

## **Assembly:**

1. Cut the top of the distributor tube 1/2 inch below the top of the resin tank threads.
2. Chamfer the top of the tube to prepare it for insertion into the control valve.
3. Verify that the control is equipped with the proper voltage, tank o-ring and injector.
4. Install the control valve onto the distributor tube.
5. Grip the control valve body and turn control into the resin tank.

## **Installation:**

### **General Information**

1. When facing the front of the control the inlet is to the right and the outlet is to the left.
2. The system pressure must be between 20 psi and 120 psi.
3. If the system pressure is greater than 120 psi a pressure reducing valve must be installed.
4. The unit must be installed in accordance with local codes.
5. Do not over tighten connections.

### **Drain Line Connection**

1. The drain line I.D. must be at least 1/2 inch.
2. Teflon tape should be used when installing the drain fitting into the control valve.
3. The drain line must be free of kinks.

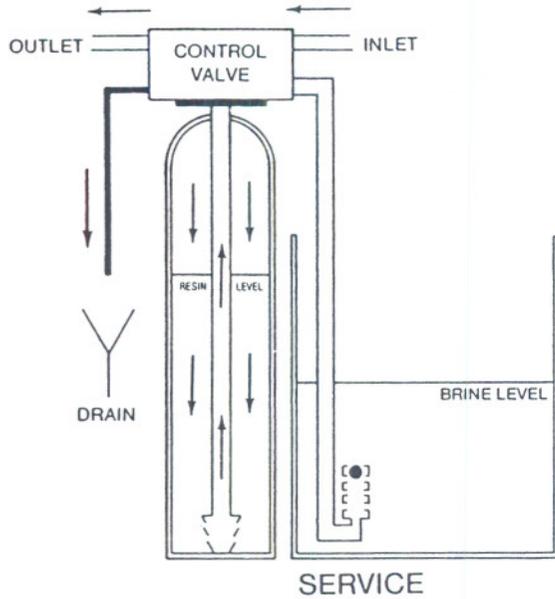
### **Fitting Kit Connection**

1. DO NOT use Teflon tape when connecting the fitting kits to the control valve.
2. If the fitting kit provides a sweat connection, care must be taken to prevent the Noryl nut from melting.
3. Place a wet rag over the copper tube and the Noryl nut prior to heating the tube.

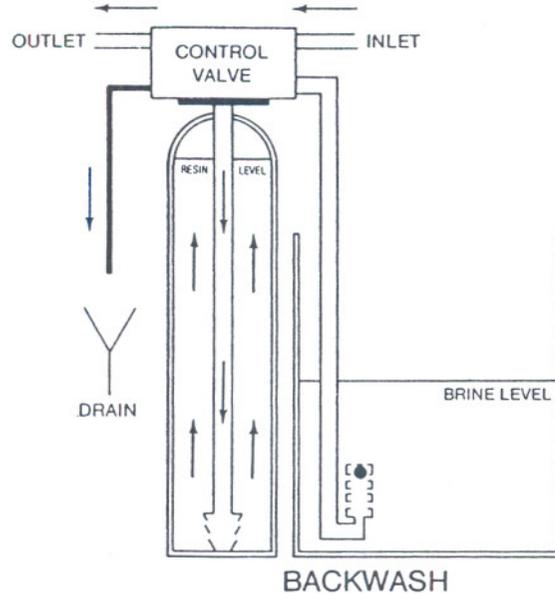
## **Start Up:**

1. Insure that the bypass is secured in the "bypass" position.
2. Verify that the control valve is in the service position.
3. Open all plumbing connections to allow the free flow of water to the unit.
4. Slowly shift the bypass valve to the service position.
5. Allow the water to completely fill the resin tank.
6. Open a tap and allow the water to run until all of the air is removed from the system.
7. Once all of the air is removed, close the tap.
8. Manually advance the control valve to the backwash position and allow water to flow to drain.
9. Manually return the control valve back to the service position.

