INSTALLATION AND OPERATING INSTRUCTIONS

CBF SERIES RESIDENTIAL BACKWASH FILTRATION SYSTEMS

MODELS:

CBF100
CBF150
CBF200
CBF200 CJ-L

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

INSTR2189 0710

3M

SAFETY INFORMATION

Read, understand, and follow all safety information contained in these instructions prior to installation and use of the CBF Series Residential Backwash Filtration Systems. Retain these instructions for future reference. Failure to follow installation, operation and maintenance instructions may result in property damage and will void warranty.

Intended use:
The CBF Series Residential Backwash Filtration Systems are intended for use in reducing certain undesirable contaminants in water in homes and have not been evaluated for other uses. The systems must be installed indoors near the point of entry of a home water line, and 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 Filtration 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 visit the web at http://solutions.3M.com/WPS/Portal/3M/EN_US/MSDS (click MSDS search). 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 33°F (0.6°C).
- **Do not** install on hot water supply lines. The maximum operating water temperature of this filter system is 110°F (43.3°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 filter system, cartridges, plastic fittings or plastic plumbing.
- 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.
- Mount 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 mineral 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.

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- **Professional Installation Required:** Installation requires shutting water off to home, cutting home water supply pipe and using a soldering torch to add piping and fittings. Specialized tools and skills are required. Not a do-it-yourself type of project. **Professional installation required!**

IMPORTANT: SECTION 1: BEFORE INSTALLATION

Inspecting And Handling Your Filtration System:

Inspect the equipment for shipping damage. If damaged, notify the transportation company and request a damage inspection. Handle the system with care. Damage can occur if dropped or set on sharp, uneven projections on the floor. Do not turn the system upside down.

We Recommend Testing Your Water Prior to Installation:

Visit www.aquapure.com for water testing information. An analysis of your water should be made prior to the selection of your water conditioning equipment and filter media. Enter your water analysis results below for a permanent record.

IMPORTANT NOTE:

Hydrogen sulfide (H2S) must be tested for at the well site. For accuracy, the sample must be drawn with the pump RUNNING and the test be completed within ONE minute after the sample is drawn.

Analysis Of Your Water

Hardness _____	gpg	Tannins (Humic Acid) _____	ppm
Iron (Fe) _____	ppm	Hydrogen Sulfide (H_2S) _____	ppm
Manganese (Mn) _____	ppm	Other _____	ppm
pH _____	ppm	Other _____	ppm

There are several different filter media which can be used in this filter. Each is designed to improve a particular aesthetic problem. None of them should be used to make non-potable water safe to drink. The following descriptions indicate not only what the media is designed to do, but also points out their limitations.

Activated Carbon

Activated carbon is generally used to reduce objectionable tastes and odors from water, chlorine being the most common. Activated carbon works primarily on the concept of adsorption. Each particle of carbon has numerous pores through which the water passes. It is in these pores that the reduction of unwanted contaminants occurs. During backwash, these “collected” contaminants are knocked off and flushed away to drain. Since the pores in the carbon are very important, the presence of sediment in the water — which can plug these pores — will greatly shorten the run time and life span of the carbon. The chlorine is reduced by a chemical reaction on the surface of the activated carbon, where the chlorine ions in the water are reduced to chloride ions, lessening the taste and odor issues associated with chlorine in the water.

The useful life of activated carbon will vary greatly depending on the water contaminants and amount of water filtered per day.

Neutralizer Blend

Neutralizer media is typically a blend of calcium carbonate (calcite) and magnesium oxide (Corosex®). This media is used to elevate the pH of acid water and is generally used when the pH is approximately 6.0-6.5. The filter media dissolves when water with a low pH passes through. The blend is used to take advantage of the fast, vigorous pH adjusting capabilities of Corosex and the slow, long-lasting capabilities of the calcite. Neutralizer is typically not recommended when the pH of the raw water is below 6.0, because the dissolve rate would be high and thus constant maintenance of the CBF Series Residential Backwash Filtration System would be necessary. In these cases contact our Customer Service Department at 1-866-990-9785 for recommendations.

Neutralizer media may require replenishment periodically. The frequency is dependent on the raw water pH and your water consumption habits. The lower the pH and the higher the water usage, the more frequently replenishment will be required. One easy way of determining when to replenish is by placing a mark on the outside of the tank at the level of the media when first installed. Periodically shine a bright light through the tank and compare the current level to the mark, if it is down more than three (3) inches, add media to the mark. If you are unable to see through the tank, remove the control valve and measure down to the top of the media. The tank should be 2/3 full. If not, add media.

IMPORTANT NOTE

Since the neutralizer media dissolves as it elevates pH level, it will increase the hardness of your water. If your dwelling is equipped with a tankless water heater, the installation of a water softener may be necessary to help prevent the heater coil from plugging.

Filter Sand

Filter Sand is recommended for high sediment loads. Make sure to visit our website at www.aquapure.com for a free water analysis kit to help assist you with product recommendation or contact our Customer Service Department at 1-866-990-9785 for recommendations.

Calcite

Calcite can be used when only a slight pH adjustment is required. Calcite is sacrificial (dissolve) when adjusting pH and will thus increase hardness as well. Replenishment will be required periodically, once again depending on raw water pH and water consumption.

Corosex

Corosex is a specially processed hard, bead-like magnesia, adapted for use in filters to neutralize acidity by increasing the pH value. By neutralizing the free carbon dioxide in water, Corosex can correct red water conditions and render it less corrosive. Corosex, being a reactive magnesium oxide, is used most effectively where pH correction is substantial or high flow conditions are in use. Being soluable to acidity, Corosex will slowly dissolve and will have to be replenished periodically. On a per weight basis, magnesium oxide can neutralize five times more acidity than can calcium carbonate. This results in greatly reduced chemical usage for the same pH correction. Under certain flow conditions, Corosex may overcorrect and create a basic (high pH) condition. Corosex can be effectively combined with Calcite to combine the high flow neutralization properties of Corosex, along with the slower reacting low flow properties of Calcite reducing potentially high basic properties due to overcorrection. As Corosex's magnesium oxide neutralizes the water, it will increase hardness and a softener may become necessary after the neutralizing filter. Advantages of Corosex is the high degree of activity and speed of correction allowing high flow rates, as well as the high capacity, which means less chemical usage.

IMPORTANT NOTE

Since both calcite and Corosex increase hardness of your water, if your dwelling contains a tankless water heater, a water softener must be installed after the filter to help prevent the heater coil from plugging with hardness material.

Check Your Water Pressure And Pumping Rate:

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

1) Minimum water pressure required at the filter tank 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.

IMPORTANT NOTE

If you have a municipal or a community water supply and daytime water pressure is 85 psi (586 kPa) or more, nighttime pressure may exceed 100 psi (689 kPa). 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 high and low system pressure. Record your water pressure data below:

Water Pressure

Low _____psi High _____psi

2) The pumping rate of your well pump must be sufficient for satisfactory BACKWASH. Although the density of a media normally determines the backwash rate, all the media discussed earlier will require the same flow rate. Refer to SPECIFICATIONS AND OPERATING DATA for the backwash requirement for models CBF150 and CBF200. 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 by 60 to arrive at the PUMPING RATE in gallons per minute (gpm). To aid in you calculation, insert the data in the following formula:

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

EXAMPLE: CYCLE TIME is 63 secs.; DRAWDOWN is 8 gals.; then PUMPING RATE equals:

8 gals. ÷ 63 secs. x 60 = 7.6 gpm

Locate Water Conditioning Equipment Correctly:

Select the location of your Backwash Filtration 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 floor or laundry tub drain.
3) Locate in correct relationship to other water conditioning equipment.
4) Allow sufficient space around the unit for easy servicing.

The Importance Of Your Pressure Tank:

A PROPERLY SIZED PRESSURE TANK WILL REQUIRE A MINIMUM PUMP CYCLE OF 60 SECONDS TO REFILL FROM PUMP ON-TO-OFF PRESSURE SETTINGS.

