Aqua-Pure®

INSTALLATION AND OPERATING INSTRUCTIONS

CBW SERIES RESIDENTIAL BACKWASH FILTER SYSTEMS

MODELS:

CBW1001	**CBW1001DM**
CBW1501	**CBW1501DM**
CBW2001	**CBW2001DM**

Installer, please leave with homeowner.
Homeowner, retain for future reference.

3M

SAFETY INFORMATION

Read, understand, and follow all safety information contained in these instructions prior to installation and use of the Aqua-Pure® CBW Series Residential Backwash Filter Systems. Retain these instructions for future reference.

Intended use:

The Aqua-Pure CBW Series Residential Backwash Filter Systems are intended for use in treating water in homes and have not been evaluated for other uses. These systems are intended for indoor installations near the entry point of a home water line, and must be installed by qualified professional installers according to these installation instructions.

EXPLANATION OF SIGNAL WORD CONSEQUENCES

⚠ WARNING	Indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury and/or property damage.
⚠ CAUTION	Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury and/or property damage.
CAUTION	Indicates a potentially hazardous situation, which, if not avoided, may result in property damage.

⚠WARNING

To reduce the risk associated with choking:
- **Do not** allow children under 3 years of age to have access to small parts during the installation of this product.

To reduce the risk associated with ingestion of contaminants:
- **Do not** use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

To reduce the risk of physical injury:
- Shut off inlet water supply and depressurize system as shown in manual prior to service.

To reduce the risk associated with a hazardous voltage:
- If the home electrical system requires use of the cold water system as an electrical safety ground, a jumper must be used to ensure a sufficient ground connection across the system installation piping — refer installation to qualified personnel.
- **Do not** use the system if the power cord is damaged — contact qualified service personnel for repair.

To reduce the risk associated with back strain due to the heavy weight of the various system components:
- Follow safe lifting procedures.

⚠ CAUTION

To reduce the risk associated skin, eye, and respiratory tract irritation from gravel and filter media during installation:
- Gravel and several types of filter media may be used in this product, depending upon the application. During installation, dust may cause irritation to skin, eyes, and respiratory tract.
- Utilize a NIOSH-approved dust filter mask, protective gloves, and appropriate eye protection when handling and pouring gravel and filter media.
- To request an MSDS relating to this product, call 203-238-8965 or go to www.3M.com, select country, and use the search engine to search MSDS. For emergencies, call 800-364-3577 or 651-737-6501 (24 hours).

CAUTION

To reduce the risk associated with property damage due to water leakage:
- **Read and follow** Use instructions before installation and use of this water treatment system.
- Installation and use **MUST** comply with existing state or local plumbing codes.
- **Protect from freezing**, relieve pressure and drain system when temperatures are expected to drop below 40°F (4°C).
- **Do not** install on hot water supply lines. The maximum operating water temperature of this system is 100°F (38°C).
- **Do not** install if water pressure exceeds 100 psi. If your water pressure exceeds 80 psi (552 kPa), you must install a pressure limiting valve. Contact a plumbing professional if you are uncertain how to check your water pressure.
- **Do not** install where water hammer conditions may occur. If water hammer conditions exist you must install a water hammer arrester. Contact a plumbing professional if you are uncertain how to check for this condition.
- Where a backflow prevention device is installed on a water system, a device for controlling pressure due to thermal expansion must be installed.
- **Do not** use a torch or other high temperature sources near system.
- On plastic fittings, never use pipe sealant or pipe dope. **Use PTFE thread tape only,** pipe dope properties may deteriorate plastic.
- Take care when using pliers or pipe wrenches to tighten plastic fittings, as damage may occur if over tightening occurs.
- **Do not** install in direct sunlight or outdoors.
- Install system in such a position as to prevent it from being struck by other items used in the area of installation.
- Ensure all tubing and fittings are secure and free of leaks.
- **SHUT OFF FUEL OR ELECTRIC POWER SUPPLY TO WATER HEATER** after water is shut off.
- **Do not** install system where water lines could be subjected to vacuum conditions without appropriate measures for vacuum prevention.
- **Do not** apply heat to any fitting connected to bypass or control valve as damage may result to internal parts or connecting adapters.
- Install on a flat/level surface. It is also advisable to sweep the floor to eliminate objects that could pierce the brine tank.

To reduce the risk associated with property damage due to plugged water lines:
- Pay particular attention to correct orientation of control valve. Water flow should match arrow on control valve. The Inlet and Outlet of other water treatment equipment products will vary depending on the control valve brand used.

IMPORTANT NOTES

- Failure to follow instructions will void warranty.

TABLE OF CONTENTS

SECTION 1: BEFORE INSTALLATION

Inspecting And Handling Your Backwash Filter:

Inspect the equipment for shipping damage. If damaged, notify the transportation company and request a damage inspection.

Handle the filter unit with care. Damage can result if dropped or if set on sharp, uneven projections on the floor. Do not turn the filter unit upside down.

CAUTION

To reduce the risk associated with property damage due to water leakage:

- **Installation must comply** with existing state or local plumbing codes.

Make Sure Your Water Has Been Thoroughly Tested:

An analysis of your water should be made prior to the selection of your water conditioning equipment. Your dealer will generally perform this service for you, and may send a sample to the factory for analysis and recommendations.

Check Your Pumping Rate and Water Pressure:

Two water system conditions must be checked carefully to avoid unsatisfactory operation or equipment damage:

1) MINIMUM water pressure required at the system inlet is 20 psi (138 kPa).

CAUTION

To reduce the risk associated with property damage due to water leakage:

- **Do not** install if water pressure exceeds 100 psi. If your water pressure exceeds 80 psi (552 kPa), you must install a pressure limiting valve. Contact a plumbing professional if you are uncertain how to check your water pressure.

NOTE: Call your local water department or plant operator to obtain pressure readings. If you have a private well, the gauge on the pressure tank will indicate the high and low system pressure. Record your water pressure data below:

Water Pressure:

Low_____ psi High _____psi

CAUTION

To reduce the risk associated with property damage due to water leakage:
- **Do not** install system where water lines could be subjected to vacuum conditions without appropriate measures for vacuum prevention.

The installer is required to take appropriate measures if there is the possibility a vacuum condition may occur. This would include the installation of an appropriate device in the supply line to the system, i.e., a vacuum breaker or backflow prevention device. Vacuum damage voids the factory warranty.

2) The pumping rate of your well must be sufficient for satisfactory operation and backwashing of the system. **(See Specifications And Operating Data, Section 6).**

To measure the pumping rate of your pump, follow these instructions:

a. Make certain no water is being drawn. Open spigot nearest pressure tank. When pump starts, close spigot and measure time (in seconds) to refill pressure tank (when pump shuts off). This figure represents cycle time.

b. With the pressure tank full, draw water into a container of known volume, measure the number of gallons drawn until the pump starts again. This is draw-down. divide this figure by cycle time and multiply the result by 60 to arrive at the pumping rate in gallons per minute (gpm). to aid in your calculation, insert the data in the following formula:

DRAW-DOWN _____ (gals.) ÷ CYCLE TIME _____ (secs.) x 60 = PUMPING RATE _____(gpm)

EXAMPLE:

CYCLE TIME is 65 secs.; DRAW-DOWN is 6 gals.; then PUMPING RATE equals: 6 gals. ÷ 65 secs. x 60 = 5.5 gpm

Installation Site Selection:

Select the location of your system with care. Various conditions which contribute to proper location are as follows:

1) Locate as close as possible to water supply source.

