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Rev.A.1909



Multi-functional Flow Control Valve for Water Treatment Systems

53550 (F96B1)

53650 (F96B3)

63550 (F96A1)

63650 (F96A3)

User manual



Please read this manual in details
before using the valve and keep it properly
in order to consult in the future
0WRX.466.565

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

The Program Type Setting (Operation by professional)

When all symbols light on, 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.**

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_____ ;
Injector No._____.
Water Source: Ground-water☐ Filtered Ground-water ☐ Tap Water☐ Other_____.

Parameter Set

Parameter	Unit	Factory Default	Actual Value
Time of Day	h:m	Current Time	
Control Mode A-01/02 (63650/53650)	/	A-01	
Water Treatment Capacity (63650/53650)	m³	400.0	
Service Days (63550/53550)	D.	03	
Regeneration Time	/	02:00	
Backwash Time	min.:sec.	10:00	
Brine Draw Time (63550/63650)	min.:sec.	60:00	
Slow Rinse Time (63550/63650)	min.:sec.	45:00	
Brine Refill Time (63550/63650)	min.:sec.	05:00	
Fast Rinse Time	min.:sec.	10:00	
Maximum Interval Regeneration Days (63650/53650)	D.	30	
Output Mode b-01 (02)	/	b-01	
K Value (Only for Meter Type)	/	4.194	

●If there is no special requirement when product purchase, we choose 5# drain line flow control(With six pieces of φ10.5 holes) and 5# injector (7805) for the standard configuration for 63550 and 63650.

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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 is turn to 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 crystalline coarse salt 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 vibrations 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℃, 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 in front of the water inlet. While, if the water pressure is under 0.2MPa, a booster pump must be installed in front of the water inlet.
- It is suggested to install PPR pipe, corrugated pipe or UPVC pipe, instead of TTLSG pipe. Pipeline should be installed straightly.
- Do not let children touch or play, because careless operation may cause the procedure changed.
- When the attached cables or transformer of this product 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
53550/53650(Filter)

Suit for swimming pool filter equipment

Filtration system

Active carbon and sand filter in RO pretreatment system

63550/63650 (Down-flow regeneration softener)

Suit for the ion exchange equipment which hardness of the raw water $\leq 6.5\text{mmol/L}$

Boiler softening water system

RO pretreatment softening system

1.2. Product Characteristics

● Simple structure and reliable sealing

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

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

● Brine refill is controlled by electric ball valve.

Brine refill is controlled by electric ball valve, refilled when in service, shorten the regeneration time.

Brine refill while in service status, so for fixed bed, the water for brine refill is hard water.

● Fixed bed softener could be converted to filter valve.

Block the brine line connector of 63550/63650, remove the drain connector, the valve could be converted to filter system.

● Manual function

Realize regeneration immediately by pressing “” 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 stripe on dynamic screen flash, which indicates 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 lights on which represents 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 time clock type or meter type 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 “▼” or “▲” buttons to select the requested model, then press “⏮” button to save the selection. Reconnect the power, the model will be showed on screen.

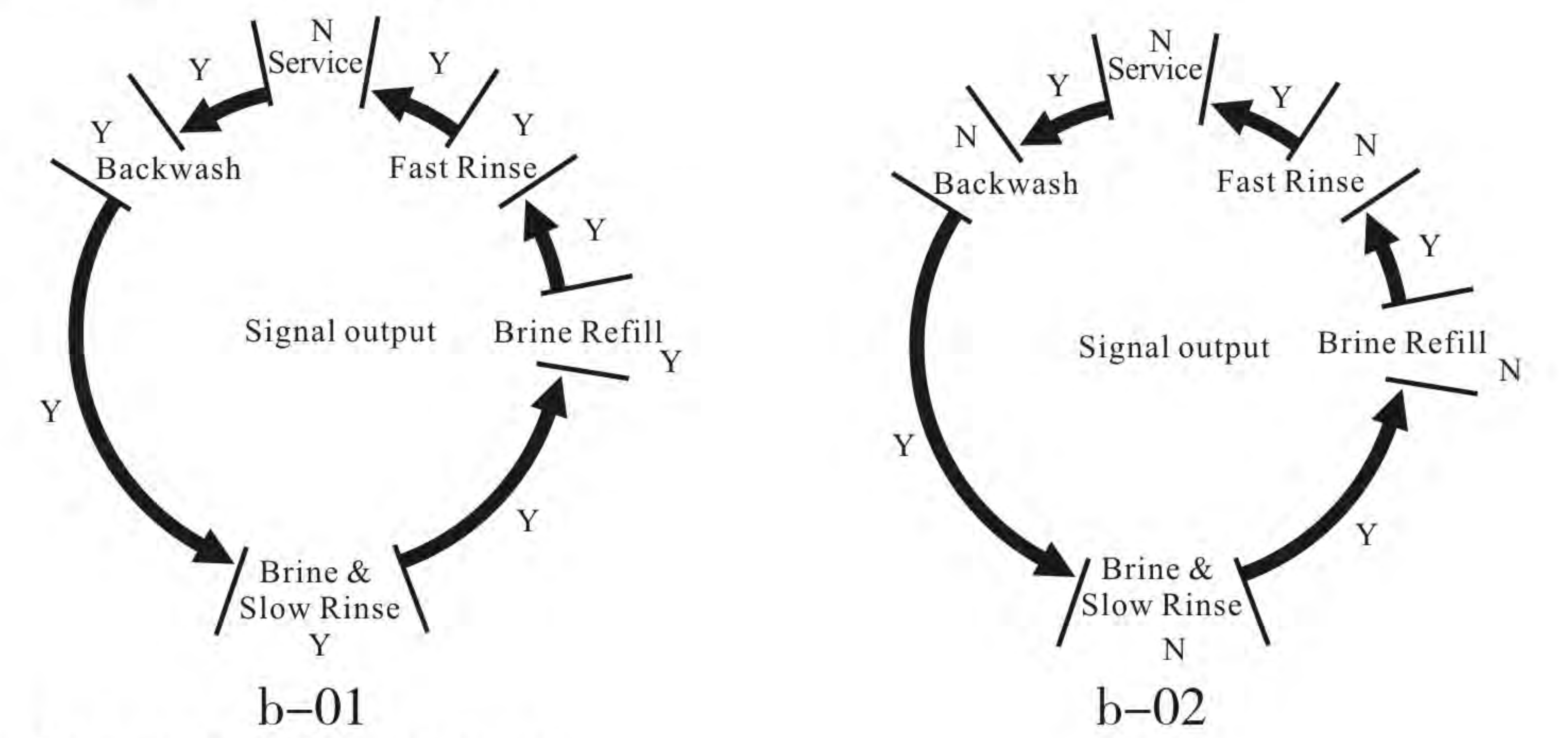
●Interlock function

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 refers to Figure 3-9)

●Signal output

There is a signal output connector on main control board. It is applied 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 when start regeneration and shut off at the end of regeneration; b-02 Mode: Signal is available only at intervals of each status. Refer to below figure:



●Remote handling connector

This connector can receive external signal, used together with PLC, and computer etc. to control the valve remotely. (Application refers to Figure 3-11)

●Pressure relief connector

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.

●Two meter types are optional (Suit for 63650/53650)

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).

●Maximum interval regeneration days (Suit for 53650/63650)

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

1.3.Service Condition

This valve should be used under the below condition

Items		Requirement
Working conditions	Water pressure	0.2MPa ~ 0.6MPa
	Water temperature	5℃ ~ 50℃
Working environment	Environment temperature	5℃ ~ 50℃
	Relative humidity	≤95% (25℃)
	Electrical facility	AC100 ~ 240V/50 ~ 60Hz
Inlet water quality	Water turbidity	Down-flow regeneration (63550/63650) < 5FTU Filter (53550/53650) < 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)

MODEL 53550-F96B1/53650-F96B3/63550-F96A1/63650-F96A3

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

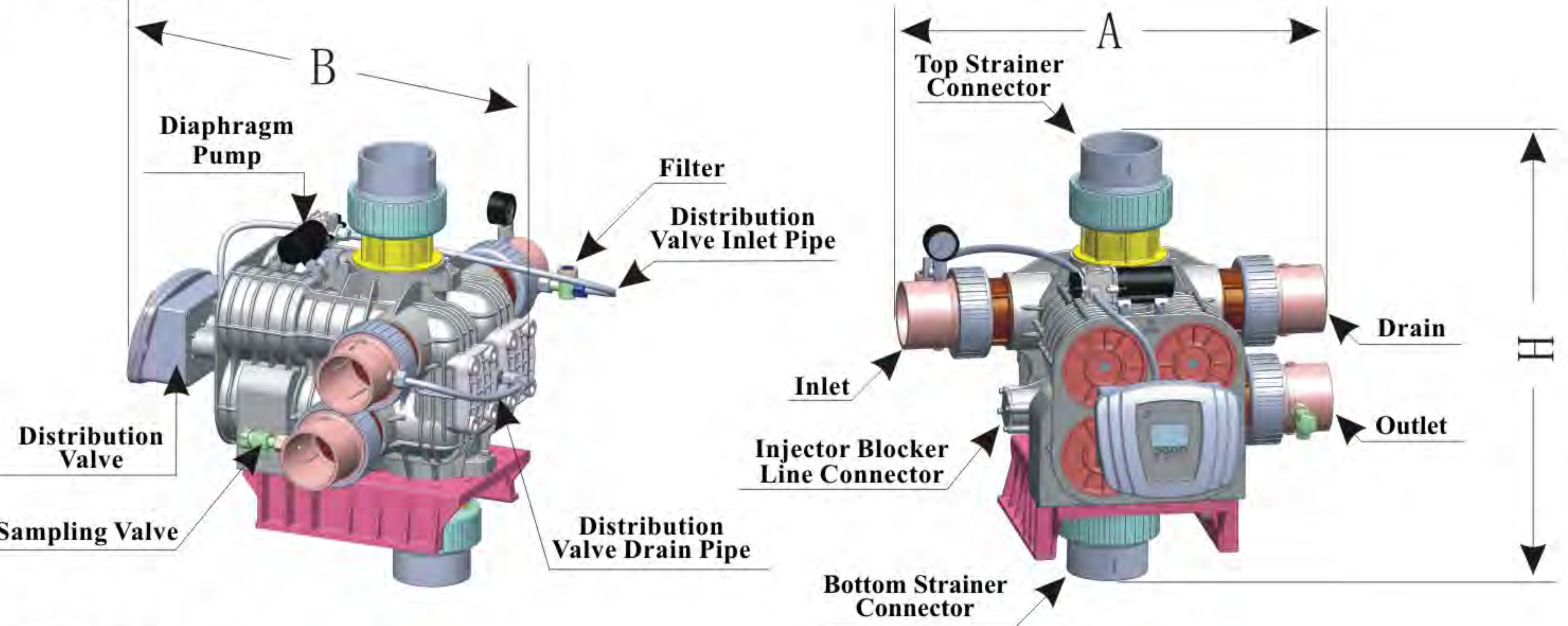
●When the water turbidity exceeds the conditions, a filter should be installed on the inlet of control valve.

●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.

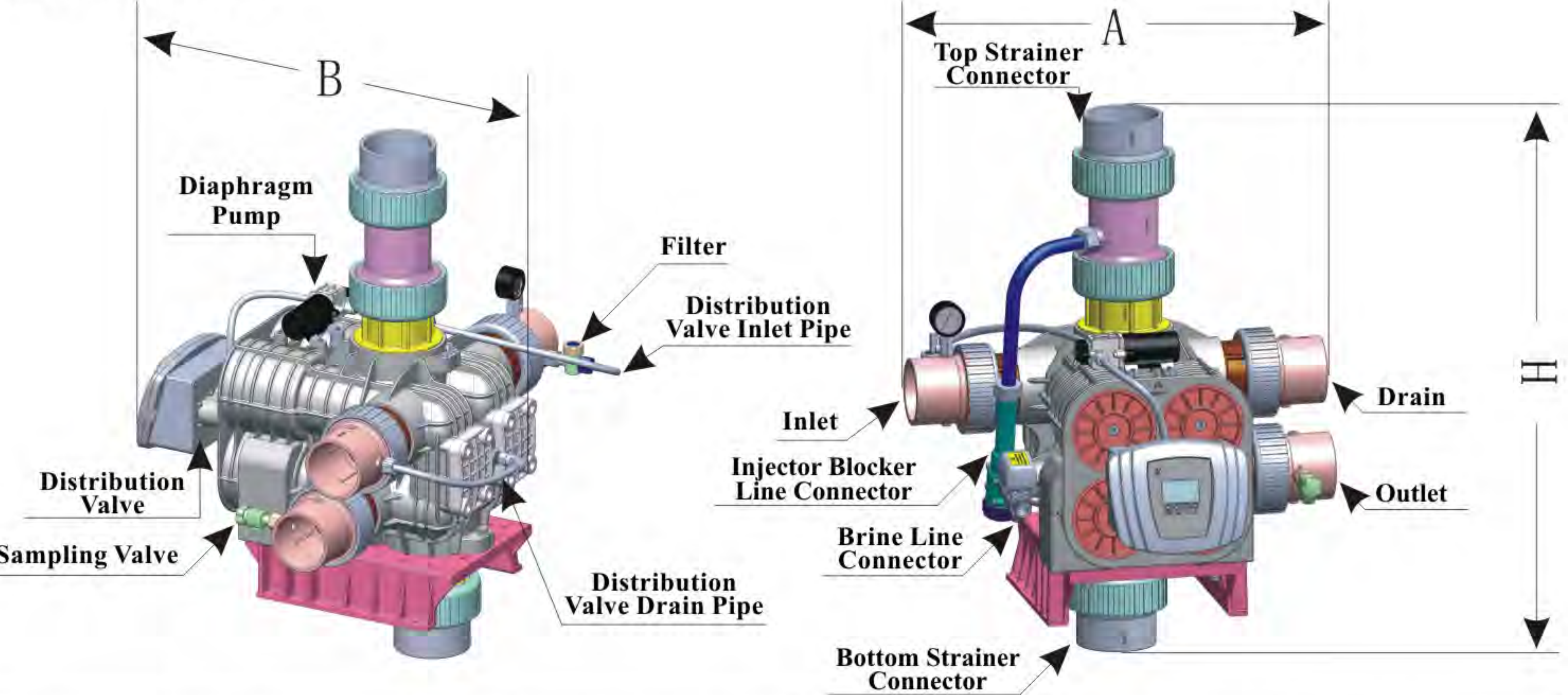
1.4.Product Structure and Technical Parameters

A. The appearance is just for reference. It is subjected to the real product.

53550/F96B1:



63550/F96A1:



Model	A (mm) max	B (mm) max	H (mm) max
53550/F96B1	658	695	707
63550/F96A1	658	695	870

MODEL 53550-F96B1/53650-F96B3/63550-F96A1/63650-F96A3

Remark: If 53550/F96B1 and 63550/F96A1 are installed a flow meter on outlet, then they will be the structure drawings of 53650/F96B3 and 63650/F96A3.

B. Technical parameter

The suitable transformer output of control valve: DC12V, 4.0A

Model	Connector Size					Flow Rate m ³ /h @0.2MPa	Regeneration Mode	Remark
	Inlet/ Outlet	Drain	Brine Line Connector	Regeneration Connector	Top and Bottom Strainer			
53550	DN80	DN80	/	/	DN100	Refer to flow rate curve on P27	By days	Filter
53650							By meter	
63550	DN80	DN80	3/4" M	/	DN100	50	By days	Down-flow regeneration
63650							By meter	

Note: M-Male F-Female

DN80—UPVC pipe with outer diameter φ90.

DN100—UPVC pipe with outer diameter φ100.

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

- ①The filter or softener should be located close to drain.
- ②Ensure the unit is installed in enough space for operating and maintenance.
- ③Brine tank needs to be close to softener.
- ④The unit should be kept away from the heater, and not be exposed outdoor. Sunshine or rain will cause the system damage.
- ⑤Please avoid installing the system in one acid/alkaline, magnetic or strong vibration circumstance, because above 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℃.

⑦Install the system in the place where with the minimum loss in case of water leaking.

C.Support installation

Take out 8 pieces of support and mats, install them according to the figure 1-1.

(The parts description please refers to 5040009 support structure on page 43.)

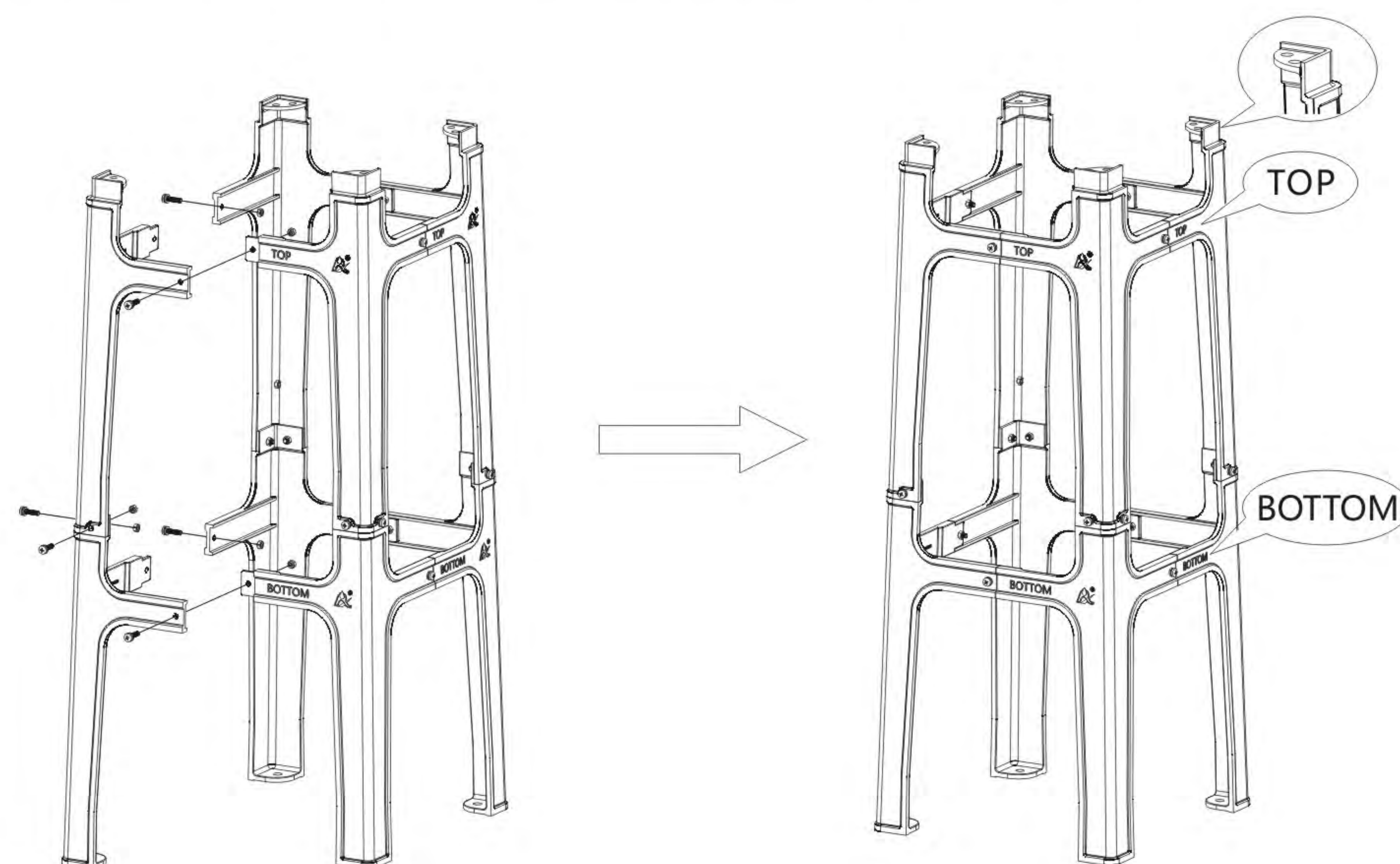


Figure 1-1

D.Pipeline installation, take 63650 as example

①Install control valve

a. As the Figure 1-2 shows, insert the riser pipe to the bottom strainer and put it into the bottom of the tank.

b. Fill the resin to the tank, and the height is accordance with the design code. Assemble the top strainer.

c. Connect the control valve and support with screw.

d. Choose the suitable position to install the valve. Using DN100(Outer diameter is $\phi 110$) UPVC pipe to connect top and bottom strainer connectors with tank's top and bottom strainers.



