Clack WS 1 water softener valve – parts and operational manual

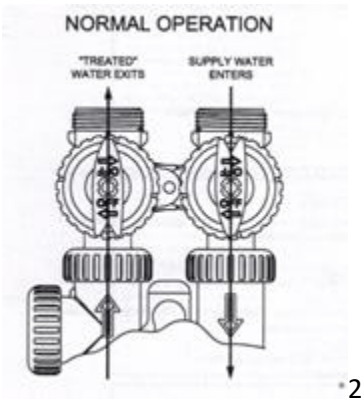
Bypass Valve

The bypass valve is typically used to isolate the control valve from the plumbing system's water pressure in order to perform control valve repairs or maintenance. The WS 1 bypass valve is particularly unique in the water treatment industry due to its versatility and state of the art design features. The 1" full flow bypass valve incorporates four positions including a diagnostic position that allows service personal to work on a pressurized system while still providing untreated bypass water to the facility or residence. It's completely non-metallic, all plastic design allows for easy access and serviceability without the need for tools.

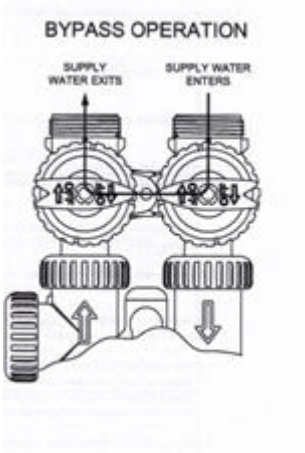
The bypass body and rotors are glass filled Noryl and the nuts and caps are glass filled polypropylene. All seals are self-lubricating EPDM to help prevent valve seizing after long periods of non-use. Internal 0-rings can easily be replaced if service is required.

The bypass consists of two interchangeable plug valves that are operated independently by red arrow shaped handles. The handles identity the flow direction of the water. The plug valves enable the bypass valve to operate in four positions.

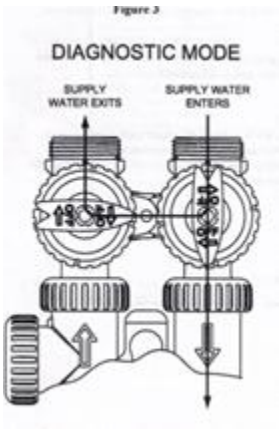
Normal Operation Position: The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve. Water flows through the control valve during normal operation and this position also allows the control valve to isolate the media bed during the regeneration cycle.



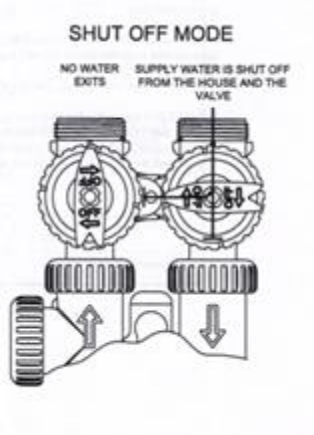
2. Bypass Position: The inlet and outlet handles point to the center of the bypass, the control valve in isolated from the water pressure contained in the plumbing system. Untreated water is supplied to the plumbing system.



3. Diagnostic Position: The inlet handle points in the direction of flow and the outlet handle points to the center of bypass valve, system water pressure is allowed to the control valve and the plumbiiig system while not allowing water to exit from the control valve to the plumbing.



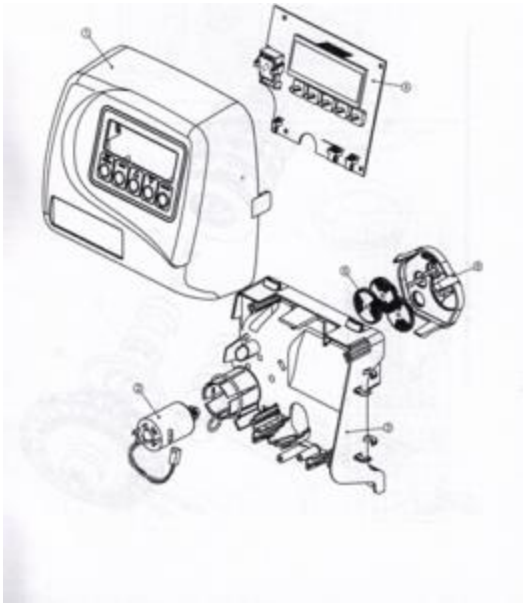
4. Shut Off Position: The inlet handle points to the center of the bypass valve and the outlet handle points in the direction of flow, the water is shut off to the plumbing system. If water is available on the outlet side of the softener it is an indication of water bypass around the system (i.e. a plumbing connection somewhere in the building bypasses the system).



