COMMERCIAL WATER FILTER

INSTALLATION & OPERATING INSTRUCTIONS

Model : **AFM20-180**

Serial No : ……

Manufacturer and Supplier of

FILTRATION & WATER TREATMENT PRODUCTS
for commercial, industrial and residential application

Telephone: (07) 3219 2233 Facsimile: (07) 3219 2266
Email: sales@ibcwater.com.au Website: www.ibcwater.com.au

OPERATING PRINCIPLE

General
Our AF Series Filters are fully automatic incorporating Backwash, Rinse-Pause, Fast Rinse and Service Cycles, controlled by cam switches in the timer. Frequency of Backwashing can be altered from that suggested in the Commissioning Section, if actual site conditions dictate alterations.

Water enters the unit through the multi-port valve and passes through the media, underdrain gravel and the distributor leaving through the multi-port valve.

Multi-Media Filters
Remove filterable turbidity at high flow rates several times the flow rate of conventional filters, producing clear filtered water down to 10 micron through the stratified bed without chemical flocculation. No additional pumping is necessary for Backwashing, as the Backwash water required is normally only 80-90% of the service flow rate. Multi Media Filter capacity is many times that of conventional filtration due to utilisation of the entire stratified bed, resulting in low operating costs.

This unit is not designed to remove colloidal matter, a plant capable of coagulation is required in such cases.

Operating Parameters

Water Temperature	5ºC - 48ºC
Water pH	5.5 - 9.0
Water Pressure	205 - 690 kPa
Oil	Free of Hydrocarbons

AF SERIES FILTERS

Table 2

TYPE	MODEL	CONTINUOS FLOW RATE L.P.M	PEAK FLOW RATE L.P.M	BACKWASH FLOW RATE L.P.M	VALVE	APPROX. WEIGHT KG	OPERATING PROCEDURES
Multi-Media	AFM 20-180	120	160	114	180	320	Water Temp: 5ºC - 48ºC Water pH: 5.5 - 9.0 Suspended Solids: Max 100 mg/l (Refer factory) Iron: No Effect Oil: Free of Hydrocarbons **NOTE: Not recommended for Colloidal Sediment removal**

Valve	180
Inlet (mm)	40
Outlet (mm)	40
Drain (mm)	40

Operating Pressure: 205 - 690 kPa
Temperature: 5^{o}C - 48^{o}C Electrical: 240V 50Hz 3 watts maximum

Warning: A pressure reduction valve should be installed if water pressure is greater than 600kPa.
Warning: A pressure reduction valve should be installed if water hammer prevails.

Table at left shows recommended MINIMUM plumbing sizes.
FAILURE TO OBSERVE WARNING WILL VOID WARRANTY

INSTALLATION

Check the equipment upon arrival for damage or shortages and report same to our Office or Agent before commencing installation.

Locate the unit on a clean, firm, level foundation, preferably concrete, with sufficient space for operation and maintenance. Level with shims if necessary. Position the tank in the correct position before loading the Media. The filter should be fitted with inlet and outlet pressure gauges to monitor the pressure loss through the filter. It is recommended that the filter be backwashed when the pressure differential increases by 35 kPa.

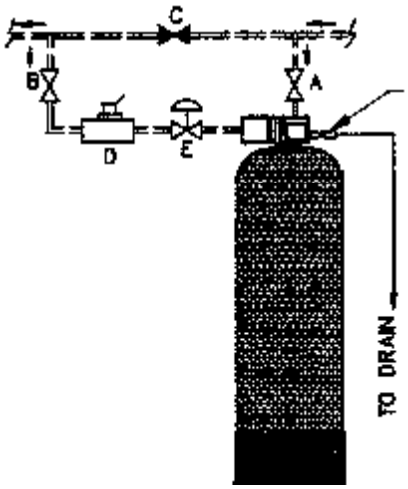
The control system is sometimes shipped as a sub-assembly to avoid damage in transit. The water filter should be assembled, piped and wired according to the following recommendations. The following instructions are provided as a general guide. The filter requires a 10amp 240 volt GPO. The filter installation must be protected from the elements

FIG.4 - INSTALLATION -- SINGLE TANK SOFTENER INSTALLATION

* Pipework Layout - suggestive only
* Unit only supplied
* Pipe, Valves, Solenoids, Water Meter supplied by others

All pipework connections to be flanged or barrel union, for ease of removal and maintenance.

* USE PIPEWORK SIZES SHOWN IN PERFORMANCE DATA TABLE 2

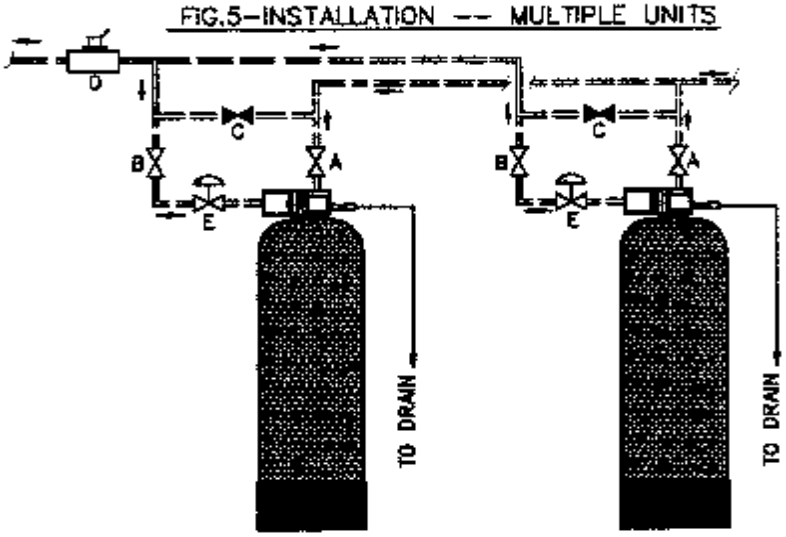


External Backwash

Flow Controller supplied separate must be fitted before Connecting Drain Line

A = Inlet Isolating Valve -- Manual
B = Outlet Isolating Valve -- Manual
C = Bypass Valve -- Manual - optional
D = Water Meter - optional, fit only where metering of supply is required
E = Solenoid Valve - optional, fit only where raw water to service is not required during REGENERATION. Valve must be 240V. 50Hz operation normally open and equal to pipeline size - connect to terminals 2 and 5 inside valve cover.

FIG.5—INSTALLATION —— MULTIPLE UNITS



MEDIA INSTALLATION

Step 1: Remove the tank and riser tube assembly from the carton and make sure the softener tank is empty and clean.

Step 2: Cover the distributor pipe with a clean rag or plastic so that **NO** gravel or media enters the distributor pipe.

Step 3: Load the media - Refer Media Placement instructions.

a) Pour in the underbed gravel (No.6). Refer Table 1. 40kg.

b) Level out the underbed gravel using a broom handle/PVC pipe. The underbed gravel should cover the bottom distributor by about 25mm.