Figure 1-2

Notice:

- Avoid filling floccules substance together with resin filled in the mineral tank.
- Pipeline installation should be straight, and shall not make control valves or the fittings under torsion.

②Install flow meter and the inlet/outlet pipeline

a.Install flow meter

Safety notice:

A. Before installation, make sure there is no pressure in pipeline and check if pressure released completely.

B. Before installation, make sure the tested liquid won't make corrosion for the probe. (The testing subject of the probe is water)

C. Before installation, make sure the temperature and pressure is comply with the probe's requirement.(The temperature of the liquid: 5 ~ 50°C ; Testing pressure: $\leq 0.6\text{MPa}$)

D. Before installation, make sure the flow rate of the liquid won't exceed the probe's

limit range. (Testing range: 1~5m/s).

E. Before installation, don't change the probe's shape structure and testing way.

F. Probe wiring couldn't connect with the transformer which has strong electric or voltage bigger than 12V. Otherwise, it will burn the electric board.

Probe test position choosing:

A. The measure distance of tangential path behind flange should comply with 10 times front and 5 times back of pipeline diameter.

B. The measure distance of tangential path behind reducer (Only allow turn big to small, but not in reverse) should comply with 15 times front and 5 times back of pipeline diameter.

C. The measure distance of tangential path behind first class aqual elbow should comply with 20 times front and 5 back of pipeline diameter.

D. The measure distance of tangential path behind coplanar second class continuous equal elbow should comply with 25 times front and 5 times back of pipeline diameter.

E. The measure distance of tangential path behind non-coplanar second class continuous equal elbow should comply with 40 times front and 5 times back of pipeline diameter.

F. The measure distance of tangential path behind valve should comply with 50 times front and 5 times back of pipe diameter.

G. Suggest that install probe perpendicularly by pipeline, shouldn't be installed in the bottom of pipeline.

H. Probe can be installed in perpendicular pipeline which is upward flow direction, but also shall meet the above line requirement.

I. Probe can not be installed in perpendicular pipeline which is downward flow direction.

J. The water in tested pipeline should be full. Make sure no air in the pipeline.

Repair and maintenance of flow meter:

A. Before the installation of probe, make sure impeller rotates freely and there is no obvious block phenomenon.

B. When the flow meter stops measuring but the tested liquid is still flowing, the working mode of probe can be checked online. Screw the probe nut A out, and check the working condition of the diode on the back of probe. If the diode always lights on or off, it indicates the impeller in pipeline stop rotating. It shall stop pipeline working, release pressure in pipeline, and disassemble the probe to check if there is any foreign matter impact impeller rotating. After cleaning, if it can rotate normally by manually, and the diode works normally, it can continue to use after confirming the installation correct. (See as Figure 1-3)

C. If the impeller of probe is broken, the top bracket of probe is damaged, bearing is bent, the impeller still is unable to rotate freely, or the part in contact with liquid is corroded, or the installation screw thread is seriously damaged, it shall replace a new probe.

D. If the diode on the back of probe works normally, but the display still does not work normally, please check if the probe wire has any damage and use a multi-meter to check whether the voltage is normal between shield and black wire. If the diode lights on, there is no voltage output, and if the diode lights off, there is voltage output.

E. The impeller may not rotate smoothly due to the stains in the liquid, which may affect the precision of probe. Therefore, it is necessary to check and clean the impeller of probe periodically.

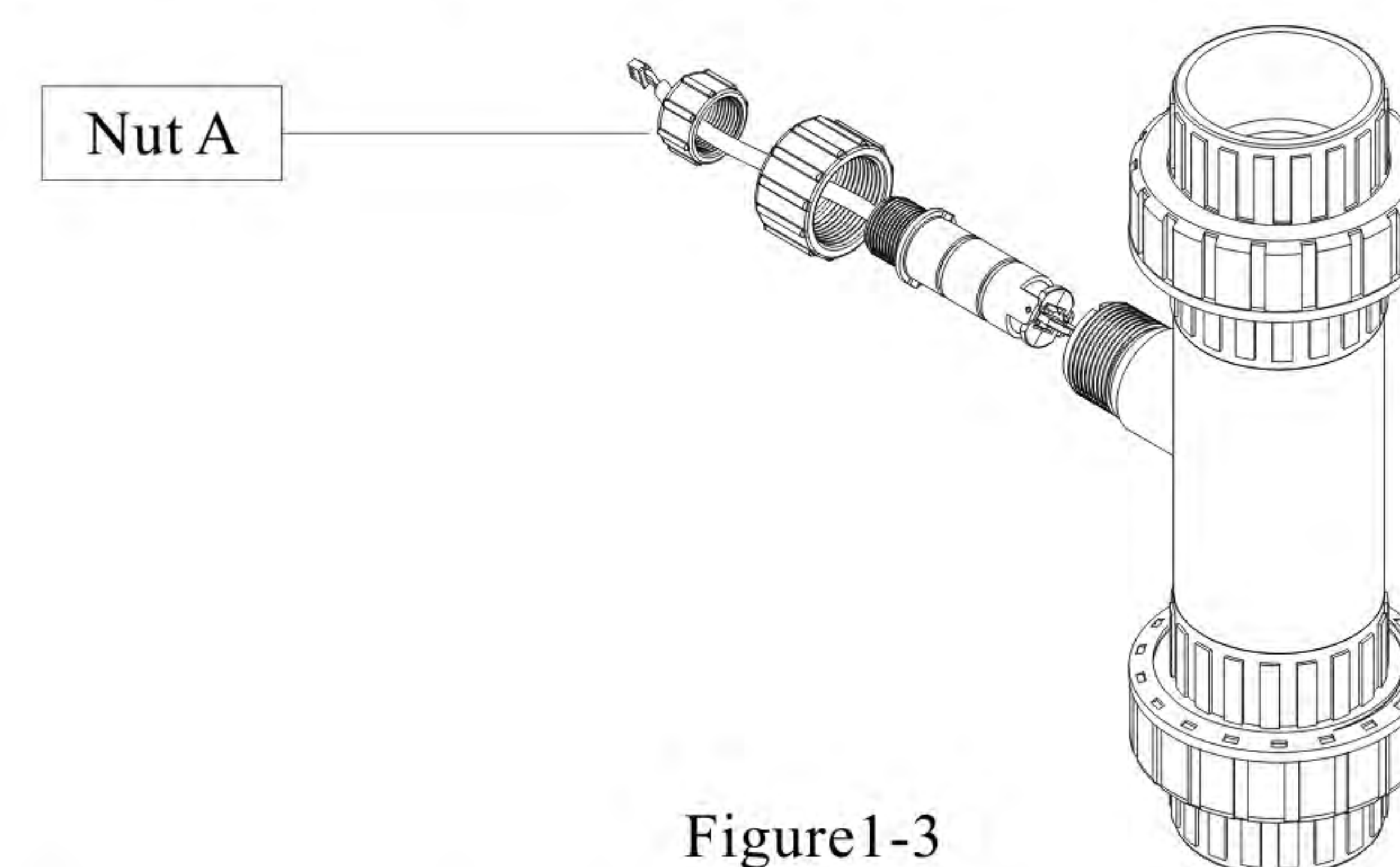


Figure1-3

b. As Figure 1-2, install a disc filter on the inlet of the filter.

c. Install valve A, valve B and valve C on the inlet, outlet and the middle of the pipeline of inlet and outlet.

d. Glue the inlet of the system with the inlet of the valve with DN80 UPVC pipeline (The outer diameter is $\phi 90$); Glue the flow meter with outlet of the valve with DN80 UPVC pipeline (The outer diameter is $\phi 90$); Glue the outlet of the system with flow meter with DN80 UPVC pipeline (The outer diameter is $\phi 90$).

e. Disassemble the front cover of the valve, connect the flow meter to the flow meter connector of the main control board. (Refer P20 main control board figure)

Notice:

● If making a soldered copper installation, do all sweat soldering before connecting pipes to the valve. The temperature generated during soldering may 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 is no flow meter installation steps.

● This flow meter error range $\leq 5\%$.

③ Install drain pipeline (If no special request, the injector is 7805)

a. According to P26, for 63550 and 63650, if the diameter of the tank is 1500mm,

please do as step e; if the diameter of the tank is 1800mm, please do as following:
b. According to P28, match the drain line flow control based on the number and size of the holes.

c. As Figure 1-4 shows, unscrew the drain connector with a wrench, take out the drain line flow control, and replace it with the one meets the requirements. (Please drill holes according to P28)

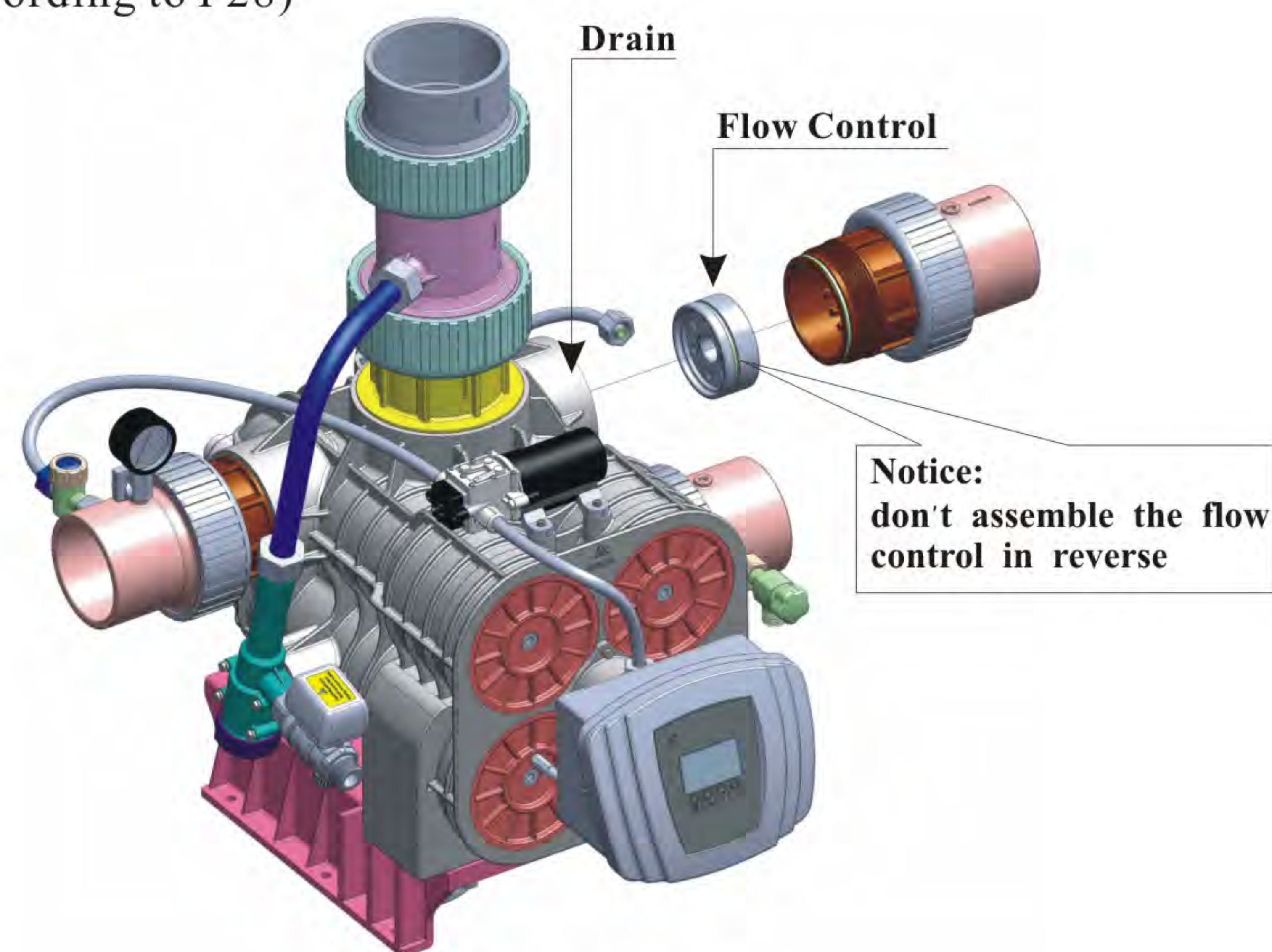


Figure 1-4

d. Tighten the drain connector with the drain of the valve.

e. Glue DN80 (Outer diameter is $\phi 90$) UPVC pipeline with the drain, drain pipeline should directly to the sewer, the sewer and the drain pipeline should be installed as Figure 1-5.



Figure 1-5

f. For 53550 and 53650 filter valve, there is no drain line flow control, please do as step e.

Notice:

● Leave a certain space between the drain pipe and the sewer to prevent the sewage from siphoning into the water treatment equipment.

● The drain pipeline shouldn't be too long, and the drain should not be higher than the valve. For softener, drain pipeline should not exceed 5m; For filter, it should not exceed 2m. If the drain pipeline is longer or higher than the requirement, please disassemble the connector between distribution valve and drain and let the drain of distribution valve connect with the air. Use G1/2 female screw to block the G1/2 male of drain.

Please refer the Figure 1-6.

④ Connect brine tube

a. As Figure 1-2 shows, use DN20 UPVC pipeline and other pipeline to connect the brine valve and the brine draw connector of the valve.

Notice:

● The brine pipeline should be as short as possible, and smooth. There are less four elbows in the pipeline, or it will make the brine sucking unsmooth.

● It must install brine valve in the brine tank.

Notice:

When installing the pipeline, please ensure that the inlet, outlet and drain pipes are parallel, and must be fixed with "fixing frame". The distance from the inlet, outlet and drain port shall not exceed 300mm.

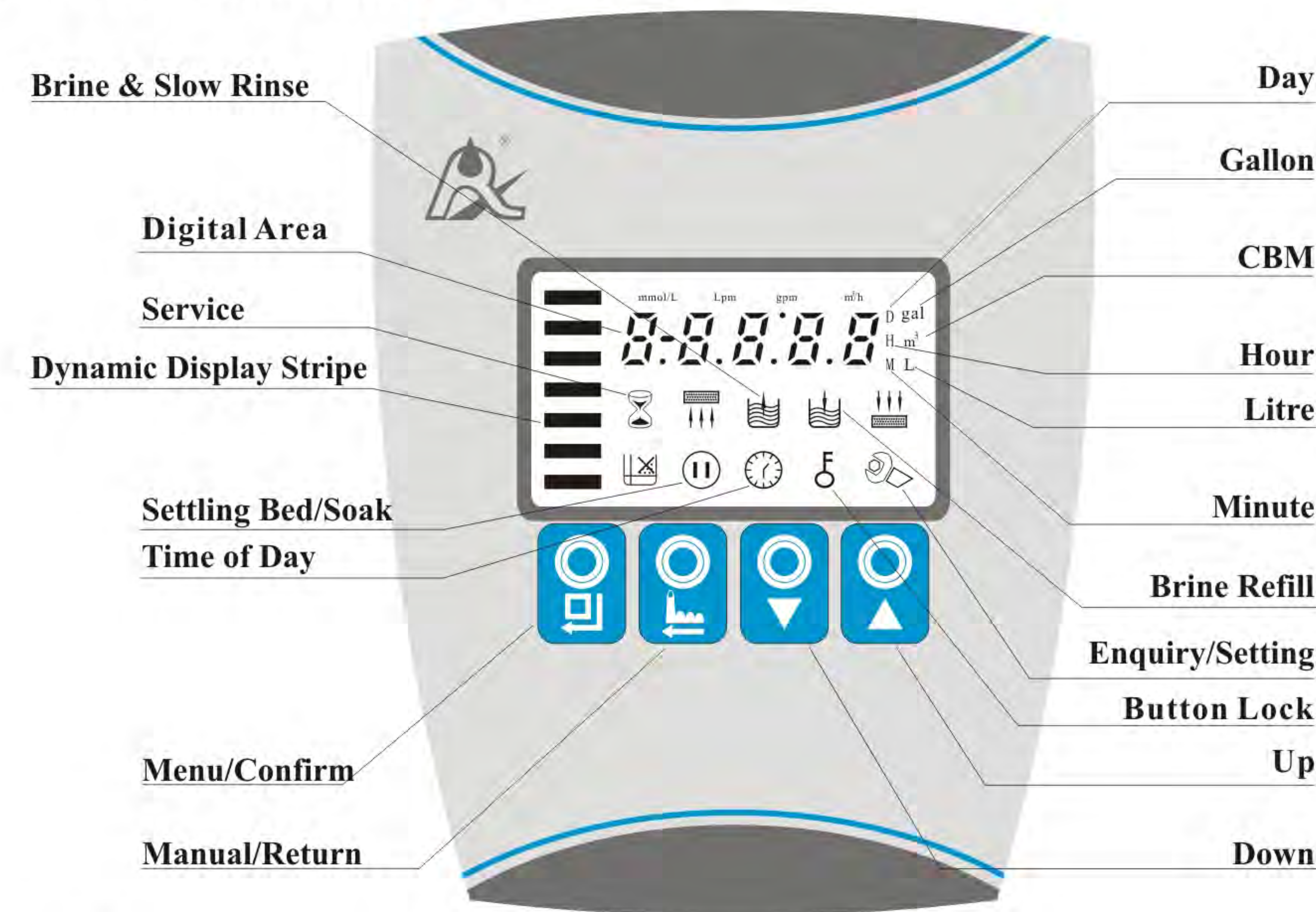
A number of examples prove that "fixed frame" can prevent the control valve from continuously vibrating during operation and causing the pipeline to rupture and leak and other adverse effects!



