USER'S MANUAL

MAX 5000

Important safety Warning

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

General Precautions

1. Before using the unit, read all instructions and cautionary markings on: (1) The unit (2) the batteries (3) all appropriate sections of this manual.
2. **CAUTION** --To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
3. Do not expose the unit to rain, snow or liquids of any type. The unit is designed for indoor use only. Protect the unit from splashing if used in vehicle applications.
4. Do not disassemble the unit. The maintenance information is only for service persons. When service or repair is required, contact your supplier for further arrangements. Incorrect re-assembly may result in a risk of electric shock or fire.
5. To reduce risk of electric shock, disconnect all wirings (AC mains, batteries, solar panel) before attempting any maintenance or cleaning. Turning off the unit might not fully eliminate the risk.
6. **WARNING: WORKING IN VICINITY OF A LEAD ACID BATTERY IS DANGEROUS.**

   BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL OPERATION. Provide ventilation to outdoors from the battery compartment. The battery enclosure should be designed to prevent accumulation and concentration of hydrogen gas in “pockets” at the top of the compartment. Vent the battery compartment from the highest point. A sloped lid can also be used to direct the flow to the vent opening location.
7. **DO NOT** charge a frozen battery.

8. No terminals or lugs are required for hook-up of the AC wiring. AC wiring must be no less than 10 AWG gauge copper wire and rated for 75°C or higher. Battery cables must be rated for 75°C or higher and should follow the recommendation in the manual. Crimped and sealed copper ring terminal lugs (refer to INSTALLATION section) should be used to connect the battery cables to the DC terminals of the unit. Soldered cable lugs are also acceptable.
9. Be cautious when working with metal tools on, or around batteries. Dropping a tool and short-circuit the batteries or other electrical parts may result in sparks and explosion.
10. No AC or DC disconnects are provided as an integral part of this unit. Both AC and DC disconnects must be provided as part of the system installation. See INSTALLATION section of this manual.
11. No over current protection for the battery supply is provided as an integral part of this unit. Over current protection of the battery cables must be provided as part of the system installation. See INSTALLATION section of this manual.
12. GROUNDING INSTRUCTIONS -This battery charger should be connected to a grounded permanent wiring system. For most installations, the Ground Lug should be bonded to the grounding system at one (and only one point) in the system. All installations should comply with all national and local codes and ordinances.

Table of Content

1. Overview

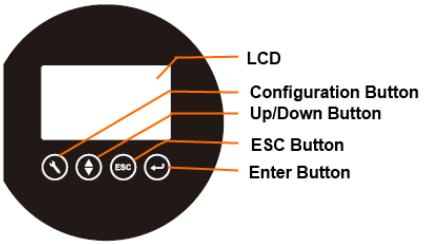
This is a pure sine wave stand-alone inverter/charger system combining the function of inverter, solar charger and AC charger, and provides a long run-time uninterruptible power supply. Its comprehensive LCD display provides system status, and user-friendly panel eases parameters settings.

1.1 Key Feature

- High-frequency switching technology for compact size and light weight
- Pure sine wave output for wide range of applications and harsh environment
- Build-in solar charger controller with MPPT technology to optimize the power utilization
- High efficient DC-to-AC conversion minimizing energy loss
- Standby Charging Mode enables battery charging even when the unit is switched off
- Intelligent cooling fan control
- Input/output isolated design for the maximum operation safety
- LCD displays comprehensive operation status
- Configurable AC input voltage range and priority for AC input or PV input
- Supports Home Appliances / Office Equipment/ Lighting Equipment/ Motor-based Equipment (such as Fan, Air-Conditioner, Washing Machines)
- Thorough protections: Input low voltage / Overload / Short circuit / Low battery alarm / Input over voltage / Over temperature
- Supports both rack and wall-mounting set-up for flexible installation

1.2 Product Outlook

Front Panel

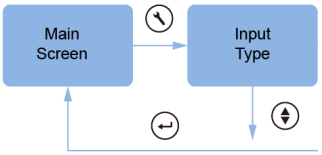


(1) Button function

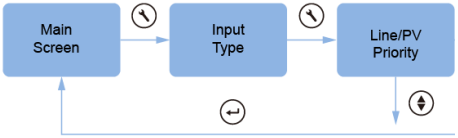
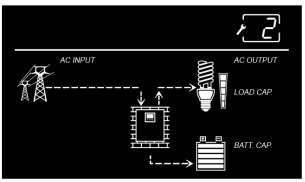
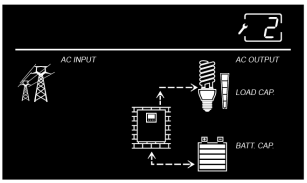
Button	Function	Description
	Configuration	Enter configuration mode, and switch between setting menus
	Up/down	Move to previous/next setting option
	ESC	Return to main menu
	Enter	Confirm setting

(2) Setting Menus

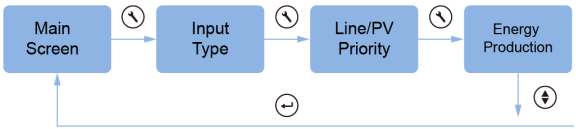
Note: in the following operations, buttons shall be pressed for more 2 seconds in order for the setting to take effect

Description	Input Type: set AC input voltage range		
Configuration Menu			
Selectable Options			
Normal	**Wide**	**Generator**	
			

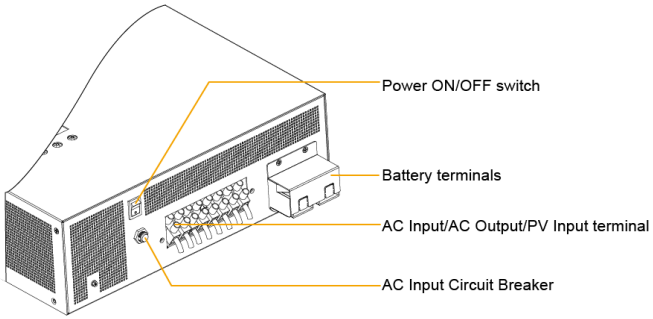
* Please refer to “Specification” section for the input voltage range for each setting.

