

Three time heating with time display

MICRO-CHIP CONTROLLER FOR SOLAR WATER HEATER

Installing and Operating Instruction

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|------------------------------------|--------------------------------------|
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INSTRUCTIONS FOR USE

◆ Preface

Dear users,

Thank you for using our company's Fully Intelligent Control Instrument of solar water heater. This Instrument, applied with the latest customized SCM, can professionally deal with a variety of demanding. It has features like: ultra-big color screen, pioneering water level display method, physical buttons which are convenient to operate. Besides, it has innovated one key mode control method and is equipped with multiple protection functions: fireproof of ribbon heater, overflow automatic prevention, idle sunning prevention, tube burst prevention, low water pressure protection and power failure memory. Its fashionable appearance shows its extraordinary taste.

Before installing and operating the product, please read the manual carefully to ensure that the product can be operated properly and bring its functions into full play. As an accessory to the machine, please keep the manual properly after using, so as to use it when you need maintenance for the product in the future.

◆ Main Technology Parameters

1. Power Supply: 220VAC±10% 50Hz Power Dissipation: < 5W
2. Temperature Measuring Range: 0~99℃
3. Temperature Measuring Accuracy: ±1℃
4. Temperature Control Accuracy: ±1℃
5. Water Level Grading: Five-grade percentage figures display
6. Power of Controllable Water Pump or Ribbon Heater: ≤ 500W
7. Power of Controllable Electric Heating Equipment: ≤ 1500W
8. Leakage Working Current: ≤ 10mA 0.1s
9. Parameter of Solenoid Valve: Direct current DC12V, pressure or no-pressure valve is optional.
Working Pressure of Pressure Valve: 0.02MPa~0.8MPa, suitable direct water supply
Working Pressure of No-pressure Valve: 0.005MPa~0.5MPa, suitable to water tank water supply or low water pressure water supply.
10. Ultra-big color screen with Low Power Dissipation: < 0.5W
11. Size of the Main Frame: 210×145×47.5mm

◆ Main Functions

1. Security Self-test: When you start the instrument, the full screen lights up and self-test starts with "Di" prompt tone to show the machine is in a normal state.
2. Clock display: Real-Local time displays.
3. Water Temperature Display: To show the actual water temperature inside the solar water heater.
4. Water Level Display: To show the actual water level inside the solar water heater.
5. Water Temperature Preset: the heating temperature preset range: 30℃~80℃.
6. Water Level Preset: the water level preset range: 50, 80, 100%.
7. Water Level Adaptation: According to the purity of water used and the degeneration in sensitivity of the sensor after a long term usage, the sensitivity of device is adjustable to ensure the accuracy of water level display.
8. Low Water Level Warning: When water level falls and water shortage appears, the device gives a buzzer alarm. And it twinkles when water level is 20%.
9. Water Fill When Lack: When water level falls and water shortage appears, with a 30-minute time-lapse, the water will be filled automatically to the preset water level. Or if the water temperature is under 95℃ and the water level is under 20% when power on, the water will be filled instantly to the preset water level.

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10. Tube Burst Protection: If the water level is under 20% and the water temperature is equal or higher than 95℃ when power on, the automatic water fill will be banned to avoid tube burst.

11. Power Failure Memory: When a power failure happens, the device will store all the parameters set before the power outage; when power on, the device will work following the model and functional parameters set before the power failure.

12. Automatic Overflow Prevention: When overflow caused by the vacuum tube broken or fault of water level sensor happens and the overflow protection time is met, the device will automatically stop filling water. Water level staying lack after 60-minute water fill will be taken as vacuum tube crack and stop water filling. When water level reaches 80% and continuing water fill for 30 minutes, it is still not filled up, the device will stop filling water.

13. Low Water Pressure Protection: During the water fill process of 20% or 50% water level, if the water level cannot rise a grade in 30 minutes because the water level is too low or the water supply is cut off, the device will stop filling water and "Low Water Pressure" prompt lights up in order to avoid the serious consequences as following in low water pressure or when water supply is cut off: 1. Long term operation of Solenoid valve or pump leads to pump idling or even burning down; 2. Water leakage caused by cracking vacuum tube of solar water heater or other reasons leads to continuously water filling and keeping leakage of tank or roof; 3. A sudden water supply after it cutting off, the temperature of tank becomes too high because of sunlight exposure, which may leads to tube burst.

