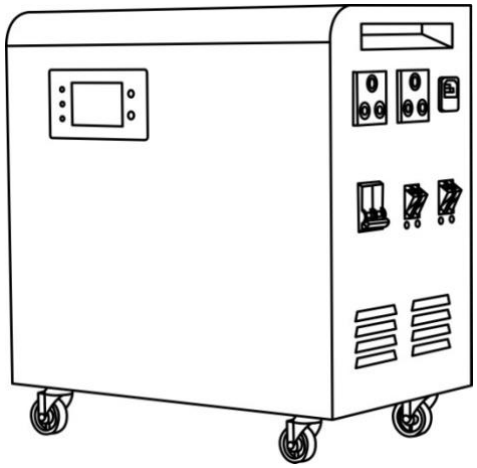
User Manual



Solar Energy Storage System

10.Technicalsheet

Model:		KAPA Energie-1000
Battery rated voltage（VDC）		12
Inverter	Rated power（W）	1000
	Input voltage range（VAC）	145-275VAC
	Input frequency（Hz）	45-65
	Output voltage（VAC）	230VAC; ±5%
	Output frequency（Hz）	50/60;±1%
	Output wave	Sine Wave
	Specification of built-in battery	1*100AH/12V
Solar input	Max. PV voltage（VDC）	≤25
	Range of charging voltage（VDC）	15-25
	Rated charge current（A）	30
	Voltage for overcharge protection（VDC）	14.2
	Voltage for overcharge recovery（VDC）	14.0
	Voltage for floating charge（VDC）	13.8
DC output	Voltage for high voltage protection（VDC）	16.8
	High voltage recovery voltage（VDC）	16.0
	Low voltage recovery voltage（VDC）	13.0
	Low voltage protection voltage（VDC）	11.0
	5VDC USB output	2units /MAX 2A
	12VDC output ports	2units /MAX 2A
Heat dissipation/Cooling		Temperature control by intelligent exhaust fan
Operating ambient temperature		-20 - +50˚C
Storage ambient temperature		-25 - +55˚C
Operating/Storage ambient		0-90% No condensation
External size：W*D*H（mm）		443*267*445mm
Package size：W*D*H（mm）		507*353*511mm

Dear Users

Thank you for choosing our products! Please read this manual carefully before you use the product. This manual is including some important information and recommendations of installation, using method, troubleshooting,etc. Please keep this manual.

Catalogue

1.Main Features

●Excellent performance because of double CPU intelligent control.

●Mains mode and battery mode can be set.

● Controlled by smart fan that is safer and more reliable.

● Pure sine wave AC output, which is able to adapt to various types of load.

● LCD display device parameters in real time, showing you the running state.

● All kinds of automatic protection and alarm of output overload and short circuit.

● 5VDC-USB output and 12VDC output port are convenient and practical for users.

● Inverter’s overcharge protection and overdischarge protection for a longer battery life.

● intelligent solar controller with overcharge protection, overdischarge protection and limiting charge protection.

2. Installation and Storage

（1） Folding packet inspection

1.1 Please open the package and check the products which including a host and a manual.

1.2 Check that if the device is damaged in transit or not. Please do not boot if the damage is found or parts are missing, and notice the shippers and distributors

（2）Installation and Storage

2.1 The equipment should be installed by professional or with the assisted of local dealer.

2.2 The product needs protective measures when transport. The droplets will occur when the equipment was moved from a low temperature environment to a high temperature environment. To ensure your safety, you need to allow it to dry completely before using it.

9.Judgment and Treatment of Simple Fault

Warning: there is a high pressure inside the machine! Do not open, try to do the repair or maintenance, so as to avoid the danger of electric shock!

Please provide the following information when you are in contact with the maintenance personnel: Machine Model / problem date / complete description of the problem (including the status of the relevant indicator display, battery equipment, connection and other information).

