

"SET/RESET" to the 8th screen.

#### The 8th screen

Water level blinks, **upper-limit** light, pressing "▲" or "▼" key to set the upper-limited level (50%, 80%, 100% can be preset). Then press "SET/RESET" to the 9th screen.

#### The 9th screen:

Water level blinks, **lower-limit** light, press "▲" or "▼" key to set the lower-limited level (20%, 50%, 80%, 100% can set). Then press "SET/RESET" to the 10th screen.

#### The 10th screen:

Water temperature blinks, **upper-limit** light, press "▲" or "▼" key to set the upper-limited temperature of temp-control water loading (30°C-80°C). Pressing "SET/RESET" to the 11st screen.

#### The 11st screen:

Water temperature blinks, **lower-limit** light, press "▲" or "▼" key to set the lower-limited temperature of temp-control water loading (30°C-80°C). Pressing "SET/RESET" to the 12nd screen.

#### The 12nd screen:

All levels light, sensitivity blinks, pressing "▲" or "▼" key to set the sensitivity (LL means low sensitivity and HH is high Sensitivity, LL used most, HH just used in pure water area)

**Note:** In telligent mode, user just can set the 1th, 2nd and 12nd.

1. Pressing "HEATING" key can start up or shut off heating function manually.
2. Pressing "HEAT PRESERVATION" can start up or shut off heat preserve function manually.
3. Pressing "WATERING" can start up or shut off water loading function manually.
4. Pressing "SET" key for 3 seconds, after a beep all the set will be return to factory default data.
5. Pressing "HEATING" for 3 seconds can start up or shut off constant-temp heating function.
6. Pressing "HEAT PRESERVATION" for 3 seconds can start up or shut off intelligent mode.
7. Pressing "WATERING" for 3 seconds can start or shut off double-pipe function.

#### Common faults and troubleshooting

Symptom	Cause	Solution
No self-test, no display or wrong display	Low power or not good connection	Check the power voltage and power on again
Display --°C, 20% level, 100% level lights	Sensor plug is not good connected, plug in wrong way or stroke by thunder	Check the red mark and plug again, or change a new sensor, or change the controller
Slow water loading or no water loading at all	Valve filter blocked or low water pressure, or no water, or valve line cut, or vacuum tube broken	Clean the solenoid valve filter, boost water supply, check the valve line or change the vacuum tube
Electric heating light but the temp. not go up or not continuously	Electric heater has temperature control or the heater is broken	Down the preset temperature or change the electric heater

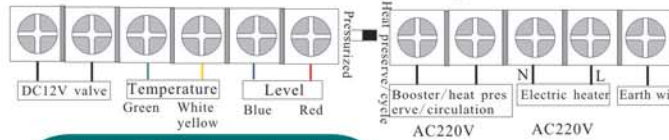
#### Controller Install

1. Open the junction box cover under the controller.
2. Put sensor's plug to the pin which is red mark, be tight and put them in the groove.
3. Put the bracket in a place where does not directly suffers trickling water easy observed, fix it by screws.
4. Hang controller on the bracket, connect lines of valve, booster pump and electric heater to the corresponding junction, and no

wrong connection, otherwise, will damage the equipment.

5. The connecting lines can be come out from the left, right or back. Then cove the box and power on self test after all installations are finished and checked.

#### Connection schematic diagram

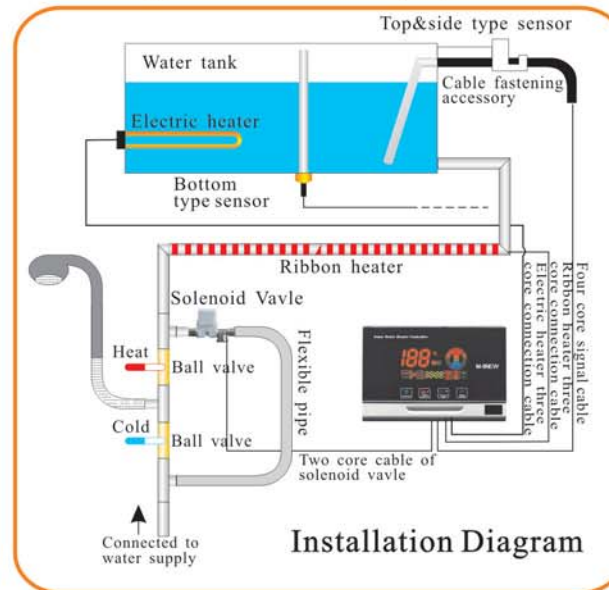


#### Solenoid valve Install

1. The one with a filter is the water in direction and the arrow at the bottom indicates the water flow direction.
2. Connect the wire to the solenoid valve. The wire can be length and the connect line should be a large size cable.
3. The solenoid valve has been equipped a check valve, so user need not install check valve again.

