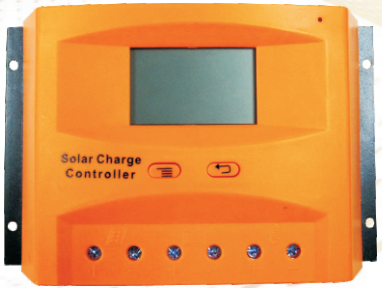
Solar Controller

Operation manual



Content

PRODUCT VOLTAGE: 12V/24V 24V/48V
CURRENT: 30A 40A 50A 60A

Dear Users: Thank you for selecting our product.
Please read this manual before you use this product.

The controller is for off-gird 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 improve system performance.

Ⅰ.Main functions

The feature are listed below:

1).Automatic identification system Voltage, 12V/24V or 24V/48V automatically recognition
2).Humanized LCD display and double button operation of man-machine interface.
3).Completed technical data for setup and modifi cation.
4).High efficiency intelligent PWM three-stage charging.
5).The load control mode can be selected, the timer function can be reset for street light at night.
6).Reliable protection: over voltage, short circuit, over load, overcharge, over- discharge.
7).Accurate temperature compensation, correcting the charging and discharging voltage automatically improving the battery lifetime.

8).Input terminal positive and negative pole reverse connected protection.
9).Solar panels, battery, solar charge controller positive poles are all connected together, adopting negative MOSFET in series control

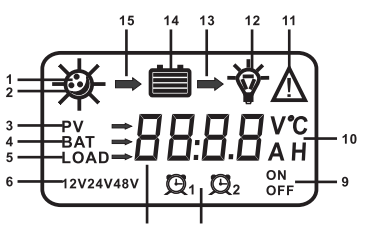
Ⅱ. Important safety information

1).It is better to install the controller indoor. If install the controller outside, please keep the environment dry, avoid from direct sunlight.
2).The controller will be hot in process of working, please keep the environment ventilation, away from the flammable.
3).The open circuit voltage of solar panel is too high, (especially 24V and 48Vsystem), please take care.
4).The battery has acidic electrolysis, please put on goggles during installation. If you accidentally exposed to the electrolysis, please rinse with water.
5).The battery has huge power, prohibit any conductor short circuit the positive and negative pole of battery. Suggest adding a fuse between battery and controller. (slow motion type, the action current of the fuse should be 1.5 times rated current of controller.)

Ⅲ. The suggestion of using

1). 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.
2). Recommend system current density of cables less than 5A/m㎡ .
3). Try to use the 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 melts the wires insulation, burns surrounding materials or even causes fire.
4). The battery should be fully charged each month. Or the battery will be destroyed.

Ⅳ.The feature of LCD



1). : Night

2). : Day

3). **PV** : Solar panels parameter

4). **BAT** : Battery parameter

5). **LOAD** : Load parameter

6).**12V24V48V**: System Voltage

7). : Numerical Display Area

8). : Timer Setting

9). ON OFF : Switch

10). V℃ A H : Unit Value

11. : Fault

12). Load on, Load off

13). : Light on when there is loads.

14). : Capacity of battery

15). : Light on when charging, flashes when float charging.

Ⅴ. Installation Instructions

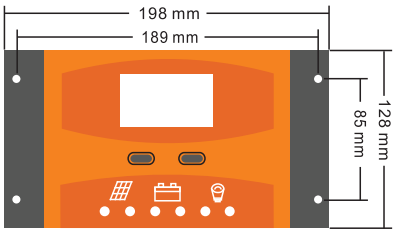
*Controller Fixed

1).The controller should be installed in well-ventilated place, avoid from direct sunlight, high temperature, should not install in location where water can enter into the controller.

2).Please select correct screw to fix the controller on the wall or other platform. Screw M4 or M5, Screw cap diameter should be less than 10mm.

3).Please reserve enough space between the wall and controller, for cooling and cable connection.

4).The mounting holes distance is 198mm*85mm,diameter of the hole is 5mm.



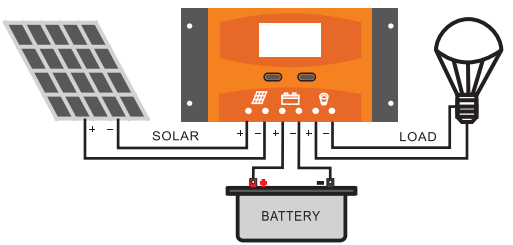
*Controller Connection

1).All terminals are in tight status when packing, in order to well connected, please loose all terminals at first.

