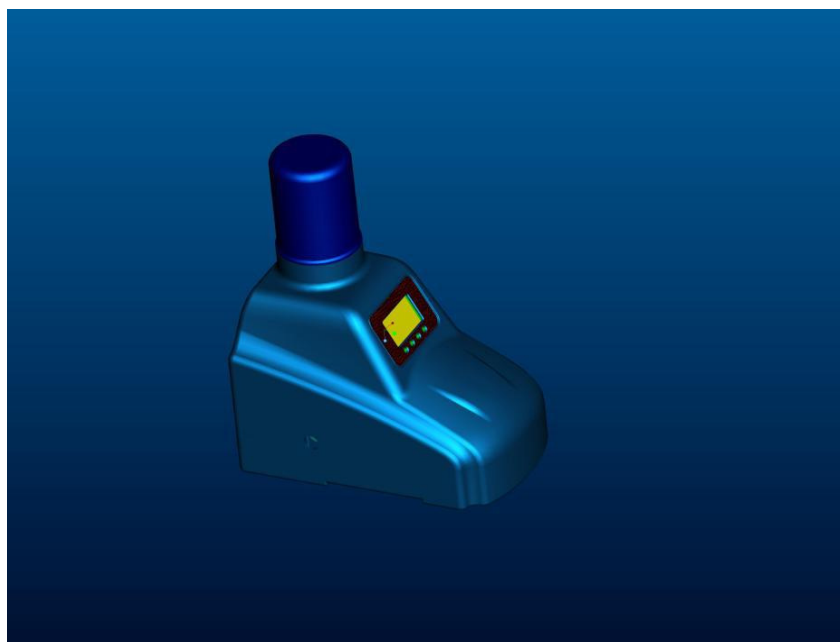




Water Treatment System



TM.F84 Online Monitoring Instrument

Instruction Manual

Please read this manual in details before using the valve and keep it properly in order to consult in the future.

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1. Main Application & Applicability

The Online Monitoring Instrument is an instrument which can automatically monitor the hardness of water from softener. Furthermore, it can control the regeneration of the valve according to the result.

Be suit for engineering system that need to control the hardness of after-softening water.

2. Product Characteristics

It adopts hermetic head faces with high degree pottery and has reliable sealing. It combine with Drain A, Rinse A, Drain B, Feed in reagent, Feed in water sample, Monitor, and Rinse B.

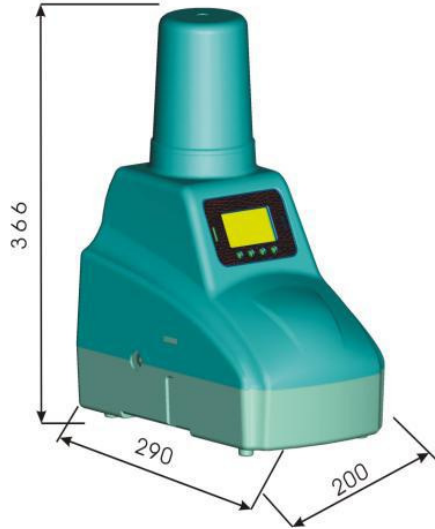
- There are high-precision through-holes in the reagent bottle, feeding in reagent accurately.
- Overall processes achieve intelligent control. All of service status and countdown shows in the color screen. Besides, it also supports manual control.
- It can adjust the monitoring time according to the water quality and the usage condition of device, so as to make full use of reagent.
- The demarcation point of monitoring can be divided according to the quantity of reagent.
- Remote handling output; if the outlet water fails to reach the requirement, the monitoring device will start the regeneration forcedly to make the outlet water is qualified.
- It has the function of giving an alarm when the device is short of reagent. Under this situation, softener automatically turns into the time type that starts regeneration by hour, avoiding no water supply.
- The device is equipped with flow meter; when softener is not in the service status (the status like Fast Rinse, Backwash, Brine refill and Brine. Under these condition, there is no water flowing out from outlet), monitor device is in waiting condition, making it better to save reagent.
- Long outage indicator; when power on, the program will return to the Drain status and device start monitoring again, avoiding the misinformation caused by power off.
- It is easy to replace the reagent and convenient to connect the softener.

