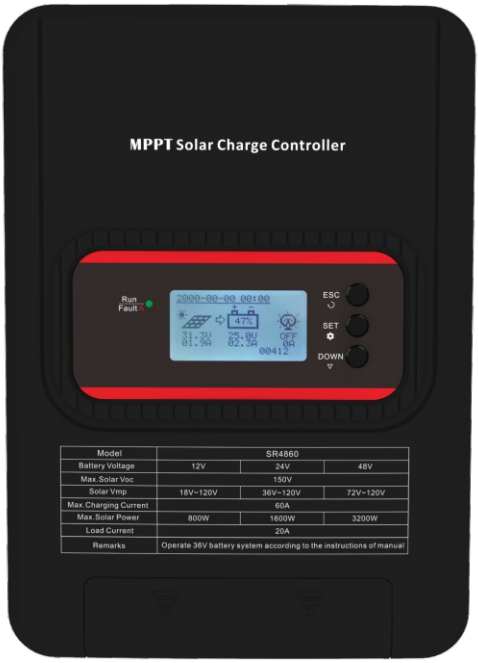
Solar charge controller
User's Manual



Model	SR4860		
Battery Voltage	12V	24V	48V
Max.Solar Voc	150V		
Solar Vmp	18V~120V	36V~120V	72V~120V
Max.Charging Current	60A		
Max.Solar Power	800W	1600W	3200W
Load Current	20A		
Remarks	Operate 36V battery system according to the instructions of manual		

Contents

1. **Thanks** 1
2. **About This Manual** 1
   - 2.1 Validity 1
   - 2.2 Purpose 1
   - 2.3 Scope 1
   - 2.4 Audience 1
3. **Important Safety Massage** 2
   - 3.1 Save these instructions 2
   - 3.2 General 2
   - 3.3 Symbol Explain 4
   - 3.4 Abbreviations and Acronyms 4
4. **Product description** 5
   - 4.1 General description 5
   - 4.2 Features 5
   - 4.3 Product description 6
   - 4.4 Introduction to Maximum Power Tracking Technology 7
   - 4.5 Introduction to charging phase 8
5. **Installation Instructions** 9
   - 5.1 Pre-Installation 9
   - 5.2 Installation location 9
   - 5.3 Mounting the Solar charger controller 10
6. **Electrical connection** 11
   - 6.1 Wire Size 11
   - 6.2 DC terminal connector locations 12
   - 6.3 PV Charge And Load Control Mode Wiring 13
   - 6.4 Grounding 14
7. **Operation Instructions** 15
   - 7.1 Key define 15
   - 7.2 Browse display message 15
8. **Configuring the Solar charge controller** 16
   - 8.1 Display message description 16
   - 8.2 Parameter setting operation 16
   - 8.3 Parameter setting description 17
   - 8.4 Time Parameter Settings 19
9. **Communications connection** 20
10. **Start-Up and shut down the Solar charge controller** 21
    - 10.1 Start-Up the the Solar charge controller 21
    - 10.2 Turn-off the Solar charge controller 21
11. **Maintenance and Cleaning** 21
    - 11.1 Checking Heat Dissipation 21
    - 11.2 Cleaning the solar charge controller 21
    - 11.3 Checking the DC Disconnect 21
12. **Trouble shooting** 22
    - 12.1 Errors(E) 22
13. **Manufacturer Warranty** 24
    - 13.1 Warranted products 24
    - 13.2 Limited Product Warranty 24
    - 13.3 Liability 25
    - 13.4 Warranty conditions 25
14. **Decommissioning** 26
    - 14.1 Dismantling the solar charge controller 26
    - 14.2 Packing the solar charge controller 26
    - 14.3 Storing the solar charge controller 26
    - 14.4 Disposing of the solar charge controller 26
15. **Technical Data** 27
16. **PV-Battery system installation reference** 30
17. **Annex** 31

1. Thanks

Thank you very much for selecting our product!choosing our and congratulations on your choosing new high-performance our product. this manual will help you get to know your new product. when you choose our solar charge controller, you option for reliable and high-performance technology.

2. About This Manual

2.1 Validity

This manual describes the assembly, installation, commissioning and maintenance of the following solar charge controller model:

SR4810 SR4820 SR4830 SR4840 SR4850 SR4860 SR4880

This manual does not cover any details concerning equipment connected to the sales (e.g. PV modules). Information concerning the connected equipment is available from the manufacturer of the equipment.

2.2 Purpose

The purpose of this manual is to provide explanations and procedures for installing, operating, maintaining, and troubleshooting the Solar charge controller.

2.3 Scope

This manual provides safety guidelines, detailed planning and setup information, procedures for installing the Solar charge controller, as well as information about operating and troubleshooting the unit. It does not provide details about particular brands of batteries. You need to consult individual battery manufacturers for this information.

2.4 Audience

This manual is intended for anyone who needs to install and operate the Solar charge controller. Installers should be certified technicians or electricians.

3. Important Safety Massage

3.1 Save these instructions

This manual contains important instructions for Solar charge controller that shall be followed during installation and maintenance.

3.2 General

3.2.1. Refer installation and servicing to qualified service personnel. Incorrect installation or use may result in risk of fire. No user serviceable parts in this unit.

3.2.2. Remove all sources of power, photovoltaic and battery before servicing or installing.

3.2.3. Warning – risk of explosive gases

- When Solar charge controller is working, Please DO NOT touch it because the temperature is too high.
- Working in the vicinity of lead-acid batteries is dangerous. Batteries produce explosive gasses during normal battery operation.
- To reduce risk of battery explosion, follow these instructions and those published by battery manufacturer and manufacturer of any equipment you intend to use in vicinity of battery.

3.2.4. Personal precautions

- Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
- Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes.
- Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
- If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.
- NEVER smoke or allow a spark or flame in vicinity of battery.
- Be extra cautious to reduce risk of dropping metal tool onto battery. It might spark or short circuit battery or other electrical part that may cause explosion.
- Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short circuit current high enough to weld a ring or the like to metal, causing a severe burn.

3.2.5. Preparing to charge

- Never charge a frozen battery.
- Be sure battery is mounted in a well-ventilated compartment.
- Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. This helps purge excessive gas from the cells. Do not overfill. For a battery without cell caps, carefully follow manufacturers charging instructions.

3.2.6. Charger location & installation

- Controller employs components that tend to produce arcs or sparks. NEVER install in battery

compartment or in the presence of explosive gases.

- Protect all wiring from physical damage, vibration and excessive heat.
- Insure that the controller is properly setup for the battery being charged.
- Do not expose controller to rain or snow.
- Insure all terminating connections are clean and tight to prevent arcing and overheating.
- Charging system must be properly installed as described in these instructions prior to operation.
- Do not connect input to DC source directly with load, Solar charger controller need to be powered by solar panel.
- Do not short-circuit DC output port, it will damage Solar charger controller.

3.3 Symbol Explain

Symbol	Explanation
	Electrical voltage!
	Risk of burns
	Operation after 10 minutes
	Point of connection for grounding protection
	Direct Current (DC)
	The Solar charge controller has no transformer isolation.
	Read the manual
	CE mark. The Solar charge controller. complies with the requirements of the applicable CE guidelines.
	The Solar charge controller must not be disposed of with the household waste.

3.4 Abbreviations and Acronyms

Abbreviations	Full name
BTS	Battery Temperature Sensor
DC	Direct Current
LED	Light Emitting Diode
LVD	Low Voltage Disconnect
LVR	Low Voltage Reconnect
B.SELECT	Battery type selector
BAT	Battery
CHG.MODE	Charge mode
PV	Photovoltaic
MPPT	Maximum Power Point Tracking
PWM	Pulse Width Modulation

4. Product description

4.1 General description

This product can detect the power generation of solar panels in real time and track the highest voltage current value(VI) so that the system can charge the battery with the maximum power output. Applied to solar off-grid photovoltaic systems, coordinating the work of solar panels, batteries, and loads is the core control component of off-grid photovoltaic systems.

