



China patent No.:
ZL02220153.X,
ZL200720045551.5

Multi-functional Flow Control Valve for Water Treatment Systems

93540 (Old Model No.: F78C1)

93640 (Old Model No.: F78C3)

91240 (Old Model No.: F78CS)

Instruction Manual



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



0WRX.466.516

MODEL: 93540-F78C1/93640-F78C3

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

For F78CS, it doesn't have relative electronic part function.

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. (Time clock type by days or hours or Meter 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
Water Treatment Capacity (Meter type)	M ³	400	
Control Mode A-01(02)	/	A-01	
Service Days (Time clock type, by days)	D.	03	
Service Hours (Time clock type, by hours)	H.	20	
Regeneration Time	/	02 : 00	
Settling Bed Time	min.	10	
Brine Drawing Time	min.	60	
Soak Time	min.	1	
Slow Rinse Time	min.	45	
Fast Rinse Time	min.	10	
Brine Refill Time	min.	05	
Interval Regeneration Days	D.	30	

● If there is no special requirement when product purchase, we choose 3# drain line flow control and 3# injector for the standard configuration.

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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 clean water softening salts 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.
- Control valve for floating bed have higher requirement for water inlet pressure, the pressure is better between(0.2-0.3)MPa. It is advised to install a regulator valve in the inlet pipeline. If the water pressure exceeds 0.6Mpa, a pressure reducing valve must be installed before the water inlet. While, if the water pressure under 0.2MPa, a booster pump must be installed before the water inlet.
- It is suggested to install PPR pipe, corrugated pipe or UPVC pipe, instead of TTLSG pipe. The pipeline should be straight.
- Please use floating bed specialized tank as resin tank, the water should be distributed equally (It is better to use cap type strainers). The volume of resin should be filled up to 10---20cm from top strainer.
- Do not let children touch or play, because carelessness operating may cause the procedure changed.
- When the attached cables of this product and transformer are changed, they must be changed to the one that is from our factory.
- Please add disc filter in the inlet of the valve.

1.Product Overview

1.Product Overview

1.1.Main Application & Applicability

Used for softening or demineralization water treatment systems

Suit for the ion exchange equipment which hardness of the water $< 15\text{mmol/L}$

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. The main valve uses the structure of four tee pistons. The distribution valve is combined with main valve.

➤The water for brine & slow rinse is soft water

Using soft water to brine & slow rinse, it is controlled by soft water pump and electronic ball valve. It can improve the regeneration effect.

➤Brine refill is using soft water

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

➤Variety kinds of installation methods.

The valve installs in side of tank, easy to operate.

Inlet, outlet, and drain adopt UPVC pipe by sticking, it comes with animated connector.

Inlet can connect pressure gauge. Sampling valve on outlet.

➤Manual function

Realize regeneration immediately by pushing  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, it indicates the control valve is in service, otherwise, it is in regeneration cycle.

➤Button lock

No operations to buttons on the controller within 1 minute, button lock indicator light on which represent buttons are locked. Before operation press and hold the  and .

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Buttons for 5 seconds to unlock. This function can avoid incorrect operation.

➤ **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 .(Application refer to Figure 2-7)

➤ **Remote handling input**

This connector can receive external signal, used together with PLC, and computer etc. to control the valve. (Application refer to Figure2-6)

➤ **Soft water pump connector**

Control the soft water pump through this connector. Connect the inlet of the soft pump with soft water tank, the outlet of the soft water pump with the inlet of electronic ball valve, connect the outlet of the electronic ball valve with the inlet of injector. When brine & slow rinse, soft water pump open, using softened water to regenerate. (Please refer the figure 2-3/4 wiring connection) It is better to choose soft water pump which flow rate is 4-5 t/h, and the pump head is 40m.

➤ **Inlet water pump connector**

When the pressure of the inlet is too low, can install inlet water pump through this connector. Increase the inlet pressure. Connect the inlet of inlet water pump with the water pipeline, connect outlet of the inlet water pump with the inlet of the valve, in order to increase the working pressure. (Please refer the figure 2-1/2 connect way)

➤ **All parameters can be modified**

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

➤ **Two meter types for optional (Suit for F78C3)**

Mode	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 F78C3)**

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:

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Item		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	<2FTU
	Water hardness	<15mmol/L
	Free chlorine	<0.1mg/L
	Iron ²⁺	<0.3mg/L
	(CODMn) CODMn	<2mg/L (O ₂)

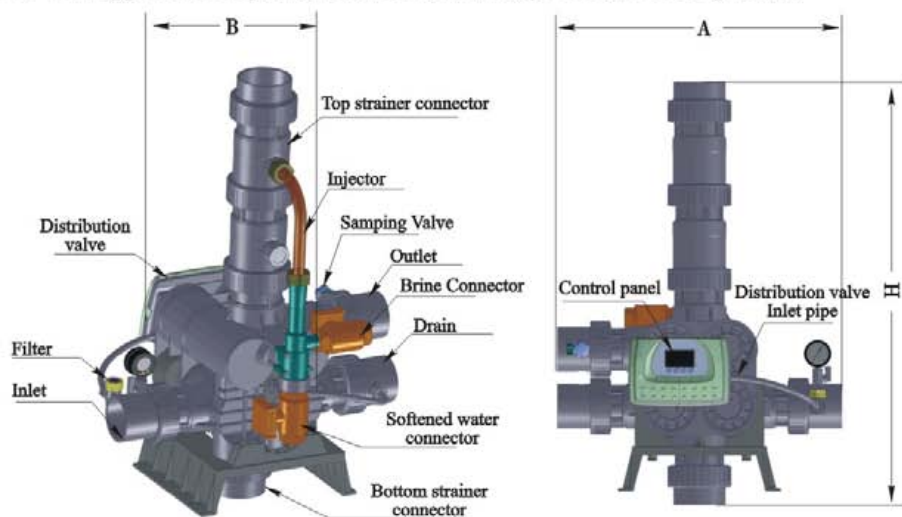
● When the water turbidity exceeds the conditions, a filter should be installed on the inlet of control valve.

● 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.

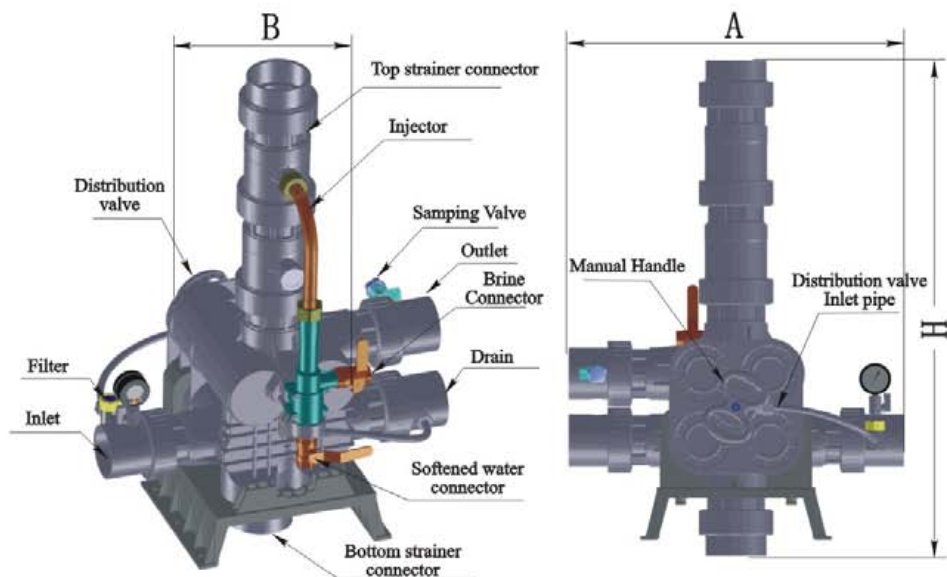
● Manual valve don't have electronic part, it need person to control the regeneration. Soft water pump need to install independent circuit which controlled by person.

1.4.Product Structure and Technical Parameters

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



MODEL: 93540-F78C1/93640-F78C3



Model	A (mm) max	B (mm) max	H (mm) max
F78C1/93540	561	545	833
F78CS/91240	561	509	833

B. Technical parameter

The suitable output of transformer for control valve: DC12V,1.5A

Model	Connect size				Flow Rate m ³ /h @0.3MPaa	Regeneration Mode	Remark
	Inlet/ Outlet	Drain	Brine Line Connector	Top and Bottom Strainer			
F78C1	DN65	DN65	G3/4	DN80	40	By days	Floating bed
F78C2						By hours	
F78C3						Meter type	
F78CS						Manual control	

Notice: DN65-Outer diameter is ϕ 75 UPVC pipeline.

DN80-Outer diameter is ϕ 90 UPVC pipeline.

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, 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 need to be close to softener
- ④The unit should be kept away the heater, and not be exposed outdoor. Sunshine or rain will cause the system damage.
- ⑤Please avoid to install 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℃.
- ⑦One place is recommended to install the system which cause the minimum loss in case of water leaking.

C. Pipeline installation

①Support installation

Take out the whole fittings and screws, install them according to the figure 1-1. When install support, each number of support should be in correspondence.



Figure 1-1

MODEL: 93540-F78C1/93640-F78C3

②Install control valve

- As the Figure 1-2 shows, insert the riser pipe to the bottom strainer and put it into the bottom of the tank.
- Fill the mineral to the tank, install the stop strainer and the height is accordance with the design code. (The resin volume is filled up to 200mm from the tank opening.)
- Connect the control valve and support with screw.
- Choose the suitable position to install the valve. Using DN80 (Outer diameter is $\phi 90$) UPVC pipe to connect top and bottom strainer connector with tank's top and bottom strainer.

