

# AQT-580XT / AQT-581XT


ELECTRONIC VALVES SERIES



## PROGRAMMING MANUAL

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 <b>WARNINGS</b>	<b>DO NOT EXCEED 120 PSI WATER PRESSURE</b>
	<b>DO NOT EXCEED 100°F WATER TEMPERATURE</b>
	<b>DO NOT SUBJECT UNIT TO FREEZING CONDITIONS</b>
	<b>CALIFORNIA PROPOSITION 65 WARNING</b> THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

**PLEASE READ THIS MANUAL IN ITS ENTIRETY AND FOLLOW ALL THE INSTRUCTIONS BEFORE INSTALLATION AND OPERATION.**

<b>Water Pressure</b>	Minimum 20 - 25 PSI
<b>Electrical Supply</b>	Input: 100-240 VAC 50/60 Hz, Output: 12V DC/1A
<b>Existing Piping</b>	Free of any deposits or build-ups inside pipes (iron, scale, etc...)
<b>Softener Placement</b>	Locate close to drain and connect according to plumbing codes
<b>Bypass Valves</b>	Always provide for bypass valve if unit is not equipped with one

## Installation Instructions

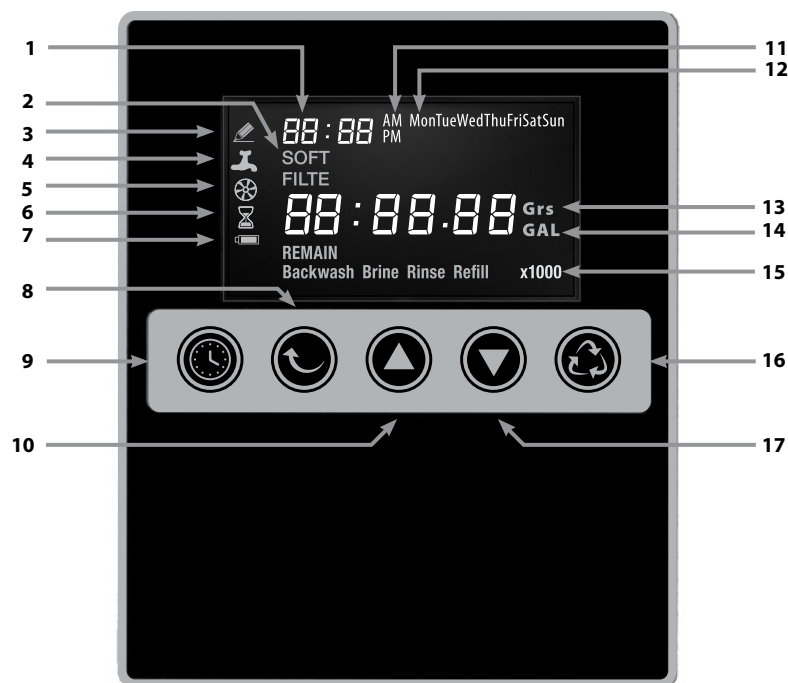
1. Place the softener tank where you want to install the unit making sure the unit is level and on a firm base. *Maximum 4 feet apart for twin units.*
2. All plumbing should be done in accordance with local plumbing codes. The pipe size for the drain line should be the same size as the drain line flow control female connection. Water meters are to be installed on soft water outlets. Twin units with (1) one meter shall be installed on common soft water outlets of units.
3. Lubricate the distributor O-ring seal and tank O-ring seal. Place the main control valve on tank. *(Only use silicone lubricant).*
4. Solder joints near the drain must be done prior to connecting the Drain Line Flow Control fitting. Leave at least 6" between the DLFC and solder joints when soldering when the pipes are connected on the DLFC. Failure to do this could cause interior damage to the DLFC.
5. Teflon tape is the only sealant to be used on the drain fitting. The drain from twin units may be run through a common line.
6. Make sure that the floor is clean beneath the salt storage tank and that it is level
7. Place approximately 1" of water above the grid plate *(if used)* in your salt tank. Salt may be place in the unit at this time.
8. On units with by-pass, place in by-pass position. Turn on main water supply. Open a cold soft water tap nearby and let run a few minutes or until the system is free from foreign material *(usually solder)* that may have resulted from the installation.
9. Place the by-pass in service position.
10. Manually index the softener control into "service" position and let water flow into the mineral tank. When water flow stops, open a cold water tap nearby and let run until air pressure is relieved.
11. Electrical: All electrical connections must be connected according to codes. Use electrical conduit if applicable. *(See Wiring Diagram section for more information).*
12. Plug into power supply.

## WARNINGS

- The information, specifications and illustrations in this manual are based on the latest information available at the time of release. The manufacturer reserves the right to make changes at any time without notice.
- This manual is intended as a guide for service of the valve only. System installation requires information from a number of suppliers not known at the time of manufacture. This product should be installed by a plumbing professional.
- This unit is designed to be installed on potable water system only.
- This product must be installed in compliance with all state and municipal plumbing and electrical codes. Permits may be required at the time of installation.
- It is established that when daytime water pressure exceeds 80 psi (5.5 bar), the maximum pressure rating of 125 psi (8.6 bar) can be exceeded. A pressure regulator must be installed on this system or warranty is voided.
- Do not install the unit where temperatures may drop below 32 °F (0 °C) or above 125 °F (52 °C).
- Do not place the unit in direct sunlight. Black units will absorb radiant heat increasing internal temperatures.
- Do not strike the valve or any of the components.
- Warranty of this product extends to manufacturing defects. Misapplication of this product may result in failure to properly condition water, or damage to product.
- A prefilter should be used on installations in which free solids are present.
- In some applications local municipalities treat water with Chloramines. High Chloramine levels may damage valve components.
- Correct and constant voltage must be supplied to the controller to maintain proper function.
- An interrupted alternating current (120 VAC) supply is required.
- The system is not designed to withstand extreme humidity or water spray from below.
- Always provide for the installation of a bypass valve if unit is not equipped with one.

## AQT-XT

Keypad



1. Current Time
2. Valve Type
  - SOFT = Softener valve
  - FILTE = Filter valve
3. Edit
  - When control valve in data setting
4. In Service
5. Flow Meter
6. Queue Regeneration
7. Battery
  - The backup battery has been installed
  - A flashing battery light means the battery charge is low
8. Enter
9. Basic Setup
10. Up Button
11. Time Of Day
  - AM or PM
12. Day of Week
13. Grain Unit
  - Grs = Total Resin Exchange Capacity
14. Gallon Unit
  - GAL = Flowrate
15. Hardness unit
  - Grs&GAL = Water Hardness
16. Cycle
17. Down Button



### Basic Set Up Button



### Enter Button

- Confirm and save the current setting
- Basic information query



### Up Button

- Increase or cycle



### Down Button

- Decrease or cycle



### Cycle

- Previous step / Manual regeneration



### To Enter Advanced Settings

- Press and hold simultaneously for 3 seconds the ENTER and UP buttons.



### To Enter Softener and Filter Regeneration Modes

- Press and hold simultaneously for 3 seconds the ENTER and DOWN buttons.



### To Enter Historic Information

- Press and hold simultaneously for 3 seconds the UP and DOWN buttons.

## 1. Enter Basic Settings



Press BASIC SET UP Button  
to enter Basic Settings.



## 2. Set Hour

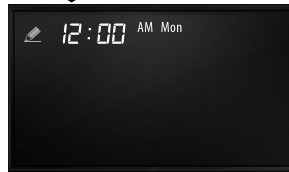
Press UP or DOWN to edit,



then press ENTER to save.



Flashing



Default: 12

Range: 00 - 12

## 3. Set Minutes

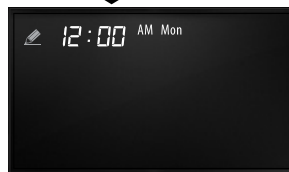
Press UP or DOWN to edit,



then press ENTER to save.



Flashing



Default: 00

Range: 00 - 59

## 4. Set Time of Day

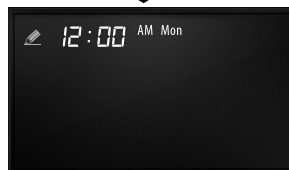
Press UP or DOWN to edit,



then press ENTER to save.



Flashing



Default: AM

Range: AM/PM

## 5. Set Day of Week

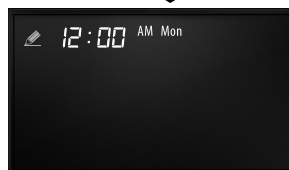
Press UP or DOWN to edit,



then press ENTER to save.



Flashing



Default: AM

Range: Mon - Sun  
Mon = Monday  
Tue = Tuesday  
Wed = Wednesday  
Thu = Thursday  
Fri = Friday  
Sat = Saturday  
Sun = Sunday

## XT Programming

### Basic Settings Cont.

#### 6. Set Override Day

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 04

Range: SOF1: 1 - 99  
SOF3 & SOF4: 0 - 99

#### 6.1. Set Regeneration Time within 12 hours

Press the DOWN Button and if the override day is less than one day, it will go to set regeneration time within 12 hours.



Press UP or DOWN to choose the override hour, then press ENTER to save.