Figure 1-6

2. Basic Setting & Usage

2.1. The Function of PC Board



- A. “🕒” Time of day indicator
 - “🕒” lights on, display the time of day.
- B. “🔒” Button lock indicator
 - “🔒” lights 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 “🔒” lights off.
- C. “🔧” Program mode indicator
 - “🔧” lights on, enter program display mode. Press “⬆️” or “⬆️” to view all values.
 - “🔧” flashes, enter program set mode. Press “⬆️” or “⬆️” to adjust values.
- D. “🔍” Menu/Confirm button
 - Press “🔍”, “🔧” lights on, enter program display mode and press “⬆️” or “⬆️” to view all values.
 - In program display mode, press “🔍”, “🔧” flashes, enter program set mode, press “⬆️” or “⬆️” to adjust values.
 - Press “🔍” after all program are set, and then the voice “Di” means all settings are success and return program display mode.

- E. “🔍” Manual/Return button
 - Press “🔍” in any status, it can proceed to next step. (Example: if the outlet water is unqualified, 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 to service status; 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 (Take 63650/63550 as example)

Function	Indicator	Factory Default	Parameter Set Range	Instruction
Time of Day	🕒	Random	00:00 ~ 23:59	Set the time of day when use; “:” flashes.
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).
Service Days	🕒	1-03D	0 ~ 99 Days	Only for 63650,53550 Time Clock Type, regeneration by days.
Regeneration Time	02:00	02:00	00:00 ~ 23:59	Regeneration time ; “:” lights on.
Water Treatment Capacity	🕒	400.0	0~9999.99 m ³	Water treatment capacity in one circle (m ³)
Backwash Time	🔧	10:00	0 ~ 99 : 59	Backwash time(Minute:Second)
Brine Draw Time	🔧	60:00	0 ~ 99 : 59	Brine Draw Time (Minute:Second)
Slow Rinse Time		45:00	0 ~ 99 : 59	Slow Rinse Time (Minute:Second)
Fast Rinse Time	🔧	10:00	0 ~ 99 : 59	Fast rinse time (Minute:Second)

Brine Refill Time		05:00	0 ~ 99 : 59	Brine refill time(Minute:Second)
Maximum Interval Regeneration Days	H-30	30	0 ~ 40	Regenerate on the day even although the available volume of treated water does not drop to zero (0).
Output Control Mode	b-01	01	01 or 02	b-01: Signal will turn on during the regeneration (Refer to P5). b-02: Signal is only available at intervals of regeneration cycles and in service. (Refer to P5).

B. Process Display(Take 63650 A-01 as example)

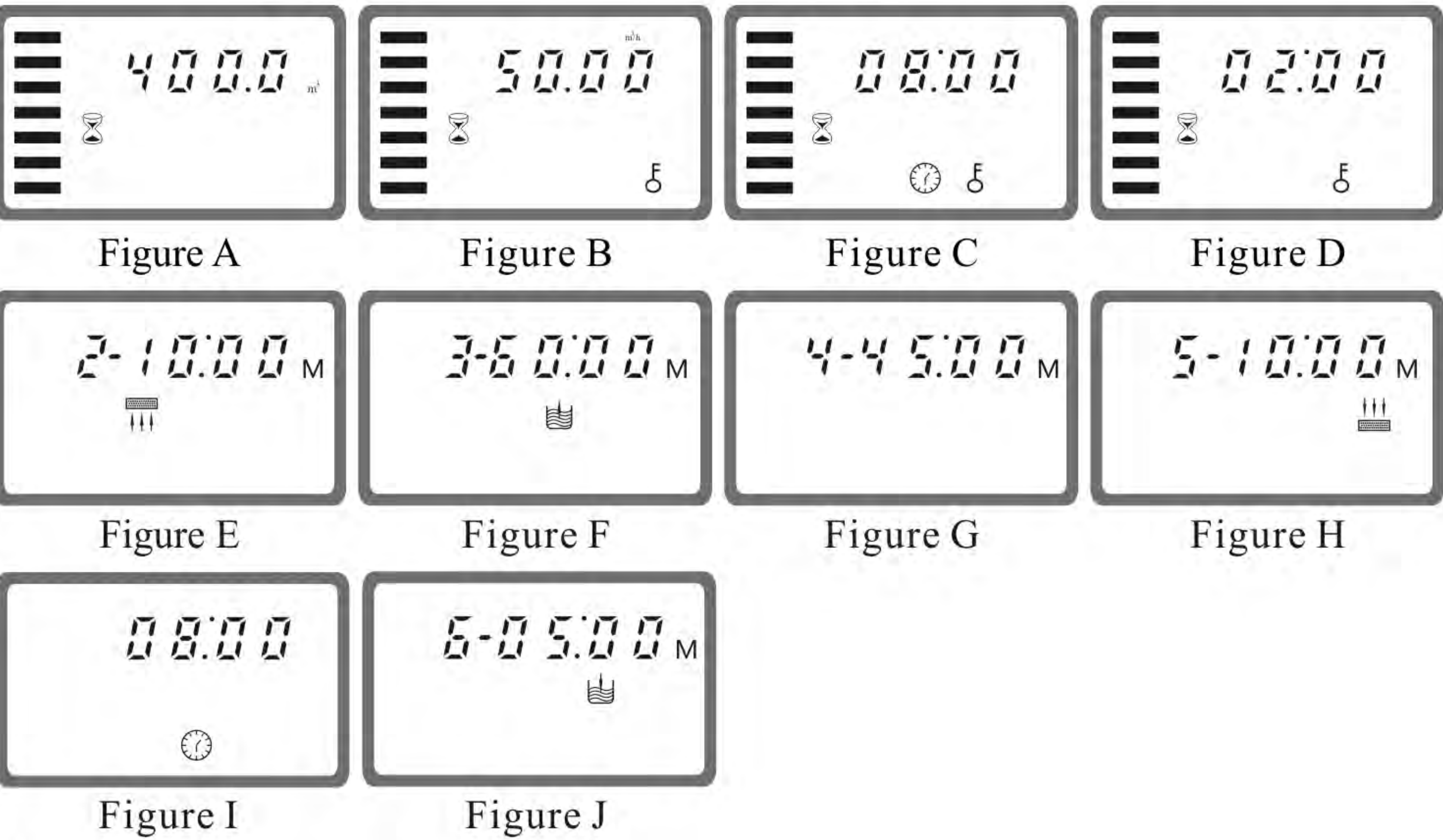


Illustration:

- 1.In Service status, the figure shows A/B/C/D; In Backwash status, it shows figure E/I; In Brine Draw status, it shows F/I; In Slow Rinse status, it shows G/I; In Fast Rinse status, it shows figure H/I; In Brine Refill status, it shows figure J/I. In each status, every figure shows 15 seconds.
- 2.Above displays are taking 63650 for example. For the Time Clock Type, it shows the rest days, such as 1-03D.
- 3.The display screen will only show “-00-” when the electrical motor is running.
- 4.The time of day figure“ ⌚ ” flashes continuously, such as “12 : 12” flashes, indicates long outage of power. It reminds to reset the time of day.
- 5.The display will show the error code, such as “-E1-” when the system is in error.

6.Working process: Service→Backwash→Brine Draw→Slow Rinse→Fast Rinse→Brine Refill→Service

C. Usage

After being accomplished installation, parameter setting and trail running, the valve could be put into use. In order to ensure the quality of outlet water can reach the requirement, the user should complete the below works:

- ①Ensure 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 crystalline coarse salt only, at least 99.5% pure, forbidding use the small salt and iodized salt.
- ②Test the outlet water and raw water hardness at regular time. When the outlet water hardness is unqualified, please press the “⌚” after unlock the buttons and the valve will temporarily regenerate again(it will not affect the original set operation cycle)
- ③When the feed water hardness changes a lot, you can adjust the water treatment capacity as follow:

Press and hold both “▲” and “▼” for 5 seconds to unlock the buttons. Press “⌚”, and the “⌚” lights on, then press “▼”, screen will show A-01 or A-02, then press “▼” three times, the digital area will show the given water treatment capacity. Press “⌚” again, “⌚” and water treatment capacity value flash, then press “▲” or “▼” reset the value. Press “⌚” and hear a sound “Di”, then finish the adjustment. Press “⌚” exit and turn back the service status.

- ④For A-01 control mode (Delayed regeneration type), please pay attention to whether it is current time or not. If the time is not right, you can adjust as follow:

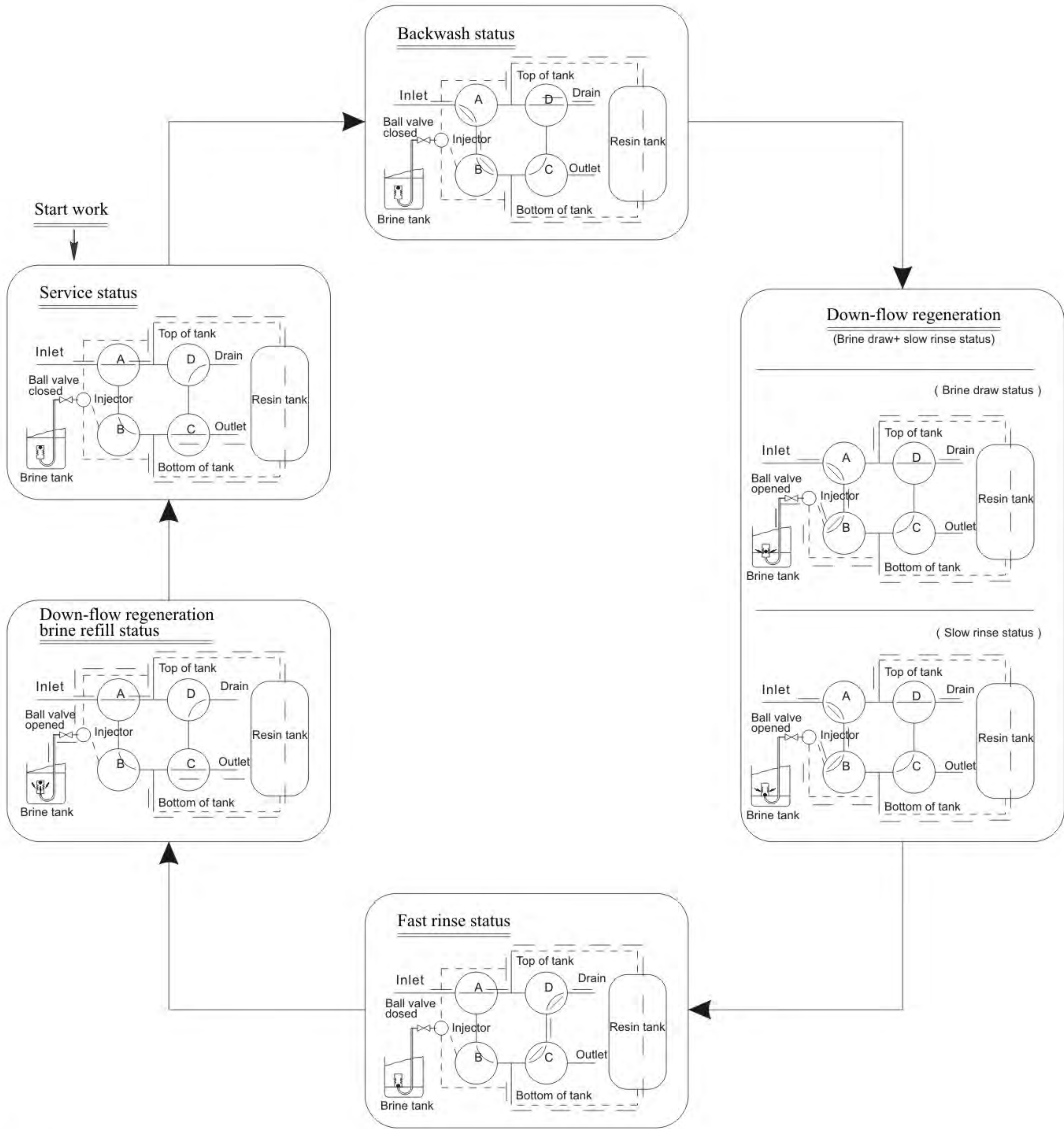
After unlock the buttons, press “⌚”, the “⌚” and “⌚” light on. Then press “⌚”, the “⌚” and hour value flash. Press “▲” or “▼” continuously to reset the hour value; Press “⌚” again, “⌚” and minute value flash. Press “▲” or “▼” continuously to reset the minute value; Press “⌚” and hear a sound “Di”, then finish the adjustment. Press “⌚” exit and turn back the service status.

The regeneration parameters have been set when control valve left factory. Generally, it does not need to reset. If you want enquiry and modify the setting, you can refer to the professional application specification.

3. Applications

3.1. Flow Chart

Down-flow regeneration softener valve (63550/63650) and filter valve (53550 /53650) flow chart:

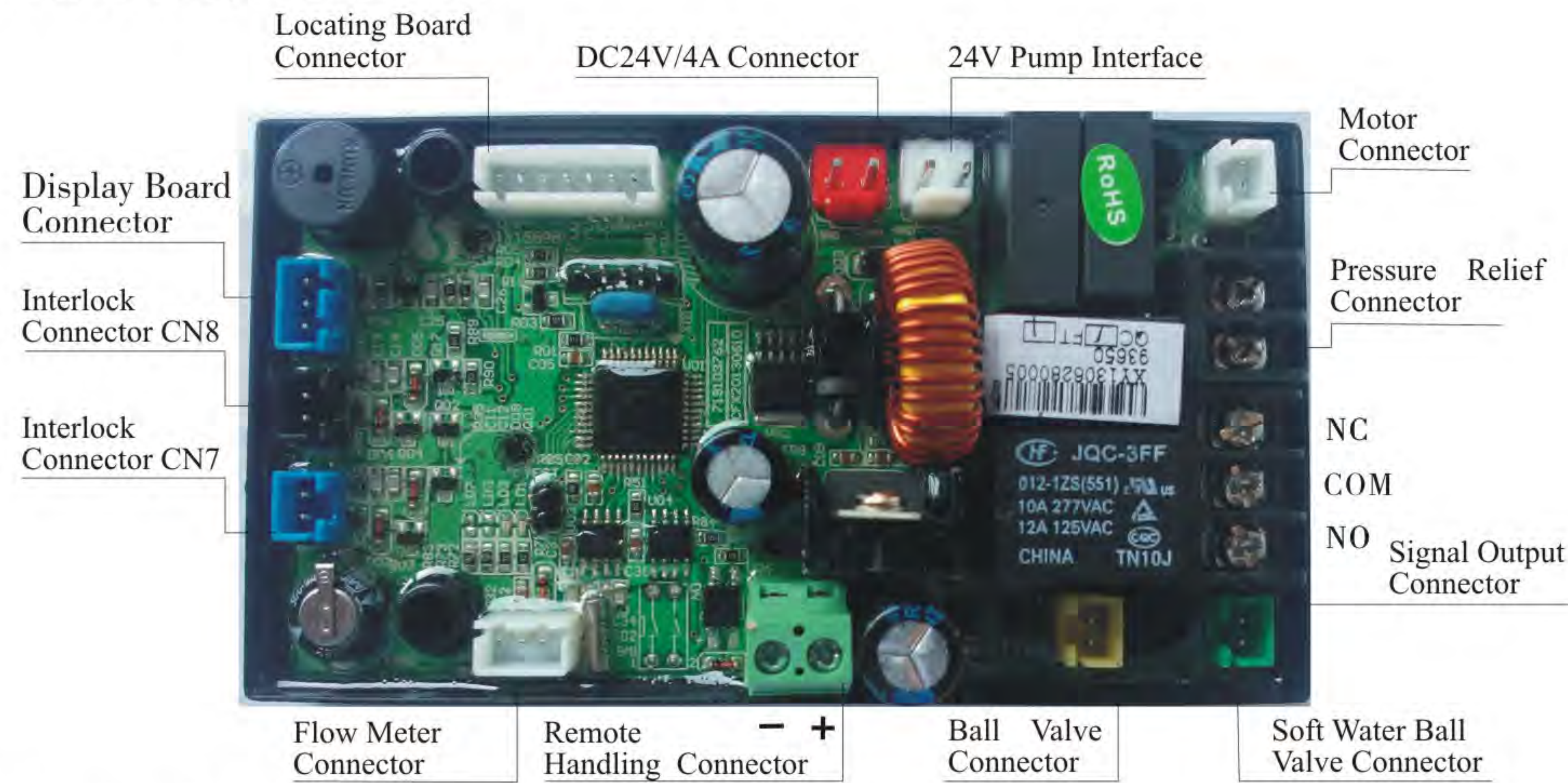


Note:

- For 53550/53650 filter valve, only has service status, backwash status and fast rinse status.
- While softening, brine refill and service are at the same status. When brine refill starts, the ball valve is opened, while it finishes, the ball valve closed.
- While softening, brine draw and slow rinse are also at the same status, after brine draw, ball valve closes, and it is in slow rinse status.

3.2. The Function and Connection of PC Board

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



The main functions on main control board:

Function	Application	Explanation
Signal output connector b-01	Outlet solenoid valve	Used in strict requirements regarding no hard water flowing 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 to protect motor when valve is rotating.
Pressure relief connector	Control the inlet bypass to release pressure	When valve is rotating, pressure relief connector opened to prevent pressure increasing rapidly.
Interlock connector	To ensure only one control valve regenerate or wash in system	Use in RO pre-treatment, water supply together but regeneration in turn. Second grade ion exchange equipment, etc.
Remote handling connector	Receive signal to make the control valve rotate to next status	It is used for on-line inspection system, connected with PC to realize automatically or remote controlling valve.

A. Signal Output Connector

1). Control Outlet Solenoid Valve (Set b-01)

①Solenoid valve on outlet controls water level in brine tank.

Instruction: If system strictly requires no hard water flowing from outlet in regeneration cycle (Mainly for no hard water flows 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.

