

Preface

Dear user, Thank you for choosing this H2O PRODUCTS multi-functional flow control valve for water treatment systems. Please read this manual carefully before attempting to use the valve for the first time, and ALWAYS adhere to all safety and operating instructions. Doing so will protect your warranty and help keep your valve running and operating safely and normally. The patented (Patent No. ZL02220153.X ZL200820169873.5) H2O PRODUCTS brand multifunctional control valve is specifically designed to work with all kinds of water treatment systems. The advanced design incorporates a microcomputer control to analyze real-world operating conditions to perform regeneration automatically. This unique control valve features highly polished/high-density ceramic discs that are the heart of the H2O PRODUCTS design.

The patented ceramic disc design incorporates one fixed and one moving disc which rotates through positions which align channels to create five different fluid pathways. These five pathways correspond to the basic operating functions of the valve, namely Service, Backwash, Brine & Slow Rinse, Brine Refill, and Fast Rinse. This proprietary design represents a significant advance beyond traditional water treatment system control valves which rely on complex valving and a high number of parts, which are vulnerable to wear and failure during operation. The breakthrough design of the advanced H2O PRODUCTS water treatment control valve results in simpler installation, operation, and maintenance.

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- ✘ To ensure normal operation of the valve, please consult with professional installation or repair personnel before using it.
- ✘ Any plumbing or electrical work must be completed by a professional before, or at the time of installation.
- ✘ Do not use control valve with water that is unsafe or of unknown quality.
- ✘ Test water periodically to verify that system is performing satisfactorily.
- ✘ Sodium used in the water softening process should be considered as part of your overall dietary salt intake. Contact doctor if you are on a low sodium diet.
- ✘ When this valve is used for softening, ensure that there is solid salt in the brine tank at all times during operation. Only clean water and water softening salts (at least 99.5% pure) should be added to the brine tank. Use of small-grain salt is forbidden.
- ✘ Do not put the valve near sources of heat, high humidity, corrosion, intense magnetic fields, or intense vibrations. Do not leave the valve outside unprotected.
- ✘ Use of the brine tube or other connectors as support to carry the system is forbidden.
- ✘ Use of the injector body as a handle or support is forbidden.
- ✘ Please use this product with water temperature between 41°F (5°C) and 113°F (45°C), and water pressure between 22psi (0.15MPa) and 87psi (0.6MPa). Using this product outside of these stated parameters voids the warranty.
- ✘ If the water pressure exceeds 87psi (0.6MPa), a pressure reducing valve must be installed before water inlet.
- ✘ This valve is not a toy. Do not let children play with or on this device. Careless operation may inadvertently change the operating parameters and functioning of the valve.
- ✘ If the attached cables of this product and/or transformer are damaged, they must be replaced with original parts from H2O PRODUCTS.

When screen is on, press  to access the menu and setup functions.

Product Characteristics

✘ More reliable design for flow control

Uses high quality, highly-polished scuff resistant, corrosion proof and leak proof ceramic valve discs.

✘ Manual function

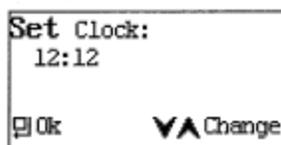
Initiate regeneration immediately by pushing manual key at any time.

✘ Keyboard locked function

If the keyboard has not been operated within one minute, it will be locked automatically. Press the Up and Down two keys for 5 seconds to unlock the keyboard before operating. This function prevents accidentally changing the operating parameters.

✘ Indication of power cut secularly.

If the power is lost for more than 3 days, the screen will display as follows:



This is a reminder to reset the current time. The other set parameters do not need to be reset. The previously programmed process will continue to work normally after power on.

✘ Model A: no water passage during recharge, Model B: water passage during recharge.

✘ Operation cycles are volume controlled.

✘ X79-A/X79-B has weather cover allows for outdoor installation, temperature parameters permitting.

✘ Partial by-pass function.

During operation, by turn by-pass adjusting bolt to direct certain portion of raw water to outlet directly without passing through tank.

✘ Incorporates dot-matrix LCD. User selectable English or Chinese version.

Method A: When screen is turned on, press both  and  keys for 5 seconds to unlock: enter into language selection section.

Method B: Enter into System Language Set directly to select language.

✘ **Down-flow, up-flow and filtration could be achieved in one valve.**

Set in Advanced Setting/Set Work Mode by keys. The work modes are as follows:

Options	Work Mode	Description
A-01	Down-flow Volume Delayed	Recharge by down-flow. Treated volume reaches the set volume and time reaches the set recharge time, then valve starts to recharge.
A-02	Down-flow Volume Controlled	Recharge by down-flow. Once treated volume reaches the set volume, the valve starts to recharge.
A-03	Down-flow Volume Intelligent	Recharge by down-flow. If the balance of treated water volume is less than recent 7 days average water use, the valve starts to recharge at the time of recharge time.
A-11	Up-flow Volume Delayed	Recharge by up-flow. Treated volume reaches the set volume and time reaches the set recharge time, then valve starts to recharge.
A-12	Up-flow Volume Controlled	Recharge by up-flow. Once treated volume reaches the set volume, the valve starts to recharge.
A-13	Up-flow Volume Intelligent	Recharge by up-flow. If the balance of treated water volume is less than recent 7 days average water use, then valve starts to recharge at the time of recharge time.
A-21	Filtration	As filter: Treated volume reaches the set volume and time reaches the set backwashing time, then valve starts to backwash.

✘ Set up interval backwash times. (Only for **Up-flow** work mode)

When work mode is set by up-flow (A-11, A-12, or A-13), you can set up interval backwash times. For example: Running for several times, but backwash one time. The parameter depends on local water turbidity. (For particular setting method please refer to page 21)

✘ Set up repeat-washing times. (Only for **Filtration** work mode)

When work mode is Filtration (A-21), you can set up repeat-washing times. For example: running one time, but backwash and fast rinse a several times, which provides more thorough washing of filtration material. If the turbidity of raw water is high, you can set repeat-washing times, such as F-01, which means running one time, but backwash and fast rinse repeat one more times, running backwash, fast rinse, backwash, fast rinse, etcetera. Under this work mode, the brine line connector should be blocked. (For detailed setting method please refer to page 21)

✘ Output signal connector (Signal output installation should be performed by a professional)

This valve provides an output signal connector which could be connected with the equipment such as a Booster Pump, Solenoid Valve, etcetera. When the mode of signal output is b-01, the signal is sent at the moment the valve discontinues running, and discontinues when the valve returns to running state. In this mode, the signal can be sent once to complete one cycle. While mode is b-02 the signal is sent at the moment the valve moves from each working position, and discontinues when the operation reaches the next state. In this mode, the signal could be sent five times to complete one cycle. (For the particular connection method please refer to page 10)

✘ Remote handling connector

This valve has remote handling connector and could receive a no power signal. In the event an outbound device determines that water quality is below desirable levels, the valve is able to respond to a remote signal to regenerate. (Refer to the detail connection method on page 12)

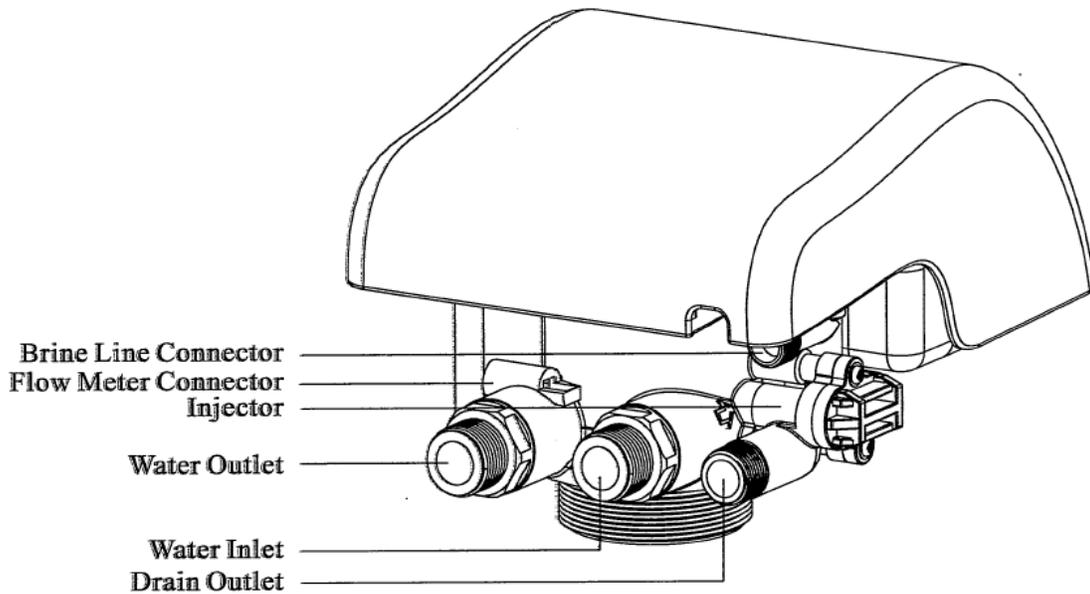
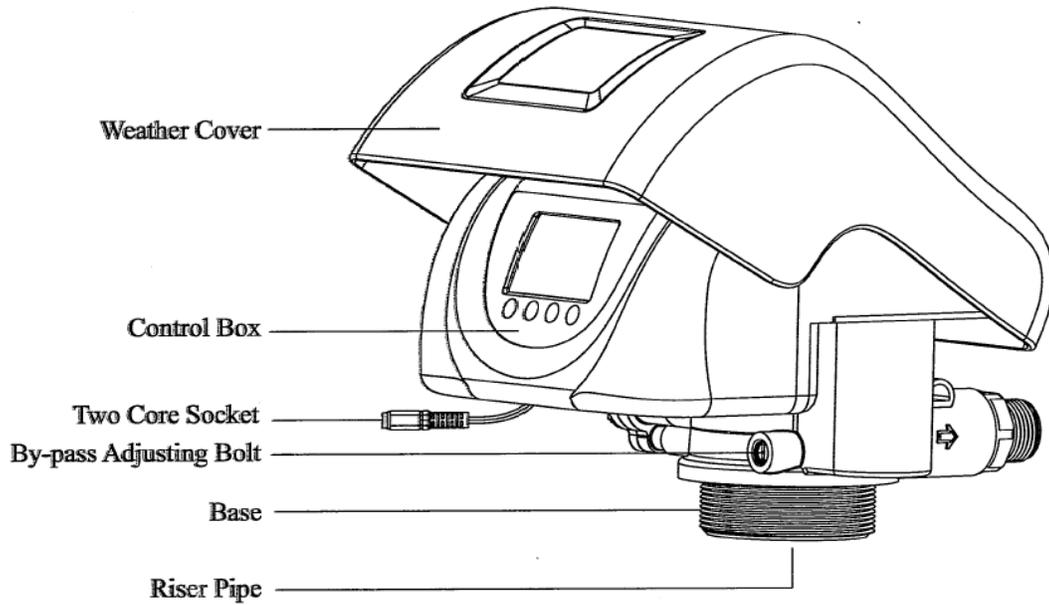
✘ Disinfection device connector. (Disinfection device should be matched separately)

