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Solar System Controller SR601

Operation Instruction



⚠ Please read this instruction carefully before using the controller

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1. Safety information

1.1 Installation and commissioning

- When laying cables, please ensure that no damage occurs to any of the constructional fire safety measures presented in the building.
- The controller must not be installed in rooms where easily inflammable gas mixtures are present or may occur.
- All devices connected to the controller must conform to the technical specifications of the controller.
- All operations on an open regulator are only to be conducted cleared from the power supply. All safety regulations for working on the power supply are valid. Connecting and /or all operations that require opening the regulator (e.g. changing the fuse) are only to be conducted by specialists.


1.2 Liability waiver

The manufacturer cannot monitor the compliance with these instructions or the circumstances and methods used for installation, operation, utilization and maintenance of this controller. Improper installation can cause damages to material and persons. This is the reason why we do not take over responsibility and liability for losses, damages or cost that might arise due to improper installation, operation or wrong utilization and maintenance or that occurs in some connection with the aforementioned. Moreover we do not take over liability for patent infringements or infringements – occurring in connection with the use of this controller- on third parties rights. The manufacturer preserves the right to put changes to product, technical date or installation and operation instructions without prior notice. As soon as it becomes evident that safe operation is no longer possible (e.g visible damage). Please immediate take the device out of operation.

Note: ensure that the device cannot be accidentally placed into operation.


1.3 Description of symbols

Safety instruction:

 Safety instructions in the text are marked with a warning triangle. They indicate measures, which can lead to injury of persons or safety risks.
Note: Contains important information on operation or function.

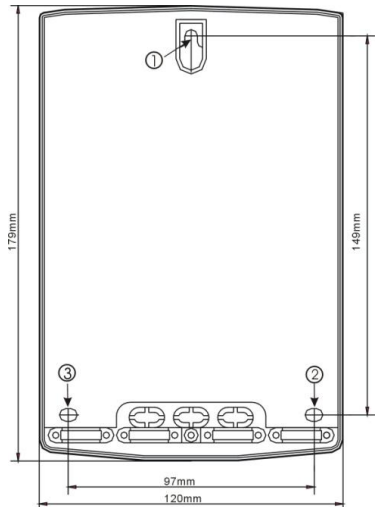
2. Installation

2.1 Installing the controller

 **Note:** the controller can only be installed in an area having an adequate level of protection.

Fixing the hang-panel of controller

- ▶ Choose a suitable site
- ▶ Mark the position of hole
- ▶ Drill the fixing hole, insert the expansion screw
- ▶ Take away the cover
- ▶ Put bottom plate one the position of ①
- ▶ Market the hole of ② and ③
- ▶ Then take away of bottom plate again.
- ▶ Drill the fixing hole.
- ▶ Rehang the bottom plate and fixing on ①
- ▶ Insert the screw,fixing hole ② and ③ on the bottom plate.



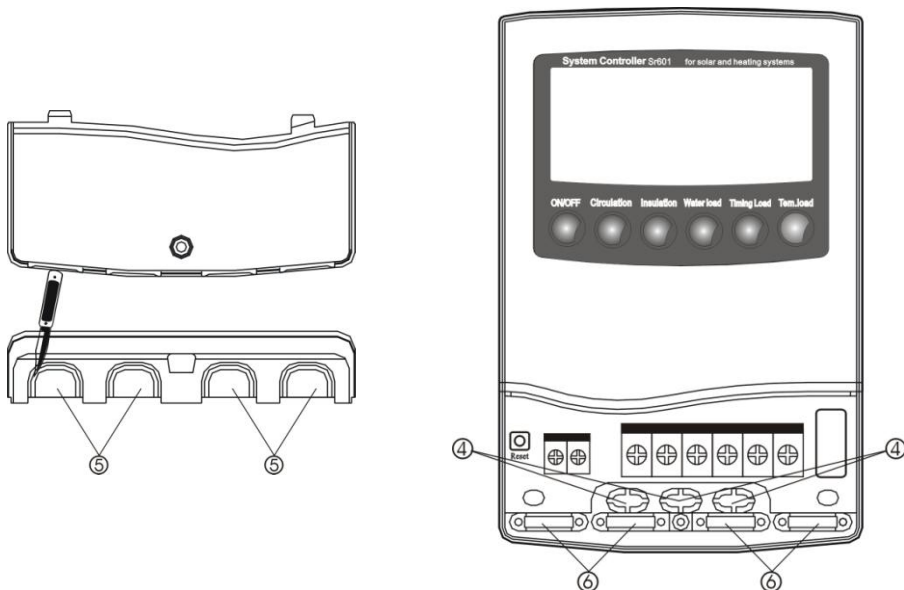
2.2 Power connection

Power can only be switched on when the house of controller is closed, an installer must make sure that the IP protection class of the controller is not damaged during installation.

