AQT-NX

ELECTRONIC SERIES

AQUATROL™
CONTROL VALVES

PROGRAMMING MANUAL

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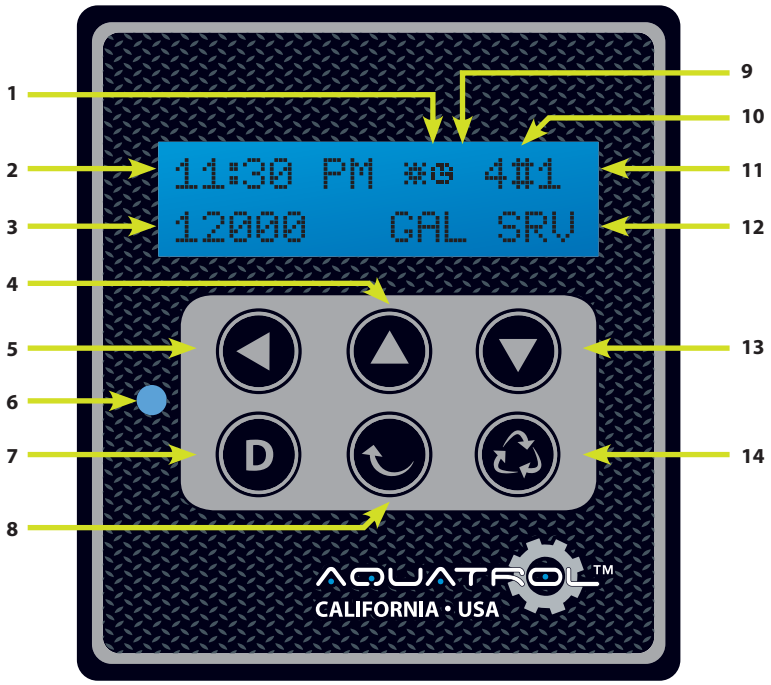
AQUATROL™
CONTROL VALVES

Water Pressure	Minimum 25 PSI
Electrical Supply	Uninterrupted AC. Check voltage compatibility
Existing	Free of any deposits or build-ups inside pipes
Softener	Locate close to drain and connect according to plumbing codes
Bypass Valves	Always provide for bypass valve if unit is not equipped with one

CAUTION	
	Do not exceed 120 PSI 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



1. Flow Indicator
2. Time Of Day
3. Volume Remaining
4. Up Button
5. Shift Button
6. Status LED
7. Diagnostic Button
8. Page Up Button
9. Timer Indicator
10. System Number
11. Valve Address
12. Valve State
13. Down Button
14. Extra Cycle Button

Diagnostic Button

1. Enter diagnostic mode. Check current flow, peak flow, total flow, time interval between the last two generations, time since the last generation, volume remaining, valve position, error signal, software version.
2. Exit without saving the data.

Up Button

1. Adjust the settings(add or cycle).
2. Use simultaneously with shift button to enter programming.
3. Use simultaneously with down button to enter user mode.

Down Button

1. Adjust the settings (add or cycle).

Shift Button

1. Move cursor to left.

Page Up (current time) Button

1. Enter to set the time of day.
2. Back to the last menu option.

Extra Cycle Button

1. Confirm the current setting and enter the next menu option.
2. Enter queued regeneration mode.
3. Press and hold for 5-6 seconds to initiate regeneration immediately.
4. Terminate current regeneration step and go to the next step.

Valve Status

SRV (service position) - Displayed when the unit is in service
CHG(Status changes) - Dual-piston unit. Displayed when the lower drive changes from service position to regeneration position.
RGQ (Queued regeneration) - Displayed when the unit is in queued regeneration.
LCK (Locked status) - Displayed when the unit is locked by remote signal

Valve Status LED

Blue - The unit is in service; Blinking blue indicates the unit queued for regeneration.
Green - The unit is in regeneration; Blinking green indicates the unit is on stand-by.
Red - The unit is in error.

Flow Indicator

A rotating star will display when the water flows through the meter.

Users Parameter setting

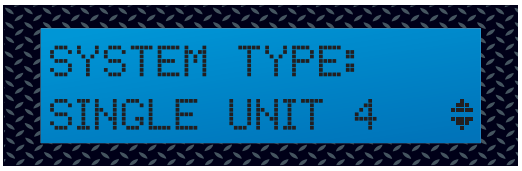
Press and hold both ◀ ▲ button for 5 seconds.

Press ↻ button to confirm the setting and enter next step; Press ↺ button to turn back to the last step for modification.

Use ▲ button or ▼ button to change, use ◀ button to move the cursor to left. Press D button to exit without saving the data.

System Number

◀ ▲



Option:
System 4 (Single Valve) (Default)
System 5 (Interlock, 2-4 valves)
System 6 (Series, 2-4 valves)
System 7 (Alternating, 2 valves)
System 9 (Alternating, 2-4 valves)

Valve Address

↻

Option:
Valve address #1 (First Valve)
Valve address # 2(Second valve) (Default)
Valve address # 3(Third Valve)
Valve address # 4(Fourth Valve)

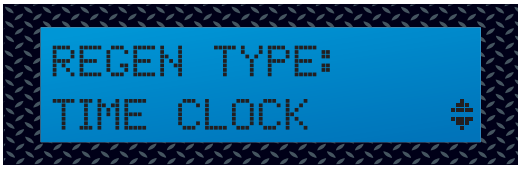
Valve Quantity

↻

Option:
2 valves--(default)
3 valves
4 valves(the fourth valve)

Regeneration Mode

↻



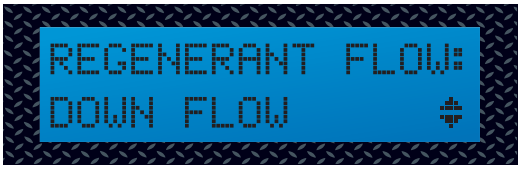
Option:
Timer (System 4# ONLY) (Default)
Meter IMM
Meter Delay

Valve Model

↻

Option:
AQT-275, AQT-285, AQT-290, AQT-315, AQT-390 (Default)

Regeneration Flow Direction



Option:
Down Flow (Default)
UF Brine Draw

Remote Signal Control

Option:
OFF (Default)
Range:
00:01 to 01:39 (HH: MM)

Flow Unit

Option:
Liters - Metric System (Default)
Gallons - American System

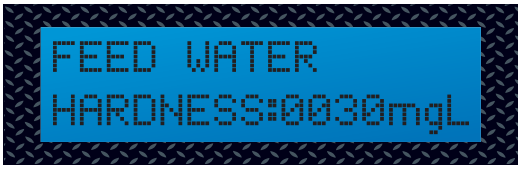
Unit Capacity

Option:
G CaCo3 (Default)
Grains
Range:
1 to 198000gCaCo3
1 to 9900000grains

Capacity Safety

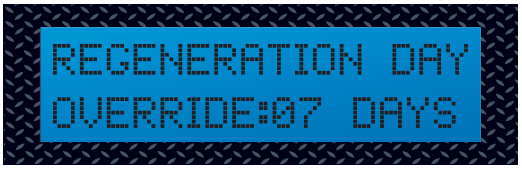
Range:
00% (Default) to 50%

Water Hardness



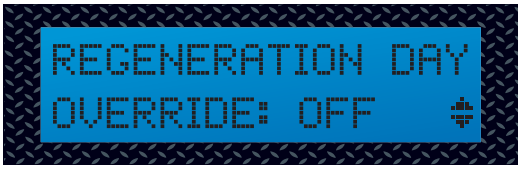
Option:
Milligrams per liter (Default)
Grains per gallon
Range:
20 to 1999milligrams per liter
1 to 199grains per gallon

Regeneration Day Override (Timer)



Option:
7 days (Default)
Range:
1 to 99 days

Regeneration Day Override (Meter)



Option:
Off (Default)
Range:
1 to 99 days

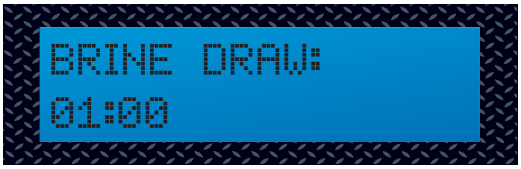
Regeneration Time

Option:
02:00 (HH:MM) (Default)
Range:
01 to 12 hours

Regeneration Steps - Backwash

Option:
00:10 (Default)
Range:
01 to 04 hours - 00:00 to 04:00
Note: the steps may changes according to the regeneration flow direction set before.

