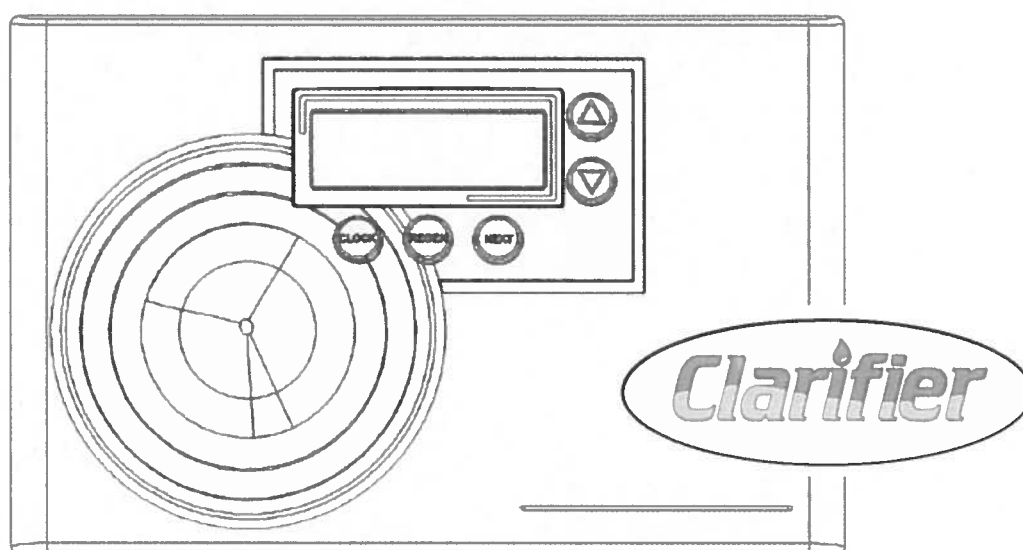




**MASTER**  
*Water Conditioning Corp.*

## **Installation and Operation Manual**



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### **MCA Time Clock Series Residential Filters**

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June 2018

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**Installation and Operating Instructions for**  
**MCA CONTROL**  
**Top Mount Water Filter with Vortech**

**Model #:**

_____	MCA-AC-10/13	Carbon Filter
_____	MCA-ACC-10/13	Centaur Carbon Filter
_____	MCA-AN-10/13	Acid Neutralizer
_____	MCA-FE-10/13B	Iron Filter
_____	MCA-MM-10/13	Multi-Media Filter

***Shipping Carton Description / unit:***

# of cartons	Contents	Description
	Mineral tank	Distributor pipe installed
	MCA control valve	MCA timer and backwash flow control and bypass with 1" copper, pvc, male threaded elbow, or sharkbite connection (in mineral tank box)
	Filter Media	½- cubic foot boxes
	Filter Media	1-cubic foot boxes

***Filter Media is Packaged as Follows:***

Model #	Gravel *	Media
MCA-AC/ACC-10	N/A	1.5 CF Carbon/Centaur
MCA-AC/ACC-13	N/A	2.0 CF Carbon/Centaur
MCA-AN-10	N/A	1.0 CF Calcite & 0.5 CF NS Mix
MCA-AN-13	N/A	2.0 CF Calcite
MCA-FE-10	N/A	1.5 CF Birm
MCA-FE-13	N/A	2.0 CF Birm
MCA-MM-10	N/A	1.5 CF Multi Media
MCA-MM-13	N/A	2.0 CF Multi Media
MCA-S-10	N/A	1.5 CF Filter Ag
MCA-S-13	N/A	2.0 CF Filter Ag

**NOTE: THIS FILTER IS NOT INTENDED TO BE USED FOR TREATING WATER THAT IS MICROBIOLOGICALLY UNSAFE OR OF UNKNOWN QUALITY WITHOUT ADEQUATE DISINFECTION WHETHER BEFORE OR AFTER THE SYSTEM.**

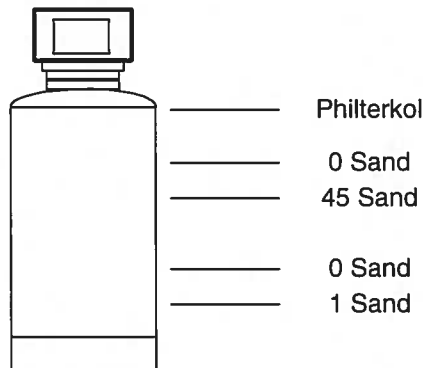
***MCA Filter Positioning:***

1. Place water filter in desired position, far enough from walls and other obstructions to allow for servicing the unit.
2. Place the water filter within reasonable access to a grounded 115V/60 HZ circuit and a legal drain line connection.

