

PBox1207

Small Solar DC System

User's Manual



Please read this manual carefully

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Respected User:

We feel grateful to you for selecting our small solar DC system product!

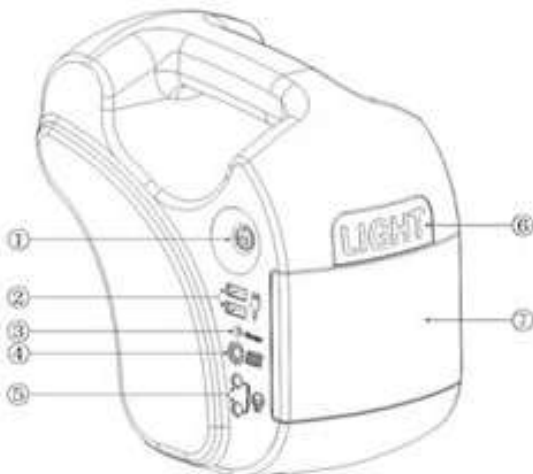
1. Attentions for Safety Use

- (1) Using under corrosive and dusty environment should be avoided.
- (2) Direct exposure to sunshine or rain should be avoid.
- (3) Please do not pour any liquid into this machine.
- (4) Please do not dismantle or repair this machine yourself.
- (5) Please do not plug charging power that does not meet requirements into charging socket.

2. Product Features

- This product is made with novel charging control algorithm which could exploit solar energy more effectively. Battery panel will charge the storage battery into saturation and elongate the lifetime of storage battery.
- This product has a built-in high-efficient white LED light with four scales brightness for adjustment in order to meet various illumination demands of users. This LED light is driven by switch-type constant current source, and bears the properties of high conversion efficiency, low heat and constant current in different voltages, which can increase the lifetime of LED light.
- USB power source is a DC/DC switch power source with high output current, high conversion efficiency and low heat.
- This product is equipped with perfect protections, can prevent re-flux of storage battery, low-voltage protection and over-current protection among others.

3. Use Instructions

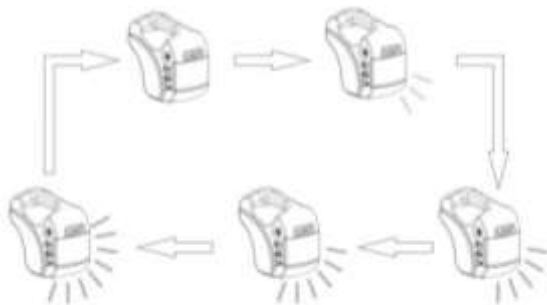


①	DC output and USB Output Control Button-Power (with back-light)
②	USB Power Output Port
③	Charging Status Indicator
④	Charging Input Port
⑤	DC Output Port
⑥	Front Light Switch and Brightness Adjustment Button-Light
⑦	Front Light

Front Light Control:

Press LIGHT button slightly to switch on or off front light and adjust the brightness of front light. When front light is off, slightly press this button, then front light will turn into a cycle as : off→100% brightness→75%brightness→50%brightness→25%brightness→off.

This front light is only controlled by LIGHT button.



Control of DC Output and USB Output:

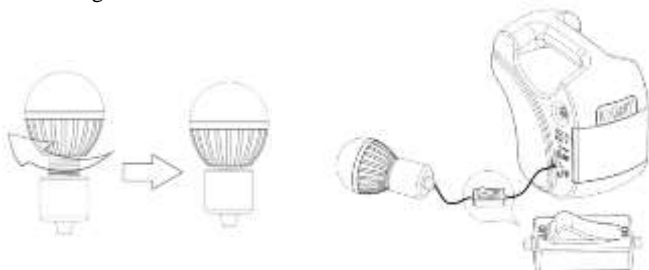
DC output and USB output are controlled by POWER button. Under normal output, back-light of POWER button is on all the time. If POWER button is slightly pressure under on status, the output port will be closed and back-light of POWER button will be off, too. When back-light of POWER button is on all the time, connect appropriate DC load to DC output port or USB output port of main unit (port parameters are shown in parameters table).



