



Multi-functional Flow Control Valve for Water Treatment Systems

- TM.F64A
- TM.F64B
- TM.F64C
- TM.F64D
- TM.F64E
- TM.F64F

User manual



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

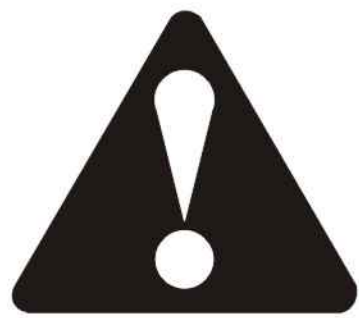
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Preface

Dear user, Thank you for using RUNXIN multi-functional flow control valve for water treatment systems. Please read this manual carefully before using, which will contribute to your machine offering perfect services for you normally for a long time.

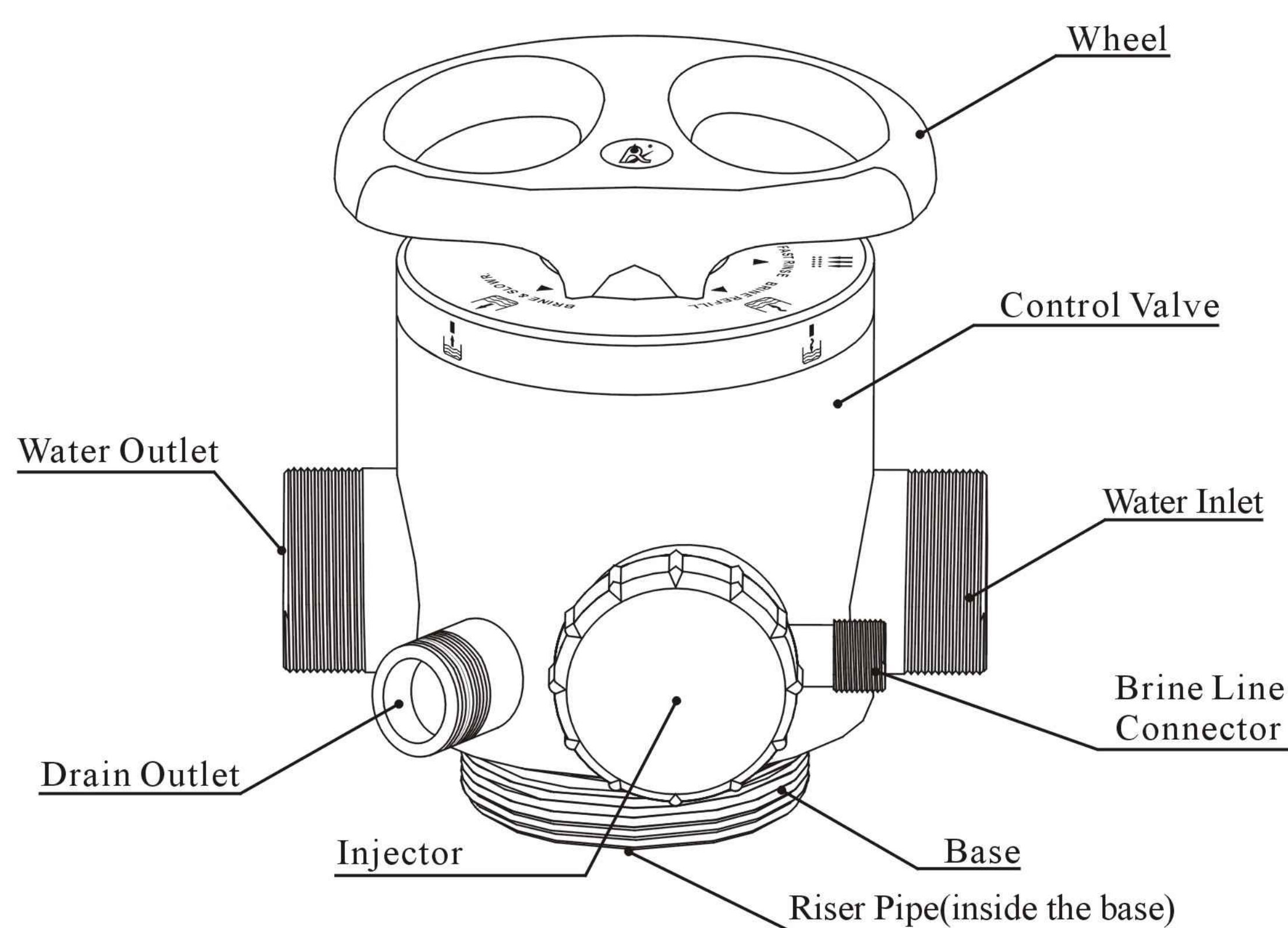
RUNXIN brand multi-functional control valve is the developed patented product of our company (Patent No.: ZL200420078956.5 , ZL02220153. X; International Patent Affiche No.:WO 2006/007772, Taiwan Area Patent No.: M287896) which specially allocate in all kinds of water treatment systems. This valve has high hardness and pottery of degree of high level ceramic moving slice inside its body. As relative and moving slice have different blind holes and put through hole respectively , with the change of the relative angle during slice rotate one course of circles definitely with it height laminating, it produces five different fluid pass way so as to realize necessary functions , namely Service, Backwash, Brine & Slow Rinse, Brine Refill, Fast Rinse. As the core control part for water treatment systems, this valve changes traditional water treatment systems tedious operation mode of a lot of valves and many pieces of pipelines , integrating various kinds of functions in one valve , which is easier to install and operate.



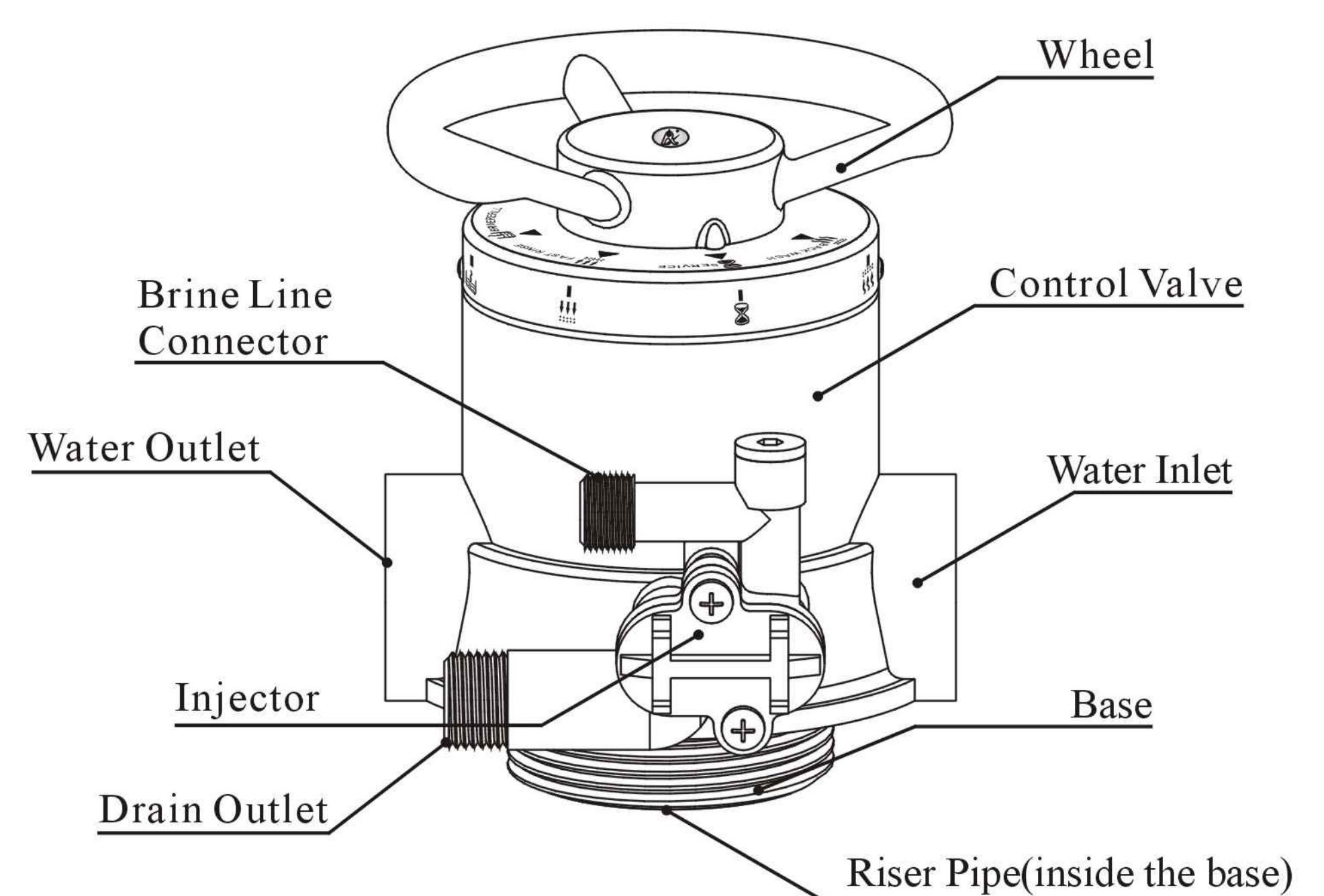
- To ensure normal operation of the valve, please consult with professional installation or repairing personnel before use it.
- If there are any of pipeline engineering and electric works, there must be finished by professional at the time of installation.
- Do not use the valve with water that is unsafe or of unknown quality.
- Test water periodically to verify that system is performing satisfactorily.
- Sodium used in the water softening process should be considered as part of your overall dietary salt intake. Contact 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 the clean water softening salts only, at least 99.5% pure, forbidding use the small salt.
- Do not put the valve near the hot resources or indirect sunlight rain and other factors that may result in damage to product. And do not leave it outside.
- Forbidden to carry the injector body. Avoid to use injector body as handle or support.
- Handle or wheel is only used for turning left or right. It is forbidden to lift it up and down.
- Forbidden to use the handle, pipelines, brine line connector or other connectors as support to carry the system.
- Please use this product under the water temperature between 5°C and 45°C, water pressure between 0.15MPa and 0.6MPa. Failure to use this product under such conditions voids the warranty.
- If the water pressure exceeds 0.6MPa, a pressure reducing valve must be installed before the water inlet.

