AQT-275

POWERFLO SERIES

AQUATROL™
CONTROL VALVES

SERVICE MANUAL

TABLE OF CONTENTS

AQUATROL™
CONTROL VALVES

Water Pressure	A minimum of 0.2 Mpa of water pressure is required for valve to operate effectively
Electrical Supply	Continuous current supply is required, check voltage compatibility
Existing	Free of any deposits or build-ups inside pipes
Installation Location	Locate close to drain and connect according to plumbing codes
Bypass Valves	Always provide for the installation of a bypass valve

CAUTION	
	Do not exceed 0.8 Mpa water pressure
	Do not exceed 100°F water temperature
	Do not subject unit to freezing conditions

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. 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.
4. 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.
5. Make sure that the floor is clean beneath the salt storage tank and that it is level
6. 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.
7. 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.
8. Place the by-pass in service position.
9. 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.
10. Electrical: All electrical connections must be connected according to codes. Use electrical conduit if applicable. See Wiring Diagram section for more information.
11. Plug into power supply

How To Set Days On Which Water Conditioner Is To Regenerate:

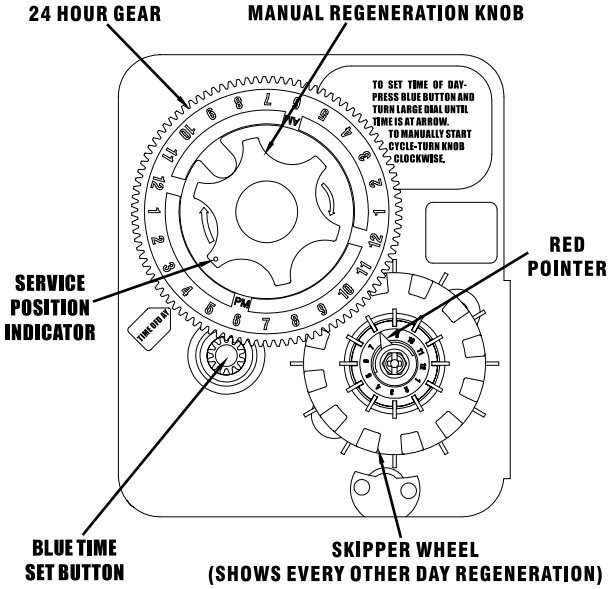
Rotate the skipper wheel until the number "1" is at the red pointer.
Set the days that regeneration is to occur by sliding tabs on the skipper wheel outward to expose trip fingers.
Each tab is one day. Finger at red pointer is tonight.
Moving clockwise from the red pointer, extend or retract fingers to obtain the desired regeneration schedule.

How To Set The Time Of Day:

Press and hold the blue button in to disengage the drive gear.
Turn the large gear until the actual time of day is at the time of day pointer.
Release the blue button to again engage the drive gear.

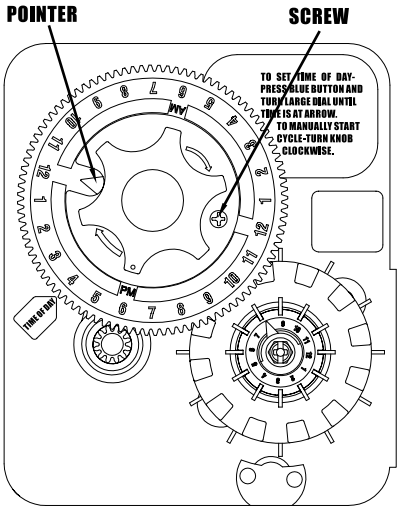
How To Manually Regenerate Your Water Conditioner At Any Time:

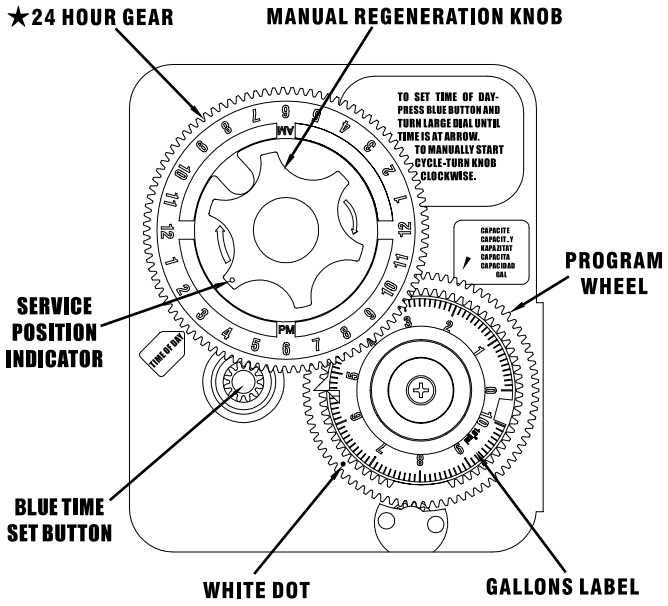
Turn the manual regeneration knob clockwise.
This slight movement of the manual regeneration knob engages the program wheel and starts the regeneration program.
The black center knob will make one revolution in the following approximately three hours and stop in the position shown in the drawing.
Even though it takes three hours for this center knob to complete one revolution, the regeneration cycle of your unit might be set only one half of this time.
In any event, conditioned water may be drawn after rinse water stops flowing from the water conditioner drain line.



