

Technology makes the life perfection!

TK-8A Series Intelligent Controllers for Solar Water Heater



⚠ Please read this instruction carefully before using the controller

TK-8A Manual

Dear users:

Thank you for using digital color-screen solar controller. TK-8A solar heater micro-computer all-intelligence controller is especially equipped for the solar heater, which is applied with the latest development in the digital singlechip technology.

It has the following characteristics: water replenishment; all-intelligence heating; humanization design; power-off memory; time setting; (overflow, high-temperature and creepage) protection; heating to a constant temper; water-replenishment to a constant volume; twice time-setting (water-replenishment, heating); super lightning protection; manual control and optional automatic pressurization or heat preservation, etc. It suits all the users who want high-quality life. It is of high convenience, safety and practice.

1. Technical index

- 1.1 applied power source: 220V/50Hz power: <5w
- 1.2 thermometric precision: $\pm 2\text{ }^{\circ}\text{C}$
- 1.3 thermometric range: 0-99 $^{\circ}\text{C}$
- 1.4 temperature-control precision: $\pm 2\text{ }^{\circ}\text{C}$
- 1.5 water levels: 5
- 1.6 power of the water-pump or electronic heating belt: $\leq 500\text{ W}$
- 1.7 power of the electronic heating: $\leq 1500\text{ W}$
- 1.8 electric current of creepage $\leq 10\text{ mA}/0.1\text{S}$
- 1.9 electromagnetic valve index: DC 12V, with or without valve is optional
working pressure of the "with valve": 0.02 MPa \sim 0.8 MPa, suitable for direct water supply;
working pressure of the "without valve": 0.0MPa, suitable for water supply from the water-tank or with low water pressure.

2. Function introduction

- 2.1 clock display: display the time
- 2.2 self-check at starting-up: the "Beep" sound shows the normal condition of the main engine
- 2.3 pre-set of the water-level: pre-set the water-level at 50, 75, 100%
- 2.4 pre-set of the water-temperature: the pre-set temperature range: 30-80 $^{\circ}\text{C}$, 00 $^{\circ}\text{C}$ means constant electric heating off.
- 2.5 water-temperature indication: display the actual temperature of the solar heater's water tank

TK-8A Manual

- 2.6 water-level indication: display the left water volume in the solar heater's water tank
- 2.7 water-lack warning: when the water-level falls and to the point of lack of water, the machine will "Beep" and the "25% water-level" indication shines.
- 2.8 water-replenishment at the point of lack of water: when the water volume falls and to the point of lack of water, the machine will automatically replenish water to the pre-set water-level after 15 minutes.
- 2.9 manual water-replenishment: when the water-levels falls below the pre-set water-level, press the "water-replenishment" button to manually replenish water. If the water-level is at the pre-set level, it will replenish to the upper level. When the water-level gets to 100%, press the "water-replenishment" button to stop replenishing.
- 2.10 manual heating: when the water-temperature gets below the pre-set temperature, press the "heating" button to heat the water to the pre-set temperature; press again to stop heating.
- 2.11 temperature-controlling water-replenishment: during 8:00-17:00, if the water-tank is not full, when the temperature is above 70°C, the machine will automatically replenish water to lower the temperature to 55°C to prevent high temperature with low water volume. When the water-levels falls, this function works after 90 minutes. During 17:00-8:00, this function stops working.
- If you want to cancel this function, press the "intelligence" button, if the indication of "temperature-controlling water-replenishment" is out, then this function is off. If the indication is on, then this function is on.
- 2.12 constant temperature heating: if the temperature of the water-tank falls below 5°C, the machine will start heating to the pre-set water-temperature to keep the constant temperature of the water-tank. (The default setting is 50°C). If the water-level falls below 50%, the machine will start replenishing to the pre-set water-level, and then heating to prevent boiling away. So the water-level should not be lower than 50% under any situation. We strongly suggest not to set the water-temperature lower than 60°C and to install up and down two water pipes to insure the constant use. Constantly press the "heating" button to start "constant temperature heating" function, the indication light of "constant temperature" is on. Otherwise, this function is off.