#### Sensor Install

1. Firstly, screw the cable fasten accessory on the overflow pipe then insert the sensor to the overflow pipe, next, pull the lead wire with slight force to make sure it attached water inlet pipe, lastly, put the cable inward by 1cm before tightened it.
  2. Lead the cable indoors and fix the outdoor cable lest it may be damaged due to scraping.
  3. The sensor cannot to close with the electric heater or touched.
  4. During installation, the socket should never be showed or soaked.
- \*With installation of bottom type sensor, it should be installed at tank's bottom; (See the installation diagram).



# SOLAR WATER HEATER CONTROLLER



**M-8 NEW**

#### Key Functions

Power off memory	Intelligent mode
Power on self-test	Heating protection
Water level preset	Water shortage alarm
Water temperature preset	Power leakage protection
Manual heating	Pipe explosion protection
Manual water loading	Pipe heat preservation
Constant water level	Constant-temp heating
Temp-control water loading	
Ribbon heater on-fire protection	
Water level upper & lower limited preset	
Heating temperature upper & lower limited preset	

- Refer to the instruction manual before installation and operation!








## Technical Data

1. Power supply: 220V Power consumption:  $\leq 5W$
2. Accuracy of temperature measuring:  $\pm 2^{\circ}C$
3. Range of temperature measuring:  $0^{\circ}C-110^{\circ}C$
4. Accuracy of controllable temperature:  $\pm 2^{\circ}C$
5. Water level: Five classes display
6. Power of boost pump or ribbon heater or circulation pump:  $\leq 500W$
7. Power of controlled electric heater:  $< 1500W$
8. Action current of electric leakage:  $\leq 10mA/0.1s$
9. Data of solenoid valve: DC12V, with pressure and non-pressure valve.  
Pressurized valve working pressure: 0.02Mpa-0.8Mpa, for direct supply water.  
Non-pressurized valve working pressure: 0.0Mpa, for water tank supply or low water-pressure supply.

## Functions

1. Time display: Display the time.
2. Power on self-test: A beep at start-up shows the controller stays in a sound condition.
3. Water level upper-limited preset: 50%, 80%, 100% (water loading will be shut off when the level up to the preset one)
4. Water level lower-limited preset: 20%, 50%, 80%, 100% (water loading will be started when level below the preset one)
5. Upper & lower limited of heating temperature can be preset:  $30^{\circ}C-80^{\circ}C$
6. Upper & lower temperature of temp-control water loading can be preset:  $30^{\circ}C-80^{\circ}C$
7. Water temperature & level display: Water temperature and level inside the solar water heater are shown.
8. Water shortage alarms: On water level declining and water shortage, the beeper alarms for 8 times and 20% will shining.
9. Full water alarm: When water level reached 100%, the beeper alarms for 4 times and then water loading is shut off.
10. Constant level water loading: When water level changes from high to low and below the lower-limited level, water loading will be started to the upper-limited level after 15 minutes.
11. Manual water loading: When the level below the up-limited one, pressing WATERING key to start manual watering to the upper-limited level.  
It will be one more level if level has reached max level.  
If the level has reached to 100%, then can not start water loading  
Water loading can be stopped if pressing WATERING key.
12. Temp-control water loading: When water tank is not full and the temperature is higher than the upper-limited temperature of temp-control water load, it will watering until the temperature declines to the lower-limited temperature and then shut off automatically. (If the upper-limited temperature below the lower-limited temperature, it means the "Temp-controlled" function has been shut off)
13. Compulsory water loading: Should the water level sensor suffer any fault (20% and 100% level both are shining), pressing the WATERING key can accomplish compulsory water loading, with a buzz of every min. as notification. Pay attention to whether the