How To Adjust Regeneration Time:

1. Disconnect the power source.
2. Locate the three screws behind the manual regeneration knob by pushing the blue button in and rotating the 24 hour dial until each screw appears in the cut out portion of the manual regeneration knob.
3. Loosen each screw slightly to release the pressure on the time plate from the 24 hour gear.
4. Locate the regeneration time pointer on the inside of the 24 hour dial in the cut out.
5. Turn the plate so the desired regeneration time aligns next to the raised arrow.
6. Push the blue button in and rotate the 24 hour dial. Tighten each of the three screws.
7. Push the blue button and locate the pointer one more time to ensure the desired regeneration time is correct.
8. Reset the time of day and restore power to the unit.





NOTE:
To set meter capacity rotate manual knob 1-360º revolution to set the gallons.

Typical Programming Procedure

Calculate the gallon capacity of the system, subtract the necessary reserve requirement and set the appropriate gallons available opposite the small white dot on the program wheel. Note, drawing shows 10,000 gallon setting. The capacity (gallons) arrow denotes remaining gallons exclusive of the calculated reserve.

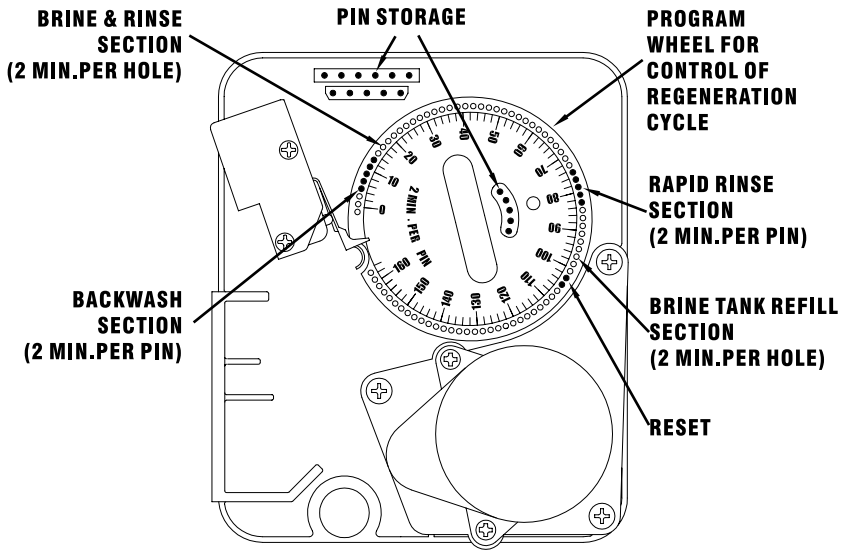
Note: To set meter capacity at initial start-up, either:
1. Rotate the manual regeneration knob one full revolution.
or
2. Rotate the program wheel manual clockwise and align white dot with capacity arrow.
This procedure must be followed any time the program wheel setting is changed.

How To Set The Time Of Day:

Press and hold the white button in to disengage the drive gear.
Turn the large gear until the actual time of say is opposite of the time of day pointer.
Release the white button to again engage the drive gear.

How To Manually Regenerate Your Water Conditioner At Any Time:

Turn the manual regeneration knob clockwise one "click".
This slight movement of the manual regeneration knob engages the program wheel and starts the regeneration program.
The black center knob will make one revolution in the following approximately three hours and stop in the position shown in the drawing.
Even though it takes three hours for this center knob to complete one revolution, the regeneration cycle of your unit might be set for only on half of this time.
In any event, conditioned water may be drawn after rinse water stops flowing from the water conditioner drain line.



How To Set The Regeneration Cycle Program:

The regeneration cycle program on your water conditioner has been factory preset, however, portions of the cycle or program may be lengthened or shortened in time to suit local conditions.

Timer Setting Procedure :

How To Change The Length Of The Backwash Time:

The program wheel as shown in the drawing is in the service position. As you look at the numbered side of the program wheel, the group of pins starting at zero determines the length of time your unit will backwash.
For example: If there are six pins in this section, the time of backwash will be 12 min. (2 min. per pin). To change the length of backwash time, add or remove pins as required. The number of pins times two equals the backwash time in minutes.

How To Change The Length Of Brine And Rinse Time:

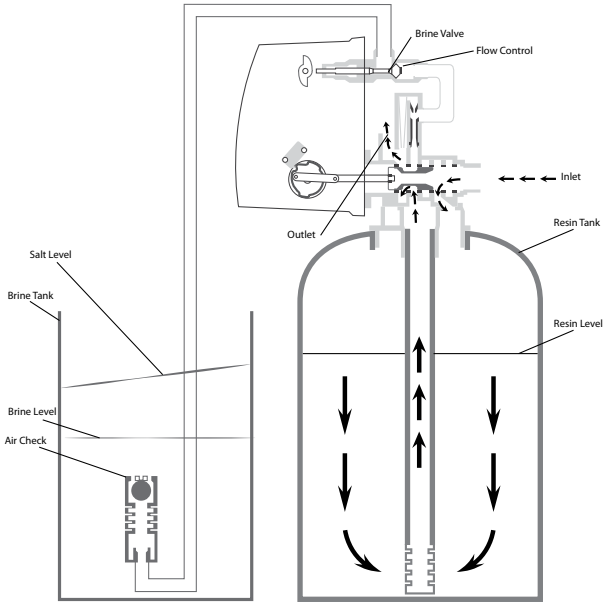
The group of holes between the last pin in the backwash section and the second group of pins determines the length of time that your unit will brine and rinse (2 min. per hole).
To change the length of brine and rinse time, move the rapid rinse group of pins to give more or fewer holes in the brine and rinse section. Number of holes times two equals brine and rinse time in minutes.

How To Change The Length Of Rapid Rinse:

The second group of pins on the program wheel determines the length of time that your water conditioner will rapid rinse (2 min. per pin)
To change the length of rapid time, add or remove pins at the higher numbered end of this section as required. The number of pins times two equals the rapid rinse time in minutes.