Depending on the type of installation, the cables may enter the device through the rear hole of the case ④ or the lower side hole of the case ⑤. Cable come from the rear ④: remove the plastic flaps from the rear side of the case using an appropriate tool.

Cable come from the below ⑤: cut the left and right plastic flaps using an appropriate tool (e.g. knife) and break them out of the case.

Notes: the flexible wire must be fastened on the case using the clamps provided

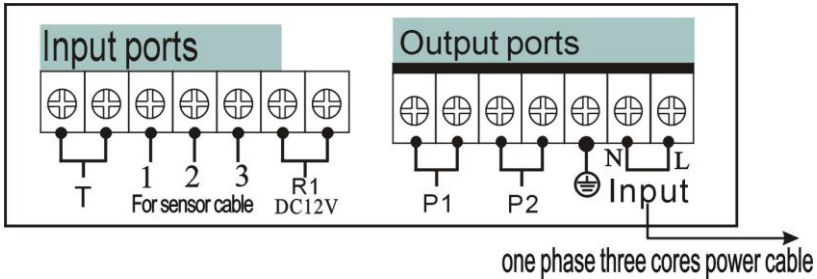


2.3 Terminal connection



Before to open the terminal, please be sure to switch-off the power supplier and pay attention to the local electricity supply rules.

- Terminal Layout.

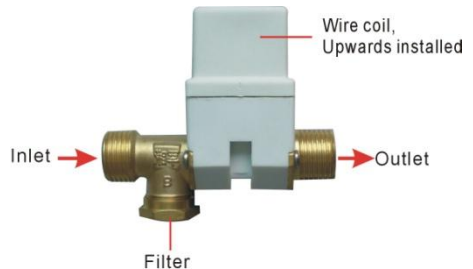


<p>Power Connection</p> <ol style="list-style-type: none"> Please note the type of power supply required from the type plate on the case of the device The protective conductor (GND) which two colors must be connected also. 	<p>Inputs: T, 1&2&3</p> <ol style="list-style-type: none"> Port T: Temperature sensor for heating cable(NTC10K) Water level and temperature sensor input: <ol style="list-style-type: none"> If silicon-sensor(B01 or B02) was connected on Port1: connect red wire Port2: connect white wire Port3: connect black wire If ion-sensor(B03) was connected on Port1: 	<p>Outputs: P1,P2, R1</p> <ol style="list-style-type: none"> Output P1: Electromagnetic relay, for pressure increasing pump, max. switching current: 5A Output P2: electromagnetic relay, maximal switching current: 5A , P2 is used for electrical heating cable Output R1: for electromagnetic vale of loading water , outlet voltage:DC12V
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	connect red wire Port2: connect white wire Port3: connect black wire	
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2.4 Installing electromagnetic valve

- Before installing electromagnetic valve, please clean up and wash pipe.
- If water is provided by water tower, please select electromagnetic valve, which caters the water pressure of water tower. So to avoid the low flow rate or even no water flows from electromagnetic valve.
- Check whether the output voltage of controller caters to the label voltage of electromagnetic valve; check whether the filter net is completed, whether the body of electromagnetic valve is completed. Outlet and inlet of electromagnetic valve should be right installed, the side with filter net is input, and water flow direction should be same as the arrow which marked on the body of electromagnetic valve.
- Electromagnetic should be installed in the place where is easy to maintain and does not bring other lose, please take measures for anti-freezing, anti-sunburn and therefore to avoid aging of body of valve and to prolong the lifetime of valve. Please pay attention to install the wire coil upwards.
- It is forbidden to use wrench to work on the wire coil and on plastic part. The inlet and outlet pipe of electromagnetic valve should be keep at a same level, and ensure not to mount valve compulsively when both connection parts are not at a same level, and therefore to avoid damaged of valve. It should be noted that installed valve doesn't bear the torsional strength which caused by wrong mounted pipe.
- Two-cores wire should be connected with electromagnetic valve, when wire need to be prolonged, please select 1.0mm² cable.
- The pipe, which is connected with valve, should be easy to dismount or use flexible pipe, it should be easy to clean the filter.



- Switch-on power and check valve after installation.

Note: electromagnetic valve has check-valve function, it is not necessary to install one way valve any more.