NOTE: If your pressure tank (or any part of your water system) is not functioning properly, corrective action MUST be taken before installation of your system.

Facts To Remember While Planning Your Installation:

CAUTION

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

1) If lawn sprinkling, geothermal heating/cooling or water for other devices/activities are to be treated by the CBF Series Residential Backwash Filtration System, a larger model system must be selected to accommodate the higher flow rate demands of these items. The pumping rate of the well pump must be sufficient to accommodate these items plus the backwashing requirement of the filter. Consult your Customer Service Department at 1-866-990-9785 for alternative instructions if the pumping rate is insufficient.
2) Remember that the filter **INLET** is attached to the pipe that supplies water (i.e. runs to the pump) and **OUTLET** is the line that runs toward the water heater or other water treatment equipment device.

CAUTION

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

- Pay particular attention to correct orientation of control valve. Water flow should match arrow on control valve;

3) Before commencing the installation, it is advisable to study the existing piping system and to determine the size, number and type of fittings required.

⚠ WARNING

To reduce the risk associated with 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 Filtration System installation piping — refer installation to qualified personnel.

CAUTION

- On plastic fittings, use thread sealing tape only. Never use pipe sealant or pipe dope on plastic fittings.

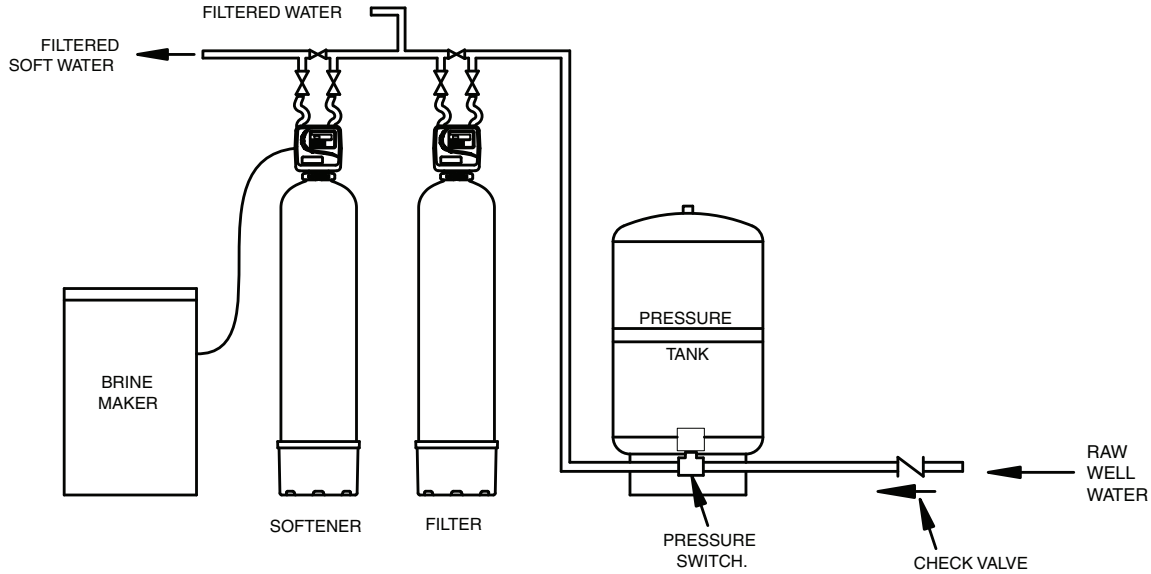
CAUTION

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.

SECTION 2: INSTALLATION

Proper installation sequence of water conditioning equipment is very important. Refer to the following diagram for your particular water supply.



STANDARD WELL INSTALLATION

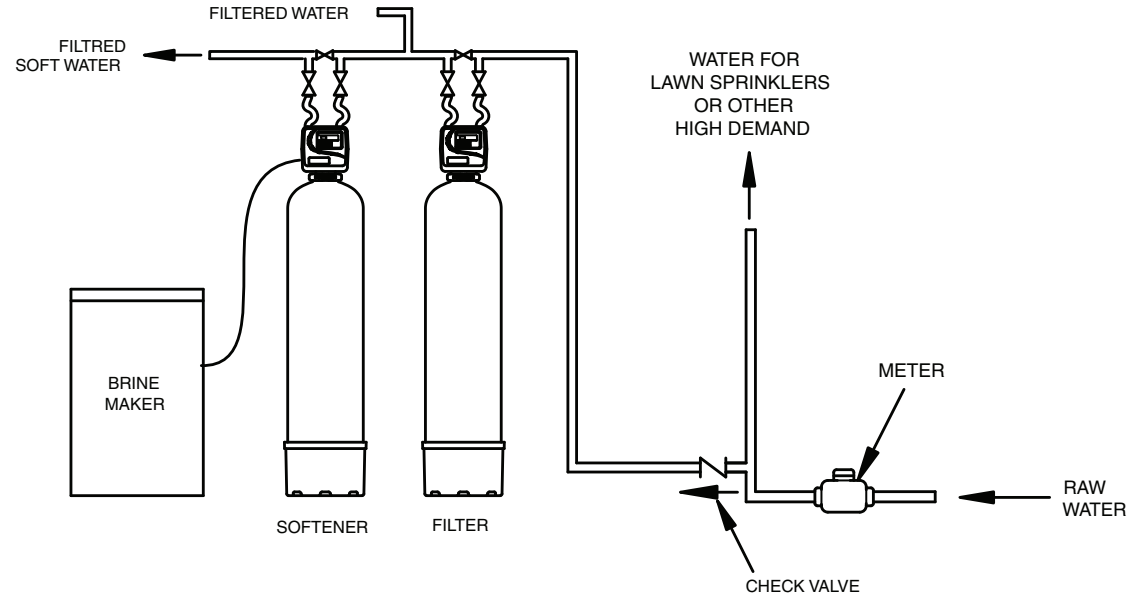


Figure 1

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.

IMPORTANT NOTES

- Damage due to heat is not covered under the manufacturers warranty and will void the warranty.
- The use of flexible drain lines are prohibited in some states, check with your local code officer for requirements. Distance and height affects the performance of the drain line to discharge at the proper rate to effectively backwash the filter media. The following are guidelines for drain line size installation. Do not bend the drain line too sharply if using flexible tubing. Secure the drain line over the discharge line to prevent splashing or blow out during regeneration. Do not use garden hose or vinyl tubing as a drain line as this may cause a failure to regenerate properly.
- You will need the serial number and model number of the unit to have certain parts replaced under warranty. Please preserve the shipping carton in case the factory technical support services personnel request to verify your claim of missing or damaged parts.
- Activated Carbon requires four (4) hours of saturation and Filter Sand two (2) hours of saturation to prevent media from washing to the waste drain prior to startup.

Step 1

Inspect and open factory sealed box to ensure all components required for installation are present. If media was ordered, verify the amount and type of filter media (ordered separately) is correct.

Step 2

Remove CBF Series Residential Backwash Filtration System from shipping carton and inspect to ensure there is no damage to product from shipping. Inspect any packing for components that have been attached for shipping before discarding. If any items intended for installation are missing at this time contact your Customer Service Department at 1-866-990-9785 to notify them of this situation and provide the model number and serial number.

Step 3

Follow the steps to center the distributor tube and load the filter media into the media tank to ensure the successful installation of your CBF Series Residential Backwash Filtration System.

a. Remove the latch and clamp assembly from around the control valve and media tank.

b. Remove the control valve from the media tank and set aside to reassemble after media is loaded into the tank.

c. Tilt media tank to a 45 degree angle until gravel shifts to the side of the tank and dimple at bottom of media tank is visible. This will allow you to place the distributor tube basket assembly in the dimple on the bottom of the media tank.

d. Place media tank back in upright position and ensure gravel at the bottom of the media tank is level. Place red plastic cap on the distributor tube that is provided in the parts bag.

e. Locate the filter media that will be used in the backwashing filter and load into the media tank. Note: fill only to the labeled line on the outside of the media tank. Refer to the Specification section on page 5-1 for the correct quantity for your CBF Series Residential Backwash Filtration System. Use a clean rag to wipe the opening of the media tank to remove any dust or sediment before moving to the next step.