Failure phenomena	Possible reason	Solution
From time to time the mains	Resettable fuse holder out strong	Pressing again the strong parts
Machine load time reduced	Battery charging is not enough	To ensure that the battery is fully charged.
	Machine connection load is too heavy	Removal of non-critical loads
	Battery aging, can not be fully charged.	Please contact a customer service representative for battery replacement components
Equipment can not be turned on	Mains input line or battery connection line contact is bad	Check and re-connect
Turn on alarm	Lack of battery power	Ensure that the battery is normal fully

		charged
	Overload	Removal of non-critical loads
Buzzed for 2 seconds 1 second off	Internal overtemperature alarm	Check the fan and Coolingvents are blocked
Fan rotation sometimes fast and sometimes slow	Fan according to temperature regulation	Normal phenomenon
When there is direct sunlight, the "Solar" indicator light is not bright	PV module array connection line open circuit	Please check whether the wiring is correct and the connection is reliable.

8. CareandMaintenance

（1）.This series product only need rarely care, battery only need keeping charging so that can get expected lifetime. When connect with the mains, no matter the equipment on and off, it should be charge battery and provide overcharge/over-discharge protection function.

（2）.If the equipment will not be used for long-term, we suggest it should be charged 1 time every 4~6 month. Usually, the battery can be used for 3~5 years, if it has some problem, then the battery should be changed as soon as possible. When changing battery, it must be operated by professional. Should not replace individual batteries, the battery should be replaced as a whole comply with the supplier's instructions.

（3）.When the equipment has been used normally, the battery need charging every 4~6 month, charging after it discharge untill the equipment power off and charging time can’t less than 12 hours. At high temperature area, the battery need charging/discharging every 2 month,and charging time can’t less than 12 hours.

（4）. Before changing the battery, it must be closed equipment and break away from the mains, close the battery switch.Take off the metal objects such as rings, watches.Use insulated handle and a screwdriver, don't put the tool, or other metal on the battery.

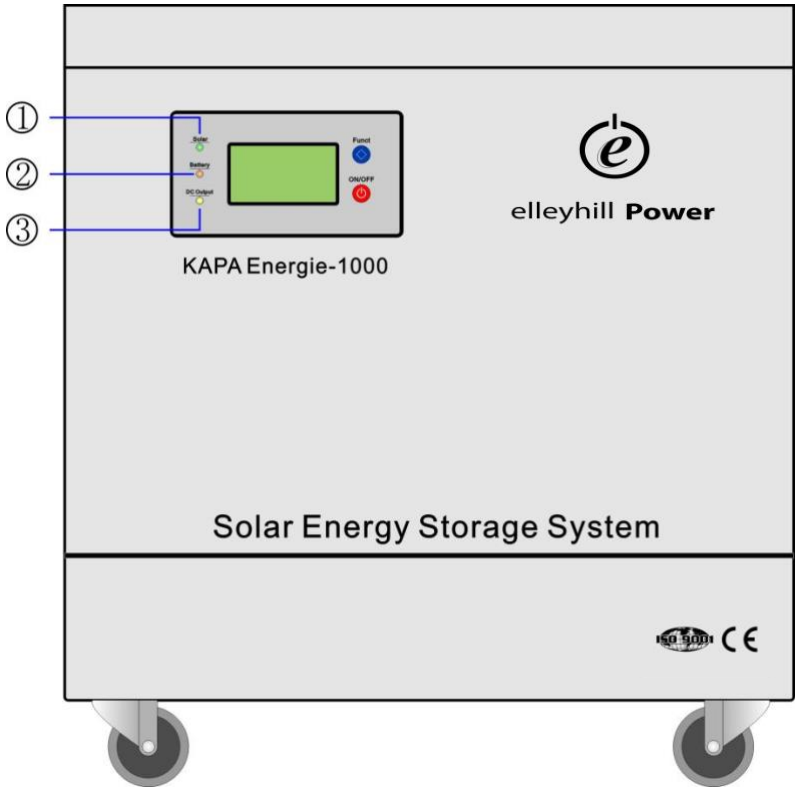
（5）.Connect the battery line, tiny spark in joint belongs to the normal phenomenon, will not cause harm to the personal safety and equipment.Never connect the battery positive and negative into short or the reverse.