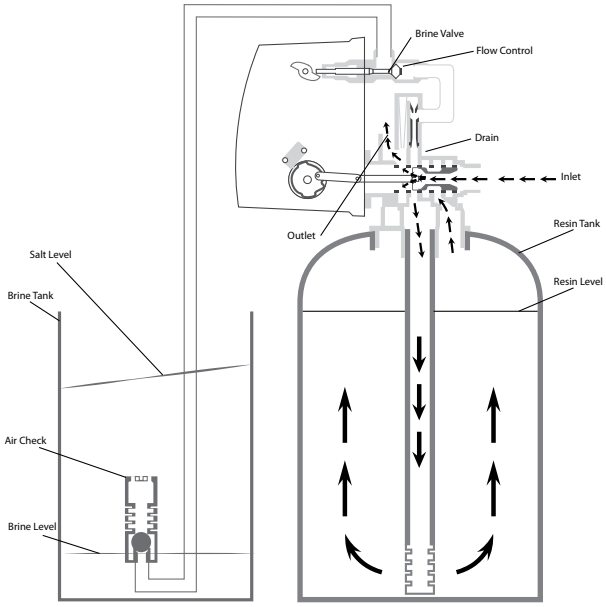
How To Change The Length Of Brine Tank Refill Time:

The second group of holes in the program wheel determines the length of time that your water conditioner will refill the brine tank (2 min. per hole).
To change the length of refill time, move the two pins at the end of the second group of holes as required.
The regeneration cycle is complete when the outer micro-switch is tripped by the two pin set at the end of the brine tank refill section. The program wheel, however, will continue to rotate until the inner micro-switch drops into the notch on the program wheel.



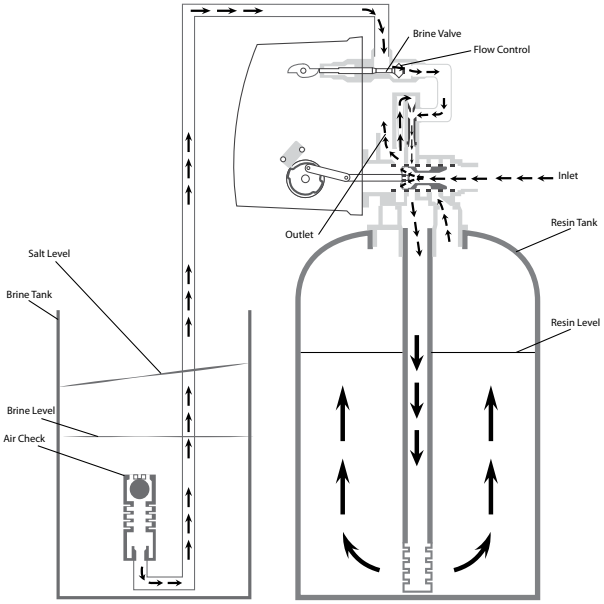
1) Service Position

Hard water enters unit at valve inlet and flows down through the mineral in the mineral tank. Conditioned water enters center tube through the bottom distributor, then flows up through the center tube, around the piston, and out the outlet of the valve.



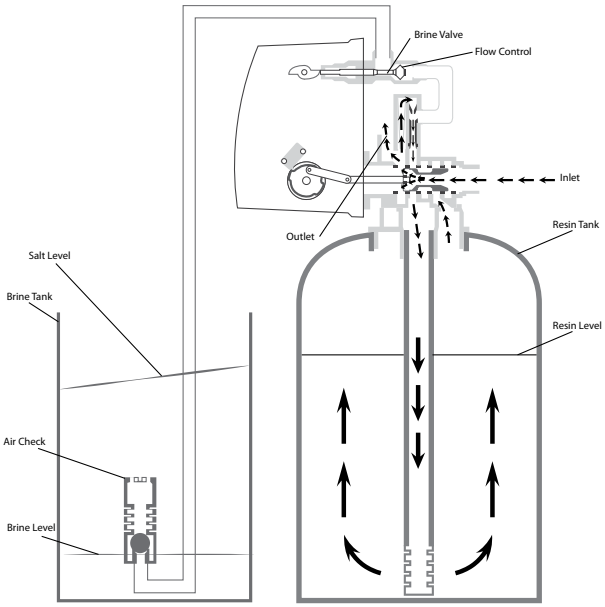
2) Backwash Position

Hard water enters unit at valve inlet and flows through the piston and down the center tube, through the bottom distributor and up through the mineral, around the piston and out the drain line.



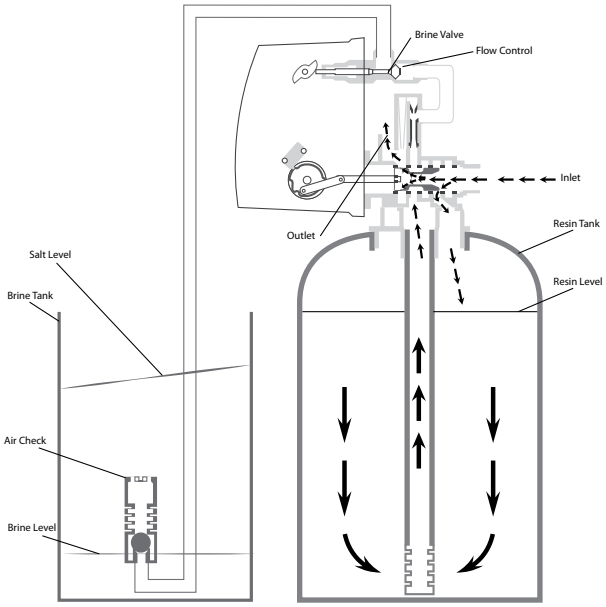
3) Brine Position

Hard water enters unit at valve inlet - flows up into injector housing and down through nozzle and orifice to draw brine from the brine tank - brine flows down the center tube through bottom of tank, up through the mineral to top of tank, around the piston and out the drain line.