14. Constraint Water Fill: When water level sensor breaks down, press "WATER" button to implement constraint water fill. The buzzer alarms every minute. Pay attention to overflow. The water fill will automatically stop after 8 minutes.

15. Temperature-controlled Water Fill: When water in tank is not full and water temperature is higher than preset controlling temperature of temperature-controlled water fill (Factory setting is 60℃.), the device will automatically fill water till temperature is 10℃ lower than the controlling temperature of water fill. This function can prevent improper matter of low water level with high water temperature. Time period covering temperature control function: 9:00-17:00. A long press on "WATER" button makes temperature control indicator light out and the "TEMP CONTROL" function canceled.

16. Deferred Water Fill: When using water (and water level declining), the device will defer 60 minutes to start temperature-controlled water fill (It won't defer when time preset) so as to prevent filling water when the user are using it.

17. Constant Temperature Heating: When the water temperature in tank is 5℃ lower than the preset constant temperature, the device will instantly start heating to the preset constant heating temperature to keep the water temperature. If the water level is lower to 50%, the device will not start heating to avoid dry heating. Therefore, the water level in the heating process shouldn't be lower to 50%. Double tubes set-up is suggested, so that the users can continuously use a large quantity of water with no influence. Press the button to cancel heating, and then the constant temperature heating function will pauses for 60 minutes. A long press on "HEATING" button makes the "CONSTANT TEMP" indicator lights out, and the constant temperature heating function is canceled. Factory setting is 50℃.

18. Tube Defrost: When it is cold outside in winter, press the "DEFROST" button to start ribbon heater so as to prevent the pipes froze and burst. Defrost time can be set by a long press on the "DEFROST" button. (Factory setting is 20 minutes; if setting 00 minutes, the ribbon heater keeps power on and stays in defrosting mode, which needs to be manually turned off.) When operating time reaches the use-set time, the meter will automatically turn off the ribbon heater. This function can not only save power but also prevent fatal accidents like fire caused by machine aging from long term of ribbon heating. In the process of defrosting, you can press the "DEFROST" button to turn off.

19. Automatic Pressure Boost: When the water supply is at low pressure, the water pump is available to be connected to help increasing water filling pressure. In the process of water filling, the meter opens the solenoid valve and starts the water pump to increase water pressure to supply water at the same time. When water filling ends, both of them turn off.

20. Overload Protection: When the meter starts electric heating, if the power supply exceeds the rated loading current or load occurs a short-circuit, the meter will automatically cut off the power supply, and gives a buzzer alarm for 5 times, the "overload" indicator lights on.

21. Screen Saver for Power Saving: On the basis of need, the user can choose whether to open the screen saver function. If you choose to open this function, the screen of meter will automatically light off if there is no button operation in 45-minute. And the screen can be light on by pressing any button. (After automatically lighting off, the functions still run as usual.) If you choose to cancel this function, the screen will keep lighting on. Factory setting is to keep lighting on (OF).

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22、 **Modes selection:** Three modes can be selected: Manual, Time and Intelligent modes.

Manual Mode:

In this mode, the device will neither automatically start water filling (excluding temperature-controlled water filling) nor automatically start heating (excluding constant temperature heating). On the basis of need, the user can press buttons to open or cancel water filling or heating. The user can enter the settings options to change the preset parameters by pressing ↑、↓. When water filling start, if the actual water level is higher than or equal to the preset water level of manual water fill, the meter will automatically fill water and shift up a level to ensure the user's need of water filling.

When heating starts, if the actual water temperature is higher than or equal to the preset water temperature of manual heating, the meter will automatically heat and shift up a level to ensure the user's need of heating. When heating starts, if the water level is lower than 50%, pressing heating button is invalid. In the process of heating, if the water level is lower than 50%, heating will be stopped instantly to protect the electric heating tube. Factory setting is 100% water level and 50℃ water temperature. The parameters can be reset by the user on the basis of need. Recommend that the preset heating temperature is no more than 60℃.