CAUTION:
Do not raise the distributor pipe. If gravel is allowed to get under the distributor, empty and start again.

c) After loading and levelling the No. 6 Gravel underbed, place the media in the tank in the ***correct order which is D1, D2, 7M Sand, and D3.***
- **Slowly fill the tank**.

Step 4: To obtain optimum performance from your unit, exercise particular care in ensuring that each grade of media is levelled evenly over the previous layer.

Step 5: Fill the tank with water to 50mm from the top.

Step 6: Clean top of tank (neck & threads) of all traces of media. Remove the rag or plastic fitted in Step 2, taking care not to raise the riser pipe.

Step 7: Unpack the valve, remove the cap screws and separate the adaptor. Store gasket safely. Check that the tank thread 'O' ring and the internal Riser Pipe "O" ring seals are in place. Using a little silicone "O" ring lubricant, lubricate the outer seal surfaces only.

Step 8: Fit the adaptor to the tank, carefully, to allow the distributor pipe to locate centrally. Screw down firmly by hand. Do not over tighten. Place the gasket on the tank adaptor, fit the valve body with cap screws provided. Tighten cap screws evenly.

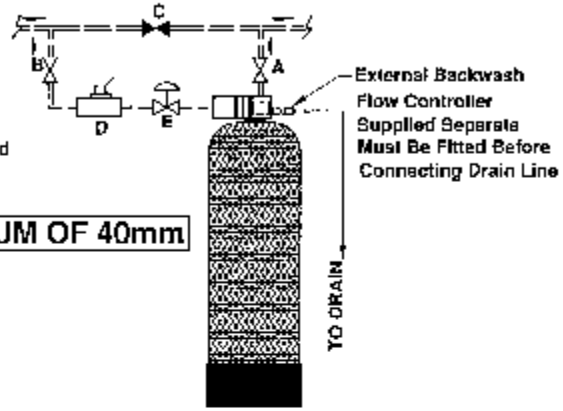
AFM20-180 AUTOMATIC WATER FILTER

TYPICAL INSTALLATION -- SINGLE TANK

* Pipework Layout Suggestive Only
* Unit Only Supplied
* Pipe,Valves,Solenoids,Water Meter Supplied By Others

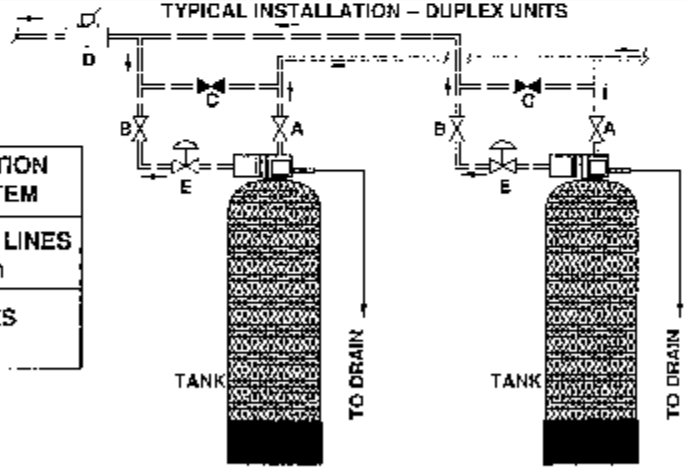
All Pipework Connections To Be Flanged Or Barrel Union,For Ease Of Removal And Maintenance

ALL PIPE LINES --MINIMUM OF 40mm



A = Inlet Isolating Valve --Manual
B = Outlet Isolating Valve --Manual
C = Bypass Valve -Manual-Optional
D= Water Meter-Optional, Fit Only Where Metering Of Supply Is Required
E= Solenoid Valve -Optional,Fit Only Where Unfiltered Water To Service Is Not Required During Backwashing Valve Must Be 240V. 50Hz Operation Normally Open And Equal To Pipeline Size-Connect To Terminals 2 and 5 Inside Valve Cover

TYPICAL INSTALLATION – DUPLEX UNITS



TYPICAL INSTALLATION DUPLEX UNIT SYSTEM
MANIFOLD MAIN PIPE LINES MINIMUM OF 50mm
BRANCH PIPE LINES MINIMUM OF40mm

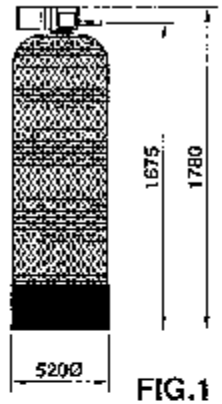
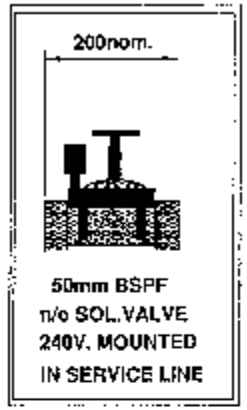
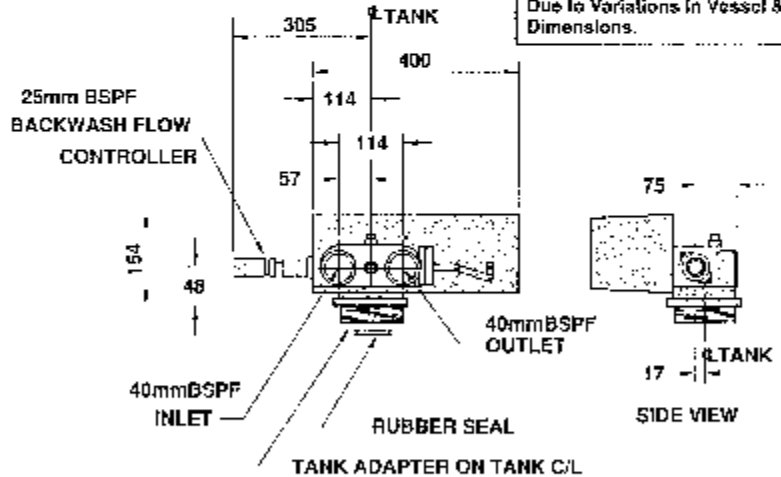


FIG.1



ITEM 'E'
FIG.3

Note:- Dimensions Are Approximate Only Due to Variations In Vessel & Fittings Dimensions.



REAR VIEW
180 TOP MOUNT VALVE
240 VOLT 50 Hz.

FIG.2

IBC water
A DIVISION OF PUMP SYSTEMS (AUST.) PTY. LTD.
P.O.BOX 2247 MANSFIELD DC QLD. 4122
18 DIVIDEND ST.
MANSFIELD QLD. 4122
TEL: (07) 3219 2233
FAX. (07) 3219 2266
EMAIL: sales@ibcwater.com.au
WEB: www.ibcwater.com.au

DRAWN	R.H.H.
DATE	11-08-03
SCALE	NONE
CHKD	

TITLE
AFM20 MULTI MEDIA WATER FILTER
WITH SERIES 180 CONTROL VALVE

CLIENT

FILE REFERENCE
C:\DWGS\IBC\AFM20-F00-03

REV.

