USER MANUAL

OFF-GRID SYSTEM

6KW-U

M-GP-6KW-U-EN-A01

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INFORMATION ON THIS MANUAL

Validity

This manual is applicable to the 6KW-U off-grid system.

Scope

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installation and operation.

Target Group

This document is intended for qualified persons and end users. Tasks that do not require any particular qualification can also be performed by end users. Qualified persons must have the following skills:

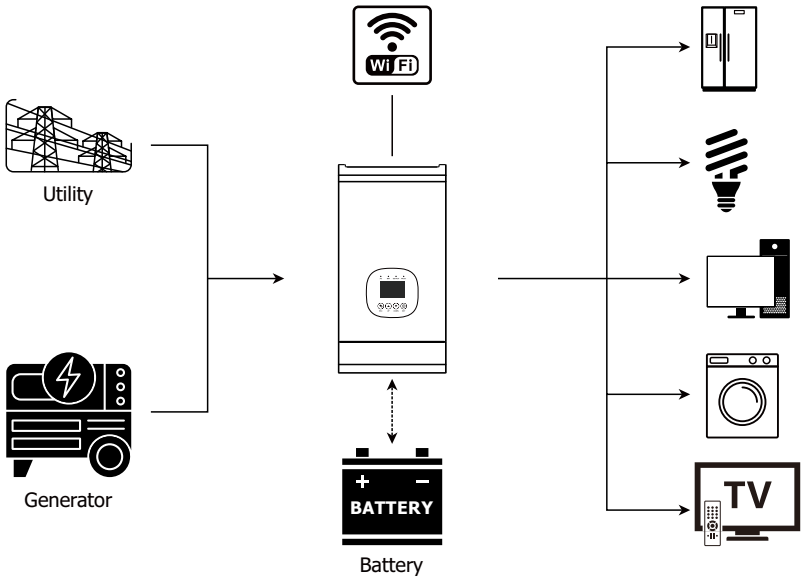
- Knowledge of how an inverter works and is operated.
- Training in how to deal with the dangers and risks associated with installing and using electrical devices and installations.
- Training in the installation and commissioning of electrical devices and installations.
- Knowledge of the applicable standards and directives.
- Knowledge of and compliance with this document and all safety information.

Safety Instructions

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

1. Please clearly specify the type of battery system you intend to use, lithium battery system or lead-acid battery system. If you choose the wrong system, the energy storage system will not function properly.
2. Before using the unit, read all instructions and cautionary marking on the unit, the batteries and all appropriate sections of this manual. The company reserves the right to void the warranty if the equipment is not installed or operated in accordance with this manual.
3. All operations and connections must be performed by a professional electrical or mechanical engineer.
4. All the electrical installation must comply with the local electrical safety standards.
5. **CAUTION**-To reduce risk of injury, charge only deep-cycle lead-acid type rechargeable batteries and lithium batteries. Other types of batteries may burst, causing personal injury and damage.
6. 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.
7. To reduce risk of electric shock, disconnect all wirings before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
8. **NEVER** charge a frozen battery.
9. For optimum operation of this inverter, please follow required specification to select appropriate cable size. It's very important to correctly operate this inverter.
10. Be very cautious when working with metal tools on or around batteries. There is a potential risk of dropping a tool that could spark or short-circuit batteries or other electrical parts and could cause an explosion.
11. Please strictly follow the installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this manual for the details.
12. GROUNDING INSTRUCTIONS - This inverter should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
13. **NEVER** short-circuit the AC output and DC input. Do NOT connect to the mains when DC input short circuits.
14. Make sure the inverter is completely assembled before operation.

INTRODUCTION



OFF-GRID SYSTEM

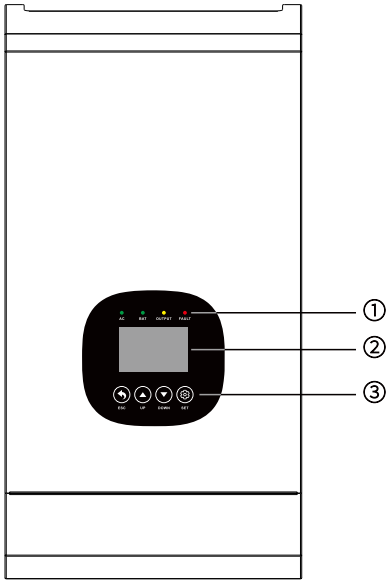
This is a multifunctional off-grid system, integrated with a low frequency pure sine wave inverter and a UPS function module in one machine, which is perfect for off grid backup power and self-consumption applications. This inverter can work with or without batteries.

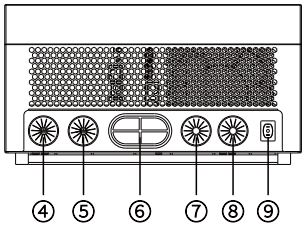
The whole system also needs other devices to achieve complete running such as generator or utility grid. Please consult with your system integrator for other possible system architectures depending on your requirements. The WiFi is a plug-and-play monitoring device to be installed on the inverter. With this device, users can monitor the status of the inverter system from the mobile phone or from the website, anytime anywhere.

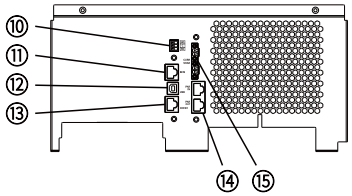
Features

- Rated power 6KW.
- Parallel Operation Supported.
- Low frequency inverter with large transformer.
- Pure sine wave AC output.
- With CAN/RS485 for BMS communication.
- Supports split-phase output, capable of delivering 120VAC and 240VAC simultaneously.
- System will go to bypass and cut off charging if an error happens under utility grid mode.
- With the ability to work without battery (only under utility grid mode).
- WiFi remote monitoring (optional).

