

GR15D~GR50D

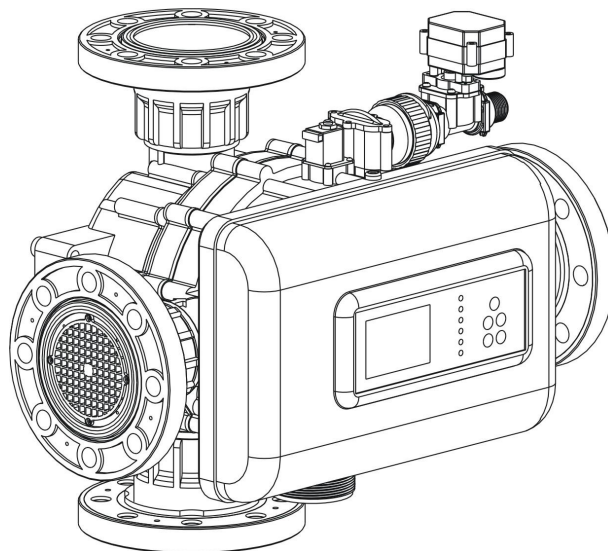
DOWNFLOW REGEN LARGE MODEL SOFTEN VALVE

INSTALL、USEING、 MAINTENANCE MANUAL

(GR15D) (GR15DT) (GR20D) (GR20DT) (GR40D) (GR40DT) (GR50D)



Scan Qr code for the latest



GR15 Install



GR20 Install



GR40/50 Install



Brine system
Flow process

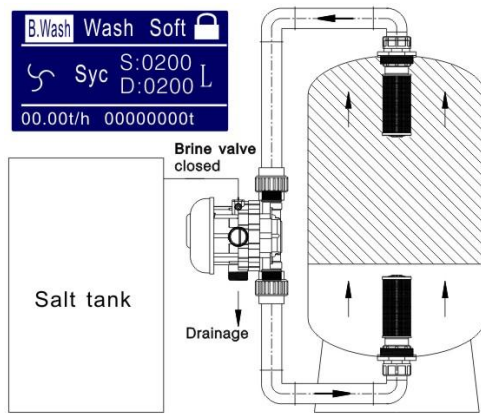


Brine system
Repair

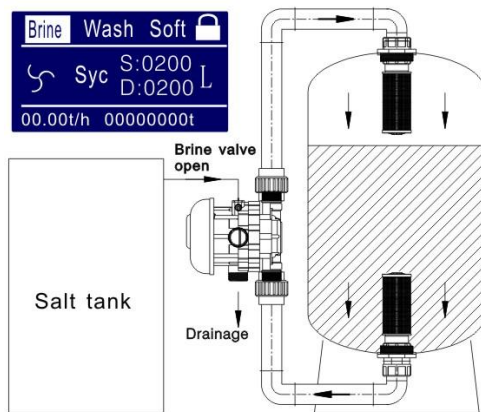


1550D
Flow process

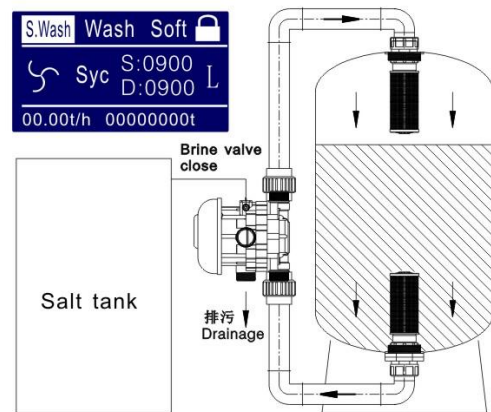
I 、 the control principle



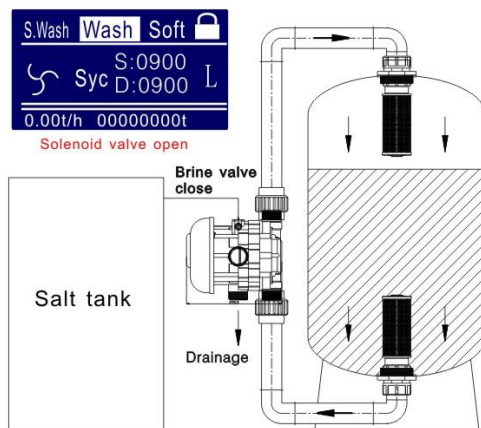
1、 Back wash



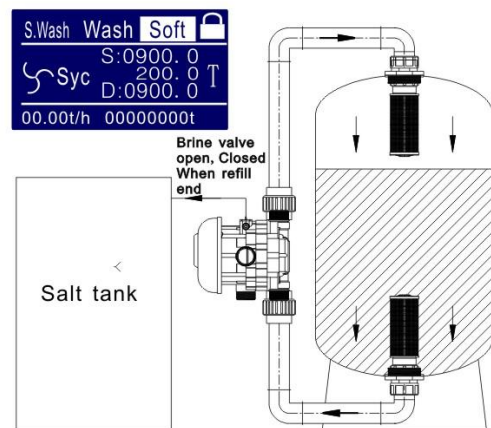
2、 Regenerating



3、 Slow wash



4、 Washing



5、 Soft + Refill

Figure1:GR15D~GR50D Downflow regen softening process

Control valve station action description:

1, **B.Wash**(Backwash): Main valve station;the station parameters is calculated by inlet flow meter.

2, **Brine**(Brine sucking): Main valve station,the station brine electric valve (DC12V) is opened, raw water through the jet to generate negative pressure suction brine mixed into the main valve. the brine quantity is calculated by brine flow meter.

3, **S.Wash**(Rinse): Brine electric valve is closed, raw water continues to enter the main valve through the jet, into the resin layer to continue to slow wash the resin,the rinse water quantity is calculated by inlet flow meter.

4, **Wash**(Washing station): Brine electric valve is still closed, solenoid valve open,raw water through the main valve,the washing water quantity is calculated by inlet flow meter.

5. **Soft**(Softening station): the main valve station. In the beginning, the brine electric valve is opened, the main valve in softening process, meanwhile refill water to the salt tank . When the filling quantity is reached, the electric valve is closed, and the softening process continues. the filling water is calculated by brine flow meter,the softening water quantity is calculated by inlet flow meter.

II 、 Controller display and operation

The operation button.:

: **Manual switch**; : **Parameter setting**; : **Mode shift**; : **Move to next**; : **Plus 1**

A、Unlock: Press " " and " "at the same time, the screen displaying " " to indicate that the lock has been opened.

B、Lock: Equipment without any operation after 3 minutes, automatic to lock.

C、 Mode shift: Unlock state, the operation button in time mode " "and flow Mode " " display to switch between.

D、 Manual switch: Unlock state, when pushing the button the valve switch to next station.

E、 Parameter setting: Unlock state, press the button, the screen will show the interface of setting parameters

F、Manual forced backwash: locking " " state, push " " 6 times, the valve enter into **B.Wash**

1\Back wash



2\Brine



3\Slow Wash



4\Wash



5\Soft

State of decline, it is to Refill water to salt tank.
The parameters is set in menu: Refill: 0200L

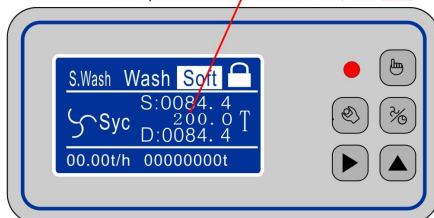


Figure2: Meter mode display interface

1\Back wash



2\Brine



3\Slow Wash



4\Wash



5\Soft

State of decline, it is to Refill water to salt tank.
The parameters is set in menu: Refill time: 060Min

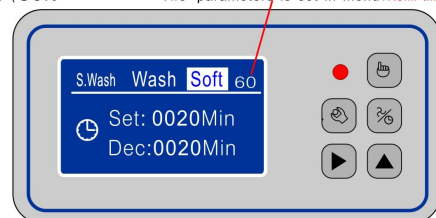


Figure3: Time mode display interface

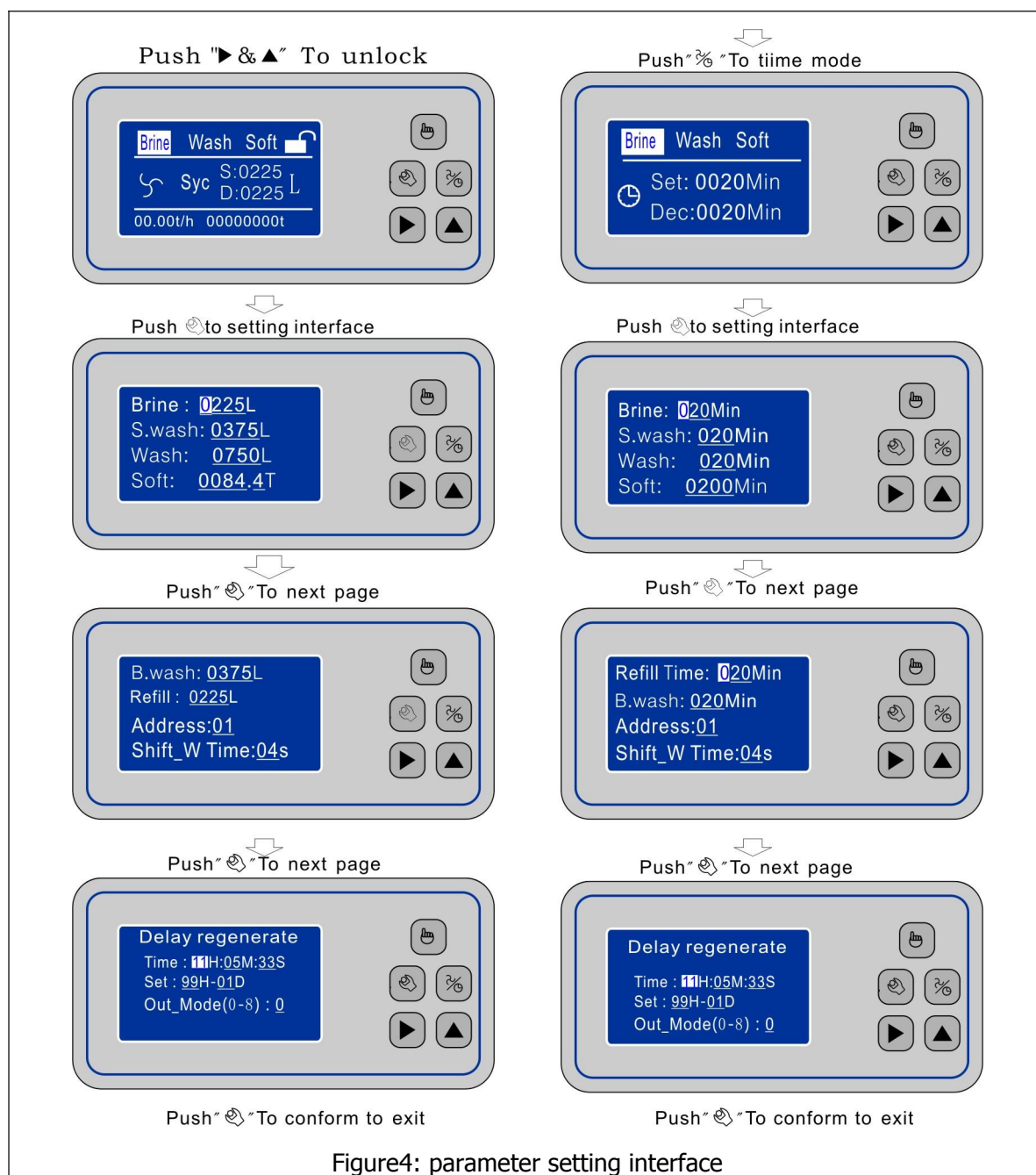


Figure4: parameter setting interface

Setup project description:

Delay regenerate: Delay Regeneration function, According to the system for 24 hours, the default 99 is to cancel the delay, set the range of 0-23 hour representing an hour a day, 01 D means once of 1 day. As the function is enable, When the set digital of **Soft** station decrease to "0", the valve does not shift to the next station and stays at the "**Soft**" station until the preset 0-23 clock begins to regenerate. If the user regenerates according to the set day as the unit of time, change the value in -01D, and at the same time, the setting time of **soft** station shall not be more than 1 day (1440 minutes) or the water amount set in the flow mode shall be guaranteed to run within one day. To cancel functions, simply set the regeneration clock to "99".

Address: Set the device definition to be used and used only when extending 485 communication modules.

Shift_W Time: Set only when installing inlet solenoid or electric valve, solenoid for 7 seconds, electric valve for 28 seconds.

Output mode(0-8): Represent the extension control output functions, external booster pump from spreading. Detailed explanatory to see "*Electric valve*", "*Booster pump*" relay output interface: mode setting .

Input/output control instructions

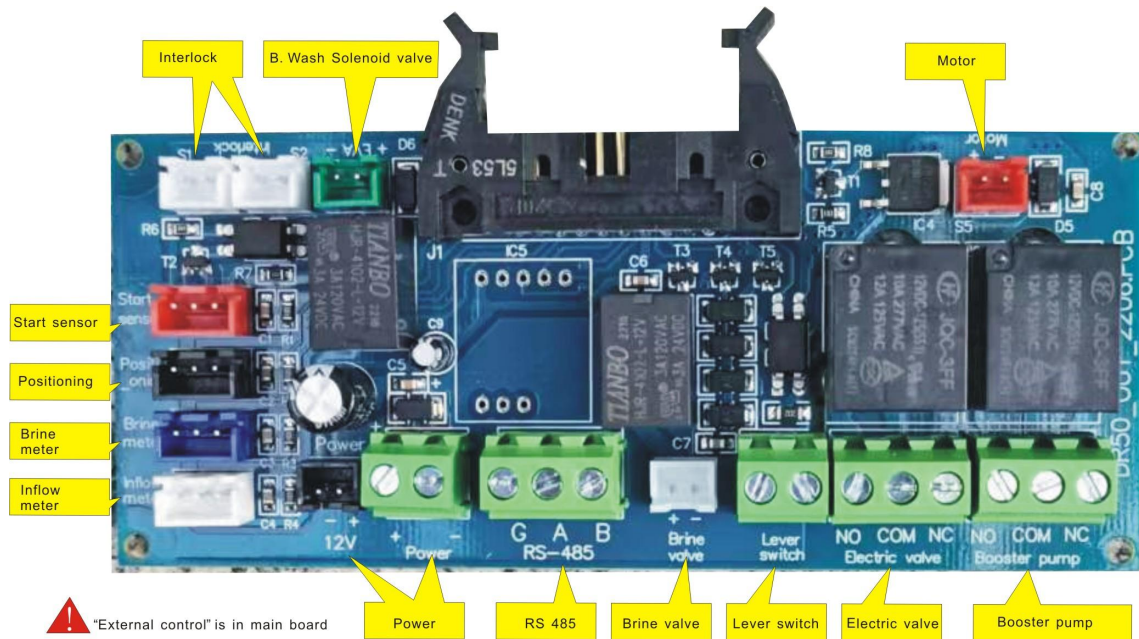


Figure 5: Output control board

1、S1\S2: Interlock line connection as below

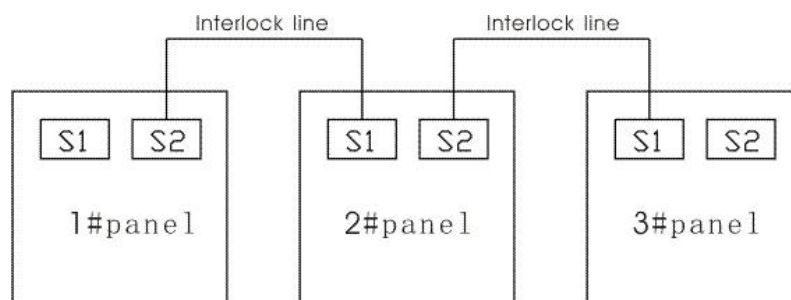


Figure 6: Multiple-valve interlock

2. RS-485: The communication port

This function according to user requirements to add 485 communication protocol before out off factory.