2.4.1 Faults checking of electromagnetic valve

Reasons of fault	Checking measures	Error rectification
Wire connection is not good	Check wire connection	Re-connect wires
Whether wire coil of electromagnetic valve has power	Measure the resistance with Ohmmeter	Change wire coil or change valve if necessary
Operation voltage is unstable	Measure voltage	Change input power resource
Water pressure is less than 0.012Mpa	Open the tap and estimating	Installing a pressure increase pump or change a new valve with lower water pressure
Filter is stopped	Check optically	Regular wash filter
Water pressure is high than 0.8Mpa	Open the tap and estimating	Installing a pressure reduction pump or change a new valve with high operational voltage (about 10% more)

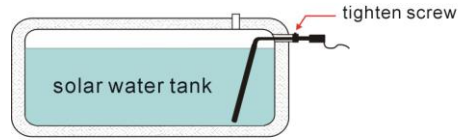
2.5 Installation of water level and temperature sensor

2.5.1 Installation of Silico-Sensor

- Insert silicon-sensor into overflow outlet of solar tank.



- Tighten the sensor screw

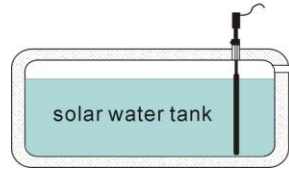


- Temperature sensor wires connection.

Red wire connect to Port1

White wire connect to Port2

Black wire connect to Port3

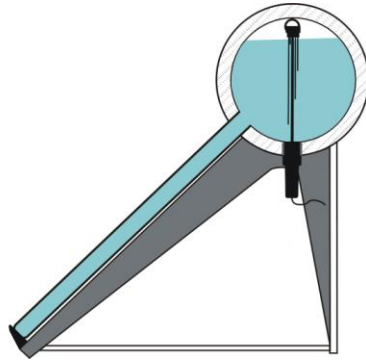


2.5.2 Installation of underside positioned sensor

Underside positioned sensor has 2 ways of installation, one is upward installed at the collector pipe hole, one is upward installed at the bottom of water tank.(see picture), diameter of 47mm and 57mm installed holes are available for selection.