3. Working Conditions & Environment

- Working pressure: 0.1~0.4MPa
- Inlet water temperature: 5~45℃
- Inlet water turbidity: <2FTU
- Power: AC100~240V 50~60Hz
- There is no corrosive acid or alkali composition in inlet water
- Working environment temperature: 5~50℃
- Working humidity: ≤95% (under 25℃)
- Place in the medium without dangerous of explosions, air and dust which can corrode the metal.
- Installed in such place where there is no snow or rain

4. Product Structure and Technical Parameters

4.1 Product Dimension



4.2 Technical Parameters

- Water pressure : 0.1~0.4MPa
- Water temperature: 5~45°C
- Power: DC12V 1A
- Inlet: ϕ 6 gas-type fitting
- Outlet: ϕ 8 gas-type fitting

5. Product Structure

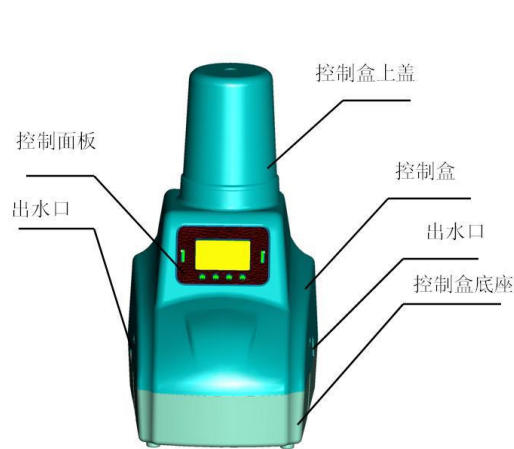


Figure 1

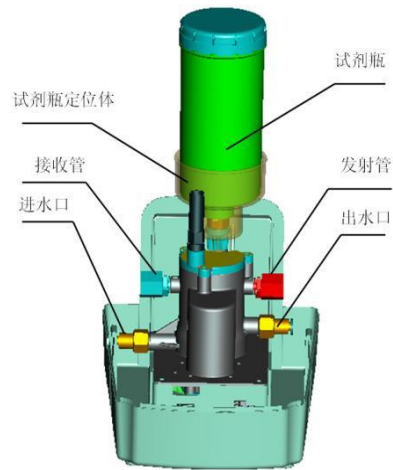


Figure 2: Removing the cover

6. Installation

6.1 The valve installation

There are two kinds of installation: wall-mounted and placing on the platform.

A. Wall-mounted

Take out the dead plate from the supporting accessories and fix the plate on the wall with expansion screws as the figure shows. Be sure the vertical length between the valve and drain pipe is more than 1.2mm and place it flatwise as best as you can. Please pay attention to the direction of arrow on the plate and make sure the directions of arrows are pointing down when it's installed. (Please refer to the figure)



Figure 3

After fixing the plate, please stick the device into the plate as the picture shows (must make sure the dead plate is fastened on the wall tightly)

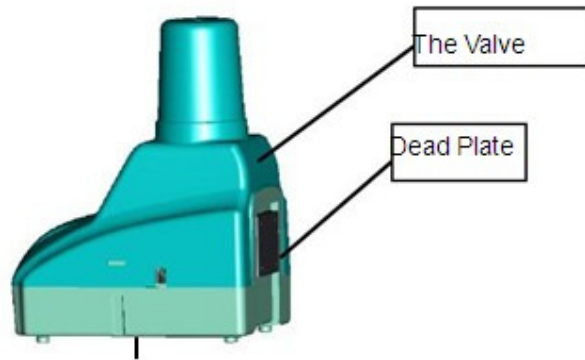


Figure 4

B. Placing on the platform

First, fix the dead plate on the platform with the screw. The arrow on the plate is the direction for device sticking into the plate. Please note the vertical height between platform and outlet should be more than 1.2mm.