3. “External control” (In main board): The external switch priority control interface

When the control valve is in a "soft" state, the valve can be controlled into "B.Wash" by other external control systems, such as an online water quality monitoring access.

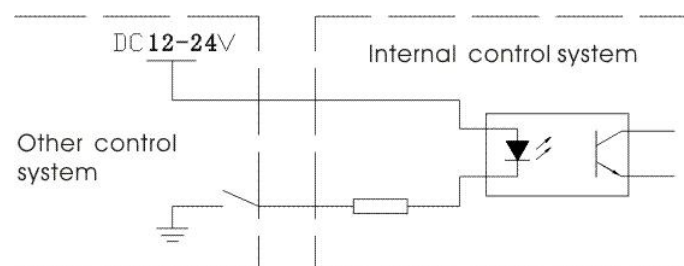
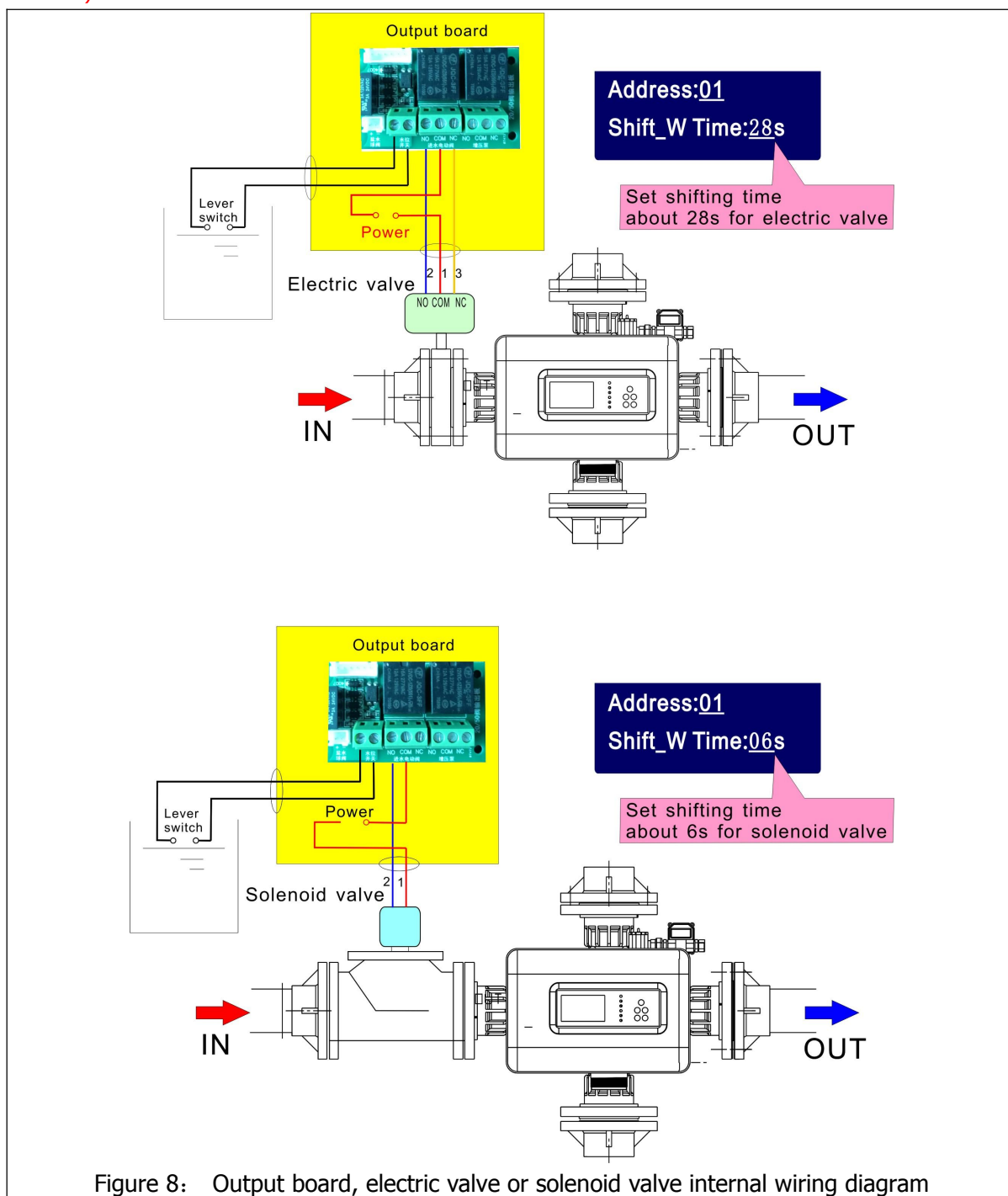


Figure7: external switch priority control instruction

4, “**Electric valve**” : Output wiring of inlet electric valve or solenoid valve is shown in Figure 7.

5, “**level switch**”: Soften water tank water level switch closing signal input, inlet electric (Solenoid) valve closed, the softener to stop service. (Note! The water level switch receives the closed loop signal, the active voltage cannot be connected!)



5. “**Electric valve**”、 “**Booster pump**” relay output interface: mode setting

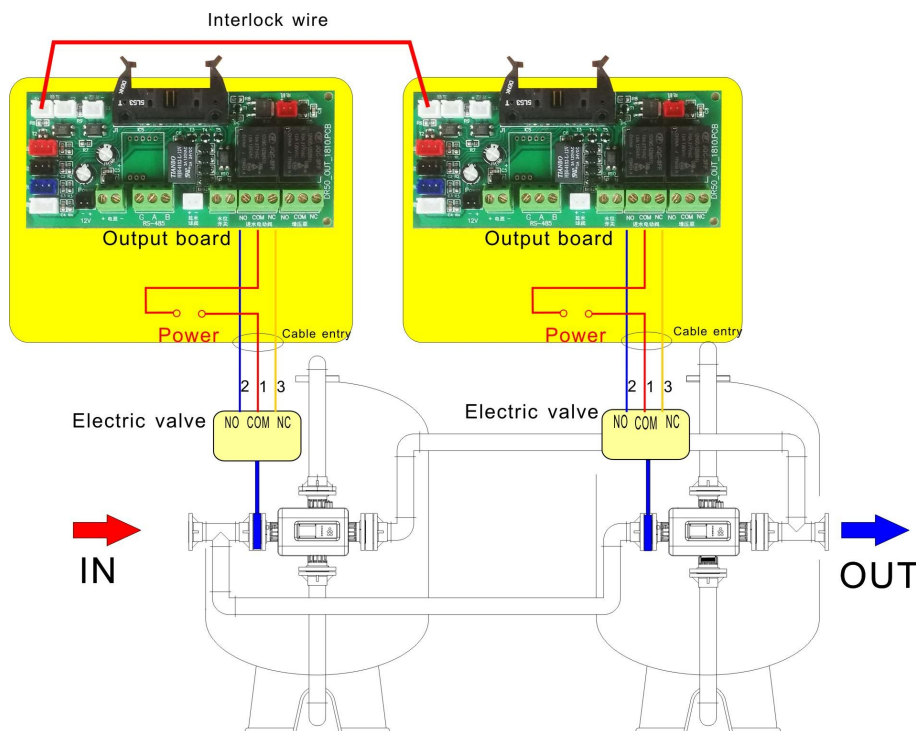
A. The contact capacity of the relay is 5A/250V.

B. Relay output port, NO(Normally open) , COM (Common port),NC(Normally closed)

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, below:(Connected for "C", disconnect for "x")

Mode	Relay	B.wash	Brine	S.wash	Clean	Soft	Shift	Applications
0	Electric valve	C	C	C	C	C	x	Inlet electric valve mode: relay break when shifting station.
1	Booster pump	C	C	C	C	x	x	booster pump mode: this mode is for filter valve.
2		x	x	x	x	C	x	Pump starting mode: for the subsequent reverse osmosis high pressure pump starting.default mode
3	Electric valve	C	C	C	C	x	x	Tow valve one RUN & one standby mode: ∴As shown in figure 8.
4		C	C	C	C	x	x	Tow valve RUN Backwash respectively mode: this mode for filter valve.
5	Booster pump	x	x	x	x	CX	x	CX(Mode2 additional conditions) : When the inlet flow meter check the water flow signal in Soft station.the Relay is Connected.
6		C	x	x	x	x	x	Backwash booster & compressed air mode
7		C	C	C	C	x	C	Only in service, "NO" is open
8		x	x	x	x	x	C	Only in the valve shifting,"NO" is closed



Interlock wire connected. When one valve completes **Brine** and **Wash** and will switch to **soft**, judge that if another valve is also **Soft**, the valve close its own inlet solenoid valve and wait for standby

Figure 9: Mode (3) Tow valve one RUN & one standby inflow water solenoid valve mode

III、Recommended configuration and operation parameter setting

1、Recommended parameter setting table

Station and description	Flow meter	Formula
Soft (Ton)	Inlet meter	(filled amount of resin(L)×90%) ÷raw water hardness (mmol/L)
Brine (L)	Brine meter	45%×filled amount of resin(L)*
Refill (L)	Brine meter	40%×filled amount of resin(L)
Slow wash (L)	Inlet meter	50%×filled amount of resin(L)
Wash (L)	Inlet meter	100%×filled amount of resin(L)
B.Wash (L)	Inlet meter	100%×filled amount of resin(L)

Note!

- 1、Water hardness unit is mmol/L;
- 2、Resin work exchange capacity calculating is $1000 \text{ mol/m}^3 = 1 \text{ mol/L}$
- 3、Design and calculation of brine concentration is 20%;
- 4、1Liter brine(20%)Molar value= $1000\text{g} \times 20\% / 58.8\text{g}(\text{NaCL}) \times 1.4(\text{specific consumption})$
 $\approx 200/80 = 2.5 \text{ mol}$, That is, the brine used for regeneration is equivalent to 40% of the resin filling amount
- 5、The volume of the salt tank is not less than the volume of filling resin
- 6、45% for brine sucking bigger than 40% refilling, we take about the accumulated error to avoid filling water overflow from salt tank.

