

INSTALLATION AND OPERATING INSTRUCTIONS

CBF/MCBF SERIES RESIDENTIAL BACKWASH FILTERS

MODELS:

MCBF1001

MCBF1501

MCBF2001

MCBF2501

CBF100

CBF150

CBF200

CBF250

(Installer, please leave with homeowner.)



3M

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SAFETY INFORMATION

Read, understand, and follow all safety information contained in these instructions prior to installation and use of the CUNO Water Treatment CBF/MCBF Series Residential Backwashing Filters. Retain these instructions for future reference.

Intended use:

The CUNO Water Treatment CBF/MCBF Series Residential Backwashing Filters are intended for use in reducing undesirable aesthetics in water in homes and have not been evaluated for other uses. The system is 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 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 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 filter installation piping — refer installation to qualified personnel.
- Do not use the Backwashing Filter if the wall-mounted power supply is damaged — contact qualified service personnel for repair.

To reduce the risk associated with back strain:

- Follow safe lifting procedures.

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.
- Refer to MSDS documents for further safety information.

CAUTION

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

- **Read and follow** Use Instructions before installation and use of this system;
- **Installation must comply** with existing state or local plumbing codes;
- **Protect from freezing.** Drain system when temperatures drop below 40°F (4.4°C);
- **Do not** install if water pressure exceeds 100 psi (689 kPa). If the system water pressure exceeds 100 psi, the installation **must** use a pressure limiting valve. Contact a licensed plumbing professional if you are uncertain how to check your water pressure;
- **Do not** install system where water lines that could be subjected to vacuum conditions without appropriate measures for vacuum prevention;
- The system **must** be installed on cold water lines only, maximum temperature 100°F (38°C);
- When water supply is shut off, shut off fuel or electric power to water heater;
- **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;
- **Do not** install this system in direct sunlight or outdoors without protection from precipitation.

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 may result in leakage and will void warranty.
- Since some media dissolves as it elevates pH level, it will increase the hardness. If your dwelling is equipped with a tankless water heater, the installation of a water softener may be necessary to prevent the heater coil from plugging.

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SECTION 1: BEFORE INSTALLATION

Inspecting And Handling Your Filter:

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

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. Enter your 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
Iron (Fe)	_____ gpg
Manganese (Mn)	_____ ppm
pH	_____
Tannins (Humic Acid)	_____ ppm
Hydrogen Sulfide (H ₂ S)	_____ ppm
Other _____	_____
Other _____	_____

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 removal of unwanted constituents 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.

Activated carbon can be used to reduce Radon gas and organic compounds from water. Check with the local board of health for the acceptability of using carbon for the reduction of these contaminants.

The useful life of activated carbon will vary greatly depending on the water contaminants and amount of water filtered per day. Rarely will the carbon last more than three (3) years.

Filter Ag

Filter Ag is used to reduce turbidity from water. While it is a good general purpose filtering media, it has its limitations. It will filter particles down to approximately 20 micron in size, but cannot be used to filter out sand. The material to be removed must have a density less than that of Filter Ag itself. If it is the same or heavier, it will not be flushed from the filter during the backwash process and will remain in the tank. Eventually the filter will plug up — causing excessive pressure drop and requiring the filter tank be emptied and new Filter Ag to be used.

Filter Ag will generally last an indefinite period of time, if the frequency of backwash flow rate is adequate. Replacement is usually necessary when the filter fails to properly reduce the turbidity or pressure drop becomes excessive.

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 5.5, because the dissolve rate would be high and thus constant maintenance of the filter would be necessary. In these cases a chemical feed pump injecting soda ash is usually recommended.

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. If your dwelling is equipped with a tankless water heater, the installation of a water softener may be necessary to prevent the heater coil from plugging.

Filter Sand

Filter Sand performs a similar function to Filter Ag (discussed earlier). It is used to remove turbidity and has the same limitations as Filter Ag. Due to its coarse physical structure, filter sand will “scrub” itself clean and for this reason it may be better for removing oxidized iron and sulfur from water than Filter Ag.