TK-8A Manual

- 2.13 constant water-level replenishment: if the water-levels falls below 75%, the machine will instantly start replenishing to 100% to make sure the water-level is not lower than the constant water-level. If manually pause replenishing, then this function will be paused for 60 minutes. We strongly suggest not to set the water-temperature lower than 60°C and to install up and down two water pipes to insure the constant use. Constantly press the "water-replenishment" button to start "constant water-level replenishment" function, the indication light of "constant water-level" is on. Otherwise, this function is off.
- 2.14 timing water-replenishment and timing heating: If the water supply becomes unstable, users can set once or twice timing water-replenishment and timing heating according to your specific life style. After the setting, water-replenishment and heating will be automatically finished everyday. If you want to cancel timing water-replenishment or timing heating function, you just need to set the timing as 24:00.
- 2.15 compulsory water-replenishment: if any problem happens with the water-level sensor, press the "water-replenishment" button to start compulsory water-replenishment. The "Beep" sound comes out every minute. Please look out overflow. This function is automatically stopped after 8 minutes.
- 2.16 automatic pressurization: when the hydrostatic pressure of water supply is low, you can choose the automatic pressurization function. Open the electromagnetic valve on the controller and start up the pump to pressurize the water supply. When the water tank is fully replenished, the electromagnetic valve and the pump will be closed synchronously.
- 2.17 pipe temperature preservation: in the winter, when the outdoor temperature is low, press the "temperature preservation" button to start up the electric heating belt, and the "pipe temperature preservation" indication shines on the screen in order to prevent the water pipe from frost cracking. Press the "temperature preservation" button again to close the electric heating belt.

Pipe temperature preservation and automatic pressurization cannot be used at the same time. How to choose: open the cover of the junction box, and use the connection collar to connect either to the pressurization or temperature preservation. The default set is temperature preservation. For example, if you choose pressurization, the temperature preservation will be

TK-8A Manual

unaffected.

2.18 electric heating belt fire-proofing: after starting up the pipe temperature preservation, the controller will automatically shut the electric heating belt when the pipe temperature is balanced. (about 15 minutes after electrify). When the pipe temperature falls down, this function will work again according to the setting timing. (The default timing is 0 minutes, so the electric heating belt is always electrified). The range of timing is 1–45 minutes. This course is automatically repeated. Please avoid long-term electrify to save energy and prevent the fire accident from the aging of the electric heating belt.

2.19 power-off memory: when the power if off, the controller will save all the index set by the users.

2.20 high-temperature protection: when the solar heater is lack of water and the temperature is higher than 95°C, the water-replenishment function will be shut down and the "high-temperature protection" indication will be lighted. After this indication is off, the water-replenishment will work again.

2.21 overflow protection: if the water-level is not raised after 30-minute replenishment because of the cracking of the vacuum tube or low water supply pressure. The water replenishment will be shut and the "overflow" indication will be lighted. Press the "water-replenishment" button to cancel the overflow protection function. Press again to start up the water replenishment. Please look out overflow.

2.22 water quality setting: C1 for normal water, C0 for pure water.

You will hear a long "Beep" when the water-replenishment and heating are started up. And three short "Beep" when they are shut down.

3.Usage

The water-replenishment and heating is all-intelligence functioned, so users don't need to operation. If users want to change the pre-set water level and temperature or change to the timing mode, do the following operations, press the "set" button to get into the setting condition:

3.1 Water-temperature setting:

After get into the setting condition, the temperature of 50°C shines, press "▲" or "▼" to set temperature.

TK-8A Manual

3.2 Water-quality setting:

Press the "set" button again, "C1" is lighted and the 100% water-level shines. Press "▲" to set water-quality and "▼" to set water level.

3.3 Pipe temperature setting:

Press the "set" button again. The temperature preservation time "00" shines, press "▲" and "▼" to set temperature preservation intervals. (1–45 minutes).

3.4 Water-replenishment timing setting:

Press the "set" button again, the indication of "08:00" means the first water-replenishment is at 8 AM. Press the "set" button again, the indication of "24:00" means the second timing water-replenishment is shut down. If you want to start up or change the timing, press "▲" and "▼" to set water-replenishment timing.