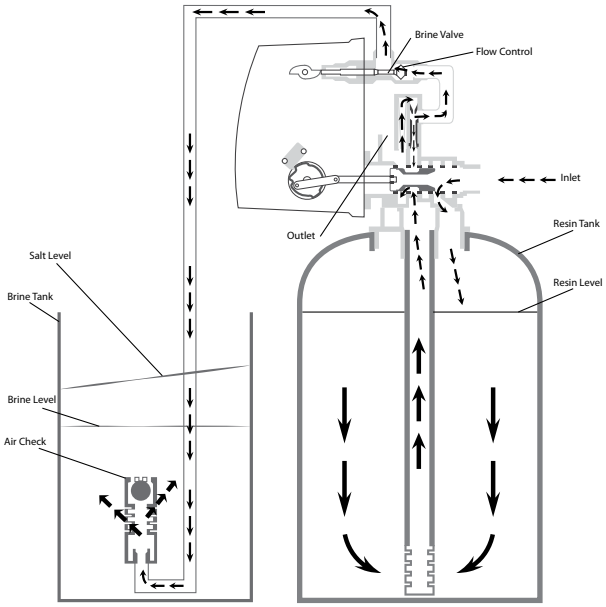
4) Slow Rinse Position

Hard water enters unit at valve inlet - flows up into injector housing and down through nozzle and orifice - around the piston - down through center tube and bottom distributor - flows up the mineral, around piston and out through the drain line.



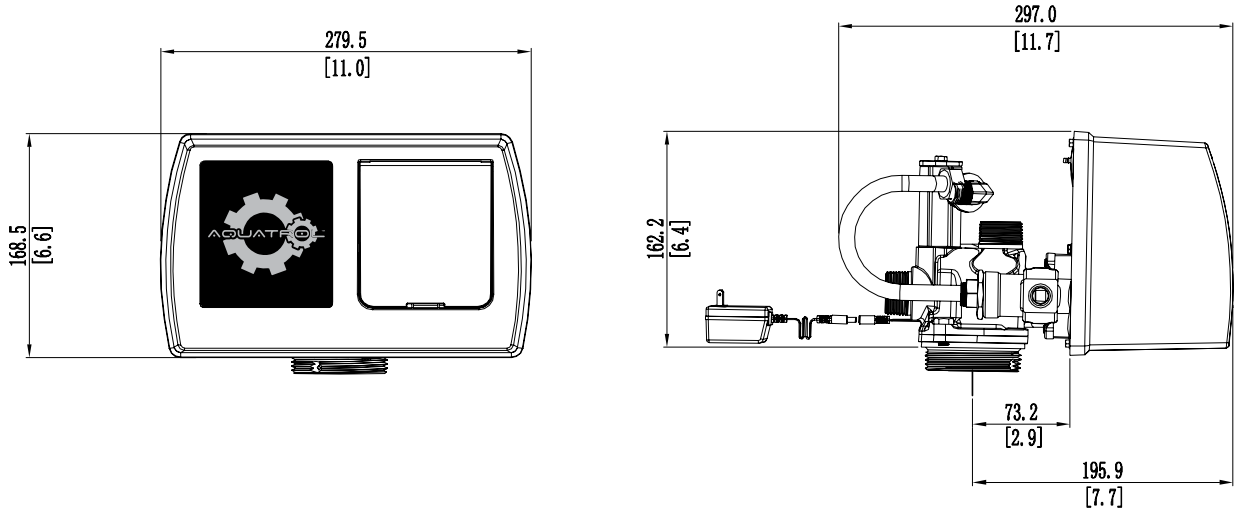
5) Rapid Rinse

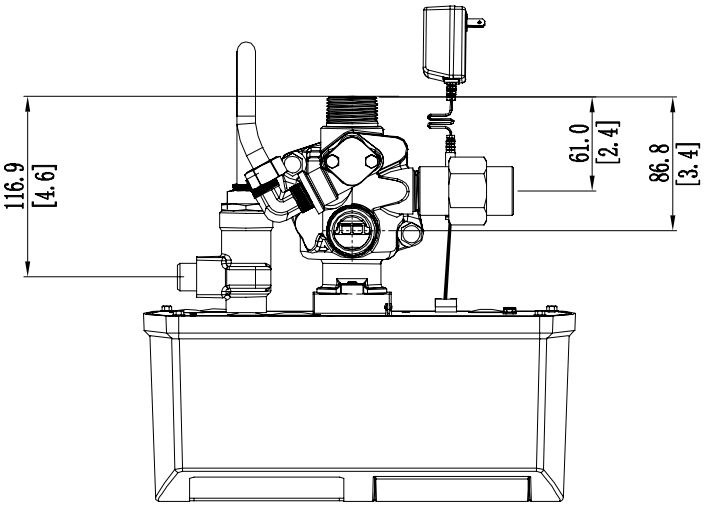
Hard water flows directly from inlet down through the mineral into the bottom distributor and up through the center tube - around the piston and out the drain line.