This product adopts liquid crystal dynamic display running state, running parameters, control parameters and so on. Users can easily access the parameters through keys and can modify the control parameters as necessary to meet different system requirements.

The controller adopts RS232 to facilitate the user to extend the view and modify the parameters of the system. At the same time, the company provides free monitoring software, which can make it easier for users to complete different remote monitoring requirements.

The internal controller has a comprehensive electronic fault self-measurement function and a powerful electronic protection function, which can avoid the damage of product components due to installation errors and system failures.

4.2 Features

- ◆ Advanced dual or multi-peak tracking technology, when the panel is shaded or some of the panel is damaged, the I-V curve will appear multiple peaks, and the controller can still accurately track the maximum power point.
- ◆ The built-in maximum power tracking algorithm can significantly improve the energy efficiency of photovoltaic system, which is about 15% and 20% higher than the traditional PWM charging efficiency.
- ◆ Combining multiple tracking algorithms, it can track accurately in a very short time. To the best working point of I-V curve.
- ◆ MPPT tracking efficiency can reach 99.9%.
- ◆ Maximum conversion efficiency of 98%.
- ◆ DC rated load current (20A)
- ◆ Wide PV input voltage range (Forbidding DC source input)
- ◆ Battery temperature detection.
- ◆ LED and LCD Display Operation Status.
- ◆ TVS Lightning protection.
- ◆ Three-stage battery charging (quick,equilibrium,and float)
- ◆ Time setting.
- ◆ Silent, pulse width modulated (PWM), high efficiency operation
- ◆ RS 232 communication.
- ◆ Natural cooling.
- ◆ Temperature compensate for battery.

- Support for Gel batteries, Sealed batteries, Flooded batteries, lithium batteries and other different types of battery .
- With a limited-current charging mode, when the battery plate power is too large and the charging current is greater than the rated current, the controller automatically reduces the charging power and makes it work at the rated charging current.
- Support capacitive load instant high current start.
- Support battery voltage automatic recognition.
- Over temperature protection.

4.3 Product description

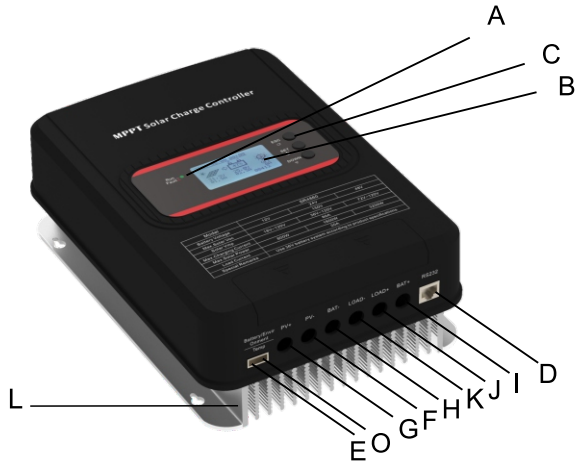


Figure 1 : The Solar charge controller Overview

Position	Description
A	LED
B	LCD
C	Function Key
D	RS232
E	Environment temperature sensor port
F	PV input negative
G	PV input positive
H	Battery negative
I	Battery positive
J	DC load positive output
K	DC load negative output
L	Safety (Earth) ground
O	Battery temperature sensor port

4.4 Introduction to Maximum Power Tracking Technology

The Maximum Power Point Tracking(MPPT) system is an advanced charging technology that allows the panel to output more electrical energy by regulating the operating state of the electrical module. Due to the non-linear characteristics of the solar array, there is an array's maximum energy output point (maximum power point) on its curve, and traditional controllers (switch charging technology and PWM charging technology) can not maintain charging the battery at this point. Therefore, the maximum energy of the panel can not be obtained, but a solar controller with MPPT control technology can track the maximum power point of the array at all times to obtain the maximum energy to charge the battery.

Take the 12V system as an example, because the peak voltage(Vpp) of the solar panel is about 17V and the battery voltage is about 12V. When the charging controller is charging, the voltage of the solar panel is about 12V, and the maximum power is not fully exerted. The MPPT controller can overcome this problem and adjust the input voltage and current of the panel from time to time to achieve the maximum input power. Compared to the traditional PWM controller, the MPPT controller can play the maximum power of the battery plate, so it can provide more charging and other charging methods to complete the charging of the battery. A complete charging process includes: fast charging, maintaining charging, and floating charging. In general, MPPT can improve the energy utilization rate by 15% to 20% compared to PWM controllers.

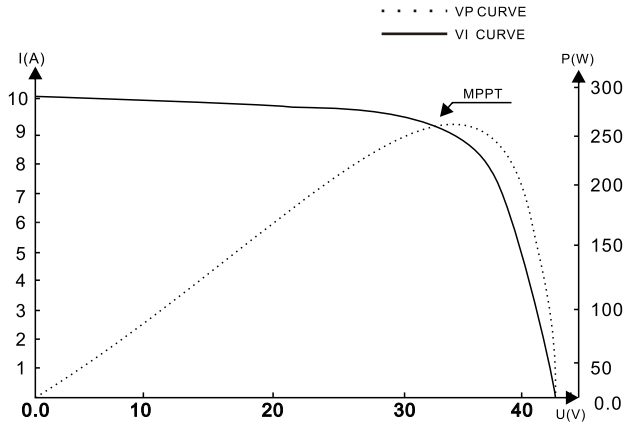


Figure2:Output Characteristic Curve of Battery Plate

At the same time, due to the different ambient temperature and light conditions, the maximum power point will often change. Our MPPT control time generator can adjust the parameters from time to time according to different conditions so that the system is always near the maximum operating point. The entire process is completely self-propelled and does not require any adjustment by the user.

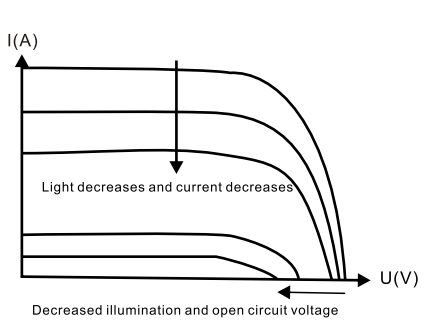


Figure3：Relation between the Output Characteristics of Battery Plate and Light

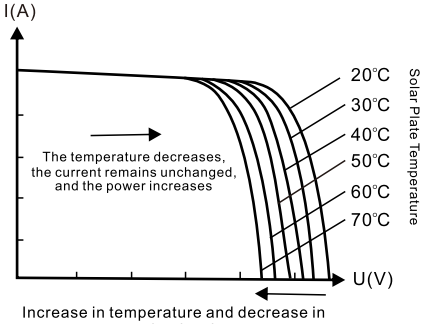


Figure4：The relationship between the output characteristics of battery panel and temperature

4.5 Introduction to charging phase

MPPT can not be used alone as a phase of charging. It is usually necessary to combine charging, charging, balanced charging and other charging methods to complete the charging of the battery. A complete charging process includes: quick charging, equilibrium charging, floating charging current, The charging curve is as follows:

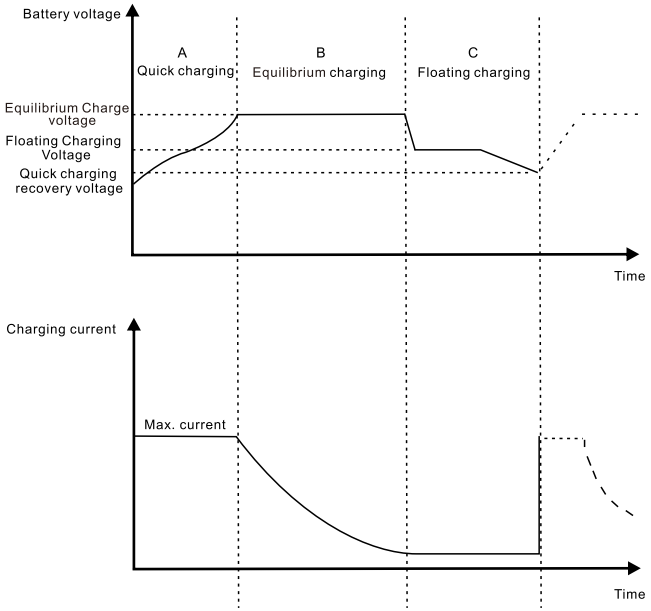


Figure5:Charging Stage Diagram of Battery

a. Quick charging

In the fast charging phase, the battery voltage has not yet reached the set value of full voltage (ie, equalized voltage), and the controller will perform MPPT charging, which will provide the maximum solar power to charge the battery. When the battery voltage reaches the default value, constant voltage charging will be performed.

b. Equilibrium Charging

When the battery voltage reaches the set value of the equilibrium voltage, the controller will charge at a constant voltage, which will not be charged by MPPT, and the charging current will gradually decrease with time.Customers can also adjust the preset value of equilibrium voltage point according to actual needs. When the preset value is reached, the system will be transferred to floating charging.

Attention:Equipment damage!

Balance can increase battery voltage to a level that may damage sensitive DC loads. It is necessary to verify that the allowable input voltage of all loads of the system is greater than the battery balanced charging setting value.

Attention: equipment damage!

Excessive charging and excessive gas release may damage the battery plate and lead to the loss of active substances on the battery plate. equilibrium charging too high or too long can cause damage. Please refer carefully to the specific requirements of the batteries used in the system.

Certain types of batteries benefit from regular balanced charging, which can agitate electrolytes, balance battery voltage and complete chemical reactions. Balanced charging increases the battery voltage so that it is higher than the standard complementary voltage and makes the battery electrolyte gasified.

c. Floating Charging

Floating charging is a balanced charging stage after which the controller will reduce the battery voltage by reducing the charging current and keep the battery voltage at the set value of floating charging voltage. In the floating charging stage, the battery is charged very slightly to ensure that the battery is kept in full state. In the floating charge stage, the load can obtain nearly all the solar energy. If the load exceeds the power provided by the solar energy, the controller will not be able to maintain the battery voltage at the floating charge stage. When the battery voltage is low enough to Quick Charging Recovery Voltage , the system will quit the floating charging stage and return to the fast charging stage.

5. Installation Instructions

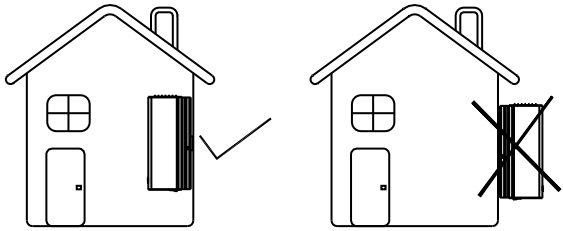
5.1 Pre-Installation

The instructions that follow are applicable to the typical installation. For special applications, consult a qualified electrician or your Certified Dealer. Installation procedures will vary according to your specific application.

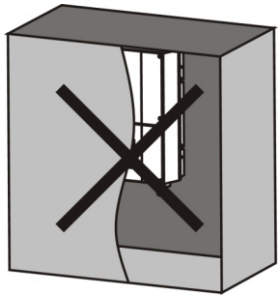
✧ **Important:** Installations should meet all local codes and standards. Installations of this equipment should only be performed by skilled personnel such as qualified electricians and Certified Renewable Energy (RE) System Installers.

5.2 Installation location

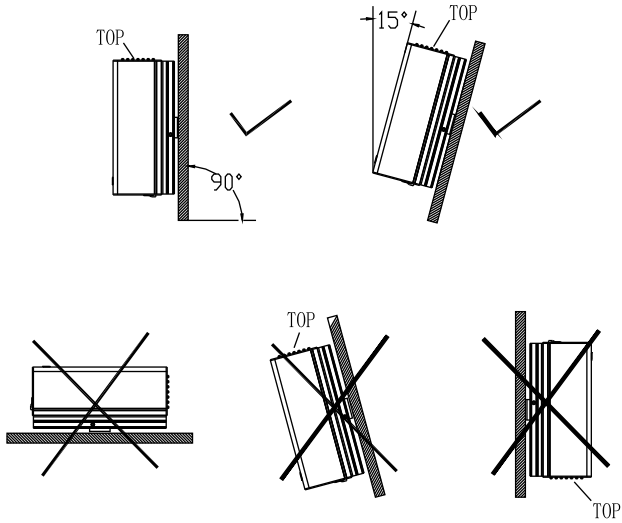
This is guidance for installer to choose a suitable installation location, to avoid potential damages to device and operators. The inverter can't install close to trunk of outdoor。The Ingress Protection rate is IP20 which means the Solar Charge Controller can be installed indoors.



Please make sure the solar charge controller installed at the right place。The the solar charge controller can not install close to trunk.



The installation location must be suitable for the inverter's weight and dimensions for a long period time. Select the installation location so that the status display can be easily viewed. Avoid installing the controller in direct sunlight, high temperature, and easy to enter the water, and ensure good ventilation around the controller. Do not install the solar charge controller on structures constructed of flammable or thermolabile materials Never install the solar charge controller in environment of little or no air flow, nor dust environment. The humidity of the installation location should be 0~95% without condensation. The installation location must be freely and safely to get at all times. Vertically installation and make sure the connection of the solar charge controller must be downwards. Never install horizontal and avoids forward and sideways tilt.



5.3 Mounting the Solar charge controller

The Solar charge controller is designed for indoor mounting. Care should be taken in selecting a location and when mounting the enclosure. Avoid mounting it in direct sunlight to prevent heating of the enclosure. Ensure it's well ventilated. The enclosure should be mounted vertically on a wall. In outdoor installations, the Solar charge controller must be installed in a rainproof enclosure to eliminate exposure to rain, mist or water-spray.

✧ Caution: Damage to Solar charge Controller, Install the Solar charge controller in a dry, protected location away from sources of high temperature, moisture, and vibration. Exposure to saltwater is particularly destructive. Corrosion is not covered by the warranty.

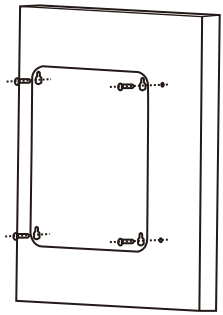
Mount the Solar charge controller step

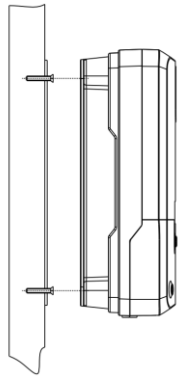
Step 1: Fixed screw

First put the installation position guide board in the right position, then use a pen to mark the installation position, drill 4 suitable size installation holes at 4 marks, and fix the screws.

Step 2: Fixed controller

Aim the fixed holes of the controller at the four screws fixed in advance and hang them to ensure the safety and reliability of the controller.





✧ **Warning:** Explosion/Corrosion Hazard and don't mount solar charger controller on the flammable wall(for example: wooden all and so on).

Do not locate the Solar charge controller in a sealed compartment with the batteries. Batteries can vent hydrogen-sulfide gas, which is corrosive to electronic equipment. Batteries also generate hydrogen and oxygen gas that can explode when exposed to a spark.

