

# User's Manual

## SAFETY INSTRUCTIONS

1. Make sure your battery has enough voltage for the controller to recognize the battery type before first installation.
2. The battery cable should be as short as possible minimize loss.
3. The regulator is only suitable for lead acid batteries: OPEN, AG, GEL. **it is not suited for nickel metal hydride, lithium ions or other batteries.**
4. The charge regulator is only suitable for regulating solar modules. **Never connect another charging source to the charge regulator.**

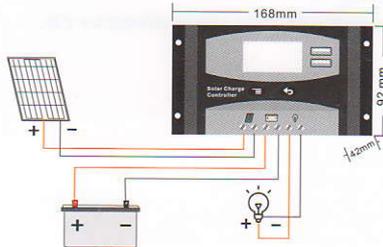
## PRODUCT FEATURES

1. Build-in industrial micro controller.
2. Large screen LCD display, charge and discharge parameters can be adjusted, with power off memory function.
3. Dual USB output, the maximum current of 2A, to support mobile phone charging.
4. Fully 3-stage PWM charge management.
5. Build-in short-circuit protection, open-circuit protection, reverse protection, over-load protection.
6. Have ambient temperature display function

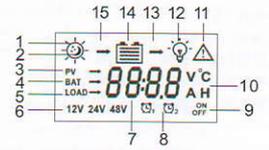
## SYSTEM CONNECTION

1. The battery positive and negative pole according to the icon access controller, the control will automatically detect the battery voltage, the load positive and negative pole according to the icon access controller, pay attention not to answer, the solar panel according to the icon access controller.

Note: 1. please strictly follow the above order to access, otherwise it may damage the controller or other components; the disassembly sequence is contrary to the wiring order.  
2. 12V system with 17.5V solar panels, 24V system with 36V solar panels.



## The feature of LCD graphic symbol



1. the default night 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.
2. the default daytime 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.
3. the indicator of PV array parameter: When the solar panels data wa displaying, this graphic symbol will be light. For example the voltage of solar panel.
4. 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.
5. the indicator of load parameter: When the load parameter was displaying, this graphic symbol will be light.
6. system Voltage: When the LCD shows different system voltage, the controller will adjust the technical data automatically.
7. numerical Display Area.
8. timer Setting Function.
9. switch Graphic Symbol.
10. Unit Symbol Value.
11. Warning: When there is fault, this graphic symbol will be light.
12. The indicator of Load status: ☺ Load on, ☹ Load off.
13. The indicator of Output power: When the load terminal have output, this graphic symbol will be light.
14. The indicator of capacity of battery: When the battery was in different capacity, the strip-type will show.
15. The indicator of charge status: When the controller is charging, the symbol will be light, float charge will be flash, no charging no display.

## 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 inner 20s, 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, if will speed auto exchange. Loose button will stop speed.



### ■ Protection Function

#### ● Battery Low Voltage Protection(LVD)

When the battery voltage less than 11V, the LVD protection started. The out put 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 come back or press button force to unlock at main interface.



#### ● Battery Over Voltage Disconnection(OVD)

When the voltage of battery more than 16V, 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.



#### ● 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.



### TROUBLE SHOOTING

Situation	Probable cause	Solution
Charge icon not on when sunny	Solar panel opened or reversed	Reconnect
Load icon off	Mode setting wrong	Set again
	Battery low	Recharge
Load icon slow flashing	Over load	Reduce load watt
	Short circuit protection	Remove short circuit, 1 minutes or so automatic recovery
Power off	Battery too low/ reverse	Check battery/connection

### TECHNICAL PARAMETER

Batt voltage	12V / 24V Auto	
Charge current	20A	30A
Discharge current	10A	10A
Max Solar input	12V battery, the highest 23V; 24V battery when the highest 46V	
Battery Over Voltage Protection	16.5V;	
Equalization	14.4V	
Float charge	13.8V (default, adjustable)	
Discharge stop	11.0V (default, adjustable)	
Discharge reconnect	12.6V (default, adjustable)	
Voltage of open light	Solar panel 8V(Light lights delay)	
Voltage of close light	Solar panel 8V(Light off delay)	
Terminal Scale	28-10 AWG	
Self-consume	<12mA	
Operating temperature	-35°C ~ +60°C	
Size/Weight	168*92*42mm /260g	

\*All red color voltage x2 while using 24V system

\*This instruction is a general manual, such as a slight difference in the physical.

\*Product specifications are subject to change without prior notice

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