2.3 Device should not be exposed to moisture, flammable dust or harsh environments. In order to have a good cooling, do not overwrite or block the vents and reserving over 10CM space around the equipment .

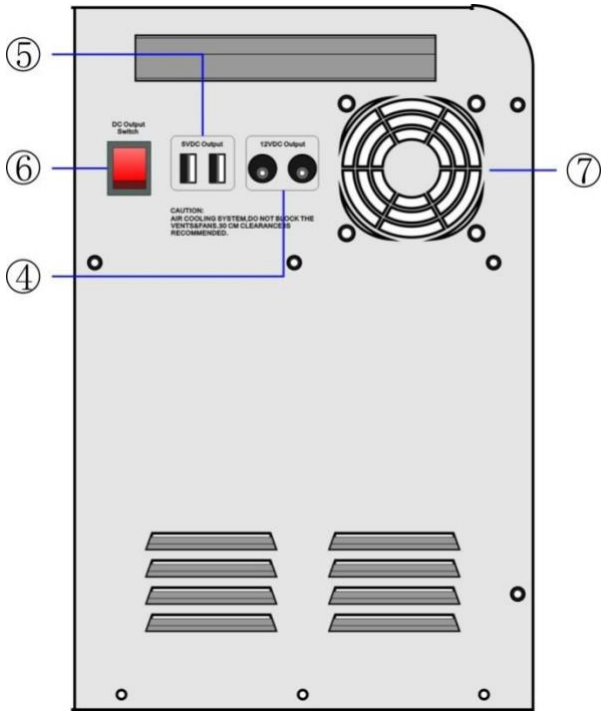
2.4 The battery switch on the rear panel must be placed in a closed state, if the equipment is not using for a long time.

3. Description and Icon

3.1 Front panel diagram



3.2 Instructions of side panel display



Guide:

①--“Solar”：Solar input status

②--“Battery”:Battery status

③--“DC Output” :5VDC-USB、12VDC Output status

④--“12VDC Output”：12VDC Output port

⑤--“5VDC Output”：5VDC-USB output

⑥--“DC Output Switch”：5VDC-USB、12VDC Output On/Off

⑦-- Radiator fan

Operation note: open the equipment and operation of circuit breakers, please follow the following order: first closed battery breaker, then Closed solar module input circuit breaker, switch off the device, first Disconnect the solar module input circuit breaker, before disconnecting the battery breaker;

Note: when not connected to the solar panels, are left unused for a Longtime without the use of equipment, must will pull the panel on the built-in battery circuit breaker switch “⑨—Battery Switch”to shutdown of the state, connecting external expansion of the battery must turn off the anode connecting line circuit breaker, to prevent the battery depth of discharge loss (internal controller in standby electric energy loss).

7.4inverter battery protection voltage profile / parameter table

In the state of open AC output，when the battery voltage reaches the value in the table, itwill perform the relevant protection or prompt;

Inverter battery voltage protection parameter table-12VDC；			
Overvoltage Protection	Overvoltage recovery	Undervoltage alarm	Undervoltage protection
16.8	16	11.3	11.0
Close AC output	AC output recovery	Keep AC output	Mains bypass Mains charger

7.Start/Run

Check the terminal voltage of solar modules and polarity are correct.The battery pack of external expansion is also required to check its end of the battery polarity is correct.

7.1 Open the solar charge controller：

7.1.1 When close the circuit breaker of built-in battery “⑨--Battery Switch”on rear board and the circuit breaker of external expansion battery pack,the “②--Battery”on the front board lights.The lighting state of indicator“③--DC Output”is based on the battery voltage and capacity.

7.1.2 The solar array is connected in series with the line,pull the circuit breaker in it to be closed,when sun shine shooting solar modules, the front panel "① - Solar" LED is lit, this time, PV modules supply power for battery via the built-in solar controller.