Flashing

Default: N/A

Range: 3  
4  
6  
8  
12

#### 7. Set Regeneration Time

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 02:00

Range: 1 :00 - 12:59

#### 8. Set Time of Day (AM or PM)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: A

Range: A, P  
A = AM  
P = PM

#### 9. Set Feed Water Hardness

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 20 Grains/gallon

Range: 1 - 999 Grains/gallon



The treated water capacity is automatically calculated. Then the display will only be shown for SOF3 or SOF4.

Done

1. Password Setup

In service position, press  
UP for 3 seconds to enter.



Default Password: 0000

2. Input Password

Press UP or DOWN  
to edit a new password



then press ENTER to save.



Flashing

Default: 0000

Range: 0000 - 9999



# XT Programming

## Advanced Settings

### 1. Enter

Simultaneously press and hold  
ENTER & UP for 3 seconds to enter,



then press ENTER to input password.



Default: N/A

Range: N/A

### 2. Input Password

Press UP or DOWN  
to edit a new password



then press ENTER to save.



Flashing

Default: 0000

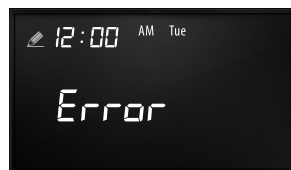
Range: 0000-9999

Original password: 0000

Only when the password is input correctly  
the program can go to step 4. If not, it will  
go to step 3.

### 3. Wrong Password

Error is displayed  
and an alarm will go off.



If an invalid password is entered an error  
alarm will go off for one second, then the  
screen will display an Error message and  
will return to service position.

### 4. Set Valve Type

Press UP or DOWN to edit,



then press ENTER to save.



Flashing



Default: SOFT

Range: SOFT  
FILTE

### 5. Down Flow or Up Flow

The screen can't be edited.  
Screen verifies valve type as  
originally ordered.



Flashing





Default: dF

Range: dF  
UF

Not shown for filter valve.



## 6. Setting the First DP Signal





-  Press the ENTER to set DP signal
-   Press UP or DOWN to edit,
-  then press ENTER to save.



Default: OFF  
Range: OFF  
dPon0  
dPdEL  
HoLd

\* DP signal function **page 40**,  
point 7.





## 7. Setting the Second DP Signal

-  Press the ENTER to set DP signal
-   Press UP or DOWN to edit,
-  then press ENTER to save.



Default: OFF  
Range: OFF  
dPon0  
dPdEL  
HoLd

## 8. Setting Aux Relay 01 Output


-  Press the ENTER to set Aux Relay output
-   Press UP or DOWN to edit,
-  then press ENTER to save.




Default: rEgon  
Range: rEgon  
Err  
t-on  
SEr-F  
rEg-F  
OFF

\* Aux Relay signal function on **page 40**,  
point 8.

If you choose "rEgon" or "Err" or "OFF" the  
system will skip to **step 9**.




 Not shown for filter valve..

### 8.1. "t-on" - Setting

-  If "t-on" is selected, Aux relay will close at **Start Time Setting** (8.1.1), and will open at **Finish Time Setting** (8.1.2). Aux Relay is NO (Normally Open).
- Press ENTER to go to next step.



#### 8.1.1. "t-on" - Start Time Setting

- Set the start time when the Aux relay closes.
-   Press UP or DOWN to edit,
-  then press ENTER to save.



Flashing

Default: 00:10:00  
Range: 00:00:00 - 23:59:59

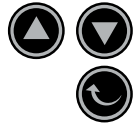
(hour: minute :second)

## XT Programming

### Advanced Settings Cont.

#### 8.1.2. "t-on" - Finish Time Setting

Set the finish time when the Aux relay opens.



Press UP or DOWN to edit,  
then press ENTER to save.



Flashing

Default: 00:18:00

Range: 00:00:00 - 23:59:59

(hour:minute:second)

#### 8.2. "SEr-F" - Setting

If "SEr-F" is selected, Aux relay closes when **Start Water Volume Setting** (8.2.1) is reached while unit is in service, and opens when **Finish Time Setting** (8.2.2) is reached. Aux Relay is NO (Normally Open).



Press ENTER to save.



Default: N/A

Range: N/A

#### 8.2.1. "SEr-F" - Start Water Volume Setting

Set the start water volume when the Aux relay closes.



Press UP or DOWN to edit,  
then press ENTER to save.



Default: 100

Range: 0 - 9999

#### 8.2.2. "SEr-F" - Finish Time Setting

Set the time when the Aux relay opens (Aux relay will be closed during this time).



Press UP or DOWN to edit,  
then press ENTER to save.



Flashing

Default: 00:18:00

Range: 00:00:00 - 99:99:99

(hour:minute:second)

#### 8.3. "rEg-F" - Setting

If "SEr-F" is selected, Aux relay closes when **Start Water Volume Setting** (8.3.1) is reached while unit is in regeneration, and opens when **Finish Time Setting** (8.3.2) is reached. Aux Relay is NO (Normally Open).



Press ENTER to save.






Default: N/A

Range: N/A



This function is only used for control valve with hard water piston.

### 8.3.1. "rEg-F" - Start Water Volume Setting




- Set the start water volume when the Aux relay closes.
- 
 Press UP or DOWN to edit,  
 then press ENTER to save.



Flashing

Default: 100  
Range: 0 - 9999

### 8.3.2. "rEg-F" - Finish Time Setting

- Set the time when the Aux relay keep opens (Aux relay will be closed during this time).
- 
 Press UP or DOWN to edit,  
 then press ENTER to save.







Flashing

Default: 00:18:00  
Range: 00:00:00 - 99:99:99

(hour : minute : second)


## 9. Setting Aux Relay 02 Output

-  Press the ENTER to set Aux Relay output  

 Press UP or DOWN to edit,  
 then press ENTER to save.






Default: rEgon  
Range: rEgon  
Err  
t-on  
SEr-F  
rEg-F  
OFF

You can setup Aux Relay 02 following steps from Aux Relay 01 on page 40, point 8.

 Not shown for filter valve.

## 10. Set Low Salt Sensor (cm)




- 
 Press UP or DOWN to edit,  
 then press ENTER to save.



Default: 067  
Range: 0-150

"000" means the low salt sensor function is off.

## 11. Set Maintenance Time (Week)

- 
 Press UP or DOWN to edit,  
 then press ENTER to save and return to service position.




Flashing

Default: 78  
Range: 0, 26, 52, 78

"0" indicates this function is off.

\*Please check detailed information on page 42, point 2.

 When the valve reaches the set weeks for maintenance, valve must be serviced by a certified professional.

## XT Softener Settings

### Softener Regeneration Modes

#### 1. Enter

Simultaneously press and hold  
ENTER & DOWN for 3 seconds to enter,



then press ENTER to input password.



Default: N/A

Range: N/A

#### 2. Input Password

Press UP or DOWN  
to edit a new password



then press ENTER to save.



Flashing

Default: 0000

Range: 0000 - 9999

#### 3. Set Softener Valve Mode

Press UP or DOWN  
to edit,



then press ENTER to save.



Flashing

Default: SOF4

Range: SOF1  
SOF2  
SOF3  
SOF4

Done

## 1. Enter SOF-1

Press UP or DOWN  
to choose SOF-1,

then press ENTER to save.



Flashing

## 2. Set Override Day

Press UP or DOWN to edit,

then press ENTER to save.



Flashing

Default: 04

Range: 1 - 99

### 2.1 Set Regeneration Time within 12 Hours

Press DOWN



If the override day is less than one  
day, it will go to set regeneration  
time within 12 hours.

Press UP or DOWN to choose the  
override hour,

then press ENTER to save.



Flashing

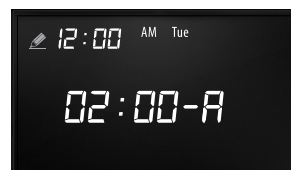
Default: N/A

Range: 3  
4  
6  
8  
12

## 3. Set Regeneration Time

Press UP or DOWN to edit,

then press ENTER to save.



Flashing

Default: 02:00

Range: 1 :00 - 12:59

## XT Softener Settings

SOF-1 Mode Cont.

### 4. Set AM/PM

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: A

Range: A = AM  
P = PM

### 5. Set Pre-Refill or Post-Refill

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: PoSt

Range: PoSt  
PrE

⚠ There is no option for regeneration within 12 hours.

#### 5.1. Set Salt-Dissolve Time (Pre-Refill)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 3

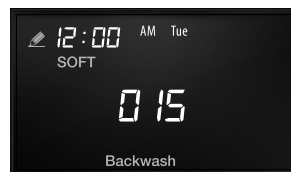
Range: 2 - 9

### 6. Set Backwash Time

Press UP or DOWN to edit,



then press ENTER to save.



Backwash

Flashing

Default: 15 min

Range: 0 - 999 min

## XT Softener Settings

SOF-1 Mode Cont.

### 7. Set Brine Draw Time

Press UP or DOWN to edit,



Default: 60

Range: 0 - 999 min

### 8. Set 2nd-Backwash Time

Press UP or DOWN to edit,



Default: 0

Range: 0 - 999 min

### 9. Set Rinse Time

Press UP or DOWN to edit,



Default: 10 min

Range: 0 - 999 min

### 10. Set Auto-Refill

Press UP or DOWN to edit,



Default: N

Range: N  
Y

If "N" was chosen -  
It means refill time is manually input and  
then continue with step 10.a.