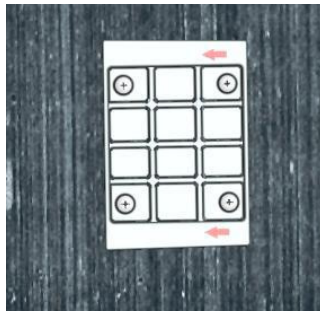


Figure 5: Overlook of plate

After fixing the dead plate, stick the valve into the plate according to the direction of arrows. The function of dead plate is anti-skidding.

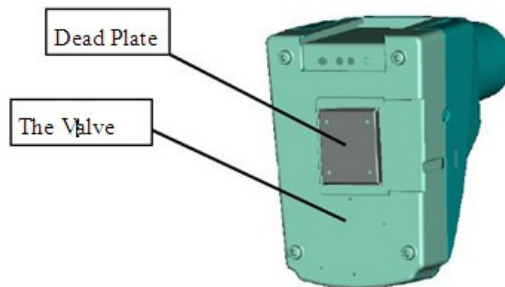


Figure 6

6.2 Installation of pipeline

A. Inlet

As the figure2 shows, after removing the cover, you can see the inlet is an $\phi 6$ gas-type fitting. The matched flow meter triple ports valve should be installed on the inlet.

As below figures show:

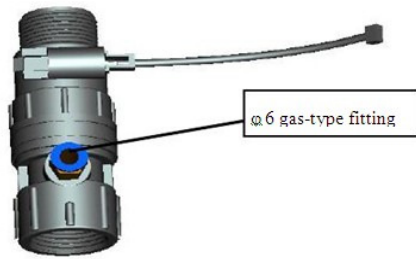
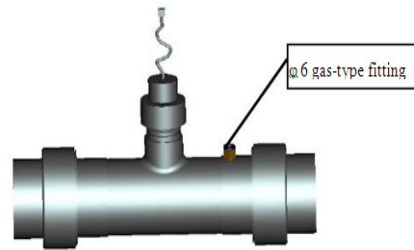
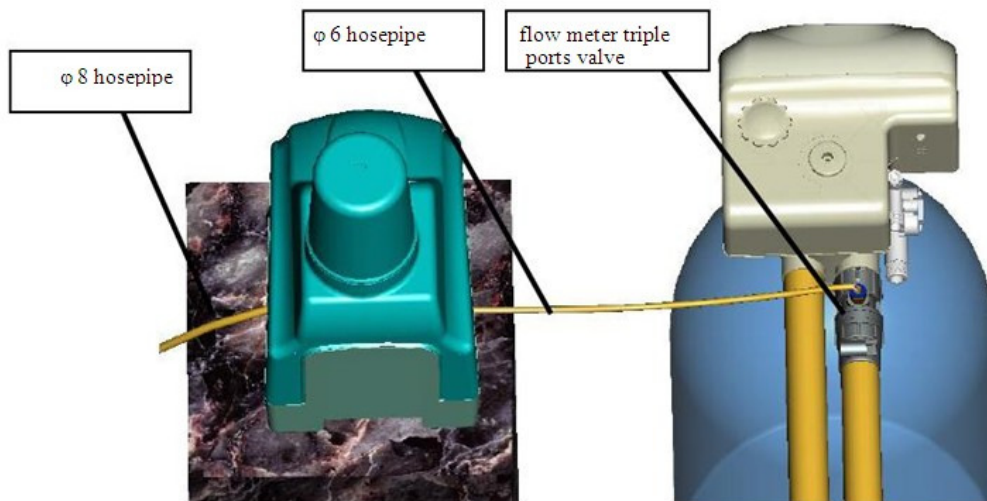


Figure 7: Flow meter triple ports valve
—Small Flow



Flow meter triple ports valve
—Large Flow

Above flow meter is supplied according to the customers' need. The flow meter is installed on the outlet of softener, and use the hosepipe to connect the on-line monitor device and triple ports valve.



