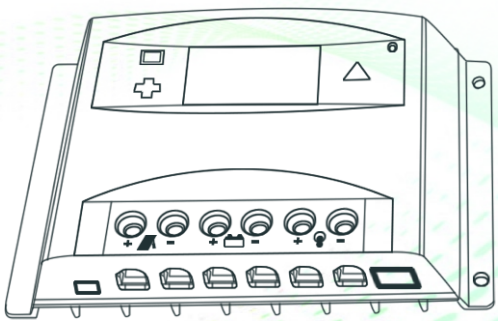
太阳能控制器操作手册

SOLAR CONTROLLER

Operation manual



产品电压：**12V/24V** 或 **48V**
安时：**20A 30A 40A 50A 60A**
亲爱的用户：感谢你选择我们的产品，在你使用本产品之前请详细阅

1、主要功能

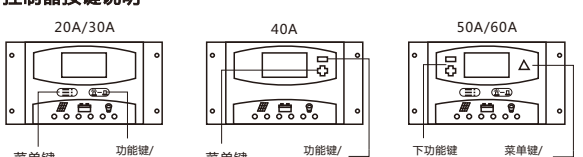
特征如下所示：

1）系统电压 12V/24V 自动识别或者48V
2）人性化液晶显示屏和双键操作人机界面
3）完全使用技术数据设置和修改
4）高效智能PWM三级充电
5）可以选择加载控制模板，在晚上可以对路灯进行时间上的设定
6）可靠地保护：过压，短路，超载，过充，过放保护功能
7）精确的温度补偿，正确地充电和放电电压自动延长电池的使用寿命。
8）输入终端的正极和负极端反向连接保护。

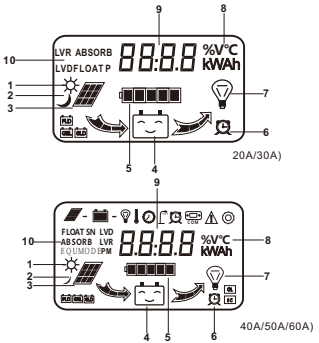
2、安全使用建议

1）控制器会检测环境的温度来适应充电电压，所以控制器应该尽可能的靠近电池。(建议在30~100cm)
2）18V太阳能板接12V蓄电池系统，36V太阳能板接24V蓄电池系统。
3）为了使终端牢固，尽可能使用绞体铜线。松动的电源连接和/或腐蚀的电线可能会导致电阻连接熔化电线绝缘，烧毁周围的材料甚至引起火灾。
4）控制器只适用于各种铅酸电池，请勿使用于其他电池(锂电池、镍氢电池)。

控制器按键说明



3、液晶显示器的特点

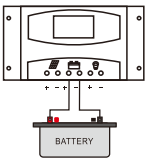


1)日间模式　2)晚间模式　3) 太阳能面板　4)电池
5)电池电量显示　6)时间设置　7)负载　8)单位
9)数码显示　10)设置参数项

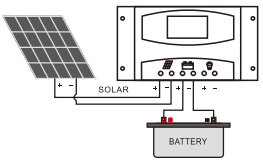
4、控制及连接安装说明

1）控制器应该安装在通风良好的地方，避免阳光直射，高温，不应该安装在水可以渗透到控制器的地方。
2）请选择正确的螺丝来安装控制器在墙上或其他平台,螺丝M4或M5,螺丝帽的直径应该小于10mm。
3）请在墙与控制器之间保留足够的空间，用于冷却和顺利连接。
4）安装孔距离为20-30A(178*60mm)、40A(80*185mm)、50-60A(98*178mm),安装孔的直径为5mm。
5）为了更好的连接，包装的时候所有的终端都是很紧的连在一起的，请先把所有终端松下来。

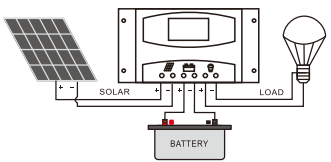
6）如图，首先连接正确电池和控制器的正负极。为了避免短路，首先将电池拧到控制器上，然后再连接太阳能板，然后再连接负载。



