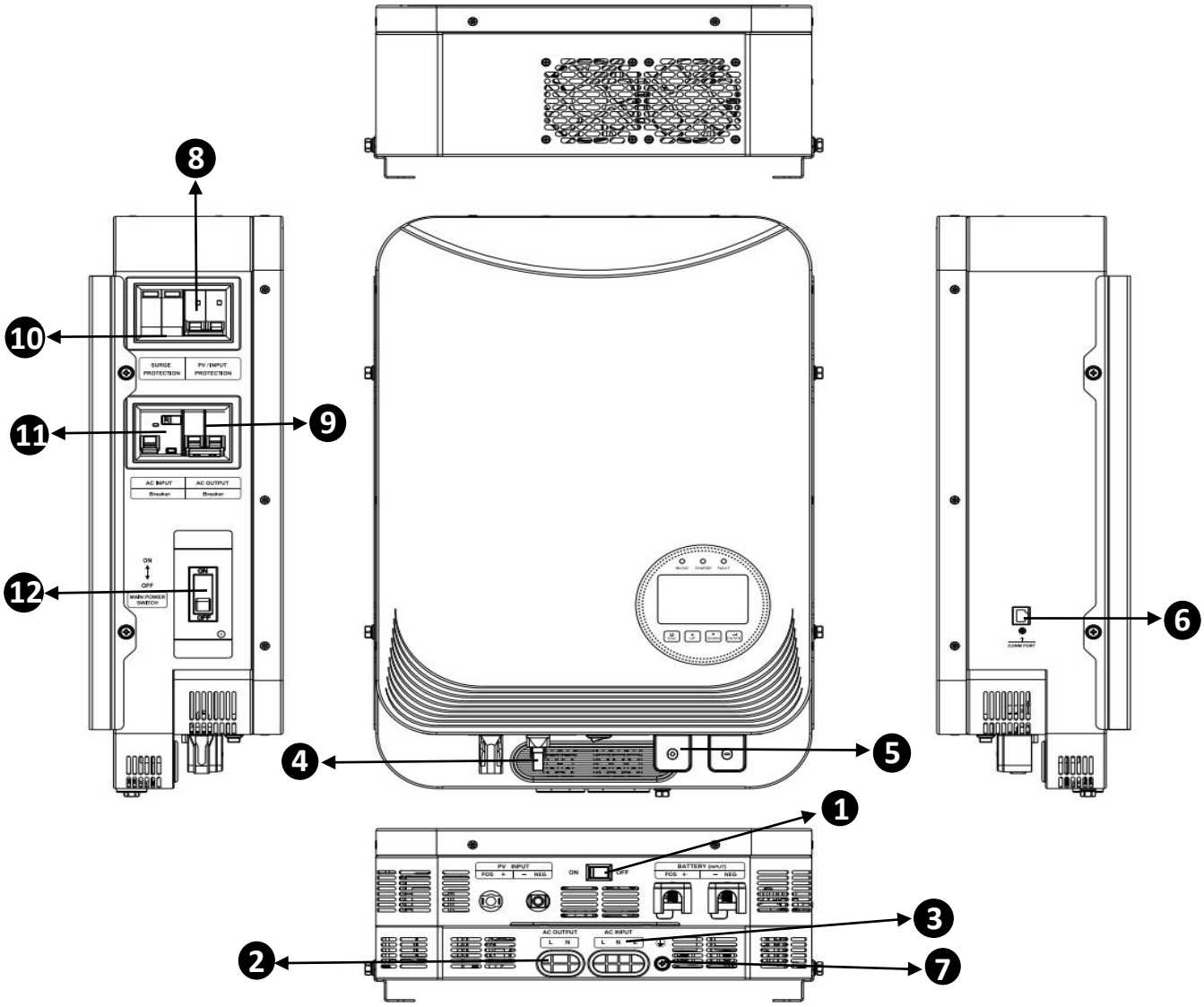
---------- Hybrid Inverter Overview----------

① **POWER Switch** ② **AC output Connectors** (Load Connector)

③ **AC Input Connector** ④ **PV Input Connector**

⑤ **Battery Input Connector** ⑥ **Communication port**

⑦ **PG Grounding/Earth**



----- Integrated Combiner Box Hybrid Inverter assembly diagram Overview------

① **POWER Switch** ②**AC output AC output Connectors** (Load Connector)