Sampling Valve—Small Flow

Figure
Connection
map



8:
sketch

Note: if the water pressure of softener outlet is unstable, it is suggested to install a pressure maintaining valve between the monitor device and outlet.

B. Drain

As the drain is $\phi 8$ gas-type fitting, please use the $\phi 8$ gas-type hosepipe to connect the drain. Make sure the drain pipe is unimpeded, without warp and not too much long. We suggest, the tail end of hosepipe should keep 20-40mm distance from blow-off line.



7. Reagent installation and replacement

A. installation and replacement

When install the reagent bottle, it has to remove the top cover. Please refer to the arrow direction when you remove the cover.

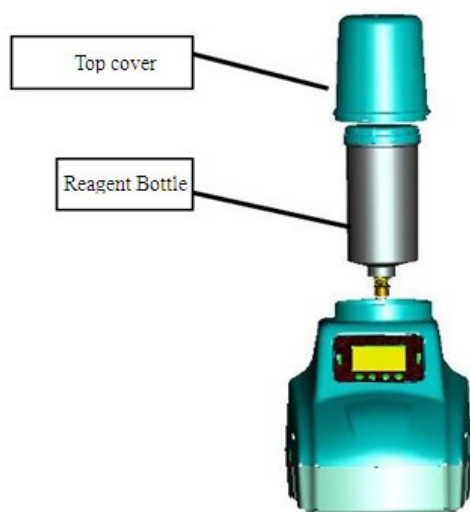


Figure 9

Please twist off the sealed cap of reagent bottle when install the reagent. (Pay attention to the arrow direction on the bottle)

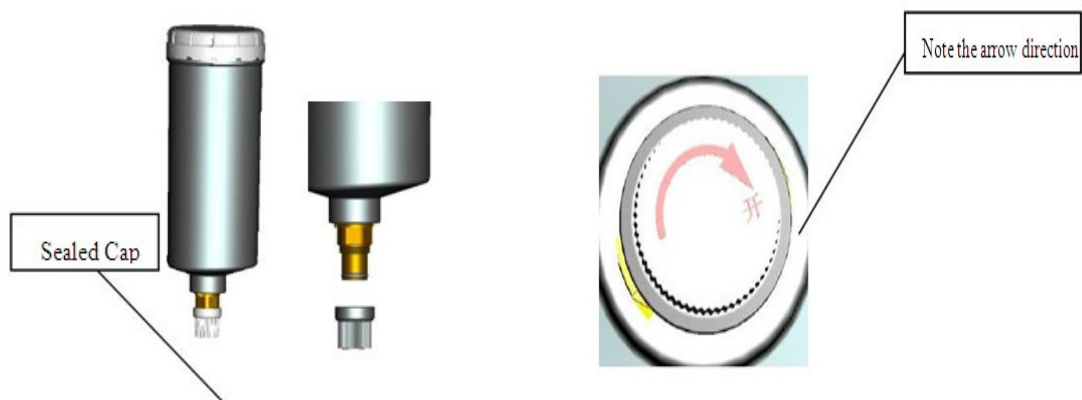


Figure 10: Reagent Bottle

Sealed Cap

On the sealing surface of bottle, there is a check valve to avoid the reagent flowing out. When use, insert the bottle whose sealing cap has been twist off into the fixed position. Please pay attention to the direction and properly assembly. You can refer to the figure 2.