⚠ 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 visit the web at http://solutions.3M.com/WPS/Portal/3M/EN_US/MSDS (click MSDS search). For emergencies, call 800-364-3577 or 651-737-6501 (24 hours).

Step 4

Please refer to page 6-1 for Component Parts List.

Once the filter media has been loaded, completely fill the media tank with water using a pail or water hose to saturate the media and expel any air out of the media tank. Some media require a saturation time to prevent washing it from the media tank to the waste drain upon start-up. Refer to Figure 5, page 2-4 for saturation time. Remove red cap from distributor tube.

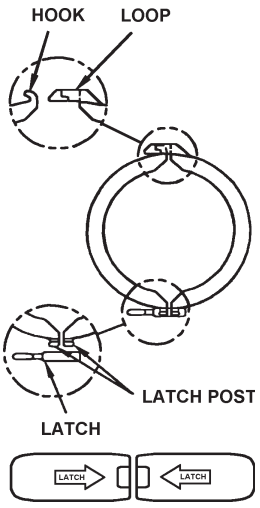


Figure 2

Step 5

Secure the control valve onto the media tank; you can use water or a silicone lubricant on the media tank opening, distributor tube, control valve o-ring and pilot tube o-ring to aid in attaching the control valve to the media tank. Insert the distributor tube into the pilot tube adapter and slide the control valve down until the valve rests on the flanged opening of the media tank. Then with one downward and swift movement push the control valve into the opening of the media tank to seat the control valve properly. Rocking the control valve to seat on the media tank may roll or pinch the o-ring and will cause a leak. If pinching or rolling of the o-ring occurs remove the control valve and try again. Be sure to orient the latch correctly and secure the control valve to the media tank with the clamp assembly as shown in Figure 2.

Step 6

Locate the installation assembly packet and assemble as the enclosed instructions dictate, refer to Figure 3. Attach the bypass assembly and connection fitting to the control valve and hand tighten only. Study the installation drawings provided (Figure 1) to determine the proper location of the Backwash Filtration System in relation to the other components of the water system (i.e. Water Softener or Water Heater, if present) and install appropriately.

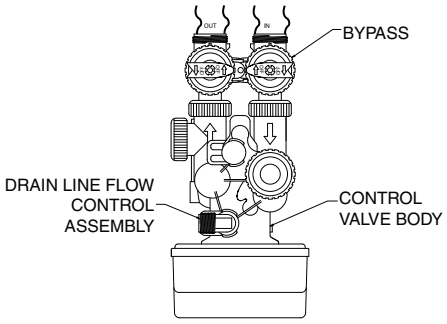


Figure 3

Step 7

Turn off the power to the well pump on a private well system or close the valve after the water meter on a public or municipal water system. Depressurize and drain the water lines to allow for connection of the plumbing to the bypass connection fittings on control valve. Be sure to attach the supply line from the pressure tank or water meter to the INLET side of bypass valve and the service line connected to the OUTLET side of bypass valve. Leave the bypass valve in the closed position until instructed later in the installation process.

CAUTION

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

- **Do not** apply heat to any fitting connected to bypass or control valve as damage may result to internal parts or connecting adapters.

Step 8

The drain line connection can utilize either a 3/4" NPT or a 5/8" COMPRESSION connection. To utilize the 5/8" connection use the provided nut and insert sleeve with a 5/8" OD rigid or semi-rigid material. Slide the nut over the tubing or piping first, and then insert the sleeve into the piping or tubing until flush. Finally insert piping or tubing in the drain elbow and thread the nut onto the elbow and hand tighten only. To utilize the 3/4" NPT feature for a drain line connection, remove the 5/8" nut from the elbow and provide your own connection device and piping for a drain line. Ensure the retaining clip is securely in place before moving on. The discharge end of the drain line requires an air gap to prevent a cross connection between grey water (sewage) and potable water (domestic). Refer to Figure 4 to help in the installation.

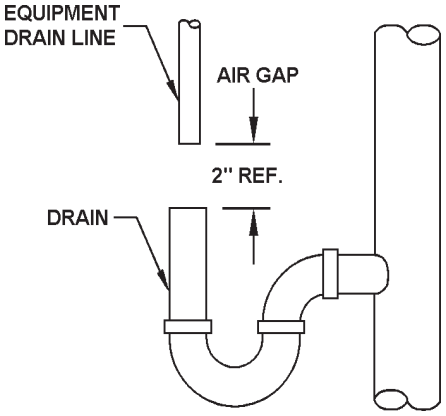


Figure 4

a. 1/2" ID lengths up to 15 feet and heights lower or slightly higher than the control valve.

b. 5/8" ID length up to 25 feet in length and up to 4 feet above the control valve.

c. For distances higher or longer than previously stated, relocate the CBF Series Residential Backwash Filtration System closer to the desired discharge point or consult our Customer Service Department at 1-866-990-9785 for advice. Avoid overhead drain lines as it may prevent desirable performance.

Step 9

Connect the transformer to a suitable power supply that is non-switched to plug the transformer into that meets the local electrical code. The required power source is 110 – 120 volt 60 Hz.

Step 10

Set the time clock for the correct time of day and set the frequency for regeneration appropriately. See "HOW TO SET TIME OF DAY" on page 2-5 for setting the time of day correctly.

Step 11

Determination of backwash frequency will vary by media used, the amount of water used and the amount of contaminant in the water. Most media should backwash once every four days in Backwash Filtration Systems containing activated carbon. If pressure drops become undesirable or the contaminant reappears, increase the frequency to correct. For media tanks containing Calcite or Corosex, the frequency should be once every other day to help prevent cementing of the media in the media tank. Correct backwashing frequency as required. Tank should be marked for easier maintenance.

Step 12

If your CBF Series Residential Backwash Filtration System contains Activated Carbon or Filter Sand proper saturation time is critical. Refer to Figure 5 to determine the proper saturation time for that media type.

Saturation Time Table	
Media	Time Required
Activated Carbon	4 Hours
Neutralizer Blend	30 minutes or less
Calcite	No saturation time required
Corosex	30 minutes or less
Filter Sand	2 Hours

Figure 5

Step 13

Turn on the electrical power to the well pump or open the valve on the municipal supply and pressurize the water line and check for leaks, correct as required. Locate the regeneration button on the control valve and initiate a manual regeneration (see “HOW TO MANUALLY INITIATE IMMEDIATE REGENERATION”), ensure the bypass valve is in the bypass position. Once the control valve stops in the first position, unplug control valve so the valve will not stage to another position to ensure proper start up and media classification. Open the INLET side of bypass 1/4 turn to allow water to run slowly to the waste drain until no air is heard in the drain line. Then slowly open the inlet side of bypass fully and let run until the waste water is clear, it should take about 10 minutes. Then open the OUTLET side of the bypass into the fully open position. During the initial backwash cycle it is normal for a small amount of “fines” to appear at the drain for proper preparation of media bed. It will subside within a few regeneration cycles and should not alarm you.

Step 14

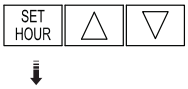
Plug the control valve into the 120v 60Hz power source once again and ensure the time clock is properly set for time and frequency of regeneration. The control valve will stage by itself and back to the service position.

Installation is complete and system is ready for use.

IMPORTANT NOTES

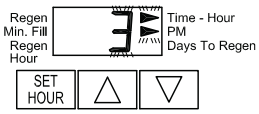
Flush at least 10 gallons (37.9 liters) through this system during installation. It may be necessary to continue flushing beyond 10 gallons until the water is clear.