This valve has a disinfection device connector; when in the brine draw state, there is a DC5V 200mA output, which electrolyzes part of the brine passing by disinfection device and makes hypochlorous acid which disinfects and sterilizes the resin in tank.

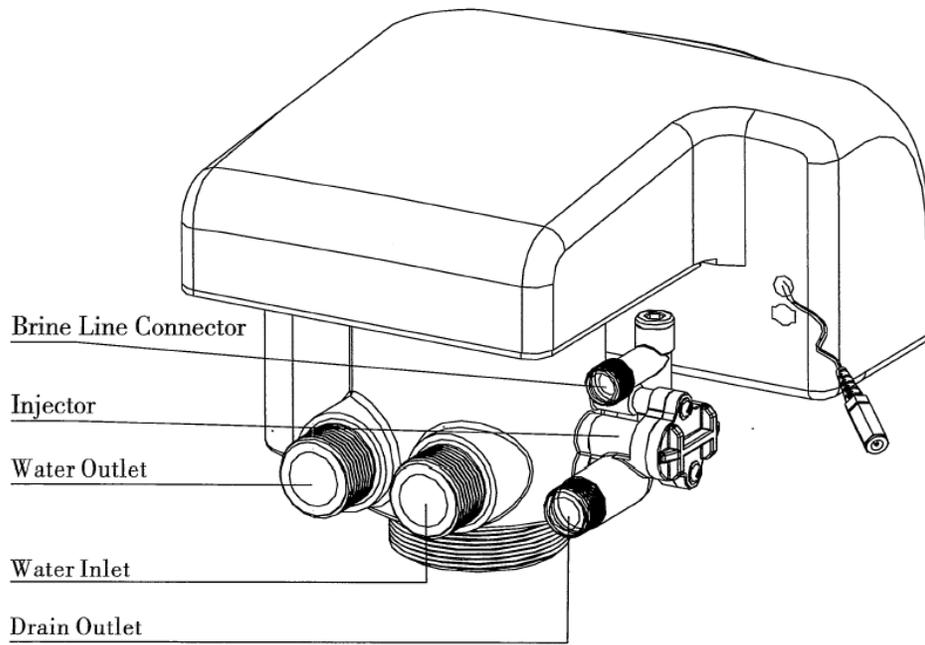
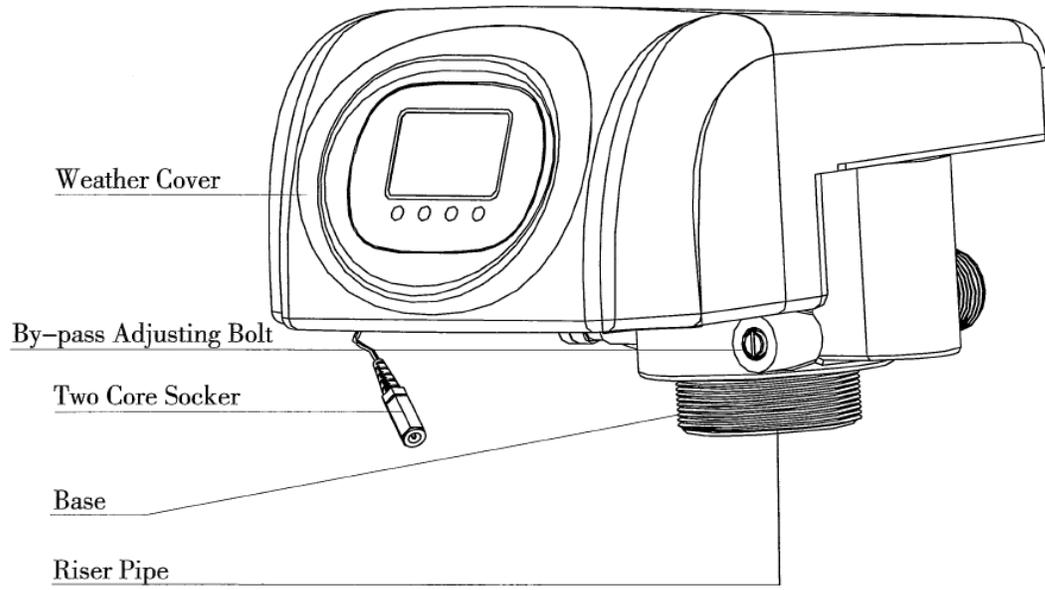
✘ Set up maximum days between recharges.

Regardless of the volume flow, or volume treated settings, the maximum number of days between recharges may be set to force regeneration (can be between 0 to 40 days).

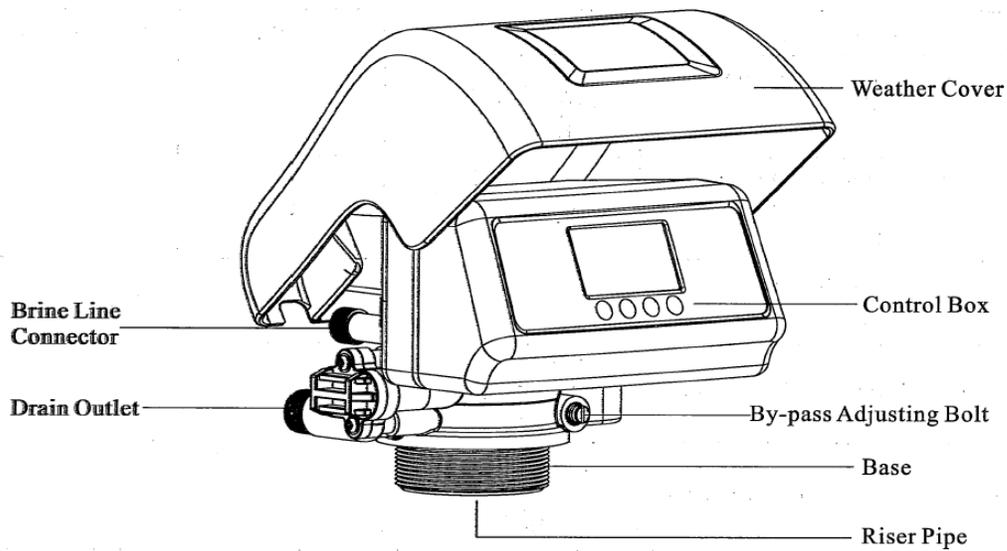
Appearance and Specifications:



TM.X79-A

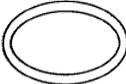
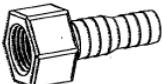


TM.X82-A/TM.X82-B

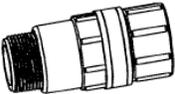
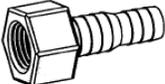
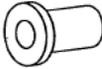


TM.X79-B

Product Accessories

TM.X79-A/TM.X79-B Accessories			
Description	Figure	Quantity	Remark
DC 12V Transformer		1PC	EU, US or UK Plug
Base Seal Ring ($\phi 73 \times \phi 5.3$)		1PC	Black
1/2" Drain Hose Connector		1PC	
3/8" Brine Tube Hose Connector		1PC	
Tube Bushing		1PC	
Brine Line Flow Control		1PC	Red
Drain Line Flow Control		1PC	White

TM.X82-A/TM.X82-B Accessories

Description	Figure	Quantity	Remark
DC12V Transformer		1PC	US, EU, or UK Plug
Flow Meter Connector (with 1" washer) ($\phi 30 \times \phi 24 \times 3.3$)		1PC	
Water Inlet Connector (with 1" washer) ($\phi 30 \times \phi 24 \times 3.3$)		1PC	
Base sealing Ring ($\phi 73 \times \phi 5.3$)		1PC	Black
1/2" Drain Hose Connector		1PC	
3/8" Brine Tube Hose Connector		1PC	
Tube Bushing		1PC	
Brine Line Flow Control		1PC	Red
Drain Line Flow Control		1PC	White