6. Electrical connection

6.1 Wire Size

Table : Suggestion Minimum wire size

Model	SR4810	SR4820	SR4830	SR4840	SR4850	SR4860	SR4880
PV connection dimensions	1*PC#10 AWG	1*PC#10 AWG	1*PC#8 AWG	2*PC#10 AWG	2*PC#8/ 1*PC#6AWG	2*PC#8/ 1*PC#6AWG	3*PC#8 AWG
Battery connection dimensions	1*PC#10 AWG	1*PC#10 AWG	1*PC#8 AWG	2*PC#10 AWG	2*PC#8/ 1*PC#6AWG	2*PC#8/ 1*PC#6AWG	3*PC#8 AWG
Load connection dimensions	1*PC#10 AWG	1*PC#10 AWG	1*PC#10 AWG	2*PC#10 AWG	1*PC#10 AWG	1*PC#10 AWG	1*PC#10 AWG

We will provide the line interface terminal free of charge.

6.2 DC terminal connector locations

Terminal connectors for DC wiring are located on the lower edge of the circuit board. Terminal Torque Requirements. Once the wires have been installed, torque the terminals as follows. Be careful not to over tighten of the power wire.

	◆ When connecting the battery and solar panels to distinguish between positive and negative attention, please pay attention to safety. ◆ PV input forbidding use DC source .

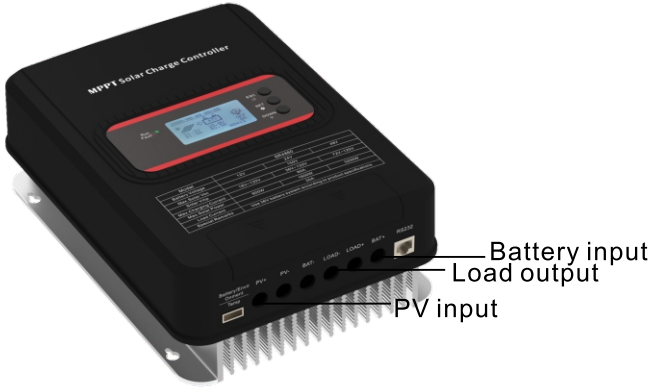
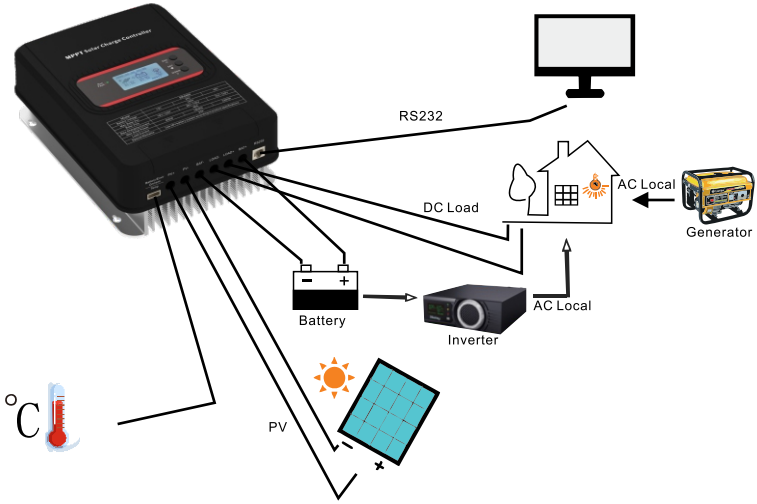


Figure6:DC terminal connector locations

6.3 PV Charge And Load Control Mode Wiring

✧ **WARNING:** Shock Hazard

PV arrays generate voltage whenever light strikes the surface of the array. Before connecting the Solar charge controller, cover or disconnect the array to prevent any current from being generated



1. Connect the PV array's positive (+) output to the terminal marked PV positive (+) on the Solar charge controller and tighten the screw.

2. Connect the PV array's negative (–) output to the terminal marked PV negative (–) on the Solar charge controller and tighten the screw.

3. Connect the terminal marked battery negative (–) on the Solar charge controller to the negative (–) battery terminal and tighten the screw.

4. Connect the terminal marked battery positive (+) on the Solar charge controller to the positive (+) battery terminal and tighten the screw.

5. Connect the terminal marked load negative (–) on the Solar charge controller to the negative (–) load terminal and tighten the screw.

6. Connect the terminal marked load positive (+) on the Solar charger controller to the positive (+) battery terminal and tighten the screw.

7. Connect a cable from the controller's other terminal marked load negative (–) to the negative terminal of your DC load and tighten the screw.

8. Connect a cable from the controller's other terminal marked load positive (+) to the positive terminal of your DC load and tighten the screw.

The procedure below is illustrated

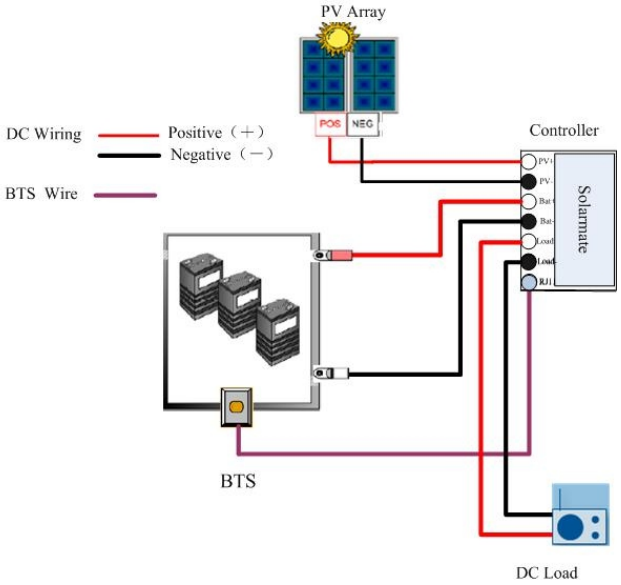


Figure7:Connection diagram

6.4Grounding

The Solar charge controller is designed to work with grounded electrical systems. In solar charge controller ground is not connected to input terminal and output terminal so customer can connect Ground to battery + or batter - But don't connect battery terminal and PV output terminal with Ground at same time



Figure8:Safety(Earth)ground

7. Operation Instructions

7.1 Key define

ESC	Back to Previous Page(Quit without saving)
SET	Set Parameters;set or save
DOWM	Turn Down;Add parameters under setting mode; Time Settings

7.2 Browse display message

Display content including solar panel voltage, current , the battery voltage, charging current ,load status , load current, power generation , Heat sink temperature, the percentage of battery power, Charging status , battery system voltage 12V/24V/48V/(36V set), Fault information, machine model, in order to cycle display the above parameters. Use the DOWN key Switching the display between the various parameters, shows the structure shown in Figure 9 :

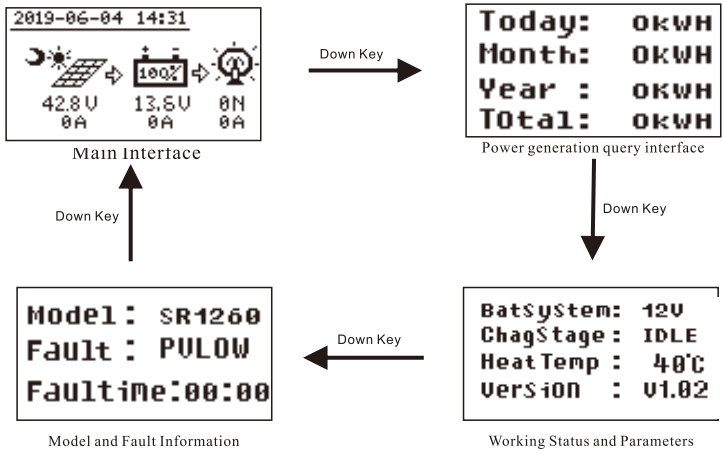


Figure9:Browse page

8. Configuring the Solar charge controller

8.1 Display message description

When have any key operation, the LCD backlight will automatically turn on; when without any key operation, the LCD backlight will automatically turns off after 30 seconds

Display message explain

When PV is connected, the PV symbol is displayed, and when load is connected, the load symbol is displayed.