HOW TO SET TIME OF DAY



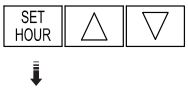
STEP 1

Press **SET HOUR** and release.



STEP 2

Set the clock display to the closest hour by pressing the △ or ▽. An arrow will appear in the display pointing to **PM** during PM hours.

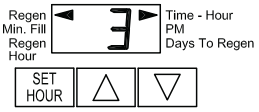


STEP 3

Press **SET HOUR** to return to the display mode.

Note: *After an extended power outage the time of day may need to be reset.*

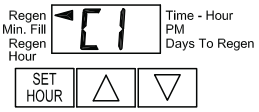
HOW TO MANUALLY INITIATE IMMEDIATE REGENERATION



STEP 1

Press and hold △ and ▽ buttons simultaneously until valve motor starts (usually about three (3) seconds).

Note: *Once a manual regeneration has been initiated, it cannot be stopped.*



STEP 2

Once the valve display is in **C1**, it is in **Backwash**. To advance to **Rapid Rinse** press and hold △ and ▽ buttons simultaneously until valve motor starts (usually about three (3) seconds).

STEP 3

Once the valve display is in **C4**, it is in **Rapid Rinse**. To advance to the display mode, press and hold △ and ▽ buttons simultaneously until valve motor starts (usually about three (3) seconds).

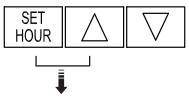
HOW TO MANUALLY INITIATE DELAYED REGENERATION

STEP 1

Press and release the △ and ▽ buttons simultaneously.

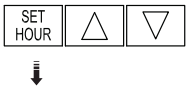
Note: *An arrow will appear in the display pointing to* ***Regen*** *indicating regeneration will occur at the programmed time.*

HOW TO CHANGE DAYS BETWEEN REGENERATION



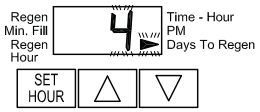
STEP 1

Press and hold **SET HOUR** and △ buttons simultaneously for three (3) seconds and release.



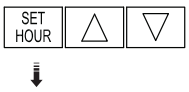
STEP 2

Press **SET HOUR** button.



STEP 3

Press △ and ▽ buttons to change the number of days between regenerations.

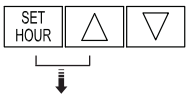


STEP 4

Press **SET HOUR** to return to the display mode.

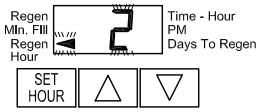
Note: Your Backwash Filtration System is factory preset for 4 days between regenerations.

HOW TO CHANGE TIME OF REGENERATION



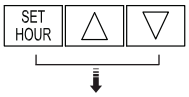
STEP 1

Press and hold **SET HOUR** and △ buttons simultaneously until the display begins flashing (usually about three (3) seconds).



STEP 2

Set the clock display to the desired hour of regeneration by pressing △ or ▽ button. An arrow will appear in the display pointing to PM during PM hours.

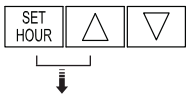


STEP 3

Press and release **SET HOUR** and △ buttons simultaneously to return to the display mode.

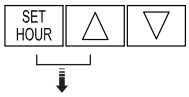
Note: Your Backwashing Filtration System is factory set to regenerate at 1:00 AM.

HOW TO CHANGE THE REGENERATION PROGRAM SETTINGS



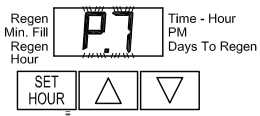
STEP 1

Press and hold **SET HOUR** and △ buttons simultaneously until the display begins flashing (usually about three (3) seconds).



STEP 2

Press and hold **SET HOUR** and △ buttons simultaneously until the display begins flashing (usually about three (3) seconds).



STEP 3

Press the △ button to change the display to P8 or P9.

STEP 4

Press the **SET HOUR** button five (5) times to return to the display mode. The time of day should be in the display.

Control Valve Function and Cycles of Operation

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

The following chart shows the time for the backwash and rapid rinse cycles for the three available programming options.

Regeneration Cycles and Times for Different Programs

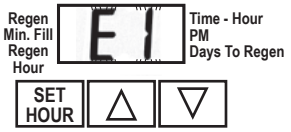
Program Number	Length of Cycle Times (Minutes)	
	BACKWASH (C1)	RAPID RINSE (C4)
P7	6	4
P8	10	6
P9	14	8

Note: *Your CBF Series Residential Backwash Filtration System is factory preset to program number P7, changing the setting to P8 or P9 is rarely needed. But if a change is desired, please refer to* ***"How to Change the Regeneration Program Settings"*** *on page 2-6.*

HOW TO SET TIMER CONTROL

Power Loss

Power outages of two (2) hours or less will not affect the time clock as the control valve has the ability to hold the correct time of day due to a capacitor on the printed circuit board. Power outages of more than two (2) hours will require the resetting of clock to the correct time. Refer to Page 2-5 to resolve. If the power goes out while the system is regenerating, the cycle picks up where it was when the power went out.



Error Message

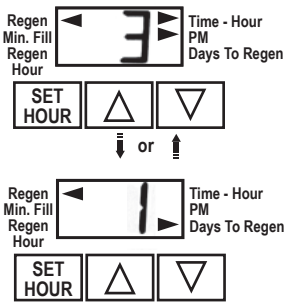
If "E1" "E2" or "E3" appears on the display, contact our Customer Service Department at 1-866-990-9785. These are error codes and will need to be resolved before the control valve will function. These codes indicate that the control valve did not function properly.

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 regeneration. If the days remaining is equal to one, a regeneration will occur at the next preset regeneration time. The user can scroll between displays as desired.

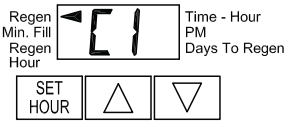
If the system has called for a regeneration that will occur at the preset time of regeneration, the arrow will point to Regen.



Regeneration Mode

Typically a Backwash Filtration System is set to regenerate at a time of low water usage. Your CBF Series Residential Backwash Filtration System is factory preset to regenerate at 12:00 AM. If there is a demand for water during the regeneration period, untreated water will be used.

When the system begins to regenerate, the display will change to indicate the cycle of the regeneration process 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 regeneration is completed.



Section 3: MAINTENANCE

1) At least every six months you should check the time of day setting. Power outages of two (2) hours or less will not affect the time clock as the control valve has the ability to hold the correct time of day due to a capacitor on the printed circuit board. Power outages of more than two (2) hours will require the resetting of clock to the correct time. Refer to Page 2-5 to resolve.

2) If your CBF Series Residential Backwash Filtration System contains activated carbon, replacement is required if the taste and odor being reduced reappears in the treated water or if pressure drop due to fouling of the media becomes excessive.

3) Filter Sand typically lasts an indefinite period of time. It may be necessary to replace them, if the pressure drop across the filter bed becomes too great or filtration results drops.

4) Neutralizer media: Calcite 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 a 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.

TO REPLENISH (REBED) 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 visit the web at http://solutions.3M.com/WPS/Portal/3M/EN_US/MSDS (click MSDS search). For emergencies, call 800-364-3577 or 651-737-6501 (24 hours).

1) Pressure must be relieved on water treatment system by turning the bypass valve to the bypass position. Then initiate an immediate manual regeneration cycle as described on Page 2-5.

2) Disconnect the power cord from the electrical outlet.

3) Remove the drain line for the control valve and clamp assembly around the valve body and flanged tank. Disconnect the bypass from the control valve and separate. Next lift the control valve off the media 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 extension tube and cap to prevent media from entering the distributor tube.

   a. If using Calcite 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) Reattach the control valve to the media tank by sliding the control valve pilot tube adapter over the distributor tube. Let the control valve rest on the flanged portion of the media tank. Then using a swift and downward motion push the control into the opening of the media tank until seated. Do not rock the valve into position as rolling or pinching of the o-ring can occur. Reinstall clamp as described Section 2 Step 5 (Figure 2).