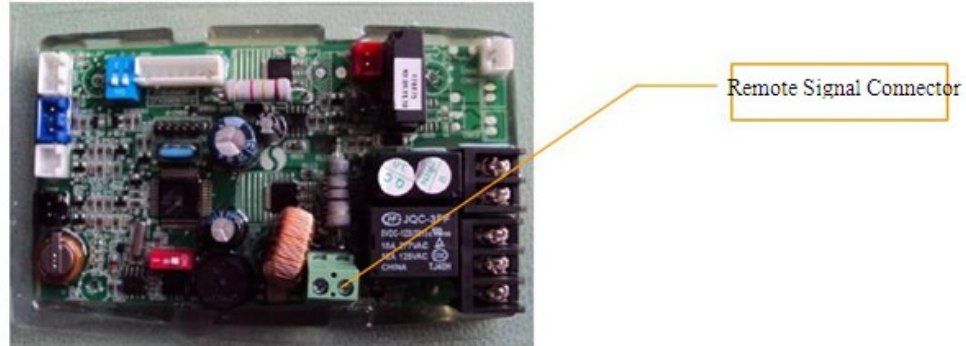
B. storage of reagent

The quality guarantee period of reagent is half year. The volume is about 450ml. Under the normal service condition the reagent should be changed once every two month.

Note: when the valve gives the alarm for the shortage of reagent, some residual reagent may still in the bottle. At this time, you can joggle the bottle to make the residual reagent available.

8. The connection of PC board

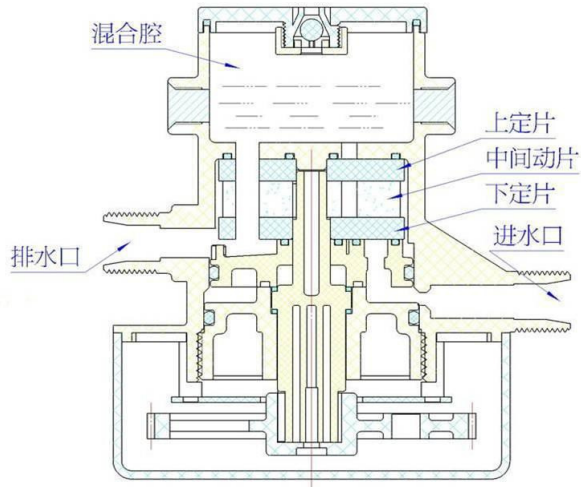
The connection of PC board is easily to be installed. In the back of valve, there are three connection wiring: 1. Power wiring; 2. Remote handing wiring; 3. Flow meter cable of sampling valve.



As the figure shows, please connect the remote handing wiring of the monitoring device to the remote handle connector on the control board of the softener. Please pay attention to the anode and cathode.

9. Flow chart and Principle

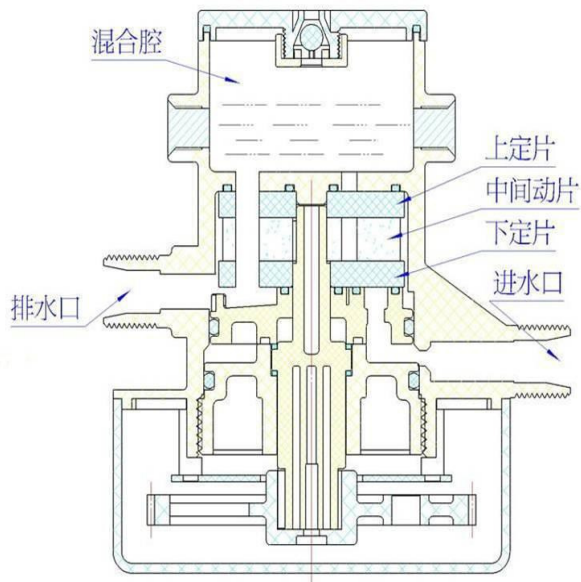
9.1 Drain A



将冲洗后残留在混合腔里的水从排水口排干，同时也是程序等待位置。此时显示屏的时间为倒计时，即表示多少时间后再次检测。

Drain out the residual water from the mixing cavity after rinsing. At the same time, the program is in the waiting status. The display screen shows the countdown, thus the rest of time before next monitoring.