2) Locate as close as possible to a waste drain.

3) Locate in correct relationship to other water conditioning equipment (Figure 1, page 2-1).

4) Locate the system in the supply line BEFORE the water heater. Temperatures above 100°F (38°C) will damage the system and void the factory warranty.

5) DO NOT install the system in a location where freezing temperatures occur. Freezing may cause permanent damage and will also void the factory warranty.

6) Allow sufficient space around the installation for easy servicing.

7) Provide a non-switched 110V, 60Hz power source for the control valve.

⚠ WARNING

To reduce the risk associated with ingestion of contaminants:
- **Do not** use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

CAUTION

To reduce the risk associated with property damage due to water leakage:
- **Protect from freezing**, relieve pressure and drain system when temperatures are expected to drop below 40°F (4°C).
- **Do not** install on hot water supply lines. The maximum operating water temperature of this system is 100°F (38°C).
- **Do not** install in direct sunlight or outdoors.

Facts to Remember While Planning The Installation:

1) All installation procedures MUST conform to local and state plumbing codes.

2) If lawn sprinklers, a swimming pool, or geothermal heating/cooling or water for other devices/activities are to be treated by the system, a larger model MUST be selected to accommodate the higher flow rate plus the backwashing requirements of the system. Consult your Dealer/Installer or our Customer Service Department at 1-800-222-7880 for alternative instructions if the pumping rate is insufficient.

3) Remember that the system inlet is attached to the pipe that supplies water (i.e. delivers water from the well pump or after the water meter) and the outlet is the line that runs toward the water heater.

CAUTION

To reduce the risk associated with property damage due to plugged water lines:

- Pay particular attention to correct orientation of control valve. Water flow should match arrow on control valve. The Inlet and Outlet of other water treatment equipment products will vary depending on the control valve brand used.

4) Before beginning the installation review the existing piping system and to determine the size, number and type of fittings required.

⚠ WARNING

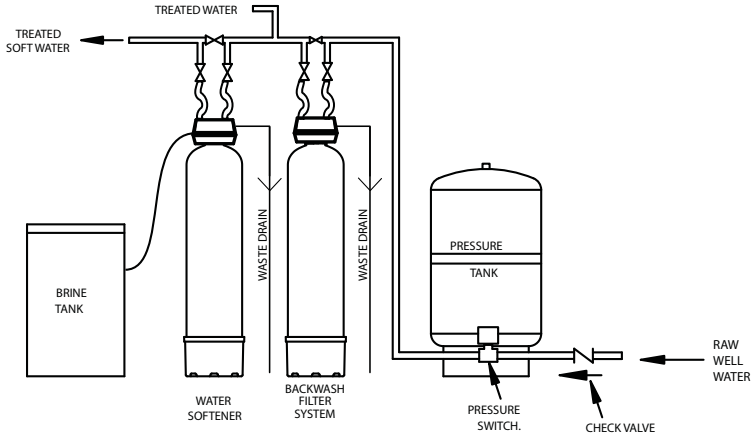
To reduce the risk associated with a hazardous voltage:

- If the home electrical system requires use of the cold water system as an electrical safety ground, a jumper must be used to ensure a sufficient ground connection across the system installation piping — refer installation to qualified personnel.

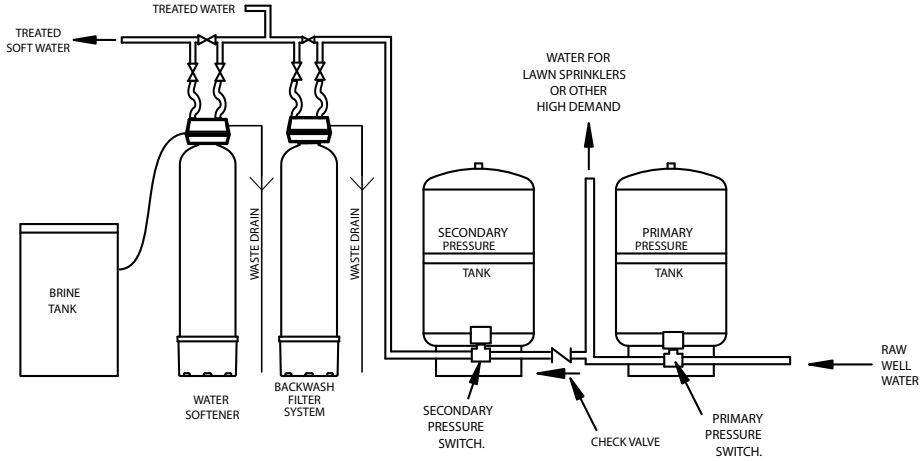
5) Sweep the floor to eliminate objects that could pierce the media tank.

SECTION 2: INSTALLATION

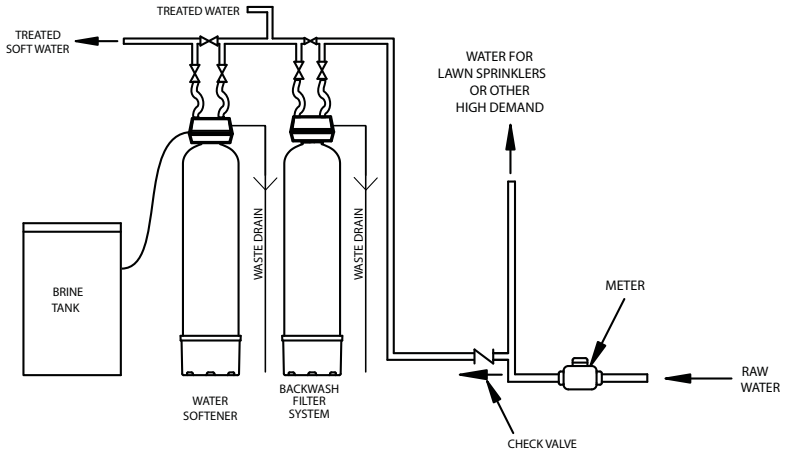
Proper installation sequence of the backwash filter system is very important. Refer to the diagram below for your particular supply.



TYPICAL WELL INSTALLATION



TYPICAL SPLIT-STREAM INSTALLATION



TYPICAL PUBLIC WATER SUPPLY INSTALLATION

Figure 1

CAUTION

To reduce the risk associated with property damage due to water leakage:

- **Read and follow** Use instructions before installation and use of this water treatment system.
- Installation and use **MUST** comply with existing state or local plumbing codes.

To reduce the risk associated with property damage due to plugged water lines:

- Pay particular attention to correct orientation of control valve. Water flow should match arrow on control valve. The Inlet and Outlet of other water treatment equipment products will vary depending on the control valve brand used.

Step 1

a) Remove cardboard die-cut from media tank.

b) Remove valve assembly from cardboard die-cut and set aside.

c) Remove distributor tube from media tank and set aside.