IV、Install

1、Installation of control valve unpacking parts

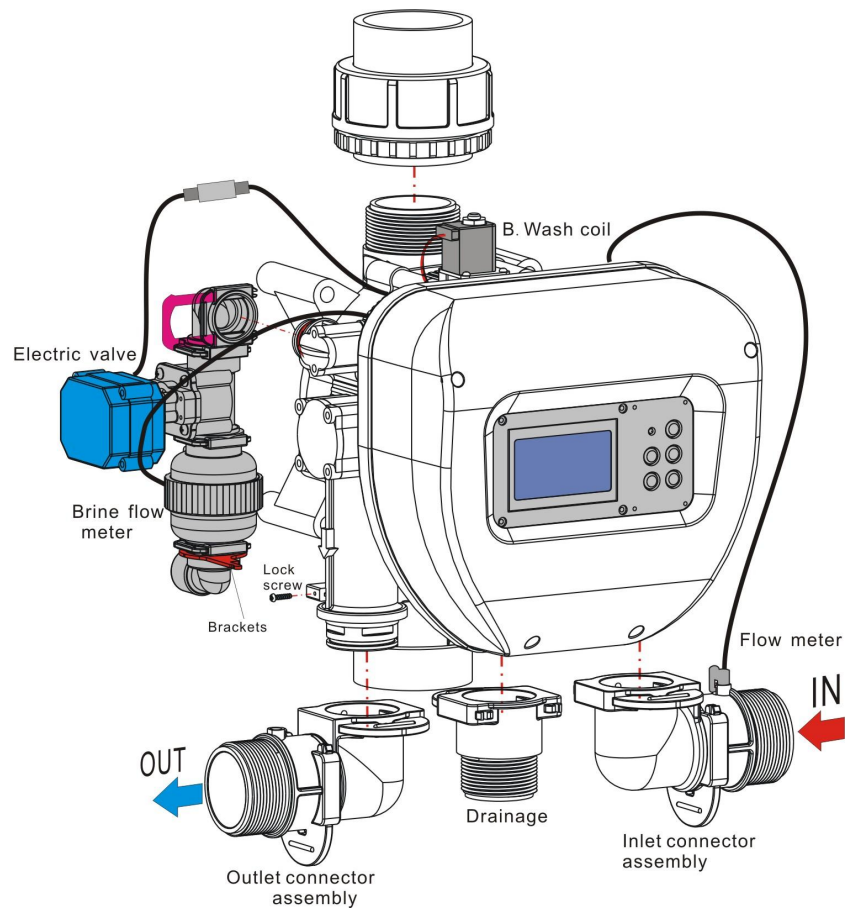


Figure 10、GR15D side installation control valve unpacking parts

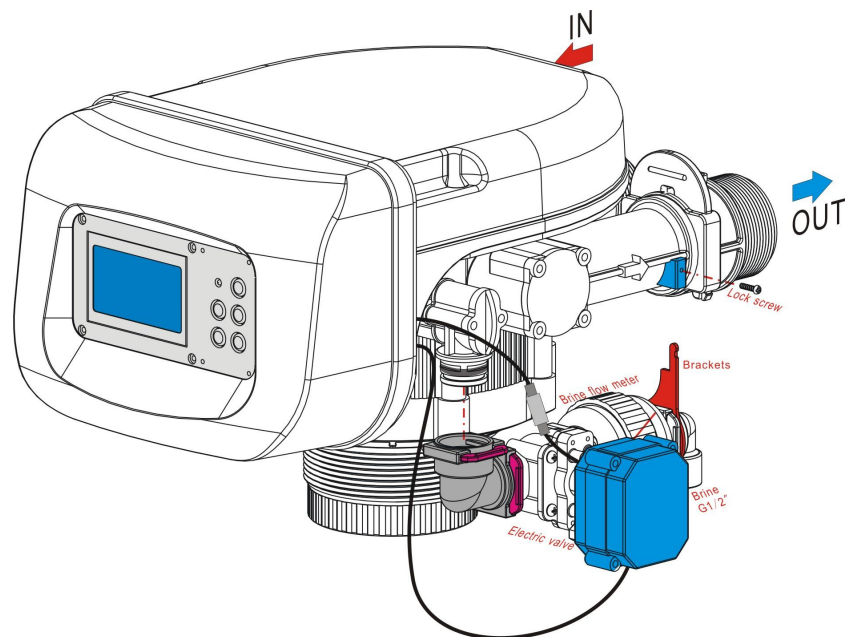


Figure 11、GR15DT top mounted control valve unpacking component

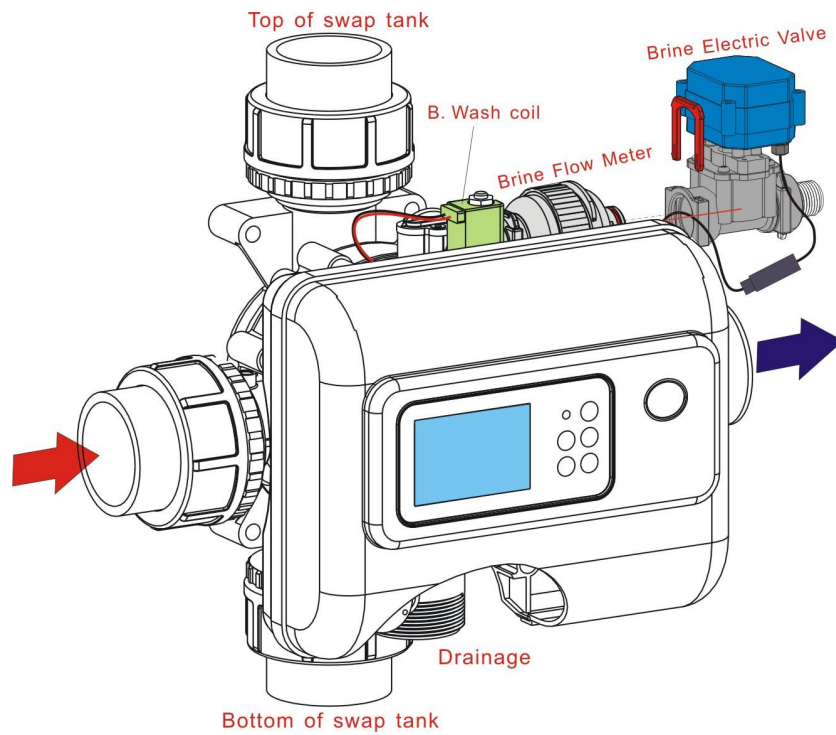


Figure 12: GR20D side installation control valve unpacking component

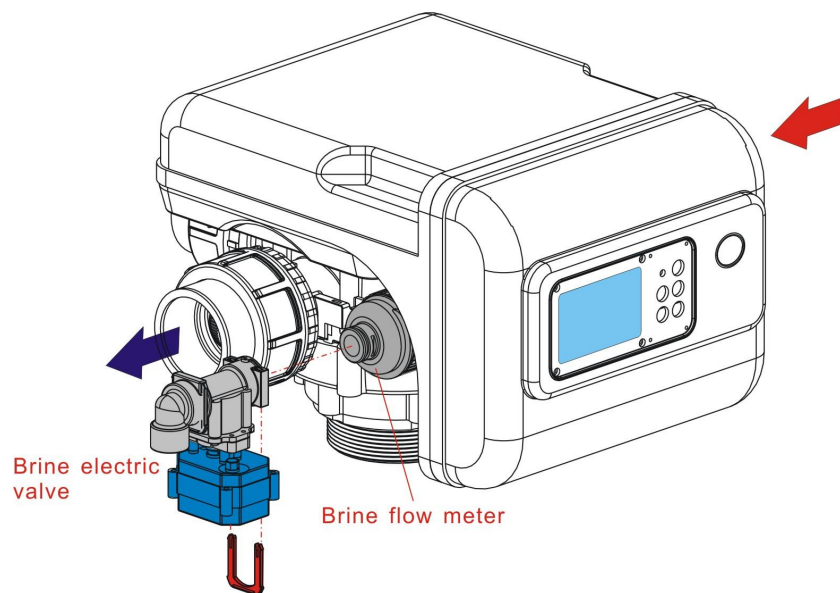


Figure 13: GR20DT top mounted control valve unpacking component

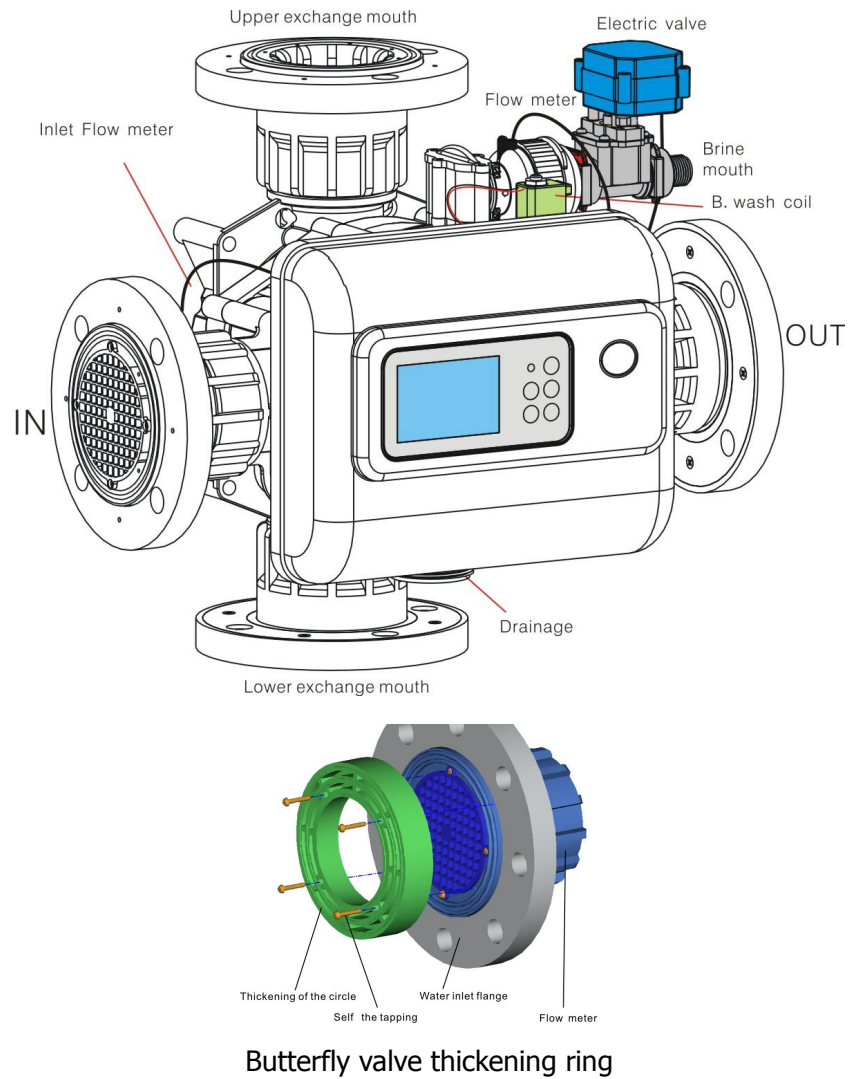


Figure14、GR40D side installation control valve unpacking component

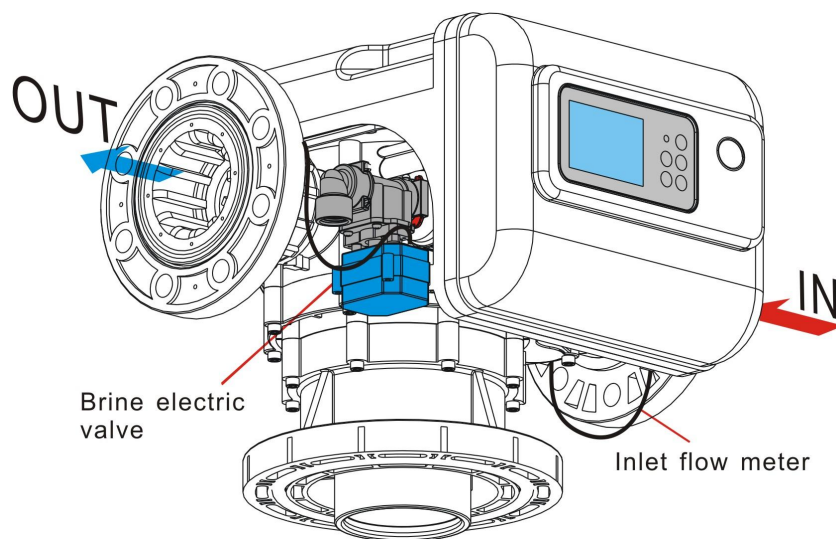
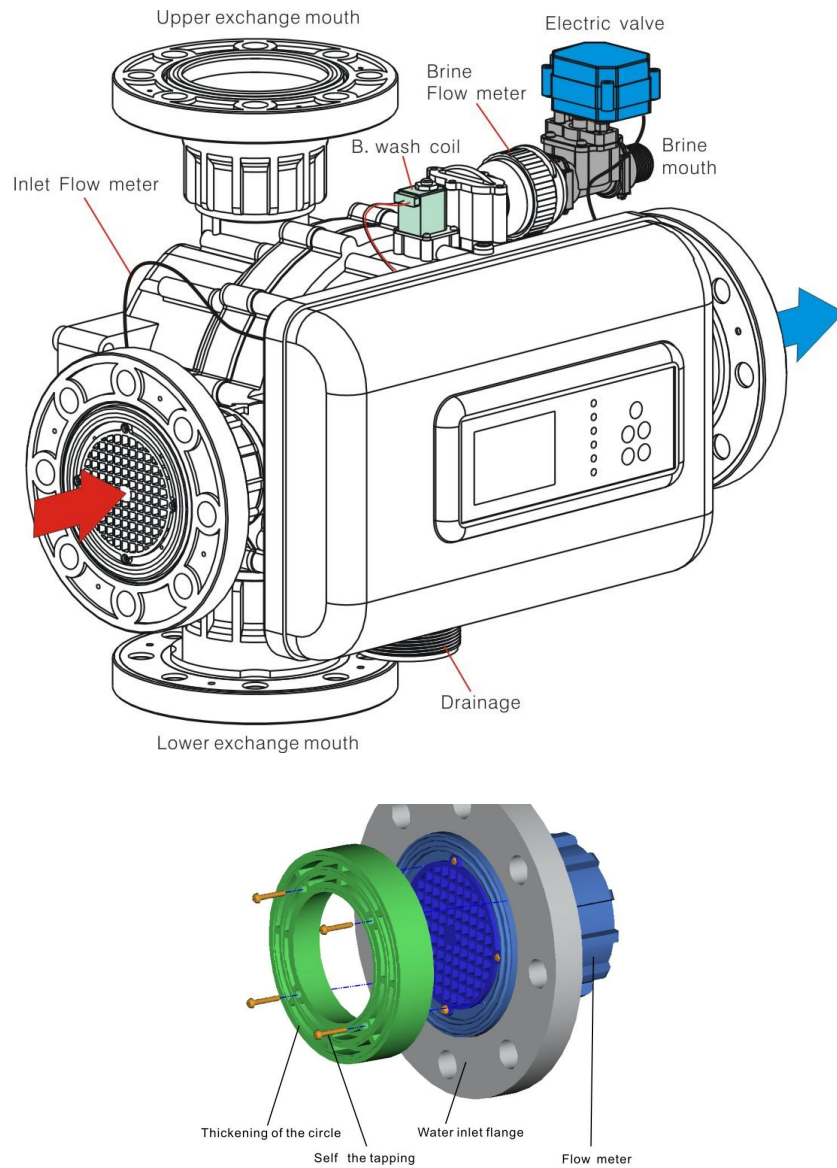
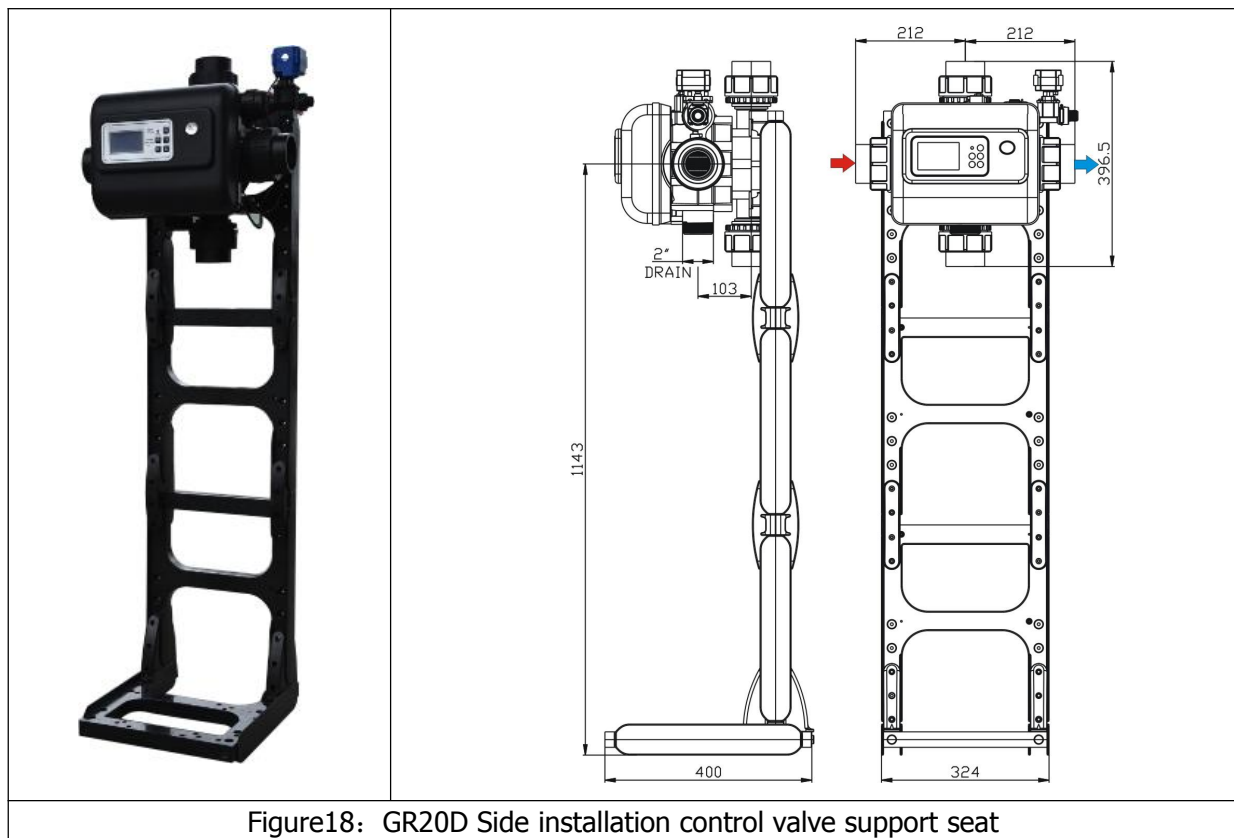
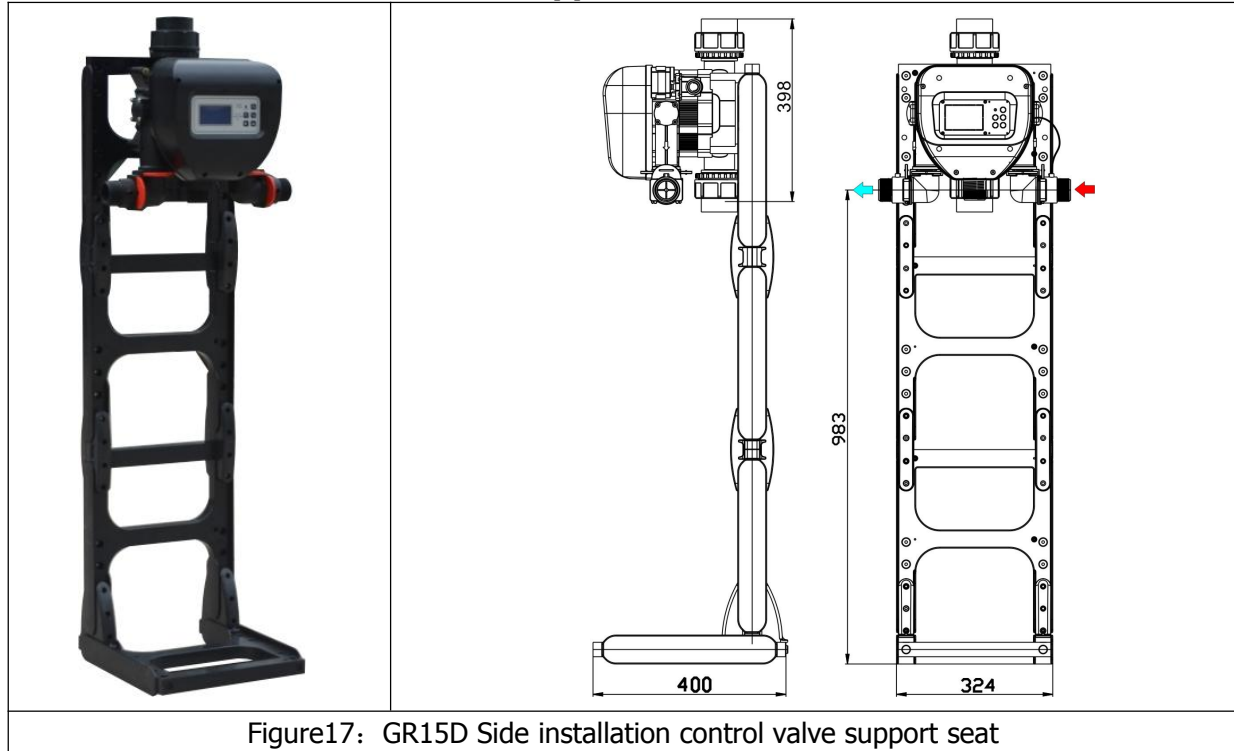