Regeneration Step - Brine Draw

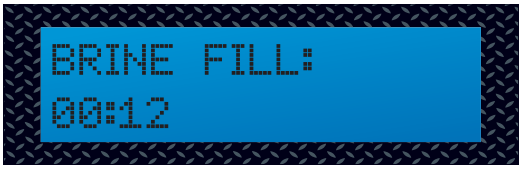


Option:
01:00 (Default)
Range:
00:00 to 04:00 (HH:MM)

Regeneration Step - Rapid Rinse

Option :
01:00 (Default)
Range:
00:00 to 04:00 (HH: MM)

Regeneration Step - Brine Fill

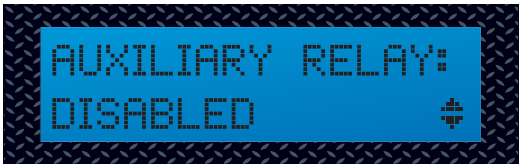


Option :
00:12 (Default)
Range:
00:00 to 04:00 (HH: MM)

Regeneration Step - Pause

Option :
Off (Default)
Range:
00:00 to 04:00 (HH:MM)

Auxiliary Relay



Range :
Disabled (Default)
Enabled

Auxiliary Relay Output, Start Time

Range:
00:00--any time during regeneration process (with exception for the last minute)
Note: displayed when the aux relay is activated. For system 6# or 7#, Aux relay display when chemical function is closed.

Auxiliary Relay Output, End Time

Range:
The start time - any time during regeneration process

Chemical Pump Function

Option :
Disabled (Default)
Enable
Note: Do not display on 6# system or 7# system lag,Chemical function only works when auxiliary relay is closed.

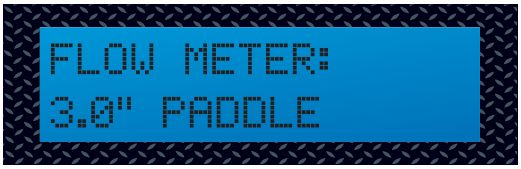
Chemical Pump Controlled By Meter

Option :
Liters (Default)
Gallons
Range:
1 to 9999 Liters
1 to 999 Gallons
Note: Only displays on Meter systems 6# and 7#

Chemical Pump Duration

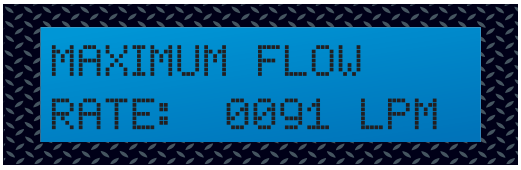
Option :
00:01 to 02:00 (HH:MM)

Flow Meter Mode



Option:
1.0, 1.5, 2.0, 2.5, 3.0 paddle (default)
Ordinary
Note: Do not display on the lag for System 6# and 7#

Maximum Flow Rate



Option :
Liters per minute (Default)
Gallons per minute
Range:
20 to 2000liter/minute
20 to 2000gallon/minute
Note: Only displays when choosing Ordinary Meter

Pluses Per Liter/Gallon

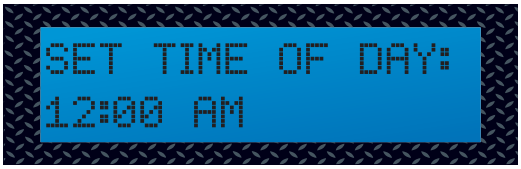
Option :
liters per minute (Default)
Gallons per minute
Range:
1 to 255 gallons
1 to 255 liters
1 to 255 plus
Note: Only displays when choosing Ordinary Meter

Programming Unit, Please Wait

Turn back to Service Position when finished

Done

Set Time Of Day



Press the Page Up (Current Time) button to set the Time Of Day.

When finished press the Extra Cycle Button to Save and Exit

Done

Hardness Of Water

Option:
Milligrams per liter (Default)
Grains per gallon

Regeneration Day Override (Timer)

Option:
7 days (Default)
Range:
1 to 99 days

Regeneration Day Override (Meter)

Option :
Off (Default)
Range:
Off, 1 to 99 days

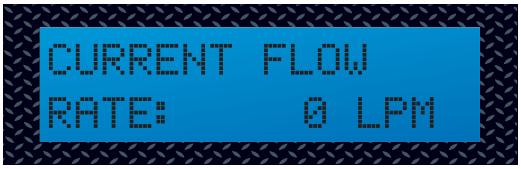
Regeneration Time

Note: time show in 12 hour clock

When finished press the Extra Cycle Button to Save and Exit

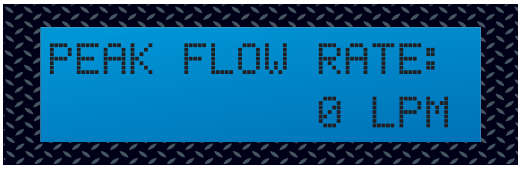
Done

Current flow



Press and hold the Diagnostic Button

Peak Flow Rate



Press the Extra Cycle Button to view Peak Flow Rate

Total flow

Press and hold both  up and down button for 5 seconds to zero out.

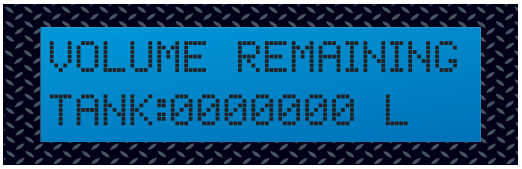
Regeneration Time Interval

The time interval between the last two regeneration

Last Regeneration

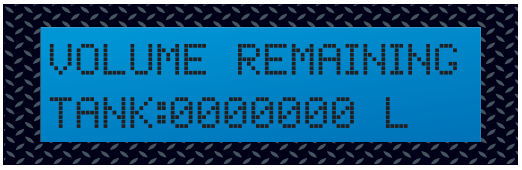
Time since the last regeneration

Volume Remaining (Except System 6)



1) Move the cursor to change
2) Press up and down button to change (reduce only)

Volume Remaining (Only Show On System 6)



The volume remaining can not be edited except for system 6# lead.

Valve Address

Display for system with 2 valves or more (single systems do not show this)

Software Version

The software version of the valve

When finished press the Extra Cycle Button to Save and Exit

Done

Timed Regeneration Mode

When the days since the last regeneration reaches the preset days, the control starts to regenerate immediately at the preset regeneration time.

Meter Immediate Regeneration Mode

When volume remaining count down to zero, the control regenerates immediately.

Meter Delay Regeneration Mode

When the volume remaining count down to zero and reach the preset regeneration time, the control will regenerate immediately.

When volume remaining zeros out, the regeneration time begins to count down.

Mix Regeneration

Under Meter Immediate Regeneration Mode or Meter Delay Regeneration Mode, open the override time setting (default setting under these two modes is off), The control will record both the remaining volume and remaining time, the valve starts to regenerate at the time whenever which reaches first.

Manual Queued Regeneration

Press button during service position, the control will just record the regeneration time regardless the override days or the remaining volume. The display shows the time counting down and WAIT, blue LED flashes. The control will start to regenerate when the time zeros out, press button once again to cancel waiting regeneration.

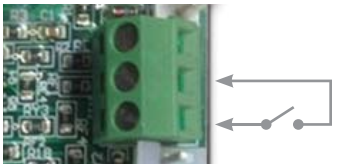
Manual Immediate Regeneration

Press and hold the button at least for 5 seconds during service position, the control will regenerate immediately.
At any step during regeneration, press button to skip the time counting.