DRAWING No.
A3-AFM20-V180

COMMISSIONING

Step 1: Remove valve cover by partly unscrewing the three cover securing screws and lifting the cover forward. Remove the clear plastic window in the cover by removing two screws and loosening the other two screws and sliding the window out. Replace the cover on the valve. Connect the power lead to the power point and turn on the electric power. Depress the **red knob** *(Fig. 7)* and rotate **anti-clockwise** to **backwash** position, release **red knob.** Note that the timer face design can vary between valve models from that illustrated and that the regeneration positions are indicated **pictorially** with Backwash being F**low** shown in a **Upward direction** and the other regeneration positions shown with their corresponding flow path. Wait for valve drive to index to backwash position, (if not already in this position) that is the spindle is fully extended.

Step 2: Just partly open inlet isolating valve. Allow unit to fill slowly (**water will issue to drain**) continue to run until the unit **automatically indexes** to the second position which is a **Pause** to allow media to settle. This may take up to 15 minutes and allows all the entrained air to be removed.

Step 3: Depress the red knob again and rotate anti-clockwise to the fast rinse position and release. Verify that the spindle has moved to its correct position as indicated in the following illustrations.

Step 4: **Allow the red knob to electrically return to the service position**. It is recommended to give the filter a complete backwash cycle so as to remove any dirt/colour and to further level out the media. Depress the red knob and turn anti-clockwise to the **start position** or the first arrow position just **anticlockwise** from the **service** position then release the red knob. The unit will now go through each cycle - Backwash, pause, purge and back to service automatically, the full cycle will take approximately 30 minutes, depending on pin settings.

NOTE: A small amount of media may pass to drain during the initial backwash, this is considered normal.

Step 5: Check with site supervisor that unit can go on line. If so - slowly open outlet isolating valve fully, check that manual bypass valve is fully closed. This unit is now on line.

Step 6: Check for and report any leaks. Go to the nearest tap, now on filtered water, open and allow to flow for a few minutes as it may take several minutes for the treated water to displace the water in the pipe system to the tap. Check for the clarity of the treated water and if unclean water persists refer to the **Trouble Shooting** in these instructions.

Step 7: It is now necessary to set up the Timer Control to backwash the filter automatically on specific days of the week. This is achieved by depressing pins on the Skipper Wheel relating to the days selected for the backwashing. **To set the skipper wheel up as required, pull all skipper wheel pins out.**

Turn the dial to the correct day of the week (note dials may be indicated as the actual day of week or as numbered days of the week) on which you are setting the dial. Now depress the pins for the desired day/s for backwashing. Initially at commissioning set the filter to backwash every second day.

Note when you are setting the backwashing frequency you should take into account the working days, for instance if the installation will only work week days, backwashing on the weekend would be a needless waste of water. Always set in accordance with the duty conditions for maximum economy.

NOTE: This is only a guide for initial setting and should be altered to suit each individual installation in accordance with load conditions of the raw water.

Step 8: Set time of day pull timer knob and set arrow to the time of day (time of your watch) note time of day may be as 12 hour or 24 hour clock, release, make sure that the knob has re-engaged gear, ie. knob right in. The filter will backwash around 2.30 AM. If it is desired to backwash at a different time it will be necessary to offset the actual time of day setting by the corresponding time difference desired for the new backwash time**.**

Step 9: After the filter has done the first backwash and the backwash sequence and time of day has been set, turn off the electric power and remove the valve cover. Replace the clear plastic window in the cover and then replace the valve cover on to the valve and reconnect the electric power. This unit is now on line.

Step 10: Do final check for leaks etc. Ensure instruction book is kept with relevant personnel

BACKWASH CYCLE TIME INSTRUCTIONS

SET TIMER

Determine a regeneration schedule for the conditioner and adjust the automatic timer as follows (Reference Figures 7 and 8):

1. Pull all SKIPPER PINS out (away from control).
2. Rotate SKIPPER WHEEL until DAY ARROW points to day of week or number 1.
3. Depress SKIPPER Pin(S) for day(s) regeneration is required.
4. Pull TIMER KNOB out (away from timer face) and rotate until BLACK ARROW on tripper arm points to correct time of day on face plate.
5. Timer will automatically initiate regeneration on preset days at 2:30AM. To alter time, simply reset TIMER KNOB to an earlier or later time, which will change the time of regeneration by the same number of hours. (Time indicated as BLACK ARROW will no longer be correct).

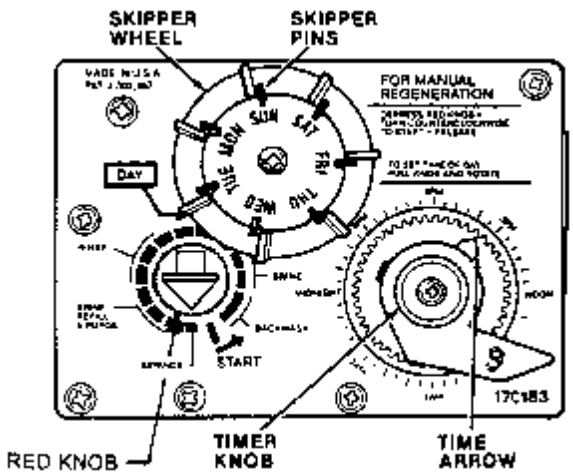


Figure 7

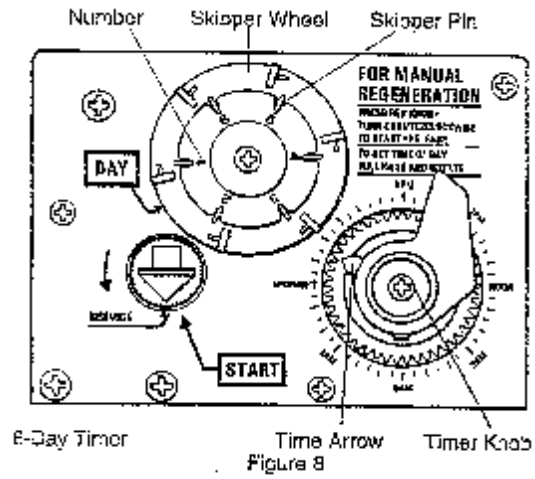


Figure 8

PIN TIME CHART

BACKWASH OR FAST RINSE		PAUSE	
NO. OF PINS OUT	TIME	NO. OF PINS IN	TIME
1	8min.	2	1.5 min.
2	11 min.	3	4.5 min.
3	14 min.	4	7.5 min.
4	17 min.	5	10.5 min.
5	20 min.	6	13.5 min.
6	23 min.	7	16.5 min.
7	26 min.	8	19.5 min.
8	29 min.	9	22.5 min.
9	32 min.	10	25.5 min.
10	35 min.	11	28.5 min.
11	38 min.	12	31.5 min.
12	41 min.	13	34.5 min.
13	44 min.	14	37.5 min.
14	47 min.	15	40.5 min.
15	50 min.	16	43.5 min.