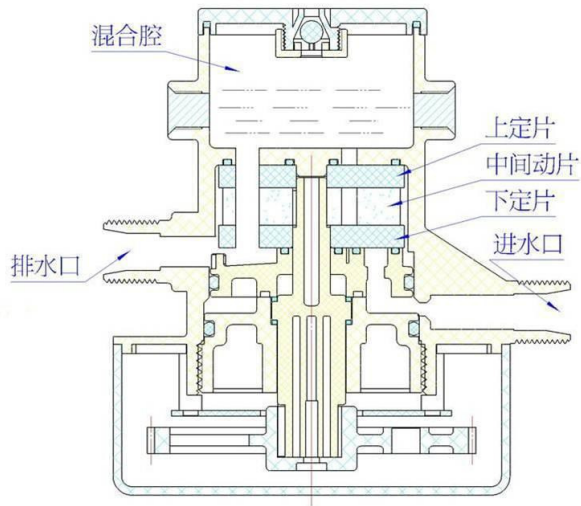
9.2 Rinse & Replacement A



In the pipeline, the residual water from last monitoring cycle can affect the water hardness. So, under this status, the valve will remove and replace the residual water by new water, so as to make the monitoring easily.

The new water flow into the mixing cavity from the inlet and flow out through the outlet. In this process, the mixing cavity will be cleaning.

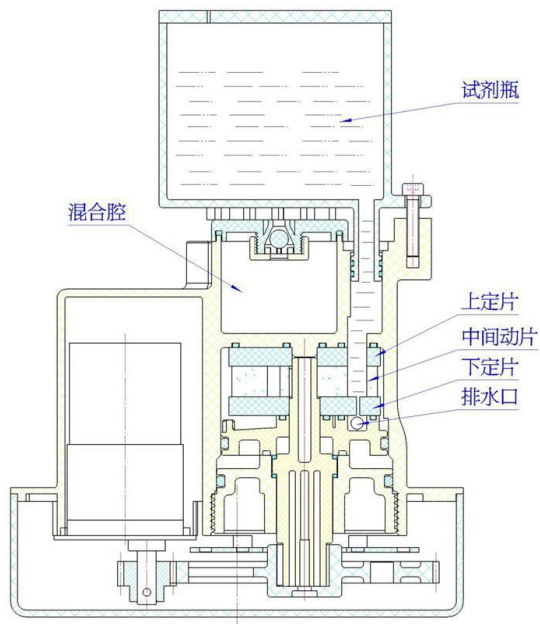
9.3 Drain B



Drain out the residual water from the mixing cavity after rinsing.

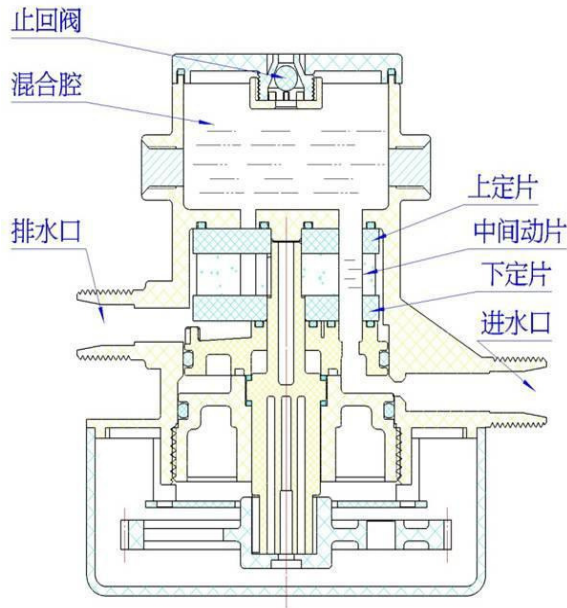
As the arrow shows, the water drain out based on the potential difference.

