

# **Z Series Solar Charge Controller**



**USER MANUAL**

Z10 Z20 Z30

**12V/24V    10A/20A/30A**

Dear Users:

**Please save this manual for future review**

Thank you for selecting our product. please read this manual carefully before use.

The controller is for off-grid tie system and control the charging and discharging of the battery. main function is protecting battery and improve

## ■ Major Features

- build-in industrial micro chip so that can guarantee work well.
- Humanized LCD displaying backlight and three buttons operation of man-machine interface.
- High efficiency intelligent PWM Fully 3-stage charging mode.
- Light and 24h Timer load control modes can be selected, timer function can be reset for street light at night.
- Dual USB output, the maximum current of 2.5A, support mobile phone charging.
- Accept OEM, ODM service, can print the logo, brand on the sticker and shell, can change the sticker color and appearance.

## ■ Protection functions

- Over-load protection.
- Build-in short-circuit protection
- Open-circuit protection.
- Reverse current protection.
- Low heat production.

## ■ Important Safety Information

- Read all of the instructions and cautions in the manual before beginning the installation.
- There are no serviceable parts for this controller. Do **NOT** disassemble or attempt to repair the controller.
- Make sure all connections going into and from the controller are tight.

- Do NOT allow water to enter the controller, please install in the room. if installed outside, please keep the environment dry, avoid directly sunlight.
- NEVER connect the solar panel array to the controller without a battery. Battery must be connected first.
- DO NOT connect any inverter or battery charger into the load terminal of the charge controller.
- Refer to the technical specification for the maximum current value and maximum wire size passing over the controller. Make sure your total input voltage and power does not exceed.
- This controller only suitable for Solar Photovoltaic panel, Never connect other power source to this controller.
- Make sure your battery has enough voltage for controller to recognize your battery voltage before first installation.
- Never install the controller in a sealed location with batteries, Do not install in an area where battery or any other flammable gasses can accumulate.
- **This Controller only suitable with the following battery types, Never connect any other type battery.**
  - a. **Lead Acid Batteries**
  - b. **GEL Batteries**
  - c. **AGM Batteries**

## ■ Installation Instructions

Tools required for installation: Screwdriver, Meter



1. Choose the installation location - Install the charge controller vertically in a place where it will not be exposed to direct sunlight and not high temperature and do not install in location where water can enter the controller.
2. Please confirm environment that sufficient ventilation is possible.

2. Clearance check - At least 6 inches (150 mm) clearance must be left above and below the controller in order to wire.
3. Cut the wall - The width of the part to cut the wall is slightly larger than the inside width of the controller and the depth must be 1.7 inches (43 mm) or more.
4. please select correct screw to fix the controller on the wall or other platform.
5. Please reserve enough space between the wall and controller, to allow for cooling and cable connection.

### 7. Wiring:

- a. Turn the adjusting screw counterclockwise until the plate moves downward.
- b. Please peel off the coating of the cable tip by about 8 to 10 mm, Then Insert the wire into the new opening between the plate and the "top" of the terminal hole.
- c. When turning the adjuster clockwise, the plate moves upward and crushes the wire in the hole of the terminal.
- d. Make sure all connections going into and from the controller are tight.

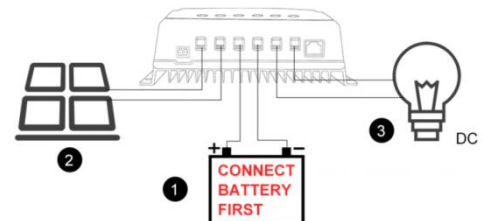
### 8. Connection order: as figure

- a. Connect the controller and battery **(First)**

Positive negative poles should be connected correct, avoid short circuit.

If you connect right, the LCD displaying will show battery voltage and other data. If LCD no indicate, please check the fault.

The cable between controller and battery as shorter as possible, suggest 30cm-80cm.



if short circuit happened on the terminals of the controller, it will result in fire explode, please careful.