③ **AC Input Connector** ④ **PV Input Connector**

⑤ **Battery Input Connector** ⑥ **Communication port**

⑦ **PG Grounding/Earth** ⑧ **PV Input Circuit Breaker**

⑨ **AC output circuit breaker** ⑩ **PV Input lightning Protector**

⑪ **AC Input Leakage Protector** ⑫ **Battery Circuit Breaker**

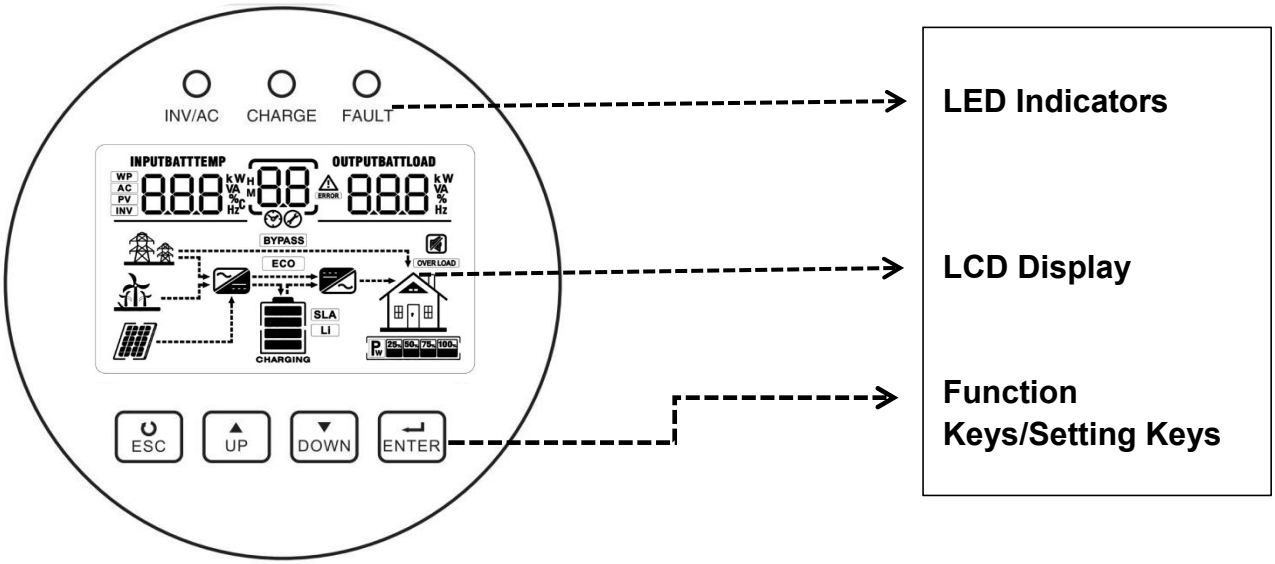
4 Operation

4.1 **Power ON/OFF**

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

4.2 **Operation and display panel**

The operation and the LCD module, shown in the chart below, includes three LED indicators, four touchable function keys and a LCD display to indicate the operating status and input/output power information.

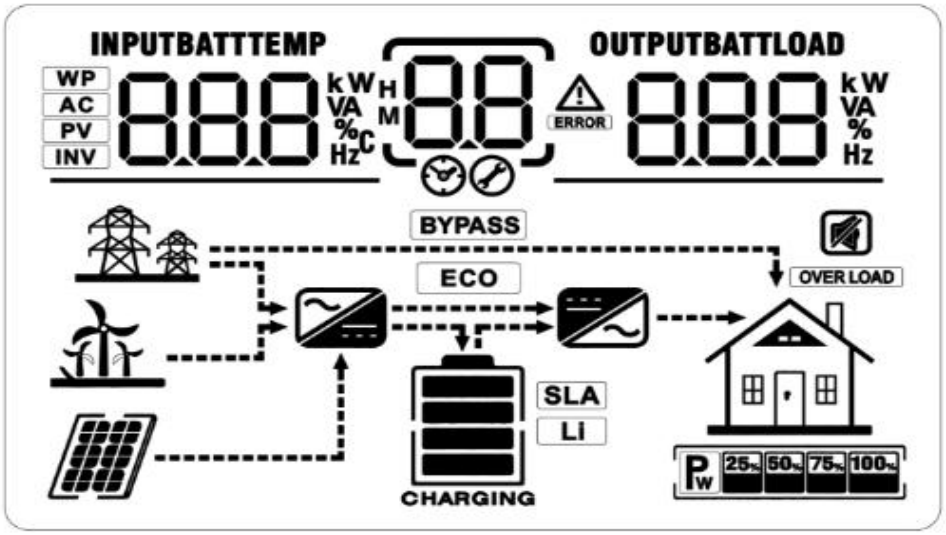


LED Indicator			Information
AC INV	Green	Always on	Powered by mains electricity
		Flash	Output powered by battery or PV in battery mode
GHARGE	Green	Always on	Battery fully charged
		Flash	Charging
FAULT	Red	Always on	Inverter failure
		Flash	Warning condition in the inverter

Function key/setting key

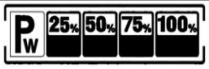
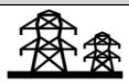
Function keys	Description
ESC	To exit the setting
UP	To last selection
DOWN	To next selection
ENTER	To confirm/enter the selection in setting mode

4.3 LCD Display Icons



4.4 Display Icon Introduction

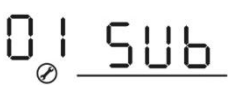
Icon	Function Description
Input Source Information	
AC	Indicates the AC mains electricity input
PV	Indicates the PV photovoltaic input
INPUTBATT 888 kW VA % °C Hz	Indicates the input voltage, input frequency, PV voltage, charging current, charging power, battery voltage.
Configure Program and Fault Information	
88	Indicates the setting programs
88 ERROR	Indicates the warning and fault codes. Warning : 88 flashing with warning code Fault : 88 ERROR Lighting with fault code
Output Information	