Restore Factory Settings

Press button and then plug in, the valve will restore to the factory default settings.

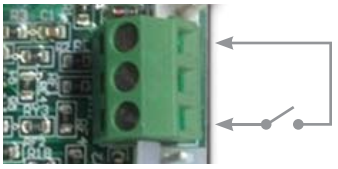
Remote Signal Control Regeneration



Switch on Remote Signal Control Regeneration

Activate the remote signal port and connect the remote signal control as show on the lower right picture. Switch on to initiate the remote control, the display shows the current time of remote signal and start to count down. Switch off to cancel this function. The control starts to regenerate when the time of remote signal zeros out. Under timer or meter delay mode, display just shows regeneration time of the day and count down. Blue light flashes until time zeros out, then control start to regenerate. Under meter immediate mode, control will start to regenerate right away.

Remote Signal Locked



Switch on Remote Signal Locked

Note: the length of the cable to connect the remote signal should be within 150m.

Activate the remote signal port and connect the remote signal control as show on the lower right picture. Switch on to lock the control at service position. So the control won't be able to regenerate even if it reaches the preset conditions. It remains in waiting position, blue LED flashes at this time. Switch off then the control will regenerate immediately.

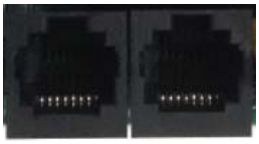
Memory During Power Failure

When power fails, current valve status, time at each step, current time can be stored in memory for two weeks and resume when power is on.
Note: time indicator flashes for 5 minutes when power resumes, press any key to cancel.

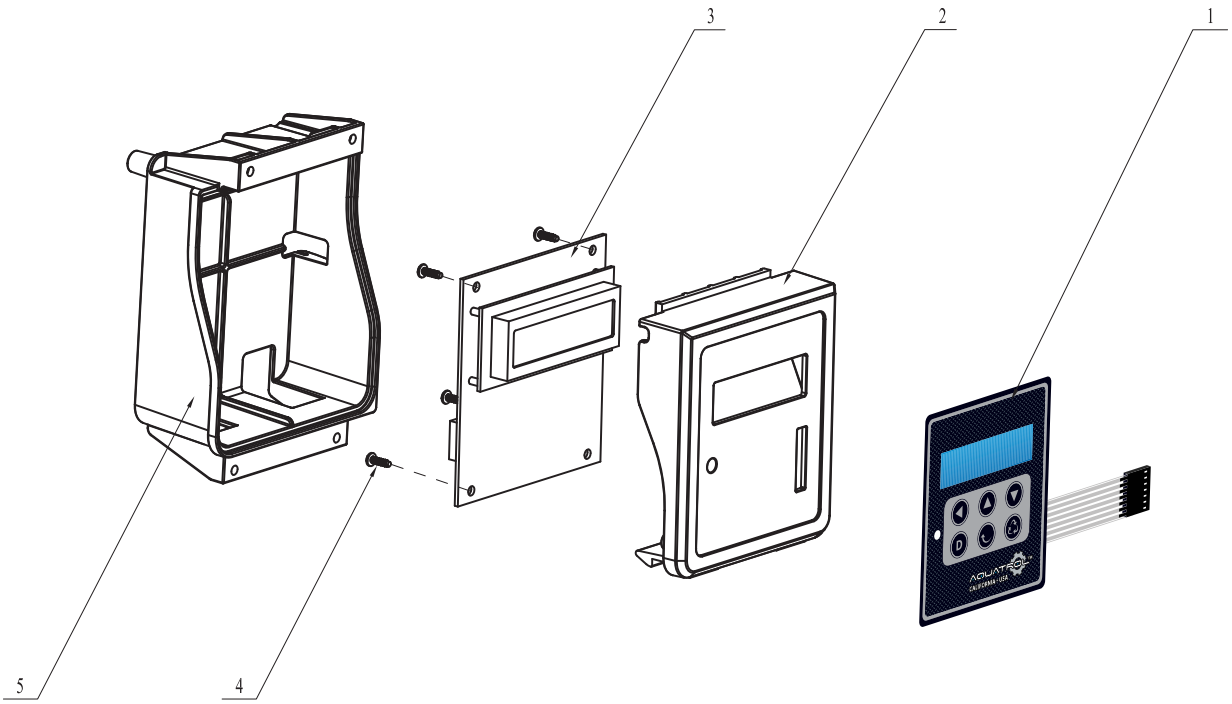
The System Holds A Maximum Of 4 Valves

Use CAT5 wire (network cable)
1. Use the network cable on system 5, 6, 7, 9.
2. Maximum length of the cable between the two boards is 30m.
3. Connect the signal ports one by one, the two port on the control are parallel with no particular order.

CAT5 wire interface
(Network cable)

