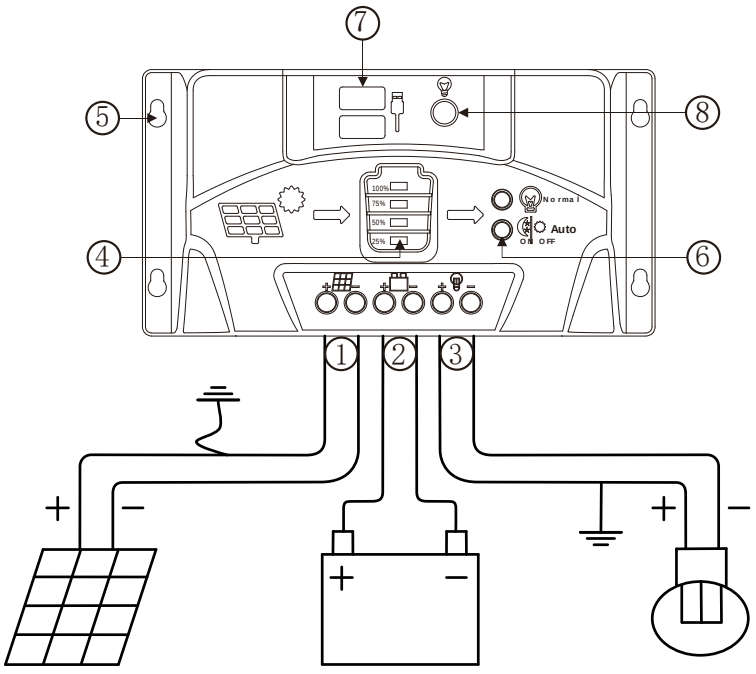
SR User's Manual For Solar Charge Controller

I. Functions and Features

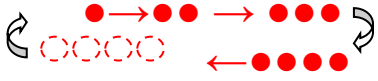
1. Series PWM charging control makes sure the controllers staying cool when charging stopped.
2. The controller use a MCU as the controlling core, so charging control process is more intelligent, and charge control voltage more accurate.
3. 3-stage charging control(Bulk, Absorption, Float), to full-charged battery faster.
4. 4-stage LED indicator which shows the battery's SOC and charging stage.
5. 2 kinds of settable load working mode: Normal and Automatic light mode. the controller will power on the load after darkness and will power off the load after sunrise.
6. 2pcs of 5V USB power output ports.
7. 1 buttons to control the load switching and load mode switching.
8. The controller uses low conduction resistance of MOSFET as the charge and discharge control device, utilization of solar panel would be more higher, charging and discharging loss would be more less.
9. All sorts of perfect protect function: reverse-connect protection for battery, reverse-connect protection for solar panel, prevent backflow function, low-voltage protect, over-voltage protect, over-load protect.

II. Connection



① Solar panel input terminals
② Battery input terminals
③ Load output terminals
④ Battery SOC indicator
⑤ Installing hole
⑥ Load status indicator
⑦ USB power port
⑧ Load control button

III. LED Indicator Instruction

Battery's Indicator				
25%	50%	75%	100%	Meaning
●				Not flashing: remaining capacity of battery is between 0%~25%. 25% LED:≥12.4V,ON ≤10.7V slow flashing.
●	●			Not flashing: remaining capacity of battery is between 25%~50%. 50% LED:≥12.9V,ON ≤11.6V OFF.
●	●	●		Not flashing: remaining capacity of battery is between 50%~75%. 75% LED:≥13.4V,ON ≤12.0V OFF.
●	●	●	●	Not flashing: remaining capacity of battery is between 75%~100%. 100% LED:≥13.7V,ON ≤12.3V OFF.
				Water lights, bulk charging stage, the controller charging the battery with the maximum current that which solar panels could provide.
●	●	●	¤	100% battery indicator continue to slow flashing, Absorption charging stage, the controller uses PWM mode to adjust the charging current to make the battery's voltage maintain the value of the absorption charge voltage.
●	●	●	●← ¤	100% battery indicator slow flash 5s and then continue 5s, Float charging stage, the controller uses PWM mode to adjust the charging current to make the battery's voltage maintain the value of the float charge voltage, to supplement the battery's discharge.
¤				25% battery indicator slow flash, battery's voltage below the low voltage protection point, the load have been powered off. When the voltage returns to the low voltage reconnection, the power returns supply automatically.
✺	✺	✺	✺	All battery's SOC indicator flash quickly, battery's voltage over the over-voltage protection point, the load have been powered off. When the voltage drops to the over-voltage recovery point and it remains 5S, the controller automatically recover to load supply.
¤	¤			25%,50% battery's indicator flash slowly synchronous for 6s, the controller detect the solar panel disconnect.(The voltage of solar panels lower than 5V).
		¤	¤	75%,100% battery's indicator flash slowly synchronous for 6s, the controller detect that the solar panel have been connected.(The voltage of solar panels more than 6V).
●-on，¤-flash slow，✺-flash fast.				