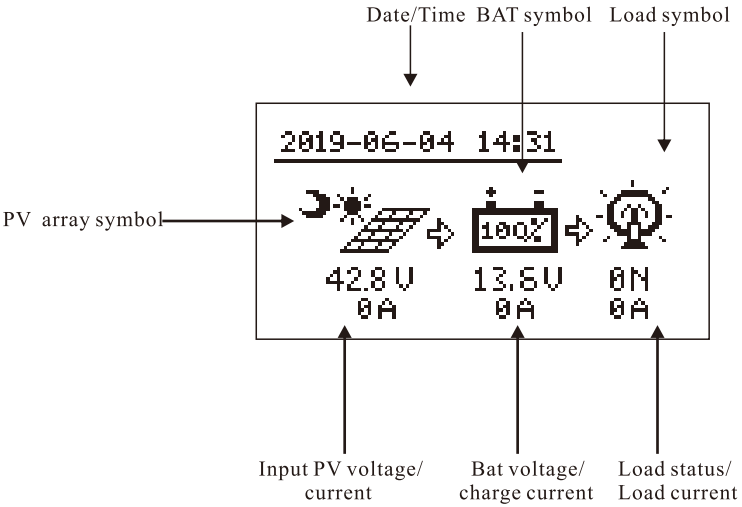


Figure10:LCD display message.

LED indicator light explain:

LED indicator light	Green	Machine normally
	Red	Abnormal/malfunction
	Red and green scintillation	Load failure

8.2 Parameter setting operation

Using **SET** Key means you can set some parameters : the battery charge current limit, the load switch, the battery capacity **AH**,the battery temperature compensation coefficient,the 36V Battery System, the battery type, a total

of six parameters that can be modified. In the Master Browse Interface, Or any interface press SET key 3 seconds to enter into the parameter setting state, There is a black sign in the parameters setting position, and press DOWM to select the parameters you want to change, press the **SET** key to set. then sign will twinkling that has entered into the modification mode, press DOWN key modify the parameter value, if the parameter have finished, press SET key to save the parameter value and return to the main page, if you do not want to save, press ESC key, return to the main page .

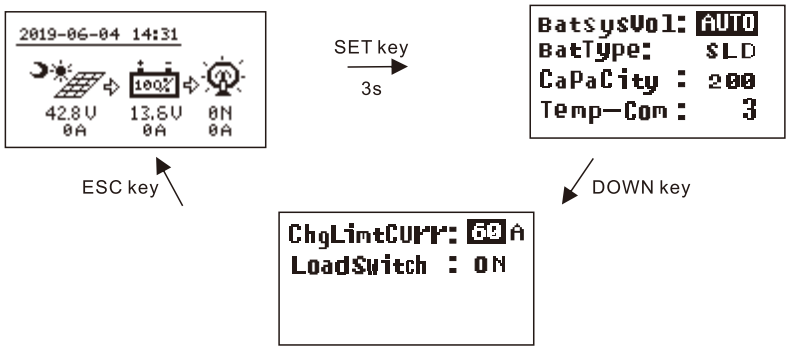


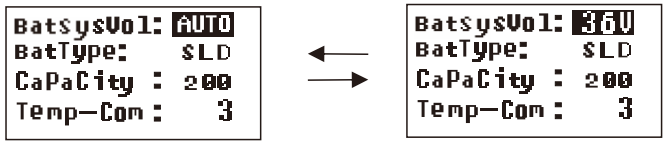
Figure11:Parameter Setting interface

8.3 Parameter setting description

8.3.1 The 36V Battery system setting

When using a 36V battery, you need to change the parameter AUTO to 36V in the parameter setting,After setting and saving, you need to restart the machine to see if the LCD interface is displayed as a 36V battery system. If so, the setting is successful, otherwise you repeat the above operation.

Similarly, when the 36V battery system is replaced by 12V/24V/48V battery system, the parameter 36V must be changed to AUTO in the parameter setting. After the setting is completed and saved, you must manual the machine power off and restarted it,then check the LCD interface matches parameter wether it is match with the connected battery system If so, the setting is successful; otherwise you repeat the above operation.



8.3.2 Battery type setting

There have five optional of the battery type SLD sealed lead-acid battery, GEL gelled lead-acid battery, FLD flooded lead-acid battery,LI lithium battery, User(Custom).The system defaults to SLD battery.

when you choose User type, you can modify the overvoltage disconnect voltage,overvoltage recovery voltage, constant charging voltage , floating charging voltage point, quick charging recovery voltage,load recovery voltage,load disconnect voltage,battery low voltage recovery voltage,battery disconnect voltage.(By default, these parameters are the same as sealed batteries.)

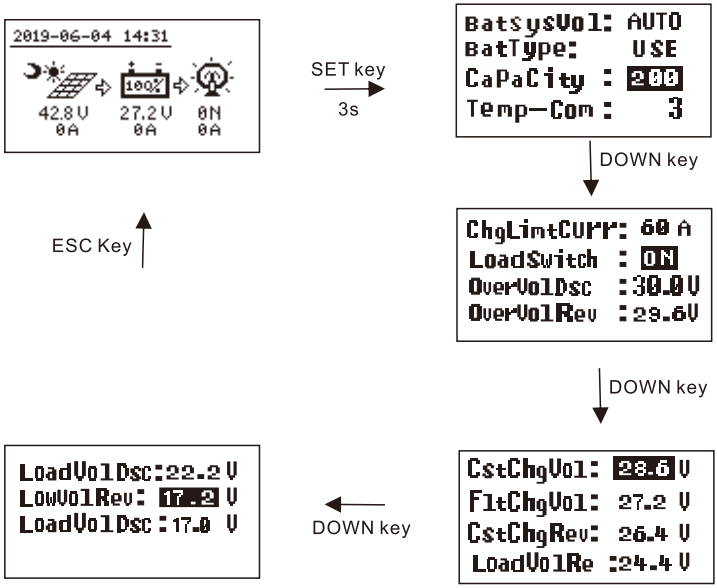


Figure12:User Parameter Setting interface

8.3.3 The battery capacity setting

The battery nominal capacity modify the range 100~400AH , Press once for 5AH adjustment, the default capacity 200AH.because the battery capacity parameters involved in the charging and discharge control operation, so try to set data security and the actual number of hours battery similar or consistent . (The charging current of the system is 0.3C of the battery capacity, and charged at 60A for more than 200AH).

8.3.4 Battery temperature compensation setting

This parameter involved in the charging and discharging control algorithms, modify the range of 0~8 mV/Cell / ℃, Press once for 1mV/Cell/ ℃ adjustment, the default 3 mV / Cell / ℃ ,when the parameter is 0,the means that there is no temperature compensation .

8.3.5 The charging current limit setting (Press once for 5A adjustment)

The SR4810 model solar charger supports charging current of 10A, System defaults to 10A, There can modify charging current limit 5A to10 A .

The SR4820 model solar charger supports charging current of 20A, System defaults to 20A, There can modify charging current limit 5A to 20 A .

The SR4830 model solar charger supports charging current of 30A, System defaults to 30A, There can modify There can modify charging current limit 5A to 30A .

The SR4840 model solar charger supports charging current of 40A, System defaults to 40A, There can modify There can modify charging current limit 5A to 40 A .

The SR4850 model solar charger supports charging current of 50A, System defaults to 50A, There can modify There can modify charging current limit 5A to 50 A .

The SR4860 model solar charger supports charging current of 60A, System defaults to 60A, There can modify There can modify charging current limit 5A to 60 A .