Notice:

● Pipeline installation should be straight, and shall not make control valves or the fittings by torsion

● Avoid floccules substance together with resin to fill in the mineral tank.

● The resin volume is filled up to 200mm from the tank opening. Or else, the resin will be layered in disorder, which result in treated water disqualified.

● Control valve for floating bed don't need backwash, after resin used for a certain time, it should be taken out of the tank for washing. So the turbidity of the water inlet should be $<2\text{FTU}$.

③Install flow meter and the inlet/outlet pipeline

- Install flow meter (Manual valve don't have flow meter.)



Figure 1-2

Safe notice:

- Before installation, make sure there is no pressure in pipeline and check if pressure released completely.
- Before installation, make sure the tested liquid won't make corrosion for the probe. (The testing subject of the probe is water)
- Before installation, make sure the temperature and pressure is comply with the probe's requirement. (The temperature of the liquid: $1\sim 45^{\circ}\text{C}$; Testing pressure: $\leq 0.6\text{MPa}$)
- Before installation, make sure the flow rate of the liquid won't exceed the probe's range. (Testing range: $1\sim 5\text{m/s}$) .
- 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 times back of pipe 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 need to confirm the impeller in free rotating, there is no obvious block phenomenon.

B. When the flow meter stop measuring but the tested liquid still flow, it can check the work mode of probe online. Screw the probe nut A out, and check the working condition of the diode on the back of probe. If the diode always light 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.

C. If the probe has impeller broken, the top bracket of probe damaged, bearing bended, after repairing but still unable to free rotation, or the wetted part has corrosion, or the installation screw thread serious damaged, it shall replace a new probe.(Refer figure 1-3)

D. If the diode on the back of probe work normally, but the display board show incorrect, please check if the probe wire has any damage and use a multi-meter to check the voltage between shielding and black wire if normally. If the diode light on, there is no voltage output, and if the diode light off, there is voltage output.

E. As the staining in liquid may cause impeller rotation not smooth, it may affect the measurement accuracy of probe. Therefore, it shall inspect and clean the impeller of probe periodically.

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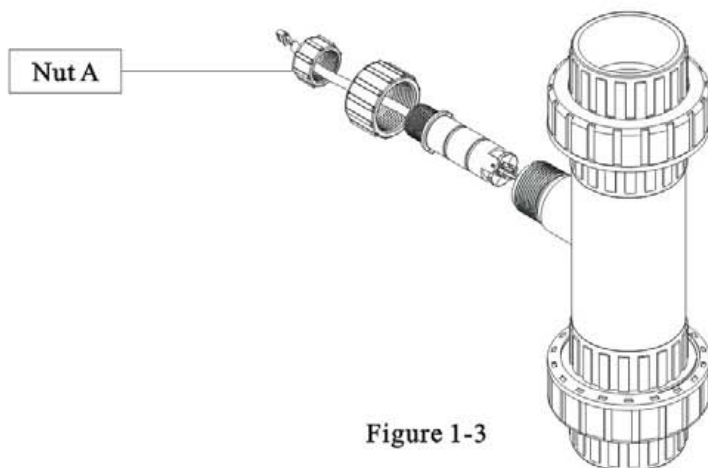


Figure 1-3

- 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 DN65 UPVC pipeline (The outer diameter is $\phi 75$); Glue the flow meter with outlet of the valve with DN65 UPVC pipeline (The outer diameter is $\phi 75$); Glue the outlet of the system with flow meter with DN65 UPVC pipeline (The outer diameter is $\phi 75$).
- e. Disassemble the front cover of the valve, connect the flow meter to the flow meter connector of the main control board.(Refer P24 main control board figure)

Notice:

- If making a soldered copper installation, do all sweat soldering before connecting pipes to the valve. Torch heat will damage plastic parts.
 - When turning threaded pipe fittings onto plastic fitting, use care not to cross thread or broken valve.
 - Inrallel with outlet pipeline. Support inlet and outlet pipeline with fixed holder.
 - If the valve belongs to time clock type, there are no flow meter installation step.
- ④Install drain pipeline. (If no special request, the injector is 7803)
- a. According to P28, for F78C, if the diameter of the tank is 1400mm or 1500mm, please do as step e; if the diameter of the tank is less than 1400mm or longer than 1500mm, please do as following:
 - b. According to P29, match the drain line flow control based on the number and size of the hole.
 - c. Use the white manual handle as figure 1-4 shows to open the drain connector, take out the drain line flow control, change it to the suitable one. (Please refer the hole of P29)

MODEL: 93540-F78C1/93640-F78C3



Figure 1-4

- d. Tight the drain connector with the drain of the valve.
- e. Use DN65 (Outer diameter is $\phi 75$) UPVC pipe stick to the drain, drain pipeline should directly to the sewer, the sewer and the drain pipeline should installed as figure 1-5.



Figure1-5

MODEL: 93540-F78C1/93640-F78C3

Notice:

- Leave a certain space between the drain pipe and the sewer, avoid wastewater be absorbing to the water treatment equipment.
- The drain pipeline shouldn't be too long, and the drain should no more higher than the valve. For softener, drain pipeline should no longer than 5m; For filter, it should no longer than 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.



Figure1-6

⑤Connect brine tube

a. As figure 1-7 shows, use DN20 UPVC pipeline and other pipeline to connect the brine valve and the brine line connector of the valve. Notice:

- The brine pipeline should as shorter 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 which has air check function which has our check function in the brine tank.



Figure 1-7

Special instruction:

This series of valve need the inlet pressure $\geq 0.2\text{MPa}$, or the piston can't reach the right position which may result in internal mixing water. For RO pretreatment system and second grade Na^+ exchanger, as the pressure drop, the pressure of second and the third one can't reach at 0.2Mpa . There are following solutions:

a. As figure 1-8 shows, install a voltage regulator air pump which has a function of oil removal in the system (The pressure is 0.6Mpa , and the pressure should be bigger than the inlet's), disassemble the connector between the contribution valve and the inlet pipeline, and make the pipeline connect with the air pump, then block the G1/2 female connector on inlet pipeline.

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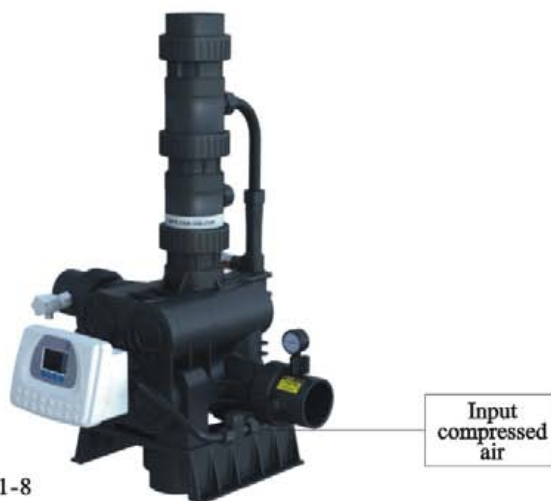


Figure 1-8

b. If the system can't offer a voltage regulator air pump, please refer the figure 1-9, disassemble the connector between the second and the third distribution valve and the inlet pipeline. Use a tee valve to connect the pipelines and make them in parallel with the first control valve's inlet pipeline. Finally block the G1/2 female inlet connector.

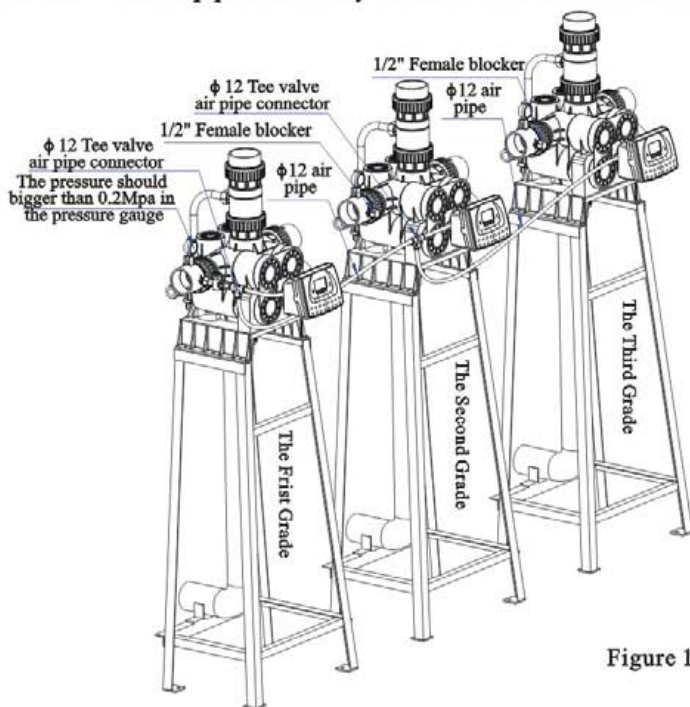


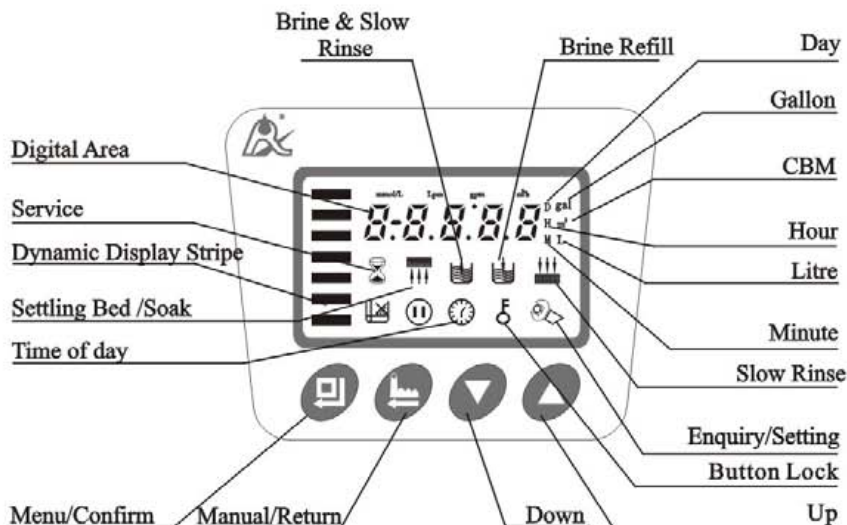
Figure 1-9

MODEL: 93540-F78C1/93640-F78C3

C. More than two sets of valve use as one in service one standby or several in service one standby, for using water pump system, the pump head should be more than 30m, the flow rate should be more than (30*set) m³/h. Don't choose low flow rate with high pump head to make sure there is 0.2MPa during working. Then, the system can work normally. If the flow rate can't meet the requirement, please solve the problem according to the instruction A.