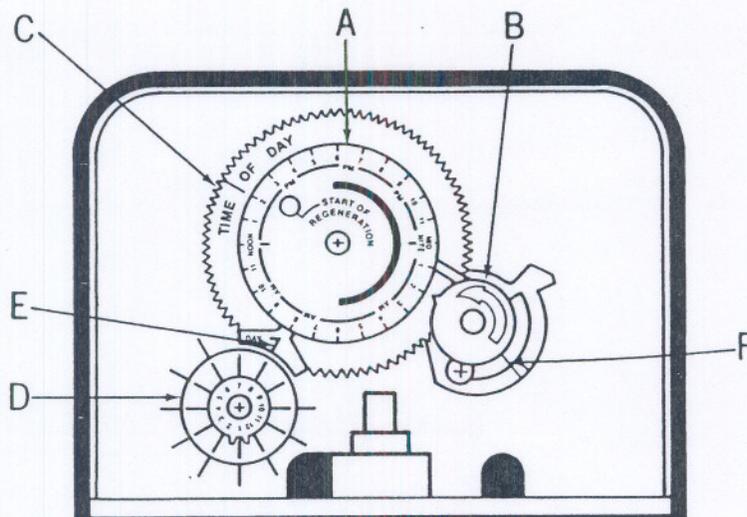
# Cycle Flow Diagrams



The service cycle position directs untreated water to flow down through the filter media in the mineral tank and up through the riser tube. The water is conditioned when passing through the media.



The backwash cycle position directs water to flow down through the riser tube and up through the filter media and to drain. Foreign material and media fines are flushed from the mineral tank during this cycle to prepare the media for filtering.



# Programming

## General Information

The control valve is designed to initiate regeneration according to pre-set factory parameters. Following the instructions contained in this section will allow the installer to customize the program for the users exact needs.

The backwash cycle time is controlled by the time cam located on the front of the timer assembly. The backwash cycle length can be adjusted between 14 to 22 minutes.

## Factory Default Setting

The factory default cycle setting is preset into the control valve.

### MODEL 2 - Cycle

Backwash 14 Minutes

## Set Time of Regeneration

1. Remove the front dust cover from the timer assembly.
2. Rotate the Time of Regeneration plate (A) until the desired time appears in the window. Note A.M. or P.M.

## Set Time of Day

1. Remove the front dust cover from the timer assembly.
2. Turn the Timer Knob (B) until the alignment mark located on the Time Of Day Gear (C) points directly to the correct time of day. Note A.M. or P.M.

## Set Backwash Frequency

1. Remove the front dust cover from the timer assembly.
2. Pull all skipper wheel tabs up.
3. Rotate skipper wheel (D) until the number one tab aligns with the DAY mark (E).
4. Starting with the number one tab push down the tabs to determine the days on which regeneration is required.

## Backwash Cycle Settings

Adjusting the backwash cycle can be accessed according to the following procedure. :

