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Russia Patent No.: 2349819
South Korea Patent No.: 10-0914137
Mexico Patent No.: 268581
Australia Patent No.: 2005263257
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Multi-functional Flow Control Valve for Water Treatment Systems

53520 (F111B1)
53620 (F111B3)
63520 (F111A1)
63620 (F111A3)

User Manual

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

0WRX.466.583

Before the valve put into use, please fill in the below content so as to help us to refer in the future .

Softener System Configuration

Tank Size: Dia. _____ mm, Height _____ mm;

Resin Volume _____ L; Brine Tank Capacity _____ L;

Hardness of Raw Water _____ mmol/L;

Pressure of Inlet Water _____ MPa;

Control Valve Model _____ ; Number _____ ;

The Specification of Drain Line Flow Control _____ ;

The Specification of Brine Line Flow Control _____ ;

Injector No. _____ .

Water Source: Ground-water Filtered Ground-water Tap Water

Other _____ .

Parameter Set

Parameter	Unit	Factory Default	Actual Value
Control Mode A-01/02/03/04 (Meter type) F111B only has A-01/02	/	A-01	
Water Treatment Capacity (Meter type)	m ³	200.0	
Service Days (Time clock type, by days)	D.	03	
Regeneration Time	/	02 : 00	
Backwash Time (F111A/B has)	min:sec	10 : 00	
Brine & Slow Rinse Time (F111A has)	min:sec	60 : 00	
Brine Refill Time (F111A has)	min:sec	05 : 00	
Fast Rinse Time (F111A/B has)	min:sec	10 : 00	
Interval Regeneration Days (Meter type has)	D.	30	
Output Mode b-01/2	/	b-01	

●If there is no special requirement when product purchase, we choose 4# drain line flow control (With 3 holes of $\varphi 6$) and 4# injector (7704) for the standard configuration for 63620/63520.

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Notice

- To ensure normal operation of the valve, please consult with professional installation or repairing personnel before use it.
- If there are any of pipeline engineering and electric works, there must be finished by professional at the time of installation.
- Do not use the control valve with the water that is unsafe or unknown quality.
- Depending on the changing of working environment and water requirement, each parameter of softener should be adjusted accordingly.
- When the water treatment capacity is too low, please check the resin. If the reason is shortage of resin, please add; if the resin turns reddish brown or broken, please replace.
- Test water periodically to verify that system is performing satisfactorily.
- Ensure that there is solid salt all the time in the brine tank in the course of using, when this valve is used for softening. The brine tank should be added the clean water softening salts only, at least 99.5% pure, forbidding use the small salt.
- Do not put the valve near the hot resource, high humidity, corrosive, intense magnetic field or intense librations environment. And do not leave it outside.
- Forbidden to carry the injector body. Avoid to use injector body as support to carry the system.
- Forbidden to use the brine tube or other connectors as support to carry the system.
- Please use this product under the water temperature between 5~50°C, water pressure 0.2~0.6MPa. Failure to use this product under such conditions voids the warranty.
- If the water pressure exceeds 0.6Mpa, a pressure reducing valve must be installed before the water inlet. While, if the water pressure under 0.2MPa, a booster pump must be installed before the water inlet.
- It is suggested to install PPR pipe, corrugated pipe or UPVC pipe, instead of TTLSG pipe. Keep the pipeline straight.
- Do not let children touch or play, because carelessness operating may cause the procedure changed.
- When the attached cables of this product and transformer are broken, they must be changed to the one that is from our factory.

1. Product Overview

1.1. Main Application & Applicability

Used for softening, demineralization or filtration water treatment systems

● 53520/53620 (Filtration)

Suitable for swimming pool filter system

Filtration system

Activated carbon filter or sand filter of RO pretreatment system.

● 63520/63620 (Down-flow regeneration)

Suitable for ion exchange equipment, the raw water hardness $\leq 6.5\text{mmol/L}$.

Boiler softening water system

RO pretreatment softening system, etc.