Product Specifications

Technical Parameter

Controller		Working Conditions	
Controller Model	Volume Type	Suited Pressure	22psi-87psi
Transformer Input	100~240V/50~60Hz	Suited Water Pressure	41°F-113°F
Transformer Output	DC 12V	Inlet Water Turbidity	<5FTU

(Table One)

Control Valve

Model	Connection Size					Maximum Water Capacity (GPM)	Remark
	Inlet /Outlet	Drain Outlet	Brine Line Connector	Base	Riser Pipe		
TM.X79-A	3/4"M	1/2"M	3/8"M	2-1/2" -8NPSM	1.05" OD 26.7mm	8.8	No water passing in recharge
TM.X79-B	3/4"M	1/2"M	3/8"M	2-1/2" -8NPSM	1.05" OD 26.7mm	8.8	Water passing in recharge
TM.X82-A	1"M	1/2"M	3/8"M	2-1/2" -8NPSM	1.05" OD 26.7mm	15.4	No water passing in recharge
TM.X82-B	1"M	1/2"M	3/8"M	2-1/2" -8NPSM	1.05" OD 26.7mm	15.4	Water Passing in recharge

Remark: M----- Male Thread F----- Female Thread OD----- Outer Diameter

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

Tank Diameter Inches	Injector Model	Injector Color	Total Outlet Flux of Injector	Slow Rinse Speed	Speed of Brine Refill	Mode of Drain Line Flow Control	Speed of Backwash and Fast Rinse
			GPM	GPM	GPM		GPM
6	6301	Coffee	0.40	0.22	0.61	1#	1.24
7	6302	Pink	0.58	0.36	0.65	1#	1.24
8	6303	Yellow	0.71	0.47	0.66	2#	2.54
9	6304	Blue	0.86	0.63	0.66	2#	2.54
10	6305	White	1.00	0.77	0.92	3#	3.17
12	6307	Purple	1.33	0.97	0.73	4#	4.65
14	6308	Red	6.10	4.45	0.57	4#	5.15
16	6309	Green	7.50	5.30	0.61	5#	6.20
18	6310	Orange	8.20	5.90	0.58	5#	6.20

Remarks:

✘ The above data in table two are tested under inlet pressure of 43.5psi.

✘ Since the difference in the quality of raw water, capability of resin, size of tank, and the pressure of inlet, the above data are for reference only.

✘ We are continually improving our products, therefore, your actual valve's specifications may differ from the specifications listed here. Always refer to your actual valve for actual specifications.

✘ The parameters in table two are suitable for X79-A. For X79-B, in regeneration, when the outlet pipe closed, table two is suited, when the outlet pipe is open, suit for table three.

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

Tank Diameter Inches	Injector Model	Injector Color	Total Outlet Flux of Injector	Slow Rinse Speed	Speed of Brine Refill	Mode of Drain Line Flow Control	Speed of Backwash and Fast Rinse
			GPM	GPM	GPM		GPM
6	6301	Coffee	0.30	0.21	0.61	1#	1.24
7	6302	Pink	0.51	0.32	0.65	1#	1.24
8	6303	Yellow	0.63	0.43	0.66	2#	2.54
9	6304	Blue	0.78	0.58	0.66	2#	2.54
10	6305	White	0.97	0.70	0.92	3#	3.17
12	6307	Purple	1.14	0.88	0.73	4#	4.65
14	6308	Red	1.56	1.12	0.57	4#	5.15
16	6309	Green	1.76	1.30	0.61	5#	6.20
18	6310	Orange	1.93	1.54	0.58	5#	6.20

Installation and Connection

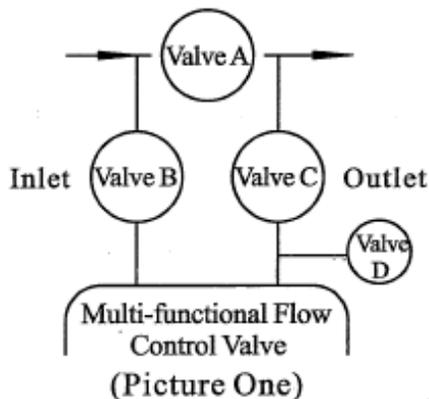
Before installation, read all installation instructions completely, then obtain all the materials and tools needed for installation.

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

1. Device location:

a). The closer softener to drain point, the better. b). Leave enough space for operating and maintaining devices conveniently. c). Brine tank need to be close to softener. d). Do not install the valve near sources of heat or in direct sunlight, rain, and other factors that may result in damage to the product. Do not leave it outside unprotected. e). Do not install the equipment in an acid or alkali environment or intense magnetic field, intense vibrations to avoid damaging the electronically controlled system. f). Do not install the device, drain, outlet, and other pipes in environments where the temperature may drop below 41°, or above 113°. g). Please install the system in a place where water damage is least likely to occur if a leak develops.

2. Pipeline connection:



In order to maintain conveniently, it is advised to install the device as illustrated in the drawing as follows:

Instruction: There are three ball valves being connected to the multi-functional flow control valve and inlet/outlet pipe. Valve B is connected to the inlet pipe. Valve C is connected to the outlet pipe. When changing filter materials or maintaining the tank, open valve A, close valve B and C. When in operation, open valve B and C, close valve A. Valve D is sampling valve.

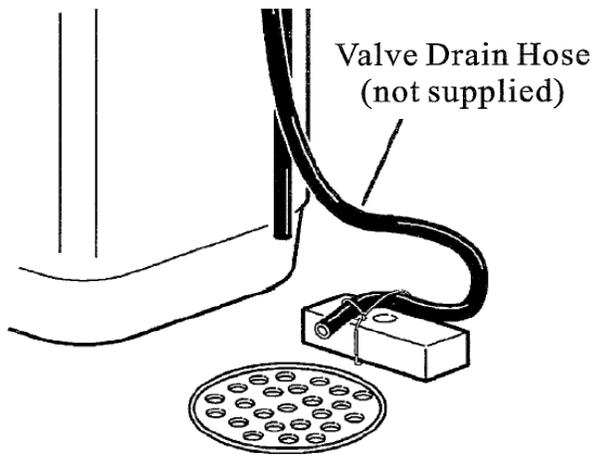
- ✘ Putting washer into one port of inlet connector, and connect the inlet of the multi-functional flow control valve (Refer to product illustration)
- ✘ Connecting inlet of the system with inlet connector of the animated connector.
- ✘ Putting washer into one port of the outlet flow meter animated connector, and connect with outlet of the multi-functional control valve (Refer to product illustration)
- ✘ Connecting the outlet of the system with the outlet connector of the animated connector.
- ✘ Rotate the flow meter connector to the jack of flow meter connector upward, put the bolt into the jack of flow meter connector.



- ✘ If making a soldered copper pipe installation, do all sweat soldering before connecting pipes to the valve. Torch heat will severely damage plastic parts.
- ✘ When turning threaded pipe fittings onto plastic fitting, take care not to cross thread or you may permanently damage the valve.
- ✘ Support inlet and outlet plumbing in some manner (use pipe hanger) to keep the weight off of the valve fittings.
- ✘ For installation of X79, just need to connect the inlet of Multi-functional flow control valve with the inlet of the system.
- ✘ X79-A/X79-B can match X70-D by-pass valve, X82-A/X82-B can match X70-C by-pass valve.

3. Connect and route the valve drain hose

- ✘ Install drain line flow control washer in drain hose connector fitting.
- ✘ Tighten drain hose connector onto drain outlet.
- ✘ Insert drain hose into drain hose connector.
- ✘ Locate the drain hose well like picture two.



(Picture Two)
Correct Method for Drain

Control valve should be higher than drain outlet, and as close to the drain as possible.



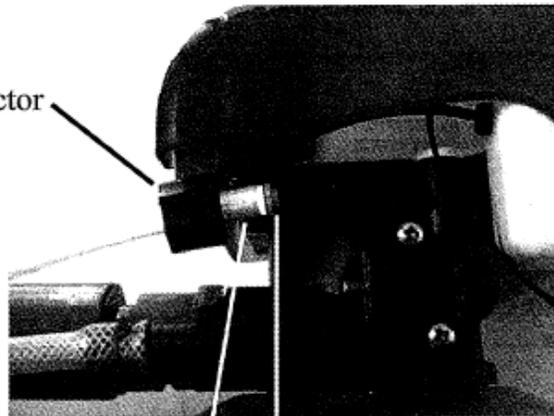
Be sure not connect drain with sewer, and leave a enough space between them, avoiding waste water contamination of the water treatment equipment, such as shown in picture two. If waste water is used for other purposes, please use a separate container for loading, and provide adequate space between the drain and container.

4. Connect brine tube

- ✘ Slide brine tube hose connector over end of brine tube as in picture three.
- ✘ Insert tube bushing into end of brine tube.
- ✘ Insert the red brine line flow control into valve brine line connector. (Attention: Cone side of flow control should face into valve).
- ✘ Tighten brine draw hose connector onto brine line connector.
- ✘ Ensure that connection is leak proof.