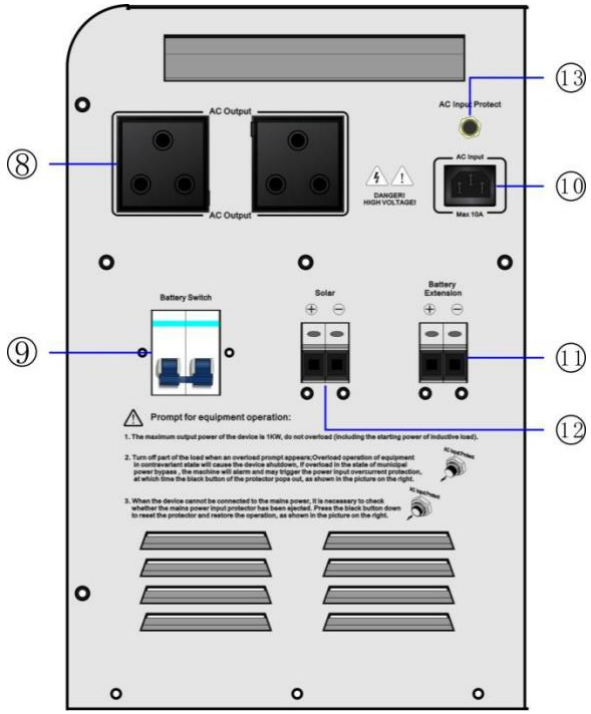
7.2 Battery inverter power on / off

7.2.1 Power on: Closing the battery switch on rear board"⑨--built-in battery input switch",then press "Power On / Off button" for 2 seconds, release it after listening the buzzer sounds,the device start to output.
7.2.2 Power off:Close the load equipment,then press “power on/switch bottom”for 2 seconds,then release it,the AC output is close and the LCD screen off.

7.3 Power on/off of Mains Input

7.3.1 Power on:Close “⑨--built-in battery input switch”,input mains and the equipment start output automatically.

7.3.2 Power off:Close every load,then press “Power on/off botton”for 2 seconds,release it and the equipment close AC output and charge for battery,LCD lights on.



Guide:

⑧-- “AC Output”：AC output socket

⑨-- “Battery Switch”：The built-in battery switch

⑩-- “AC Input”：AC input socket(MAX 10A)