Front Cover and Drive Assembly for WS1 Clack water softener valve

Drawing No.	Order No.	Description	Quantity
1	V3175-01	WS 1 Front Cover ASY	1
2	V3107-01	WS 1 Motor	1
3	V3106-01	WS 1 Drive Bracket & Spring Clip	1
4	V3108	WS 1 PC Board	1
5	V3110	WS 1 Drive Geart 12×36	3
6	V3109	WS 1 Drive Gear Cover	
V3002	WS 1 Drive ASY		
Not Shown	173186	WS Transformer ttOV-t2V	

* Drawing number parts 2 through 6 may be purchased as a complete assembly, part ‘5/3002.

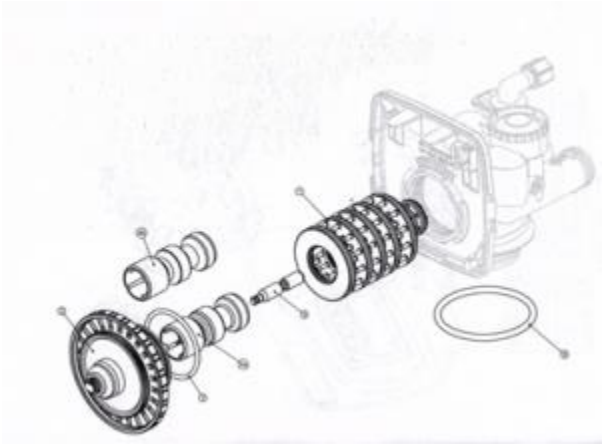


Drive Cap Assembly, Dowoflow Piston, Upflow Piston, Regenerant Piston and Spacer Stack Assembly for WS1 Clack Water Softener

Drawing No.	Order No.	Description	Quantity
1	V3005	WSI Spacer Stack Assembly	1
2	V3004	Drive Cap ASY	1
3	V3135	0-ring 228	1
4a	V3011*	WS 1 Piston Downflow ASY	1
4b	V301 1-01	WS1 Piston Upflow ASY	1
5	V3174	WS 1 Regenerant Piston	1
6	V3180	0-ring 337	1

V3O11 is labeled with DN and V3011-01 is labeled with UP.

Note: The regenerant piston is not used in backwash only applications.

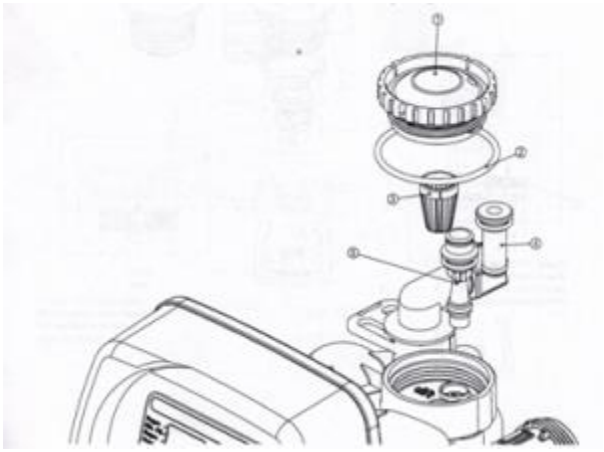


Injector Cap, Injector Screen, Injector, Plug and 0-Ring

Drawing No.	Order No.	Description	Quantity
1	V3176	Injector Cap	1
2	V3152	0-ring 135	1
3	V3177	Injector Screen	1
4	V3010-IZ	WS 1 Injector ASY Z Plug	1
	V3010-1A	WS1 INJECTOR ASYABLACK	
	V3010-IB	WS1 INJECFORASY B BROWN	
	V3010-IC	WS1 INJECTOR ASY C VIOLET	
	V30I0-ID	WS1 INJECTOR ASYDRED	
	V3010-1E	WS1 INJECTOR ASYE WHITE	
5	V3010-IF	WS1 INJECTOR ASYFBLUE	
	V3010-IG	WS1 INJECTOR ASY G YELLOW	
	V3010-1H	WS1 INJECTOR ASYHGREEN	
	V3010-1I	WS1 INJECTOR ASY I ORANGE	
	V3010-1J	WS1 INJECTOR ASY J LIGHT BLUE	
	V3010-1K	WS1 INJECTOR ASY K LIGHT GREEN	
Not Shown	V3170	0-ring011	
Not Shown	V3171	0-ring 013	

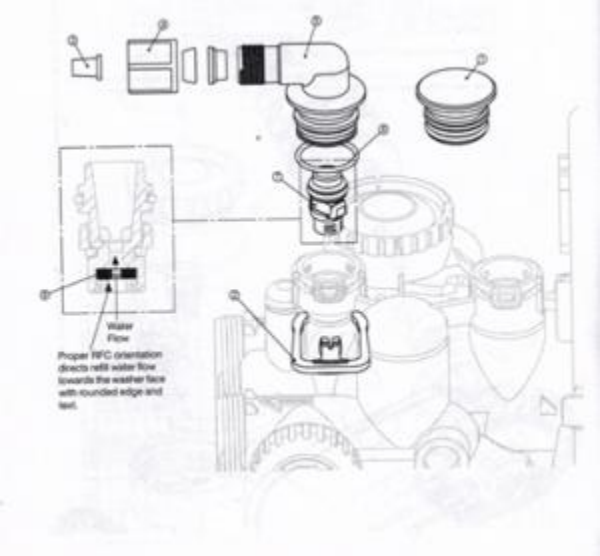
*The injector ping and the injector each contain one 011 (tower) and 013 (upper) 0-ring.

