USER'S MANUAL

INVERTER/CHARGER

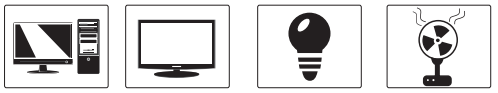
MAXPOWER

USER'S MANUAL

INVERTER/CHARGER

720W/1000W/1440W

Appliances



PC TV Light Electric fan

420-00237-A5

Table Of Contents

Specifications

MODEL	1200	1800	2400
CAPACITY	720W	1000W	1440W
INPUT			
Voltage	230 VAC		
Voltage Range	170~280 VAC(UPS mode) 90~280 VAC(IUV mode)		
OUTPUT			
Voltage Regulation (Batt. Mode)	+10/-18%		
Transfer Time	20 ms typical		
Waveform	Modified sine wave		
BATTERY			
Battery Voltage	12 VDC		24 VDC
Floating Charge Voltage	13.7VDC ±0.1 VDC		27.4VDC ±0.2 VDC
Maximum Charge Current	10A or 20A		
PHYSICAL			
Dimension (D*W*H) mm (plastic)	295 x230 x85		
Net Weight (kgs) (plastic)	2.5	2.7	
Dimension (D*W*H) mm(Iron piecesc)	290 x 252 x 99		
Net Weight (kgs) (Iron piecesc)	3.9	4.1	

TROUBLE SHOOTING

Use the table beiow to solve minor problems

Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do
When power fails the battery tome is shorter.	Battery low alarm issue quickly.	Battery voltage is too Low.	Charge the unit at least 8 hours.
		Battery capacity is not full even after charge the unit for at least 8 hours.	Check the date code of the battery. If the batteries are too old, replace the batteries.
Mains exists but the unit works in battery mode.	Input voltage is displayed as 0 on the LCD and green LED is flashing.	Input protector is tripped.	Check if AC breaker is tripped and AC wiring is connected well.
	Green LED is flashing.	Insufficient quality of AC power. (Shore or Generator)	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS Appliance)
	Green LED is flashing.	Set "Solar First" as the priority of output source.	Change output source priority to Utility first.
	No LED display	Battery is not connected well.	Check the external battery cable and terminal. Make Sure all the battery connections to the unit are all correct.
		Battery defect.	Replace the batteries.
Buzzer beeps continuously and red LED is on.	Fault code 00	Output short circuited.	Check if wiring is connected well and remove abnormal load.
	Fault code 01 /16	Overload error. The inverter is overload 110% and time is up.	Reduce the connected load by switching off some equipment.
	Fault code 02 /15	Battery weak Battery voltage too low.	1. Re-charge battery. 2. Replace battery.
	Fault code 03	Output voltage too high	Return to repair center.
	Fault code 04	Output voltage too low	Return to repair center.
	Fault code 06	Battery voltage too high	Check the battery specifications
	Fault code 07	Fan fault Inverter temperature too high.	Replace the fan.
	Fault code 14	Output frequency anomaly	Return to repair center.

General Precautions

1. Before using it, read all instructions and cautionary markings on :
(1) inverter (2) the batteries (3) this manual
2. CAUTION --To reduce risk of injury, charge only lead-acid rechargeable batteries. If customer use flooded batteries, they must maintain them usually. Other types of batteries may cause damage and injury.
3. Do not expose it to rain, snow or liquids of any type. It is designed for indoor.
4. Do not disassemble it. Take it to a qualified service center when service or repair is required.
5. To prevent the risk of electric shock, disconnect all wiring before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
6. WARNING: Provide ventilation to outdoors from the battery compartment. The battery enclosure should be designed to prevent accumulation and concentration of hydrogen gas at the top of the compartment.
7. NEVER charge a frozen battery and connect the inverter with 12V to 24V battery.
8. Input/output AC wiring must be no less than 18 AWG gauge copper wire and rated for 75°C or higher. Battery cables must be rated for 75°C or higher and should be no less than 6AWG gauge.
9. Be extra cautious when working with metal tools around batteries. Short-circuiting the batteries could cause an explosion.
10. Read the battery manufacturer's installation and maintenance instructions prior to operating.