(we strongly suggest to connecting a fuse at the battery side 1.5time of the rated current of the controller)



if the battery reverse connection, do not connect any load at that time, the load and the controller will destroy.

- b. Connect the solar panel and the controller. **(Second)**

Connect solar panel and the controller correctly under the sunshine is full, then the LCD will show solar panel and an arrow from the solar panel to battery will be light.



please confirm the VOC of the controller is higher 5V-10V than the solar panel total VOC. If not, the controller will be burnt and destroy the whole system device under the circumstances the solar panels VOC higher the solar controller VOC range, Please be careful.

Ps :VOC means open circuit voltage

c. Connect your load.



if you want connect the load directly from the controller, please confirm your load should be DC input.

For instance, you want connect the 1 bulb to the 10A controller and 12V battery system, should ensure your bulb is DC input 12V, and the current should be less than 10A, that can work.

If your load is not DC 12V, and the current exceeds 10A, the load cannot open and work.

More series, it will destroy the controller.

## 9. Disconnect order:

- a. Load
- b. Solar panel
- c. Battery

## ■ Characteristics



ITEM	NAME	ITEM	NAME
①	Plus	⑤	Solar Panel Terminal
②	Set Up	⑥	Battery Terminal
③	Minus	⑦	Load Terminal
④	Usb 5v	⑧	Usb 5v

## ■ Setting

① Battery's voltage or Time

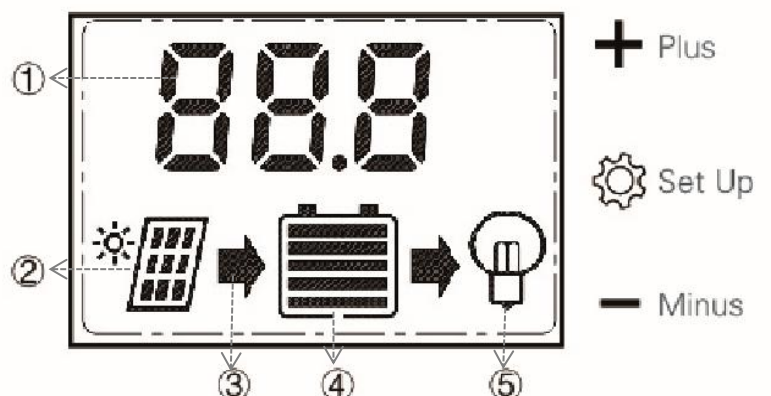
② Solar panel icon

③ Charging Arrow

Flashing: Charging

Keeps on: Battery full

Or constant voltage charging



④ Battery Icon

Indicate the capacity of the battery.