9.4 Feed in reagent



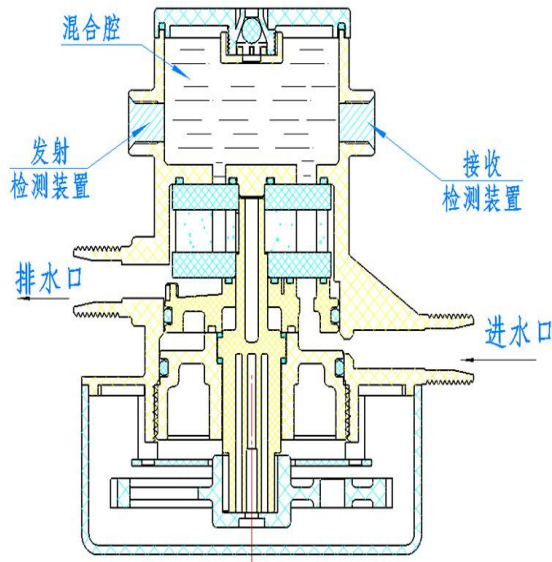
Under this status, the through-hole in the moving disk is open to the reagent in the reagent bottle. When the hole is filled with reagent, moving disk rotate and switch over.

9.5 Feed in water sample



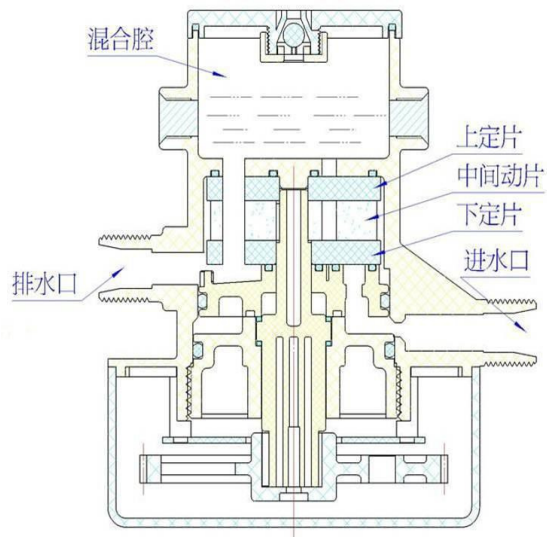
When feed in the water sample, the water sample from the outlet of softener follow into the inlet of the device, and mix the reagent in the mixing cavity. After the cavity being filled, the check valve will closed automatically and stop water inflowing.

9.6 Monitor



After mixing the water sample and reagent for 2 minutes and reaching the stable situation, the program starts to control the device to send and receive the single. If the received single value exceeds the setting value, the program sends the signal.

