Operating Manual

⚠WARNING This equipment must be installed and serviced by a qualified technician. Improper installation can create electrical hazards which could result in property damage, serious injury or death. Improper installation will void the warranty.

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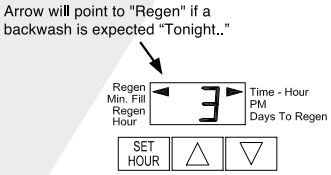
MANUAL BACKWASH

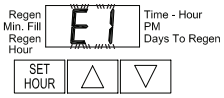
If you need to initiate a manual backwash, either immediately, or tonight at the preprogrammed time (typically 2 a.m.), complete the following steps.



For Immediate Backwashing:
Press and hold UP and DOWN simultaneously until valve motor starts (typically 3 seconds).

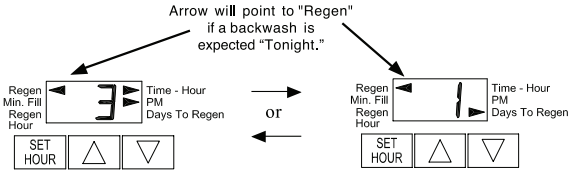
For Backwash Tonight:
Press and release UP and DOWN simultaneously (notice that arrow points to Regen).

If the display shows “E1,” “E2” or “E3” (for error), call a service technician.



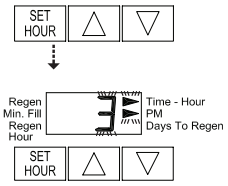
GENERAL OPERATION

When the system is operating one of two displays will be shown: time of day or days until the next backwash.
Pressing UP or DOWN will toggle between the two choices.



TO SET TIME OF DAY

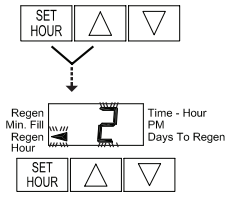
In the event of a power outage, time of day needs to be reset. All other information will be stored in memory no matter how long the power outage. Please complete the steps as shown to the right. To access this mode, press SET HOUR.



1. Accessed by pressing SET HOUR.
2. Adjust to the nearest hour using UP or DOWN. An arrow points to PM during p.m. hours.
3. Press SET HOUR to complete and return to normal operation.

TO SET TIME OF A BACKWASH

For initial set-up or to make adjustments, please complete the steps as shown to the right. Access this mode by pressing SET HOUR and UP simultaneously for 3 seconds.



1. Accessed by pressing SET HOUR and UP simultaneously for 3 seconds.
2. Adjust time of backwash hour using the UP or DOWN. An arrow points to PM during p.m. hours. Simultaneously press SET HOUR and DOWN to return to normal operation.

Introduction

General Warnings

The control valve and fittings are designed to accommodate minor plumbing misalignments but are not designed to support the weight of a system or the plumbing.

Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicon lubricant may be used on black o-rings but is not necessary. **Avoid any type of lubricants, including silicone, on red or clear lip seals.**

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

Do not use pipe dope or other sealants on threads. Teflon tape must be used on the threads of the 1" NPT elbow or the 1/4" NPT connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connection or caps because of o-ring seals.

After completing any valve maintenance involving the drive assembly or the drive cap assembly and pistons, unplug power source jack from the printed circuit board (black wire) and plug back in. This resets the electronics and establishes the service piston position.

All plumbing should be done in accordance with local plumbing codes.

When assembling the installation fitting package (inlet and outlet), connect the fitting to the plumbing system first and then attach the nut, split ring and o-ring. Heat from soldering or solvent cements may damage the nut, split ring or o-ring. Solder joints should be cool and solvent cements should be set before installing the nut, split ring and o-ring. Avoid getting primer and solvent cement on any part of the o-rings, split rings, bypass valve or control valve.

Plug into an electrical outlet.

Note: All electrical connections must be connected according to local codes.
(Be certain the outlet is uninterrupted.)

Install grounding strap on metal pipes.