Description	Line/PV priority: give priority to either Line (AC input) or PV input
Configuration Menu	
Selectable Options	
Line (AC Input) priority	**PV priority**
	

* Please refer to “Operation Modes” for more details.

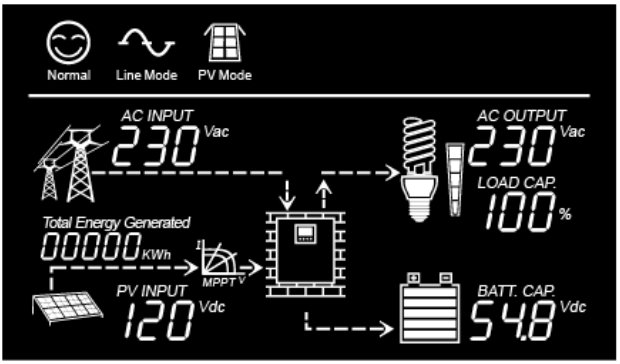
Description	Energy Production: show/reset total energy production
Configuration Menu	
Selectable option	
Show accumulated energy production	**Reset energy production**
	

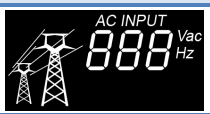
Real Panel

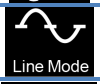


LCD Display

LCD displays the power flow and input/output readings in a visualized graphic design which allows the user to understand the operation status easily. The backlight of LCD remains on whenever the inverter is working (including Standby Charging Mode and Fault Mode).



Icon	Description
	This icon is showed when AC input (from AC mains or generator) presents. Input voltage level can be told by the numeric reading.
	This icon is showed when PV (solar) system presents. Input voltage level can be told by the numeric reading.
	Level of remaining battery capacity

	Inverter is operated under over-loading condition
	The icon and level bar indicates the loading level (0~100%)
	Line Mode is enabled
	Backup Mode is enabled
	PV input is connected
	This icon is showed when there is a fault event. The number is the fault code which can be referred to specific fault event (please refer to Section “Troubleshooting”).

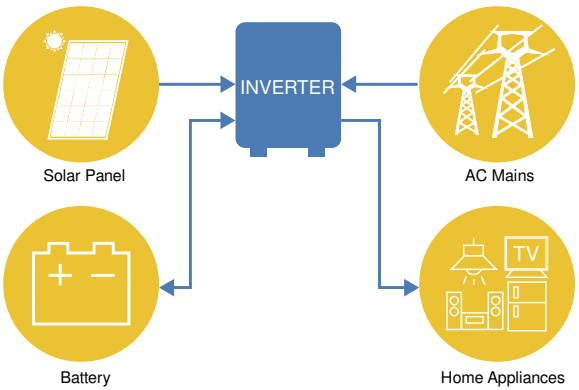
1.3 Basic System Architecture

A typical application diagram for home and office applications is as shown below.

The inverter supports the following power sources as input:

- Generator or AC utility
- PV modules(optional)

And the inverter is capable of supplying various loads such as fluorescent lamp, fan, TV, refrigerator, air conditioner and so on.



2. INSTALLATION

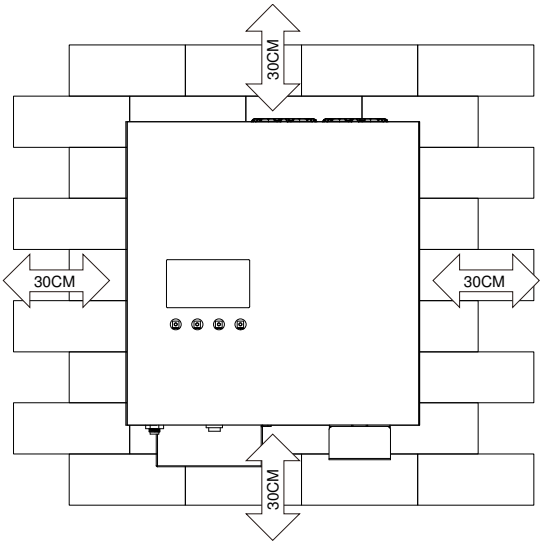
2.1 Unpacking and Inspection

The product package is shipped with the following items. Please call your supplier or dealer if any items are missing.

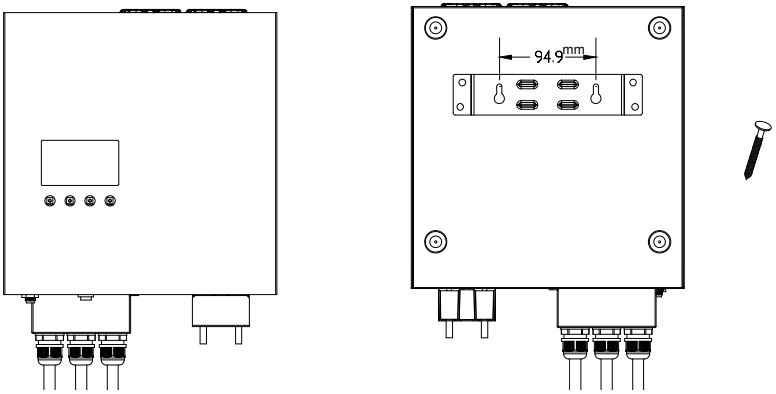
- Inverter
- 1 DC red cable
- 1 DC black cable
- 1 User's manual

2.2 Placement

Choosing a location to install, the place should be in a well-ventilated room protected against rain, vapor, moisture and dust. The location should provide adequate air flow around the Inverter with 30cm minimum clearance on all sides for proper ventilation.



