PV System Generation Station

Excellent Solar Charge Controller

SPECIFICATION

Version: V5.0

Thank you very much for selecting our product!
This manual offers important information and suggestions with respect to installation, use and troubleshooting, etc. Please read this manual carefully before using the product and pay attention to the safety recommendations in it.

CONTENTS

1. Important Safety Information

WARNING:

1. If your battery voltage is lower than 80% of normal power volume, connect to controller is prohibited! Controller would be damaged much possibly caused by this occurrence.
2. Solar panel groups open circuit voltage (**Voc**) do not higher than rated battery bank voltage 1.8times. (suggest be 1.5times)
3. Solar panel groups operation voltage (**Vmp**) do not higher than rated battery bank voltage 1.5times. (suggest be 1.2times)

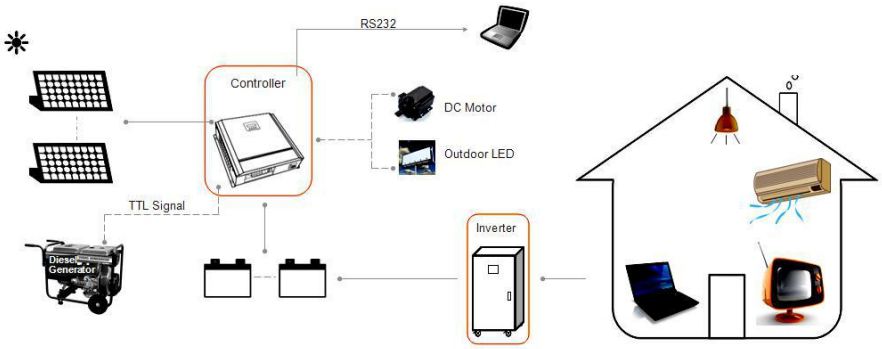
2. General Safety Information

- Read all of the instructions and cautions in the manual before beginning installation.
- There are no user serviceable parts inside the controller. Do not disassemble or attempt to repair the controller.
- Disconnect the solar module and fuse/breaker near to battery before installing or adjusting the controller.
- Install external fuses/breakers as required.
- Prevent any liquid from spattering on controller. Do not clean the controller with wet cloth.
- Confirm that power connections are tightened to avoid excessive heating from loose connection.
- Keep controller away from electrical heater, warmer and avoid controller under sunlight.
- Keep children away from controller !

3. General Description

The solar charge controller is the intelligent device with integration of controlling . It has good running performance with LCD display and convenient operation. Also have multi protection functions such as over-charge, over-discharge protection, and pole-confusion protection for storage battery. The controller is adopted PWM charging mode. It has day and night two type working mode with high reliable and safe operation, high efficiency, long service life functions.

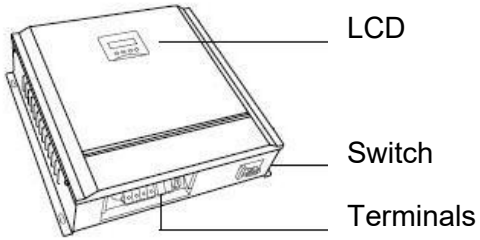
topology diagram



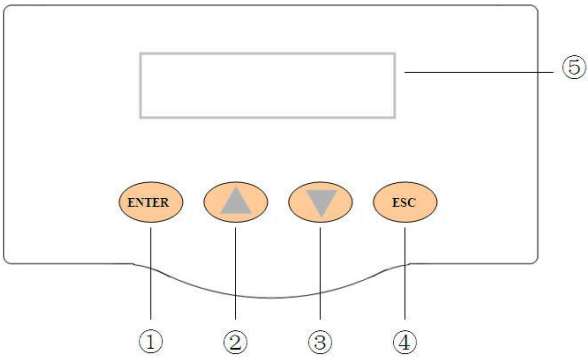
4. Performance Feature

- Control using common positive polarity way, double lines for solar array.
- Digital design, module structure, high stability and reliability.
- LCD equipped (backlighting) to show parameters of system running status.
- High efficiency with by PWM charging method.
- Anti-reverse connection, no charging reversely while night. And Over-charge, limited charging current &voltage protections for battery.
- User can adjust setting of system parameters as over-charge voltage, recovery charging voltage, and time delay, etc.
- With alarm function in system abnormal status.
- Equipped with data communication function (optional)
- Day and night double process mode.
- Wall mounting type is easy for installation.

