INTELLIGENT SOLAR LIGHTING CONTROLLER

Characteristics

- Series controller is suitable for the street light system.

- The controller charging process has been optimized for long battery life and improved system performance. The comprehensive self-diagnostics and electronic protection functions can prevent damage from installation mistakes or system faults.

- Peak conversion efficiency of 97 %, high Tracking efficiency of 99%.

- Widely used, automatic recognize day/night.

- Unique dual timer function, enhance the flexibility of street light system. Timer function with 1-15 hours option for street light.

- Sealed, Gel and Flooded battery option.

- Adopting temperature compensation and correcting the charging and discharging parameters automatically, improving the battery lifetime.

- Electronic protection: over charging, over discharging, overload, short circuit. Reverse protection: any combination of solar module and battery, without causing damage to any component.

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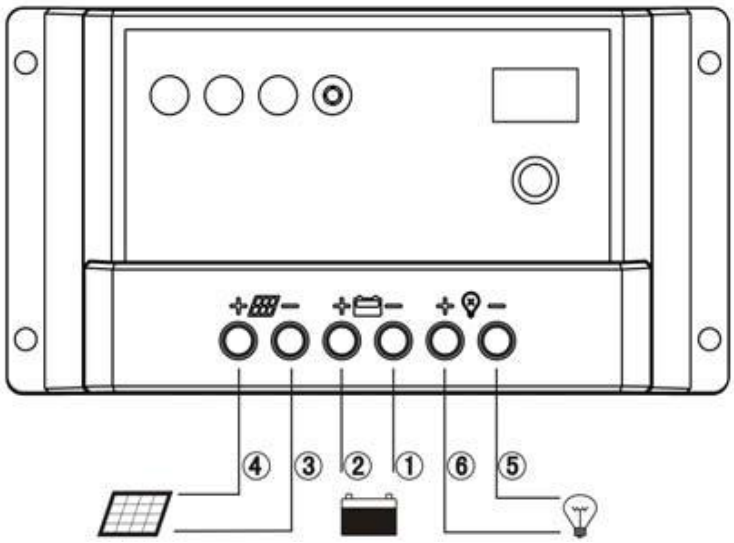
1. Tecnical Specifications

Model	12V10A	12V15A	12V20A
Rated Current	10 A	15 A	20 A
Rated Voltage	12V / 24V Auto Work		
Low voltage disconnect	11,1V / 22,2V		
Under voltage warning	12,6V / 25,2 V		
Low voltage reconnect	12,6V / 25,2 V		
Boost return voltage	11,1V / 22,2V		
Float voltage	13,8V / 27,6V		
Charging limit voltage	14,4V / 28,8 V		
High Volt Disconnect	14,6V / 29,2 V		
Self-consumption	≤ 30 mA ≤ 30 mA		
Discharge Circuit Voltage Drop	≤ 170 mV <≤ 200 mV		
Charging Mode	Modo PWM		
Temperature Compensation	-30mV / ºC / 12V		
Installation cable area	< 4 mm²	≤ 6 mm²	≤ 6 mm²
Working Temperature	-35ºC ~ +55ºC		
Storage Temperature	< 90%, sem condensação		
Humidity Requirement	140x85x45		
Dimension (mm)	(60*178)mm - θ5mm (90*178)mm - θ5mm		
Mounting Hole spacing	210		

2. INSTRUCTIONS



2.1. Mounting and Testing

This section provides a brief overview of how to get started using the controller. However, please review the entire manual to ensure best performance and years of trouble-free service.

1. Mount the controller to a vertical surface. Allow space above and below the controller for air flow.
2. Make sure the PV and load currents will not exceed the ratings of the controller being installed.
3. It is recommended that the connections be made in order from 1 to 6. (see the following picture).
4. Connect the BATTERY first. Use care that bare wires do not touch the metal case of 3
the controller.
5. Connect the SOLAR(PV array) next. The green LED indicator will light if sunlight is present.
6. Connect the LIGHT last. If the red LED indicator lights, the battery capacity is low and should be charged before completing the system installation
7. Press the BUTTON as 16 or 17 to verify the system connecting.

LIGHTING CONTROL OPTIONS

8. Press the power switch for 5 seconds, and select the desired LIGHTING CONTROL option. The LED is on, which confirmed you have selected the right one.
9. The controller requires 10 minutes of continuous transition values before it starts to work. These constraints avoid false transitions due to lightning or dark storm clouds.
10. 10 minutes off before the controller start to work.

2. INSTRUCTIONS

2.2. FUNCTIONS

2.2.1. LOAD ON TIME SETTING

Press the setting key, and the led will repeat from LOAD ON TIME SETTING, DELAY TIME SETTING and BATTERY TYPE SETTING. Press the key for 5 seconds when the led is on LOAD ON TIME SETTING, the number will flash, and choose one number as following setting until it is still.

2.2.2. DELAY TIME SETTING

Press the key for 5 seconds when the led is on DELAY TIME SETTING, the number will flash, and choose one number as following setting until it is still.

2.2.3. BATTERY TYPE SETTING:

Press the key for 5 seconds when the led is on BATTERY TYPE SETTING, the number will flash, and choose one number as following setting until it is still.

