



# **PWM Intelligent Solar Controller**

## **User Manual**

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### Warning

This is A class inverter. It might cause slightly radio interference in daily life. And practical measure is required to take under this condition.

## 1. Main Feature

1-1. Intelligent control is realized by using microprocessor and dedicated control calculation.

1-2. Use advanced three-phase charging mode which is divided into constant current, constant voltage and floating charging as the way of charging battery. It's not only improve the efficiency of charging battery, but also reduce the time of charging and prolong the lifespan of battery.

1-3. With IGBT series circuit control in charging circuit and PWM fuzzy control in charging, the charge efficiency and discharging time is improved a lot.

1-4. LCD screen shows the working state of solar panel, storage battery and load. It also shows the adjusted parameter. In this way, user can learn the operation state in real time. Besides, there are various choices for parameter; user can select the proper working mode based on the different conditions.

1-5. Industrial grade chips and precision components are adopted for all the controls. Therefore, the controller performs well in very low and high temperature, as well as humid environment.

1-6. Chinese/English self option.

1-7. Charging voltage and charging current self option.

1-8. Battery reverse protection, solar panel reverse protection, over current protection, over temperature protection, intelligent fan.

## 2. System Description

The controller is specially designed for solar power system and small&middle solar power plant system. Intelligent control is realized by using dedicated computer chips. The controller can be used in hard environment, since its adoption of industrial grade chips. Through the computer chips, the controller takes samples from the parameters of storage battery voltage, solar panel voltage, charging current and environment temperature, and then use the dedicated control mode calculation to control the discharge rate and make it matching with the characters of storage battery, realize the high accurate temperature compensation and use Intelligent and high efficient PWM fuzzy charge mode and 3-phases charging mode to assure storage battery always in the perfect working state which prolong the lifespan of the battery..

### 3. Installation and Use

- 3-1. Controller installation should be firm which is as close as possible to battery.
- 3-2. Preparing cable: Choose cable suitable for current and calculate the cable length. Please use less cable in order to avoid power loss.
- 3-3. Storage battery connection: Attention for + and -, do not reverse connect. If connecting correctly, LCD will light after POWER switch on. Or please check if cable connection is correct.
- 3-4. Solar panel connection: Attention for + and -, do not reverse connect. If there's sunlight, LCD will display solar panel voltage after SOLAR switch on. Or please check cable connection is correct.

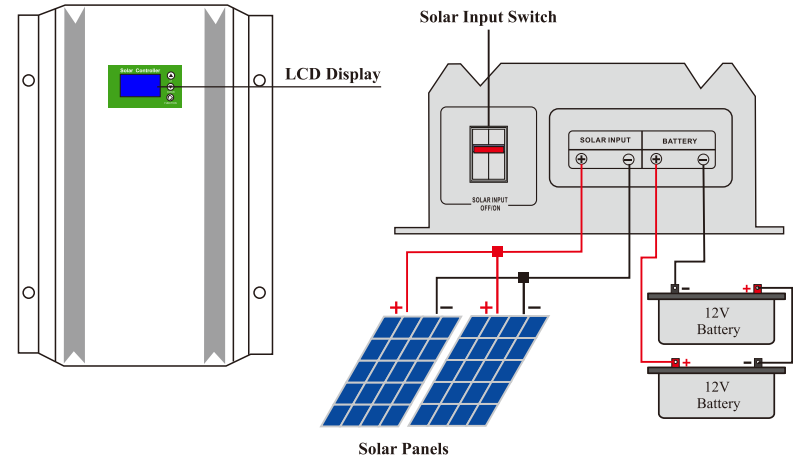
#### Note:

- ✧ Connect battery first, then PV solar panels. Pay attention to the polarity, Opposite connection is not allowed.
- ✧ Dismantle PV solar panels first, then battery.
- ✧ Each PV input current should be in accord with the technique parameter sheet strictly.