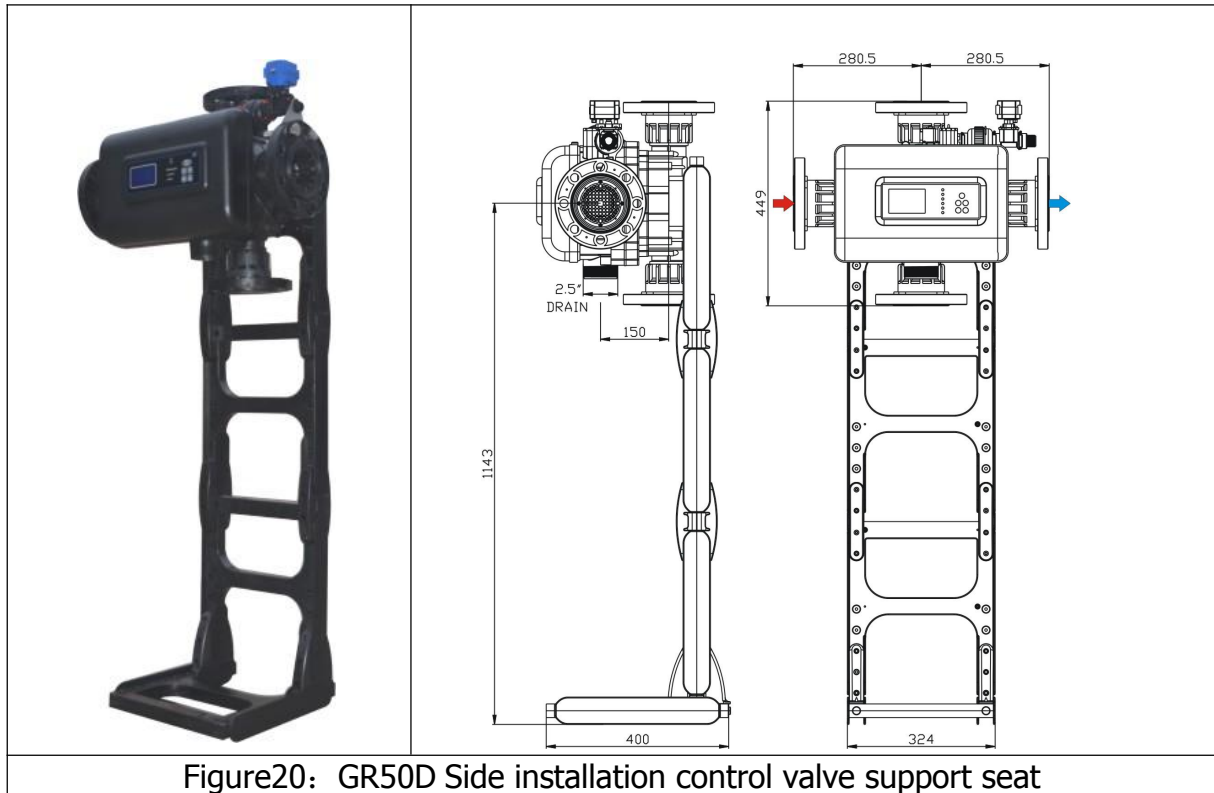
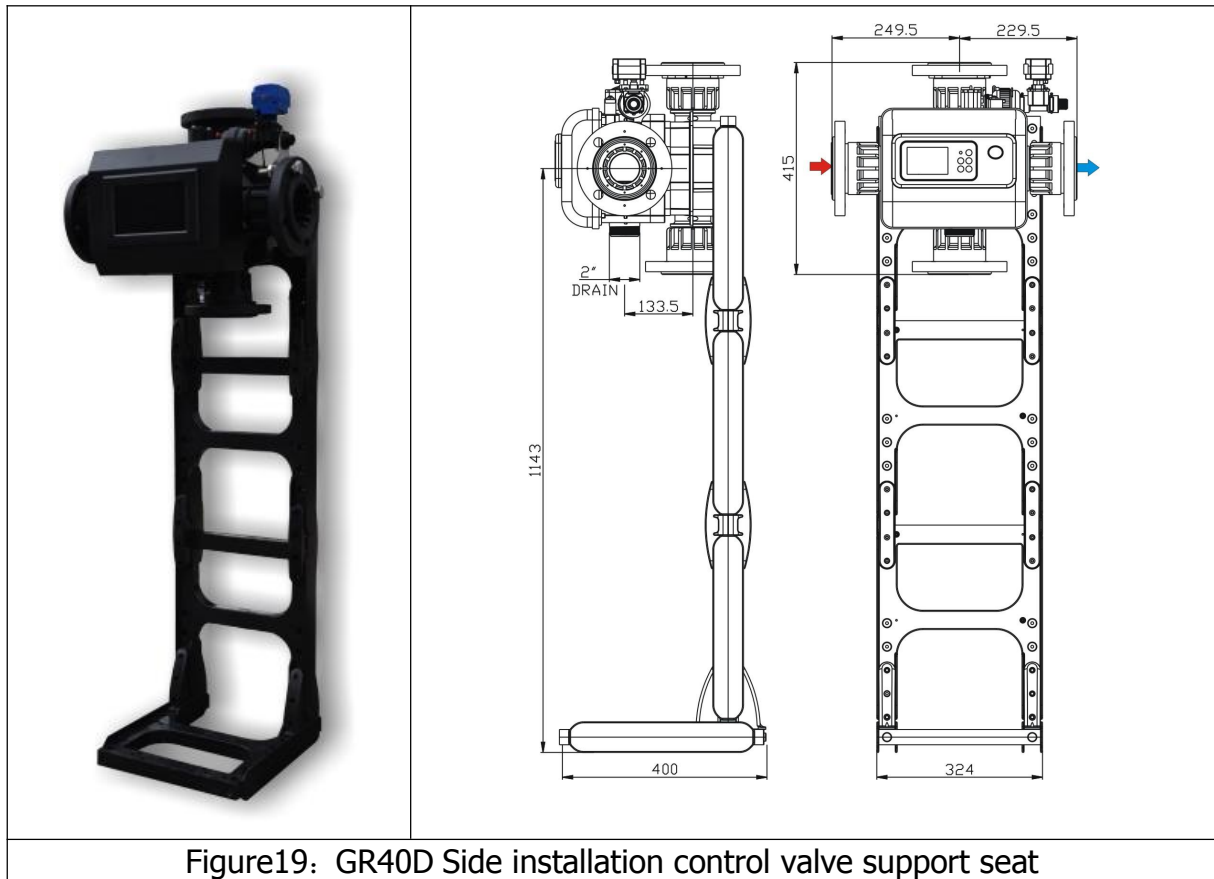
Figure15: GR40DT top mounted control valve unpacking component



Feed butterfly valve thickening ring

Figure16: GR50D side installation control valve unpacking component

2, Side mounted control valve support seat



3、 Internal configuration and installation of side valve equipment

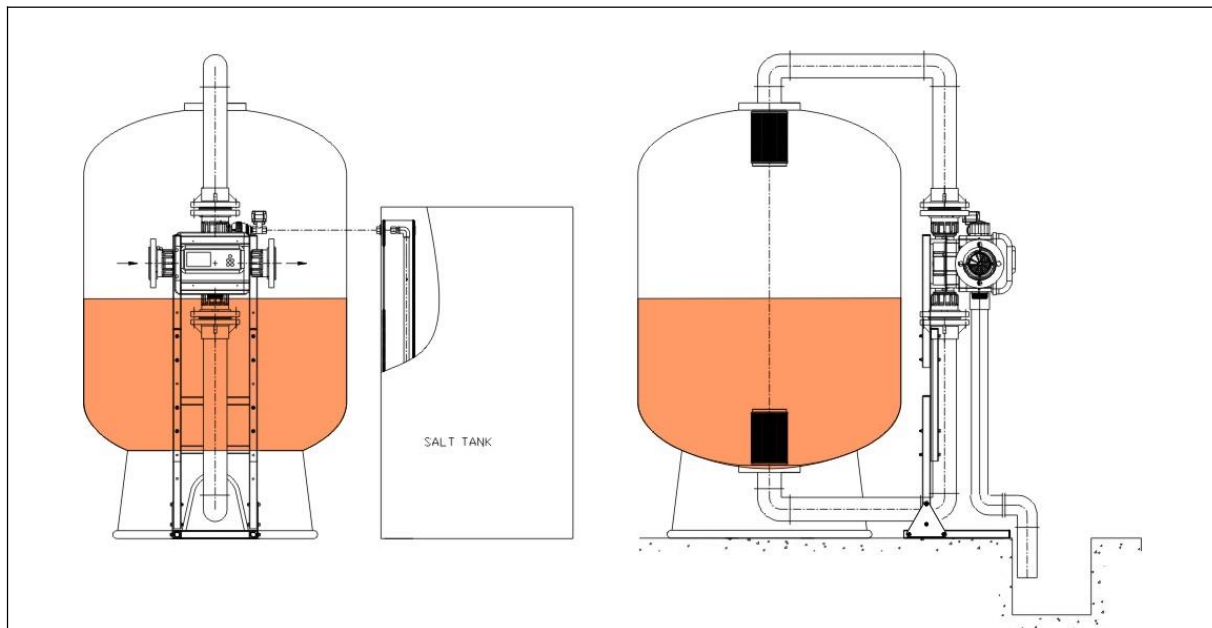


Figure 21: Schematic Diagram of installation of side valve Softener (GR40 valve as an example)