 Each additional pin either pulled out or pushed in equals 3 minutes

SET BACKWASH TIMING

Pull pins as shown for desired backwash time.
- See chart.

SET PAUSE TIME

Depress pins as shown for desired time.
- See chart. (Minimum of two pins down)

SET FAST RINSE TIME

Pull pins as shown for desired fast rinse time.
- See chart

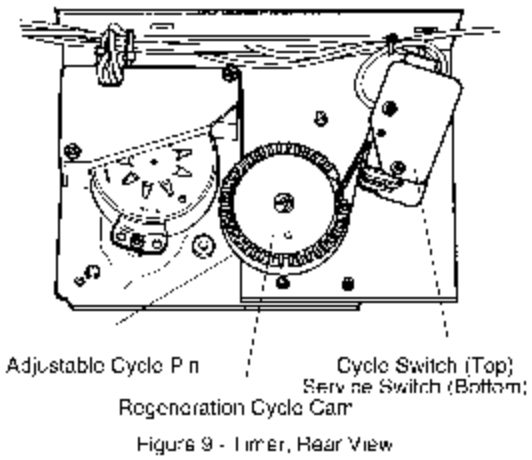
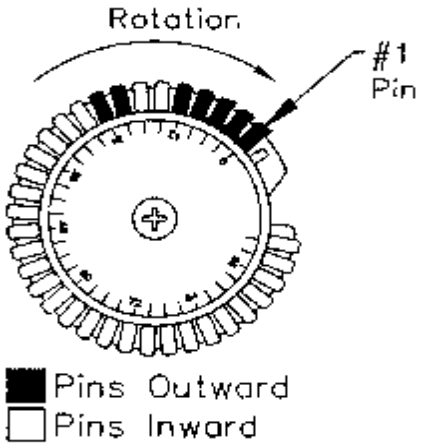


Figure 9 - Timer, Rear View

VALVE AND CYCLE PIN POSITIONING

TYPICAL FILTER APPLICATION CYCLE

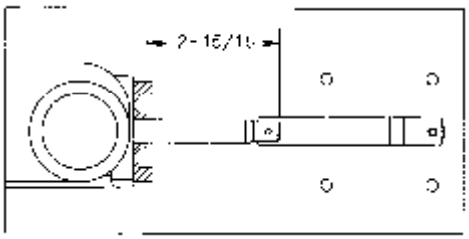
Backwash …….. 20 min. - 5 pins outward
Pause …….. 1.5 min. - 2 pins inward
Fast Rinse …….. 11 min. - 2 pins outward



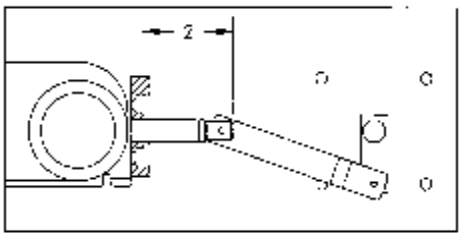
MANUAL OPERATION

Push in RED KNOB and turn COUNTERCLOCKWISE to the **START** position. **Release**. Unit will then go through a complete regeneration as programmed.

