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Multi-functional Flow Control Valve for Water Treatment Systems

For models:

F63P1, F63P3
F68P1, F68P3
F65P1, F65P3
F69P1, F69P3
F67P1
F71P1

User Manual

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

Before the valve put into use, please fill in the below content for future reference.

The Program Type Setting (Operation by professional)

When all symbols light no, press and hold and buttons for 5 seconds to enter the menu of valve model selection. **Please set the program type in accordance with the product type**. (Time clock type by days or hours or Meter type). For example，F63P1 should be set as F63B1; F63P3 should be set as F63P3. It should not be set to other type.)

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_____ ；
Specifications of Drain Line Flow Control_____；
Injector No._____.
Water Source: Ground-water□ Filtered Ground-water □Tap Water □ Other_____.

Filter System Configuration

Tank Size：Dia. _____mm，Height_____mm；
Filter Material _____Kg; Filter Material Height_____mm；
Turbidity of Inlet Water_____FTU；
Pressure of Inlet Water_____MPa；
Control Valve Model_____ ；Number_____ ；
Water Source: Ground-water□ Filtered Ground-water □Tap Water □ Other_____.

Parameter Setting

Parameter	Unit	Factory Default	Actual Value
Control Mode A-01/02 (P3 meter type available)	/	A-01	
Unit Mode HU1/2 (P3 meter type available)	/	HU01	
Water Treatment Capacity (P3 meter type available)	m^3	10	
Service Days（Time type by day）	D.	03	
Regeneration Time	/	02：00	
Backwash Interval Times (F68P/F69P have the item)	/	F-00	
Rinsing Frequence (F67P/F71P have the item)	/	F-00	
Backwash Time	min.	10	

Catalogue

Notice

● To ensure normal operation of the valve, please consult with professional installation or maintenance personnel before use it.

● Any pipeline engineering and electric works should be finished by professional in the time of installation.

● Do not use the control valve with the water of unsafe or unknown quality.

● Depending on the changes of working environment and water requirements, softening parameters should be adjusted accordingly.

● When the water treatment capacity is too low, please check the resin. If the cause is shortage of resin, please add it; if the resin turns reddish, brown or broken, please replace it.

● Test water periodically to verify that system performs satisfactorily.

● Sodium used in the water softening process should be considered as part of your overall dietary salt intake. Contact your doctor if you are on a low sodium diet.

● 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 by the clean water softening salts only, at least 99.5% pure. It is forbidden to use fine salt.

● Do not put the valve near heat sources or surroundings with 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 at water temperatures between 5～50℃,

water pressure 0.15～0.6MPa. Failure to use this product under such conditions voids the warranty.

● If the water pressure exceeds 0.6Mpa, a pressure-relief valve must be installed before the water inlet; if the water pressure under 0.15MPa, a booster pump must be installed before the water inlet.

● It is suggested to install PPR pipe, corrugated pipe or UPVC pipe, rather than TTLSG pipe.

●Do not let children touch or play, because careless operating may cause the procedure changed.

●When the attached cables of this product and transformer are changed, they must be changed to the one that is from our factory.

1. Product Overview

1.1. Main Application & Applicability

Used for intelligent filtering and softening in the water treatment systems. Be suitable for

Residential softening system
Residential filtration system
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 for softener or Service, Backwash and Fast Rinse for filter.

- **No water pass the valve in regeneration in single tank type.**
- **Manual function**

Realize regeneration immediately by pushing manual button at any time.

- **Long outage indicator**

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

- **The valve will automatically rotate for more than ten seconds after it is electrified**

After the valve is electrified, it will automatically rotate for more than ten seconds to turn back to the position when the electricity is cut off.

- **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.

- **Interval backwash times (Suitable for F68P/F69P)**

It could set up interval backwash times for F68P/F69P up-flow regeneration valve which means several times of services but one time of backwash. The setting of interval backwash time depends on the local water turbidity. (The lower the turbidity is , the longer of the interval backwash time can be set)

- **It can choose time clock type or meter type by program selection**

When all symbols light no, press and hold ▼and ▲buttons for 5 seconds to enter the menu of valve model selection. Please set the program type in accordance with the product type. (Tim clock type by days or hours or meter type) (Notice: The meter type product has one flow meter and flow meter cable, but the time clock type does not have).

- **Two meter types can be selected (Suitable for F63P3, F65P3, F68P3, F69P3)**

Model	Name	Instruction
A-01	Meter Delayed	Regenerate on the day although the available volume of treated water drops to zero (0). Regeneration starts at the regeneration time.
A-02	Meter Immediate	Regenerate immediately when the available volume of treated water drops to zero(0).

- **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

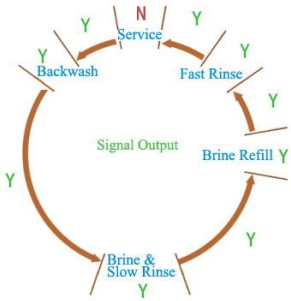
several valves are in series, there is only one valve in regeneration or washing to ensure pass water all the times while different valves in regeneration or washing.(Application refer to Figure 3-9)

- **Control Signal Output (F63P as example)**

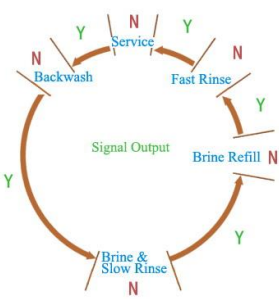
There is a signal output connector on the main control board. It is for controlling external wiring (Refer to Figure from Figure3-1 to Figure 3-8).

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 at intervals of regeneration cycles and In service.



b-01



b-02

- **User can set the maximum interval regeneration days (Only for F63P3/F65P3/F68P3/F69P3)**

In the situation of service reaching the setting days but the volume not yet, it could enter into regeneration process forcibly when current time is the same as regeneration time.

- **All parameters can be modified**

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

1.3. Service Condition

Runxin Valve should be used under the below conditions:

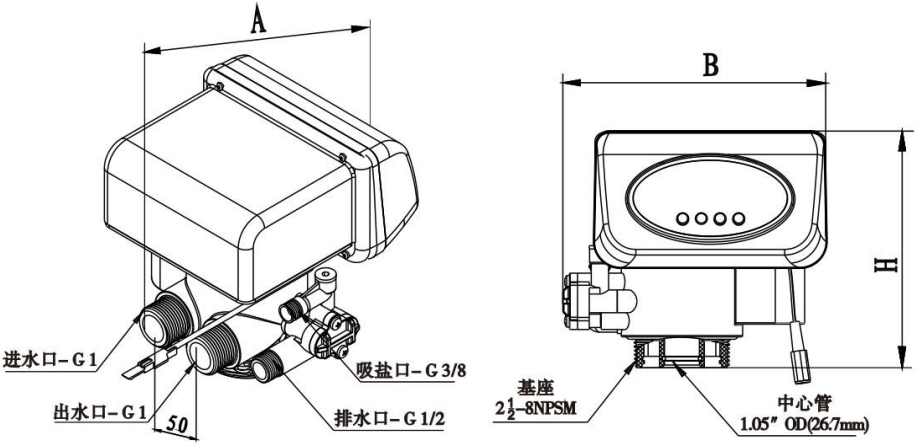
Items		Requirement
Working Conditions	Water pressure	0.15MPa～0.6MPa
	Water temperature	5℃～50℃
Working Environment	Environment temperature	5℃～50℃
	Relative humidity	≤95%（When temperature is 25℃）
	Electrical facility	AC100～240V/50～60Hz
Inlet Water Quality	Water turbidity	Down-flow regeneration＜5FTU；Up-flow regeneration＜2FTU
	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）
Inlet Water Filter	Turbidity	<20FTU

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 is more than the conditions allow, 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

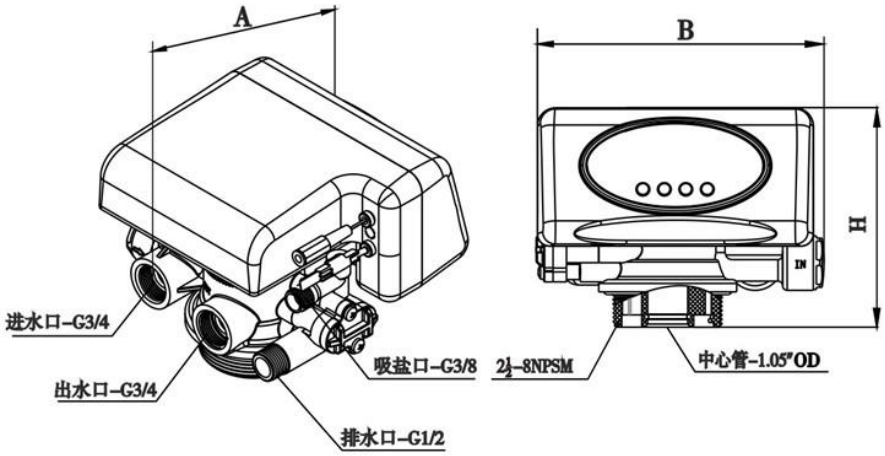
The appearance is just for reference. It is subject to the real product.
A.F63P1/F63P3/F68P1/F68P3



进水口 Inlet　出水口 Outlet 吸盐口 Brine Line Connector　排水口 Drain
基座 Base　中心管 Riser Piper

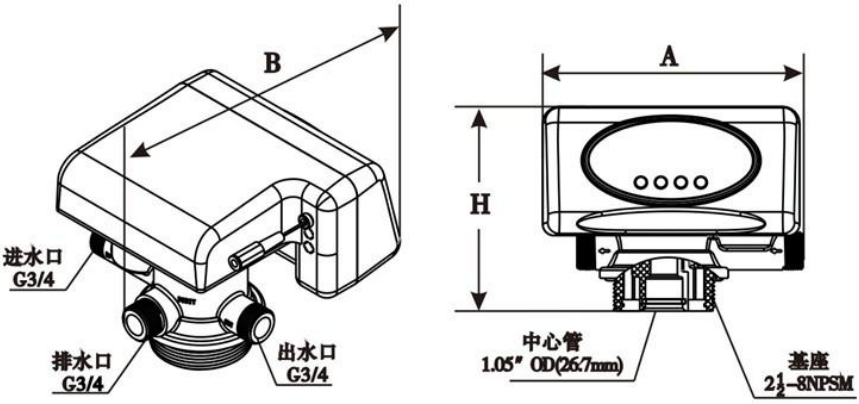
Model	A（mm）max	B（mm）max	H（mm）max	Flow Rate m^3/h @0.3MPa	Regeneration Mode
F63P1/F63P3	282	198	177	4.0	Down-flow
F68P1/F68P3	282	198	176.5	4.0	Up-flow

B. F65P1/F65P3/F69P1/F69P3

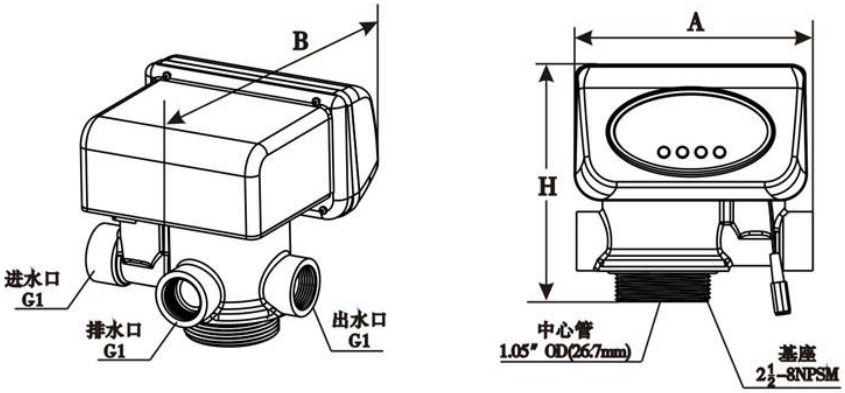


Product Model	A(mm) max	B(mm) max	H(mm) max	Water Treatment Capacity m3/h @0.3MPa	Regeneration Type
F65P1/F65P3	187.3	187.8	142.8	2.0	Down-flow
F69P1/F69P3	196.4	187.8	152.8	2.0	Up-flow

C. F71P1



D. F67P1



Notice: OD-Diameter

Control Valve Transformer Output: DC12V, 1.5A.