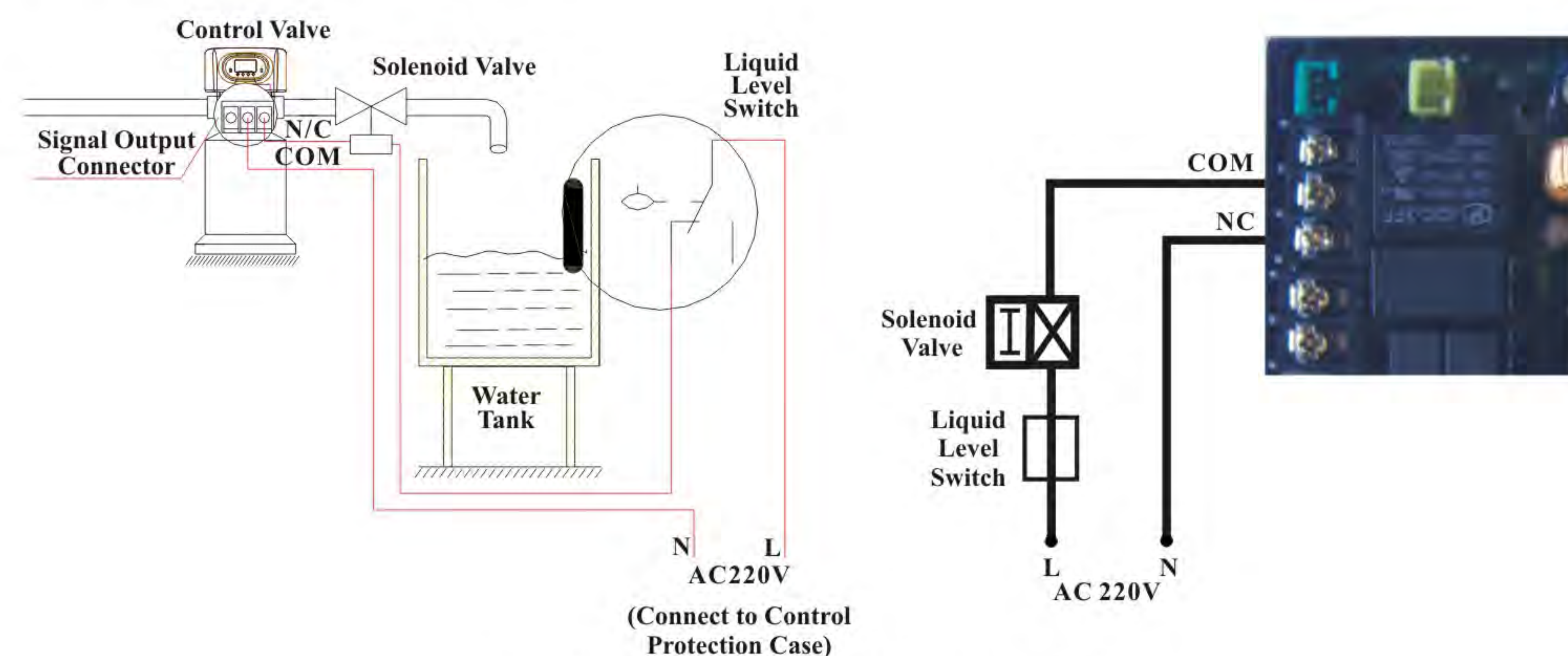


Figure3-1 Wring of Solenoid Valve on Outlet

Function:

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

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

②Control Inlet Solenoid Valve (Set b-02)

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

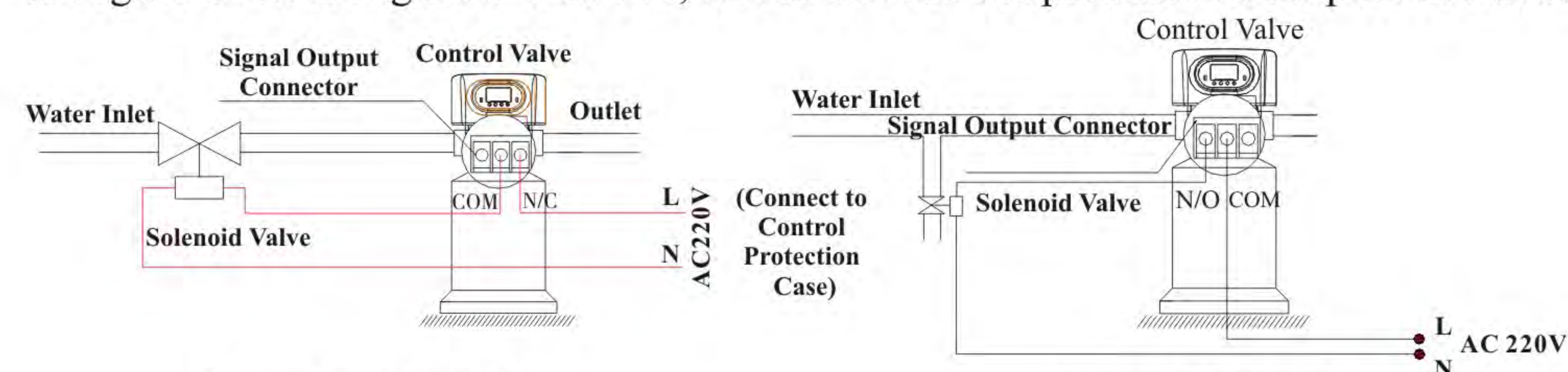


Figure 3-2 Wiring of Solenoid Valve on Inlet

Function:

When inlet pressure is high, install a solenoid valve on inlet to ensure valve switches properly. The solenoid valve will open when valve is exactly at status of Service, Backwash, Brine Draw, Slow Rinse, Brine Refill and Fast Rinse. When valve is switching, solenoid valve is closed, no water flows into valve to ensure valve switching properly. It could prevent the problem of mixing 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:

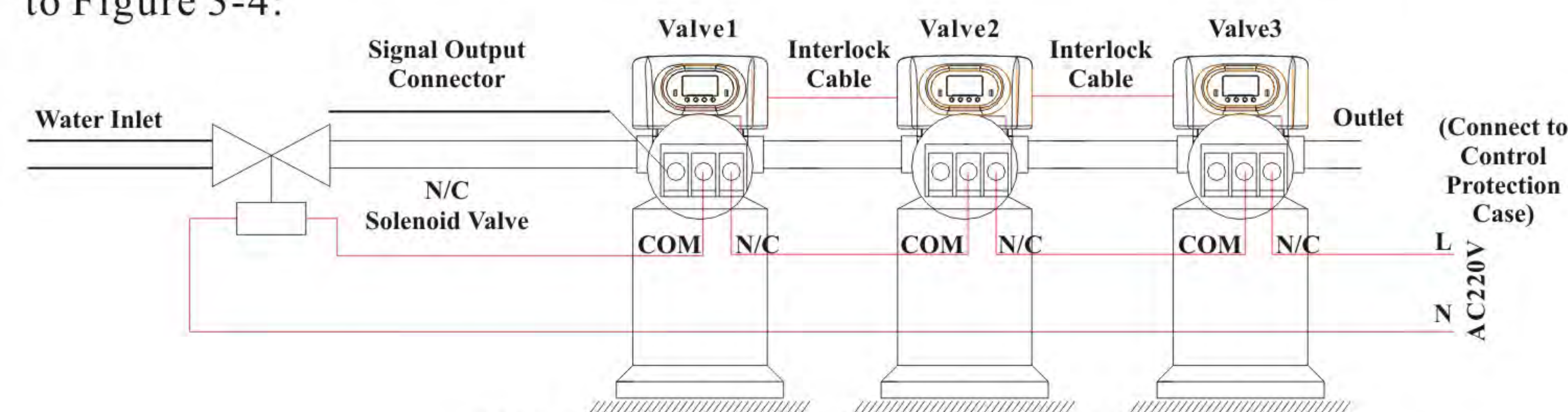


Figure 3-4 Wiring of Solenoid Vale in Inlet

2).Liquid Level Controller Controls Inlet Pump(Two-phase motor)(Set b-01)

Instruction: For the system using underground water or middle-tank supplying water, users can turn on and turn off the pump by operating the switch of liquid level controller and control valve. The wiring refers to Figure 3-5:

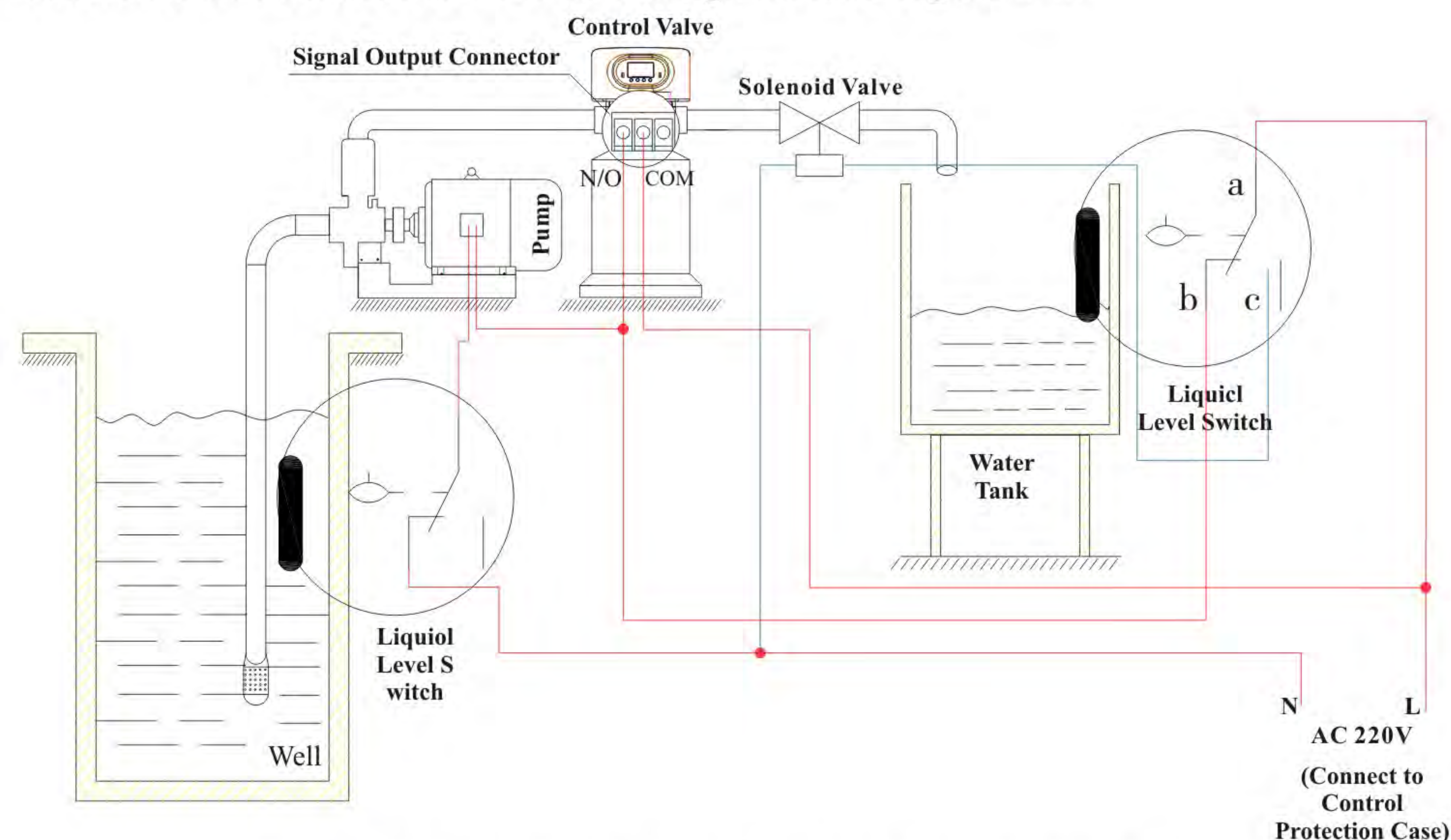


Figure 3-5 Wiring of Liquid Level Controller Controlling Inlet Pump

Function:

When valve is in service status, if water tank is short of water, pump starts working, but if water tank has enough water, the switch of liquid level controller is closed, so pump doesn't work.

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

A liquid switch at the top opening of well or in middle water tank in RO system protects 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 b-01)
(Refer to Figure 3-6)

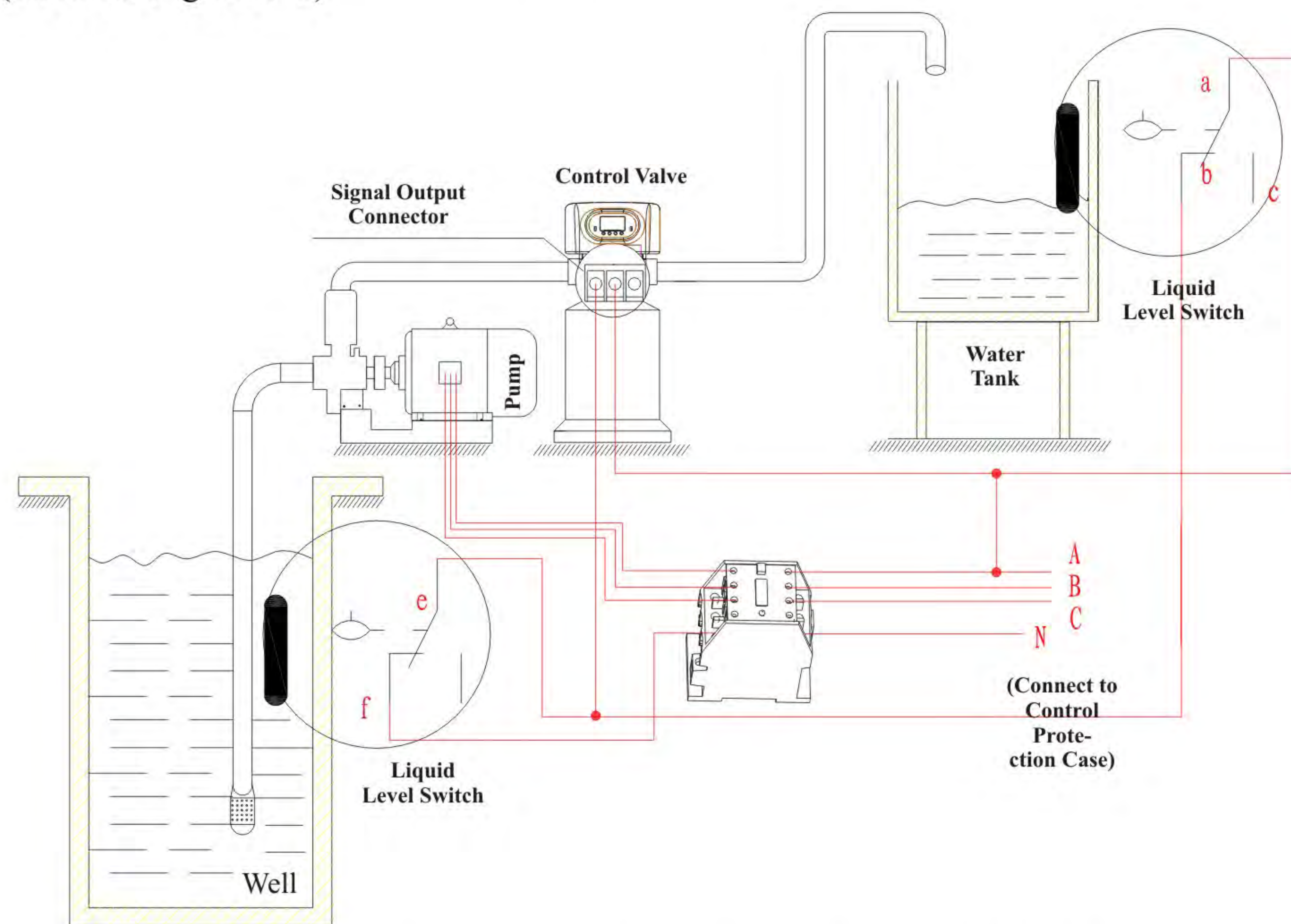


Figure3-6Wiring of Liquid Level Switch in Water Tank Controls Inlet Pump

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

Instruction: If inlet water pressure is less than 0.15MPa, which makes backwash or brine 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 opens, the wiring refers to Figure 3-7. If the booster pump current is bigger than 5A, system need to install an contactor, the wiring refers to Figure 3-8.