Load Mode Indicator		
Normal	Auto	Meaning
●		The LED indicator is on, load control is in normal mode, load is in normal power supply condition.
☼		Flashing fastly, load control is in normal mode. Load over current has occurred.the load have been powered off automatically. You can manually unlock the protection or wait the controller automatically unlock at dusk.
☒		Flashing slowly, load control is in normal mode, load have been powered off manually. And at this condition, the controller wouldn't be power on the load automatically.
	●	The LED indicator is on, the load is in light control mode and the load is in normal power supply condition.
	☼	Flashing fastly, load control is in light control mode. Load over current has occurred. the load have been powered off automatically. You can manually unlock the protection or wait the controller automatically unlock at dusk.
	☒	Low-voltage protection of battery or over-voltage protection of battery,or load control is in light control mode and now is daytime,or powered off manually in light control mode.
●-on，☒-slow flashing，☼ -Quick flashing.		

IV. Instructions For Use

1.Battery Charging Control

The Charging process contain three stages: Bulk, Absorption, Float. On Bulk stage, controller charge the battery with max current from solar panels; on Absorption stage, controller will adjust the Duty Cycle of current to remain the battery voltage at charging voltage point for 2H ,so that charge the battery full faster. Controller will entry this stage only when the battery voltage stays lower than 12.6V for 5mins. If the battery voltage does not satisfy this condition, the controller will directly enter the float Stage. On Float Stage, controller will adjust the Duty Cycle of current to remain battery voltage at Float charging point to supply the consumption of battery.

2.Normal Mode

Normal indicator is on or flickering ,means the load is in normal control mode,so that the load do not in the the control of lighting.

In this mode, the load will be powered off only when battery low voltage,battery over-voltage or over-load happened.

3.Lighting Control Mode

Auto indicator is on or flickering ,means load in lighting control moder.In this mode, the controller will power on the load after darkness and will power off the load after sunrise.Press the button "load " to turn on or turn off the load by manually.The Power supply state of the load will be changed if in the face of the turning on or turning off the load event (such as dawn, battery low voltage, load current).

4.Short Press The Button

Turn on or turn off the load and unlock the protection of controller on any of the two Load modes (Battery over-voltage protection could not been unlock).

5.Long Press The Button

After 5s, load control mode will switch between the two modes. Corresponding mode indicator will be on.

V. Fault And Handling

Fault Phenomenon	Causes of Fault	Solutions
After system connection, all the indicators are off	The polarity of battery reversed	Checking whether the connection of battery polarity is right.
	Battery voltage is too low	Replaced battery or connect the negative of the battery with the negative of solar panels directly，then disconnect them after the controller power on.
Four battery capacity indicators flicker quickly, you can't turn on the load manually	The battery voltage exceeds the over voltage protection point	Checking whether the battery voltage level is correct Checking whether the battery's capacity is matched to the power of the solar panel.Checking whether there is bad condition about connecting line between the controller and battery.
After Connected the solar panel, charging indicator is off	Solar panel connection reversed	Checking whether the connection of the polarity of solar panels is correct.
	Solar panel voltage is too low	Checking whether the voltage of the solar panel is greater than the battery voltage.
The load shut down automatically	Load mode stayed in the light control mode	Long press the button 5S to switch the load mode to normal mode.
	Battery low-voltage protection	After full-charged, the controller started automatically.
	Over-load protection	Turn on the load manually after reducing the load.

VI. Quality Assurance

1. Quality assurance should be carried out according to the following rules:

● The product is guaranteed of replacement, returning and repairing within 7 days after sale.

● The product is guaranteed of replacement and repairing within 1 month after sale.

● The product is guaranteed of repairing within 12 months after sale.

2. If it is not possible to identify the using date of the controller, we would refer to the ex-work date, and prescribe 18 months as the warranty period. We need to charge beyond the warranty period. The controller can be repaired for life no matter when and where you use it.

3. If the controller is damaged by the following causes, we need to charge even if it is

In the guarantee period:

● Do not operate according to the user's manual.

● Use the controller under the condition which is beyond the using standard and technical requirements.

● Repair by yourself or reform by yourself.

● The inappropriate environmental condition which can cause the breakdown and aging of the apparatus.

● Improper carrying or storage.

● Regarding to the service of replacement, returning and repairing, you need to retreat the product to our company, and we decide whether to replace or repair after we make clear who should be responsible.

4. We will not note if there is any change of this product.

VII. Technical Data

Model	1012	2012	3012
Rated Voltage	12V	12V	12V
Rated Current	10A	20A	30A
Voltage Drop	0.1V/0.05V	0.2V/0.1V	0.2V/0.1V
Solar Input	≤25V/≤170W	≤25V/≤340W	≤25V/≤510W
Self Consumption	≤16mA		
Absorption Voltage	14.4V/2h		
Float Voltage	13.8V		
LVD Voltage	10.7V		
LVR Voltage	12.6V		
HVD Voltage	15.5V		
HVR Voltage	15.0V		
Voltage Tolerance	±0.2V		
Charging Control	3step，PWM		
Load Mode	Normal, Auto		
Photo Detection Voltage	Dusk:5V, Dawn:6V		
Load Over Current	1.1 times the rated current 20S		
USB Power Output	2 port (When using a single interface, the maximum output current 1A)		
Cable Dimension	<6mm^2， 10# AWG		<16mm^2，7# AWG
Installation Hole	Φ4mm-159mm*56mm		Φ5mm-178mm*60mm
Working Temperature	-20℃～50℃		
Storage Temperature	-30℃～70℃		
Humidity	≤90％, no condensation		
Dimension	169mm*90mm*39mm		188mm*90mm*39mm
Weight	210g	253g	290g