### ***MCA Filter Tank Loading:***

1. Remove yellow caplug from top of tank. DO NOT CUT white riser tube. Tube was prefitted at the factory.
2. The distributor is permanently attached to the vortech----centering is not necessary. The top of the distributor will be 5/8" above the top of the tank (this was prefitted at the factory).
3. Cover the top opening of the distributor pipe before filling the tank with media.
4. Pour the appropriate media provided with the unit into the top of the tank. See page one for your specific model number unit to determine the amount of media to load into the mineral tank.**NOTE: SEE CHART AND FIGURE BELOW IF INSTALLING A MCA-MM-10/13.**

Model #	Gravel*	1 Sand	0 Sand	45 Sand	0 Sand	Philterkol
MCA-MM-10	N/A	20 lbs.	12 lbs.	37 lbs.	25 lbs.	19 lbs.
MCA-MM-13	N/A	25 lbs.	16 lbs.	50 lbs.	35 lbs.	25 lbs.

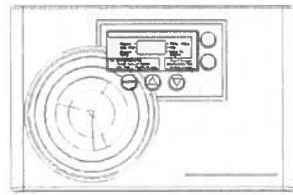


5. Remove the material used to cover the top opening of the distributor pipe.

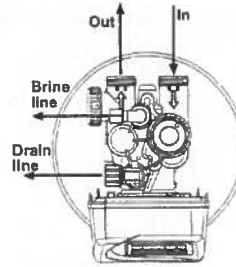
### ***MCA Control Valve:***

1. When facing the front of the MCA timer, the inlet connection is located on the right and the outlet connection is on the left. The control valve's inlet and outlet connections are either 1" copper, PVC, male threaded elbow, or sharkbite equipped with o'ring seal and nut.

## Control Valve



Front View



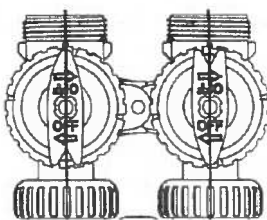
Top View

Turn the control valve upside down and ensure that the control valve distributor o'ring is in place. Use silicone lubricant on the o'ring.

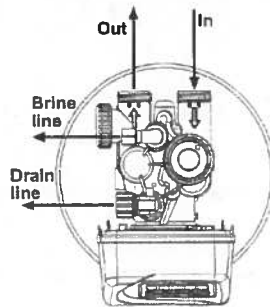
**\*\*DO NOT USE PETROLEUM!\*\***

**\*\*USE ONLY SILICONE \*\***

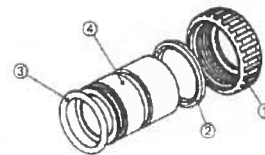
2. Place the control valve onto the distributor pipe and into the tank opening.
3. Thread the control valve hand tight . Do not overtighten.
4. Locate the bypass valve assembly that is packaged with the control valve. The bypass valve has two red handles that indicate flow direction, two threaded connections for the tail piece kit and two o'ring seal connections with nuts for the control valve. Align the insert connection ends with o'ring seals and nuts to the inlet and outlet connections of the control valve. Hand tighten the nuts. **DO NOT OVERTIGHTEN THE NUT!**



Bypass Valve



Control Valve



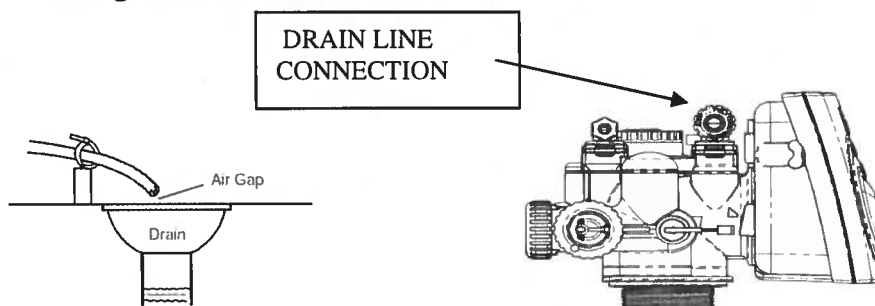
Tail piece assembly

5. Locate the tail piece kit that is packaged with the control valve. The standard tail piece kit is 1" copper with optional 1" PVC or 3/4" copper kits available as a special order. Each tail piece, o'ring, split ring and nut is presassembled at the factory. Align a tail piece assembly to the bypass valve threaded inlet and insert

until the nut can be tightened. Hand tighten the nut because excessive tightening will damage the assembly. **REPEAT THE PROCEDURE FOR THE OUTLET CONNECTION.**

### ***Service and Drain Piping:***

1. Pipe water filter into the service lines .The inlet and outlet connections of the control valve are 1" copper, PVC, male threaded elbow, or sharkbite and are located on the back of the valve body. As you face the timer the inlet is on the right and the outlet is on the left. Always follow local plumbing codes when installing our water treatment equipment.
2. If sweat fittings are used, be sure soldering is done in such a manner as not to allow heat to reach the control valve or bypass. (If Schedule 80 PVC is used make sure to follow the proper primer and solvent instructions.)
3. The drain line connection is  $\frac{3}{4}$ " npt or (optional ) 5/8 OD and is located on the top left of the valve as you face the timer. It is recommended you install a  $\frac{3}{4}$ " union on the drain line for servicing if not using 5/8 OD. The drain line must be of adequate size to allow for full regeneration flow.