2.Basic Setting & Usage

2.1.The Function of PC Board



A. ⌚ Time of day indicator

⌚ Light on, display the time of day.

"12: 12" Light flash, remind you to reset the time of day if electrical service interrupted 3 days more (If electrical service interrupted within 3 days, it doesn't need to reset the time.)

B. 🔒 Button lock indicator

● 🔒 Light 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 light off.



C. ⏸ Program mode indicator



● ⏸ Light on, enter program display mode. Use ▲ or ▼ to view all values.


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● Flash enter program set mode. Press ▲ or ▼ to adjust values.




D.  Menu/Confirm button



● Press ,  light on, enter program display mode and use ▲ or ▼ to view all values.


● In program display mode, press ,  flash, enter program set mode, press ▲ or ▼ and adjust values.

● Press  after all program are set, and then the voice “Di” means all setting are success and return program display mode.

E.  Manual/Return button

● Press  in any status, it can proceed to next step. (Example: 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 in Service; 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 lift the Button Lock status.

2.2. Basic Setting & Usage

A. Parameter specification

Function	Indicator	Factory Default	Parameter Set Range	Instruction
Time of Day		Random	00:00 ~ 23:59	Set the time of day when use; “:” flash.
Control Mode	A-01	A-01	A-01	Meter delayed: Regenerate on the day although the available volume of treated water drops to zero (0). Regeneration starts at the regeneration time.
			A-02	Meter immediate: Regenerate immediately when the available volume of treated water drops to zero(0).
Service Days		1-03D	0 ~ 99Days	Only for Time Clock Type, regeneration by day
Service Hours		1-20H	0 ~ 99Hours	Only for Time Clock Type, regeneration by hour
Regeneration Time	02:00	02:00	00:00 ~ 23:59	Regeneration time; “:” light on

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Water Treatment Capacity		400m ³	0~9999.9 m ³	Water treatment capacity in one circle (m ³)
Settling Bed Time		10min.	0~99	Settling bed time
Brine Drawing Time		60min.	0~99	Brine drawing time
Soak Time		1min.	0~200	Soak time
Slow Rinse Time		45min.	0~99	Slow rinse time
Fast Rinse Time		10min.	0~99	Fast rinse time
Brine Refill Time		5min.	0~99	Brine refill time
Maximum Interval Regeneration Days	H-30	30	0~40	Regenerate on the day even through the available volume of treated water do not drop to zero (0)

B. Process Display



FigureA



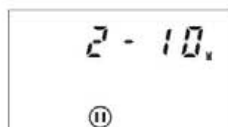
FigureB



FigureC



FigureD



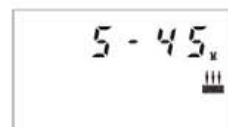
FigureE



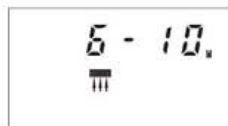
FigureF



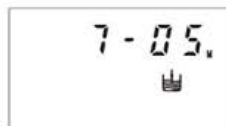
FigureG



FigureH



FigureI




FigureJ

Illustration:


● In Service status, the figure shows A/B/C/D; In Settling Bed status, it shows figure E/C; In Brine Drawing status, it shows figure F/C; In Soak status, it shows G/C; In Slow Rinse status, it shows figure H/C; In Fast Rinse status, it shows figure I/C. In Brine Refill status, it shows figure J/C. In each status, every figure shows 15 seconds.













MODEL: 93540-F78C1/93640-F78C3

- Above displays are taking the Meter Type for example. For the Time Clock Type, it shows the rest days or hours, such as 1-03D or 1-20H.
- The display screen will only show “-00-” when the electrical motor is running.
- The time of day figure “” flash continuously, such as “12: 12” flashes, indicates long outage of power. It reminds to reset the time of day.
- The display will show the error code, such as “-E1-” when the system is in error.
- Working process: Service → Settling Bed → Brine Drawing → Soak → 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 woks:

- ① 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 and iodized salt.
- ② Test the outlet water and raw water hardness at regular time. When the outlet water hardness is unqualified, please press the  under unlock status and the valve will temporary regenerate again (It will not affect the original set operation cycle)
- ③ When the feed water hardness change a lot, you can adjust the water treatment capacity as follow:

Press and hold both  and  for 5 seconds to lift the lock status. Press , and the  light on, hen press , the digital area show the control mode. If it shows A-01 or A-02, press  two times, and the digital area will show the given water treatment capacity; Press  again,  and digital flash. Press  or  continuously, reset the capacity value. Press  and hear a sound “Di”, then finish the adjustment. Press  exit and turn back the service status.

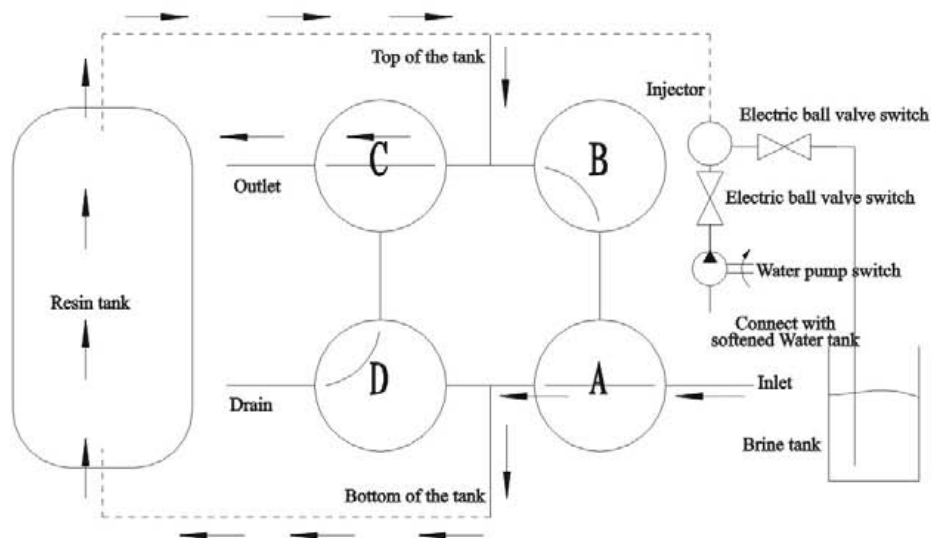
The estimation of water treatment capacity, you can refer to the professional application specification.