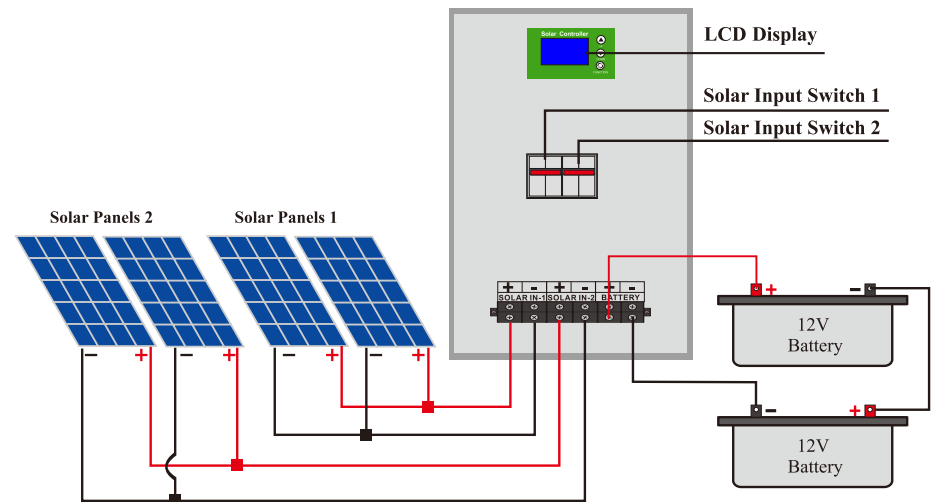
### 4. Front & Wire Diagram

(Remarks: Please refer to the technical parameter table for specific battery voltage and solar panel parameter, This diagram is only for wiring diagram. )

4-1. 50-100A controller single channel input wire diagram



4-2. 150-200A controller double channel input wire diagram



## 5. Operation

### 5-1. Display interface Description

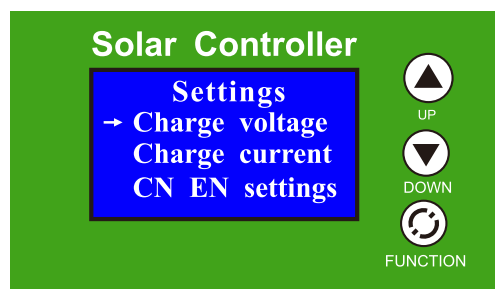
- (1) Main screen: The data of battery voltage ,solar panel voltage and current can be displayed in real time.
- (2) Parameter setting interface: Charging voltage ,charging current and language (only ENG/CHN available) can be set.
- (3) Information query interface: The equipment error, amount of power generation and other info can be checked.

### 5-2. Button Description

- (1) **UP Button:** Long press to enter or exit the parameter setting interface; press slightly to choose parameter setting and choose which digit you want to modify.
- (2) **DOWN Button:** Long press to enter the information query interface; press slightly to choose enquiry option and check other info in other pages.
- (3) **FUNCTION Button:** The button for confirmation and modify the value of parameter setting.

### 5-3. Parameter Setting Description

- (1)Long press UP button for 5s,screen will switch to “Parameter Setting Interface” from “Main Screen”, which provides 3 options: charging voltage ,charging current and language setting(only ENG/CHN available).As shown in the following picture.



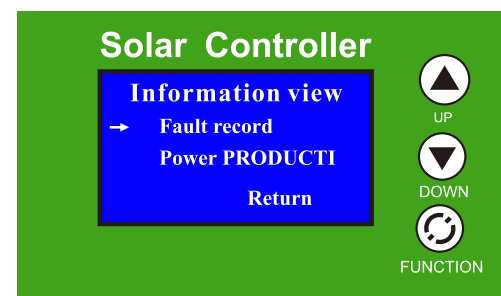
- (2) Press UP button(moving arrow) to select the relevant parameter setting, then press FUNCTION button to enter its sub-menu. When having entered, press UP button to select which digit you want to modify, then press FUNCTION button to adjust the value of parameter. At last a dialog box would show up to confirm