⑪-- “Battery”：External Battery input terminal

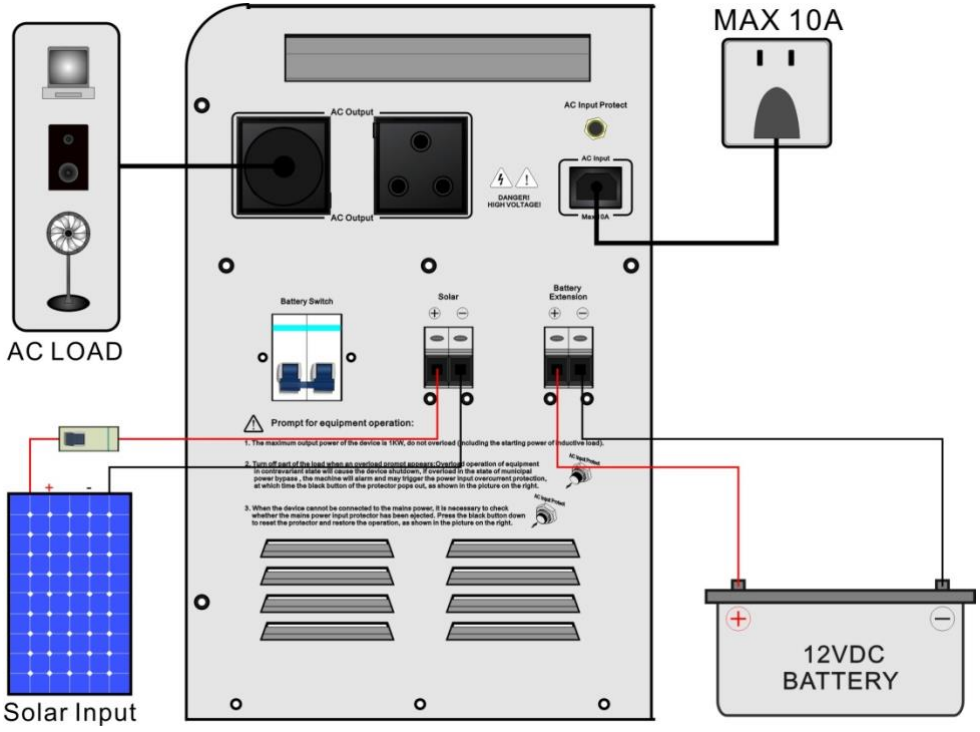
⑫-- “Solar”：Solar input terminal

⑬--AC input fuse holder

3.4 Solar Charge/Discharge LED Indicating Lamp Status

LED display			Introduction
Solar	Green	Light	Charge controller is in charging...
		Twinkle	Charging controller to prepare...
		Extinguish	Charge controller is in standby...
Battery	Green	Light	Battery voltage charging protection；
		Light	Battery voltage normal；
		Extinguish	Battery voltage under-voltage protection or high-voltage protection
DC Output	Yellow	Quick flashing	DC load current overload or short circuit
		Light	DC output voltage normal
		Twinkle	DC load current overload
		Extinguish	Power off DC output

6. System connection diagram



5.3 Descripition of connecting “④--12VDC Output”、“⑤--5VDCOutput”

5.3.1 Make sure the DC load current is no more than rated current of device,three “④--12VDC Output”DC port supply respectively 1AMP,a “⑤—5VDC Output”DC port supply 2AMP current.

5.3.2When connecting to the DC load,note that the polarity can not be wrong to avoid short circuit of DC output port connection and damage to the equipment.

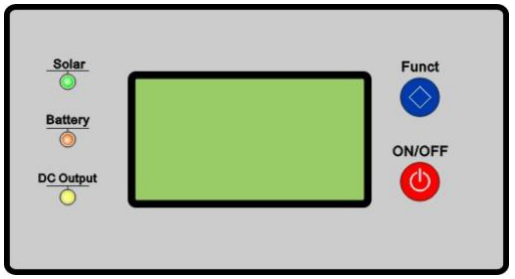
5.4 Description of AC charginig function(battery preferred and with mains charging function)

5.4.1 the alternating current input to the panel "⑩-AC input"; AC input socket;The LCD display; automatic light that is connected to AC power; pay attention to the input AC voltage in the equipment of AC input voltage range (so as not to damage the equipment), now connected to alternating current and can be used AC charging;

4.Operation Instruction

4.1Panel LCD display icon

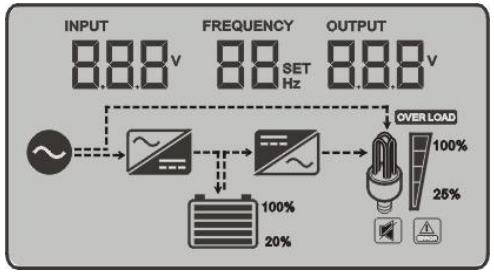
4.1.1 LCD display and function key operation interface can display the equipment working status，such as input or output voltage, frequency, main supply mode, inversion mode, battery capacity, load capacity, warning tips, etc.



4.1.2 Key Instruction

Function Key		Instruction
◇	Mute/Function key	Short press can mute; Long press to enter the device work mode settings
⏻	Power on /off key	Single on / off control

4.1.3 LCD Display



Equipment Indexes	
LCD Display	Function
INPUT 888 V	AC Input Voltage
FREQUENCY 88 Hz	AC Output Frequency
OUTPUT 888 V	AC Output Voltage
88 SET	Working mode selection

	Main supply mode	Battery mode
	01 SET	03 SET

Battery icon description		
LCD Icon	Status	Battery voltage/12V；*A（Number）
	Flash	＜10.5V；*A
	Turn on	10.5～11.2V；*A
	Turn on	11.2～11.6V；*A
	Turn on	11.6～12.1V；*A
	Turn on	12.1～12.5V；*A
	Turn on	＞12.5V；*A

5.Description of Wiring Step

Note:make sure the switch on the front panel and the circuit breaker on the rear panel are in the state of closing,then operate the following procedures;

5.1Installation of External Battery:the machine has built-in battery, if you need to install external battery,you should operate as follow steps:

5.1.1 The external battery is connected properly with the appropriate diameter wire with a voltmeter storage,the voltage across the battery pack is about the rated voltage.