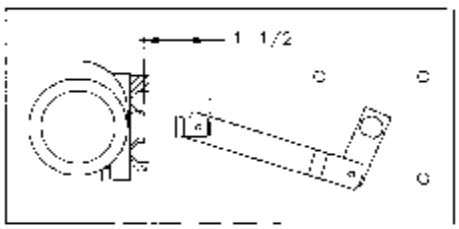
Valve Position



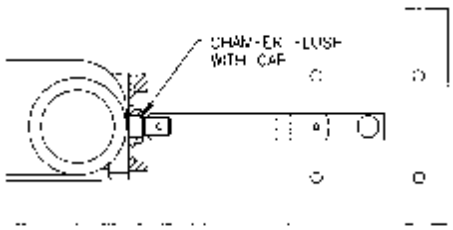
1. BACKWASH POSITION



2. BRINE AND SLOW RINSE POSITION



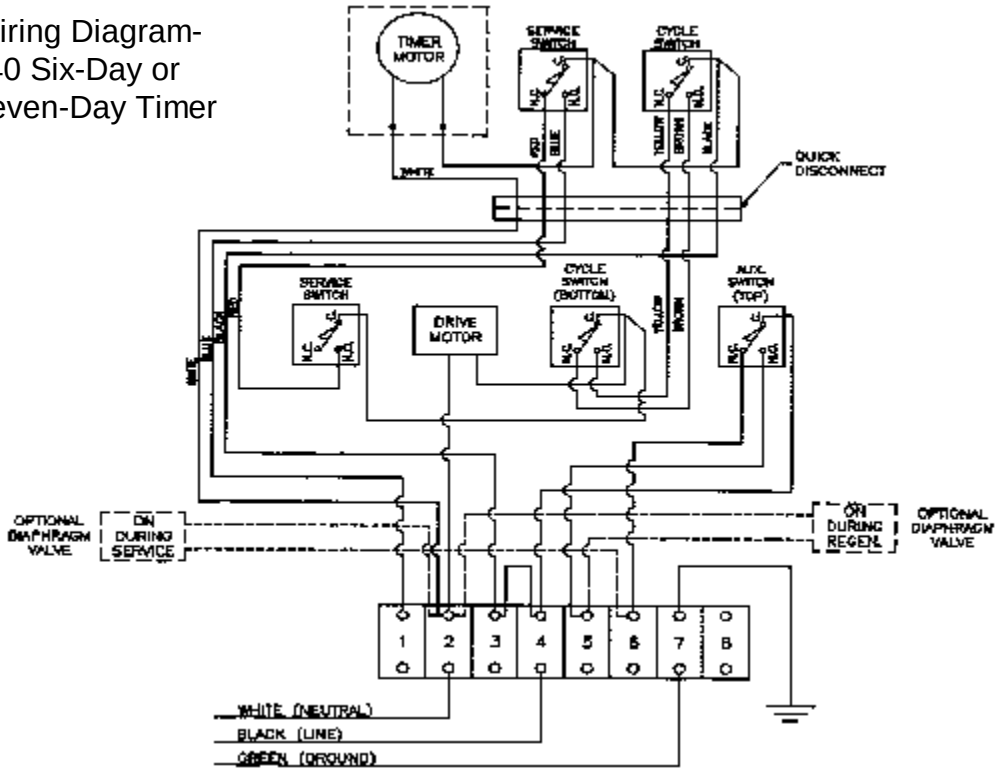
3. FAST RINSE POSITION



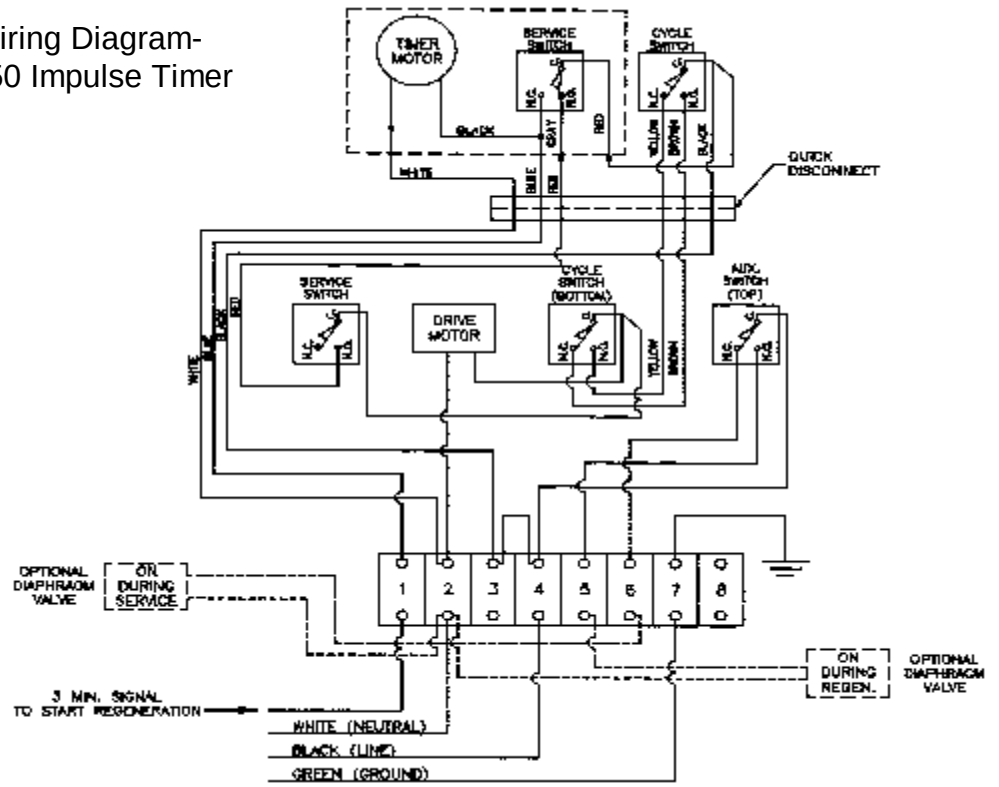
4. SERVICE POSITION

ELECTRICAL DIAGRAMS

Wiring Diagram-
440 Six-Day or
Seven-Day Timer



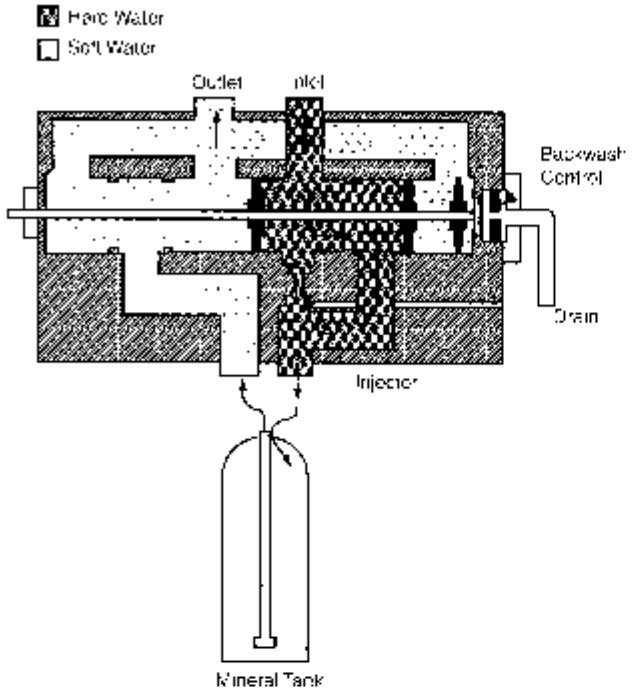
Wiring Diagram-
450 Impulse Timer



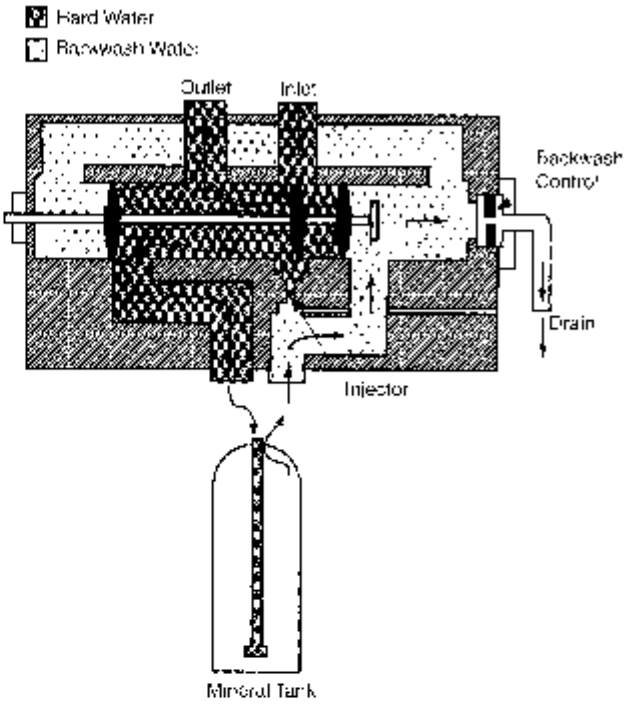
FLOW SCHEMATIC

Flow Diagrams

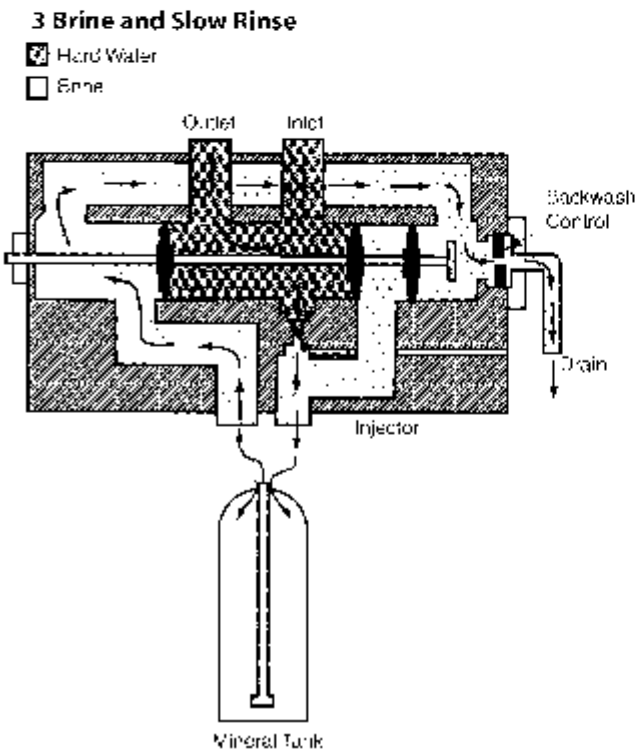
1 Service Position



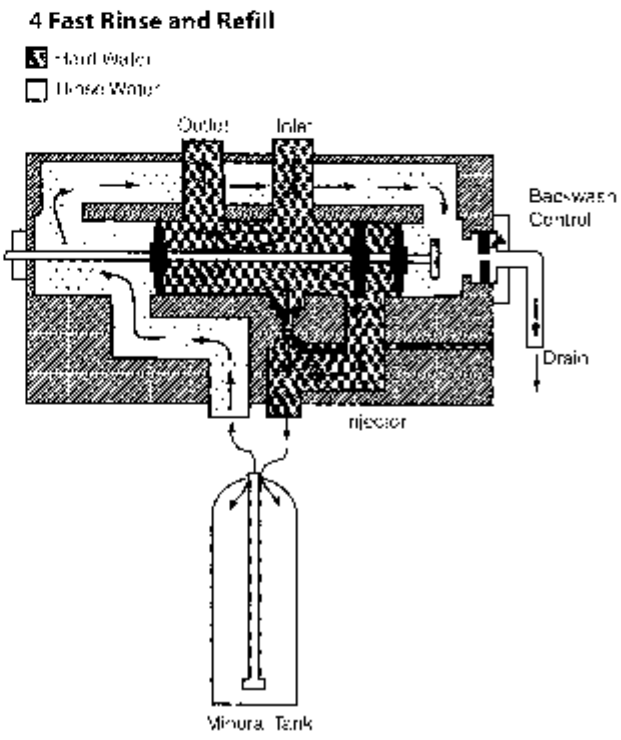
2 Backwash



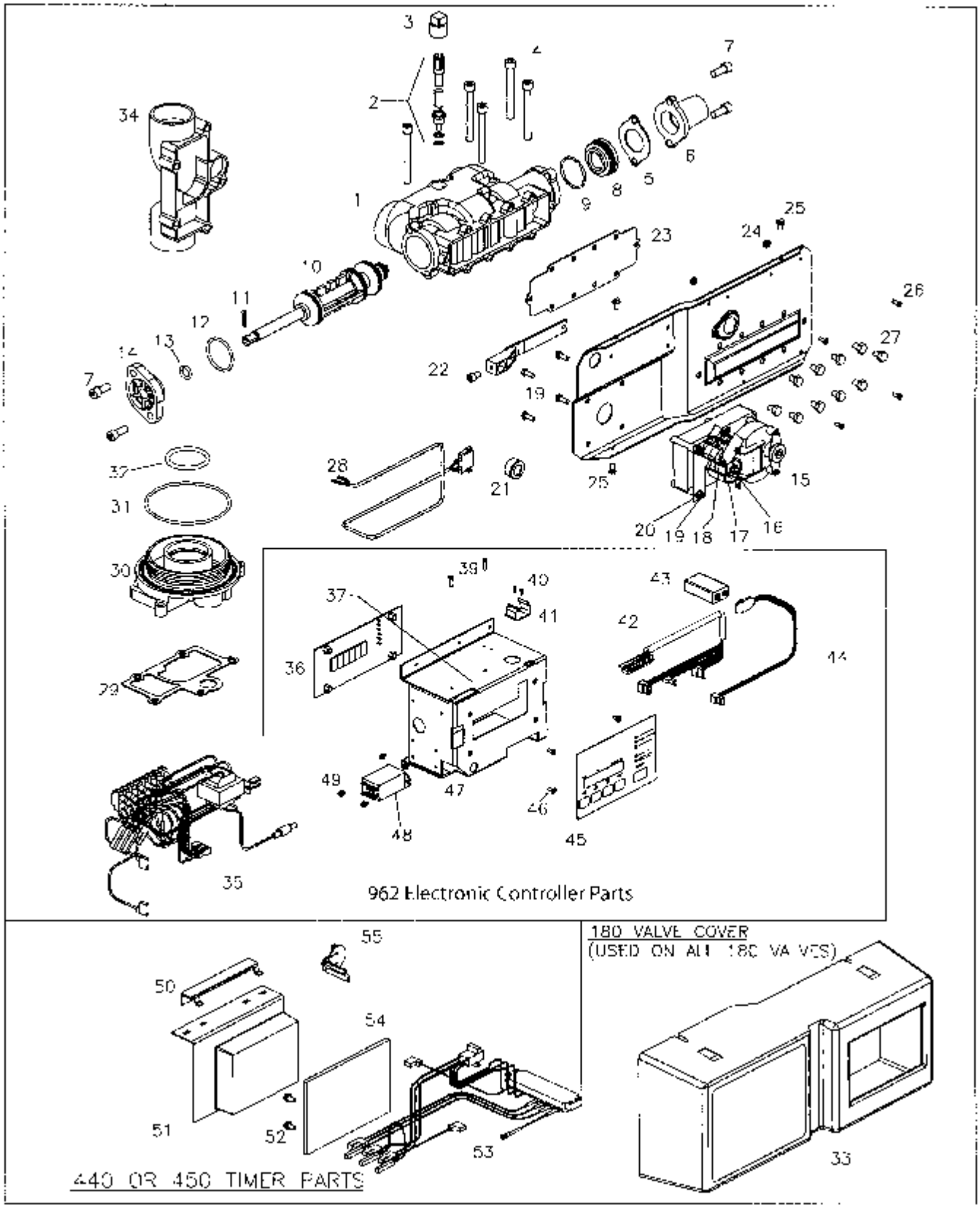
3 Brine and Slow Rinse



4 Fast Rinse and Refill



REPLACEMENT PARTS

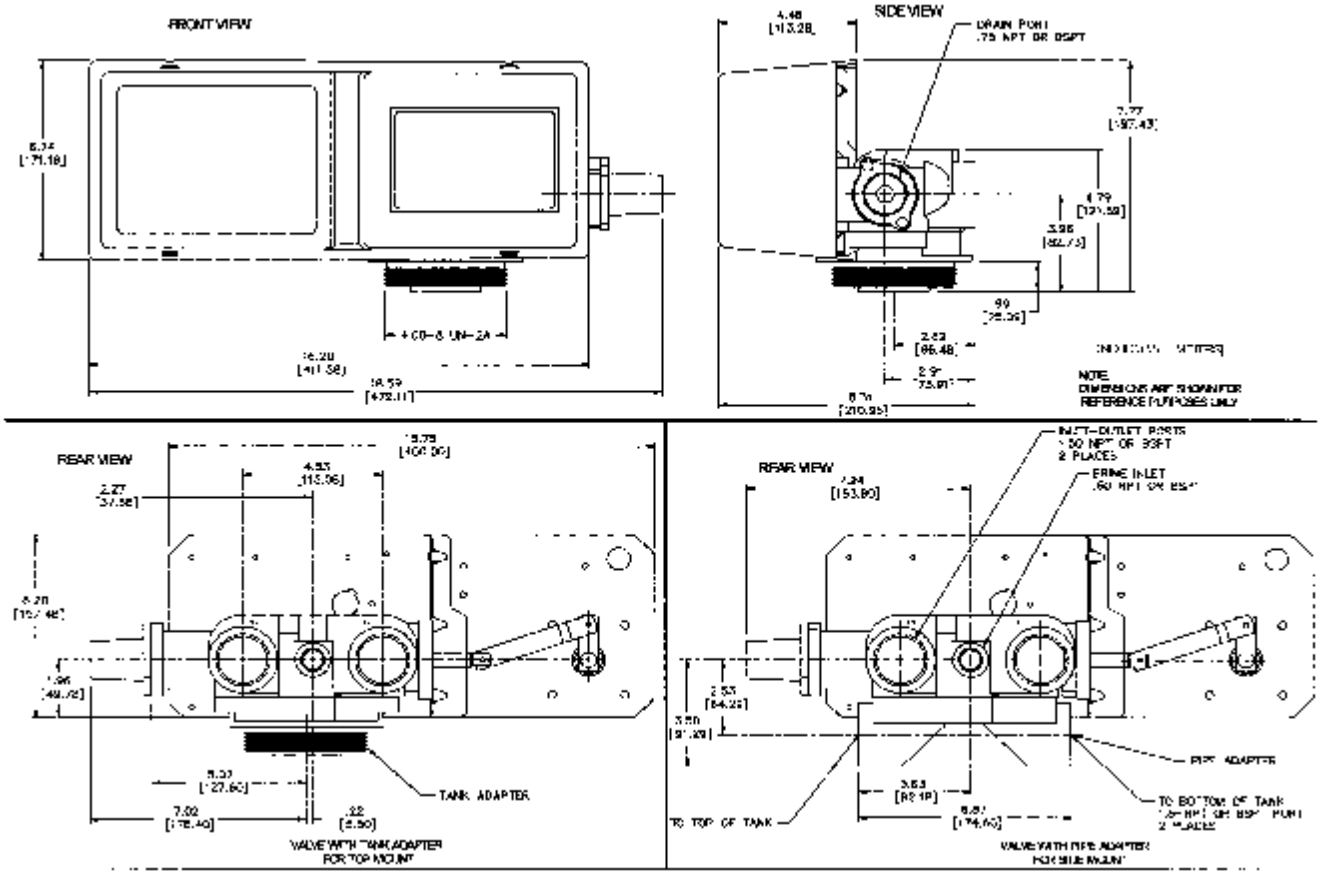


VALVE ASSEMBLY PARTS LIST

Ref #	Part No.	Description
1		Valve Body:
	1034502	NPT
	1034506	BSPP
2		Injector Assy.
	1034936	"A" (Yellow)
	1034931	"B" (Orange)
	1034934	"C" (Gold)
	1034170	Blank (undrilled)
	1034173	Injector screen
	1010301	Injector o-ring
3	1003062	Injector plug, ½ in NPT
4	1006285	Cap screw, 5/16-18 x 2¾
		(5 required)
5	1035018	Gasket, Upper Cap
6		Backwash Assembly:
	1034704	4 gpm, NPT
	1034705	4 gpm, BSPT
	1034706	5 gpm, NPT
	1034707	5 gpm, BSPT
	1034708	6 gpm, NPT
	1034709	6 gpm, BSPT
	1034710	10 gpm, NPT
	1034711	10 gpm, BSPT
	1034712	15 gpm, NPT
	1034713	15 gpm, BSPT
	1034714	25 gpm, NPT
	1034715	25 gpm, BSPT
	1034700	Open, NPT
	1034701	Open, BSPT
7	1006266	Cap Screw, 5/16-18 x ¾
		(4 required)