Time Mode:

Users can set three times water-filling and three times heating. Factory setting of the first time water filling is to start filling at 2:00 to 50% water level; the second is to start filling at 10:00 to 80% water level; and the third is to start filling at 16:00 to 100% water level. Factory setting of the first time heating is to start heating at 5:00 to 50℃; the second is canceled; and the third is to start heating at 17:00 to 55℃. The time and parameters mentioned above are factory default settings, which can be reset by the user to fully meet user's individual needs. In this mode, pressing buttons is valid.

Intelligent Mode:

Starting water filling at 2:00 to 50% water level and heating at 5:00 to 50℃ to ensure water supply for washing after the user get up. Starting water filling at 10:00 to 80% water level and heating at 11:00 to 50℃ to ensure water supply in the afternoon. Starting water filling at 16:00 to 100% water level and heating at 17:00 to 55℃ to ensure water supply in the evening. The time and parameters of all-day intelligent mode are unchangeable. In this mode, pressing buttons is valid.

◆ Application Method

The operation of our Fully Intelligent Controller of solar water heater is fully intelligent, so users don't have to do any operation. If users want to change operational modes, please press the SET button to switch among the three modes (The indicator of the selected mode keeps light-on; factory set is Intelligent mode.).

If the user wants to change the parameters in each mode, please operate as follows: press the SET button for more than 3 seconds till the buzzer alarms, release the button to enter the SET option, and press ↑、↓ to choose preset parameters as needed. After one preset parameter is set up, press SET button to enter the next option. The setting process is as follows:

In Manual Mode

- 1、 Set "Hour" of Clock Display (Factory setting is 12:00): Hour twinkling means the value of hour is being set now. Press↑、↓ to choose a suitable value of hour and press SET to enter the next option;
- 2、 Set "Minute" of Clock Display(Factory setting is 00:00): Minute twinkling means the value of minute is being set now. Press↑、↓ to choose a suitable value of minute and press SET to enter the next option;
- 3、 Set Water Level of Manual "WATER" (Factory setting is 100%): "Water Fill" lighting on and the value of water level twinkling means the water level of manual water fill is being set now. Press ↑、↓ to choose the water level needed and press SET to exit settings;
- 4、 Set Temperature of Manual Heating (Factory setting is 50℃): "HEATING" lighting on and the value of temperature twinkling means the value of the temperature of manual heating is being set now. Press ↑、↓ to choose the temperature needed and press SET to enter the next option.