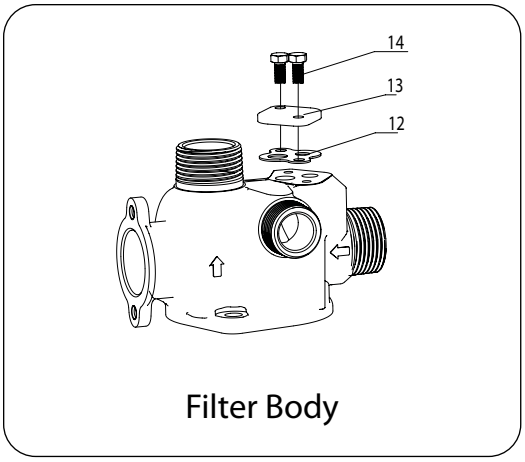


6) Brine Tank Fill Position

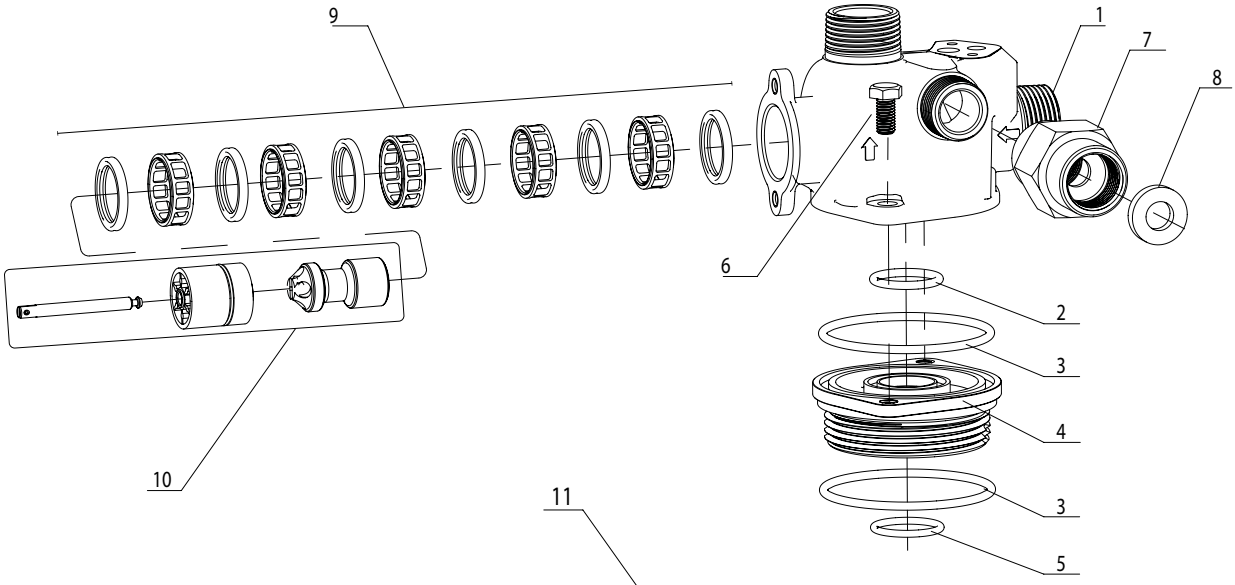
Hard water enters unit at valve inlet -flows up through the injector housing and through the brine valve to fill brine tank.


279.5
[11.0]
168.5
[6.6]
297.0
[11.7]
162.2
[6.4]
73.2
[2.9]
195.9
[7.7]

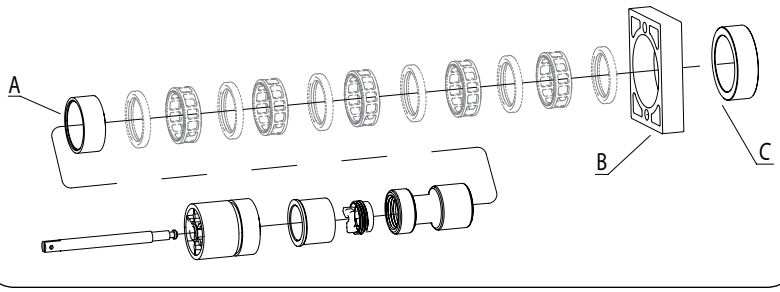

116.9
[4.6]
61.0
[2.4]
86.8
[3.4]