5. Outline of Device



6. LCD showing illumination



①---"Enter" key to process setting condition or save modification of parameters.

②--- ▲ key is using to browse status data of system and set value of parameters for increasing.

③--- ▼ key is using to browse status data of system and set value of parameters for reducing.

④--- "Esc" key for existing system without save setting.

⑤---LCD with green backlight to display battery voltage(V) and charging current(A)， bottom of line is showing will show"STATE: Normal" while battery be normal, if battery at high volume will showing 'STATE: OVER VOLTS', if battery is under level will show 'STATE: LOW VOLTAGE'. And battery power volume with percent.

7. Installation Guide

7.1 General Installation Notes

- Be very careful when working with batteries. Wear eye protection. Have fresh water available to wash and clean any contact with battery acid.
- Uses insulated tools and avoid placing metal objects near the batteries.
- Explosive battery gasses may be present during charging .Be certain there is sufficient ventilation to release the gasses.
- Avoid direct sunlight and do not install in locations where water can enter the controller.
- Loose power connections and /or corroded wires may result in resistive connections that melt wire insulation, burn surrounding materials, or even cause fire. Ensure tight connections and use cable clamps to secure cables and prevent them from swaying in mobile applications.

- Use with Gel, Sealed or Flooded batteries only.
- Battery connection may be wired to one battery or a bank of batteries. The following instructions refer to a singular battery, but it is implied that the battery connection can be made to either one battery or a group of batteries in a battery bank.
- Select the system cables according to 3A/mm² current density.

7.2 Controller Mounting

NOTE:
When mounting the controller, ensure free air through the controller heat sink fins. There should be at least 150mm of clearance above and below the controller to allow for cooling. If mounted in an enclosure, ventilation is highly recommended.

Step 1: Choose Mounting Location
Locate the controller on a vertical surface protected from direct sun, high temperature, and water.

Step 2: Check for Clearance
Place the controller in the location where it will be mounted. Verify that there is sufficient room to run wires and that there is sufficient room above and below the controller for air flow

Step 3: Mark Holes
Use a pencil or pen to mark the four (4) mounting hole locations on the mounting surface.

Step 4: Drill Holes
Remove the controller and drill four sizeable holes in the marked locations.

Step 5: Secure Controller
Place the controller on the surface and align the mounting holes with the drilled holes in step 4. Secure the controller in place using the mounting screws.

7.3 System Wiring

CAUTION:

1. Please make sure connection is according to following sequence for safety during installation.
2. For mobile applications, be sure to secure all wiring. Use cable clamps to prevent cables from swaying when the vehicle is in motion. Unsecured cables create loose and resistive connections which may lead to excessive heating and/or fire.

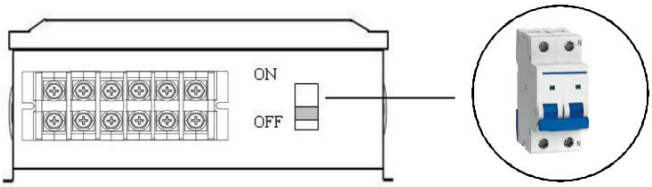
Step 1: Battery Wiring

WARNING:

1.Reverse connection of positive (＋) and negative (－) is prohibited !

2.Never short circuit battery positive (＋) and negative (－) or cables

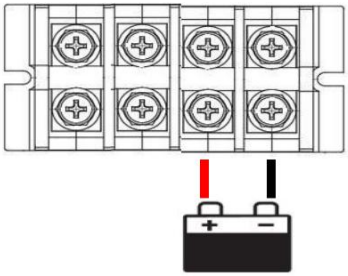
1． Make sure switch is at ‘OFF’ situation.



2． Take off protection panel which on rear of device side.