⚠ CAUTION

To reduce the risk associated skin, eye, and respiratory tract irritation from gravel and filter media during installation:

- Gravel and several types of filter media may be used in this product, depending upon the application. During installation, dust may cause irritation to skin, eyes, and respiratory tract.
- Utilize a NIOSH-approved dust filter mask, protective gloves, and appropriate eye protection when handling and pouring gravel and filter media.
- To request an MSDS relating to this product, call 203-238-8965 or go to www.3M.com, select country, and use the search engine to search MSDS. For emergencies, call 800-364-3577 or 651-737-6501 (24 hours).

d) Using a clean pail, pour the gravel from the media tank into the pail.

e) Next, ensure the distributor tube is covered with the centering tool provided. Reinstall the distributor tube into the dimple located at the base of the media tank. Add the gravel back to the media tank, gently rock the media tank to ensure the gravel under-bed is evenly distributed.

f) Locate filter media and add the required amount up to the indicator line on the media tank, move the media tank to approximate final installation location. Using a clean pail or water hose, fill the media tank with water to the opening to expel any air pockets.

g) Using a clean rag, clean the opening of the media tank to ensure all dust or media particles are removed from the media tank opening. Locate and install the control valve into the opening of the media tank and secure the valve assembly by rotating to the right or clockwise until valve head assembly is seated to the tank hand tight.

h) Assemble and attach bypass valve to the control valve. See Figure 2 if needed. Arrows can be viewed on the bypass valve to confirm the correct flow path. At this time make certain the bypass valve is in the bypass position and leave in that position until instructed to place in the service position. Refer to Figure 2 for proper operation.

CAUTION

To reduce the risk associated with property damage due to plugged water lines:

- Pay particular attention to correct orientation of control valve. Water flow should match arrow on control valve. The Inlet and Outlet of other water treatment equipment products will vary depending on the control valve brand used.

Step 2

Shut off all water at main supply. On a private well system, turn off power to pump and drain pressure tank. Make certain pressure is relieved from complete system by opening nearest faucet to drain system. If an electric water heater is being used, ensure that power to the unit is shut off. Close the inlet/outlet isolation valves on all water heaters to prevent the drainage of the water heater.

Step 3

Determine location and cut the water line on the supply side of the pressure tank as required to fit the plumbing to the control valve connection fittings. You may want to install a separate three valve bypass prior to the control valve in case the supplied bypass valve requires maintenance in order to provide undisturbed water use.

Step 4

Attach plumbing. Make certain water flow enters through inlet and discharges through outlet.

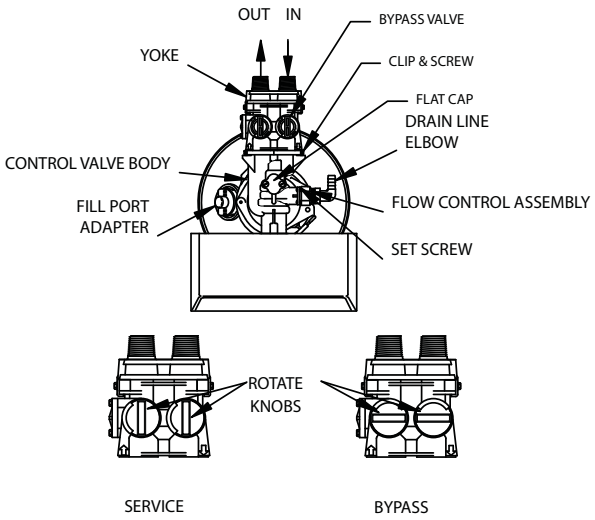


Figure 2 . INLET/OUTLET CONNECTIONS

CAUTION

To reduce the risk associated with property damage due to water leakage:

- **Do not** use torches or other heat sources near plastic plumbing, as damage may occur.
- Take care when using pliers or pipe wrenches to tighten plastic fittings, as damage may occur.
- On plastic fittings, use thread sealing tape only. Never use pipe sealant or pipe dope on plastic fittings, as damage may occur.

Step 5

Loosen set-screw and pull out drain line flow control (DLFC) assembly from valve body (see Figure 2). Unscrew drain line elbow from DLFC. Apply PTFE tape to threads. Reassemble to valve body, making certain DLFC assembly is fully inserted into valve body before tightening set-screw.

Attach drain line to drain line fitting. To prevent back pressure from reducing flow rate below minimum required for backwash, drain line must be sized according to run length and relative height. Be careful not to bend flexible drain tubing sharply enough to cause "kinking" (if kinking occurs drain line must be replaced!).

Typical examples of proper DRAIN LINE diameters are:

1) 1/2 in. ID up to 15 ft. when discharge is lower than inlet.
2) 5/8 in. ID up to 15 ft. when discharge is slightly higher than inlet.
3) 3/4 in. ID when drain is 25 ft. away and/or drain is installed overhead.

Some areas prohibit the use of flexible drain lines. Check with local code officials prior to installation.

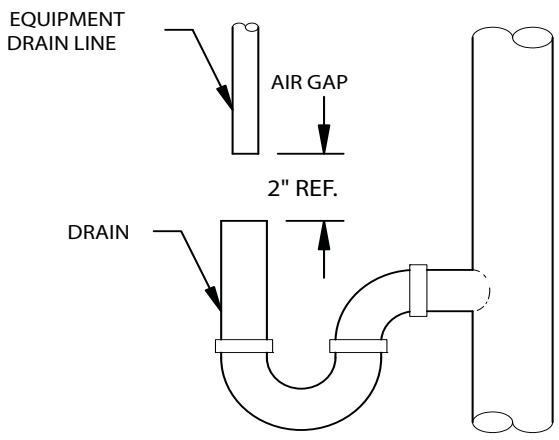


Figure 3. DRAIN

Step 6

Position the drain line over the waste drain pipe and secure firmly. To prevent back siphoning of sewer water or grey water, provide an air gap of at least two inches or 2 times the pipe diameters between the end of drain line tubing and waste drain (Figure 3). Do not raise the drain line more than 10 feet above the floor. Check with local code officials to ensure you conform to local, state and national plumbing codes.

Step 7

a) Turn on power to well pump and plug control valve power cord into 110V/60Hz, non-switched power source. Manually stage control to backwash position (Refer to page 3-1) and then unplug power cord to prevent the unit from advancing automatically. Open bypass valve inlet knob approximately 1/4 of the way to full open (service position) this will purge any entrapped air in the media bed to drain.

IMPORTANT NOTE

Filters containing activated carbon, Filter-Ag® or iron reduction media must be saturated for at least four (4) hours prior to subjecting the unit to full backwash flow rates. Failure to do this may result in loss of mineral during initial backwash procedure.