Filter Body

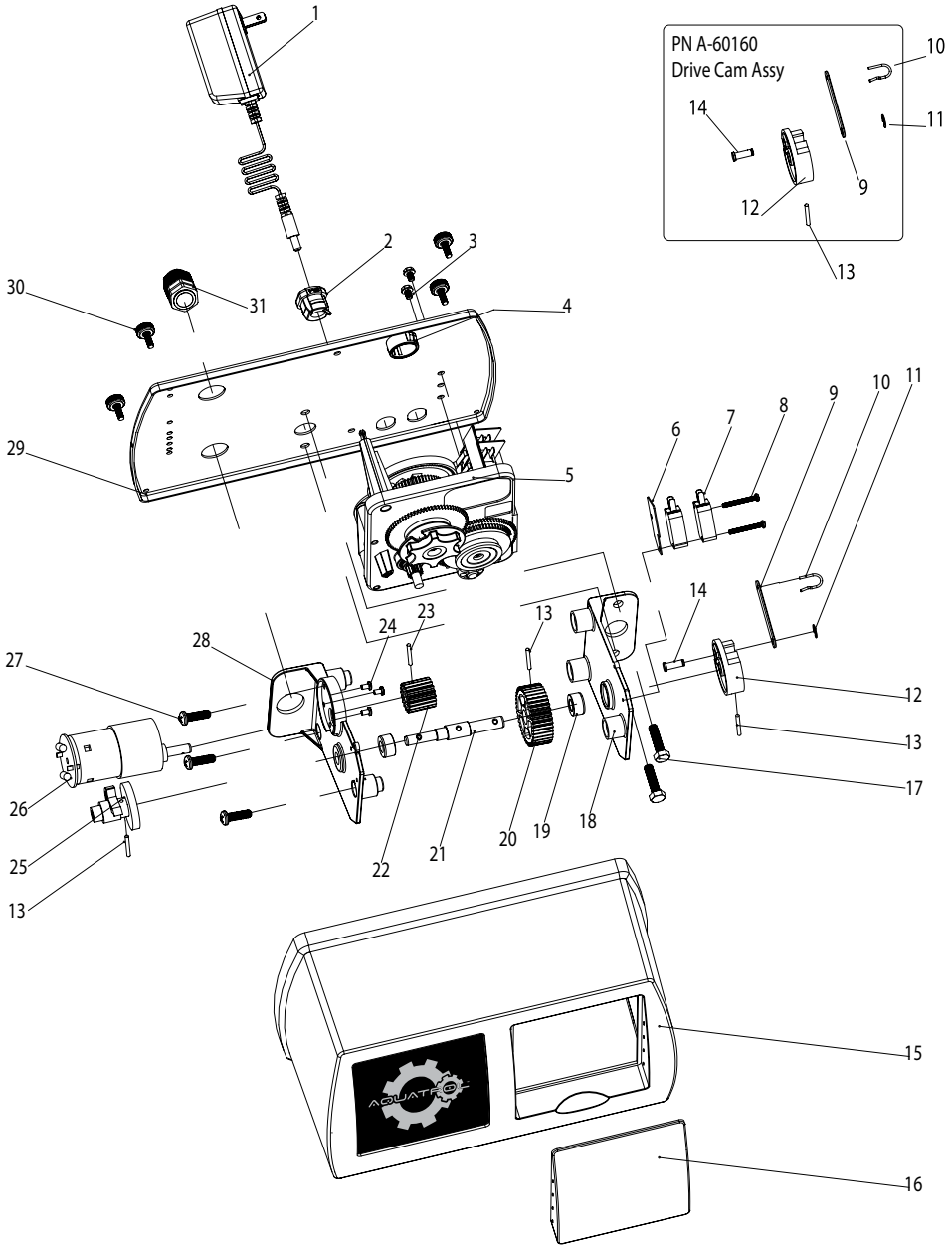


PN A-60101-01
NHWB Piston, Includes spacers, A B & C.



Item No.	Quantity	Part No.	Description
1	1	A-14749	Body, Valve, AQT-275
2	1	A-11710	O-ring, Body, Riser Tube
3	2	A-11208	O-ring, Body, Base
4	1	A-12461-01	Adapter Base, 2.5" - 8
5	1	A-11710-01	O-ring, Adapter Base, Riser Tube
6	2	A-11224	Screw, Hex Hd
7	1	A-60699-00	DLFC Brass, F 3/4" X F 3/4", No Washer
8*	1		DLFC Button/Washer
9	1	A-60121-10	Seals & Spacers, Kit, AQT275 & AQT-290 Upper
10	1	A-60090-HF	Piston HW, Assy, AQT-275 & AQT-290 Upper
11	1	A-60101-01	Piston NHWB, Assy, AQT-275
12	1	A-14805	Injector, Body Gasket
13	1	A-11893	Injector, Cover
14	2	A-15137	Screw, Hex, Filter Body

*** DLFC Button / Washer Options**	
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 pm
A-16737	DLFC Washer Flow 25 gpm


PN A-60160
Drive Cam Assy
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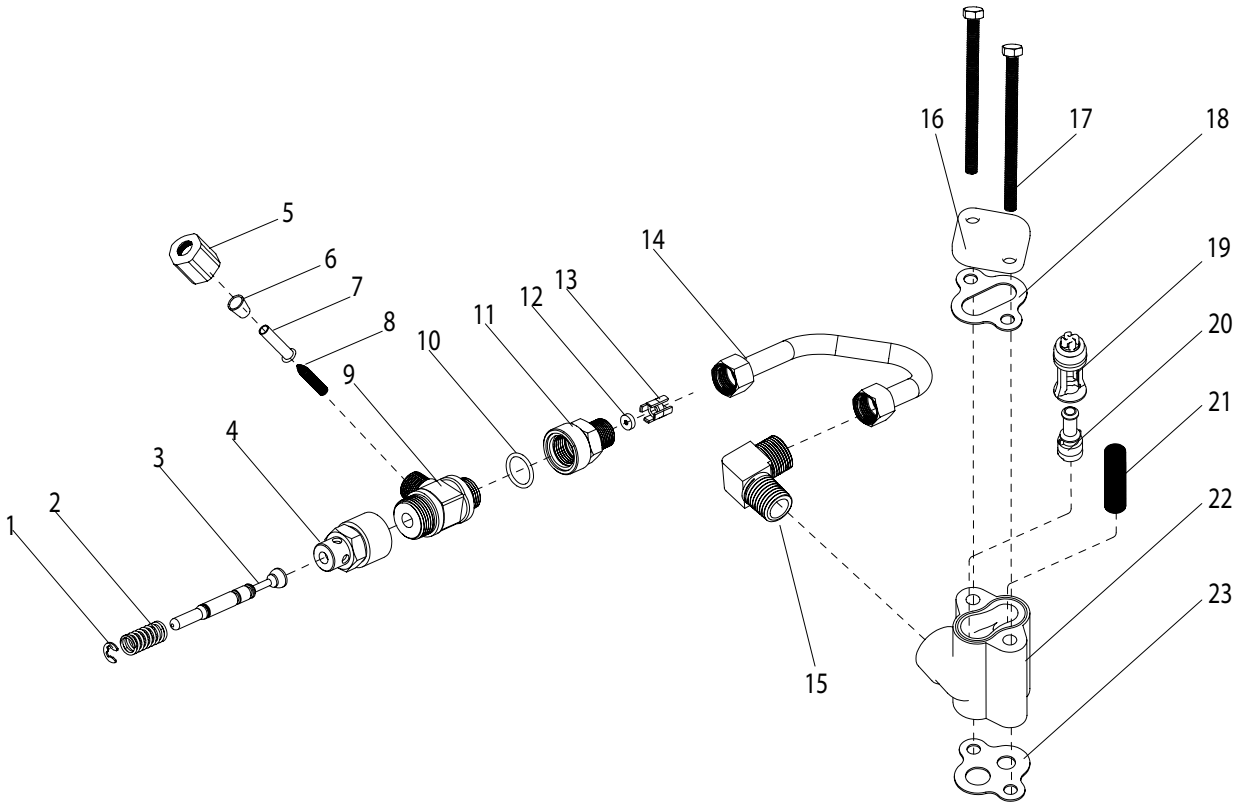
Item No.	Quantity	Part No.	Description
1	1	A-07190F	Transformer, 24V, 60Hz, for Mechanical and NX
2	1	A-13547	Strain Relief, Cord, Back Plate
3	2	A-10300	Screw, Hex, Back Plate-Timer
4	1	A-19691	Plug, Back Plate
5*	1		Timer, Mechanical
6	1	A-10302	Insulator, Micro Switch
7	2	A-10218	Micro Switch
8	2	A-14923	Screw, Mirco Switch
9-14	1	A60160	Drive Cam Assy, AQT-275, 285 & Upper 290
15	1	A-60219	Cover, Valve
16	1	A-60219-01	Cover, Panel, Polycarbonate
17	2	A-10231	Screw, Hex, Bracket Motor
18	1	A-10774	Braket, Motor
19	2	A-10157	Bushing
20	1	A-16044-3G	Gear Drive, AQT-275, 285 & Upper 290
21	1	A-10158	Axis Drive, AQT-275, 285 & Upper 290
22	1	A-16043-3G	Pinion Drive, AQT-275, 285 & Upper 290
23	1	A-10338	Roll Pin
24	3	A-10016S	Screw, Motor Mounting
25	1	A-12777	Cam, Shut-off Valve
26	1	A-30018F	Motor 24V, AQT-275, 285, 290 Up, 315, 390 Up & Low
27	3	A-02002	Screw
28	1	A-11826-01	Bracket, Brine Valve Side
29	1	A-18697	Back Plate
30	4	A-02115	Back Plate, Knob Screw
31	1	A-19048	Cable Gland Connector