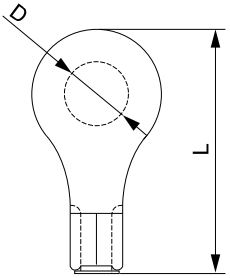
Use 2 screws to mount the inverter to a solid surface. The recommended screw size is M5*50~65mm.



2.3 Battery Connection

CAUTION: For safety operation and regulation compliance, it is requested to install a separate DC over-current protector or disconnect device between battery and inverter. Note that some installation requirements may not require a disconnect device, however, an over-current protection installed is still required.

Please ensure better contact and reliability, ring terminal shall be fit on the cables in below table.



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

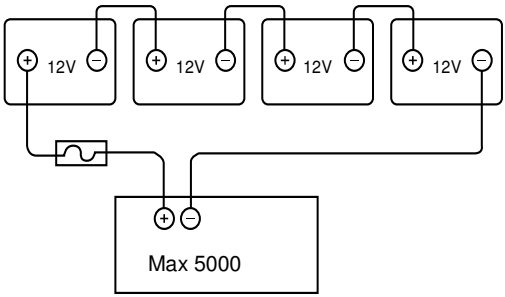
WARNING! Check the polarity before connecting the battery wires in order not to damage the

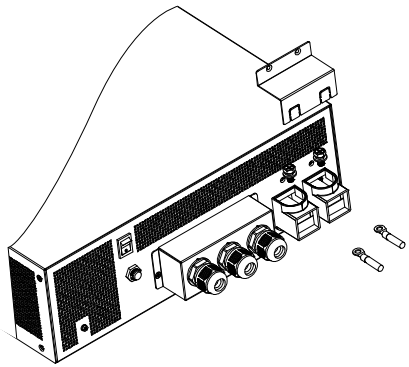
Model Number	Typical Amperage	Battery Capacity	Wire Size	CABLE TERMINAL			Torque value
				Cable mm^2	Dimensions		
					D(mm)	L(mm)	
Max 5000	100A	100AH	1*4AWG	22	8.4	35	5~ 8 Nm
		200AH	2*6AWG	28	8.4	35	5~ 8 Nm

Please follow steps below to connect the battery:

Step 1 - Install a DC Circuit Breaker for positive (+) battery cable. The rating of the DC Circuit Breaker must be at least 120Amp for MAX 5000 to guarantee safe operation without interruption. Keep the DC Circuit Breaker off.
Step 2 - Connect a red cable to DC input terminal(+), and a black cable to DC input terminal(-) of the inverter.
Step 3 - Connect the above mentioned red cables to the battery's positive (+) terminal and black cable to battery's negative (-) terminal.
Step 4 - Screw tightly the DC terminal cover.
Step 5 - After AC input and output wires are connected, switch on the DC Circuit Breaker.

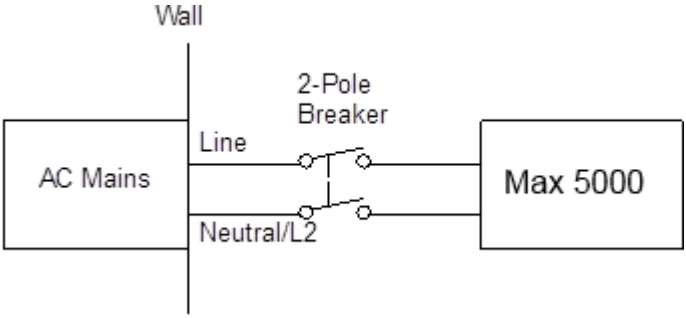
Make sure the battery voltage meets the inverter's specification, MAX 5000 supports 48V_{DC} system.





2.4 AC Connection

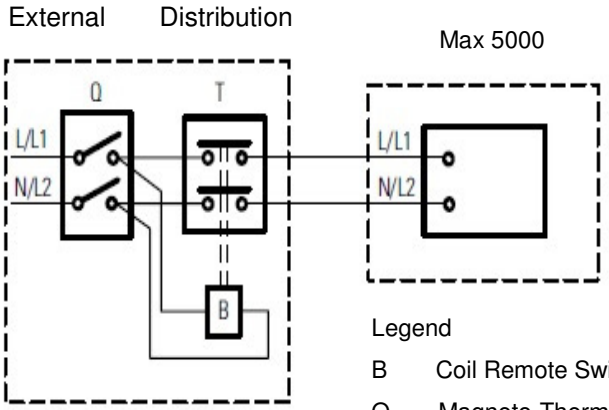
CAUTION: A 40A circuit breaker shall be installed between MAX 5000 and AC Mains. Be sure that AC source is switched off before installing the circuit breaker.



CAUTION: Since the inverter doesn't have an automatic protection device against back feed current, it's recommended to install an external AC contactor (see the diagram below). A warning label shall be attached on such AC contractor to remind the user to disconnect the inverter before accessing the circuit.

The rated voltage and current of the AC contactor shall be no less than the inverter's rated voltage and current, and a minimum 1.6mm space clearance shall be reserved.

A circuit breaker shall be installed between AC mains and the inverter in order to disconnect the AC mains when needed.



Legend

B Coil Remote Switch

Q Magneto-Thermal Input Main Switch

T AC Contactor

N/L2 Neutral/L2

L/L1 L1 Line Input

Please follow the steps below to connect AC wires:

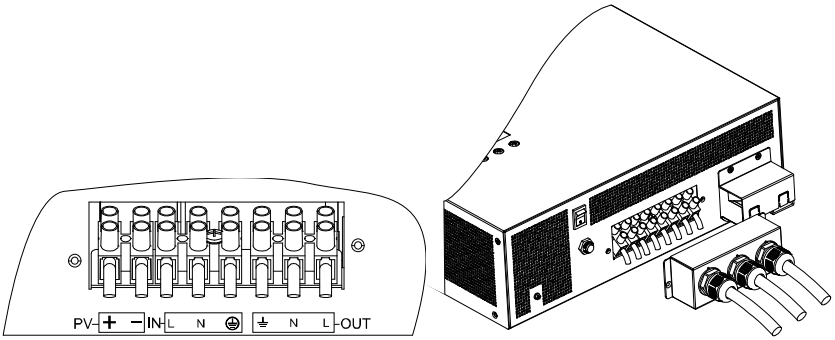
WARNING! All wiring shall be performed by a qualified technician.