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

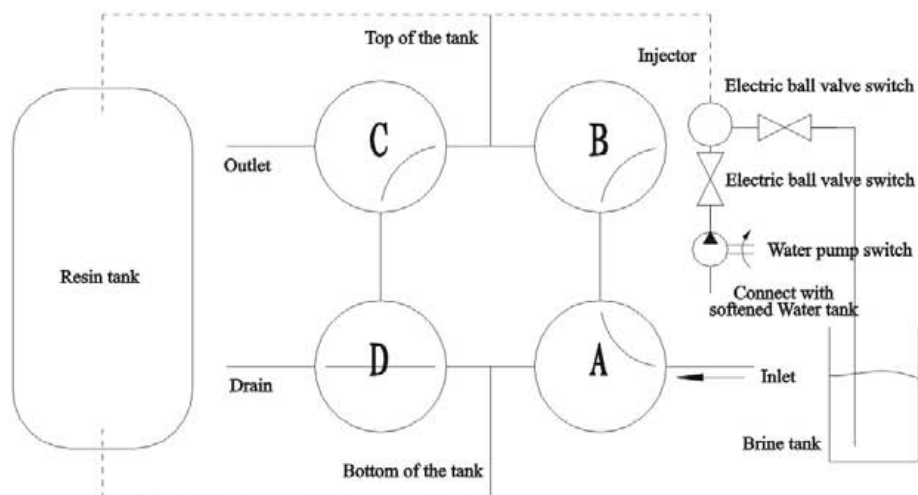
3.Applications

3.1.Softener Flow Chart

Service status

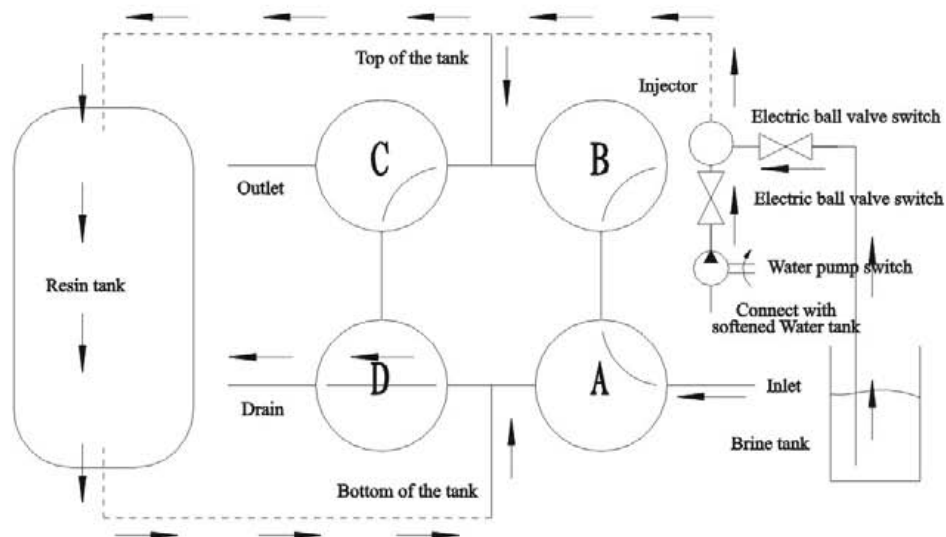


Settling bed status

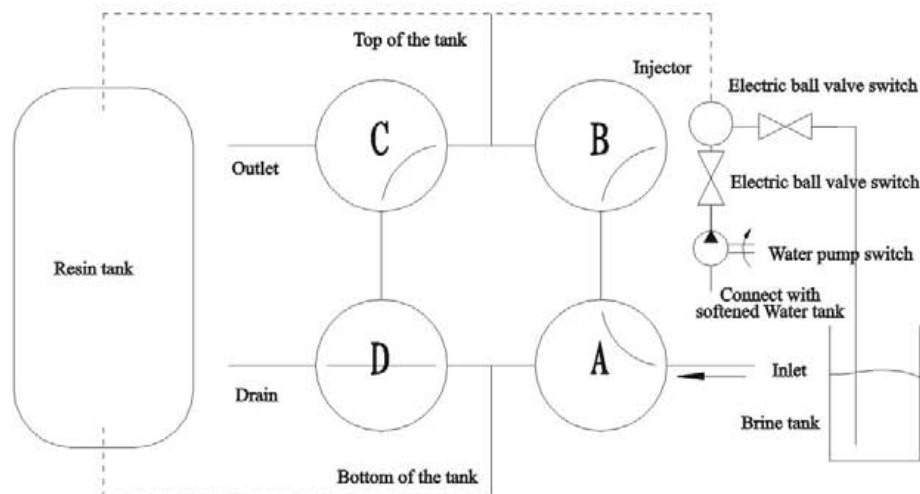


MODEL: 93540-F78C1/93640-F78C3

Brine drawing status

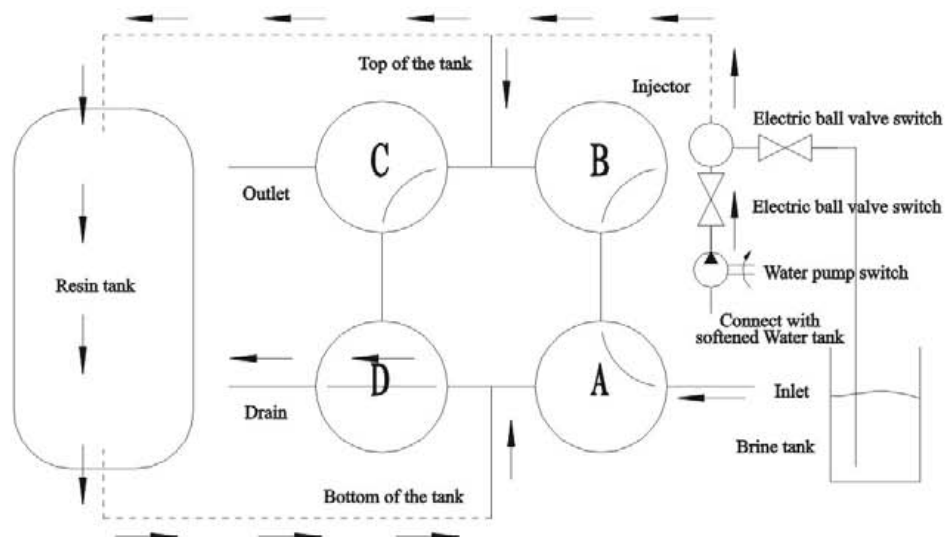


Soak status

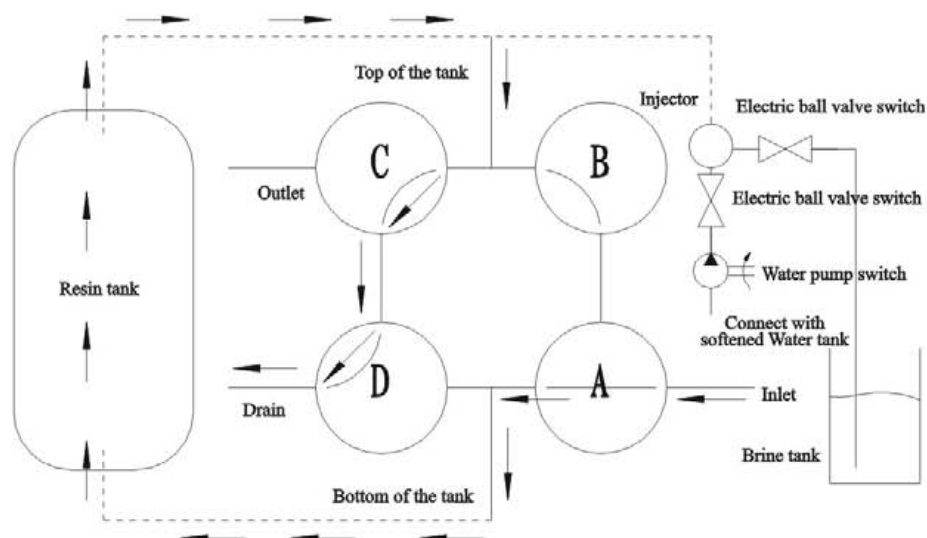


MODEL: 93540-F78C1/93640-F78C3

Slow rinse status

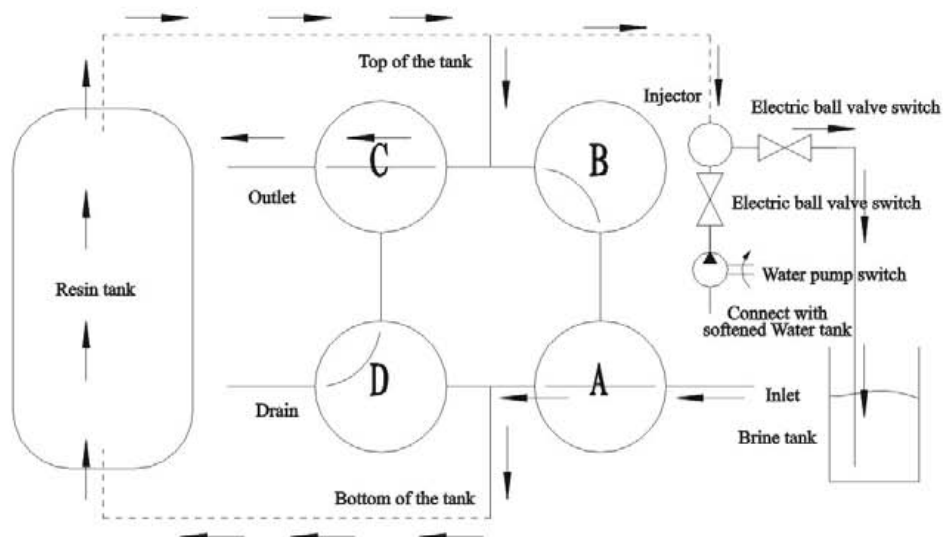


Fast rinse status



MODEL: 93540-F78C1/93640-F78C3

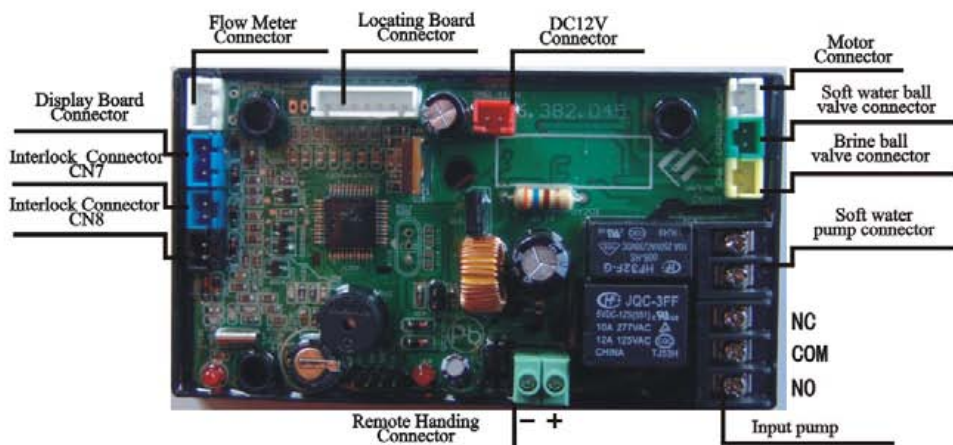
Service and brine refill status



Brine refill and service are in same status, when brine refilling, brine sucking valve open, after finish the brine refilling, the valve is closed.