（1）电池连接示意图



（2）太阳能连接示意图



（3）太阳能系统连接完成示意图

***警告：请按上图（1）（2）（3）顺序连接，否则会有损坏电池和控制器的后果！**

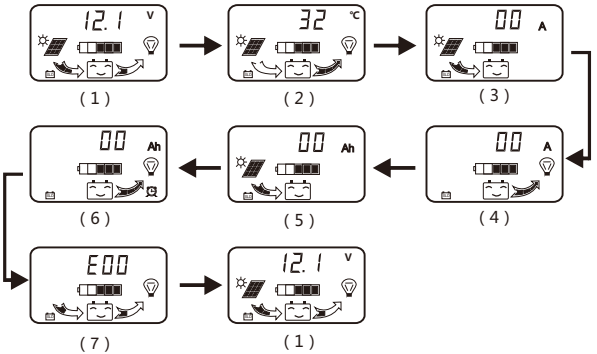
*如果在控制器终端发生短路，将会造成火灾或泄露，必须要非常小心。（我们强烈建议将电池侧的保险丝连接到控制器额定电流的1.5倍）

*正确连接成功后，太阳光充足，液晶显示屏将会显示太阳能电池板，从太阳能电池板到电池的箭头将会点亮。

5、操作指示

(一) 20A/30A操作指示

*通电开机后, 在主界面按“菜单”键，会依次进入下一个菜单在主界面短按“功能”键，可以打开和关闭负载输出(注意:设置过参数的控制器断电后即可复位为默认)



1）主界面显示设置

如图(1); 在此界面长按“菜单”键3S以上，进入后按功能键选择三种电池类型模式(FLD封闭式铅酸电池模式，SLD开放式铅酸电池模式，GEL 胶体电池模式)，默认是GEL电池模式。

2)温度显示界面

如图(2); 在此界面可以查看控制器的工作环境的温度。

3）充电电流界面

如图(3); 此界面参数可以查看太阳能板给电池的充电电流的数值，在此界面长按“菜单”键3S以上，进入后可以调节太阳能三种充电方式的电压数值。(FLOAT浮充电压、ABSORB全充电压、EQU均衡充电电压)

4）负载电流界面

如图(4); 此界面参数可以查看电池给负载的放电电流的数值，在此界面长按“菜单”键3S以上，进入后可以设置*电池低压保护电压（LVD），*电池低电压复位电压（LVR），*1-24小时光控加延时设置模式。**(详细设置方法第7大点)**

5)累积充电电力（安时）

如图(5); 此参数是正在充电AH计数器，这显示了太阳能板全部的发电量。在此界面长按菜单键超过5S 计数器将会归零。

6)累积放电电力（安时）

如图(6); 此参数为放电电力计量器，它显示了负载能量的消耗，在此界面长按菜单键计量器将会归零。

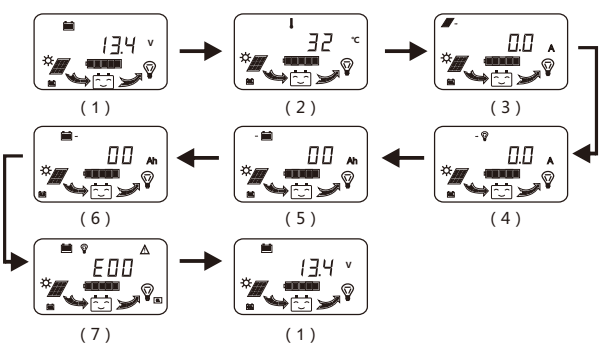
7)警告显示界面

保护电路启动后显示的警告界面。

(二) 40A/50A/60A操作指示

*控制器将在通电后具有1s的初始化界面，然后进入主界面。(注意:设置过参数的控制器断电后即可复位为默认)