Brine Draw Hose Connector

(Picture Three)
Correct Method for Installation



Tube Bushing Brine Line Flow Control(Red)

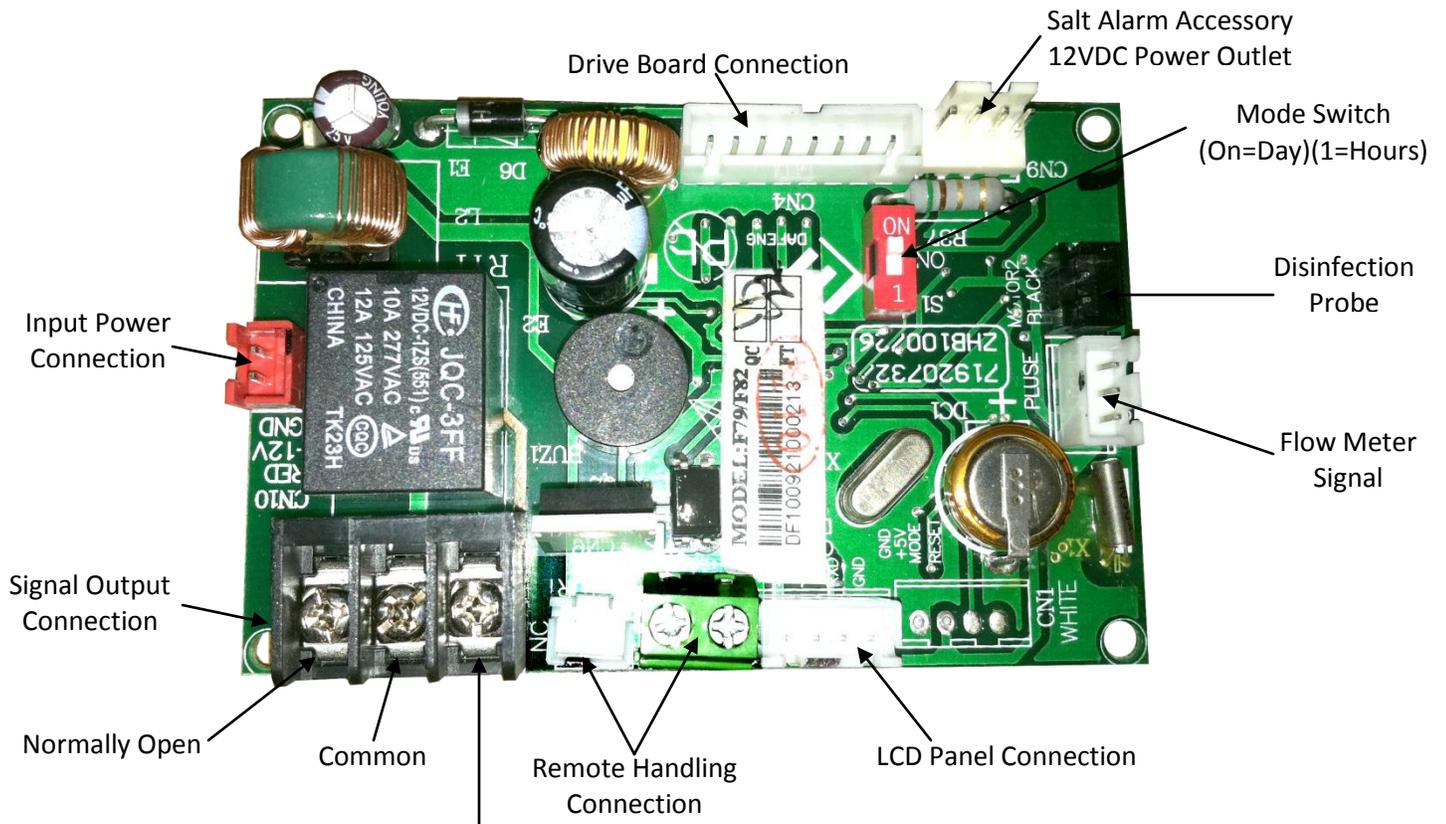
5. Electronic appliance connection

- ✘ Connect the adapter of the transformer output with two core socket to the controller.
- ✘ Connect the adapter of transformer to 100~240V/50~60Hz outlet.

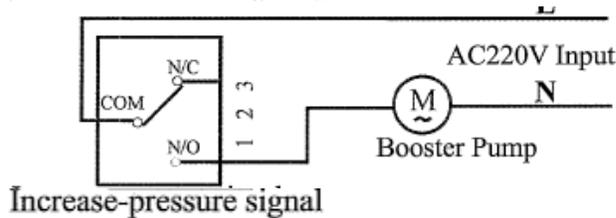
6. Connect output signal

If raw water pressure is too low, or increased outlet pressure is required, you need to install a booster pump at the inlet, or install as solenoid valve at the outlet and make use of the output signal connector to export the signal to an outboard control.

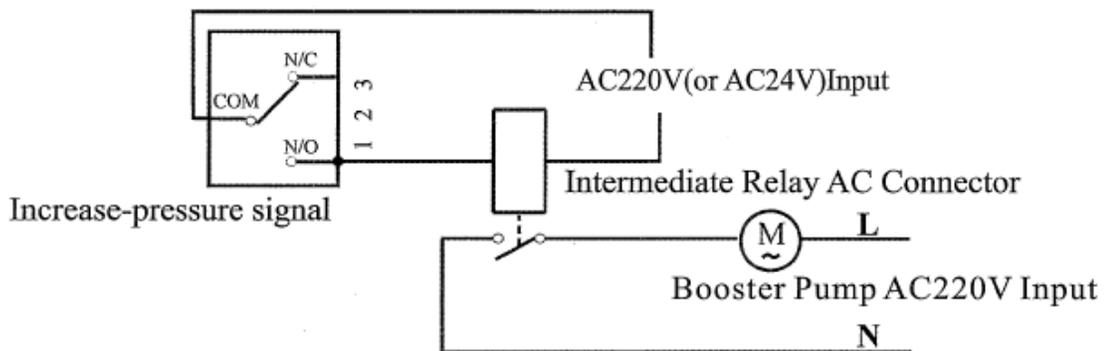
- ✘ Use a screwdriver or other tools to open the cover of the control valve.
- ✘ At the output signal connector see (Picture Four), please connect wire as shown (Picture Five)



Directly control booster pump connection mode (current <5A)



AC Connector (Intermediate Relay) control Booster Pump connection mode (current >5A)



Request:AC220V electrical source input port need connect broken electrical leakag.
(Picture Five)



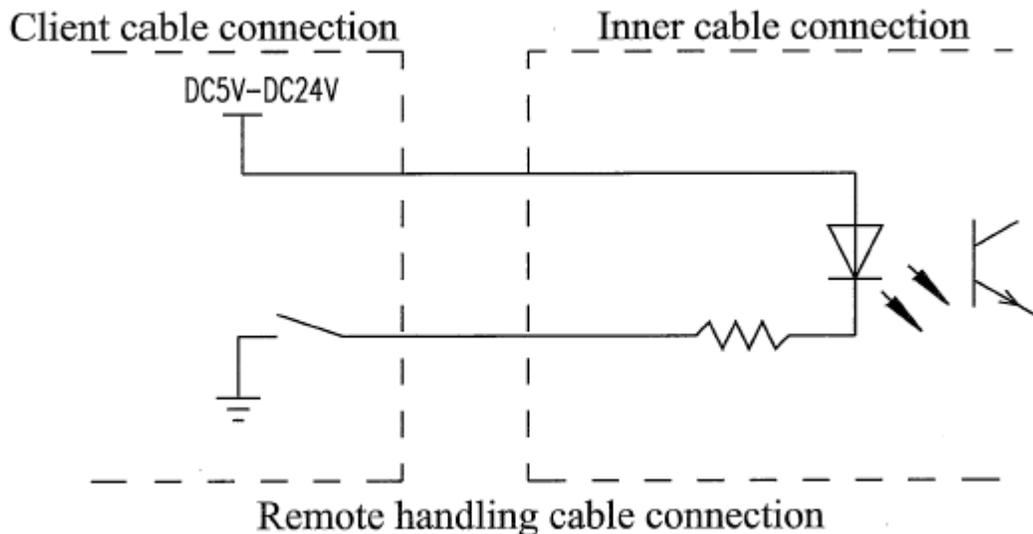
- ⚠ The time of signal for opening and closing: In mode b-01, the signal is sent at the moment the valve leaves the position of running, and disappears while it arrives at the running state. While in mode b-02, the signal is sent at the moment the valve leaves from each working position, and disappears while it arrives at the next state.
- ⚠ AC220V power supply should be connected to a slow blow breaker when connecting the output signal wire.
- ⚠ Picture five shows the output signal connector. The common port at the middle station, marks N/C (right station) is normal close port, Marks N/O (left station) is normal open port.

7. Partial by-pass function

When valve is in running state, and user needs certain hardness, use a straight screwdriver to adjust the bolt. Turn the bolt in clockwise direction to close. Turn counter-clockwise to achieve partial by-pass. By-pass is at maximum when the adjusting bolt is flush with the face.

