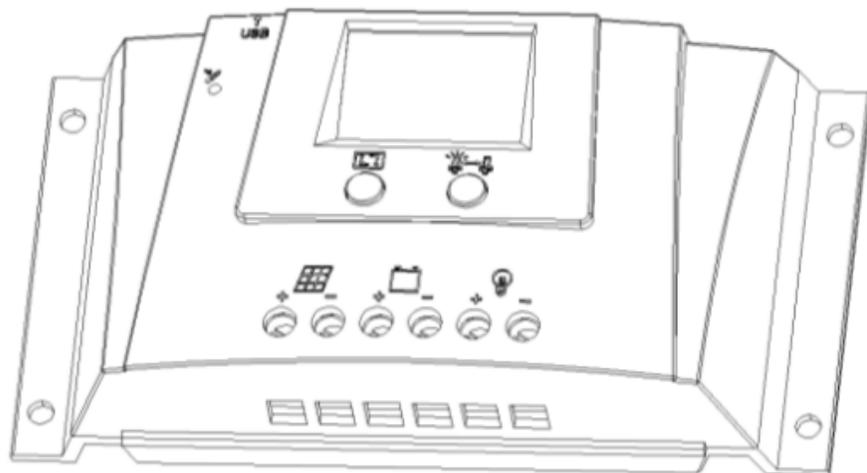


Solar Charge Controller

User's Manual



Please read this manual carefully before you use this product

Contents

1. Product Introduction.....	1
2. Installation	2
3. Operation	4
4. Common Fault and Handling.....	11
5. Quality Assurance.....	12
6. Technical Data.....	14

1. Product Introduction

This intelligent, multi-purpose solar charge and discharge controller has a very friendly interface of fixed LCD display. Various control parameters can be flexibly set, fully meet your various application requirements. It has following features:

- Vivid LCD graphic symbols
- Simple button operation
- Automatic Identification of System Voltage level
- Adjustable control parameters
- Battery reverse-discharge protection
- Battery reverse-connected protection
- Intelligent PWM charging mode
- Settable Operating mode of Load
- Battery Low-voltage protection
- Over-current protection
- USB Power Output(optional)

2. Installation

2.1 Ready tools and cables, right cables are recommended. Ensuring that the current density $<4A/mm^2$, Which is conducive to reducing the line voltage drop. **Recommended:20A with 6mm² cable.** Check whether the installation sites compliance with the relevant safety requirements. Please avoid using or installing the controller in damp,dusty places or places with flammable,explosive and corrosive gases.

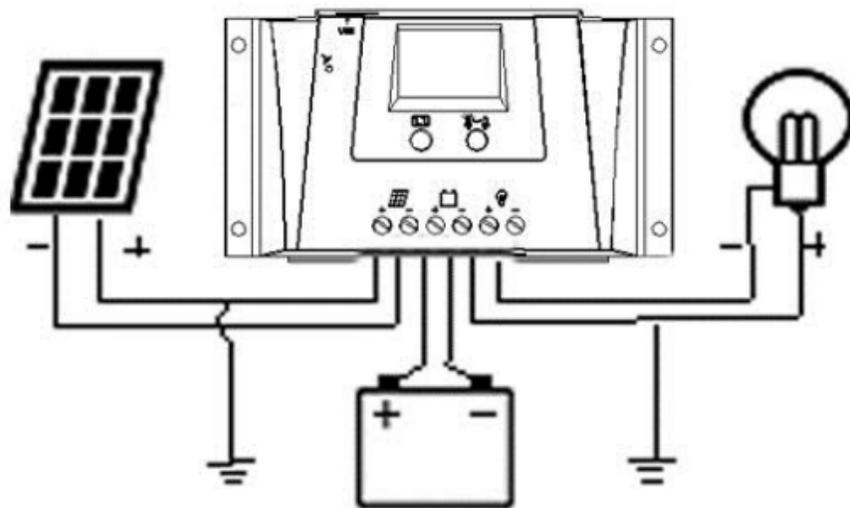
2.2 The controller is fixed to the vertical plane. In order to ensure good heat dissipation conditions of the controller, the controller please beneath the reserved space above 10cm.

2.3 To connect the controller and the battery by cables with right polarity. The LCD of controller will be on if successfully connected,otherwise,to check and reconnect.

2.4 To connect the solar panel and the controller by cables with right polarity. If there is sunshine and is correctly connected,the solar icon will be on, otherwise,to check and reconnect .

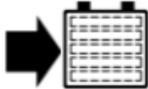
2.5 To connect your load and the controller with right polarity. Pay attention to + - polarity to avoid reversed connection, otherwise, your load may be damaged. **Demolition: In case of any accident, please disconnect the solar panel, battery and load with controller in order.**

Note: Reversed battery polarity will not damage the controller, but may bear security risks on your load equipment.