If "Y" was chosen -  
It indicates the refill time is automatically  
calculated by the controller and then  
continue with step 10.b.1.

## XT Softener Settings

SOF-1 Mode Cont.

### 10.a. Set Refill Time (If "N" was chosen in step 9)

Press UP or DOWN to edit,



then press ENTER to save.



Then return to service position.



Flashing

Default: 12

Range: 0 - 999 min

### 10. b.1. Set Salt Consumption per cu.ft Resin (If "Y" was chosen in step 9)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 10

Range: 0.1 - 99.9 min

### 10. b.2. Set Total Resin Amount (ft<sup>3</sup>)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 14.0

Range: 0.01 - 99.99

### 10.b.3. Set BLFC (gpm)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 3.0

Range: 1.0  
2.0  
3.0  
4.0  
5.0



## 10.b.4. Display the Auto Refill Time

This data is calculated by the control valve and it is not editable.

Press ENTER to return to service position.



## 11. Set Chlorine Production

Press UP or DOWN to edit,



then press ENTER to save.



Flashing



Default: OFF

Range: OFF  
ON

*If "OFF" was chosen -  
The chlorine producer will turn off.*

*If "ON" was chosen -  
The chlorine producer will turn on.*

### 11. 1. Set Chlorine Production Time (If "ON" was chosen in step 11)

Press UP or DOWN to edit,



then press ENTER to save



and return to the service position.



Flashing



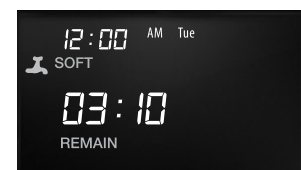
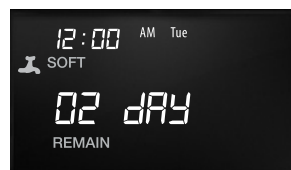
Default: 060 = 1 min

Range: 1min - max Brine Draw  
Time (set in step 7)

*It will not be shown if chlorine producer is  
set to "OFF".*

## 12. Display for SOF-1

When the override days reaches "0" days, the display panel will show the time to regenerate for the next regeneration.



**Done**

## XT Softener Settings

SOF-2 Mode

### 1. Enter SOF-2

Press UP or DOWN  
to choose SOF-2,



then press ENTER to save.



Flashing

### 2. Set Regeneration Time

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 04

Range: 1 - 99

### 3. Set AM/PM

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: A

Range: A = AM  
P = PM

### 4. Set Day of Week

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: d1--OFF  
d2--OFF  
d3--OFF  
d4--OFF  
d5--OFF  
d6--ON  
d7--OFF

Range: d1 - d7 / ON - OFF

d1 - d7 indicates from Monday - Sunday  
accordingly. There are ON and OFF for choice.

## 5. Set Pre-Refill or Post-Refill

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

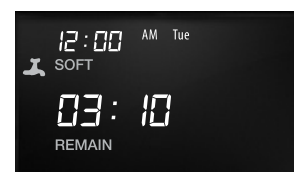
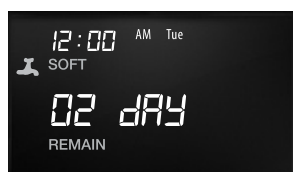
Default: PoSt

Range: PoSt  
PrE

*The next steps same as SOF-1 on page 14.*

## 6. Display for SOF-2

When the set days reaches "0" days,  
the display panel will show the time  
to regenerate for the next regeneration.



**Done**

## XT Softener Settings

SOF-3 Mode

### 1. Enter SOF-3

Press UP or DOWN  
to choose SOF-3,



then press ENTER to save.



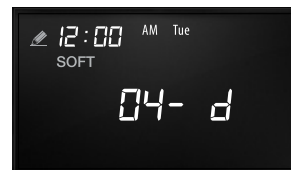
Flashing

### 2. Set Override Day

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 04

Range: 1 - 99

### 3. Set Regeneration Time

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 02:00

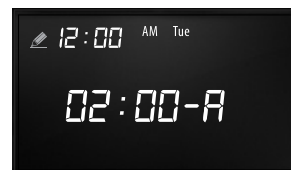
Range: 1:00 - 12:59

### 4. Set AM/PM

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: A

Range: A = AM  
P = PM

## XT Softener Settings

SOF-3 Mode Cont.

### 5. Set Treated Water Capacity

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: N

Range: N  
Y

*If "N" was chosen - Manually set the treated water capacity.*

*If "Y" was chosen - Automatically calculate the treated water capacity by controller.*

#### 5.a. Set the Treated Water Capacity (If "N" was chosen in step 5)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 9.0 x 1000 Gallons

Range: 0.01 - 999.99 x 1000  
Gallons

#### 5.b.1 Set the Feed Water Hardness (If "Y" was chosen in step 5)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 20 Grains/gallon

Range: 1 - 999 Grains/gallon

#### 5.b.2 Set the Total Resin Exchange Capacity

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 180 x 1000 Grains

Range: 1 - 9999 x 1000 Grains

## XS Softener Settings

SOF-3 Mode Cont.

### 5.b.3 Auto-Calculated Value Display

This screen is not editable.



### 6. Set Backwash Time

Press UP or DOWN to edit,



then press ENTER to save.



Flashing



Default: 15 min

Range: 0 - 999 min

*The next steps same as SOF-1 on page 14.*



### 7. Display for SOF-3

This screen is not editable.



**Done**

## 1. Enter SOF-4

Press UP or DOWN to choose SOF-4,

then press ENTER to save.

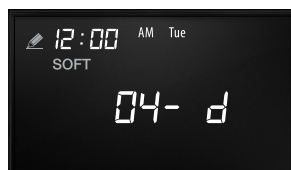


Flashing

## 2. Set Override Day

Press UP or DOWN to edit,

then press ENTER to save.



Flashing

Default: 04

Range: 0 - 99

*If set "0" day, the valve only can be initiated into regeneration by volume capacity.*

## 3. Set Regeneration Time

Press UP or DOWN to edit,

then press ENTER to save.



Flashing

Default: 02:00

Range: 1:00 - 12:59

## 4. Set AM/PM

Press UP or DOWN to edit,

then press ENTER to save.



Flashing

Default: A

Range: A = AM  
P = PM

## XT Softener Settings

SOF-4 Mode Cont.

### 5. Set the Treated Water Capacity

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: N

Range: N  
Y

*If "N" was chosen - Manually input the treated water capacity.*

*If "Y" was chosen - Automatically calculate the treated water capacity by controller.*

#### 5.a. Set the Treated Water Capacity (If "N" was chosen in step 5)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 9.0 x 1000 Gallons

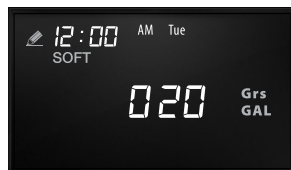
Range: 0.01 - 999.99 x 1000  
Gallons

#### 5.b.1 Set the Feed Water Hardness (If "Y" was chosen in step 5)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 20 Grains/gallon

Range: 1 - 999 Grains/gallon

#### 5.b.2 Set the Total Resin Exchange Capacity

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 180 x 1000 Grains

Range: 1 - 9999 x 1000 Grains



## 5.b.3 Auto-Calculated Value Display

This screen is not editable.



## 6. Set Safety Factor

Press UP or DOWN to edit,



then press ENTER to save.



Flashing



Default: 1.15

Range: 1.00 - 1.50

*Water reserve capacity = Daily average water consuming x Safety factor.*

## 7. Set Pre-Refill or Post-Refill

Press UP or DOWN to edit,



then press ENTER to save.



Refill

Flashing



Default: PoSt

Range: PoSt  
PrE

*Pre refill should be chosen for proportional regeneration.*

### 7.1.1 Set Salt-Dissolve Time (If "PrE" was chosen in step 7)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing



Default: 3

Range: 2 - 9

## XT Softener Settings

SOF-4 Mode Cont.

### 7.1.2. Set the Treated Water Capacity

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: N

Range: N  
Y

"N" - Proportional regeneration turn off.

"Y" - Proportional regeneration turn on.

If "N" was chosen - continue to step 8 and finish the settings.

If "Y" was chosen - set regeneration times in step 8, then continue through step 9.1 and 10.

\* Please check detailed information on Page 39, point 5.2.

### 8. Set Time for Each Regeneration Step (Post-Refill)

Press UP or DOWN to edit,



then press ENTER to confirm one by one.



Backwash  
Flashing

Default: 15

Range: 0 - 999 min

Regeneration Cycle Times: Backwash, Brine, and Rinse same as SOF-1 on page 14 and 15.

If PoSt was Chosen, you have finished.

### 9.1. Set Salt Consumption per cu.ft Resin (If "Y" was chosen in step 7.1.2)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 10

Range: 0.1 - 99.9

## 9.2. Set Total Resin Volume (ft<sup>3</sup>)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 14.0

Range: 0.01 - 99.99

## 9.3. Set BLFC (gpm)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 3.0

Range: 1.0  
2.0  
3.0  
4.0  
5.0

## 9.4. Display the Auto Refill Time

This data is calculated by the control valve and it is not editable.