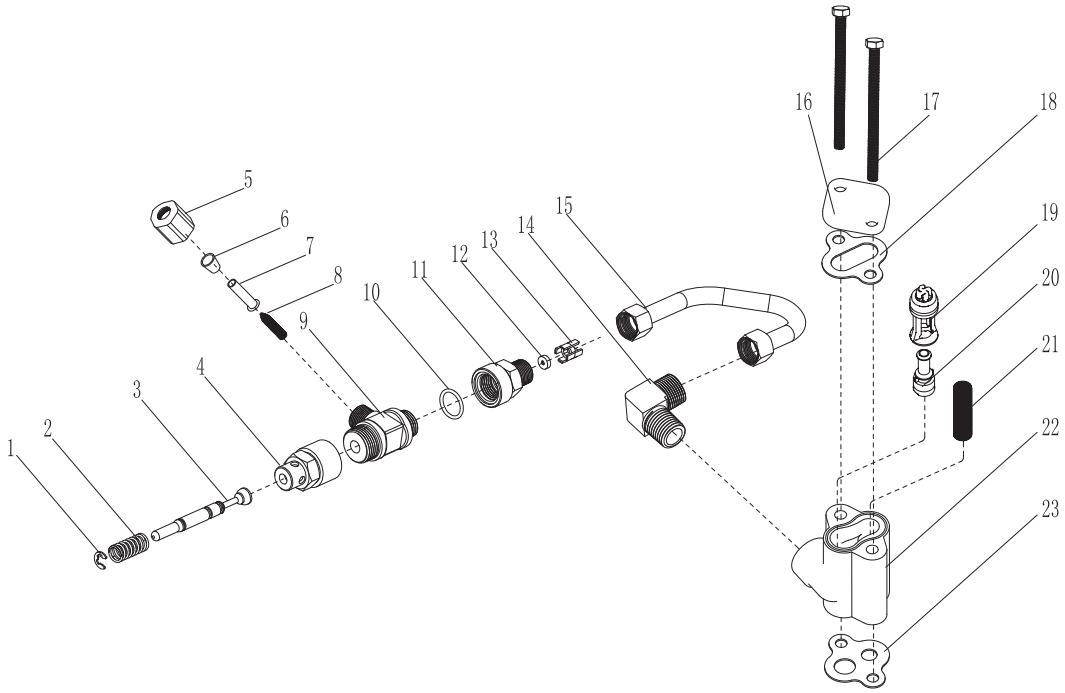


Cable interface 1 Cable interface 2



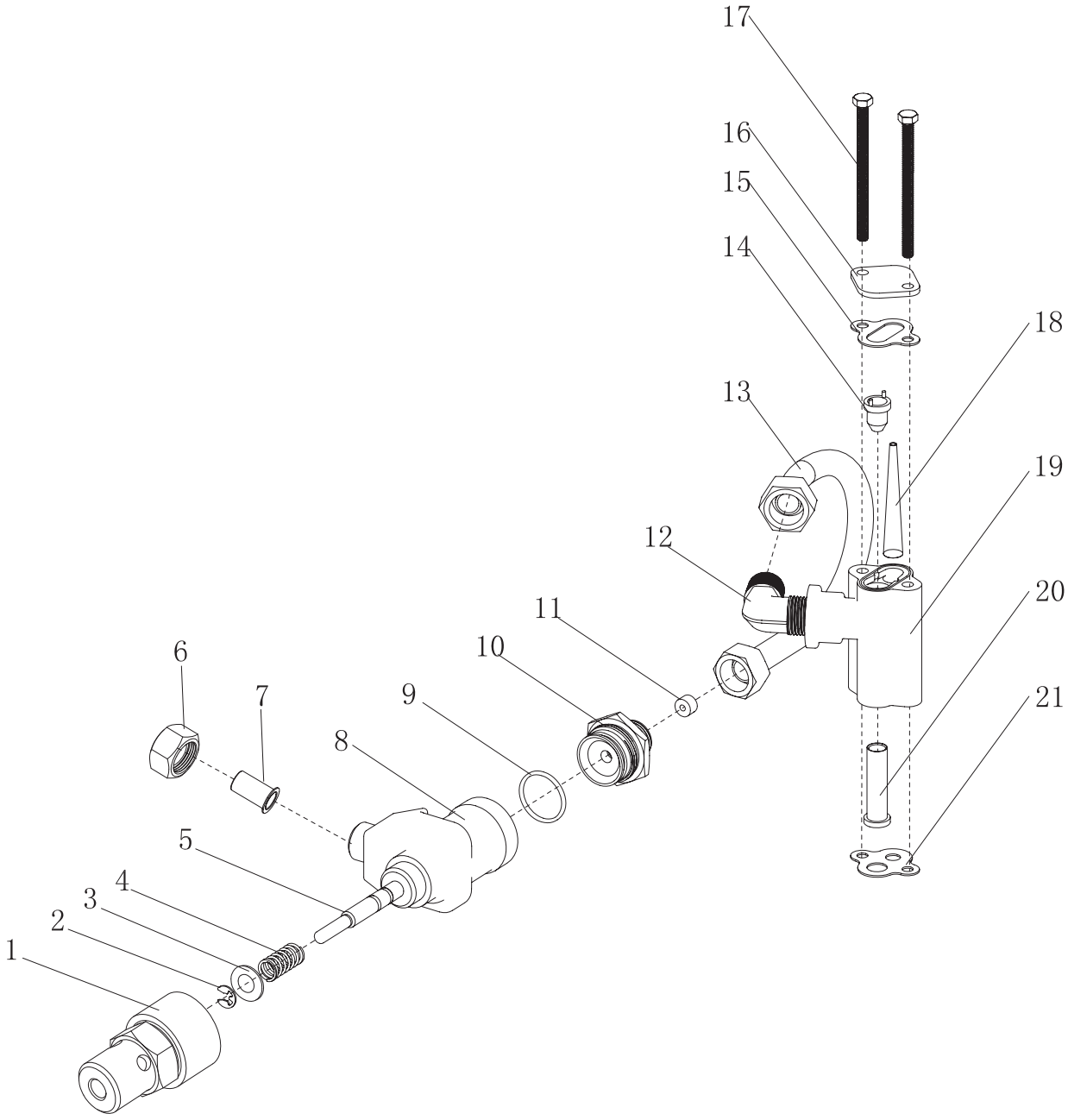
Item No.	Quantity	Part No.	Description
1	1	A31570	Label
2	1	A31546	NX Housing
3	1	A07039	PCB
4	4	A02110	Screw
5 *	1	A31547	Bracket

* Only for AQT-315/AQT-390



Item No.	Quantity	Part No.	Description
1	1	A-10250	Retaining Ring
2	1	A-10249	Spring
3	1	A-66122F	Brine Stem Assembly
4	1	A-11749	Stem Guide
5	1	A-56061F	B.L.F.C Fitting Nut
6	1	A-56023F	B.L.F.C Ferrule
7	1	A-56062F	B.L.F.C Tube Insert
8	1	A-56060F	Brine Line Screen
9	1	A-16051F	Brine Valve Body
10	1	A-11982	O-ring
11	1	A-16054F	Brine Valve End Plug
12 *	1		B.L.F.C Button
13	1	A-56015F	Brine Dispenser
14	1	A-10328	Elbow Fitting
15	1	A-66124F	Brine Tube
16	1	A-11893	Injector Cover
17	2	A-02060F	Screw
18	1	A-10229	Injector Cover Gasket
19 *	1		Injector Nozzle
20 *	1		Injector Throat
21	1	A-56059F	Screen
22	1	A-16001F	Injector Body
23	1	A-14805	Injector Body Gasket

* Extra Option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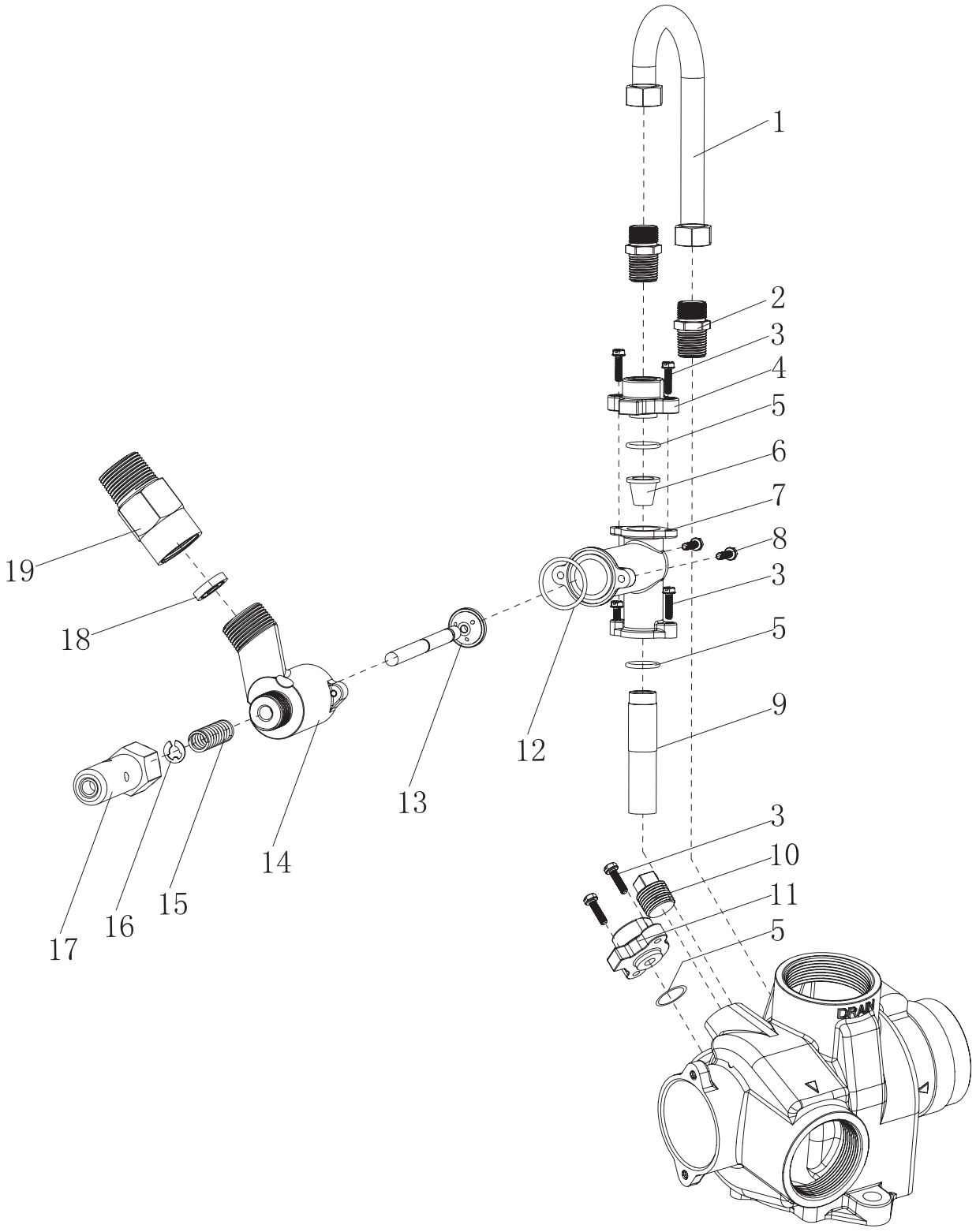
Item No.	Quantity	Part No.	Description
1	1	A-66164F	Brine Valve Cap Assembly
2	1	A-10250	Retaining Ring
3	1	A-04003F	Washer
4	1	A-15310	Spring
5	1	A-66128F	Brine Stem Assembly
6	1	A-66175F	B.L.F.C Fitting Nut
7	1	A-17061F	B.L.F.C Tube Insert
8	1	A-17053F	Brine Valve Body
9	1	A-13201	O-ring
10	1	A-17055F	Brine Valve End Plug
11 *	1		B.L.F.C Button
12	1	A-15413	Elbow Fitting
13	1	A-66160F	Brine Tube
14 *	1		Injector Nozzle
15	1	A-10229	Injector Cover Gasket
16	1	A-11893	Injector Cover
17	2	A-02051F	Screw
18	1	A-14803	Screen
19	1	A-17777	Injector Body
20 *	1		Injector Throat
21	1	A-14805	Injector Body Gasket

