



International Professional Manufacturer of
Control Valve for Water Treatment Systems

China RUNXIN Valve

Technical Support and Service Manual(2015)



WENZHOU RUNXIN MANUFACTURING MACHINE CO.,LTD.



Runxin company outer view

● Company Profile

Founded in 2000, Wenzhou Runxin Manufacturing Machine Co., Ltd. is located in Wenzhou, Zhejiang. Runxin is titled with the "National New High-tech Enterprise", "Zhejiang Patent Model Enterprise", "Wenzhou High Integrity Enterprise" and "Interview Base". Its main products include multi-functional flow control valve for water treatment systems, residential softener, ceramic ball valve, valve for solar energy heating and so on, which are rewarded of Zhejiang famous trademark and Wenzhou famous product. With more than ten years development, Runxin becomes one of three global professional manufacturers of control valve for water treatment systems. Up till November of 2014, Runxin products are widely spread in China and exported to 84 countries and regions in Asia, Europe, Oceania, Africa and America.

Self-researched and developed with intellectual property right, the core product "Multi-functional flow control valve for water treatment systems" creatively adopts ceramic hermetic head faces and multiple passages which bring the breakthrough in the water treatment field. It is not only authorized with many patents from America, Russia, South Korea, Mexico, Australia, India, Philippines and European countries more than ten, like Germany, Italy and France and Taiwan of China, but also recognized by National Sanitary Foundation(NSF), thus gaining good reputation both at home and abroad. These patents, combined with other 20 more patent technologies which are gained by successively researching "Multi-functional softener valve", "Integrated softener" and "Ball valve" form a patent net that establish the technology leading status of Runxin in water treatment field.

The new developed Runlucky residential softener and the whole house water filter based on Runxin valve technology is favored in the market once it launched. Till now, it has been exported to 24 countries and regions, such as America, Russia, France, Italy, Brazil, etc.. Runxin successfully uses the ceramic hard sealing technology on ball valve. The patented ceramic ball valve improved the shortage of traditional metal core ball valve which is easy leakage, heavy torque and the sealing surface is not corrosion resistance, and overcame the difficulties of tough process technology. Till now, it has three series which are manual, automatic and pneumatic.

We established the R&D center, testing center, laboratory, measuring room with strictly requirements and heavy investment. Talents converge on Runxin and Runxin is equipped with the best testing equipments which can do bursting pressure test, cyclic pressure test, life time test and simulated transportation test. They can detect the performance on mechanics, thermology, environmental aging and electronic interference aspects of plastic, rubber and electronic components, to make sure each product which from raw material, spare part and finished product is safety and reliable on from design, manufacturing to leave from factory. Runxin has more than 400 sets of production equipments, including 63 sets of precision injection machines, 8 sets of process centers, 15 sets of CNC machines, etc., concentrated feed systems and mechanical arm, adopts automated assembly line. Through implementing PDM, ERP, OA systems to realize standardization and information management.

Now, Runxin has established distributors and after sales service offices in more than 30 cities in China including Beijing, Shanghai, Guangzhou, Wuhan, Chengdu etc., and in 50 countries including America, Russia, France, India, Spain, Brazil etc.. Products have been exported to 84 countries and regions, such as America, Germany, Japan, England, Italy, etc., serviced for millions of users in all five continents.

With the spirits of "Humbleness, gratefulness, honesty, wisdom and diligence" and value of "Surpass myself, dedicate to society", Runxin is devoted to shaping herself as a "Global professional manufacturer of residential softener and control valve for water treatment systems" and making more people benefit from our innovation and enjoy a better life.



Injection Workshop



Production Workshop



Process Center



Test Center



Water Quality Test

● Certificate and patent

Runxin valve with the design of ceramic hermetic head faces, multi-flow passages, have achieved 18 countries' innovation patents including USA, Russia, South Korea, Mexico, Australia, India, Philippines and EU ten members Germany, Italy, France, Netherlands, etc..Products have been authorized by NSF, CE and RoHS.