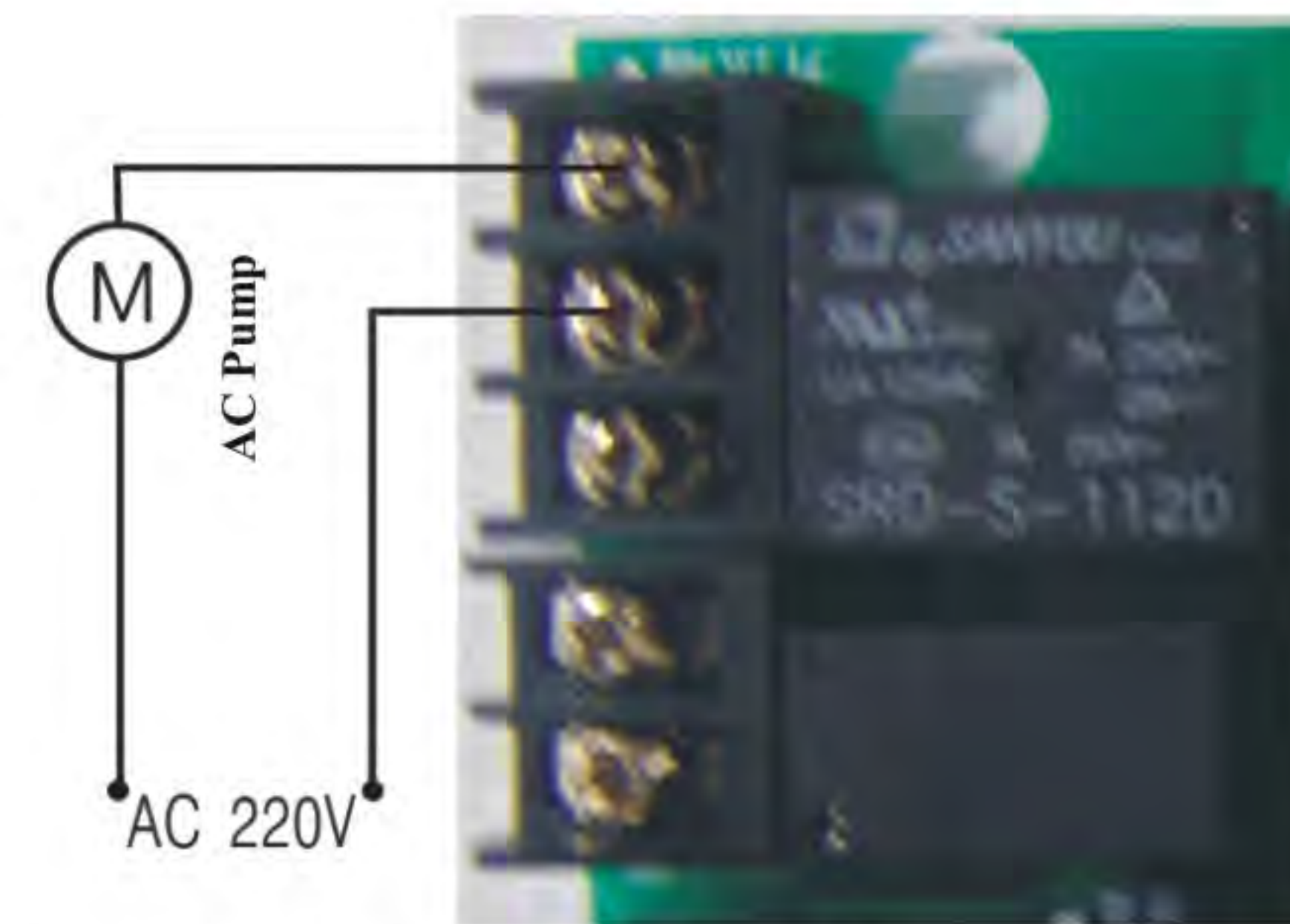


Figure 3-7Wiring of Booster Pump on Inlet

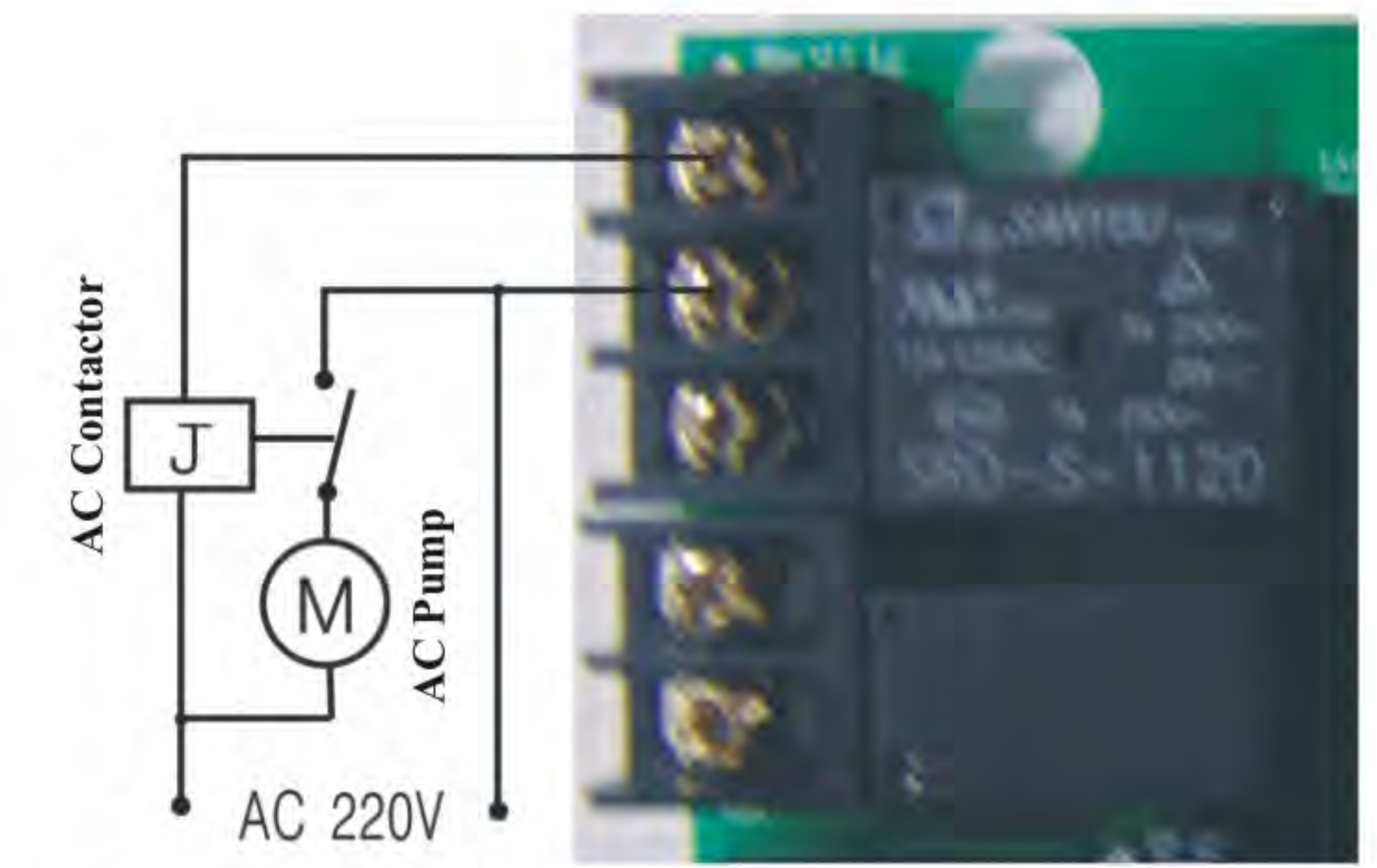


Figure 3-8 Wiring of Booster Pump on Inlet

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

In the series and parallel water treatment system (Second grade Na^+ Exchanger or RO pre-treatment system), it ensures only one valve in regeneration or washing cycle and there is water in service. Refer to Figure 3-9.

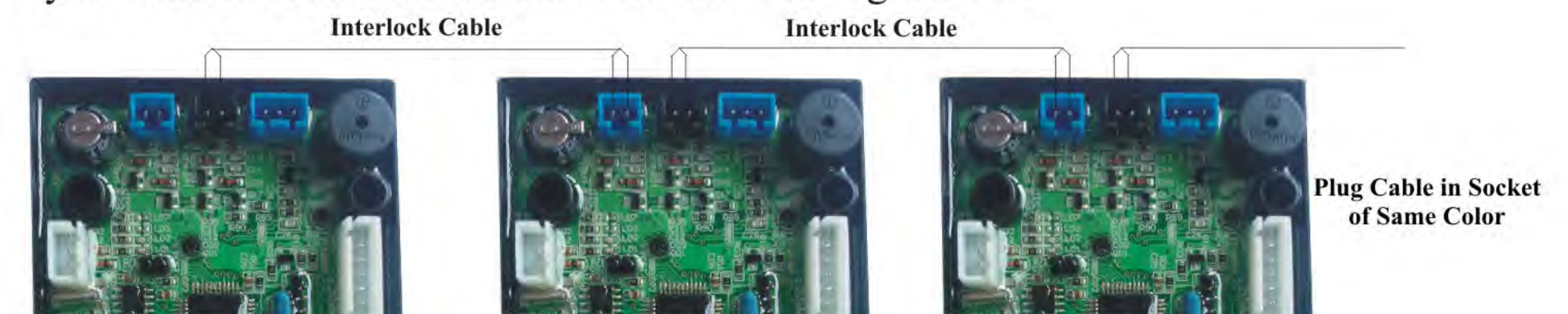


Figure 3-9 Network System Wiring with Interlock Cable

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. Pressure Relief Output

The valve will cut off feeding water to drain line when it switches in regeneration cycles. 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. The wiring refer to Figure 3-10.

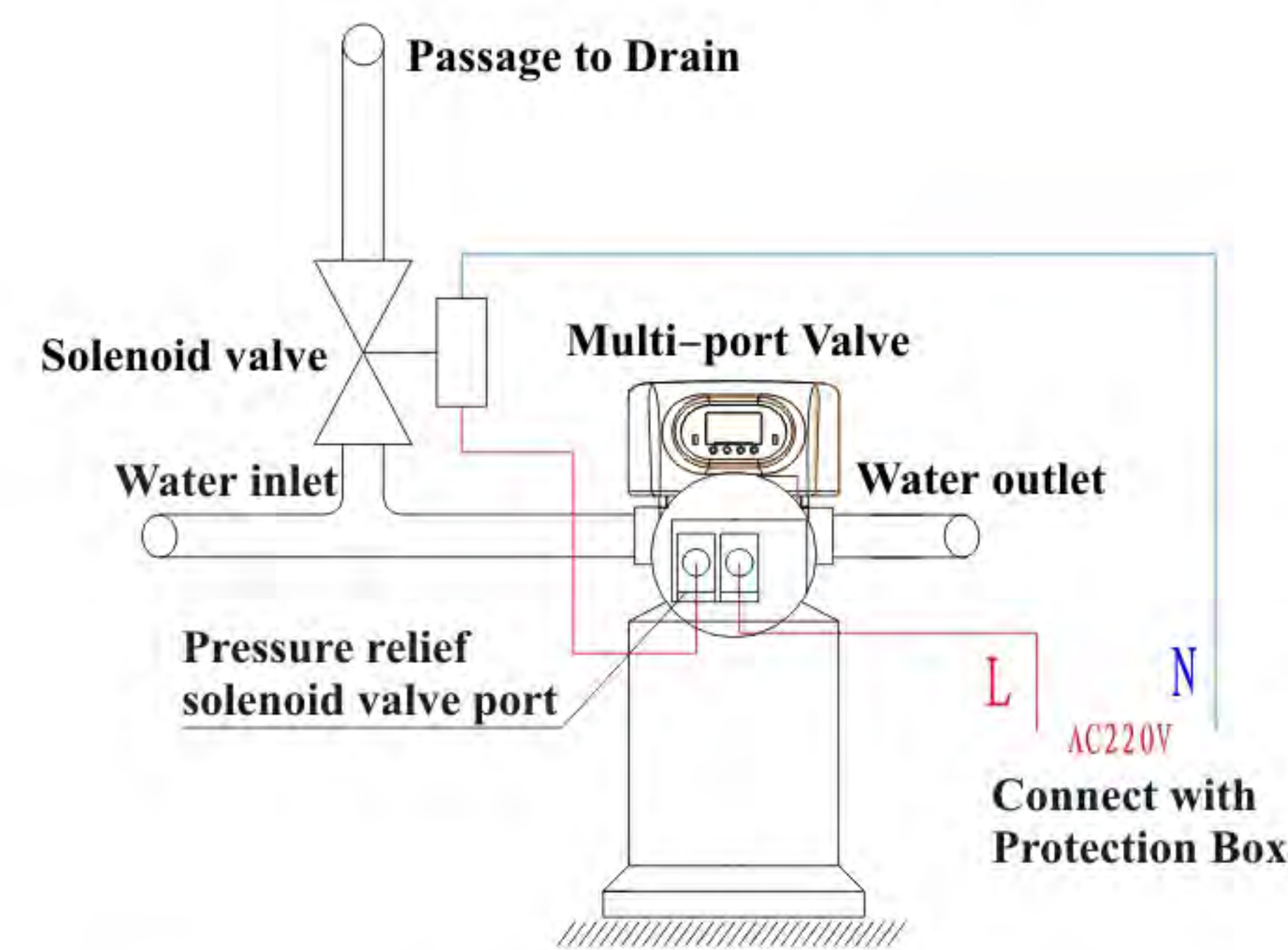


Figure 3-10 Wiring of Pressure Relief Output
D. Remote Handling Connector

When the valve is used to make pure water or other system that can be monitored online or connected to a PC, etc., when the conductivity or other parameters reach the set value or the PC sends a signal and needs system regeneration, it can be provide a signal to remote handling connector of main control board by the signal line, which can make the valve regenerate immediately. The connector receiving the signal is equivalent to pressing the manual button. The wiring refers to Figure 3-11.

E.Interlock system

2 or more than 2 valves are interlocked connecting in one system and all valves are in service but regenerate individually. The wiring refers to Figure3-12.

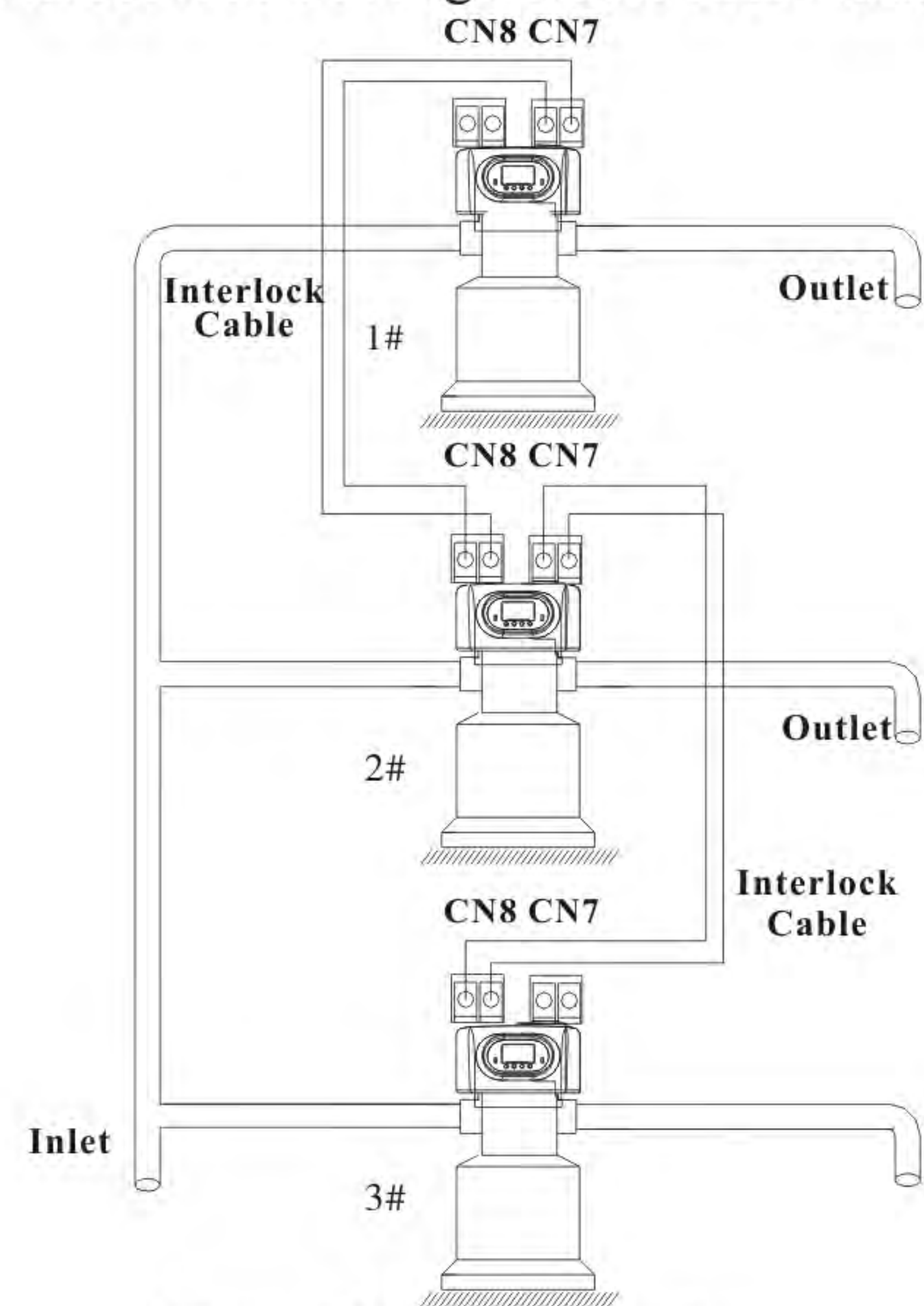


Figure 3-12 Interlock system

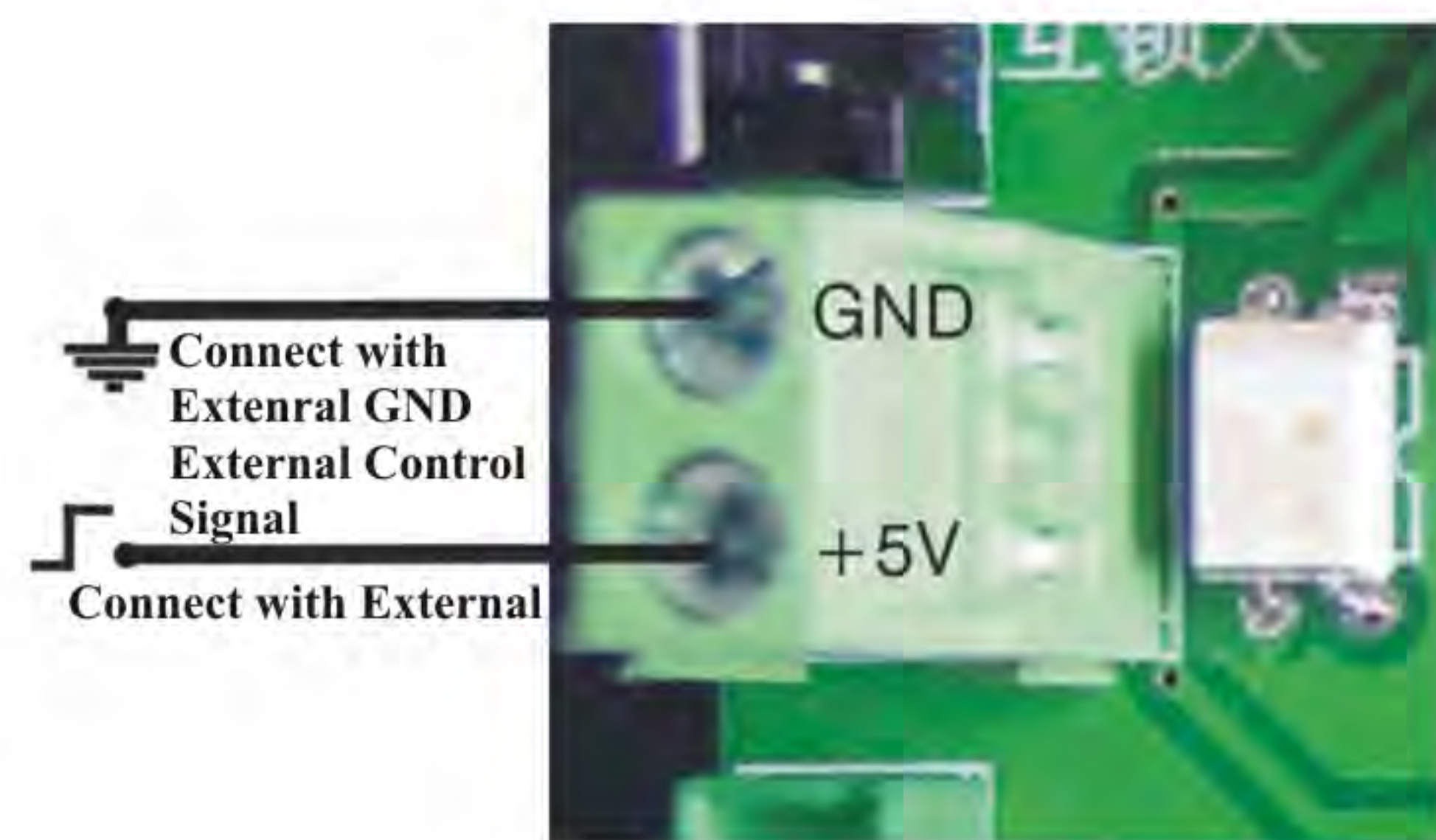


Figure 3-11 Wiring of Remote Input

F.Series System

This is a 2 or more than 2 valves system, all in service, with one flow meter for the entire system. For the time type valve, the regeneration time should be set and adjusted to the Max; for the meter type valve, connect its signal output connector with the remote handle connector of the time-type valve. That can realize the function of supplying water simultaneously and regenerating orderly. The wiring refers to Figure 3-13:

3.3.System Configuration and Flow Rate Curve

A. Product Configuration

①Product 63550/63650 configuration with tank, resin volume, brine tank and injector.

Tank Size (mm)	Resin Volume (L)	Flow Rate (t/h)	Brine Tank Size (mm)	The Minimum Salt Consumption for Regeneration (Kg)	Injector Model
φ 1500 × 2400	2500	44.0	φ 1360 × 1690	375.00	7804
φ 1800 × 2400	3200	63.0	φ 1360 × 1690	480.00	7805

Note: The flow rate calculation is based on linear velocity 25m/h; the minimum salt consumption for regeneration calculation is based on salt consumption 150g / L (Resin).

②Product 53550/53650 configuration with tank, filter material.