NO. 1	NO. 2	NO. 3	NO. 4
PV ＋	PV －	BATT.＋	BATT.－

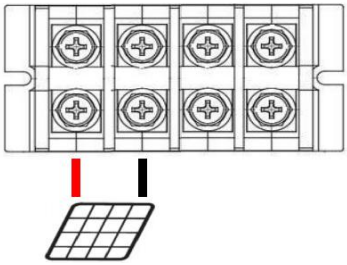
3． Connect battery wires to controller **NO.3** red terminal and **NO.4** black terminal accordingly.



Step 2: Solar Module Wiring

CAUTION:

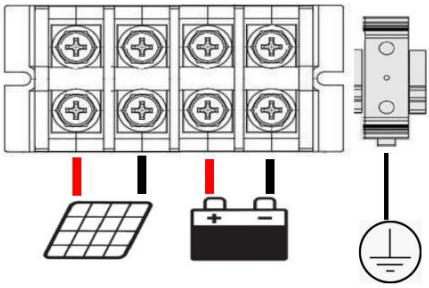
- If you can not confirm the scientific and rational PV module series and parallel way, please contact the manufacturer of controller.
- The controller can be applied to the single crystal silicon, polycrystalline silicon, thin-film photo voltaic group.



Connect solar panels to controller **NO.1** & **NO.2** terminals accordingly.

Step 3: Confirmation for Wiring

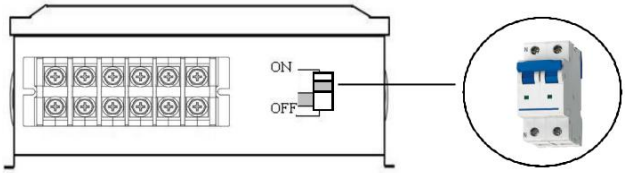
Double-check the wiring in step1 through 2. Confirm correct polarity at each connection. Verify that all six terminals are tightened.



Step 4: Controller power-up

1. Turn-on battery firstly.
2. Push the switch to "ON" position which be on rear of device.
3. Turn-on controller.

Controller will start to work normally. LCD is showing "system initial, Please wait…" last approximate 3seconds. Then battery voltage and charging current data would be showing on LCD.



Step 5: PV arrays power-up

Please power on your PV arrays aim to process system operation, and pay attention on charging current, battery voltage whether be normal as well.

CAUTION

if you would take down system as need, must be comply with following sequence.

1. Remove PV arrays wiring from controller firstly!
2. Turn-off controller by switch rear of device.
3. Remove batteries bank wiring from controller lastly.

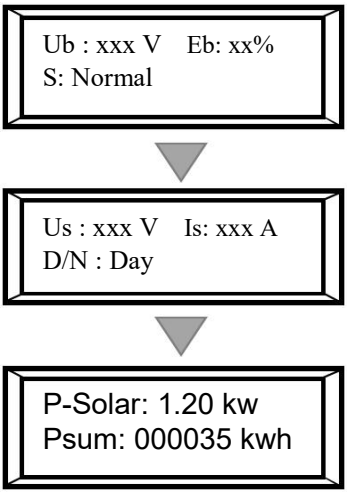
8. LCD Browsing Instructions

LCD backlight is on after pressing any key. The backlight will last 15 seconds ,then would be power-off if you stop press any key long time.

8.1 Description of Key-Press:

▲key: In browsing window, press this key to back previous page content of LCD showing.

▼key: In browsing window, press this key to look next page content of LCD showing



Ub: it's meaning voltage of batteries bank. The follow up "Ub" has the same meaning, no longer describe.

Eb: it's meaning power volume of battery by percent format

S: "Normal" is meaning battery in normal condition. While battery voltage rise up to float charging point, it would be showing "Float".

Us: mean solar panel voltage

Is: charging current from solar panel to battery.