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 port as below:



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The main functions on main control board:

Function	Application	Explanation
Inlet water pump connector	Control inlet water pump	When the inlet pressure is lower than request, open the pump in service, fast rinse and brine refill status.
Soft water pump connector	Control soft water pump	Brine drawing, slow rinse status, use softened water to regenerate, soft water pump open.
Interlock connector	To ensure no more than one control valve regeneration or washing in system.	Use in RO Pre-treatment, water supply together but regeneration in turn. Second grade ion exchange equipment, etc.
Remote handling connector	Receipt signal to make the control rotate to next circle	It is used for on-line inspection system, PC connection, and realize automatically or remote controlling valve.

A. Inlet water pump connector (Wiring of water inlet pump)

When the inlet pressure is lower than request, to make sure the valve work normally, can install a water pump in the inlet, the wiring as figure 3-1 (This wiring suit for the pump which power is less than 1KW).

After wiring well connected, the pump open in service, fast rinse and brine refill status, the pump close in other status (Like settling bed, brine drawing, soak and slow rinse status).

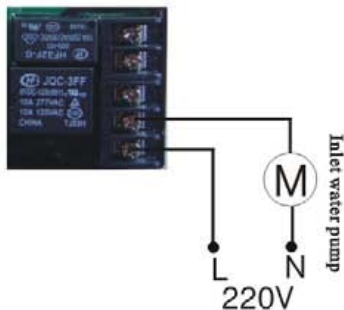


Figure 3-1 Wiring of water inlet pump
(Pump less than 1KW)

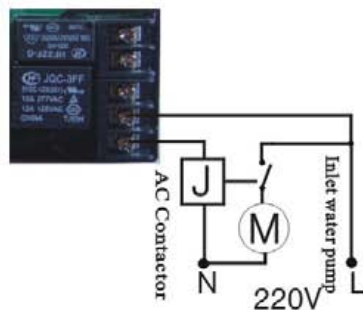


Figure 3-2 Wiring of water inlet pump
(Pump bigger than 1KW)

If the inlet water pump's power is bigger than 1KW, wiring as figure 3-2. After wiring well connected, the relay open, so the pump open in service, fast rinse and brine refill status, the relay close, so the pump close in other status (Like settling bed, brine drawing, soak and slow rinse status).

B. Soft water pump connector (Wiring of soft water pump)

Floating bed is used in big hardness application, so it needs to use softened water to

MODEL: 93540-F78C1/93640-F78C3

regenerate in brine & slow rinse status. It means in brine & slow rinse status, the soft water pump open, and it close in other status (Like service, settling bed, soak, fast rinse and brine refill state). The wiring as figure 3-3

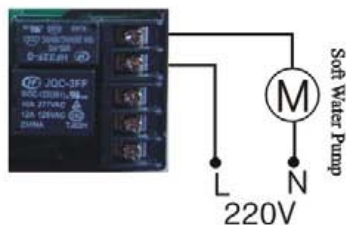


Figure 3-3 Wiring of soft water pump
(Pump less than 1KW)

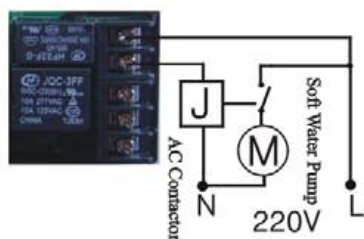


Figure 3-4 Wiring of soft water pump
(Pump bigger than 1KW)

If the soft water pump's power is bigger than 1KW, wiring as figure 3-4. After wiring well connected, the relay open, so the pump open in brine & slow rinse status, the relay close, so the pump close in other status (Like service, settling bed, soak, fast rinse and brine refill state).

C. Interlock Connector

Instruction:

In the parallel water treatment system, it ensure 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 ensure only one valve in regeneration or washing cycle and there is/are water in service. refer to Figure 3-5



Figure 3-5 Network System Wiring with Interlock Cable

Note: Use Interlock Cable to connect black one to black one on next valve in the loop.

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

D. Remote Handling Connector

Used for making pure water, connected with online monitory system or PC machine. When the conductivity or other parameter reach the setting value or PC machine give the signal, need regeneration. It can give the signal to the remote handling connector of the main control board to let it regenerate by signal line. The Connector receives the signal is same as handle press. The wiring refer to Figure 3-6:

MODEL: 93540-F78C1/93640-F78C3

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 refer to Figure 3-7.

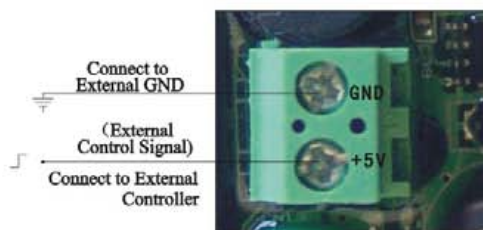


Figure 3-6 Wiring of Remote Input

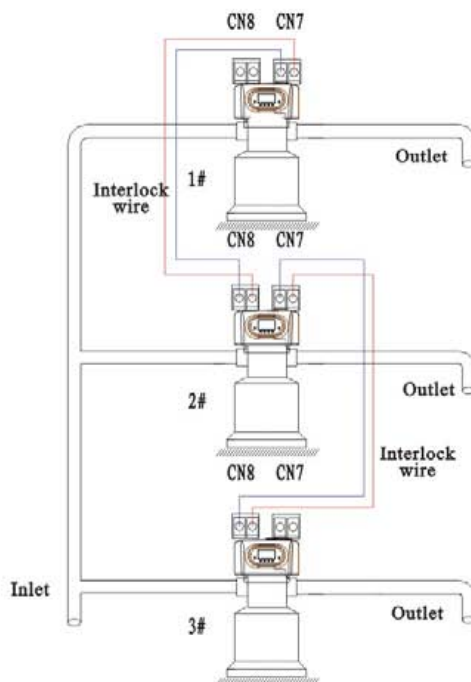


Figure 3-7 Interlock System

MODEL: 93540-F78C1/93640-F78C3

3.3 System Configuration and Flow Rate Curve

A. Product Configuration

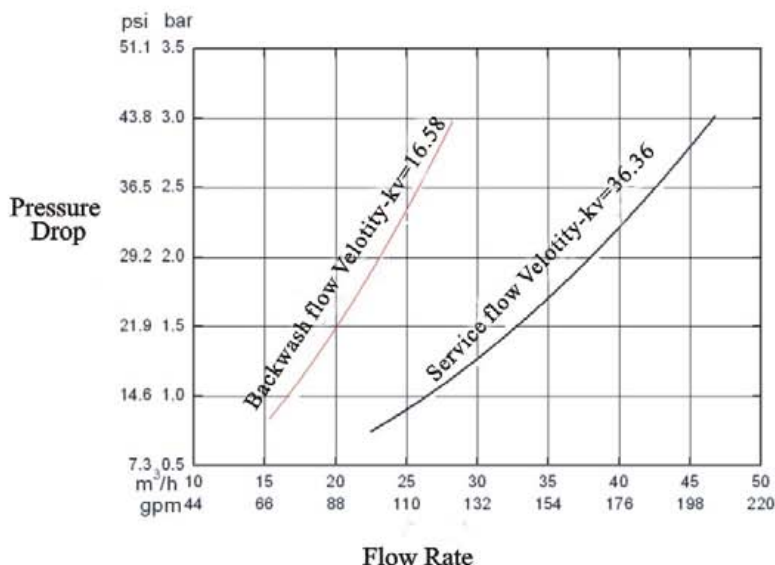
Product F78C configuration with tank, resin volume, brine tank and injector.

Tank Size (mm)	Resin Volume (L)	Flow Rate (t/h)	Brine Tank Size (mm)	The Minimum Salt Consumption for Regeneration (Kg)	Injector Model
φ 900 × 2400	1300	28.0	φ 960 × 1400	133.00	7801
φ 1000 × 2400	1600	35.0	φ 1100 × 1500	164.00	7801
φ 1200 × 2400	2300	50.0	φ 1240 × 1600	235.00	7802

Note: The flow rate calculation is based on linear velocity 45m/h, but not the valve water capacity; the minimum salt consumption for regeneration calculation is based on salt consumption 100g / L(Resin). The resin volume in practical application may be different from this value depending on different tank sizes. The resin volume is filled up to 200mm from the tank opening.

B. Flow Rate characteristic

1) Pressure-flow rate curve



MODEL: 93540-F78C1/93640-F78C3

2) Configuration for standard injector and drain line flow control

Tank Dia. mm	Injector Model	Injector Color	Draw Rate	Slow Rinse Rate	Brine Refill Rate	Hole Qty on Drain Outlet	Hole Size on Drain Outlet	Backwash/ Fast Rinse
			L/h	L/h	L/h			t/h
900	7801	Coffee	3960	2550	2150	0	/	12.40
1000	7801	Coffee	3960	2550	2150	0	/	12.40
1200	7802	Pink	5280	3430	2150	2	φ 7	17.02
1400	7803	Yellow	6810	4800	3400	4	φ 8	22.34

Note: ①The above data in table is tested under pressure of 0.3MPa.

②Since the different 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.

③If the real goods are different in specification, configuration or appearance, please subject to the real goods.

④The 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.

⑤The products don't have any special request, the injector is 7803.

3.4.Parameter settlement

①Service time T1

Water treatment capacity:

$$Q = V_R \times K \div Y_D \quad (\text{m}^3)$$

Hardness of Inlet Water (mmol/L)

Exchange factor (mmol/L) 400~1000. Down-flow regeneration, take 400~750. Up-flow regeneration, take 450~1000. If the inlet water hardness is higher, the factor is smaller.

Resin volume (m³)

By hours: $T1 = Q \div Q_h \quad (\text{hour})$

Water treatment capacity per hour (m³/h)

Water treatment capacity (m³)

By days: $T1 = Q \div Q_d \quad (\text{Day})$

Water treatment capacity per day (m³/d)

Water treatment capacity (m³)

②Stealing bed time T2

The time of the resin flowing down to the bottom of the tank. It is suggested to be set 8-12 minutes.