Multi-layer

Multi Layer media provides the best quality of water when it comes to removing particles and color from the water. It consists of three (3) specially selected media materials designed to form a true gradual reduction of particulate from top to bottom in the filter, moving from the largest to the smallest particles. The media include anthracite coal, aluminum silicate (filter ag) and filter garnet sand. It will last almost indefinitely and should only be changed when pressure drop is unacceptable. The micron rating for this media is 10 to 15 nominal. The pressure drop should be less with this type of media than the other types offered by CUNO/3M.

Corosex Or Calcite

Corosex and Calcite, like Neutralizer which is a blend of these two items, are used to adjust pH. Corosex can be used alone when it is desirable to have a media which is very vigorous in its adjustment of pH. Calcite can be used alone when only a slight pH adjustment is required. Both media are 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.

IMPORTANT NOTE

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

Birm

Birm can be used to reduce iron in water, but has limitations which typically do not make it a practical alternative to other iron filters, such as the Chem-Free filter. When used to reduce iron, the pH of the water must be 6.8 or higher and the dissolved oxygen (D.O.) level must equal to 15% of the iron concentration. If used to reduce manganese, the pH must be 8.0-9.0. Birm should not be used to remove hydrogen sulfide and cannot be used if the water contains organic compounds.

Birm will require periodic replacement. Although it is not sacrificial, it will lose its effectiveness over time.

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

- **Do not** install if water pressure exceeds 100 psi (689 kPa). If the system water pressure exceeds 100 psi, the installation **must** use a pressure limiting valve. Contact a licensed 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. The model CBF100/MCBF 1001 requires a 5 gpm rate (refer to SPECIFICATIONS AND OPERATING DATA for the backwash requirement for other models). 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:

$$\text{DRAW-DOWN} \frac{\text{_____}}{\text{(gals.)}} \div \text{CYCLE TIME} \frac{\text{_____}}{\text{(secs.)}} \times 60 = \text{PUMPING RATE} \frac{\text{_____}}{\text{(gpm)}}$$

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

$$8 \text{ gals.} \div 63 \text{ secs.} \times 60 = 7.6 \text{ gpm}$$

Locate Water Conditioning Equipment Correctly:

Select the location of your filter tank 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 filter.

Facts To Remember While Planning Your Installation:

CAUTION

1) **Installation must comply** with existing state or local plumbing codes

2) If lawn sprinkling, a swimming pool, geothermal heating/cooling or water for other devices/activities are to be treated by the filter, a larger model filter 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 installer for alternative instructions if the pumping rate is insufficient.

3) 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;

4) 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 softener installation piping — refer installation to qualified personnel.

CAUTION

5) 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.