6) Reattach the bypass valve to the control valve and slowly open the bypass. Allow the Backwash Filtration System to fill with water and set for the required time period. Refer to Figure 5, page 2-4 to determine the amount of time to wait before backwashing can occur.

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 regeneration (see Page 2-5). 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) Re-bedding of media tank is now complete.

SECTION 4: TROUBLESHOOTING

Problem	Possible Cause	Solution
1) Timer does not display time of day.	A) Transformer is unplugged	1) Reconnect Transformer
	B) No power at outlet	1) Repair working outlet
		2) Check circuit breaker in main power box.
	C) Damaged transformer	1) Replace transformer
	D) Damaged PC board	1) Replace PC board
2) Timer does not display the correct time of day.	A) Outlet on a switched circuit	1) Use a non-switched circuit
	B) Power outage	1) Reset time of day
	C) Time of day set wrong	1) Reset to the correct time
3) Error followed by a code number	A) Valve just serviced	1) Press SET HOUR and ▽ for 3 seconds or momentarily unplug power source from PC board
Error Code E1 — Unable to recognize start of regeneration	B) Foreign material stuck in valve	1) Check piston and spacer stack for obstruction
Error Code E2 — Unexpected stall	C) Excessive piston resistance	1) Replace piston and spacer assembly
Error Code E3 — Motor ran too long. Timed out trying to reach next cycle position.	D) Position not in the home position	1) Press Set Hour and ▽ or momentarily unplug PC board
4) Excessive pressure drop through Backwash Filtration System	A) Filter not backwashing	1) Increase backwash frequency as needed
		2) Check for uninterrupted power source
		3) Check for backwash frequency on timer assembly on control valve
	B) Filter bed loaded with well sand	1) Verify sediment being reduced is less dense than the filter media
	C) Cementing or channeling of media bed	1) Probe media bed for this condition, verify adequate pumping rate for backwashing
		2) Check for frozen, plugged, kinked or restricted drain line
		3) Ensure no vinyl tubing or garden hose has been used as a drain line
		4) Check for adequate backwashing rate
5) Regenerates at the wrong time of day	A) Wrong time of day displayed	1) Reset the time of day
	B) Past power outage	1) Reset the time of day
	C) Time of regeneration wrong	1) Reset the time of regeneration
6) Water runs to drain in the service position	A) Piston and seal assembly damaged	1) Replace piston and seal assembly
7) Discoloration in treated water	A) Media not sufficiently washed to drain upon start of filter	1) Change regeneration programming to P8 or P9
	B) Iron in treated water	1) Check raw water quality and correct with the appropriate products (contact our Customer Service Department at 1-866-990-9785)
8) Taste in treated water	A) Media fines in treated water	1) Change regeneration program to P8 or P9
	B) Hydrogen Sulfide in raw water	1) Check raw water quality and correct with the appropriate products (contact Customer Service Department for help)
	C) Iron in raw water	1) Check raw water quality and correct with the appropriate products (contact our Customer Service Department at 1-866-990-9785)
9) Media in aerators at the faucets	A) Unit installed backwards	1) Ensure that the piping enters to INLET side of bypass and exits on the OUTLET side. (Refer to red handles on bypass to check for flow direction.)
	B) Distributor is damaged	1) Remove distributor tube from media tank and inspect. Replace as needed
	C) Media was loaded in distributor tube while loading filter unit.	1) Remove distributor tube from media tank, clean and reinstall correctly. Cover distributor tube with plug provided or something appropriate

Problem	Possible Cause	Solution
10) Water leaking from media tank	A) Media tank was subjected to a vacuum condition	1) Replace media tank and check to see that either a check valve or back flow prevention device is installed and operating
	B) Media tank is damaged	1) Contact installing contractor to have evaluated and replaced
	C) Pin hole in media tank	1) Contact installing contractor to have evaluated and replaced
11) Time of day flashes on and off	A) Power has been off for more than two hours	1) Reset the time of day
	B) Transformer was unplugged from either wall outlet or PC board	1) Reset the time of day
	C) SET HOUR was pressed	1) Reset the time of day
12) Valve stalled in regeneration	A) Motor not operating	1) Replace motor
	B) No power at the outlet	1) Repair outlet or use a working outlet
		2) Check circuit breaker at the main power box
	C) Damaged transformer	1) Replace transformer
	D) Damaged PC board	1) Replace PC board
	E) Damaged drive gear or drive cap assembly	1) Replace gear or drive cap assembly
	F) Damaged piston retainer	1) Replace main piston assembly
	G) Damaged main piston	1) Replace main piston assembly
13) Valve does not regenerate automatically when the △ and ▽ button is pushed	A) Transformer unplugged	1) Connect transformer and the PC board power
	B) No power at outlet	1) Restore or repair power source
	C) Damaged drive gear or drive cap assembly	1) Replace gear or drive cap assembly
	D) Damaged PC board	1) Replace PC board
14) Valve does not regenerate automatically, but does when △ and ▽ is depressed	A) Programming error	1) Review programming of control valve
	B) Damaged PC board	1) Replace PC board

SECTION 5: SPECIFICATION AND OPERATING DATA

ITEM	CBF100	CBF150	CBF200 / CBF200 CJ-L
Filter Media Volume, cu. ft. (cu. mtr.) (Note 1):	1.0 (0.03)	1.5 (0.04)	2.0 (0.06)
Gravel Underbed, lbs. (kg)	13 (5.9)	13 (5.9)	18 (8.2)
Operating Flow Rate, gpm (lpm) (Note 2):	3 (11.4)	3 (11.4)	4 (15.1)
Backwash Flow Rate, gpm (lpm) Note 3	5.3 (20.1)	5.3 (20)	7.5 (28.4)
Service Pipe Size, in. (cm) (Note 4)	1 (2.5)	1 (2.5)	1 (2.5)
Filter Tank Diameter x Height, in. (cm)	10 x 44 (26 x 112)	10 x 54 (26 x 137)	12 x 54 (30 x 137)
Minimum Space Required, in. (cm):			
Width	10 (26)	10 (26)	12 (31)
Depth (w/Bypass)	16 (41)	16 (41)	16 (41)
Height	53 (135)	63 (160)	63 (160)
Approximate Shipping Weight, lbs. (kg)	53 (24)	59 (26.7)	62 (28.1)
Maximum Operating Temperature 110°F (43.3°C); Electrical requirements 110V/60Hz; Operating Pressure 20 -100 psi (138-689 kPa). Specifications subject to change without notice.			

IMPORTANT NOTES

1) Replenishment of pH adjusting component of media may be required periodically, the frequency of which is dependent on raw water pH, manganese concentration and water consumption rate. Consult our Customer Service Department at 1-866-990-9785 for more information.

2) For satisfactory performance, indicated durations should not be exceeded. Flow rates specified are adequate for normal residential applications. Do not use listed flow rates if treated water is to supply a geothermal heat pump, etc. (contact Customer Service Department at 1-866-990-9785 before selecting equipment).