Tabel - 1

Specifications

Service Flow Rate (includes bypass)	102.2 lpm (27gpm) @ 103kPa (15psig) drop
Backwash Flow Rate (includes bypass)	102.0 lpm (27gpm) @ 172 kPa (25psig) drop
Minimum/ Maximum Operating Pressures	138 kPa (20psi) - 862 kPa (125psi)
Minimum/ Maximum Operating Temperatures	4°C (40° F) - 43° C (110° F)
Transformer :	
Supply Voltage	220 - 240 VAC
Supply Frequency	50Hz
Power Consumption	9.5W
Output Voltage	12 VAC
Output Current	500mA
Inlet/ Outlet Fitting Options	3/4" & 1" PVC solvent weld fitting.
Distributor Tube Opening	1.05" Diameter (3/4" U.S. PVC Pipe Size)
Tank Thread	2-1/2" - 8 NPSM
Control Valve Weight	2.0 kg (4.5 lbs)
PC Board Memory	Nonvolatile EEPROM (electrically erasable programmable read only memory)

Control Valve Function and Cycles of Operation

This automatic control valve is designed as the primary control center to direct and regulate all cycles of a filter.

The time clock control valve has two calendar options for backwash frequency :

1. an option where the user can choose the number of days (1-99) between each backwash; and

2. a seven-day option where the user can choose which day(s) of the week a backwash should occur.

The control valve regulates the flow rates for backwashing and rinsing.

The control valve uses no traditional fasteners (e.g. screws), instead clips, threaded caps and snap type;latches are used. Caps and nuts only need to firmly hand tightened because radial seals are used. Tools required to service the valve include one small blade screw driver, one large blade screw driver, pliers and a pair of hands. A plastic wrench is available which eliminates the need for screw drivers and pliers. Disassembly for servicing takes much less time than comparable products currently on the market. Control valve installation is made easy because the distributor tube can be cut 1/2" above to 1/2" below the top of tank thread. The distributor tube is held in place by an o-ring seal and the control valve also has a bayonet lock feature for upper distributor baskets.

The transformer power pack comes with a 15 foot power cord and is designed for use with the control valve. The transformer power pack is for dry location use only. If the power goes out, only the time of day needs to reset. All other values are permanently stored in the nonvolatile memory.

Table - 3
Regeneration Cycles and Times for Different Programs

Program	All Times in Minutes				
	C1 1st Backwash	C2 Regenerate	C3 2nd Backwash	C4 Rinse	C5 Fill
P0	3	50	3	3	1-99
P1	8	50	8	4	1-99
P2	8	70	10	6	1-99
P3	12	70	12	8	1-99
P4	10	50	Skipped	8	1-99
P5	4	50	Skipped	4	1-99
P6	12	6	Skipped	12	1-99
P7	6	Skipped	Skipped	4	Skipped
P8	10	Skipped	Skipped	6	Skipped
P9	14	Skipped	Skipped	8	Skipped

Note: During regeneration the display will show C1, C2, etc. If the cycle is skipped, that cycle number will not be displayed.

General Instructions

The control valve offers multiple procedures that allow the valve to be modified to suit the needs of the installation.

These procedures are :

- Installer Displays & Settings (either 1-99 Days Between Backwash option or 7-Day option).
- User Displays.

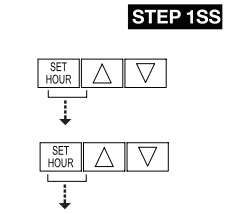
When in operation, normal user displays show the time of day or days remaining before backwashing. When stepping through a procedure if no buttons are pressed within five minutes the display returns to a normal user display. Any changes made prior to the five minute time out are incorporated.

To quickly exit Installer Displays & Settings simultaneously press SET HOUR + DOWN. Any changes made prior to the exit are incorporated.

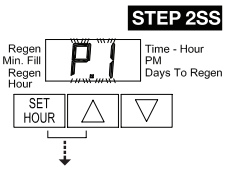
To reinitialize the control valve check to make sure the valve is in the User Display.

Then simultaneously press SET HOUR + DOWN or unplug power source plug (black wire) on the circuit board and plug back in.