Appearance and Specification of the Product

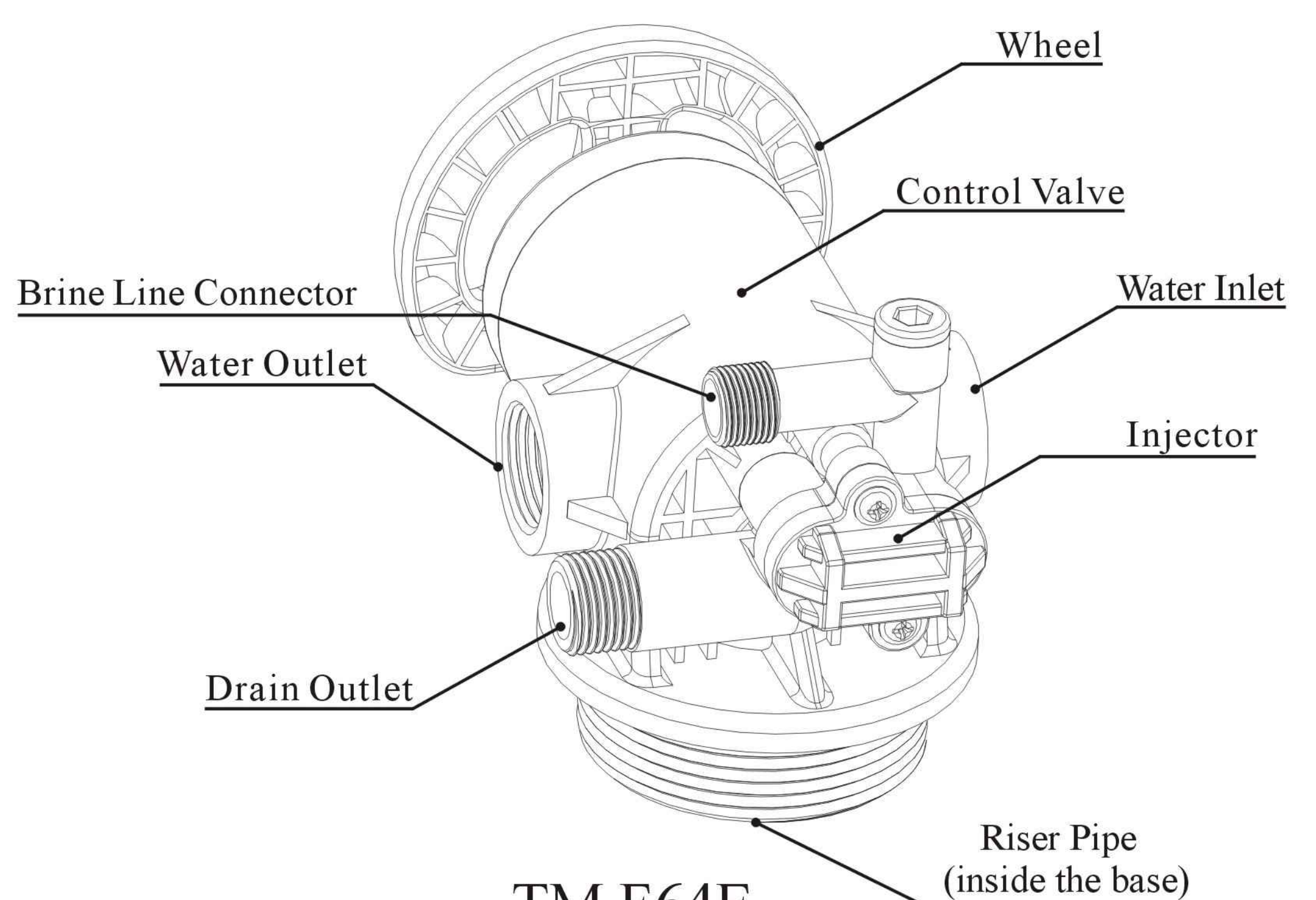
Product Appearance (Only for reference please subject to the real goods)



TM.F64D/F

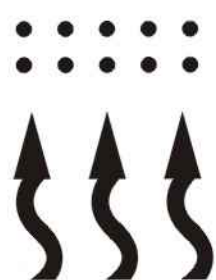
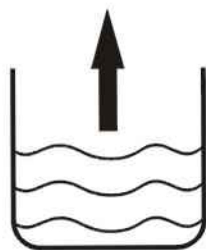
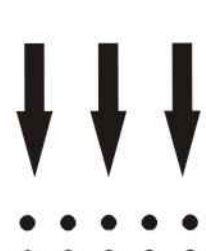


TM.F64A\B\C

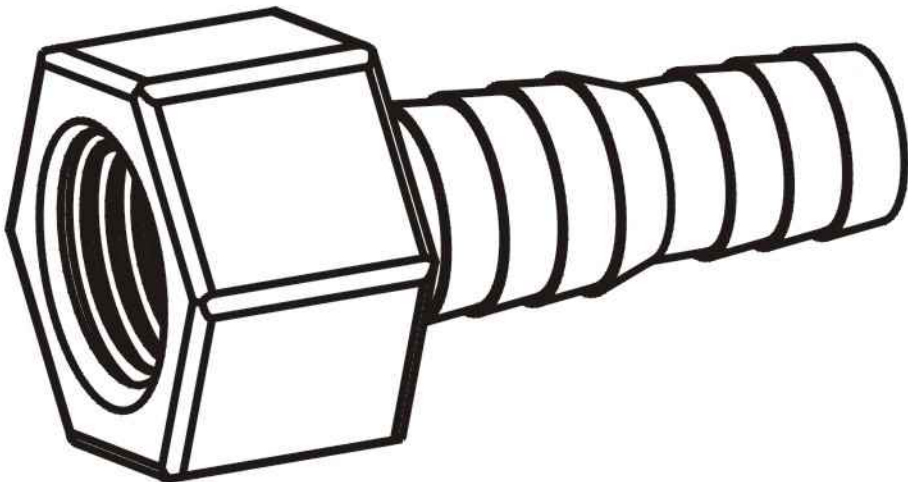
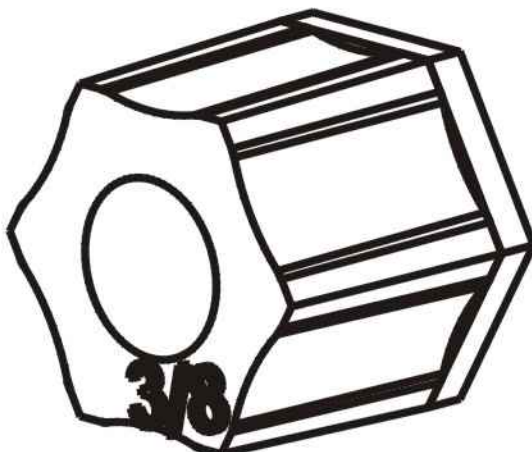
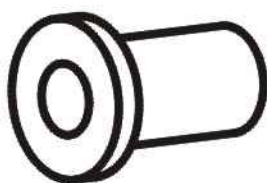


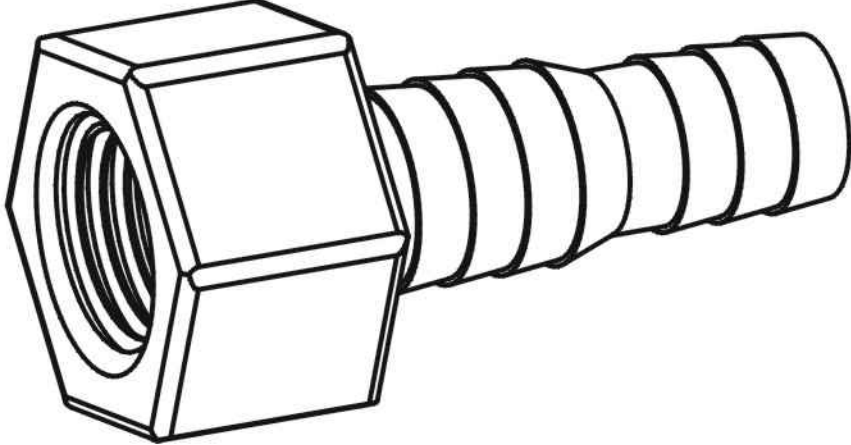
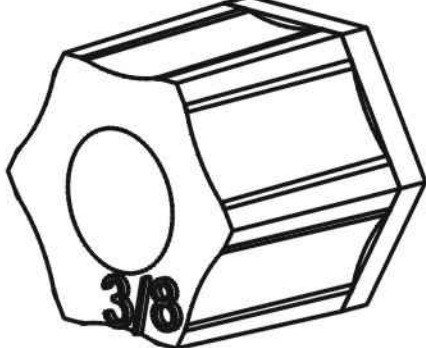
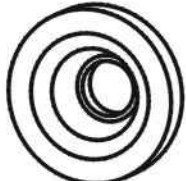
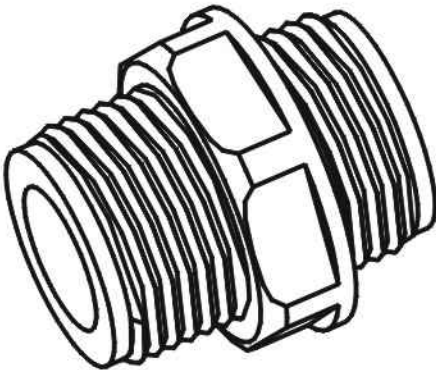
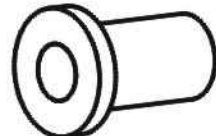
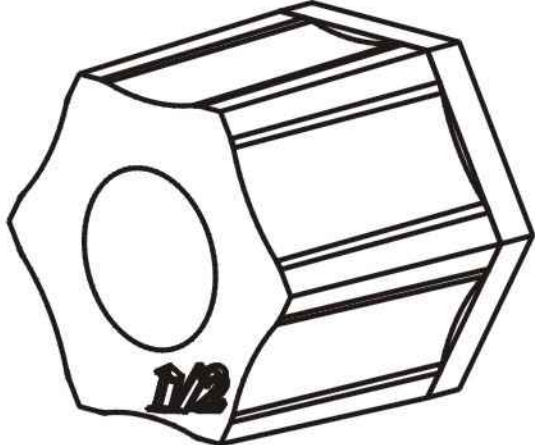
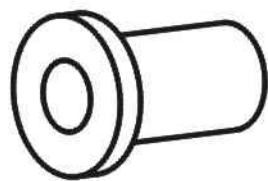
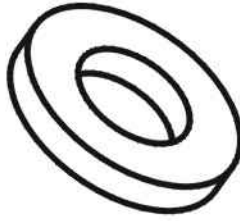
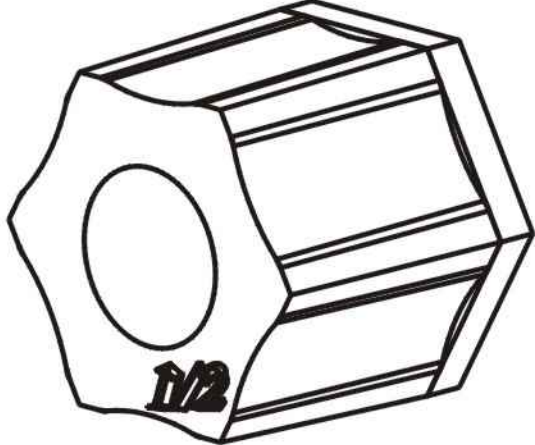
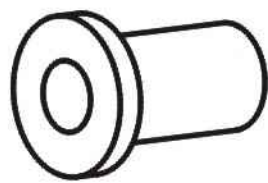
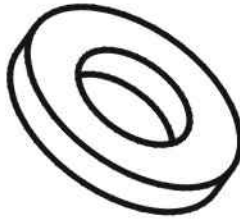
TM.F64E