Press ENTER to return to service position.



## 10. Set Chlorine Production

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: OFF

Range: OFF  
ON

If "OFF" was chosen -  
The chlorine producer will turn off.

If "ON" was chosen -  
The chlorine producer will turn on.

## XT Softener Settings

SOF-4 Mode Cont.

### 10. 1. Set Chlorine Production Time (if "ON" was chosen in step 10)

Press UP or DOWN to edit,



then press ENTER to save



and return to the service position.



Flashing

Default: 060 = 1 min

Range: 1min - max Brine Draw Time

*It will not be shown if chlorine production is set "OFF".*

### 11. Display for SOF-4

When the override days reaches "0" days, the display panel will show the time to regenerate for the next regeneration.



**Done**

**1. Enter**

Simultaneously press and hold  
ENTER & DOWN for 3 seconds to enter,



then press ENTER to input password.



**2. Input Password**

Press UP or DOWN  
to edit a new password



then press ENTER to save.



Flashing

Default: 0000

Range: 0000 - 9999

**3. Set Filter Valve Mode**

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: FIL

Range: FIL1  
FIL3  
FIL4

**Done**

## XT Filter Settings

FIL L-1 Mode

### 1. Enter FIL-1

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

### 2. Set Override Day

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 04

Range: 1 - 99

#### 2.1. Set Regeneration Time within 12 hours



Press the DOWN Button and if the override day is less than one day, it will go to set regeneration time within 12 hours.



Press UP or DOWN to choose the override hour, then press ENTER to save.



Flashing

Default: N/A

Range: 3  
4  
6  
8  
12

### 3. Set Regeneration Time

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 02:00

Range: 1:00 - 12:59

#### 4. Set Time of Day (AM or PM)

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: A

Range: A, P

A = AM

P = PM

#### 5. Set Backwash Time

Press UP or DOWN to edit,



then press ENTER to save.



Backwash

Flashing

Default: 15 min

Range: 0 - 999 min

#### 6. Set Brine Time

Press UP or DOWN to edit,



then press ENTER to save.



Brine

Flashing

Default: 0 for filter

Range: 0 - 999 min

#### 7. Set 2nd-Backwash Time

Press UP or DOWN to edit,



then press ENTER to save.



Backwash

Flashing

Default: 0

Range: 0 - 999 min

## XT Filter Settings

FIL-1 Mode Cont.

### 8. Set Rinse Time

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: 10 min

Range: 0 - 999 min

### 9. Set Refill Time

Press UP or DOWN to edit,



then press ENTER to save.



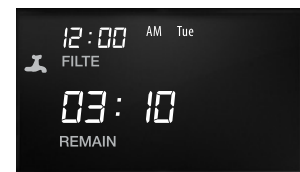
Flashing

Default: 0 for filter

Range: 0 - 999 min

### 10. Display for FIL-1

When the override days reaches "0" days, display panel will show the time to regenerate for the next backwash.



**Done**



## 1. Enter FIL-3 or FIL-4

Press UP or DOWN to  
choose FIL-3 or FIL-4



then press ENTER to save.



Flashing

## 2. Set Treated Water Capacity

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

**Default:** 9.0 x 1000 Gallons

**Range:** 0.01 - 999.99 x 1000 Gallons

## 3. Set Override Day

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

**Default:** 04

**Range:** 0 - 99

If set "0" days, the valve can only be initiated into regeneration by volume capacity.

## 4. Set Regeneration Time

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

**Default:** 02:00

**Range:** 1:00 - 12:59

## XT Filter Settings

FIL-3 & FIL-4 Mode Cont.

### 5. Set AM/PM

Press UP or DOWN to edit,



then press ENTER to save.



Flashing

Default: A

Range: A, P  
A = AM  
P = PM

### 6. Set Backwash Time

Press UP or DOWN to edit,



then press ENTER to save.



Backwash

Flashing

Default: 15 min

Range: 0 - 999 min

*The next steps same as FILT-1 on page 31.*

### 7. Display for FIL3 & FIL-4

This screen is not editable.



**Done**

### 1. Enter Setup Information

In Service Position, press  
ENTER for 3 seconds  
to enter and query.



Then press ENTER again  
to check the next Item.



#### 1.a. Check the valve regeneration mode

Press ENTER to check the Valve  
Regeneration Mode



#### 1.b. Check the Valve Regeneration Mode

Press ENTER again to check the Valve  
with Downflow or Upflow.



#### 1.c. Check the Remaining Days Before Maintenance

Press ENTER one more time  
to check the Remaining  
Days for Maintenance.



**Return to service position.**

## Setup & Historical Information

### Historical Information

---

#### 2. View Historical Information

---

In Service Position, press UP and DOWN for 3 seconds to enter and query.



then press ENTER to check the next Item.



##### 2.a. Check the Current Flow (GAL/min)

---

Press ENTER to check the Current flow.



Units: GAL = Gallons/min

##### 2.b. Check the Peak Flow (GAL/min)

---

Then press ENTER again to check the Peak flow.

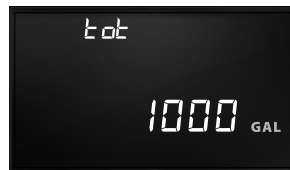


Units: GAL = Gallons/min

##### 2.c. Check the Total Flow After Installation

---

Press ENTER again to check the Total Flow after installation.



Units: Gallons

##### 2.d. Check the Total Use Time After Installation

---

Press ENTER again to check the Total Use Time after installation.



Units: h = hours

**2.e. Check the Total Regeneration Times After Installation**

Press ENTER again to check the total regeneration times after installation



Units: Regeneration times

**2.f. Check the Total Time Interval Between the Last 2 Regenerations**

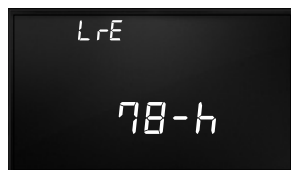
Press ENTER again to check the total time interval between the last 2 regenerations.



Units: h = hours

**2.g. Check the Time from the Last Regeneration**

Press ENTER again to check the time from the last regeneration.



Units: h = hours

**2.h. Check Remaining Days for Next Maintenance**

Press ENTER again to check the remaining days for next maintenance.



Units: d = days

*Return to service position.*

# XT Features

AQT-580XT & AQT-581XT Valves

---

## 1. Softener Regeneration Modes

---

### 1.1 SOF1 – Time Mode

- Regeneration initiates at the preset time in every set override days.
- The regeneration mode could be set in Pre-refill.

### 1.2 SOF2 – Day of Week Mode

- Regeneration initiates at the preset time in the preset date of the week.  
At least one day of a week need to be chosen.
- The regeneration mode could be set in Pre-refill.

### 1.3 SOF3 – Meter-Immediate Mode

- Regeneration initiates immediately when the volume capacity reaches zero.
- If the preset override day is reached before the preset water capacity, the regeneration will initiate at the preset time of the day.
- The volume capacity could be automatically calculated by the controller or manually input.

### 1.4 SOF4 – Meter Delayed Mode

- Regeneration initiates at the preset time of the day when the volume capacity reaches zero.
- If the preset override days is reached before the preset water capacity, the regeneration will initiate at the preset time of the day.
- The volume capacity could be automatically calculated by the controller or manually input.
- The regeneration mode can set Pre-refill and Proportional regeneration.

## 2. Filter Backwash Modes

---

### 2.1 FIL1 – Time Mode

- Backwash or regeneration initiates at the preset time in every set override days.

### 2.2 FIL3 – Meter Immediate Mode

- Backwash or regeneration initiated immediately when the volume capacity reaches zero.
- If the preset override days is reached before the preset water capacity, the regeneration will initiate at the preset time of the day.
- The volume capacity only can be set manually.

### 2.3 FIL4 – Meter Delayed Mode

- Backwash or regeneration initiates at the preset time of the day when the volume capacity reaches zero.
- If the preset override days is reached before the preset water capacity, the regeneration will initiate at the preset time of the day.
- The volume capacity only can be set manually.

### 3. Regeneration Cycle Sequence

The valve can regenerate in downflow or upflow. It will adjust the regeneration step accordingly based on the user's settings. Please refer to the below cycle sequence.

#### DOWNFLOW CYCLE SEQUENCE FOR DIFFERENT VALVE TYPE

TYPE	Softener		Regen Filter	Backwash Filter
CYCLE	POST REFILL	PRE REFILL	POST REFILL	—
1	Backwash	Refill / Dissolve	Backwash	Backwash
2	Brine draw	Backwash	Regen	—
3	2nd-Backwash	Brine draw	Rinse	2nd-Backwash
4	Rinse	2nd-Backwash	2nd-Backwash	Rinse
5	Refill	Rinse	Refill	—

### 4. Power Outage

- 4.1 When a power outage happens while valve is in service position, the control valve will keep in the same position when the power is restored.
- 4.2 If a power outage happens in any regeneration cycles, once the power is restored, the control valve will automatically look for the target position when the power outage happened. Then it will continue to complete the regeneration steps.
- 4.3 If the power outage happens when the control valve is moving from one position to the other, once the power restored, it will look for the target position when the power outage happened. Then it will continue to complete the regeneration steps.