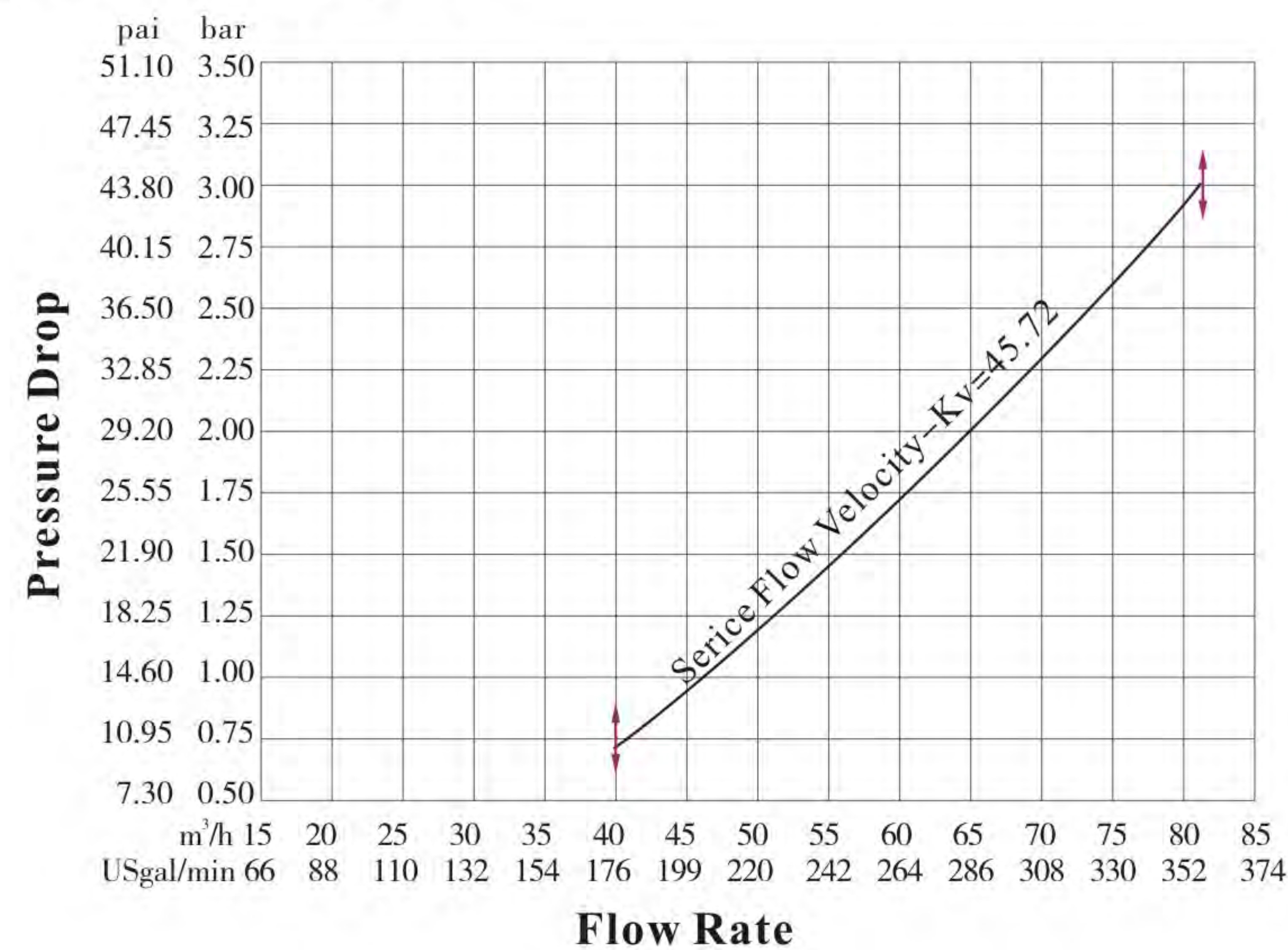
Tank Size	Volume of Filter Material	Carbon Filter		Sand Filter	
		Filtering Flow Rate	Backwash Flow Rate	Filtering Flow Rate	Backwash Flow Rate
mm	L	m³/h	m³/h	m³/h	m³/h
φ 900 × 2400	900	7.6	22.9	15.9	34.3
φ 1000 × 2400	1100	9.5	28.2	19.6	42.4
φ 1200 × 2400	1500	13.5	40.7	28.2	61.0

Attention: the filtering flow rate of carbon filter is calculated based on the 12m/h operation rate; the backwash flow rate is calculated based on the 10L/(m²*s) backwash intensity; the filtering flow rate of sand filter is calculated based on the 25m/h operation rate; the backwash flow rate is calculated based on the 15L/(m²*s) backwash intensity.

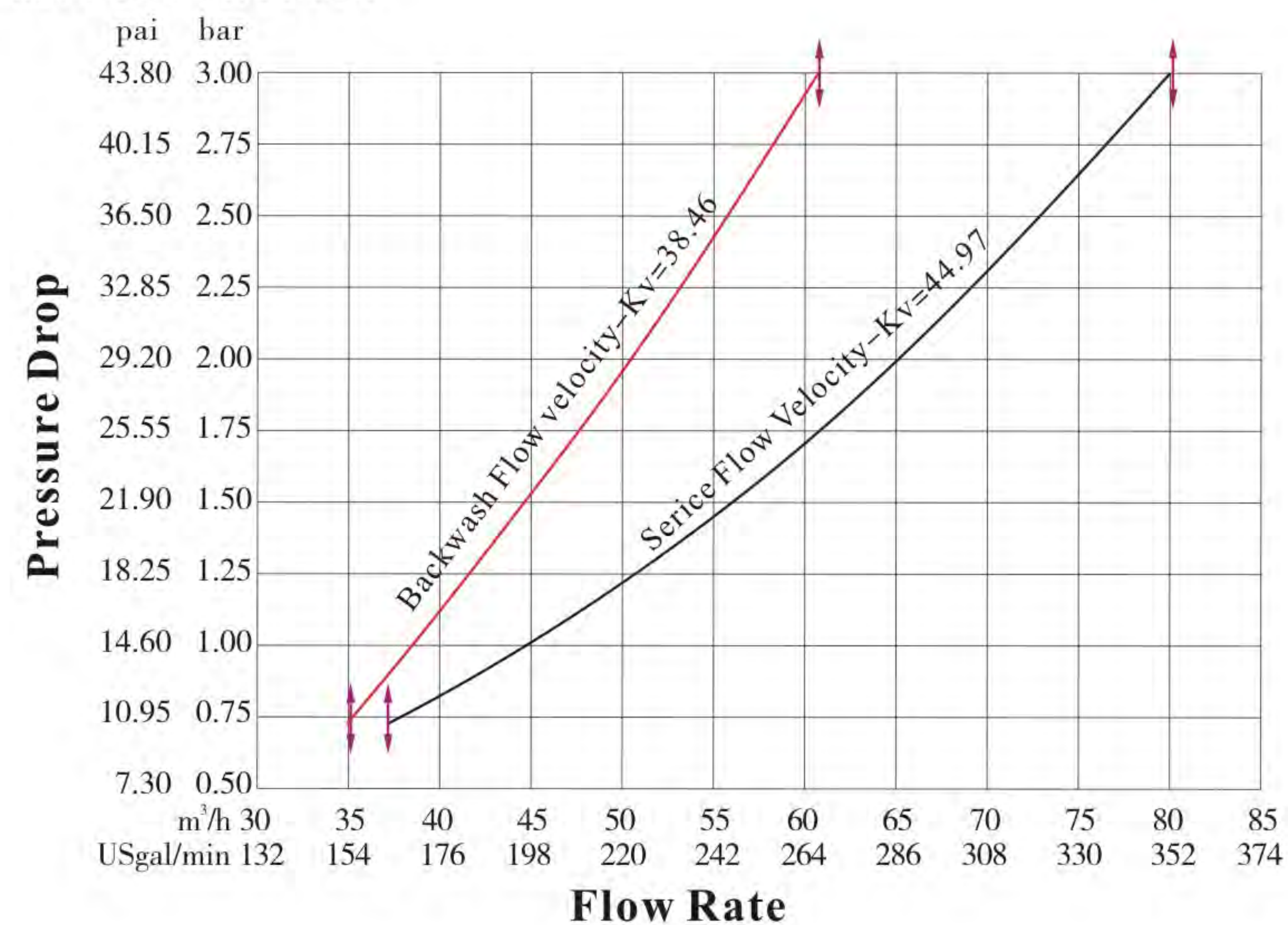
B. Flow Rate Characteristic

1) Pressure-flow rate curve

Softener valve 63550/63650



Filter valve 53550/53650



2) Configuration for standard injector and drain line flow control

Fixed bed 63550/63650:

Tank Dia. mm	Injector Model	Injector Color	Total Flow Rate on Injector	Flow Rate of Slow Rinse	Flow Rate of Brine Refill	Hole Qty & Size on Drain Outlet	Flow Rate of Backwash and Fast rinse
			L/h	L/h	L/h		
1500	7804	Blue	9155	6000	3090	5×φ8.5	27.14
1800	7805	White	12200	9200	3120	6×φ10.5	37.70

Note:

- ① The above data in table is tested under pressure of 0.3MPa.
- ② Since the differences in the quality of raw inlet water, capacity of resin, size of the tank and the pressure of inlet, the above data are only for reference.
- ③ If the real goods are different in specification, configuration or appearance, please subject to the real goods.
- ④ The hole is made depending on the size of matched tank in practical application. The hole's numbers and size are made based on the above table.

3.4.Parameter Settlement

① Service time T1

Water treatment capacity:

$$Q = V_R \times K \div Y_D (m^3)$$

Hardness of inlet water (mmol/L)

Exchange factor (mmol/L) 400~1000. Down-flow regeneration, take 400~750. If the inlet water hardness is higher, the factor is smaller.

Resin volume (m³)

By days:

$$T1 = Q \div Q_d (\text{Day})$$

Average water consumption per day (m³/d)

Water treatment capacity (m³)

② Backwash 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.

③ Brine & slow rinse time T3

$$T3 = (40 \sim 50) \times H_R \text{ (min.)}$$

Generally, $T3 = 45H_R \text{ (min.)}$

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

④ Brine refill time T4

Down-flow regeneration: $T4 = 0.45 \times V_R \div \text{Brine refill speed (min.)}$

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. (If there is a brine valve installed in the brine tank)

⑤ Fast rinse time T5

$$T5 = 12 \times H_R \text{ (min.)}$$

Generally, the water for fast rinse is 3~6 times of resin volume. It is suggested to be set 10~16 minutes, but it should be washed until the outlet water meets the requirements.

⑥ Exchange factor

$$\text{Exchange factor} = E / (k \times 1000)$$

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.

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.

⑦ Regeneration time:

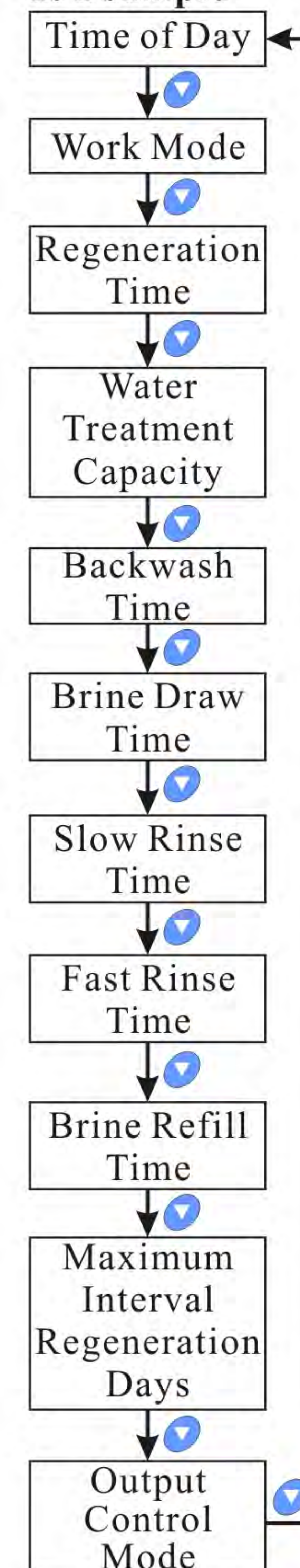
The whole cycle for regeneration is about two hours. Please try to set up the regeneration time when you don't need to use water according to the actual situation.

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.

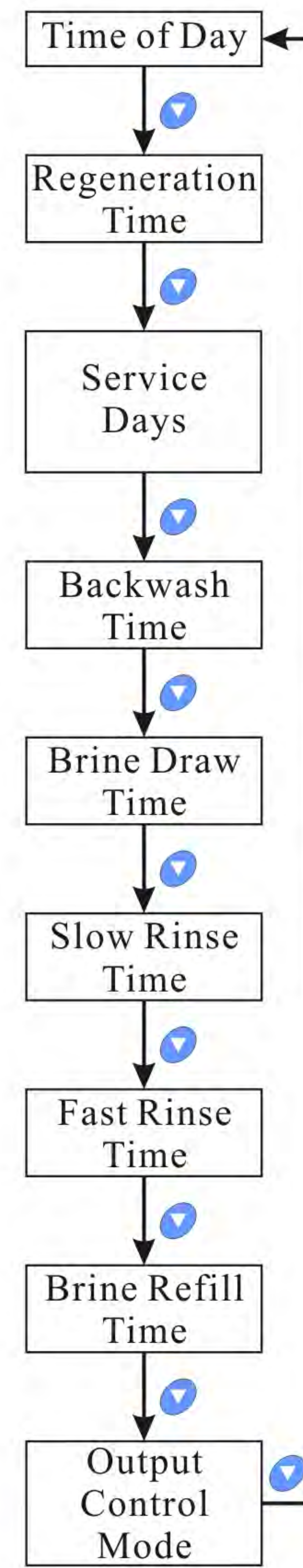
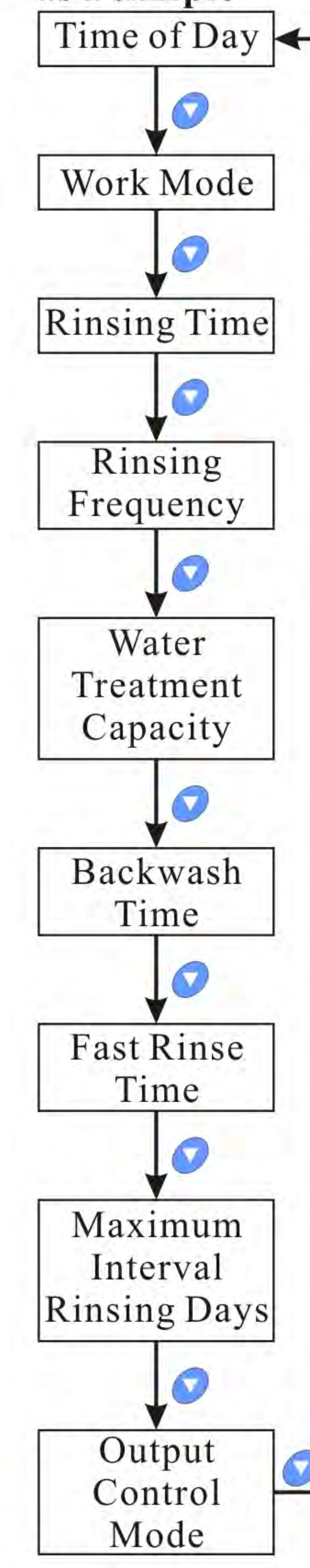
3.5.Parameter Enquiry and Setting

3.5.1.Parameter enquiry

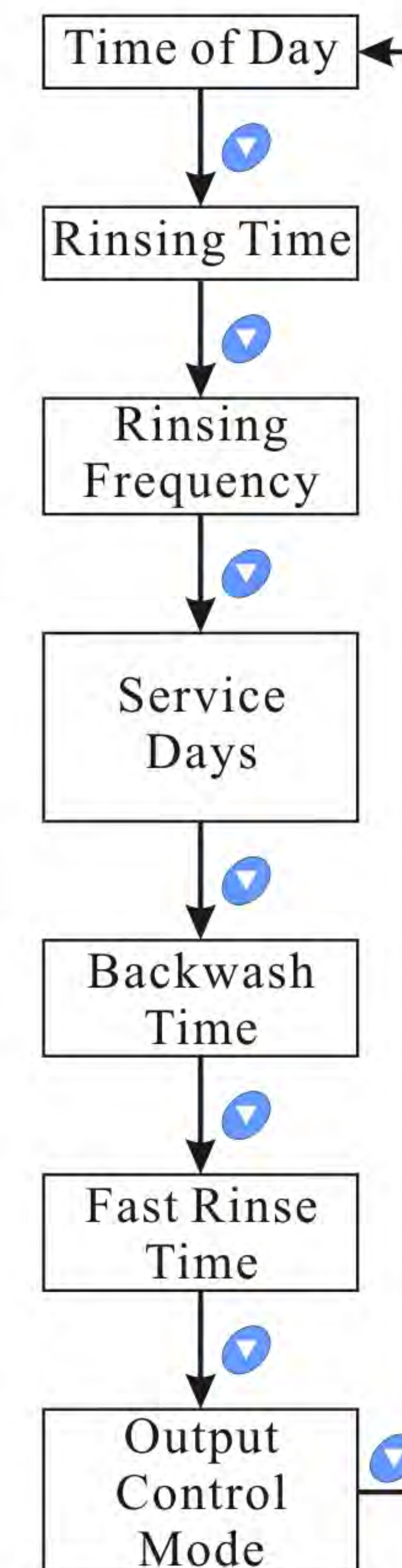
When “ F ” lights on, press and hold both “ $\blacktriangle$ ” and “ $\blacktriangledown$ ” for 5 seconds to unlock buttons; then press “ M ”, “ R ” lights on, enter program display mode; press “ $\blacktriangle$ ” or “ $\blacktriangledown$ ” to view each value according to below process. (Press “ M ” exit and turn back to service status).

63650:Take A-01
as a sample

63550:

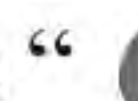
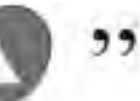
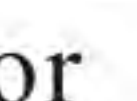
53650:Take A-01
as a sample

53550:

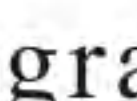
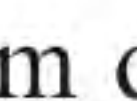
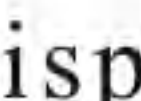
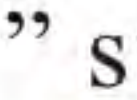
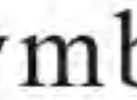
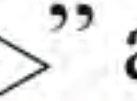
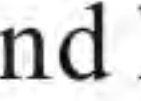
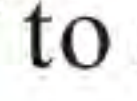
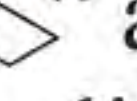
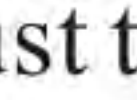
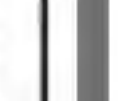
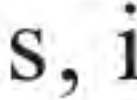
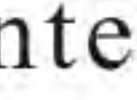
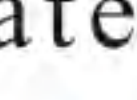


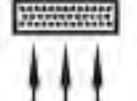
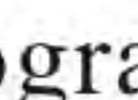
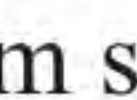
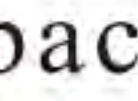
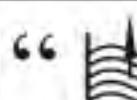
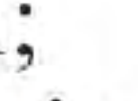
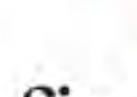
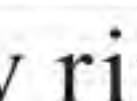
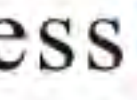
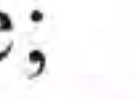
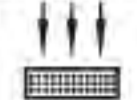
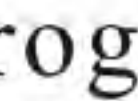
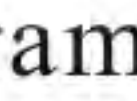
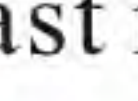
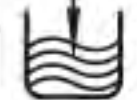
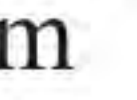
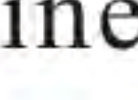
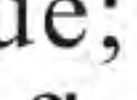
3.5.2. K valve setting method (It is related to flow rate factor. The K value is opposite to the flow rate factor.)