WARNING! Operation without a proper grounding connection may result in electrical shock.

Step 1 - Disconnect the unit from the battery either by turning off the battery circuit breaker or removing the battery cables from the battery. Note that turning the unit off does not disconnect the batteries.

Step 2 - Remove AC cover.

Step 3 - Thread the wires through cable clamps and AC cover, and then connect the AC input wires to input terminal, AC output wires to output terminal: GND (green/yellow), Line (brown or black), and neutral (blue) wires.



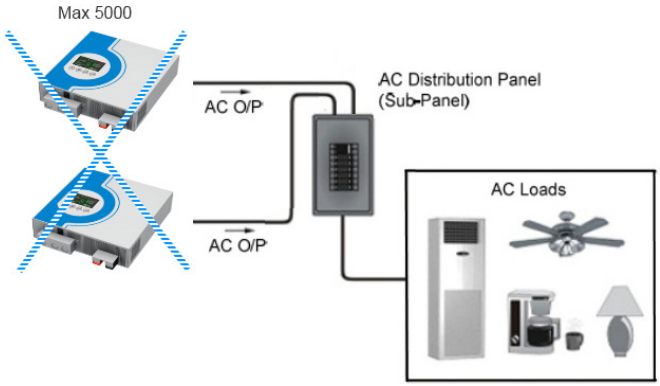
Step 4 - Fix the AC cover with two screws. Fasten the clamps on the AC cable (not the individual wires) so that the cable won't be pulled off easily.

The recommended wire gauge and fixing torque are as below,

Model Number	AC Input Wires Gauge	AC Output Wires Gauge	Torque
MAX 5000	10 AWG	10 AWG	1.2~1.8 Nm

WARNING! The inverter is designed to be operated alone and is not designed for

parallel connection. Please DO NOT connect the inverter in parallel with any other equipment.



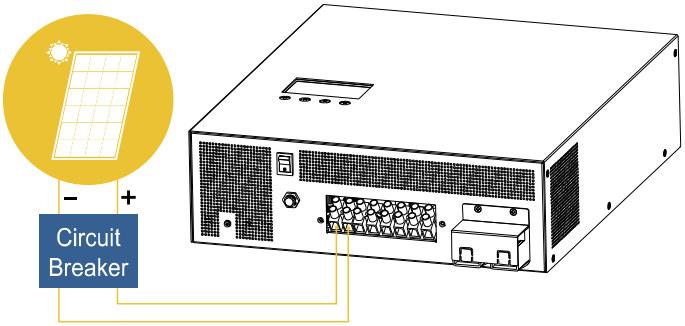
2.5 PV connection (only apply for the model with solar charger)

PV panel selection

PV string is a connection of PV panels whose output voltage and current vary under different illumination. And just like battery, the PV panel can be connected in either series or parallel as per needed. Please consult the supplier of PV panel so that the operational voltage and current fall within the allowed range of the inverter as set out in the specification.

Connect PV strings

CAUTION: As the PV string generates power as long as illumination exists, a circuit breaker with 30A rating shall be installed as shown below, so that PV string can be disconnected when needed (e.g. regular maintenance).



Please follow steps below to connect PV string

WARNING! All wiring shall be performed by a qualified technician.
WARNING! Please do not use PV panel which requires one terminal connected to ground (e.g. thin-film panel).

Step 1 - Disconnect the unit from the battery either by turning off the battery breaker or removing the battery cables from the battery. Note that turning the unit off does not disconnect the batteries.

Step 2 - Remove AC cover.

Step 3 - Thread the wires through cable clamps and AC cover, and then connect the PV string wires to PV input terminals. Check the polarity of wires before connecting to terminals.

Step 4 - Fix AC cover with two screws.

Step 5 - Turn on battery breaker or connect battery cable.

The recommended wire gauge and fixing torque are as below,

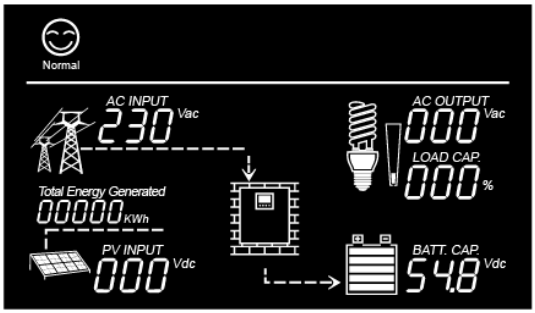
Model Number	PV Input Wire Gauge	Torque
MAX 5000	10 AWG	1.2~1.8 Nm

3. OPERATION

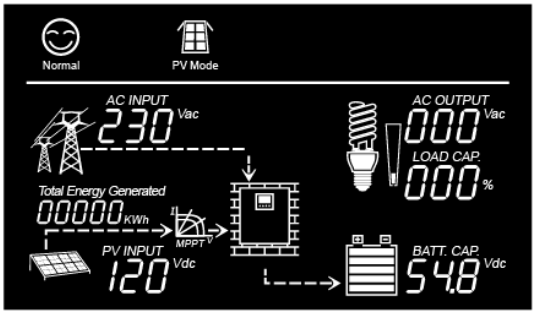
After connecting batteries, AC input cables, and loads, the inverter is now ready to work.

