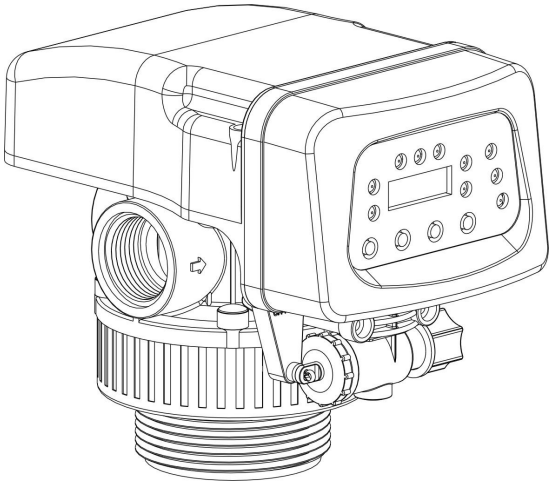
User Manual

GR-2 Economical Softening Valve

(GR2-2\GR4-2\GR10-2)



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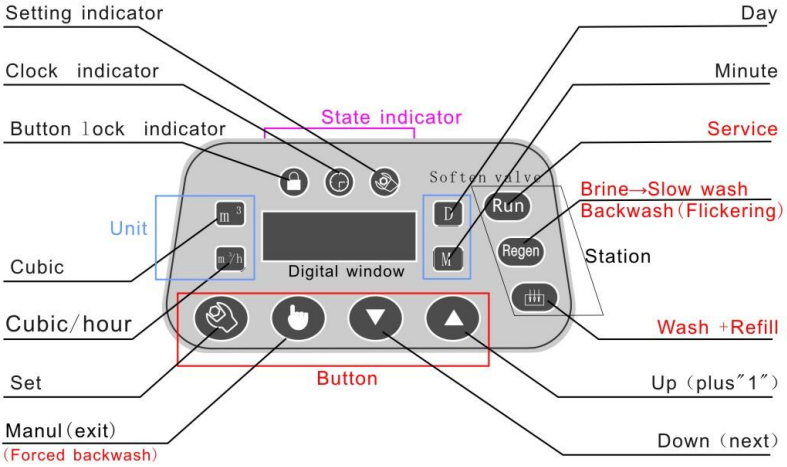
Ⅰ.The Controller



Pic1: Soften valve Controller interface

（1）Panel indicator and button

1、Station Indicator

(Regen) Flickering:Backwash

(Regen): Regenerate(Brine in) → slow wash(rinse);

(⊞): Wash + Refill

(Run): Service(Softening)

2、Control signal light

Light "◷"

lighting, The LED digital display is the clock.

flashing, It means there is a long time power off (more than 10 days). That need to set the current clock

Light "🔓"

lighting, means *lock state*, the buttons are locked. Any button is pressed will not work.

Goes out,*Unlock* state,if there is no operation on button in 2 minutes, the buttons will be automatic locked.

"  "

lighting, indicate under *inquiry* state. The parameters menus can be inquired by "  ""  " up and down.

flashing, indicate under *setting* state. The parameters can be changed by " "  "  lus and minus

3、button.

Button "  "

If the button "  " were pressed under *unlock state*, "  " indicator lighting, enter into *inquire state,* to inquire parameter menus(follow table) up and down by "  ""  " button.

Press "  " under *inquire state*, "  " flashing, enter to *setting state,* the parameter can be modified.by "  ""  "to plus & minus to modify the value of the blinking digit, press again to switch another blinking digit, finally press "  " to confirm the modification and return to the *inquire* state.

Button "  ":

lockin"  " state，push"  " 6 times，the valve enter into **B.Wash** *(Forced backwash)*

Press "  " under *unlock state,* the current valve station will be shift into next (**Manual shift**).

Press "  "under *inquire state*, return back to *unlock state.*

Press"  "under *setting state*,return back to *inquiry state* and the parameter modified will be not saved.

Button ""&""

Unlock: hold down at the same time button“ ▲ ”“ ▼ ” for around 2 seconds, " 🔒 light will go out and enter into *unlock state*.

Inquire parameters menus up and down under *inquire state*.

Plus1 and minus1:for digit of each parameter under *setting state*.

(2) Parameters menus

Function	Digital window	Indicator light of LED and instruction
Start up display		**S**: Time model, **L**: Meter model **5** means the fifth generation products, 03 means that the current program version
		
clock		clock, the factory set for random
Unlock state, press “ ⚙ ”to *inquire state,* display in turn		
Time model		Run means RUN station. **D** is unit. Left of “.” is day. Right of “.”is hour, If the unit is **M** ,Left of “.” is hour. Right of “.”is minute,
		Regen *Flickering*, backwash time, unit is minute（M）,
		Regen time of brine absorb to slow wash station,unit display is minute（M）
		3 means wash and refill station,02 is time, unit is minute（**M**）
Meter model		Run RUN station water volume. unit display is M^3
		Regen *Flickering*,water volume of **backwash**. unit is M^3
		Regen Water volume of Brine absorb → slow wash ,unit is M^3
		water volume of Wash + refill. unit is M^3
Back wash cycle		Set 01 to "backwash" once per cycle (Regen to Run).