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 that the product can operate normally.

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

B. Device location

①The filter or softener should be located as close as to the drain.
②Ensure the device is installed in enough space for operating and maintenance.
③Brine tank needs to be close to softener.
④The device should be kept off the heater, and not be exposed outdoor. Sunshine or rain will cause damage to the system.
⑤Please avoid to install the system in one Acid/Alkaline, Magnetic or strong vibration circumstance, because such factors will cause the system disorder.
⑥Do not install the filter or softener, drain pipeline in circumstance which temperature may drop below 5℃, or above 50℃.
⑦The system should be installed in a place where there will be the minimum loss in case of water leakage.

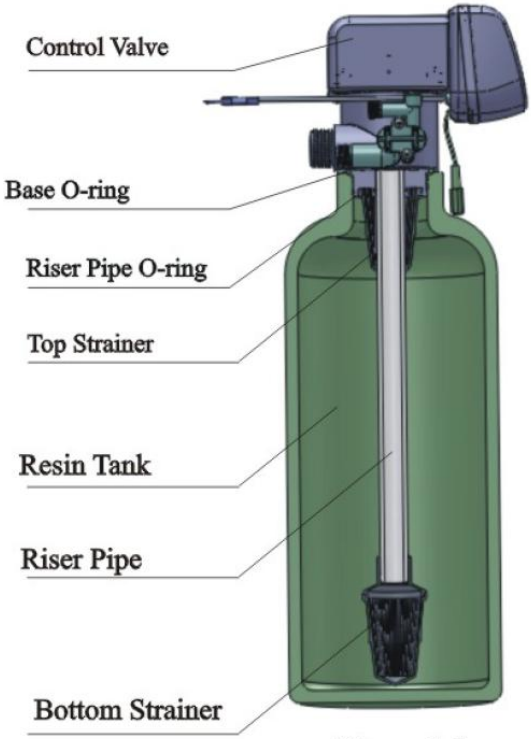


Figure1-1

C. Pipeline installation (F63P3 as example)

① Install control valve

a. As the Figure 1-1 shows, select the riser pipe with 26.7mm OD, glue the riser pipe to the bottom strainer and put it into the resin tank, cut off the exceeding tube out of tank top opening and make the tube exterior rounded.

b. Fill a stipulated amount of resin to the tank.

c. Screw the top strainer into the control valve.

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

Notice:

● The length of riser tube should be neither higher 2mm nor 5mm lower than the tank top opening, 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 animated connector

As Figure1-2 shows, put the sealing ring into nut of animated connector, and screw in water inlet.

③ Install flow meter

As Figure1-2 shows, put the seal ring into nut of flow meter, screw in water outlet; insert the sensor into flow meter.

④ Pipeline connection

a. As Figure1-3 shows, install a pressure gauge in water inlet.

b. Install valve A, B, C and D in the intermediate pipeline, inlet and outlet valve D is a sampling valve. (Or adopt F70A/F70C bypass valve).

c.Inlet pipeline should be in parallel with outlet pipeline. Support inlet and outlet pipeline with fixed holder.

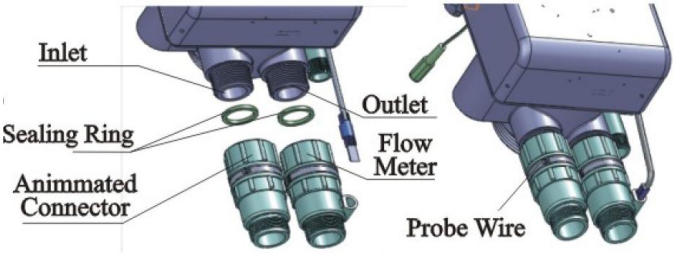


Figure1-2

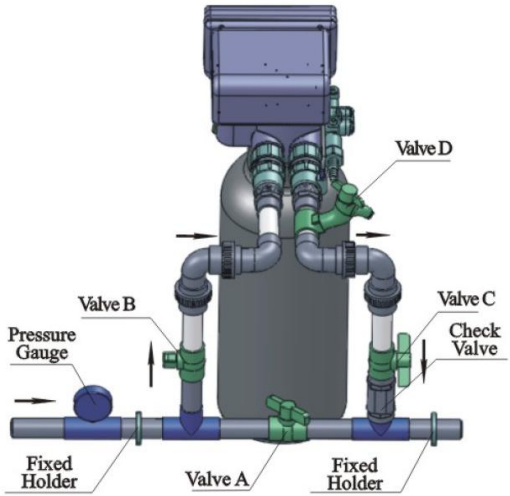


Figure1-3

Note:

●If the water outlet or water tank is installed higher than control valve or parallel interlock system with multi-outlets, a liquid level controller must be installed in brine tank. **Or else, the water in water outlet or water tank will flow backwards into brine tank when backwash.**

●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 not to cross thread or broken valve.

●If the valve belongs to time clock type, there are no step ② and ③

⑤ Install drain pipeline

a.As the Figure 1-4 shows, slide the drain hose connector into drain outlet.

b.Insert drain line flow control into drain outlet

c.Screw drain hose connector into drain outlet, and lock it.

d.Locate the drain hose well as the Figure1-4 show.

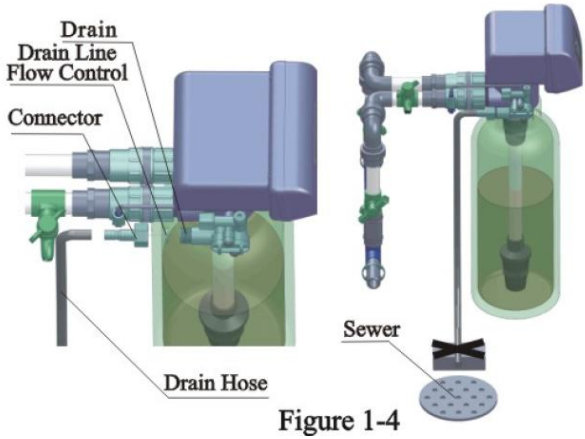


Figure 1-4

Note:

● Be sure not to connect drain with sewer, and leave a certain space between them, avoid wastewater be absorbed to the water treatment equipment, such as showed in the Figure1-4.

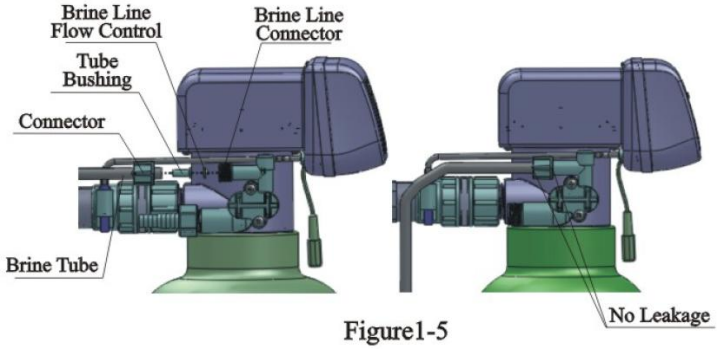


Figure1-5

⑥ Connect brine tube

a.As Figure1-5 shows, slide 3/8″brine tube hose connector over end of brine tube.

b.Insert tube bushing into the end of brine tube.

c.Insert the red brine line flow control into valve brine line connector(Attention: cone side of control should face into valve)

d.Tighten brine draw hose connector onto brine line connector.

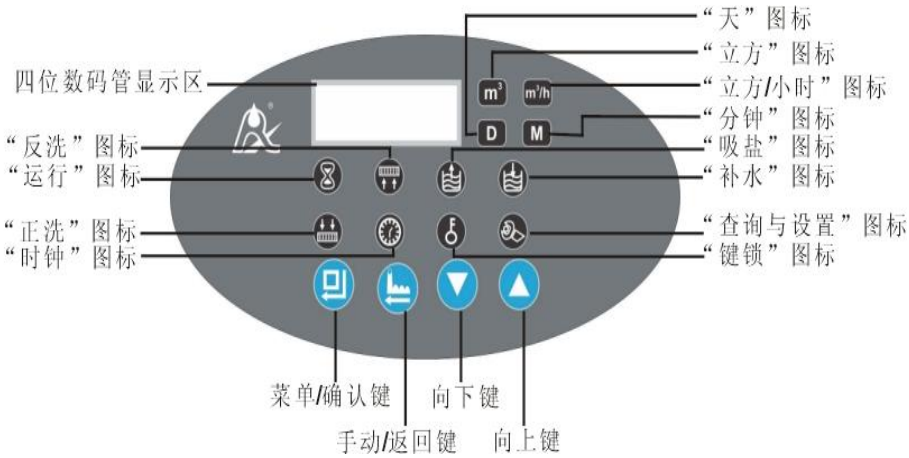
e.Connect the other end of brine tube with the brine tank. (The liquid

level controller and air-blocker should be installed in the brine tank.)

Notice: The brine tube and drain pipeline should not be bended or plugged.

2. Basic Setting & Usage

2.1. The Function of PC Board



四位数码显示区 Four Digital Area 反洗图标 Backwash 运行图标 Service 正洗图标 Fast Rinse 时钟图标 Time of Day 天图标 Day 立方图标 CBM 立方/小时图标 Cubic Meter per Hour 分钟图标 Minute 吸盐图标 Brine & Slow Rinse 补水图标 Brine Refill 查询与设置图标 Enquiry/Setting 键锁图标 Button Lock

A.“”

●“”Light on，display the time of day.

B.

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

- Unlocking：Press and hold both ▲and ▼ for 5 seconds until the 🔒 light off.

C. 🔧

- 🔧Light on，enter program display mode. Use ▲or▼ to view all values.
- 🔧 Flash, enter program set mode. Press▲or▼ to adjust values.

D. ⏹ 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 settings are successful and return to program display mode.

E.⏻ Button

- Press ⏻ in any status, it can proceed to next step.(Example: If outlet water is unqualified, press ⏻ in Service status, it will start regeneration cycle 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 to program display mode directly without saving values.