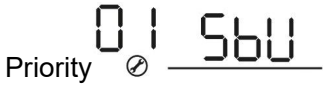
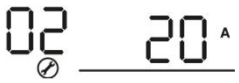
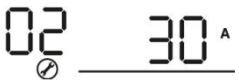
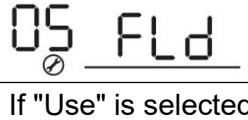
<table>
<tr><td> 
</td><td>Indicates the output voltage, output frequency, load percentage, VA load, load power and discharging current</td></tr>
<tr><td colspan="2">Battery Information</td></tr>
<tr><td> 
</td><td>Indicates Battery level in battery mode
They are : 0-24%, 25-49%, 50-74%, 75-100%</td></tr>
<tr><td colspan="2">1) In AC mains mode, it will display the battery charging status , with the battery level blinking incrementally until the battery is fully charged.
2) In BAT battery mode, it will display the battery charging status.</td></tr>
<tr><td colspan="2">Load information</td></tr>
<tr><td> 
</td><td>Indicates overload</td></tr>
<tr><td rowspan="3">  </td><td colspan="4">Indicates the load level by 0-24%, 25-49%, 50-74% , 75-100%</td></tr>
<tr><td>0%~24%</td><td>25%~49%</td><td>50%~74%</td><td>75%~100%</td></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
<tr><td colspan="2">Mode Operation Information</td></tr>
<tr><td>  </td><td>Indicates that the inverter is connected to the utility.</td></tr>
<tr><td>  </td><td>Indicates that the inverter has been connected to the solar power</td></tr>
<tr><td> 
</td><td>Indicates that the load is directly powered by the mains electricity (UPS bypass)</td></tr>
<tr><td>  </td><td>Indicates that the the mains electricity is charging/working (charging)</td></tr>
<tr><td>  </td><td>Indicates that DC to AC is working (inversion)</td></tr>
<tr><td colspan="2">Mute Operation</td></tr>
<tr><td>  </td><td>Indicates that the alarm prompt (buzzer) has been disabled</td></tr>
</table>

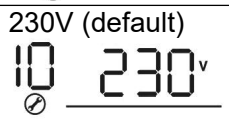
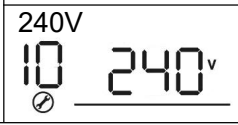
4.5 Hybrid Inverter Parameter Settings

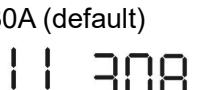
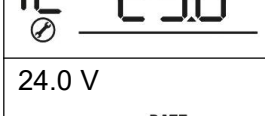
After pressing and holding the ENTER button for 3 seconds, the unit will enter the set mode. Press the "UP" or "DOWN" button to select setting programs. Press the "ENTER" button to confirm your selection or press the ESC button to exit.

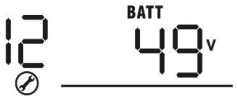
Setting program:

Program	Description	Options to select	
00	Exit Settings Mode	Escape 	
01	Output source priority setting: To configure load power priority	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.
		SUB Solar First 	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, The battery energy will supply power to the loads at the same time. The battery simultaneously supplies power to the load only if any of the following occurs: --No solar power supply --Battery voltage drops to low warning voltage --Set voltage point in program 12

		SBU Global Auto 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 only when battery voltage drops to either low level warning voltage or the setting point in program 12.
02	PV + AC hybrid charging Maximum charging current setting Max. charging current=Utility charging current + solar charging current	10A 	20A 
		30A 	40A 
		50A 	60A (default) 
		70A 	80A 
		90A 	100A 
03	AC input voltage range	Appliances (default) 	AC input range within 90-280VAC
		UPS 	AC input range within 170-280VAC
05	Battery Type Settings	Battery (defaul  t)	Lithium battery (lithium battery can be activated by feeding) 
		User-Defined 	If "Use" is selected, battery charge voltage and low DC cut-off voltage can be set up in programs 26/27 and 29.
06	Auto restart when overload occurs	Restart disable (default) 	Restart enable 

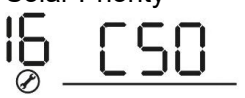
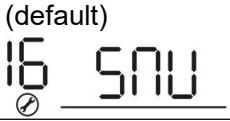
07	Auto restart when over temperature occurs	Restart disable (default) 	Restart enable 
09	Output frequency setting	50Hz (default) 	60Hz 
10	Inverter output voltage setting	220V 	230V (default) 
		240V 	

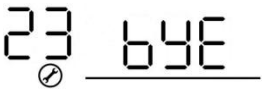
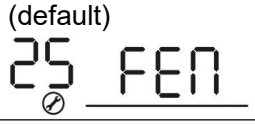
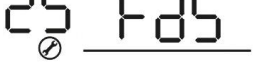
11	Maximum utility charging current If the setting value of program 02 is smaler than that in program 11, the inverter will apply charging current from 02 for the AC charger.	2A 	10A 
		20A 	30A (default) 
		40A 	50A 
		60A 	80A 
12	Setting battery low voltage point back to utility source when selecting “SBU” (SBU priority) in program 01 24V battery: Default 23V switches to utility 48V battery: Default 46V switches to utility	Configurable options on 24V battery:	
		22.0 V 	22.5 V 
		23.0 V (default) 	23.5 V 
		24.0 V 	24.5 V 
		25.0 V 	25.5 V 

<table>
<tr><td></td><td></td><td colspan="2">Configurable options on 48V battery:</td></tr>
<tr><td></td><td></td><td>44V
  </td><td>45V
  </td></tr>
<tr><td></td><td></td><td>46V (default)
  </td><td>47V
  </td></tr>
<tr><td></td><td></td><td>48V
  </td><td>49V
  </td></tr>
<tr><td></td><td></td><td>50V
  </td><td>51V
  </td></tr>
<tr><td rowspan="8">13</td><td rowspan="8">Setting battery high voltage point back to battery mode
when selecting “SBU” (SBU priority) or “SUB” (SUB priority) in program 01.