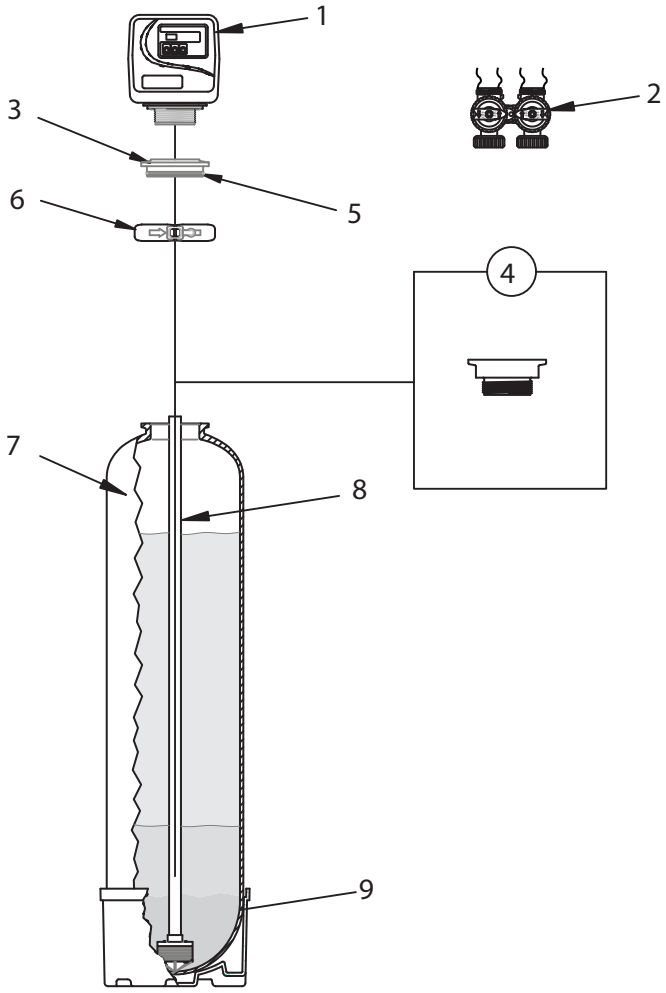
3) For your CBF Series Residential Backwash Filtration System to operate properly, pumping rate of well pump MUST be sufficient to backwash unit at rate specified.

SECTION 6: COMPONENT PARTS LIST

Ref. No.	Description	CBF100	CBF150	CBF200
1	Control Valve, Complete, Less Bypass Valve (CBF Series)	W217530-003-0N	W217530-003-00Z	W217750-003-00Z
2	Bypass Valve	V3006	V3006	V3006
3	Threaded Tank Adapter	FA45TX	FA45TX	FA45TX
4	O-ring (Included with Item #3)	ORG-234	ORG-234	ORG-234
5	Clamp Assembly	FC45XX	FC45XX	FC45XX
6	Media Tank w/ Base	MTP1044FB	MTP1054FBZ	MTP1254FBZ
7	Distributor Tube	C37S-16-44	C37S-16-54	C37S-16-54
8	Gravel Underbed	QC-15P	QC-15P	QC-18P

Items Not Shown	
Description of Item	**Part Number**
Wrench	V3193-01
Vertical Bypass Adapter	V3191-01
Funnel	U1006
Tube Extension Device and Cap	CENTERINGTOOL
1" Plumbing Connection Fitting - Straight Male NPT Fitting - Straight Brass Sweat Connection	 V3007-04 V3007-02

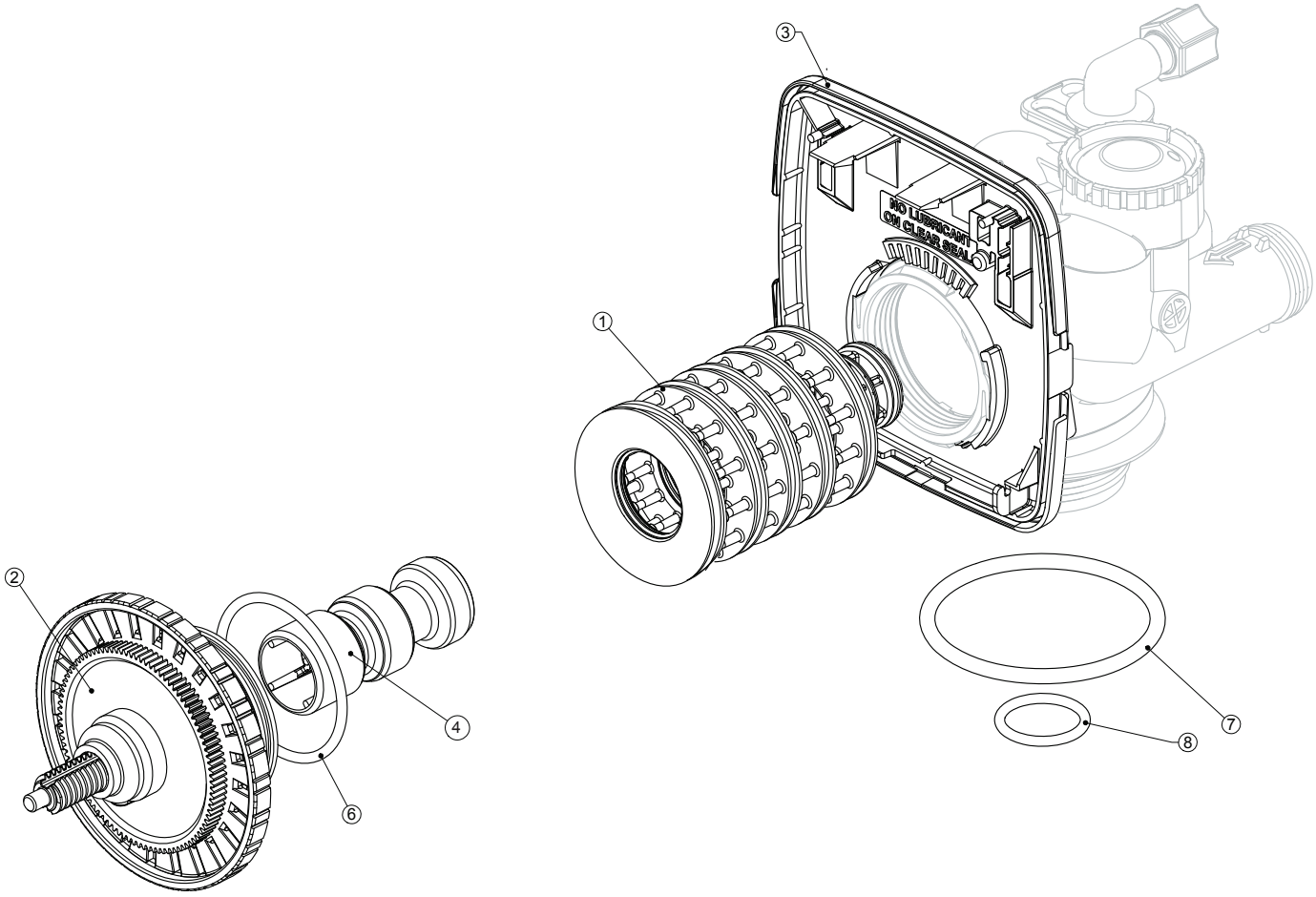
* see assembly drawings for individual components.