F. ▼ Button and ▲ Button

- 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 lift the Button Lock status.

2.2. Basic Setting & Usage

A. Parameter specifications

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	A-01	Meter Delayed: Regenerate on the day although the available volume of treated water drops to zero (0). Regeneration starts at the regeneration time.
			A-02	Meter Immediate: Regenerate immediately when the available volume of treated water drops to zero(0).
Unit Mode	HU-01	HU-01	1, 2	1-m3；2-gal
Service Days		1-03D	0～99 Days	Only for Time Clock Type, regeneration by days.
Regeneration Time	02:00	02:00	00:00～23:59	Regeneration time；“：” light on.
Interval Backwash Times	F-00	00	0～20	For example, F-01 indicate service 2 times, backwash 1 time.（Only for F68P, F69P）
Rinsing Frequence	F-00	00	0~20	For example, F-01 indicate rinse 2 times, service 1 time.（Only for F67P, F71P）
Water Treatment Capacity		10m^3	0～99.99 m^3	Water treatment capacity in one circle (m^3)
Backwash		10min.	0～99	Backwash time(Minute)

Brine & Slow Rinse Time		60min.	0～99	Brine & Slow rinse time(Minute)
Brine Refill Time		5min.	0～99	Brine refill time(Minute)
Fast Rinse Time		10min.	0～99	Fast rinse time(Minute)
Maximum Interval Regeneration Days	H-30	30	0～40	Regenerate on the day even through the available volume of treated water do not drop to zero (0).
Output Control Mode	b-01	01	01 or 02	Mode 01: Signal turn on start of regeneration and shut off end of regeneration. (Connection refer to the Figure P3) Mode 02: Signal available only intervals of regeneration cycles and in service. (Connection refer to the Figure P4)

B. Process Display

Figure A

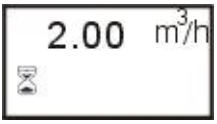


Figure B

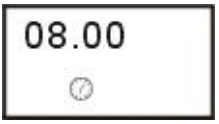


Figure C

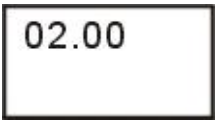


Figure D

Figure E

Figure F

Figure G

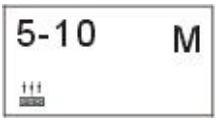


Figure H

Illustration:

- In Service status, the figure shows A/B/C/D; In Backwash status, it shows figure E/C; In Brine& Slow Rinse status, it shows F/C; In Brine Refill status, it shows figure G/C; In Fast Rinse status, it shows figure H/C. In each status, every figure shows 15 seconds.
- The above displays take the Meter Type for example. For the Time Clock Type, it shows the rest days or hours, such as 1-03D.
- The display screen will only show "-00-" when the electrical motor is running.
- The time of day figure"" flash continuously, such as "12：12" flash, indicates long outage of power. It reminds resetting the time of day.
- When the system malfunctions, the display will show error code, such as "-E1-".
- F63P/F65P/F68P/69P working process: Service→ Backwash→ Brine & Slow Rinse→ Brine Refill→ Fast Rinse.
- F67P/F71P working process: Service→ Backwash→ Fast Rinse.

C. Usage

After the accomplishment of installation, parameter setting and trial running by the professional, the valve can be put into use. In order to ensure that the quality of outlet water can reach the requirements, the user should complete the below work:

① Ensure that there is solid salt all the time in the brine tank in the course of use when this valve is used for softening. Only clean softening salt can be added to the brine tank, at least 99.5% pure. It is forbidden to use fine salt and iodized salt.

② Test the outlet water and raw water hardness on a regular basis. When the outlet water hardness is unqualified, please press the and the valve will temporarily regenerate again(It will not affect the original set operation cycle)

③ When the feed water hardness changes a lot, you can adjust the

water treatment capacity as below:

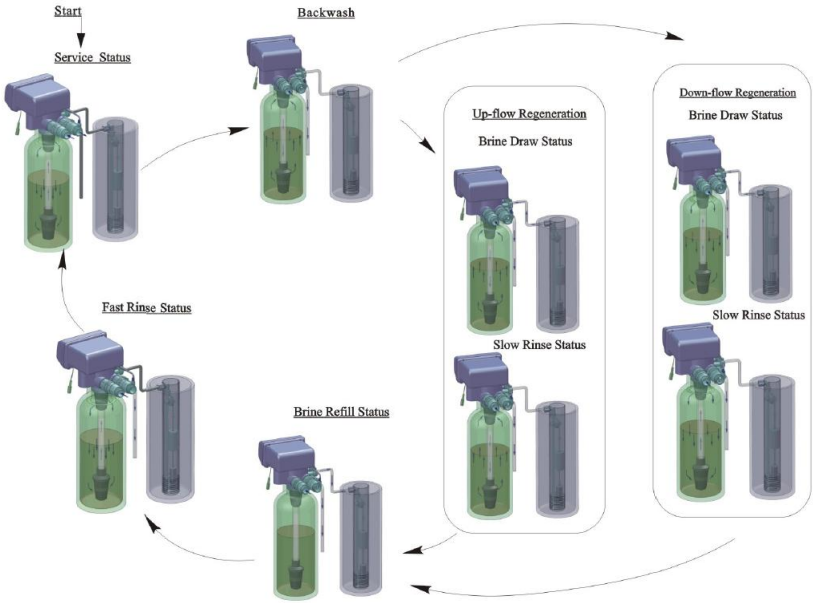
Press and hold both and for 5 seconds to lift the lock status. Press, and the light on, then press to choose the water treatment capacity. The digital area will show the given water treatment capacity, such as 10.00m^3. Press again, the water treatment capacity "10.00" flash, then press to reset the value. Press twice and hear a sound "Di", then finish the adjustment. Press exit and turn back to the service status.

④ For A-01 control mode (Delayed regeneration type), please pay attention whether the time is current or not. If the time is not right, you can adjust as below: After lifting the lock status, press, the and "" light on. Then press, the and hour value flash. Press or continuously to reset the hour value; Press again, and minute value flash. Press or continuously, reset the minute value; Press and hear a sound "Di", then finish the adjustment. Press exit and turn back to the service status.

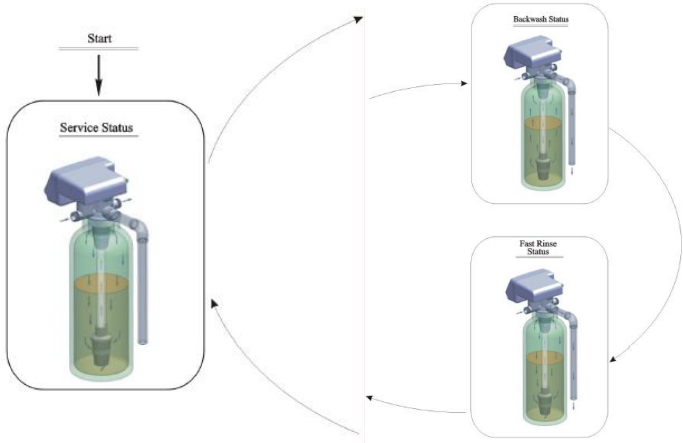
The regeneration parameters have been set when control valve left the factory. Generally, it does not need resetting. If you want to inquire and modify the settings, you can refer to the professional application specifications.

3. Applications

3.1. Softener Flow Chart

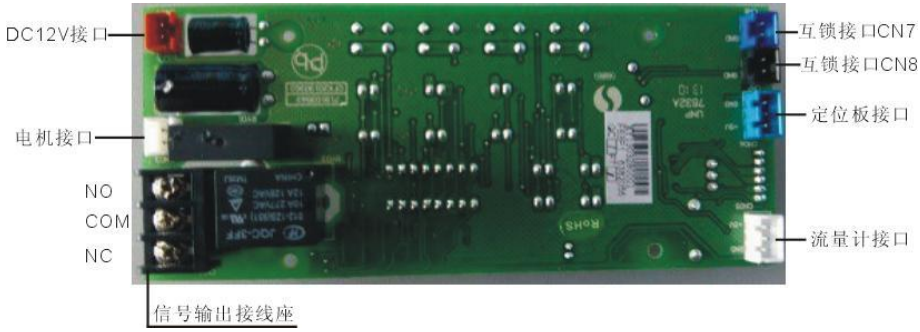


B. Filter Flow Chart



3.2. The Function and Connection of PC Board

Opening the front cover of control valve, you will see the main control board and connection port as below:



DC12V 接口 DC12V Connector 电机接口 Motor Connector 信号输出接线座 Signal Output Connector 流量计接口 Flow Meter Connector 互锁接口 Interlock Connector 定位板接口 Locating Board Connector

The main functions on main control board：

Function	Application	Explanation
Signal output connector b-01	Outlet solenoid valve	If system strictly requires no hard water to flow from outlet or controlling the liquid level in water tank.
	Inlet pump	Increase pressure for regeneration or washing. Use the liquid level controller to control inlet pump to ensure there is water in tank.
Signal output connector b-02	Inlet solenoid valve or inlet pump	When inlet pressure is high, it needs to close water inlet when valve is rotating to protect motor.
Interlock connector	To ensure only one control valve in regeneration or washing in system.	Use in RO Pre-treatment, water supply together but regeneration in turn. Second grade ion exchange equipment, etc.

A. Signal Output Connector

1） Control Solenoid Valve（Set as b-01）

①Solenoid Valve on Outlet Controls Water Level in Brine Tank.

Instruction: If system strictly require no hard water to flow from outlet in regeneration cycle(Mainly for no hard water flow out when valve is switching or valve in backwash or brine drawing positions), a solenoid valve could be installed on outlet, the wiring refer to Figure 3-1.

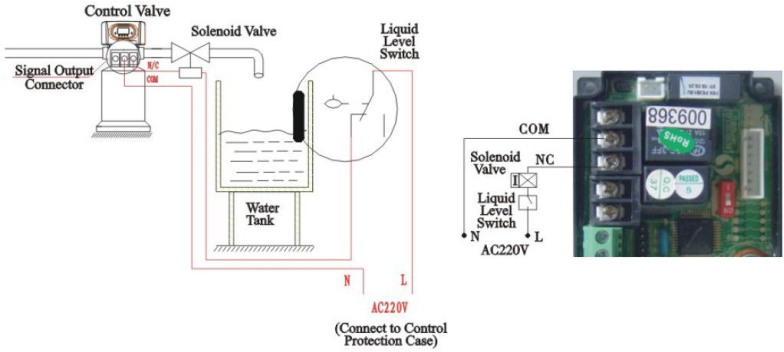


Figure3-1 Wring of Solenoid Valve on Outlet

Function:

When valve in service status, if soft water tank is short of water, solenoid valve is open to supply soft water, but if water tank has enough water, solenoid valve is closed, so no soft water will be supplied.

When the valve in backwash status, there is no signal output. So, solenoid valve is closed, and now water flows into soft water tank.

②Solenoid Valve on Inlet(Set as b-02)

Instruction: When inlet pressure exceeds 0.6MPa, install a solenoid valve on inlet. Control mode is b-02. Pressure will be relieved when valve is switching, the wiring refer to Figure 3-2. As Figure 3-3 shows, it also can use the pressure relief port to work.