⑤ Load Icon

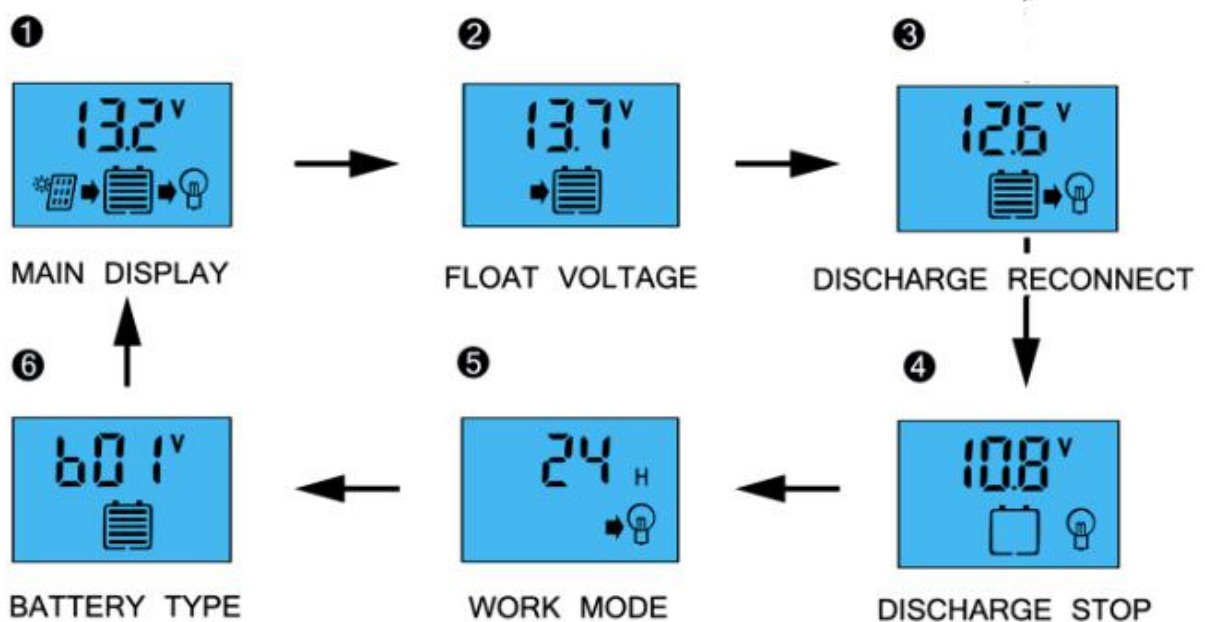
Plus: Press to increase value

Set up: Switch to different parameter, long press 5S to enter/exit setting

Float charge voltage, Float charge voltage, Float charge voltage, battery type choose, timer setting can be setting.

Minus: Press to decrease value.

or open/close the load output (under the [24H] working mode).



Press [setting] button to browse parameters.

**How to change the parameter value:**

- a. Short press to though the data till you see the parameter which you want to modify.
- b. Long press (Press and hold) about 5 second until the data blinking.
- c. Short Press to adjust the parameter.
- d. Just wait 5 second will Automatic save.

**How to restore factory settings?**

- browse your LCD screen, when the interface in NO.2-NO.5, Press and hold the button about 5

seconds.

## ● Function declaration and Attention

### 1. battery type:

b01-----AGM battery;

b02-----Open battery/**Lead Acid Batteries**;

b03-----GEL battery.


### 2. Load mode:

(24H)Load output 24hours(except for battery under voltage)

(1-23H) Load on after sunset and closed after setting hours

(0H)Dusk to dawn

3. Floating voltage: this parameter is High Voltage Disconnect(HVD) voltage.(Boost state voltage will be increase 0.6V base on HVD).the controller will be started PWM function at this point(HVD),limited voltage rising

Press  to second interface,long press this button 5S,the parameter will blink then you can press **+** **-** to set your needed technical data.

4. Low voltage reconnect voltage (LVR): the controller will stop offer the power to the load for protecting the battery when the voltage of the battery is low,if the controller needs to reconnected the output,the voltage of the battery mush be higher than LVR voltage.

The setting procedure is the same as float voltage.

5. Low voltage disconnect voltage : when the voltage of battery is low,the load output will be cut off. Only when the voltage higher LVD voltage,the load will be connect immediately and work again.