Product Overview







①	LED indicators	⑨	Switch button
②	LCD display	⑩	Dry contact
③	Function buttons	⑪	BMS port
④	AC output port	⑫	USB port
⑤	AC input port	⑬	Communication port
⑥	Communication connection	⑭	Parallel communication port (parallel module only)
⑦	BAT+ port	⑮	Current sharing port (parallel module only)
⑧	BAT- port		

INSTALLATION

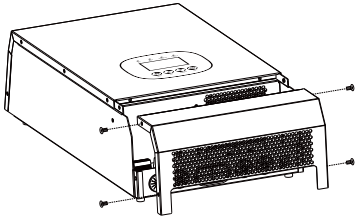
Unpacking and Inspection

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

- The unit x 1
- User manual x 1
- Communication cable x 1
- Screws x 4
- Mounting board x 1

- **Preparation**

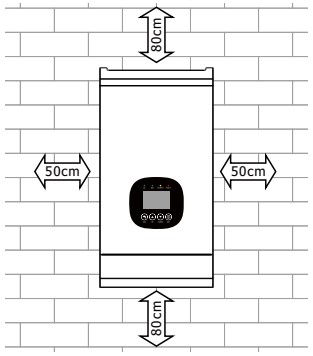
Before connecting all wiring, please remove the bottom cover by removing four screws as shown below.



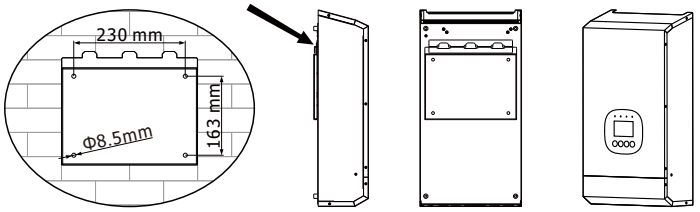
Mounting the Unit

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 50°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.**



Install the unit using three screws. It is recommended to use attachment screw φ6*60 outside hexagon self-tapping stainless steel screws and plastic expansion tube.

Battery Connection

- **Lead-acid Battery Connection**

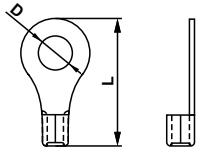
User can choose proper capacity lead acid battery with a nominal voltage at 48V. Also, you need to choose battery type as "AGM(default) or FLD".

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

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

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.

Ring terminal:



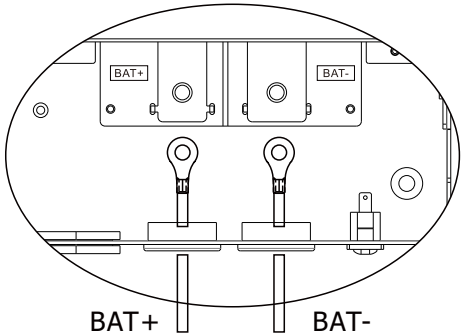
Recommended battery cable and terminal size:

Model	Wire Size	Torque value
6KW-U	1*3 AWG	4-6 N·m

The recommended charge current is 0.2C, where C is the battery's rated capacity (Ah).

Please follow below steps to implement battery connection:

1. Assemble battery ring terminal based on recommended battery cable and terminal size.
2. Connect all battery packs as the units require. It's suggested to connect at least 200Ah capacity battery for 6KW-U series.
3. Insert the ring terminal of battery cable flatly into battery connector of inverter and make sure the bolts are tightened with torque of 4-6 N·m. Make sure polarity at both the battery and the inverter/charger 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.

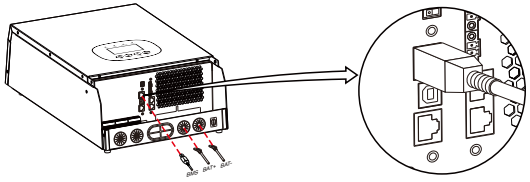
⚠	**CAUTION!!** Do not place anything between the flat part of the inverter terminal and the ring terminal. Otherwise, overheating may occur. **CAUTION!!** Do not apply anti-oxidant substance on the terminals before terminals are connected tightly. **CAUTION!!** Before making the final DC connection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

- **Lithium Battery Connection**

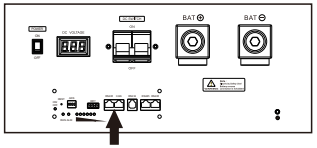
If choosing lithium battery for the inverter, you are allowed to use the lithium battery only which we have configured. There are two connectors on the lithium battery, RJ45 port of BMS and power cable.

Please follow below steps to implement lithium battery connection:

1. Assemble battery ring terminal based on recommended battery cable and terminal size (same as Lead acid, see section Lead-acid Battery connection for details).
2. Insert the ring terminal of battery cable flatly into battery connector of inverter and make sure the bolts are tightened with torque of 2-3 N·m. Make sure polarity at both the battery and the inverter/charger is correctly connected and ring terminals are tightly screwed to the battery terminals.
3. Connect the end of RJ45 of battery to BMS communication port(BMS) of inverter.



4. The other end of RJ45 insert to battery communication port(RS485 or CAN).



Note: If choosing lithium battery, make sure to connect the BMS communication cable between the battery and the inverter. You need to choose battery type as "lithium battery".

Code Reference

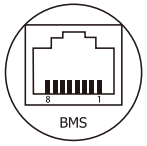
Related information code will be displayed on LCD screen. Please check inverter LCD screen for the operation.

20	BMS communication lost

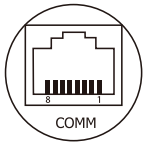
- **Lithium battery communication and setting**

In order to communicate with battery BMS, you should set the battery type to "LI-ION" in Program 5. Then the LCD will switch to Program, which is to set the protocol type. There are several protocols in the inverter.