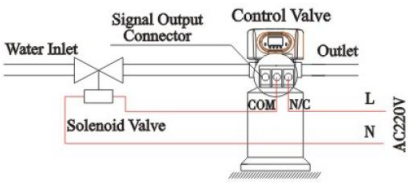


Figure 3-2 Wiring of Solenoid Valve on Inlet

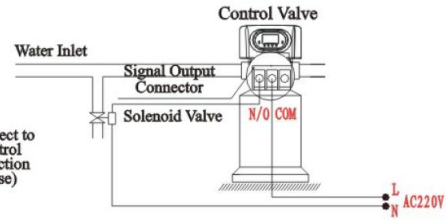


Figure3-3 Wiring of Pressure Relief Port

Function:

When inlet pressure is high, install a solenoid valve on inlet to ensure valve switching properly. When valve is exactly in position of Service, Backwash, Brine& Slow Rinse, Brine Refill and Fast Rinse, solenoid valve is open. When valve is switching, solenoid valve is closed, no water flow into valve to ensure valve switching properly. It could prevent the problem of mix water and water hammer.

Use interlock cable to realize valves in parallel and series in same system which is suited for RO pretreatment system or second grade Na^+ system. The Wiring refers to Figure 3-4:

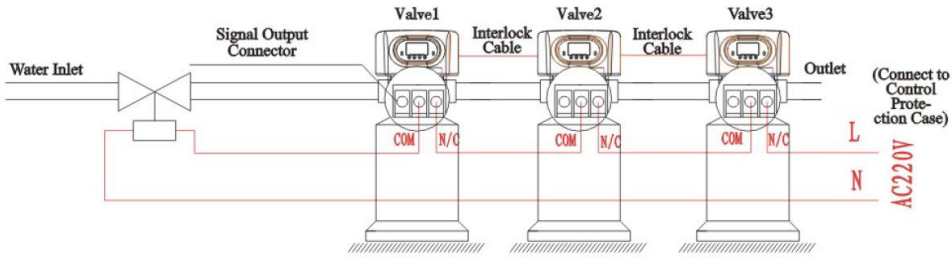


Figure 3-4 Wiring of Solenoid Vale in Inlet

2） Liquid Level Controller controls Inlet Pump(Two-phase motor)(Set as b-01)

Instruction: For the system using well or middle-tank supplying water, switch of liquid level controller and valve together control pump opening or closing. The wiring refer to Figure 3-5:

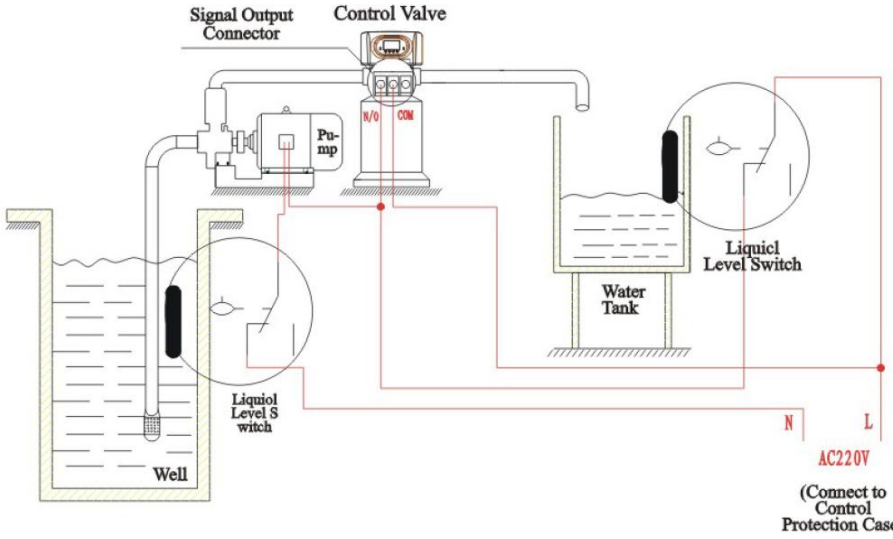


Figure 3-5 Wiring of Liquid Level Controller Controlling Inlet Pump

Function:

When valve in service status, if water tank is short of water, start up pump, but if water tank has enough water, the switch of liquid level controller is closed, so pump does not work.

When valve in regeneration cycle, inlet always has water no matter what is water condition in water tank. As Runxin valve no water pass outlet in regeneration cycle, it ensures no water fill into brine tank.

A liquid switch at the top opening O well or in middle water tank in RO system protect pump from working without water in case of out of raw water.

3） Liquid Level Switch in Water Tank Controls Inlet pump (Three-phase) (Set as b-01)

The principle is the same as for two-phase's, only change single-phase into three-phase motor, and use an AC contactor (Refer to Figure 3-6)

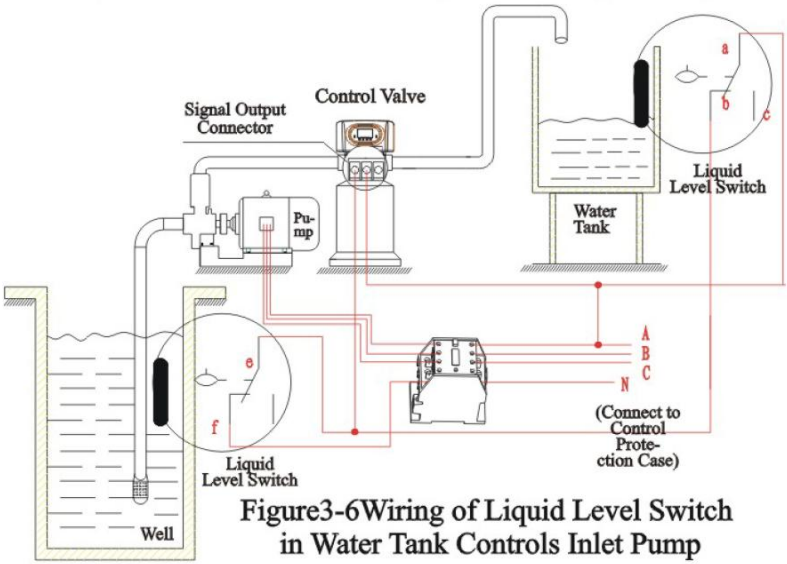
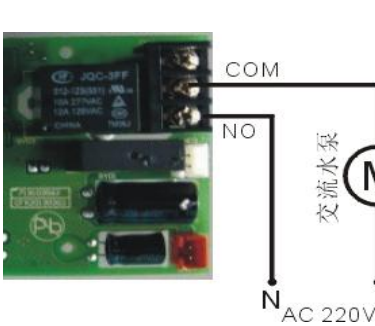
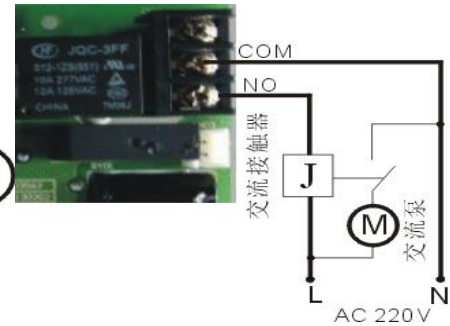


Figure3-6Wiring of Liquid Level Switch in Water Tank Controls Inlet Pump

4） Control Inlet Booster Pump(Set as b-01 or as b-02)

Instruction: If inlet water pressure is less than 0.15MPa, which makes rinse drawing difficult, a booster pump is suggested to be installed on inlet. Set Control mode as b-01. When system in regeneration cycle, booster pump is open, the wiring refer to Figure 3-7. If the booster pump current is bigger than 5A, system need to install a contactor, the wiring refer to Figure3-8





交流水泵 AC Pump 交流接触器 AC Contactor

Figure 3-7Wiring of Booster Pump on Inlet

Figure 3-8 Wiring of Booster Pump on Inlet

B. Interlock

Instruction:

In the parallel water treatment system, it ensures only one valve in regeneration or washing cycle and (n-1) valves in service, that is, realizing the function of supplying water simultaneously and regenerating individually, the wiring refer to Figure3-9.

In the series and parallel water treatment system(Second grade Na+ Exchanger or RO pre-treatment system), it ensure only one valve in regeneration or washing cycle and there is/are water(s) in service.

互锁线 Interlock Cable 互锁线插头。。。一直相连接 Plug Cable in Socket of Same Color

Note: Use Interlock Cable to connect CN8 to CN7 on next valve in the loop.

One system with several valves, if interlock cable is disconnected, the system is divided into two individual system.

C. Interlock System

It only needs to connect the 2 or more valve by interlock cable to realize simultaneous water supply and independent regeneration. The wiring refer to Figure3-12.

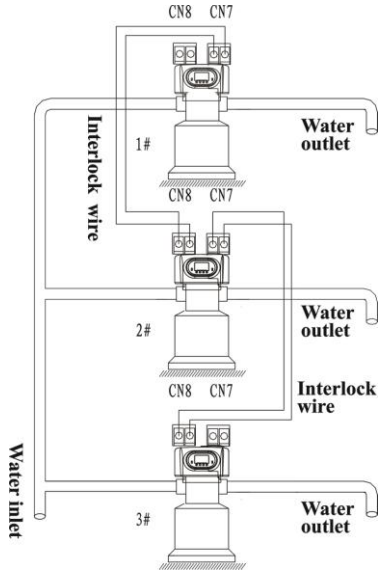


Figure 3-12 Interlock System

3.3. System Configuration and Flow Rate Curve

A. Product Configuration

Product configuration with tank, resin volume, brine tank and injector

Item No.	Tank Size （mm）	Resin Volume （L）	Flow Rate （t/h）	Brine Tank Size (mm)	Minimum Salt Consumption for Regeneration （Kg）	Injector Model
1	φ180×1130	16	0.5	φ200×500	2.40	6302
2	φ205×1300	25	0.7	Φ250×520	4.00	6303
3	φ255×1390	40	1.2	Φ250×520	6.00	6305
4	φ300×1650	60	1.8	φ400×800	9.00	6306
5	φ355×1650	100	2.5	Φ450×940	15.00	6308
6	φ400×1650	120	3.5	Φ450×940	18.00	6309
7	φ450×1650	150	4.5	φ500×1060	22.50	6310

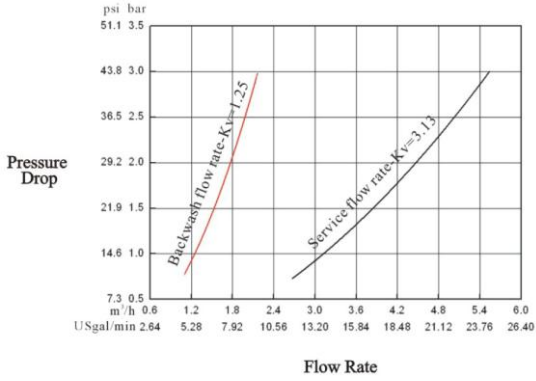
Attention: The tank size and brine tank configuration should comply with the technical requirements of softener valves.