### 5. Intelligent Control

#### 5.1 Pre- refill

- Soft water refill before the regeneration. Pre-refill can keep the brine tank dry to prevent bacteria from growing in the brine tank. The salt dissolving will be shown as below.



#### 5.2 Optional Proportional Regeneration

- The control valve will only regenerate the exhausted resin according to the water usage. This can keep the resin fully effective. At the same time, salt and water can be saved.

## XT Features

AQT-580XT & AQT-581XT Valves Cont.

### 6. Backup Battery

Remove the front cover and connect the battery with connectors.



Battery Model: 6LR619V

⚠ It is suggested that the battery be connected after the valve has been installed to protect the battery.

### 7. Optional DP Switch Signal Input

The valve has reserved two interfaces for DP input. The user can connect DP signal based on the circuit diagram and settings to regenerate via the DP input.

**OFF - DP** Signal is closed.

**HoLd** If the DP switch is closed, a regeneration will be prevented from starting.

**dPon0** If the DP switch is closed for a total of 30 seconds, a regeneration will occur immediately.

**dPdEL** If the DP switch is closed for a total of 30 seconds, a regeneration will occur at the set regeneration time.

Priority level: Hold > dPon0 > dPdEL

### 8. Optional AUX Relay Output

The main control panel has two reserved interfaces of Aux Relay Output which sends an on-off signal based on the valve state. It is a convenient feature for the user to control peripheral equipment.

Details of functions are as follows:

**rEgon** NO (Normal Open) - While valve is in Service Position.  
NC (Normal Close) - While valve is in Regeneration Process (start to finish).

**Err** Error Indication - Relay closes whenever it enters error mode, and immediately deactivates when mode is exited.

**t-on** By Time On - During the Regeneration Process, Relay closes at the Starting Time set and opens at a Finishing Time set.

**SEr-F** By Softening Volume On - Relay closes after the set Volume of Water has been used while in service, and then opens after the set time period has expired.

**rEg-F** By Regeneration Volume On - Relay closes after the set Volume of Water has been used while in regeneration, and then opens after the time period has expired. (This function is only used for control valve with hard water piston).

**OFF** No Relay functions activated.



The maximum load for the Aux Relay is 30VDC/1A or 24VAC/1A.



---

**9. Optional Powered Output During Regeneration**

---

12VDC/0.35A(max) from the beginning of the regeneration until going back to service again.

---

**10. Optional RS 485 Communication Port**

---

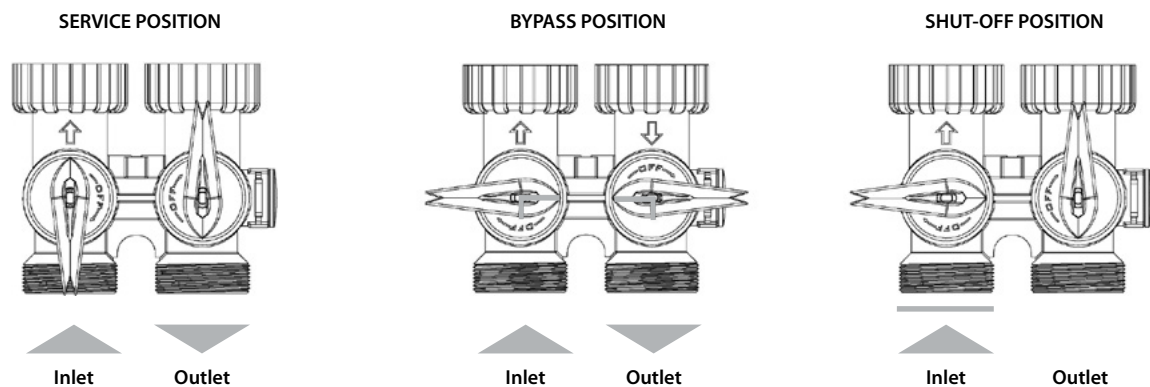
Communication port with 2 lead output, for open communication to the external devices. This enables to read the valve information as well as to control/set the valve.

---

**11. Bypass (Only AQT-580XT)**

---

Rotate the handles to adjust the bypass position.



## Maintenance

AQT-580XT & AQT-581XT Valves

### 1. Backup Battery

Backup battery will keep the CPU and flow meter working as normal.

Flashing ▶



#### Battery Power

When the battery power is low, the icon "🔋" is flashes to remind the user to replace the battery.

#### Power Supply On/Off

If the valve is without battery and a power outage happens during regeneration, the valve will keep in the position it was in. The valve will continue to regenerate when power is back.

If the valve has a battery installed, the valve will remind the user with a sound alarm and in the display. The screen will power off after 5 seconds. However, the sound alarm will stay on. The user can silence the sound alarm by pressings .

### 2. Maintenance Reminder

When it is time for maintenance, the display will automatically remind the user to call for maintenance.



Alternating  
Screen



Press UP



to cancel  
and return to  
Service Position

### 3. Low Salt (Optional)

When salt is detected, the screen will show the following:

1. The screen will alternatively show the service position and SALT screen. The sound alarm will remind the user to add salt.
2. The user can short press to cancel the buzzer alarm manually. But salt adding reminding can't be removed.
3. Add salt reminder won't disappear until salt is added to a higher level than the reserve level.



Alternating  
Screen



## 4. Manual Regeneration

While in Service Position, press CYCLE Button to initiate a queued regeneration,



then the Queue Regeneration icon will flash.

Flashing



Display for: SOF1  
SOF2  
SOF4

The control valve will regenerate at the preset regeneration time of the current day. Press CYCLE again to cancel the queued regeneration.



For SOF3, the display will alternate between *REMAINING GALLONS CAPACITY* and *REGENERATION TIME*. The valve will start to regenerate when either *REMAINING GALLONS CAPACITY* = 0 or preset *REGENERATION TIME* reaches first.



Alternating  
Screen



## 5. Manual Immediate Regeneration

While in Service Position, press and hold CYCLE Button for 5 seconds. The control valve will initiate an immediate regeneration.



Press the CYCLE Button to jump to the next cycle step. A system queued regeneration can only be cleared by stepping through the regeneration process step by step.



## 6. System Errors

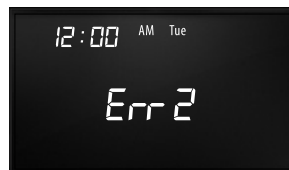
The control valve will automatically display and alarm any detected system errors. The detailed information is as follows:

1. Cannot locate Service position.



Flashing

2. Optical sensor does not have signal.



Flashing

## Maintenance

AQT-580XT & AQT-581XT Valves Cont.

3. Electric motor stalled or locked.



Flashing

4. Wrong service position.



Flashing



If there are several reminders at the same time, priority sequence is:

error alarm > low salt reminder > maintenance reminder.

## 7. Reset

If any Error alarm occurs on the screen.

Simultaneously press the UP and CYCLE Buttons and hold for 3 seconds to reset.



If reset is successful the error alarm will disappear and it will return to the position where the error occurred. Otherwise, call a professional for more help.

## 8. Restore Factory Settings

While the valve is unplugged, press and hold the BASIC SET UP Button,



then plug in the valve.



The display will show as illustrated.

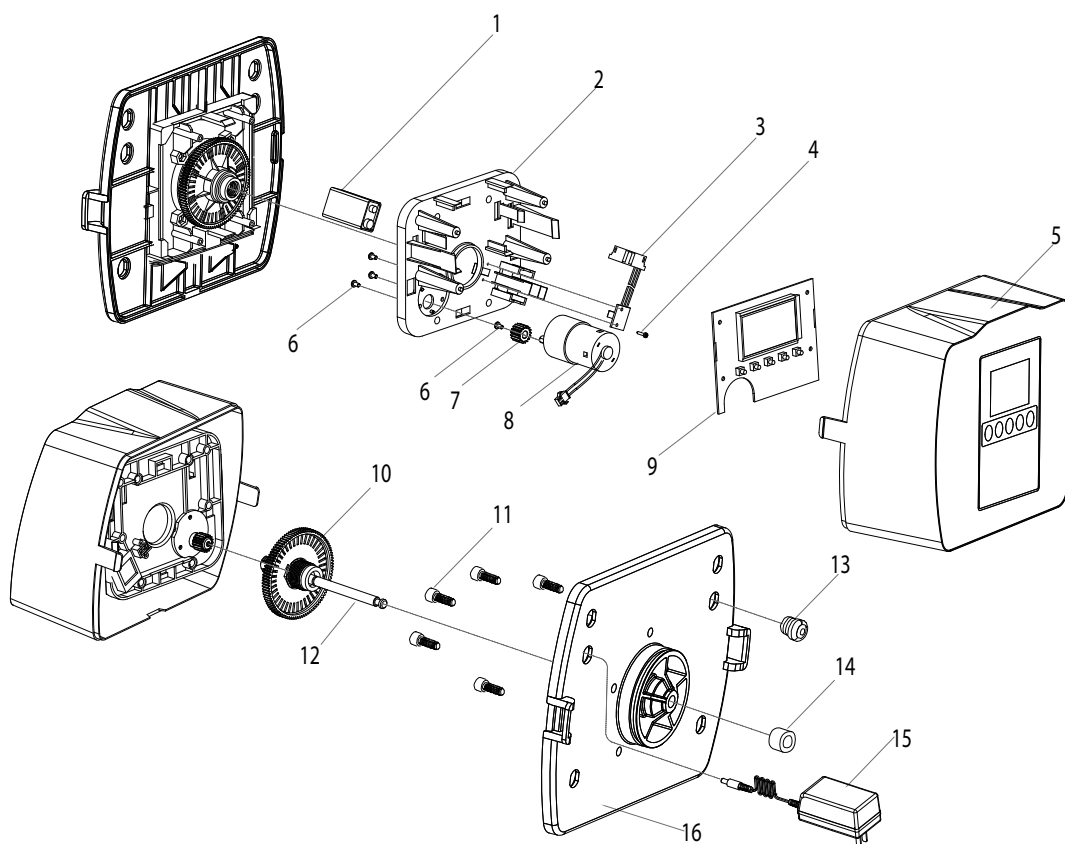
Release the BASIC SET UP Button,



The parameters of the valve will be restored back to factory default settings.