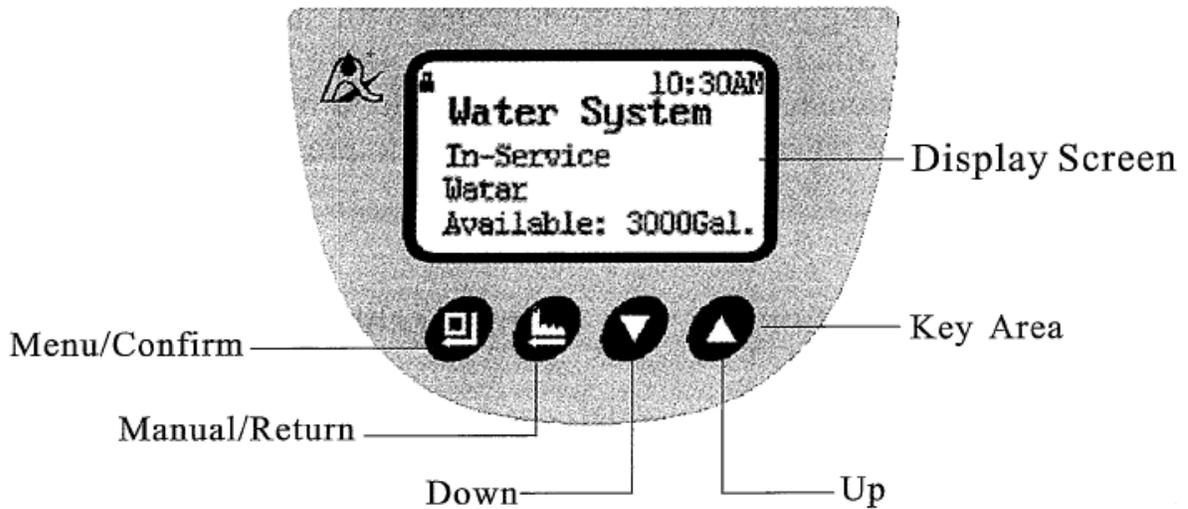
8. Remote handling connector

When this valve is used for making pure water, connected with on-line monitoring system, or PC, electrical conductivity or other data reaches at the set value or PC sends signal, it needs regeneration, the signal can be transferred through signal cable to remote handling connector on main control board to initiate regeneration. This is similar to pressing a manual button.



- ✘ Failure to install the multi-functional flow control valve correctly voids the warranty.
- ✘ Any plumbing, engineering, and electrical work, must be completed by a professional prior to installation.
- ✘ Minimum inlet water pressure is 22psi, maximum inlet water pressure is 87psi. If the inlet pressure exceeds 87psi, a pressure reducing valve must be installed before inlet pipeline.
- ✘ During installation, do not use brine tube or other connectors as a handle for transport.
- ✘ Handle all components of this valve with care. Do not drop, drag, or turn components upside down. Please use the factory-authorized accessories we supplied.
- ✘ Take care not to over-tighten connections. Take care not to cross-thread or damage threads on the valve and its related connectors. Valve ports are not designed to bear ANY loading!
- ✘ It is suggested to use PPR pipe, Wave-thread pipe, or URVC pipe, and avoid using Aluminum Plastic pipe.
- ✘ The connection of all pipelines should be adequately sealed, with no leakage. Otherwise, flow capacity under some conditions may not reach to expected results.
- ✘ The use of a liquid level controller and brine valve, with interdiction air, in brine tank is recommended.

Controller Operation Instruction

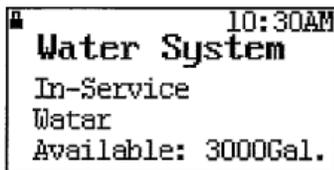


1. Display Screen

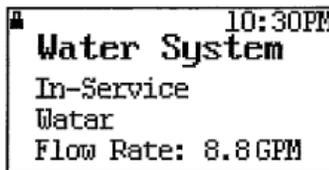
At service state, the display screen shows the following images every 10 seconds cyclically:

- ✘ Balance treated water volume (See picture 1A), such as 3000 Gal.
- ✘ Current flow rate (See picture 1B), such as 8.8 GPM
- ✘ System work mode (See picture 1C), such as A-03 (Represent recharge by down-flow, volume intelligent)
- ✘ Recharge time (See picture 1D, only for work mode A-01/03/11/13, and balance treated water volume being 0, when it is waiting, it has this item.), such as 02:00
- ✘ Alarm signal when lack of salt (See picture 1E), shown only when receiving the alarm signal (Alarm device installation is required in case of lack of salt)

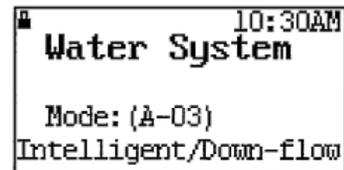
For Example: For controller work mode A-03, at service state, balance treated water volume 0, and lack of salt, display screen will show the following 5 images cyclically:



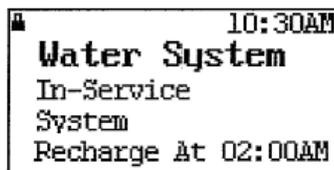
(Picture 1A)



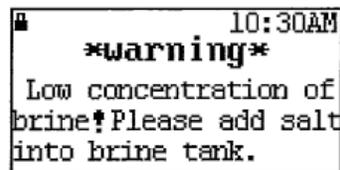
(Picture 1B)



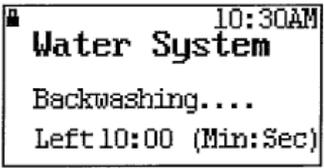
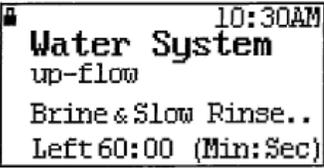
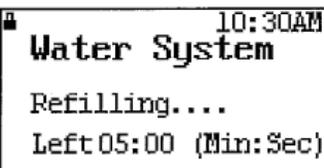
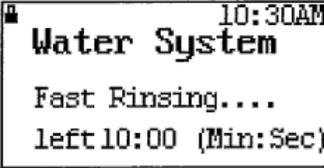
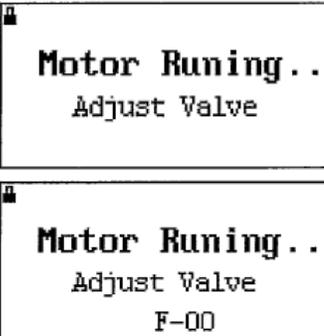
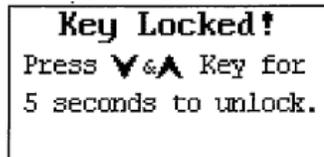
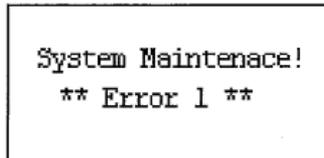
(Picture 1C)



(Picture 1D)



(Picture 1E)

Work State	Showing Content	Description	Remark
Backwash		10:30:25 current time. 10:00 represents the balance time of this state, unit second, count down.	
Brine & Slow Rinse		60:00 represents the balance time of this state, unit second, count down.	When work mode is A-01, A-02, or A-03, it shows recharge by down-flow. When work mode is A-11, A-12, or A-13, it shows recharge by up-flow. When work mode is A-21, no this image
Brine Refill		05:00 represents the balance time of this state, unit second, count down.	
Fast Rinse		10:00 represents the balance time of this state, unit second, count down.	
Motor Running		Work mode A-21, when work state is switching from service to backwash, it looks like upper left image. Work mode A-11/12/13, when work state is switching from service to backwash, it looks like lower left image.	Work mode A-21, when work state is switching from fast rinse to service, service to backwash, it looks like upper left image. After passing service, F-00 minus 1 if it is not 0, but if it is 0, then it stops at service position.
Key Locked		When at key locked state, press any key, it shows this image to unlock.	
System Maintenance Error		E-01 represents error code.	

	<p>Current time is 24 hour. Flow rate unit: m³, current flow rate unit: m³/h.</p> <p>When  lights, it represents key locked condition.</p> <p>The time on right top corner, is the current time.</p>
---	---

2. Key

✘ Press this key to enter into menu, press Up or Down, to show each parameter value.

✘ After entered into menu, press this key again, to show parameter adjusting image, the parameter flickers.

✘ After setting the parameter, press this key, there is a sound “ding”, to confirm setting and to return to set up state.

3. Key

✘ Press this key when not at the menu state, this allows you to finish the current working state and go to the next working state immediately.

✘ Press this key when in the menu state to go back to the set up menu.

✘ Press this key when at the setting state (the setting parameter is not saved) to return to set up.

4. Up and Down Keys

✘ Enter into the menu, press Up or Down, to show each parameter value.

✘ When setting the parameter, press Up or Down continuously to adjust the parameter.

✘ Press Up or Down keys together for 5 seconds to unlock.



✘ Setting or inquiring after unlocking the keyboard.

✘ When pressing the Up or Down key to adjust parameter, a number is changed incrementally per press. Alternatively, press the key and hold for longer than 1.5 seconds, to scroll through numbers incrementally at the rate of 1 every 0.2 seconds. Holding the key longer than three seconds advances the parameter at the rate of 20 per 0.20 seconds for rapid scrolling.

Inquiring and Establishment of Each Parameter

1. Parameter Set

✘ When system is in set state, the parameter requested to be reset flickers. Press Up or Down key to adjust.

✘ Adjusting method: For parameter, a number is changed by per pressing or press the key and keep longer than 1.5s, then a number is changed per 200ms, or keep longer than 3s, 20 numbers is changed per 200ms. For selection mode, each option is changed per press (in this case, there is no scrolling function).