PN 1 - 23 -------- A-60029 --- Brine Valve, Short Stem, Less BLFC, 3/8" for AQT-275
PN 15 - 23 ------ A-60480 --- Inyector Body, 3/8" for AQT-275



Item No.	Quantity	Part No.	Description
1	1	A-10250	Retaining Ring
2	1	A-10249	Spring, Brine Valve
3	1	A-12552-02	Stem, Brine Valve
4	1	A-11749	Stem Guide, Brine Valve
5	1	A-10329	Fitting Nut, 3/8", Brass
6	1	A-10330	Fitting Sleeve
7	1	A-10332	Fitting Insert
8	1	A-56060	Screen, Brine
9	1	A-12748	Body, Brine Valve
10	1	A-11982	O-Ring
11	1	A-60020	End Plug, Brine Valve
12**	1	A-120XX	BLFC, Button
13	1	A-13245	BLFC, Retainer
14	1	A-16508	Tube, Brine Valve
15	1	A-10328	Fitting, Elbow
16	1	A-11893	Injector Cover
17	2	A-14804	Screw, Injector Cover
18	1	A-10229	Injector Cover Gasket
19*** - 20***	1	A-18272-X	Injector Assy
21	1	A-10227	Screen, Injector
22	1	A-17776	Injector, Body
23	1	A-14805	Injector, Body Gasket

** BLFC Button Options	
A-12094	BLFC Button - 0.25 gpm
A-12095	BLFC Button - 0.5 gpm
A-12097	BLFC Button - 1.0 gpm

*** Injectors	
A-18272-0	Injector Assy #0, Red (12" and 13" Tank)
A-18272-1	Injector Assy #1, White (14" and 16" Tank)
A-18272-2	Injector Assy #2, Blue (18" Tank)
A-18272-3	Injector Assy #3, Yellow (20" Tank)

Problem	Cause	Correction
1) Softener fails to regenerate.	A) Electrical service to unit has been interrupted.	A) Assure permanent electrical service (check fuse, plug, pull chain or switch).
	B) Timer is defective.	B) Replace timer.
	C) Power failure.	C) Reset time of day.
2) Hard water.	A) By-pass valve is open.	A) Close by-pass valve.
	B) No salt in brine tank.	B) Add salt to brine tank and maintain salt level above water level.
	C) Injector screen plugged.	C) Clean injector screen.
	D) Insufficient water flowing into brine tank.	D) Check brine tank fill time and clean brine line flow control if plugged.
	E) Hot water tank hardness.	E) Repeated flushing of the hot water tanks required.
	F) Leak at distributor tube.	F) Make sure distributor tube is not cracked. Check O-ring and tube pilot.
	G) Internal Valve Leak.	G) Replace seals and spacers and/or piston.
	H) Service Adapter did not return to service.	H) Check drive motor and switch.
3) Unit used too much salt.	A) Improper salt setting.	A) Check salt usage and salt setting.
	B) Excessive water in brine tank.	B) See problem No. 7.
4) Loss of water pressure.	A) Iron buildup in line to water conditioner.	A) Clean line to water.
	B) Iron buildup in water conditioner.	B) Clean control and add mineral cleaner to mineral bed. Increase frequency of regeneration.
	C) Inlet of control plugged due to foreign material broken loose from pipes by recent work done on plumbing system.	C) Remove piston and clean control.
5) Loss of mineral through drain line.	A) Air in water system.	B) Assure that well system has proper air eliminator control. Check for dry well conditions.
	B) improper size drain line flow control.	B) Check for proper drain rate.
6) Iron in conditioned water.	A) Fouled mineral bed.	A) Check backwash, brine draw and brine tank fill. Increase frequency of regeneration. Increase backwash time.
7) Excessive water in brine tank.	A) Plugged drain line flow control.	A) Clean flow control.
	B) Plugged injector system.	B) Clean injector and screen.
	C) Timer not cycling.	C) Replace timer.
	D) Foreign material in brine valve.	D) Replace brine valve seat and clean valve.
	E) Foreign material in brine line flow control.	E) Clean brine line flow control.