● NSF Certificate



● CE Certificate



● RoHS Certificate



● ISO9001:2008 Certificate



● US Patent



● Russia Patent



● Taiwan Patent



● South Korea Patent



● EU Patent



● Philippines Patent



● India Patent



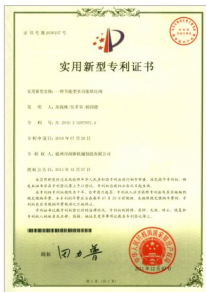
● Mexico Patent



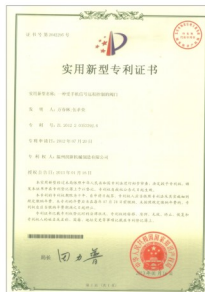
● Australia Patent



● Multi-functional Flow Control Valve for Continuous Water Supplying



● Multi-function Softener Valve for Energy Saving



● A Valve Remotely Controlled by Cell Phone



● Automatic Water Treatment Device

● Company honor



● National New High-tech Enterprise



● Wenzhou High Integrity Enterprise



● China Customs Recognized Class A Enterprise



● Zhejiang Province Famous Trademark



● ISO9001:2008 Certificate



● Wenzhou Credit Management Model Company



● Wenzhou Top Industrial Enterprise



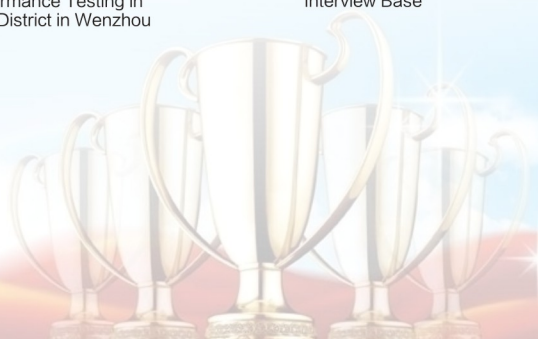
● Zhejiang Industrial Product Exportation Management Class 1 Enterprise



● One of Main Pioneer Enterprises for Performance Testing in Lucheng District in Wenzhou



● Wenzhou Propaganda Interview Base



1.2. Principle

1.2.1. Working Principle

Using hermetic head faces theory, Runxin valve is designed to integrate multi-ports round closely to one valve body. When the rotor rotates, some ports will be shut off and meanwhile some other ports will be open, and thus the water will flow in and out this valve.

A. Construction

Runxin valve uses high-flatness moving disk and fixed disk to work as a valve. Fixed disk is fixed and moving disk is driven by handle or motor to rotate closely over fixed disk. There are several blind via and through-holes on fixed disk and moving disk, when moving disk stays on different positions of fixed disk, and then different flow passages will be formed. For softener valves, these positions are Service, Backwash, Brine & Slow Rinse, Brine Refill and Fast Rinse. If it is a filter valve, it has 3 positions: Service, Backwash and Fast Rinse.

B. Controller

Signal→Controller→Actuator→Moving Disk→ Locating Device→ Controller

The controller gets signal from Timer, Meter or Water Quality Detecting Instrument, and then will initiate the motor to drive the actuator to rotate the moving disk, and when the moving disk rotates to the correct position, another signal will be sent to the controller through the locating device, and the controller will stop the moving disk until it finishes this step; When next new signal is received by the controller, the controller will drive the moving disk to rotate to a new position and so on until all steps are finished.

The operational process for F63 and F96 are below:

1.2.2. The Principle of F63 Softener Valve

In Figure 1-1, it shows moving disk and fixed disk of F63 Runxin valve. Fixed disk is fixed on the valve body. Valve body has ports of Inlet, Outlet, Drain, Brine and Top/Bottom strainers, and these ports are connected with through hole on fixed disk. On the moving disk, it has a

through-hole permanent connect with inlet, two blind holes. The moving disk will closely attach the fixed disk and rotates and thus flow passages are formed, named Service, Backwash, Brine & Slow Rinse and Fast Rinse working positions, as shown in Figure 1-2 to Figure 1-6.