Figures on Decoration Cover and its English Description

ENGLISH	FIGURE	DESCRIPTION
SERVICE		In Service state
BACK WASH		In Backwash state
BRINE & SLOW R.		In Brine & Slow Rinse state
BRINE REFILL		In Brine Refill state
FAST RINSE		In Fast Rinse state

Product Accessories

TM.F64A Accessories		
Figure	Description	Quantity
	1/2"Drain Hose Connector	1PC
	3/8 '' Brine Tube Hose Connector	1PC
	Tube Bushing	1PC
	Base Seal Ring （ $\phi 73 \times \phi 5.3$ ）	1PC
	Drain Line Flow Control	1PC
	Brine Line Flow Control (Red)	1PC
	1 '' Waher （ $\phi 30 \times \phi 24 \times 3.3$ ）	2PCS

TM.F64B/C/E Accessories		
Figure	Description	Quantity
	1/2 " Drain Hose Connector	1PC
	3/8 " Brine Tube Hose Connector	1PC
	Brine Line Flow Control(Red)	1PC
	3/4 " or 3/4 " to 1/2 " Outer Tooth	2PCS
	Tube Bushing	1PC
	Base Seal Ring ($\phi 73 \times \phi 5.3$)	1PC
	Drain Line Flow Control	1PC
	3/4" Washer($\phi 24 \times \phi 18 \times 3$)	2PCS
TM.F64D Accessories		
Figure	Description	Quantity
	1/2 " Brine Tube Hose Connector	1PC
	Tube Bushing	1PC
	Base Seal Ring ($\phi 104.6 \times \phi 5.7$)	1PC
	Drain Line Flow Control(5#、 6# injector no D.L.F.C)	1PC
TM.F64F Accessories		
Figure	Description	Quantity
	1/2 " Brine Tube Hose Connector	1PC
	Tube Bushing	1PC
	Base Seal Ring ($\phi 104.6 \times \phi 5.7$)	1PC
	Drain Line Flow Control(4# injector no D.L.F.C)	1PC

Product Specification

Control Mode---Manual

Working Condition: Suited Pressure---0.15~0.6MPa

Suited Water Temperature---5~45℃

(Table One)Control Valve

Model	Connection Size					Maximum Water Capacity m³/h	Regeneration Mode
	Inlet / Outlet	Drain outlet	Brine Line Connector	Base	Riser Pipe		
TM.F64A	1 " F	1/2 " M	3 / 8 " M	2-1/2 " -8NPSM	1.05 " OD (26.7mm)	4.5	Down-flow
TM.F64B	3/4 " F	1/2 " M	3 / 8 " M	2-1/2 " -8NPSM	1.05 " OD (26.7mm)	2	Down-flow(S)
TM.F64C	3/4 " F	1/2 " M	3 / 8 " M	2-1/2 " -8NPSM	1.05 " OD (26.7mm)	2	Up-flow(N)
TM.F64D	2 " M	1" M	1/2 " M	4" -8UN	1-1/2 " D-GB (50mm)	10	Down-flow
TM.F64E	3/4" F	1/2 " M	3 / 8 " M	2-1/2 " -8NPSM	1.05 " OD (26.7mm)	2	Down-flow(S)
TM.F64F	1-1/2" M	3/4" M	1/2 " M	4" -8UN	1.25"D-GB (40mm)	8	Down-flow

Remark: M —— Male Thread F —— Female Thread OD —— Outer Diameter
S —— Down-flow N —— Up-flow

(Table Two)Configuration for Standard Injector and Drain Line Flow Control

Tank Dia mm	Injector Model	Injector Color	Total Outlet Flux of Injector	Slow Rinse Speed	Speed of Brine Refill	Mode of Drain Line Flow Control	Speed of Backwash and Fast Rinse
			L / mi n	L / mi n	L / mi n		L / mi n
150	6301	Coffee	1.30	0.91	3.0	1#	4.7
175	6302	Pink	1.81	1.32	3.7	1#	4.7
200	6303	Yellow	2.18	1.73	3.8	2#	8.0
225	6304	Blue	3.05	2.14	3.3	2#	8.0
250	6305	White	3.66	2.81	4.3	3#	14.4
300	6306	Black	4.74	3.32	4.2	3#	14.4
325	6307	Purple	5.15	3.55	4.1	4#	22.8
350	6308	Red	5.95	4.0	4.0	4#	22.8
400	6309	Green	7.50	5.13	4.0	5#	26.4
450	6310	Orange	8.60	5.98	3.9	5#	26.4
500	7401	Coffee	16.0	10.56	23	1#	46.3
550	7402	Pink	20.0	13.88	28.2	2#	67
600	7403	Yellow	23.4	15.75	32.9	3#	71
750	7404	Blue	36.2	24.17	50.5	4#	75
800	7405	White	40.2	29.0	60		
900	7406	Black	40.7	33.8	62.7		

500	7401	Coffee	17.3	12.8	19.1	1#	53.7
550	7402	Pink	20.2	15.2	21.3	2#	62.7
600	7403	Yellow	21.3	15.8	22.6	3#	73.7
700	7404	Blue	30.8	24.4	26.1		86.8

Remark:

- ①The above data in table two are tested under inlet pressure of 0.3MPa
- ②Since the difference in the quality of raw inlet water, capability of resin, size of the tank and the pressure of inlet, the above data are only for reference.
- ③If the real goods are different in specification, configuration or appearance, please subject to the real goods.
- ④In table two, tank diameter no more than 450mm, base 2.5'' -8NPSM,it matches with F64A/F64B/F64C/F64E; tank diameter no less than500mm, base 4'' -8UN, it matches with F64D/F.

Installation and Connection

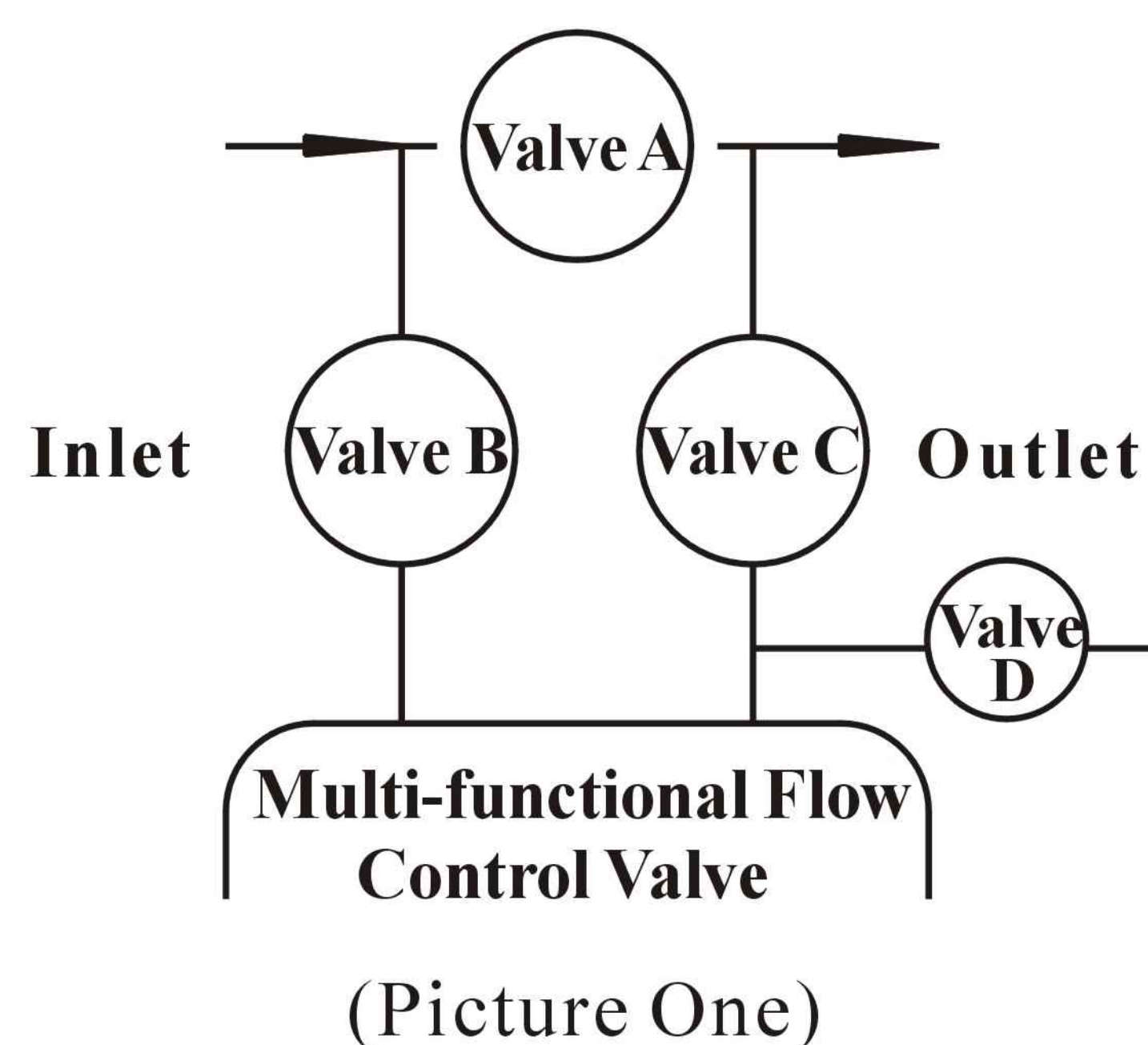
Before installation,read all those instructions completely.Then obtain all the materials and tools needed for installation.