Output control mode		Relay output mode include: 00, 01, 02, 03, 04, 05, 06. See section **Relay output mode** for details.
Delay Regrat		Delay Regeneration,"--:--" lighting; If set left as "99"(default), means cancel the function.
Reg times		L is setting code. 01 means from Regen to once per cycle
Unit D/Mof Time model		00: "-- : --"the unit ahead of ":"is hour , the unit behind of ":"is minutes **M** 01: "-- : --"the unit ahead of ":"is day **D**, the unit behind of ":"is hour

Note

1. Under inquire state or setting state, if there is no button operation in 30 seconds.,The state will automatically exit.

2.During normal operation, the data window will display: station parameters (decreasing state), clock, water inflow flow rate, and corresponding signal indication, station indication, unit indication every 10 seconds

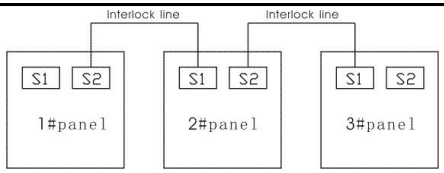
3. Display  *,means the valve is shifting to next station.the motor is rotating.*

4. Display clock flashing, such as  *,that means power off time is too long, remind the user to check current time.*

5. " E1" display means the system out of order.

(3)、Output control

1、Interlock line connection as below



Pic2: Interlock line Instruction

Explanation:

A. Any valve at (Regen) 、 ( ) *position, the valve can send lock signal.*

B. Any valve from (Run) *to* (Regen) 、 ( ) *position, the program will read locking signal from interlock line. If there are locking signals (that means there are other valves is in* (Regen) 、 ( ) *, the valve will continue service in* (Run) *,Until other valves finish in* (Regen) 、 ( ) *(locking signal disappear), this valve shift to* (Regen) ( ) *.*

C. S1 and S2 is same signal on PCB board. There is no sequence relationship.

3、Delay regeneration explain :

Under delay regeneration function, when the digital of (Run) station decrease to "0", the equipment will continue in (Run) „ until the actual time come to the time of "0-23" clock set in advance.

4. Relay output mode（b-0X）

A、The contact capacity of the relay is 5A/250V.

B. **Relay output port:**

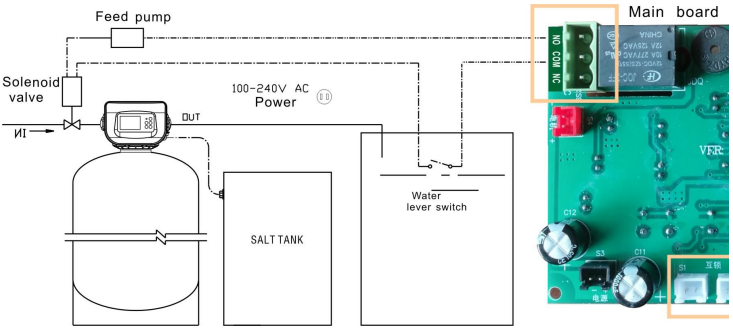
NO= Normal open port, **NC**=Normal Close port ,**COM** =Common port

C. When connecting the output of the relay, the AC220V power supply input end shall be connected with the leakage circuit breaker.

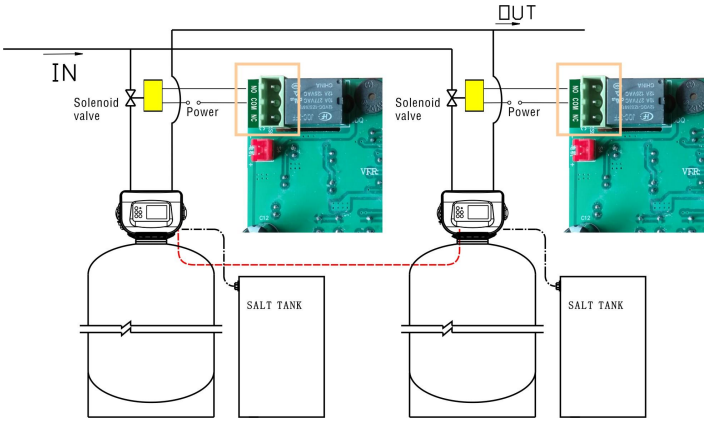
Different mode, the relay output NO and COM Connected for "C", disconnect for "x"

Mode	(B.wash)	Regen		RUN	
b=00	C	C	C	C	×
b=01	C	×	C	×	×
b=02	×	×	×	C	×
b=03	C	C	C	×	×
b=04	C	C	C	×	×
b=05	×	×	×	CX	×
b=06	C	×	×	×	×