- water overflows, water loading will be shut off after 8 mins.
14. Sensitivity setting: High sensitivity "HH" and low sensitivity "LL" can be set.
  15. Timing water loading: 3 times timing water loading can be set, the first time is at 09:00am (factory default), the second and third time both are at 24:00. If set 24:00 means the timing function is shut off. At the set time: if the water level below the upper-limited level, it will start watering to the upper-limited one and then shut off automatically; if the level has reached to the upper-limited one, it will not start water loading.
  16. Watering under low pressure: During watering, if there is low pressure or water supply stopped, it will auto turn into the low pressure mode, and it will try to start watering in every 30-min interval; if the machine fails to lift one level to a higher one in 30 min, it will restart watering after 30min. delay. The procedure will be repeated for 3 times then shut off the solenoid valve.
  17. Delayed to close water loading: Manual shut off watering and temp-control water loading and then shut off will not be delayed. And other ways to shut off water loading will be has 8 seconds delayed.
  18. High-temperature explosion protection: When the tank's temperature  $\geq 95^{\circ}C$  and the water level below 20%, all watering functions except manual loading will be closed for the moment. And it will recover automatically when the temperature below  $90^{\circ}C$ , to avoid vacuum tube fracture when cold water come in.
  19. Delayed to water loading when using: When the level declines one, if the level is no less than the lower limit one, the temp-control watering function will be delayed for 90 minutes, and others will be 30 min. delay; if the level below lower limited one, the Temp-controlled watering function will be delayed for 90 minutes, and water shortage loading will be delayed for 15 min, and others will be 30 minutes delay.
  20. Automatic watering pressurization: Toggle the power switch to the pressurized direction, the controller opens solenoid valve while starting up the water pump for pressurizing water supply, and the voltage at "Booster/Heat preservation" port is AC220V, user can connect the booster pump to this port to pressure water loading.
  21. Heat preservation delay manually: Heat preservation time can be set from 1 to 99 mins then auto shut off. If set 00 means the function opens all the time and will stop 10 mins every 15 minutes. It will cycle as this situation.
  22. Timing heating: 3 times timing heating can be set. The first time is 17:00 (factory default), the second and third time both are at 24:00. If set it to be 24:00 means the timing function is shut off. At the timing time: if the water temperature below the heating upper-limited one, it will start heating to the upper-limited one and then shut off automatically; if the temperature has reached to the upper-limited one, it will not start heating.
  23. Manual heating: If the temperature below heating upper-limited, user can start heating function manually and it will auto stops until the temperature to the upper-limited one. If water temperature is higher than upper-limited one, it will not start heating function.
  24. Constant-temp heating: When the temperature declines to the

- lower-limited, it will auto start heating until the temperature to the upper-limited one and then auto stopped.
25. Heating protection 1: When heating function opened and the water level is lower than 50%, it will start water loading to 50% first and then start heating.
  26. Heating protection 2: If continuously heating for 2 hours but temperature does not rise for  $3^{\circ}C$ , heating function will be auto shut off. (Except constant-temp heating function)
  27. Double pipe function: After starting this function, delayed water loading and heating when using water will not work.
  28. Intelligent mode: At 03:00 start water loading to 50% level, at 04:00 heat water to  $50^{\circ}C$  to guarantee user can use warm water in the morning. At 09:00 am fill water to 100% level, if using water when water loading and level below 80%, it will fill to 80% at 16:00pm.  
If temperature below  $55^{\circ}C$  at 17:00, heating will be started to  $55^{\circ}C$  to guarantee user to use in the evening. The intelligent mode is the factory default, so we suggest to use this mode better. (All settings will be shut off in this mode except Time display and the sensitivity)
  29. Electric leakage protection: The controller will shows "LD" if has leakage in the electric heater or booster pump, self-heating cable or circulation pump and the function which has leakage will be shut off. After checking and press any key to clean up the "LD" sign and the function will be restarted again.
  30. Power-off memory: All the setting parameters will be saved and could keep for 10 years after power off.
- ## Operation
- Press "SET/RESET" key into parameter set state.
- The 1st screen:**  
The hour blinks, pressing "▲" or "▼" to set hour (00-23).  
Then press "SET/RESET" to the 2nd screen.
- The 2nd screen:**  
The minute blinks, pressing "▲" or "▼" key to set minute. (00-59). Then press "SET/RESET" to the 3rd screen.
- The 3rd screen:**  
Water temperature blinks,  upper-limit light, press "▲" or "▼" key to set the upper-limited temperature of heating ( $30^{\circ}C-80^{\circ}C$ ). Then press "SET/RESET" to the 4th screen.
- The 4th screen:**  
Water temperature blinks,  lower-limit light, press "▲" or "▼" key to set the lower-limited temperature of heating ( $30^{\circ}C-80^{\circ}C$ ). Then press "SET/RESET" to the 5th screen.
- The 5th screen:**  
The hour blinks,  light, press "▲" or "▼" key to set the time of timing heating 1 (0-24h). Then press "SET/RESET" to the 6th screen.
- The 6th screen:**  
The hour blinks,  light, press "▲" or "▼" key to set the time of timing heating 2 (0-24h). Then press "SET/RESET" to the 7th screen.
- The 7th screen:**  
The hour blinks,  light, press "▲" or "▼" key to set the time of timing heating 3 (0-24h). Then press