Personnel Precautions

1. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
2. Avoid touching eyes while working near batteries.
3. NEVER smoke or allow a spark or flame in vicinity of a battery.
4. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with batteries. Batteries can produce a short-circuit current high enough to make metal melt, and could cause severe burns.
5. If a remote or automatic generator start system is used, disable the automatic starting circuit or disconnect the generator to prevent accident during servicing

FOLLOW STANDARD
EN 60950-1:2006+A2:2013+A11:2009+A1:2010+A12:2011
EN 55022:2010, EN 55024:2010, EN 61000-3-3:2008

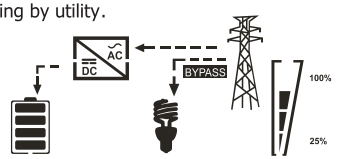
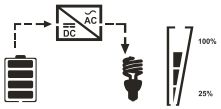
Introduction

It is a cost effective, intelligent solar inverter which accept Solar & Utility input at the same time. The comprehensive LCD display offers user-configurable and easy-accessible button adjustment such as battery charging current, priority. When battery voltage low, it will automatically switch to AC grid to supply continuously power to the loads.

Features:

- Simulated sine wave inverter
- 10A or 20A standard charging current from utility
- MFD (multi-function display)
- AC/Battery priority for output via MFD
- AC/Battery priority for charging via MFD
- Smart user friendly interface
- 3 step charging algorithm
- Over load & short-circuit protection
- Battery reverse polarity protection
- Deep discharge protection
- Auto restart while AC is recovering

Operating Mode Description

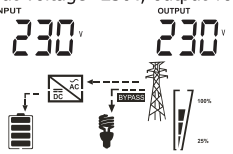
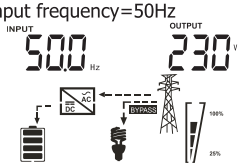
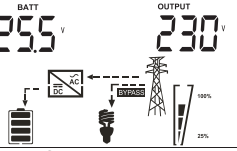
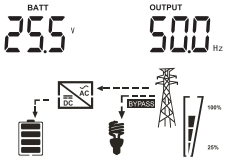
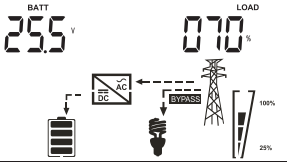
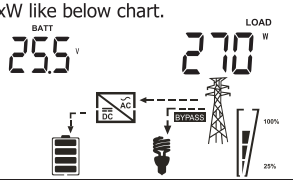
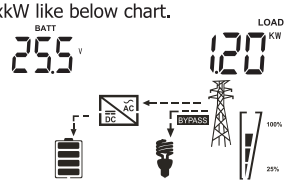
Operation mode	Description	LCD display
Line Mode	The unit will provide output power from the mains. It will also charge the battery at line mode.	Charging by utility. 
Battery Mode	The unit will provide output power from battery and PV Power.	Power from battery only. 

Fault Reference Code

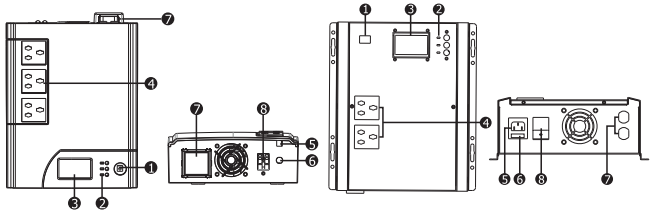
Fault Code	Fault Event	Icon on
00	Output short circuit	
01	Over load time out	
02	Battery weak	
03	Output voltage too high	
04	Output voltage too low	
06	Battery voltage too high	
07	Fan fault	
08	—	
09	—	
13	—	
14	Output frequency abnormal	
15	Battery voltage low	
16	Load too high	

Display Setting

The LCD display information will be switched in turns by pressing "UP" or "DOWN" key. The selectable information is switched as below order: input voltage, input frequency, PV voltage, charging current, battery voltage, output voltage, output frequency, load percentage, load in VA, load in Watt.