1.Connect the end of RJ45 of battery to BMS communication port of inverter. Make sure the lithium battery BMS port connects to the inverter is Pin to Pin, the inverter BMS port pin assignment shown as below:



Pin on Rj45-BMS	Description
1	RS485-B
2	RS485-A
3	GND
4	CAN-H
5	CAN-L



Pin on Rj45-COMM	Description
1	RS485-A
2	RS485-B
7	5V
8	GND

- **LCD setting**

To connect the battery BMS, you need to set the battery type as "LI-ION" in Program 05.

After setting "LI-ION" in Program 05, it will switch to Program 51 to choose communication protocol. You can choose RS485 communication protocol, and you can also choose CAN communication protocol.

Note: You can only use one communication type RS485 or CAN at a time.

05	Battery type	AGM (default) AGM
		Flooded FLd
		Lithium(only suitable when communicated with BMS) LI-ION
		User-Defined USE If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 19,20, and 21.
		User-Defined 2(suitable when lithium battery without BMS communication) USE2 If "User-Defined 2" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 19, 20 and 21. It is recommended to set to the same voltage in program 19 and 20 (full charging voltage point of lithium battery). The inverter will stop charging when the battery voltage reaches this setting.

51	RS485 Communication protocol	①PACE
		②PLY
	CAN Communication protocol	①PLY

Note: When the battery type is set to LI-ION, the setting option 12, 13, 21 will change to display percent.
Note: When the battery type set as "LI-ION", the Maximum charge current can't be modified by the user. When the communication fails, the inverter will cut off output.

12	Setting SOC point back to utility source when selecting "BAT" in program 01	40% Default 40%, 6%~50% Settable, value set higher than Program 21 setting
13	Setting SOC point back to battery mode when selecting "BAT" in program 01	80% Default 80%,60%~100% Settable

21	Low DC cut-off SOC If "LI-ION" is selected in program 5 this program can be set up	20% Default 20%,5%~49% Settable, value set lower than the Program 12 setting

Note: For any questions regarding communication with the BMS, please consult us.

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. The recommended specification of AC breaker is 50 A for 6KW-U off-grid system.

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 person.

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.

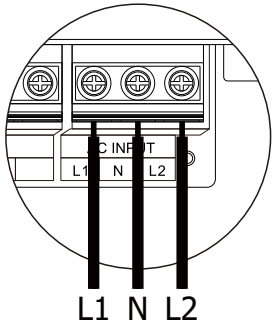
Suggested cable requirement for AC wires

Model	Gauge	Torque Value
6KW-U	1* 10 AWG	1.2-2 N·m

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. Cut the insulation sleeves of the six conductors by 10mm.
3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor ⏚ first.

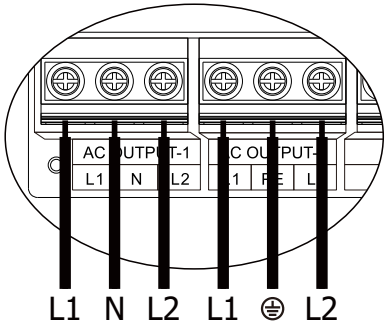
Pe→⏚ (yellow-green)
L→LINE(brown or black)
N→Neutral(blue)



⚠	**WARNING: Shock Hazard** Installation must be performed with care due to high battery voltage in series.

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

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



5.Make sure the wires are securely connected.

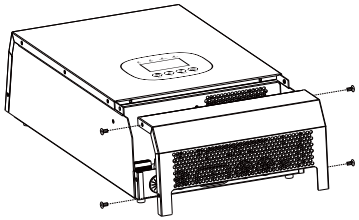
CAUTION: Important
Be sure to connect the AC wires with correct polarity. Reversing the L and N wires may cause a short circuit on the utility grid side, potentially damaging the grid or the inverter.

CAUTION: Appliances such as air conditioners require 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 with the manufacturer of the air conditioner to see if it's equipped with time-delay function before installation. Otherwise, this off-grid system will trigger overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

Note: Max. AC input current is 50 A. If the AC input current exceeds 50 A, the AC charge current will drop to zero. The system will cut off the output if the AC input remains over 50 A.

- **Final Assembly**

After connecting all wiring, please put bottom cover back by screwing four screws as shown below.



Dry Contact Signal

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

Unit Status	Condition			Dry contact port: NO N NC	
				NC & C	NO & C
Power Off	Unit is off and no output is powered			Close	Open
Power On	Output is off and no output is powered			Close	Open
	Output is powered from Battery	Battery not in "LI-ION" mode	Battery voltage < Low DC Cut-off Voltage +2Vdc	Open	Close
			Detected there's AC input	Close	Open
		Battery in "LI-ION" mode	Battery SOC < Low DC Cut-off SOC +5%	Open	Close
			Detected there's AC input	Close	Open

Parallel function (Only for parallel models)

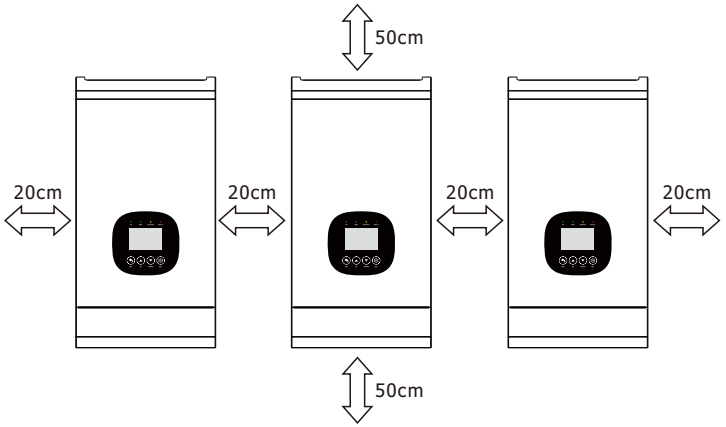
Introduction

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

1.Parallel operation in single phase is with up to 6 units. The supported maximum output power for 6KW-U model is 36KW/36KVA.

