LC POWER

USER MANUAL

LCSC-A

Intelligent Solar Charger+Built-in Timer

20120314 **VERSION 1**

Please read the instructions carefully and thoroughly before using the product. It comes with a number of outstanding features, such as:

◆ Positive grounding;

◆Automatic 12/24 V detection;

◆Waterproof:IP68, in 1.5 m water depth 72 Hours;

◆ External temperature sensor for temperature compensation of charge voltages;

◆ Improved 4 stage charging (main, boost, equalization, float) for flooded battery, 3 stage charging (main, boost, float) for sealed battery;

◆ Multi optional output mode easily meeting different demands;

◆ With electricity protection data-saving function;

◆ Perfect protections on reverse polarity (battery or solar panel), over-charge, over-discharge, over load, short circuit, TVS lightening;

◆ Imported good-quality components contributing to high reliability;

◆ Widely programmable;

Installation and connecting

Notes

◆ The solar panel voltage may exceed human body safety voltage in 24V system. So it is better to cover the solar panel and use insulating tools;

◆ No damage to controller but to load if battery reverse polarity connecting;

◆ Short circuit may damage battery permanently, one fuse between battery and controller are recommended;

◆ Please install in ventilated environment and keep the heat dissipation good, because temperature will rise when it is running.;

◆ Make sure the distance between battery and controller is short as possible;

◆ Recommended minimum wire size: 2.5mm^2 ;

- Controller has Reverse Current Protection function relay on MOSFET which detects the current direction regularly;

Installation steps

1. Be aware that the positive terminals of LCSC are connected; the electrical potential is the same. There for, only the positive pole could grounded.

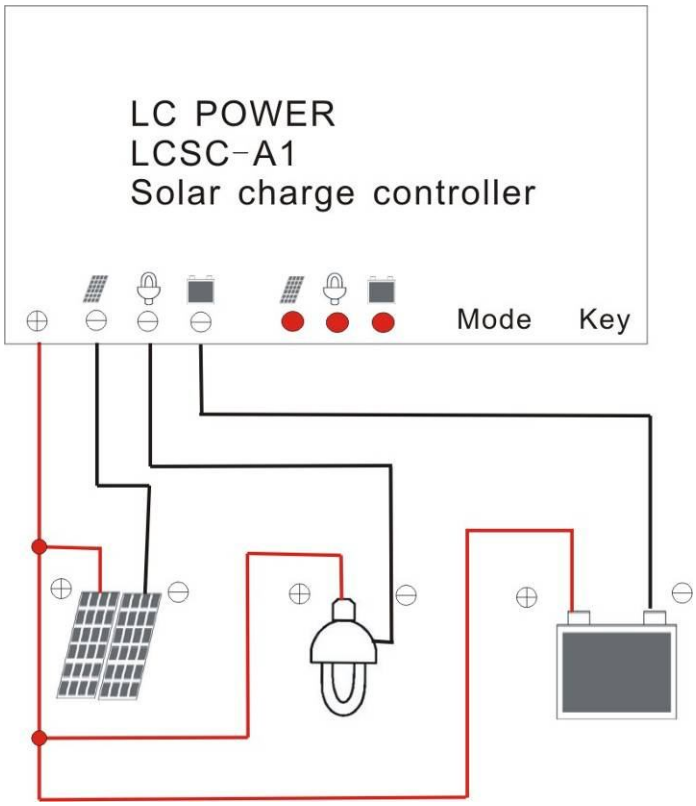
2. Please following the diagram below before wiring; at first, connect all the positive terminals of battery, solar panel, load and controller (red wire);

3. Controller starts to work after connecting the correspond negative terminals of controller and battery; System voltage will be detected and showed on the nixie tube, “1”(stand for 12V system) and “2”(stand for 24V system);

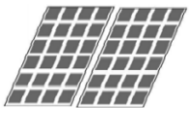
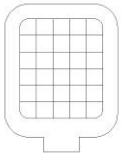
4. Connect the correspond negative terminals of solar panel and controller;

5. Connect the correspond negative terminals of controller and Load;

WIRING DIAGRAM



Display & Warning Functions

Image	Indication	Status	Description
	Battery	On	Battery working normally
		Off	No battery connected
		Slow flash	Battery undervoltage
		Quick flash	Battery overvoltage
	Solar panel	On	Daytime
		Off	Nighttime
		Slow flash	Charging
		Quick flash	Controller over temperature
	Load	On	Load on
		Off	Load off
		Slow flash	Over load protection
		Quick flash	Short circuit protection

Output Mode

The controller can automatically detect day/night through testing the open circuit voltage of the solar panel, requires no user settings and adjustments during use in different area or season.