whether to save or not(Y/N) then return to the “Parameter Setting Interface” after your choice. If you want to return to “Main Screen” , long press UP button for 5s would be available. For example, if you want to adjust charging voltage setting, you can press UP button to move the arrow. When the arrow points to “Charging Voltage Setting”, press FUNCTION button to confirm and enter its sub-menu.After entering, press UP button to select the digit and press FUNCTION button to modify a specific value. Then you can choose save or not to return “Parameter Setting Interface” and long press UP button for 5s to the “Main Screen”, it is the same operation as the other parameter settings.

**Note: DOWN button is unavailable in the parameter setting interface, only UP and FUNCTION button available.**

### 5-4. Information Query Interface

- (1)Long press UP button for 5s,screen will switch to “Information Query Interface” from “Main Screen”, which provides 2 options: Fault Information Inquiry and Power Generation Information Inquiry. As shown in the following picture.



- (2) Press DOWN button to select relevant information enquiry option, then press FUNCTION button to enter its sub-menu and press DOWN button to look for the info you want then The system would automatically return to “Information Query Interface”. After select the EXIT option ,it would return to the “Main Screen”.

**Note: DOWN button is unavailable in the information enquiry interface, only UP and FUNCTION button available.**

## 6. Technical Specification

|  |  |        |             |        |                   |                                   |                                    |
|--|--|--------|-------------|--------|-------------------|-----------------------------------|------------------------------------|
| Model : KY1  | 5096/192   | 10096  | 50384       | 80120  | 100192/384        | 15096/192/384                     | 20096/192/384                      |
| Rated Current  | 50A  | 100A   | 50A         | 80A    | 100A              | 150A                              | 200A                               |
| Rated System Voltage                                     | 96V/192V   | 96V    | 384V        | 120V   | 192V/384V         | 96V/192V/384V                     |                                    |
| PV Input Voltage Range                                   | 96V System: 120V-176V; 120V System: 150V-220V; 192V System: 240V-352V; 384V System: 480V-704V          |        |             |        |                   |                                   |                                    |
| Max PV Input Voltage(Voc)<br>(At the lowest temperature) | 96V System: 200V; 120V System: 250V; 192V System: 400V; 384V System: 750V                              |        |             |        |                   |                                   |                                    |
| PV Array Input Number                                    | 1  |        |             |        |                   | 2                                 |                                    |
| PV Array Maximum Power                                   | 5.6KW/<br>11.2KW   | 11.2KW | 22.4KW      | 11.2KW | 22.4KW/<br>44.8KW | 8.4KW*2/<br>16.8KW*2/<br>33.6KW*2 | 11.2KW*2/<br>22.4KW*2/<br>44.8KW*2 |
| Battery Type   | Lead acid battery, deep cycle battery, gel battery etc(Battery type base on user charge specification) |        |             |        |                   |                                   |                                    |
| Floating Voltage   | 13.8V Single battery   |        |             |        |                   |                                   |                                    |
| Charge Voltage   | 14.2V Single battery   |        |             |        |                   |                                   |                                    |
| Charging Protection Voltage                              | 15V Single battery   |        |             |        |                   |                                   |                                    |
| Temperature Compensation Coefficient                     | -3mV / °C / 2V (25°C is base line) (Optional)  |        |             |        |                   |                                   |                                    |
| Charging Mode  | PWM Pulse width control  |        |             |        |                   |                                   |                                    |
| Charging Method  | Three stages: constant current; constant voltage; floating charge                                      |        |             |        |                   |                                   |                                    |
| Conversion efficiency                                    | > 95%  |        |             |        |                   |                                   |                                    |
| Display  | LCD  |        |             |        |                   |                                   |                                    |
| Thermal method   | Cooling fan in intelligent control   |        |             |        |                   |                                   |                                    |
| Type of mechanical protection                            | IP20   |        |             |        |                   |                                   |                                    |
| Operating temperature                                    | -15°C~-+50°C   |        |             |        |                   |                                   |                                    |
| Storage temperature                                      | -20°C~-+60°C   |        |             |        |                   |                                   |                                    |
| Elevation  | < 5000m(Less solar panel when exceed 2000m)  |        |             |        |                   |                                   |                                    |
| Humidity   | 5%~95%(No condensation)  |        |             |        |                   |                                   |                                    |
| Communication  | RS485(Optional)  |        |             |        |                   |                                   |                                    |
| Machine Size (L*W*Hmm)                                   | 340*300*140  |        | 460*360*160 |        |                   | 500*330*805                       |                                    |
| Package Size (L*W*Hmm)                                   | 400*345*195  |        | 530*405*225 |        |                   | 565*395*870                       |                                    |
| N.W(kg)  | 5  | 6      | 9           | 9.5    | 10                | 32                                | 33                                 |
| G.W.(kg)   | 6  | 7      | 11          | 11.5   | 12                | 37                                | 38                                 |