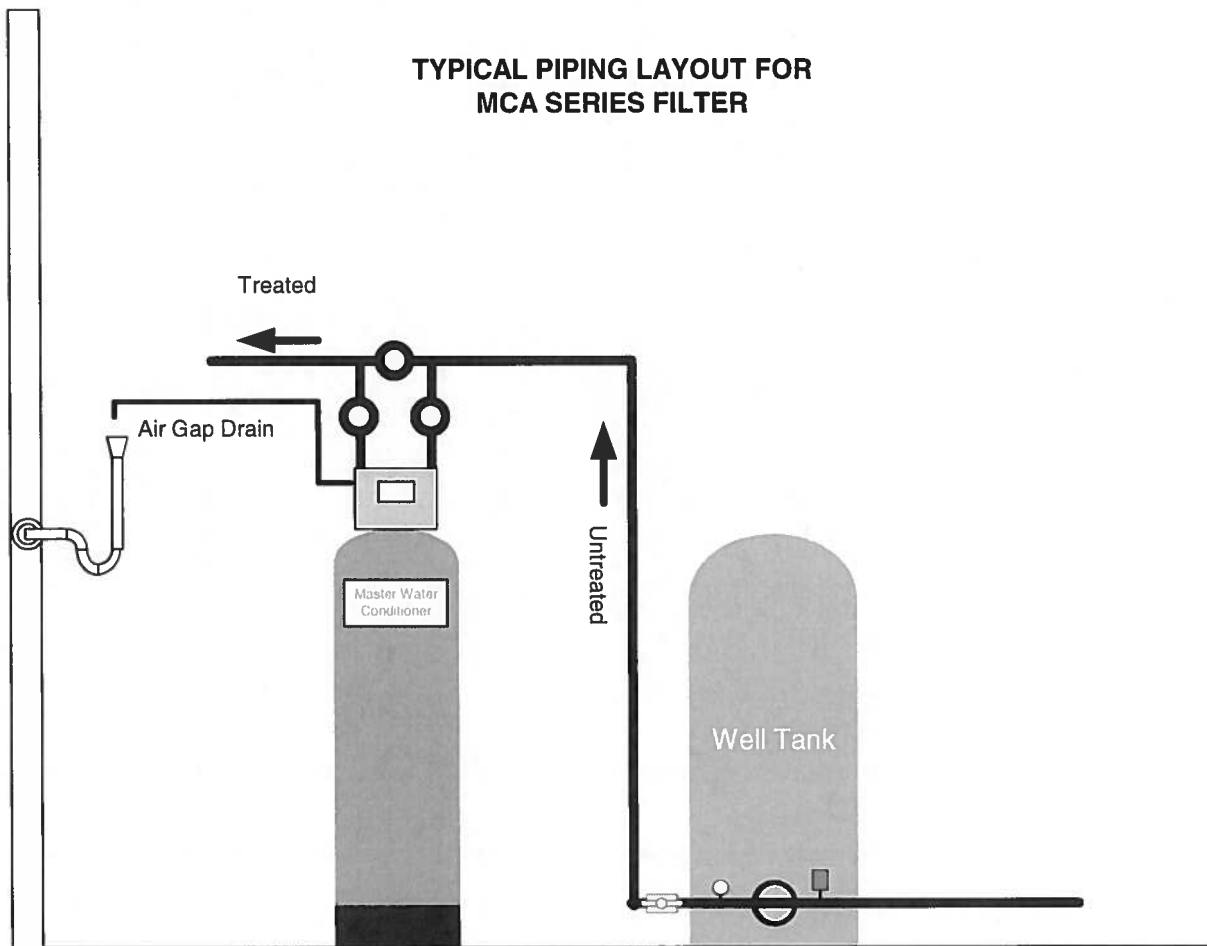
- The control valve drain connection is 3/4" npt.
- Never decrease the drain piping size to below the drain connection size.
- Maximum drain line length is 30 feet with slope the entire length.
- Maximum drain line height is 6 feet above the control valve.
- The drain line must be piped to an open air gap (See Figure above)
- Always follow local plumbing codes.

**UNDER NO CIRCUMSTANCES SHOULD THERE BE A DIRECT CONNECTION WITH SANITARY SEWAGE FACILITIES.**



**MASTER**  
*Water Conditioning Corp.*

**TYPICAL PIPING LAYOUT FOR  
MCA SERIES FILTER**

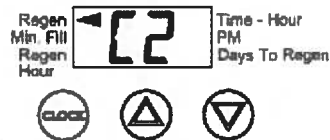


**NOTE:** All Master Water Conditioners must be installed after the well tank or water meter if its public water supply.

## ***Electrical Requirements:***

Always follow all local electrical codes when installing our water treatment equipment.

1. Provide an 115v/60Hz properly grounded dedicated electrical Outlet. (It's very important that the polarity be correct)  
**Avoid using outlets that are switch controlled.**
2. Maximum amperage required is 5 amps.
3. Make sure the electrical service provides power 24 hours per day.  
We recommend installing a **surge protector** to protect unit from power surges, which are not covered by warranty.