8	1035159	Drain Shut-off
9	1010130	O-ring
10	1035069	Piston Assembly
11	1005222	Cotter Pin
12	1010144	O-ring
13	1010136	O-ring
14	1035022	Cap
15	1034940	24VAC Drive Motor Assembly
	1034961	120VAC Drive Motor Assembly
	1034962	230VAC Drive Motor Assembly
16	1005580	Screw, Hex Hd., 8-32 x ¾
17	1033889	Cam Assembly
18	1008332	Switch (3 required)
		Included with item 15
19	1005850	Screw, Hex Hd., 10-24 x ½
		(6 required0
20	1035156	Bracket, Switch

Ref #	Part No.	Description
21	1077710	Wire guide bushing, .875
22	1035085	Drive link assembly
23	1035041	Gasket (valve motor plate)
24	1077699	Nut, keps, 6-32, plated steel
		(4 required)
25	1078196	Screw, Hex Hd., 10-32 x 3/8
		(3 required)
26	SCS-0070	Screw, 6-32 x 3/8 round head
		(4 required)
27	1005585	Screw, Hex Hd., ¼-20 x 3/8
		(10 required)
28	1077798	962-180 turbine meter cable
29	1035042	Gasket (valve to adapter
30	1034851	Adapter kit, top mount
31	ORE-347	O-ring
32	ORE-225	O-ring
33	1077721	Cover
34	1034524	Side Mount Adapter
962 Electronic Control Parts (Sub-Assy. P/N: 1077719)		
35	107713	Wire harness assembly
36	1076297	PWA assembly 962
37	ZHDW4152	Marker strip, 11-20
38	650022	10 Terminal block
39	SCS-0064	Screw, 4-40 x 5/8 round head
		(2 required)
40	SCS-0054	Screw, 2-56 x ¼ ph/pnhd
		(2 required)
41	1075767	Battery Clip, 962
42	1075721	Wire harness, 10 cond., 962
43	1075768	Battery, NiMH, 9V, 962 (optional)
44	1075764	Wire harness, battery, 9V
45	1070488	Keypad, membrane, 962
46	1075766	Screw, 8-32 x ¼ ph/flhd