Note: For downflow, injector is located in the down hole and injector plug in the up hole. For a filter that only backwashes, injector plugs are located in both holes, and regenerant piston must be removed.



Refill and Refill Port Plug

Drawing No	Order No.	Description	Quantity
1	V3195-01	WS Refill Port Plug ASY	This part is required for backwash only systems
2	H4615	Elbow Locking Clip	
3	JCP-P-6	Polytube insert 3/8	
4	JCPG-6PBLK	Nut 3/8	
5	014613	Elbow Cap 318	
6	V3163	0-ring019	1
7	V3165_01*	WS 1 RFC Retainer ASY	
8	V3182	WS1RFC	1
Not Shown	H4650	Elbow 1/2” with nut and insert	Option



Drain Line-3/4”

Drawing No.	Order No.	Description	Quantity
I	114615	Elbow LockingClip	1
2	PKPIOTS8-BULK	Polytube insert 5/8	Option
3	V3I92	WS1 Nut 3/4 Drain Elbow	Option
4	V3158-01	WS 1 Drain Elbow ¾ Male ASY	1
5	V3163	0-ring 019	1
6	V3159-Ol	WS1 DLFC Rotairrr ASY	1

VS 162-007 WS DLFC 0.7 rpm for 3/4

V3162-010 WS1 DLFC I.) Gpm for 3/4

V3162-013 WS 1 DLFC 1.3 gym for 3/4

V3162-0I7 WS1 DLFC l.7gimc for 3/4 0ne

V3162-022 WS1 DLFC 2.2 ppm for 3/4 DLFC

V3162-027 WS1 DLFC 2.7 gpm for /3/4 must be

used if ¾”

fitting is used

7 V3I62-032 WS1 DLFC 3.2 fgpm or 3/4

VS l62-042 WS1 DLFC 4.2 gym for 314

V3162-053 WS1 DLPC 5.3 gym for 3/4

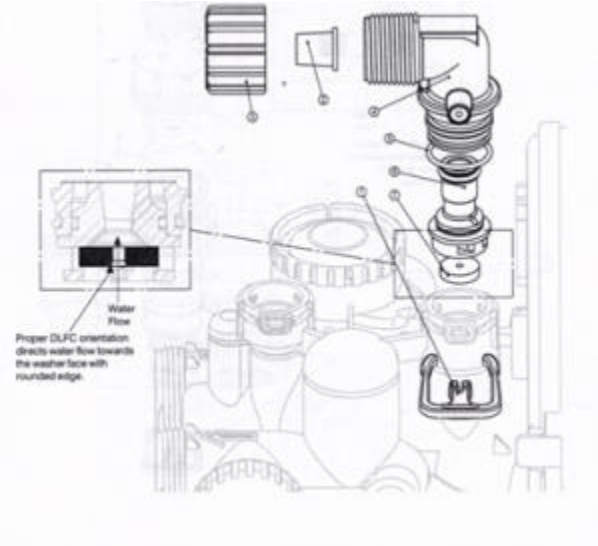
V3162-065 WS1 DLFC 6.5 gym for 3/4

VS 3162-075 6'Sl DLFC 7.5 gym for 3/4

V3162-090 WSI DLFC 9.0 ppm for 3/4

V3162-I00 WSI DLFC 10.0 gpm for 3/4

Valves are shipped without drain line flow control (DLFC) —install DLPC before using. Valves are shipped without ¾" nut for drain elbow (polytube installation only) and 5/8" polytube installation only).



Drawing No.	Order No.	Description	Quantity
1	H4615	Elbow Locking Clip	1
2	V3008-02	WS Drain FTG 1 Straight	1
3*	V3166	WS 1 Drain FTC Body 1	1
4°	V3167	WS1 Drain FTG Adaptor 1	1
5°	V3163	0-ring 019	1
6°	V3150	WS1 Split Ring	1
7°	V3151	WS1 Nut 1" QC	1
8*	V3105	O-ring 215	1