*在主界面按“菜单”键，会依次进入下一个菜单，在主界面短按“功能”键，可以打开和关闭负载输出。



(一)主界面显示设置

1.设置ABBORB 太阳能全充电压）

如图(1); 在主界面长按“菜单”键3S以上，进入ABSORB设置界面，按一次“菜单”键，数字开始闪烁时，再按“功能”键设置太阳能充电电压，设置完成后，再按一次“菜单”键可锁定。退出时按“菜单”键3S即可退出（下面设置后退出同此操作）。

2.设置FLOAT（太阳能浮充电压）

如图(2); 在主界面长按“菜单”键3S以上，进入ABSORB设置界面后按一次“功能”键，显示FLOAT设置界面，按一次“菜单”键，数字开始闪烁时，再按“功能”键设置太阳能浮充电压，设置完成后，再按一次“菜单”键锁定。

3.设置LVD电压（电池低压保护电压）

如图(3); 在主界面长按“菜单”键3S以上，进入ABSORB设置界面后按两次“功能”键，显示LVD设置界面，按一次“菜单”键，数字开始闪烁时，再按“功能”键设置电池低压保护电压，设置完成后，再按一次“菜单”键锁定。

4.设置LVR 电池低电压复位电压）

如图(4); 在主界面长按“菜单”键3S以上，进入ABSORB设置界面后按三次“功能”键，显示LVR设置界面，按一次“菜单”键，数字开始闪烁时，再按“功能”键设置电池低压复位电压，设置完成后，再按一次“菜单”键锁定。

5.选择电池充电模式

如图(5); 在主界面长按“菜单”键3S以上，进入ABSORB设置界面后按四次“功能”键，显示电池模式设置界面，按一次“菜单”键，字母开始闪烁时，再按“功能”键选择电池模式（按功能键选择三种电池类型模式(FLD封闭式铅酸电池模式，SLD开放式铅酸电池模式，GEL胶体电池模式,默认是GEL电池模式），设置完成后，再按一次“菜单”键锁定。

6.设置温度微调

如图(6); 在主界面长按“菜单”键3S以上，进入ABSORB设置界面后按五次“功能”键，显示温度微调设置界面，按一次“菜单”键，字母开始闪烁时，再按“功能”键设置温度微调，设置完成后，再按一次“菜单”键锁定。

7.设置光控模式

如图(7); 在主界面长按“菜单”键3S以上，进入ABSORB设置界面后按六次“功能”键，显示光控模式设置界面，按一次“菜单”键，字母开始闪烁时，再按“功能”键设置光控模式，*00为纯光控模式，*01-15为小时光控加延时模式，24为负载常开模式。设置完成后，再按一次“菜单”键锁定。

(二)温度界面显示设置

在此界面可以查看控制器的工作环境的温度。

(三)充电电流界面

此界面参数可以查看太阳能板给电池的充电电流的数值。

(四)负载电流界面

此界面参数可以查看电池给负载的放电电流的数值。

(五)累积充电电力（安时）

此参数是正在充电AH计数器，这显示了太阳能板全部的发电量。

(六)累积放电电力（安时）

此参数为放电电力计量器，它显示了负载能量的消耗。

(七)警告显示界面

保护电路启动后出现的警告界面

6、保护功能

1)低压重连接电压

当电池的电压很低时控制器将会停止给负载提供能量，如果控制器需要和输出负载重新连接，电池的电压必须高于LVD电压或按返回键强行离开。
当电池电压高于LVD的时候，用户必须要给电池充电。或者按返回键强制退出。负载输出将会重新工作。

4)电池低压保护(LVD)

当电池的电压低于10.7V时, 电池低压保护将会启动，输出会切断，同时，电池的标志和警告显现，请增加充电电流以及充电时间。
当电池电压超过12.6V时，保护功能将会关闭，为负载提供的输出将会重新工作，或者按返回键强制返回主界面。