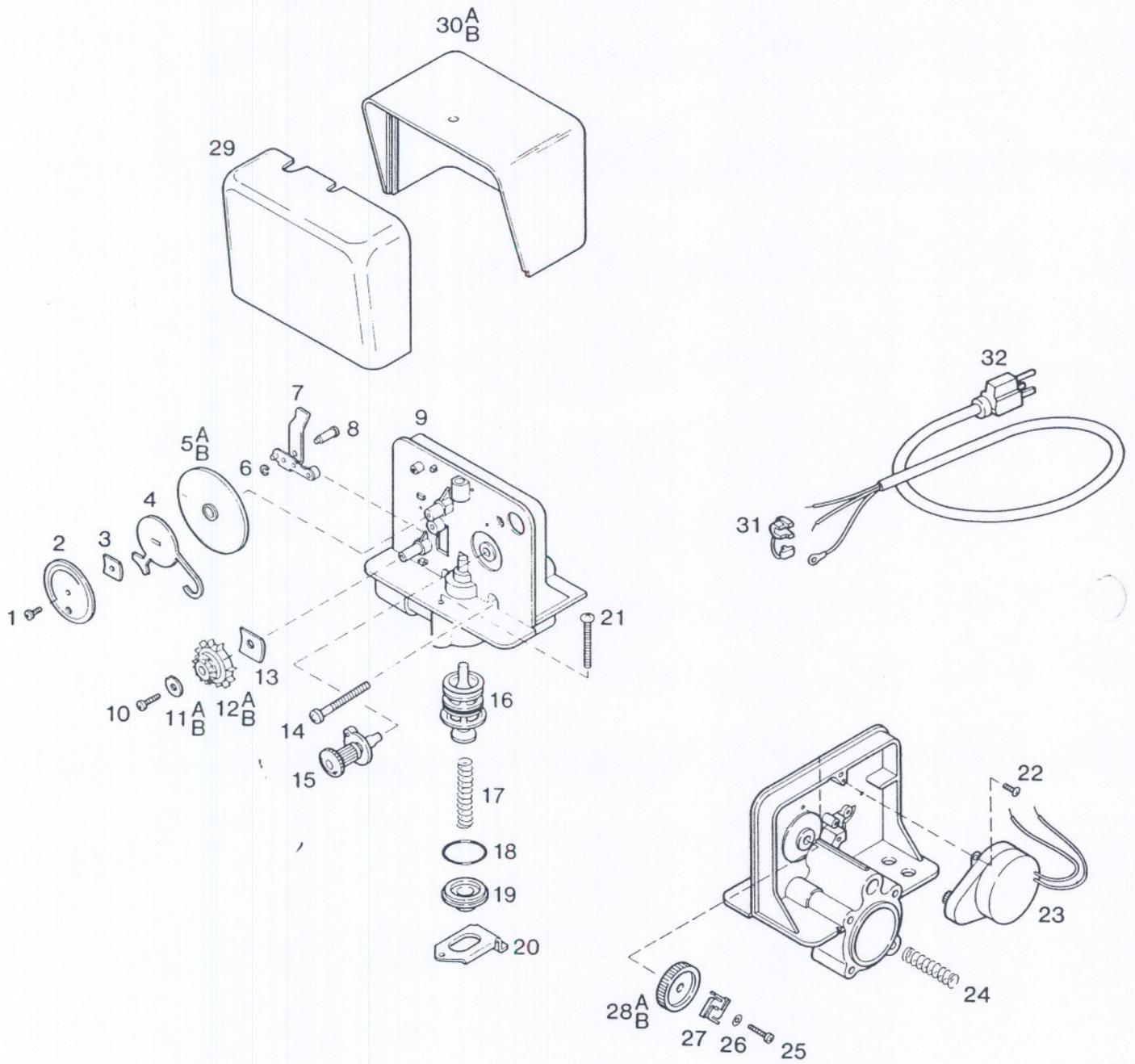
1. Loosen the screw located on top of the timer cover, remove front dust cover from timer assembly.
2. Turn timer knob (B) until set screw on the time cam is visible. On the upper timing cam two (2) black timing marks will appear.
3. Loosen the set screw, and position the alignment mark (F) located on the lower cam, on or between the timing marks. The timing mark closest to the set screw will provide 14 minutes of backwash. The timing mark furthest from the set screw will provide 22 minutes of backwash.  
**Note: The alignment mark must be located on or between the black timing marks.**
4. Tighten set screw and install dust cover.

## ELECTROMECHANICAL POWER HEAD PARTS LIST

ITEM	P/N	DESCRIPTION	QTY
1.	15-76	Screw	1
2.	529-309	Time Dial	1
3.	525-303	Spring Washer, (Small)	1
4.	52-308	Locating Dial	1
5A.	529-232-1	Gear, Time of Day (12 Day)	1
5B.	529-232-2	Gear, Time of Day (7 Day)	1
6.	19-3	C-clip	1
7.	529-218	Actuator	1
8.	529-212	Spindle, Actuator	1
9.	529-333-1	Housing, Power Head	1
10.	15-185-10	Screw, Day Selector Wheel	1
11A.	525-274-1	Washer, Day Indicator (12 Day)	1
11B.	525-274-2	Washer, Day Indicator (7 Day)	1
12A.	525-241-2	Day Selector Wheel (12 Day)	1
12B.	525-241-4	Day Selector Wheel (7 Day)	1
13.	525-205	Spring Washer, (Large)	1
14.	15-87	Screw, Head Mount	4
15.	529-245	Cycle Cam & Knob Assembly	1
16.	529-219-3	Drain Plunger Assembly	1
17.	401-7	Return Spring, Drain Plunger	1
18.	185-0221-1	O-ring, Plunger Cap	1
19.	529-286	Plunger Cap	1
20.	529-280	Retainer, Drain Plunger	1
21.	15-92-2	Screw, Retainer	1
22.	15-76	Screw, Timer Motor	2
23.	30-77-_*	Timer Motor	1
24.	516-221	Return Spring, Main Diaphragm	1
25.	15-185-10	Screw, Ratchet	1
26.	14-11	Washer, Ratchet	1
27.	525-260	Ratchet	1
28A.	525-254-2	Gear, Ratchet (12 Day)	1
28B.	525-254-5	Gear, Ratchet (7 Day)	1
29.	529-234-_*	Front Cover	1
30A.	529-220-1	Rear Cover (Gray)	1
30B.	529-220-2	Rear Cover (White)	1
31.	28-8-28	Strain Relief	1
32.	28-142-2	Power Cord (120 Volt)	1