2).Please strictly obey the following connection order, otherwise it will cause system voltage recognition fault.

3).As figure, first connected the battery to contro ller correct poles . In order to avoid short circuit, please screw the cable of battery to the contro ller firstly, then connected to battery poles secondly,

if your connection is correct, the LCD display will shows the battery voltage and other technical data. If LCD without indicate, please check the fault. The length of cable between battery and controller should be as shorter as possible. Suggest to 30CM-100CM.



* If short circuit happen on the terminals of controller, it will result in fire or explosion. Please be careful. (We strongly suggest to connecting a fuse at the battery side 1 .5 times of rated current of controller.)

* If the battery is reverse connected, the output of controller also same with battery polarity, please do not connect any load with controller at that time, otherwise the load and controller will be destroyed. (We only provide the Input terminal positive and negative pole reverse connected protection.)

4).As figure, connected solar panels with controller correctly, if the connection is successful and sunshine is full the LCD will show solar panel and an arrow from solar panel to battery will be light.

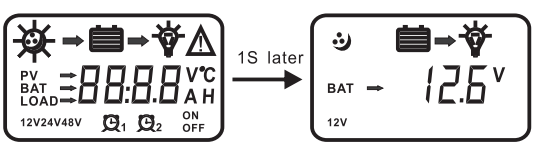
The voltage of solar panel is very high under sunshine, high voltage can cause injury or destroy controller. As figure, connect loads with controller correctly. In order to avoiding injury from load voltage, please close the output of controller with button at first, then connected the load on the controller. The controller do not offer reverse connection protection for load, so please take care. Reverse connection for load will destroy the bulb.

* About grounding connection of solar system Please noted, this solar charge controller designed by all positive connection, all components inside the controller are positive combined together. If your solar system needs grounding connection, please let positive grounding.

Warning: For some force to ground 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.

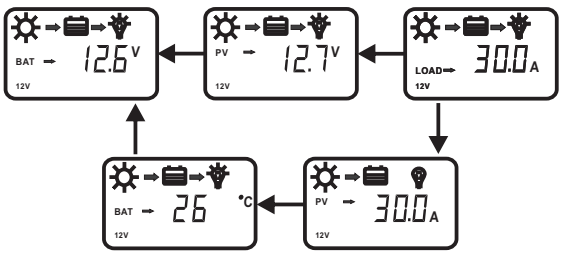
Ⅵ. Operation and Indication

* Main interface
*The controller will have 1s initialization interface after electrified, then go into main interface.

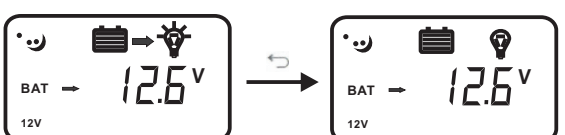


* If no operation at main interface in 20s, the main interface will be automatically exchange amongst voltage of battery, voltage of solar panel, temperature of environment, each interface keeps 3s.

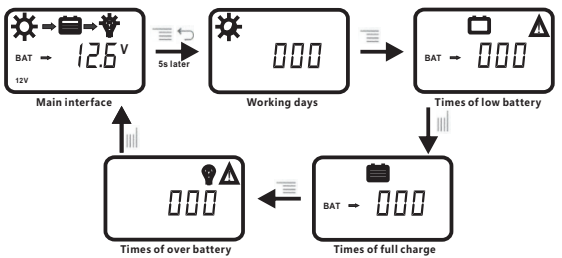
Long press "⮌"more than 5s at main interface , it will speed auto exchange. Loose button will stop speed.



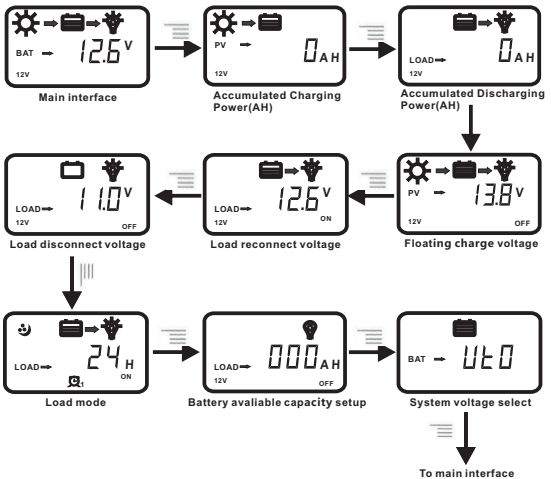
* Press"⮌"in main interface could switch on or off the load output.