V3190-090 WS 1 DLFC 9.0 gpm for 1

V5190-100 WS 1 DLFC 10.0 gpm for 1 One

V3190-110 WS 1 DLFC 11.0 gpm for 1 DLFC

V3190-130 WS 1 DLFC 13.0 gpm for 1 must be

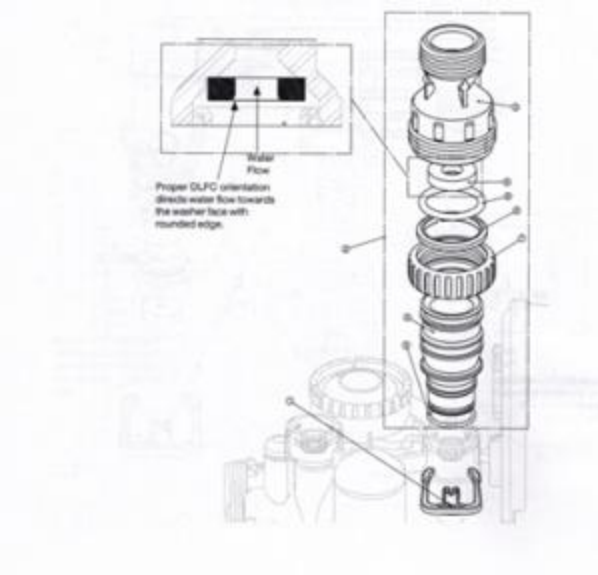
V3190-150 WS1 DLFC 15.0 gym for 1 used if

V3190-170 WS 1 DLFC 17.0 gym for 1 1” fitting

V3190-200 WS 1 DLFC 20.0 gym for 1 is used

V3190-250 WS1 DLFC 25.0 gym for 1

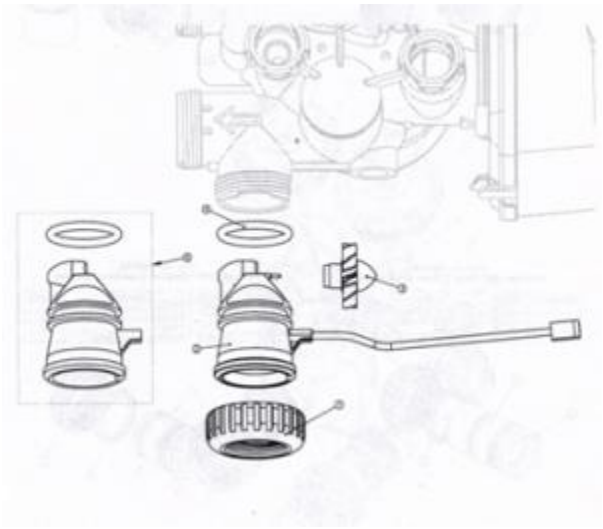
Can be ordered us a set order number V3008-02, description: WS1 Drain FTG 1 Straight.



Water Meter and Meter Plug

Drawing No.	Order No.	Description	Quantity
1	V3151	WS1 Nut 1” QC	1
2	V3003°	WS1 Meter ASY	1
3	V3118-01	WS1 Turbine ASY	1
4	V3105	0-ring 215	1
5	V3003-01	WS 1 Meter Plug ASY	1

*Order number V3003 includes V3118-01 and V3105.

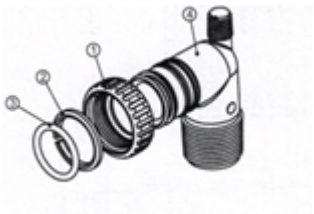


Installation Fitting Assemblies

Order No: V3007

Description: WS1 Fitting 1” PVC Male NPT Elbow Assembly

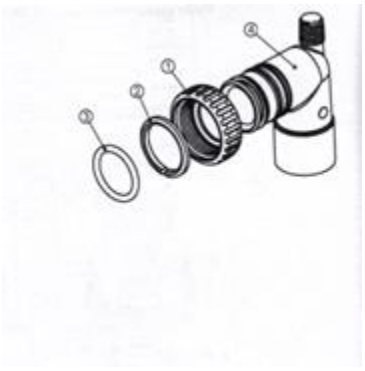
Drawing no	order no	description	quantity
1	V3151	WS1 Nut 1 “ Quick Connect	2
2	V3l50	WS 1 Split Ring	2
3	V3105	O-Ring 215	2
4	V3149	WS1 Fitting 1 PVC Male NPT Elbow	2



Order No: V3007

Description: WS1 Fitting 1” PVC Male NPT Elbow Assembly

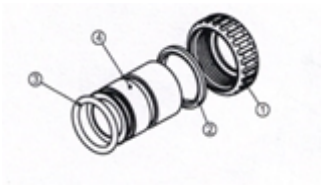
Drawing no	order no	description	quantity
1	V3151	WS1 Nut 1” Quick Connect	2
2	V3150	WS1 Split Ring	2
3	V3105	O Ring 215	2
4	V3149	WS1 Fitting 1 PVC Male NPT Elbow	2