5)电池电压超压保护

当电池的电压超过15V 时，超压保护将会启动。

6)负载超越电流保护

当负载短路或超负荷时，输出将会断开，同时负载及警告标志显现，请确认是否是负载终端出现短路，降低负载的能量，30s后控制器会自动重启，或按返回键强制返回子界面。

7、光控模式设置

在光控设置界面里选择，00h为纯光控模式（晚上开灯，白天关灯）。
01—15h光控加延时模式（晚上自动开灯(白天关闭)至设定的时间后关闭），24h为负载常开模式（电瓶欠压除外)。
系统默认为负载常开模式,光控模式需要重新设定后,须等待1分钟以后设定才有效。
如果重新设置的时间超过实际晚上的时间，负载的输出将会在太阳升起的时候开始切断工作。

8、日常问题及处理

问题	可能的原因	解决办法
连接电池后，LED 无显示	电池低电量，电池没有接好，连接断开	请确认电池电压，重新和正确链接控制器和电池
太阳光直射太阳能电池板，无太阳能符号和无电荷符号	太阳能板连接电路开了，短路，或者反向链接	请检查天眼能电池板的运作情况，如果正确就会连接起来。
控制器显示LVD	电池过度放电	请检查系统是否合理，和消耗电量是否多于充电量。
控制器显示超电流保护	负载短路，高功率	请检查负载是否短路，负载的功率是否超过设计的功率，涌动的功率太高。

9、技术数据

型号	20A	30A	40A	50A	60A
系统电压	12V/24V(自动切换），或48V				
太阳能板输入的最大电压	50V(12V/24V),100V(48V)				
自我损耗	≤13MA				
最大充电电流	20A	30A	40A	50A	60A
最大放电电流	20A	30A	40A	50A	60A
LVD(低压保护电压)	10.7V(10-13.8V),21.4V(20-27.6V),42.8V(40-55.2V)				
LVR(低压复位电压)	12.6V(10.2-14V),25.2V(20.4-28V),50.4V(40.8-56V)				
浮充电压	13.8V(13-15V),27.6V(26-30V),55.2V(52-60V)				
电池超压保护	15V/30V/60V				
输入反向连接保护	是的				
充电模式	PWM				
温度补偿	-24mv/℃,-48mv/℃,-96mv/℃,相对于12V/24V/48V系统。				
工作温度	-20℃-+55℃				
终端尺度	28-10AWG				
防水级别	IP32				
产品尺寸(mm)	20-30A(187*90*47mm)		40A(195*107*50mm)		50-60A(187*122*57mm)
包装尺寸(mm)	200*102*53mm		210*118*59mm		200*132*63mm
重量(净重)	320g		340g		588g

Product voltage: 12V/24V 或 48V
20A 30A 40A 50A 60A: ah

Dear user: Thank you for choosing our product. Please read it carefully before you use this product

1、Major function

The characteristics are as follows:

1) 12V/24V automatic identification or 48V

2) humanized LCD display and double bond operation man-machine interface

3) full use of technical data set and modify

4) efficient smart PWM three charging

5) can choose the loading control template, in the evening time can be set on the street

6) reliable protection: overvoltage, short circuit, overload, overcharge, over discharge protection function

7) accurate temperature compensation, correct charging and discharging voltage, automatically prolong the service life of the battery

8) input terminal positive and negative extreme reverse connection protection

2、Safety recommendations

1) the controller will check the ambient temperature to accommodate the charging voltage, so the controller should be as close as possible (in 30~100cm) battery.

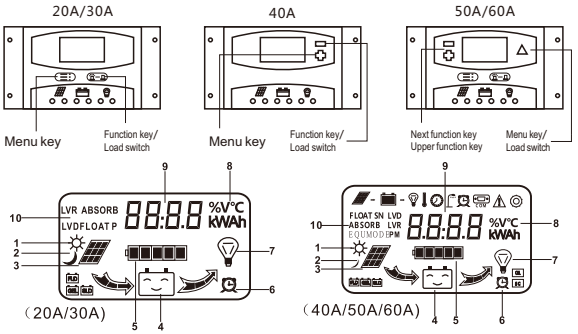
2) 18V solar panel connect with 12V battery, 36V solar panel connect with 24V battery .

