

**CAUTIONS**

1. To protect solar water heater and water temperature and level sensor, water tank shall not be empty for long.
2. In case of mistaken operation or malfunction of power supply, or other unexpected conditions cause long-time overflow, electromagnetic valve and solar water heater must be installed where water will not leak indoors or spout out, causing danger. Reliable thunder-proof system must be installed.
3. The apparatus has power-leakage protection function. When users want to use water, press "heating" key to stop heating. When the indicator is off, users will feel assured to use. Pull out the plug if necessary.

**INSTALLATION OF INTELLIGENT TESTING AND CONTROLLING APPARATUS**

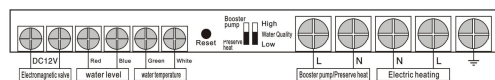
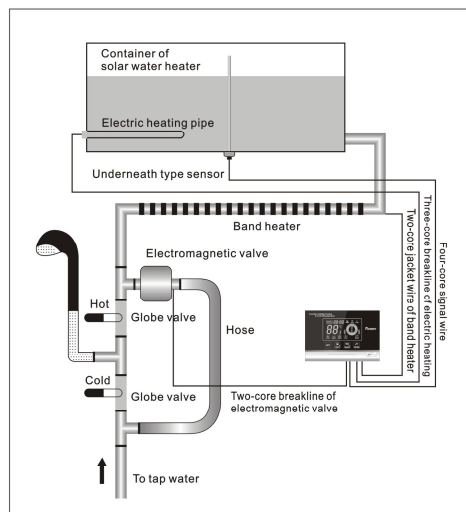
1. Open the cover of junction box below testing and controlling apparatus.
2. Install bracket on the place sheltered from watering and convenient for observing. Fix it with screws.
3. Hang the testing the controlling apparatus on bracket. Connect electromagnetic valve, signal lines and connecting wire to the corresponding connection socket according to sketch map.
4. Connecting wire may be drawn from behind. Cover junction box. Have a general check after installation, then power on for self-detecting.

**INSTALLATION OF ELECTROMAGNETIC VALVE**

1. Direction: Do not mix the water inlet and outlet of electromagnetic valve. The end with sieve is water inlet. Arrow on bottom is the direction of water flow.
2. Two-core connecting wire is connected to electromagnetic valve. Down-lead may be lengthened. Choose cable conductor of large diameter.
3. The electromagnetic valve of Pioneer-Series testing and controlling apparatus is equipped with non-return system. One-way check valve is not necessarily installed.
4. Pipes connected to water inlet shall be hose or other pipes easy for disassembly, for the convenience of removing obstructions on sieve. Have a general check after installation, then power on for self-detecting.

**INSTALLATION OF WATER TEMPERATURE AND LEVEL SENSOR**

1. Insert sensor through overflow pipe and connect and fix the four-core signal wires according to the corresponding sensor junction box. Cover the box and adjust the position to fix it and tighten the sensor screws.
  2. Draw the cable indoors. Fix the outdoor cable to avoid being rubbed.
  3. Sensor is strictly forbidden to touch or be too close to electric heating pipe.
  4. Strictly avoid being wet or soaking socket during installation.
- \*Underneath type sensor is installed upward from the bottom of water tank. Fix and tighten screws. No water leakage is allowed (refer to the Scheme of Installation).

**SCHEME OF WIRING****SCHEME OF INSTALLATION**

※Please consult the local service supplier or dealer, or require to provide after-sale service.

**WARRANTY CERTIFICATE**

User's name \_\_\_\_\_ User's Tel. \_\_\_\_\_  
 User's address \_\_\_\_\_  
 Product model \_\_\_\_\_ Ex-works no. \_\_\_\_\_  
 Date of production \_\_\_\_\_ Date acquisition \_\_\_\_\_

Dealer (stamp)

# PIONEER-SERIES OF COMPLETE-INTELLIGENT TESTING & CONTROLLING APPARATUS

**MAJOR FUNCTIONS**

- ◎Water-temperature display
- ◎Water-level display
- ◎Cock display
- ◎Water level preset
- ◎Water-temperature preset
- ◎Water-full stops
- ◎Water fill on shortage
- ◎Manual affusion
- ◎Timing affusion
- ◎Forced affusion
- ◎Manual heating
- ◎Timing heating
- ◎Constant-temperature heating
- ◎Power-leakage protection
- ◎Water-overflow protection
- ◎Preserve heat in water pipes
- ◎Booster pump in water pipes
- ◎Prevention of empty burning
- ◎Memories-on with power off
- ◎Intelligent mode
- ◎Timing mode
- ◎Temperature-control mode
- ◎Timing affusion twice
- ◎Timing heating twice
- ◎Pipe-explosion protection