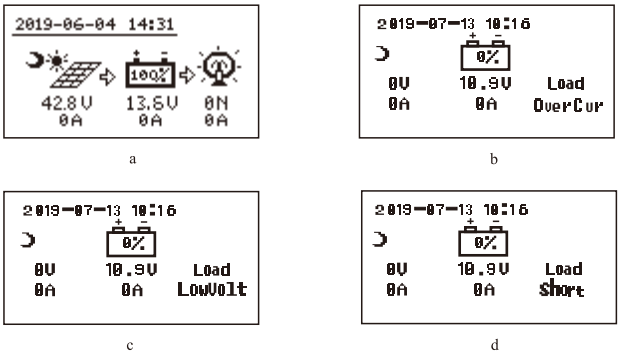
The SR4880 model solar charger supports charging current of 80A, System defaults to 80A, There can modify There can modify charging current limit 5A to 80 A .

8.3.6 Load switch setting

When the load switch is turned on and the load is connected, the main interface will display the load pattern, load status and current. As shown in Figure (a).When the load overflows,the load switch will turn off, and the main interface will display load information. As shown in Figure (b).You need to reduce the load to the allowable range, and turn on the load switch in the Settings, and the load will resume. (note: load can only be started by restarting the machine after turning off twice).

When the battery voltage is low, the load will be turned off, and the main interface will display load low voltage. As shown in Figure (c), when the battery voltage reaches the load recovery voltage, the fault information will be automatically cleared.

The machine load switch will stop powering the load when the load short circuit occurs,as shown Figure(d), after a while,the machine will auto restart load switch to power the load.The machine s powering the load again if the load still short circuiting ,The machine will not auto restart the loa switch when the load protection times up to five,you must be restarted the machine if you want to powering the load.



8.4 Time Parameter Settings



Figure13:Time Setting interface

In the Master Browse Interface, Or any interface press **DOWN** key 3 seconds to enter into the parameter setting state, Subsequent setup steps are the same as in section 8.2.

9. Communications connection

By using RS232 to connect the computer's upper computer software, you can monitor the machine's operating status and parameter information at all times, and you can also calibrate the parameters.



Figure14:The Communications connection diagram

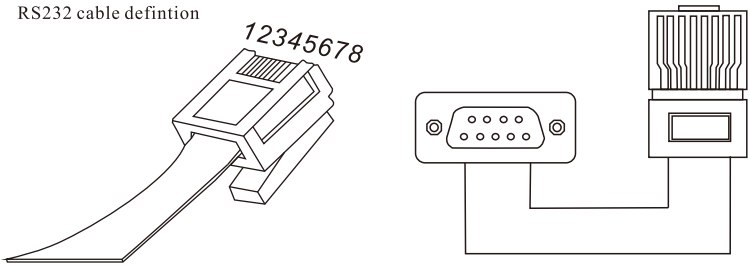


Figure15:The cable connection diagram

Crystal Head/RJ45	Function
Pin1	RS232-TX
Pin2	RS232-RX
Pin3	NC
Pin4	NC
Pin5	NC
Pin6	NC
Pin7	NC
Pin8	GND

10. Start-Up and shut down the Solar charge controller

10 .1 Start-Up the the Solar charge controller

Turn –on the Solar charge controller step

1. Connect the Battery breaker of the Solar charge controller.
2. Turn on the PV switch, and the Solar charge controller will start automatically when the input voltage is 3V higher than the battery voltage .
3. Check the Solar charge controller operating status .
4. Waiting until LED, LCD display have operation normal, the Solar charge controller is start up.

10.2 Turn-off the Solar charge controller

Turn –off the Solar charge controller step:

1. Disconect PV breaker
2. Turn off the Battery switch.
3. Check the Solar charge controller operating status
4. Waiting until LED, LCD display have go out, the Solar charge controller is shut down.

11. Maintenance and Cleaning

11.1 Checking Heat Dissipation

	Please stop the solar charge controller , half an hour after the operation, the heat sink temperature too high prevent scalding hands.

If the solar charge controller regularly reduces its output power due to high temperature, please improve the heat dissipation condition. Maybe you need to clean the heat sink.

11.2 Cleaning the solar charge controller

If the solar charge controller is dirty, turn-off the DC breaker or DC switch ,waiting the solar charge controller shut down ,then clean the enclosure lid and the display using only a wet cloth. Do not use any cleaning agents (e.g. solvents or abrasives).

11.3 Checking the DC Disconnect

	When connecting the battery and solar panels to distinguish between positive and negative attention, please pay attention to safety. Don't disconnect under the DC connectors under load.

Check for externally visible damage and discoloration of the DC Disconnect and the cables at regular solar charge controllers.If there is any visible damage to the DC Disconnect, or visible discoloration or damage to the cables, contact the installer.

12. Trouble shooting

12.1 Errors(E)

CAUTION	When the LED light turns on the red light ,the solar charge controller had operation abnormal.please check the solar charge controller.

Errors(E) codes identify a possible equipment failure fault or incorrect solar charge controller setting or configuration. Any and all attempts to correct or clear a fault must be performed by qualified personnel. Typically, the (E) code can be cleared once the cause or fault is removed Some of the (E) codes Error as indicated in the table below, may indicate a fatal error and require you to contact the supplier or our company to replace a new one.

When an exception occurs, you can browse the fault information according to the following procedure.

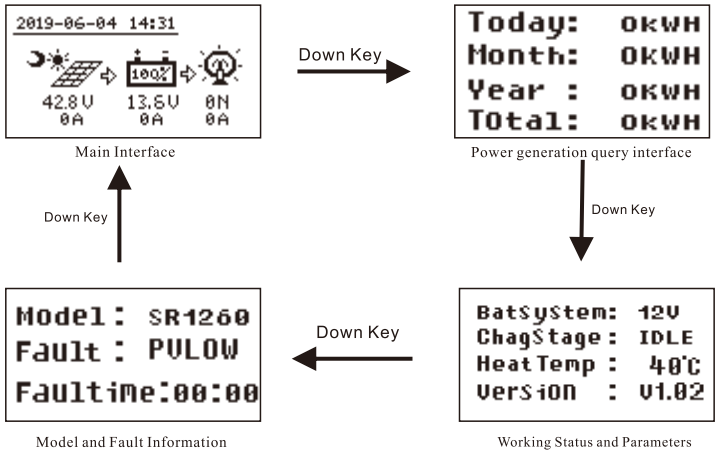


Figure16:The fault browse interface

Error code	Description	Suggestion
EEPROMErr	EEPROM fault	1.Restart the solar charge controller. 2.If error message still exists,contact factory.
COMErr	Remote communicate fault	1.Restart the solar charge controller. 2.If error message still exists,contact factory.
PVLow	Input PV voltage too low	1.Please check the PV voltage. 2.If the PV normal,restart the solar charge controller. 3.If error message still exists,contact factory.
PVHigh	Input PV voltage too high	1.Please check the PV voltage. 2.If the PV normal,restart the solar charge controller. 3.If error message still exists,contact factory.
BatLow	Battery voltage too low	1.Please check the battery voltage. 2.If the battery normal,restart the solar charge controller. 3.If error message still exists,contact factory.
BatHigh	Battery voltage too high	1.Please check the battery voltage. 2.If the battery normal,restart the solar charge controller. 3.If error message still exists,contact factory.
OverChg	Charging overflow	1.Please check the charging current. 2.If the charging current normal,restart the solar charge controller. 3.If error message still exists,contact factory.
OverLoad	Load overflow	1.Please check the DC Load. 2.If the DC Load normal,restart the solar charge controller. 3.If error message still exists,contact factory.
BatTErr	Battery temperature too high	1.Check actual battery temperature. 2.Restart the solar charge controller. 3.If error message still exists,contact factory.
HeatTErr	Heat sink temperture too high	1.Restart the solar charge controller. 2.If error message still exists,contact factory.
BatErr	Battery system recognition error	1.Restart the solar charge controller. 2.If error message still exists,contact factory.
Loadshort	Load short circuit	1.Please check the DC Load. 2.If the DC Load normal,restart the solar charge controller. 3.If error message still exists,contact factory.