Selectable information	LCD display
Input voltage/Output voltage (Default Display Screen)	Input Voltage=230V, output voltage=230V 
Input frequency	Input frequency=50Hz 
Battery voltage	Battery voltage=25.5V 
Output frequency	Out put frequency=50Hz 
Load percentage	Load percent=70% 
.	When load is lower than 1kW, load in W will present xxxW like below chart. 
Load in Watt	When load is larger than 1kW (≧ 1KW), load in W will present x.xkW like below chart. 

Product Overview



1. Power switch
2. Status indicators(please see the Operation section for the details)
3. LCD display
4. Output receptacles
5. AC input
6. Input circuit breaker
7. External battery connectors
8. Solar panel terminal

Installation

NOTE: Before installation, please inspect the unit. Be sure that nothing inside the package is damaged.

Mounting the unit

The unit ONLY can be mounted vertically to a wall surface.

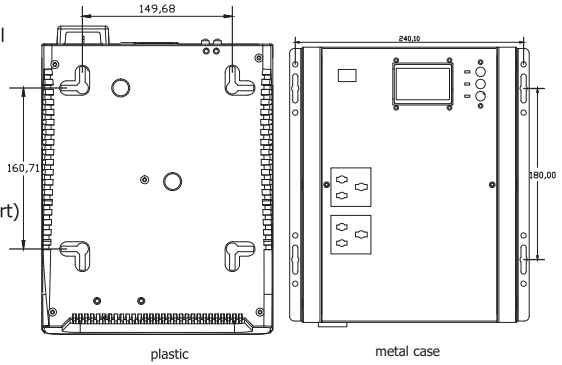
Please follow below steps:

1.Turn off the unit before mounting.

2.Select an appropriate mounting location. Use a horizontal and the length at one must be 80mm and mark the two ends on the wall.(see right chart)

3.Drill two marks by screws

4.Mount the unit by positioning the key-hole slots over the mounting screws.



Connect to utility and charge

Plug the AC input cord to the wall outlet. The unit will automatically charge the connected external battery even though the unit is off.

Connect External Battery

Step1: Away the cover of external battery terminal.

Step2: Following battery polarity guide printed near the battery terminal.

RED cable to the positive terminal (+);

BLACK cable to the negative terminal (-).

WARNING! Please use the appropriate battery cable. Please refer to Important Safety Warnings Section for the details

Step3: Tight the battery cables with the M5 nuts .Do NOT place anything between the flat part of battery terminal and the battery cable ring terminal or overheating may occur.(See Fig.i)

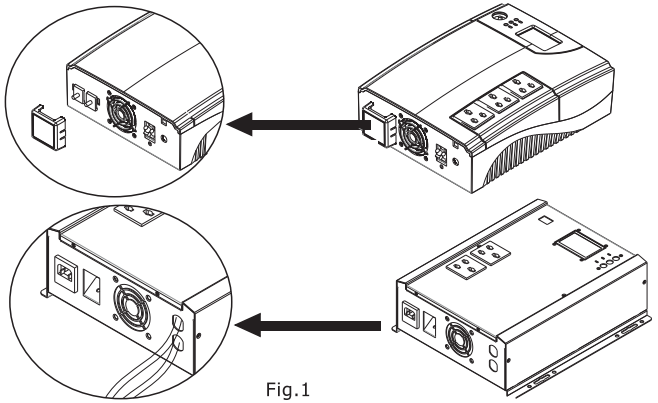


Fig.1

Step4: Install a DC Breaker in a positive line.The rating of the DC Breaker must be according to the inverters battery current(75Amp).Keep the DC breaker off(see Fig.2).

Step5: Connect battery cable to the external batteries.

