

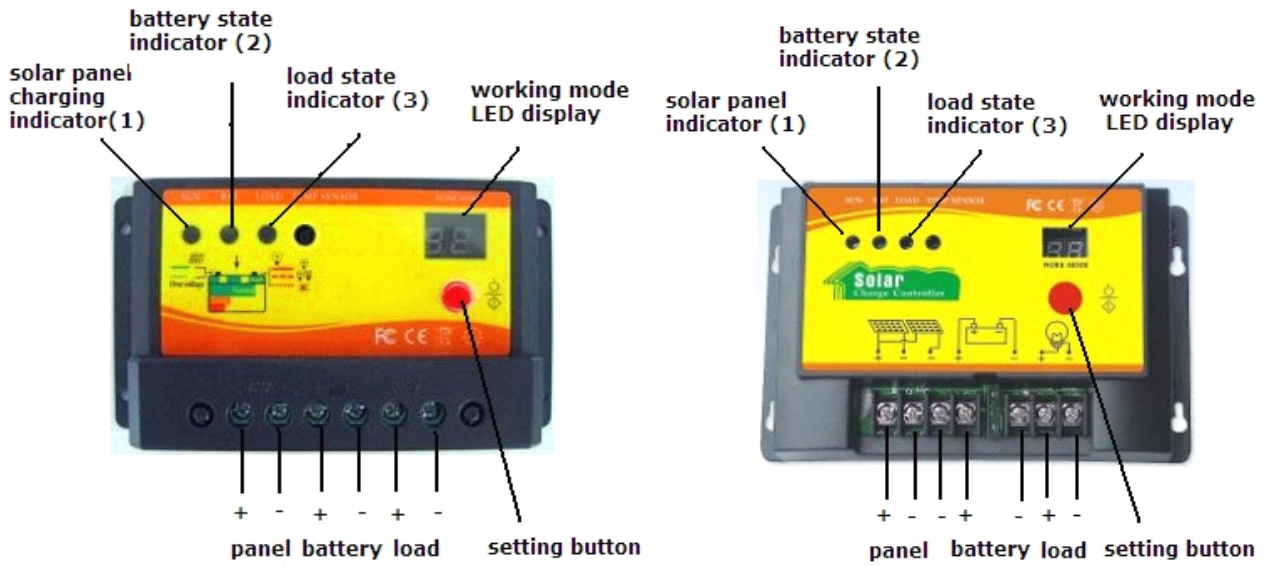
Solar Charge Controller

User Manual

1. Main characteristics:

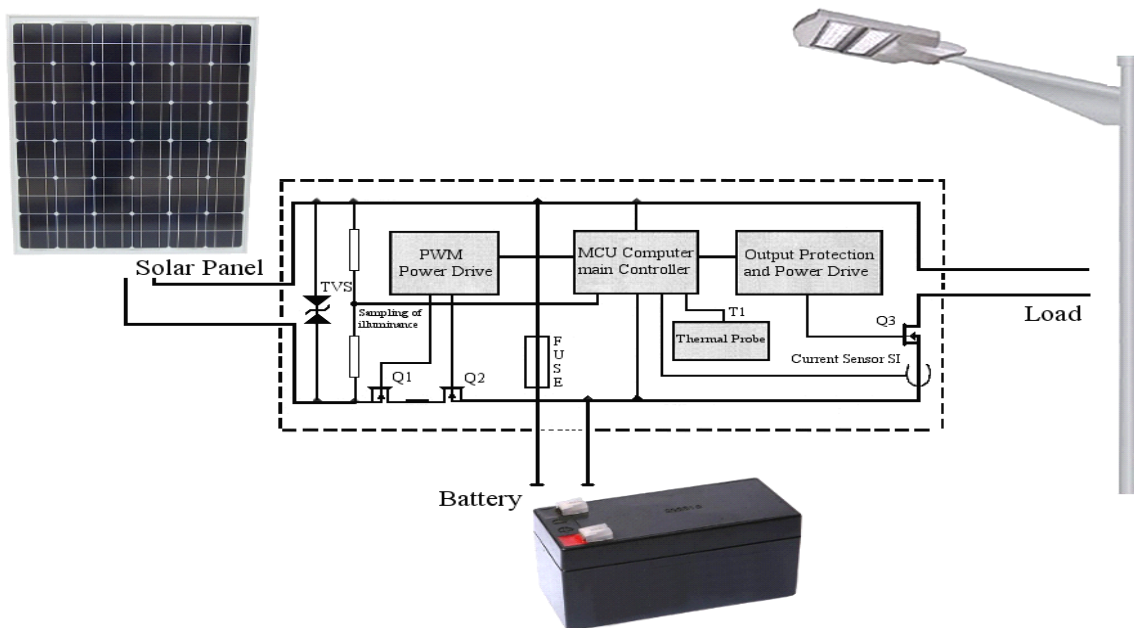
- 1.1 Using the singlechip and special software on the basis of expert control system , realized the Intelligence Optimization SOC control .
- 1.2 Using External temperature transmitter to compensate temperature , much precise than internal temperature transmitter
- 1.3 automatic protect against over charge , over discharge , electronic circuit , overload , these protections avoid any harm to the component or fuse wire .
- 1.4 Take series connection PWM charge as the main circuit , charging efficiency is 3%~6% higher than non-PWM charging .
- 1.5 LED shows the battery condition ,users can get the service state directly ,
- 1.6 All the control adopt Industry-specific chip , can running free under any cold , hot , humid circumstance .
- 1.7 Using audio-visual double LED to show the settings , complete all operating and Settings by one press button , time alarm and figure display correspond to each other .
- 1.8 Making full use of the advanced power source technology , Greatly improved the effective power of unit area, much more compact structure.
- 1.9 The large diameter, big interval terminals, can install 6 mm² conducting wire , wire interval is 9.5 mm, can enhance the isolation and the installation reliability, wires hard to slip .