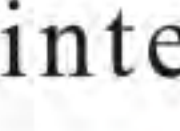
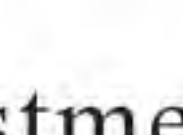
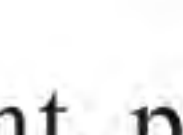
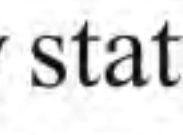
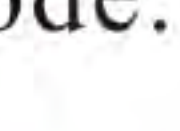
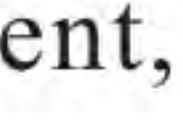
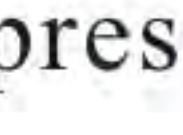
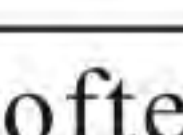
When connect power, press and hold on “Menu/Confirm” button and “Manual/Return” button for 3 seconds, enter K valve setting interface. Press “ $\blacktriangle$ ” and “ $\blacktriangledown$ ” button to adjust K value. Press “Menu/Return” button to go back to working interface.

3.5.3.Parameter setting (Take 63650 A-01 as example)
In program display mode, press “” to enter program set mode, press “” or “” can adjust every parameter,

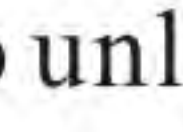
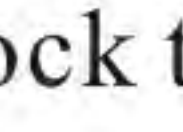
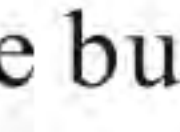
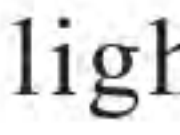
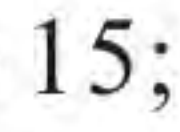
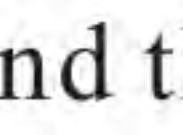
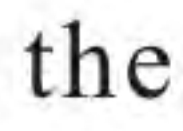
3.5.4 Parameter setting steps

Items	Process Steps	Symbol
Time of Day	When time of day “12:12” continuously flashes, it reminds to reset; 1. Press “  ” to enter program display mode; both “  ” and “  ” symbol light on, “:”flashes; Press “  ”, both “  ” and hour value flash, press “  ” or “  ” to adjust the hour value; 2. Press “  ” again, both “  ” and minute value flash, press “  ” or “  ” to adjust the minute value; 3. Press “  ” and hear a sound “Di”, then finish adjustment, press “  ” to turn back.	
Control Mode	1. In control mode display status, press “  ” and enter program set mode, “  ” and 01 value flash; 2. Press “  ” or “  ”, set the value to be A-01 or A-02 control mode; 3. Press “  ” and hear a sound “Di”, then finish adjustment, press “  ” to turn back.	
Regeneration Time	1. In regeneration time display status, press “  ” to enter program set mode, it shows 02:00, “  ” and 02 flash; Press “  ” or “  ” to adjust the hour value; 2.Press “  ”, “  ” and 00 flash, press “  ” or “  ” to adjust the minute value; 3. Press “  ” and hear a sound “Di”, then finish adjustment, press “  ” to turn back.	
Water Treatment Capacity	1. In water treatment capacity display status, it shows “  ” and 400.0. Press “  ” and enter program set mode. “  ” and 400 flash; 2. Press “  ” or “  ” to adjust the water treatment capacity value(m³); 3. Press “  ”, decimal value flash. Press “  ” or “  ” to adjust the decimal value; 4. Press “  ” and hear a sound “Di”, then finish adjustment, press “  ” to turn back.	

Backwash Time	1. In backwash time display status, it shows “  ” and 2-10:00. Press “  ” and enter program set mode. “  ” and 10 flash; 2. Press “  ” or “  ” to adjust the backwash minute value; 3. Press “  ” and 00 flashes. Press “  ” or “  ” to adjust second value; 4. Press “  ” and hear a sound “Di” then finish adjustment, press “  ” to turn back.	
Brine Draw Time	1. In brine draw time display status, it shows “  ” and 3-60:00. Press “  ” and enter program set mode. “  ” and 60 flash; 2. Press “  ” or “  ” to adjust the brine draw minute value; 3. Press “  ” and 00 flashes. Press “  ” or “  ” to adjust the brine draw second value; 4. Press “  ” and hear a sound “Di” then finish adjustment, press “  ” to turn back.	
Slow Rinse Time	1.In slow rinse time display status, it shows 4-45:00. Press  and enter program set mode.  and 45 flash; 2. Press  or  to adjust the slow rinse minute value; 3. Press  and 00 flashes. Press  or  to adjust the slow rinse second value; 4. Press  and hear a sound “Di”, then finish adjustment, press  to turn back.	
Fast Rinse Time	1. In fast rinse time display status, it shows “  ” and 5-10:00. Press “  ” and enter program set mode. “  ” and 10 flash; 2. Press “  ” or “  ” to adjust the fast rinse minute value; 3. Press “  ”and 00 flashes. Press “  ” or “  ” to adjust the fast rinse second value; 4. 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 6-05:00, Press “  ” and enter program set mode. “  ” and 05 flash; 2. Press “  ” or “  ” to adjust the brine refill minute time; 3. Press “  ” and 00 flashes. Press “  ” or “  ” to adjust the brine refill second value; 4. Press “  ” and hear a sound “Di” then finish 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 “  ” to finish 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 01 flash; 2. Press  or  to adjust the mode; 3. Press  to finish adjustment, press  to turn back.	

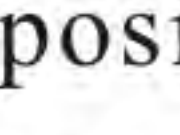
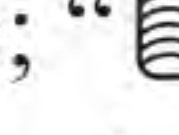
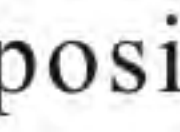
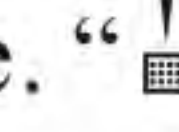
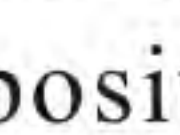
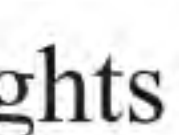
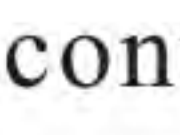
For example, the fast rinse time of a softener is 12 minutes. After regenerating, the chloridion in the outlet water is always higher than normal, indicating that the time is not enough for fast rinse. If you want the time to set to 15 minutes, the modification steps as follows:

- ① Press and hold both “” and “” to unlock the buttons.(“” lights off);
 - ② Press “”, and “” lights on;
 - ③ Press “” or “” continuously until “” lights on. Then the digital area shows: 5-12:00M;
 - ④ Press “”, “” and 12 flash;
 - ⑤ Press “” continuously until 12 is changed to 15;
 - ⑥ Press “”, there is a sound “Di” and the figure stops flashing; the program is back to enquiry status
 - ⑦ If you want to adjust other parameters, you can repeat the steps from ② to ⑤;
- If you don’t, press “” and quit from the enquiry status, 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 parameter, please conduct the trail running as follows:

- A. Close the inlet and outlet valve B & C, and open the bypass valve A. After cleaning the foreign materials in the pipe, close the bypass valve A. (As Figure 1-2 shows).
- B. Add calculated water to the brine tank 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 turn to the Backwash position; when “” lights 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; “” lights on and enter in the process of Brine& Slow Rinse. The air check valve closes when control valve finish brine draw, then slow rinse starts to work. It takes about 60~65minutes for whole process.
- E. Press “”, turning the position from Brine & Slow Rinse to Fast Rinse. “” lights on. It takes about 10~15 minutes, take out 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.
- F. Press “”, turning the position from Fast Rinse to Brine Refill. “” lights on, the valve starts brine refill (Meanwhile it is in Service status) until the brine tank is being refilled with water to the required level. It takes about 5~6 minutes, then add solid salt to the brine tank.
- G. Press “”, making the control valve return to Service Status; “” lights on and starts to running.

Note:

- When the control valve enters the regeneration status, all programs can be finished automatically according to the setting time; if you want one of steps to be terminated early, you can press “”.
- If water inflows too fast, the media in tank will be damaged. When water inflows slowly, there is a sound of air emptying from drain pipeline.
- After changing resin, please empty air in the resin according to the above Step C.
- In the process of trial running, please check the water situation in all positions, and ensure there is no resin leakage.
- The time for Backwash, Brine Draw, Slow Rinse, Brine Refill and Fast Rinse can be set and executed according to the calculation in the formula or suggested from the control valve suppliers.

3.7.Trouble-Shooting

A.Control Valve Fault

MODEL 53550-F96B1/53650-F96B3/63550-F96A1/63650-F96A3

Problem	Cause	Correction
1. Softener fails to regenerate.	A. Electrical service to unit has been interrupted. 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. Check or replace controller. D. Check or replace motor.
2. Regeneration time is not correct.	A. Time of day does not set correctly. B. Power failure more than 3 days, the time of day is incorrect.	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 is plugged. D. Insufficient water flows into brine tank. E. Internal valve leaks. F. Incorrect regeneration time or raw water quality deterioration. G. Shortage of resin. H. Bad quality of raw water or turbine is 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. Change valve body. F. Set correct regeneration time or water capacity treatment. G. Add resin to mineral tank and check whether resin leaks. H. Reduce the raw water turbidity or clean or replace the flow meter.
4. Softener fails to draw brine.	A. Inlet line pressure is too low. B. Brine line is plugged. C. Brine line is leaking. D. Injector is plugged or broken down. E. Internal valve leaks. F. Drain line is plugged. G. Sizes of injector and DLFC are not matched with tank. H. Ball valve or cable failure.	A. Increase inlet line pressure. B. Clean brine line. C. Replace brine line. D. Clean or replace new injectors. E. Replace valve body. F. Clean drain line flow control. G. Select correct injector size and DLFC according to the requirements. H. Replace ball valve or cable.
5. Unit used 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. Power outage when brining and system without liquid level controller. E. Brine refill is out of control. F. Ball valve doesn't close completely.	A. Reset correct brine refilling time. B. Check the injector and make sure no stuff in the brine pipe. 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. F. Repair or replace ball valve.

MODEL 53550-F96B1/53650-F96B3/63550-F96A1/63650-F96A3

7. Pressure lost or rust in pipeline	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. Strainer is broken. C. Improperly sized drain line control.	A. Assure that well system has proper air eliminator control. B. Replace new strainer. C. Check for proper drain rate.
9. Control cycle continuously.	A. Locating signal wiring breaks down. B. Controller is faulty. C. Foreign material stuck the driving gear. D. Time of regeneration steps were set to zero.	A. Check and connect locating signal wiring. B. Replace controller. C. Take out foreign material. D. Check program setting and reset.
10. Drain flows continuously.	A. Internal valve leaks. B. Power off when valve is in backwash or fast rinse 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.
11. Interrupted or irregular brine.	A. Water pressure is too low or not stable. B. Injector is plugged or faulty. C. Air in resin tank. D. Floccules in resin tank during up-flow regeneration. E. Strainer is plugged.	A. Increase water pressure. B. Clean or replace injector. C. Check and find the reason of air intake. D. Clean the floccules in resin tank. E. Clean the broken resin from strainer.
12. Water flows 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 valve body. C. Water pressure is too high which results in valve doesn't get the right position. D. Ball valve is not be closed completely.	A. Clean foreign material in valve body. B. Change valve core or sealing ring. C. Reduce water pressure or use pressure relief function. D. Repair or replace the ball vale or the wire.
13. Salt water in softener water	A. Foreign material in injector or injector fails to work. B. Brine valve cannot be shut-off. C. Time of fast rinse is too short.	A. Clean and repair injector. B. Repair brine valve and clean it. C. Extend fast rinse time.

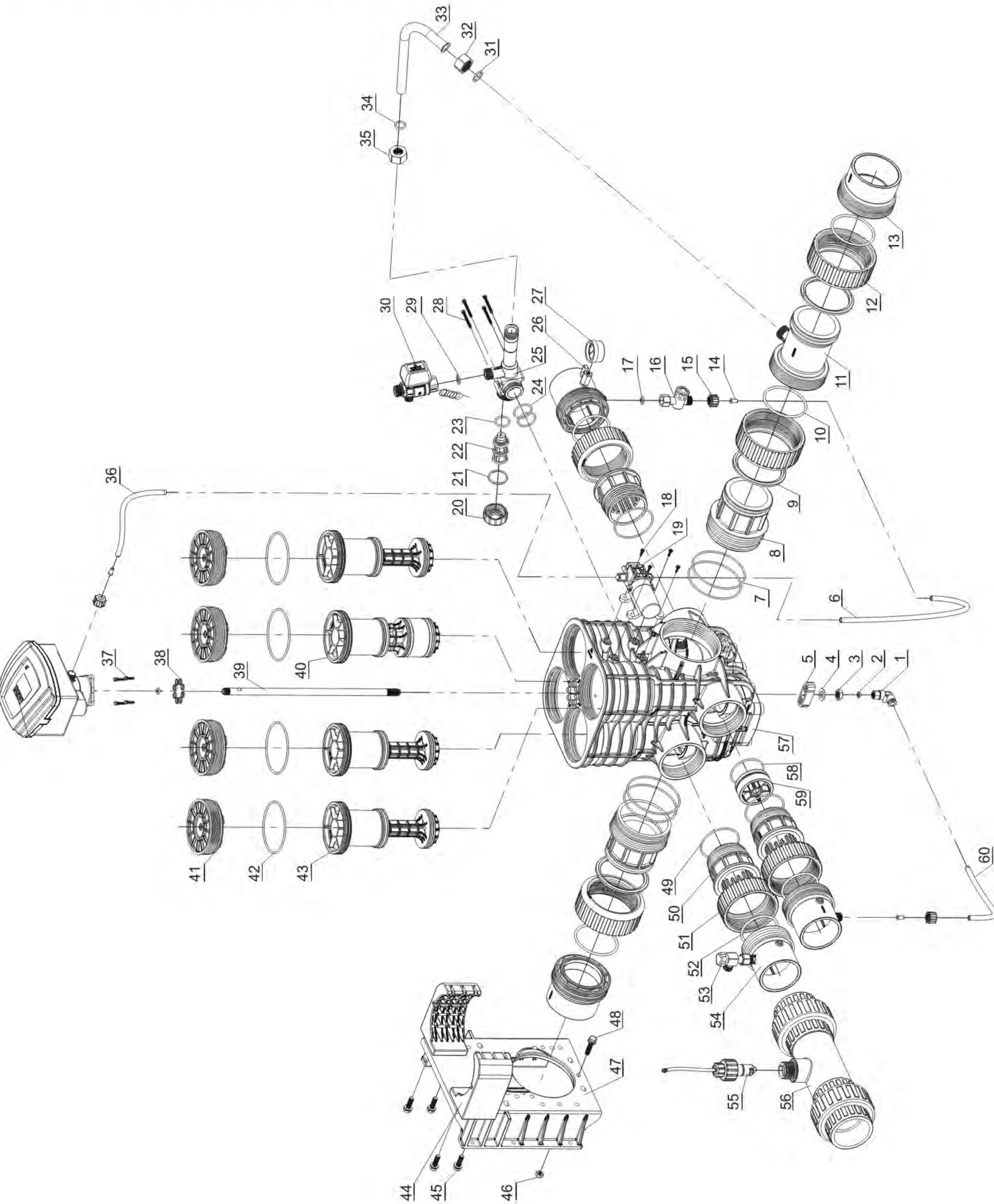
14. Unit capacity decreases.	A. Doesn't regenerate properly. B. Fouled resin bed. C. Salt setting is not proper. D. Softener setting is not proper. E. Raw water quality deterioration. F. Turbine of flow meter is stuck.	A. Regenerate according to the correct operation requirement. B. Increase backwash flow rate and times, 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 a new flow meter.
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B.Controller Fault

Problem	Cause	Correction
1. All indicators display on front panel.	A. Wiring of display board with control board fails to work. B. Control board is faulty. C. Transformer is damaged. D. Electrical service is not stable. E. Display board is damaged.	A. Check and replace the wiring. B. Replace control board. C. Check and replace transformer. D. Check and adjust electrical service. E. Replace display board.
2. No display on front panel	A. Wiring of front panel with controller fails to work. B. Front panel damaged. C. Control board damaged. D. Electricity is interrupted.	A. Check and replace wiring. B. Replace front panel. C. Replace control board. D. Check electricity.
3. E1 Flashes	A. Wiring of display board with control board fails to work. B. Locating board is damaged. C. Mechanical driven failure. D. Control board is damaged. E. Wiring of motor with control board is fault. F. Motor damaged.	A. Replace wiring. B. Replace locating board. C. Check and repair mechanical part. D. Replace control board. E. Replace wiring. F. Replace motor.
4. E2 Flashes	A. Hall component on locating board is damaged. B. Wiring of locating board with control board fails to work. C. Control board is faulty.	A. Replace locating board. B. Replace wiring. C. Replace control board.
5. E3 or E4 Flashes	A. Control board is faulty.	A. Replace control board.

3.8.Assembly & Parts

63650 Structure(Main valve body part)



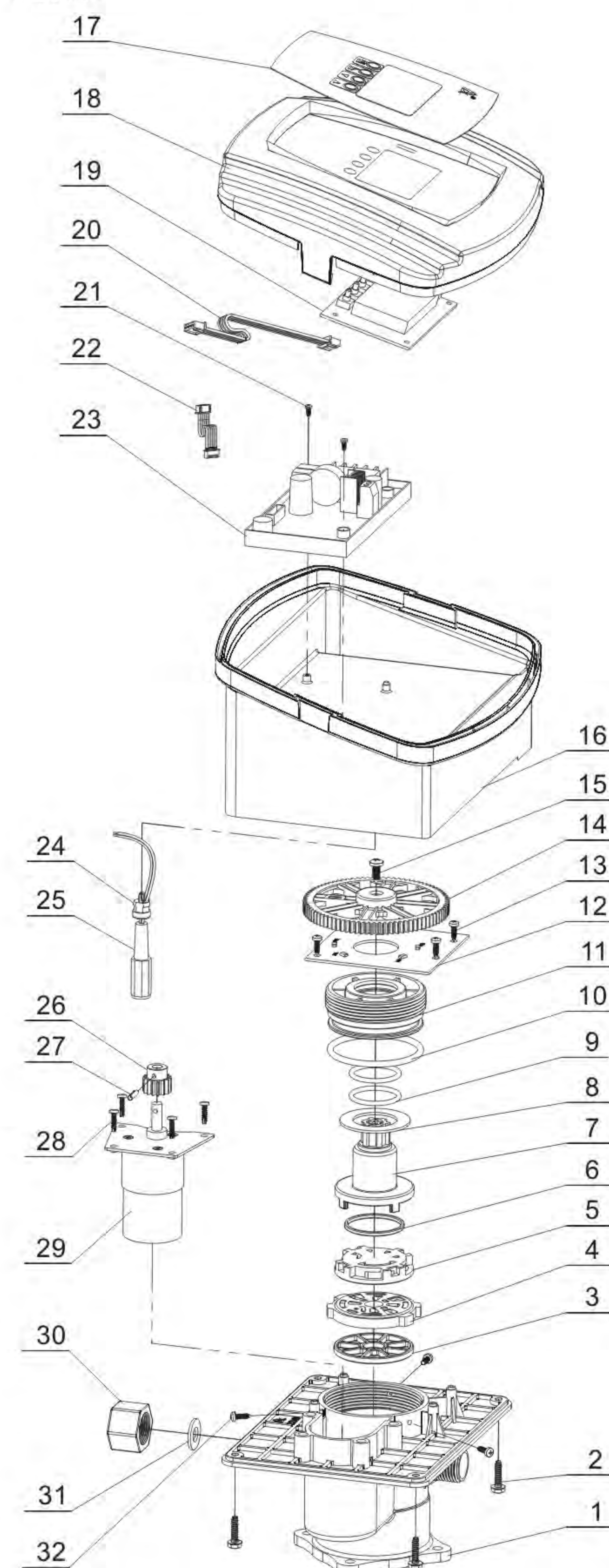
63650 Valve Body Components and Part No.