1.2. Product Characteristics

● Simple structure and reliable sealing

It adopts hermetic head faces with high degree pottery and corrosion resistance for opening and closing. It combines with Service, Backwash, Brine & Slow Rinse, Brine Refill and Fast Rinse.

● No water passes the valve during regeneration in single tank type

● Brine refill controlled by electronic ball valve

During service, electronic ball valve will control to start the brine refill. In order to short the regeneration cycle time.

● DF softener system can be changed to filtration system

Block the brine line connector and remove the drain connector of 63520 to change the valve to filter valve 53520.

Block the brine line connector and remove the drain connector of 63620 to change the valve to filter valve 53620.

● Manual function

Realize regeneration immediately by pushing “” at any time.

● Long outage indicator

If outage overrides 3 days, the time of day indicator “12:12” will flash to remind people to reset new time of day. The other set parameters do not need to reset. The process will continue to work after power on.

● LED dynamic screen display

The stripes on dynamic screen flash, they indicate the control valve is in service, otherwise, it is in regeneration cycle.

● Buttons lock

No operations to buttons on the controller within 1 minute, button lock indicator light on which represent buttons are locked. Before operation, press and hold the “” and “” buttons for 5 seconds to unlock. This function can avoid incorrect operation.

● It can choose all models by program selection

When all symbols light on, press and hold “” and “” buttons more than 2 seconds to enter the menu of valve model selection. Press “” and “” buttons to select the requested model, then press “” button to save the selection. Reconnect the power, the model will be showed on display board.

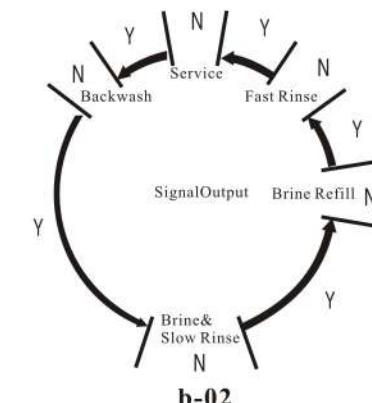
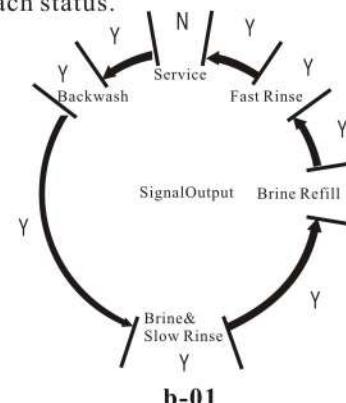
● Interlock function

It has a function of interlock to realize only one valve in regeneration but the other valves are in service while several valves parallel in system. In multi-steps treatment systems such as RO pre-treatment, when several valves are in series, there is only one valve in regeneration or washing to ensure pass water all the times. (Application refer to Figure 3-9)

● Signal output (Only for 63620/63520)

There is a signal output connector on main control board. It is for controlling external wiring (Refer to Figure 3-1 to Figure 3-8).

There are two kinds of output modes: b-01 Mode: Turn on start of regeneration and shut off end of regeneration; b-02 Mode: Signal available only intervals of each status.



● Remote handling input

This connector can receive external signal, used together with PLC, and computer etc. to control the valve. (Application refers to Figure3-11)

● Pressure relief output

The valve will cut off feeding water to drain line when it switches in regeneration cycles (Same as signal output b-02). Thus in some water treatment system, e.g. Deep Well, one booster pump was installed on the inlet to increase the system water feeding pressure, this cut-off will cause pressure on inlet rising too fast to damage the valve. Pressure Relief Output can be used to avoid this problem. (Application refers to Figure3-10)

● All parameters can be modified

According to the water quality and usage, the parameters in the process can be adjusted.