Both long press ☰ and ↩ more than 5s under main interface, the working storage interface will be turn on, automatically display working days, times of low battery, times of full battery and times of over-current protection.

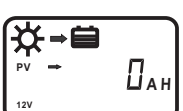


* Press“☰”button could enter the next menu under main interface.



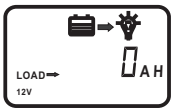
1). Accumulated Charging Power(AH)

This parameter is charging AH counter, it shows total generating capacity of solar panels. Long press ☰ more than 5s under this interface, the counter could back to zero.



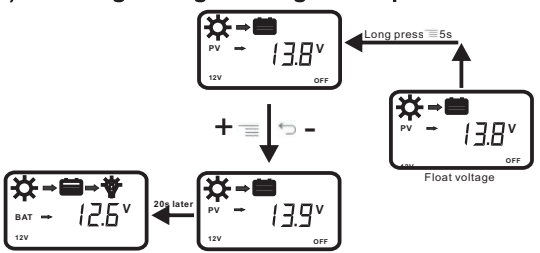
2). Accumulated Discharging Power(AH)

This parameter is discharging AH counter, it shows the power consumption of the loads. Long press ☰ more than 5s under this interface, the counter could back to zero.



Accumulated Discharging Power(AH)

3) Floating Charge Voltage Set up



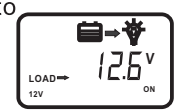
This parameter is High Voltage Disconnection (HVD) Voltage. (Boost state voltage will be increased to 0.6V base on HVD) The contr oller will be started PWM function at this point (HVD) limited voltage rising.

Press“ ☰ ”to enter the float voltage menu. Long press“ ☰ ”button ≥5S, the parameter on the interface will flash, and here is the set up interface. Loose the button,

Press“ ☰ ” again could operate plus data,
Press“ ↩ ”, could operate minus data.
After finish setting technical data, long press “ ☰ ” button again ≥5s, the parameter save and come out set up state. If there is 20s without operation, automatically back to main interface.

4). Low Voltage Reconnect Voltage (LVR)

When the voltage of battery is low, the control will stop offer power to the load. If the controller needs to reconnect with the output, thevoltage of battery must be higherthan LVD voltage or press “ ↩ ” button force to release. The procedure is the same as Ⅵ. 3).

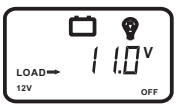


Load reconnect voltage

5).Low Voltage Disconnect Voltage(LVD)

When the voltage of battery is low, the load output will be cut off. When the controller detects the battery voltage was less than LVD point, the cut off function will immediately work. At the same time, the status of controller is locked. User have to charge the battery, when the battery voltage is higher than.

LVD or press " ↩ " button force to release. The load output will be back.
The procedure is the same as Ⅵ. 3).

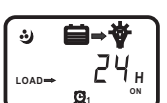


Load disconnect voltage

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.

6). Load Working Mode Selection

Default loading output offer time is 24 hours. When the load working time is set ≤ 23H, it means the load starts timer or sensor function. If the battery capacity is enough, the load will be started working at sunset. The load will work till the period set or stop working till sunrise.

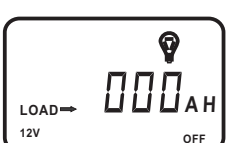


Load mode

When the load starts by timer or sensor mode, if the reset working time more than actual night time, the load output will be cut off at sunrise, although the working time does not reach to setting hours. For example, the local actual night time is 10 hours, user reset the working time at night 12 hours, but 10 hours later the output will be cut off automatically, the balance hours will return to zero. The load will work by next sunset signal.

7). Battery available capacity setup

This parameter is for load discharging capacity setup. When the load using capacity (AH) was reached to set value, the load will be shut down automatically, at the same time the setup value returns to zero. Please manually start load or reset consumption capacity of the load. The default consumption capacity of the load is unlimited.



Battery available capacity setup

8). System Voltage Selection

This parameter is designed for customers' wide range voltage requirement. The default display **"Ut0"** system voltage 12/24V is automatically.