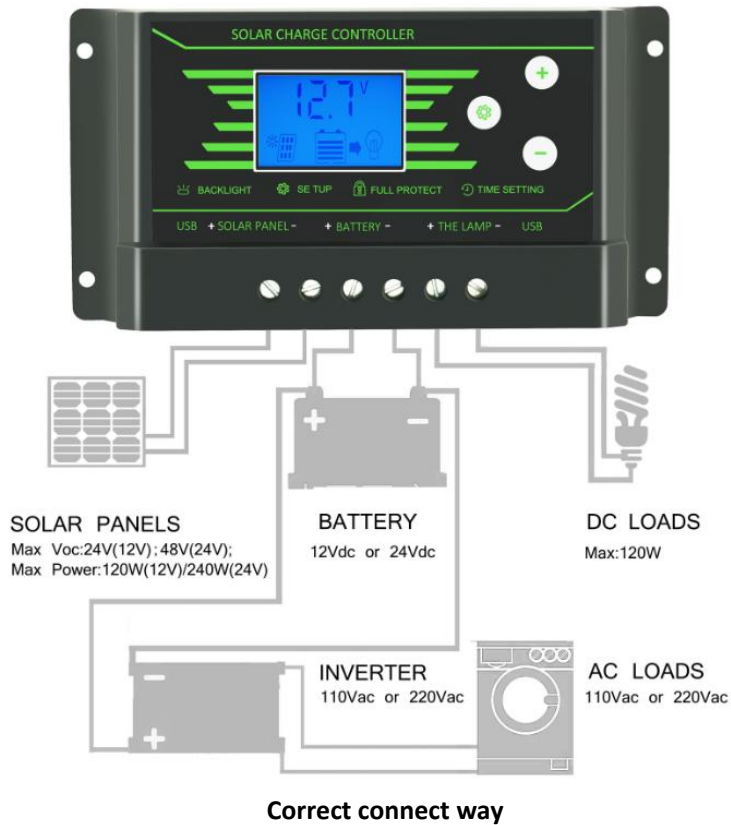
The setting procedure is the same as float voltage.

6. Load Light control mode is controlled by your solar panel,when the solar panel is higher 8V,it will auto daytime,and the load will close;when the solar panel voltage less than 8V,it will auto night time,the load will work.

7. IF Load symbol light, doesn't mean the load has been connected, only that the output is turned on.

8. If there is an inverter, please connect it to the battery directly, NEVER connect inverter to controller's LOAD terminal.

9. Maximum output of 12V system is 120W, 24V system is 240W. NEVER exceed the load's max output power.



## Trouble Shooting

Situation	Probable Reasons	Solution
Charge icon not on when sunny	Solar panel wire reversed	Check your wire and reconnect it in correct way.
Load icon off	Mode setting problem	Set working mode
	Battery low-voltage	charge your battery till it has enough voltage
Load icon slow flashing	Over Load	Reduce load power
	Short circuit protection	Remove short circuit, about 1 minutes will auto recovery
Power off	Battery is low-voltage	1. Use a multi-meter to verify the rated battery voltage. 2. charge your battery till it has enough voltage.
	incorrect wire/reverse	Check your wire and reconnect it right.
Battery icon blinking	Battery is low-voltage	charge your battery till it has enough voltage.
solar panel icon keeps shutting off	incorrect wire/reverse	<b>Reconnect</b> check if the wire is in correctly, If the wire is too thin or too loose.



## Technical Specification

Description	Z10	Z20	Z30
Battery Voltage	12V/24V AUTO		
<b>Rated Charge Current</b>	10A	20A	30A
Rated Discharge Current	10A	20A	30A
<b>Max.PV input power</b>	120W/12V 240/24V	240W/12V 480/24V	360W/12V 720W/24V
<b>Max. PV Input Voltage</b>	23V(12V system); 46V(24V system)		
Self-Consumption	<10mA		
Discharge stop	10.7V/12V; 21.4V/24V (default, adjustable)		
Discharge reconnect voltage	12.6V/12V system; 25.2V/24V system (default, adjustable)		
Charge reconnect	13V/12V system; 26V/24V system		
Equalization Voltage	14.4V/12V system; 28.8/24V system		
Float charge Voltage	13.7V/12V; 27.4/24V(default, adjustable)		
USB Output	Dual USB, 5V/2.5A		
Voltage of Open light	Solar Panel 8V(Light On delay)		
Voltage of Close Light	Solar Panel 8V(Light On delay)		
Working Temperature	-35°C—60°C / -95°F—140°F		
Dimensions	14.9*7.3*3.3cm/(5.86*2.87*1.3in)		
Weight	200g(0.44lb)		
<b>Max Gauge Size</b>	100pcs/Ctn		
	19.3KG/Ctn		