Picture of the solar charge controller



2. System specification

This controller designed for solar energy system, solar street lamp system , using a special computer chip intelligent controller, complete all operating and Settings by pressing one button . Automatically shutoff and resume to protect against short circuit, overload, over charge , over discharge . With LED light indicating the battery charging state, load and kinds of fault instructions. This controller takes parameters according to the battery voltage, current, environment temperature by the computer chip ,after special control calculation, it can realize the discharge rate conform to battery characteristics perfectly . Compensate temperature at very high efficiency and accuracy , used the high efficient PWM charging mode , ensure the battery working in the best state , greatly extend the service life of the battery. It has different choices of work modes , can meet the various needs of users.



3. Installation and application

3.1 Controller's fixation should be rigid

10A : pore overall dimension: 125*50mm

pore size of installation: 4*4mm

20A : pore overall dimension : 153*60.5mm

pore size of installation : 5.5*2.5mm

30A : pore overall dimension : 153*60.5mm

pore size of installation : 5.5*2.5mm

3.2 Preparing wire : we suggest using Multi-Strands Copper Core Insulated Wire .

First determine the length of the wire, decrease the connection length as far as possible in order to reduce electrical loss. The current of copper wire need no more than 4A/mm², and strip 5mm insulation at the controller side .

3.3 First , connect the terminals with battery , Please note don't reverse the + - side, If the connection is right, the indicator (2) will light, which can be examined by pressing the button. If the connection is reverse, it won't burn the fuse or damage any component of the controller.

3.4 Connect the terminals with solar panel , Please note don't reverse the + - side, If there is sunlight, the solar panel indicator (1) will light.

3.5 Connect the load with the load terminals . Please note don't reverse the + - side , or may damage the electrical appliances.

4. Application instructions

4.1 Charging and overvoltage instructions: when the system is normally connected , and under the sunshine , charge indicator light (1) will display green and steady light , which means the charging system is normal; When charging indicator light (1) appear green but flashing rapidly ,that means the system is overvoltage , solutions please refer to the "Solutions to common problems " below . The charging process adopted PWM ways, if happen to over discharging, the charging state first need to improve to the promote charging voltage, and keep 30 minutes, then fall to straight charging voltage , keep 30 minutes, finally fall to float charging voltage , and keep the float charging voltage. The automatic control process will make the battery charge efficiently and extend its service life.

4.2 Battery state directions: when the battery voltage is in normal range, state indicator light (2) will display green and steady light ; After fully charged the

light will display green and flash slowly ; When fall to under-voltage ,state indicator light turn to red , when the battery voltage continue to fall to over discharge voltage, the controller will automatically turn off the output, reminding users timely compensate the power. When the battery voltage return to the normal state, the controller will automatically start the output , state indicator light 2 change to green.

- 4.3 Load instructions: when open the load , the load indicator light (3) display steady light . If the load current over the rated current 1.25 times for 60 seconds,or over the rated current 1.5 times for 5 seconds, the indicator light (3) will display red and flash slowly, which means overload, the controller will close the output. When load side happen to short circuit ,the controller will immediately shut off the output, indicator light (3) flash rapidly ,when this condition happen , users shall carefully check the connections of the load , cut off the connection with defective load . Then press the button, 10 seconds later the controller will back to normal. Under the common controller mode, press the button can clear overload or short circuit record, and press again can resume the output.

5. Working mode setting

5.1 Setting methods: first press the switch button for 5 seconds until (mode) shows the figure , digital LED flash, then loosen the button, the number can be changed with each press, choose the number you need then wait until the LED digital do not twinkle , which is a complete setting .

5.2 Test mode : press the button until the LED figures shows 17 , which means the system is under test mode . when the controller feel there is no sunlight , it will turn on the load , then load begin to work; When feeling there is sunlight , it will turn off the load , then load stop working . This mode usually be used for testing the controller .