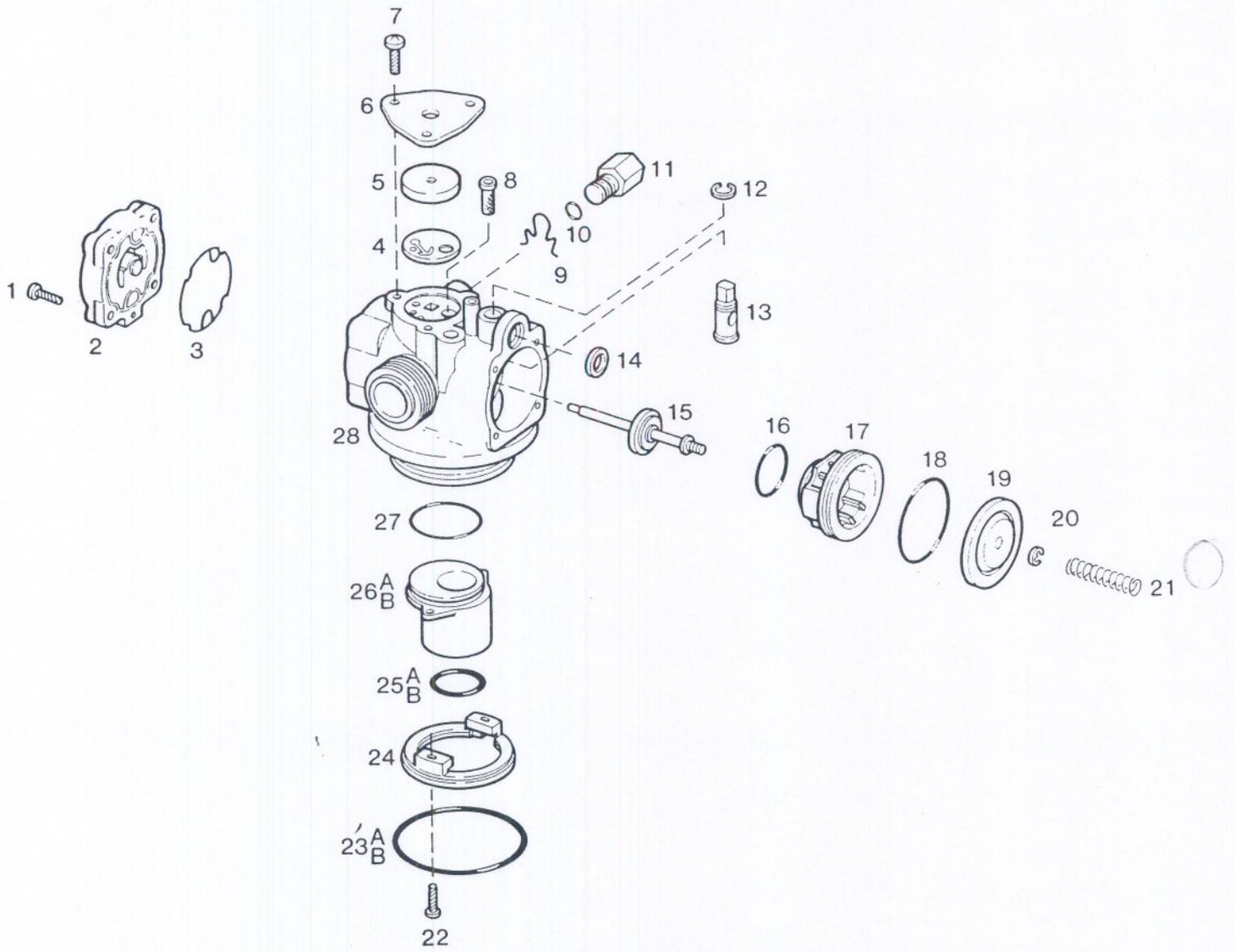
\* Indicate Voltage

\*\* Indicate Opaque or Clear



## VALVE BODY PARTS LIST

<u>ITEM</u>	<u>P/N</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1.	15-88	Screw, Backcap	4
2.	541-207	Backcap, 3 Cycle	1
3.	541-206	Seal, Backcap	1
4.	541-325	Gasket, Injector	1
5.	428-__	Injector (Specify Size)	1
6.	541-221	Cover Plate, Injector	1
7.	15-89	Screw, Injector Mount	3
8.	413-13	Filter Screen, Injector	1
9.	541-254	Spring Clip	1
10.	186-111-N	O-Ring, Plug	1
11.	541-273	Plug	1
12.	19-19	C-Clip, Backwash Flow Adjuster	1
13.	541-243	Backwash Flow Adjuster w/o-rings	1
14.	529-244	Gasket, Cross Over Port	1
15.	541-244	Body Stem Assembly	1
16.	185-024-1	O-Ring (Small), Seat Insert	1
17.	541-204	Seat Insert	1
18.	185-028-12	O-Ring (Large), Seat Insert	1
19.	541-256	Main Diaphragm	1
20.	19-3	C-Clip, Main Diaphragm	1
21.	516-221	Return Spring, Main Diaphragm	1
22.	19-90	Screw, Adapter Ring	2
23A.	185-231-1	O-Ring, Structural Tank	1
23B.	186-105	O-Ring, Park Tank	1
24.	541-232	Adapter Ring	1
25A.	185-211-1	O-Ring, 13/16" Riser Adapter	1
25B.	185-214-1	O-Ring, 1.050" Riser Adapter	1
26A.	541-205	13/16" Riser Adapter	1
26B.	541-218	1.050" Riser Adapter	1
27.	185-029-1	O-Ring(Outside), Riser Adapter	1
28.	541-257-1	Valve Body & Seal	1



# Troubleshooting Guide:

Symptom / Cause	Solution
<b>1. Unit Fails To Cycle</b>	
A. Faulty electrical circuit.	A. Verify electrical service (fuse, circuit breaker, light switch, pull chain, power cord).
B. Defective clock motor.	B. Replace the clock motor. Follow the procedure outlined in the Parts Replacement section of this manual
C. Low inlet pressure.	C. Verify that the service inlet pressure is a minimum of 20 psi.
D. Drain line is restricted.	D. Insure that the drain line is free of kinks. Cycle the control to backwash and verify flow rate.
