

Instruction of Solar Charge Controller

User's Manual

12V/24V 10A /15A /20A /30A /40A /50A /60A

Dear Users:

Thank you for selecting our product. Please read this manual carefully before you use this product.

- The indicator of battery parameter: When the battery parameter was displaying, this graphic symbol will be light. For example the voltage of battery, temperature of battery.
- The indicator of load parameter: When the load parameter was displaying, this graphic symbol will be light.
- System Voltage: When the LCD shows different system voltage, the controller will adjust the technical data automatically.
- Numerical Display Area
- Timer Setting Function
- Switch Graphic Symbol
- Unit Symbol Value
- Warning: When there fault, this graphic symbol will be light.
- The indicator of load status: Load on, Load off.
- The indicator of Output power: When the load terminal have output, this graphic symbol will be light.

The controller is for off-grid solar system and control the charging and discharging of the battery. Main function is protecting battery. The intelligent charging process has been optimized for long battery life and improved system performance.

Major Functions

The features are listed below:

- Automatic Identification System Voltage, 12V 24V auto recognition
- Humanized LCD displaying and double button operation of man-machine interface.
- Completed technical data for setup and modify.
- High efficiency, intelligent PWM 3stage charging
- The load control mode can be selected, the timer function can be reset for street light at night.
- Reliable over voltage protection, short circuit protection, over load protection, overcharge protection, overdischarge protection
- Accurate temperature compensation, correcting

Important Safety Information

- It is better to install the controller in the room, if installed the controller outside, please keep the environment dry, avoid direct sunlight.
- The controller will be hot in process of working, please keep the environment ventilation, away from flammable.
- The open circuit voltage of solar panel too high, (especially 24V system), please take care.
- The battery has acidic electrolysis, please put on goggles during installation, if you accidentally exposed to the electrolysis, please rinse with water.
- The battery has huge power, prohibit any conductor

Controller Connection

- All terminals are in tight status after factory, in order to well connected, please loose all terminals at first.
- The following order of connection please do not free change or cause system voltage recognition fault.
- As figure, first connected the battery to controller correct poles. In order to avoid short circuit, please screw the cable of battery to the controller in advance, then connected to battery poles secondly. If your connection is correct, the LCD displaying will show battery voltage and other technical data. If LCD no indicate, please check the fault: length of cable between battery and controller as short as possible. Suggest to 30CM-400CM.
 - If short circuit happened on the terminals of controller, it will be result in fire or explode. Please be careful! We strongly suggest (disconnecting at least 1 side 1 time of rated current of controller.) If the battery reverse connection, the output of controller also same with battery polarity, please do

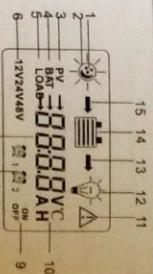


short circuit the positive and negative pole of battery. Suggest to adding fuse between battery and controller. (Slow motion type, the action current of the fuse should be 1.5 times rated current of controller.)

The suggestion of using

- The controller could detect the temperature of environment to adjust the voltage of charging, so that the controller should be closed to battery as near as possible.
- Recommend system current density of cables less than 3A/mm²
- Try to use multi strand copper wire in order to connecting with the terminal firmly. Loose power connection and/or corroded wires may result in resistive connections that melt wire insulation, burn surrounding materials or even cause fire.
- The battery should be full charged each month. Or the battery will be destroyed.

The feature of LCD graphic symbol



- The default/light display of controller: When the solar panel input voltage have been detected by controller less than sensor identification point voltage, this graphic symbol will be light.
- The default day/time display of controller: When the solar panel input voltage have been detected by controller more than sensor identification point voltage, this graphic symbol will be light.
- The indicator PV array parameter: When the solar panels data was displaying, this graphic symbol will be light. For example the voltage of solar panel.

positive combined together. If your solar system needs ground connection, please let positive ground connection.

Warning: For some force to ground connected system, such as solar communication system, portable solar system, they are negative ground connected, at this time please do not positive connected, or can cause short circuit.

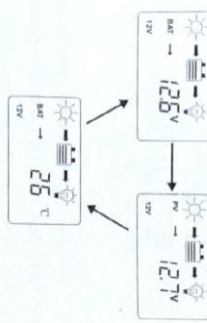


Operation and Indication

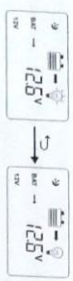
- Main Interface**

The controller will use 1s initialization interface after electrified, then go into main interface.
- If no operational main interface, then the main interface will be auto exchange during voltage of battery, voltage of solar panel, temperature of environment each interface keep 3s. Long press

more than 5s at main interface, it will speed auto exchange. Loose button will stop speed.



Press under main interface record open or close the load output.



Press button could join into next menu under main interface

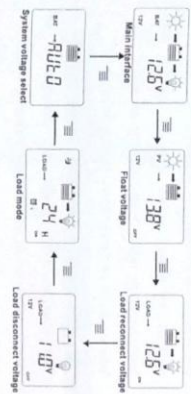
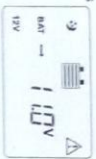
When battery voltage is more than 18V, the controller will be auto change to 24V system with 24V control data. When battery voltage is less than 18V, the controller will be auto change to 12V system with 12V control data.

If the system voltage is set 13V, the controller will be work under 2V version forever. The battery voltage is not valid. The reset data will be working after reconnection.

If the system voltage is set 12V, the controller will be work under 24V version forever. The battery voltage is not valid. The reset data will be working after reconnection.