## ***Filling Water Softener with Water:***

1. Connect the MCA control valve transformer into the electrical outlet provided.
2. Press and hold the Up and Down arrows simultaneously for three seconds until the drive motor starts. When the drive motor stops, the display will read "C1" backwash position.
3. Open the inlet ball valve a ¼ turn of its full open position to allow water to enter the water filter mineral tank slowly. The water is going to enter the tank from the bottom of the distributor pipe and leave the tank from the top. This will slowly purge all the air from the tank.  
**IF WATER ENTERS THE TANK TOO FAST, ALL THE RESIN WILL BE FLUSHED TO DRAIN DURING START UP.**
4. When only water is running to the drain, open the inlet and outlet ball valves fully.
5. Once the drive motor stops, press the Up button to advance the control valve to the fast rinse position. The display will read "C4".  
The fast rinse position will rinse the filter tank.

**NOTE: THE TIMER WILL AUTOMATICALLY ADVANCE TO THE SERVICE POSITION AND THE DISPLAY WILL READ TIME OF DAY.**



## ***MCA Control Valve Timer Settings:***

**Note:** The control valve is set at the factory. You only need to set the time of day and regeneration time if required, which is preset at 1 am.



### ***Time of Day Setting***

- 1) Press and hold the CLOCK button. The screen will display “Set Time” and the hour will be blinking.
- 2) Press the UP or DOWN arrows to adjust the hour —check for correct am or pm mode.
- 3) Press the CLOCK button.
- 4) Press the UP or DOWN arrows to adjust the minutes.
- 5) Press the CLOCK button.

### ***Time of Regeneration Setting (the factory default is 1 AM)***

Simultaneously press the CLOCK and the UP arrow for 3 seconds: The screen will display “Set Time Regen” and the hour will be blinking.

- 1) Use the UP or DOWN arrows to adjust hour.
- 2) Press the CLOCK button.
- 3) Press the UP or DOWN arrows to adjust the minutes.
- 4) Press the CLOCK button.

### ***Regeneration Frequency Setting (the factory default is every 7 days)***

The screen will display “Set Regen Day” and the days of regeneration frequency will be blinking.

- 1) To change the number, use the UP or DOWN arrows.
- 2) Press the CLOCK button.
- 3) Set up is complete and the screen will now show the time.

### ***Final Check:***

1. Make sure the drain line connection meets all plumbing codes and that the drain line size can handle the backwash flow rate of the softener.
2. Make sure the Inlet and Outlet on bypass valves are open.

3. Make sure the control valve timer is plugged into an dedicated electrical outlet with power 24 hours per day.
4. Check all piping for leaks.

### MANUAL REGENERATION

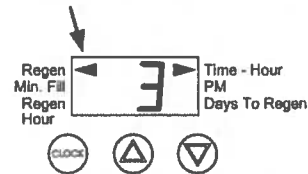
**NOTE:** For softeners, if brine tank does not contain salt, fill with salt and wait at least 2 hours before regeneration.

If you need to initiate a manual regeneration, either immediately, or tonight at the preprogrammed time (typically 2 a.m.), complete the following steps.

#### For Immediate Regeneration:

Press and hold  $\Delta$  and  $\nabla$  simultaneously until valve motor starts (typically 3 seconds).

Arrow will point to Regen if a regeneration is expected "Tonight."



#### For Regeneration Tonight:

Press and release  $\Delta$  and  $\nabla$  simultaneously (notice that arrow points to Regen).