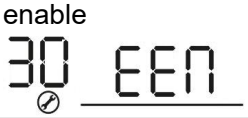
24V battery:
Default 27V Switch back to battery</td><td colspan="2">Configurable options on 24V battery:</td></tr>
<tr><td>Full voltage or full charge
  </td><td>24V
  </td></tr>
<tr><td>24.5 V
  </td><td>25V
  </td></tr>
<tr><td>25.5 V
  </td><td>26V
  </td></tr>
<tr><td>26.5 V
  </td><td>27V (default)
  </td></tr>
<tr><td>27.5 V
  </td><td>28V
  </td></tr>
<tr><td>28.5 V
  </td><td>29V
  </td></tr>
<tr><td colspan="2">Configurable options on 48V battery:</td></tr>
</table>

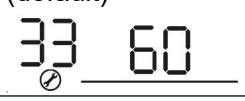
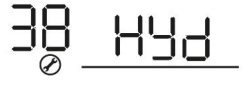
<table>
<tr><td rowspan="6"></td><td rowspan="6">48V battery:
Default 54V Switch back to battery</td><td>Full voltage or full charge
  </td><td>48V
  </td></tr>
<tr><td>49V
  </td><td>50V
  </td></tr>
<tr><td>51V
  </td><td>52V
  </td></tr>
<tr><td>53V
  </td><td>54V (default)
  </td></tr>
<tr><td>55V
  </td><td>56V
  </td></tr>
<tr><td>57V
  </td><td>58V
  </td></tr>
<tr><td rowspan="5">16</td><td rowspan="5">Charger Source Priority

To configure charger priority</td><td colspan="2">If this inverter/charger is working in Line, Standby, or Fault mode, the charger source can be programmed as follows:</td></tr>
<tr><td>Utility grid priority
  </td><td>The utility grid will prioritize charging the batteries, and solar energy will only charge the batteries if there is no utility grid.</td></tr>
<tr><td>Solar Priority
  </td><td>Solar energy gives priority to charging the battery, and the utility grid only charges the battery when solar energy is not available.</td></tr>
<tr><td>Solar and utility grids (default)
  </td><td>Solar and utility grids will simultaneously provide Battery charging.</td></tr>
<tr><td>Only solar energy
  </td><td>Solar energy will be the only source of chargers,
Whether the utility is available or not.</td></tr>
</table>

		If this inverter/charger is working in battery mode or power saving mode, only solar power can charge the battery.	
18	Buzzer Alarm ON/OFF	Alarm on  (default)	Alarm Off 
19	Auto return to the default display screen	Return to default display screen (default)  	No matter how users switch display screen, it will automatically return to default display screen after no button is pressed for 1 minute.
		Stay at the latest screen  	Will stay on the latest display screen. Manual switching to the final display by the user
20	LCD backlight ON/OFF	Backlight on (default)  	Backlight off 
22	Beeps ON/OFF while primary source is interrupted	Alarm on (default)  	Alarm Off 
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default)  	Bypass enable 
25	Record fault code	Records enabled (default)  	Records enabled disable 
26	Bulk charging voltage (C.V Voltage)	24V battery default setting: 28.2 V  	
		48V battery default setting: 56.4 V  	

<table>
<tr><td></td><td></td><td>If a custom program is selected in program 5, this program can be set.
The setting range of 24V battery is 25.0V ~ 31.5V, and increment of each click is 0.1 V
The setting range of 48V battery is 48.0V ~ 61.0V, and increment of each click is 0.1V</td></tr>
<tr><td rowspan="3">27</td><td rowspan="3">Floating charging voltage</td><td>24V battery default setting: 27.0V
  </td></tr>
<tr><td>48V battery default setting: 54.0 V
  </td></tr>
<tr><td>The setting range of 24V battery is 25.0V ~ 31.5V, and increment of each click is 0.1V
The setting range of 48V battery is 48.0V ~ 61.0V, and increment of each click is 0.1V</td></tr>
<tr><td rowspan="3">29</td><td rowspan="3">Low DC cut-off voltage

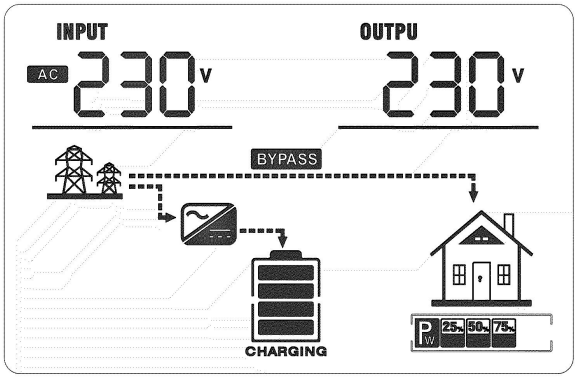
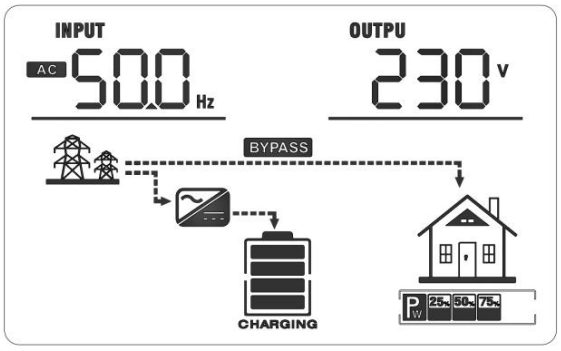
Under-voltage shutdown-POWER setting</td><td>24V battery default setting: 20.0 V
  </td></tr>
<tr><td>48V battery default setting: 40.0 V
  </td></tr>
<tr><td>If a custom program is selected in program 5, this program can be set.
The setting range of 24V battery is 20.0V ~ 24.0V, and increment of each click is 0.1 V
The setting range of 48V battery is 40.0V ~ 48.0V, and increment of each click is 0.1 V
The low DC cut-off voltage will be fixed to the set value regardless of the load percentage state</td></tr>
<tr><td rowspan="2">30</td><td rowspan="2">Battery equalization</td><td>Battery equalization enable
  </td><td>Battery equalization disable
(default)  </td></tr>
<tr><td colspan="2">If “User-Defined” is selected in program 05, this program will be configured automatically (invalid in lithium battery mode)</td></tr>
<tr><td>31</td><td>Battery equalization voltage</td><td colspan="2">24V battery default setting: 29.2V
  </td></tr>
</table>