Item 4 should be selected for the softener valve of 2m^3/h water treatment capacity.

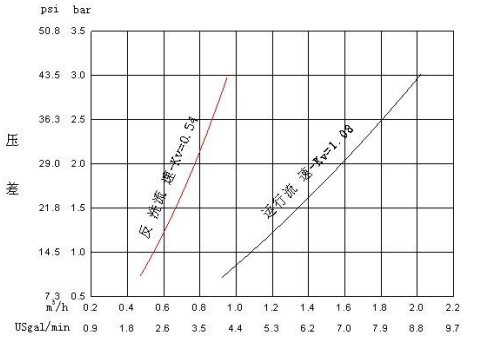
B. Flow Rate characteristic

1) Pressure-flow rate curve

F63P1/F63P3/F68P1/F68P3



F65P1/F65P3/F69P1/F69P1



压差 Pressure Drop 反洗流速 Backwash flow rate 运行流速 Service flow rate

2) Injector parameter table

Inlet Pressure	Draw Rate（L/M）									
MPa	6301 Coffee	6302 Pink	6303 Yellow	6304 Blue	6305 White	6306 Black	6307 Purple	6308 Red	6309 Green	6310 Orange
0.15	0.81	1.12	1.58	2.21	2.45	3.30	3.44	4.08	5.19	5.69
0.20	0.95	1.41	1.87	2.53	2.89	3.88	4.21	4.83	5.36	6.80
0.25	0.99	1.61	2.08	2.79	3.30	4.30	4.66	5.39	6.86	7.65
0.30	1.30	1.81	2.18	3.05	3.66	4.74	5.15	5.95	7.50	8.60
0.35	1.45	1.96	2.39	3.27	3.94	5.02	5.55	6.51	8.30	9.57
0.40	1.56	2.12	2.55	3.50	4.25	5.41	5.88	6.77	8.74	9.90

3) Configuration for Standard Injector and Drain Line Flow Control

Item No.	Tank Dia. mm	Injector Model	Injector Color	Draw Rate	Slow Rinse	Brine Refill	DLFC	Backwash / Fast Rinse
				L/m	L/m	L/m		L/m
1	150	6301	Coffee	1.30	0.91	3.0	1#	4.7
2	175	6302	Pink	1.81	1.32	3.7	1#	4.7
3	200	6303	Yellow	2.18	1.73	3.8	2#	8.0
4	225	6304	Blue	3.05	2.14	3.3	2#	8.0
5	250	6305	White	3.66	2.81	4.3	3#	14.4
6	300	6306	Black	4.74	3.32	4.2	3#	14.4
7	325	6307	Purple	5.15	3.55	4.1	4#	22.8

8	350	6308	Red	5.95	4.0	4.0	4#	22.8
9	400	6309	Green	7.50	5.13	4.0	5#	26.4
10	450	6310	Orange	8.60	5.98	3.9	5#	26.4

Remark: The above data for the product configuration and relevant characteristics are only for reference. When put in practice, it is subject to the different requirements of raw water hardness and application.

Item 6 should be selected for the softener valve of 2m^3/h water treatment capacity.

3.4. Parameter settlement

①Service timeT1

Water treatment capacity：

$Q=V_R \times K \div Y_D$（m^3）

- Y_D — Hardness of Inlet Water (mmol/L)
- K — Exchange factor (mmol/L) 400 ～ 1000. Down-flow regeneration, take 400 ～ 750. Up-flow regeneration, take 450～1000. If the inlet water hardness is higher, the factor is smaller.
- V_R — Resin volume($m^{3)}$

By hours: $T1=Q \div Q_h$（Hour）

- Q_h — **Water treatment capacity per hour (m^3/h)**
- Q — Water treatment capacity（m^3）

By days：$T1=Q \div Q_d$（Day ）

- Q_d — **Water treatment capacity per day (m^3/d)**
- Q — Water treatment capacity (m^3)

②Backwash time T2

It is subject to the turbidity of inlet water. Generally, It is suggested

to be set 10～15 minutes. The higher the turbidity is, the longer backwash time can be set. However, if the turbidity is more than 5FTU, it should be better to install a filter in front of the exchanger.

③Brine & slow rinse time T3

T3=(40～50)×H_R（min.）

Generally, T3=45H_R（min.）

In this formula, H_R——The height of resin in exchange tank (m.)

④Brine refill timeT4

Down-flow regeneration：T4＝0.45×V_R÷Brine refill speed (min.)

Up-flow regeneration：T4＝0.34×VR÷Brine refill speed (min.)

In this formula, V_R—— Resin volume (m^3)

The Brine refill speed is related to inlet water pressure. It is suggested to lengthen 1~2 minutes of calculated brine refilling time to make sure there is enough water in tank.（The condition is that the there is a level controller installed in the brine tank）

⑤Fast rinse time T5

T5=12×H_R（min.）

Generally, the water for fast rinse is 3～6 times of resin volume. It is suggested to be set 10～16 minutes, but subject to the outlet water reaching the requirement.

⑥Exchange factor

Exchange factor =E/ (k×1000)

In this formula, E——Resin working exchange capability（mol/m^3），it is related to the quality of resin. Down-flow regeneration, take 800～900. Up-flow regeneration, take 900～1200.

K——Security factor, always take 1.2～2. it is related to the hardness of inlet water: the higher the hardness is, the bigger the K is.

⑦Set up interval backwash times（Only for F68 P/F69P）

When the turbidity of raw water is higher, the interval backwash time could be set F-00. That is, backwash in each regeneration; when the turbidity is lower, the interval backwash time could be set F-01(or other number value), it is to say that backwash in every two regeneration. Thus, Service→Brine& slow rinse→Brine refill→ Fast rinse→ Service→

Backwash →Brine& slow rinse →Brine refill →Fast rinse.

⑧Regeneration time

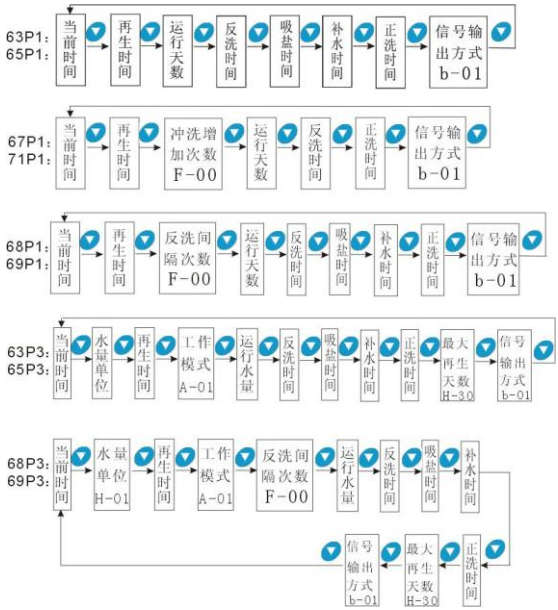
The whole cycle for generation needs approximately two hours. According to the actual situation, please try to set up the regeneration time in the period when you don't need to use water.

The calculation of parameters for each step is only for reference, the actual proper time will be determined after adjusting by water exchanger supplier. This calculation procedure of softener is only for industrial application; it is not suitable for small softener in residential application.

3.5. Parameter Enquiry and Setting

3.5.1. Parameter Enquiry

When light on, press and hold both ▲ and ▼ for 5 seconds to lift the button lock status; then press ■ and light on, enter the program display mode; press ▲ or ▼ to view each value according to below process.（Press ↵ exit and turn back to service status）



当前时间 The Time of Day 再生时间 Regeneration Time 运行天数 Service Days 反洗时间 Backwash Time 吸盐时间 Brine Draw Time 补水时间 Brine Refill Time 正洗时间 Fast Rinse Time 信号输出方式 Signal Output Control Mode
冲洗增加次数 Backwash Frequence
反洗间隔次数 Interval Backwash Times
水量单位 Unit 最大再生天数 Maximum Interval Regeneration Days
工作模式 Work Mode

3.5.2. Parameter Setting

In program display mode, press and enter the program set mode. Press or to adjust the value.

3.5.3. The steps of parameter setting (Take F63P3 A-01 as an example)

Items	Process steps	Symbol
Time of Day	When time of day "12:12" continuously flash, it reminds to reset; 1. Press to enter into program display mode; both and "" symbol light on, ":" flash; Press , both and hour value flash, through or to adjust the hour value; 2. Press again, both and hour value flash, through or to adjust the minute value;3 3. Press and finish the adjustment, press to turn back.	
Unit Mode	1.In unit mode display status, press and enter into program set mode, and 1value flash; 2.Press or , and choose from the m^3/gal; 3. Press and finish adjustment, press to turn back.	

Regeneration Time	1. In regeneration time display status, press and enter into program set mode. and 02 flash; 2. Press or to adjust the hour value; 3. Press again, and 00 flash, press or to adjust the minute value; Press and hear a sound “Di”, then finish adjustment, press to turn back.	
Control Mode	1. In control mode display status, press and enter into program set mode, and 01 value flash; 2. Press or , set the value as A-01 or A-02, 3. Press and then finish adjustment, press to turn back.	
Water Treatment Capacity	1. In water treatment capacity display status, it shows and 10.00. Press and enter into program set mode. and 10.00 flash 2. Press or to adjust the water treatment capacity value（m^3）; 3. Press and finish the adjustment, press to turn back.	
Backwash Time	1. In backwash time display status, it shows and 2-10. Press and enter into program set mode. and 10 flash; 2. Press or to adjust the backwash time; 3. Press and finish the adjustment, press to turn back.	
Brine & Slow Rinse Time	1. In brine& slow rinse time display status, it shows and 3-60. Press and enter into program set mode. and 60 flash; 2. Press or to adjust the brine &slow rinse time; .	

	3. Press and hear a sound “Di”, then finish adjustment, press to turn back.	
Brine Refill Time	1. In brine refill time display status, it shows and 4-05. Press and enter into program set mode. and 05 flash； 2. Press or to modify the brine refill time； 3. Press and finish the adjustment, press to turn back.	
Fast Rinse Time	1. In fast rinse time display status, it shows and 5-10. Press and enter into program set mode. and 10 flash； 2. Press or to adjust the fast rinse time(minute)； 3. Press and finish the adjustment, press to turn back.	
Maximum Interval Regeneration Days	1. In maximum Interval regeneration days display status, it shows H-30. Press and enter into program set mode. and 30 flash； 2. Press or to adjust the Interval regeneration days； 3. Press and finish the adjustment, press to turn back.	
Signal Output Mode	1. In signal output mode display status, it shows b-01. Press and enter into program set mode. and 01flash； 2. Press or to adjust the b-02； 3. Press and finish the adjustment, press to turn back.	

For example，the fast rinse time of a softener is 12 minutes. After regenerating, the chloridion in the outlet water is always higher than

normal, indicating that there is not enough time for fast rinse. If you want the time to set to 15 minutes, the modification steps as follows:

① Press and hold both and to lift the button lock status（ light off）;

② Press , and light on;

③ Press or continuously until light on. Then the digital area shows: 5-12M;

④ Press , and 12 flash;

⑤ Press continuously until 12 changes to 15;

⑥ Press , there is a sound “Di” and the figure stop flashing; the program back to enquiry status

⑦ If you want to adjust other parameters, you can repeat the steps from ②to ⑤; If you don’t, press and quit from the enquiry stat, the display will show the current service status.