E. All skipper tabs in the "out" position.	E. Push desired number of skipper tabs to the "in" position.
F. Main diaphragm is torn.	F. Replace the diaphragm. Follow the procedure detailed in the Parts Replacement section of this manual.
G. Timer Knob out of alignment with Time Gear.	G. Realign the Knob and Gear. Follow the procedure outlined in the Parts Replacement section of this manual.
H. Body stem assembly worn.	H. Replace body stem assembly. Follow the procedure detailed in the Parts Replacement section of this manual.
<b>2. Unconditioned Water To Service</b>	
A. The bypass valve is open or faulty.	A. Close the bypass valve.
B. Excessive water usage.	B. Check regeneration frequency.
C. Unit not cycling.	C. See Symptom/Cause #1.
D. Loss of filter media.	D. See Symptom/Cause #4.
E. Change in raw water.	E. Retest the water.
F. Leak at the distributor tube.	F. Verify that the distributor tube is seated correctly and is not cracked.
<b>3. Loss Of Resin</b>	
A. Leak at the distributor tube.	A. Verify that the distributor tube is seated correctly and is not cracked.
B. Backwash control improperly adjusted.	B. Verify the backwash flow.
<b>4. Continuous Flow To Drain</b>	
A. Drain plunger stuck open.	A. Clean or replace the drain plunger assembly. Follow the procedure detailed in the Parts Replacement section of this manual.
B. Clock motor stalled.	B. Replace the clock motor. Follow the procedure detailed in the Parts Replacement section of this manual.
<b>5. Loss Of Water Pressure</b>	
A. Media Bed Fouled	A. Verify backwash flow rate and/or backwash more frequently.
B. Lower distributor basket crushed.	B. Replace the basket and verify that the distributor is cut 1/2 inch below the top of the tank threads.