## AQT-580XT/AQT-581XT Control

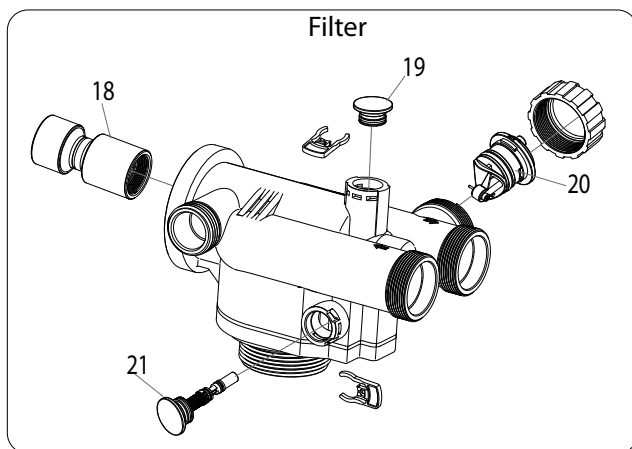
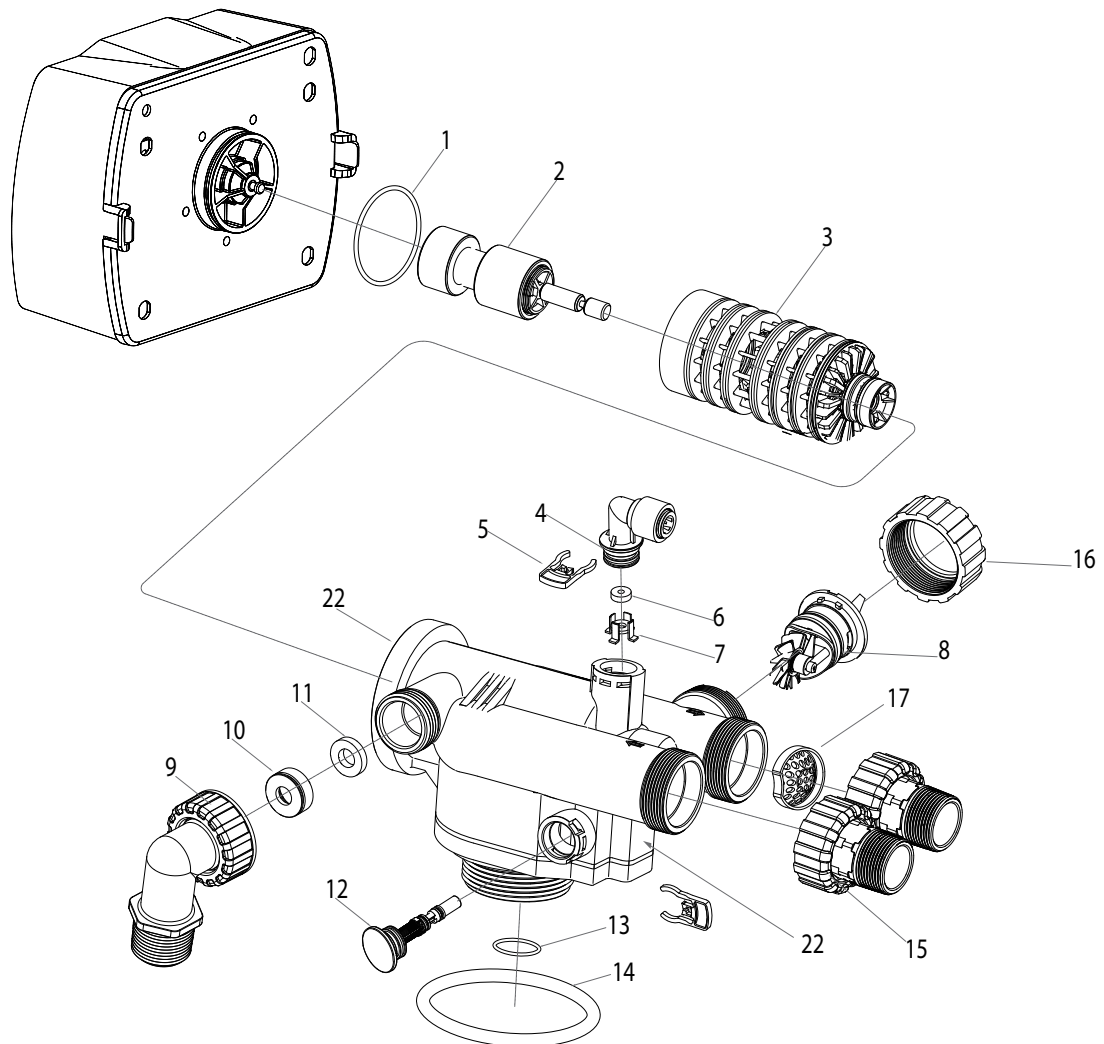
Assembly & Parts List



Item No.	Quantity	Part No.	Description
1	1	A-70010	Battery 9V
2	1	A-70011	Bracket, Board
3	1	A-70012	Optical Sensor, AQT-580/581
4	1	A-70013	Screw
5	1	A-70014	Valve Cover, AQT-580/581
6	4	A-70015	Screw
7	1	A-70016	Pinion Gear
8	1	A-70017	Motor for XT, 12V, AQT-580/581
9	1	A-70018	Electronic Board, AQT-580/581, XT
10 + 12	1	A-70019	Main Gear with End Plug, AQT-580/581
11	5	A-70020	Screw, Back Plate
13	1	A-70022	Cable Bushing Connector
14	1	A-70023	Cable Sleeve
15	1	A-70024	Transformer, 12V, AQT-580/581/910/950
16	1	A-70025	Backplate, 580/581