System voltage select

When battery voltage is more than 18V, the con troller will be automatically change to 24V syste m. When battery voltage is less than 18V, the controller will be automatically change to 12V system.

If the system voltage is set as **"UT1"**, the contro ller will be work under 12V version forever. The battery voltage is not valid. The reset data will be worked after re-connection.If the system voltage is set as **"UT2"**, the controller will work under 24V version forever. The battery voltage is not valid. The

9). System Voltage Selection

This parameter is designed for customers' wide range voltage requirement. The default display **"Ut0"** system voltage 24/48V is automatically.

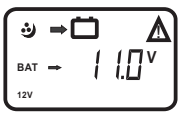
System voltage select

The default display **"UT0"** system voltage 24/48V is automatically. When battery voltage is more than 36V, the controller will be automatically change to 48V system. When battery voltage is less than 36V, the controller will be automatically change to 24V system.

If the system voltage is set as **"UT1"**, the controller will worke under 24V version forever. The battery voltage is not valid. The reset data will work after re-connection.If the system voltage is set as **"Ut2"**, the controller will work under 48V version forever. The battery voltage is not valid. The reset data will be worked after re-connection.

Ⅶ. Protection Function

*** Battery Low Voltage Protection(LVD)**



When the battery voltage is less than 11V, the LVD protection will start. The output will be cut off, at the same time the battery symbol and warning flash. Please increase charging current or increase charging time.

When the battery voltage is more than 12.6V, the protection will be turned off. The output for loads will come back, or press“ ⮌ ”button force to release at main interface.

*** Battery Over Voltage Disconnect (OVD)**

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

*** Load Over Current Protection**

When the load is short circuit or overload, the output will be cut off, at the same time the load symbol and warning flash. Please confirm if there is short circuit on the loading terminal. Decrease the power of the load. 30s later the controller will automatically restart.
or press“ ⮌ ”button force to release.
at main interface.

*** High Voltage Disconnection Protection (HVD)**

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

Ⅷ. Common Fault and Handling

Fault phenomenon	Possible reason	Solution
LCD no displayafter connected with battery	*Battery low *Battery release connection *The connection cut off	Please confirmthevoltage of battery reconnectingwiththe controller with battery firmlyand correctly.
Full of sunshineverticalon solar panel, no solar symboland no charge symbolon LCD	The solar panelconnection open circuit,shortcircuit, or reverse connected	Please check the cable of solar panels if they are correctly and firmly connected
The controller displaying LVD	The batteryis over discharged.	Please check if the system is reasonablydesigned,and if discharging capacity is morethan charging.
The controller displaying HVD	The voltageof batteryis high	Please firstlycut offthe solar panelto see if the voltagedropsto normallevel. If the faultstays still, please disconnectthe battery and re-connect.
The controller displaying Over CurrentProtection	The loadis shortcircuit,or high surge power.	Please check the load cables have shortcircuit,the powerof the load over rated desgin,the surge power of loadis toohigh.

Ⅸ. Technical Data

Model	30A	40A	50A	60A
System Voltage	12V/24V, 24V / 48V (Automatic recgonition)			
Max. Input Voltage of solar panel	50V (12/24V) / 100V (24/48V)			
Self - consumption	≤13mA			
Max. Charge current	30A	40A	50A	60A
Max. Discharge current	30A	40A	50A	60A
LVD	10.5V (9-11.0V) / 21V (18-22.0V) / 42V (36-44.0V)			
LVR	12.6V (11-13.5V) / 25.2V (22-27V) / 50.4V (44-54V)			
Float Voltage	13.8V (13-15V) / 27.6V (26-30V) / 55.2V (52-60V)			
Boost charging	14.4V / 28.8V / 57./6V Battery Voltage less than 12V/24V/48V start boost charging 2 hours.			
Battery Over Voltage Protection	16.5V / 33V / 66V			
Input reverse Connection Protection	Yes			
Load Over Current Protection	Yes, each two minutes restart once			
Charge Type	PWM			
Temperature Compensation	-24mV/ ℃, -48mV/ ℃, -96mV/ ℃ for 12V / 24V/ 48V system			
Working Temperature	-20℃—+55℃			
Terminal Scale	28-10 AWG			
Waterproof grade	IP32			
Product Size	196mm*125mm*58mm			
Box Size	215mm*140mm*68mm			
Weight	780g	850g		