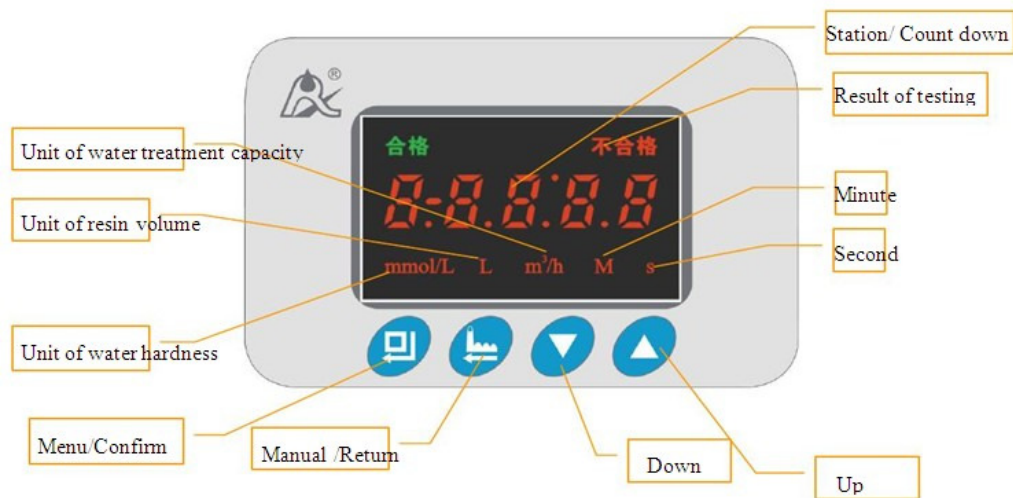
9.7 Rinse & Replacement B



Clean the mixed liquor in the mixing cavity and drain out the water from the outlet, preparing for the next monitoring.

The water flow into the mixing cavity from the inlet and flow out through the outlet. In this process, the mixing cavity will be cleaning.






10. Parameter Setting & Usage



10.1 Factory Defaults

Customer needn't to set all of parameters, except the cycle of monitoring. There are three kinds of cycle for customer choosing:

1-30: Monitoring once every 30 minutes; 2-60: Monitoring once every 60 minutes; 3. Intelligent type:the valve will calculating the time automatically after setting the resin volume, water hardness, averagely water consumption per hour. Please set the cycle of monitoring according to the actual situation so as to reach the perfect operation.

When setting, press the , and the screen shows 1-30:00. Then, you can choose the cycle type through the  or  in accordance with your requirement. Take the intelligent type for example, when choose the cycle type, please select three and press . At this time, the symbol **mmol/L L m³/h** will light on one by one. Please set each parameter one by one and press  to save the setting.

In these symbol, mmol/L means the current hardness of water, L is the volume of resin, m³/h indicate the averagely water treatment capacity per hour. After all these parameter set , the display screen will show the countdown. During the process of operation, the valve needn't to be set in other positions.

10.2 The Based Formulas

A. Water treatment capacity:

$$Q = VR \times E / (YD \times K)$$

Q: the unit is m3. VR: the unit is m3. E: Down-flow regeneration, the value is 800~900 mol/ m3 ; Up-flow regeneration, the value is 900~1200 mol/ m3

YD: the unit is mmol/L. the security coefficient K take 1.5 value.

B. Service time

$$T = Q/q$$

q is the averagely water consumption per hour

After inputting all parameters, the system will automatically calculate the service time. For the reasonableness, now we divide the cycle T into three parts to set the monitoring spacing interval of the valve. These three parts are: advanced 10%T, middle 70%T, last 20%T. In the advanced 10%T and last 20%T, the valve monitor once every 30 minutes. While, in the middle 70%T, the valve will monitor seven times. Dividing the cycle T into three parts also can save the reagent. All above time is calculated automatically by system. After inputting parameters, the system will automatically calculate the monitoring spacing interval.

11. Trouble Shooting

Code	Cause	Correction
E0	The hardness of water continuously fails for more than two times.	A. The resin is fouled B. Some factors, like shortage of salt that affect the regeneration

—E1—	A. Wiring of locating board with controller fails to work. B. Locating board damaged C. Mechanical driven failure D. Faulty control board E. Wiring of motor with controller is fault F. Motor damaged	A. Replace wiring B. Replace locating board C. Check and repair the mechanical part. D. Replacing control board E. Replace wiring F. Replace motor
—E2—	A. Hall component on locating board damaged B. Wiring of locating board with controller fails to work C. Control board is faulty	A. Replace locating board B. Replace wiring C. Replace control board
—E3—	Control board is faulty	Replace control board
—E4—	Reagent is shortage	Add reagent

If you find the valve shows the below code during the usage, please refer to the table:

When the valve breakdown, all of buttons will fails to work and display screen will shows the faulty code, accompanying with the sound of “Di”. As long as the problem is solved, the code disappears.