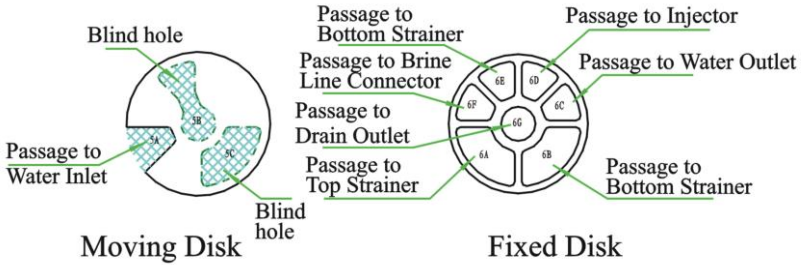


Figure 1-1 Moving Disk and Fixed Disk of F63

A. Service Position

In Service position, hard water enters unit at valve inlet and flows through-holes on moving disk-then flows through the fixed disk-then flows through top strainer- then flows down through the resin in the resin tank. In the resin bed, the hard water is revert to soft water after ion-exchange process. Soft water enters center tube through the bottom distributor — then flows up thru the center tube — then through valve body-then through the passage formed by the fixed disk and moving disk-then flows through out of valve.

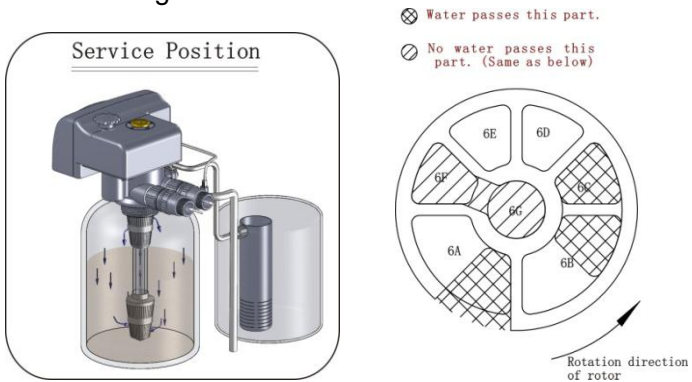


Figure 1-2 Flow Process of Service Position

B. Backwash Position

In Backwash position, hard water enters unit at valve inlet - flows to the passage of moving disk- enters the Stator-through valve body- down the center tube - through the bottom distributor and up through the resin – flows up to top distributor – to valve body – to the fixed disk- to the moving disk-flows out the drain line.

(Under backwash status, outlet water could pass through brine line connector into brine tank so a check valve is suggested to be installed in water outlet.)

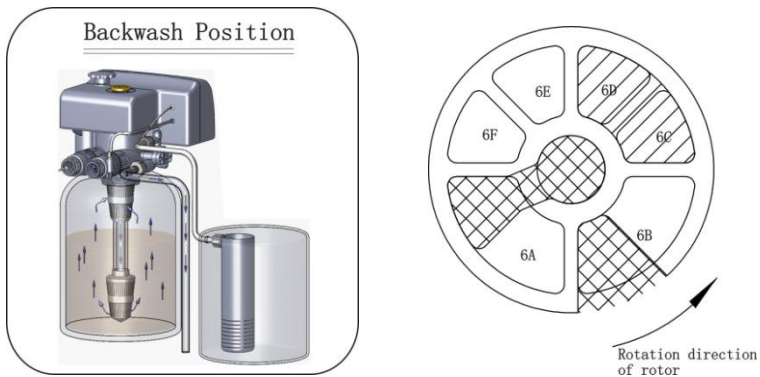


Figure 1-3 Flow Process of Backwash Position

C. Brine & Slow Rinse Position

In Brine & Slow Rinse Position, hard water enters unit at valve inlet - flows through-holes on moving disk-then flows through the fixed disk - flows up into injector housing and down through nozzle and orifice to draw brine from the brine tank —mixed salt water flows down thru resin – after finishes ion-exchange – to bottom distributor — flows up up thru center tube —flows up to top distributor – to valve body – to the fixed disk- to the moving disk-flows out the drain line.