# BYPASS VALVE OPERATION

Figure 1

## NORMAL OPERATION

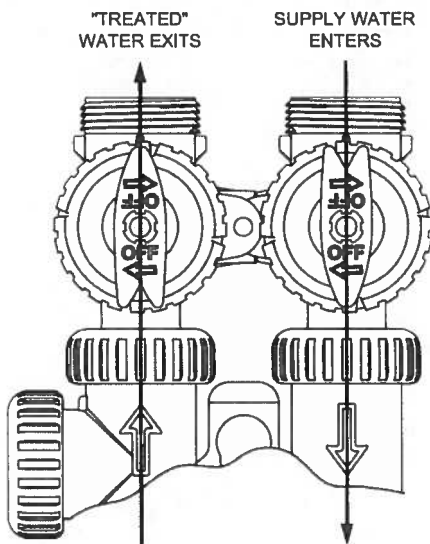


Figure 2

## BYPASS OPERATION

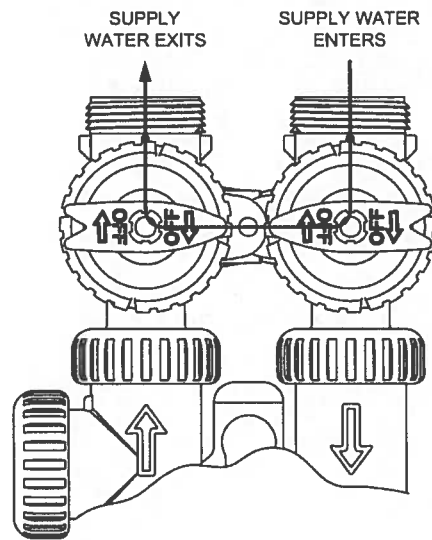


Figure 3

## DIAGNOSTIC MODE

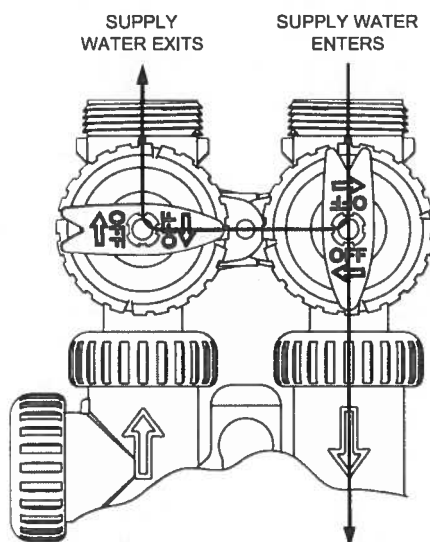
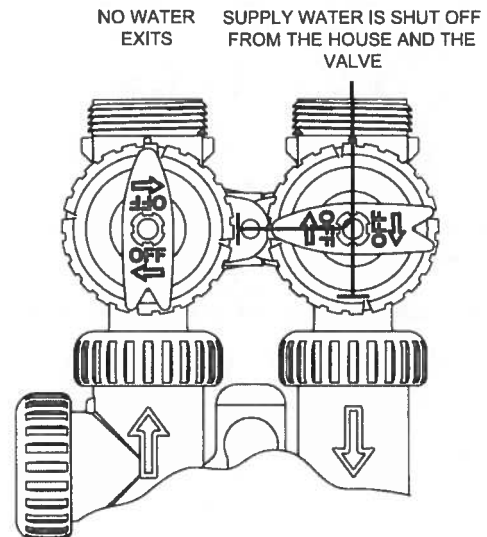


Figure 4

## SHUT OFF MODE



# Troubleshooting

## **Problem:** Unit Fails to Regenerate

<b>Cause</b>	<b>Solution</b>
Faulty electrical supply	Verify that electrical power is getting to the outlet
Low inlet water pressure	Verify a minimum 30 psi inlet water pressure
Drain line is restricted	Insure that the drain line is free of blockage
Defective timer motor	Replace the timer motor
Plugged backwash flow control	Clean or replace the backwash flow control
Incorrect P Value Programming	Reprogram with proper P Value

## **Problem:** Poor Water Quality When Unit is in Service Position

<b>Cause</b>	<b>Solution</b>
The bypass valve is open or defective	Insure that the bypass valve is in the service position
Excessive water usage	Set the timer to regenerate more often
Loss of filter media	See symptom: Loss of filter media
Change in raw water quality	Test the raw water quality and adjust regeneration frequency
Leak at the distributor tube	Verify that the distributor is flush with the top of the tank

## **Problem:** Loss of Filter Media

<b>Cause</b>	<b>Solution</b>
Backwash flow control is missing or is the incorrect size	Verify that the proper backwash flow control is installed
Air in the system	Verify that the well system is operating properly

**Problem:** Continuous Flow to Drain

<b>Cause</b>	<b>Solution</b>
Defective or damaged piston stack assembly	Replace the piston stack assembly
Piston rod assembly is damaged	Replace piston rod assembly
Drive motor failure	Replace the drive motor

**Problem:** Loss of Water Pressure

<b>Cause</b>	<b>Solution</b>
Dirt build-up in filter tank	Clean or replace the Filter media
Dirt build-up in the inlet piping to the Filter Unit	Clean or replace the inlet piping
Distributor pipe is plugged	Clean or replace the distributor pipe

**Problem:** Control Valve Cycles Continuously

<b>Cause</b>	<b>Solution</b>
Defective timer circuit board	Replace the circuit board

**Problem:** Timer does not display time of day

<b>Possible Cause</b>	<b>Solution</b>
AC Adapter unplugged	Connect power
No electric power at outlet	Repair outlet or use working outlet
Defective AC Adapter	Replace AC Adapter
Defective PC Board	Replace PC Board

**Problem:** Timer does not display correct time of day

<b>Possible Cause</b>	<b>Solution</b>
Switched outlet	Use uninterrupted outlet
Power Outage	Reset time of day
Defective PC Board	Replace PC Board

**Problem:** Control Valve regenerates at wrong time of day

Possible Cause	Solution
Power Outages	Reset control valve to correct time of day
Time of day not set correctly	Reset to correct time of day
Time of regeneration incorrect	Reset regeneration time

**Problem:** Control valve stalled in regeneration

Possible Cause	Solution
Motor not operating	Replace motor
No electric power at outlet	Repair outlet or use working outlet
Defective AC adapter	Replace AC adapter
Defective PC board	Replace PC board
Broken drive gear or drive cap assembly	Replace drive gear or drive cap assembly
Broken piston retainer	Replace piston retainer
Broken main or regenerate piston	Replace main or regenerate piston