		(4 required)
47	1077706	PWA Mounting bracket 962
48	1070491	Relay, SPDT, 12VAC, 962
49	1077915	Screw, 4-40 x ¼ ph/pnhd, Stl,
		SEMS
		(4 required)
440 or 450 Timer Parts		
50	1035047	Timer Mounting Bracket
51		Timer Assembly
52		Screw, 8-32 x ¼ (4 required)
53	1035479	Wire Harness Assembly
54	1077751	Window
55	1035431	Timer Lock

SPECIFICATIONS



Hydrostatic test pressure …….. 250 psi (17.2 bar)
Working pressure …….. 20 - 100 psi (1.38 - 6.89 bar)
Standard electrical rating ……. 120V/60Hz
Optional standard electrical rating (Timers) ……. 24V/50Hz, 24V/60Hz, 120V/50Hz, 100V/60Hz, 100V/50Hz, 230V/50Hz Optional standard electrical rating (962 Controller) ……... 230V 50/60Hz
Electrical cord (when furnished, with standard rating …….. 6ft, 3 wire with plug
Electrical Connection …….. Terminal strip
Standard plumbing connection …… 1 - 1/2 in NPT inlet, outlet top and bottom of tank
1/2 in NPT brine; 3/4 in NPTdrain
Rubber parts …….. Compound for cold water service
Valve body …….. Brass
Injector …….. 3 sizes available: A, B, C (Refer to page 20)

MODEL 180 VALVE CAM POSITION
GENERAL MAINTENANCE

For correct operation the cam should be set to stop, the position at the point of each function. This is done at the factory and rotation checked at this time. However, resetting may be necessary from time to time should the unit fail to draw brine. Setting is simple, index position to service position, (fully in), switch off power, loosen screw "A", adjust cam to position shown above. Switch on power.