MODEL: 93540-F78C1/93640-F78C3

③ Brine drawing time T3

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

Generally, $T3 = 45H_r$ (min.) (It is better within 45~65min.)

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

④ Soak time T4

Can be choose from 0~200 min. to the request.

⑤ Slow rinse time T5

Generally, within 15~25 min.

⑥ Fast rinse time T6

$$T6 = 12 \times H_r \text{ (min.)}$$

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

⑦ Brine refill time T7

$$\text{Down-flow regeneration: } T7 = 0.45 \times V_r \div \text{Brine refill speed (min.)}$$

$$\text{Up-flow regeneration: } T7 = 0.34 \times V_r \div \text{Brine refill speed (min.)}$$

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. (The condition is that there is a level controller installed in the brine tank)

⑧ 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. Up-flow regeneration, take 900~1200.

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









⑨ Regeneration time

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

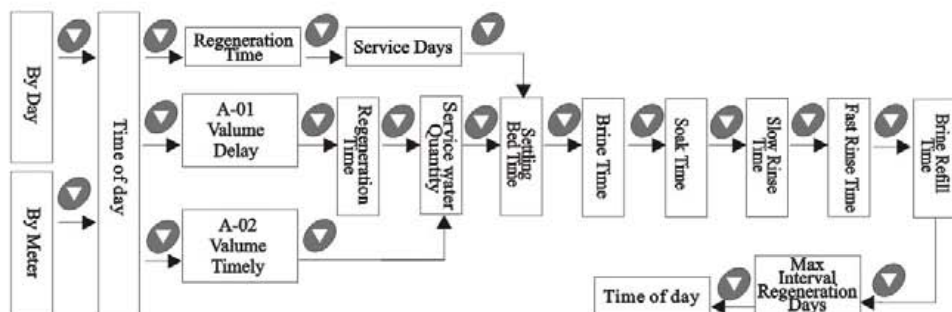
The calculation of parameters for each step is only for reference, the actual proper time will be determined after adjusting by water exchanger supplier. This calculation procedure of softener is only for industrial application; it is not suitable for small softener in residential application.

3.5. Parameter Enquiry and Setting

3.5.1. Parameter Enquiry

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

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3.5.2. Parameter Setting

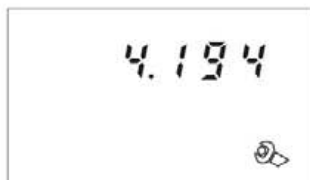
In program display mode, press and enter into program set mode. Press or to adjust the value.

3.5.3. Flow rate factor (K value) check and set

A. Connect power, all symbols light on, press and hold both and for 5 seconds, enter into flow rate factor display and set mode. The value and both flash, such as showed in right picture.

B. If need to reset flow rate factor, press or to change the value to a needed one, then press to save the set, and then the voice "Di" means all setting are success and return new service state with updated data.















































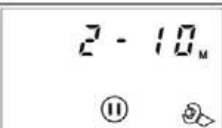
C. In flow rate factor display and set mode, if there is no effect operation within 1 minute, the amended data will not be saved, and return service status.


























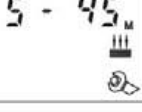























Notice:

- Flow rate factor (K) only exist in F78C3 model.
- The meaning of flow rate factor (K value) is the pulse's number of probe when each unit liquid volume passing the probe. For example, set the K value to 4.194, it means if there is 1 litre of liquid passing the probe, the probe will have 4.194 pieces of pulse signals. As the tested pipeline diameter is different, user can adjust K value to make adjusting. Each flow meter will have different K values. Flow rate sensor connector is connected with CN204 connector on main control board.

3.5.4. The steps of parameter setting (Take F78C3 as example)














Item	Process steps	Symbol
Time of Day	<p>When time of day “12:12” continuously flash, it reminds to reset;</p> <p>1. Press  to enter into program display mode; both  and  symbol light on, “:” flash;</p> <p>Press , enter into time of day setting both  and hour value flash, through  or  to adjust the hour value;</p> <p>2. Press  again, both  and minute value flash, through  or  to adjust the minute value;</p> <p>3. Press  and hear a sound “Di”, then finish adjustment, press  to turn back.</p>	
Control Mode	<p>1. In control mode display status, press  and enter into program set mode, show “02:00”  and 01 value flash;</p> <p>2. Press  or , set the value to be A-01 or A-02 control mode</p> <p>3. Press  and hear a sound “Di”, then finish adjustment, press  to turn back.</p>	
Regeneration Time	<p>1. In regeneration time display status, press  and enter into program set mode.  And 02 flash;</p> <p>Press  or  to adjust the hour value;</p> <p>2. Press  again,  and 00 flash, press  or  to adjust the minute value;</p> <p>3. Press  and hear a sound “Di”, then finish adjustment, press  to turn back.</p>	
Water Treatment Capacity	<p>1. In water treatment capacity display status, it shows  and 400.0 Press  and enter into program set mode.  and 400.0 flash;</p> <p>2. Press  or  to adjust the water treatment capacity value (m³);</p> <p>3. Press  and hear a sound “Di”, then finish adjustment, press  to turn back.</p>	
Settling bed Time	<p>1. In settling bed time display status, it shows (11) and 2-10. Press  and enter into program set mode.  and 10 flash.</p> <p>2. Press  or  to adjust the settling bed time.</p> <p>3. Press , then finish adjustment, press  to turn back.</p>	

MODEL: 93540-F78C1/93640-F78C3

Brine Drawing Time	<p>1. In brine drawing time display status, it shows  and 3-60. Press  and enter into program set mode.  and 60 flash;</p> <p>2. Press  or  to adjust the brine drawing time(minute);</p> <p>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</p>	
Soak Time	<p>1. In soak time display status, it shows  and 4-01. Press  and enter into program set mode.  and 01 flash.</p> <p>2. Press  or  to adjust the soak time.</p> <p>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</p>	
Slow Rinse Time	<p>1. In slow rinse time display status, it shows  and 5-45. Press  and enter into set mode.  and 45 flash.</p> <p>2. Press  or  to adjust the slow rinse time.</p> <p>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</p>	
Fast Rinse time	<p>1. In fast rinse time display status, it shows  and  and 6-10. Press  and enter into program set mode. and 60:00 flash;</p> <p>2. Press  or  to adjust the brine drawing time(minute);</p> <p>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</p>	
Brine Refill Time	<p>1. In brine refill time display status, it shows  and 7-05:00. Press  and enter into program set mode.  and 05:00 flash;</p> <p>2. Press  or  to adjust the brine refill time(minute);</p> <p>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</p>	
Max Interval Regeneration Days	<p>1. In maximum Interval regeneration days display status, it shows H-30. Press  and enter into program set mode.  and 30 flash;</p> <p>2. Press  or  to adjust the Interval regeneration days;</p> <p>3. Press  and hear a sound "Di", then finish adjustment, press  to turn back.</p>	















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

MODEL: 93540-F78C1/93640-F78C3


- ① Press and hold both  and  to lift the button lock statues ( light off) ;
- ② Press , and  light on;
- ③ Press  or  continuously until  light on. Then the digital area shows: 6-12M;
- ④ Press ,  and 12 flash;
- ⑤ Press  continuously until 12 changed to 15;
- ⑥ Press , there is a sound “Di” and the figure stop flashing; the program back to enquiry status
- ⑦ If you want to adjust other parameters, you can repeat the steps from 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 trial running as follows:

- A. Close the inlet valve, and open the bypass valve. After cleaning the foreign materials in the pipe, close the bypass valve open the inlet valve. (As Figure 1-3 shows)
- B. Fill the brine tank with the planned amount of water and adjust the air check valve. Then add solid salt to the tank and dissolve the salt as much as possible.
- C. Switch on power. Press  and go in the Fast Rinse status; when  light on, slowly open the inlet valve 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 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  twice, finish fast rinse turning the position from Fast Rinse to Settling Bed;  light on and enter in the process of Settling Bed. The default settling bed time is 10 minutes.
- E. Press  finish settling bed, turning the position from Settling Bed to Brine Drawing;  light on and enter in the process of Brine Drawing. It is about 60 minutes.
- F. Press  finish brine draw, turning the position from Brine Drawing to Slow Rinse;  light on and enter in the process of Slow Rinse. It is about 45 minutes. (Normally don't need soak, request, can if have special set time yourself.)
- G. Press  finish show rinse, turning the status from Slow Rinse to Fast Rinse.  light on and start to fast rinse. After 10 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.
- H. Press  finish fast rinse, turning the position from Fast Rinse to Brine Refill.  light on (Meanwhile it is in Service status) and it indicates 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.
- I. Press  finish brine refill making the control valve return to Service Status;  light on and start to running.

Note:

- When the control valve enter into the regeneration status, all program can be finished automatically according to the setting time; if you want one of steps terminated early, you can press .
- If water inflow too fast, the media in tank will be damaged. When water inflow slowly, there is a sound of air emptying from drain pipeline.
- After changing 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 position, ensuring there are no resin leakage.
- The time for Settling Bed, Brine drawing, Slow Rinse, Fast Rinse, and Brine Refill status can be set and executed according to the calculation in the formula or suggestions from the control valve suppliers.