**Problem:** Control valve does not regenerate automatically when UP and DOWN buttons are held and depressed

Possible Cause	Solution
AC adapter unplugged	Connect AC adapter
No electric power at outlet	Repair outlet or use working outlet
Broken drive gear or drive cap assembly	Replace drive gear assembly
Defective PC board	Replace PC board

**Problem:** Control valve does not regenerate automatically but does when UP and DOWN buttons are depressed and held

Possible Cause	Solution
Defective PC board	Replace PC board
Set-up error	Check control valve set-up procedure

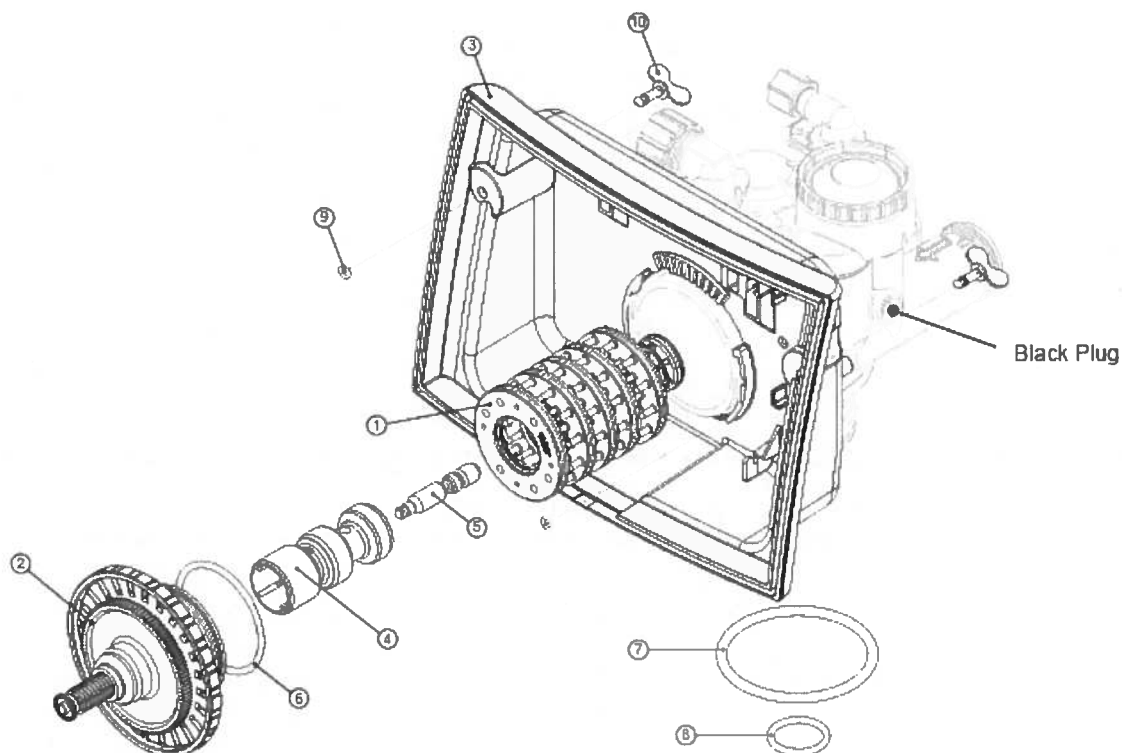
## ERROR CODES

Display	Description	Cause
E1 (1001)	Unable to recognize start of regeneration	Defective motor, damaged wiring, or poor wire connection.
E2 (1002)	Unexpected electrical or mechanical stall	Defective motor, damaged wiring, poor wire connection, or mechanical component failure.
E3 (1003)	Motor running too long or timeout during piston relocating	Damaged wiring, poor wire connection, or mechanical component failure.
E4 (1004)	Motor timeout when piston is relocating to service position	Damaged wiring, poor wire connection, or mechanical component failure.
(1006)	MAV-No Hard Water Bypass motor ran too long, piston can't find proper position	Unplug transformer from electrical outlet. After 1 minute, connect transformer to electrical outlet. The MAV will synchronize to the proper position.
(1007)	MAV-No Hard Water Bypass motor ran too short, piston can't find proper position and movement is stalled	Unplug transformer from electrical outlet. After 1 minute, connect transformer to electrical outlet. The MAV will synchronize to the proper position.
(1009)	Internal software error generated by detection of an invalid motor start	Replace circuit board.