Saturation Time Table	
Media	**Time Required**
Activated Carbon	4 hours
Iron and Manganese Standard Media	30 Minutes or less
Filter-Ag®	4 Hours
Filter Sand	None required
Multi-Layered Media	4 Hours
Neutralizer	30 minutes or less
Sulfur	30 Minutes or less
Calcium Carbonate	30 Minutes or less
Magnesium Oxide	30 Minutes or less

b) Once a steady stream of water is flowing to drain, open both the bypass valve inlet and outlet knobs completely. Check for leaks. Leave unit in backwash for at least 10 minutes or until drain line water runs clear, whichever is longer. After this preliminary backwash, stage control valve to service position and plug timer into a 110/120V, 60 Hz non-switched power source (Refer to page 3-2). Manually initiate a complete backwash process, allowing unit to automatically proceed through a backwash and rapid rinse. Check drain water at end of rapid rinse cycle.

Step 8

Set the time of day by referring to Page 3-1 "How To Set The Time-Of-Day". Set backwash frequency (see Determine Backwash Frequency.)

INSTALLATION IS NOW COMPLETE AND SYSTEM IS READY FOR SERVICE

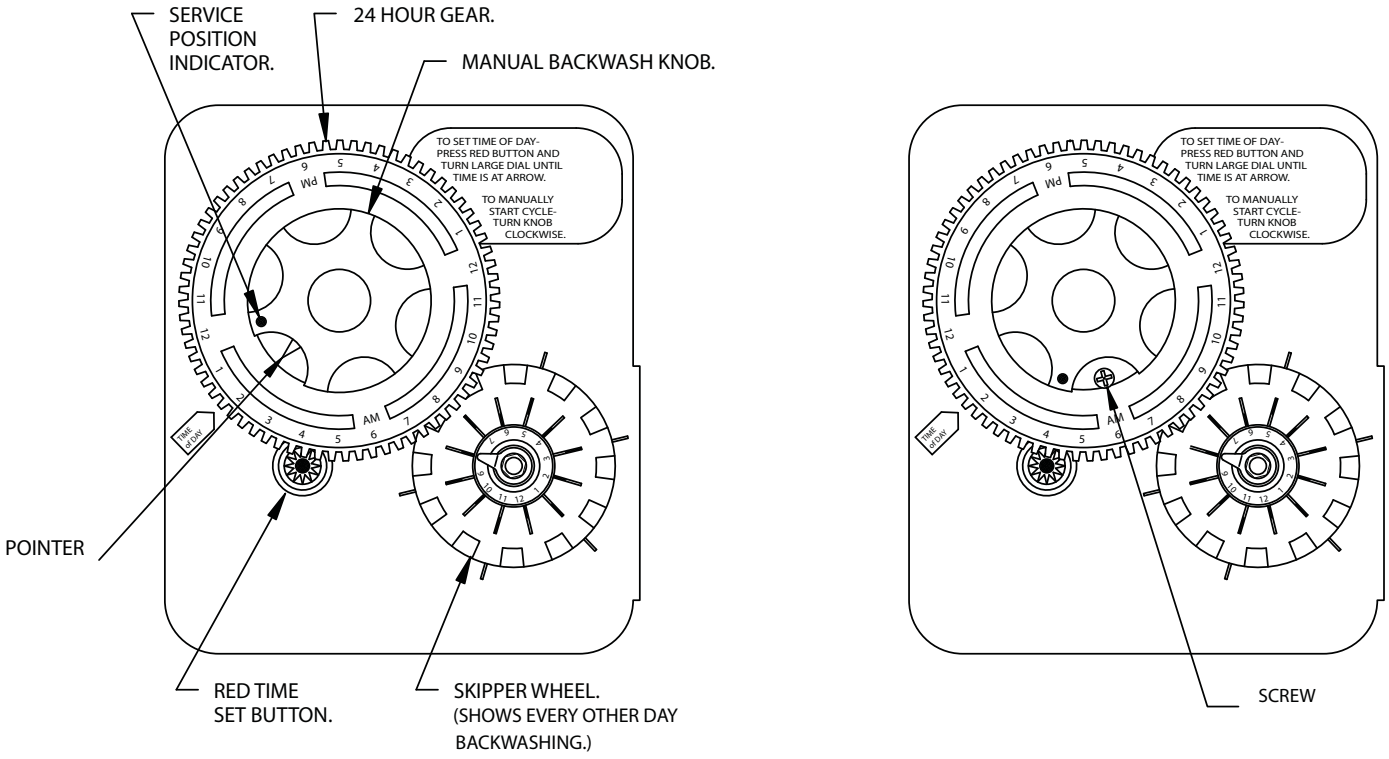
Determine Backwash Frequency

The exact backwashing frequency depends on the quality of the raw water, but it is recommended that filters containing activated carbon, Filter-Ag or filter sand be programmed to backwash at least once every four days. If pressure drop becomes excessive, contaminant reappears in the treated water before four days, increase the frequency.

Filters containing neutralizer, calcium carbonate or magnesium oxide should be backwashed every three days to prevent the media particles from cementing together.

SECTION 3: BACKWASHING INSTRUCTIONS

HOW TO SET TIME CONTROL



HOW TO SET DAYS ON WHICH FILTER IS TO BACKWASH:

Rotate the skipper wheel until the number "1" is at the red pointer. Set the days that backwash is to occur by sliding tabs on the skipper wheel outward to expose trip fingers. Each tab is one day. Finger at red pointer is tonight. Moving clockwise from the red pointer, extend or retract fingers to obtain the desired backwashing schedule:

HOW TO SET THE TIME-OF-DAY:

1) Press and hold the red button in to disengage the drive gear.
2) Turn the large gear until the actual time of day is opposite the time of day pointer. Unit will now be set to backwash at 1:00 a.m. (See below to adjust this time.)
3) Release the red button to again engage the drive gear.

HOW TO MANUALLY BACKWASH YOUR FILTER AT ANY TIME:

Turn the manual backwash knob to the right until the knob engages the program wheel. This slight movement of the knob will start the backwash program.

The backwash knob will make one revolution in approximately three hours and stop in the position shown in the drawing. Even though it takes three hours for the knob to complete one revolution, the backwash cycle of your unit might be only 12 to 20 minutes in duration.

Filtered water may be drawn after rinse water stops flowing to drain.

How to Adjust Backwash Time:

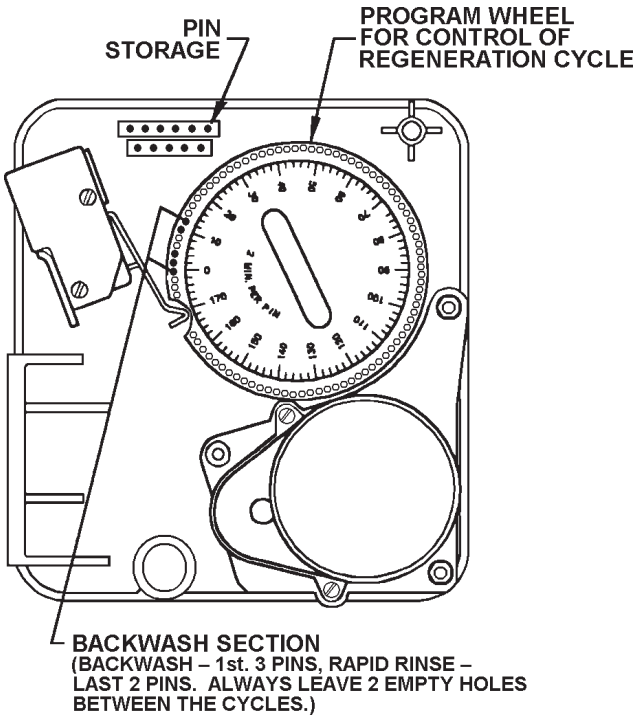
1) Disconnect the power source.
2) Locate the three screws behind the manual backwash knob by pushing the red button in and rotating the 24 hour dial until each screw appears in the cut out portion of the manual backwash knob.
3) Loosen each screw slightly to release the pressure on the time plate from the 24 hour gear.
4) Locate the backwash time pointer on the inside of the 24 hour dial in the cut out.
5) Turn the time plate so the desired backwash time aligns next to the raised arrow.
6) Push the red button in and rotate the 24 hour dial. Tighten each of the three screws.
7) Push the red button and locate the pointer one more time to ensure the desired backwash time is correct.
8) Reset the time of day and restore power to the unit.