3.7.Trouble-Shooting

A. Control Valve Fault

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

MODEL: 93540-F78C1/93640-F78C3

4. Softener fails to draw brine.	A. Line pressure is too low. B. Brine line is plugged. C. Brine line is leaking. D. Injector is plugged. E. Internal control leak. F. Drain line is plugged. G. Sizes of injector and DLFC not match with tank. H. Ball valve or cable failure	A. Increase line pressure. B. Clean brine line. C. Check brine line. D. Clean or replace new injector. E. Replace valve body. F. Clean drain line flow control. G. Select correct injector size and DLFC according to the P20 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. Excessive water after brine. C. Foreign material in brine valve. D. Not install Liquid Level controller but power failure whiling salting. E. Brine refill can't be controlled. F. Ball valve doesn't close	A. Reset correct refilling time. B. Clean brine line and injector. C. Clean brine valve and brine line. D. Stop water supplying and restart after power on or install Liquid level controller. E. Repair or replace Liquid level controller. F. Repair or replace ball valve.
7. Pressure lost or iron in conditioned water.	A. Iron in the water supply pipe. B. Iron mass in the softener. C. Fouled resin bed. D. Too much iron in the raw water.	A. Clean the water supply pipe. B. Clean valve and add resin cleaning chemical, increase frequency of regeneration. C. Check backwash, brine draw and brine tank refill. Increase frequency of regeneration and backwash time. D. Iron removal equipment is required to install before softening.
8. Loss of mineral through drain line.	A. Air in water system. B. Strainer 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 breakdown. 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 leak. B. When electricity fails to supply, valve stops backwash or rapid rinse position.	A. Check and repair valve body or replace it. B. Adjust valve to service status or turn off bypass valve and restart when electricity supply.

MODEL: 93540-F78C1/93640-F78C3

11. Interrupted or irregular brine.	A. Water pressure too low or not stable. B. Injector is plugged or faulty. C. Air in resin tank. D. Floccules in resin tank during up-flow regeneration E. Strainer blocked.	A. Increase water pressure. B. Clean or replace injector. C. Check and find the reason. D. Clean the floccules in resin tank. E. Remove the broken resin
12. Water flow out from drain or brine pipe after regeneration.	A. Foreign material in valve which makes valve can't be closed completely. B. Hard water mixed in valve body. C. Water pressure is too high which result in valve doesn't get the right position. D. Ball valve can't close	A. Clean foreign material in valve body. B. Change valve core or sealing ring. C. Reduce water pressure or use pressure release function. D. Replace ball valve or cable.
13. Salt water in soften water.	A. Foreign material in injector pr injector fails to work. B. Brine valve cannot be shut-off. C. Time of fast rinse is too short.	A. Clean and repair injector. B. Repair brine valve and clean it. C. Extend rapid rinse time.
14. Water treatment Capacity	A. Unit fails to regenerate or regenerate not properly. B. Fouled resin bed. C. Salt setting not proper. D. Softener setting not proper. E. Raw water quality deterioration. F. Turbine of flow meter is stuck.	A. Regenerate according to the correct operation requirement. B. Increase backwash flow rate and time, clean or change resin. C. Readjust brine drawing time. D. According to the test of outlet water, recount and reset. E. Regenerate unit by manual temporary then reset regeneration cycle. F. Disassemble flow meter and clean it or replace a new turbine.

B. Controller Fault

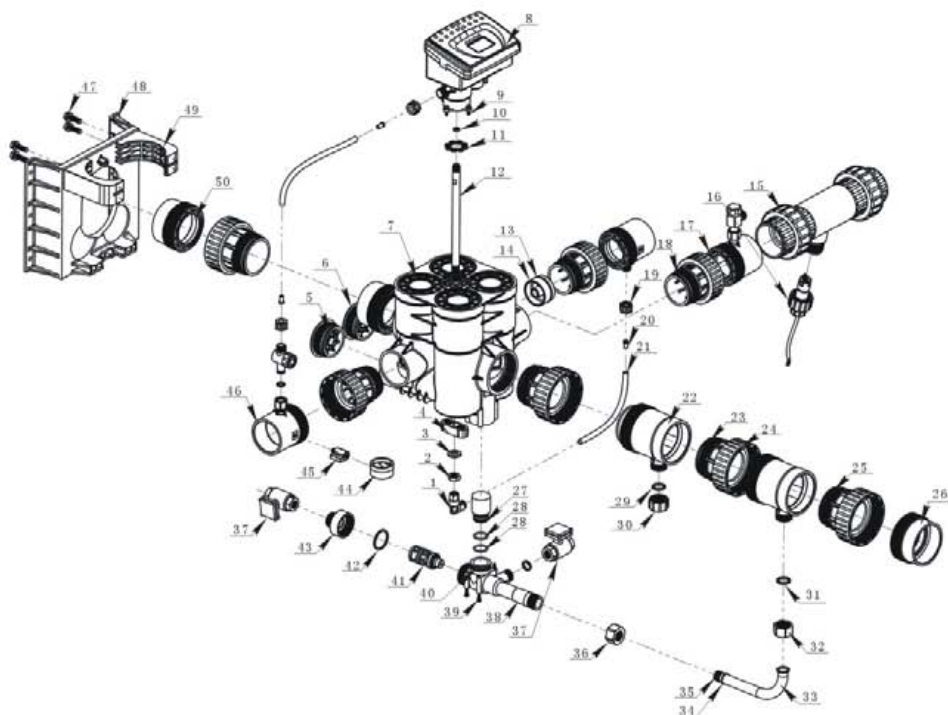
Problem	Cause	Correction
1. All indicators display on display board.	A. Wiring of display board and control board fails to work. B. Control board is faulty. C. Transformer damaged. D. Electrical service not stable.	A. Check and replace the wiring. B. Replace control board. C. Check and replace transformer. D. Check and adjust electrical service.
2. No display on display board.	A. Wiring of display board and control board fails to work. B. Display board damaged. C. Control board damaged. D. Electricity is interrupted.	A. Check and replace wiring. B. Replace display board. C. Replace control board. D. Check electricity.

MODEL: 93540-F78C1/93640-F78C3

3. E1 Flashes	<p>A. Wiring of locating board with controller fails to work.</p> <p>B. Locating board damaged.</p> <p>C. Mechanical driven failure.</p> <p>D. Faulty control board.</p> <p>E. Wiring of motor with controller is fault.</p> <p>F. Motor damaged.</p>	<p>A. Replace wiring.</p> <p>B. Replace locating board.</p> <p>C. Check and repair mechanical part.</p> <p>D. Replace control board.</p> <p>E. Replace wiring.</p> <p>F. Replace motor.</p>
4. E2 Flashes	<p>A. Hall component on locating board damaged.</p> <p>B. Wiring of locating board with controller fails to work.</p> <p>C. Control board is faulty.</p>	<p>A. Replace locating board.</p> <p>B. Replace wiring.</p> <p>C. Replace control board.</p>
5. E3 or E4 Flashes	<p>A. Control board is faulty.</p>	<p>A. Replace control board.</p>

3.8.Assembly & Parts Number

F78C3 Structure (Main body part)