3) in order to make the terminal firm, using copper wire twisting body as much as possible. Loose connection to the power supply and/or corrosion of the wire.It can cause electrical connections, melting wires, insulation, burning materials around, and even causing fires

4)The controller is only applicable to a variety of lead-acid batteries, do not use other batteries (lithium batteries, nickel hydrogen batteries)

3、LCD features

Controller key instructions



1) day mode 2) evening mode 3) solar panel 4) battery
5) battery power display 6) time setting 7) load 8) unit
9) digital display 10) setting parameter items

4、Control and connection installation instructions

1) the controller should be installed in a well ventilated place, avoiding direct sunlight and high temperature, should not be installed in the Water can penetrate into the controller.

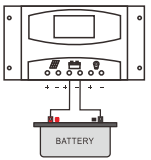
2) select the correct screw to install the controller on the wall or other platforms, M4 or M5 screw, screw cap The diameter should be less than 10mm.

3) keep enough space between the wall and the controller for cooling and smooth connection

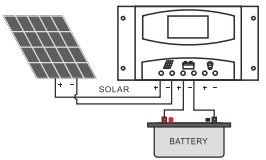
4) the mounting hole distance is 20-30A (178*60mm), 40A (80*185mm), 50-60A (98*178mm), the diameter of the mounting hole is 5mm.

5) in order to better connect, when packaging, all terminals are very tight, linked together, please first All terminals are loose

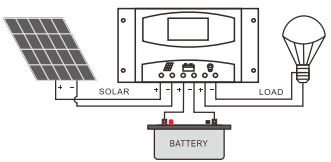
6) As shown in Figure, positive and negative first properly connected battery and controller. In order to avoid short circuit, the battery Screw onto the controller, then connect the solar panel, and then connect the load



(1) Schematic diagram of battery connection



(2) Solar connection diagram



(3) the solar system connection diagram

*** warning: please according to the above (1) (2) (3) are connected in sequence, otherwise it will damage the battery and the controller of the consequences!**

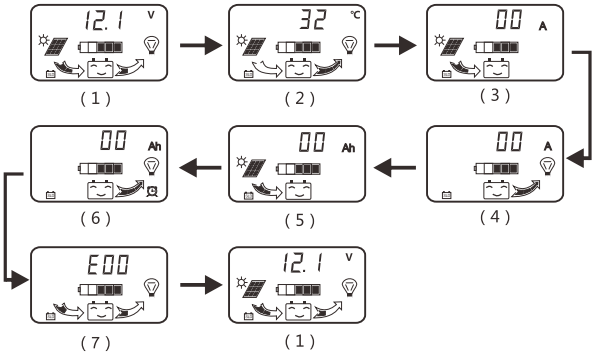
* if a short-circuit occurs at the controller terminal, it will cause fire or leakage, and must Be very careful. (we strongly recommend connecting the battery side fuses to the control 1.5 times the rated current of the instrument)

* after the proper connection is successful, the sun is bright enough and the LCD screen will show the solar panel from the sun An arrow that can hook the battery to the battery will light up

5、Operation instruction

(一) 20A/30A operation instructions

* the power on, press the "menu" button in the main interface, will turn into the next menu in the main interface short press The "function" key can turn on and off the load output. (Note: the controller that sets the parameter can be reset after power failure is the default)



1) The main interface display settings

Figure (1); this interface long press "menu" button to enter the 3S above, after the selection of three types of battery press Mode (FLD closed lead acid battery mode, SLD open lead acid battery mode, GEL colloid battery mode), The default is GEL battery mode.

2) Temperature display interface

Figure (2);the temperature of the working environment of the controller can be viewed at this interface.