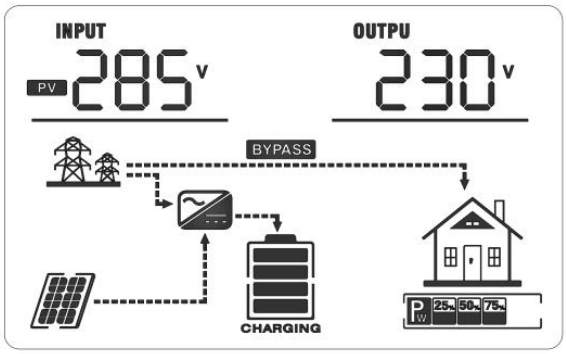
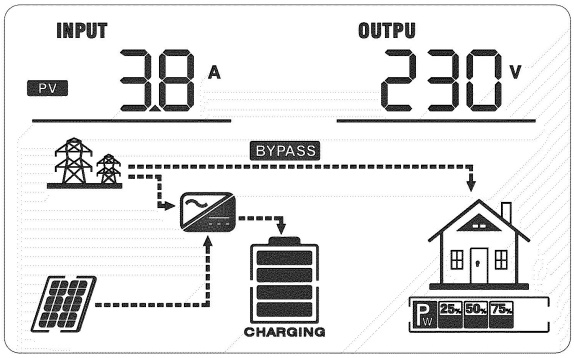
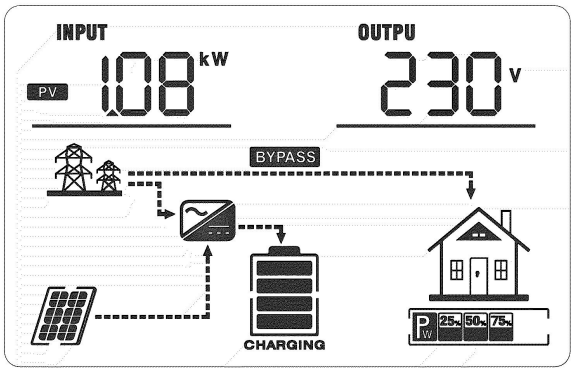
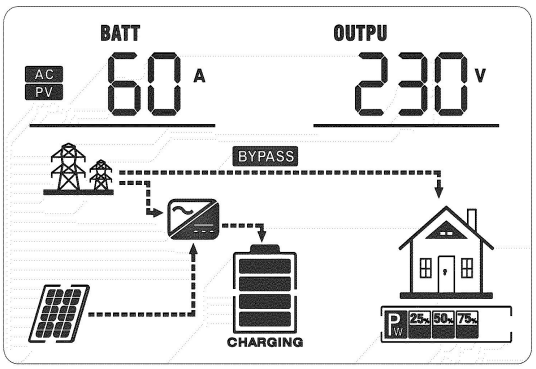
		48V battery default setting: 58.4 V 	
		The setting range of 24V battery is 25.0V ~ 31. V, and increment of each click is 0.1V The setting range of 48V battery is 48.0V ~ 61.0V, and increment of each click is 0.1V	
33	Battery equalized time	60 minutes (default) 	The setting range is 5 minutes to 90 days, Increments of each click is 5 minutes.
34	Battery equalized timeout	120 minutes (default) 	The setting range is 5 minutes to 90 days, Increments of each click is 5 minutes.
35	Battery equalized interval	30 days (default) 	The settings range is 0 to 90 days, Increments of each click is of 1 day.
36	Equalization activated immediately	Enable 	Disabled (default) 
		If equalization function is enabled in the program 30, the program may be set up. If "Enable" is selected in this program, battery equalization will be activated immediately and the LCD home page will display "E9". If "Disable" is selected, it will cancel the equalization function until next activated equalization time arrives based on program 35. At this time," E9" will not be displayed in the LCD home page.	
37	Off-grid/parallel (parallel) mode	Off-grid mode (default) 	The inverter operates in off-grid mode
		Parallel mode/not open 	The inverter operates in parallel (parallel) mode

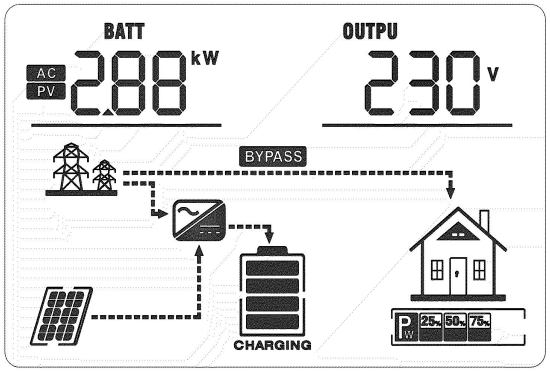
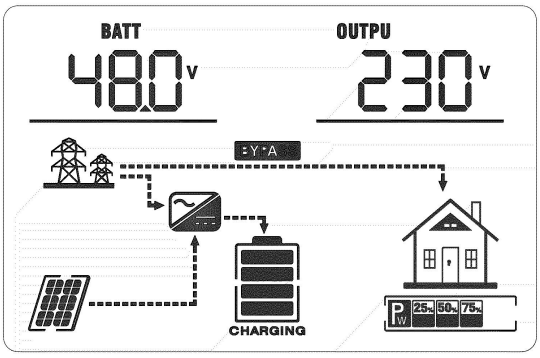
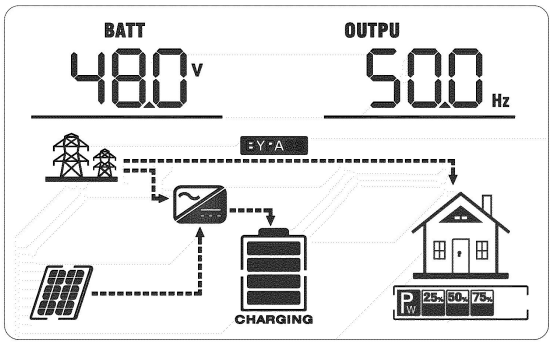
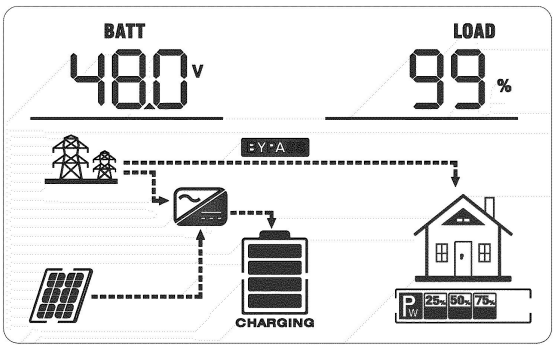
4.6 LCD display /manual page display