Mode	Applications
b=00	Inflow water solenoid valve mode: Pressure relief when valve shifting.water Lever switch,feed pump combine control PIC3
b=01	Booster pump mode: this function is used for filter valve, control backwash pump start-up.
b=02	Out of the water pump start-up mode: For subsequent reverse osmosis high pressure pump startup.
b=03	Tow valve one RUN & one standby inflow water solenoid valve mode: Interlock wire connected. When one valve completes Regen and and switches to Run station, judge that if another valve is also Run station, the valve close its own inlet solenoid valve and wait for backup. As shown in PIC 4.
b=04	Tow valve RUN simultaneously Backwash respectively: this mode for filter valve use.
b=05	CX(Mode2 additional conditions) : When the inlet flow meter check the water flow signal in RUN station.the Relay is Connected.
b=06	Backwash booster and compressed air mode

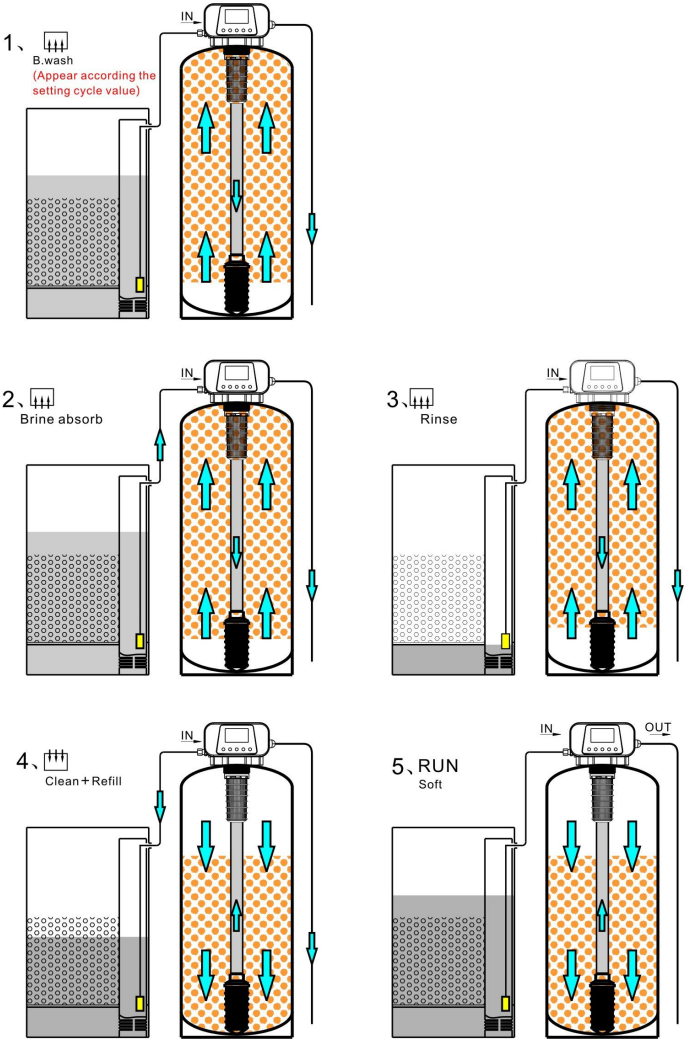


Pic3：Mode(b=00): Solenoid valve liquid level switch and feed pump.



Pic4：Mode(b=03): Tow valve one RUN & one standby inflow water solenoid valve mode:

Ⅱ、Flow Process



Pic5：GR-2 fixed bed back flow regenerate flow process

Ⅲ、Configuration and Installation

1，If the raw water contains mechanical impurities of gel or powder, it is necessary to install sand filter, cloth bag or disc type functional filter, factory valve inlet filter can only ensure the occasional large particles into

the valve body.

2. The diameter of the exchange tank should meet the flow rate requirements of ion exchange.

3. The volume of the salt tank is not less than the volume of the exchange tank.

4. The GR fixed bed resin filling rate ensures 30% backwash space on the top of the exchange tank.

5 .The drainage pipe outlet is close to the ground level, too high or too low will affect the brine absorption of equipment.