INSTRUCTIONS FOR USE

In Time Mode

- 1、 Set "Hour" of Clock Display(Factory setting is 12:00): Hour twinkling means the value of hour is being set now. Press↑、↓ to choose a suitable value of hour and press SET to enter the next option;
- 2、 Set "Minute" of Clock Display(Factory setting is 00:00): Minute twinkling means the value of minute is being set now. Press↑、↓ to choose a suitable value of minute and press SET to enter the next option;
- 3、 Set Time of the First Time Water Fill(Factory setting is 02:00): TIME WATER and ① lighting on and hour twinkling means the value of hour of the first time water fill is being set now. Press↑、↓ to choose time needed and press SET to enter the next option;
- 4、 Set Water Level of the First Time Water Fill(Factory setting is 50%): TIME WATER, ① and Time Set lighting on and Water Level twinkling means the value of water level of the first time water fill is being set now. Press↑、↓ to choose water level needed and press SET to enter the next option;
- 5、 Set Time of the Second Time Water Fill(Factory setting is 10:00): TIME WATER and ② lighting on and hour twinkling means the value of hour of the second time water fill is being set now. Press↑、↓ to choose time needed and press SET to enter the next option;
- 6、 Set Water Level of the Second Time Water Fill(Factory setting is 80%): TIME WATER, ② and Time Set lighting on and Water Level twinkling means the value of water level of the second time water fill is being set now. Press↑、↓ to choose water level needed and press SET to enter the next option;
- 7、 Set Time of the Third Time Water Fill(Factory setting is 16:00): TIME WATER and ③ lighting on and hour twinkling means the value of hour of the third time water fill is being set now. Press↑、↓ to choose time needed and press S E T to enter the next option;
- 8、 Set Water Level of the Third Time Water Fill(Factory setting is 100%): TIME WATER, ③ and Time Set lighting on and Water Level twinkling means the value of water level of the third time water fill is being set now. Press↑、↓ to choose water level needed and press SET to enter the next option;
- 9、 Set Time of the First Time Heating(Factory setting is 05:00): TIME HEAT and ① lighting on and hour twinkling means the value of hour of the first time heating is being set now. Press↑、↓ to choose time needed and press SET to enter the next option;
- 10、 Set Temperature of the First Time Heating(Factory setting is 50℃): TIME HEAT, ① and Time Set lighting on and temperature value twinkling means the value of temperature of the first time heating is being set now. Press↑、↓ to choose temperature needed and press SET to enter the next option;
- 11、 Set Time of the Second Time Heating(Factory setting is --:--): TIME HEAT and ② lighting on and hour lighting on showing --:-- means the value of hour of the second time heating is being set now. Press↑、↓ to choose time needed and press SET to enter the next option;
- 12、 Set Temperature of the Second Time Heating(Factory setting is 50℃): TIME HEAT, ② and Time Set lighting on and temperature value twinkling means the value of temperature of the second time heating is being set now. Press↑、↓ to choose temperature needed and press SET to enter the next option;
- 13、 Set Time of the Third Time Heating(Factory setting is 17:00): TIME HEAT and ③ lighting on and hour twinkling means the value of hour of the third time heating is being set now. Press↑、↓ to choose time needed and press SET to enter the next option;
- 14、 Set Temperature of the Third Time Heating(Factory setting is 55℃): TIME HEAT, ③ and Time Set lighting on and temperature value twinkling means the value of temperature of the third time heating is being set now. Press↑、↓ to choose temperature needed and press SET to exit settings.

INSTRUCTIONS FOR USE

In Intelligent Mode

- 1、Set "Hour" of Clock Display(Factory setting is 12:00): Hour twinkling means the value of hour is being set now. Press↑、↓ to choose a suitable value of hour and press SET to enter the next option;
- 2、Set "Minute" of Clock Display(Factory setting is 00:00): Minute twinkling means the value of minute is being set now. Press↑、↓ to choose a suitable value of minute and press SET to exit settings.

Remarks:

- 1、A long press on "HEATING" button for 3 seconds can open or cancel the function of constant temperature heating: Set Temperature of Constant Temperature Heating(Factory setting is 55℃): "CONSTANT TEMP" indicator lighting on and temperature value twinkling means the temperature value of constant temperature heating is being set now. Press↑、↓ to choose temperature needed.
- 2、A long press on "WATER" button for 3 seconds can open or cancel the function of temperature-controlled water fill: *(Note: if you choose the constant water level version, then long press water key can open or close the constant water level function)*
Set Temperature of Temperature-controlled Water Fill(Factory setting is 60℃): "TEMP CONTROL" indicator lighting on and temperature value twinkling means the temperature value of temperature-controlled water fill is being set now. Press↑、↓ to choose temperature needed.
- 3、A long press on "DEFROST" button for 3 seconds can set the time of stopping defrosting:
Set Defrost Time (Factory setting is 20 minutes): "DEFROST" indicator lighting on and minute value twinkling means the time of automatically turn off after starting defrosting is being set now. Press↑、↓ to choose time needed.
- 4、A long press on "MODE" button for 3 seconds can shift into screen saver function for Power Saving:
Screen Saver ON、OF (Factory setting is OF, "ON" means turning on, "OF" means turning off) .
- 5、A press on Reset button can reset all the parameters to factory settings. Reset button is shown in the wiring diagram. In the process of setting, if the user doesn't operate for a long time, the setting option will twinkles for 10 times and automatically exits the setting interface