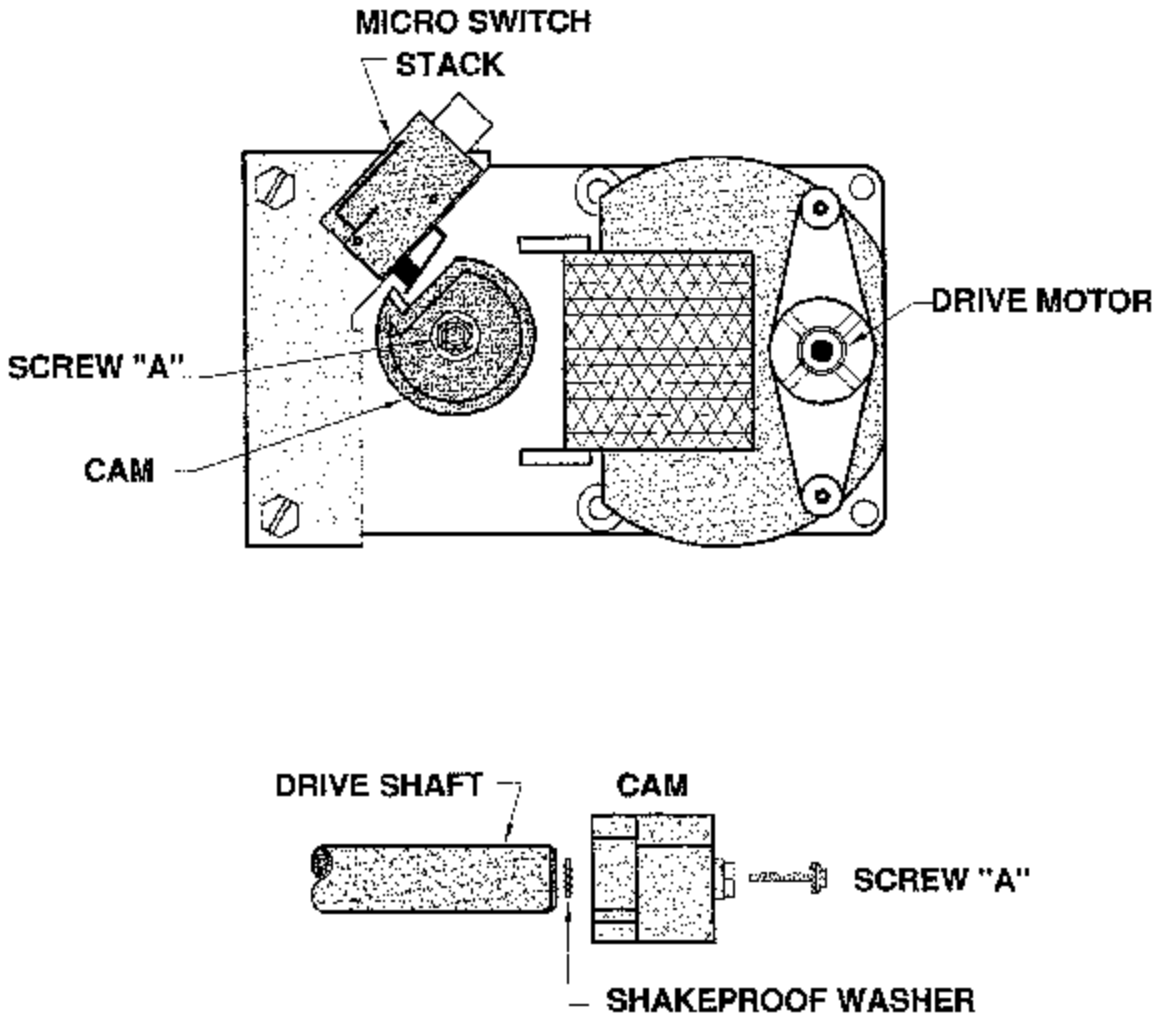


FIG. 20

MEDIA PLACEMENT

MULTI-MEDIA SEDIMENT FILTER

Table 1

Sequence in Tank	AFM20
1st (in bottom of tank)	30kg #6 gravel (1 Bag +)
2nd	44kg D1 (2 Bags)
3rd	44kg D2 (2 Bags)
4th	80kg 7M Sand (4 Bags)
5th	50kg D3 (2 Bags)

TROUBLE SHOOTING

GUIDE

AFM20-180

MULTI MEDIA FILTER

1. Unit will not Backwash Automatically

A) **IS THERE POWER TO THE UNIT ?**
B) **IS THE POWER CORD PLUGGED IN ?**
C) **IS THERE A REMOTE SWITCH IN THE LINE ISOLATED ?**
- check these possibilities, and correct if necessary

D) **IS THE TIMER MOTOR RUNNING**
- if the timer motor is running, the small driven gear on the timer motor will be turning. If not, replace the timer motor.

E) **BACKWASH DRIVE GEAR NOT ENGAGED**
- check gear behind push button on timer for proper alignment, and time of day lever is down and fully engaged.

F) **VALVE MOTOR MICRO SWITCH NOT OPENING OR CLOSING**
- adjust micro switch stack (Fig. 20)

G) **VALVE MOTOR MICRO SWITCH BURNED OUT**
- replace micro switch

H) **VALVE MOTOR MICRO SWITCH NOT OPENING OR CLOSING**
- replace micro switch

I) **TIMER MOTOR SWITCH BURNED OUT**
- replace micro switch

2. Unfiltered Water to Service

A) **RISER TUBE "O" RING MISALIGNED OR MISSING AT TOP OF DISTRIBUTOR PIPE IN VALVE ADAPTOR**
- remove valve head and replace rubber "O" ring

B) **UNIT INSTALLED BACKWARD**
- check arrow markings on top of valve head for correct inlet/outlet plumbing

C) **REFER SECTION 1 FOR FURTHER INFORMATION**

3. Leak to Drain

A) **CHECK PLUNGER POSITIONING**
- refer valve positions

B) **CHECK DRAIN SHUT-OFF 'O' RING**
- located at drain and of plunger

4. Insufficient Service Flow Rate

A) **UNIT MAY BE FOULED WITH SUSPENDED SOLIDS**
- backwash and check again

B) **SERVICE INLET OR OUTLET VALVE NOT FULLY OPENED**
- ensure they are opened

C) **PISTON OUT OF POSITION**
- reposition (refer valve position diagram)