HOW TO SET THE BACKWASH CYCLE PROGRAM:

The backwash cycle program on your filter has been factory preset. However, portions of the cycle or program may be lengthened or shortened in time to suit local conditions.

To expose cycle program wheel, grasp timer in upper left-hand corner and pull, releasing snap retainer and swing timer to the right.

To change the backwash cycle program, the program wheel must be removed. Grasp program wheel and squeeze protruding lugs towards center, lift program wheel off timer. (Switch arms may require movement to facilitate removal.)



HOW TO CHANGE THE LENGTH OF THE BACKWASH TIME:

The program wheel as shown in the drawing is in the service position. As you look at the numbered side of the program wheel, the group of pins starting at zero determines the length of time that your unit will backwash.

FOR EXAMPLE: If there are three pins in this section, the time of backwash will be six minutes (2 min. per pin). To change the length of backwash time, add or remove pins as required. The number of pins times two equals the backwash time in minutes.

HOW TO CHANGE THE LENGTH OF RAPID RINSE TIME:

The second group of pins on the program wheel determines the length of time that your filter will rapid rinse (2 min. per pin.)

To change the length of rapid rinse, add or remove pins at the higher numbered end of this cycle as required (See note below). The number of pins times two equals the rapid rinse time in minutes.

The backwash cycle is complete when the outer micro-switch drops off the last pin in the rapid rinse group of pins. The program wheel, however, will continue to rotate until the inner micro-switch drops into the notch on the program wheel.

IMPORTANT NOTE
There must always be two empty holes between the backwash and rapid rinse cycles for proper cycle staging.

Return program wheel to timer and return timer to closed position engaging snap retainer in back plate. Make certain all electrical wires locate above snap retainer post.

HOW TO MANUALLY CYCLE PROGRAM:

Manually cycling control is useful when it is desirous to check control functions. Slowly rotate programming wheel counter clockwise until valve drive motor engages. Release program wheel until motor stops. Control will be in backwash cycle. Continue rotating wheel repeating above procedure and motor will drive piston to the second (intermediate) position. Repeating procedure will cause motor to drive piston to rapid rinse position. Control may be returned to service by rotating program wheel to home position (micro-switch lever will drop into notch on program wheel).

SECTION 4: MAINTENANCE

General Maintenance

1) At least every six (6) months, you should check the time of day setting. Power outages will cause the unit to lose time.
2) If your unit contains activated carbon, you must replace the carbon and gravel underbed at least every three (3) years. Replacement may be required sooner, if the issue being treated reappears in the treated water or pressure drop becomes excessive.
3) Filter-Ag® and filter sand will last an indefinite period of time. It may be necessary to replace them, if the pressure drop across the filter becomes too greate or filtration results drop.
4) Neutralizer media, calcium carbonate or magnisium oxide must be replenished at least annually. At the time of installation, it is advisable to mark the level of the media on the outside of the tank. At a later date, you can shine bright light through the tank, comparing the current level with the mark. If the level is down by more than three (3) inches, add media back to the original mark.
5) Birm should be replaced when iron reappears in the treated water and backwashing does not return the media to a functional form.

Special Service Instructions:

Under normal circumstances removal of the valve should not be required. However, if it must be removed, disconnect the plumbing attached to the bypass valve first. Then, rotate the valve head assembly to the left or counter-clockwise. Before attempting any disassembly, pressure should be relieved by shutting off water to the system and opening a faucet. Upon reassembly, all o-rings should be lubricated with silicone grease. Reattach valve head assembly by rotating to the right or clockwise until valve head assembly is seated to the tank hand tight. Reconnect the plumbing to the bypass valve.

Replenishing Media:

CAUTION

To reduce the risk associated skin, eye, and respiratory tract irritation from gravel and filter media during installation:

- Gravel and several types of filter media may be used in this product, depending upon the application. During installation, dust may cause irritation to skin, eyes, and respiratory tract.
- Utilize a NIOSH-approved dust filter mask, protective gloves, and appropriate eye protection when handling and pouring gravel and filter media.
- To request an MSDS relating to this product, call 203-238-8965 or go to www.3M.com , select country, and use the search engine to search MSDS. For emergencies, call 800-364-3577 or 651-737-6501 (24 hours).

Threaded Tank Models: CBW1001, CBW1501, CBW2001 (For Dome Hole Tank Models: CBW1001DM, CBW1501DM, CBW2001DM, please refer to media replacement instructions on page 4-2):

1) Pressure must be relieved on water treatment system by turning the bypass valve to the bypass position. Then initiate an immediate manual backwash cycle as described on Page 3-1.
2) Disconnect the power cord from the electrical outlet.
3) Remove the drain line for the control valve. Remove the control valve by rotating the valve head assembly to the left or counter-clockwise and set aside to reassemble after media is loaded into the tank.
4) Using flexible tubing, insert down the distributor tube and siphon the water from the media tank to aid in adding or replacing filter media. Cover the distributor tube with the centering tool to prevent media from entering the distributor tube.
    a. If using calcite, magnesium oxide or neutralizer media, add the media you are using to the line on the side of the media tank. Then refill the media tank with water utilizing a hose or clean bucket. Proceed to Step # 5.
    b. If utilizing activated carbon media that needs to be entirely replaced you will need to empty the media tank of both the gravel underbed and media. The use of a garden hose and several buckets to place the spent media into is helpful. The changing of the media should take place outdoors as this can be messy. Once the media tank is emptied, you can rinse the media tank out and inspect the distributor for damage or fines being lodged into the slots of the basket assembly. Clean as required before loading the media with gravel or filter media. Place the distributor into the media tank and ensure it is in the dimple on the bottom of the media tank. Utilizing the extension tube, red cap and funnel place over the distributor tube and into the opening of the flanged tank. Next take the correct amount of gravel and dump into the media tank. Hold the distributor tube and gently shake the media tank to level the gravel in the media tank. Next load the filter media into the media tank to the proper level. This can be determined by observing the media level line on the outside of the media tank. Gently shake the media tank to level the media. Using a hose or clean bucket fill the media tank with water to help saturate the filter media before placing the control valve on the media tank. Using a clean rag or paper towel, wipe the opening of the media tank to remove any media fines before attaching the control valve. **Dispose of spent media in accordance with federal, state, and local regulations.**
5) Prior to reattaching valve head assembly to the tank, inspect the o-ring for wear. If none, lubricate with silicone grease or water. Reattach valve head assembly by rotating to the right or clockwise until valve head assembly is seated to the tank hand tight.
6) Reattach the bypass valve to the control valve and slowly open the bypass. Allow the backwash filter system to fill with water and set for the required time period.
7) Plug the control valve into the electrical outlet and set the time of day on the display.
8) Once the saturation time has been achieved, manually initiate an immediate backwash (see Page 3-1). Backwash the media until the water runs clear. Observe the color of the water in the drain line discharge to determine if is has washed long enough. The water should be fairly clear and absent of fines before quitting the cleaning process. If not, proceed to regenerate the unit again until the water runs clear to the waste drain.
9) Replenishing or re-bedding of media tank is now complete.