3.6. Trial running

After installing the multi-functional flow control valve on the resin tank with the connected pipes, as well as setting up the relevant parameters, please conduct the trial running as follows:

A. Close the inlet valve B & C, and open the by-pass valve A. After cleaning the foreign materials in the pipe, close the by-pass valve A. (as Figure 1-3 shows)

B. Fill the brine tank with the planned amount of water and adjust the air check valve. Then add solid salt to the tank and dissolve the salt as much as possible.

C. Switch on power. Press and go to the Backwash position; when light on, slowly open the inlet valve B to 1/4 position, making the water flow into the resin tank; you can hear the sound of air-out from the drain pipeline. After all air is out of pipeline, then open inlet valve B completely and clean the foreign materials in the resin tank until the outlet water is clean. It will take 8～10 minutes to finish the whole process.

D. Press, turning the position from Backwash to Brine& Slow Rinse; light on and enter in the process of Brine& Slow Rinse. The air check valve close when control valve finished sucking brine, then slow rinse start to work. It is about 60～65minutes for whole process.

E. Press to Brine refill position. light on and it indicates the brine tank is being refilled with water to the required level. It takes about 5～6minutes, then add solid salt to the brine tank.

F. Press, turning to Fast Rinse position. light on and start to fast rinse. After 10～15minutes, take our some outlet water for testing: if the water hardness reach the requirement, and the chloridion in the water is almost the same compared with the inlet water, then go to the next step.

G. Press , making the control valve return to Service Status; light on and start to run.

Note:

- If water inflow is too fast, the media in tank will be damaged. When water inflow slowly, there is a sound of air emptying from drain pipeline.
- After changing the resin, please empty air in the resin according to the above Step 2.
- In the process of trial running, please check the water situation in all position, ensuring there are no resin leakage.
- The time for Backwash, Brine& Slow Rinse, Brine Refill and Fast Rinse position can be set and executed according to the calculation in the formula or suggestions from the control valve suppliers.

3.7. Trouble-Shooting

A. Control Valve Fault

Problem	Cause	Correction
1.Softener fails to regenerate.	A. Interruption of electricity B. Regeneration cycles set incorrect. C. Controller is defective. D. Motor fails to work.	A. Assure permanent electrical service(Check fuse, plug, pull chain or switch). B. Reset regeneration cycles. C. Replace controller. D. Replace motor.
2. Incorrect Regeneration Time	A. Time of Day is not set correctly. B. Power failure more than 3 days.	Check program and reset time of day.
3.Softener supply hard water.	A. Bypass valve is open or leaking. B. No salt in brine tank. C. Injector plugged. D. Insufficient water flowing into brine tank. E. Leak at O-ring on riser pipe. F. Internal valve leak. G. Regeneration cycles not correct. H. Shortage of resin. I. Bad quality of feed water or turbine blocked.	A. Close or repair bypass valve. B. Add salt to brine tank and maintain salt level above water level. C. Change or clean injector. D. Check brine tank refill time. E. Make sure riser pipe is not cracked. Check o-ring and tube pilot. F. Change valve body. G. Set correct regeneration cycles in the program. H. Add resin to mineral tank and check whether resin leaks. I. Reduce the inlet turbidity, clean or replace turbine.

4.Softener fails to draw brine.	A. Line pressure is too low. B. Brine line is plugged. C. Brine line is leaking. D. Injector is plugged. E. Internal control leak. F. Drain line is plugged. G. Sizes of injector and DLFC does not match with tank.	A. Increase line pressure. B. Clean brine line. C. Replace brine line. D. Clean or replace new parts. E. Replace valve body. F. Clean drain line flow control. G. Select correct injector size and DLFC according to the P20 requirements.
5.System uses too much salt.	A. Improper salt setting. B. Excessive water in brine tank.	A. Check salt usage and salt setting. B. See problem no.6.
6.Excessive water in brine tank.	A. Overlong refilling time. B. Foreign material in brine line. C. Foreign material in brine valve and plug drain line flow control. D. Not install safety brine valve but power failure whiling salting. E. Safety brine valve breakdown.	A. Reset correct refilling time. B. Clean brine line. C. Clean brine valve and brine line. D. Stop water supplying and restart pr install safety brine valve in salt tank. E. Repair or replace safety brine valve.
7.Pressure lost or iron in conditioned water.	A. Iron in the water supply pipe. B. Iron mass in the softener. C. Fouled resin bed. D. Too much iron in the raw water.	A. Clean the water supply pipe. B. Clean valve and add resin cleaning chemical, increase frequency of regeneration. C. Check backwash, brine draw and brine tank refill. Increase frequency of regeneration and backwash time. D. Iron removal equipment is required to install before softening.

8.Loss of resin through drain line.	A. Air in water system. B. Bottom strainer broken. C. Improperly sized drain line control.	A. Assure that well system has proper air eliminator control. B. Replace the bottom strainer. C. Check for proper drain rate.
9.Control cycle continuously.	A. Controller is faulty. B. Some parameter is set as 0 in program.	A. Replace the controller. B. Check and reset the program.
10.Drain flows continuously.	A. Internal valve leak. B. When electricity fails to supply, valve stops backwash or fast rinse position. C. Control valve is in Backwash status.	A. Check and repair valve body or replace it. B. Adjust valve to service position or turn off bypass valve and restart when electricity supply. C. When F63, F65, F68, F69 control valve is in Backwash status, the outlet is connected with drain port.
11.Salt water in soften water.	A. Foreign material in injector pr injector fails to work. B. Brine valve cannot be shut-off. C. Time of rapid rinse too short.	A. Clean and repair injector. B. Repair brine valve and clean it. C. Extend rapid rinse time.
12.Interupted or irregular brine.	A. Water pressure too low or not stable. B. Injector is plugged or faulty. C. Air in resin tank. D. Floccules in resin tank during backwash.	A. Increase water pressure. B. Clean or replace injector. C. Check and find the reason. D. Clean the floccules in resin tank.
13.Water flow out from drain or brine pipe after regeneration.	A. Foreign material in valve which makes valve can't be closed completely. B. Hard water mixed in	A. Clean foreign material in valve body. B. Change valve core or sealing ring. C. Reduce water pressure or use

	valve body. C. Water pressure is too high which result in valve doesn't get the right position.	pressure release function.
14.Cycle water treat capacity decreases.	A. Unit fails to regenerate or regenerate not properly. B. Fouled resin bed. C. Salt setting not proper. D. Softener setting not proper. E. Raw water quality deterioration. F. Turbine of flow meter is stuck.	A. Regenerate according to the correct operation requirement. B. Increase backwash flow rate and time, clean or change resin. C. Readjust brine drawing time. D. According to the test of outlet water, recount and reset. E. Regenerate unit by manual temporary, then reset regeneration cycle. F. Disassemble flow meter and clean it or replace it with a new turbine.

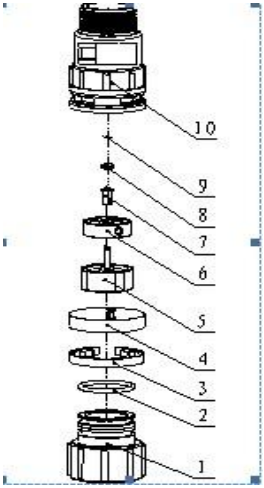
B. Controller Fault

Problem	Cause	Correction
1. All indictors display on front panel.	A. Control board is faulty. B. Transformer dampened or damaged. C. Electrical service not stable.	A. Replace control board. B. Check and replace transformer. C.Check and adjust electrical service.
2. No display on front panel.	A. Wiring of front panel with controller fails to work. B. Control board damaged. C. Transformer damaged D. Electricity is interrupted.	A. Check and replace wiring. B. Replace front panel. C. Replace transformer. D. Check electricity supply.

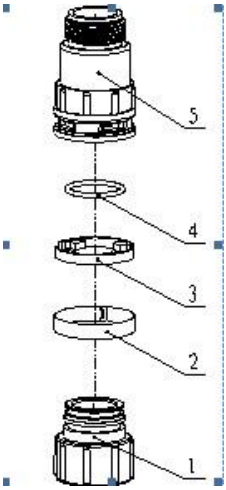
3. E1 Flash	A. Wiring of locating board with controller fails to work. B. Locating board damaged. C. Mechanical drive failure. D. Faulty control board. E. Wiring of motor with controller is fault. F. Motor damaged. G. The set mode does not match with the valve body.	A. Replace wiring. B. Replace locating board. C. Check and repair mechanical part. D. Replace control board. E. Replace wiring. F. Replace motor. G.Empower the system to reset it.
4. E3 or E4 Flash	A. Control board is faulty.	A. Replace control board.

3.8. Assembly & Parts

Flow Meter Connector & Animated Connector



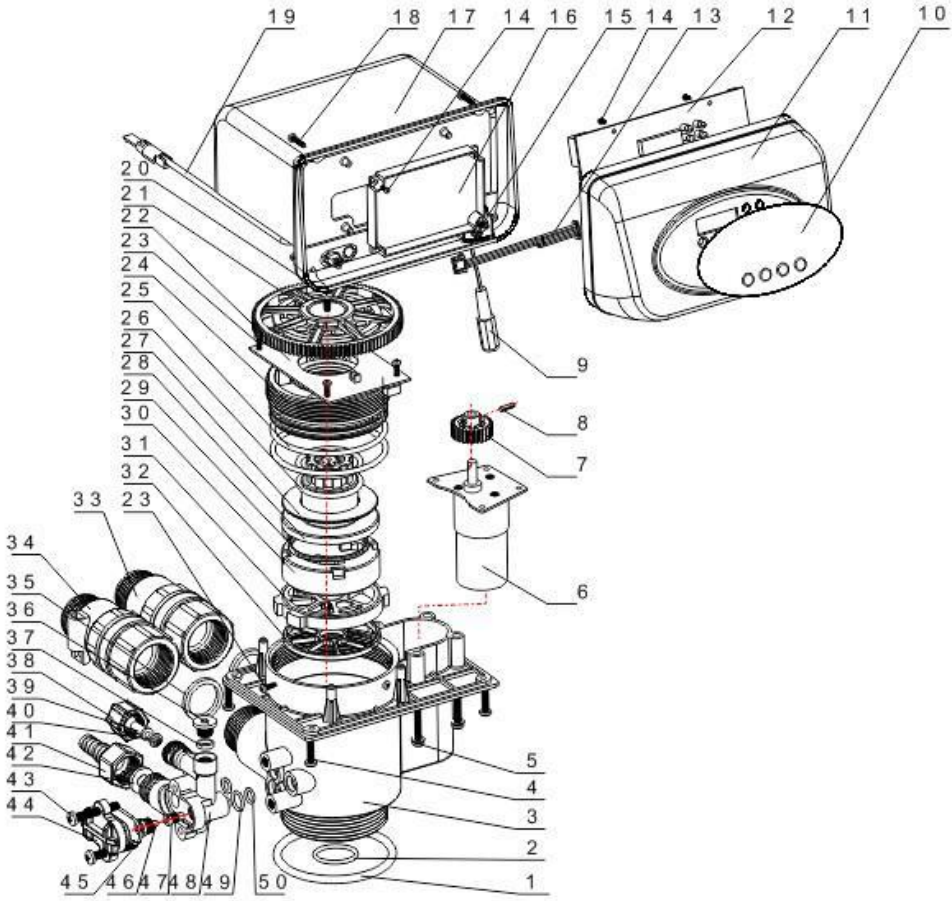
5447001 Flow Meter



5457002 Animated Connector

5447001 Flow Meter					5457002 Animated Connector			
Item No.	Description	Part No.	Quantity		Item No.	Description	Part No.	Quantity
1	Animated nut	8945001	1		1	Animated nut	8945001	1
2	O-ring 28X2.65	8378081	1		2	Ferrule	8270002	1
3	Clip	8270001	1		3	Clip	8270001	1
4	Ferrule	8270002	1		4	O-ring 28X2.65	8378081	1
5	Impeller supporter	5115001	1		5	Connector	8458038	1
6	Impeller	5436001	1					
7	Rotating core	8211001	1					
8	Bushing	8210001	1					
9	Spring Check Ring	8945005	1					
10	Shell	8002001	1					