System Setup



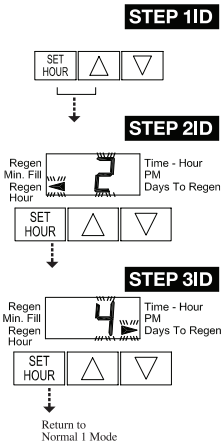
STEP 1SS - From normal mode, press SET HOUR + UP buttons simultaneously for 3 seconds and release. Then press SET HOUR + UP buttons simultaneously for 3 seconds.



STEP 2SS - Choose the desired program by pressing the UP or DOWN buttons. Press SET HOUR button to go to Step 3SS.

Installer Displays & Settings

(1-99 Days Between Backwash option)

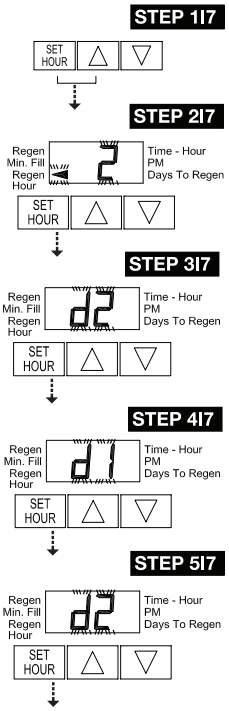


STEP 1ID - From normal mode, press SET HOUR + UP buttons simultaneously for 3 seconds and release.

STEP 2ID - Backwash Time (Regen Hour): Set the clock to the hour the backwash should occur by using the UP or DOWN buttons. An arrow points to PM after 12. Press SET HOUR to go to STEP 3ID.

STEP 3ID - Days To Backwash (Regen): Set the number of days between backwashes. The allowable range is 1 to 99. Press SET HOUR to exit Installer Displays & Settings.

Installer Displays & Settings (7 day option)



STEP 1I7 - From normal mode, press SET HOUR + UP buttons simultaneously for 3 seconds and release.

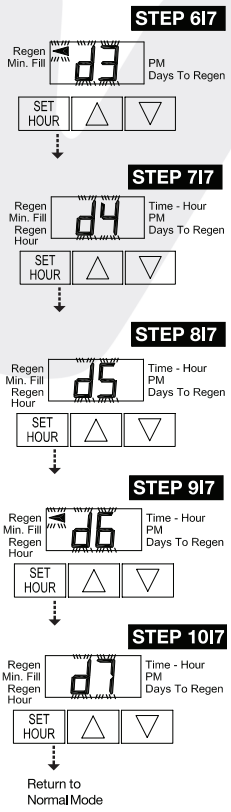
STEP 2I7 - Backwash Time (Regen Hour): Set the clock to the hour the regeneration should occur by using the UP or DOWN buttons. An arrow points to PM after 12. Press SET HOUR to go to STEP 3I7.

STEP 3I7 - Current Day of Week: Set the current day of the week by using the UP or DOWN buttons (See chart at right for date codes). Press SET HOUR to go to STEP 4I7.

Display	Day of Week
day1	Sunday
day2	Monday
day3	Tuesday
day4	Wednesday
day5	Thursday
day6	Friday
day7	Saturday

STEP 4I7 - Sunday Backwash: To regenerate on Sunday use the UP or DOWN button until the arrow points to “Regen”. If the arrow does not point to “Regen” a backwash will not occur on Sunday. Press SET HOUR to go to STEP 5I7.

STEP 5I7 - Monday Backwash: To backwash on Monday use the UP or DOWN button until the arrow points to “Regen”. If the arrow does not point to “Regen” a backwash will not occur on Monday. Press SET HOUR to go to STEP 6I7.



STEP 6I7 - Tuesday Backwash: To backwash on Tuesday use the UP or DOWN button until the arrow points to “Regen”. If the arrow does not point to “Regen” a rBackwash will not occuron Tuesday. Press SET HOUR to go to STEP 7I7.