3.1 Standby Charging Mode

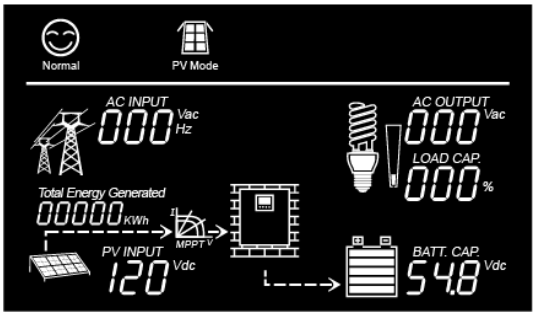
The battery can be charged without switching on the inverter, and such operation is called Standby Charging Mode. When AC input cable and battery is connected, the inverter will enter into Standby Charging Mode and LCD will be turned on with the following display.



If PV string is also connected with enough voltage, the display will be as shown below to indicate the power flow from PV string.



Even if AC input is absent, PV power can still charge the battery and the display will be as shown below.



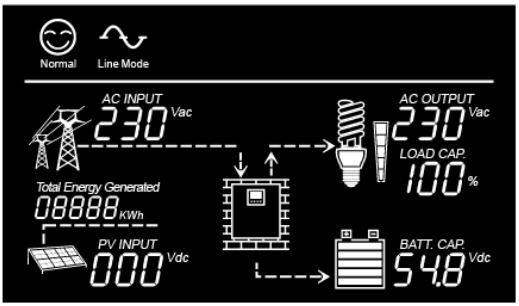
3.2 Operation Modes (after powered on)

Press the Power ON/OFF button to power on the inverter and the inverter will automatically enter into either of the operation mode according to the condition of AC input and PV input as shown in the table below,

	PV Power present	Less PV Power	No PV Power
AC Input Power Present	LINE MODE 2		LINE MODE 1
AC Input Power Absent	BACKUP MODE 3	BACKUP MODE 2	BACKUP MODE 1

LINE MODE 1

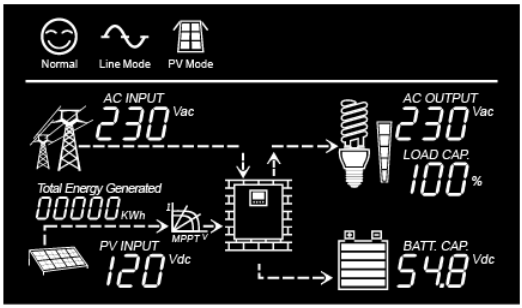
AC input is present and PV input is absent. Load is supplied by AC input power directly.



LINE MODE 2

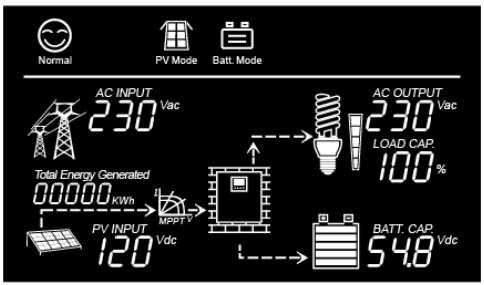
Both AC input and PV input are present. Load is supplied by either AC input or PV

input depending on the priority switch's setting.



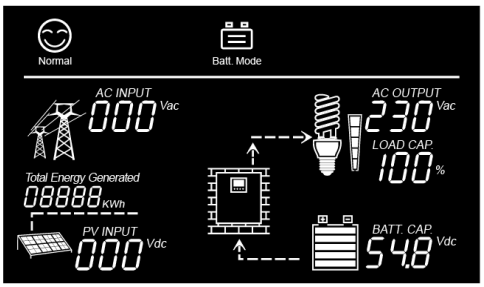
Priority Setting Switch

In LINE MODE 2, if priority setting is set to give PV priority and PV power is also strong enough to support load, the AC input will not be consumed even though it is present. This is deemed an energy-saving operation.



BACKUP MODE 1

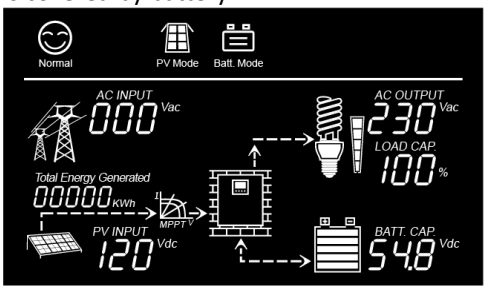
Both AC input and PV input are absent. The backup power to load comes only from battery. The backup time is determined by the capacity of battery.



BACKUP MODE 2

AC input is absent and PV power is not enough to support loads completely. The

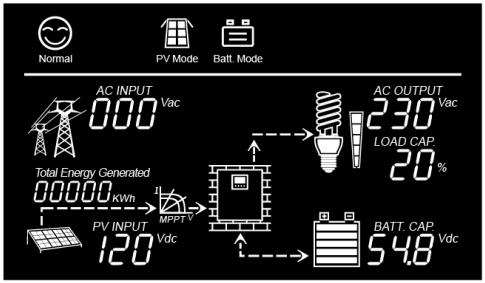
insufficient power is covered by battery.



The larger the PV power, the less consumption from battery and therefore the longer backup time.

BACKUP MODE 3

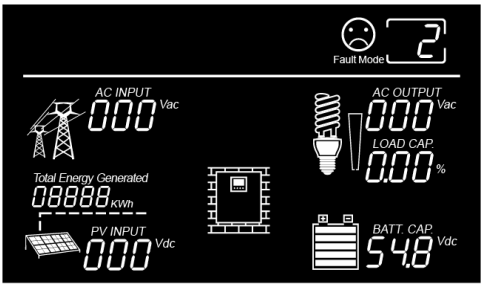
AC input is absent and PV power is strong enough to not only support the load but also charge the battery.



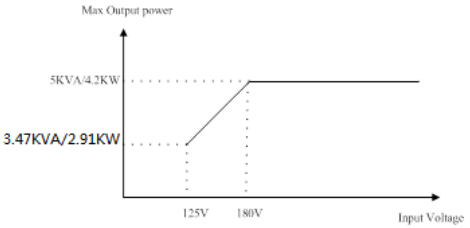
As long as the PV power persists, the load can be powered continuously without consuming power from battery.