D/N: will show 'Day' or 'Night' actually

P-solar.: real-time power from PV

Psum: cumulative power of PV

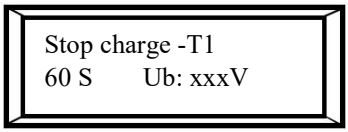
8.2 Abnormal status of batteries LCD show message automatically

Note:

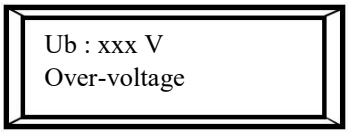
You could not browse screen showing as such so abnormal status. Screen will display back to browsing status while battery voltage is normal.

8.2.1 Battery voltage is in the status of over-charge

Once voltage of battery rise up to over-charge point with setting, the controller will start to execute timer. The timer value will be blinking.

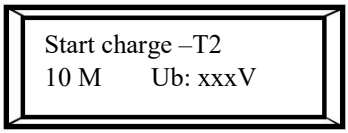


While time delay was end, controller will cut-off charging immediately. Screen will showing immediately as following



8.2.2 Battery voltage is in the status of over-charge recovery

When battery voltage was down to recovery-charge voltage, controller will start to time for charging. The timer value will be blinking.

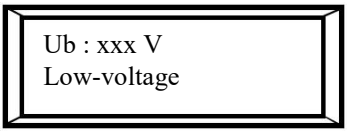


While time delay was end, the controller will restart to charge

immediately. And LCD would show back to first browsing page content accordingly.

8.2.3 Battery voltage is in the status of over-discharge

If battery voltage was down to over-discharge voltage point, the screen would be showing as following.

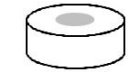


When battery voltage was rise up to normal value, screen would show back to first browsing page content accordingly.

9. Buzzer alarm instructions

9.1 When the battery over-voltage, buzzer will intermittent sound, as a reminder of the battery current state.

9.2 The buzzer will stop the alarm when the battery voltage drops to over charge recovery point.



Tips

If you think the sound of the buzzer is interference, you could press be the key to forcibly stop the current sound alarm. The method of operation is Press any two adjacent keys for 3 seconds.

10. System setting Instructions

CAUSION

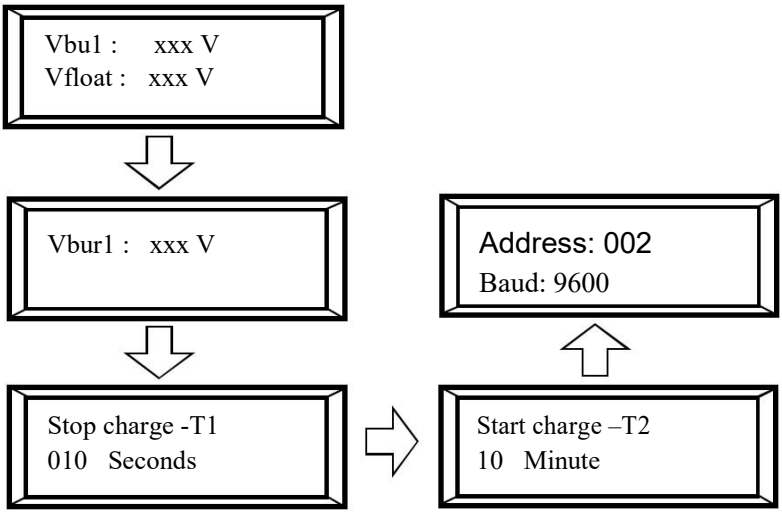
1. Make sure no solar panels connected before the setting ！
2. System parameters must be operated by professional or technical person. It's prohibited to modify by the Non-professional user.
3. Make sure to turn-off controller after complete the setting. Restart the controller after 10 seconds, to ensure that the modified parameter settings are valid.

"ENTER" key：symbolizes set or confirm: press this key to access setting window. In setting window, press this key to choice each parameter and go

to next page.

"Esc" key: cancel or manual switch. In setting window, press this key to return to browsing window and do not save the modified parameters.