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.

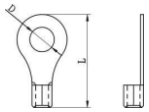
Wiring Connection

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:

Model	Wire Size	Cable mm^2	Ring Terminal Dimensions		Torque value
			D (mm)	L (mm)	
6KW-U	1x2AWG	35	6.4	33.2	3 N·m

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
6KW-U	10AWG	1.2~1.6 N·m

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*
6KW-U	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
6KW-U	100A/230VAC	150A/230VAC	200A/230VAC	250A/230VAC	300A/230VAC

Note 1: Also, you can use 50A breaker for 6KW-U models 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:

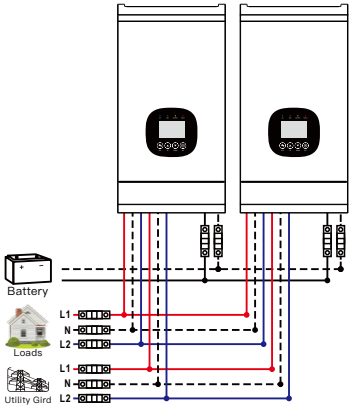
Inverter parallel numbers	2	3	4	5	6
Battery Capacity	200AH	400AH	400AH	600AH	600AH

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

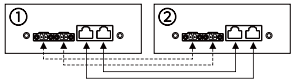
Parallel Operation in Single phase

Two inverters in parallel:

Power Connection

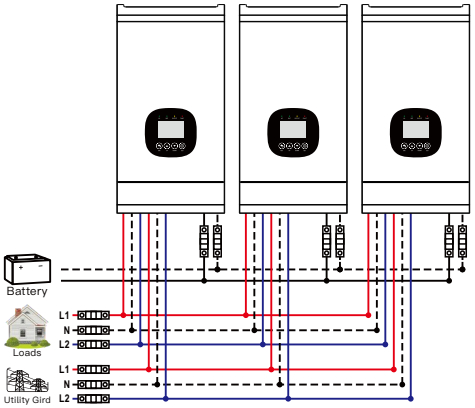


Communication Connection

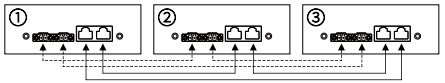


Three inverters in parallel:

Power Connection

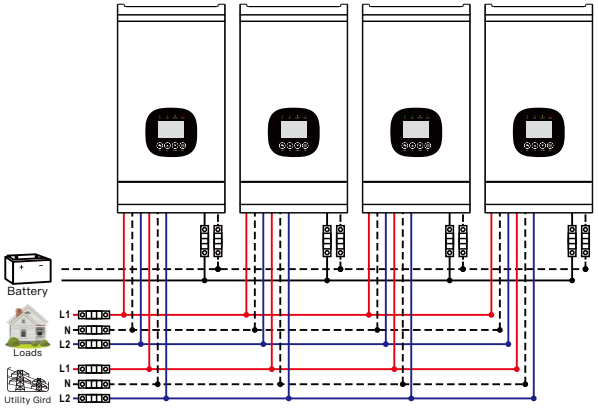


Communication Connection

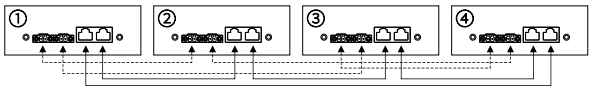


Four inverters in parallel:

Power Connection

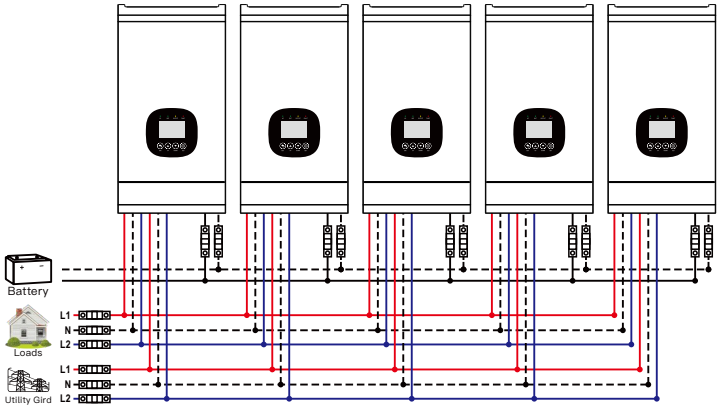


Communication Connection

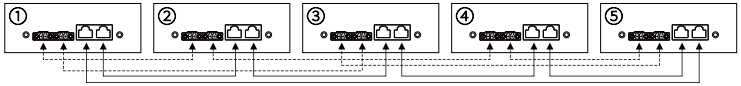


Five inverters in parallel:

Power Connection

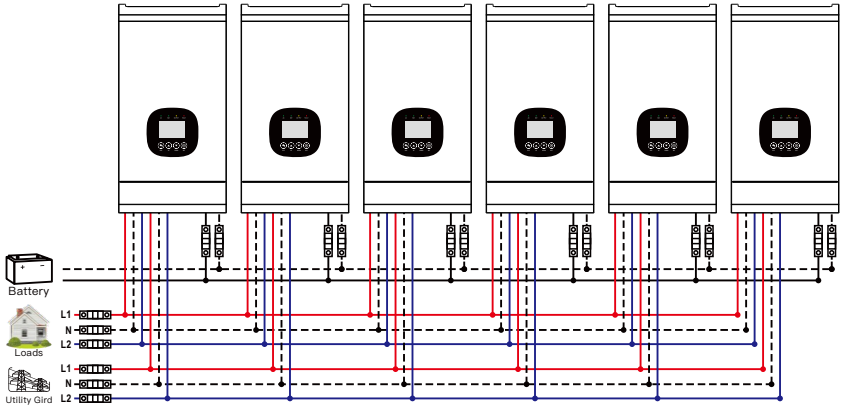


Communication Connection

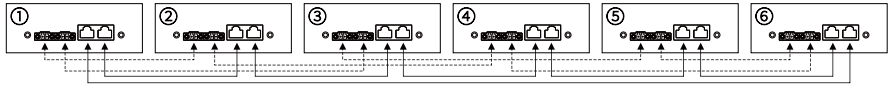


Six inverters in parallel:

Power Connection



Communication Connection



LCD Setting and Display

- **Setting Program:**

Program	Description	Selectable option	
23	AC output mode *This setting is able to set up only when the inverter is in standby mode. Be sure that on/off switch is in "OFF" status.	Single (default) SIG	When the unit is operated alone, please select "SIG" in program 23.
		Parallel PAL	When the units are used in parallel for single phase application, please select "PAL" in program 23.

- **Fault code display**

Fault Code	Fault Event	Icon on
15	Abnormal mains voltage in parallel operation	15
16	Parallel phase abnormal	16
17	Parallel phase loss	17
80	CAN comm error	80
81	Master CAN comm error	81

BATTERY CHARGER

The inverter is equipped with an active PFC (power factor correction) multistage battery charger.

When AC voltage is in the range of 154~260VAC, the charging current is 100%. The inverter is with a strong charging current, and the charge current can be adjusted from 10A~80A.

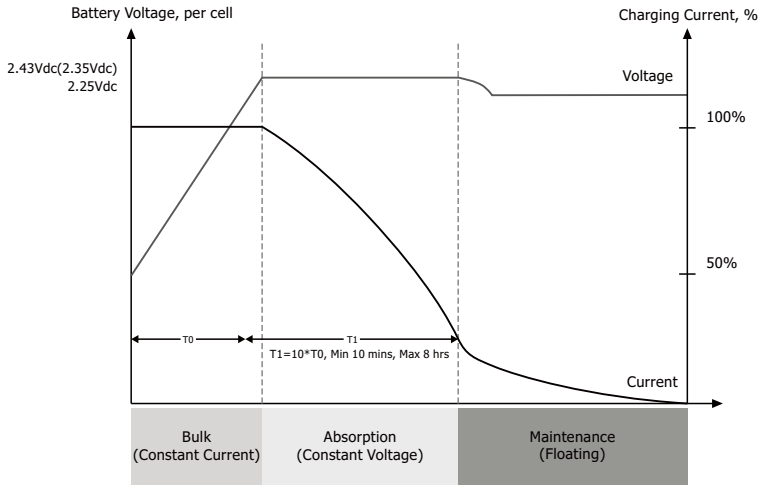
There are mainly 3 stages:

Bulk charging: This is the initial stage of charging. While bulk charging, the charger supplies the battery with controlled constant current, The charger will remain in bulk charge until the absorption charge voltage is achieved.

Absorption charging: This is the second charging stage and begins after the absorb voltage has been reached absorption charging provides the batteries with a constant voltage and reduces the DC charging current in order to maintain the absorb voltage setting.

In this period, the inverter will start a T1 time; the charger will keep the boost voltage in boost CV mode until the T1 time has run out. When charging current is <0.01C or the time is over 12 hours, then drop the voltage down to the float voltage.

Float charging: The third charging stage occurs at the end of the absorption charging time. During float charging, the charge voltage is reduced to the float charge voltage. In this stage, the battery are kept fully charged and ready if needed by the inverter.



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.

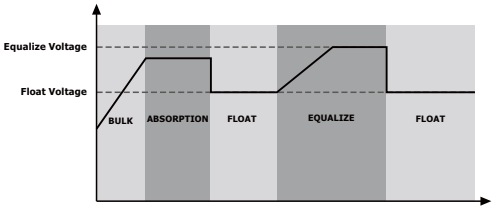
- **How to Apply Equalization Function**

You must enable battery equalization function in monitoring LCD setting program 27 first. Then, you may apply this function in device by either one of following methods:

1. Setting equalization interval in program 31.
2. Active equalization immediately in program 32.

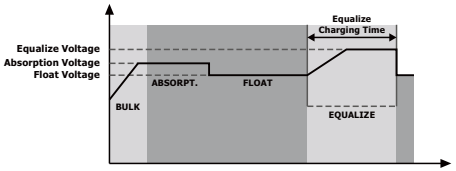
- **When to Equalize**

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.

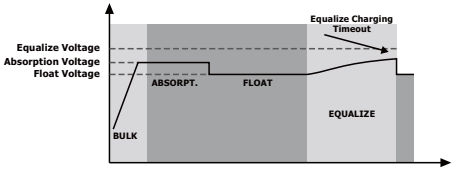


- **Equalize charging time and timeout**

In the equalization 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.

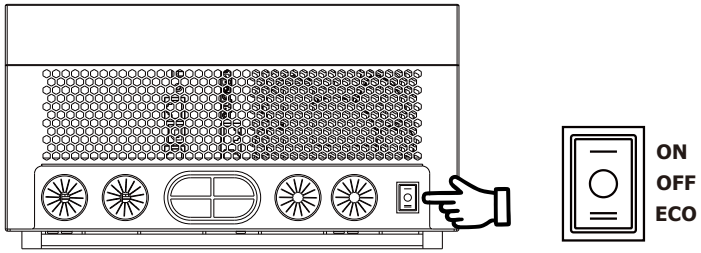


However, in equalize stage, when battery equalized time is expired and battery voltage doesn't rise to battery equalization voltage point, the charge controller will extend the battery equalized time until battery voltage achieves battery equalization voltage. If battery voltage is still lower than battery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



OPERATION

Power ON/OFF

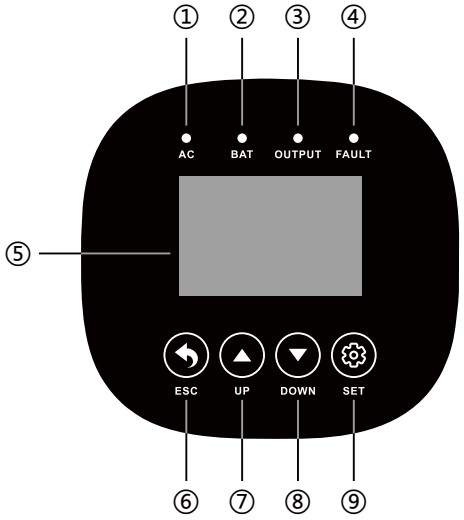


Once the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the botton of the case) to turn on the unit. The switch is located on the underside, at the bottom right of the product.