Dome Hole Tank Models: CBW1001DM, CBW1501DM, CBW2001DM:

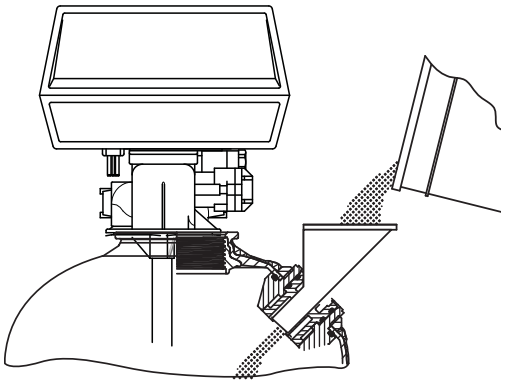
10) Follow steps 1 - 2 on previous page.

a. Add media through fillport cap located on tank using funnel (See FILLING MEDIA TANK below). Fillport cap can be removed by turning a quarter turn counter clockwise.

⚠ CAUTION

To reduce the risk associated with skin, eye, and respiratory tract irritation from dust from filter media during installation:

- Gravel and several types of filter media may be used in this product, depending upon the application. During installation, dust may cause irritation to skin, eyes, and respiratory tract, and may affect lungs.
- Utilize a NIOSH-approved dust filter mask and appropriate eye protection when handling and pouring gravel and filter media.
- To request an MSDS relating to this product, call 203-238-8965 or go to www.3M.com , select country, and use the search engine to search MSDS. **For emergencies, call 800-364-3577 or 651-737-6501 (24 hours).**



FILLING MEDIA TANK

b. Reinstall fillport cap by turning a quarter turn clockwise.

c. If bypass valve assembly is not factory pre-installed, attach using clips and screws.

d. Using a clean dry rag, wipe the opening of the media tank to remove any dust or residue from the opening to receive the control valve. Attach the valve head to the media tank by rotating the valve head assembly to the right (clockwise).

SECTION 5: TROUBLESHOOTING

PROBLEM		CAUSE		SOLUTION	
1	Excessive pressure drop through filter.	A	Filter not backwashing.	1	Check timer motor and replace as necessary.
				2	Check for uninterrupted power supply
				3	Check backwash frequency. Make sure fingers are extended on days backwash is to occur.
		B	Filter bed loaded with sand.	1	Verify sediment being treated is less dense than the filter media.
		C	Cementing or channeling of media	1	Probe bed for this condition. Verify adequate pumping rate for backwashing.
				2	Check for frozen, plugged or restricted drain line.
				3	Check for adequate backwash frequency.
2	Contaminant not being properly treated	A	Leaking bypass valve.	1	Check bypass valve in service potion. Repair or replace if necessary.
		B	Internal valve leak.	1	Check piston, spacers and seals. Replace as necessary.
		C	Distributor not properly seated in control valve.	1	Make sure distributor is in tube adaptor protruding from bottom of control valve.
				2	Check distributor o-ring. Replace as necessary.
		D	Flow rate too high for filter	1	Check demand requirements against filter recommended flow rates.
3	pH too high (neutralizer)	A	Filter media is brand new.	1	Open the bypass valve slightly, allowing some water to bypass the unit.
		B	Wrong media used.	1	Magnesium oxide is used when neutralizer blend should have been used. Open the bypass valve slightly or rebed unit.
4	pH too low (neutralizer)	A	Flow rate is too high.	1	Verify demand rate does not exceed filter rating.
		B	Filter bed cemented or channeled.	1	Verify adequate pumping rate for backwashing unit.
				2	Check drain line for freezing, plugging or restrictions.
5	Iron present in water	A	pH too low.	1	pH of raw water must be 6.8 units or higher. Adjust with proper equipment.
		B	Dissolved oxygen level inadequate.	1	Venturi assembly may be installed prior to filter.

SECTION 6: SPECIFICATION AND OPERATING DATA

ITEM	CBW1001	CBW1501	CBW2001
Nominal Media Volume, cu. ft. (cu. mtr.)	1.0 (0.03)	1.5 (0.04)	2.0 (0.06)
Gravel Underbed, lbs. (kg)	18 (8.2)	18 (8.2)	25 (11)
Flow Rates, gpm (lpm) (2) Service (10 min. or less)	5.0 (18.9)	6.0 (22.7)	7.0 (26.5)
Backwash Flow Rate, gpm (lpm) (2)	5.0 (18.9)	5.0 (18.9)	7.0 (26.5)
Inlet/Outlet Pipe Size, inches (cm)	1 (2.5)		
Media tank Diameter x Height, inches (cm)	10 x 44 (25.4 x 111.8)	10 x 54 (25.4 x 137.2)	12 x 52 (30.5 x 132)
Minimum Space Required, inches (cm) Width Depth (w/Bypass) Height (Including Valve)	 12 (30.5) 16 (40.6) 56 (142.2)	 12 (30.5) 16 (40.6) 75 (190.5)	 12 (30.5) 16 (40.6) 73 (185)
Approximate Shipping Weight, lbs. (kg)	62 (28)	68 (31)	71 (32)

Maximum operating temperature 100º F (38º C)

Electrical requirements 110V/60Hz

Operating pressure 20-100 psi.

Specifications are subject to change without notice.

NOTES:

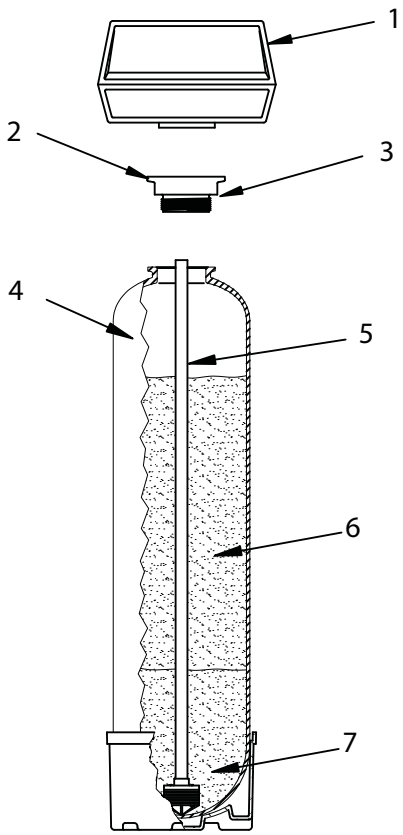
1) For satisfactory performance, indicated durations should not be exceeded. Flow rates specified are adequate for normal residential applications. Do not use Service or Peak flow rates when sizing commercial applications or if treated water is to supply a geothermal heat pump, swimming pool, etc. (contact dealer before selecting equipment). Service flow rates have been tested against NSF Standard 42 and have a rated pressure drop of less than 10 psi.