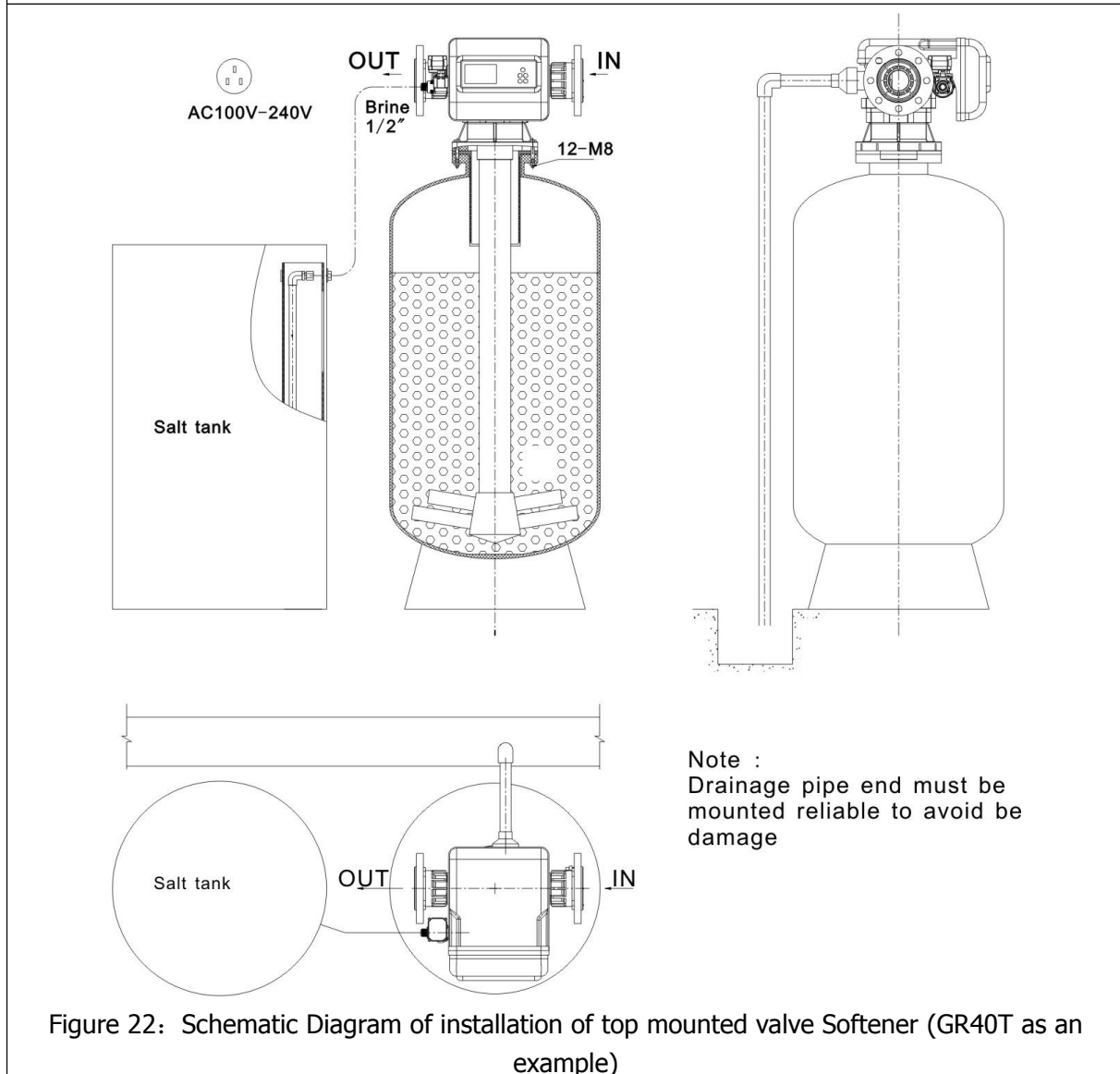
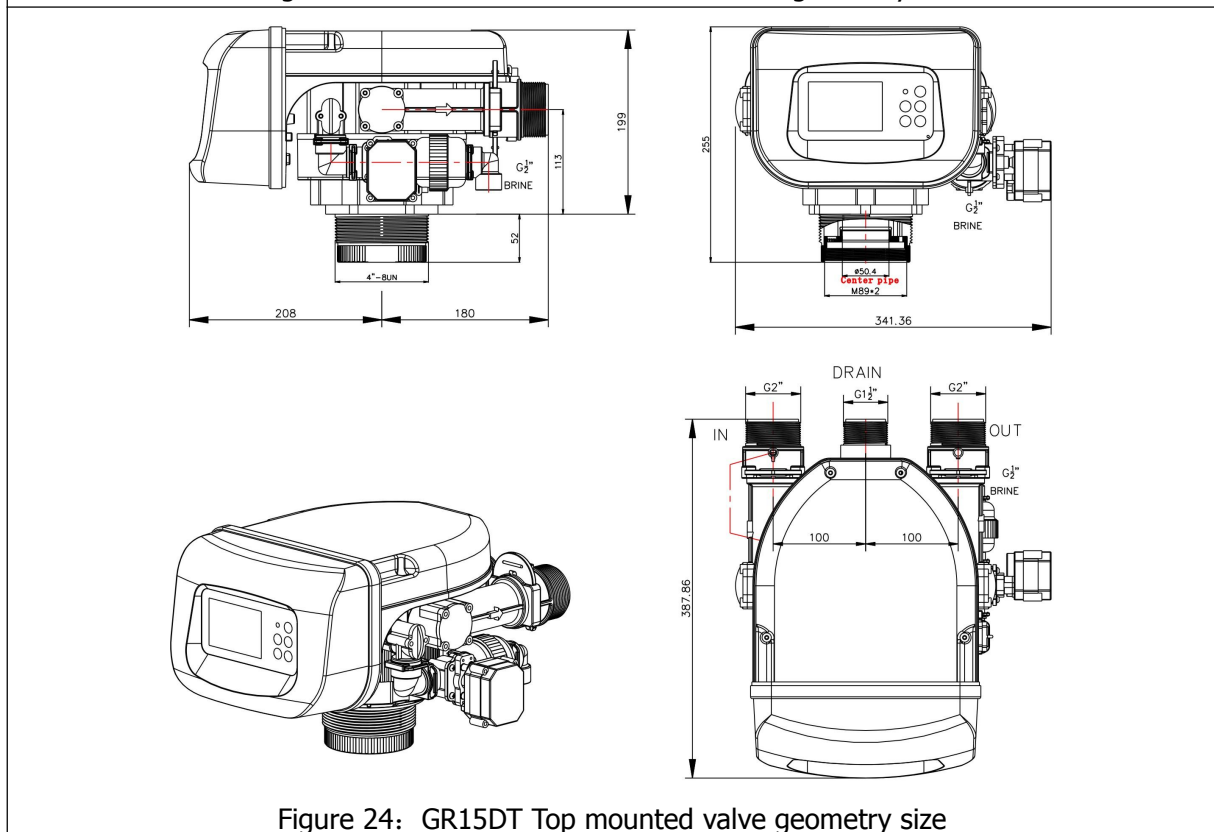
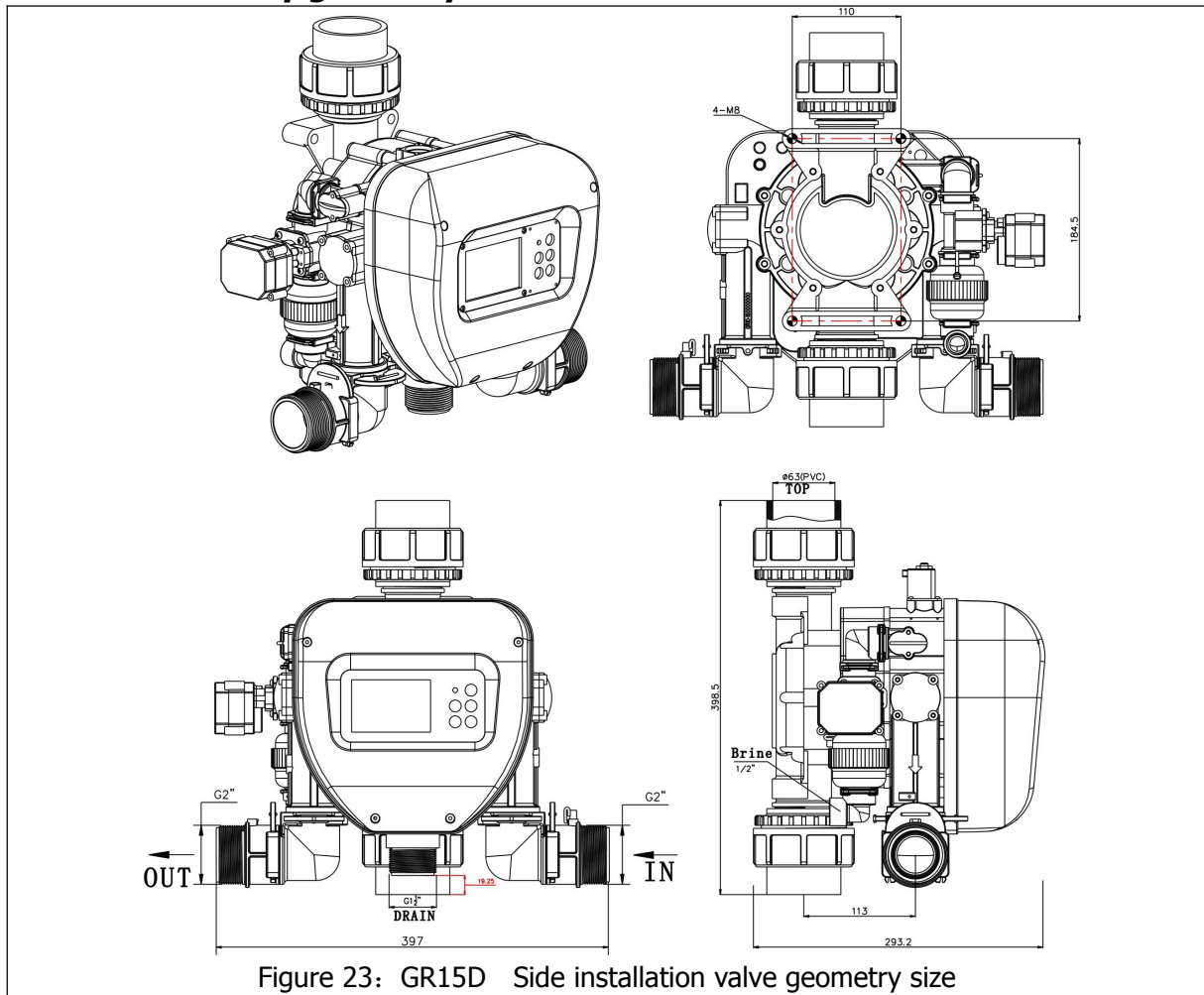


Figure 22: Schematic Diagram of installation of top mounted valve Softener (GR40T as an example)

4、 The Valve body geometry size



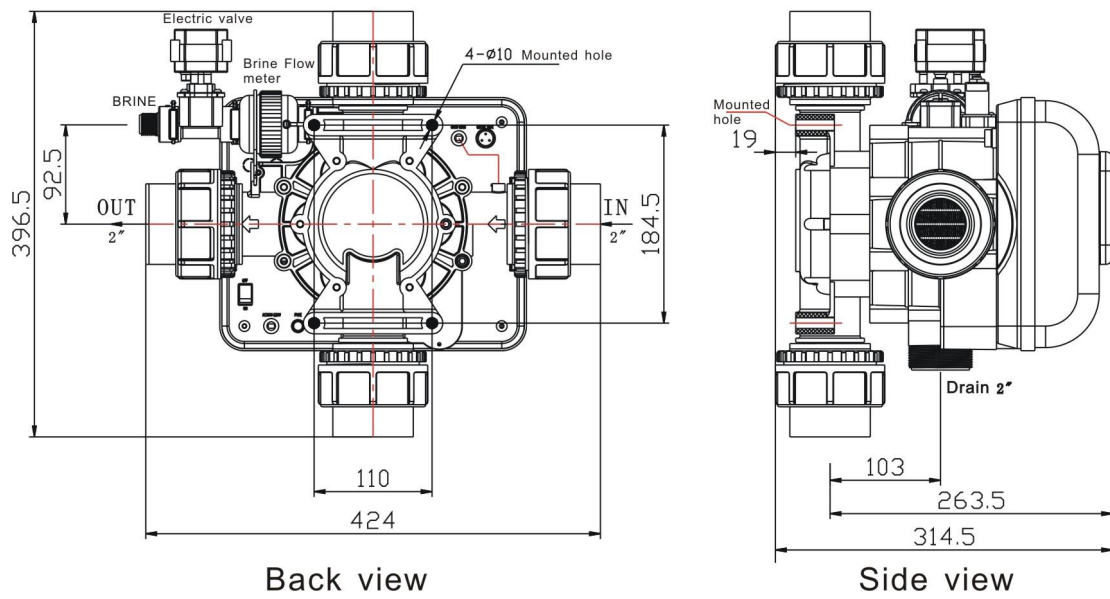


Figure 25: GR20D Side installation valve geometry size

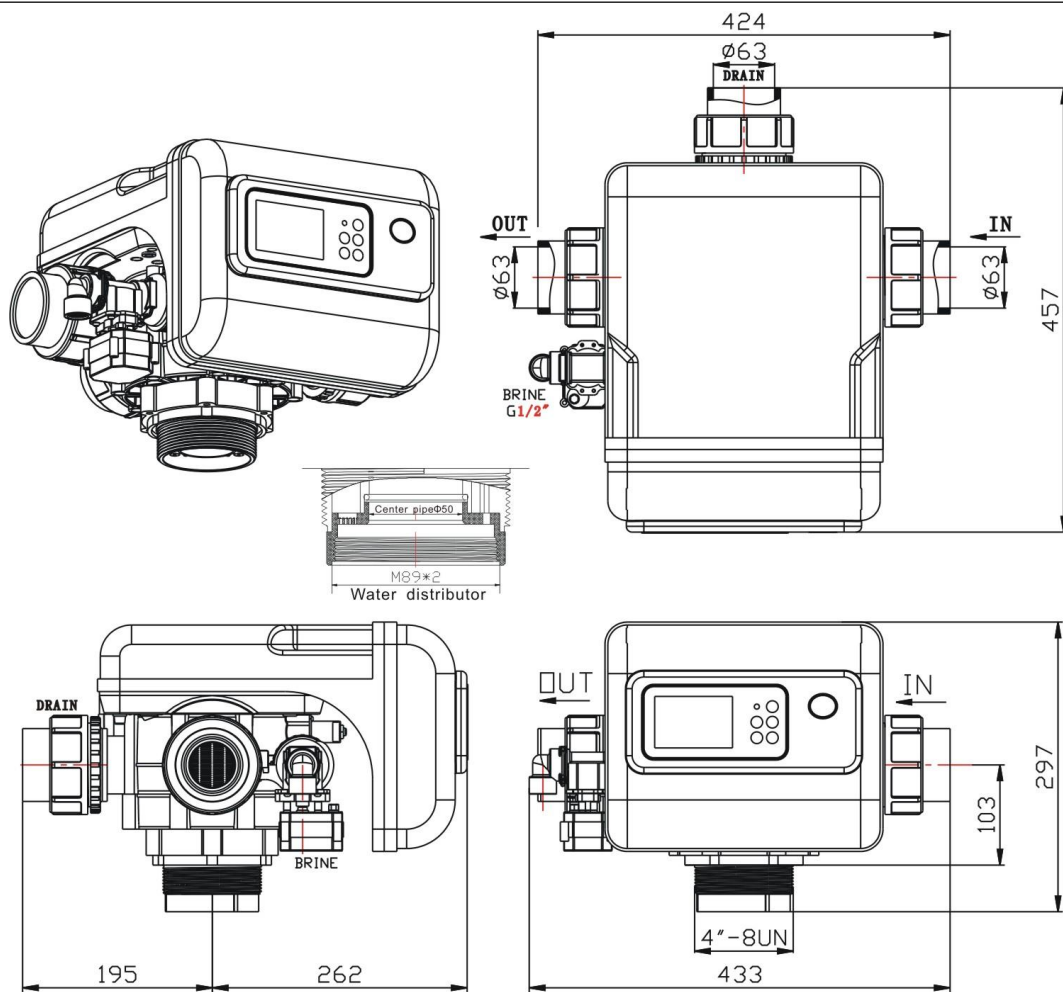
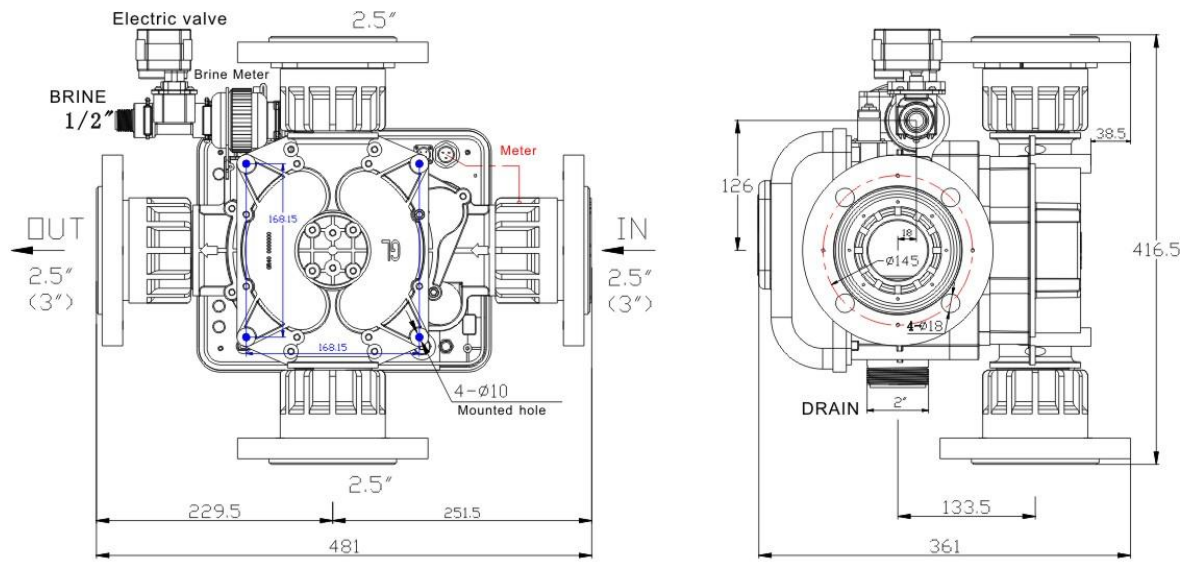