POWER Indicator Instructions	
On all the time	Both DC output and USB output are normal.
On for 3 seconds and off for 1 second	Voltage of storage battery is lower than 1.6V, please save power consumption.
Sparkling in 2 seconds interval	Voltage of storage battery is lower than 10.7V, low voltage protection is started.
Sparkling in 2 seconds interval for 30 seconds then off	Voltage of storage battery is lower than 10.5V, low voltage protection is started. The control circuit will be cut off 30 seconds later.
Sparkling in 2 seconds interval	Discharging current of storage battery is too large. In order to prevent circuit damage and storage battery damage, output has been cut off. Press POWER button to unlock.

Use of LED Bulb:

Rotate LED bulb clock-wisely to install into the included screw lamp holder. Then fix the lamp holder onto proper position. Connect plug of bulb guiding wire to DC output port of main unit. Slightly press POWER button on main unit and wait until the POWER is light. Then place control switch on guiding wire of bulb to ON position of switch to lighten the LED bulb.



Sustainable Working Time of Various Loads When Main Unit is Fully Charged.

1	Internal 3W main lamp, 25% brightness	About 54 hours
2	Single 3W/12V bulb	About 18 hours
3	Single 5W/12V bulb	About 10 hours
4	Single 3.6V/2000mAh lithium battery	About 7 times for full charging
5	Single 8W/12V DC fan	About 6 hours
6	1 set of 3W radio with speaker or MP3	About 17 hours

Installation Position of Solar Battery Panel:

Places with direct sunshine all the time are preferred and other shaded places should be avoided to maximize the utilization of solar energy for power generation. When solar battery panel is installed in high place, the battery panel should be secured to prevent battery being blown off. Please do not install battery panel on the highest point to prevent thunder-striking.



Solar Battery Panel Orientation:

Solar battery panel should face toward the direction from which sun light is emitted. Namely, it should face toward south in north hemisphere and toward north in south hemisphere. A simple method for determination is :in the noonday, rotate solar battery panel with the vertical center of battery battery as axial line such that the

protection of solar battery panel on ground is similar to a right angle to the largest extent.

Tilt Angle of Solar Battery Panel:

The horizontal tilt angle of solar battery panel (angle between horizontal plane and the surface on which solar pane is exposed to the sun) is determined by the specific altitude and season. The higher altitude, the larger the required tilt angle. Required tilt angle in winter is larger than that in summer. It is recommended to adjust the tilt angle every three months. A simple method to determine horizontal tilt angle is :in the noonday, vertically erect a long and thin object on surface of solar battery panel, then adjust the horizontal tilt angle of solar battery panel until the projection of such object is shortest.

Use Solar Battery Panel to Charge Main Unit:

After solar battery panel is completely installed. Connect the plug of guiding wire of solar battery panel to main unit. If sunlight is projected on panel at this time, the CHARGE indicator on main unit will be on.



CHARGE Indicator Status Instructions	
On all the time	Normal charging, under Bulk charging status currently.
Sparkling for 5 times in 1 second interval, then on for 5 seconds, and repeat the above cycle	Normal charging, under Absorption charging status currently. In this case, charging is conducted at high voltage to accelerate the charging process.
Sparkling in 1 second interval	Normal charging, under Float charging status currently.
Off	Solar battery panel is not connected or storage battery is charged fully, and not being charged not.

Charge Storage Battery with AC Charger: (AC Charger is an Optional Accessory)

If the power generated by solar battery panel is inadequate or it is need to charge storage battery quickly, AC charger could be plugged into DC input port of main unit to charge the storage battery. Note: please do not use other AC adapter to prevent over-current or excess voltage damaging circuit or storage battery.