2) For system to operate properly, pumping rate of well pump MUST be sufficient to backwash unit at rate specified.

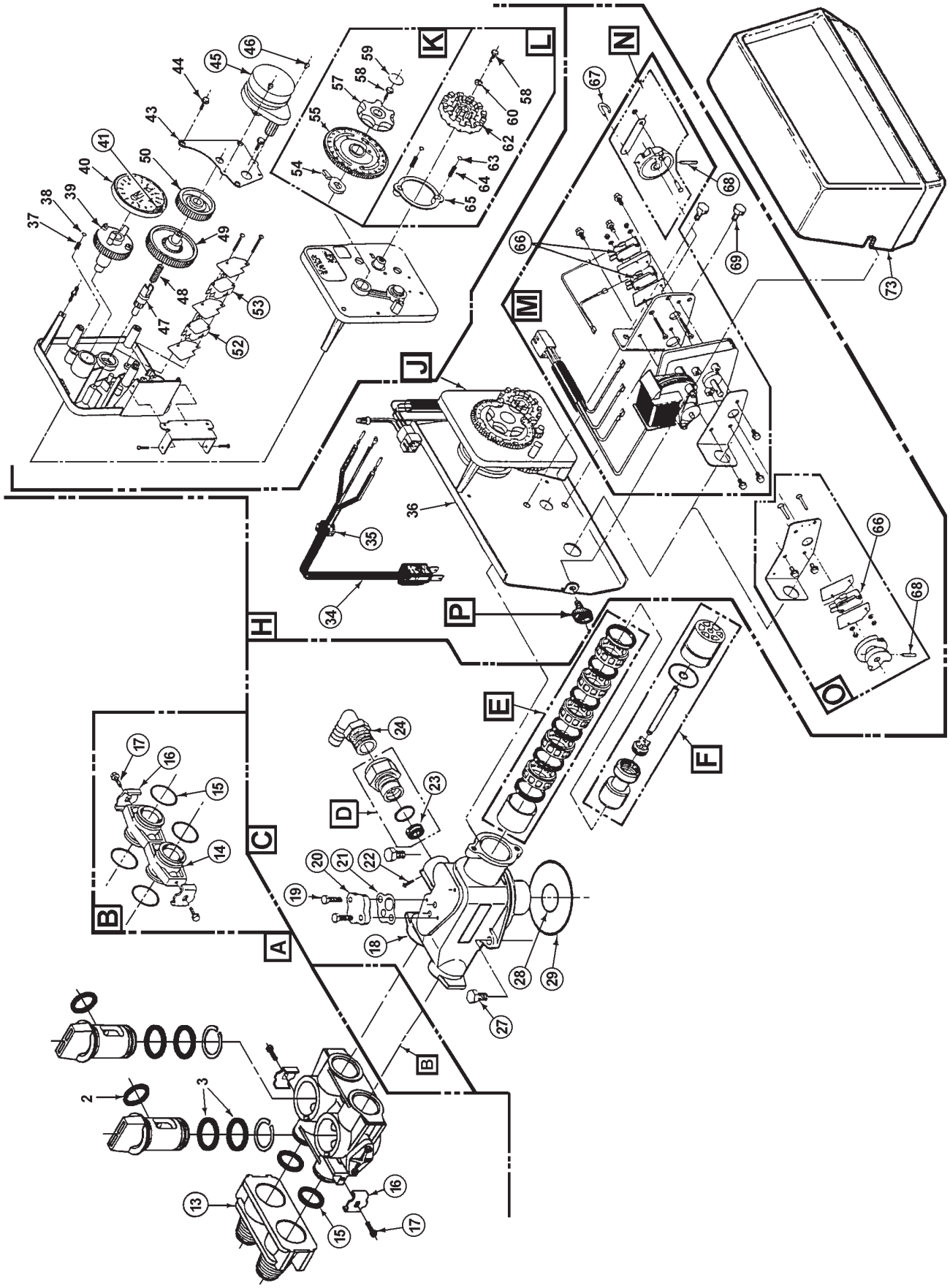
COMPONENT PARTS LIST

REF	Description	CBW1001 CBW1001DM	CBW1501 CBW1501DM	CBW2001 CBW2001DM
1	Control valve, complete, less bypass	C210500-003	C210500-003	C210700-003
2	Adapter Assembly, Threaded Tank (includes ref 3)	52-87001	52-87001	52-87001
3	O-Ring	10381	10381	10381
4	Standard Media Tank w/Base	6236001-1044	6236001-1054	6236001-1252
4a	Dome Hole Media Tank w/Base	6238601-1044	6238601-1054	6238601-1252
5	Distributor	62364-35	62364-40	62364-39
6	Media (Various Types)	1.0 CF	1.5 CF	2.0 CF
7	Gravel Underbed	QC-18	QC-18	QC-22
Not Shown	Standard Media Fill Funnel	U1006	U1006	U1006
Not Shown	Dome Hole Media Fill Funnel	6238731	6238731	6238731

NOTE: When ordering components, always specify model number.