3) Charging current interface

Figure (3), this interface parameter allows you to see the value of the charge current of the solar panel to the battery "The above menu" button after entering 3S, can adjust the voltage value of solar three charging modes. (FLOAT Float voltage, ABSORB charging voltage, charging voltage EQU equilibrium)

4) Load current interface

Figure (4), this interface parameter allows you to see the value of the discharge current of the battery to the load More than a single "key after entering the 3S, you can set the battery low voltage protection * (LVD) *, battery low voltage reset Voltage (LVR), *1-24 hour light control with delay setting mode (detail setting method seventh points)

(detail setting method seventh points)

5)Cumulative charge power (An)

Figure (5), this parameter is the charged AH counter, which shows the total power output of the solar panel The interface is long, press the menu key more than 5S, and the counter will be zero

6)The cumulative discharge of power (An)

Figure (6); the parameter to discharge power meter, it shows the load energy consumption, long press this interface The menu key gauge will be zero.

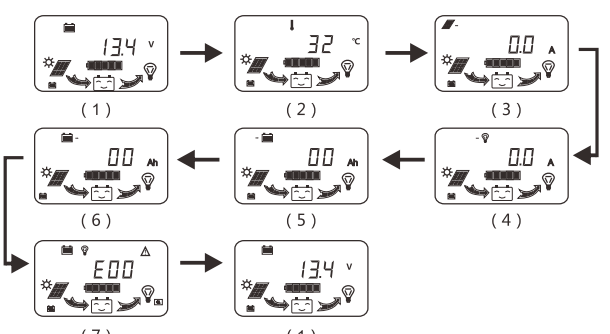
7)Warning display interface

The warning interface displayed after the protection circuit is started

(二) 40A/50A/60A operating instructions

*The controller will have 1s in power after the initialization interface, and then enter the main interface. (Note: set up parameters The controller can be reset to the default power)

* press the "menu" button in the main interface, will turn into the next menu in the main interface, short press "function" button, You can open and close the output load.



(一)The main interface display settings

1.Set the ABBORB (solar charging voltage)

Figure (1) , the main interface in the long press "menu" button above 3S , enter the ABSORB setup , press "menu" When the number starts to flash , press the "function" button to set the solar charging voltage . After setting , press the button again The "menu"button can be locked out.Press the "menu" button to exit (3S exit is arranged under the same operation).

2.Set the FLOAT (solar float voltage)

Figure (2), press the "menu" key 3S above the main interface, and then click "function" after entering the ABSORB settings interface"Key, display the FLOAT settings interface, press a menu key,and when the numbers begin to flash,press the function button again Set the solar float voltage, after setting, press the "menu" button to lock.

3.Set the LVD voltage (battery low voltage protection voltage)

Figure (3), press the "menu" key 3S above the main interface, then enter the ABSORB settings interface, and press the two function" Key, display the LVD settings interface, press a menu key , and when the numbers begin to flash , press the function button. The battery low voltage protection, setup is complete, click a menu button lock.

4.Set the LVR (battery low voltage reset voltage)

Figure (4), press the "menu" key 3S above the main interface, then enter the ABSORB settings interface, and press the three function"Key, display the LVR settings interface, press a menu key,and when the numbers begin to flash, press the function button The battery low voltage reset, setup is complete, click a menu button lock.

5.Choose the battery charging mode

Figure (5), press the "menu" key 3S above the main interface, then enter the ABSORB settings interface , and press the four function " Button to display the battery mode setting interface,press the menu key, and the letters start flashing,then press"function"" Button select battery mode (press function key to select three battery type mode) (FLD closed lead-acid battery mode,SLD Open type lead-acid battery mode,GEL colloid battery mode, the default is GEL), battery mode setup is complete, then Press "menu" button to lock.

6.Setting temperature trim

Figure (6), press the "menu" key 3S above the main interface, then enter the ABSORB settings interface , and press the five function "Key , display temperature adjustment setting interface , press "menu" button , letters start flashing , press " function " Key setting temperature adjustment, after setting is finished, press again "menu" key lock

7.Set light control mode

Figure (7) , press the "menu" key 3S above the main interface, then enter the ABSORB settings interface, and press the six function" Button, display light control mode settings interface, press the "menu" key, the letters begin to flash, and then press "function""Key set light control mode, *00 is pure light control mode, *01-15 is hour light control plus delay mode, and 24 is load constant Open mode. After setup is complete, click a menu button lock.