3.3 Fault Mode

Inverter enters into Fault Mode when there is a fault event. The fault icon will be shown with a fault code. Please refer to fault code table in “Troubleshooting” section.



4. SPECIFICATION

MODEL	MAX 5000
CAPACITY	4.2KW/5000VA
INPUT	
Input Voltage Waveform	Pure sine wave (utility or generator)
Nominal Input Voltage	230Vac
Input voltage range	175Vac-280Vac(Normal) ; 125Vac-280Vac(Generator/Wide)
Max AC Input Voltage	300Vac RMS
Nominal Input Frequency	50Hz / 60Hz (Auto detection)
OUTPUT	
Wave from	Pure sine wave (Inverter mode)
Voltage Regulation (Inverter Mode)	±10% RMS
Output Frequency	50Hz / 60Hz ± 1Hz
Nominal Efficiency	90% (@Inverter mode with normal DC Input; >60% R load); 95% (@Line mode with Rated R load, battery full charged)
Capable of starting electric motor	2.5HP
Power Factor	0.84
Over-Load Protection	Tripped off after 5s@≥150% load Tripped off after 10s@110%~150% load
Transfer Time (AC to DC)	Normal range : 10ms (typical) 15ms (max) Generator/wide range: 20ms (typical) 40ms (max)
Power Limitation	
BATTERY	
Battery Voltage	48.0Vdc± 1.2Vdc
Battery low alarm voltage	42.0Vdc± 1.2Vdc
Battery low shut-down voltage	40.0Vdc ± 1.2Vdc
AC CHARGER	
Charger Current	25A @180V~280V; 20A @125V~180V
Boost charger voltage (bat. Type)	56.8Vdc
Floating charger voltage (bat. Type)	54.8Vdc
Over charger Voltage	60.0Vdc
SOLAR CHARGER MODULE	
Max Charger current	60A
Charger Power	2400W
System DC Voltage	48.0Vdc
Operating Voltage Range	60~150Vdc

PV Optimal Work Voltage Range	90~144Vdc
Max. PV Array Open Circuit Voltage	150Vdc
MAX. PV Input Current	30A
AUDIBLE ALARM	
Low Battery at Inverter Mode	Beeps 1 time every 2s
Overload	110%~150%load: beep 10 times every 0.5s; >150% load: beep 5 times every 0.5s then fault.
Fault	Beeps continuously
PHYSICAL	
Dimension(D*W*H)mm	428.5mm*350.4mm*119.1mm
Net weight	10.4kg

General Specification

Safety Certification	CE EN62040-1: 2008
EMC Classification	EN62040-2, C2
Operating Environment	0°C to 45°C; 5% to 95% non-condensing
Altitude, operational	Elevation: 0~1500 Meters
Storage temperature	-15°C ~ 60°C

Troubleshooting

Problem	Possible Causes	Remedy
No LCD display	1. Battery weak	1. Re-charge battery
	2. Battery defective (can't be charged)	2. Battery replacement
	3. Power switch is not pressed	3. Press and hold power switch
	4. Battery polarity reversed, can't start up the unit	4. Contact dealer or supplier for service
Mains normal but works in inverter mode	1. AC Input is missing	1. Check AC input connection
	2. Input protector tripped off	2. Reset the input protector
PV input normal but works in inverter mode	1.PV weak	1.Check PV power or reduce loading
	2.PV input is missing	2.Check PV input connection
Alarm buzzer beeps continuously	1. Overload (fault code: F2)	1. Reduce loading so the loads' capacity is no larger than the upper limit
	2. Output short-circuited (fault code: F3)	2. Check wiring or remove abnormal load
	3. Inverter over-temperature (fault code: F5)	3. Check the ventilation at installed location and make sure the air vent of inverter is clear
	4. Over charging (fault code: F1)	4. Restart the unit, If the fault persists, contact dealer or supplier for service.
	5. Fan error (fault code: F4)	5. Check if the fan is blocked by obstacle. if not, contact dealer or supplier for service
	6. DC voltage is under low DC shut-down point (fault code: F0)	6. Make sure mains is normal to recharger the battery
	7. Output abnormal (fault code: F6)	7. Contact dealer or supplier for service
	8. Back-EMF (fault code: F7)	8. Check the AC Input and output wire connection
	9.SCC output over current (fault code: F11)	9.Check wiring or remove abnormal load
	10.SCC over temp(fault code: F12)	10. Check the ventilation at installed location and make sure the air vent of inverter is clear
	11.SCC Output over voltage(fault code: F13)	11. Restart the unit. If the fault persists, contact dealer or supplier for service
	12.SCC PV input over voltage (fault code: F14)	12.Check PV input voltage. If the voltage is normal, contact dealer or supplier for service
	13.SCC Fan Fault (Only for Max 5000) (fault code: F15)	13. Check if the fan is blocked by obstacle. if not, contact dealer or supplier for service
Back up time is shortened	1. Overload	1. Reduce the loading
	2. Battery voltage is too low	2. Charge battery for 8 hours or more
	3. Battery bank is too small	3. Increase battery bank capacity

Note: If the unit fails to operate properly after installation and the setup has been re-examined thoroughly, use the troubleshooting table to determine the probable cause and remedy. For unlisted faults, please contact your local dealer or supplier for service assistances.