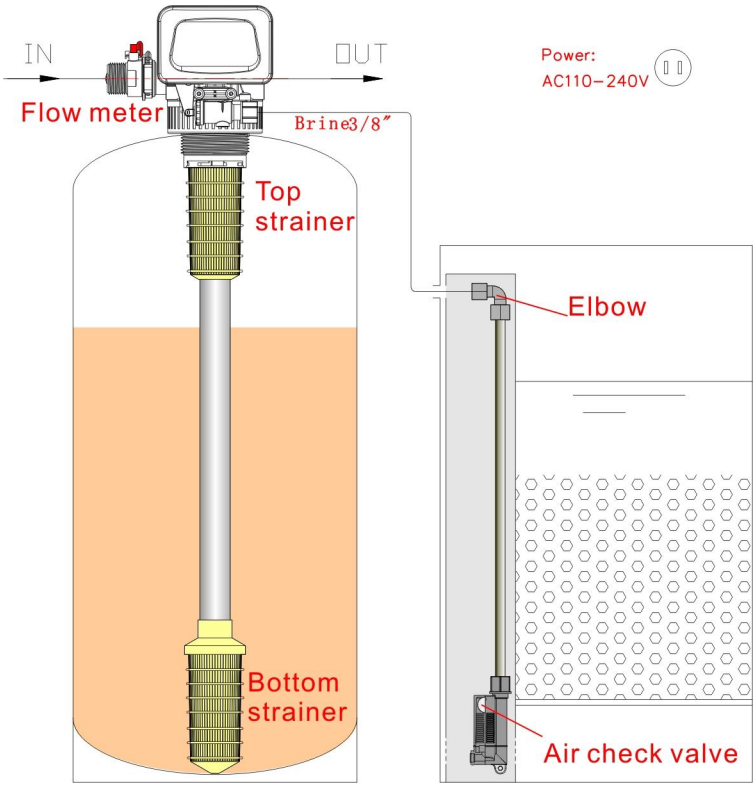
6,The specification of pipe is not less than the inlet and outlet of control valve.

7, Water static pressure is not higher than 0.1～0.6 MPa

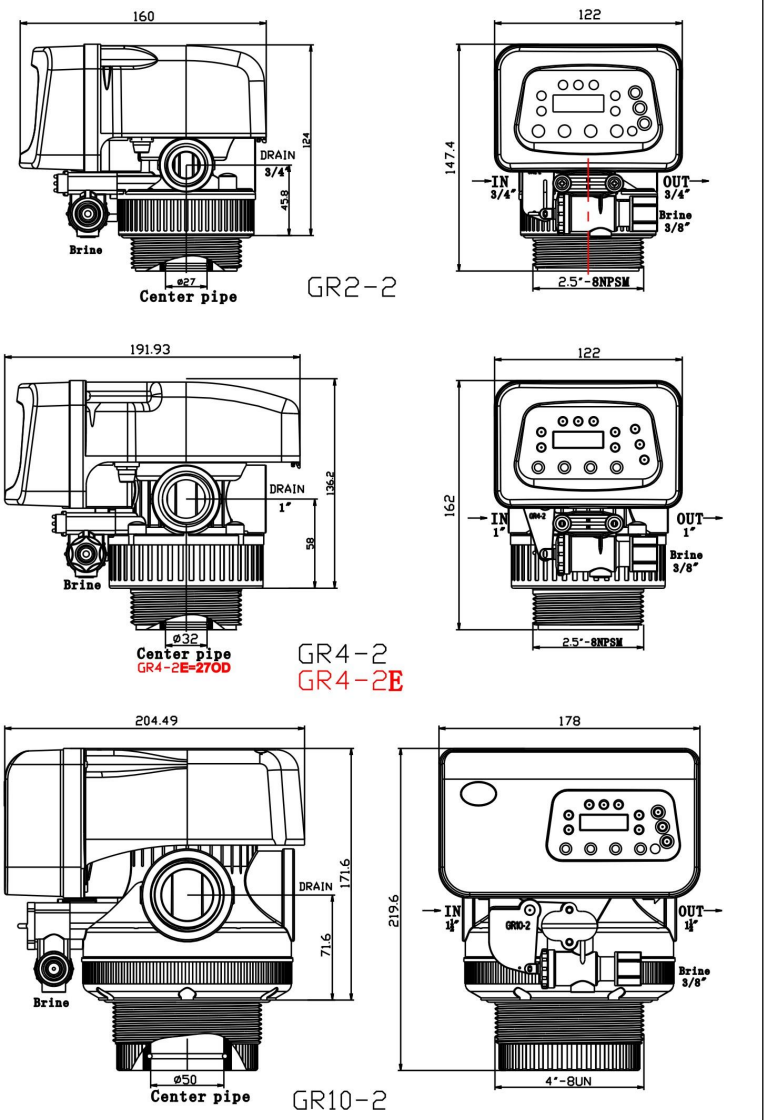
8, water temperature is 0°C ～ 50°C

9, the equipment is installed in the room, the humidity should not be too high, there should be no corrosive chemical gas around, to avoid strong electromagnetic interference to affect the power supply of the control valve.