The switch has three positions. The middle position means OFF. The I position means ON, turning on inverting and inverter is fully functional. The II position is power save mode, inverter will only start inverting when loads are higher than 50W if under this power save mode.

Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes four indicators, four function keys and a LCD display, indicating the operating status and input/output power information.



Indicator status

Identification	Indicators	Color	Description
①	AC	Green	Solid on: Grid connection normal
②	BATTERY	Green	Flash: Charging; Long bright: Full
③	OUTPUT	Yellow	Solid light: Utility grid BYPASS output
			Flash: Inverter output
④	FAULT	Red	Flash: Error occurs

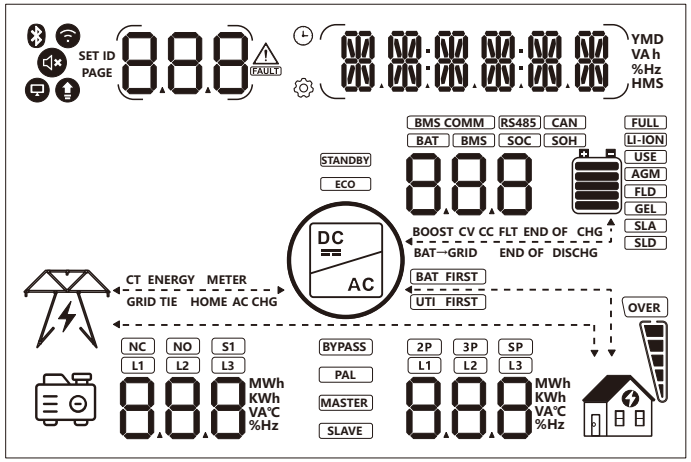
LCD Display

Identification	LCD Display	Description
⑤	Detailed display information	Navigation keys: selection, opening, obtaining information, modifying system parameters, etc.

Physical button

Identification	LCD Display	Description
⑥	ESC	Return to the previous interface menu or exit the settings interface (do not save the settings)
⑦	UP	Page turning; switching options; adding setting value
⑧	DOWN	Page turning; switching options; minus setting value
⑨	SET	Press and hold for 5 seconds to enter the setting interface; short press to confirm and save or enter the setting submenu.

Display panel

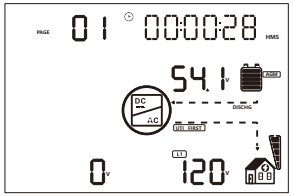
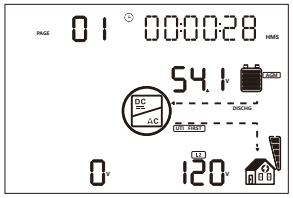


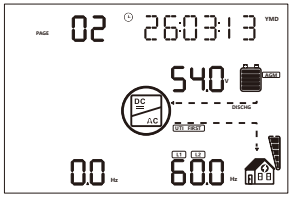
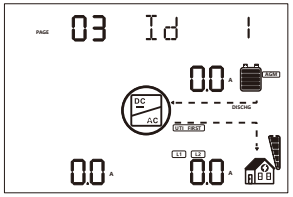
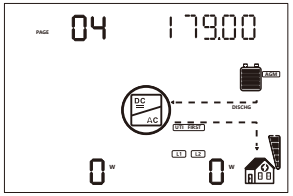
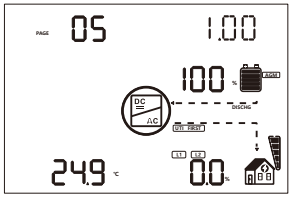
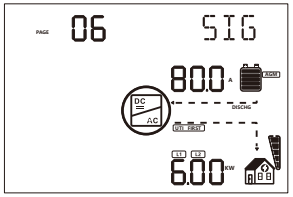
Icon	Function Description
Input Source Information	
NC NO S1 L1 L2 L3 MWh KWh VA℃ %Hz	Indicates the AC information
Output Information	
2P 3P SP L1 L2 L3 MWh KWh VA℃ %Hz	Indicates output voltage, output frequency, load percentage, VA in load, load watts and discharge current
Battery Information	
BMS COMM RS485 CAN BAT BMS SOC SOH	Indicates battery voltage and charging current

	The battery capacity status is 0-20%, 21-40%, 41-60%, 61-80%, and 81~ 100%				
	0%~20%	21%~40%	41%~60%	61%~80%	81%~100%
Load Information					
OVER	Indicates overload				
	Indicates load				
	0%~5%	6%~20%	21%~40%	41%~60%	61%~80%	81%~100%
Mode Operation Information					
	The utility grid				
DC AC	The inverter is working				
	The home load				
FAULT	Error occur				
	Setting				

Buzzer Information	
	Buzzer off
AC CHG	AC IN energy is charging the load
BAT FIRST	The inverter output mode is battery first
UTI FIRST	The inverter output mode is mains power first