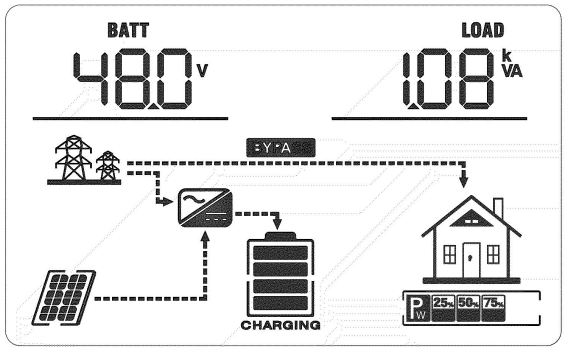
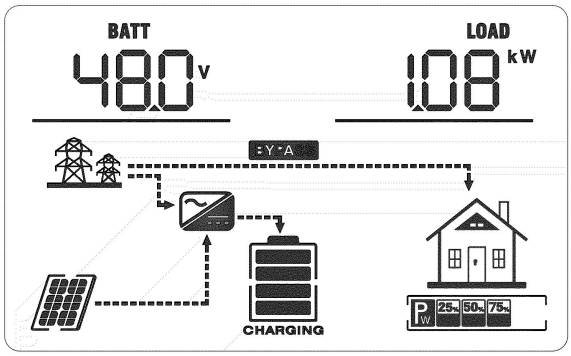
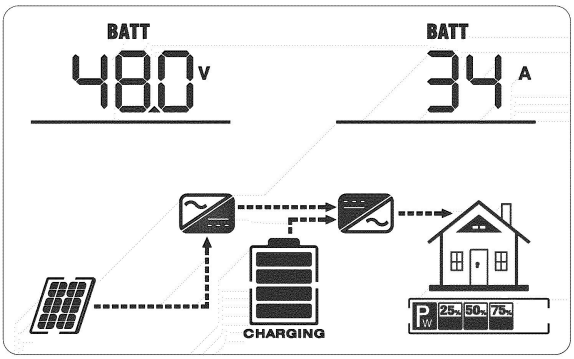
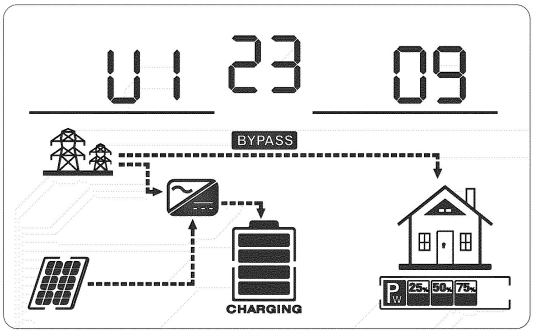
Press the "UP " or " DOWN " to switch the LCD display information in turn.

The information that can be selected or viewed is switched in the following order::Input Voltage, Input Frequency, PV Voltage, Charging Current, Charging Power, Battery Voltage, Output Voltage, Output Frequency, Load Percentage, Watt Load , DC Discharge Current, Version Number.

Optional Information	LCD Display Screen
Utility input voltage (Default display screen)	
Utility input frequency	

PV input voltage	
PV input current	
PV input power	
PV and utility hybrid charging current	

PV and utility hybrid charging power	
Battery voltage	
Battery voltage and output frequency	
Battery voltage and load percentage %	

Battery voltage and load V A	
Battery voltage and load power	
Battery voltage and discharge current	
Main CPU version number	

4.7 Battery Equalization Description

The charge controller adds an equalization function. It reverses the build-up of negative chemical effects such as stratification, a condition where the acid concentration at the bottom of the battery is higher than at the top. Equalization also helps to remove sulfate crystals that may accumulate on the plates. If not controlled, this condition, called sulphation, will reduce the overall capacity of the battery. For this reason, it is recommended to equalize the battery regularly.