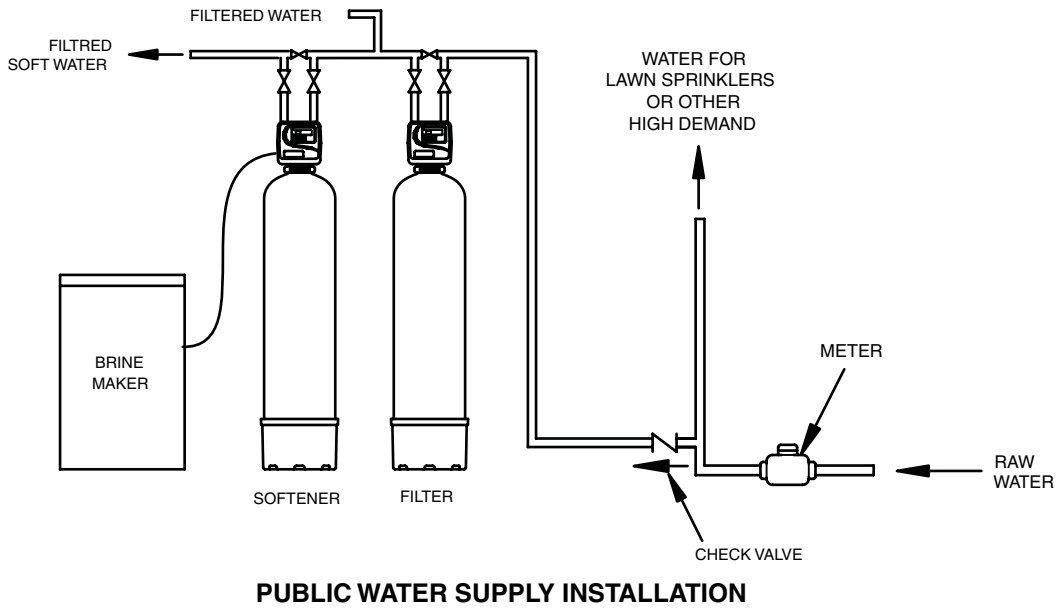
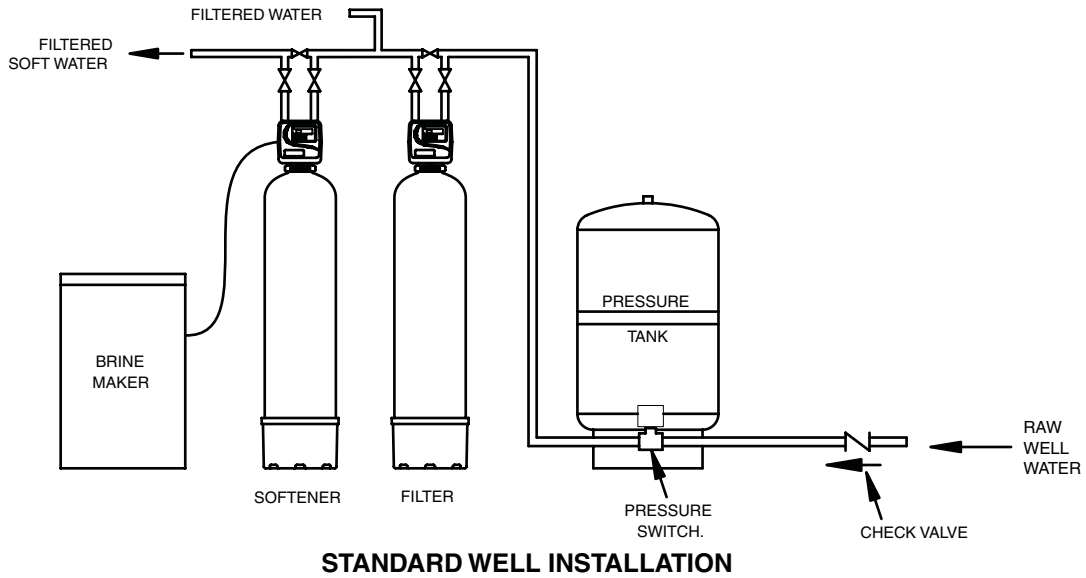


Figure 1

CAUTION

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

- **Read and follow** Use Instructions before installation and use of this system;

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.

CAUTION

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

- **Installation must comply** with existing state or local plumbing codes, even if they are contrary to our instructions.
- **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

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 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. Freight damage claims on unit damage needs to be filed with the freight company.
- Activated Carbon and Filter Ag require four (4) hours of saturation and Birm, Multi-Layer 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 filter 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 wholesaler to notify them of this situation. Provide the model number and serial number before contacting our technical support services department @ 1-800-222-7880.

Step 3

Follow the steps to load the filter media into the filter vessel to ensure the successful installation of your backwashing filter.

- a. Remove the latch and clamp assembly from around the control valve and mineral tank.
- b. Remove the control valve from the mineral tank and set aside for future use.
- c. Remove the distributor tube from the mineral tank and place the red plastic cap on the distributor tube that is provided in the parts bag.
- d. Pour out the filter gravel in the mineral tank into a clean pail for future use.
- e. Place the distributor tube back into the mineral tank, ensuring the slotted basket assembly is installed in the dimple on the bottom of the mineral tank. This is important as the tube was precut to the proper height.
- f. Locate and place into the mineral tank opening the fill funnel (Part Number U1006) provided with the backwash filter.
- g. Pour the filter gravel into the mineral tank, holding the distributor tube in place; gently shake the mineral tank to equally distribute the gravel in the mineral tank. Verify that the distributor tube has not moved when the gravel was loaded.
- h. Locate the filter media that will be used in the backwashing filter and load into the mineral tank. Note: fill only to the labeled line on the outside of the mineral tank. Refer to the Specification page for the correct quantity for your filter system. Use a clean rag to wipe the opening of the mineral tank to remove any dust or sediment before moving to the next step.