* Extra Option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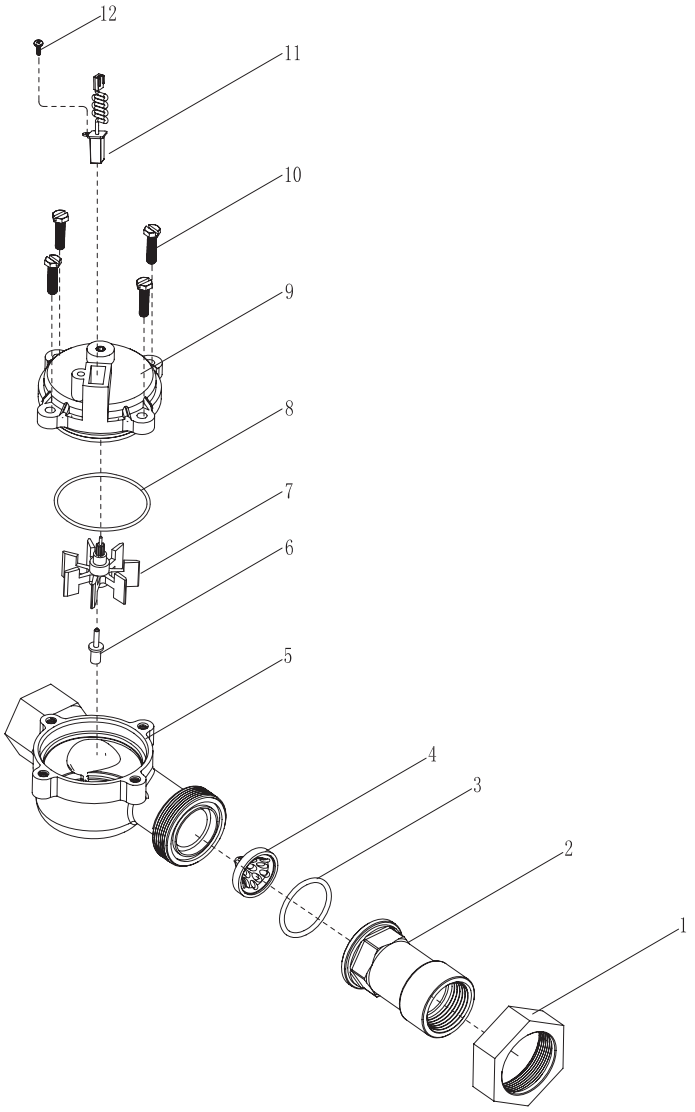
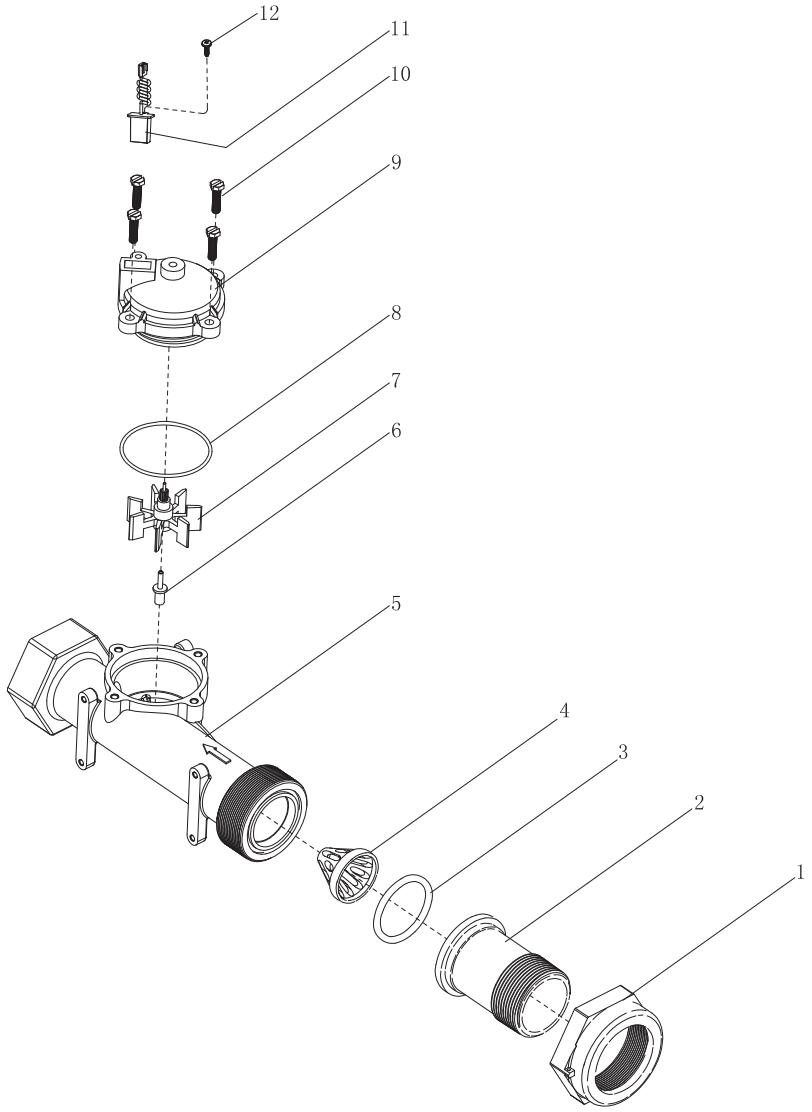
DRAIN

Item No.	Quantity	Part No.	Description
1	1	A-66161F	Brine Tube
2	2	A-18702	Tube Fitting
3	6	A-02002	Screw
4	1	A-16341-01	Injector Cover
5	2	A-15246	O-ring
6 *	1		Injector Nozzle
7	1	A-16340	Injector Body
8	2	A-12473	Screw
9 *	1		Injector Throat
10	1	A-31509F	Nut
11	1	A-31506F	Cover
12	1	A-18879	O-ring
13	1	A-16497-01	Brine Stem Assembly
14	1	A-18713	Brine Valve Body
15	1	A-11772	Spring
16	1	A-11774	Retaining Ring
17	2	A-16498-01	Stem Guide Assembly
18 *	1		B.L.F.C Button
19	1	A-18059F	Brine Fitting