13. Manufacturer Warranty

This certificate represents a 3~5 year warranty for the solar charge controller products listed below. Possession of this certificate validates a standard factory warranty of 3~5 years from the date of purchase.

13.1 Warranted products

This warranty is applicable solely to the following products:

SR4810 SR4820 SR4830 SR4840 SR4850 SR4860 SR4880

13.2 Limited Product Warranty

(Applicable under normal application, installation, use and service conditions)
Our company warrants the above listed products to be free from defects and/or failure specified for a period not exceeding 3~5 years from the date of sale as shown in the Proof of Purchase to the Original purchaser.
The warranties described in these “Limited Warranties” are exclusive and are expressly in lieu of and exclude all other warranties, whether written, oral, express or implied, including but not limited to, warranties of merchantability and of fitness for a particular purpose, use, or application, and all other obligations or liabilities on the part of our company , unless such other obligations or liabilities are expressly agreed to it in writing signed and approved by our company, Our company shall have no responsibility or liability whatsoever for damage or injury to persons or property, or for other loss or injury resulting from any cause whatsoever arising out of or related to the modules, including, without limitation, any defects in the modules or from use or installation. Under no circumstances shall our company be liable for incidental , consequential or special damages howsoever caused; loss of use, loss of production, loss of revenues are therefore specifically and without limitation excluded to the extent legally permissible, Our company 's aggregate liability, if any, in damages or otherwise, shall not exceed the invoice as paid by the customer.

The “Limited Product Warranties” described above shall not apply to, and our company shall have no obligation of any kind whatsoever with respect to, any inverter which has been subjected to:

- Misuse, abuse, neglect or accident;
- Alteration, improper installation or application;
- Unauthorized modification or attempted repairs;
- Insufficient ventilation of the product;
- Transport damage;
- Breaking of the original manufacturers seal;
- Non-observance of Sumry installation and maintenance instruction;
- Failure to observe the applicable safety regulations
- Power failure surges, lighting, flood, fire, exposure to incorrect use, negligence, accident, force majeure, explosion, terrorist act, vandalism or damage caused by incorrect installation, modification or extreme weather conditions or other circumstances not reasonably attributable to our company.

The warranty shall also cease to apply if the product cannot be correctly identified as the product of factory . Warranty claims will not be honored if the type of serial number on the inverters have been altered, removed or rendered illegible.

13.3 Liability

The liability of factory in respect of any defects in its solar charge controller shall be limited to compliance with the obligations as stated in these terms and conditions of warranty. Maximum liability shall be limited to the sale price of the product.factory shall accept no liability for loss of profit, resultant of indirect damage, any loss of electrical power and/or compensation of energy suppliers within the express meaning of that term. The warranty rights as meant herein are not transferable or assignable to any third party excepting the named warranty holder.

13.4 Warranty conditions

If a device becomes defective during the agreed factory warranty period and provided that it will not be impossible or unreasonable, the device will be, as selected by factory. Shipped to factory service centre for repair, or repaired on-site, or exchanged for a replacement device of equivalent value according to model and age.

The warranty shall not cover transportation costs in connection with the return of defective modules. The cost of the installation or reinstallation of the modules shall also be expressly excluded as are all other related logistical and process costs incurred by all parties in relation to this warranty claim.

14. Decommissioning

14.1 Dismantling the solar charge controller

1 Disconnect the solar charge controller
2 Remove all connection cables from the solar charge controller

 CAUTION	Danger of burn injuries due to hot enclosure parts! Wait 10 minutes before disassembling until the housing has cooled down.
	When your want backout the PV input wire, you must break down the switch ,and wait 10 minutes .

3 Screw off all projecting cable glands.
4 Lift the solar charge controller off the bracket and unscrew the bracket screws.

14.2 Packing the solar charge controller

If possible, always pack the solar charge controller in its original carton and secure it with tension belts. If it is no longer available, you can also use an equivalent carton. The box must be capable of being closed completely and made to support both the weight and the size of the solar charge controller.

14.3 Storing the solar charge controller

Store the solar charge controller a dry place where ambient temperatures are always between -20°C and +45°C.

14.4 Disposing of the solar charge controller



Do not dispose of faulty solar charge controller or accessories together with household waste. Please accordance with the disposal regulations for electronic waste which apply at the installation site at that time. Ensure that the old unit and, where applicable, any accessories are disposed of in a proper manner

15. Technical Data

Model		SR4810	SR4820	SR4830	SR4840	SR4850	SR4860	SR4880
PV Input (PV)								
Max.PV voltage (VOC)		75V		135V(-20℃) 145V(25℃)				
System voltage		12V/24V		12V/24V/48V Auto,36V Set				
MPPT voltage range		Battery voltage+3V-60V		Battery voltage+3V-120V				
Suggest input Voc voltage		22V/40V		22V/40V/60V/80V				
Number of MPPT trackers		1	1	1	1	1	1	1
Max.PV input power	12V	140W	270W	400W	540W	670W	800W	1100W
	24V	270W	540W	800W	1070W	1340W	1600W	2150W
	36V	400W	800W	1200W	1600W	2000W	2400W	3200W
	48V	540W	1080W	1600W	2140W	2670W	3200W	4300W
Charging Output (DC)								
Max.output current (revisable)		10A	20A	30A	40A	50A	60A	80A
Rating load current		20A						
Max. capacitive load capacity		10000uF						
Ripple voltage		< 0.5%						
Applicable battery type (ex-factory default lead-acid battery)		SLD sealed lead-acid battery/GEL gelled lead-acid battery/FLD flooded lead-acid battery/ lithium battery,other battery types can be customized						
Efficiency								
Conversion efficiency		≤ 98%						
MPPT efficiency		>99%						

Protection				
Load Short Circuit Protection(Five times that day)	Yes	Yes	Yes	Yes
Load overcurrent protection	Yes	Yes	Yes	Yes
Output overvoltage protection	Yes	Yes	Yes	Yes
Input overvoltage protection	Yes	Yes	Yes	Yes
PV Anti-reverse protection	Yes	Yes	Yes	Yes
Battery Anti-reverse protection	Yes	Yes	Yes	Yes
Input overcurrent protection	Yes	Yes	Yes	Yes
Over temperature protection	Yes(75℃ protection, restore70 ℃)	Yes(75℃ protection, restore70 ℃)	Yes(75℃ protection, restore70 ℃)	Yes(75℃ protection, restore70 ℃)
Battery voltage too low/high protection	Yes	Yes	Yes	Yes

Regular data							
Product dimension (D*W*H),mm						279*201*96 mm	
Weight						3.6KG	
Unloaded loss	<1.5W	<1.5W	<1.5W	<1.5W	<1.5W	<1.5W	<1.5W
Operating temperture range	-20 ~ +45℃						
Elevation height	≤ 3000m						
Working humidity	0%to95%(no condensat)						
Cooling concept	Natural						
IP Rate	IP20						

Features							
PV connection	Screw terminal						
Battery connection	Screw terminal						
Load connection	Screw terminal						
Battery type choice	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Environment temperature detect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery temperature detect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Charge current limit	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time setting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Battery temperature compensation factor	-3mV/℃(default、except lithium battery)						
Mode of communication	RS232(Extensible interface)						
Display mode	LCD128*64						
Warranty: 3year/5year	Standard/ optional	Standard/ optional	Standard/ optional	Standard/ optional	Standard/ optional	Standard/ optional	Standard/ optional
Certification and licensing							