CEC1000 SERIES BACKWASH CONTROL



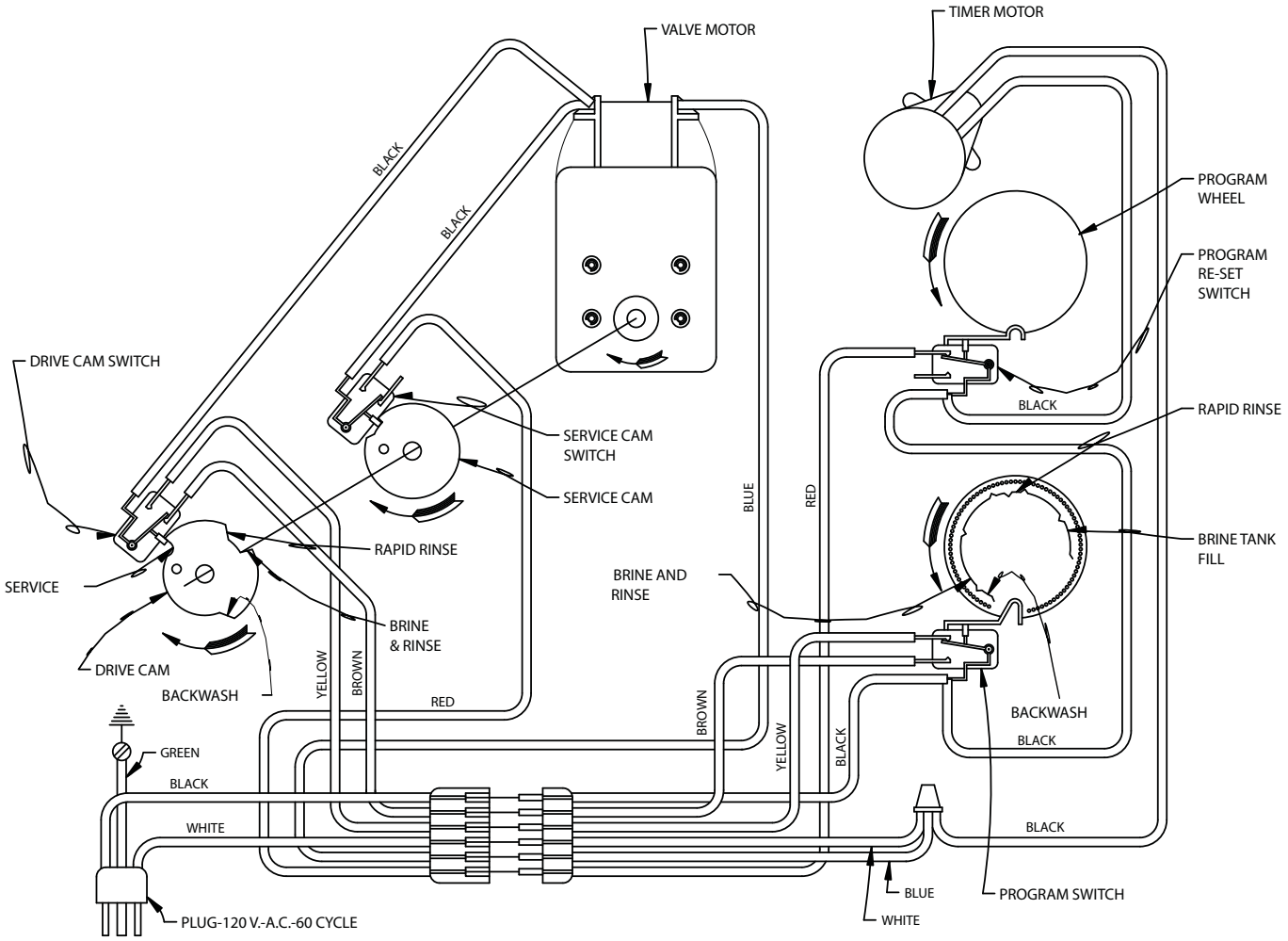
ONLY THOSE PARTS CIRCLED IN DRAWING ON PREVIOUS PAGE AND/OR LISTED BELOW ARE STOCK ITEMS.

ALL OTHERS ARE SPECIAL ORDER, NON-RETURNABLE.

BACKWASH CONTROL 12 Day Timer

REF.	PART NO.	DESCRIPTION
A	60049/18706X 60049/18706-02X	1" Bypass Valve Assy. (Incl. Ref Items 2, 3, 13, 15, 16 and 17) 3/4" Bypass Valve Assy. (Incl. Ref Items) (Optional)
B	10090x	Adapter Coupling Assy. (Incl. 2 ea. Ref Items 18-33, E and F) (Specify Model)
C	10070	Control Valve Body Assy. (Incl. Ref Items 18-33, E and F) (Specify Model)
D	60705	Drain Line Flow Control Assy. (Specify Size)
E	60121C	Seal Kit
F	60090	Piston Kit
H	60407-BW	Power Head Assy., 1/Cover (Incl. Ref. Items 34-72 and F)
J	60304B-13	Timer Assy. (1:00 a.m. Init) (Incl. Ref Items 37-65)
K	13007X	24-Hour Gear Assy. (Incl. Ref. Items 54-59)
L	14381X	Skipper Wheel Assy. (Incl. Ref Items 58 and 60-65)
M	60050	Drive Motor Assy., Complete (Specify Model) (Incl. Ref. Items 66 and N)
N	60160-00	Drive Cam Assy. - White
O	10025X	FAS Switch Assy. (Optional) (Incl. Ref. Items 66 and 68)
P	19367	Cover Mounting Screw
2	18660	O-Ring
3	18661	O-Ring (ORG-218)
13	18706-02	3/4" NPT Adapter Yoke
	18706	1" NPT Adapter Yoke
14	13709	Adapter Coupling
15	13305	Coupling O-Ring
16	13255	Adapter Clip
17	13314	Screw-Adapter Coupling
18	15058	Control Valve Body - CEC1000
19	12112	Hex Head Machine Screw
20	11893	Injector Flat Cap - CEC1000
21	11475	Injector Body Gasket
22	11180	Flow Control Retainer Screw
23		DLFC Button (Listed by Model Series:
	12092	5.0 GPM (1001, 1501)
	12408	7.0 GPM (2001)
24	12338	Drain Ftg. Elbow (1/2" Thread to Hose)
27	BLT0015	Hex Head Cap Screw
28	11710	Inside Tube O-Ring
29	11208	Seal O-Ring
34	11838	Power Cord, 7 ft.
35	13547	Strain Relief - Flat Cord
41	15493	Roll Pin
45	18743	Timer Motor, 110V/60Hz
56	13278	Screw-Motor Mounting
52	10896	Micro-Switch
53	15320	Micro-Switch
66	10218	Micro-Switch
67	10909	Connecting Rod Pin
68	10338	Drive Roll Pni
69	10231	Box Mounting Screw
73	14779-5P	Control Cover (Specify Model)

WIRING DIAGRAM FOR VALVE DRIVE MOTOR AND TIMER
CEC1000 SERIES VALVES



SECTION 7: LIMITED WARRANTY

Limited Warranty: 3M Purification Inc. warrants this Product to be free from defects in material and workmanship during normal use for the warranty period set forth below. The warranty period commences from the date of purchase. This warranty does not cover failures resulting from abuse, misuse, alteration or damage not caused by 3M Purification Inc. or failure to follow installation and use instructions. No warranty is given as to the service life of any filter cartridge, membrane, or media as it will vary with local water conditions and water consumption.

3M PURIFICATION INC. MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOMER OR USAGE OF TRADE.

If the Product is found defective within the warranty period, your exclusive remedy and 3M Purification Inc.'s sole obligation shall be, at 3M Purification Inc.'s option, to replace or repair the Product or refund the purchase price of the Product. This warranty does not cover labor. The remedy stated in this paragraph is Customer's sole remedy and 3M Purification Inc.'s exclusive obligation.

Warranty Period:
- One (1) year on the entire product unit
- Five (5) years on the media tank only (does not include internal component parts)
- Five (5) years on the control valve
- Five (5) years on salt storage container and components*

Limitation of Liability: 3M Purification Inc. will not be liable for any loss or damage arising from this 3M Purification Inc. product, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability. Some states and countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Warranty Claims:
To obtain warranty service, call 1-877-238-9119 or mail your request to: 3M Purification Inc., 400 Research Parkway, Meriden, CT 06450. Proof of purchase (original sales receipt) must accompany the warranty claim, along with a complete description of the Product, model number and alleged defect. **This warranty gives you specific legal rights, and you may have other rights which may vary from state to state, or country to country.**

* Systems only

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