Protection Function

Battery Low Voltage Protection(LVD)
When the battery voltage less than 11V, the LVD protection started. The output cut off at the same time the battery symbol and warning flash. Please increase charge current or increase charge time. When the battery voltage more than 12.6V, the protection will be closed. The load output is



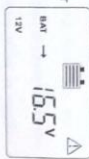
a) Float Voltage Set up

This parameter is High Voltage Disconnection (HVD) voltage. (Boost state voltage will be increased 60 base on HVD). The controller will be started PWM function at this point (HVD), limited voltage rising. Press button join in float voltage menu. Long press

come back or press button force to unlock at main interface.

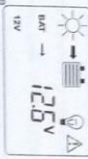
Battery Over Voltage Disconnection (OVD)

When the voltage of battery more than 16.5V, the over voltage protection will be started. The load cut off at the same time the load and warning symbol flash. When the voltage of battery was decreased to 15V, the protection will be release. The output of the load is back.



Load Over Current Protection

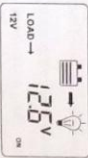
When the load is short circuit or overload, the output cut off at the same time the load symbol and warning flash. Please confirm if there is short circuit on the load terminal, decrease the power of the load. 30s later the controller will be auto restart with unlock or press button force to unlock at main interface.



button, the parameter on the interface will be flash, here is set up state. Loose the button, press button again could operate plus data, press button could operate minus data. After finish the needed technical data, long press button but no any operation, automatically come out set up state. If 20s no any operation, automatically back to main interface.

b) Low Voltage Reconnection Voltage (LVR)

When the voltage of battery is low, the control will stop power to the load. If the controller needs reconnected the output, the voltage of battery must be higher than LVD voltage or press button force to release. The procedure is same with (a).



c) Low Voltage Disconnection Voltage

When the voltage of battery is low, the load output will be cut off. When the controller detected the battery voltage was less than LVD point, the cut off function will be immediately

High Voltage Disconnection Protection (HVD)

When the battery was charged to 13.8V, the PWM function will be started, the charge symbol will be flash, and the voltage of battery has been limited.



Common Fault and Handling

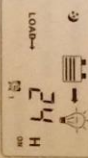
Fault Phenomenon	Possible Reason	Solution
LCD display after connected with battery	Battery Low Battery Connection The connection status	Please confirm the voltage of battery, reconnect the controller with battery firmly and correctly.

working. At the same time, the status of controller is in lock. Users have to charge the battery, when the battery voltage is higher than LVD voltage or press button force to release. The load output will be back. The procedure is same with (a).

Above a, b, c three parameter default data was fully considered by designer according to the actual use. Generally users don't need to adjust. Please must be refer to battery supplier's suggestion, or the battery will be damaged or irreparable destroy.

d) Load Working Mode Selection

The control default load working 24hours. When the Load Working Time set to 24hours, the load will keep working 24hours in no fault status. When the load working

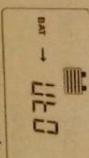


time set to 23H, it means the load start timer or sensor function, if the battery capacity is enough, load will be started at sunset. The load will work under timer setting hours or stop working till sunrise.

When the load join into timer or sensor mode, if the reset working time more than actual night time, the load output will be closed at sunrise, although the working time is not reach to setting hours. For example, the local actual night time is 10hours, user reset working time at night is 12hours, but 10hours later the output will be closed automatically, the balance hours will be back to zero. The load will be working with next sunset signal.

e) System Voltage Select

This parameter designed for customers wide range voltage requiring. The default display "UTO" system voltage 12/24 System voltage select



Fault of sunshine	The solar panel connection open circuit, short circuit, or reverse connected	Please check the cable of solar panels if they are correct connection and firmly.
Vertical symbol and no change on LCD <td>The battery is over discharging <td>Please check the system design is reasonable or not if there is discharging more than 24h. </td></td>	The battery is over discharging <td>Please check the system design is reasonable or not if there is discharging more than 24h. </td>	Please check the system design is reasonable or not if there is discharging more than 24h.
The controller displaying HVD <td>The voltage of battery is high <td>Please first cut off the solar panel and see if the voltage of battery is normal. If not, please cut off the battery with controller and reconnect again. </td></td>	The voltage of battery is high <td>Please first cut off the solar panel and see if the voltage of battery is normal. If not, please cut off the battery with controller and reconnect again. </td>	Please first cut off the solar panel and see if the voltage of battery is normal. If not, please cut off the battery with controller and reconnect again.
The controller displaying Over Current Protection <td>The load is short circuit or high surge power <td>Please check the load power of the load over the power of the load over power of load too high. </td></td>	The load is short circuit or high surge power <td>Please check the load power of the load over the power of the load over power of load too high. </td>	Please check the load power of the load over the power of the load over power of load too high.

Model	5V/2A
USB output	5V/2A
System Voltage	12V/24V
Max. Input Voltage of solar panel	55V
Self-consumption	512mA

Max. charge current	10A/15A/20A/30A/40A/50A/60A
Max. discharge current	10A/15A/20A/30A/40A/50A/60A
LVD	11.0V ADJ 9V...12V ; *2 24V
LVR	12.6V ADJ 11V...13.5V ; *2 24V
Float Voltage	13.8V ADJ 13V...15V ; *2 24V
Boost charging	14.4V ; *2 24V Battery Voltage less than 12V after boost charging 2 hours
Battery Voltage Protection	16.5V ; *2 24V
Reverse Connection Protection	yes
Load Over Current Protection	Yes, each two minutes restart once
Charge Type	PWM
Temperature Compensation	-24 mV/°C for 12V system ; *2 24V
Working Temperature	-20°C ~ +55°C
Terminal Scale	28-10 AWG
Waterproof grade	IP32
Size	168 mm x 82 mm x 41.5 mm
Netweight	320g ± 10g

Subject to change without notice
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