Figure 26: GR20DT Top mounted valve geometry size



Back view
Side view
Figure 27: GR40D Side installation valve geometry size

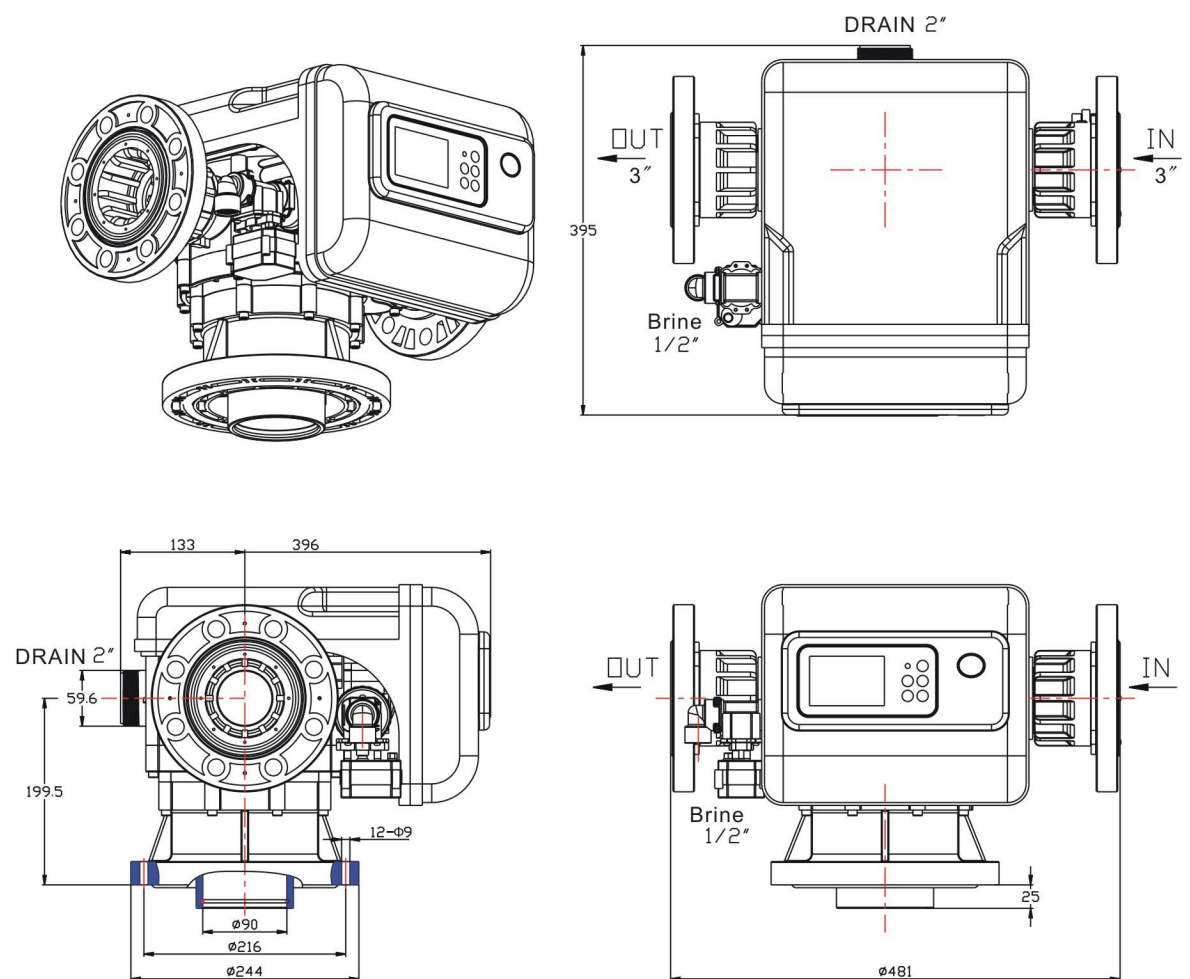


Figure 28: GR40DT Top mounted valve geometry size

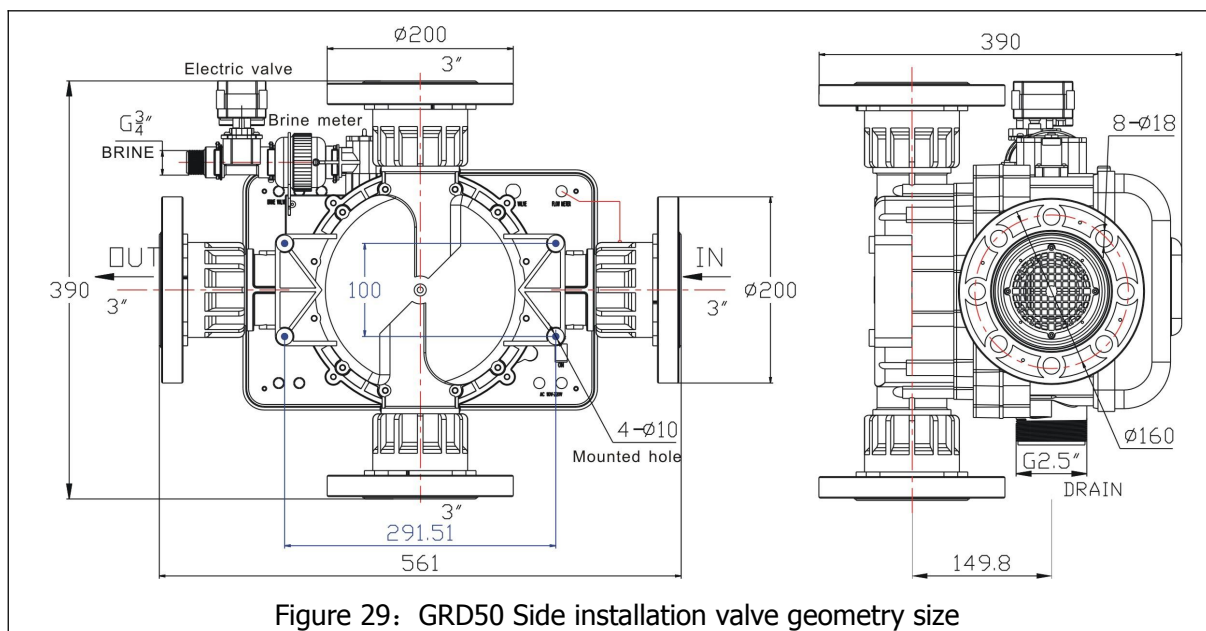


Figure 29: GRD50 Side installation valve geometry size

V. Tips and Precautions of Equipment

1. The equipment should use industrial salt with the size of more than 4mm to guarantee the smooth passage of water filling and salt absorbing. 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. The bottom of the salt tank needs to be checked frequently; the deposit and sludge need to be cleared out.
3. 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 water amount.

VI .Conditions of use

- 1, The equipment must be installed the water filter in the feed water pipe to prevent clogging;
- 2, Feed water pressure should be kept constant, When the water source is well water or low water tank provided by the inlet pressure for the feed pump, A check valve shall be installed in the feed water line to prevent the feed water in the equipment from back flow when the pump stops. The outlet pressure of the equipment outlet pipe should be kept constant, and the inlet and outlet of the softening water tank should be higher than that of the equipment.
- 3, Equipment installed in the indoor, the working environment should be $1^{\circ}\text{C} \rightarrow 45^{\circ}\text{C}$, humidity is not too high, there should be no corrosive chemical gases, control valve note waterproof. Strong electromagnetic interference may have influence on the normal work of the device. Environment should be tolerated to some extent the leaking equipment accident.
- 4, The water pressure 0.10MPa ~0.6 MPa, less than 0.10 MPa should add booster pump, above 0.6 MPa should add pressure reducing valve.
- 5, Brine absorption and water refilling are automatically controlled by the brine flow meter and electric valve. The salt valve serves as a safety protection for water refilling and has the function of filtering and water refilling and throttling.

VII. Regular failure and failure elimination

1、Soft water hardness become high

Phenomena/reasons	Solution
No salt in the brine tank	Add salt to the brine tank
Clogged salt filter in the salt tank	Clean it regularly and guarantee sufficient amount of water injection
Water rate is too large, running velocity is too high	Reduce the pressure difference between the inflow and outflow
No enough resin and too much space at the top of the swap tank	Add more resin to reduce the space

2 、Salt leaking out to the water outlet

Too little washing water	Set to increase washing water
No enough resin, existence of concentration water at the top of the swap tank and too much space cause incomplete cleaning	Add more resin and reduce the space

3 、Increase of the inflow pressure and decrease of the flow rate of outlet

Resin's being polluted by the suspended matter	Shorten the number of backwash cycles and increase the amount of backwash water
The upper water distributor is blocked by broken resin	Unload the water distributor and clean it
Outlet Water pipes system have blocking phenomenon	Check and eliminate the problem

4、Poor brine absorption of the controlling valve

Phenomena/reasons	Solution
drainage pipe has jam	Check whether the exit of the drain pipe is clogged
Clogged ejector	Remove the water injector end cover, check the jet nozzle and clean.

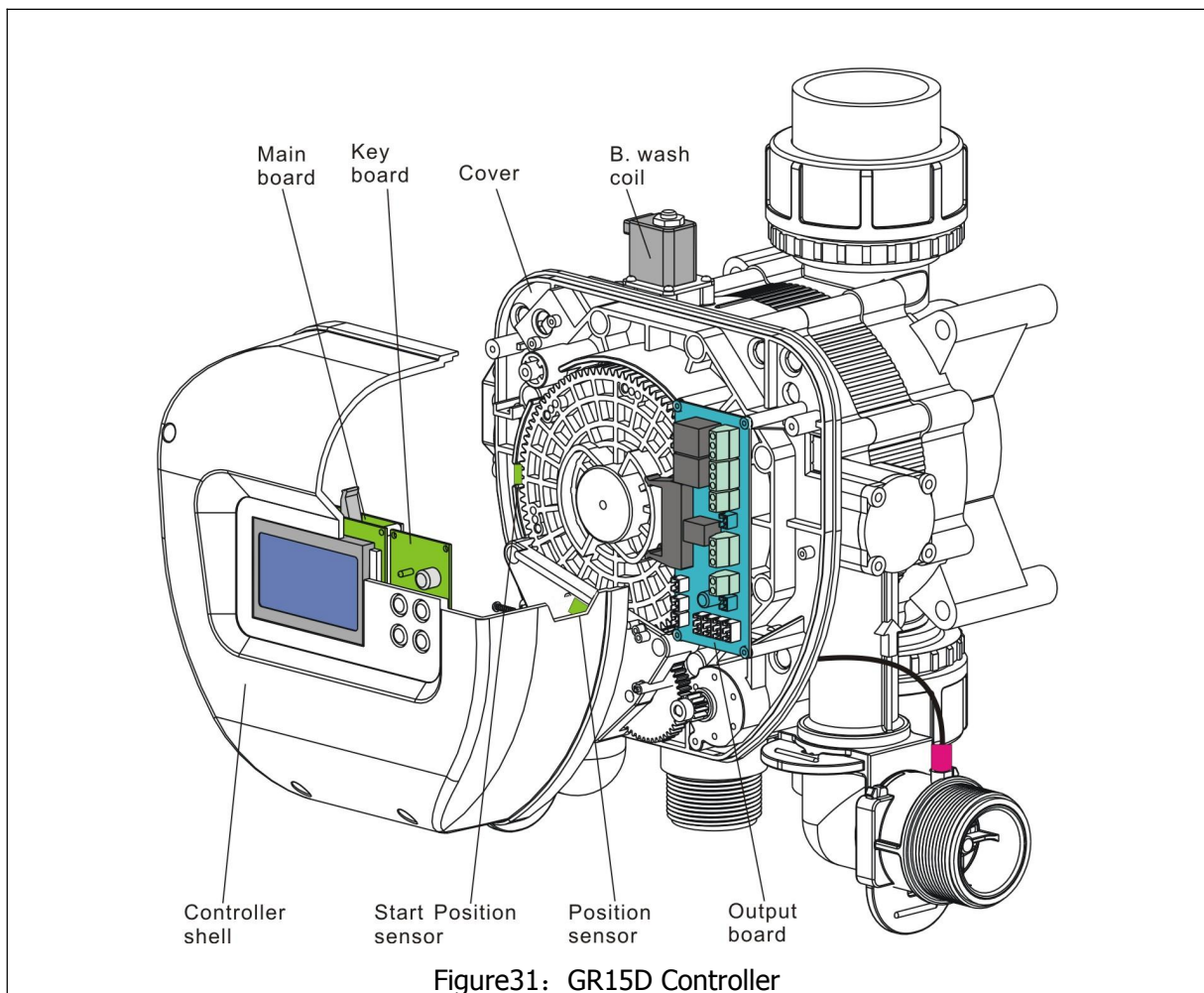
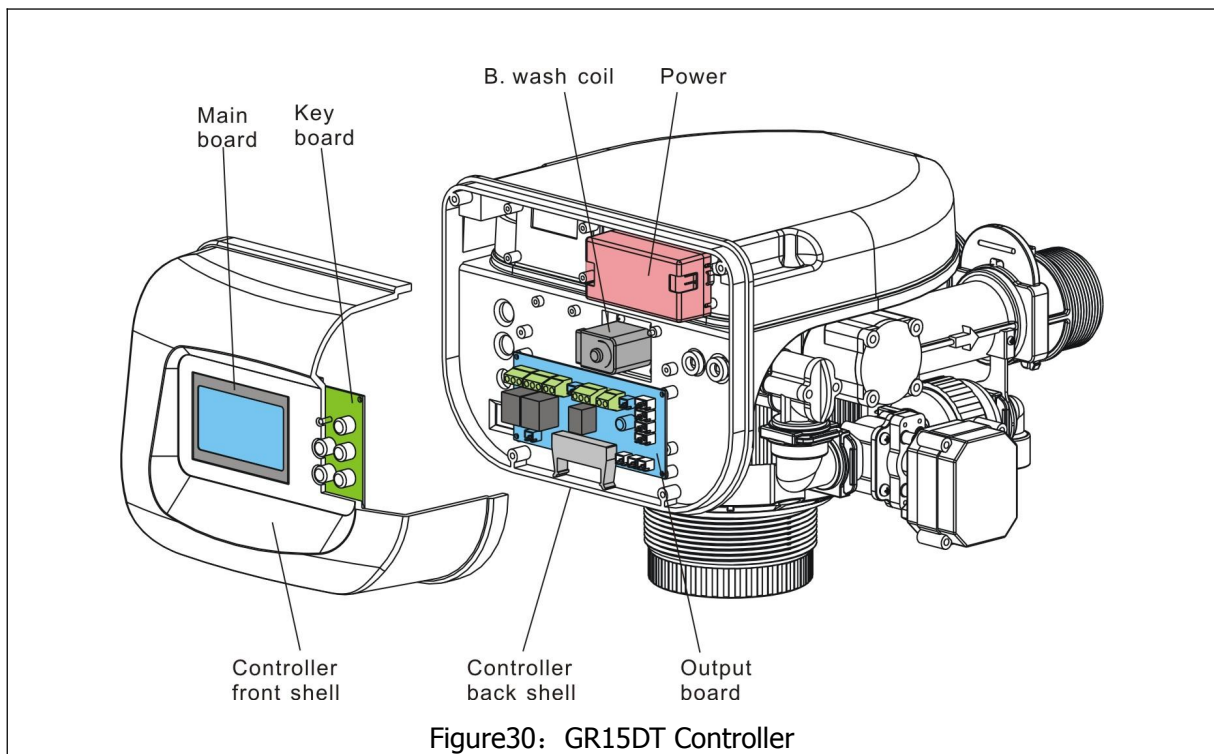
5、The value of inlet flow parameter does not decrease

The equipment has water flow out, the inlet flow parameter value does not decrease, the main valve does not switch.	If the impeller of the inlet flow meter is stuck by foreign matter or foreign matter is absorbed by the magnet, which causes rotation failure, remove the inlet flow meter and clean up
	Abnormal flow sensor or sensor wire plug comes off
During regeneration, the brine flow value does not decrease	The impeller of the brine flow meter is stuck by foreign matter or foreign matter is attracted on the magnet, which causes the rotation to be ineffectual.

6、Abnormal discharge

Phenomena/reasons	Solutions
Water is discharged from the drainage pipe all the time when it is servicing	If there is any foreign matter or damage in the valve core, ceramic ring or silica gel ring, open the main valve, remove and repair it and check whether the front filter is abnormal.