## DEAR CUSTOMERS:

Thank you for choosing XBS-series of solar water heater with a complete-intelligent testing & controlling apparatus, which is developed based on the latest single-chip computer technology and a higher demand for new ideas. The present product has a large and colorful screen applying screen touch-tone which is more convenient as it has three modes: intelligence, timing and temperature control. Its outlook is ultra thin and has a ring-shaped water level display. In addition, many other functions are included as follows: prevention of electric band heater catching fire; auto leakage prevention; prevention of vacuum tubes exposed in the sun; pipe-explosion protection; protection for low water-pressure; memories-on with power off ect. All these provide more convenience and more stability for you to use our apparatus.

## MAJOR TECHNICAL INDEX

1. Power supply: 220VAC (or select 110 VAC) power dissipation: <5W
  2. Precision of temperature measurement:  $\pm 2^{\circ}\text{C}$
  3. Range of temperature measurement: 0-99 $^{\circ}\text{C}$
  4. Precision of temperature controlling:  $\pm 2^{\circ}\text{C}$
  5. Water level: five levels
  6. Controllable pump or power of electric band heater: <500W
  7. Power of controllable electric heating: <1500W 3000W available
  8. Action-current of power-leakage:  $\leq 10\text{mA}/0.1\text{s}$
  9. Parameter of electromagnetic valve: Direct current: DC12V (valve with or without pressure)
- Working pressure with valve with pressure: 0.02MPa, available to direct water supply
- Working pressure with valve without pressure: 0.0MPa, available to cistern supply or low-pressure water supply

## MAJOR FUNCTIONS

- **Time:** Show real Beijing time
  - **Water level preset:** Preset water level to 50%, 80% or 100%
  - **Water temperature preset:** Heating range 30 $^{\circ}\text{C}$ -80 $^{\circ}\text{C}$ . When timing heating, if you needn't start electric heating, water temperature can be preset to 00 $^{\circ}\text{C}$
  - **Water temperature indication:** actual water temperature inside solar water heater
  - **Water level indication:** actual remaining water level inside solar water heater
  - **Water shortage indication:** when water level lowers or water in shortage, buzzer will alarm and at the same time 20% of water lever will glint.
  - **Water affusion on shortage:** when water level lowers and water is in shortage, water will be auto-matically filled in 30 minutes to the preset level.
  - **Hand control:** Start water-affusion and water-heating manually. On operation, first it shows the preset water-level and water-temperature. Customers can use keys " $\uparrow$ " or " $\downarrow$ " to adjust and preset parameter, make sure and start water-affusion and water-heating and also it can be closed manually. In order to heat water, if water level is low than 50%, you should start water-affusion first and then start water-heating. On water heating, if water level is low than 50%, it will be closed automatically to protect electric heating pipes.
- Start water affusion manually, if actual water level is greater or equal to the preset water level, the apparatus will automatically up-regulate the preset water level to guarantee customers' demand of water affusion. Start water heating manually, if actual water temperature is greater or equal to the preset water temperature, the apparatus will automatically up-regulate the preset water temperature to guarantee customers' demand of water heating. Suggested preset water temperature is below 60 $^{\circ}\text{C}$ .

● **Modes to choose:** Three modes to choose: intelligent, timing and temperature-controlled.

**Timing mode:** Preset timing water affusion twice and timing water heating twice. When produced, the first timing water affusion was preset at 9:00am up to 100% and the second timing water affusion was at 15:00pm up to 100%. As to timing water heating, the first one was preset at 4:00am up to 50 $^{\circ}\text{C}$  and the second one at 16:00pm up to 50 $^{\circ}\text{C}$ . Customers can repret the time and its parameter to meet different demands.