(二)Temperature display settings

This interface can view controller working environment temperature.

(三)Charging current interface

This interface parameter allows you to see the value of the charge current of the solar panel to the battery

(四)Load current interface

The numerical interface parameters can view the battery discharge current to the load.

(五)Cumulative charge power (AH)

This parameter is charging AH counter, which shows the power output of the solar plate is full

(六)The cumulative discharge of power (AH)

This parameter is the discharge power meter, which shows the energy consumption of the load

(七)Warning display interface

A warning interface that occurs after the boot of the protection circuit

6、defencive function

1)Low voltage reconnection voltage

When the voltage of the battery is very low , the controller will stop providing energy to the load, if the controller needs and outputs. Load reconnection, the battery voltage must be higher than the LVD voltage, or press the return key to force to leave .
When the battery voltage is higher than LVD, the user must charge the battery or press the return. key to force it out. The output will be back to work.

4)Battery low voltage protection (LVD)

When the battery voltage is lower than 10.7V,the battery low voltage protection will be activated at the same time,the battery output will cut off. The signs and warnings appear, please increase the charging current and charging time. When the battery voltage exceeds 12.6V, the protection function will be switched off and the output supplied for the load will be re operated. Press the return key, or forced to return to the main interface.

5)Overvoltage protection of battery voltage

When the battery voltage exceeds 15V, the overpressure protection will start.

6)Load over current protection

When the load is short or overload, the output will be off, and the load and warning sign will appear. No, the load terminal is short circuited and the energy of the load is decreased. After 30s, the controller will restart automatically or press back. Forced to return back key sub interface.

7、Light mode setting

In optical setup interface in 00h, pure light mode (ON at night, OFF at day).
01 - 24h light control plus delay mode (automatic turn on light at night (closed during the day) and closed after set time), 24h. Load normally open mode (except under battery voltage).
The system default load normally open mode, control mode need to re set, must wait 1 minutes later set to be effective. If the reset time is longer than the actual night time, the output of the load will begin when the sun rises cut off the job.

8、Daily problems and disposal methods

Problem	Possible reason	Solution
After connecting the battery, LED does not show	Battery low battery, the battery is not connected, the connection is disconnected	Please confirm the battery voltage, re-link the controller and battery correctly
Solar direct solar panels, no solar symbols and no charge symbols	The solar panel connection circuit is open, shorted, or backlinked	Please check the operation of the battery can be connected, if it will be connected together.
The controller displays LVD	Excessive battery discharge	Please check whether the system is reasonable, and whether the power consumption is more than the amount of charge.
The controller displays over current protection	Load short circuit, high power	Please check whether the load is short, the power of the load exceeds the designed power, surging power is too high.

9、Technical data

Model	20A	30A	40A	50A	60A
System voltage	12V/24V(Automatically switch) , 48V,				
The maximum voltage of the solar panel input	50V(12V/24V),100v(48V)				
Self loss	≤13MA				
Maximum charge current	20A	30A	40A	50A	60A
Maximum discharge current	20A	30A	40A	50A	60A
LVD	10.7V(10-13.8V),21.4V(20-27.6V),42.8V(40-55.2V)				
LVR	12.6V(10.2-14V),25.2V(20.4-28V),50.4V(40.8-56V)				
Floating voltage	13.8V(13-15V),27.6V(26-30V),55.2V(52-60V)				
Battery overpressure protection	15V/30V/60V				
Input reverse connection protection	Yes				
Charging mode	PWM				
Temperature compensation	-24mv/℃,-48mv/℃,-96mv/℃, Relative to 12V/24V/48V system。				
Operating temperature	-20℃-+55℃				
Terminal scale	28-10AWG				
Waterproof level	IP32				
Product Size(mm)	20-30A(187*90*47mm)		40A(195*107*50mm)	50-60A(187*122*57mm)	
Packing size(mm)	200*102*53mm		210*118*59mm	200*132*63mm	
Weight	320g		340g	588g	