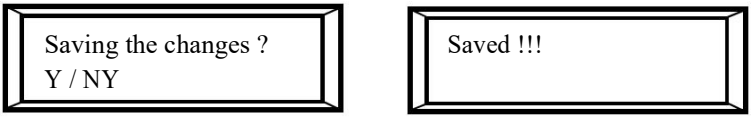
▲key and ▼key to adjust the value



* Vbu1：Battery over-charge voltage
* Vfloat：float charge voltage point of battery
* Vbur1：Battery over- charge recovery voltage
* Stop charge-T1 : Time delay duration for cutting-off charge while battery voltage is over
* Start charge –T2 : Time delay duration for starting charge while battery voltage was recovery charge

*BAUT and ADDRESS, These two values are setting just for data communication function of RS485. Please ignore following content if you bought no this function.

NOTE: Adjustement need to comply : Vbul＞Vfloat＞Vbur1!



If you have selected 'Y' and press 'Enter' key, controller will save value which you have modified. If you have selected 'N', controller wouldn't save what your adjustment.

Then approximate 3seconds later, screen will back to show first page of browsing window content.

11. Troubleshooting

Trouble phenomenon	Reason	Solution
The first installation of the controller, not working	The battery voltage is too low Battery reverse wiring	1.Replace the battery before charging or charge by using other methods 2.Please adjust to proper connection
When direct sunlight the photovoltaic module, the controller is not charging	1. Solar panels wiring incorrectly and being circuit open 2.Battery in situation of overcharge point, need down to the resume charging point	1.Please check if the wiring and make sure connection of terminals rightly and reliability. 2.Please use the inverter to discharge
The charging current is small	1. light intensity is not strong 2.The battery is near saturation, in floating state	1.Observed when the sun is strong 2.Normal

12. Maintenance

The following inspections and maintenance tasks are recommended at least two times per year for best controller performance.

- Check that the controller is securely mounted in a clean and dry environment.
- Check that the air flow and ventilation around the controller is not blocked. Clear all dirt or fragments on the heat sink.
- Check all the naked wires to make sure insulation is not damaged for serious solarization, frictional wear, dryness, insects or rats etc. Maintain or replace the wires if necessary.
- Tighten all the terminals. Inspect for loose, broken, or burnt wire connections.
- Check and confirm that LCD displayer is consistent with required. Pay

attention to any troubleshooting or error indication. Take necessary corrective action.

- Confirm that all the system components are ground connected tightly and correctly.
- Confirm that all the terminals have no corrosion, insulation damaged, high temperature or burnt/discolored sign, tighten terminal screws to the suggested torque.
- Check and confirm that lighting arrester is in good condition. Replace a new one in time to avoid damaging of the controller and even other equipments.

13. Usage Environment

1. Let the machine work in the dry, clean and well ventilated environment.
2. Keep away from the point-blank, humid or acid environment.
3. Avoid from dust when used.
4. The distance should be above 0.5m between the machine and the battery .
5. It is not allow to use it in the flammable and easy blast environment, be care of blaze and scintilla.
6. Environment temperature: -25^0C ~ $+50^0$C.
7. The max humidity is under 85%. （25℃±5℃）。

14. Warranty

The charge controller is warranted to be free from defects for a period of ONE (1) years from the date of shipment to the original end user. We will, at its option, repair or replace any such defective products.

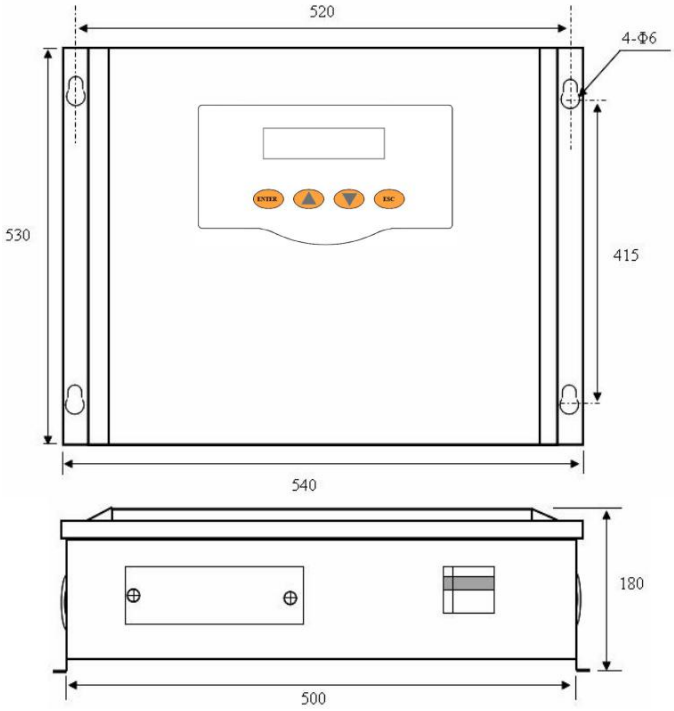
- This warranty does not apply under the following conditions:

1. Damage by accident, negligence, abuse or improper use.
2. PV or load current exceeding the rating of product.
3. Unauthorized product modification attempted repair.
4. Damage occurring during shipment.
5. Damage results from acts of nature such as lightning, weather extremes.
6. Irreclaimable mechanical damage.

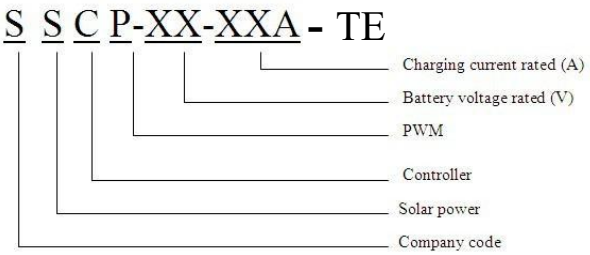
15. Declare

The product has applied for patent protection, counterfeiting will be subject to legal sanctions. Our Company reserves the right to change products and without notice when products update.

16. Dimension (mm)



17. Model Description



18. part of tech-parameters

Model	**SSCP - 96 - 300 A - TE**	
Rated PV power watts [KW]	20KW	
Rated charging current [A]	300A	
VOC of PV arrays Max. [V]	≤300V	
Rated battery bank voltage [V]	96V	
Over-charge voltage of batteries [V]	120V (default)	adjustable
Over-charge recovery voltage [V]	108(default)	adjustable
Battery float charging voltage [V]	112(default)	adjustable
Time delay to cut-off charge	60 seconds (default)	adjustable
Time delay to charge recovery	10 minutes (default)	adjustable
Self-consumption (day) [mA]	≤50 (backlight off)	
Self-consumption (night) [mA]	≤30 (backlight off)	
Ambient temperature	-25℃ ～ +50℃	
Humidity	85%. NC（25℃±5℃）	
Altitude [m]	≤2000 (without power derating)	
Protection class	IP20	
Data-transfer port	RS232 or RS485	
Net weight	15.2 KG	

19. Accessories for data communication (Option)

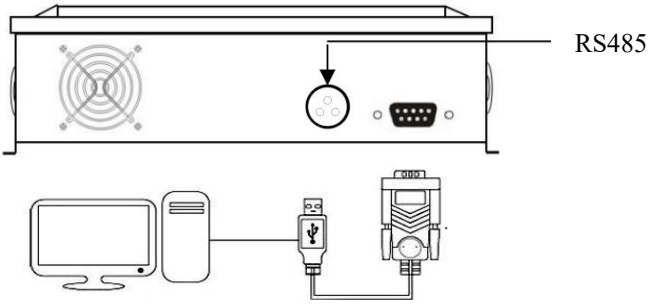
Tips:

- If the device you purchased no requirement of data transfer communication function, please ignore this instructions .
- The controller communication functions should be informed before buying or noted in orders, we will be factory configured.
- If you choose RS232 transfer type, we will provide cable RS232 to USB type by default. For other types of data lines, please note before buying.
- Default transfer type is RS485 port.

19.1 Equipment Communication serial are RS485 and RS232 ports. Serial ports were installed at the top of the controller.

19.2 Please remove the random with data lines and connected to the computer. Make sure the controller is in shutdown state before connecting .

19.3 As to the using of monitoring functions, please refer to the user manual of monitoring software.



Computer RS232-USB