Order No: V3507-02

Description: WSI Fitting 1” Brass Sweat Assembly

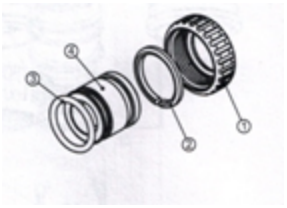
Drawing no	order no	description	quantity
1	V3151	WS1 Nut 1” Quick Connect	2
2	V3150	WS1 Split Ring	2
3	V3105	O-Ring215	2
4	V3188	WS1 Fitting 1” Brass Sweet	2



Order No: V3007-03

Description: WSJ Fitting 3/4’” Brass Sweat Assembly

Drawing no	order no	description	quantity
1	V3151	WS1 Nut 1” Quick Connect	2
2	V3150	WS1 Split Ring	2
3	V3105	O-Ring 215	2
4	V3188-01	WS 1 Fitting ¾ Brass Sweat	2



Bypass Valve

Drawing No.	Order No.	Description	Quantity
1	V3151	WS1 Nut 1” Quick Connect	2
2	V3150	WS1 Split Ring	2
3	V3105	O-Ring 2I5	2
4	V3145	WS1 Bypass 1” Rotor	2
5	V3146	WS1 Bypass Cap	2
6	V3147	WS1 Bypass Handle	2
7	V3148	WS1 Bypass Rotor Seal Retainer	2
8	V3152	0 -ring 135	2
9	V3152	0-ring 112	2
10	V3156	O-ring 214	2

(Not Shown) Order No. V3191-01, Description: WS1 Bypass Vertical Adapter Assembly

Order No.	Description	Quantity
V3151	WS1 Nut 1” Quick Connect	2
V3150	WS1 Split Ring	2
V3105	0-Ring 215	2
V3191-01	WS1 Bypass Vertical Adapter Assembly	2

Service Instructions

Drive Assembly

Remove the valve cover to seems the drive assembly

Disconnect the power source plug (black wire) from the PC board prior to disconnecting the motor or water meter plugs from the PC board. The motor plug connects to the two-pin jack on the left-hand side of the PC board. The power source plug connects to the four-pinjack. The four-pinjack is between the two-pin and three-pin jacks. The water meter plug (gray wire) connects to the three-pin jack on the far right-hand side of the PC board.

The PC board can be removed separately from the drive bracket but it is not recommended. Do not attempt to remove the display panel from the PC board. Handle the board by the edges. To remove the PC board from the drive bracket, unplug the power, water meter and motor plugs from the PC board. Lift the middle latch along the top of the drive bracket while pulling outward on the top of the PC board. The drive bracket has two plastic pins that fit into the holes on the lower edge of the PC board. Once the PC board is tilted about 45 from the drive bracket it can be lifted off of these pins. To reinstall the PC board, position the lower edge of the PC board so that the holes in the PC board lineup with the plastic pins. Push the top of the PC board towards the valve until it snaps under the middle latch, weave the power and water meter wires into the holders and reconnect the motor, water meter and power plugs.

The drive bracket must be removed to access the drive cap assembly and pistons or the drive gear cover. It is not necessary to remove the PC board from the drive bracket to remove the drive bracket. To remove the drive bracket start by removing the plugs for the power source and the water meter. Unweave the wires from the side holders. Two tabs on the top of the drive back plate hold the drive bracket in place. Simultaneously lift the two tabs and gently ease the tap of the drive bracket towards your body. The lower edge of the drive bracket has two notches that rest on the drive back plate. Lift up and outward on the drive bracket to disengage

the notches.

To reassemble seat the bottom of the drive bracket so the notches are engaged at the bottom of the drive back plate. Push the top of the drive bracket towards the two latches. The drive bracket may have to be lifted slightly to let the threaded piston rod pass through the hole In the drive bracket Maintain a slight engaging force on top of the drive bracket while deflecting the bracket slightly to the left by pressing on the side of the upper right corner. This helps the drive gears mesh with the drive cap assembly. The drive bracket is properly seated when it snaps under the latches on the drive back plate. If resistance is felt before latching, then notches are not filly engaged, the piston rod is not in hole, the wires are jammed between the drive bracket and drive buck plate, or the gear is not engaging the drive cap assembly.

To inspect drive gears, the drive gear cover needs to be removed. The drive gear cover is held in place on the drive bracket by three clips. The largest of the three clips is always orientated to the bottom of the drive bracket. Before trying to remove the drive gear cover, the drive bracket must be removed from the drive back plate. The drive gear cover can be removed from the drive bracket without removing the motor or the PC board. Simultaneously, push in and down on the large clip at the bottom and the clip on the left-hand side of the drive bracket behind the PC board. Keep your other fingers behind the drive gear cover so the drive gears do not drop on the ground.

Replace broken or damaged drive gears. Do not lubricate any of the gears. Avoid getting any foreign matter on the reflective coating became dirt or oils may interfere with pulse counting.