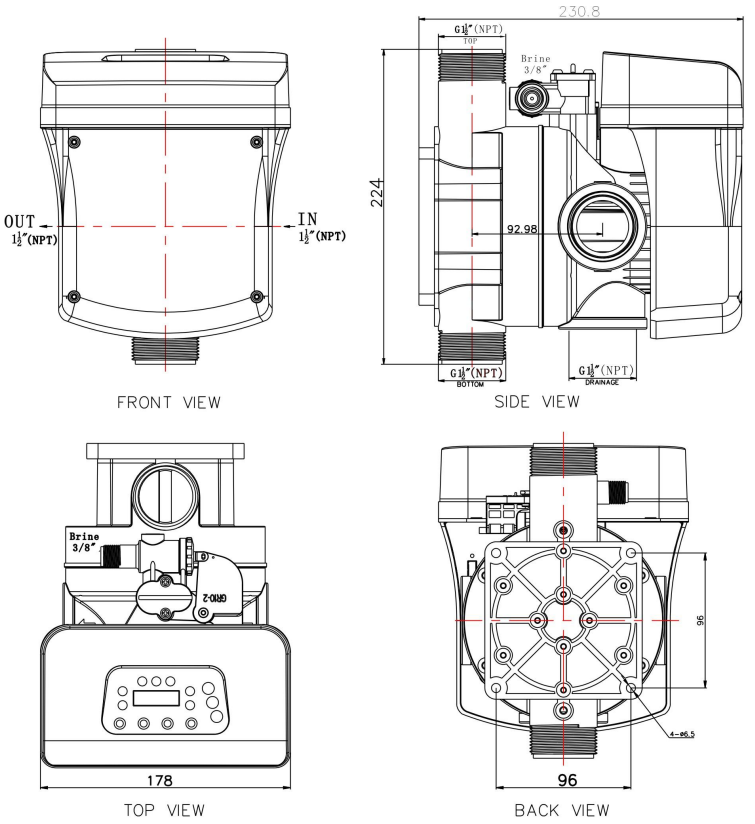
10. Floor drain or trench drainage shall be set around the equipment to avoid accidental water leakage causing the floor and other indoor items to be flooded.



Pic6：GR-2 configuration and install



Pic7：valve geometric parameter



Pic8：GR10-2S valve geometric parameter

g

Ⅳ Recommended parameter setting

Station	describe	Formula
Run	Service	[resin filling volume (L) x 90%] ÷ Raw water hardness(mmol/L). unit is ㎥
Regen Flickering	Backwash	Resin filling volume (L) x 100%*
Regen	Brine absorb →Slow wash	Resin filling volume (L) x 250%*
	Wash +Refill	Resin filling volume (L) x 200%(40%+160%)**

*1 *The setting water refers to the process of jet injection quantity sum, including Brine Absorption and back slow washing quantity.*

*2. **1/5 of the set water amount is the salt tank refill water and 4/5 is the positive washing water. This ratio is based on the valve body channel design and test.The total water quantity shall be based on 200% resin filling quantity, and the principle shall meet the requirements of 1/5×200%=40% resin filling quantity (1 liter of pure brine regenerate 2.5 liters of resin). If the brine valve is equipped, the set water quantity shall be increased or adjusted on site.The only way to increase the salt absorption is to increase the value of this parameter.*

3, Water hardness unit is mmol/L

4, Resin work exchange capacity calculating is 1000 mol/m³;

5, Design and calculation of brine concentration is 20%;

6、1Liter brine(20%)Molar value=1000g×20%/58.8g(NaCL)×1.4(Specific consumption) ≈200/80=2.5mol

Ⅴ Steps for initial water supply

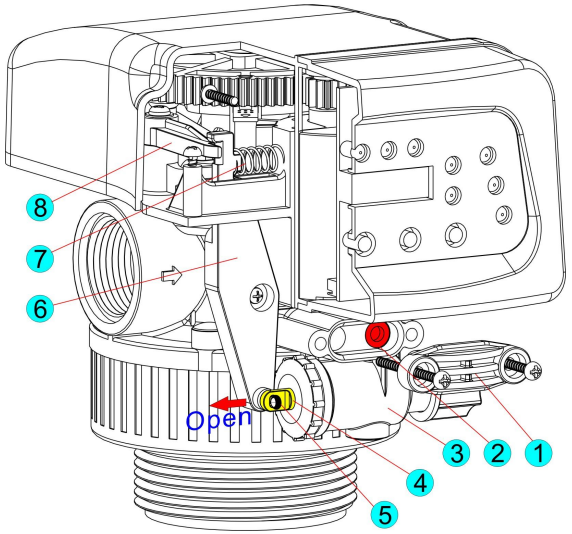
1.Make sure that the external pipeline and sealing are strong and the brine pipeline is connected in good condition, and turn on the power.

2.Forced backwash,(press " ")6 times unlock state),cleaning resin.

3.To the " " station, filling water to the salt tank.Check and calculate salt tank fill (40% resin), Check sewage pipes and drains.