STEP 7I7 - Wednesday Backwash: To backwash on Wednesday use the UP or DOWN button until the arrow points to “Regen”. If the arrow does not point to “Regen” a backwash will not occur on Wednesday. Press SET HOUR to go to STEP 8I7.

STEP 8I7 - Thursday Backwash: To backwash on Thursday use the UP or DOWN button until the arrow points to “Regen”. If the arrow does not point to “Regen” a backwash will not occur on Thursday. Press SET HOUR to go to STEP 9I7.

STEP 9I7 - Friday Backwash: To regenerate on Friday use the UP or DOWN button until the arrow points to “Regen”. If the arrow does not point to “Regen” a backwash will not occur on Friday. Press SET HOUR to go to STEP 1017.

STEP 10I7 - Saturday Backwash: To backwash on Saturday use the UP or DOWN button until the arrow points to “Regen”. If the arrow does not point to “Regen” a backwash wil not occur on Saturday. Press SET HOUR to exit Installer Displays & Settings.

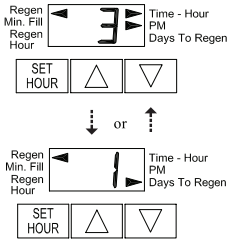
NOTE: If all arrows are turned off in d1-d7, “Days to Regen” in the User Displays will always read 7 and a backwash will never occur.

User Displays

General Operation

When the system is operating one of two displays will be shown. Pressing UP or DOWN button will alternate between the displays. One of the displays is always the current time of day (to the nearest hour). The second display is the days remaining until the next backwash. If the days remaining is equal to one, a backwash will occur at the next preset backwash time. The user can scroll between display as desired.

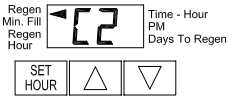
If the system has called for a backwash that will occur at the preset backwash time, the arrow will point to “Regen”.



Backwash Mode

Typically a system is set to backwash at a time of low water usage. An example of a time with low water usage is when a household is asleep. If there is a demand for water when the system is backwashing, untreated water will be used.

When the system begins to backwash, the display will change to indicate the cycle of the backwash process (see Table2) that is occurring and an arrow will also point to “Regen”. The system will run through the steps automatically and will reset itself to provide treated water when the backwash is completed.

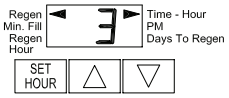


Manual Backwashing

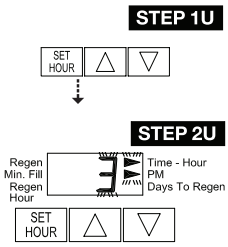
Sometimes there is a need to backwash the system, sooner than when the system calls for it, usually referred to as a manual backwash. There may be a period of heavy water usage because of guests or a heavy laundry day.

To initiate a manual backwash at the preset delayed backwash time, simultaneously press UP + DOWN buttons together and release. The arrow will point to the word “Regen” if a backwash is expected “tonight.” To cancel the regeneration simultaneously press UP + DOWN buttons and release.

To initiate a manual backwash immediately, simultaneously press UP + DOWN buttons together for three seconds. The system will begin to backwash immediately. The request cannot be cancelled.



Set Time of Day



STEP 1U - Press SET HOUR

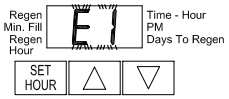
STEP 2U - Current time: Set the clock to the closest hour by using the UP and DOWN button. An arrow points to PM after 12. After a power outage, the time of day will need to be reset. Press SET HOUR to exit.

Power Loss

If the power goes out current time of day will need to be reset. If the power goes out while the system is backwashing, the cycle picks up where it was interrupted when the power returns. Note : The display will flash if a power outage has occurred.

Error Message

If “E1”, “E2” or “E3” appears on the display contact the OEM for help. This indicates that the valve did not function properly.



Installation Fitting Assemblies

The installation fittings connect to the control valve using nuts that only require hand tightening. Hand tighten nut connections between control valve and installation fittings.

Do not use a pipe wrench to tighten nuts on installation fittings. Hand tighten only.