The drive gear cover only fits on one way, with the large clip orientated towards the bottom. If all three clips are outside of the gear shroud on the drive bracket the drive gear cover slips easily into place.

The drive bracket does not need to be removed from the drive plate if the motor needs to be removed. To remove the motor, disconnect the power and motor plugs from the jacks on the PC board. Move the spring clip loop to the right and hold. Rotate the motor at least a% turn in either direction before gently pulling on the wire connectors to remove the motor. Pulling directly on the wires without rotating the motor may break the wires off the motor.

Replace the motor if necessary. Do not lubricate the motor or the gears. When reinstalling the motor gently turn the motor while inserting so that the gear on the motor meshes with the gears under the drive gear cover and the small plastic bulge engages one of the slots on the motor housing. Reconnect the motor plug to the two pronged jack on the lower left hand side of the PC board. If motor will not easily engage with drive gear when reinstalling, lift and slightly rotate motor before reinserting.

Replace the valve cover. After completing any valve maintenance, press and hold NEXT and REGEN bottom for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the soft ware version (e.g. 154) and then reset the valve to the service position.

Drive Can Assembly Main Piston and Regenerant Piston

The drive assembly must be removed to access the drive cap assembly. The drive cap assembly most be removed to access the piston(s). The drive cap assembly is threaded into the control valve body and seals with an o-ring. To remove the drive cap assembly use the special plastic wrench or insert a ¼’ to /i flat bladed screwdriver into one of the slots around the top 2” of the drive cap assembly so it engages the notches molded into the drive back plate around the top 2’ of the piston cavity. The notches are visible through the holes. Lever the screwdriver so the drive cap assembly turns counter clockwise. Once loosened unscrew the drive cap assembly by hand and pull straight out.

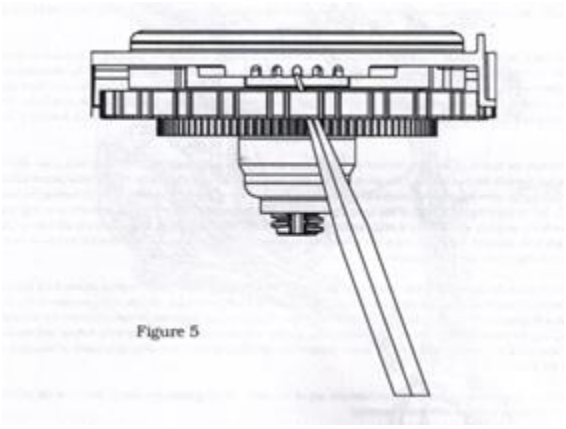


Figure 5

The drive cap assembly contains the drive cap, the main drive gear, drive cap spline, piston rod and various other parts that should not be dissembled in the field. The only replaceable part on the drive cap assembly is the 0-ring. Attached to the drive cap assembly is the main piston (down flow or up flow) and if a regenerant is used, a regenerant piston.

The regenerant piston (the small diameter one behind the main piston) is removed from the main piston by unsnapping it from its latch. Chemically clean in dilute sodium bisulfite or vinegar or replace the regenerant piston if needed. To remove the main down flow or up flow piston fully extend the piston rod and then unsnap the main piston from its latch by pressing on the side with the number. Chemically clean in dilute sodium bisulfite or vinegar or replace the main piston.

Reattach the main piston to the drive cap assembly. Reattach the regenerant piston (if needed) to the main piston. Do not lubricate the piston rod, main piston or regenerant piston. Lubricant will adversely affect the red or clear lip seals. Reinsert the drive cap assembly and piston into the spacer stack assembly and hand tighten the drive cap assembly. Continue to tighten the drive cap assembly using a screwdriver as a ratchet until the black o-ring on the spacer stack assembly is no longer visible through the drain port. Excessive force can break the notches molded into the drive back plate. Make certain that the main drive gear still turns freely. The exact position of the piston is not important as long as the main drive gear turns freely.

Reattach the drive assembly to the control valve and connect all plugs. After completing any valve maintenance, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the soft ware version (e.g. 154) and then reset the valve to the service position.

spacer stack assembly

To access the spacer slack assembly remove the drive assembly, drive cap assembly and piston. The spacer stack assembly can be removed easily without tools by using thumb and forefinger. Inspect the black 0-rings and red or clear lip seals for wear or damage Replace the entire stack if necessary. The spacer stack assembly has been 100% tested at the factory to insure proper orientation of one way seals. Do not disassemble the stack.

The spacer stack assembly maybe chemically cleaned (dilute sodium bisulfite or vinegar) or wiped with a soft cloth.

The spacer stack assembly can be pushed in to the control valve body bore by hand. Since the spacer stack assembly can be compressed it is easier to use a blunt object (5/8” to 1-1/8” in diameter) to push the center of the assembly into the control valve body. – The assembly is properly seated when at least four threads are exposed (approximately 5/8”). Do not force the spacer stack assembly in. The control valve body bore interior can be lubricated with silicone to allow for easy insertion of the entire stack. Do not use silicone or any other type of lubricant on the red or clear lip seals or the piston.