**Temp-controlled mode:** When water tank is not fully filled and water temperature is higher than the preset temperature of temp-controlled water affusion (when produced, it was set to 70 $^{\circ}\text{C}$ . 65 $^{\circ}\text{C}$  or 80 $^{\circ}\text{C}$ ), it will automatically fill water till a proper water temperature 15 $^{\circ}\text{C}$  below the temp-controlled water. This function can prevent some unreasonable phenomena like low-water discharge and high water temperature. When used (water level changes), it will delay 60 minutes to start in order to avoid water affusion when customers are using water. It has time fuction of controlling water temperature: 8:00-

17:00. Under this mode, it won't automatically start electric heating. Customers can choose manual water-heating according to your demands as it is much more energy-saving.

**Intelligent mode:** Water affusion at 3:00am to 50% water level and water heating at 4:00am to 50 $^{\circ}\text{C}$  to guarantee the washing water after getting up. Ater affusion at 9:00am to 100%. If customers use water on the way and the water level is below 80%, then the apparatus will start water affusion again at 16:00pm to 80%. If water temperature is below 50 $^{\circ}\text{C}$ , then the apparatus will start water heating at 17:00 to 50 $^{\circ}\text{C}$  so that it can guarantee customers 80% water level and water temperature at 50 $^{\circ}\text{C}$ . Under the intelligent mode, if water tank is not full between 8:00am and 17:00pm and water temperature is higher than the preset temperature of temp-controlled water affusion, then the apparatus will start temp-controlled water affusion so that it can guarantee the largest quantity of water on the condition of water temperature above 50 $^{\circ}\text{C}$ . All the parameter in intelligent mode were set when produced and we suggest you choosing this mode as it can not only guarantee the demand of using hot water but also can save electric energy.

● **Automatic prevention of water overflow:** It will stop water affusion automatically when water overflows as a result of vacuum tube bursting or broken-down water-level sensor or other reasons. When in water shortage or 80% water level, start water affusion and 30 minutes later water level do not change, it will go into the state of prevention of water overflow and stop water affusion. Remove at 8:00am and start water affusion.

● **Memories-on with power off:** When power is off, the apparatus will reserve all the preset parameters and Beijing Time and will be automatically deadlocked to prevent incorrect manipulation. When power is on, it can work again according to the previous preset working modes and functions.

● **Constant-temperature heating:** When water temperature in water tank is below constant temperature 5 $^{\circ}\text{C}$ , it will start water heating immediately to constant-temperature water tank to guarantee a constant water temperature in the tank. When water level is below 50%, it will first start automatic water affusion and then water heating in order to prevent burning without water. Therefore water level shouldn't be below 50% and we suggest installing two pipes (one for water up and one for water down) so as not to influence you when you want a large amount of water.

Continue to press "Heating" key to enter the function of constant-temperature heating(it was set at 50 $^{\circ}\text{C}$  when produced), doing so once more will cancel this function.

● **Constant water level:** When water level in water tank is below the preset constant water level, immediately start water affusion to the water level by manual water affusion(if the preset manual water level is below the preset constant water level, water affusion will be to 100%), which can guarantee the water level in water tank above (not below) the preset constant water level. If you stop water affusion manually, then it will stop the function of constant water level for one hour. We suggest installing two pipes (one for water up and one for water down) so as not to influence you when you want a large amount of water.

Continue to press "Water affusion" key to enter the function of constant water level(it was set to 100% when produced), doing so once more will cancel this function.

● **Forced water fill:** When water level sensor is broken-down, press "Affusion" key to fill water forcibly. Buzzer will give indications every minute. Pay attention to water overflow. Water affusion will automatically stop in 8 minutes.

● **Water affusion at low water-pressure:** During the process of water affusion, because of low water-pressure or water cut off, the apparatus will automatically enter the mode of low water-pressure, during which the apparatus will start water affusion with 30 minutes interval. If water level can not upgrade to another level within 30 minutes, it will stop for 30 minutes and then restart water affusion again and thus continue the repeating work. All such repeating work, at the low water-pressure or water cut-off, can avoid the following severe results: electromagnetic valve and water pump going for long will cause the water pump to burn down for racing; 2. Constant water affusion because of vacuum tubes bursting or other reasons for water leakage, thus causing water tank and roofs to overflow water for long; 3. After a sudden stop of water cut-off, when water supply resumes, the vacuum tubes may explode because of the solar water heater being long exposed to the sun without water and a overtemperature water tank.

● **Preserve heat in water pipes:** When temperature is low in winter, press the "Preserve heat" key to start electric band heater to prevent pipes from bursting. Press the "Preserve heat" key once again to stop electric band heater.