● Four kinds of meter type can be selected (Suit for 63620)

Mode	Name	Instruction
A-01	Meter Delayed	Regenerate on the day although the available volume of treated water drops to zero (0). Regeneration or fast rinse starts at the regeneration time.
A-02	Meter Immediate	Regenerate or fast rinse immediately when the available volume of treated water drops to zero(0).
A-03	Intelligent Meter Delayed	Meter Delayed Regeneration type, but by setting Resin Volume, Feed Water Hardness, Regeneration Factor, the controller will calculate the System Capacity. Regeneration mode is the same as A-01.
A-04	Intelligent Meter Immediate	Meter Immediately Regeneration Type, but by setting Resin Volume, Feed Water Hardness, Regeneration Factor, the controller will calculate the System Capacity. Regeneration mode is the same as A-02.

A-01, A-02 are suitable for 53620.

● Maximum interval regeneration days (Suit for 53620/63620)

Under the situation of service reaching the setting days and the volume not yet, it could enter into regeneration process or fast rinse forcibly when current time is the same as regeneration time.

1.3. Service Condition

Runxin Valve should be used under the below conditions:

Items	Requirement
Working conditions	Water pressure 0.2MPa ~ 0.6MPa
	Water temperature 5℃~50℃
Working environment	Environment temperature 5℃~50℃
	Relative humidity ≤95% (25℃)
Inlet water quality	Electrical facility AC100~240V/50~60Hz
	Water turbidity Softener(63520/63620) < 5FTU; Filter(53520/53620) < 20FTU
Water hardness	First Grade Na ⁺ < 6.5mmol/L; Second Grade Na ⁺ < 10mmol/L
	Free chlorine < 0.1mg/L
Iron ²⁺	< 0.3mg/L
CODMn	< 2mg/L (O ₂)

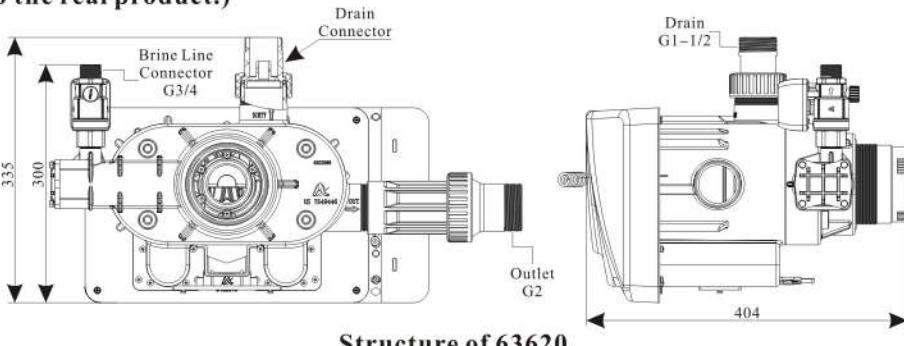
In the above table, First Grade Na⁺ represents First Grade Na⁺ Exchanger. Second Grade Na⁺ represents Second Grade Na⁺ Exchanger.

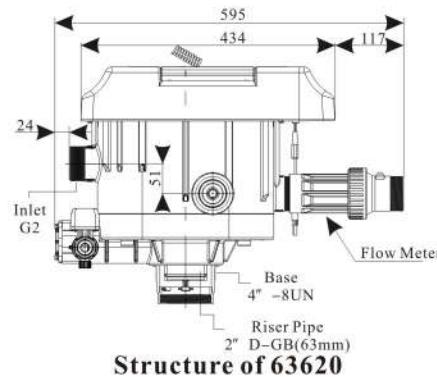
● When the water turbidity exceeds the conditions, a filter should be installed on the inlet of control valve.

● When the water hardness exceeds the conditions, the outlet water hardness will hardly reach the requirement of boiler feed water(0.03 mmol/L). It is suggested to adopt second grade softener.

1.4. Product Structure and Technical Parameters

A. Product dimension (The appearance is just for reference. It is subjected to the real product.)



**Remark:**

Remove the flow meter from 63620, it will be 63520.

If block the brine line connector of 63620 and remove the ball valve and drain connector, it will be 53620.

If block the brine line connector of 63520 and remove the ball valve and drain connector, it will be 53520.