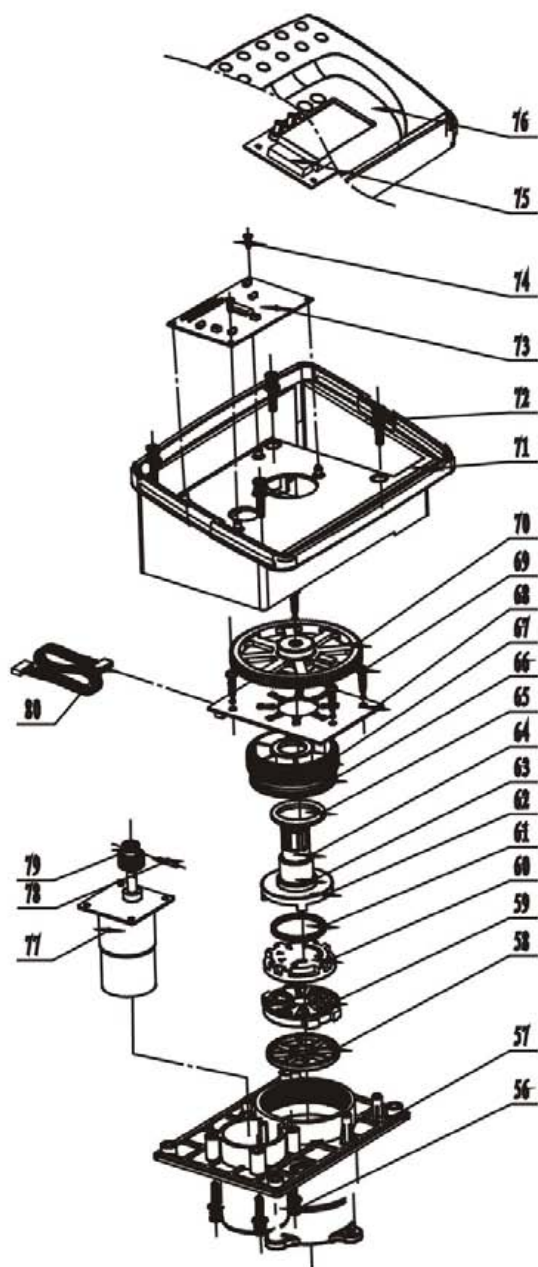
MODEL: 93540-F78C1/93640-F78C3

F78C3 Valve Body Components and part Number

Item No.	Description	Part Number	Quantity	Item No.	Description	Part Number	Quantity
1	Air Pipeline Connector	5455001	1	26	Connector	8458024	2
2	Hexagonal Nut	8940016	1	27	Plug	8323023	1
3	Seal Washer	8371011	1	28	O-ring	8378115	2
4	Washer	8156003	1	29	Seal Washer	8371001	1
5	O-ring	8378127	2	30	Blind Hole Nut	8945002	1
6	Plug	8323011	2	31	Seal Washer	8371010	1
7	Valve Body	5022027	1	32	Hexagonal Nut	8940006	1
8	Distribution Valve	2974017	1	33	Elbow Pipeline	8457019	1
9	Hexagonal Bolt	8920006	4	34	O-ring	8378073	1
10	Sealing washer	8371011	1	35	O-ring	8378064	2
11	Seal Washer	8371009	8	36	Hexagonal Nut	8940007	1
12	Pipeline	8457008	1	37	3/4" Electronic Ball Valve	2976008	2
13	O-ring	8378125	1	38	Injector Body	8008006	1
14	Flow Control	8468013	1	39	Hexagonal Bolt	8920005	4
15	Tee Joint	5457009	1	40	O-ring	8378101	2
16	Impeller Set	5295004	1	41	Nozzle	8454024	1
17	O-ring	8378137	3	42	Seal Washer	8371006	1
18	Connector	8458020	3	43	Connector	8458066	1
19	Hexagonal Nut	8940016	2	44	Pressure Gauge	6342001	1
20	Pipeline	8457025	2	45	Pressure Gauge Protect Valve	2976013	1
21	Air pipe	8465001	1	46	Connector	8458021	3
22	Connector	8458023	1	47	Hexagonal Bolt	8920001	4
23	O-ring	8378129	3	48	Toggle	8109009	1
24	Animated Nut	8947008	3	49	Washer	5156001	2
25	Connector	8458022	3	50	O-ring	8378138	3

MODEL: 93540-F78C1/93640-F78C3

F78C3 Structure (Distribution valve part)



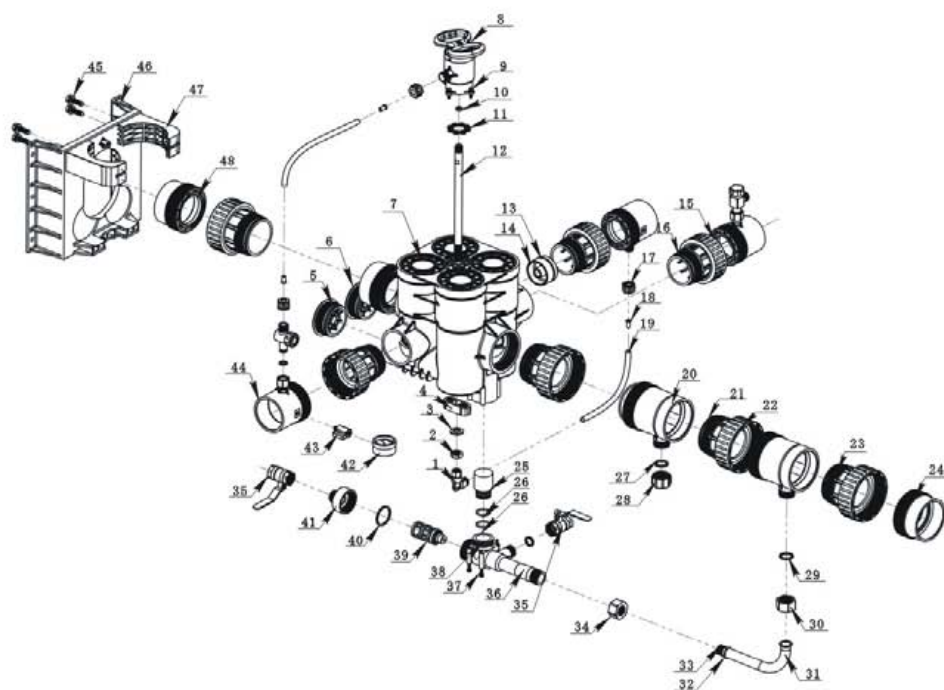
MODEL: 93540-F78C1/93640-F78C3

F78C3 Distribution valve components and part No.

Item No.	Description	Part Number	Quantity
56	Screw, Cross (Three parts)	8902008	4
57	Distribution Valve Body	5022028	1
58	Seal Ring	8371031	1
59	Fixed Disk	8469023	1
60	Moving Disk	8459025	1
61	Moving Seal Ring	8370053	1
62	Shaft	8258009	1
63	O-ring	8378078	1
64	O-ring	8378073	1
65	Anti-friction Washer	8216010	1
66	O-ring	8378107	1
67	Fitting Nut	8092007	1
68	Locating Board	6380018	1
69	Screw, Cross	8909007	4
70	Gear	5241005	1
71	Front cover	8005012	1
72	Screw, Cross (Three parts)	8902008	4
73	Control Board	6382033	1
74	Screw, Cross	8909004	2
75	Display Board	6381009	1
76	Front Cover	8300014	1
77	Motor	6158007	1
78	Pin	8993001	1
79	Small Gear	8241010	1
80	Wire for Locating Board	6511002	1

MODEL: 93540-F78C1/93640-F78C3

F78CS Structure (Main body part)



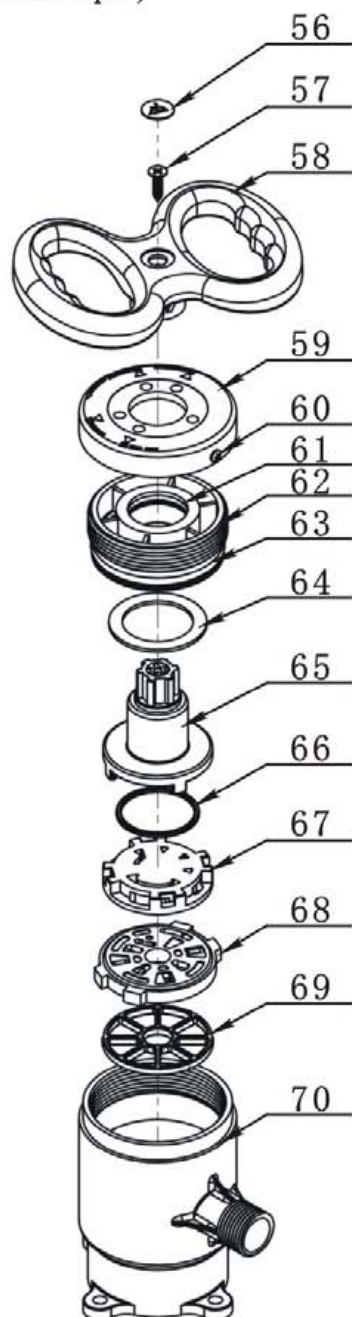
MODEL: 93540-F78C1/93640-F78C3

F78CS Valve Body Components and part No.

Item No.	Description	Part Number	Quantity	Item No.	Description	Part Number	Quantity
1	Air Pipeline Connector	5455001	1	26	O-ring	8378115	2
2	Hexagonal Nut	8940016	1	27	Seal Washer	8371001	1
3	Seal Washer	8371011	1	28	Blind Hole Nut	8945002	1
4	Washer	8156003	1	29	Seal Washer	8371010	1
5	O-ring	8378127	2	30	Hexagonal Nut	8940006	1
6	Plug	8323011	2	31	Elbow Pipeline	8457019	1
7	Valve Body	5022027	1	32	O-ring	8378073	1
8	Distribution Valve	2974017	1	33	O-ring	8378064	2
9	Hexagonal Bolt	8920006	4	34	Hexagonal Nut	8940007	1
10	Seal Washer	8371011	1	35	3/4" Manual Ball Valve	2976009	2
11	Seal Washer	8371009	8	36	Injector Body	8008006	1
12	Pipeline	8457008	1	37	Hexagonal Bolt	8920005	4
13	O-ring	8378125	1	38	O-ring	8378101	2
14	Flow Control	8468013	1	39	Nozzle	8454024	1
15	O-ring	8378137	3	40	Seal Washer	8371006	1
16	Connector	8458020	3	41	Connector	8458066	1
17	Hexagonal Nut	8940016	2	42	Pressure Gauge	6342001	1
18	Pipeline	8457025	2	43	Pressure Gauge Protect Valve	2976013	1
19	Air Pipeline	8465001	1	44	Connector	8458021	3
20	Connector	8458023	1	45	Hexagonal Bolt	8920001	4
21	O-ring	8378129	3	46	Toggle	8109009	1
22	Animated Nut	8947008	3	47	Washer	5156001	2
23	Connector	8458022	3	48	O-ring	8378138	3
24	Connector	8458024	2				
25	Plug	8323023	1				

MODEL: 93540-F78C1/93640-F78C3

F78CS Structure (Distribution valve part)



MODEL: 93540-F78C1/93640-F78C3

F78AS Distribution valve components and part No.

Item No.	Description	Part Number	Quantity
56	Label	8860001	1
57	Screw, Cross	8909014	1
58	Handle Wheel	8253033	1
59	Decorative Cover	8444018	1
60	Screw, Cross	8909008	1
61	O-ring	8378078	1
62	Fitting Nut	8092007	1
63	O-ring	8378107	1
64	Anti-friction Washer	8216010	1
65	Shaft	8258009	1
66	Moving Seal Ring	8370053	1
67	Moving Disk	8459025	1
68	Fixed Disk	8469023	1
69	Seal Ring	8370031	1
70	Distribution Valve Body	8022060	1


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 Accomplishment		Maintenance Man Signature

When product need warranty service, please fill in the below content and sent 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 ϕ ×	Resin Tank Size	L	Raw Water Hardness	Mmol/L
Water Source: Ground-water <input type="checkbox"/> Tap Water <input type="checkbox"/>	Water Treatment Capacity	m ³	Backwash Time	min
Brine & Slow Rinse Time	min	Brine Refill Time	min	Fast Rinse Time
Problem Description				



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