3.5 Heating timing setting:

Press the "set" button again, the indication of "16:00" means the first heating is at 16:00. Press the "set" button again, the indication of "24:00" means the second timing heating is shut down. If you want to start up or change the timing, press "▲" and "▼" to set heating timing.

3.6 Time setting:

Press the "set" button again and get into the time setting. Press the "set" button, the "hour" shines, press "▲" and "▼" to set hour. Press the "set" button again, the "minute" shines, press "▲" and "▼" to set minute.

When the set is finished, press the "set" button to get back to the main interface.

3.7 Index restoration:

If you want to cancel all the setting, press the "set" button for a long time to restore all the default setting. (water temperature 50°C, water level 100%, water-replenishment timing ① 8:00 ② 24:00 shut down, heating timing ① 16:00 ② 24:00 shut down, pipe temperature preservation 00 long-term temperature preservation started up, temperature-controlled water-replenishment open, water quality C1 normal water).

4.Attentions:

4.1 Don't wet the controller directly by the water.

4.2 Don't leave the water tank empty to protect the solar heater and sensor.

TK-8A Manual

- 4.3 To prevent long-time overflow from wrong operation, unstable power or control failure, the electromagnetic valve and solar heater must be installed in the place which is safe from overflow and injection accidents and has reliable thunder-arresting equipments. Look out the thunder attack. When the thunder attack happens, shut down the power at once and stop using the solar heater. Look out personal security.
- 4.4 It is normal that the speed of water-replenishment is slow but the water pressure is ok. Maybe it is because the filter screen of the electromagnetic valve is stuck. Discharge the connection port and clean the filter screen.
- 4.5 If the sensitivity of the sensor goes down because of the extra-longtime usage or the water purity(the bad electrical conductivity) and the 100% water-level is not lighted, press the "set" button to raise the sensitivity.
- 4.6 The controller has the creepage protection function. The users must press the "heating" button to shut down heating. The indication of "heating" is off. No need to unplug the power.
- 4.7 Restoration operation: if the controller needs restoration, electrify the controller first, pull out the cover of the connection junction box under the panel and press the "restoration" button to do the restoration operation.

5.Three guarantees

We implement one-year "three guarantees" and life-long maintenance for our products which are non-personal damaged.

Common troubleshooting

trouble	reason	resolving method
No self-check no display or wrong display when the machine is started up.	Power shortage or bad contact. The inner rechargeable batteries are used out.	Unplug the power, check the power pressure, re-plug the power and charge.
The indications of "— °C" "25%"water-level and "100%" water-level are lighted at the same time.	Bad contact, inverted plug or connection failure, damaged by the thunder-attack.	Re-plug the power by the corresponding green label. Change or maintain the main machine.
Slow or no water-replenishment. The indication of "overflow" is lighted.	Low water supply pressure. The filter screen of the electromagnetic valve is stuck. Connection failure in the electromagnetic valve. No water supply or broken vacuum tube.	Pressurize the water supply or clean the filter screen of the electromagnetic valve. Check the connection. Wait for the water-supply or change the vacuum tube.
The indication of "heating" is lighted. The temperature cannot go up or keep going up.	The electric heating pipe is broken. The electric heating pipe has temperature-control equipment.	Change the electric heating pipe. Lower the pre-set heating temperature.
Display "creepage protection"	Creepage protection	Check the electric connection.

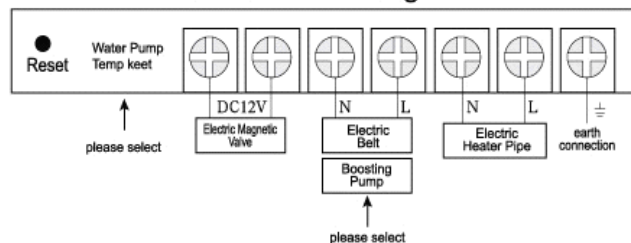
* The manufacturer reserve the right of changing the technology and product specifications without beforehand notice.