F63P3 and F68P3 Exploited Drawing



F63P1/F63P3 Component Name and Codes (Item No. 19, 33 34 only for F63P3)

Item No.	Description	Part No.	Quantity
1	O-ring 73×5.3	8378143	1
2	O-ring 25.8×2.65	8378078	1
3	Valve Body	5022033	1
		5022034	
4	Screw, Cross ST3.9X16	8902016	4
5	Screw, Cross M4X30	8909009	4
6	Gear Motor	6158011	1
7	Small Gear, Motor	8241003	1
8	Pin	8993001	1
9	Power Cable	5513001	1
10	Label	8865057	1
11	Front Cover	8300038	1
12	Control Board	6382056	1
13	Wire for Locating Board	5511017	1
14	Screw,Cross, ST2.2X6.5	8909004	5
15	Wire Clip	8126004	2
16	Wire-pressing Plate	8005044	1
17	Dustproof Cover	8005006	1
18	Screw,Cross, ST2.9X16	8909010	4
19	Probe Cable	6386001	1
20	Screw,Cross, ST3.9X13	8909013	1
21	Big Gear, Driven	8241033	1
22	Locating Board	6380032	1
23	Screw,Cross, ST2.9X9.5	8909008	4
24	Fitting Nut	8092004	1

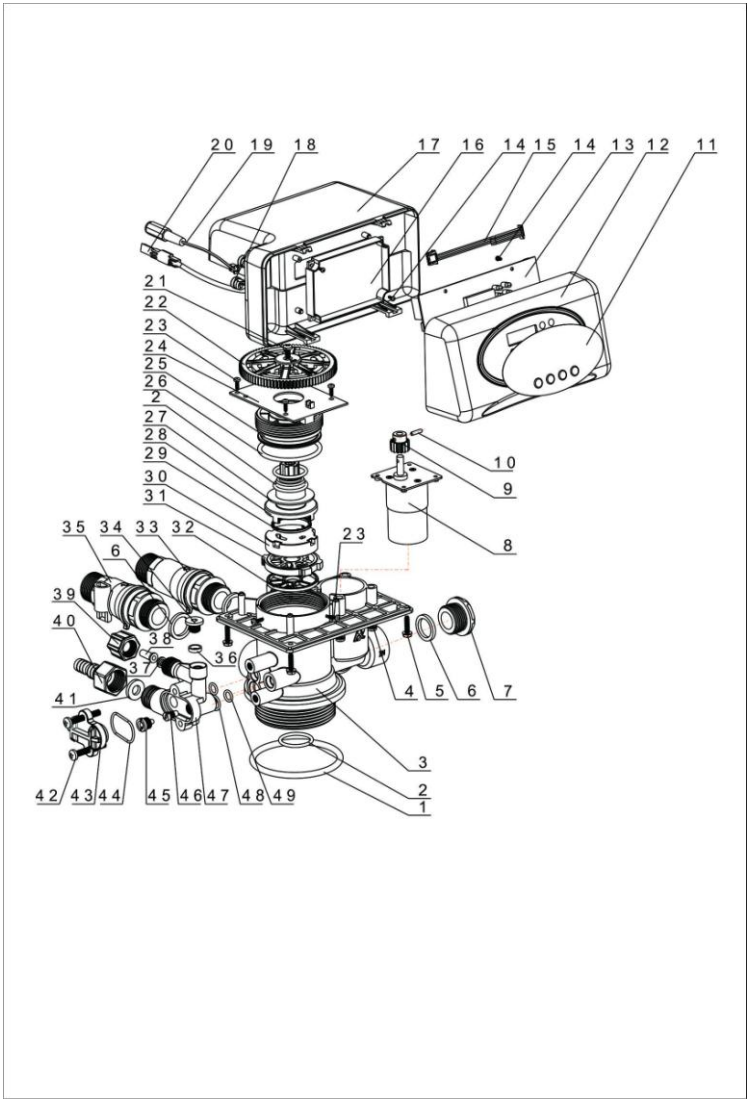
Item No.	Description	Part No.	Quantity
25	O-ring 73X3.55	8378128	2
26	O-ring 37.7X3.55	8378118	2
27	Anti-friction Washer	8216004	1
28	Shaft	8258004	1
29	Moving Seal Ring	8370001	1
30	Moving Disk	8459001	1
31	Fixed Disk	8469001	1
32	Seal Ring	8370002	1
33	Animated Connector	5457002	1
34	Flow Meter	5447001	1
35	Seal Ring	8371001	1
36	Plug	8323002	1
37	Seal Ring	8370003	1
38	Hexagonal Nut	8940001	1
39	Tube	8457004	1
40	Brine Line Flow Control	8468002	1
41	Joint	8458017	1
42	Drain Line Flow Control	8468007	1
43	Screw,Cross M5X35	8902017	2
44	Injector Injector	8315001	1
45	O-ring 30X1.8	8378025	1
46	Nozzle, Injector	8454009	1
47	Throat, Injector	8467009	1
48	Injector Body	8008001	1
49	O-ring 10.82X1.78	8378012	1
50	O-ring 7.5X1.8	8378016	2

F68P1/F68P3 Component Name and Codes (Item No. 19, 33, 34 only for F68P3)

Item No.	Description	Part No.	Quantity
1	O-ring 73×5.3	8378143	1
2	O-ring25.8×2.65	8378078	1
3	Valve Body(ABS+GF10)	5022022	1
	Valve Body(PPO+GF20)	5022023	
4	Screw,Cross, ST3.9X16	8909016	4
5	Screw, Cross M4X30	8902009	4
6	Motor	6158011	1
7	Small Gear, Motor	8241003	1
8	Pin	8993001	1
9	Power Cable	5513001	1
10	Label	8865057	1
11	Front Cover	8300038	1
12	Control Board	6382056	1
13	Wire for Locating Board	5511017	1
14	Screw,Cross, ST2.2X6.5	8909004	5
15	Wire Clip	8126004	2
16	Wire-pressing Plate	8005044	1
17	Dustproof Cover	8005006	1
18	Screw,Cross, ST2.9X16	8909010	4
19	Probe Cable	6386001	1
20	Screw,Cross, ST3.9X13	8909013	1
21	Big Gear	8241035	1
22	Locating Board	6380032	1
23	Screw,Cross	8909008	4
24	Fitting Nut	8092004	1
25	Locating Board	8380006	1
26	Fitting Nut	8092004	1

Item No.	Description	Part No.	Quantity
25	O-ring 73X3.55	8378128	2
26	O-ring 37.7X3.55	8378118	2
27	Anti-friction Washer	8216004	1
28	Shaft	8258004	1
29	Moving Seal Ring	8370001	1
30	Moving Disk	8459015	1
31	Fixed Disk	8469014	1
32	Seal Ring	8370029	1
33	Animated Connector	5457002	1
34	Flow Meter	5447001	1
35	Seal Ring	8371001	1
36	Plug	8323002	1
37	Seal Ring	8370003	1
38	Hexagonal Nut	8940001	1
39	Tube	8457004	1
40	Brine Line Flow Control	8468002	1
41	Joint	8458017	1
42	Drain Line Flow Control	8468007	1
43	Screw, Cross M5X35	8902017	2
44	Injector Cover	8315001	1
45	O-ring 30X1.8	8378025	1
46	Injector Nozzle	8454009	1
47	Injector Throat	8467009	1
48	Injector Body	8008001	1
49	O-ring 10.82X1.78	8378012	1
50	O-ring 7.5X1.8	8378016	2

F65P3 and F69P3 Exploited Drawing



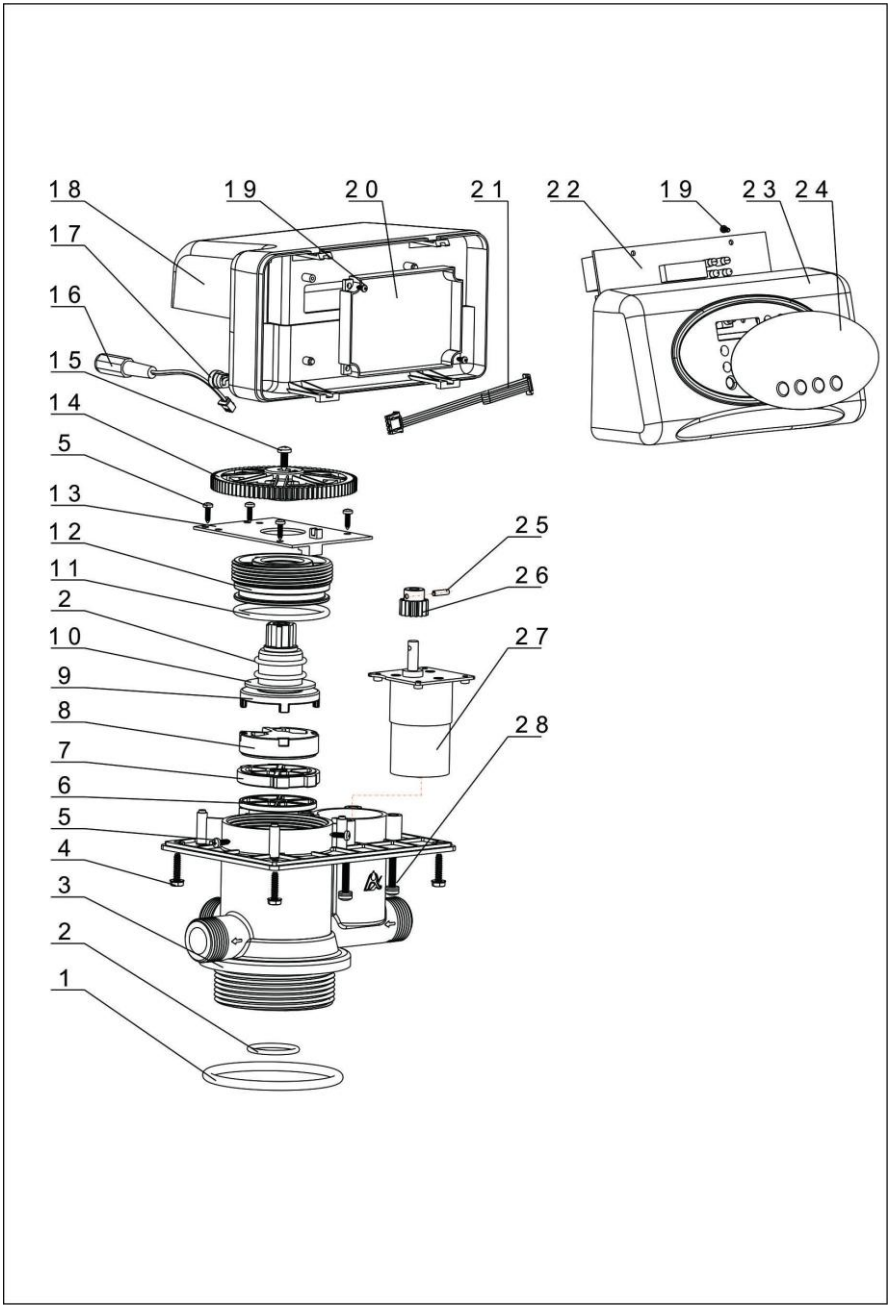
F65P3/F65P1 Component Name and Codes (Item No.20, 33, 39 only for F65P1)