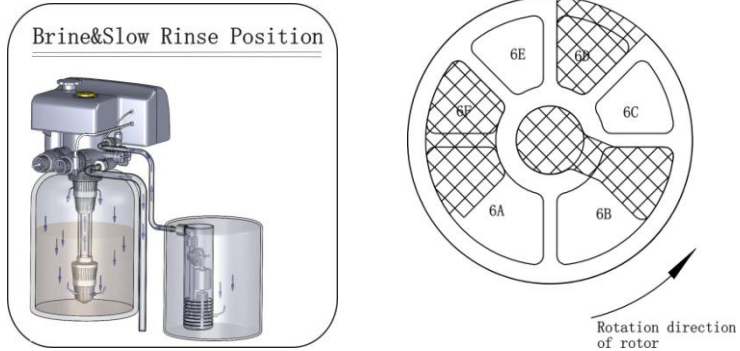


Figure 1-4 Flow Process of Brine & Slow Rinse Position

D. Brine Refill Position

In Brine Refill Position, hard water enters into the fixed disk via through-holes on moving disk-flows through the injector, one part of water fills into the brine tank from brine line connector, another part cleans up the injector-then flows through the passage formed by the fixed disk and moving disk-flows out the drain line.

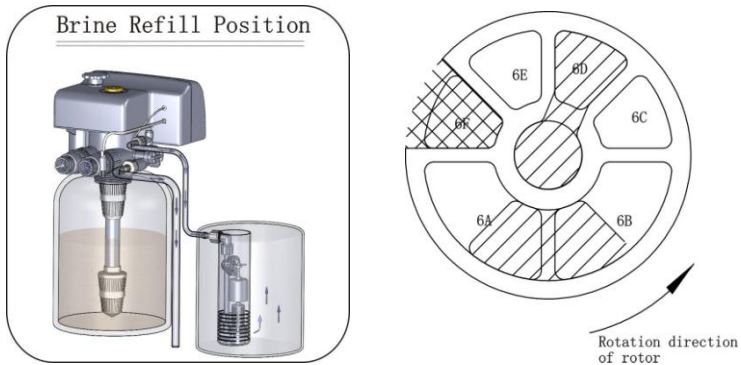


Figure 1-5 Flow Process of Brine Refill

E. Fast Rinse Position

In Fast Rinse Position, hard water enters into the fixed disk via through-holes on moving disk-then flows through valve body and top strainer- then flows down through the resin in the resin tank-after rinse, sewage enters center tube through the bottom distributor-then

through the passage formed by the fixed disk and moving disk- flows out the drain line.

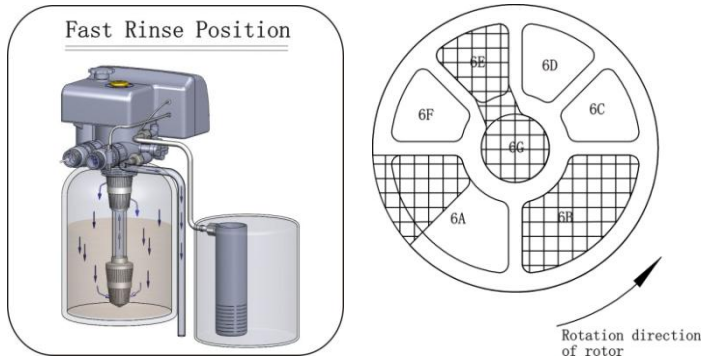


Figure 1-6 Flow Process of Fast Rinse

Runxin filter control valve, it only has Service, Backwash and Fast Rinse total 3 steps.

1.2.3. The Principle of F96 Softener Valve

F96 has 4 Tee piston valves A, B, C, D inside the valve body (Figure1-7). The moving disk has 4 through-holes and 1 blind hole (Figure1-8). The fixed disk has A upper, A lower, B upper, B lower, C upper, C lower, D upper, D lower, total 8 passages (Figure1-9) and interlink with upper/lower rooms of A, B, C, D of tee piston valve (Figure1-10).