Display information

Icon	Parameter Interface	LCD Display
①	1. Current time: 00:00:28 2. BatVolt: 54.1V 3. GridVolt：0V 4. OpVolt: 120V	
	1. Current time: 00:00:28 2. BatVolt: 54.1V 3. GridVolt：0V 4. OpVolt: 120V	

Icon	Parameter Interface	LCD Display
②	1. Current date: 26:03:13 2. BatVolt: 54.0V 3. Input frequency: 0.0Hz 4. Output frequency: 60.0Hz	
③	1. Current ID: 1 2. Bat charge/discharge current: 0.0A 3. AcInCurr: 0.0A 4. OpCurr: 0.0A	
④	1. MCU version: 179.00 2. AcInWatt: 0W 3. OpWatt/OpVA: 0W	
⑤	1. LCD version: 1. 00 2. BatPercent: 100% 3. InvThermal: 24. 9℃ 4. Load: 0.0%	
⑥	1. Operating mode: SIG 2. Max charging current: 80A 3. Output voltage rated power: 6.00KW	

LCD Setting

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

Program	Description	Setting Option	
01	Output source priority: To configure load power source priority	Utility first (default)	UTI
		Utility will provide power to the loads as first priority. Battery energy will provide power to the loads only when utility power is not available.	
		BAT priority	bAT
		The battery supplies power to the loads as the first priority. The utility will supply power to the loads only when the battery voltage drops to the low-level warning voltage or the set point in Program 12.	
03	AC input voltage range	Appliance (default) APL If selected, acceptable AC input voltage range will be within 154~272VAC	
		UPS UPS If selected, acceptable AC input voltage range will be within 184~272VAC	
05	Battery type	AGM (default) AGM	
		Flooded FLd	
		Lithium (only suitable when communicated with BMS) LI-ION	
		User-Defined USE If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 19, 20, and 21.	
		User-Defined 2 (suitable when lithium battery without BMS communication) USE2 If "User-Defined 2" is selected, battery charge voltage and low DC cut-off voltage can be set in programs 19, 20, and 21. It is recommended to set the charge voltage in program 19 and the low DC cut-off voltage in program 20 to the same value — the full charge voltage of the lithium battery. The inverter will stop charging when the battery voltage reaches this setting.	
06	Auto restart when overload occurs	Restart disable (default) dIS	
		Restart enable ENA	

06	Auto restart when overload occurs	Restart bypass byP When overload under battery mode，system will switch to bypass automatically	
08	Output voltage	230V 230	220V 220
		240V (default) 240	208V 208
09	Output frequency	50Hz 50	60Hz (default) 60
11	Maximum utility charging current	30A Default 30A, 10A~80A Settable (If LI is selected in Program 5, this program can't be set up)	
12	Setting voltage point back to utility source when selecting "UTI priority" in program 01	46.0V Default 46.0V, 44.0V~51.2V Settable	
		40% Default 40%, 6%~50% Settable, value set higher than Program 21 setting	
13	Setting voltage point back to battery mode when selecting "BAT priority" in program 01	54.0V Default 54.0V, 48.0V~58.0V Settable	
		80% Lithium battery mode: default 80%, 60%~100% settable	
14	Mains charging switch	dIS Disable battery charging	
		ENA Enable battery charging	
15	Alarm control	Alarm on (default) ON	Alarm off OFF
16	Backlight control	Backlight on (default) ON	Backlight off OFF
17	Beeps while primary source is interrupted	Alarm on (default) ON	Alarm off OFF
19	C.V. charging voltage. If self-defined is selected In program 5, this program can be set up	56.4V Default 56.4V, 48.0V~58.4V Settable	
20	Floating charging voltage. If self-defined is selected in program 5, this program can be set up	54.0V Default 54.0V, 48.0V~58.4V Settable	

21	Low DC cut-off voltage. If self-defined is selected in program 5, this program can be set up.	420 V Default 42.0V, 40.0V~48.0V Settable	
		20 % Default 20%, 5%~49% Settable，value set lower than Program 12 setting	
		When reach Low DC cut-off voltage: If battery power is only power source available, inverter will shut down. Battery power and utility are all available, inverter will transfer to line mode and provide output power to loads, and charge the battery at the same time.	
22	RS485 communication address	1 Default 1, 1-255 Settable	
23	AC output mode *This setting is only available when the inverter is in standby mode (Switch off).	Single: This inverter is used in single phase application(default) SIG	Parallel: This inverter is operated in parallel system. PAL
		When the inverter is operated in 3-phase application, set up inverter to be operated in specific phase.	
27	Battery equalization	dIS Battery equalization disable(default)	ENA Battery equalization enable
		If "Flooded" or "User-Defined" is selected in program 05, this program can be set up.	
28	Battery equalization voltage	58.4 V Default 58.4V, 48.0V~60V Settable (the value should be higher than Program 19 value)	
29	Battery equalized time	60 Default 60min, 5min~900min Settable	
30	Battery equalized timeout	120 Default 120min, 5min~900min Settable	
31	Equalization interval	1 Default 1 days, 1 days~90 days Settable	
32	Equalization activated immediately	Equalization activated immediately disable (default) dIS	Equalization activated immediately enable ENA
		If equalization function is enabled in program 27, this program can be setup. If "On" is selected in this program, it's to activate battery equalization immediately and LCD main page will shows "E9". If "Off" is selected, it will cancel equalization function until next activated equalization time arrives based on program 31setting. At this time, "E9" will not be shown in LCD main page.	
36	Real time setting--Year	26:03:12 YMD	Default 2024,range 2024~2099
	Real time setting--Month		Default 01,range 01~12
	Real time setting--Date		Default 01,range 01~31

39	Real time setting--Hour	10:23:13 HMS	Default 01,range 00~23
	Real time setting--Minute		Default 01,range 00~59
	Real time setting--Second		Default 01,range 00~59
43	Timed charging settings	09--12	Default 01,range 00~23
44	Timed discharge settings	18--00	Default 01,range 00~23
48	Earthing switch setting	dIS Earthing disable(default)	ENA Earthing enable