5.2.2 Series connecting a suitable circuit breaker to the External battery pack to the the positive line of "⑪--Battery" terminal block,please see "System Connection Diagram";

5.1.3 The battery pack is properly connected access devices "⑪-- Battery"terminal blocks on the rear panel,, note the battery polarity access process is not wrong, in order to avoid damage to the equipment.

5.1.4 Prior to connecting an additional battery make sure the battery in the system is fully charged. （**Certain requirement is same specification, had better be same as manufacturer, capacity is consistent.It is recommended that new batteries and batteries that have been used for a period of time should not be used in parallel**）

5.2Description of Solar Module Connection

5.2.1Connecting the solar modules within the rated power with suitable diameter wire,measure the open circuit voltage by voltmeter,the voltage should be about 1.5-1.7 times of the rated voltage

5.2.2Series connecting a suitable circuit breaker between solar modules and the positive line of “⑫--Solar”terminal blocks；

5.2.3 Connecting solar modules to “⑫--Solar”terminal blocks,note that access to process solar modules whose polarity can not be wrong, so as to avoid damage to the equipment output

4.4 Sound alarm prompt instruction

Normal operation	Buzzer prohibited	Defaultstate, the buzzer does not chirp.
	Buzzer opened	Buzzer chirping four times at 15s intervals prompt that the device is operated under the condition of the battery pack inverter.
Battery high voltage alarm	Buzzer chirping four times with 1s prompt high voltage	
Battery undervoltage alarm	Buzzer chirping twice with 1s prompt undervoltage	
Overtemperature	Buzzer chirping 2s and stop with 1s	

alarm	

4.5 Generator connection notice：

If connect the generator, please follow the steps.

4.5.1Start the generator until it works stably, connect its output power to the input terminal of the equipment and determine the output of the device is idle state, and then turn on the device.

4.5.2 Connect to the load after start the device.

4.5.3It is recommended that depend on the capacity of the generator 2-3 times to choose the capacity of the equipment.

Work mode icon instruction		
LCD display	Function instruction	
	Mains supply input icon	
	AC-DC icon	
	DC-AC icon	
Buzzer icon instruction		
	Light up	Buzzer prohibited
	Light off	Buzzer opened
Fault/anomaly icon instruction		
	Fault/anomaly prompt	

Loading icon instruction				
LCD display	Function instruction			
	Output load overload prompt			
	0%～25%	25%～50%	50%～75%	75%～100%

4.2Panel button/LCD setting instruction

Function button		Operation instruction
◇	Mute button	Long press for 1s, buzzing once time, opened the mute state; Return long press for 1s, buzzing twice, closed the mute state.
	Function button	Long press for 5s can cycle choose 01, 02, 03 mode. The machine will restart to take effect afterselected mode.

		Mains supply preferred mode	Battery preferred mode
			
⏻	On/off button	Power-on	Long press for 2s, stop after buzzing once time, equipment turn on output.
		Power-off	Long press for 2s, stop after internal relay start working, equipment turn off output.

4.3 Work mode instruction

Icon	Work mode	Operating condition
	Mains supply preferred mode	After equipment starting, it stabilized voltage by mains supply bypass to provide power to the load and charge the battery pack under normal mains supply input. When mains supply is too high, too low, severe distortion or other abnormal conditions, the equipment switches the battery energy into the high quality power by internal model, and provide to the load.
	Battery preferred mode	When the device is first started, in the case of the normal input, the device operates with the mains supply preferred mode, but not charge the battery pack. When the battery pack is full charged by the external charging device, such as solar charging system, the equipment automatically turn the battery energy into the high quality power by internal module and supply to the load. When the battery voltage drops below the threshold, it stabilized voltage by mains supply bypass to provide power to the load and charge the battery pack under normal mains supply input, but not charge the battery pack. This mode is mainly designed for new energy power generation system, such

		as wind and solar power generation system).