2. When keys are not locked, press  key to enter into menu, for the following options:

✘ Set Clock

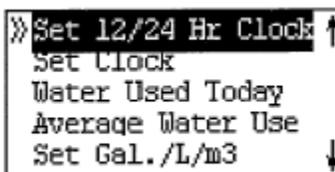
✘ Water Used Today

✘ Recently 7 Days Average Water Use

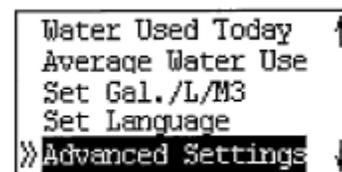
✘ Set Language

✘ Advanced Setting

✘ By pressing Up or Down to select the option, the option selected turns to grey shadow. Such as the following images:



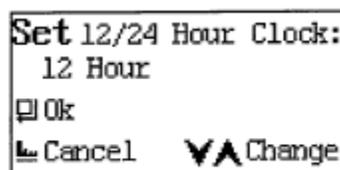
(This image shows the selected option Set Clock)



(This image shows the selected option Advanced Setting)

Enter into menu, press  key to go back to set up.

-After selecting Set Clock, press  key, it shows:



Adjusting: 09:30 both flicker, press Up or Down key to the parameter requested, then press  to preserve setting and go back to set up. Pressing  key returns to set up without preserving the parameter.

```
Set Clock:
 09:30
[OK]
[Cancel]  [Change]
```

After selecting Water Used Today, press  key, to show:

```
Water Used Today:
 2000 Liters

[Back]
```

Press  key go back to set up.

-After selecting Recently 7 Days Average Water Use, press  key, to show:

```
Average Daily Water
Use: 3500 Liters

[Back]
```

Press  key to go back to set up.

-After selecting Set Gal./L/M3, press  key, to show:

```
Set Gal./L/M3:
 U.S Gallons
[OK]
[Cancel]  [Change]
```

Press  key to go back to set up.

-After selecting Set Language, press  key, to show:

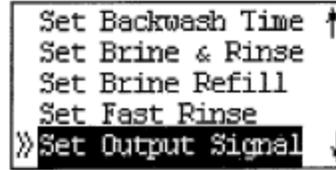
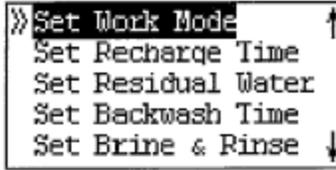
```
» English
 中文
[OK]
[Cancel]  [Change]
```

English turns to gray shadow, press Up or Down key to change between English and Chinese. Press  to preserve and go back to set up. The language version takes effect immediately once set. Press the  key, to return to set up without preserving your selection.

3. After selecting Advanced Setting, press  key to enter into Advanced Setting, there are the following options:

- Set Work Mode
- Set Recharge Time (Work mode A-02, A-12 no this item)
- Set Residual Water Capacity
- Set Repeat Washing Times (Only for work mode A-21)
- Set Interval Backwash Times (Only for work mode A-11, 12, 13)
- Set Backwash Time
- Set Brine & Slow Rinse Time (Work mode A-21 does not support this item)
- Set Brine Refill Time (Work mode A-21 does not support this item)

- Set Fast Rinse Time
- Set Max Days Between Recharges
- Set Output Signal Work Mode



(1) After selecting Set Work Mode, press key, to show:

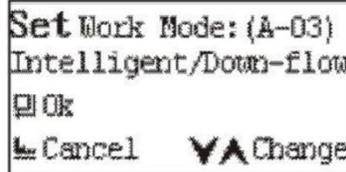
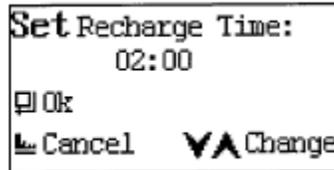


Image of recharge by down-flow, intelligent volume flicker, press Up or Down to adjust, A-03 is changed as well.

There are seven options: A-01 down-flow, volume delayed, A-02 down-flow, volume timely, A-03 down-flow, volume intelligent, A-11 up-flow, volume delayed, A-12 up-flow, volume timely, A-13 up-flow, volume intelligent, A-21 filtration.

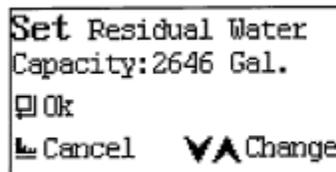
After selecting requested work mode, press to preserve and go back to set up. Press key, to return to set up without preserving your selection.

(2) After selecting Set Recharge Time, press to show:



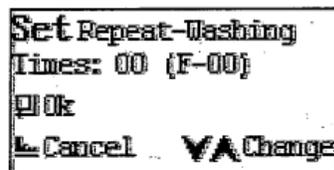
02:20 in image Up or Down key to the parameter requested, then press to preserve selection and to go back to set up. Press key to return to set up without preserving selection.

(3) After Selecting Set Residual Water Capacity, press key, to show:



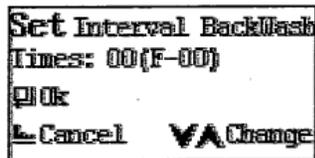
2646 displays in image, and flickers. Press Up or Down keys to change the parameter. Press key to preserve the change and return to set up process or press key to return to set up without preserving the selection.

(4) After selecting Set Repeat-washing Times, press key to show:



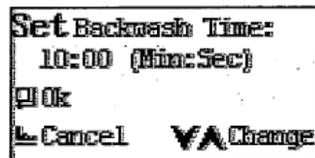
0 in image flickers, press Up or Down key to the parameter requested, then press to preserve and go back to set up. Press key to return to set up without preserving your selection.

(5) After selecting Set Interval Backwash Times, press  key, to show:



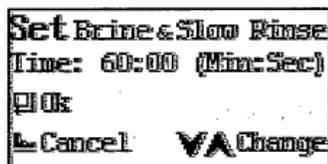
0 in image flickers, press Up or Down key to the parameter requested, then press  to preserve and go back to set up. Press  key to return to set up without preserving your selection.

(6) After selecting Set backwash Times, press  key, to show:



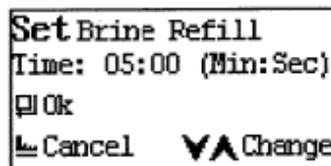
10:00 in image flickers, press Up or Down key to the parameter requested, then press  to preserve and go back to set up. Press  key to return to set up without preserving your selection.

(7) After selecting Set Brine & Slow Rinse Time, press  key, to show:



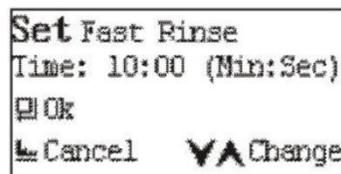
60:00 in image flickers, press Up or Down key to the parameter requested, then press  to preserve and go back to set up. Press  key to return to set up without preserving your selection.

(8) After selecting Set Brine Refill Time, press  key, to show:



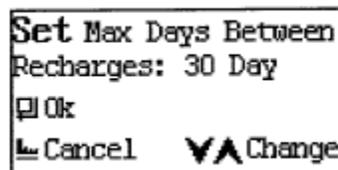
05:00 in image flickers, press Up or Down key to the parameter requested, then press  to preserve and go back to set up. Press  key to return to set up without preserving your selection.

(9) After selecting Fast Rinse Time, press  key, it shows:



10:00 in image flickers, press Up or Down key to the parameter requested, then press  to preserve and go back to set up. Press  key to return to set up without preserving your selection.

(10) After selecting Set Max Days Between Recharges, press  key, to show:



30 in image flickers, press Up or Down key to the parameter requested, then press  to preserve and go back to set up. Press  key to return to set up without preserving your selection.

(11) After selecting Output Signal Work Mode, press  key, to show:

```
Set output signal
Work Mode: 01 (b-01)
  OK
  Cancel  Change
```

01 in image flickers, press Up or Down key to the parameter requested, then press  to preserve and go back to set up. Press  key to return to set up without preserving your selection.

Parameter Settings

No.	Content	Value Range	Default Value	Unit	Remark
P1	12/24 Clock	12 or 24 Clock optional	24		Not available under Chinese version
P2	Current Time	00:00-23:59	Set on site	Hr:Min	Changeable
P3	Flow Rate Unit	Gal/L/m ³ optional	m ³		Not available under Chinese version
P4	Work Mode	A-01 A-02 A-03 A-11 A-12 A-13 A-21	A-01		01: Volume delayed (Recharge by down-flow) 02: Volume controlled (Recharge by down-flow) 03: Volume intelligent (Recharge by down-flow) 11: Volume delayed (Recharge by up-flow) 12: Volume controlled (Recharge by up-flow) 13: Volume intelligent (Recharge by up-flow) 21: Filtration
P5	Recharge Time	00:00-23:59	02:00	Hr:Min	Set on site(When P4 item is 02, 12, no this item)
P6	Running Capacity	0-99.99	10.00	m ³	Set on site(Under English version, three units of P3 items are optional)
P7	Washing Increased Times	0-20	0		Set on site(Only when P4 item is 21)
P8	Interval Backwash Time	0-20	0		(Only when P4 is A-11, 12, 13)
P9	Backwash Time	0-99:59	10:00	Min:Sec	Set on site
P10	Brine & Slow Rinse Time	0-99:59	10:00	Min:Sec	Set on site(When P4 item is 21, unavailable)
P11	Brine Refill Time	0-99:59	5:00	Min:Sec	Set on site(When P4 item is 21, unavailable)
P12	Fast Rinse Time	0-99:59	10:00	Min:Sec	Set on site
P13	Max Days Between Recharges	0-40	30	Day	Set on site(When it is set to be 0, this item is disabled)
P14	Output Signal Work Mode	b-01, b-02	b-01		Set on site

Basis of the Parameter Settings

This valve is automatic valve controlled by volume. The time on each position is calculated as the following formulas or as the suggestions offered by whole system supplier.