Perform installation according to regulated Water Inlet, Water Outlet, Drain Outlet, Brine Line Connector and relative plumbing codes.

1、 Device location:

- ① The closer filter or softener to drain point, the better.
- ② Leave a certain space for operating and maintaining devices conveniently.
- ③Brine tank need to be close to softener.
- ④Do not install the valve near hot resources or in direct sunlight, rain and other factors that may result in damage to the product. And do not leave it outside.
- ⑤ Do not install the device, drain outlet and other pipes under environment where the temperature may drop below 5℃, or above 45℃.
- ⑥ Please install the system in a place where water damage is least likely to occur if a leak develops.

2、 Pipeline connection

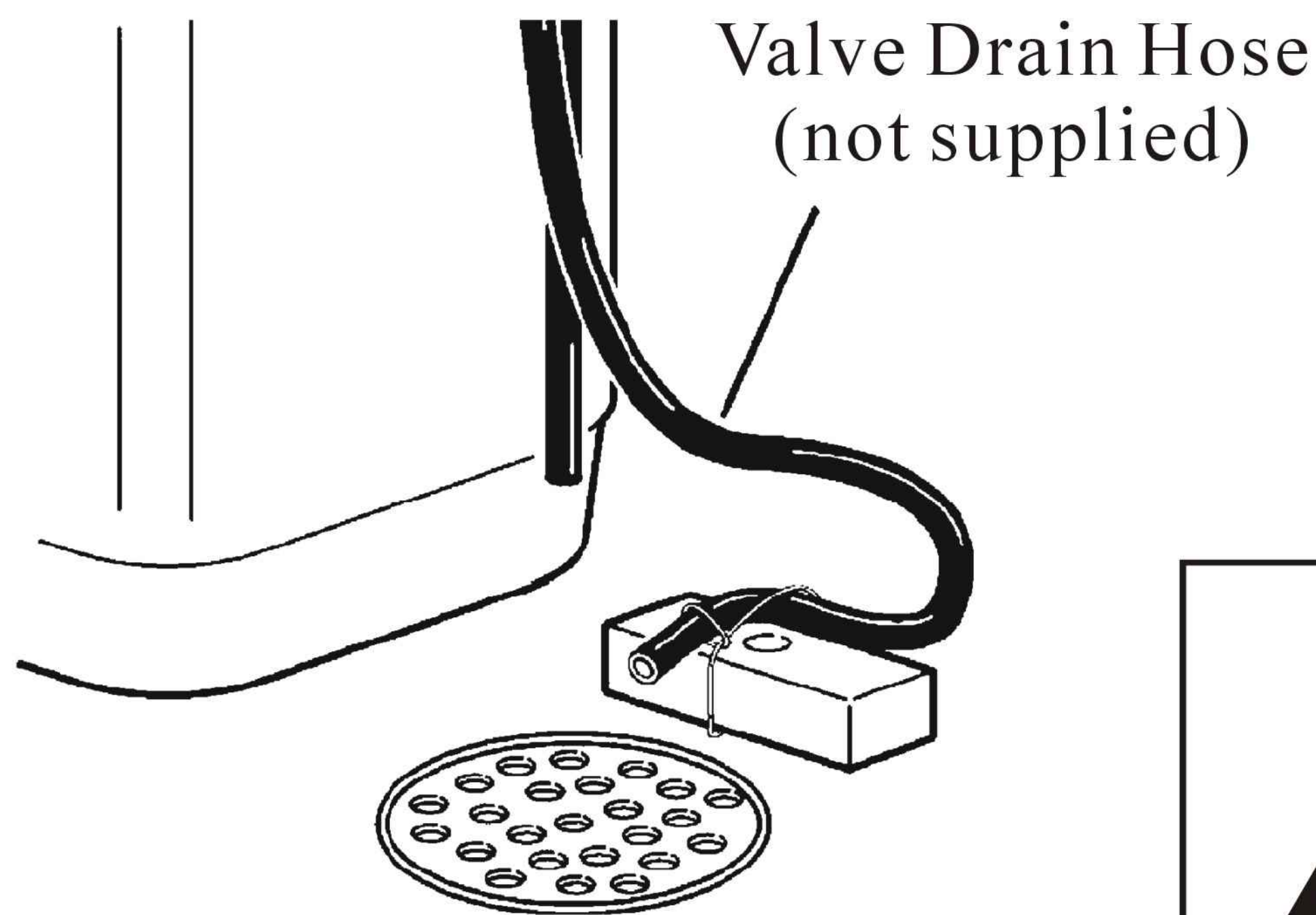


In order to maintain conveniently, device is advised installation like drawing as follows:
Instruction: There are three ball valves being connected to the multi-functional flow control valve and inlet outlet pipe. Valve B is connected to the inlet pipe. Valve C is connected to the outlet pipe. When changing filter materials or maintaining tank, open valve A, close valve B, C. When using, open valve B, C, close valve A. Valve D is for taking water used to test.

 If the water outlet or water tank is installed higher than control valve, the 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.

3、 Connect and route the valve drain hose

- ①Install drain line flow control washer in drain hose connector fitting ;
- ②Tighten drain hose connector onto drain outlet;
- ③Insert drain hose into drain hose connector;
- ④Locate the drain hose well like below picture two.



(Picture Two)
Correct Method for Drain

Control valve should be higher than drain outlet,
and be better not far from the drain hose.

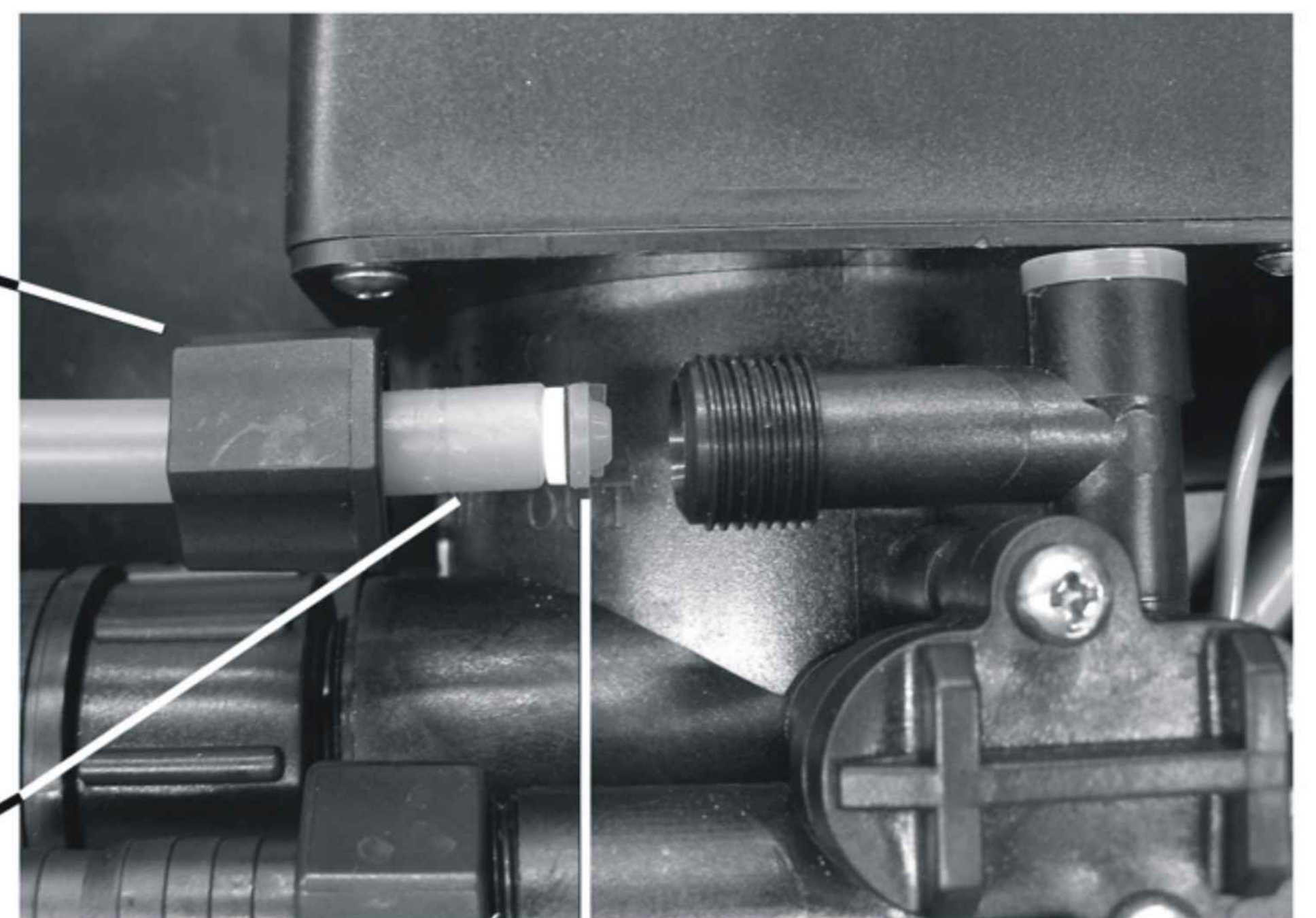


Be sure not connect drain with sewer definitely,
and leave a certain space between them avoiding
wastewater be absorbing to the water treatment
equipment, such as showed in picture two. If
wastewater is used for other purpose, please use
another container for loading. And also keep a
certain space between drain and container.

4、Connect brine tube

- ①Slide brine tube hose connector over end of brine tube like picture three show .
- ②Insert tube bushing into end of brine tube.
- ③Insert the red brine line flow control into valve brine line connector (Attention:
Cone side of control should face into valve) .
- ④Tighten brine draw hose connector onto brine line connector .