IX、 Control valve decomposition figure



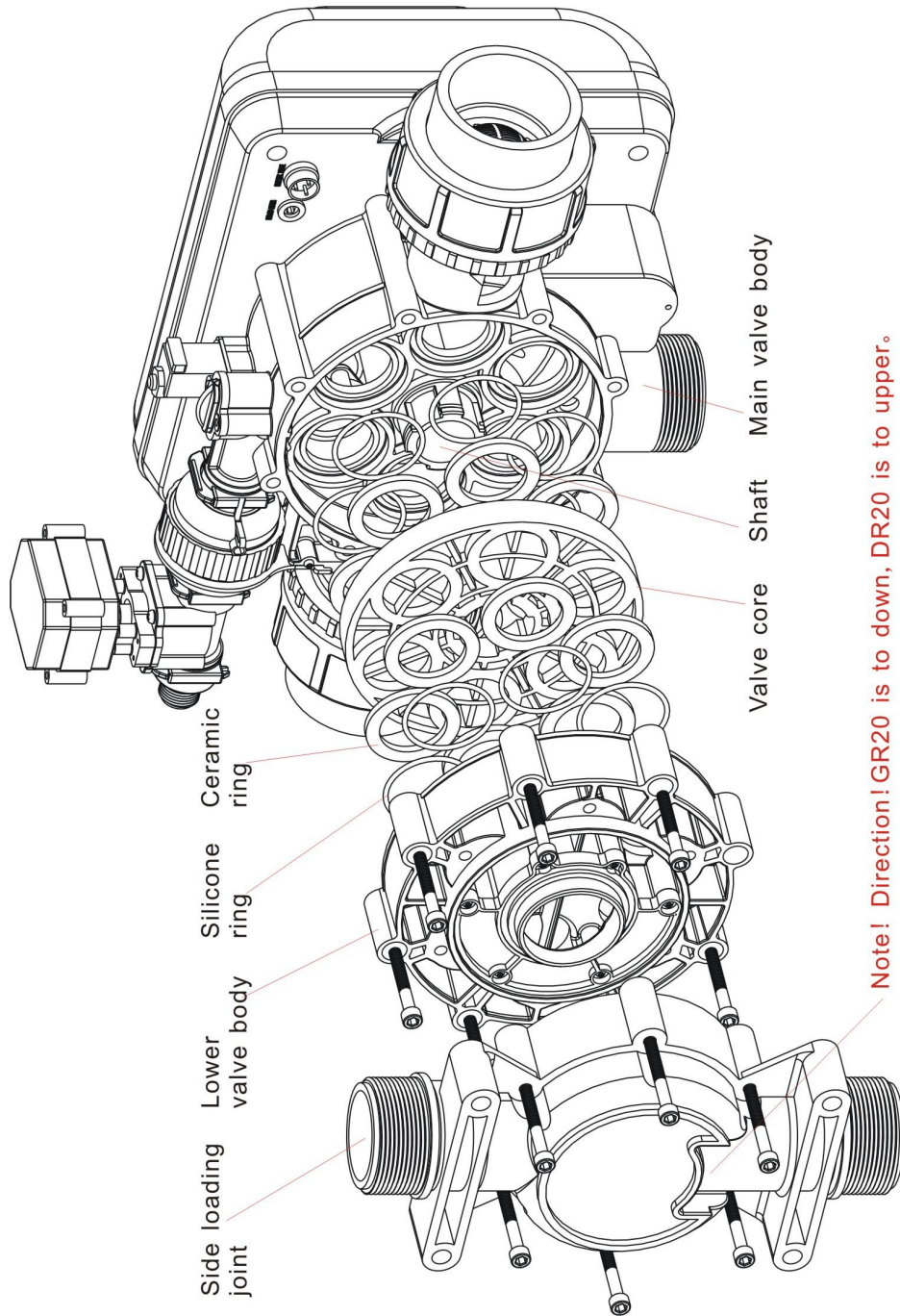


Figure 32: Valve core (GR20D example)

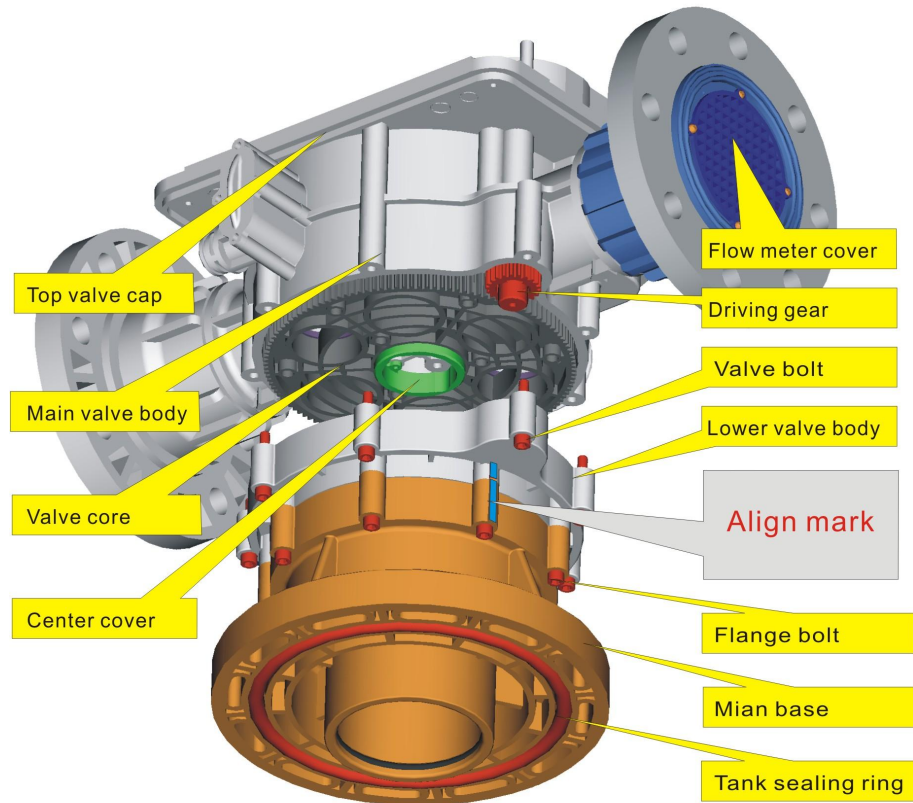


Figure33: GR40DT valve core and valve seat

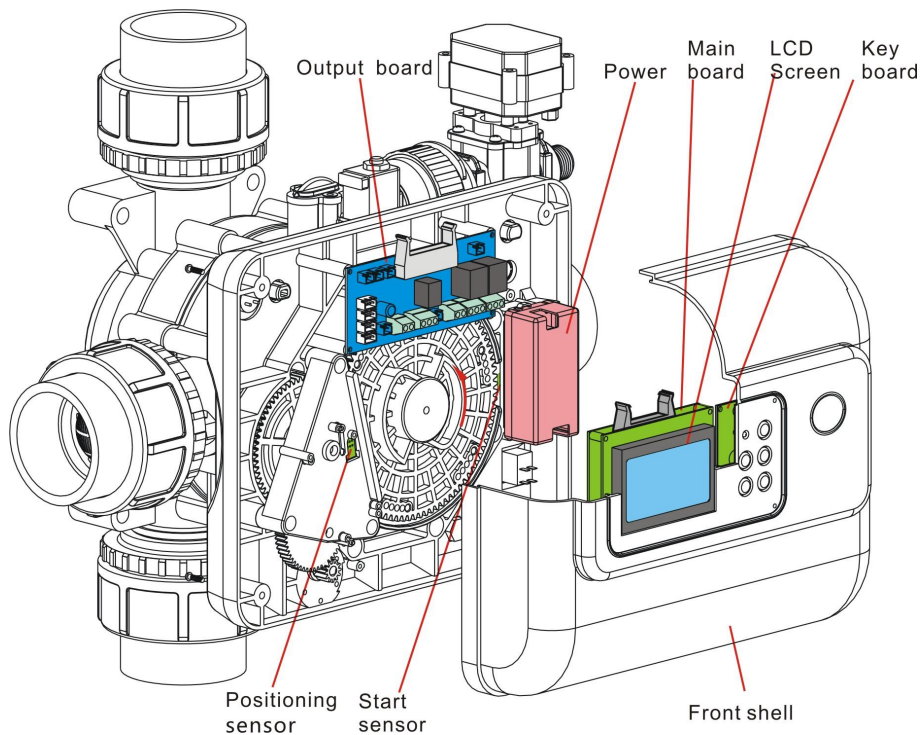
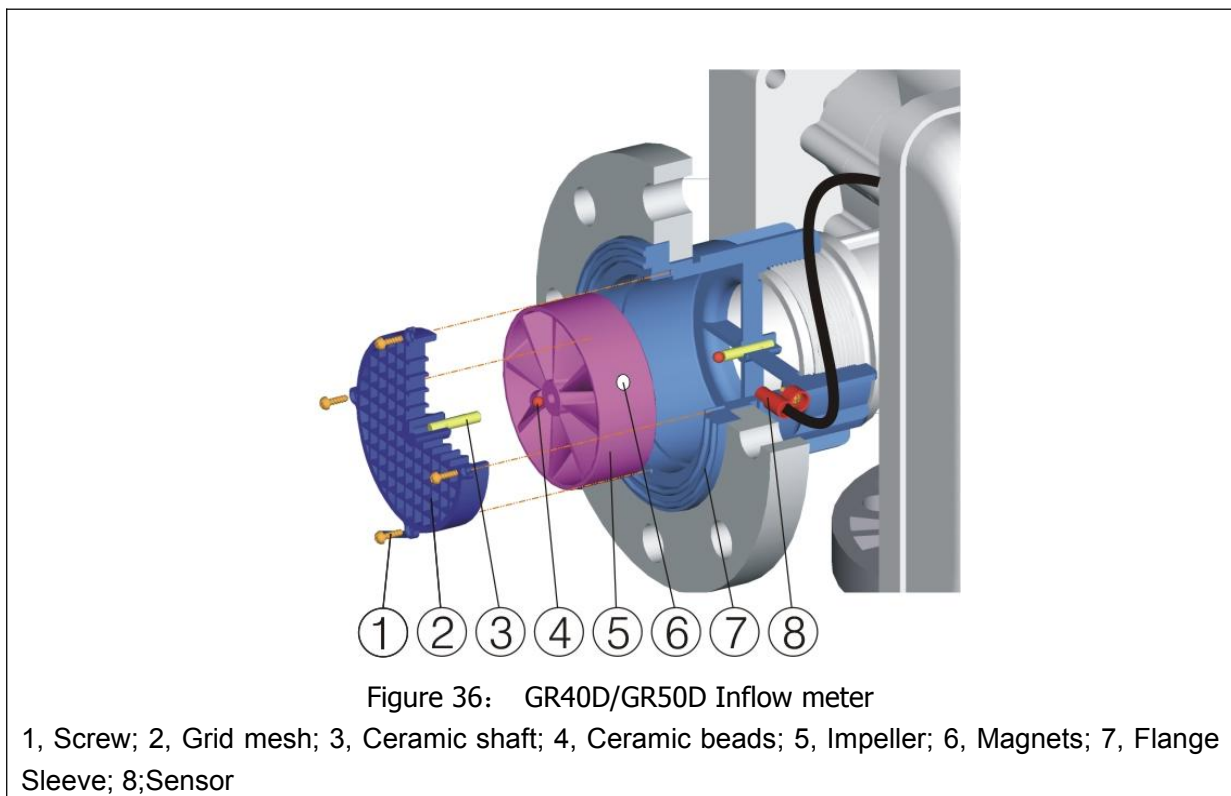
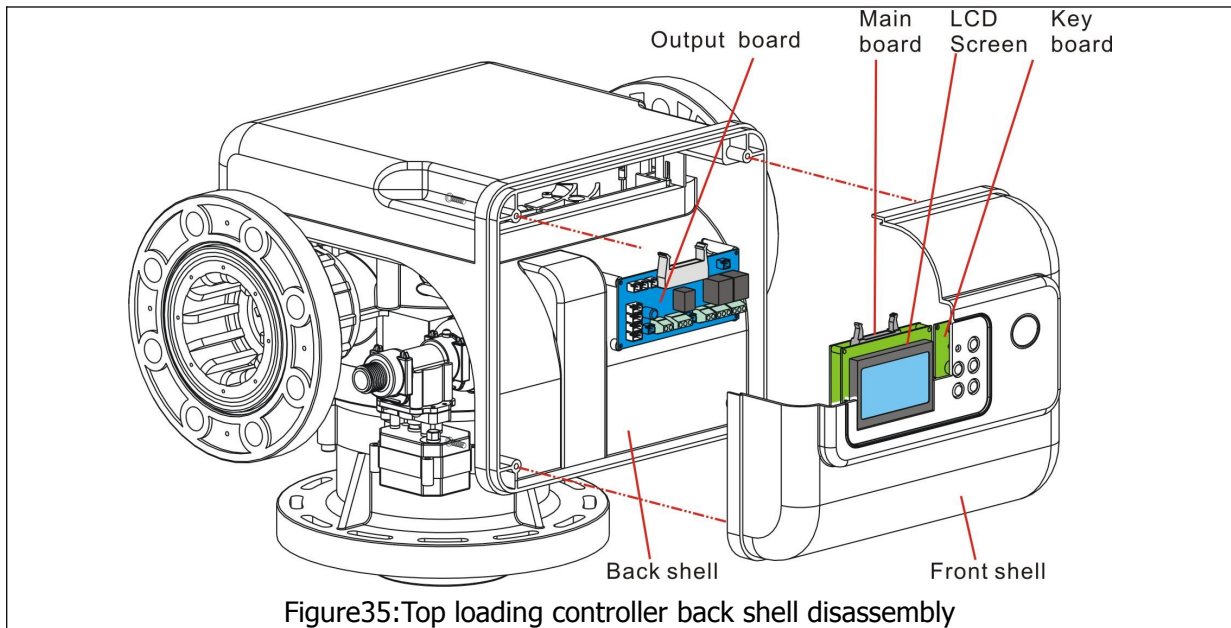