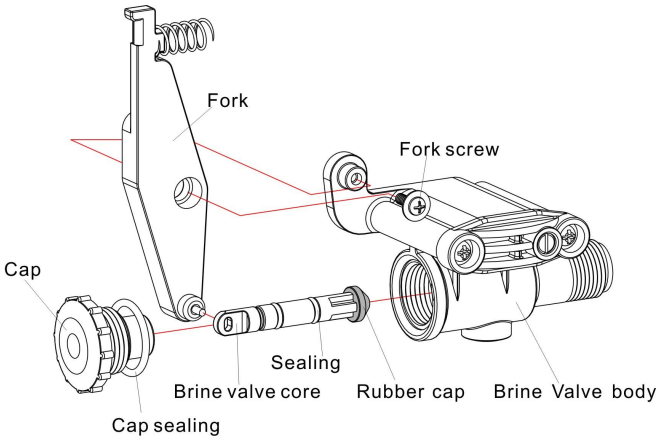
4.To "Regen"station, check whether the brine absorption is normal.

Ⅵ. The disassembly of the brine valve and injector

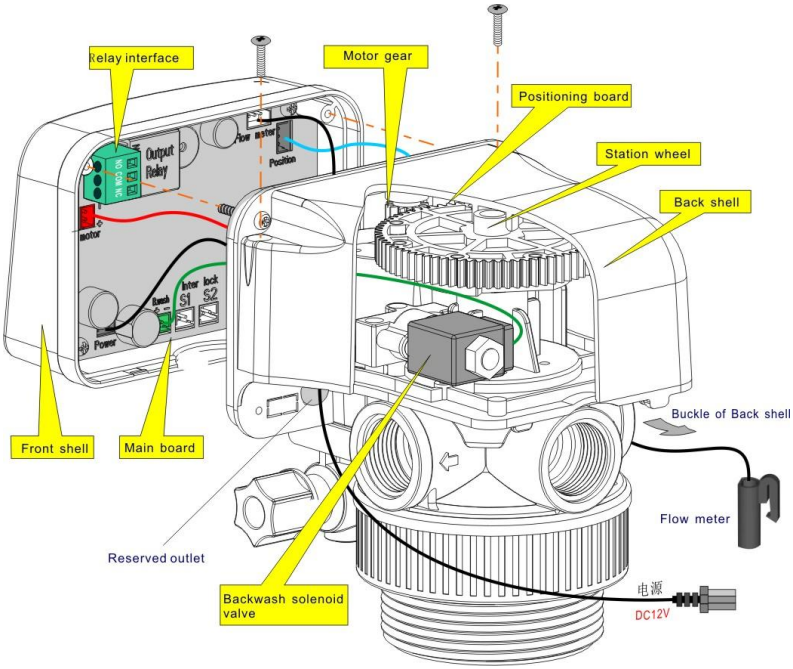


1. End cover; 2. Jet nozzle; 3 Brine valve ; 4, Brine valve core; 5,Pin; 6, fork;7. Spring; 8, leverage

Pic9. The disassembly of the brine valve and injector

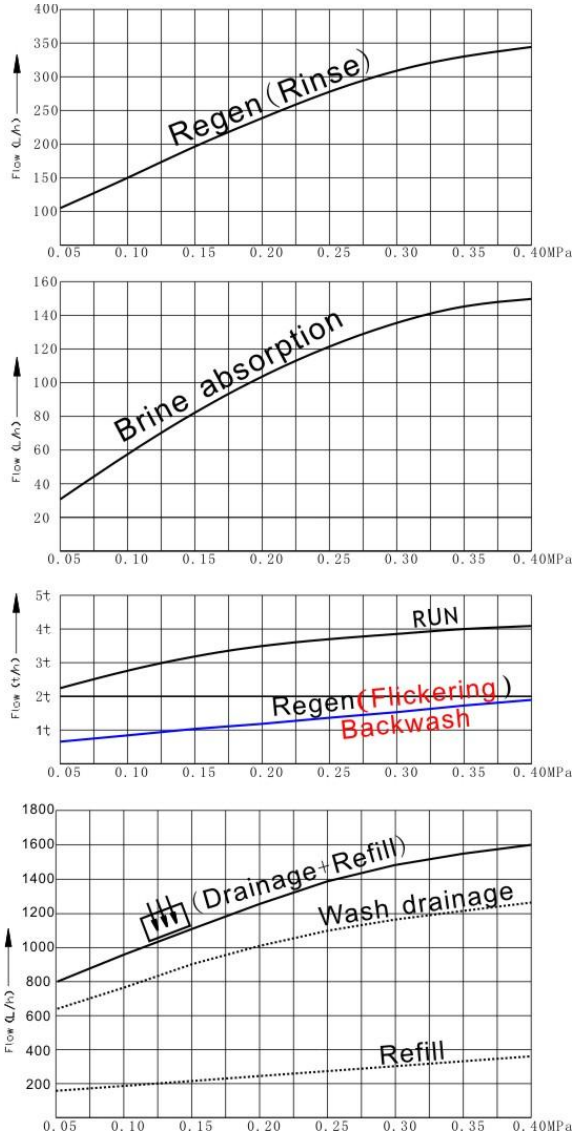


Pic10: Brine valve explode drawing

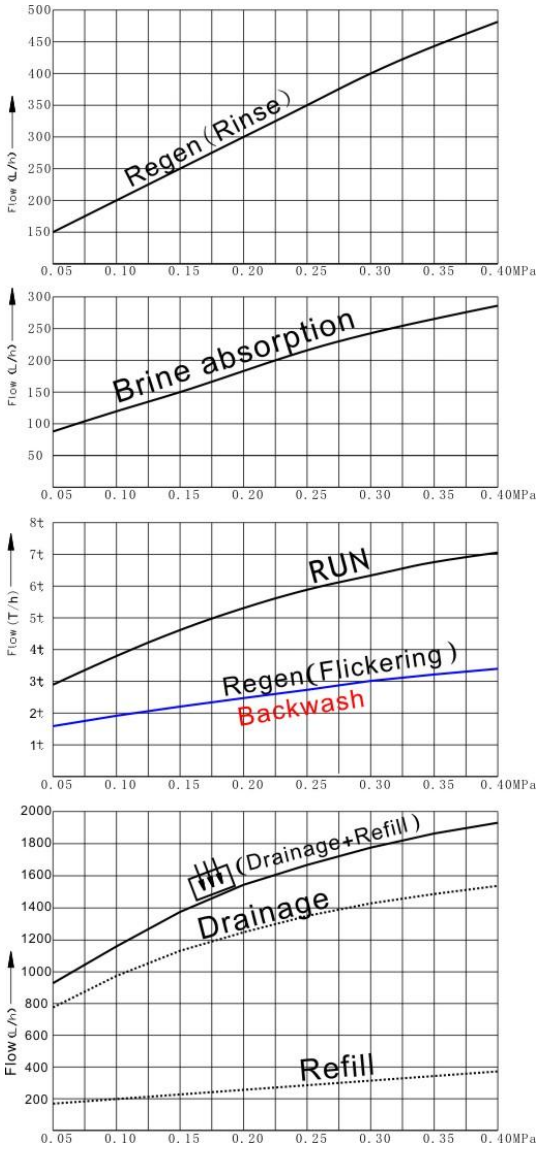


Pic11: Removal and connection of front shell of the controller

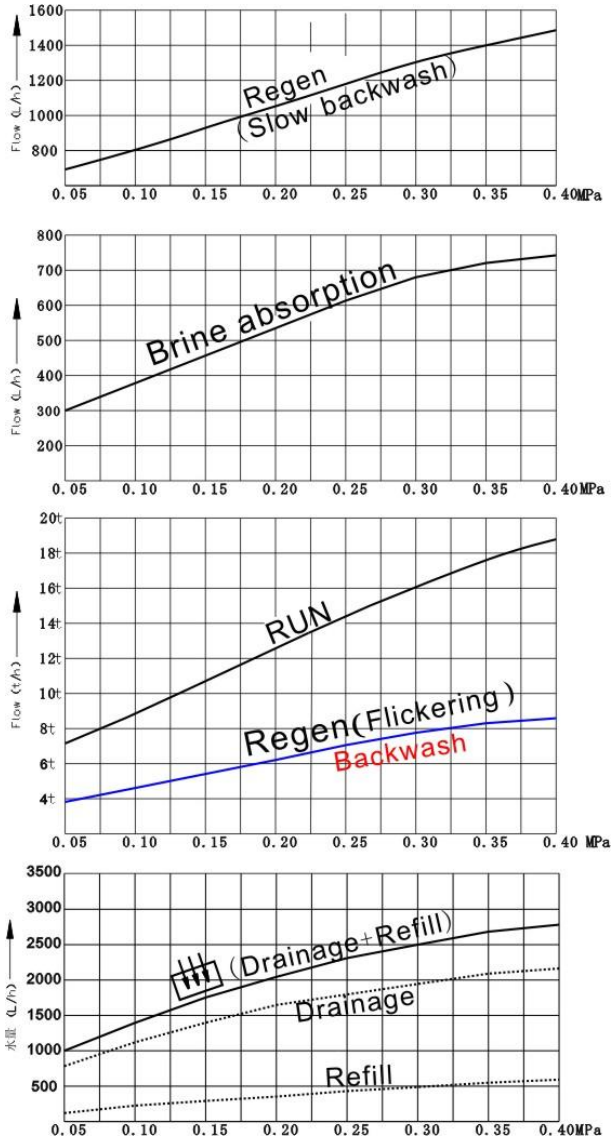
Ⅶ. Curve of Flow and Pressure for the Valve



Pic12：GR2-2 Flow pressure curve



Pic13：GR4-2 Flow pressure curve



Pic14：GR10-2 Flow pressure curve

Ⅷ、Regular failure and failure elimination

Produced water is not qualified

Phenomena/reasons	Solution
No salt particle in the brine tank	Add salt to the brine tank
No enough absorption of salt water	Increase refilling water amount of setting value
Flow rate is too large, running velocity is too high	Reduce the pressure difference between the inflow and outflow
The sealing problem of the center pipe or the pipe is too short	Check the center pipe and the sealing ring