Brine Draw Hose Connector
(Picture Three)
Correct Method for Installation



Tube Bushing

Brine Line Flow Control(Red)



- Failure to install the multi-functional flow control valve correctly voids the warranty.
- Minimum inlet water pressure is 0.15MPa, maximum inlet water pressure is 0.6MPa. If the inlet pressure exceeds 0.6MPa, a pressure reducing valve must be installed before inlet pipeline.
- When installation, do not use brine tube or other connectors as support to carry.
- Handle all components of this valve with care. Do not drop, drag or turn components upside down. And please use the accessories we supplied.
- Forbidden overexerted when installation and connection pipelines to avoid thread broken. And no bearance of all stresses on all ports of the valve.
- It is suggested to use PPR pipe, Wave - thread pipe or UPVC pipe, and avoid using A luminum Plastic pipe.
- The connection of all pipelines should be sealed enough, no leakage. Otherwise, flow capacity under some status may not reach to expected effect.
- It is suggested to use liquid level controller and salt valve with interdiction air in brine tank.

Basis of the Parameter Settlement

This valve is manual valve . When it needs to regenerate, rotate the handle or wheel to realize the regeneration. The time on each position is calculated as the following formulas or as the suggestions offered by whole system supplier

- 1、 Service Time=Output Q/ Water Using Per Hour (Suitable for control valve (F63B2/F65B2)
Service Time = Output Q/Water Using Per Hour(Suitable for control valve F63B1/F65B1)

$$\text{Output } Q = V_r \times E / (Y_d \times k)$$

On the above formula, V_r —— Cubage of Resin (m^3)

E —— Resin Working Exchanged Capability (mol/m^3)

Y_d —— Rigidity of Inlet Water (mol/m^3)

k ——Security Modulus, usually 1.2~2. It is related to the rigidity of inlet water. The k 's choosing number is increasing with rise of modulus.

Water Using Per Hour —— For boiler, is the evaporation cubage per hour.

Water Using Per Day——For household, are averaged by the totally amount in a month.

——For boiler, Water Using Per Day= Evaporation Cubage Per Hour x Service Time(h/d).

- 2、 Backwash Time: It is related to the consistency of inlet water. It is suggested to be set up 10~15 minutes. The consistency is higher, then the backwash time is longer. When the consistency of inlet water is more than 5, a filter is suggested to be installed before the control valve.

- 3、 Brine & Slow Rinse =Brine Draw Time+ Slow Rinse Time(Slow Rinse times also called Replacement Time)

①Brine Draw Time $t = 60V_z / (S \times v)$ (min)

$$V_z = m_{cz} / (C \times \rho \times 10^3) \quad (\text{m}^3)$$

On the above formula,

V_z ——Cubage of Regenerated Liquid, m^3

S ——Cut Acreage of Exchange Menstruum Layer(exchange equipment) m^2

v ——Flow Velocity of Regenerated Liquid, m/h

m_{cz} ——Regeneration Menstruum Dosage which is with 100% pure and regenerate once Kg.

C ——Consistency of Regenerated Liquid, %

ρ ——Consistency of Regenerated Liquid %

$$m_{cz} = VREkM / (\varepsilon \times 1000) \quad \text{Kg}$$

On the above formula, VR ——Resin Loadage, m^3

E ——Exchange Cubage of Exchange Menstruum, (mol/m^3)

k ——Regeneration Menstruum Consumption. For downflow regeneration, k could be chosen 2~3.5; For upflow regeneration, k could be chosen 1.2~1.8.

M ——Mol Quality of Regeneration Menstruum , NaCl is 58.5.

ε ——Consistency of Regenerated Menstruum, in common salt, the NaCl represents 95%~98%.

- ②Slow Rinse Time= Slow Rinse Flow/ Slow Rinse Speed (minute). Water cubage of slow wash, in general, it is 0.5 ~1 times of resin loadage.

- 4、 Brine Refill Time= Brine Refill Water Cubage / Pouring Water Speed (minute)

Water cubage refilled to tank equal to the totally consumed cubage of regenerated brine.

Because of the differences inlet water pressure, the speed of pouring to tank is also different. It is

suggested that actual time of pour water to tank is 1 ~2 minutes longer than the time which is calculated in theory as to make sure there is enough water in tank. (Notice: there is a liquid level controller in the tank.)

5、Fast Rinse Time=Fast Rinse Water Cubage/Fast Rinse Speed (minute) Water cubage is 3~6 times of resin loadage. In general, it choose 10~12 minutes, but subject to the outlet water reaching to the requirement.

Note: On above, Slow Rinse speed, Pouring speed, Fast Rinse speed are according to the types of injector. Refer to the table two in this instruction.

The above formulas are only for your reference.

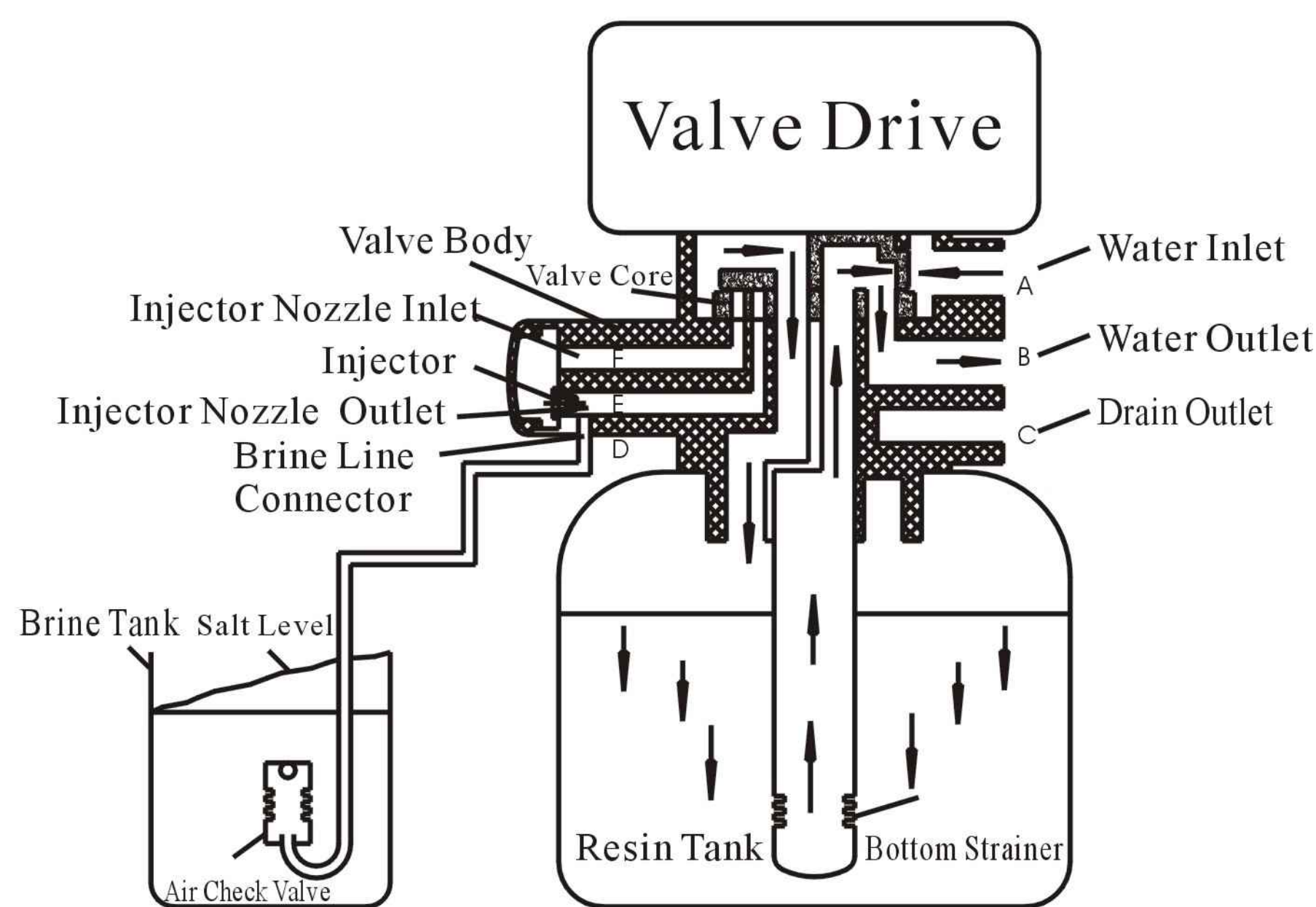
Trial Running

- 1、Installation the multi-functional flow control valve on the resin tank according to the using state and pipe, close the by-pass valve (valve A, as picture one, following same as).
- 2、Opening inlet valve B to 1/4 position slowly, making water flow into the resin tank. When water stop flowing, open the outlet valve C. Until all the air are out of the pipe, then close the outlet valve.
- 3、When all the air is out of the tank, then open the inlet valve completely.
- 4、Rotate the valve handle to the 'Backwash' position. Let drain water flow out for 3 ~ 4 minutes.
- 5、Refilling water to brine tank by hose or measure until water goes to the top of air check valve. Then add required quantity of salt to tank, and dissolve the salt as much as possible.
- 6、Rotate the valve handle to the 'Brine & Slow Rinse' position, make control valve suck brine from brine tank until stop.
- 7、Rotate the valve handle to the 'Brine Refill' position, make the water refilled to required level.
- 8、Rotate the valve handle to the 'Fast Rinse' position, Fast Rinse for a certain time.
- 9、Take out some water for analysis. If the water quality is eligible, then rotate the handle to the 'Service' position to be used.