Alarm Behavior Table

Fault Code	Protect Function	Active Mode	Condition	Warning (O/P=ON)	Fault (O/P=OFF)	Restart	
						Operate	Condition
--	Low DC Voltage Alarm	Inv. mode	DC voltage<Low DC Alarm	1beep/2s	--	--	--
1	Over Charge Protection	Line mode	DC Voltage>High DC input Shut-down	Beep continuous	--	Manual	--
1	Over Voltage Protection	Standby	DC Voltage>High DC input Shut-down	--	Beep continuously	Auto	DC Voltage<High DC input Shut-down Recovery
2	Over Load Protection	Line/ Inv. mode	110%~150% load	1beep/0.5s,and continue for10s	Beep continuously	Manual	--
			>150% load	1beep/0.5s,and continue for 5s	Beep continuously	Manual	--
3	Output Short Circuit protection	Inv. mode	Output Voltage<20Vrms	--	Beep continuously	Manual	--
4	Inverter Fan Fault Protection	Line/ Inv. mode	Fan Locked Fan Defected	2beep/2s,and continue for 1min	Beep continuously	Manual	--
5	Inverter Over Temp Protection	Line/ Inv. mode	HEAT SINK over temp	--	Beep continuously	Auto	HEAT SINK Temp≤ 55℃
6	Output Abnormal	Inv. mode	(Output Voltage <170Vrms and output current under 32Arms) or Output Voltage >280Vrms	--	Beep continuously	Manual	--
7	Bus Over Protection	Standby/ Line/ Inv. mode	Bus voltage over/ AC Input and output reconnect	--	Beep continuously	Manual	--
11	SCC charger Current Over FAULT	SCC	Scc charger current over 60A(3K)/80A(5K)	--	Beep 1time/ 2Second	Manual	--
12	SCC over temp.	SCC	SCC NTC Temperature over 85c(3K)/105c(5K)	--	Beep 1time/ 2Second	Manual	--
13	SCC Output voltage Over	SCC	SCC Output voltage over 32V(3K)/64V(5K)	--	Beep 1time/ 2Second	Manual/ Auto	SCC Output voltage low then 24V(3K)/ 48V(5K)
14	SCC PV voltage Over	SCC	PV Input voltage over 75V(3K)/150V(5K)	--	Beep 1time/ 2Second	Manual/ Auto	PV Input voltage low then 65V(3K)/ 130V(5K)
15	SCC Fan Fault(Only for max 5000)	SCC	SCC Fan lock	--	Beep 1time/ 2Second	Manual	--

Note: when SCC Fault, press ENTER Key will clear this fault message.

1) Unit will shut down after alarm for 1min, when unit on both fault mode and Switch-off mode.
2) Unit will shut down immediately without any alarm, when unit on Switch-on mode with low DC input.

AC Input voltage setting:

(1) **Normal** "175V~280V"for Max 5000 model, setting for valuable electronic devices. If the utility is higher or lower than this range, the unit will transfer to inverter mode automatically.

(2) **Wide** "125V~280V" for Max 5000 model, setting for home application. If the utility is higher or lower than this range, the unit will transfer to inverter mode automatically.

(3) **Generator**, if AC input is connected to a generator, please choose "generator" as "Input range".

APPENDIX A

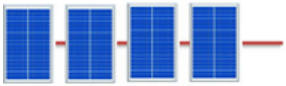
How to Select and Configure PV Panels

The following parameters can be found in each PV panel's specification:

- P_{max}: Max output power (W)
- V_{oc}: open-circuit voltage (V)
- I_{sc}: short-circuit current (A)
- V_{mp}: max power voltage (V)
- I_{mp}: max power current (A)

PV panels can be connected in series or parallel in order to obtain the desired output voltage and current which meets the inverter's allowed range.

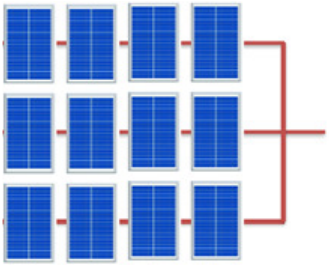
When connecting PV panels in series, the max voltage and current of the string is



$V_{string} = V_1+V_2+V_3+V_4\ldots$

$I_{string} = I_1=I_2=I_3=I_4$

When connecting the above PV string in parallel, the max voltage and current of the total string is



$V_{total} = V_{string1}=V_{string2}=V_{string3}=V_{string4}\cdots$

$I_{total} = I_{string1}+I_{string2}+I_{string3}+I_{string4}$

In either case, the total output power is $P_{total} = P_{panel}$ X Number of PV panel

The guideline to select and configure PV string is

- P_{total} shall be equal or slightly larger than the max. capacity of solar battery charger (900W for 3000VA model and 2600W for 5000VA model). Surplus capacity of PV string does not help the solar charger's capacity and only result in higher installation cost.
- Total V_{mp} of the string shall be within the operating voltage range of solar battery charger (45~72V for 3000VA model and 90~144V for 5000VA model are recommended).
- Total I_{mp} of the string shall be less than the max. input charging current of the solar battery charger (20A for 3000VA and 30A for 5000VA model)

- Total V_{oc} of the string shall be less than the max. PV input voltage of the solar battery charger (75V for 3000VA and 150V for 5000VA model).
- Total I_{sc} of the string shall be less than the max. PV input current of the solar battery charger (20A for 3000VA and 30A for 5000VA model).

Example 1 - How to connect 3000VA **model to PV panels with the following parameters?**

- P_{max}: 260W
- V_{mp}: 30.9V
- V_{oc}: 37.7V
- I_{mp}: 8.42A
- I_{sc}: 8.89A

(1) The max. PV input power for 3000VA model is 900W,

900W / 260W = 3.46⇒ min. 4 PV panels shall be connected.

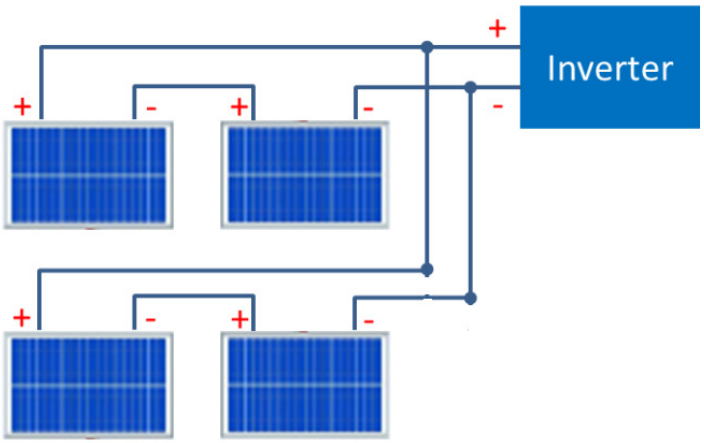
(2) Best Operating Voltage Range is 45~72V,

72V/30.9V = 2.33 ⇒ max. number of PV panel in series is 2.