● **Prevention of electric band heater catching fire:** After starting Preserve heat in water pipes, the apparatus will automatically cut off the band heater after the band heater heats the pipe temperature (about 10 mins). And wait till the pipe temperature lows and set time delay (its origin set is 30 minutes, if the set is 0 minute, electric band heater will be on for long) This procedure is automatically repeated and can avoid long-lasting power-on and also can

prevent some disasters because of aging hand heater.

● **Pipe explosion protection:** In the state of water shortage and water temperature higher above 95 $^{\circ}\text{C}$ , all the functions of water affusion will end, which can prevent the pipes from exploding.

● **Automatic start-up of booster pump:** Choose the function of start-up of booster pump when pressure of water supply is low. On affusion, the apparatus will open electromagnetic valve and start pump to increase pressure of water supply until water inside is full and then both will be cut off at once.

Open the small cap below to adjust or move the switches and then choose function of start-up of booster pump or function of Preserve heat in water pipes.

● **Water-level sensitive adjustment:** If water is of poor quality (poor conductance, especially in the mountainous areas), move the switch to "high". It was "low" when produced.

● **Power leakage protection:** When electric heating is in power leakage, the electric band heater will be cut off at once and "leakage" on the screen will shine with the buzzer alarming three times. Press the "heating" key and the leakage reset. After power leakage, you should examine the electric heating at once to avoid accidents.

## METHOD OF APPLICATION

When produced, testing and controlling apparatus run according to the intelligent mode, therefore you don't need to do any operations. If you want to adjust Beijing Time and choose other working modes, you can do as follows:

1. Adjust Beijing Time: Press "Set" key and "Hour" twinkles and you can use up " $\uparrow$ " and down " $\downarrow$ " to adjust hours and then press "Set" key to confirm. "Minute" twinkles and you use up " $\uparrow$ " and down " $\downarrow$ " to adjust minutes and then press "Set" key to confirm.

2. After adjusting Beijing Time, use up " $\uparrow$ " and down " $\downarrow$ " to choose intelligent or timing or temp-controlled mode and then the chosen mode begins to twinkle and press the "Set" key to conform.

3. If timing mode is chosen: In order to show the first timing water affusion and up-water level, you can use up " $\uparrow$ " and down " $\downarrow$ " to adjust hours, minutes and preset water level and then press "Set" key to confirm. Do the same as the second timing water affusion. After setting two timing water affusions, the set the first timing water heating and its water temperature, you can use up " $\uparrow$ " and down " $\downarrow$ " to adjust hours, minutes and preset water temperature and then press "Set" key to confirm. Do the same as the second timing water heating.

4. If temp-controlled mode is chosen: Showing temp-controlled water affusion, you can use up " $\uparrow$ " and down " $\downarrow$ " to preset water-controlled temperature and then press "Set" key to confirm

Press "heating" key, "Water affusion" key, "Preserve heat" key to start corresponding functions. After that, icons like "heating", "Water affusion", "Preserve heat" will twinkle.

If customers press the "Set" key for long, all the parameters will be resumed as in the factory.

## WARRANTY

For non-artificial damage, the product is free of repair in a year. And it is under maintenance for the whole service of life.

### COMMON BREAKDOWNS AND THE WAYS TO DEAL WITH

Phenomena in common breakdowns	Causes	Measures
No self-test on start-up; nothing or random show while starting up	Voltage insufficiency or bad contact	Tear off the plug to examine the voltage and then turn on the electricity once and press "Chief Reset" key to reset.
Indicating lamps glint at the same time when showing --C, 20% water level and 100% water level	The plug has bad contact or insert opposite or the wires are broken or suffer thunder	Red color code opposite each other and insert again tightly or make a maintenance or change for another one.
Slow affusion or cannot	Low water pressure or electromagnetic valve sieve has some dirt and make the electromagnetic valve jammed or wires broken or water supply besing cut off or the burst of the vacuum pipes.	Affusion with increasing pressure or clean the electromagnetic valve sieve; check the connected wires and so on; wait for water or replace the vacuum pipes.
The design "heating" lightens while temperature doesn't go up or cannot rise continually.	Electric heating pipes are broken down (which has installments of temperature-control)	Change for another electric heating pipes to reduce the setting for heating temperature.

The manufacture has the rights to change its technology and product specification with no need to foretell.