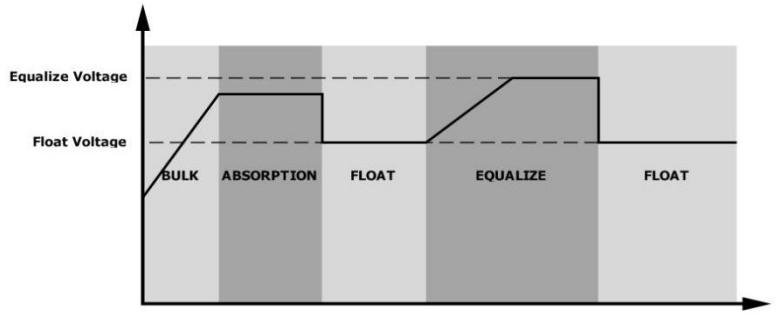
- **How to apply the equalization function**

First, enable the battery equalization function in LCD Setup 30 , then apply this function to the unit by any of the following methods:

1. Set the equalization interval time in program 35.
2. Active equalization immediately in program 36.

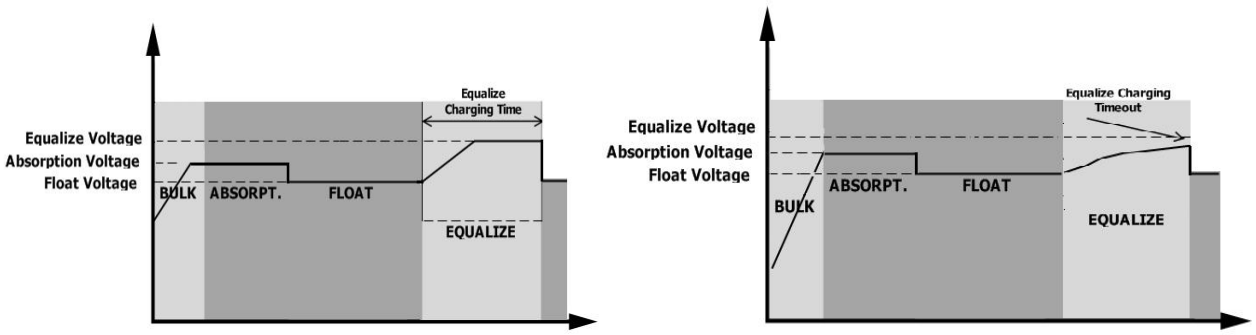
- **When to equalize**

During the float charge phase, the controller will enter the equalization phase when the set equalization interval (battery equalization cycle) is reached, or when equalization is activated immediately.



- **Balanced charging time and timeout time**

During the equalization phase, the controller will charge the battery as much as possible until the battery voltage is increased to the battery equalization voltage. Then, constant voltage regulation is applied to keep the battery voltage at the battery equalization voltage. The battery will remain in the equalization phase until the time to set the battery to equalize is reached.



However, during the equalization phase, when the battery equalization timeout expires and the battery voltage does not rise to the battery equalization voltage point, the charge controller will extend the battery equalization timeout until the battery voltage reaches the battery equalization voltage. When the battery equalization timeout setting ends, if the battery voltage is still lower than the battery equalization voltage, the charge controller will stop equalization

6 Specifications

Table 1: AC Line mode specifications

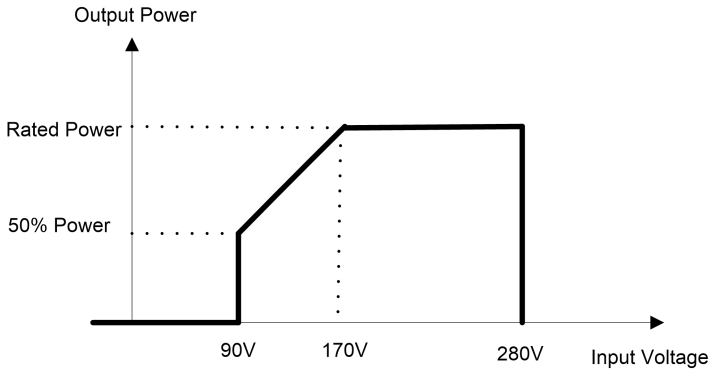
Inverter Model	0918KHP4.2 KW	0918KHP6.2 KW
Input voltage waveform	Sine wave (utility grid or generator)	
Nominal input voltage	230Vac	
Low loss voltage	170Vac±7V (UPS bypass); 90Vac±7V (Appliances)	
Low loss return voltage	180Vac ±7V (UPS bypass); 100Vac ±7V (Appliances)	
High loss voltage	280Vac±7V	
High loss return voltage	270Vac±7V	
Maximum AC input voltage	300Vac	
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	breaker	
Efficiency (Line Mode)	>95% (rated R load, battery fully charged)	
UPS switching time	10ms (UPS bypass); 20ms (Appliances)	
Output power derating: **When the AC input voltage drops to 170V, the output power will be derated.** **Derating curve** ⟶		

Table 2 Inverter Mode Specifications

Inverter Specifications	0918KHP4.2KW	0918KHP6.2KW
Rated output power	**4.2 KW**	**6.2 KW**
Output voltage waveform	Pure sine wave	
The output voltage	230Vac±5%	
Output frequency	50Hz /60HZ	
Max. efficiency	93 %	
Overload protection	5s@≥150% load ; 10s@110%~150% load	
Surge capacity /peak power	1 times/(2 x rated power 5 s)	
DC input voltage range	24Vdc -33Vdc	48Vdc - 63Vdc
DC cold start /POWER startup voltage	22 .0Vdc	44 .0Vdc
Low voltage warning	21.0Vdc	42.0Vdc
Low pressure recovery	22.0Vdc	44.0Vdc
Under-voltage protection/shutdown		
@Load < 5 0 %	20.5Vdc	41.0Vdc
@Load ≥ 50%	20.0Vdc	40.0Vdc
Under-voltage recovery/power on	Reset POWER	Reset POWER
Battery overvoltage protection	33.0Vdc	63.0Vdc
Battery overvoltage recovery	32.0Vdc	62.0Vdc
No-load current	0.5A	0.7A