## AQT-580XT Body

Assembly



**AQT-580XT Body**

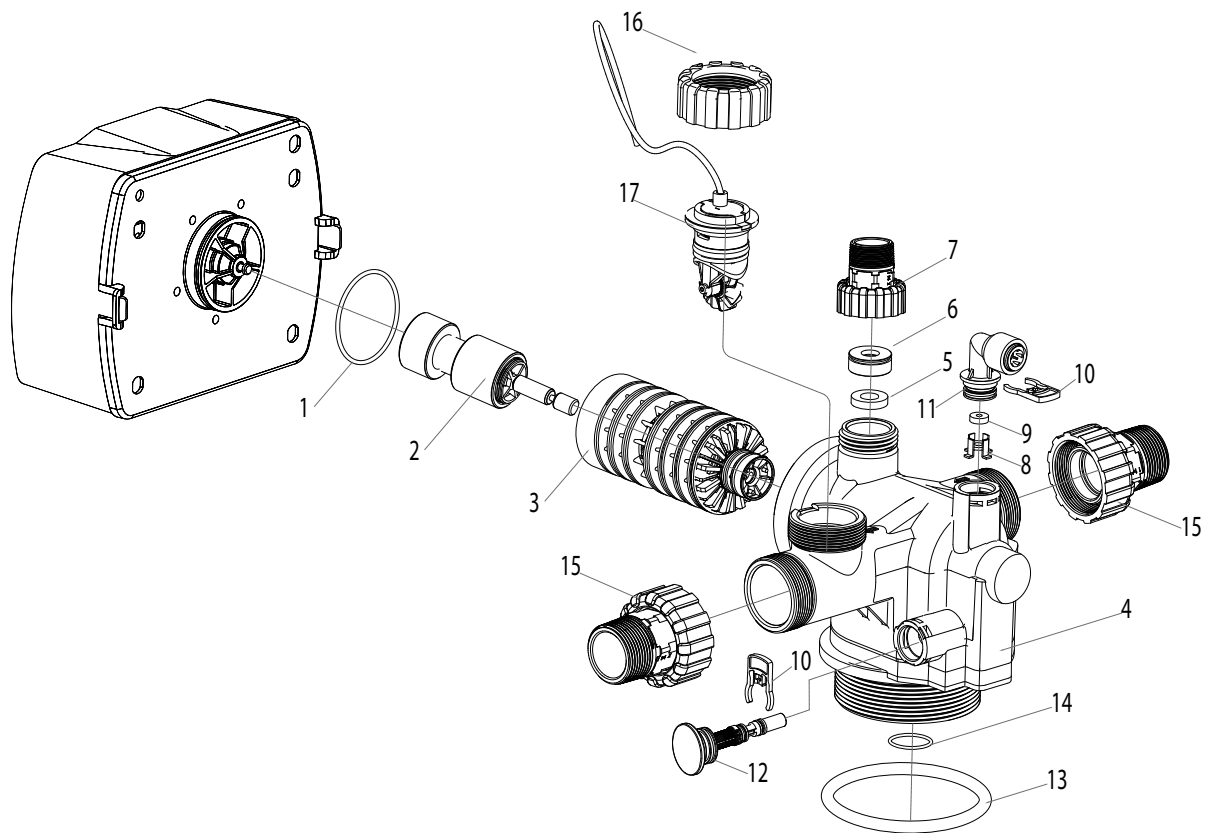
Parts List

Item No.	Quantity	Part No.	Description
1	1	A-71013	O-ring, End Plug, AQT-580/581
2	1	A-60500-01	Piston Assy, Softener, HW, AQT-580/581
	1	A-60501-01	Piston Assy, Softener, NH, AQT-580/581
3	1	A-71012	Seals and Spacers Stack, AQT-580/581
4	1	A-71013-38	Brine Connector, 3/8", Elbow
5	2	A-71014	U Clip, Red, Brine and Injector
6	1	*	BLFC (must see BLFC Table)
7	1	A-71016	BLFC Retainer
8	1	A-71017	Turbine Meter, AQT-580/581
9	1	A-71018	Drain Conenctor, 1" NPT, Elbow
10	1	A-71019	DLFC Retainer
11	1	**	DLFC (must see DLFC table)
12	1	***	Injector Assy (must see Injector Table)
13	1	A-71021-25	O-ring, Riser Pipe (2.5" Base)
14	1	A-71022-25	O-ring, Valve Base (2.5" Base)
15	2	A-71024	Inlet/Outlet Connectors, 1.25" NPT, Set 2 Pieces
16	1	A-71025	Turbine Meter, Nut
17	1	A-71026	Flow Straightener
18	1	A-60500-02	Piston Assy, Filter, HW, AQT-580/581
	1	A-60501-02	Piston Assy, Filter, NHW, AQT-580/581
19	1	A-71029	Plug, Brine Connector
20	1	A-71030	Plug, Turbine Meter
21	1	A-71031	Plug, Injector
22	1	A-71032-25HW	Body, AQT-580XT, 2.5" base

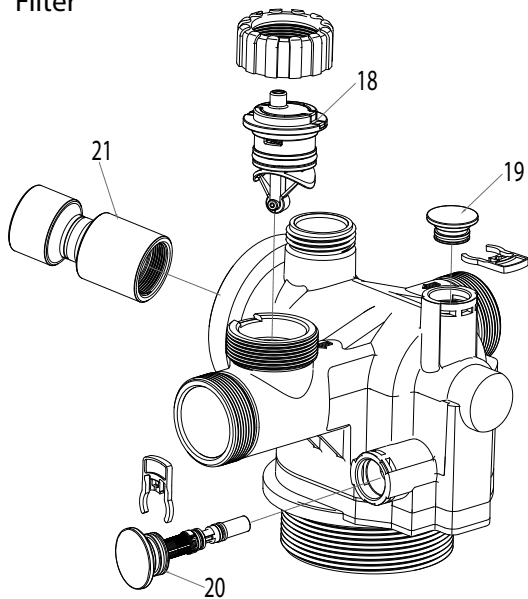
<b>* BLFC Button Options</b>	
A-71015-01	BLFC Button, 1.00 gpm
A-71015-02	BLFC Button, 2.00 gpm
A-71015-03	BLFC Button, 3.00 gpm
A-71015-04	BLFC Button, 4.00 gpm
A-71015-05	BLFC Button, 5.00 gpm
<b>** DLFC Button/Washer Options</b>	
A-17938	DLFC Washer Flow 2.4 gpm
A-17939	DLFC Washer Flow 3.2 gpm
A-17940	DLFC Washer Flow 3.5 gpm
A-17941	DLFC Washer Flow 4 gpm
A-17942	DLFC Washer Flow 5 gpm
A-17943	DLFC Washer Flow 8 gpm
A-17944	DLFC Washer Flow 9 gpm
A-16529	DLFC Washer Flow 10 gpm
A-16735	DLFC Washer Flow 12 gpm
A-16736	DLFC Washer Flow 15 gpm
A-16528	DLFC Washer Flow 20 gpm
A-16737	DLFC Washer Flow 25 gpm
A-16738	DLFC Washer Flow 32 gpm
<b>*** Injector Options</b>	
A-10225-0-N	Injector Assy, #0, Red
A-10225-1-N	Injector Assy, #1, White
A-10225-2-N	Injector Assy, #2, Blue
A-10225-3-N	Injector Assy, #3, Yellow