5.3 Light control mode : press the button until the LED figures shows 0 , which means the system is under light control mode . when the controller feel there is no sunlight for 10 minutes , it will turn on the load , then load begin to work; When feeling there is sunlight for 10 minutes , it will turn off the load , then load stop working . The 10 minutes delay is set for avoiding some misjudgment by some suddenly lights .

5.4 Light control + time control mode: Press the button at any figure from 1~15 , which means the system is under light control and time control mode . when the controller feel there is no sunlight for 10 minutes, it will turn on the load, then load begin to work; after (1~15 as you set)

hours , the controller will turn off the load . It requires manul operation to restart the system after it worked (1~15 as you set) hours under this working mode .

5.5 Common controller mode : press the button until the LED figures shows 16 , which means the controller is just a common controller for charging and protection . This mode cancel the light control , time control , 10 minutes delay functions , The load can only be turned on or turned off by human .

Woking mode setting table :

O = open , C = close , (T) = test mode , without 10min delay .

Woking mode & LED figure		Woking mode & LED figure		Woking mode & LED figure	
Light control O+light control C	00	Light control O+7h working +C	07	Light control O+14h working +C	14
Light control O+1h working +C	01	Light control O+8h working +C	08	Light control O+15h working +C	15
Light control O+2h working +C	02	Light control O+9h working + C	09	Human control O + human control C	16
Light control O+3h working +C	03	Light control O+10h working +C	10	Light control O + Light control C (T)	17
Light control O+4h working +C	04	Light control O+11h working +C	11		
Light control O+5h working +C	05	Light control O+12h working +C	12		
Light control O+6h working +C	06	Light control O+13h working +C	13		

Examples:

Mode 01:

When sunlight is off , controller waits for 10 min and then turns the load ON for 1 hour + 10 min then turns the load OFF.

Mode 02:

When sunlight is off, controller waits for 10 min and then turns the load ON for 2 hours + 10 min then turns the load OFF.

Mode 15:

When sunlight is off , controller waits for 10 min and then turns the load ON for 15 hours + 10 min then turns the load OFF.

Special modes:

Mode 00 (light control):

When sunlight is off controller waits for 10 min and then turns the load ON.

When sunlight is on controller waits for 10 min and then turns the load OFF.

Mode 16 (common controller) :

Controller turns the load ON no matter day or night without any delays.

The load is turned on or turned off by manual control .

Mode 17 (testing mode) :

When sunlight is off, the controller turns the load ON.

When sunlight is on, the controller turns the load OFF.

(This mode is similar to Mode 00, but works without 10 min delay)

6. Solutions to common problems :

phenomenons	solutions
Solar panel indicator (1) doesn't shine when the solar module be shone directly	Please check whether the wire is right on both ends of the power , contact is reliable or not
Solar panel indicator (1) twinkle rapidly	System overvoltage. check the connection of battery, or charging circuits damaged
Load indicator (3) shining, but no output	Please check if the electricity appliance be connected correctly
Load indicator (3) shining rapidly , and no output	Output is short circuit, please check the output circuit, remove all load, resume the system
Load indicator (3) shining slowly , and no output	Load power over the rated power , please reduce the load
Battery indicator (2) shining red lights, and no output	Battery over discharge, resume to service after fully charged

7 . Technic index

Model	NV12V005	NV12V010	NV12V015	NV12V020	NV12V025	NV12V030
Rated charge current	5A	10A	15A	20A	25A	30A
Rated load current	5A	10A	15A	20A	25A	30A
System voltage	24v/12v AUTO					
Overload, short circuit protection	over the rated current 1.25 times for 60 seconds, or over the rated current 1.5 times for 5 seconds , or ≥ 3 times rated current					
No-load loss	$\leq 6\text{mA}$					
Charging loop pressure drop	$\leq 0.26\text{V}$					
Discharge loop pressure drop	$\leq 0.15\text{V}$					
Overvoltage protection	17V , $\times 2/24\text{V}$					
Working temperature	Industrial grade : $-35^{\circ}\text{C} \sim +55^{\circ}\text{C}$					
Promote charging voltage	14.6V ; $\times 2/24\text{V}$ (maintain time :30 min) (Only used for over discharge)					
Straight charging voltage	14.4V ; $\times 2/24\text{V}$ (maintain time :30 min)					
Floating charging	13.6V ; $\times 2/24\text{V}$ (maintain time: until fall to the charging return voltage)					
overcharge return voltage	13.2V; $\times 2/24\text{V}$					
Temperature compensation	$-5\text{mv}/^{\circ}\text{C}/2\text{V}$ (promote , straight charging , charge return voltage compensation)					
Under voltage	12.0V ; $\times 2/24\text{V}$					
Over discharge voltage	11.1v-no-load voltage ; $\times 2/24\text{V}$					
Over discharge return voltage	12.6V; $\times 2/24\text{V}$					
Control method	PWM					