# Parts Replacement:

## General Information

Familiarize yourself with the parts replacement procedures and component parts thoroughly before attempting any repair.

Insure that the unit is in the bypass position and relieve the system pressure before attempting any repair procedure.

**WARNING! Disconnect all electrical power to the unit before attempting any repair procedure.**

## Required Tools

The following tools are required to perform routine maintenance on this control valve.

- Phillips Screwdriver
- Needle Nose Pliers
- Adjustable Wrench
- Small Standard Screwdriver

## Timer Head Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Remove the front dust cover from the timer assembly.
4. Relieve the system pressure.
5. Remove the four (4) head mounting screws.
6. Lift the timer assembly away from the valve body.
7. Follow these steps in reverse to reinstall the timer assembly.

**Note: Prior to re-installment insure the main return spring is centered over the main diaphragm.**

## Timer Motor Replacement

1. Disconnect all electrical power to the control.
2. Remove both the front dust cover and rear timer cover.
3. Disconnect the two (2) wire nuts from the timer motor leads.
4. Remove the two (2) motor mount screws.

5. Lift the motor away from the timer assembly.
6. Follow these steps in reverse to re-install the timer motor.

## Main Diaphragm Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Remove the front dust cover from the timer assembly.
4. Relieve the system pressure.
5. Remove the four (4) head mounting screws.
6. Lift the timer assembly away from the valve body.
7. Remove the c-clip from the center of the diaphragm.
8. Lift the diaphragm away from the body stem assembly.
9. Follow these steps in reverse to re-install the main diaphragm.

**Note: Prior to re-installment insure the main return spring is centered over the main diaphragm and the outside edges of the main diaphragm are tucked into the valve body.**

## Drain Plunger Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Remove the front dust cover from the timer assembly.
4. Relieve the system.
5. Remove the retainer screw located below the "Time Of Day" gear.
6. Lift the retainer down and away from the timer assembly.
7. Press down on the drain plunger to remove it from the valve body.
8. Inspect the plunger o-rings and center cup for wear.
9. Clean out the plunger orifice in valve body.
10. Use a Dow 111 Silicone based lubricant to lightly lubricate the plunger o-rings and the valve body orifice.
11. Follow these steps in reverse to re-install drain plunger.

## Backwash Adjustment Valve Replacement

1. Place the bypass valve into the "bypass" position.
2. Relieve the system pressure. Remove the four (4) head mounting screws.
4. Lift the timer assembly away from the valve body.
5. Remove the c-clip from the center of the diaphragm.
6. Lift the diaphragm away from the body stem assembly.
7. Remove the seat assembly.
8. Disconnect the large c-clip located on top of the backwash adjustment valve.
9. Press the backwash adjustment valve down and out through the valve body assembly.
10. Inspect the o-rings on the valve for wear. Clean or replace the valve assembly if necessary.
11. Lightly lubricate the o-rings with a Dow 111 Silicone based lubricant.
12. Follow these steps in reverse to re-install the backwash adjustment valve.
4. Relieve the system pressure.
5. Remove the four (4) head mounting screws.
6. Lift the timer assembly away from the valve body.
7. Remove the c-clip from the center of the diaphragm.
8. Lift the diaphragm away from the body stem assembly.
9. Remove the seat assembly.
10. Lift out the body stem assembly.
11. Inspect the center check disc rubber seal for wear. Clean or replace if necessary.
12. Re-install the body stem assembly.
13. Lightly lubricate the seat assembly o-rings with a Dow 111 Silicone based lubricant.
14. Re-install the seat assembly, insure that one of the two (2) flats is facing towards the top of the valve body.
15. Re-install main diaphragm and timer assembly.

## Riser Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Relieve the system pressure.
4. Disconnect the unit from the bypass connections.
5. Remove the unit from the resin tank.
6. Turn out the upper distributor basket from the unit adapter ring.
7. Remove the two (2) adapter hold down screws, and lift away the adapter ring.
8. Separate the riser assembly from the valve body.
9. Clean the riser o-rings and wipe out the valve body cavity.
10. Use a Dow 111 Silicone based lubricant to lightly lubricate the riser o-rings and the valve body cavity.
11. Follow these steps in reverse to re-install the riser assembly.

## Body Stem Assembly Replacement

1. Disconnect all electrical power to the control.
2. Place the bypass valve into the "bypass" position.
3. Remove the front dust cover from the timer assembly.