Brine water leaking out to the water outlet

Phenomena/reasons	Solution
Insufficient amount of washing	Increase Regen value to extended slow wash time
No enough resin and too much space at the top of the swap tank	Add more resin or other to reduce the space

The inlet pressure of the equipment increases and the water output decreases

Phenomena/reasons	Solution
Resin's being polluted by the suspended matter	Forced backwash or Unload the valve and wash the resin both inside and outside the tank.
water distributor is blocked by broken resin	Unload the water distributor and clean it.
Out pipes system have closure phenomenon	Check and eliminate the problem

The salt tank overflowed

Phenomena/reasons	Solutions
Station setting is too large or the salt tank is too small	Reduce the set value, or increase the salt tank

No brine absorption

Phenomena	Reasons and Solution
Drainage pipe have water out,but no brine absorption,instead of refilling water to salt tank	water distributor inside the exchange tank is blocked, resin is contaminated, or there is interception in the sewage pipe system, forced backwashing or dismantling cleaning should be carried out, or the backwashing water volume should be increased or the set amount of backwashing cycle should be reduced.
No water out from drain pipe,also no brine absorption.	Mainly is the jet nozzle blocked, (pic:9).

Ⅸ. Tips and Precautions of Equipment

1. **Add salt to salt tank**

The equipment should use large particles industrial salt. If some fine salt is used, please keep it at small amount. Otherwise, it will get agglomerated, leak to the salt filter and clog the tube.

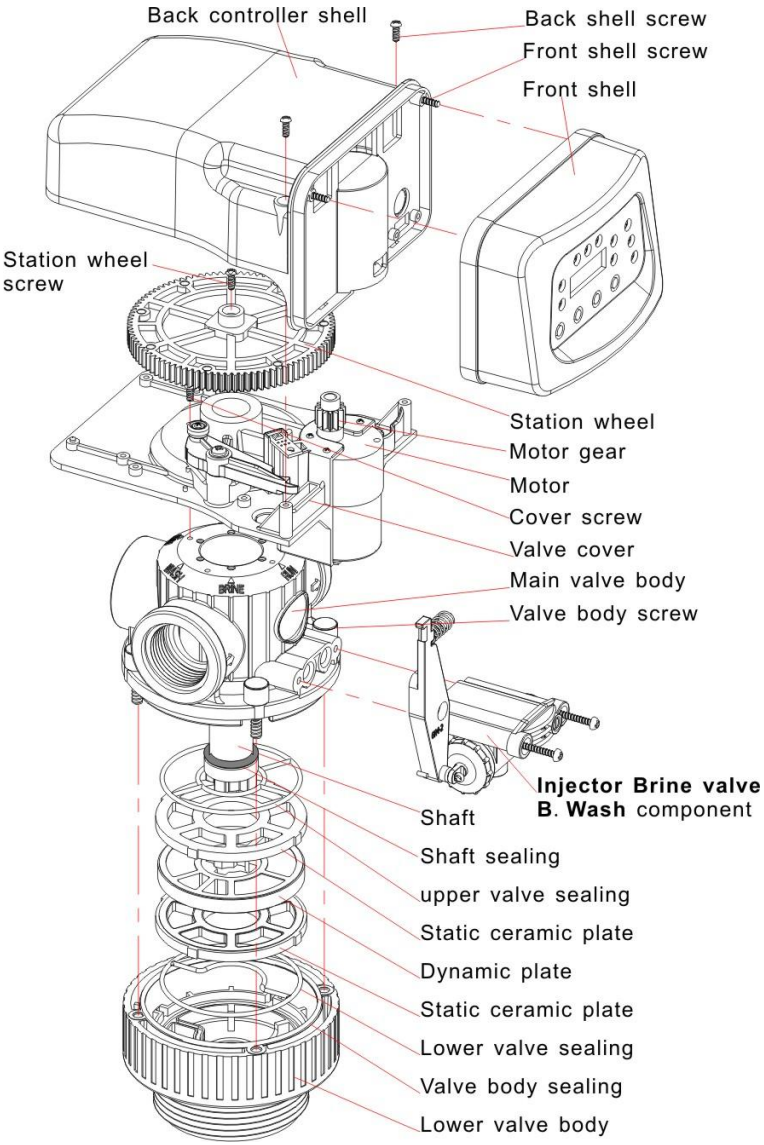
2. **Clean salt tank**

The bottom of the salt tank needs to be checked frequently; the deposit and sludge need to be cleared out.

3. **Clean inflow filter**

The filter of inflow needs to be cleaned periodically in case that the inflow clogs the tubes and leads to low efficiency of the equipment as well as the decrease of the outflow amount.

X. GR-2 valve explode drawing（GR4-2 example）



Pic15：GR-2 valve explode drawing（GR4-2 example）

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