B. Technical parameter

Transformer Output: DC24V/1.5A

Model	Connector Size					Flow Rate m³/h@ 0.2MPa	Remark
	Inlet/ Outlet	Drain	Brine Line Connector	Base	Riser Pipe		
53620	2" M	2" M	/	4" -8UN	2"D-GB (Outer diameter 63mm)	See the Flow Rate Characteristic	Filter, meter type
53520							Filter, time clock type
63620	2" M	1.5" M	3/4" M	4" -8UN	2"D-GB (Outer diameter 63mm)	21.1	DF softener, meter type
63520							DF softener, time clock type

Remark: M—Male F—Female

1.5. Installation**A. Installation notice**

Before installation, read all those instructions completely. Then obtain all materials and tools needed for installation.

The installation of product, pipes and circuits, should be accomplished by professional to ensure the product can operate normally.

Perform installation according to the relative pipeline regulations and the specification of Water Inlet, Water Outlet, Drain Outlet, and Brine Line Connector.

B. Device location

- ① The filter or softener should be located close to drain.
- ② Ensure the unit is installed in enough space for operating and maintenance.
- ③ Brine tank need to be close to softener.
- ④ The unit should be kept away the heater, and not be exposed outdoor. Sunshine or rain will cause the system damage.
- ⑤ Please avoid to install the system in one acid/alkaline, magnetic or strong vibration circumstance, because above factors will cause the system disorder.
- ⑥ Do not install the filter or softener, drain pipeline in circumstance which temperature may drop below 5°C, or above 45°C.
- ⑦ One place is recommended to install the system which cause the minimum loss in case of water leaking.

C. Pipeline installation (Take 63620 as a sample)

- ① Install control valve

a. As the Figure 1-1 shows, select the riser pipe with 63mm OD, glue the riser pipe to the bottom strainer and put it into the mineral tank, cut off the exceeding tube out of tank top opening. Plug the riser tube in case of mineral entering.

b. Fill the mineral to the tank, and the height is accordance with the design code.

c. Install the top distributor to the valve.

d. Insert the riser tube into control valve and screw tight control valve.

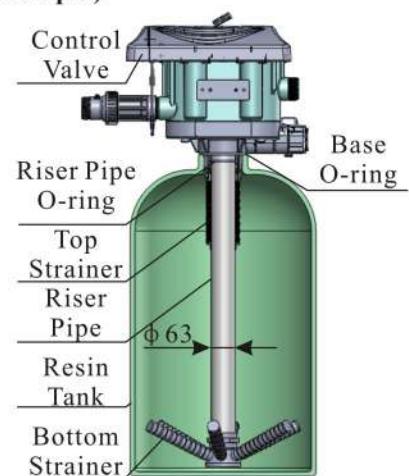


Figure 1-1

Note:

- The length of riser tube should be neither higher 2 mm nor lower 5 mm tank top opening height, and its top end should be rounded to avoid damage of O-ring inside the valve.
- Avoid floccules substance together with resin to fill in the mineral tank.
- Avoid O-ring inside control valve falling out while rotating it on the tank.

② Install flow meter

As Figure 1-2 shows, put the sealing ring into nut of flow meter, screw in water outlet; insert the sensor into flow meter.