Figure34:Side loading controller front shell disassembly



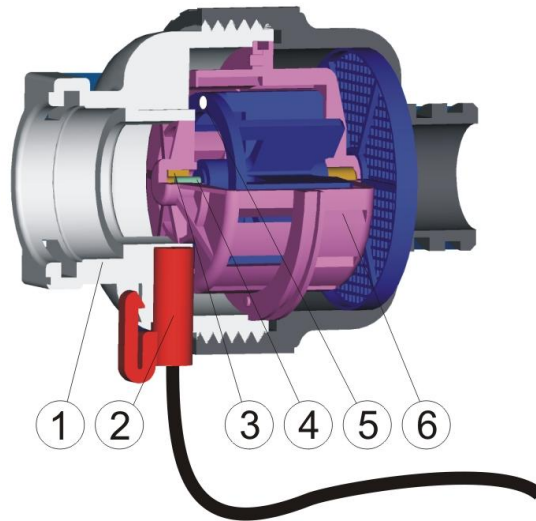


Figure 37: Brine flow meter

1、Shell; 2、Sensor; 3 Sleeves; 4、 Axis; 5 、 Magnet; 6、 Eddy current detector

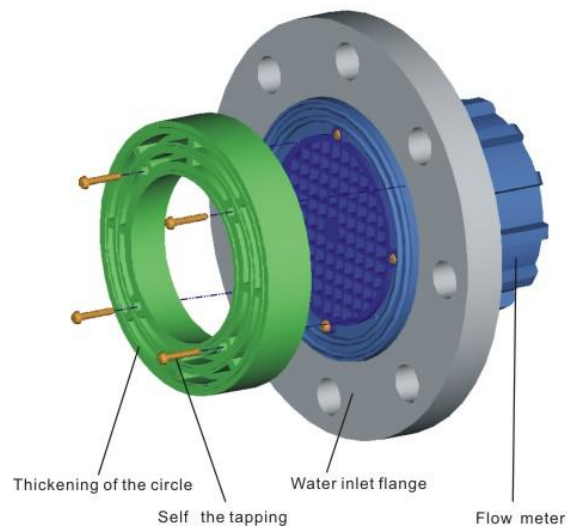


Figure 38: Thickening of the inlet butterfly valve

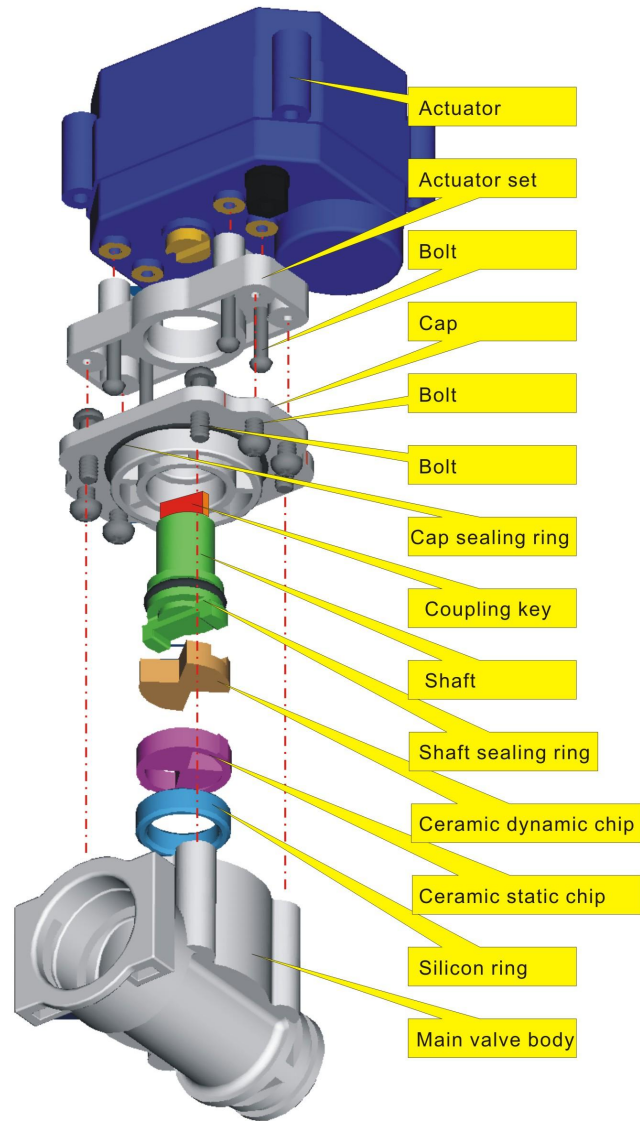


Figure 39: Brine Electric valve

X Curve of Flow and Pressure for the Valve

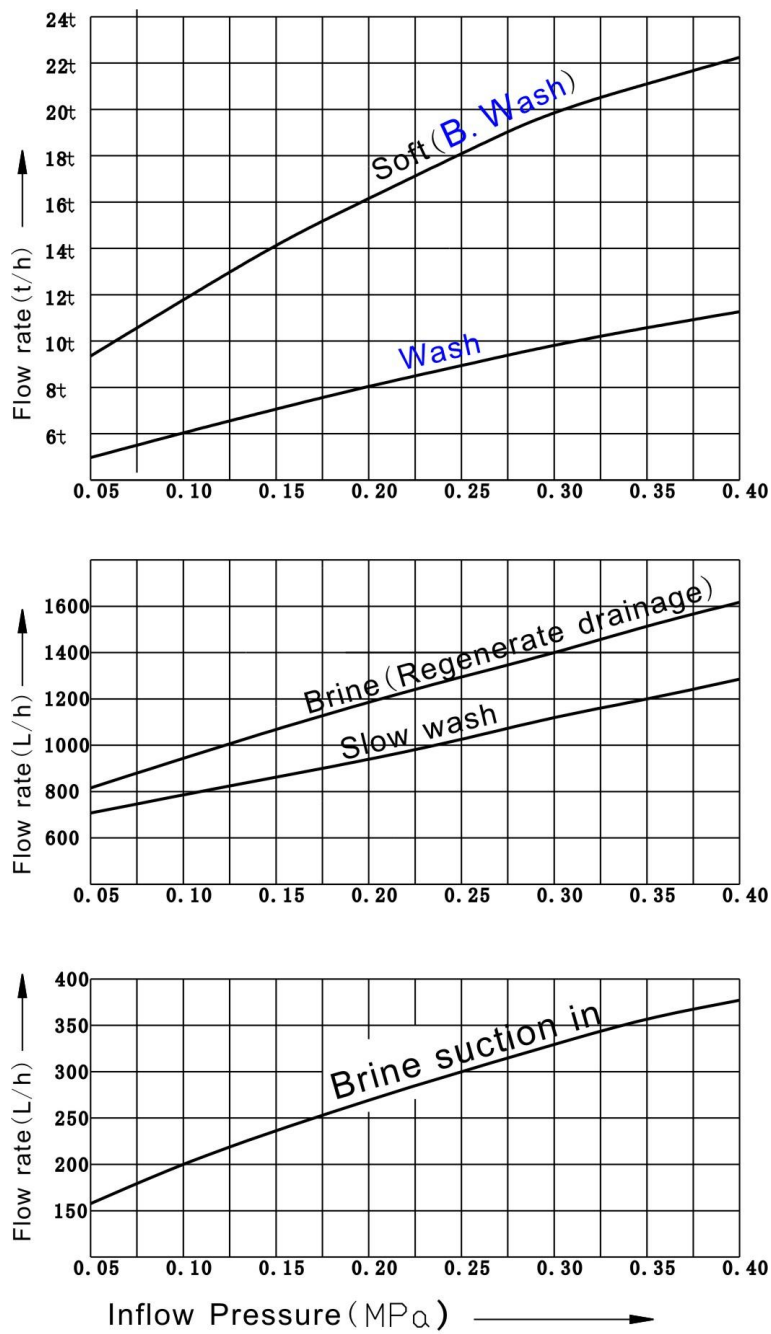


Figure40:Curve of Flow and Pressure for the Valve GR15D

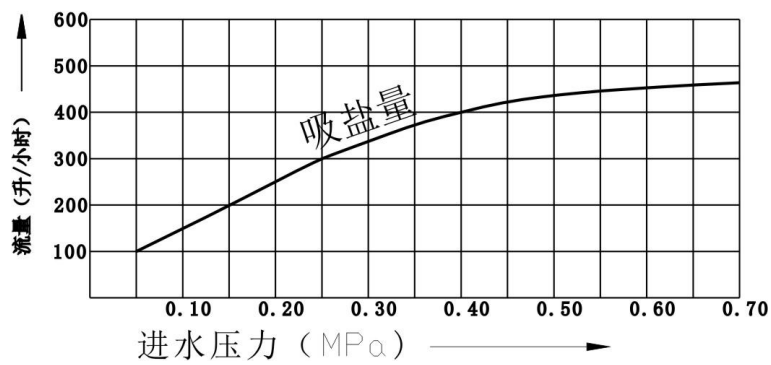
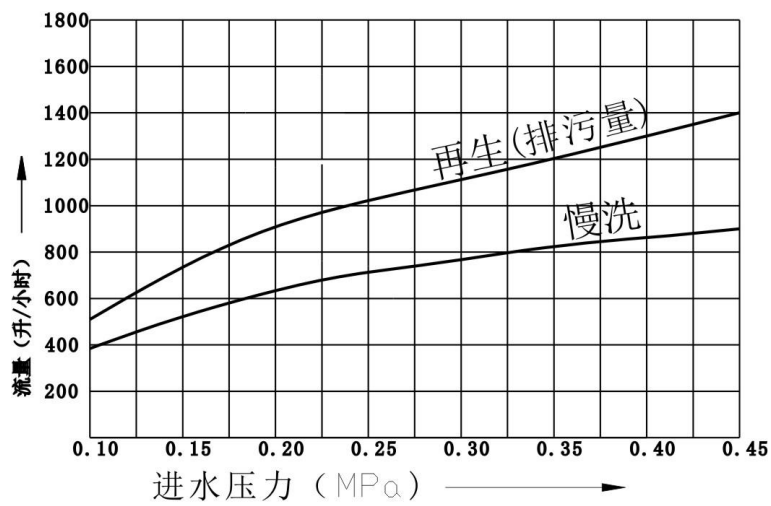
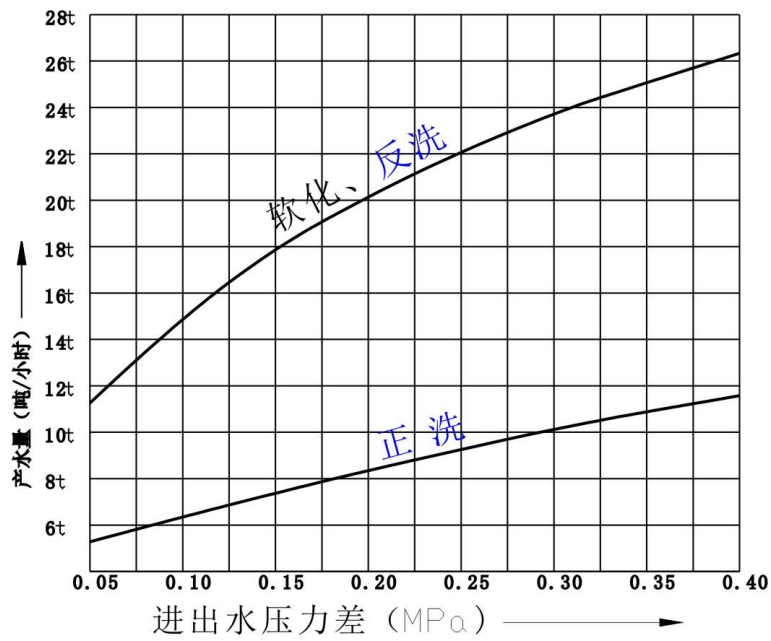


Figure 41: Curve of Flow and Pressure for the Valve GR20D

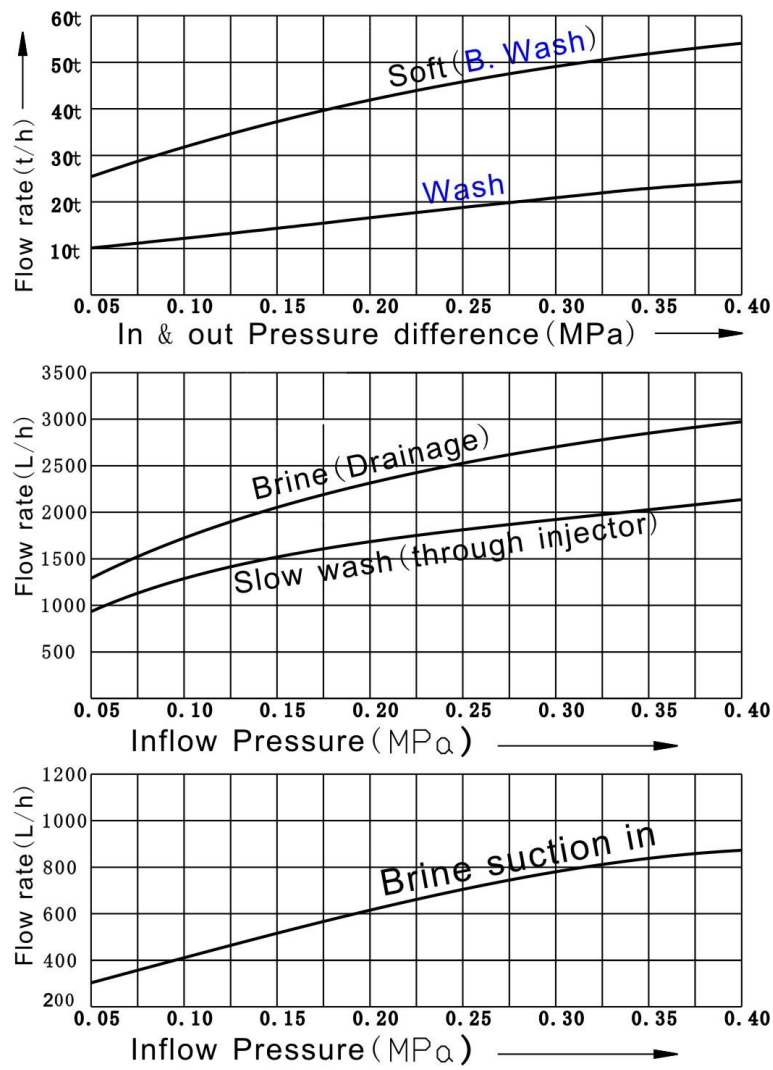


Figure42:Curve of Flow and Pressure for the Valve GR40D

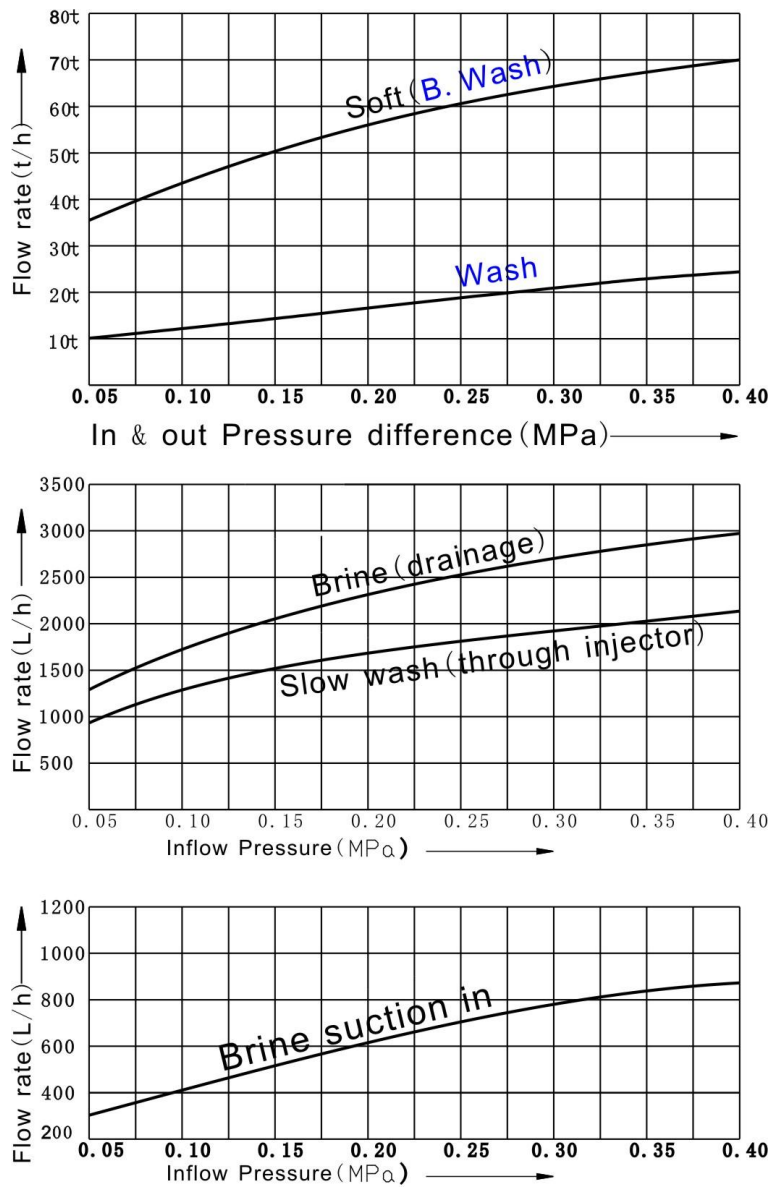


Figure 43:Curve of Flow and Pressure for the Valve GR50D