◆ Parameter Range Establishment

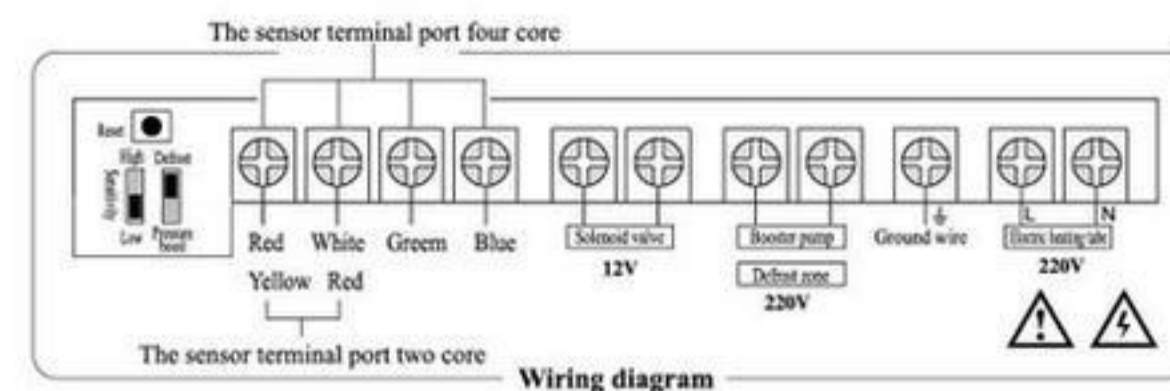
- 1、Time of the First Time Water Fill: 00:00~23:00 (Factory setting is 02:00)
- 2、Water Level of the First Time Water Fill: 20%&100%, 50, 80, 100% (Factory setting is 50%)
- 3、Time of the Second Time Water Fill: 00:00~23:00 (Factory setting is 10:00)
- 4、Water Level of the Second Time Water Fill: 20%&100%, 50, 80, 100% (Factory setting is 80%)
- 5、Time of the Third Time Water Fill: 00:00~23:00 (Factory setting is 16:00)
- 6、Water Level of the Third Time Water Fill: 20%&100%, 50, 80, 100% (Factory setting is 100%)
- 7、Time of the First Time Heating: 00:00~23:00 (Factory setting is 05:00)
- 8、Temperature of the First Time Heating: 30℃~80℃ (Factory setting is 50℃)
- 9、Time of the Second Time Heating: 00:00~23:00 (Factory setting is --:--)
- 10、Temperature of the Second Time Heating: 30℃~80℃ (Factory setting is 50℃)
- 11、Time of the Second Time Heating: 00:00~23:00 (Factory setting is 17:00)
- 12、Temperature of the Third Time Heating: 30℃~80℃ (Factory setting is 55℃)
- 13、Water Level of Manual Water Fill: 50, 80, 100% (Factory setting is 100%)

INSTRUCTIONS FOR USE

- 14、Temperature of Manual Heating: 30℃~80℃ (Factory setting is 50℃)
- 15、"Hour" of Clock Display: 00:00~23:00 (Factory setting is 12:00)
- 16、"Minute" of Clock Display: 00:00~00:59 (Factory setting is 00:00)
- 17、Temperature of Temperature-controlled Water Fill: 50℃~80℃ (Factory setting is 60℃)
- 18、Temperature of Constant Temperature Heating: 30℃~80℃ (Factory setting is 50℃)
- 19、Time of Defrost: 00, 5~90 minutes (Factory setting is 20 minutes)
- 20、Screen Saver for Power Saving: On, OF (Factory setting is OF, "On" means function working and "OF" means function canceling)
20% and 100% twinkling when setting water level means this function canceled.

◆ Installation of Fully Intelligent Controller Meter

- 1、Install the plate at places away from water and convenient for observation and operation, and fix it with screws.
- 2、Put the meter on the plate and open the cover of terminal box below the meter.
- 3、Match the socket of cable of water temperature and water level sensor probe with the red-marked plug, and fasten them. (If using the wiring connection way, please connect them to the corresponding terminals according the wire colors)
- 4、Referring to the wiring diagram, connect the wires of electric heating tube, Solenoid valve, water pump and ribbon heater to the corresponding binding posts and the wires must be fastened. Make sure no misconnection, otherwise accidents may occur.
- 5、the wires can be pull out from the lower right side. After all the installation have been done and checked, close the cover of terminal box. Switch on the device and start up self-testing.



- ⚠ Attention: As the power of electric heating is large, binding must be fastened; otherwise serious fire may be caused.
The Diameter of Electric heating output wires must be no less than 1mm.