Item No.	Description	Part No.	Quantity		Item No.	Description	Part No.	Quantity
1	O-ring73X5.3	8378143	1		29	Moving Seal Ring	8370053	1
2	O-ring 25.8X2.65	8378078	1		30	Moving Disc	8459013	1
3	Valve Body (ABS+GF10)	5022018	1		31	Fixed Disc	8469012	1
	Valve Body (PPO+GF20)	5022019						
4	Screw, Cross M4X25	8902008	4		32	Seal Ring	8370025	1
5	Hexagonal Screw, Cross, Flange Head, ST3.9X16	8909016	4		33	Animated Connector	5757003	1
6	Seal Ring	8371019	3		34	Plug	8323002	1
7	Plug	8323005	1		35	Flow Meter	5447002	1
8	Gear Motor	6158006	1		36	Seal Ring	830003	1
9	Small Gear	8241010	1		37	Brine Line Flow Control	8468002	2
10	Pin	8993001	1		38	Tube	8457004	1
11	Label	8865057	1		39	Hexagonal Nut	8940001	1
12	Front Panel	8300039	1		40	Joint	8458017	1
13	Control Board	6382056	1		41	Drain Line Flow Control	8468007	1
14	Screw, Cross	8909004	5		42	Screw, Cross M5X35	8902017	2
15	Wire for Locating Board	5511017	1		43	Injector Cover	8315001	1
16	Wire-pressing Plate	8005044	1		44	O-ring 30X1.8	8378025	1
17	Dustproof Cover	8005005	1		45	Injector Nozzle	8454009	1
18	Wire Clip	8126004	2		46	Injector Throat	8467009	1
19	Power Cable	5513001	1		47	Injector Body	8008001	1
20	Probe Cable	6386001	1		48	O-ring 10.82X1.78	8378012	1
21	Screw, Cross	8909013	1		49	O-ring 7.5X1.8	8378016	2
22	Big Gear	8241036	1					
23	Screw, Cross	8909008	1					
24	Locating Board	6380033	1					
25	Fitting Nut	8092007	2					
26	O-ring 50.39X3.53	8378107	1					
27	Anti-friction Washer	8216010	1					

F69P3/F69P1 Component Name and Codes (Item No. 20, 33, 35 only for F69P3)

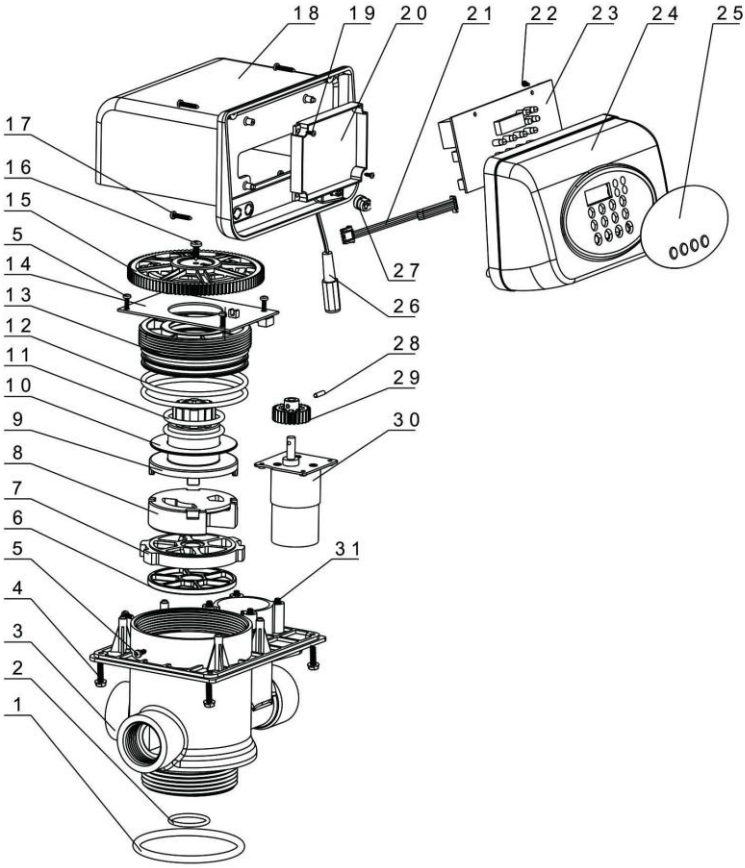
Item No.	Description	Part No.	Quantity		Item No.	Description	Part No.	Quantity
1	O-ring73X5.3	8378143	1		26	O-ring 50.39X3.53	8378107	1
2	O-ring 25.8X2.65	8378073	1		27	Anti-friction Washer	8216010	1
3	Valve Body (ABS+GF10)	5022018	1		28	Shaft	8258009	1
	Valve Body (PPO+GF20)	5022019						
4	Screw, Cross M4X25	8902008	4		29	Moving Seal Ring	8370053	1
5	Hexagonal Screw,Cross Flanged Head, ST3.9X16	8909016	4		30	Moving Disc	8459016	1
6	Screw, Cross M4X1	8902005	4		31	Fixed Disc	8469015	1
7	Plug	8323005	1		32	Seal Ring	8370034	1
8	Gear Motor	6158006	1		33	Animated Connector	5457003	1
9	Small Gear	8421010	1		34	Plug	8323002	1
10	Pin	8993001	1		35	Flow Meter	5447002	1
11	Label	8865057	1		36	Seal Ring	8370003	1
12	Front Panel	8300039	1		37	Brine Line Flow Control	8468002	1
13	Control Board	6382056	1		38	Tube	8457004	1
14	Screw, Cross ST2.2X6.5	8909004	1		39	Hexagonal Nut	8940001	1
15	Wire for Locating Board	5511017	1		40	Joint	8458017	1
16	Wire-pressing Plate	8005044	1		41	Drain Line Flow Control	8468007	1
17	Dustproof Cover	8005005	2		42	Screw, Cross M5X35	8902017	2
18	Wire Clip	8125004	2		43	Injector Cover	8315001	1
19	Power Cable	5513001	1		44	O-ring 30X18	8378025	1
20	Probe Cable	6386001	1		45	Injector Nozzle	8454009	1
21	Screw, Cross ST3.9X13	8909013	1		46	Injector Throat	8467009	1
22	Gear	8241037	1		47	Injector Body	8008001	1
23	Screw, Cross ST2.9X9.5	8909008	4		48	O-ring 10.82X1.78	8378012	1
24	Locating Board	6380033	1		49	O-ring 7.5X1.8	8378016	1

F71P1 Exploited Drawing



Item No.	Description	Part No.	Quantity		Item No.	Description	Part No.	Quantity
1	O-ring 73X5.3	8378143	1		15	Screw, Cross ST3.9X13	8909013	1
2	O-ring 25.8X2.65	8378078	1		16	Power Cable	5513001	1
3	Valve Body (ABS+GF10)	8022048	1		17	Wire Clip	8126004	1
	Valve Body (PPO+GF20)	8022049	1		18	Dustproof Cover	8005005	1
4	Hexagonal Screw,Cross Flanged Head ST3.9X16	8909016	1		19	Screw, Cross ST2.2X6.5	8909004	1
5	Screw, Cross ST2.9X9.5	8909008	1		20	Wire-pressing Plate	8005044	1
6	Seal Ring	8370038	1		21	Wire for Locating Board	5511017	1
7	Fixed Disc	8469018	1		22	Control Board	6382056	1
8	Moving Disc	8459019	1		23	Front Panel	8300039	1
9	Shaft	8258009	1		24	Label	8865057	1
10	Anti-friction Washer	8216010	1		25	Pin, Φ2.5X12	8993003	1
11	O-ring 50.39X3.53	8378107	1		26	Small Gear	8241010	1
12	Fitting Nut	8092007	1		27	Gear Motor	6158006	1
13	Locating Board	6380033	1		28	Screw, Cross Triple Assembly M4X25	8902008	1
14	Big Gear	8241036	1					

F67P1 Exploited Drawing



F67P1(53604P) Component Name and Codes

Item No.	Description	Part No.	Quantity		Item No.	Description	Part No.	Quantity
1	O-ring 73X5.3	8378143	1		16	Screw, Cross ST3.9X13	8909013	1
2	O-ring 25.8X2.65	8378078	1		17	Screw, Cross ST2.9X16	8909010	4
3	Valve Body (ABS+GF10)	8022039	1		18	Dustproof Cover	8005006	1
	Valve Body (PPO+GF20)	8022040	1		19	Screw, Cross ST2.2X6.5	8909004	5
4	Hexagonal Screw,Cross Flanged Head ST3.9X16	8909016	1		20	Wire-pressing Plate	8005044	1
5	Screw, Cross ST2.9X9.5	8909008	1		21	Wire for Locating Board	5511017	1
6	Seal Ring	8370027	1		22	Control Board	6382056	1
7	Fixed Disc	8469013	1		23	Front Panel	6300038	1
8	Moving Disc	8459014	1		24	Label	8865057	1
9	Shaft	8258004	1		25	Wire Clip	8126004	1
10	Anti-friction Washer	8216004	1		26	Power Cable	5513001	1
11	O-ring 37.7X3.55	8378119	2		27	Pin, Φ2.5X12	8993003	1
12	O-ring 73X3.55	8378128	2		28	Small Gear	8241003	1
13	Fitting Nut	8092004	1		29	Gear Motor	6158021	1
14	Locating Board	6382032	1		30	Screw, Cross Triple Assembly M4X30	8902009	1
15	Big Gear	8241034	1					