(3) Max. input charging current is 20A,

20A/8.42A = 2.37 ⇒ max. number of PV panel in parallel is 2.

(4) Taking (1)~(3) into consideration, the optimized configuration is 2 PV panels in series as a string and 2 strings in parallel, as shown below.



(5) Check again the V_{oc} and I_{sc} of PV string,

V_{oc} of string is 61.8V < 75V (Max. PV Input Voltage) ⇒ OK
I_{sc} of string is 2 x 8.89A = 17.78A < 20A (Max. PV Input Current) ⇒ OK

Example 2 - How to connect 5000VA **model to PV panels with the following parameters?**

- P_{max}: 260W
- V_{oc}: 37.7V
- I_{sc}: 8.89A
- V_{mp}: 30.9V
- I_{mp}: 8.42A

(1) The max. PV input power for 5000VA model is 2600W,

2600W / 260W = 10⇒min. 10 PV panels shall be connected.

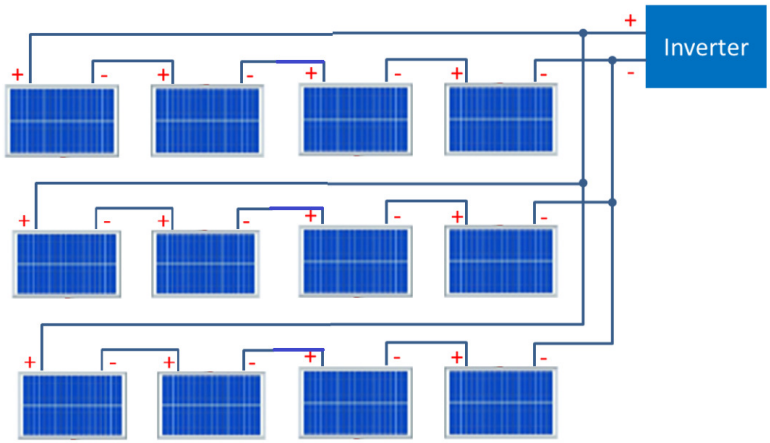
(2) Best Operating Voltage Range is 90~144V,

144V/30.9V = 4.66 ⇒ max. number of PV panel in series is 4.

(3) Max. input charging current is 30A,

30A/8.42A = 3.56 ⇒ max. number of PV panel in parallel is 3.

(4) Taking (1)~(3) into consideration, the optimized configuration is 4 PV panels in series as a string, and 3 strings in parallel (as shown below).



(5) Check again the V_{oc} and I_{sc} of PV string,

V_{oc} of string is 4 x 30.9V = 123.6V < 150V (Max. PV Input Voltage) $\Rightarrow$ OK

I_{sc} of string is 3 x 8.89A = 26.67A < 30A (Max. PV Input Current) $\Rightarrow$ OK

DISPOSAL

In the event the product reaches the end of its service life, please contact the local dealer for disposal instructions.

The product must not be disposed of with the household waste.

Disposal of the product at the end of its service life shall be done in accordance with applicable disposal regulations for electronic waste.

HOW TO DETERMINE THE PRIORITY SETTING BETWEEN UTILITY AND SOLAR POWER?

Please read this document carefully if you intend to manually set the priority setting of the product. Improper setting might compromise the function and performance of the product.

The product is designed to accept both utility and solar (PV) power as input source, and it also provides a function allowing the user to determine the priority between utility and solar input power. In 1000/2000VA models, the priority is to be set via the switch on the rear panel; In 3000/5000VA models, the setting is to be done via the LCD and control buttons on the front panel (please refer to user manual for more details). This document explains how the product's behavior will be at each setting and what should be considered while determine the priority.

1. Setting Utility as Priority

1.1 When utility is normal

The loads connected to the product are supplied by utility power only, even when solar power presents. Solar power is only used for changing the battery.

1.2 When utility is down

As soon as the utility is down, the inverter enters into "Backup Mode" and checks both solar power and battery's status. If solar power is strong enough, it will supply the loads and charge the battery. If solar power becomes weak, the loads will then be supplied by battery until it's too low. The longer the solar power lasts, the less consumption from the battery and hence the longer backup time.

Advantages	Disadvantages/Risk
• Both inverter's built-in charger and solar charger are active to charge the battery, the battery recharging time will be largely shortened. • Better chance to keep the battery fully-charged so that the backup function won't be compromised when the utility is down.	• The solar power cannot be fully utilized by supporting the loads, especially when battery if fully charged.

2. Setting Solar as Priority

2.1 When utility is normal

As long as solar power is strong enough to support the loads and charge the battery, utility power will not be consumed even though it's available. If solar power is not enough, battery will firstly come up to support the loads, and after battery is low, utility will then take over to support the loads and charge the battery.

2.2 When utility is down

The behavior is the same as 1.2.

Advantages	Disadvantages
• The utilization of solar power is maximized. • Save electricity bill by reducing the consumption of utility	• Battery will experience more frequent charge and discharge cycles and therefore battery's service life will be shorter. • If both solar power and battery is low, and utility outage occurs before the battery can fully-charged by utility, the backup function of the product might be compromised or void.

Summary

Whether setting utility as priority or setting solar as priority is subject to purpose of installing the product. In the event the product is to be installed in areas where the utility power is unstable and backup function is much important than energy saving, utility shall be set as priority.

If the product is to be installed in areas with stable utility power and strong sunlight, and energy saving is more concerned than backup function, solar power shall be set as priority.