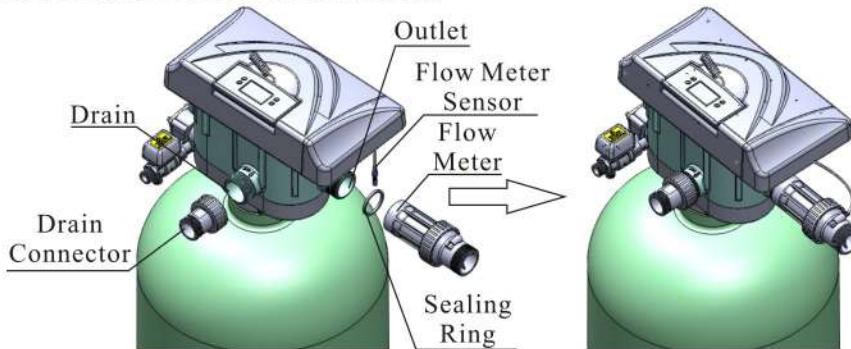


Figure 1-2

③ Pipeline connection

- As Figure 1-3 shows, install a pressure gauge in water inlet.
- Install valves A.B.C.D in inlet, outlet and pipeline as showed in Figure 1-3. Valve D is a sampling valve.
- Inlet pipeline should be in parallel with outlet pipeline. Support inlet and outlet pipeline with fixed holder.

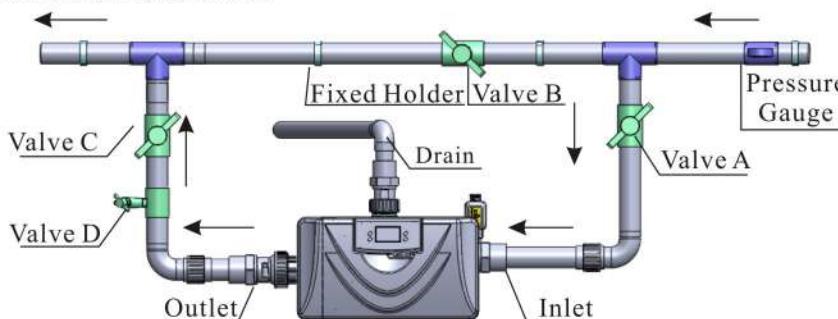


Figure 1-3

Note:

- If making a soldered copper installation, do all sweat soldering before connecting pipes to the valve. Torch heat will damage plastic parts.
- When turning threaded pipe fittings onto plastic fitting, use care and do not cross thread or break valve.
- If the valve belongs to time clock type (F111A1, F111B1), there are no step ②.

④ Install drain pipeline (If no special requirement, the standard DLFC is No.7704)

- Based on product configuration, for 63620/63520, if tank diameter is 1000 mm, install step d. If the tank size is 900 mm or 1200mm, you need to ask supplier for another injector & DLFC. Install it as below steps.
- Change 7704 to the corresponding injector for the tank which is 900 mm or 1200mm.
- Change DLFC to the corresponding DLFC for the tank which is 900 mm or 1200mm.
- Insert drain line flow control into drain hose connector, then screw it into drain outlet, and lock it.
- Glue the drain outlet with UPVC (DN40). Put drain outlet pipe to sewer as showed in the Figure 1-4.
- For filter valve 53620/53520, there is no DLFC, install UPVC (DN50) according to step e.

Note:

- Control valve should be higher than drain outlet, and be better not far from the drain hose.
- Be sure not connect drain with sewer, and leave a certain space between them, avoid wastewater be absorbing to the water treatment equipment.

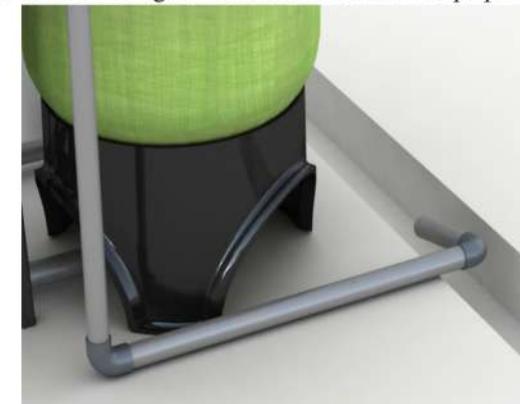


Figure 1-4

⑤ Connect brine tube

- As Figure 1-5 shows, use UPVC (DN20) to connect brine valve with brine line connector

Note:

- Keep brine line short and smooth. Elbows no more than four to avoid bad brine.
- Brine valve must be installed.