◆ Installation of Temperature and Water Level Sensor

- 1、Insert the sensor through the overflow pipe. Pull the leading wire lightly to make it close to the inlet. Reach into the pipe for about 1 centimeter and then set silicone fasteners on the overflow pipe.
- 2、Lead the cable indoor. Fix the cable outdoor to prevent it broken from straining or scraping.
- 3、The sensor mustn't be set close together with or near electric heating tube.
- 4、In the process of installation, Must keep the socket from getting wet or soaked.
*Also have underneath type sensor, which is installed upward from the bottom of water tank. Fasten screw nuts of installing fastener. Make sure no water leakage (Shown as the installation diagram)
- 5、Recommended that all the cables are protected by PVC protecting pipes and reduce faults by normative installation.

INSTRUCTIONS FOR USE

◆ Installation of Solenoid Valve

- 1、 Installation direction: Don't misplace the inlet and outlet ends of Solenoid valve. The inlet end is with strainer and the arrow at the bottom shows the water flow direction.
- 2、 Two-core connection wire is connected to Solenoid valve. The wire can be lengthened. Cable with a larger diameter should be used when connecting.
- 3、 The Solenoid valve used on the meter contains block device, so don't need install one-way check valve.
- 4、 If the strainer is clogged with dirt, unscrew the nuts of tee joint on the inlet end of solenoid valve, take out the strainer and put it back after cleaning, and then fasten the nuts.

◆ Matters for Attention

- 1、 Don't install the meter at places where may be showered.
- 2、 Should be installed by the professional, because improper installation may make the meter out of work or even permanent damage.
- 3、 Don't keep the tank empty for a long term, so as to avoid high temperature caused by sun exposure and to protect solar water heater and water temperature and water level sensor.
- 4、 In order to avoid a long term of overflow caused by improper operation, unstable power supply, control failures, the solenoid valve and the solar water heater mustn't be installed at places where water may seep into room or accidents may caused by water spraying. If there is a return tube, it should be connected to reliable drainage pipes.
- 5、 The meter itself has the lightning protection, but for security reasons, please install reliable lightning protect measure to protect against lightning. When lightning occurs, cut off power supply instantly and stop using solar water heater, pay attention to the personal safety.
- 6、 The meter has multiple protection features, so there is no need to unplug when using water.
- 7、 Before the maintenance operations like changing sensors, maintenance man must cutoff power supply.