Time Needed to Fully Charge the Used up Storage Battery

1	10W solar battery kit(with good sunlight)	About 2 days
2	1A/14.4V AC charger	About 4.5 hours

Attentions:

- Please turn off power source of this product if it is intended to not use it for a long time.
 - Please charge the product for over 2 days for the first time use or after the product is not used for a long time.
 - Please do not connect DC load higher than rated current to DC input port of product.
 - Please do not connect the plug of solar battery panel or AC adapter into DC output port of product.
 - Please fully charge storage battery every three months to elongate the lifetime of storage battery.
 - Do not incline or bottom up the product during charging or discharging to prevent reduce lifetime of storage battery.
 - Do not connect DC LED bulb to AC socket!
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4. Troubleshooting

Trouble	Possible Causes and Solutions
Press POWER button or LIGHT button, the product has no response.	Storage battery is used up so that voltage is too low to start control circuit. Use solar battery panel or AC adapter to charge the main unit.
Front light cannot be lightened.	Check if POWER indicator is sparkling. Sparkling means storage battery is under low voltage protection.
Solar battery panel is connected, but charging indicator is not on.	Connection circuit of solar battery panel is short or open, or the solar of circuit are wrong, or sun light is too weak. If storage battery is used up, the indicator will not be on until the voltage of battery is to 9V.
External bulb cannot be lightened.	Check if the switch on connection wire is on, if the connection line is damaged or short circuit, check if main unit is under low voltage protection or over-current protection.
Mobile phone cannot be charged after being connected to USB port.	Check if POWER indicator is on normally and try to change USB cable.

5. Technical Parameters

Model	PBox1207
Charging Port	
Input Port	1 ×DC socket (inner cord diameter 2.0mm, inner cord is positive polar)
Output Port	≤25V
Input Current	≤1A
Input Power	≤17W
Storage Battery	
Battery Type	AGM battery (valve-controlled closed lead-acid storage battery)
Rated Capacity	4.5Ah
Rated Voltage	12V
Standby Loss	≤9mA(DC port and USB power are on)
Charging Control	3 stages PWM manner
Charging indicator	1 ×green LED indicator
DC Output	
DC Output Port	2 ×DC sockets(inner cord diameter 2.0mm, inner cord is positive) Maximum output current of each port is 1A
USB Power Source	2 ×USB power source output ports, the total maximum output current is 1A
Output Protection	low voltage protection, over-current protection, automatic cut off under super-low voltage
Output Control	1 ×button with red back-light
Output Indicator	Back-light indicates output status

Front Light of Main Unit	
Light Source Type	LED light source, white light, color temperature 6000K
Rated Power	3W,switch power source mode with constant current source
Light Adjustment	100%-75%-50%-25%
Front Light Control	Controlled by LIGHT button, IR remote control(optional accessory and functions)
Volume of Main Unit	197mm*135mm*198mm
Weight of Main Unit	2.07KG
Work Temperature	-10°C ~+50°C
Work Humidity	0~95%,non condensed fog

Standard Accessories	
Solar Battery Kit	1×10W solar battery kit, 0.12mm ² cable 5m
LED Bulb	2×3W bulbs , E27 screw base
Bulb Holder	2×E27 screw holders,0.5mm ² cable 4m, with switch
USB Cable	1*10 cable

Optional Accessories	
AC Adapter	1A/14.4V AC adapter with constant current output
Remote Control	Remote controller with one button
DC Fan	DC12V/8W, 10 inch diameter
LED Bulb	DC12V/5W, E27 screw base

6. Warranty

Quality warranty of this product is executed according to the following rules:

- This product can be repaired and changed free of charge within 1 month after being sold.
- This product can be repaired free of charge within 18 months after being sold.
- We offer repairing service in exchange of payment for this product within its whole lifetime.

Controller damage caused by any of the following reasons shall be repaired for payment even if it is within warranty period:

- Damage caused by improper transport or storage after being sold.
- Damage caused by reasons with respect to usages out of technical parameters.
- Damage caused by incorrect operations.
- Damage caused by unapproved dismantling, refitting or repairing.
- Damage caused by factors out of control.

We reserve all the rights to explain this manual!

This manual is subject to change without further notice!