	● If the inlet water flow too quickly, material in resin tank will be damaged. The air sound from drain could be heard when water flow into tank slowly. ● The operating time in backwash, brine & slow rinse, brine refill and fast rinse status could according to the basis of the parameter settlement or according to the suggestions of set equipments suppliers.
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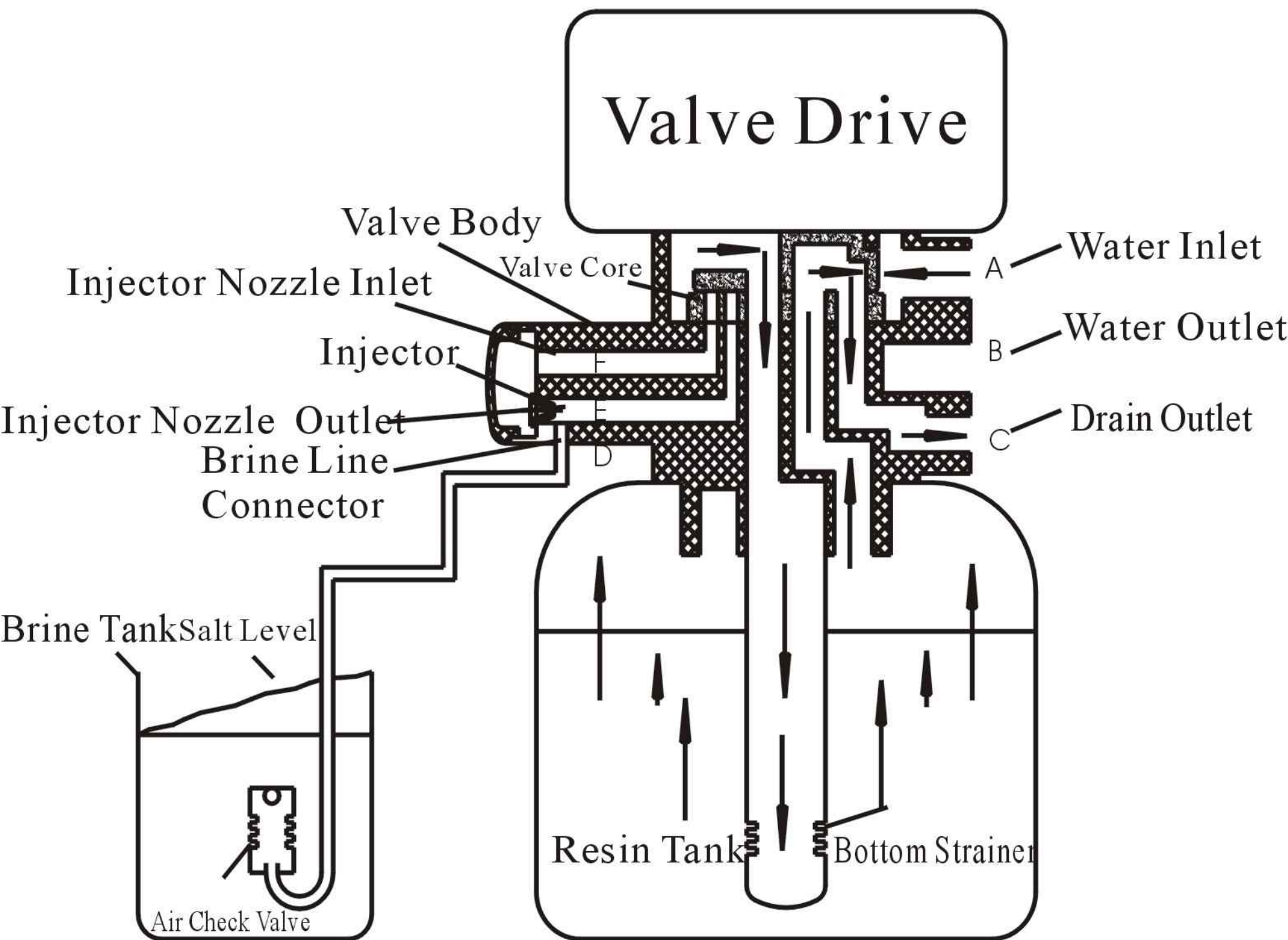
Working Principle and Flow Chart

Service Position



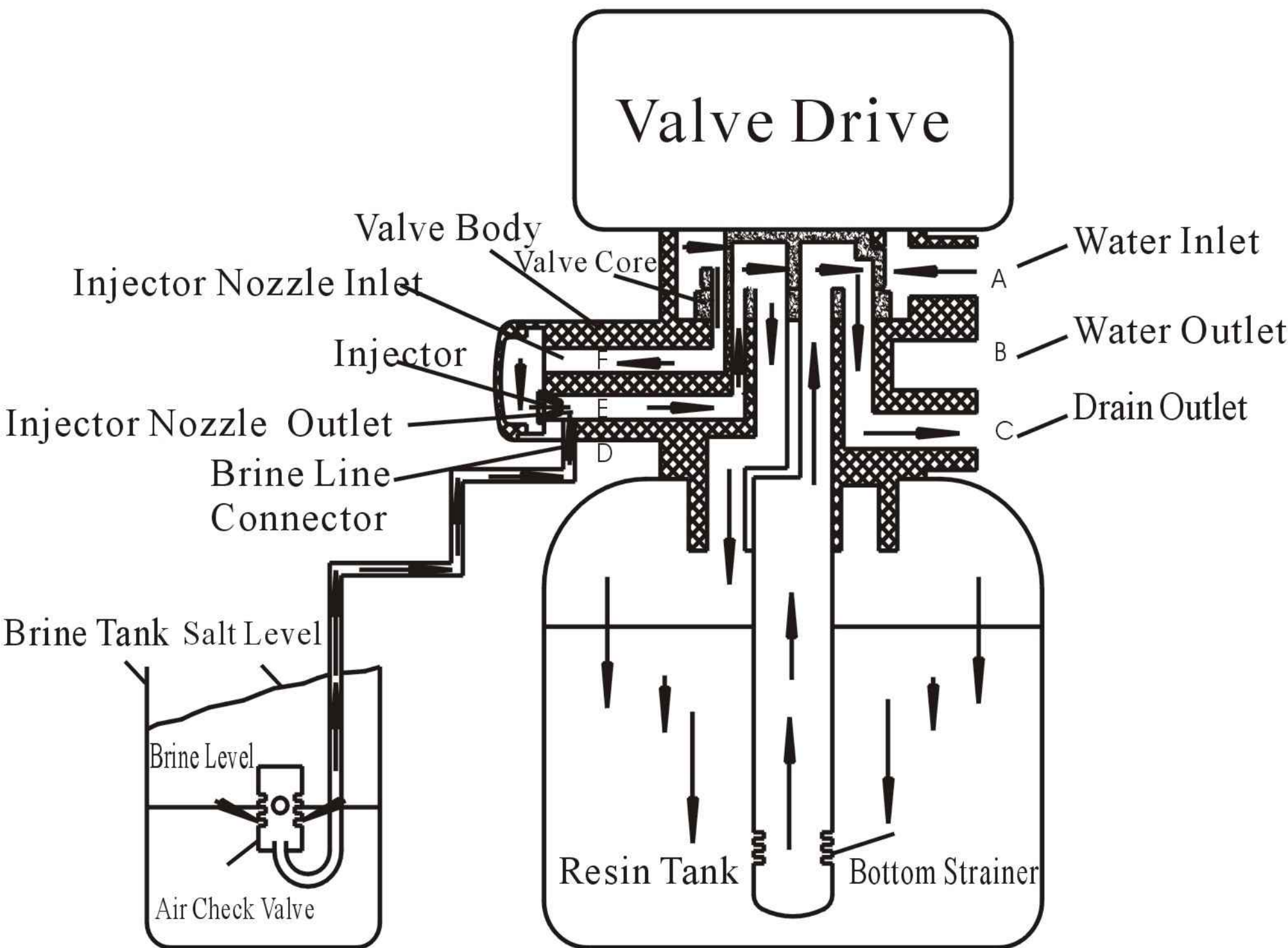
Raw water enter into control valve from inlet A, through valve body from the top of valve core, and going into tank from top (or riser pipe outside of resin tank, the same as below). Then, adown through resin layers(it is soften, and it will be carbon layer while purify, the same as below), to be softened water, then through bottom strainer to return to riser pipe, upward to valve body, pass through valve core, and finally flow out from outlet B.

Backwash Position



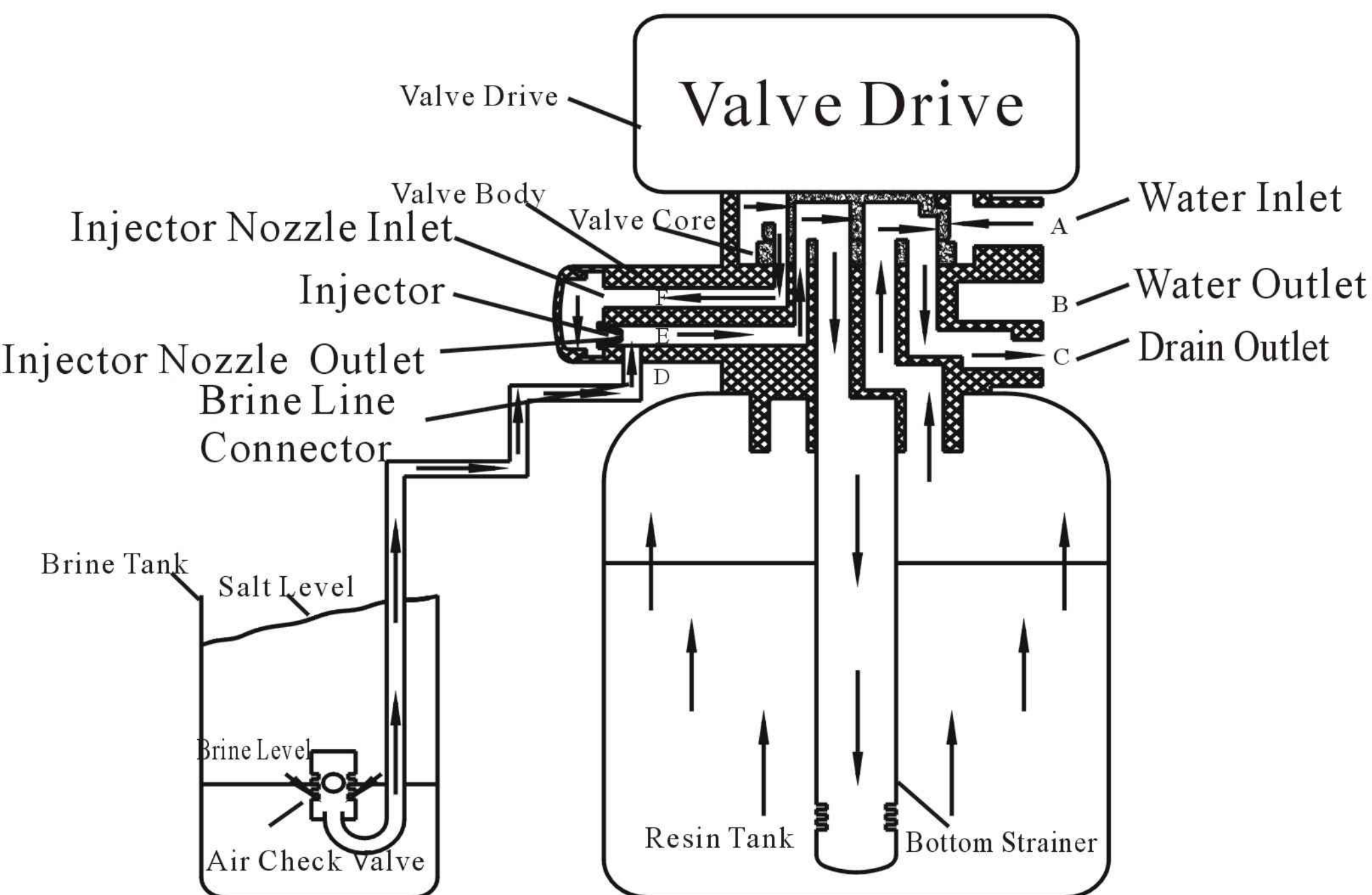
Raw water enter into control valve from inlet A, through valve body from the top of valve core, then from the bottom of tank (or riser pipe inside, the same as below), bottom strainer into tank, upward through resin layers, and valve body, valve valve core, finally flow out from drain C.