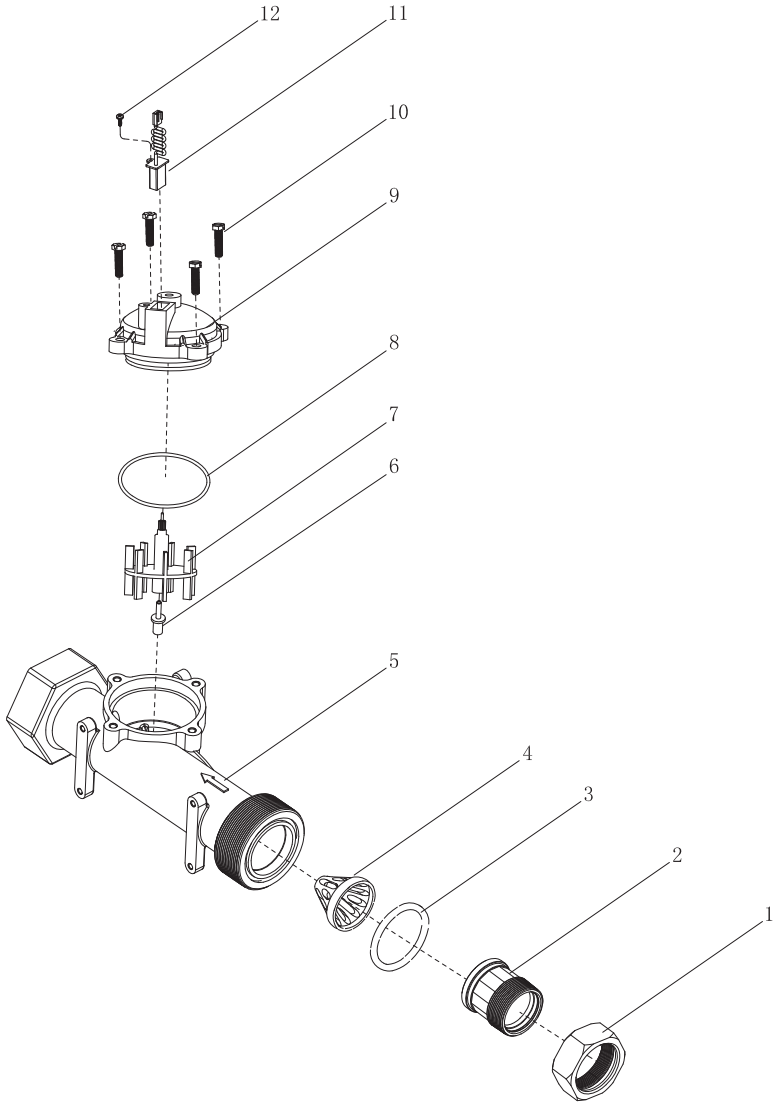
* Extra Option



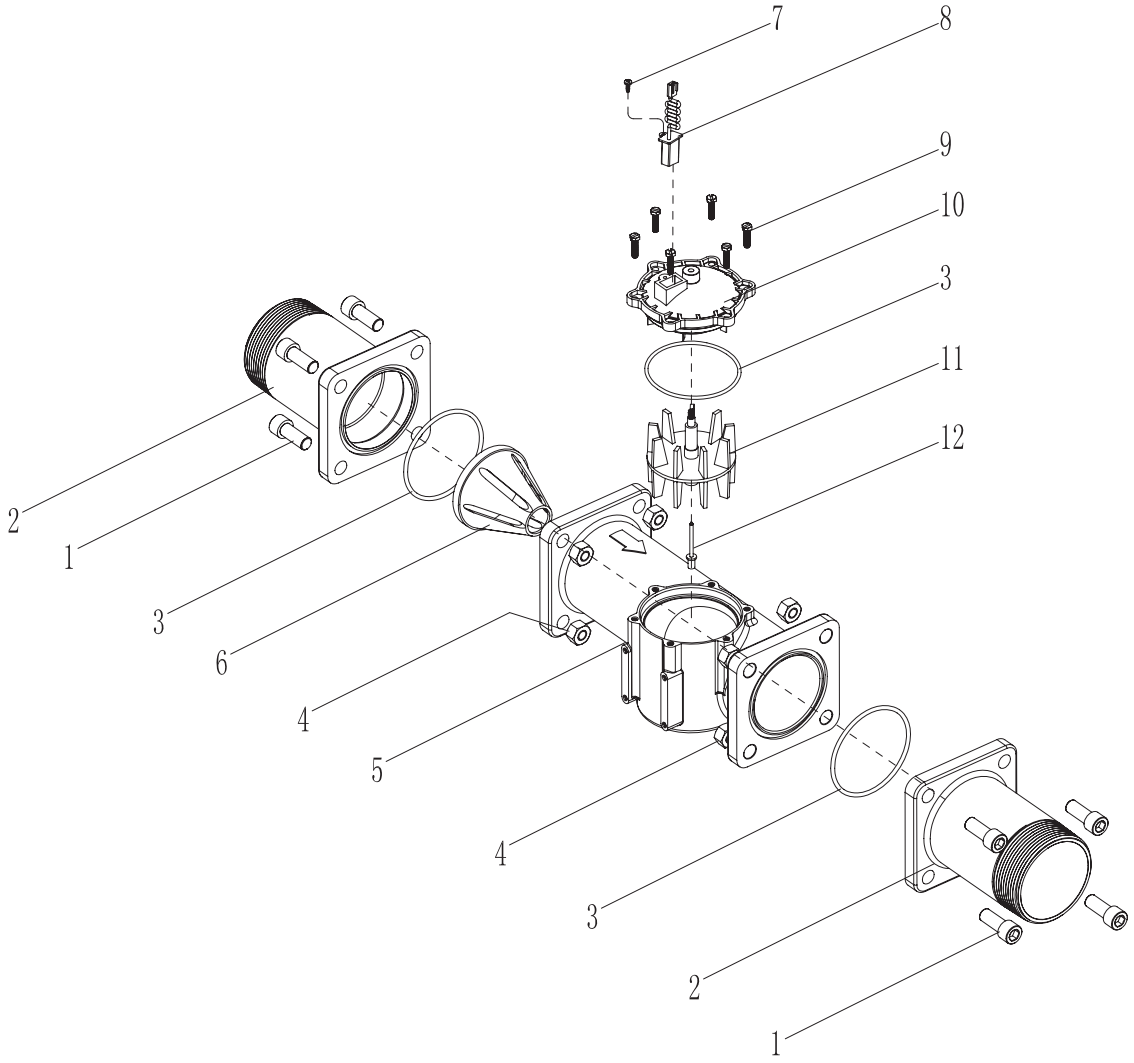
Item No.	Quantity	Part No.	Description
1	1	A-12003F	Nut
2	1	A-12002F	Fitting
3	1	A-01031F	O-ring
4	1	A-56013F	Flow Straightener
5	1	A-12001F	Meter Body
6	1	A-12101F	Post Meter Impeller
7	1	A-12204AF	Impeller
8	1	A-13847	O-ring
9	1	A-12332F	Meter Cover
10	4	A-02082F	Screw
11	1	A-12334F	Sensor
12	1	A-02106F	Screw



Item No.	Quantity	Part No.	Description
1	1	A-17543	Nut
2	1	A-12121F	Fitting
3	1	A-12733	O-ring
4	1	A-17542	Flow Straightener
5	1	A-12120F	Meter Body
6	1	A-12101F	Post Meter Impeller
7	1	A-12204AF	Impeller
8	1	A-13847	O-ring
9	1	A-12332F	Meter Cover
10	4	A-02082F	Screw
11	1	A-12334F	Sensor
12	1	A-02106F	Screw