Reattach the drive cap assembly and piston(s) and the drive assembly.

After completing any valve maintenance, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position The display should flash all wording, then flash the soft ware version and then reset the valve to the service position.

Injector Can. Screen Injector Plug and Injector

Unscrew the injector cap and lift off. Loosen cap with special plastic wrench or pliers if necessary. Attached to the injector cap is a screen. Remove the screen and clean if fouled.

The plug and/or injector can be pried Out with a small screwdriver. The plug can be wiped clean. If the plug leaks replace the entire plug. The injector consists of a throat and a nozzle. Chemically clean the injector with vinegar or sodium bisulfite. The holes can be blown out with air. Both pieces have small diameter holes that control the flow rates of water to insure that the proper concentration of regenerant is used. Sharp objects, which can score the plastic, should not be used to clean the injector. Scoring the injector or increasing the diameter of the hole could change the operating parameters of the injector.

Two holes are labeled DN and UP. Check for compliance with one of the following:

for down flow systems, the appropriate size injector in located in the “DM’ hole, a plug is in the “UP” hole and that the piston is a combination of the down flow main piston and the regenerant piston.

for up flow systems, the appropriate size injector is located in the “UP” hole, a plug is in the “Whole and that the piston is a combination of the up flow main piston and the regenerant piston; or

for backwash only systems, a plug is in the “DN” hole and in the “UP” hole, and that the piston only has a down flow main piston (the regenerant piston must be removed) and a plug is in the refill flow control position.

Push the plug(s) and/or injectors firmly in place, replace the screen and hand tighten the injector cap.

Refill Flow Contrpl Assembly or-Refill Port Plug

To clean or replace the refill flow control, pull out the elbow-locking clip and then pull straight upon the elbow. Replace the elbow locking clip in the slot so that it is not misplaced. Twist to remove the white flow control retainer. The flow control can be removed by prying upward through the side slots of the retainer with a small blade flat screwdriver.

Chemically clean the flow control or the white flow control retainer using dilute sodium bisulfite or vinegar. Do not me a wire brush. If necessary, replace the flow control, wring on the flow control retainer, or the 0-ring on the elbow.

Reseat the flow control so the rounded end is visible in the flow control. Reseal the white flow control retainer by pushing the retainer into the elbow until the wring seats. Remove locking clip, push down on elbow to reseat and insert locking clip.

Do not use Vaseline, oils, or other unacceptable lubricants on o-rings. A silicon lubricant may be used on the n-ring on the elbow or the white retainer.

Water Meter or Meter Plug

The water meter assembly is connected to the PC board by a wire. If the entire water meter assembly is to be replaced, remove the control valve cover and remove the power source and water meter plugs from the PC board. Unlatch the drive assembly and lean it forward. Unthread the water meter wire from the side of the drive assembly and through the drive back plate. To reinstall, rethread the water meter wire through the drive back plate and the side of the drive assembly. Reattach the drive assembly and the water meter and power plugs.

If no water meter wire is visible, then a plug is installed not a water meter.

The water meter wire does not need to be removed from the PC board if the water meter is only being inspected and cleaned. To remove the water meter assembly, unscrew the meter capon the left side of the control valve. Pliers maybe used to unscrew the nut if necessary.

With the nut removed, a slot at the top of the water meter is visible. Twist a flat blade screwdriver in the slot between the control valve body and the meter. When the meter is part way out it is easy to remove the water meter from the housing. Once the water meter is removed from the control valve body, use your fingers to gently pull forward on the turbine to remove it from the shaft.

Do not use a wire brush to clean. Wipe with a clean cloth or chemically clean in dilute sodium bisulfite or vinegar. The turbine can be immersed in the chemical. Do not immerse electronics. If the turbine is scored or damaged or the bearings on the turbine are worn replace the turbine.

Do not lubricate the turbine shaft. The turbine shaft bearings are prelubricated Do not use Vaseline, oils, or other unacceptable lubricants on the o-ring. A silicon lubricant may be used on the black 0-ring.

Snap the turbine on the shaft and reinsert the water meter into the side slot. Hand tighten the nut. Do not use a pipe wrench to tighten nut.

Bypass Valve

The working parts of the bypass valve are the rotor assemblies that are contained under the bypass valve caps. Before working on the rotors, make sure the system is depressurized. Turn the red arrow shaped handles towards the center of the bypass valve and back to the arrow direction several times to ensure rotor is turning freely.

The nuts and caps are designed to be unscrewed or tightened by hand. If necessary a pliers can be used to unscrew the nut or cap. Do not uses pipe wrench to tighten or loosen nuts or caps. Do not place screwdriver in slots on caps and/or tap with a hammer.