Brine Draw Position (Down-flow)



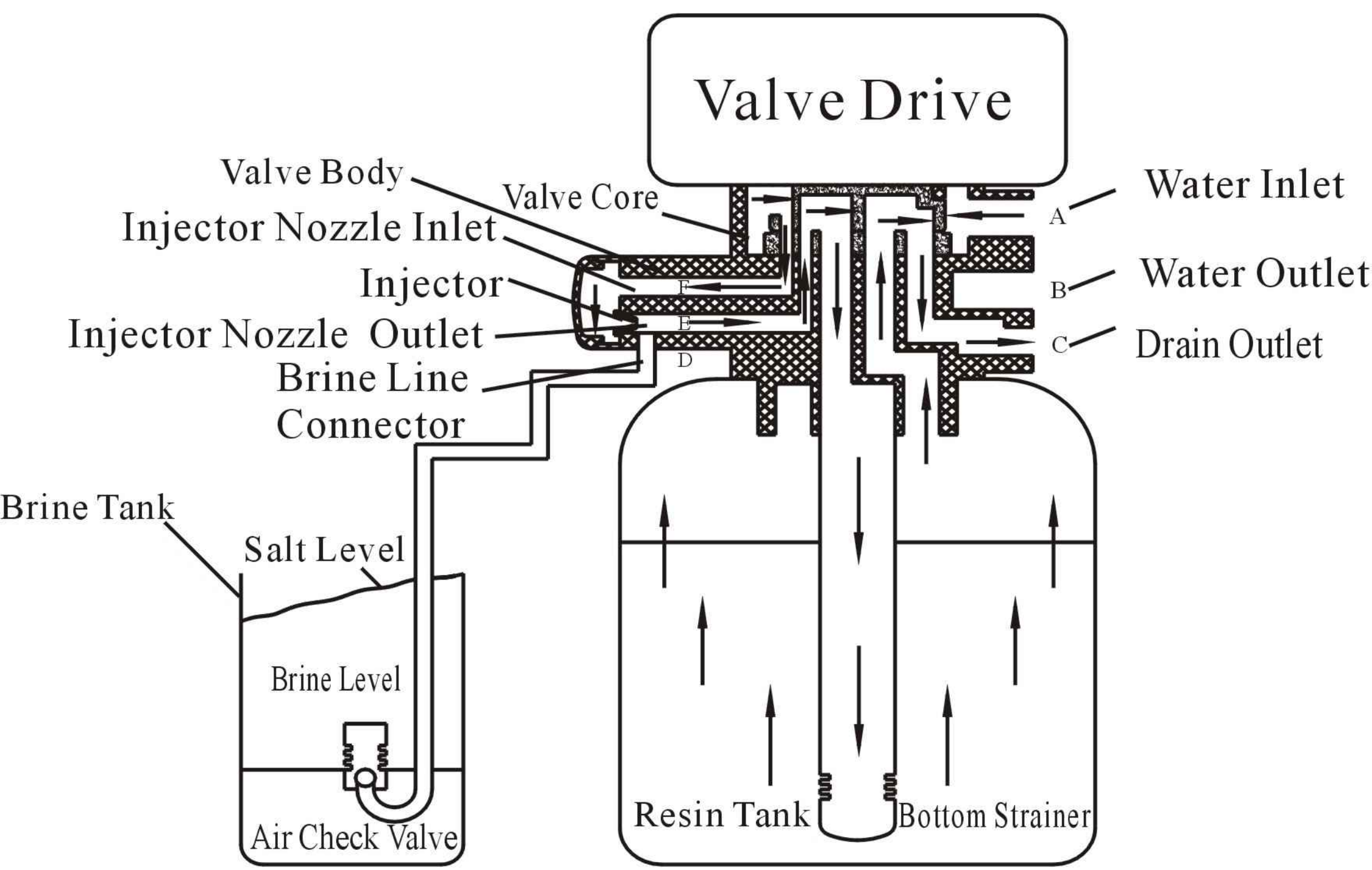
Raw water enter into control valve from inlet A, through valve core into injector inlet F, and flow quickly to injector outlet E, which produce minus pressure, so the brine in tank are sucked to valve from D, then into the top of the tank. Brine adown pass through resin layers, through bottom strainers, upward along with riser pipe, then through valve body, valve core, finally flow out from drain C.

Brine Draw Position (Up-flow)



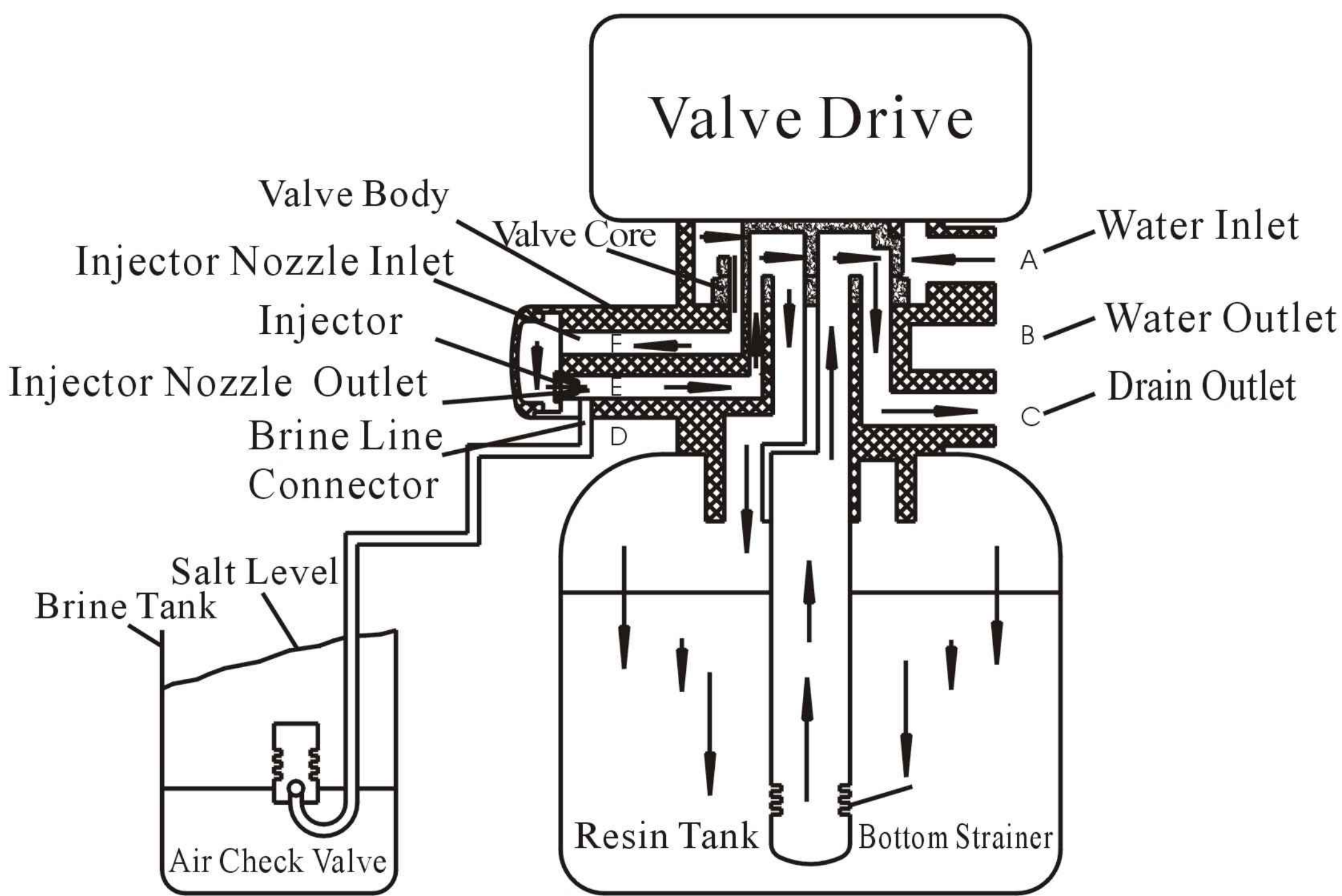
Raw water enter Into control valve from inlet A, through valve core into injector inlet F, and flow quickly to injector outlet E, which produce minus pressure, so the brine in tank are poured to valve from D, then into the riser pipe, though bottom strainer in to the tank up though resin layer, valve core ,and flow out from drain C.