FAULT CODE

Fault Code	Fault Event
01	Inverter Fan is not working
02	Inverter Over temperature
03	Battery voltage is too high
04	Battery voltage is too low
05	Output short circuited
06	Output voltage is abnormal. Output voltage is too high.
07	Overload time out
10	Output derating
19	Battery not connected
51	Output overcurrent
52	Bus undervoltage
53	Soft start failure
58	Low output voltage

WARNING CODE

Warning Code	Warning Event	Audible Alarm
04	Low battery	Beep once every second
07	Overload	Beep once every second
19	Battery disconnect	Beep once every second
58	AC output low voltage	Beep once every second
63	Sampling error of battery voltage detecting is over 0.5V	Beep once every second

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. Re-charge battery 2.Replace battery
No response after power on	No indication	1. The battery voltage is far too low 2.Battery polarity is connected reversed	1. Check if batteries and the wiring are connected well 2.Re-charge battery 3.Replace battery
Buzzer beeps continuously and red LED is on	Fault code 01	Fan fault	Replace the fan
	Fault code 02	Internal temperature of component is over 90°C	Check if the air flow of the unit is blocked or the ambient temperature is too high
	Fault code 03	Battery is over-charged	Return to repair center.
		The battery voltage is too high	Check battery spec and quantity.
	Fault code 04	The battery voltage is too low	
	Fault code 05	Output short circuited	Check if wiring is connected well and remove abnormal load
	Fault code 06/58	Output abnormal (Inverter voltage below 180Vac or higher than 290Vac)	1. Reduce the connected load 2. Return to repair center
	Fault code 07	Overload error. The inverter is overload 101% and time is up	Reduce the connected load by switching off some equipment
	Fault code 20	BMS communication failed	1. Check the BMS communication wire to see if it's well connected 2. Check the transceiver signal
	Fault code 51	Over current or surge	Restart the unit, if the error happens again, please return to repair center

Note: To restart the inverter, all power sources need to be disconnected, After the LCD screen light is off, only use the battery to boot.

SPECIFICATIONS

Table 1 line mode specifications

INVERTER MODEL	6KW-U
Input Voltage Waveform	Pure sine wave/ same as input (bypass mode)
Nominal Input Voltage	240Vac (split-phase)
Input voltage range	184~272Vac(UPS) : 154~272Vac(APL)
Low Loss Voltage	184Vac±7V(UPS); 154Vac±7V(APL)
Low Loss Return Voltage	194Vac±7V(UPS); 164Vac±7V(APL)
High Loss Voltage	>272Vac±7V
High Loss Return Voltage	<262Vac±7V
Nominal Input Frequency	50Hz / 60Hz (Auto detection)
Input Frequency range	45-65Hz
Low Loss Frequency	45±1Hz
Low Loss Return Frequency	47±1Hz
High Loss Frequency	65±1Hz
High Loss Return Frequency	63±1Hz
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)
Input Current	Max 50A
Transfer Time	Typical 10ms

Table 2 Inverter Mode Specifications

INVERTER MODEL	6KW-U
Rated Output Power	6KVA / 6KW
Output Voltage Waveform	Pure Sine Wave
Output Voltage Regulation	120/240Vac±5%
Output Frequency	60Hz
Peak Efficiency	94%
Overload Protection	10s@110%~150% load; 5s@≥150% load
Surge Capacity	18KVA / 18KW
Nominal DC Input Voltage	48Vdc
Cold Start Voltage (Lead-Acid Mode)	Low DC Cut-Off Voltage +2Vdc
Cold Start SOC(Li Mode)	>Low DC Cut-off SOC +10%
Low DC Warning Voltage (Lead-Acid Mode)	44.0Vdc @ load < 20% 42.8Vdc @ 20% ≤ load < 50% 40.4Vdc @ load ≥ 50%
Low DC Warning Return Voltage (Lead-Acid Mode)	46.0Vdc @ load < 20% 44.8Vdc @ 20% ≤ load < 50% 42.4Vdc @ load ≥ 50%
Low DC Cut-off Voltage (Lead-Acid Mode)	42.0Vdc @ load < 20% 40.8Vdc @ 20% ≤ load < 50% 38.4Vdc @ load ≥ 50%
Low DC Cut-off Voltage (Lead-Acid Mode)	42.0Vdc (Based on Program 21, 40Vdc~48Vdc settable)
Low DC Warning SOC (Li Mode)	Low DC Cut-off SOC +5%
Low DC Warning Return SOC (Li Mode)	Low DC Cut-off SOC +15%
Low DC Cut-off SOC(Li Mode)	Default 20%, 5%~49% settable
High DC Recovery Voltage	58Vdc
High DC Cut-off Voltage	AGM:60V, FLD:62V, USE or Li Mode: C.V. Voltage + 4.0V
No Load Power Consumption	<30W

Table 3 Charge Mode Specifications

Utility Charging Mode		
Rated Output Power		6KW
Charging Algorithm		3-Step
Max. AC Charging Current		80Amp (@$V_{I/P}$=240Vac)
Bulk Charging Voltage	Flooded Battery	58.4Vdc
	AGM / Gel Battery	56.4Vdc
Floating Charging Voltage		54Vdc

Table 4 General Specifications

INVERTER MODEL	6KW-U
Operating Temperature Range	-20℃ to 50℃ (fan assisted cooling)
Storage temperature	-40℃~ 60℃
Humidity	5% to 95% Relative Humidity (Non-condensing)
Altitude	<2000m
Product size(D*W*H)	600x310x155mm
Packing size(D*W*H)	675x385x230mm
N.W.(KG)	31Kg
G.W.(KG)	32.66Kg