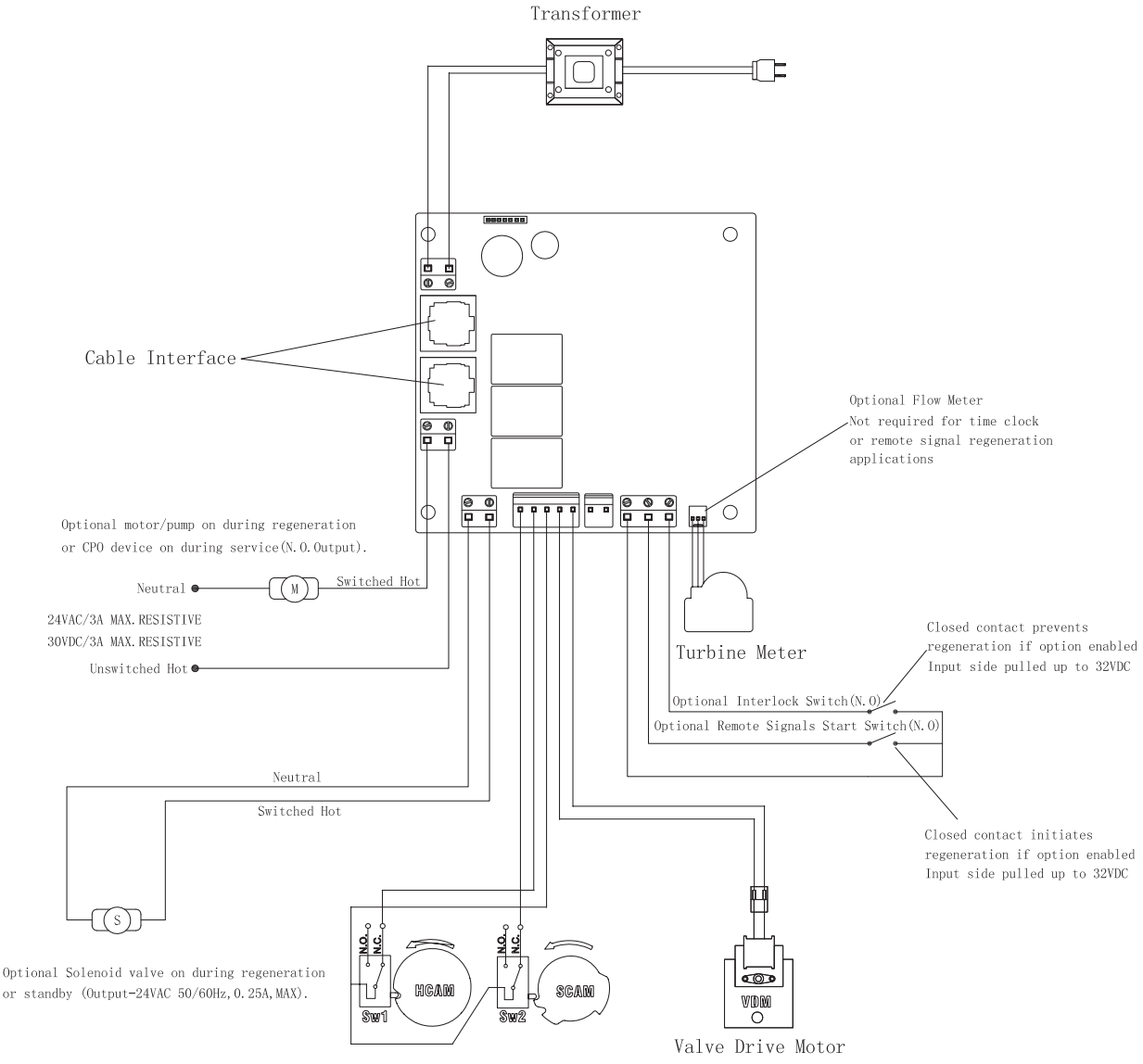
Item No.	Quantity	Part No.	Description
1	1	A-14569	Nut
2	1	A-14568	Fitting
3	1	A-14679	O-ring
4	1	A-14680	Flow Straightener
5	1	A-12301F	Meter Body
6	1	A-12101F	Post Meter Impeller
7	1	A-12331F	Impeller
8	1	A-13847	O-ring
9	1	A-12332F	Meter Cover
10	4	A-02082F	Screw
11	1	A-12334F	Sensor
12	1	A-02106F	Screw



Item No.	Quantity	Part No.	Description
1	1	A-17543	Screw
2	1	A-12121F	Fitting
3	1	A-12733	O-ring
4	1	A-17542	Nut
5	1	A-12120F	Meter Body
6	1	A-12101F	Flow Straightener
7	1	A-12204AF	Screw
8	1	A-13847	Sensor
9	1	A-12332F	Screw
10	4	A-02082F	Meter Cap
11	1	A-12334F	Impeller
12	1	A-02106F	Post Meter Impeller

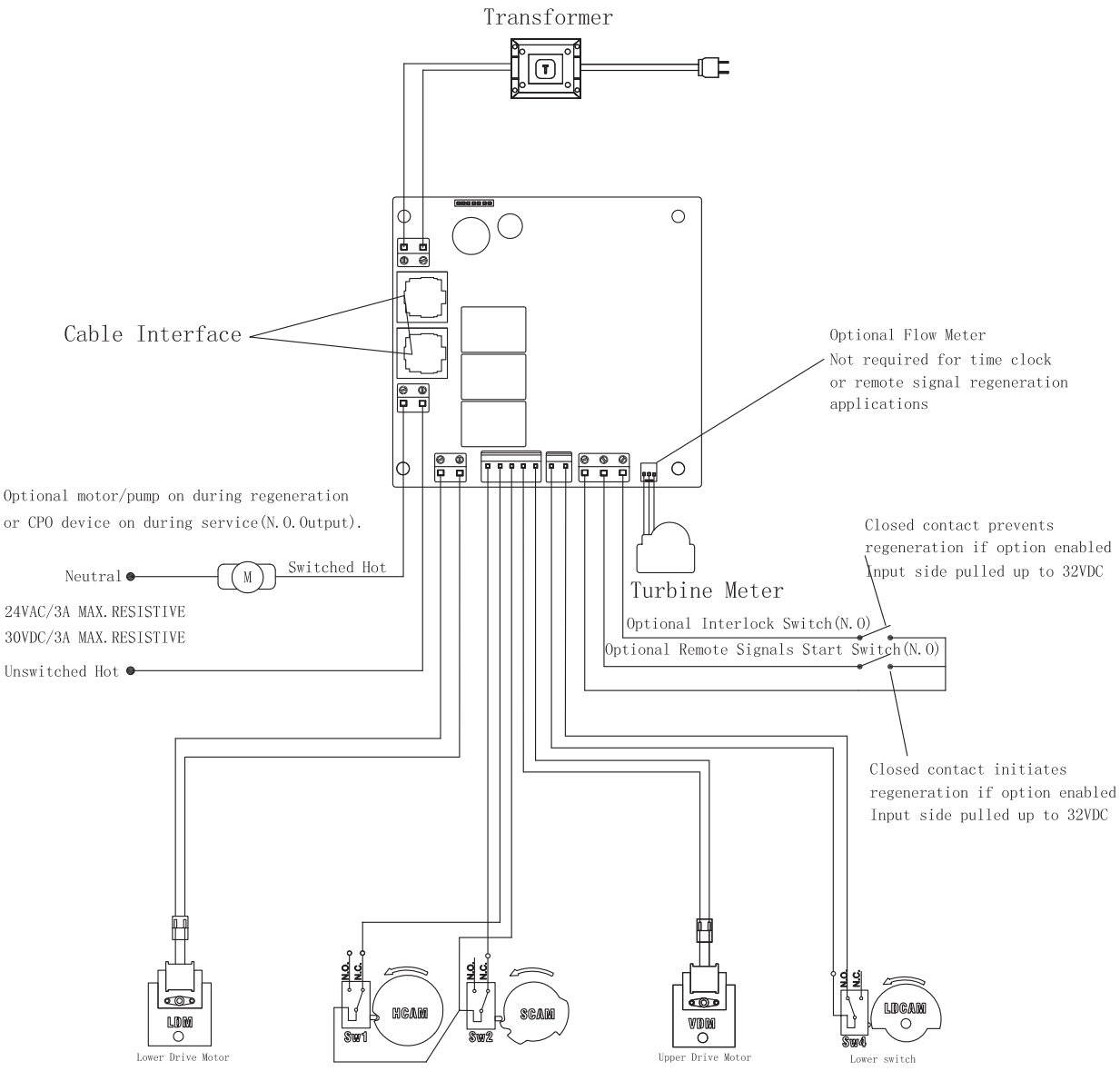
For Models:

AQT-275, AQT-285 and AQT-315



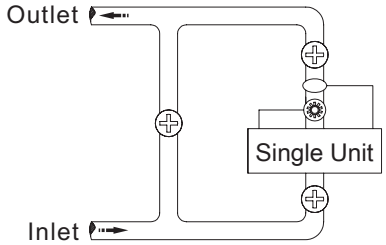
For Models:

AQT-290 and AQT-390



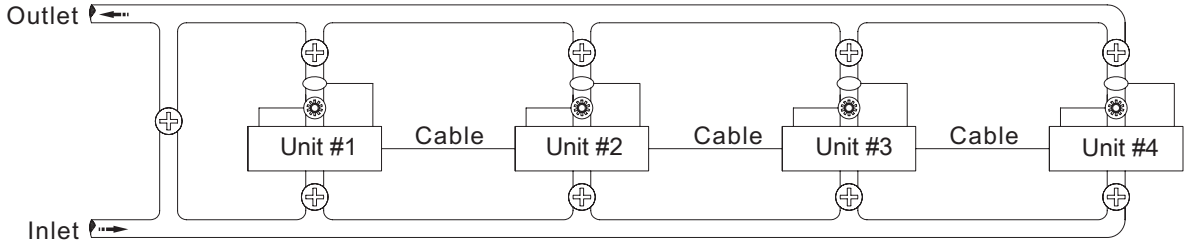
System	Valve Qty	Valve Needed	Meter	Function
4# Single Valve	1	Time	N/A	Regenerates by set time
		Meter Imm	1	Regenerates immediately when meter zeros out
		Meter Delayed	1	Regenerates delayed to the set time after meter zeros out
		Remote Signal Start	Optional	Regenerates starts by remote signal
5# Interlock	2-4	Meter Imm	All Meters	All units in service at the same time. When one meter zeros out or receives a remote signal, that unit starts regenerating. Other units remain in service even if they zero out during this time.
		Remote Signal Start	Optional	
6# Series	2-4	Meter Imm	1	All units in service at the same time. When system meter zeros out or receives remote start signal, the "lead" unit regenerates, others remain in service until the lead returns to service. The subsequent units regenerate as needed.
		Remote Signal Start	Optional	
7# Alternating	2	Meter Imm	1	One unit in service, the other one on stand-by. When meter zeros out or receives the remote start signal, the service one goes to regeneration and the stand-by one goes to service at the same time.
		Remote Signal Start	Optional	
9# Alternating	2-4	Meter Imm	All Meters	One unit on stand-by, all units in service. When one meter zeros out or receives the remote start signal, it goes to regeneration and the stand-by one goes to service at the same time.
		Remote Signal Start	Optional	

4# Single Unit

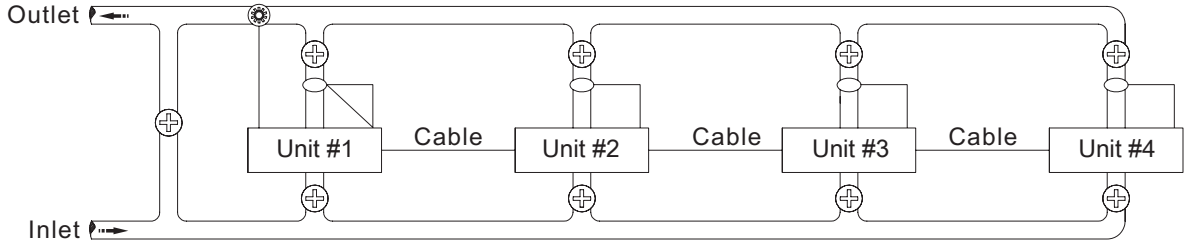


Note:
For system 7# and 9#, solenoid valve must be installed at the outlet for AQT-275, AQT-290, AQT-315. For dual piston AQT-290, AQT-390 this is not necessary. Optional solenoid valve for other systems.

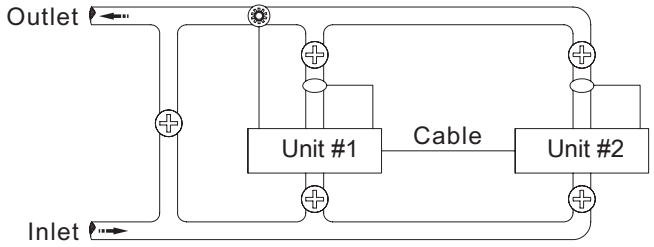
System 5#、9#

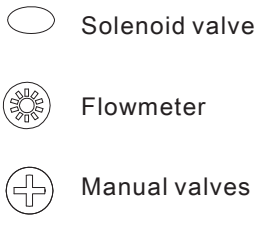


System 6#



System 7#





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) Regeneration at wrong time	A) Timer improperly set, due to power failure	A) Reset timer
3) loss of capacity	A) Increase draw water hardness	A) reset unit to the new capacity
	B) Brine concentration or quantity.	B) Keep brine tank full of salt at all times. Clean it yearly. Salt may be bridged. If using a salt grid Plate insure refill water is over it.
	C) Rinse fouling	C) Consolidate the rinse tank, clean the rinse and prevent future fouling
	D) Poor distribution, channeling (Uneven bed service).	D) Check distributors and backwash flow
	E) Internal control leak	E) Replace the spacer, seal or piston
	F) Ageing of rinse	F) Check for resin oxidation caused by Chlorine. Mushy resin.
	G) Loss of rinse	G) Check for correct bed depth. Broken distributors. Air or gas in bed: Well gas Eliminator loose brine line.
4) Poor water quality	A) Check items listed in Problem # 3.	A) Check items listed in Correction # 3.
	B) Bypass is open	B) Close the bypass
	C) Channeling	C) Check for too slow or high service flow
5) Excessive salt use	A) High salt setting	A) adjust salt setting
	B) Excessive water in brine tank	B) refer to problem # 7 tank.
6) Loss of water pressure	A) Fouling of inlet pipe	A) Clean or replace the pipeline
	B) Fouled resin	B) Clean the resin. Pretreat to prevent
	C) Improper backwash	C) Too many resin fines. Reset the flow rate and time of backwash
7) Excessive water in brine tank	A) Plugged drain line	A) Check drain line and clean flow control
	B) Brine valve plugged or damaged	B) Clean or replace the brine valve
	C) Injector plugged	C) Clean injector, replace injector screen
	D) Low inlet water pressure	D) Increase water pressure to allow Injector to perform properly
8) Softener fails to brine draw	A) Plugged drain line	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 restriction in B.L.FC. Ensure Safety float is not stuck
	D) Low water pressure	D) Increase water pressure
	E) Brine line injects air during brine draw	E) Check brine line for air leaks
	F) Internal control leak	F) Check seal, spacer and piston for scratches and dents
9) Control cycles continuously	A) Faulty timer	A) Replace timer
10) Continuous flow to drain	A) Foreign material in the control	A) Call dealer. Clean valve, rebuild unit
	B) Internal control leak	B) Same as above
	C) Piston jammed in brine or back wash position	C) Same as above

Error	Cause	Solution
	User resume factory setting	Press shift button and up button simultaneously, go through the master programming to program the unit, press cycle button to save and exit
	No message #1	1) Make sure all communication cables are connected 2) Keep the same format for the lead unit and the lag unit 3) Confirm there is unit 1# or 2# or 3# set in the system 4) The number of the control used should comply with the number set in the system 5) There shouldn't be any same valve address in the system
	No message #2, #3, #4	
	No message #2	
	No message #3	
	No message #4	
	No message #2, #3	
	No message #2, #4	
	No message #3, #4	
	In system 7, lead unit and lag unit setting of different format	Enter the system setting and reset the format for system 7#

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CONTROL VALVES