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.
- Refer to MSDS documents for further safety information.

Step 4

Once the filter media has been loaded, fill the mineral vessel with water using a pail or water hose to saturate the media and expel any air out of the filter vessel. Some media require a saturation time to prevent washing it from the filter vessel to the waste drain upon start-up. Refer to Figure 5 for saturation time.

Step 5

Secure the control valve onto the mineral tank; you may use a silicone lubricant on the mineral tank opening, distributor tube, control valve O-ring and pilot tube O-ring to aid in attaching the control valve to the mineral tank. Insert the distributor tube into the pilot tube adapter and slide the control valve down until the valve rest on the flanged opening of the mineral tank. Then with one downward and swift movement push the control valve into the opening of the mineral tank to seat the control valve properly. Rocking the control valve to seat on the mineral 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 mineral tank with the clamp assembly as shown in Figure 2.

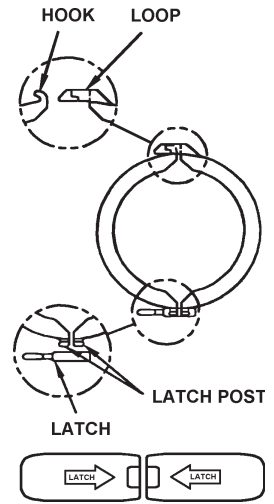


Figure 2

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 filter in relation to the other components of the water system (i.e. Water Softener, Ultra Violet Lamp System or Water Heater, if present) and install appropriately.

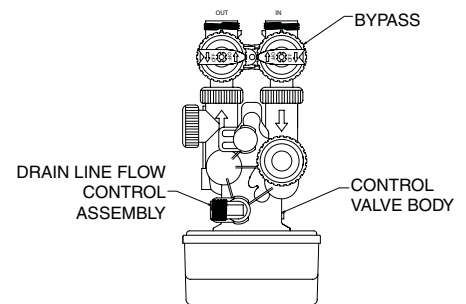


Figure 3

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

Do not allow any heat to come in contact with the control valve or any plastic component of the connection fittings. Doing so will cause the system to fail and will void your warranty to your water treatment system.

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.

- 1/2" ID lengths up to 15 feet and heights lower or slightly higher than the control valve.
- 5/8" ID length up to 25 feet in length and up to 4 feet above the control valve.
- For distances higher or longer than previously stated, relocate the filter closer to the desired discharge point or consult factory for advice. Avoid overhead drain lines as it may prevent desirable performance.

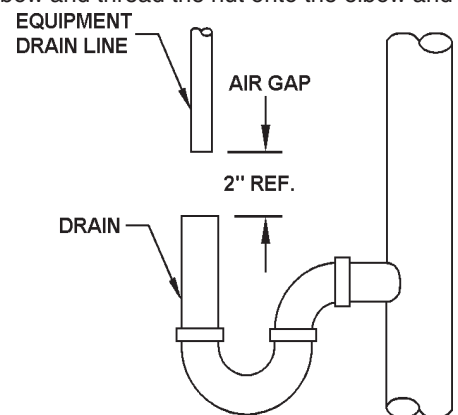


Figure 4

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 CLOCK" 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 filters containing activated carbon, birm, multi layer or filter ag. If pressure drops become undesirable or the contaminant reappears, increase the frequency to correct. For filter vessels containing calcite or corosex, the frequency should be once every other day to prevent cementing of the media in the filter vessel. Correct backwashing frequency as required.

Step 12

If the backwashing filter contains Activated Carbon or Filter AG 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
Filter Ag	4 Hours
Birm	2 Hours
Calcite	30 minutes or less
Corosex	30 minutes or less
Multi Layer	2 Hours
Filter Sand	2 Hours

Figure 5

Step 13

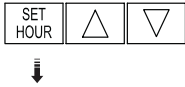
Turn on the electrical power to the well pump or open the valve on the municipal supply and pressurize the water line and check for leaks, correct as required. Locate the regeneration button on the control valve and initiate a manual regeneration (see "HOW TO MANUALLY INITIATE IMMEDIATE REGENERATION"), 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.