Problem	Cause	Correction
8) Softener fails to draw brine.	A) Drain line flow control is plugged.	A) Clean drain line flow control.
	B) Injector is plugged.	B) Clean injector.
	C) Injector screen plugged.	C) Clean screen.
	D) Line pressure is too low.	D) Increase line pressure to 20 P.S.I.
	E) Internal control leak.	E) Change seals, spacers and piston assembly
	F) Service adapter did not cycle.	F) Check drive motor and switches.
9) Control cycle continuously.	A) Misadjusted, broken or shorted switch.	A) Determine if switch or timer is faulty and replace it or replace complete power head.
10) Drain flows continuously.	A) Valve is not programming correctly.	A) Check timer program and positioning of control. Replace power head assembly if not positioned properly.
	B) Foreign material in control.	B) Remove power head assembly and inspect bore. Remove foreign material and check control in various regeneration positions.
	C) Internal control leak	C) Replace seals and piston assembly.

General Service Hints for Meter Control

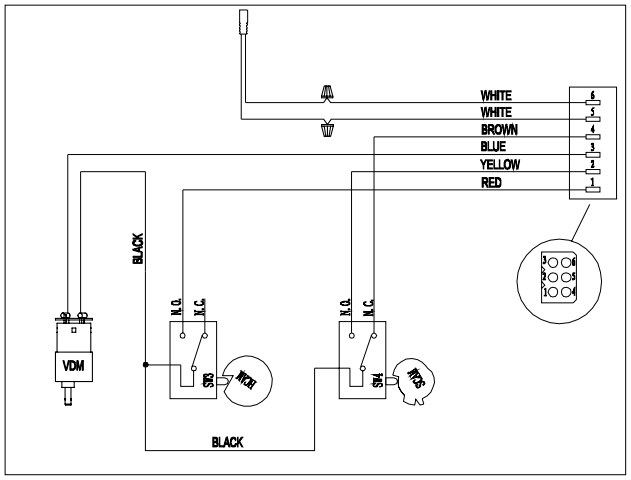
Problem: Softener delivers hard water

Reason: Reserve capacity has been exceeded.
Correction: Check salt dosage requirements and reset program wheel to provide additional reserve.

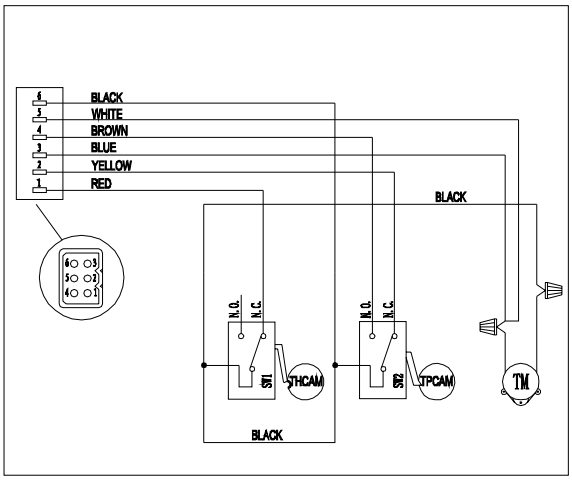
Reason: Program wheel is not rotating with meter output.
Correction: Pull cable out of meter cover and rotate manually. Program wheel must move without binding and clutch must give positive "clicks" when program wheel strikes regeneration stop. If it does not, replace timer.

Reason: Meter is not measuring flow.
Correction: Check meter with meter checker.

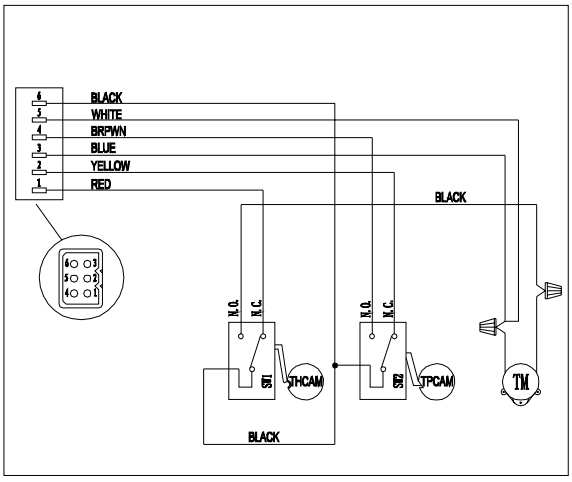
drive assembly



timer,meter-timer control valve



meter control valve



TM	Time Motor
VDM	Valve Drive Motor
SW1	Timer Homing Switch
SW2	Timer Program Switch
SW3	Valve Homing Switch
SW4	Valve Step Switch
THCAM	Timer Homing Cam
TPCAM	Timer Program CAM
HCAM	Valve Homing Cam
SCAM	Valve Step Cam

NOTES:

NOTES:

www.aquatroltech.com

AQUATROL™
CONTROL VALVES

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