## MCA PARTS

Drawing No.	Order No.	Description	Quantity
1	V3005	WS1 Spacer Stack Assembly	1
2	V3004	Drive Cap ASY	1
3	V3372	WS1MR Drive Back Plate	1
4	V3011	WS1 Piston Downflow ASY	1
5	V3174	WS1 Regenerant Piston	1
6	V3135	O-ring 228	1
7	V3180	O-ring 337	1
8	V3105	O-ring 215 (Distributor Tube)	1
9	V3466	O-ring 008	2
10	V3463	WS1MR Quarter Turn Fasteners	2
Not Shown	V3001	WS1 Body ASY Downflow	1
	V3001-02	WS1 Mixing Valve Body ASY	
	V3001UP	WS1 Body ASY Upflow	
	V3001-02UP	WS1 Mixing Valve Body Upflow ASY	
Not Shown	V3013	WS1 Mixing Valve ASY	1

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





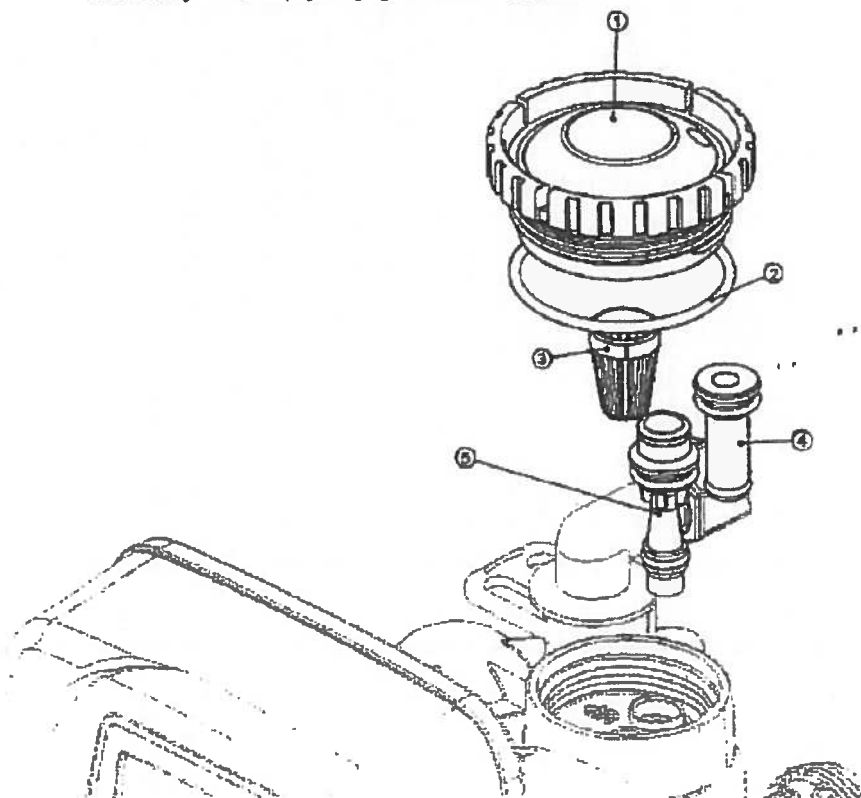
## MCA PARTS

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

Drawing No.	Order No.	Description	Quantity
1	V3176	Injector Cap	1
2	V3152	O-ring 013	1
3	V3177	Injector Screen	1
4	V3010-1Z	WS1 Injector ASY Z Plug	1
5	V3010-1A	WS1 INJECTOR ASY A BLACK	1
	V3010-1B	WS1 INJECTOR ASY B BROWN	
	V3010-1C	WS1 INJECTOR ASY C VIOLET	
	V3010-1D	WS1 INJECTOR ASY D RED	
	V3010-1E	WS1 INJECTOR ASY E WHITE	
	V3010-1F	WS1 INJECTOR ASY F BLUE	
	V3010-1G	WS1 INJECTOR ASY G YELLOW	
	V3010-1H	WS1 INJECTOR ASY H GREEN	
	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	O-ring 011	1
Not Shown	V3171	O-ring 013	1

\*The injector plug and the injector each contain one 011 (lower) and 013 (upper) o-ring.

Note: For upflow position, injector is located in the up hole and injector plug is in the other hole. WS1MR upflow bodies are identified by having the DN marking removed. For a filter that only backwashes, injector plugs are located on both holes.