Table of parameters of various types of batteries					
Set voltage battery type	SLD sealed lead-acid battery	GEL gelled lead-acid battery	FLD flooded lead-acid battery	LI lithium battery	User(Custom)
Equilibrium voltage (V)	14.3	14.2	14.2	12.6	8.5-17.0
Floating voltage (V)	13.6	13.7	13.6	12.6	8.5-17.0
Quick Charging recovery voltage (V)	13.2	13.2	13.2	12.0	8.5-17.0
Battery overvoltage(V)	15.0	15.0	15.0	15.0	8.5-17.0
Overvoltage recovery voltage(V)	14.8	14.8	14.8	14.8	8.5-17.0
Bat Low voltage disconnect voltage(V)	8.5	8.5	8.5	8.5	8.5-17.0
Bat Low voltage disconnect recovery voltage(V)	9.0	9.0	9.0	9.0	8.5-17.0
Load disconnection voltage(V)	11.1	11.1	11.1	9.1	8.5-17.0
Load recovery voltage(V)	12.2	12.2	12.2	10.2	8.5-17.0

User batteries are used as customized battery types. The default voltage parameters of the system are consistent with those of sealed lead-acid batteries. The following logic must be followed when modifying the charging and discharging parameters of batteries:

◆Battery overvoltage> overvoltage recovery voltage>equilibrium voltage ≥ Floating voltage> Quick Charging recovery voltage

◆Quick Charging recovery voltage≥ Load recovery voltage >Load disconnection voltage

◆ Load disconnection voltage≥ Bat Low voltage disconnect recovery >Bat Low voltage disconnect voltage

16. PV-Battery system installation reference

Suggestion

Model	SR4810	SR4820	SR4830	SR4840	SR4850	SR4860	SR4880
BAT	12V/24V		12V/24V/36V /48V				
VOC	22V/40V		22V/40V/60V /80V				

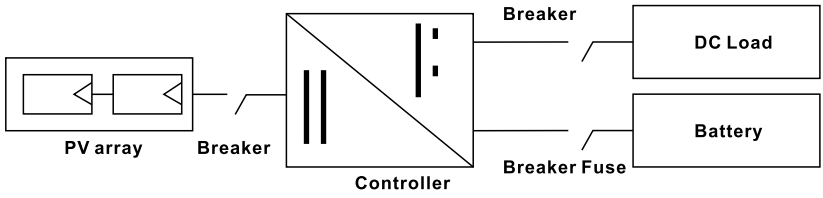
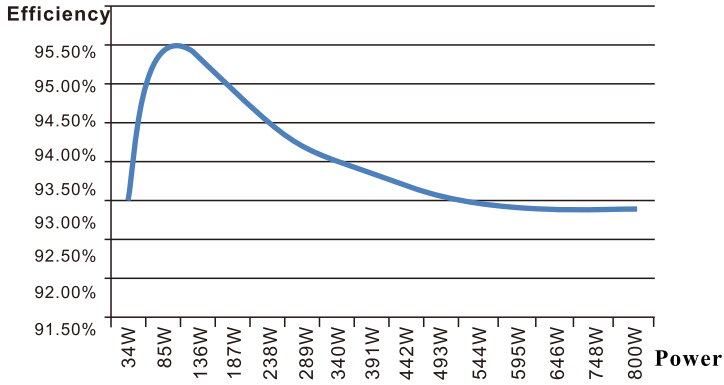


Figure16:PV-Battery system installation diagram

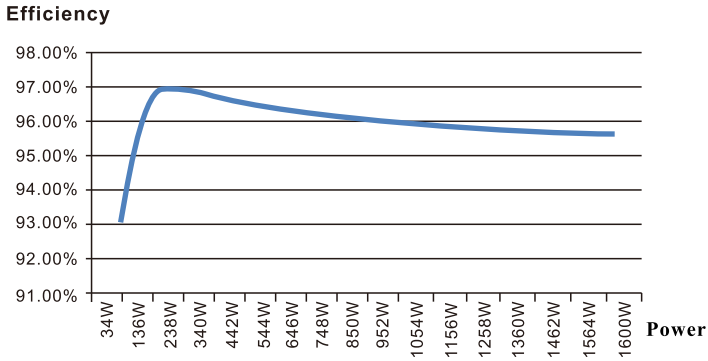
17. Annex

17.1 SR4860 Efficiency curve: (suggest input Voc 22V/40V/60V/80V)

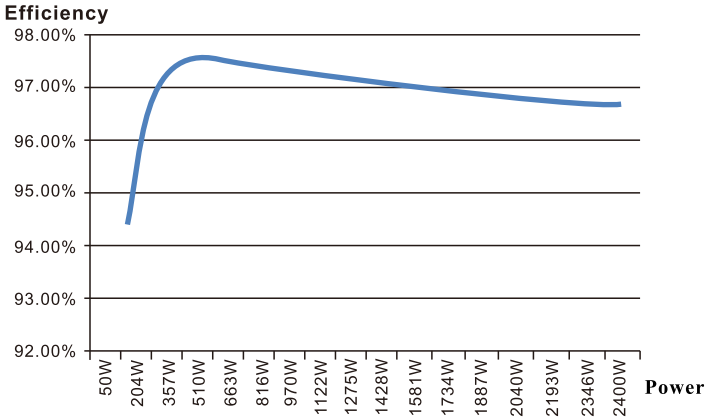
12V battery system (input Voc 22V)



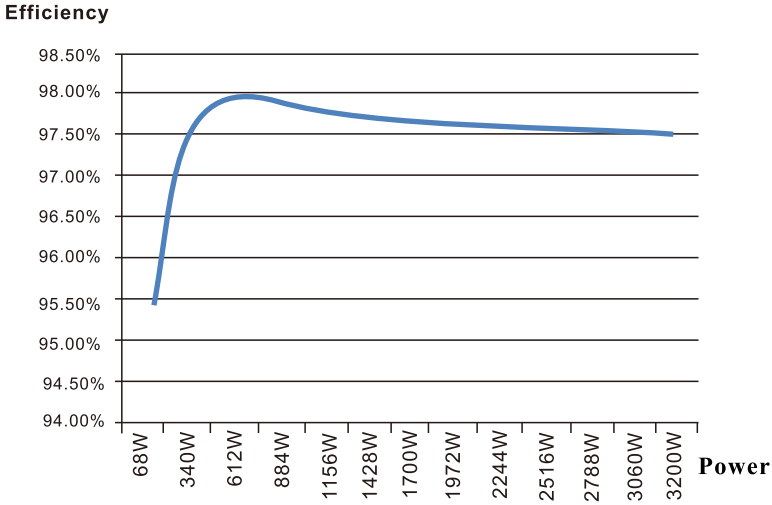
24 V battery systerm (input Voc 40V)



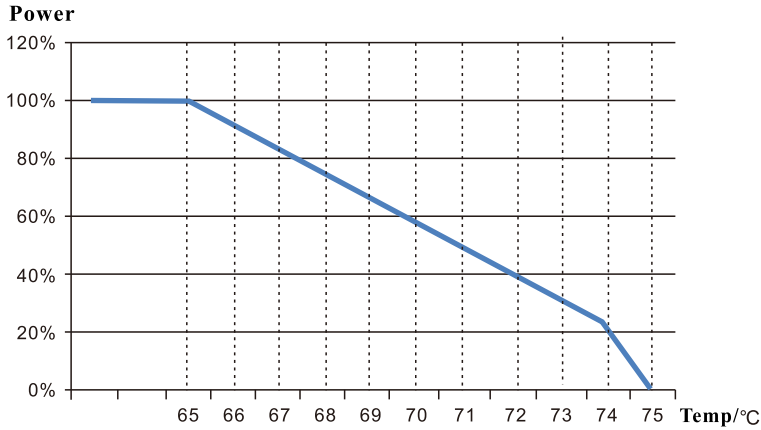
36 V battery system (input Voc 60V)



48 V battery systerm (input Voc 80V)



17.2 SR4860 Temperature-Power curve：



技术要求：单页尺寸142*210mm;
材质：封面157g铜版纸CMYK彩色印刷,内页80g书写纸黑白印刷;料号打于后封面左下角;