There are 4 modes available:

1. Light control “on” and light control “off” (10);.
   Light control “on” and time control “off” (1n): Load starts working when controller detects dark and stop working as set time (the load stops working if controller detects “dawn” no matter the set ting time is achieved or not); <n stands for working time>;
   Load always “on” (15.);
2. Dawn light Mode (2): The load would be turned on automatically as requested (several hours before dawn) working time before the morning.
3. Manual mode (3): can switch output on or off manually no matter daytime or night; (30) load “off”, (31) load “on”.
4. Debug mode (⊢): used for debugging and installation;

Remark: *No matter which mode, the controller turns off the output if the battery is over voltage or over-discharge.*

Image on tens digits	Description	Image on unit digits	Description
1	Load on after dark	0	Load off before dawn
		1 ~ 4.	Load off after 1-14 hours
	Load	5.	Always on
2	Load on befor dawn	0 ~ 4.	working time (0-14h)
3	Manual mode	0 ~ 1	0 load off 1 load on
t	Debug mode		

Remark: *the dot behind units digit on nixie tube stands for plus 10; eg. 3 stand for3, 3. Stands for 13*

Keys and setting

Short Pressing: press key within 2 seconds

2 sec. pressing: press key within 2 to 4 seconds

4 sec. pressing: press key over 4 seconds

Brows mode:（ nixie tube turns off or on (except t pattern) ）, 2 sec. pressing and enter setting mode (nixie tube flash). Short pressing once, number on nixie tube change one time. User press 2 to 4 seconds or wait for 5 seconds when expect figure appeared and then nixie tube stop flashing, enter brows mode. Setting is done.

Brows mode:（ nixie tube turns off or on (except t pattern ）, 4 sec. pressing and enter debug mode (nixie tube displays t). After 4 sec. pressing or wait for 3 minutes, automatically exits debug mode and recover to brows mode.

SPECIFICATIONS

Model	**LCSC-A1**	**LCSC-A2**
System voltage	12/24V auto recognition	
Max. charge/load current	10A	20A
Float Charge	13.8V/27.6V (25℃)	
Main Charge	14.4/28.8V (25℃)	
Boost charge	14.4/28.8V (25℃), Activation: battery voltage＜12V/24V	
Deep discharge protection: Cut-off voltage	11V/22V	
Deep discharge protection: Reconnect voltage	12V/24V	
Overvoltage protection	16V/32V	
Max. panel voltage	55V	
Temperature compensation	(-4mA/℃.2V)	
Max. own consumption	5 ~ 10mA	
Night/day detection delay time	3 Min.	
Overload and short-circuit protection	Overload: ⩾1.2 times rated current and last 20 seconds: ⩾1.5 times rated current and last 3 seconds; Short-circuit: ⩾2.5 times rated current	
Grounding	Positive grounding possible	
Ambient temperature	(-40 ~ +55℃)	
Max. altitude	4,000m above sea level	
Dimmensions (LXWXH)	82X59X20	82x100x20
Weight	140g	300g
Wire cross section	2.5mm²	
Protection level	IP67 (1.5m, 72h)	

1.2 times of rated current at least 20 seconds, grounding: positive grounding

Remark: *1. The parameters before or after the slash are correspond 12V or 24V systems respectively.*

2. only solar panel or load can full load running if environment temperature is over 55℃.

Common Problems & Solutions

Phenomenon	Problem	Solution
Battery indicator off	Battery working problem	Make sure the wiring between controller and battery is correct.
Battery indicator slowly flash, without output	Battery under over discharge protection	Charge to recover voltage
Batteryindicator quickly flash, without output	Battery under over voltage protection	Cut off output for protecting load, auto working after recovering voltage
Solar indicator “off” in daytime	Solar panel wiring problem	Make sure the wiring between controller and solar panel is correct.
Solar indicator “on” in nighttime, without load output	System cannot detect night	System detects “night” when solar voltage drops Less than 7V; Solar indicator be “off” and with load output; make sure solar panel not shone by light if no output 3 min. later
Solar indicator quick flash	No charging	Over temperature, solar charging “off”; System auto recovered when temperature return to normality.
Load indicator slow flash, no output	Under over load protection	Make sure the load power less than rated power of controller, press the button once to recover.
Load indicator quick flash, no output	Under short circuit protection	Remove the short circuit load, press the button once or wait to the next day (auto recover).
others	-	Check the wiring

SUBJECT TO CHANGE WITHOUT NOTICE
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MADE IN CHINA
SHENZHEN LC POWER CO., LTD
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