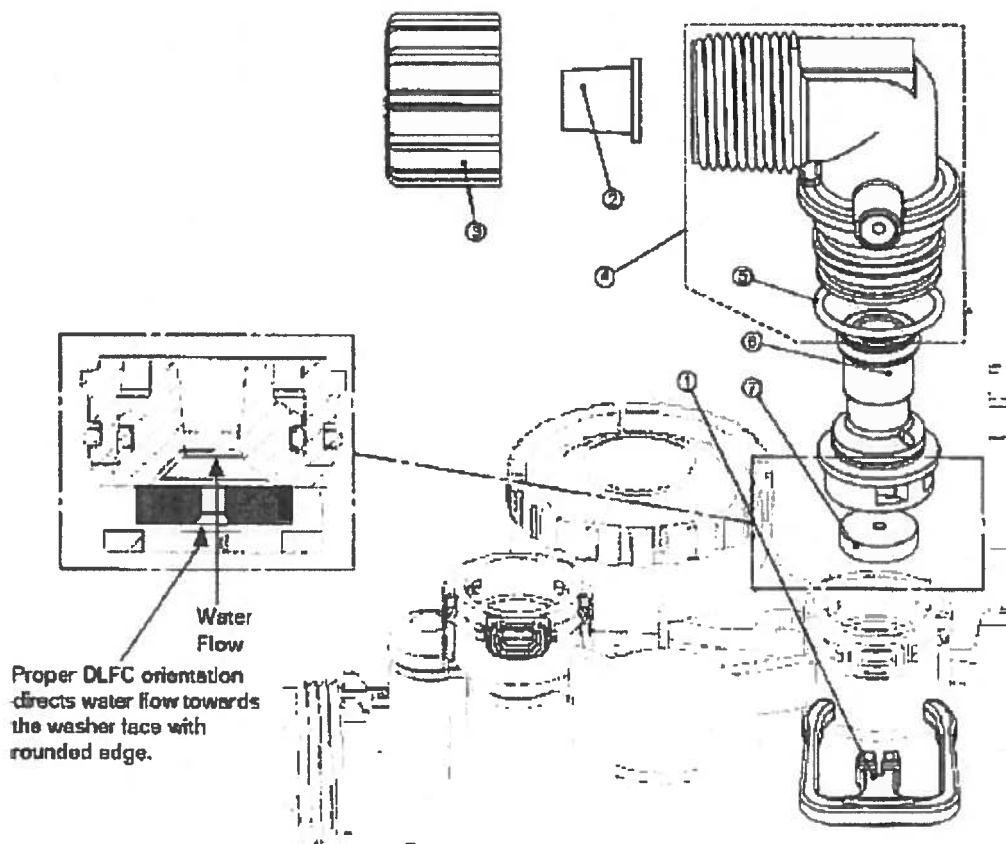
# MCA PARTS

Drain Line - 3/4"

Drawing No.	Order No.	Description	Quantity
1	H4615	Elbow Locking Clip	1
2	PKP101S8-BULK	Polytube insert 5/8	Option
3	V3192	WS1 Nut 1/2 Drain Elbow	Option
4*	V3158-01	WS1 Drain Elbow 1/2 Male	1
5	V3163	O-ring 019	1
6*	V3159-01	WS1 DLFC Retainer ASY	1
7	V3162-007	WS1 DLFC 0.7 gpm for 1/2	One DLFC must be used if 1/2 fitting is used
	V3162-010	WS1 DLFC 1.0 gpm for 1/2	
	V3162-013	WS1 DLFC 1.3 gpm for 1/2	
	V3162-017	WS1 DLFC 1.7 gpm for 1/2	
	V3162-022	WS1 DLFC 2.2 gpm for 1/2	
	V3162-027	WS1 DLFC 2.7 gpm for 1/2	
	V3162-032	WS1 DLFC 3.2 gpm for 1/2	
	V3162-042	WS1 DLFC 4.2 gpm for 1/2	
	V3162-053	WS1 DLFC 5.3 gpm for 1/2	
	V3162-063	WS1 DLFC 6.5 gpm for 1/2	
	V3162-075	WS1 DLFC 7.5 gpm for 1/2	
	V3162-090	WS1 DLFC 9.0 gpm for 1/2	
	V3162-100	WS1 DLFC 10.0 gpm for 1/2	

\*4 and 6 can be ordered as a complete assembly - V3331 WS1 Drain Elbow and Retainer Asy

Valves are shipped without drain line flow control (DLFC) - install DLFC before using. Valves are shipped without 1/2 nut for drain elbow (polytube installation only) and 5/8" polytube insert (polytube installation only).



# 12 YEAR LIMITED WARRANTY

As of Oct. 1, 1995

This Residential Water Conditioner is warranted for a period of **one year** from date of purchase by first user against defects in materials and workmanship. In addition, the complete control valve is warranted for **five years**. The control valve body (excluding internals and electrical parts) is warranted for **six years**. The mineral tank, plastic brine tank or cabinet tank (excluding mineral) is warranted against rust, corrosion or bursting for a period of **twelve years** from date of manufacture. Except, as specifically set forth in this paragraph, Master Water Conditioning Corporation makes no other warranties, express or implied.

This warranty shall be void if the conditioner is moved from the place of original installation, or if damage is caused by misuse, misapplication, accident, freezing, flood, fire or if not installed in accordance with instructions furnished by Master Water Conditioning Corporation.

This warranty shall be void in the event of damages from external sources or where the conditioner has been operated at pressure in excess of 100 pounds per square inch or at a temperature greater than 100 degrees F. or less than 32 degrees F. Incidental costs or consequential damages are not covered by this warranty.

All defective parts shall be returned prepaid to Master Water Conditioning Corporation for inspection. **Master shall not be liable for labor charges other than Master factory repairs.**

This warranty gives you specific legal rights, and you may have other rights which vary from state to state. Some states do not allow limitations on duration of implied warranties or exclusion of incidental or consequential damages, so the above limitations may not apply to you.

All claims must be submitted in writing to Master Water Conditioning Corporation at 224 Shoemaker Road, Pottstown, Pennsylvania 19464 within thirty (30) days from the discovery of the defect. Master Water Conditioning Corporation thereafter will correct defective parts and workmanship or rusting, corrosion or bursting within sixty (60) days.



**MASTER**  
*Water Conditioning Corp.*

224 Shoemaker Rd. Pottstown, Pa. 19464