SECTION 6: COMPONENTS ASSEMBLIES

BACKWASH FILTER SYSTEM ASSEMBLIES AND COMPONENTS DRIVE CAP ASSEMBLY, DOWNFLOW PISTON, AND SPACE STACK ASSEMBLIES

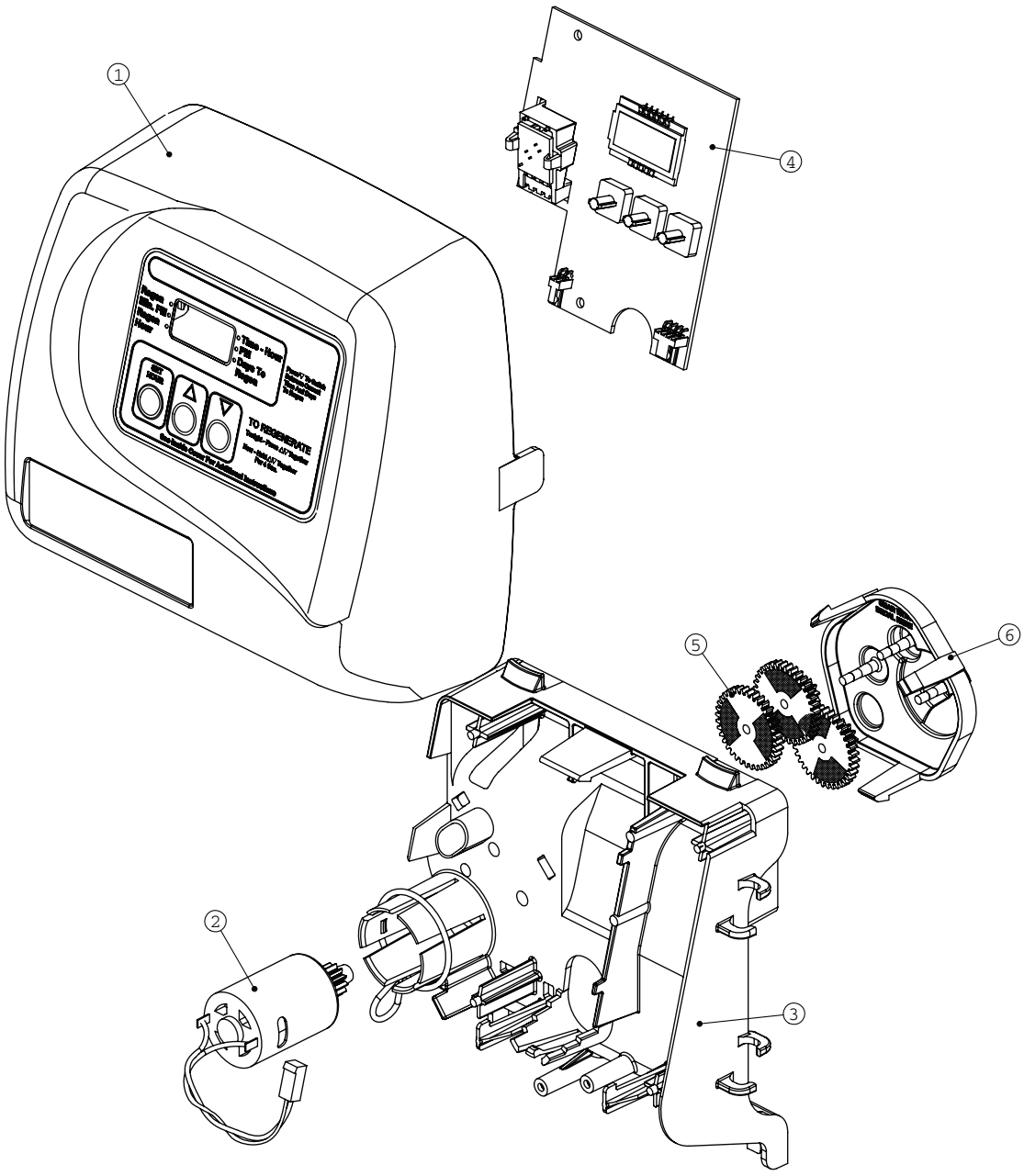
Reference No.	Part No.	Description	Quantity
1	V3005	Spacer Stack Assembly	1
2	V3004	Drive Cap Assembly	1
3	V3178	Drive Back Plate	1
4	V3011	Piston Downflow Assembly	1
6	V3135	O-ring 228	1
7	V3180	O-ring 337	1
8	V3105	O-ring 215 Pilot Tube	1
NOT SHOWN	V3001	Downflow body Assembly	1



SECTION 6: FRONT COVER AND DRIVE ASSEMBLY

Reference No.	Part No.	Description	Quantity
1	V3175TC-01	Time Clock Front Cover Assembly	1
2	V3107-01	Motor	1
3	V3106-01	Drive Bracket & Spring Clip	1
4	V3108TC	Time Clock PC Board	1
5	V3110	Drive Gear 12 x 36	1
6	V3109	Time Clock Cover	1
	V3002TC	Time Clock Drive Assembly	1
NOT SHOWN	V3186	AC Adapter 110V - 12V	1

Drawing number parts 2 through 6 may be purchased as a complete assembly, part V3202.



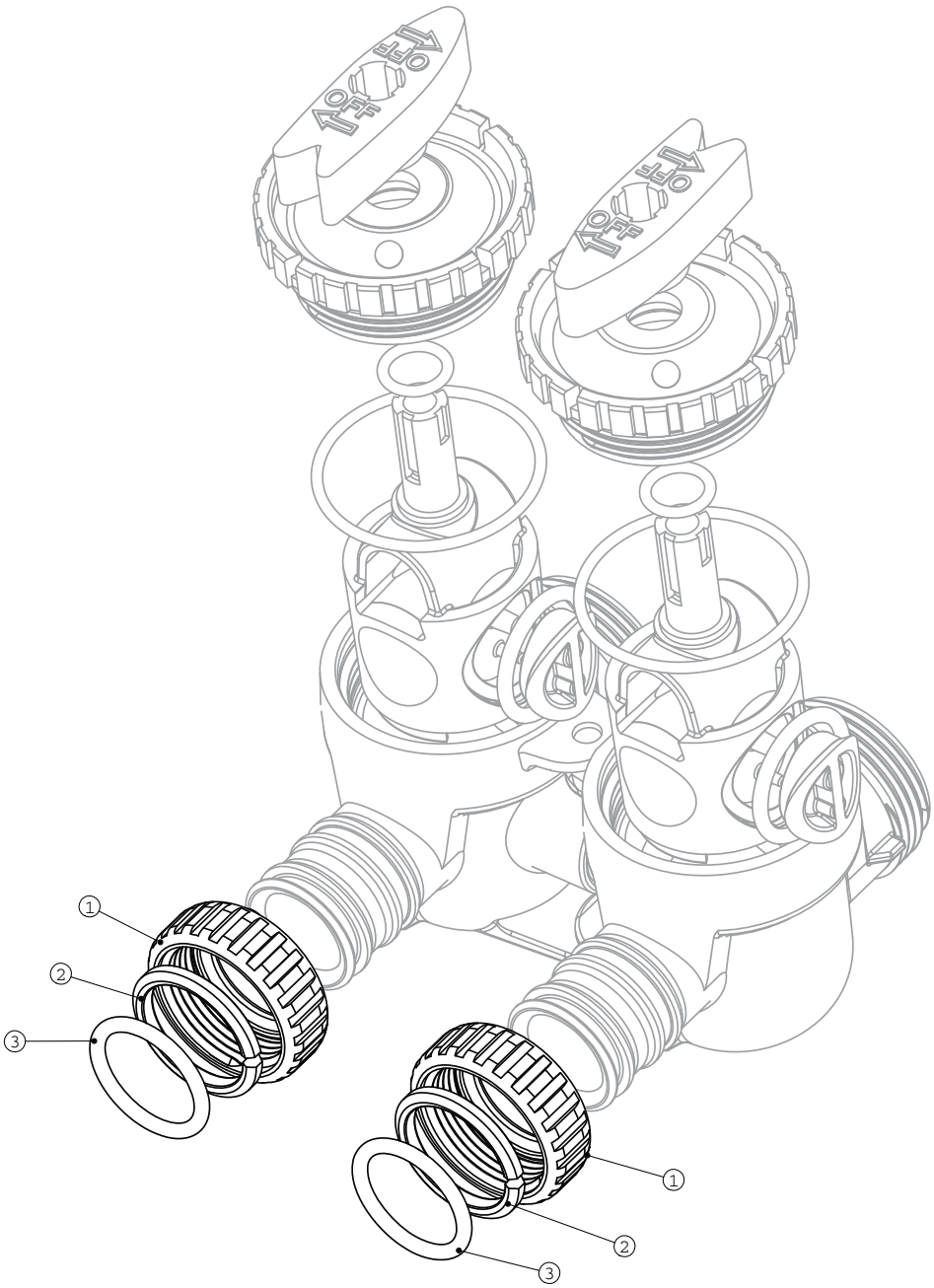
SECTION 6: QUICK CONNECT BYPASS

Part Number V3006

Reference No.	Part No.	Description	Quantity
1	V3151	Nut 1” Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-ring	2