1) The regeneration cycle requires approximately 2 hours to complete. It is better to schedule regeneration during times the client is not using water.

2) Treated Capacity $Q=V_R \times E / (Y_D \times k)$

On the above formula,

V_R	Cubage of Resin	m^3
E	Resin Working Exchanged Capability	mol/m^3
Y_D	Hardness of Inlet Water	mol/m^3
k	Security Modulus, usually 1.2~2. It is related to the hardness of inlet water.	

The k's choosing number is increasing with the rise of modulus.

3) Backwash Time: Related to the turbidity of inlet water. It is suggested to be set up 10-15 minutes. If the turbidity is higher, then the backwash time is longer. When the turbidity of the inlet water is more than 5, a filter is suggested to be installed before the control valve.

4) Brine & Slow Rinse=Brine Draw Time+Slow Rinse Time(Slow Rinse Times also called Replacement Time)

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

On the above formula,

$V_z = m_{cz} / (C \times \rho \times 10)$	m^3
V_z	Cubage of Recharged Liquid, m^3
S	Cut Acreage of Exchange Menstruum Layer(exchange equipment) m^2
v	Flow Velocity of Recharged Liquid, m/h
m_{cz}	Recharged Menstruum Dosage which is with 100% pure and regenerated by one time Kg.
C	Consistency of Recharged Liquid, %
ρ	Density of Recharged Liquid, %
$M_{cz} = V_R E k M / (\varepsilon \times 1000)$	Kg

On the above formula,

V_R	Resin Loadage, m^3
E	Exchange Cubage of Exchange Menstruum, mol/m^3
k	Recharge Menstruum Consumption. For exchange by down-flow, k could be chosen 2~3.5; For up-flow k could be chosen 1.2~1.8.
M	Mol Quality of Recharged Menstruum, NaCl is 58.5
ε	Consistency of Regenerated Menstruum, in common salt, the NaCl Represents 95%~98%

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

5) Brine Refill Time=Brine Refill Water Capacity/Pouring Water Speed(minute)

Water Capacity refilled to tank equal to the totally consumed cubage of recharged brine. Because of the differences inlet water pressure, the speed of pouring to tank is also different. It is suggested that actual time of pour water to tank is 1~2 minutes longer than the time which is calculated in theory as to make sure there is enough water in tank. (Notice: there is liquid level controller in tank)

6) Fast Rinse Time=Fast Rinse Water Capacity/ Fast Rinse Speed(minute)

Water capacity is 3~6 times of resin loading. In general, it choose 10~12 minutes, but subject to the outlet water reaching to the requirement.

7) Set up the Interval Backwash Times(Only for work modes A-11/12/13)

When the raw water is high turbidity, the Interval Backwash Times can be set up F-00, viz.backwash in each recharge; when the raw water is low turbidity, the Interval Backwash Times can be set F-01 (or other number value), Service-Backwash-Brine & Slow Rinse-Brine Refill-Fast Rinse-Service-Brine & Slow Rinse-Brine Refill-Fast Rinse.

8) Washing Increased Times (Only for work mode A-21)

When raw water is high turbidity, washing increased times could be set F-01(or Bigger), viz. Service-Backwash-Fast Rinse-Backwash-Fast Rinse-Service.

Notice: On above, Slow Rinse speed, Pouring speed, Fast Rinse speed are according to the type of injector. Refer to the table two in manual. The above formulas are only for reference.

Trial Running

- 1) Installation of the multi-functional flow control valve on the resin tank according to the usage state and plumbing, close the by-pass valve (valve A, as picture one, following same as); then connect the power.
- 2) Open inlet valve B to 1/4 position slowly, making water flow into the resin tank. When water stops flowing, open the outlet valve C. Until all the air is out of the pipe, then close the outlet valve; then check for leakage. In case of leaks, remedy immediately before proceeding.
- 3) Open the inlet valve B completely now.
- 4) Press the  button to the "Backwash" position. Let water flow from drain for 3~4 minutes.
- 5) Fill water in brine tank by hose until water goes to the top of air check valve. Then, all required quantity of salt to tank, and dissolve the salt as much as possible.

 **The brine tank should add the clean water softening salts only, at least 99.5% pure, use of small-grain salt is prohibited!**

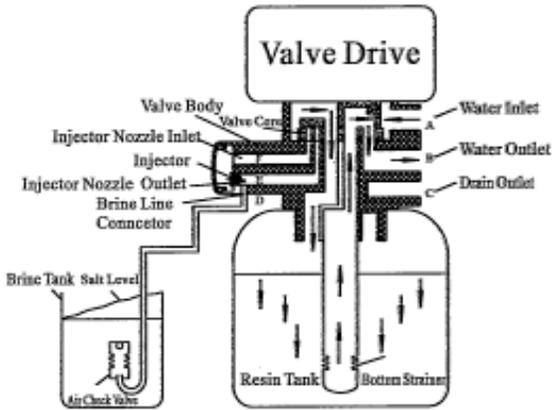
- 6) Press the  button to "Brine & Slow Rinse" position, making control valve draw brine from tank until the air check stops brine draw. After air check valve stops brine draw, pause several minutes (viz. Slow Rinse)
- 7) Press the  button to "Brine Refill" position, and refill water to the required level, viz. close the liquid level controller. stop refilling water.
- 8) Press the  button to "Fast Rinse" position, after Fast Rinse for some time.
- 9) Take out some water for analysis. After water quality is acceptable press the  button to make control valve return to Service State.
- 10) Set up the time parameter according to operating instructions of controller.



- ⌘ If the inlet water flows to quickly, material in resin tank will be damaged. The air sound from drain can be heard when water flows into tank slowly.
- ⌘ The operating time in backwash, brine & slow rinse, brine refill, and fast rinse status may Be set in accordance with parameter settings in this manual or according to Recommendations by specific equipment suppliers.

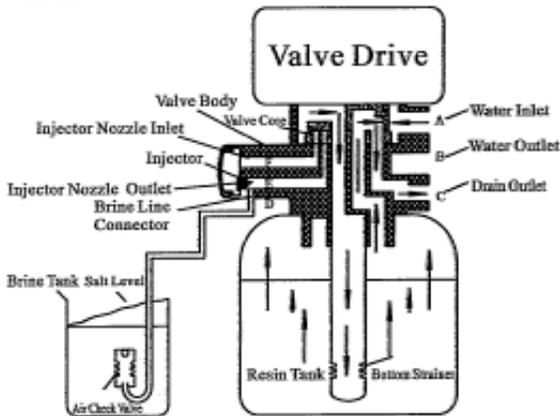
Working Principle and Flow Chart

Service Position



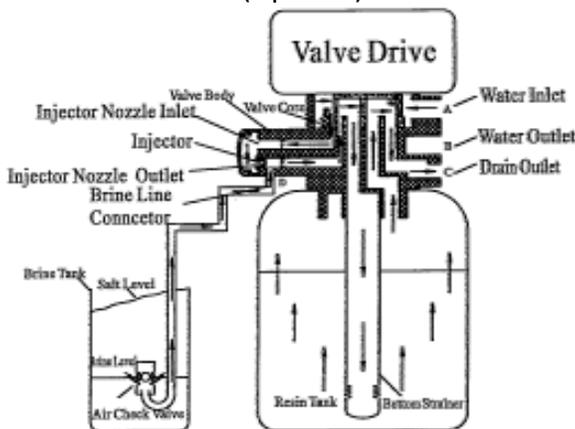
Raw water enters into the control valve from inlet A, through valve body from the top of valve core, and goes into the tank from top(or riser pipe outside of resin tank, the same as below). Then, down through resin layers(it is softened, or purified by carbon if set up for carbon filtration as below), to be softened water, then through bottom strainer to return to riser pipe, upward to valve body, through valve core, and finally flows out from outlet B. Partial by-pass, if required, is available via control provided.

Backwash Position



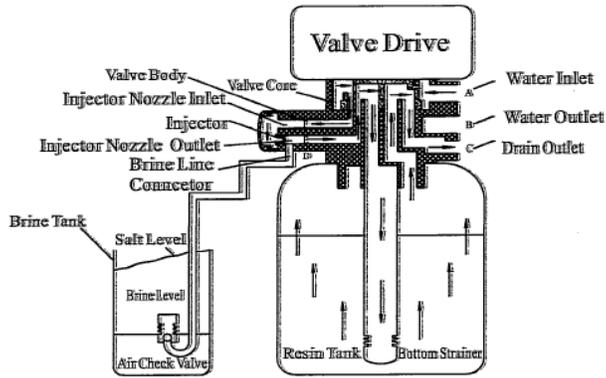
Raw water enters into the control valve from inlet A, through valve body from the top of valve core, then from the bottom of tank(or riser pipe inside, the same as below), bottom strainer into tank, and valve body, valve core, finally flows out from drain C.