3. Operation

3.1 Description of LCD Graphic Symbol

	Solar panels icon has no indication, which said solar panels voltage less than 5V (12V systems) or 10V (24V system), solar panel icon flashes slowly said solar panels was not detected in 24 hours.
	The arrow has no indication, which said the solar panel voltage is lower than the battery voltage, and stop charging.
	Solar charging arrow is on and the internal cell of battery is in the animation state is meaning that, the current charging step is in full charge step (Bulk).
	Solar charging arrow slow flash, the fifth cell of battery slow flash is meaning that, the current charging step is in boost charging step (Absorption).
	Solar charging arrow slow flash, the battery is full of personality is meaning that, the current charging process in float charging (Float) stage.
	The figure is in flickering state, indicated that the current figure can be adjusted by keys.

	The battery icon is empty and flash slowly is meaning that, the battery voltage is too low the load has been shut off.
	The battery icon is full and flash fastly is meaning that, the battery voltage is too high, the load has been shut off.
	Discharging arrow is on means that the load is supplying, Discharging arrow is not on means that the load is not supplying. The load will be supplying automatic after coming across an event,etc dark, LVR, HVR.
	The discharging arrow is flash slowly, it means that the load has been turned off by user and won't be turn on automatic (only in the 24h mode).
	Load icon flash represents the load short circuit protection, load icon flashes slowly said load overload protection, 1min after controller will automatically attempt to restart load, three times attempt to restart the failure loads into the locked state. The controller is detected after dark will automatically unlock and try again to restart the load 3 times.
The picture on the dotted line shows slow or fast flashing or in the animation state.	

3.2 Description of Button Function

: Pages loop switch button, use the button to cycle between pages in each switch cycle sequence shown in (figure1). Moreover, this button can perform the function of “increase” in the parameter setting state.

: This button can be used to turn on or off the load in all pages. It can perform the function of “decrease” in the parameter setting state.

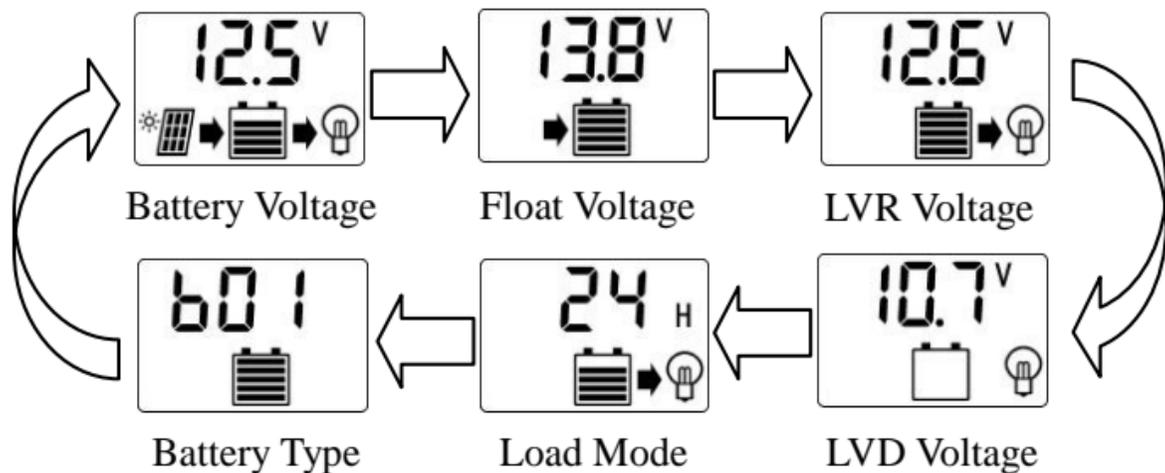


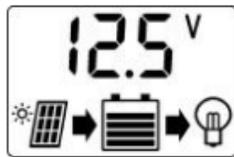
Figure 1

3.3 Viewing and Setting the Parameters

The controller will default entry “battery voltage” interface after correct power-on. This is the main interface. Use the button  could in turn visit the following parameters interface. If the parameters in that interface could be set, long press the button  (>5 seconds, numbers start flashing) to enter the parameter setting interface. Long press the button  again and then return to main interface. (the numbers stop flashing)

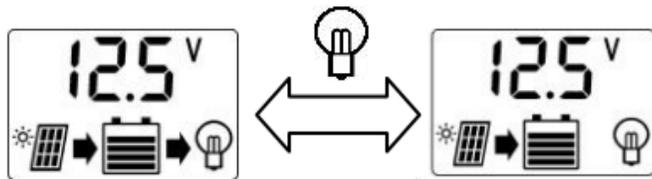
3.3.1 Overall Unit State

This interface shows the overall unit state (picture at right). It's the default interface after correct power-on, showing charging and discharging state, 5bars battery power indication and the voltage of the battery.