Not Shown Part# V3191-01 Vertical Bypass Adapter

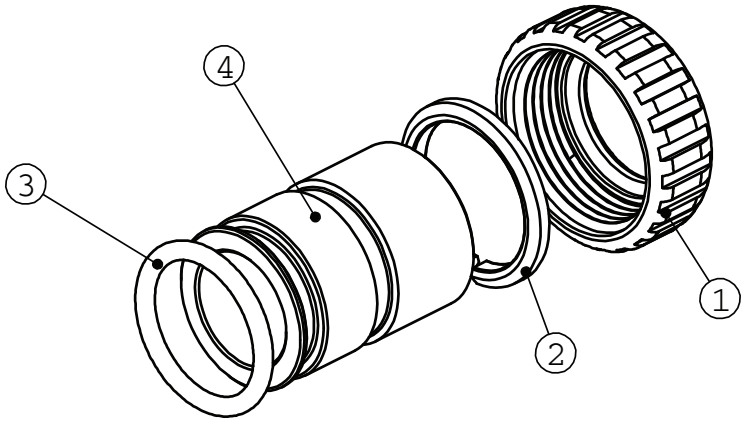
V3151	1” Quick Connect Nut	2
V3150	Split Ring	2
V3105	O-ring 215	2
V3191	Vertical Bypass Adapter	1



SECTION 6: INSTALLATION FITTING AND ASSEMBLIES

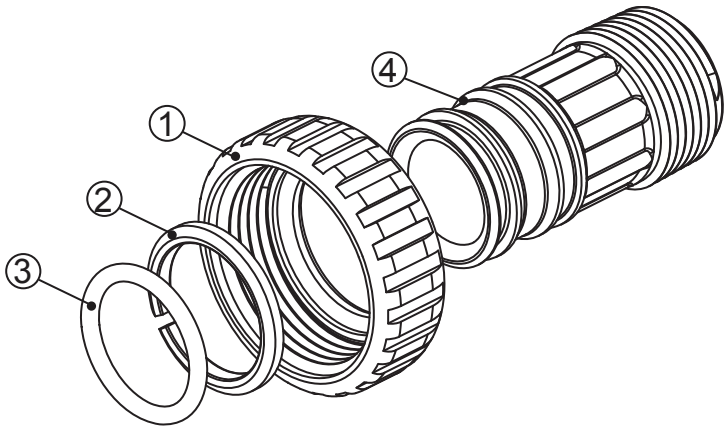
Quick Connect Assemblies
Part # V3007-02
1” Copper Brass Sweat Adapter

Reference No.	Part No.	Description: 1” Brass Sweat Assembly	Quantity
1	V3151	1” Quick Connect Nut	2
2	V3150	1” Quick Connect Split Ring	2
3	V3105	1” Quick Connect O-Ring 215	2
4	V3188	1” Quick Connect Brass Sweat Assembly	2

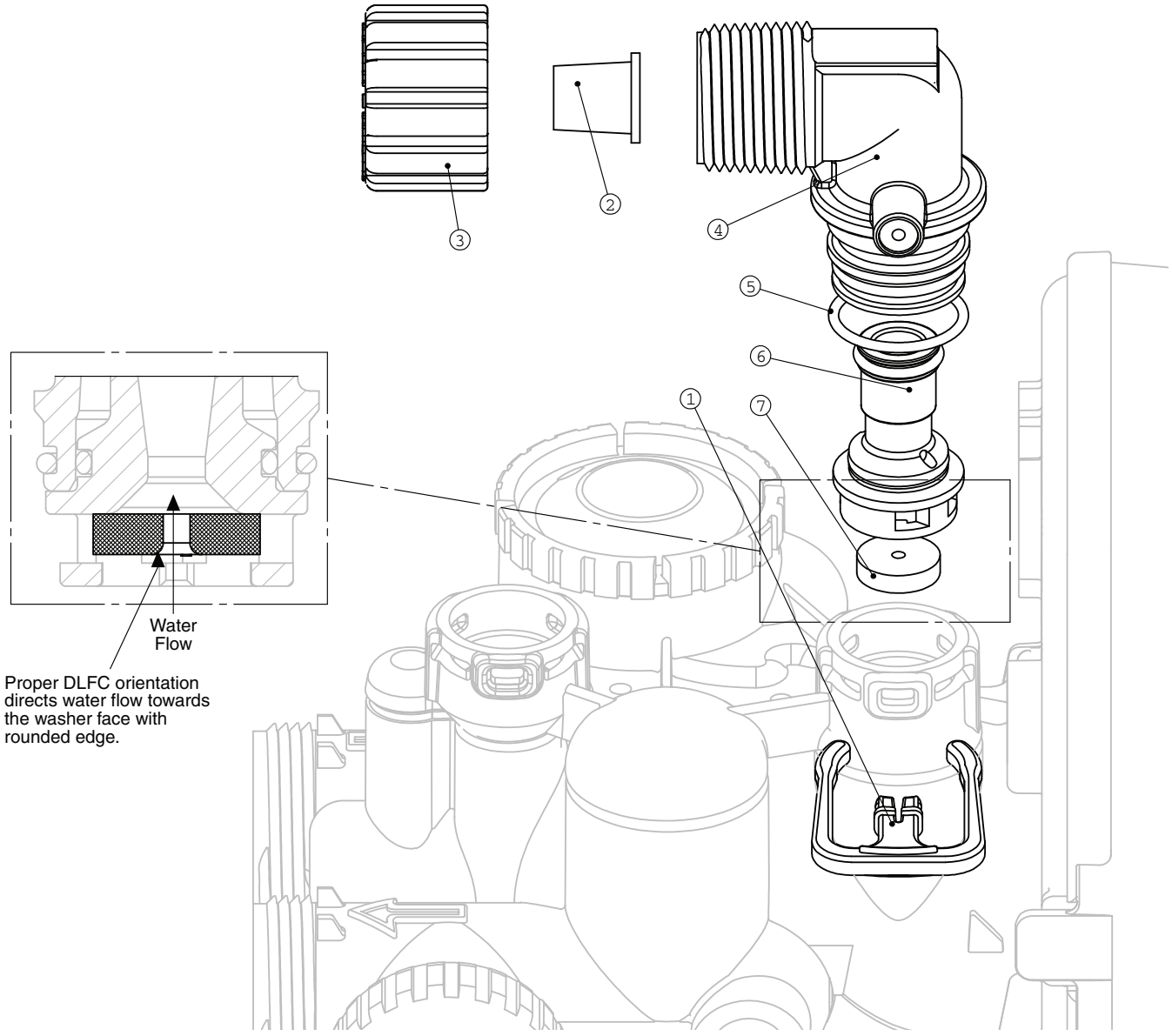


Part # V3007-04
1” Plastic Male NPT Assembly

Reference No.	Part No.	Description	Quantity
1	V3151	1” Quick Connect Nut	2
2	V3150	1” Quick Connect Ring	2
3	V3105	1” Quick Connect O-Ring 215	2
4	V3164	1” NPT Quick Connect Plastic Male Assembly	2



Reference No.	Part No.	Description	Quantity
1	H4615	Elbow Locking Clip	1
2	PKP10T58-BULK	5/8” Insert Sleeve	1
3	V3192	Quick Connect 3/4” Drain Elbow Nut	1
4	V3158-01	Quick Connect 3/4” Drain Elbow	1
5	V3163	O-ring 019	1
6	V3159-01	Drain Line Flow Control Retainer Assembly	1
7	V3162-042	4.2 gpm Drain Line Flow Control Button	1
7	V3162-053	5.3 gpm Drain Line Flow Control Button	1
7	V3162-075	7.5 gpm Drain Line Flow Control Button	1
7	V3162-100	10.0 gpm Drain Line Flow Control Button	1



SECTION 7: LIMITED WARRANTY

For any warranty questions, please refer to the enclosed warranty card or call 1-800-222-7880 or mail your request to:

3M Purification Inc.
400 Research Parkway
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