Slow Rinse Position (at the same position with Brine Draw State-- Up-flow)



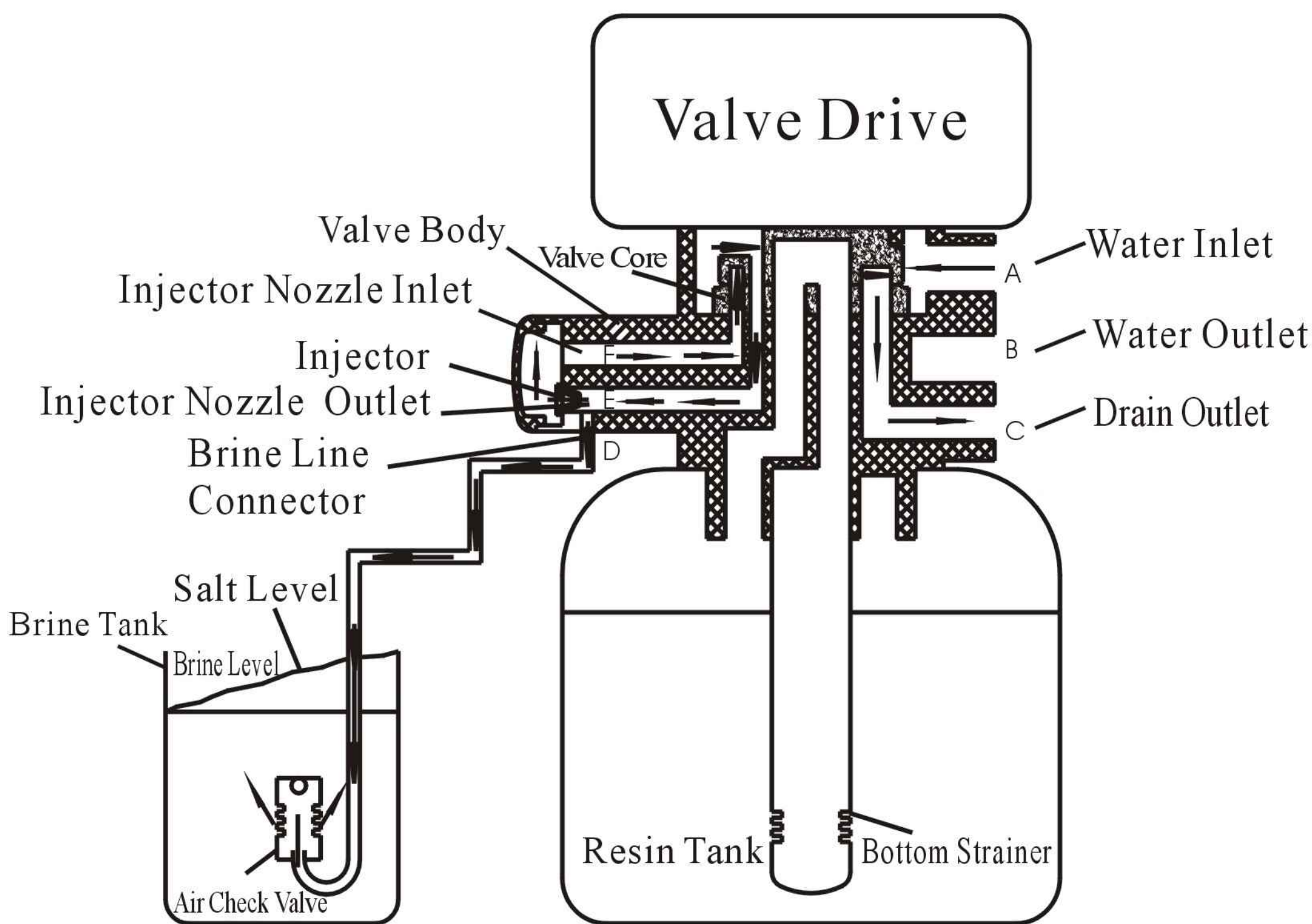
After absorbing all salt, raw water enter into control valve continually from Inlet A, through valve core into injector nozzle, then pass injector nozzle, adown to riser pipe, though bottom strainer, enter into valve body flow up though resin layer, after into valve body, valve core, flow out from drain C.

Slow Rinse Position (at the same position with Brine Draw State--Down-flow)



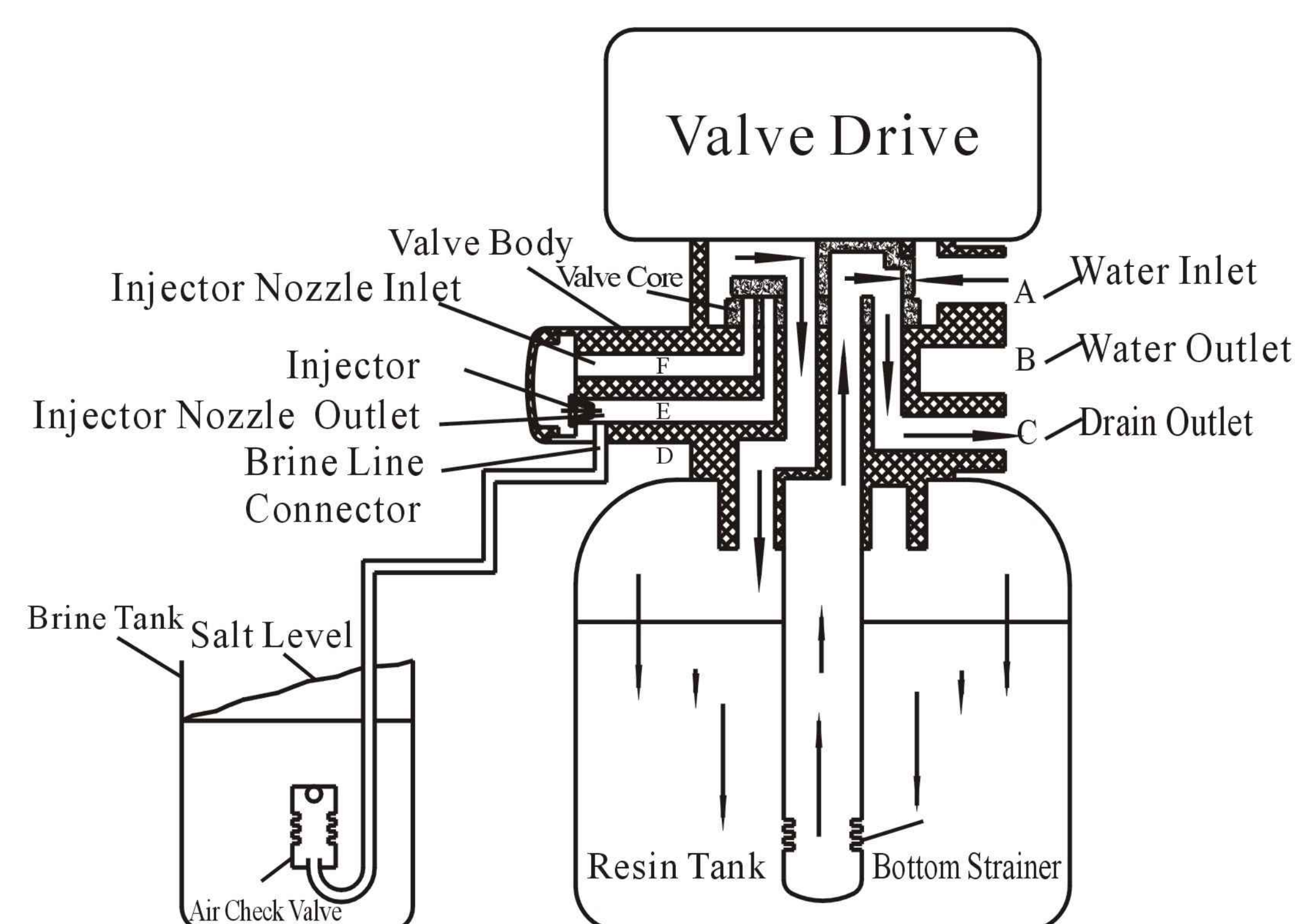
After sucking all salt,raw water enter in-to control valve continually from inlet A, through valve core into injector nozzle, then pass injector nozzle, adown to resin layers, through bottom strainer, upward along with riser pipe to valve body, valve core, finally flow out from drain C.

Brine Refill Position



Raw water enter into valve from inlet A , through valve core to injector outlet E, from brine tank connection D pour in to brine tank; Another part of water pass through injector outlet E, and small hole to injector inlet F, then from valve body, valve core, flow out from the drain outlet C.

Fast Rinse Position



Raw water enter into control valve from A, through valve body from the top of valve core, and enter into tank from the top. Then, adown through the resin layers, return to riser pipe from bottom strainer, upward to valve body, through valve core, finally flow out from drain C.

Maintenance Guide

Part of Control Valve

Problem	Cause	Correction
1. Softener outputs hard water.	A. By pass ball valve opened. B. No salt in brine tank. C. Injector be blocked. D. No enough water refilled in brine tank. E. Leakage on riser pipe. F. Leakage in valve body inside.	A. Close the by pass ball valve. B. Make sure there is solid salt in tank C. Change or clean the injector. D. Check time of refill water to brine tank. E. Check riser pipe not broken, and check O seal rings. F. Check and repair or change valve body.
2. Can not suck salt	A. Inlet pressure too low B. Brine pipeline blocked. C. Leakage on brine pipeline. D. Injector damaged. E. Leakage in valve body inside.	A. Heighten inlet pressure. B. Check pipeline. Take out the stem. C. Check pipeline. D. Change a new injector. E. Check and repair or change valve body.
3. Too much water in brine tank.	A. Brine Refill time too long. B. Too much water in brine tank after sucking salt.	A. Readjusting Brine Refill Time. B. Check whether it is blocked or not in injector. or brine pipeline.
4. Water pressure damage.	A. Pipeline leading to softener blocked by iron matter. B. Softener blocked by iron matter.	A. Clean up pipeline of softener. B. Clean up control valve. Add cleaning liquid to resin tank in order to increase the regeneration efficiency.
5. Resin flow out from drain pipe.	A. Air in system.	A. Make sure exhaust normally in system. Check it whether dry or not.
6. Too much water in brine tank.	A. The absorbing salt time is incorrect. B. Injector is blocked up. C. Abnormal things in brine valve.	A Stick for a certain time at the position of absorbing salt. B Clean up the injector. C Clean up or change the brine valve.
7. Water flow out from the drain continuously	A. Valve body inside leaking B. Power off when backwash or fast rinse.	A. Check and repair or change valve body. B. Switch by hand to service position or close by-pass valve. Reopen when power normal.

Guarantee Card

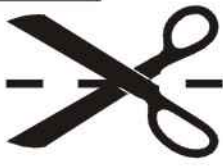
Dear Client:

This card is the guarantee credence of RUNXIN brand multi-functional flow control valve.It is kept by the client himself. You could get the after-sale 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:

- (i) Guarantee repair period expired.
- (ii) Damage resulting from using, maintenance, and keeping that are not according to the instruction.
- (iii) Damage resulting from repairing not by the appointed maintenance man.
- (iv) No purchase credence and effectual invoice.
- (v) Content in guarantee credence is unconfirmed with the label on the real good or be altered.
- (vi) Damage resulting from force majeure.

Product Name	Multi-functional Flow Control Valve for Water Treatment Systems		
Brand			
Model	TM.F	Code Of Valve Body	
Guarantee Term	One year Notice: Charge the fee over expiration date		
Purchase CoMPany Name		Tel Fax	
Problem		Date of Repairing	
Solution			
Date of Accomplishment		Signature by Maintenance Man	





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