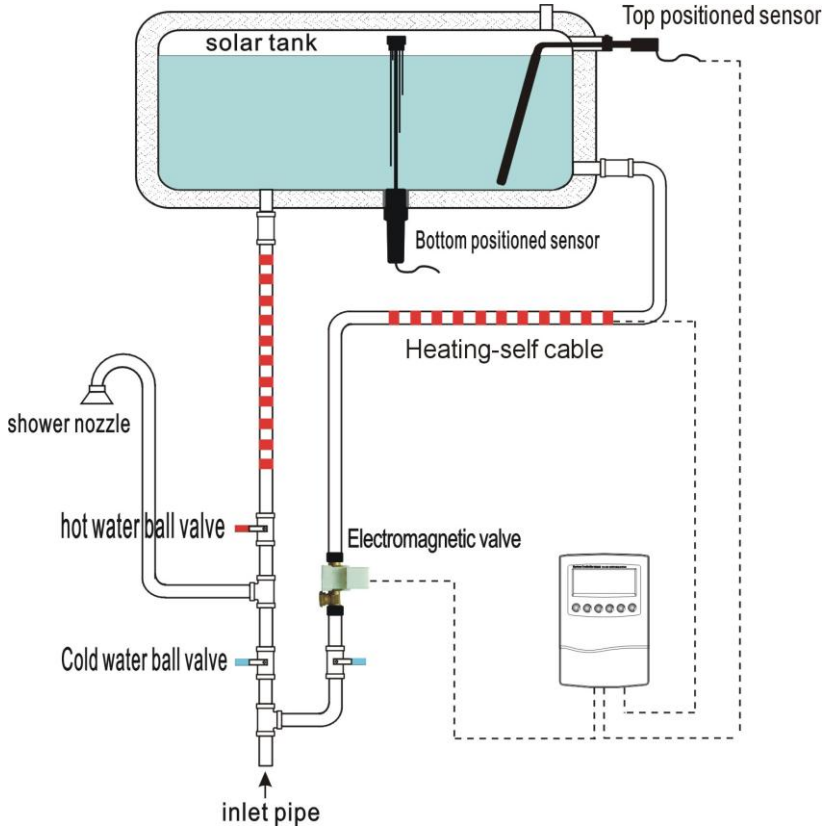
installed at the collector pipe hole



installed at the bottom of water tank

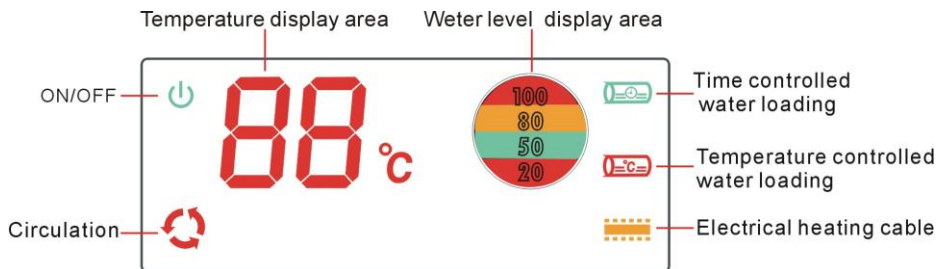
3.Introduction of solar system

Description: this system is water and collector integrated solar water system, it is easy for mounting, and efficiency is high.



4. Instruction of display illustration

4.1 Screen display instruction



4.2 Code instruction

Code	Code explanation
E0	Connection cable between controller and sensor fault
E4	Collector pipe high temperature protection
E6	Temperature sensor fault
E7	Water level sensor fault

5.Functions and Operation



Under cut off power supply, Connection sensors, pump or solenoid valves to the controller!

5.1 “ON/OFF” button

- After power is switched-on, as default set controller is open, and controller displays water temperature and water level, all functional buttons are ready for setting operational parameters. After controller is open, press on/off button, then controller entries into close mode, after two 2 hours controller recovers to work again.

- Automatically water loading under Auto mode:

When water temperature is over 60°C and water level is at 20% position or at 50% or 80% position, 10 minutes later it starts to load water, but in the case when man is using water (water level is changing) it starts to load water 60 minutes later. When water temperature is lower than 55°C or when water level raises up to 100% position, then it stops to load water. When water level drops due to using water, tank appears the status of lack of water, and then it starts to load water to desired position after 30 minutes.

5.2 Water loading

Functional description:

When water isn't full in tank, and user wants to start water load immediately, it can be achieve by press "water load" button to start manual water loading function

Activate and deactivate function:

▶ press "water load" button, water loading signal displays. Water level area blinks,

▶ press "water load" button continuously to set desired water level (50% - 100%)

► press "water load" button again to deactivate function.

Note:

- Water level of loading can be set by user.
- First time loading of new installation, there is some water overflow, it's normal operation by controller.
- Or power off suddenly during the using, there is some water overflow when power on again, it's normal operation by controller.

5.3 Water supply function when lack of water

Functional description:

Water level from high to lower, when water level lower than 20% position, delay 30 minutes, then loading water to preset position (Water level setting: see paragraph 5.2; factory default: 20%)

5.4 Timing control water loading


Functional description:

"Timing load" button is used to set the time for triggering the water loading. Press "Timing load" button continuously to set the desired time for triggering water loading, (adjustable time range 1-23 hours).

For example: if now is 8 o'clock AM, but you want to load water at 4 o'clock PM, then press this button until 08 disappears on screen, that means controller will start to load water 8 hours later automatically. After setting an indicating light blinks, 3 seconds later controller confirms the setting, and the indicating light of this function is on. After the setting, you can press this button to check how long time is left to the preset water loading time. Press this button again to cancel this function.

- System has memory function, in the condition that power of controller isn't switched-off, your setting will be remembered, it is not

necessary to set every day.

- During the water loading process, press "Timing load" button again, it can stop the water loading immediately.
- When the symbol "  " light on screen, "Timing load" function is activated.

5.5 Temperature control water loading

Functional description:

When this function is activated, water will be loaded according to preset loading temperature. In the case that water tank isn't full, when tank temperature is above the preset loading temperature, controller starts to load water automatically until tank temperature drops to 5 °C below the loading temperature. In the case that water level is changed in the same, then water loading will be started after 60 minutes, doing like this can avoid water temperature changes so acutely and therefore avoid uncomfortable feeling for customer.


Press "tem. Load" button continuously to adjust the desired temperature for triggering water loading, adjustable range is "35°C ~95°C", default value is 55°C, 3 seconds later controller confirms the setting. The indicating light of temperature controlled water loading is on. When the water temperature is higher than the preset temperature of tank, water loading is started, when the water temperature drops 5°C below the preset temperature, water loading is stopped. Press this button again to cancel this mode.

When the symbol "  " light on screen, "Tem.Load" function is activated.

5.6 Hot water circulation

Function description:

The controller support the function that time-controlled hot water circuit

pump. It's asked to add one circuit pump (P2),user can set operation time of pump, to achieve hot water and water pressurized will come soon. Press "circulation" button continuously to adjust the operation time for circulation pump(adjustable time range is 1-30 minutes) and default value is 3 minutes. After 3 seconds controller confirms the setting, and indicating light of "  " is on, press this button again to switch off circulation pump during the operation of circulation pump.