Note: For the user operation safety. we strongly recommend that you should use tapes to isolate the battery terminals before you start to operate the unit.

1) Single battery connection(Refer to Fig.2) When using a single battery, its voltage must be equal to the Nominal DC Voltage of the unit(see below Table 1).

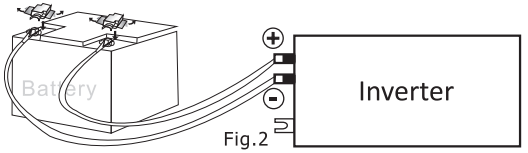


Fig.2

Table 1

Model	Nominal Battery DC Voltage
1200/1800	12Vdc
2400	24Vdc

2) Multiple batteries in series connection(Refer to Fig.3): All batteries must be equal in voltage and amp hour capacity. The sum of their voltages must be equal to the nominal DC Voltage of the unit.

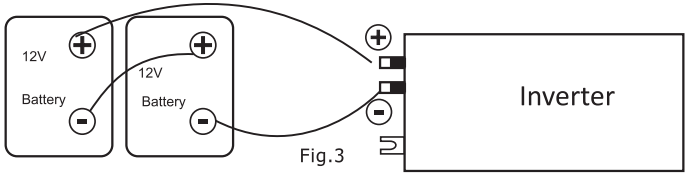


Fig.3

3) Multiple batteries in parallel connection(Refer to Fig.4): Each battery' svoltage must be equal to the Nominal DC Voltage of the unit.

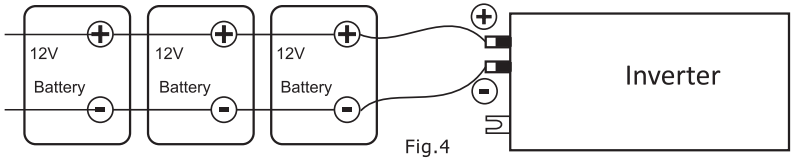


Fig.4

Step 6: Make sure to connect the polarity of battery side and unit correctly.
Positive pole(Red) of battery to the positive terminal(+) of the unit.
Negative pole(Black) of battery to the negative terminal(-) of the unit.

Step 7: Put the covers back to the external battery terminals.

Step 8: Take the DC breaker on.

Operation

Power On/Off

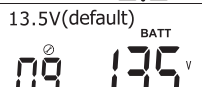
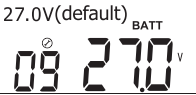
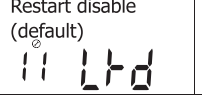
Once the inverter has been property installed, press the power switch to tun on the unit. The unit will work automatically in line mode or inverter mode according to input utility power's status. When press the power switch again, the unit will be tumed off.

LED Indicators & Audible Alarms

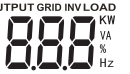
There are three indicators (Green/Red) in the front panel of the unit

LED Indicators		Messages
∿ Green (Line)	Constant on	Line Input Voltage normal
	Flashing	Line Input Voltage Fault
Green (INV)	Constant on	Inverter mode
	off	Bypass mode
⚠ Red (Fault)	Constant on	Fault mode
	Flashing	battery low or overload warning
Buzzer Audible Alarms		Messages
Inverter Mode (low-battery Voltage)		Buzzing every 1 seconds
110% overload warning		Buzzing every 0.5 seconds
Over charge		Buzzing continuously
Fault mode		Buzzing continuously

12	Auto return to default display screen	Return to default display screen 	If selected, no matter how users switch display screen, it will automatically return to default display screen (Input voltage /output voltage) after no button is pressed for 1 minute.
		Stay at latest screen (default) 	If selected, the display screen will stay at latest screen user finally switches.
13	Backlight control	Backlight on 	Backlight off (default) 
14	Alarm control	Alarm on (default) 	Alarm off 
15	Button beep control	Alarm on (default) 	Alarm off 