TK-8A Manual

6. The installation of the all-intelligence controller

- 6.1 open the cover of the connection junction box under the controller
- 6.2 connect the green labels on both the electric outlet of the sensor of water-level and temperature and the plug. Fix the electric outlet and the plug in the slot.
- 6.3 install the bracket in the places where the controller won't be directly wet by the water and easy to see.
- 6.4 install the controller on the bracket. Then connect the electromagnetic valve, pressure pump or electric heating belt, and the electric heating pipe to the corresponding electric outlet according to the connection diagram. Don't make any mistake, otherwise there would be accidents. Please choose temperature preservation or pressurization.
- 6.5 connection wires come out from two positions in the back below the controller, then close the controller with the cover. Electrify the controller after all the connections are finished and function the "self-check".

Connection Diagram



Special tips: the power of the electric heating is big, so the wiring terminal must be tightly pressed. Otherwise big accidents like fire will happen.

7. The installation of the sensor of the water-temperature and level

- 7.1 Fix the fastening accessories to the overflow pipe, and then insert the overflow pipe into the sensor. Push the wire and fix it onto the entry. Then insert the wire back by 1 cm and fix the wire by press plate.
- 7.2 Pull the wire indoors and fix the outdoor wires to prevent from breaking.
- 7.3 The probe of the sensor must not touch or be too close to the electric heating pipe.
- 7.4 Must not wet the electric outlet during the installation.
- 7.5 All the wires must be protected by the PVC protecting pipe. Install according to the instruction to prevent accidents.

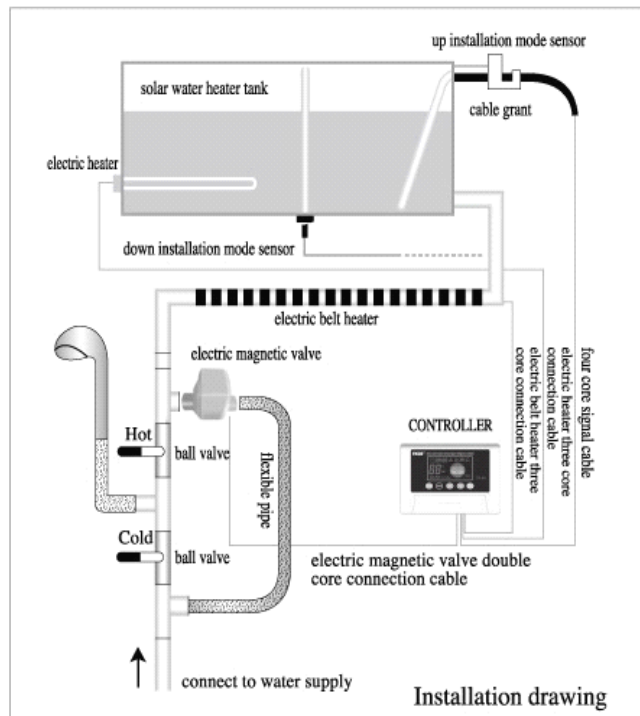
Install the underneath type of sensor from the bottom of the water tank. Tightly fix screw cap. No leak. (refer to the installation diagram)

8. The installation of the electromagnetic valve

- 8.1 Installation direction: don't mis-connect the "entry" and "exit" of the

TK-8A Manual

- electromagnetic valve. The "entry" is where there is a filter screen. The direction of the arrowhead underneath is the water flow direction.
- 8.2 Connect the two-core wire with the electromagnetic valve. The leading wire can be lengthened. Thicker wire is preferred.
- 8.3 The electromagnetic valve of the TK-8A all-intelligence controller is equipped with anti-backflow device. It is not necessary to install one-way valve with anti-backflow device.
- 8.4 The pipe connected to the water-entry should be soft pipe or other ones easy to discharge for the convenience of cleaning the stopper on the filter-screen.



TK-8A controller warranty card	
USER:	<input style="width: 100%;" type="text"/>
TELEPHONE:	<input style="width: 100%;" type="text"/>
ADDRESS:	<input style="width: 100%;" type="text"/>
DATE OF PURCHASE:	<input style="width: 100%;" type="text"/>
PRODUCT MODEL:	<input style="width: 100%;" type="text"/>
DATE OF SHIPMENT:	<input style="width: 100%;" type="text"/>
SERIES NUMBER OF SHIPMENT:	<input style="width: 100%;" type="text"/>
SIGNATURE OF FACTORY	