To access the rotor, unscrew the cap and lift the cap, rotor and handle Out as one unit. Twisting the unit as you pull it out will help to remove it more easily. There are three 0-rings: one under the rotor cap, one on the rotor stem and the rotor seal. Replace worn 0-rings. Clean rotor. Reinstall rotor.

When reinstalling the red arrow handles be sure that:

0-rings on both rotors face to the right when being viewed from the front of the control valve when the handle pointers are lined up with the control valve body arrows; or

2 Arrows point toward each other in the bypass position.

Since the handles can be pulled off, they could be accidentally reinstalled I 80°° from their correct orientation. To install the red arrow handles correctly, keep the handles pointed in the same direction as the arrows engraved on the control valve body while tightening II bypass valve caps.

After completing any valve maintenance, press and hold NEXT and REGEN buttons for 3 seconds or unplug power source jack (black wire) and plug back in. This resets the electronics and establishes the service piston position. The display should flash all wording, then flash the software version (e.g. 154) and then reset the valve to the service pdsition.

Troubleshooting Procedures

Problem	Possible Cause	Solution
Timer does not display time of day		
	Transformer unplugged	a. Connect power
	No electric power at outlet –	b. Repair outlet or use working outlet
	Defective transformer	c. Replace transformer
	Defective PC board	d. Replace PC board
Timer does not display correct time of day	a. Switched outlet	a.Use uninterrupted outlet
	Power outage	b. Reset time of day
	Defective PC board	c. Replace PC board
No softening/filtering display when water is flowing		
	Bypass valve in bypass position	a.Put bypass valve in service position
	Meter connection disconnected	b. Connect meter to PC board
	Restricted/stalled meter turbine	c. Remove meter and check for rotation or foreign material
	Defective meter	d. Replace meter
	Defective PC board	e. Replace PC board
Control valve regenerates at wrong time of day		
	Power outages	a. Reset control valve to correct time of day

Time of day not set correctly b. Reset to correct time of day

Time of regeneration incorrect c. Reset regeneration time

Control valve set at " on 0" d. Check control valve set-up procedure

(immediate regeneration) regeneration time option

Control valve set at NORMAL + c. Check control valve set-up procedure

on 0 regeneration time option

ERROR followed by code number

Error Code 1001 -Unable to recognize start of regeneration

Error Code 1002— Unexpected stall

Error Code 1003 – Motor ran to long, limed out trying to reach next cycle position

Error Code 1004- Motor ran to long, timed out trying to reach home position.

If other Error Codes display contact the factory.

Control valve has just been a. Press NEXT and REGEN for 3

serviced seconds or unplug power source jack

(black wire) and plug back in to reset

control valve

Foreign matter is lodged in b. Check piston and spacer stack

control valve assembly for foreign matter

High drive forces on piston c. Replace piston(s) and spacer stack assembly

Control valve piston not in home position d. Press NEXT and REGEN for 3 seconds or

unplug power source jack (black wire) and

plug back in to reset control valve

Motor not inserted filly to engage e. Check motor and wiring.

pinion, motor wires broken or disconnected, Replace motor if necessary

motor failure

Drive gear label dirty or damaged, f.Replace or clean drive gear

missing or broken gear

Drive bracket incorrectly aligned to back plate g. Resent drive bracket properly

PC board is damaged or defective h. Replace PC board

i.PC board incorrectly aligned to i.Ensure PC board is correctly snapped

drive bracket onto drive bracket

Problem Possible Cause Solution

Control valve stalled in regeneration

Motor not operating a. Replace motor

No electric power at outlet b. Repair outlet or use working outlet

Defective transformer c. Replace transformer

Defective PC board d. Replace PC board

Broken drive gear or drive cap e. Replace drive gear or drive cap

assembly assembly

Broken piston retainer f. Replace drive cap assembly

Broken main or regenerant piston g. Replace main or regenerant piston

Control valve does not regenerate automatically

when REGEN button is depressed and held a. Transformer unplugged a. Connect transformer

No electric power at outlet b. Repair outlet or use working outlet

Broken drive gear or drive cap assembly c. Replace drive gear or drive cap

assembly

Defective PC board d. Replace PC board

Control valve does not regenerate automatically but does when REGEN button is depressed

By-pass valve in bypass position a. Put bypass valve in normal operation

position

Meter connection disconnected b. Connect meter to PC board

Restricted/stalled meter turbine c. Remove meter and check for rotation

or foreign matter

Defective meter d. Replace meter

Defective PC board . e. Replace PC board

Set-up error f.Check control valve set-up procedure

Time of day flashes on and off

Power has been out more than two a. Reset the time of day

hours, the transformer was

unplugged and then plugged back

into the wall outlet, the

transformer plug was unplugged and then plugged back into the

board or the NEXt and REGEN

buttons were pressed to reset the

valve.