◆ Product Warranty

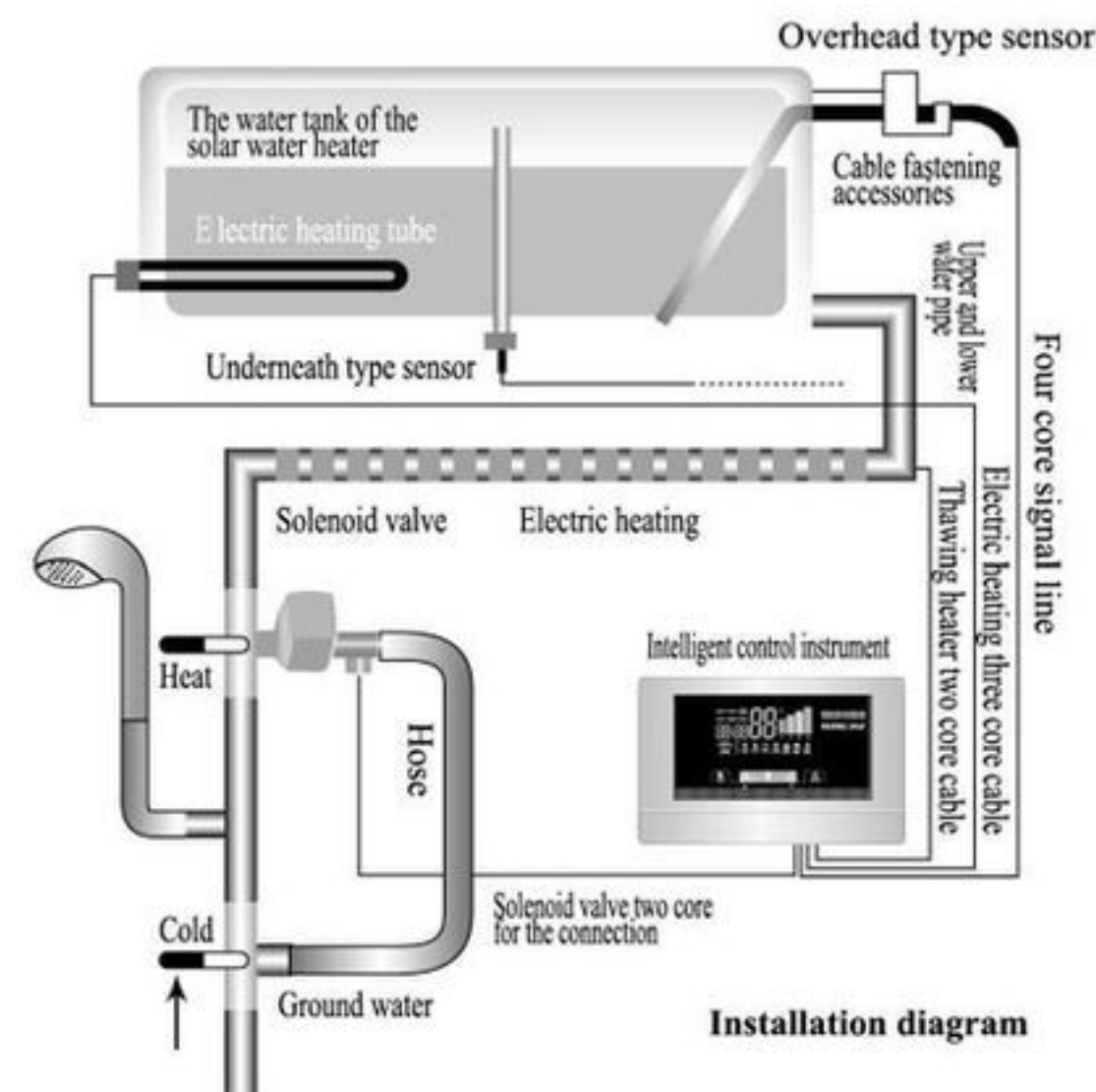
One year warranty from the date of purchase and lifetime services are offered. The warranty is not applied under the following circumstances, which are chargeable services:

1. Be expired for the warranty period, altering or lacking production conformity label.
2. Altering the warranty card, or the content of card not consistent with the actual condition.
3. Lacking warranty card or legal purchase receipt.
4. Damage caused by private teardown.
5. Damage caused by violation of product instruction.
6. Damage caused by force majeure.

measurement and control instrument guarantee

Name of the user:	Telephone number:
Address of the user:	Ex factory number:
The product model:	The date of purchase:
Ex factory date:	Distributor (seal):

INSTRUCTIONS FOR USE



Installation diagram

- * please to the local service supplier, dealer or required to provide after sale service
- * Morpheus models according to the host on the right side of the switch to open or close the intelligent anti-theft function

The Common Faults and Settlement

symptom	cause	solution
Boot without self-test, no display or display exceptions	Insufficient voltage or poor contact	Unplug the power cord , check the voltage and re plug the power supply or reset
Display —℃ Both the lights at water level 20% and 100% are on	Poor contact, insert reversely or wire break; Damaged by lightning	Tight plug the red marked terminal or replace it Repairing or replace the mainframe
Water filling is too slow or no water filling Light of low water pressure is twinkling	Water pressure is low or solenoid valve strainer is clogged with dirt The connection wire of Solenoid valve broken Water supply cut-off or vacuum tube crack	Fill water with pressurization or clean the strainer of Solenoid valve Check connection wires Wait for water supply or replace vacuum tube
Heating light on but temperature does not rise or not continuous rise	Electric heating tube breaks; Electric heating tube has temperature control device	Replace electric heating tube; Reduce the preset heating temperature
Display leakage	leakage protection	Check electric wiring
Display overload	Overload protection	Check overload connection

*The manufacturer reserves the right to revise technical and the product specifications without advance notice.