Item No.	Description	Part No.	Quantity	Item No.	Description	Part No.	Quantity
1	Air Pipeline Connector	5455001	1	31	Washer	8371001	1
2	Seal Washer	8371011	2	32	Nut	8940006	1
3	Nut	8940005	1	33	Elbow Pipeline	8457072	1
4	Washer	8952003	1	34	O-ring	8378113	1
5	Gasket	8156003	1	35	Nut	8940007	1
6	Air Pipeline	8465010	1	36	Air Pipeline	8465012	1
7	O-ring	8378218	4	37	Hexagonal Bolt Set	5851006	4
8	Connector	8458081	2	38	Seal Washer	8371047	8
9	Clip	8270011	3	39	Pipeline	8457075	1
10	O-ring	8378219	3	40	Piston	5450002	1
11	Connector	8458078	1	41	Plug	8315037	4
12	Animated Nut	8947030	3	42	O-ring	8378214	4
13	Connector	8458077	2	43	Piston	5450001	3
14	Pipeline	8457025	3	44	Support	5156002	2
15	Hexagonal Nut	8940016	3	45	Hexagonal Bolt Set	5851001	4
16	Filter Valve	3914001	1	46	Hexagonal Bolt	8940023	1
17	Seal Washer	8371044	1	47	Fixer	8109053	1
18	Screw, Cross	8909019	4	48	Hexagonal Bolt Set	5851009	1
19	Diaphragm Pump	2976091	1	49	O-ring	8378199	3
20	Injector Cover	8315013	1	50	Connector	8458080	3
21	Seal Washer	8371006	1	51	Animated Nut	8947031	3
22	Nozzle	8454032	1	52	O-ring	8378216	12
23	O-ring	8378104	1	53	Corner Valve	3911004	1
24	O-ring	8378101	2	54	Connector	8458079	3
25	Injector Body	8008011	1	55	Turbine	5295004	1
26	Pressure Gauge Protect Valve	2976013	1	56	Tee Valve	5457026	1
27	Pressure Gauge	6342001	1	57	Valve Body	5022068	1
28	Hexagonal Bolt Set	5851005	4	58	O-ring	8378217	1
29	Seal Washer	8371019	1	59	Flow Control	8468072	1
30	Ball Valve	6922075	1	60	Air Pipeline	8465013	1

Note:

- For 63550 components, there is no #55 and #56.
- For 53650 components, there is no #9~#11. Change #20~#25, #28~#35 to 1 piece of 8323012, 4 pieces of 5851006 and 2 pieces of 8378101.
- For 53550 components, there is no #55 and #56.

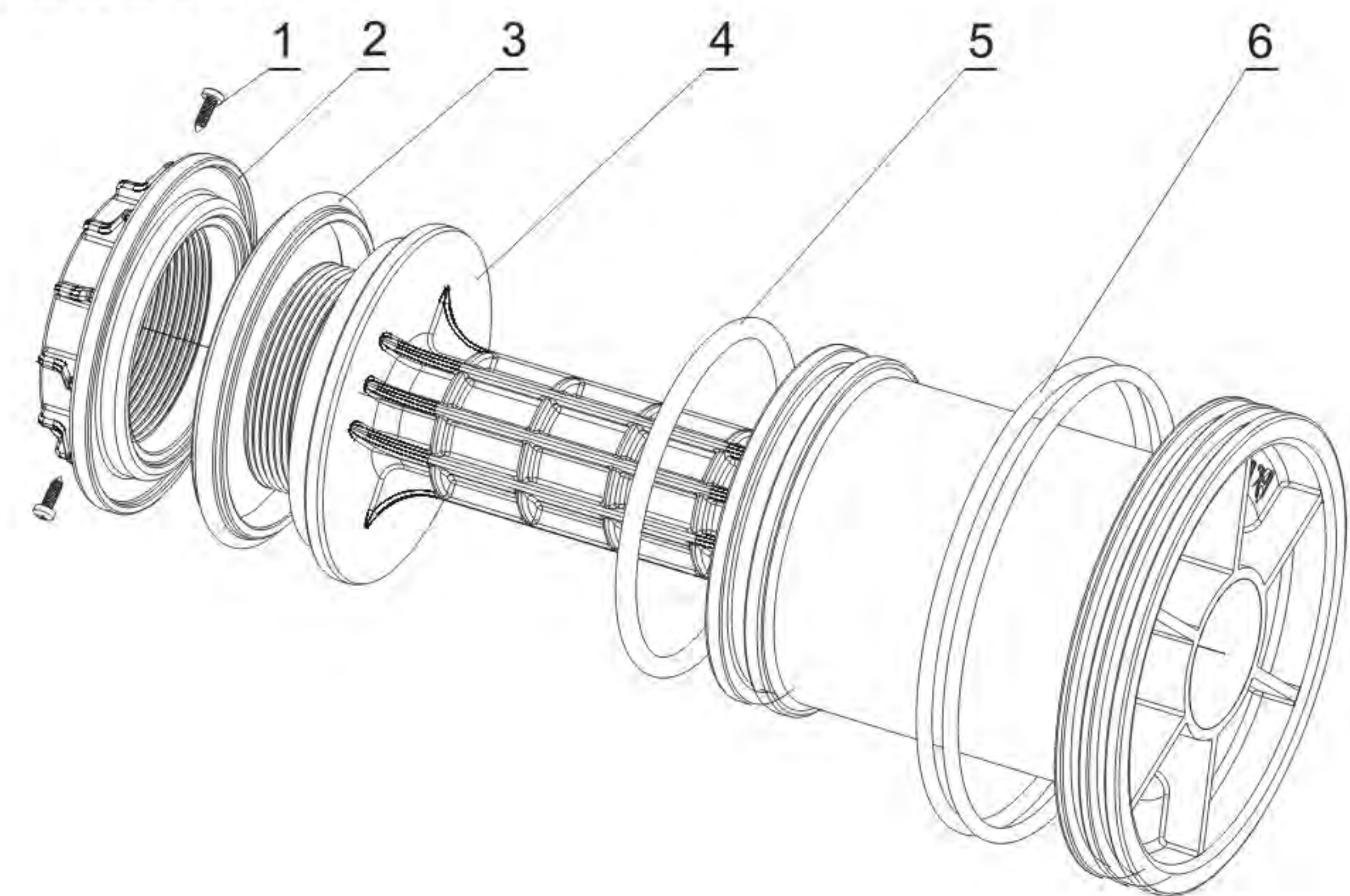
63650 Distribution Valve



63650 Distribution Valve

Item No.	Description	Part No.	Quantity	Item No.	Description	Part No.	Quantity
1	Valve Body	8022169	1	17	Sticker	8865001	1
2	Screw Cross	8909016	4	18	Front Cover	8300002.05	1
3	Seal Ring	8370031	1	19	Display Board	6381003	1
4	Fixed Disk	8469023	1	20	Wire for Display Board	5512001	1
5	Moving Disk	8459025	1	21	Screw, Cross	8909004	2
6	Moving Seal Ring	8370053	1	22	Wire for Locating Board	5511019	1
7	Shaft	8258009	1	23	Main Board	6382057	1
8	Anti-friction Washer	8216010	1	24	Wire Clip	8126007	1
9	O-ring	8378078	2	25	Power Wire	5513011	1
10	O-ring	8378107	1	26	Small Gear	8241010	1
11	Fitting Nut	8092007	1	27	Pin	8993003	1
12	Locating Board	6380034	1	28	Screw, Cross	8909044	4
13	Screw, Cross	8909008	4	29	Motor	6158506	1
14	Gear	5241005	1	30	Blind Hole Nut	8940012	1
15	Screw, Cross	8909013	1	31	Seal Ring	8371020	1
16	Back Cover	8005002	1	32	Screw, Cross	8909008	3

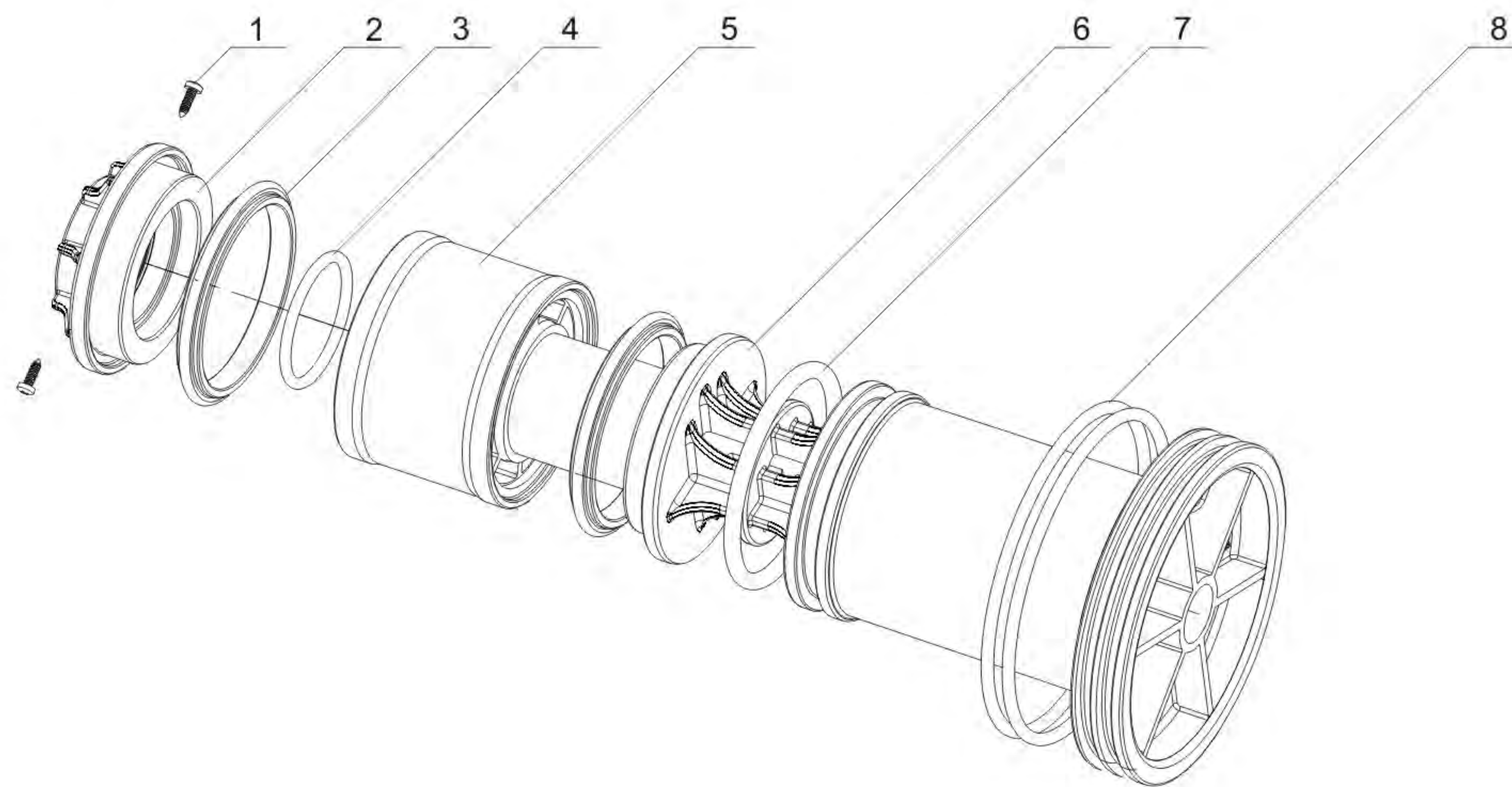
5450001 Piston Structure



5450001 Piston Components and Part No.

Item No.	Description	Part No.	Quantity	Item No.	Description	Part No.	Quantity
1	Screw, Cross	8909008	3	4	Piston	8450003	1
2	Fitting Nut	8092041	1	5	O-ring	8378216	1
3	Seal Ring	8370094	1	6	O-ring	8378214	2

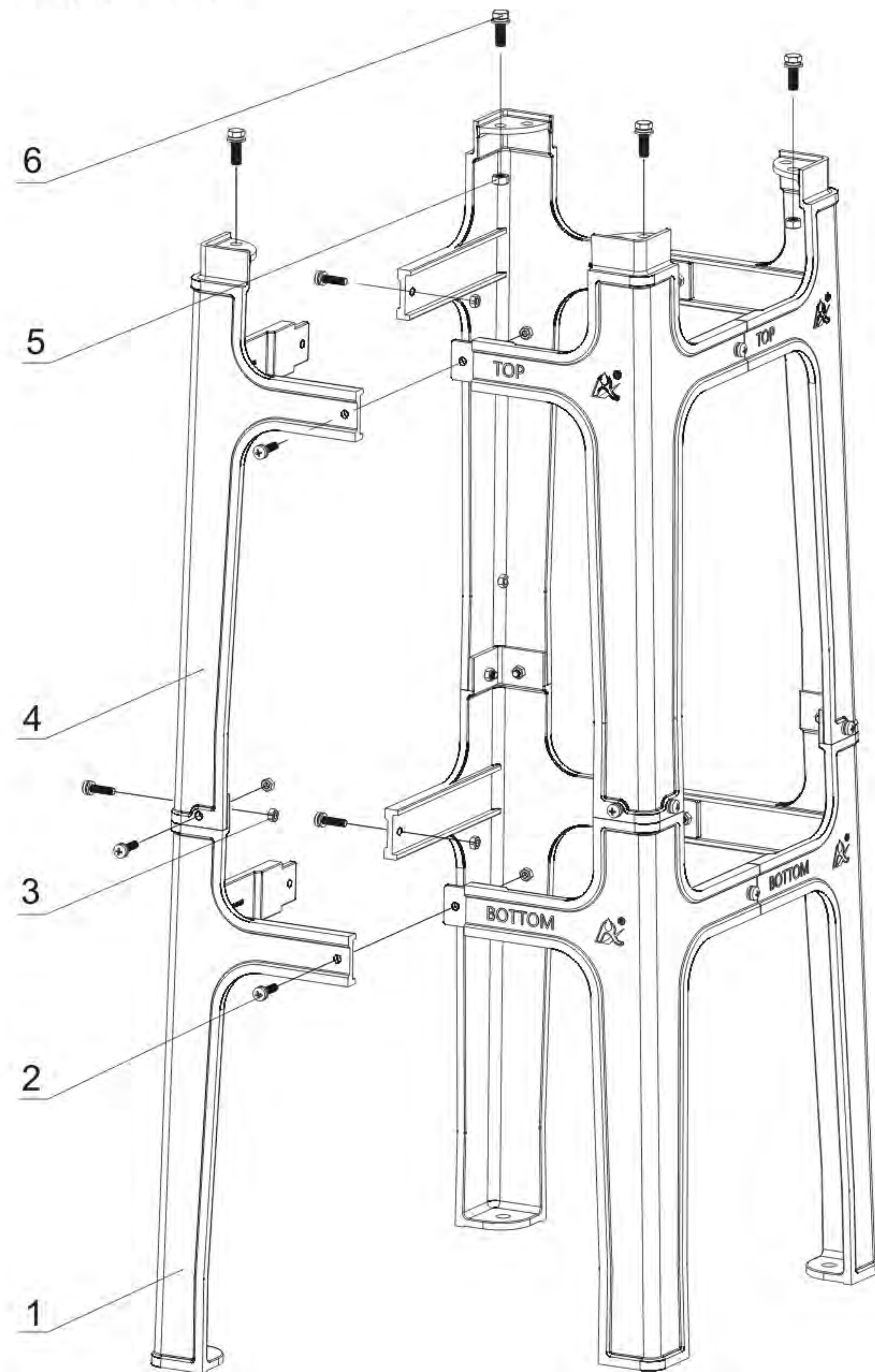
5450002 Piston Structure



5450002 Piston Components and Part No.

Item No.	Description	Part No.	Quantity	Item No.	Description	Part No.	Quantity
1	Screw, Cross	8909008	3	5	Bushing	8210005	1
2	Fitting Nut	8092042	1	6	Piston	8450004	1
3	Seal Ring	8370094	2	7	O-ring	8378216	1
4	O-ring	8378110	1	8	O-ring	8378214	1

5040009 Support Structure



5040009 Support Components and Part No.

Item No.	Description	Part No.	Quantity	Item No.	Description	Part No.	Quantity
1	Support	8040030	4	4	Support	8040031	4
2	Screw, Cross	5851012	16	5	Hexagonal Nut	5940021	4
3	Hexagonal Nut	5851020	16	6	Hexagonal Nut Set	5851002	4

4.Warranty Card

Dear client:

This warranty card is the guarantee proof of Runxin brand multi-functional flow control valve. It is kept by client self. You could get the after-sales services from the supplier which is appointed by Runxin manufacturer. Please keep it properly. It couldn't be retrieved if lost. It couldn't be repaired free of charge under the below conditions:

- 1. Guarantee period expired. (One year)
- 2. Damage resulting from using, maintenance, and keeping that are not in accordance with the instruction.
- 3. Damage resulting from repairing not by the appointed maintenance personnel.
- 4. Content in guarantee proof is unconfirmed with the label on the real good or be altered.
- 5. Damage resulting from force majeure.

Product Name	 Multi-functional Flow Control Valve for Water Treatment Systems			
Model		Code of Valve Body		
Purchase Company Name		Tel/Cel.		
Problem				
Solution				
Date of Repairing		Date of Examination		Maintenance Man Signature

When product needs warranty service, please fill in the below content and send this card together with the product to the appointed suppliers or Runxin company.

End-user Company Name		Tel/Cel.		
Purchase Company Name		Tel/Cel.		
Model			Code of Valve Body	
Tank Size $\phi \times$	Resin Tank Size L	Raw Water Hardness mmol/L		
Water Source: Ground-water ☐ Tap Water ☐	Water Treatment Capacity m^3	Backwash Time min		
Brine Draw Time min	Slow Rinse Time min	Brine Refill Time min	Fast Rinse Time min	
Problem Description				