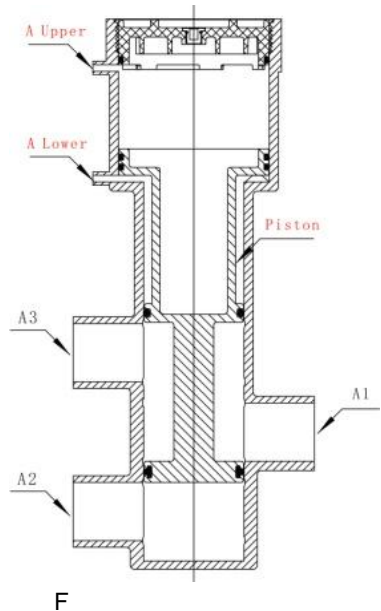


Figure 1-7 Tee Piston Valve

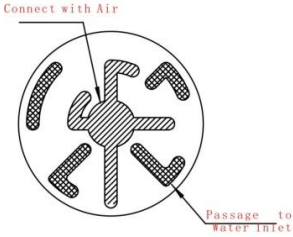


Figure1-8 The Moving Disk

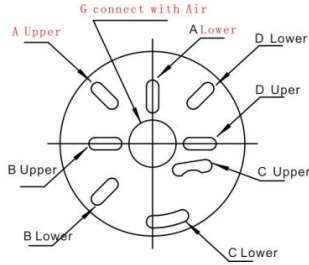


Figure1-9 The Fixed Disk

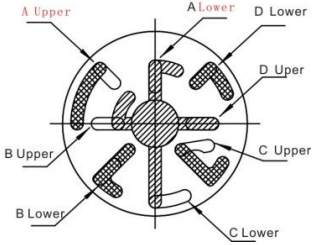


Figure1-10 The Fixed Disk/Moving Disk in Service Position

A. Service Position

In Service position, as shown in Figure1-10, distribution valve control four tee piston valves to realize A piston downward, B piston upward, C piston downward, D piston upward, then it can form passage as Figure1-11.

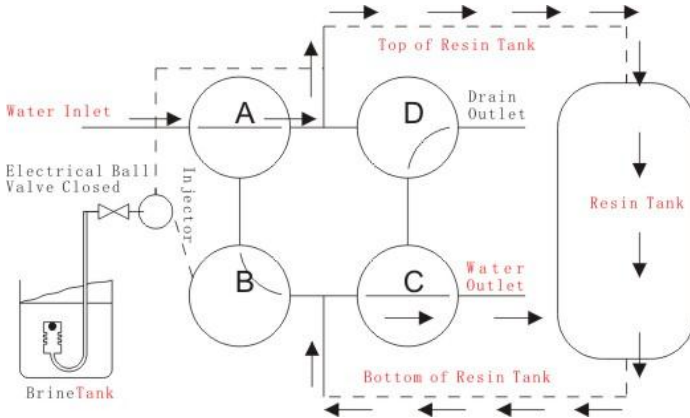


Figure1-11 Water Flow Process in Service Position

B.Backwash Position

In Backwash position, through different angles of fixed and moving disks located respectively, distribution valve control four tee piston valves to realize A piston upward, B piston upward, C piston upward, D piston downward, then it can form passage as Figure1-12.