Table 3: Charge Mode Specifications

Utility charging mode		
Inverter Model	**0918KHP4.2KW**	**0918KHP6.2KW**
Charging Mode	3 - stage	
Maximum charging current (grid input)	80A (@$V_{I/P}$ = 230Vac)	80A (@$V_{I/P}$ = 230Vac)

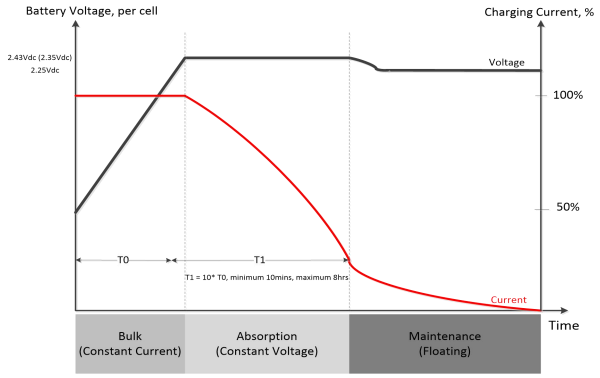
Maximum charging voltage (CV voltage)	**lithium battery**	28.2 Vdc (default/configurable)	56.4 Vdc (default/configurable)
	Lead-acid batteries	29.2 Vdc (default /configurable)	58.4 Vdc (default/configurable)
Floating charging voltage		27.0 Vdc (default /configurable)	54.0 Vdc (default /configurable)
Charging curve			
Solar Charging Mode (MPPT type)			
Inverter Model		**0918KHP4.2KW**	**0918KHP6.2KW**
Photovoltaic maximum input power		**4.2KW**	**6.2KW**
Nominal photovoltaic voltage		240Vdc	
PV array MPPT voltage range		120~450Vdc / Opening voltage 150V	
Maximum PV array open circuit voltage		500Vdc	
Maximum charging current = utility charging + solar charging		100A	

Table 4 General Specifications

Safety certification	CE
Operating temperature range	-10°C to 50°C
Storage temperature	-15°C~ 60°C
Storage humidity	5% to 95% relative humidity (non-condensing)

7 Troubleshooting

7.1 Fault reference code

Error code	Fault events	icon
01	Fan failure or lockup	
02	Over temperature protection	
03	Battery over-voltage protection	
04	Low battery voltage/charge	
05	Internal converter short circuit or overheated	
06	AC output voltage is too high	
07	Overload protection	
08	BUS voltage is too high	
09	BUS soft start failed	
51	Over-current or surge /(peak power exceeds the limit)	
52	BUS voltage is too low	
53	Inverter soft start failure	
55	Over-DC voltage at AC output	
57	Current sensor failure	
58	AC output voltage is too low	
59	PV voltage exceeds limit	

7.2 Warning Lights

Warning Codes	Warning Events	Sound alarm	Icon flashing
01	Fan locked	Beeps three times per second	
03	Overcharged battery	Beeps once per second	
04	Low battery	Beeps once per second	

07	Overload/Overload	Beep every 0.5 seconds	
10	Output power derating	Beeps twice every 3 seconds	
15	Low photovoltaic input energy	Beeps twice every 3 seconds	
E9	Battery Balancing	No	
bP	Battery not connected	No	

7.3 Questions and Answers

Problem	LCD/LED/ Buzzer	Explanation/Possible Cause	What to do
The unit shuts down automatically during startup process	The LCD display and buzzer will be activated for 3 seconds and then turn off	Battery voltage is too low , cold start fails ①24V inverter cold start voltage 22V ②48V inverter cold start voltage 44V	①Recharge the battery ②Replace the battery
No response after power on	No indication	①Battery voltage is too low ②The internal fuse is damaged or the circuit breaker is tripped	①Contact the maintenance center to replace the fuse ②Recharge the battery ③Replace the battery
Mains exist but the unit works in battery mode.	The input voltage on the LCD is displayed as 0 and the green LED is flashing	Input protector is tripped	① Check if the AC circuit breaker is tripped ② Check if the AC wiring is connected well
	Green LED is flashing	Inadequate AC power quality	① Check if the AC power cord is too small or too long. ② Check whether the generator is working properly or whether the input voltage range is set correctly (UPS (equipment)
	Green LED is flashing	Set "Solar Priority" as the output source priority	Change the output source priority to "Utility First"
When the unit is turned on, the internal relay is switched on and off repeatedly.	LCD display and LED lights are flashing	Battery is disconnected	Check if the battery sires are connected well
Buzzer beeps	Fault code 07	The inverter is overloaded by	Reduce the connected load

continuously and the red LED lights on.		110%. Abnormal time , more than 3 times	by turning off some equipment.
	Fault code 05	Output short circuit	Check if wiring is connected well and eliminate any abnormal loads.
		Internal temperature of inverter component is over 120°C.	Check if the airflow of the unit is blocked or the ambient temperature is too high
	Fault code 02	The internal temperature of the inverter exceeds 100°C	
	Fault code 03	Battery is over-charged	Return to repair center
		Battery over-voltage protection abnormality	Check whether the specifications and quantity of the batteries meet the requirements
	Fault code 01	Fan failure	Check if the fan has fallen off or replace it
	Fault code 06/58	Output abnormality (inverter voltage is lower than 190Vac or higher than 260Vac)	① Reduce the load ②Return to the repair center
	Fault code 08/09/53/57	Internal component failure	Return to repair center
	Fault code 51	Over current or surge	Restart the inverter . If the error occurs again, return to the repair center.
	Fault code 52	Bus voltage is too low	
	Fault code 55	Output voltage is unbalanced	