Brine Draw Position(Up-flow)



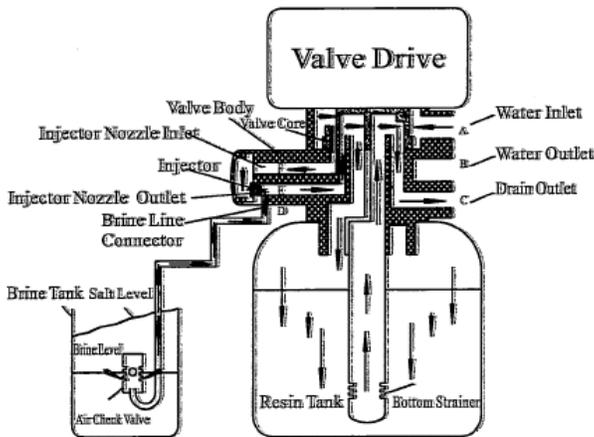
Raw water enters into control valve from inlet A, through valve core into injector inlet F, and flows quickly to the injector outlet E, which produces minus pressure, so the brine in tank is poured to valve from D, then into the riser pipe, through bottom strainer into the tank up through resin layer,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

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



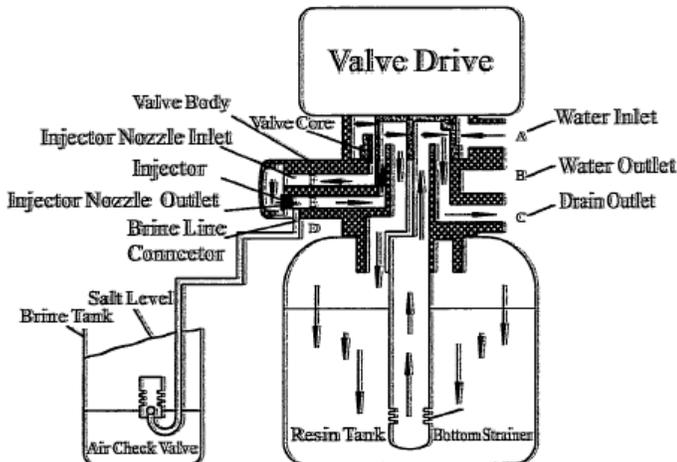
After absorbing all salt, raw water enters into control valve continually from inlet A, through valve core into injector nozzle, then passes through the injector nozzle, down to riser pipe, through bottom strainer, enters into the valve body, flows up through resin layer, into valve body, valve core and flows out from drain C.

Brine Draw Position(Down-flow)



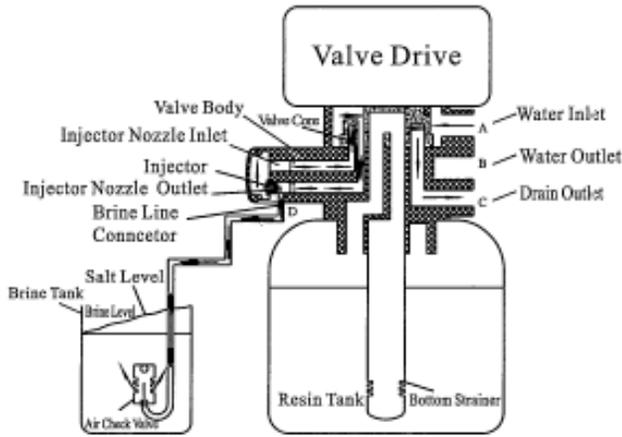
Raw Water enters into the control valve from inlet A, through valve core into injector inlet F, and flows quickly to injector outlet E, which produces minus pressure, so the brine in tank is drawn to the valve from D, then into the top of the tank, through brine and passes through resin layers, through bottom strainers, upward along with riser pipe, then through valve body, valve core, finally flows out from drain C.

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



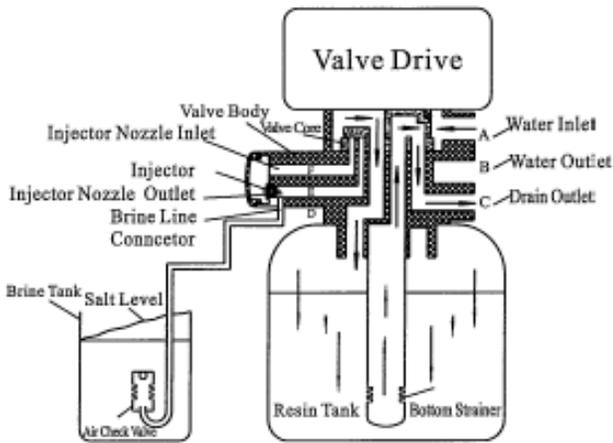
After drawing all salt, raw water enters into the control valve continually from inlet A, through valve core into injector nozzle, and down to resin layers, through bottom strainer, upward along with riser pipe to valve body, valve core, and finally flows out from drain C.

Brine Refill Position



Raw water enters into the valve from inlet A, through valve core to injector outlet E, from brine tank connector D pours into brine tank; Another part of water passes through injector E, and small hole to injector inlet F, then from valve body, valve core, and flows out from the drain outlet C.

Fast Rinse Position



Raw water enters into the control valve from A, through valve body from the top of valve core, and enters into the tank from the top, then, down through the resin layers, returns to the riser pipe from bottom strainer, upward to the valve body, through valve core and finally flows out from drain C.

Remarks: The above flow charts are specific to X79-A(No water passing in recharge). Either down-flow or up-flow can be selected, but not both at the same time. For X79-B(Water passing in recharge), besides running state, with the other states, operation is the same as described above but with a user-define outlet volume untreated raw water.

Maintenance Guide

Part of Control Valve

Problem	Cause	Correction
1. Softener cannot regenerate.	A. Device power off. B. Regeneration time is set wrong. C. Controller damaged.	A. Check supply power whether normal or not(including fuse, plug, switch, etc). B. Readjust Time. C. Check or change controller.
2. Softener outputs hard water.	A. By-pass ball valve opened B. No salt in brine tank. C. Injector is blocked. D. No enough water refilled in brine tank. E. Leakage on riser pipe. F. Leakage in valve body inside. G. Partial by-pass open to much to pass hard water H. Using X79-B and it is in recharge state.	A. Close the by-pass ball valve. B. Make sure there is solid salt in tank. C. Change or clean the injector. D. Check time of refill water to brine tank. E. Check riser pipe not broken, and check seal O-ring. F. Check and repair or change valve body. G. Adjust the by-pass bolt to proper setting. H. If request no raw water pass valve when recharge, use X79-A.
3. Cannot draw brine.	A. Inlet pressure to low. B. Brine pipeline blocked. C. Leakage on brine pipeline. D. Injector damaged. E. Leakage in valve body inside.	A. Increase inlet pressure. B. Check pipeline. Take out the stem. C. Check pipeline. D. Replace Injector E. Check and repair or change valve body.
4. Too much water in brine tank.	A. Brine Refill time too long. B. Too much water in brine tank after drawing salt.	A. Readjusting Brine Refill Time. B. Check whether it is blocked or not in injector or brine pipeline.
5. Water pressure damage.	A. Pipeline leading to softener blocked by iron matter. B. Softener blocked by iron matter.	A. Clean up pipeline of softener. B. Clean up control valve. Add cleaning liquid to resin tank in order to increase the regeneration efficiency.
6. Resin flow out from drain pipe.	A. Air in system. B. The strainer is damaged.	A. Make sure exhaust normally in system. Check whether dry or not. B. Change out strainer.
7. Control valve Continuously circulates	A. Signal line is cut off. B. Fault on controller C. Wheel locked by foreign matter.	A. Insert the signal line again. B. Change the controller. C. Remove foreign matter.
8. Water flows out from the drain continuously.	A. Valve body inside is leaking. B. Power off when backwash or fast rinse.	A. Check and repair or change valve body. B. Switch by hand to service position or close by-pass valve. Reopen when power normal.

Controller

1. All signs and figures light in screen.	A. The connect line between screen panel and control panel is damaged. B. Main control panel damaged. C. Transformer is wet or damaged.	A. Change the connect line. B. Change the main control panel. C. Check or change the transformer.
2. Nothing displays on screen.	A. The connect line between screen panel and control panel is damaged. B. Screen panel is damaged. C. Main control panel is damaged. D. Power is cut off.	A. Change the connect line. B. Change the screen panel. C. Change the main control panel. D. Check the cables and main power.
3. Only E1 shows in screen and flickering.	A. The connect line between locating panel and main control panel is damaged. B. Locating panel is damaged. C. Mechanical driving device is damaged. D. Main control panel is damaged. E. The connect line between driver and main control panel is damaged. F. Driver is damaged.	A. Change the connect line. B. Change the locating panel. C. Check the mechanical gearing. D. Change the main control panel. E. Change the connect line between driver and control panel. F. Change the driver.
4. Only E2 show in screen and flickering.	A. Hall components on locating panel are damaged. B. The connect line between locating panel and main control panel is damaged. C. Main control panel is damaged.	A. Change the locating panel. B. Change the connect line. C. Change the main control panel.
5. Only E3 show in screen and flickering.	A. The memory chip on main control panel damaged	A. Change the main control panel.
6. Only E4 show in screen and flickering.	A. The time chip on main control panel is damaged.	A. Change the main control panel.