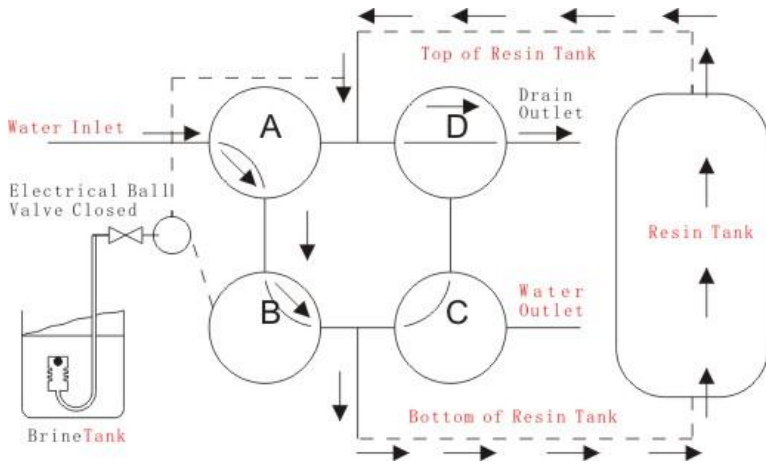


Figure1-12 Water Flow Process in Backwash Position

C.Brine & Slow Rinse Position

In Brine & Slow Rinse position, through different angles of fixed and moving disks located respectively, distribution valve control four tee piston valves to realize A piston upward, B piston downward, C piston upward, D piston upward, meanwhile, electronic ball valve will be opened, then it can form passage as Figure1-13. When brine draw finished, the ball valve will be turned off and enters into slow rinse status.

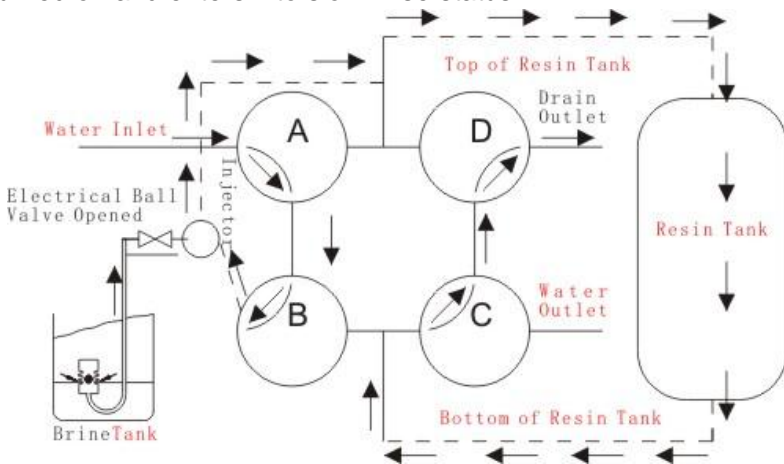


Figure1-13 Water Flow Process in Brine& Slow Rinse Position

D. Fast Rinse Position

In Fast Rinse position, through different angles of fixed and moving disks located respectively, distribution valve control four tee piston valves to realize A piston downward, B piston upward, C piston upward, D piston upward, then it can form passage as Figure1-14.

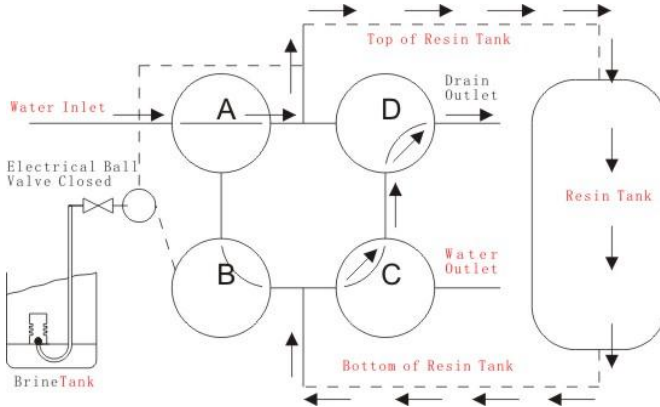


Figure1-14 Water Flow Process in Fast Rinse Position

E. Brine Refill Position

After the unit finishes Fast Rinse position, it will return service position again. In the same time, the electrical ball valve will opened, a small part of hard water fills into brine tank though injector. The electrical ball valve will be turned off when the set Brine Refill Time ends.

From its principle, F96 softener valve distributes the pressure source on four tee piston valves through distribution valve. The area of bearing pressure on the top and bottom of piston is different which forms pressure difference and result in piston moves in or out in chamber. In order to make this pressure difference, there is a diaphragm pump matched with control valve to make **inlet pressure $\geq 0.2\text{MPa} \geq$ inlet pressure of main valve ensure fixed disk is connected with G.**

When used as a filtration system, distribution valve controls pistons to run Service, Backwash and Fast Rinse functions.

2.1.2. F63C3 Valve Assembly