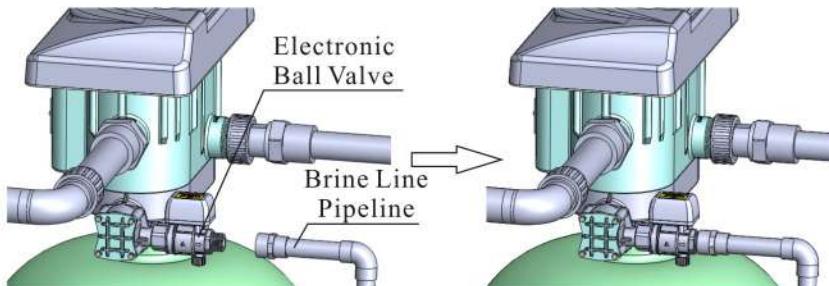
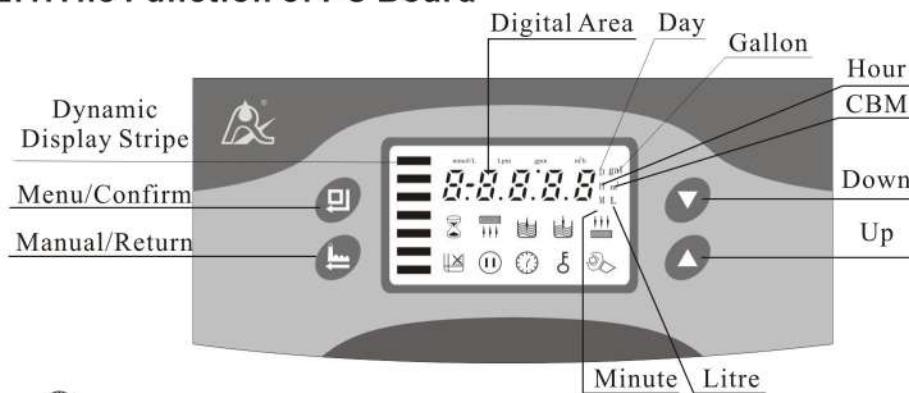


Figure 1-5

2. Basic Setting & Usage

2.1. The Function of PC Board



A. “” Time of day indicator

“” Light on, display the time of day

B. “” Button lock indicator

● “” Light on, indicate the buttons are locked. At this moment, press any single button will not work (No operation in one minute, “” will light on and lock the buttons.)

● Solution: Press and hold both “” and “” for 5 seconds until the “” light off.

C. “” Program mode indicator

● “” Light on, enter program display mode. Use “” or “” to view all values.

● “” Flash, enter program set mode. Press “” or “” to adjust values.

D. “” Manu/Confirm button

● Press “”, “” light on, enter program display mode and use “” or “”

to view all values.

● In program display mode, press “”, “” flash, enter program set mode, press “” or “” and adjust values.

● Press “” after all program are set, and then the voice “Di” means all setting are success and return program display mode.

E. “” Manual/Return button

● Press “” in any status, it can proceed to next step.(Example: Press “” in Service status, it will start regeneration cycles instantly; Press “” while it is in Backwash status, it will end backwash and go to Brine & Slow Rinse at once.)

● Press “” in program display mode, and it will return in Service; Press “” in program set mode, and it will return program display mode.

● Press “” while adjusting the value, then it will return program display mode directly without saving value.

F. Down “” and Up “”

● In program display mode, press “” or “” to view all values.

● In program set mode, press “” or “” to adjust values

● Press and hold both “” and “” for 5 seconds to unlock the buttons.

2.2. Basic Setting & Usage

A. Parameter specification

Function	Indicator	Factory Default	Parameter Set Range	Instruction
Time of Day		Random	00:00 ~ 23:59	Set the time of day when use “:” flash.
Control Mode		A-01	A-01	Regenerate on the day although the available volume of treated water drops to zero (0). Regeneration starts at the regeneration time.
			A-02	Regenerate immediately when the available volume of treated water drops to zero(0).
		A-03		Meter Delayed Regeneration type, but by setting Resin Volume, Feed Water Hardness, Regeneration Factor, the controller will calculate the System Capacity. Regeneration mode same as A-01.