3.3.2 Turn on and Turn off the Load

You can use the button  on the faceplate to on or off the load in the default interface.



3.3.3 Viewing and Setting the Floating Voltage

As picture at right, the floating charge voltage is showed. When the battery reaches the floating voltage, the controller will maintain the voltage values by PWM charging mode to avoid overcharge.

Long press the button  (>5 seconds, numbers start flashing) to finish the setting of floating voltage values and use the   button to adjust the parameter; calling off the parameter interface after long press the button  again. (the numbers stop flashing) the floating voltage value will be saved by controller.



3.3.4 Viewing and Setting of Recovery After Under-voltage

As picture at right, the recovered voltages is showed. After the controller performs the function of under-voltage protection, the output of the load will be recovered as soon as the battery voltage recovers to higher than the LVR value.

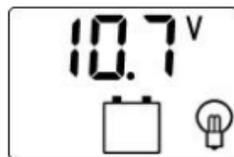
Long press the button  (>5 seconds, numbers start flashing) to enter the setting interface of recovery after under voltage; long press the button  again, (the numbers stop flashing) to call off the parameter interface after finish setting. Setting value will be conserved by the controller.



3.3.5 Viewing and Setting of Under-voltage Protection

As picture at right, the value for under-voltage protection is showed. The controller will cut off load circuit when battery voltage is lower than this value.

Long press the button  (>5 seconds, numbers start flashing) to enter the setting interface of under-voltage protection and use the    button to adjust the parameter; long press the button  again (the numbers stop flashing) to call off the parameter interface after finishing setting. Setting value will be conserved by controller.



3.3.6 Viewing and Setting of load Working Mode

As shown in the figure at right, the interface of load mode is displayed, and different numbers represent different modes.

24h: Normal Mode, in case of no fault state of the load is always in power.

1--23h: Light Control with Time Control Mode, at this mode, the controller will start the load after darkness and will close the load after setting hours.

0h--: Light Control Mode, Load will be on-power after darkness, turn off the load after drawn.

Long press the button  (>5 seconds, numbers start flashing) at this interface to active the setting interface of load working modes and use the button    to adjust the parameter; long press the button  again (The numbers stop flashing) to call off parameter interface after finishing setting.



Setting value will be conserved by controller.

3.7 Viewing and Setting of Battery Types

As picture at right, different numbers represent different types of battery.

b01: Sealed battery(default type for the controller)

b02: Gel battery

b03: Flooded battery

Long press the button  (>5seconds, numbers start flashing) at this interface to active the battery type and use the button  to adjust the parameter;long press the button  again (The numbers stop flashing) to call off parameter interface after finish setting. Setting value will be conserved by controller.



3.8 The Control Parameters of the Factory Default Recovery

Long press the button  (>5seconds) at main interface, the whole LCD icon began to flash, indicates that the controller has entered the factory default recovery processes and all parameters returned to the factory default settings and then return to the home page.

4. Common Fault and Handling

4.1 Under-voltage Protection and Treatment

 Shows up and flash on the screen means the battery voltage is lower than the under-voltage protection voltage. The controller has enter the under-voltage protection state and the output has been stopped.

Solution:Using solar panel or battery charger  to charge battery,when the battery voltage reaches the recovery value,the load will be on power again and enter normal working state.

4.2 Overload Protection and Treatment

 Shows up and flash on the screen,it means the occurrence of over-current or short circuit. The controller will stop output and enter overload protection state.

Solution:After solving the problem of output short circuit and reducing the load,press the button  to recover the normal working state.

4.3 Input Over-voltage and Handling

 Shows up and flash on the screen means the battery input voltage of the controller is higher than rated input voltage,controller will stop output and enter over-voltage protection state.

Solution: 1.Please choose battery with appropriate voltage grade to connect with controller.

2.other charge for the battery to be removed.

5. 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.

6. Technical Data

Rated Current	10A	15A	20A	Over Current Protect	1.25 times rated current 10S
Rated Voltage	12V/24V Auto			Charge/Discharge Voltage Drop	≤0.3V/0.2V
Solar Input	≤50V			USB Port (optional)	5V/1A Max
Float Voltage	13.8V/27.6V			Charging Mode	3 step, PWM charge
LVD	10.7V/21.4V			Specification of Cable	AWG 5# (6mm ²)
LVR	12.6V/25.2V			Working Temperature	-20°C ~50°C
Boost Voltage	b01:14.4V/28.8V	Duration 2 hours		Storage Temperature	-30°C ~70°C
	b02:14.2V/28.4V			Humidity	≤90%, no condensation
	b03:14.6V/29.2V			Diameter of Mounting Hole	150mm×64mm --Φ5
HVD	15.5V/31.0V			Dimension	166mm×88mm×38mm
No Load Loss	≤13mA			Weight	270g