## AQT-581XT Body

Assembly



### Filter





## AQT-581XT Body

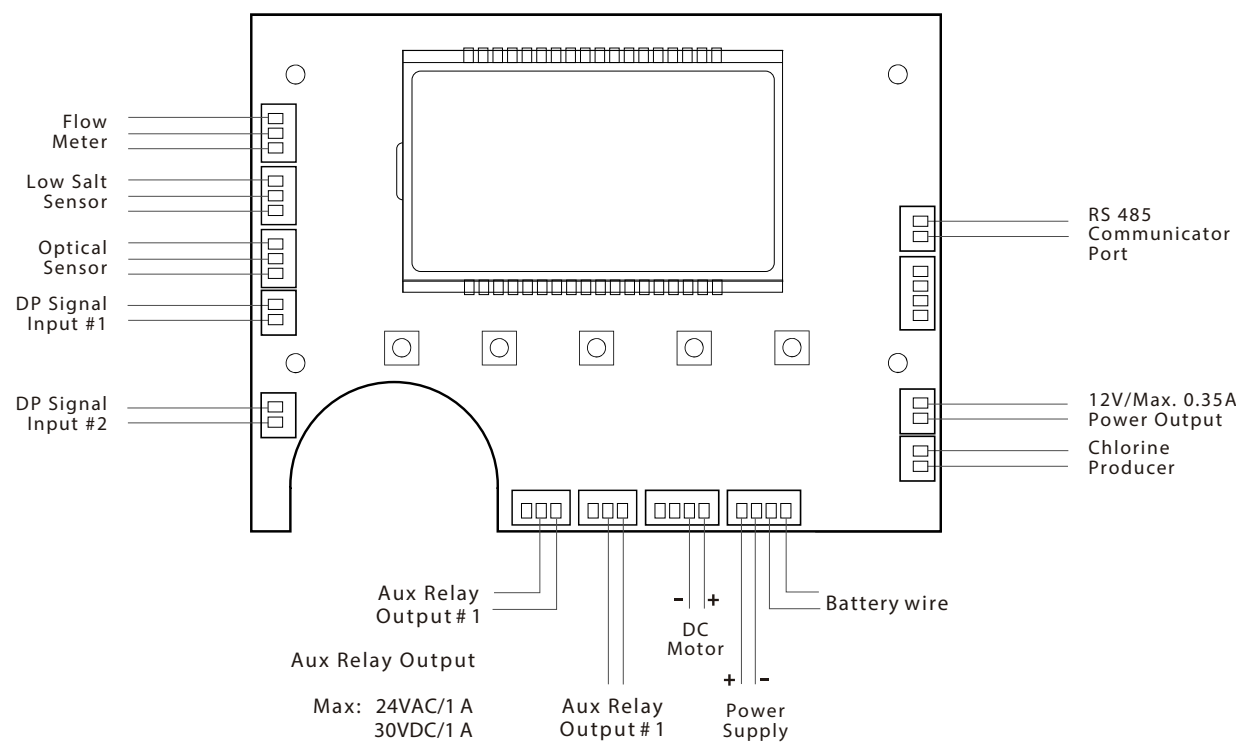
Parts List

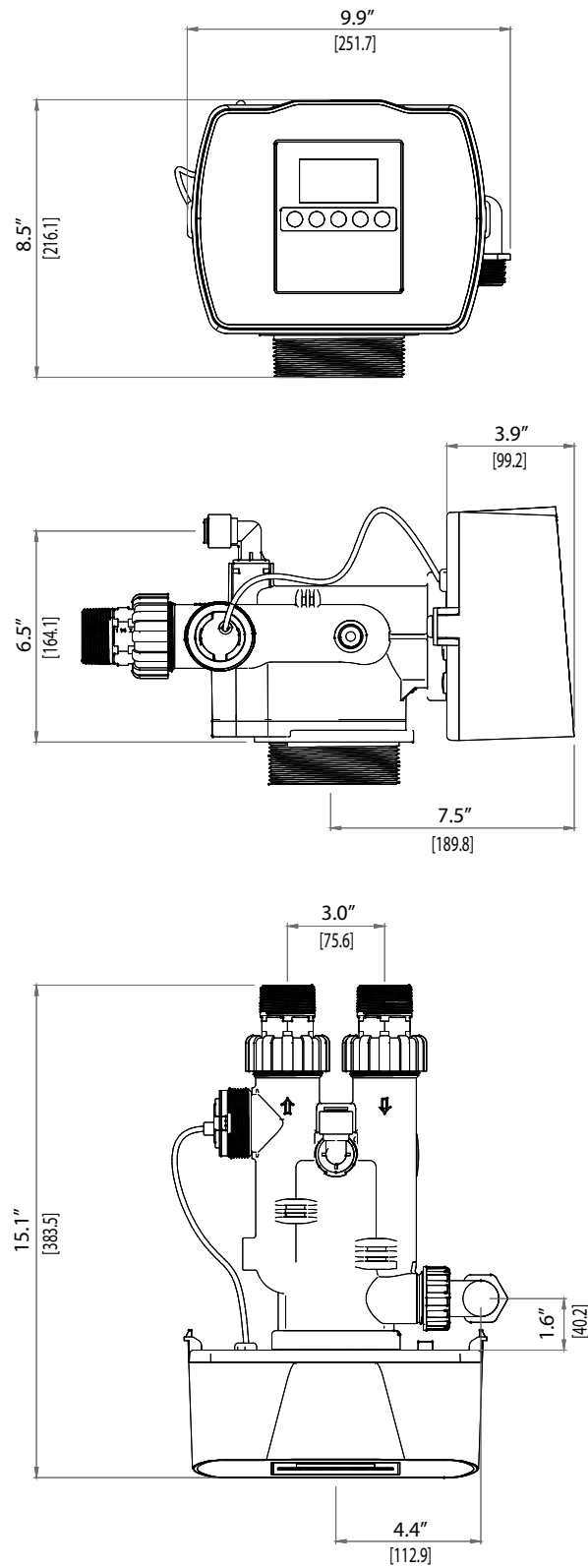
Item No.	Quantity	Part No.	Description
1	1	A-71013	O-ring, End Plug, AQT-580/581
2	1	A-60500-01	Piston Assy, Softener, HW, AQT-580/581
	1	A-60501-01	Piston Assy, Softener, NH, AQT-580/581
3	1	A-71012	Seals and Spacers Stack, AQT-580/581
4	1	A-71033-40	Body, AQT-581XT, 4.0" base
5	1	**	DLFC (must see DLFC table)
6	1	A-71019	DLFC Retainer
7	1	A-71018-01	Drain Conenctor, 1" NPT, Straight
8	1	A-71016	BLFC Retainer
9	1	*	BLFC (must see BLFC Table)
10	2	A-71014	U Clip, Red, Brine and Injector
11	1	A-71013-12	Brine Connector, 1/2", Elbow
12	1	***	Injector Assy (must see Injector Table)
13	1	A-71022-40	O-ring, Valve Base (4" Base)
14	1	A-71021-40	O-ring, Riser Pipe (4" Base)
15	2	A-71024-15	Inlet/Outlet Connectors, 1.5" NPT, Set 2 Pieces
16	1	A-71025	Turbine Meter, Nut
17	1	A-71017	Turbine Meter, AQT-580/581
18	1	A-71030	Plug, Turbine Meter
19	1	A-71029	Plug, Brine Connector
20	1	A-71031	Plug, Injector
21	1	A-60500-02	Piston Assy, Filter, HW, AQT-580/581
	1	A-60501-02	Piston Assy, Filter, NHW, AQT-580/581

* BLFC Button Options	
A-71015-01	BLFC Button, 1.00 gpm
A-71015-02	BLFC Button, 2.00 gpm
A-71015-03	BLFC Button, 3.00 gpm
A-71015-04	BLFC Button, 4.00 gpm
A-71015-05	BLFC Button, 5.00 gpm
** DLFC Button/Washer Options	
A-17938	DLFC Washer Flow 2.4 gpm
A-17939	DLFC Washer Flow 3.2 gpm
A-17940	DLFC Washer Flow 3.5 gpm
A-17941	DLFC Washer Flow 4 gpm
A-17942	DLFC Washer Flow 5 gpm
A-17943	DLFC Washer Flow 8 gpm
A-17944	DLFC Washer Flow 9 gpm
A-16529	DLFC Washer Flow 10 gpm
A-16735	DLFC Washer Flow 12 gpm
A-16736	DLFC Washer Flow 15 gpm
A-16528	DLFC Washer Flow 20 gpm
A-16737	DLFC Washer Flow 25 gpm
A-16738	DLFC Washer Flow 32 gpm
*** Injector Options	
A-12540-3	Injector, #3, White
A-12540-4	Injector, #4, Green
A-12540-5	Injector, #5, Blue

## AQT-580XT/AQT-581XT

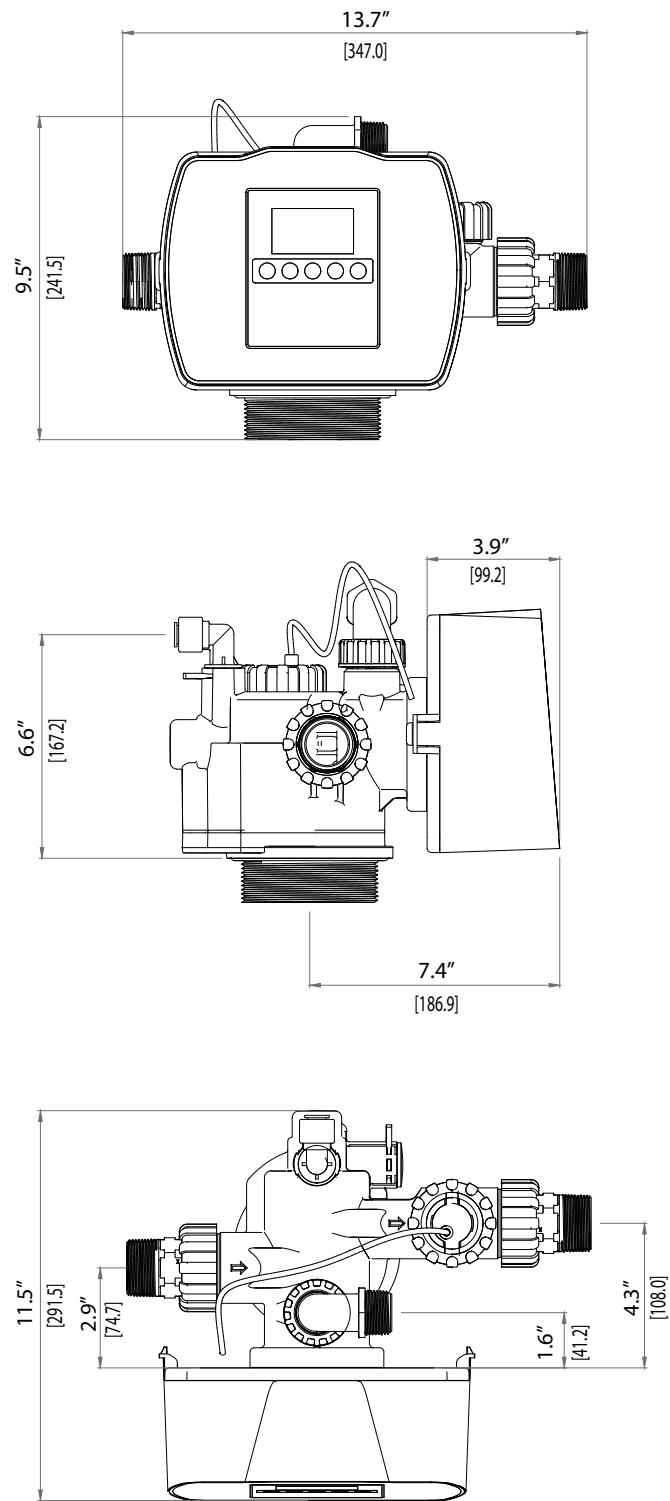
### Controller Wiring





**AQT-581XT**  
Dimensional Drawing

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## Troubleshooting

Problems, Cause & Corrections

Problem	Cause		Correction	
1) The control fails to regenerate automatically.	A)	Disconnected meter cable.	A)	Reconnect the meter cable.
	B)	Transformer damaged.	B)	Replace the transformer.
	C)	Electronic controller or sensor damaged.	C)	Replace or repair.
2) The treated water hardness is higher than setting.	A)	Bypass valve is not in service position.	A)	Adjust the bypass valve to service position.
	B)	The inlet and outlet water pipe are installed in reverse.	B)	Install the water inlet and water outlet pipe correctly.
	C)	The raw water hardness is higher than setting.	C)	Reset the inlet hardness.
	D)	Resin is polluted and invalid.	D)	Contact a professional to change the resin.
	E)	Brine concentration or quantity.	E)	Keep brine tank full of salt at all times. Clean it yearly. If using a salt grid plate, insure refill water is above the grid plate.
3) Softener fails to brine draw.	A)	Plugged drain line or BLFC.	A)	Clean drain line and flow control.
	B)	Plugged injector.	B)	Clean or replace the injector and screen.
	C)	No water in the brine tank.	C)	Check for blockage in BLFC. Ensure Safety float is not stuck.
4) Salty taste for treated water.	A)	Low pressure for inlet water.	A)	Install booster pump to increase pressure of inlet water.
	B)	Drainage pipeline is blocked.	B)	Clean up the blockage.
5) Continuous flow to drain.	A)	Foreign material in the control.	A)	Contact a professional to repair.
	B)	Internal control leak.	B)	
	C)	Piston jammed in brine or back wash position.	C)	

## Notes

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