5.7 Insulation by Tem. controlled

Functional description:

In Winter when ambient temperature is low, in order to avoid freezing pipeline.When test the temperature(T) on the pipeline less than turning on temperature(1°C),activate the accompany electrical heating cable(P2). When test the temperature(T) on the pipeline more than turning on temperature(5°C),deactivate the accompany electrical heating cable(P2).

For example:If setting turning on temperature was 1°C ,so when T drop to 0°C active the P2.When T rise up to 6°C deactivate the P2.


(Doing like this can save electricity, prolong the lifetime of heating wire and avoid fire accident which caused by aging electrical heating wire.)

Activate/deactivate function:

▶press "Insulation" button, Insulation signal and temperature blinks on displays,the function is activate.

▶press "Insulation" continuously,to adjust switch-on temperature(adjustable:0-99 $^{\circ}\text{C}$)

▶After setting,3seconds later,the controller activate insulation function. press "Insulation" button again to deactivate function.

When the symbol"  " light on screen,the function activated.

Note:

- Temperature sensor(T) not belong to standard delivery scope,user

who want to use this function need to buy it(T) with extra

- Without installation sensor(T),the function was deactivated automatically.
- Hot water circulation pump and pipe insulation function are controlled by a same output P2, when use pipe insulation function, P2 outlet is used, then thermostat hot water supply function will be deactivated automatically.

5.8 Insulation by time controlled


In Winter when ambient temperature is low, in order to avoid freezing pipe man can press "Insulation" button to activate accompany electrical heating cable (P2) to heat pipe. When this function is activated, electrical heating wire will works for 10 minutes(factory default,can not adjustable) and then stops for 30minutes(can adjustable), this process repeats. Doing like this can save electricity, prolong the lifetime of heating wire and avoid fire accident which caused by aging electrical heating wire.

Activate/deactivate function:

▶press "Insulation" button, Insulation signal and time blinks on displays,the function is activate.

▶press "Insulation" continuously,to adjust switch-off time(adjustable:0-99mins,factory default "00",mean that accompany electrical heating cable always "power on")

▶After setting,3seconds later,the controller activate insulation function. press "Insulation" button again to deactivate function.

When the symbol"  " light on screen,the function activated.

Note:

- Hot water circulation pump and pipe insulation function are controlled by a same output P2, when use pipe insulation function, P2 outlet is used, then thermostat hot water supply function will be deactivated automatically.

6. Protection Fuction

6.1 Collector high temperature protection

Functional description:

In the status that there is no water inside tank, and tank temperature is over 99 °C, then water-loading button is invalidated, and “E4” displays on screen, water loading is complete stopped until tank temperature drops below 80 °C. Doing like this can avoid breaking collector pipe, which caused by large temperature difference.

6.2 Low water pressure protection

Functional description:

During the water loading mode, because of low water pressure or no water flow rate (when water level can rise 1 level within 60minutes, then it means no water flow rate) controller will entry low water pressure protection mode automatically, low water pressure signal displays, after 30 minutes, controller exit program automatically. Doing like this can avoid damaging of electromagnetic valve, which caused by long operation, and avoid water flows back from tank to pipe.

7. Technical data

- Appearance of controller: see product itself
(dimension: 180mm x120mm x40mm)
- Power supply: AC230V±10%
- Power consumption: < 3W
- Accuracy of temperature measuring: ± 2°C
- Range of tank temperature measuring: 0 ~99 °C
- Range of temperature display: 0~ 99 °C
- Can connect loading pump:1pc < 600W
- Can connect electrical heating cable:1pc < 800W
- Ambient temperature : -10°C ~ 50°C.
- Water proof grade: IP41.
- Socket : choice by customer

8. Delivery scope

Controller-----	1 piece
Customer manual-----	1 piece
Water level and temperature sensor-----	1 piece
Solenoid valve-----	1 piece
M6 Plastic expansion screw-----	3 pieces
Ø4*30 flat screw-----	3 pieces
Power cord-----	1piece

9. Quality Guarantee

Manufacturer provides following quality responsibilities to end-users: within the period of quality responsibilities, manufacturer will exclude the failure caused by production and material selection. A correct installation will not lead to failure. When a user takes incorrect handling way, incorrect installation, improper or crud handling, wrong connection of sensor in system and incorrect operation, the quality responsibility is invalid for them.

The warrantee expires within 12 months after the date of purchasing the controller.