09	Setting voltage point back to battery mode when selecting "SBU priority" or "Solar first" in program 01.	Available options in 1200/1800 model:	
		12.0V 	
		12.2V 	12.5V 
		12.7V 	13.0V 
		13.2V 	13.5V(default) 
		13.7V 	
		Available options in 2400 model:	
		24.0V 	
		24.4V 	25.0V 
		25.4V 	26.0V 
		26.4V 	27.0V(default) 
		27.4V 	
11	Auto restart when overload occurs	Restart disable (default) 	Restart enable 

LCD Display

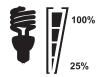
Display	Function
Input Source Information	
AC	Indicates the AC input.
INPUT PV BATT TEMP 	Indicate input voltage, input frequency, PV voltage, battery voltage and charger current.
Configuration Program and Fault Information	
	Indicates the setting programs.
	Indicates the warning and fault codes. Warning and Fault: flashing with ⚠ ERROR .
Output Information	
OUTPUT GRID INV LOAD 	Indicate output voltage, output frequency, load percent, load in VA, load in Watt.
Battery Information	
	Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.

In AC mode, It will present battery charging status

Status	Battery voltage	LCD Display
Constant Current mode / Constant Voltage mode	< 11Vdc/pcs	4 bars will flash in turns.
	11Vdc ~ 11.5Vdc/pcs	Bottom bar will be on and the other three bars will flash in turns.
	11. 5Vdc ~ 12.5Vdc/pcs	Bottom two bars will be on and the other two bars will flash in turns.
	> 12.5Vdc/pcs	Bottom three bars will be on and the top bar will flash.
Floating mode. Batteries are fully charged.		4 bars will be on.

In battery mode, it will present battery capacity.

Battery Voltage	LCD Display
< 11Vdc/pcs	
11Vdc ~ 11.5Vdc/pcs	
11. 5Vdc ~ 12.5Vdc/pcs	
> 12.5Vdc/pcs	

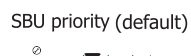
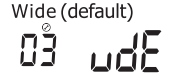
Load Information				
OVER LOAD	Indicates overload.			
	Indicates the load level by 0-24%, 25-50%, 50-74% and 75-100%.			
	0%~25%	25%~50%	50%~75%	75%~100%
				
Mode Operation Information				
	Indicates unit connects to the mains.			

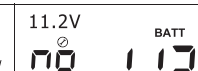
BYPASS	Indicates load is supplied by utility power.
	Indicates the utility charger circuit is working.
	Indicates the DC/AC inverter circuit is working.
Mute Operation	
	Indicates unit alarm is disabled.

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. And then, press "ENTER" button to confirm the selection or ESC button to exit.

Setting Programs:

Program	Description	Selectable option	
01	Output source priority: To configure load power source priority	Utility first 	Utility will provide power to the loads as first priority. Solar and battery energy will provide power to the loads only when utility power is not available.
		SBU priority (default) 	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level cut-off voltage or the setting point in program 08.
03	AC input voltage range	Wide (default) 	If selected, acceptable AC input voltage range will be within 90-280VAC.
		Narrow 	If selected, acceptable AC input voltage range will be within 170-280VAC.
04	Output frequency	50Hz (default) 	60Hz 
05	Maximum utility charging current Note: If setting value in program 02 is smaller than that in program in 05, the inverter will apply charging current from program 02 for utility charger.	10A 	20A (default) 

07	Low DC cut-off voltage	1200 model: default setting 9.9V 
		2400 model: default setting 19.8V 
		Setting range is from 9.9V to 12.0V for 1200 model, 19.8V to 24.0V for 2400 model. Increment of each click is 0.1V. Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.
08	Setting voltage point back to utility source when selecting "SBU priority" in program 01.	Available options in 1200/1800 model:
		11.0V  / 11.2V 
		11.5V (default)  / 11.7V 
		12.0V  / 12.2V 
		12.5V  / 12.7V 
		Available options in 2400 model:
		22.0V  / 22.4V 
		23.0V (default)  / 23.4V 
		24.0V  / 24.4V 
		25.0V  / 25.4V