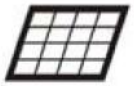
NUMBER	LOAD ON TIME SETTING
0	Dusk-to-Dawn, light is on all night
1	Light is turn on after sundown for 1 hour
2	Light is turn on after sundown for 2 hour
3	Light is turn on after sundown for 3 hour
4	Light is turn on after sundown for 4 hour
5	Light is turn on after sundown for 5 hour
6	Light is turn on after sundown for 6 hour
7	Light is turn on after sundown for 7 hour
8	Light is turn on after sundown for 8 hour
9	Light is turn on after sundown for 9 hour
0.	Light is turn on after sundown for 10 hour
1.	Light is turn on after sundown for 11 hour
2.	Light is turn on after sundown for 12 hour
3.	Light is turn on after sundown for 13 hour
4.	Light is turn on after sundown for 14 hour
5.	Light is turn on after sundown for 15 hour
6.	Lights remain turned off, ON/OFF mode
7.	Test mode, lights on after it detects no light, lights off after it detects light.

NUMBER	DELAY TIME SETTING
0	Without any delay, lamp is on after dusk.
1	Since its dusk, the lamp will be on after 10 min.
2	Since its dusk, the lamp will be on after 20 min.
3	Since its dusk, the lamp will be on after 30 min.
4	Since its dusk, the lamp will be on after 40 min.
5	Since its dusk, the lamp will be on after 50 min.
6	Since its dusk, the lamp will be on after 60 min.
7	Since its dusk, the lamp will be on after 70 min.
8	Since its dusk, the lamp will be on after 80 min.
9	Since its dusk, the lamp will be on after 90 min.

NUMBER	BATTERY TYPE SETTING
1	Seal lead acid battery
2	Flooded battery
3	Gel battery

2. INSTRUCTIONS

2.3. LED INDICATOR



GREEN ON: when solar is charging battery
GREEN BLINK: when the system over voltage

Red ON when battery level in the right range
Red slowly flashing when its over load
Red blink when the load is short-circuit

Please note

1. the output will cut off once there is over load or short circuit. Disconnect all the loads, press the power switch, or wait for another day, the controller will resume to work automatically.
2. If its on ON/OFF MODE, press the key, and erase the error, the output will be on after press it again.

2.4. TROUBLESHOOTING

2.4.1. Charging LED indicator is off when it is daytime

a. The green Charging LED should be on if its day time.
b. Check that the proper battery type has been selected.
c. Check that all wire connections in the system are correct and tight. Check the polarity(+ and -) of the connections
d. Measure the PV array open-circuit voltage and confirm it is within normal limits. If the voltage is low or zero, check the connections at the PV array itself. Disconnect the PV from the controller when working on the PV array.
e. Measure the PV voltage and the battery voltage at the controller terminals. If the voltage at the terminals is the same(within a few tenths of volts) the PV array is charging the battery. If the PV voltage is close to the open circuit voltage of the panels and the battery voltage is low, the controller is not charging the batteries and may be damaged.

2.4.2. Charging LED indicator is blinking

a. First check the operating conditions to confirm that the voltage is higher than specifications. Consider the temperature compensation of the controller's PWM setpoint. For example, at 0°C the controller will regulate at about 15.1 volts
b. Check that all wire connections in the system are correct and tight.

2.4.3. Error icon is blinking, or flashing or on red(load not operating properly)

a. Check that the load is turned on. Check that no system fuses are defective.
b. Check connections to the load, and other controller and battery connections. Make sure voltage drops in the system wires are not too high.
c. If the LED indicator is blinking and no output, check if the load is short-circuit. Disconnect the load, and press the switch button, the controller will return to work after 30 seconds.
d. If the LED indicator is flashing and no output, check if the load is over the rated power. Reduce the load, and press the switch button, the controller will return to work after 30 seconds.

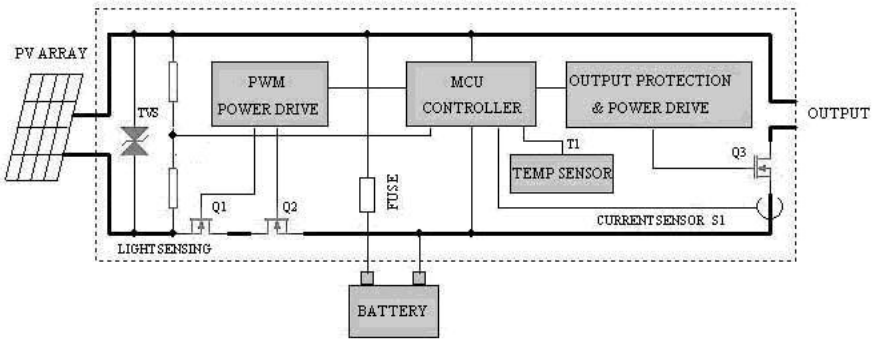
2. INSTRUCTIONS

2.5. INSPECTION AND MAINTENANCE

The following inspections and maintenance tasks are recommended at least once per year for best controller performance:

1. Confirm that the correct battery type has been selected.
2. Confirm that the current levels of the solar array and load do not exceed the controller ratings.
3. Tighten all the terminals. Inspect for loose, broken, or burnt wire connections. Be certain no loose strands of wire are touching other terminals
4. Press the TEST button(number: 0 or 9) to verify the lights are working
5. Check that the controller is securely mounted in a clean environment. Inspect for dirt, insects and corrosion.
6. Check the air flow around the controller is not blocked.
7. Protect from sun and rain. Confirm that water is not collecting under the cover
8. Check that the controller functions and LED indicators are correct for the system conditions at that time.
9. Make sure the PV array is clean and clear of debris and snow. Confirm the array is oriented correctly for the installation location.

2.6. CIRCUIT DIAGRAM



2.7. DIMENSIONS