**Note:** All specification is subject to change without prior notice!

## 7. Fault and solution

| Failure                          | Cause of failure  | Solution   |
|----------------------------------|---|--|
| The display screen is not bright | 1. Whether to be on screen saver.<br>2. Whether the battery connection is in contact with bad or reverse. | 1. Click the button on the screen to light up the screen.<br>2. Check whether the connection line of the battery is correct or fastening.  |
| Controller is not charged        | 1.PV switch unclosed<br>2.Low input voltage<br>3.Controller abnormal                                      | 1. Please switch on the PV input switch.<br>2. When the PV input voltage is lower than the battery voltage, it can not be charged. When the /PV voltage is restored to normal, the battery can be charged.<br>3. Please contact the supplier |
| Battery low pressure alarm       | Low voltage of battery  | Please charge the battery in time  |
| High voltage alarm               | PV high input voltage   | Test whether the actual input voltage of solar panels is too high  |
| Over-current alarm               | PV high input current   | Check whether the maximum working current of the solar panel exceeds the rated current of the controller.  |
| Over-temperature alarm           | The internal temperature of the controller is too high  | 1.The controller will stop charging, restart the charge when the internal temperature drops to a certain temperature.<br>2. Minimize the ambient temperature.  |
| Temperature sensor failure       | 1. temperature sensor with bad contact<br>2. temperature sensor failure                                   | 1. Reconnect the temperature sensor interface;<br>2. Replace the same type of temperature sensor   |

# Warranty Card

Customer Name: \_\_\_\_\_ Tel.: \_\_\_\_\_

Address: \_\_\_\_\_

Brand: \_\_\_\_\_ Model: \_\_\_\_\_

Serial No.: \_\_\_\_\_ Date of Purchase: \_\_\_\_\_

Bought From: \_\_\_\_\_

Invoice Number: \_\_\_\_\_ Invoice Price: \_\_\_\_\_

## Warranty Instruction

- Please keep this warranty card as proof of maintenance.
- The warranty period is 1 year from the date of purchase.
- During the warranty period, under the condition of normal use and maintenance, if damage caused by the product's own quality, the company will provide free repair and replacement parts after verification.
- The company reserves the right to maintain and interpret all contents.

## Free maintain won't be given under the following circumstance:

- The damage caused by the manipulation that hasn't follow the requests of the manual.
- The product has been repaired, modified by technicians other than our company's, and any internal parts of the product have been replaced by users.
- The product number has been altered or product is inconsistent with the warranty card.
- Damage caused by careless use, penetration of water or other substances into the product.
- Damage caused by accident or natural disaster.

# Certificate

Name: \_\_\_\_\_

Model: \_\_\_\_\_

Inspectors: \_\_\_\_\_

Date: \_\_\_\_\_

Products have been tested qualified by standard and permitted to deliver.