Split ring retainer design holds the nut on and allows load to be spread over the entire nut surface area reducing the chance for leakage. The split ring design, incorporated into the installation fittings allows approximately 2 degrees off axis alignment to the plumbing system. The installation fittings are designed to accommodate minor plumbing misalignments but are not designed to support the weight of a system or the plumbing.

When assembling the installation fitting package, connect the fitting to the plumbing system first and then attach the nut, split ringand o-ring. Heat from soldering or solvent cements may damage the nut, split ring or o-ring. Solder joints should be cool and solvent cements should be set before installing the nut, split ring and o-ring. Avoid getting primer and solvent cement on any part of the o-rings, split rings or control valve.

Solvent cements and primers should be used in accordance with the manufacturerís instructions.

Slip the nut onto the fitting first, then the split ring second and the o-ring last. Hand tighten the nut. If the fitting is leaking tightening the nut will not stop the leak. Remove the nut, remove the fitting, and check for damage or misalignment of the o-ring.

Do not use pipe dope or other sealant on threads. Teflon tape must be used on the threads of the 1” NPT elbow and the 1/4” NPT connection and on the threads for the drain line connection. Teflon tape is not necessary on the nut connection or caps because of o-ring seals.

Do not use Vaseline, oils, or other unacceptable lubricants on o-rings. A silicon lubricant may be used on black o-rings.

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Timer does not display time of day	a. Transformer unplugged	a. Connect power
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective transformer	c. Replace transformer
	d. Defective PC board	d. Replace PC board
2. Timer does not display correct time of day	a. Switched outlet	a. Use uninterrupted outlet
	b. Power outage	b. Reset time of day
	c. Defective PC board	c. Replace PC board
3. Control valve backwashes at wrong time of day	a. Power outages	a. Reset control valve to correct time of day
	b. Time of day not set correctly	b. Reset to correct time of day
	c. Time of backwash incorrect	c. Reset backwash time
4. E1, E2 or E3 **E1 - Unable to recognize start of backwash** **E2 – Unexpected stall** **E3 – Motor ran to long, timed out trying to reach the next cycle position or trying to reach home position**	a. Control valve has just been serviced	a. Press SET HOUR and DOWN for 3 seconds or unplug power source jack (black wire) from the circuit board and plug back in to reset control valve
	b. Foreign matter is lodged in control valve	b. Check piston and spacer stack assembly for foreign matter
	c. High drive forces on piston.	c. Replace piston(s) and spacer stack assembly
	d. Control valve piston not in home position	d. Press SET HOUR and DOWN for 3 seconds or unplug power source jack (black wire) from the circuit board and plug back in to reset control valve
	e. Motor not inserted fully to engage pinion, motor wires broken or disconnected, motor failure	e. Check motor and wiring. Replace motor if necessary
	f. Drive gear label dirty or damaged, missing or broken gear	f. Replace or clean drive gear
	g. Drive bracket incorrectly aligned to back plate	g. Reseat drive bracket properly
	h. PC board is damaged or defective	h. Replace PC board
	i. PC board incorrectly aligned to drive bracket	i. Ensure PC board is correctly snapped on to drive bracket
5. Control valve stalled in backwash	a. Motor not operating	a. Replace motor
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Defective transformer	c. Replace transformer
	d. Defective PC board	d. Replace PC board
	e. Broken drive gear or drive cap assembly	e. Replace drive gear or drive cap assembly
	f. Broken piston retainer	f. Replace drive cap assembly
	g. Broken main or regenerant piston	g. Replace main or regenerant piston
6. Control valve does not backwash automatically when UP and DOWN buttons are depressed and held	a. Transformer unplugged	a. Connect transformer
	b. No electric power at outlet	b. Repair outlet or use working outlet
	c. Broken drive gear or drive cap assembly	c. Replace drive gear or drive cap assembly
	d. Defective PC board	d. Replace PC board
7. Control valve does not backwash automatically but does when UP and DOWN buttons are depressed	a. Defective PC board	a. Replace PC board
	b. Set-up error	b. Check control valve set-up procedure

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