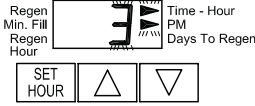
Installation is complete and system is ready for use.

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 Δ or ∇ . An arrow will appear in the display pointing to **PM** during PM hours.

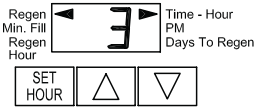


STEP 3

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

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

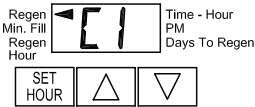
HOW TO MANUALLY INITIATE IMMEDIATE REGENERATION



STEP 1

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

HOW TO MANUALLY INITIATE DELAYED REGENERATION

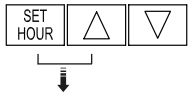


STEP 1

Press and release the Δ and ∇ buttons simultaneously.

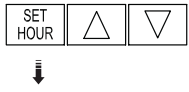
Note: An arrow will appear in the display pointing to **Regen** indicating regeneration will occur at the programmed time.

HOW TO CHANGE DAYS BETWEEN REGENERATION



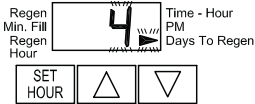
STEP 1

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



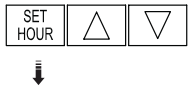
STEP 2

Press **SET HOUR** button.



STEP 3

Press Δ and ∇ buttons to change the number of days between regenerations.

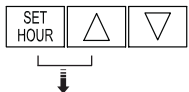


STEP 4

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

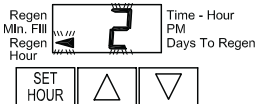
Note: Your Backwashing Filter is factory preset for 4 days between regenerations.

HOW TO CHANGE TIME OF REGENERATION



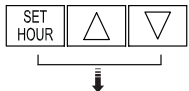
STEP 1

Press and hold **SET HOUR** and Δ 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 Δ or ∇ button. An arrow will appear in the display pointing to PM during PM hours.

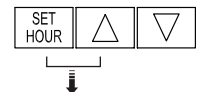


STEP 3

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

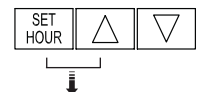
Note: Your Backwashing Filter is factory set to regenerate at 1:00 AM.

HOW TO CHANGE THE REGENERATION PROGRAM SETTINGS



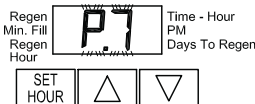
STEP 1

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



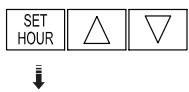
STEP 2

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



STEP 3

Press the Δ 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 Backwashing Filter 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.

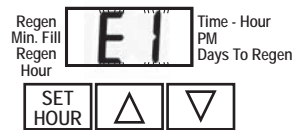
HOW TO SET TIMER CONTROL

Power Loss

If the power goes out, current time of day will need to be reset. 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 CUNO Water Treatment Technical Support Services @ 1-800-222-7880. 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.

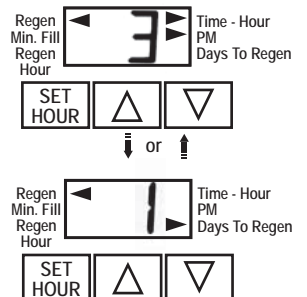


USER DISPLAYS

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.

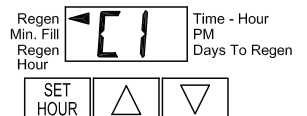
If the system has called for a regeneration that will occur at the preset time of regeneration, the arrow will point to Regen.



Regeneration Mode

Typically a filter system is set to regenerate at a time of low water usage. Your Backwashing filter 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 Section 2 to resolve.
- 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 taste and odor being removed reappears in the treated water or pressure drop, due to fouling of the media, becomes excessive.
- 3) Filter Ag, Filter Sand and Multi Layer Media will last 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 or Corosex 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.
- 5) Birm should be replaced when the iron reappears in the treated water and backwashing does not return the media to functional form.

TO REPLENISH (REBED) MEDIA:

- 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 in Section 2.
- 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 mineral tank.
- 4) Using flexible tubing, insert down the distributor tube and siphon the water from the mineral 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, Corosex or Neutralizer media, add the media you are using to the line on the side of the mineral tank. Then refill the filter tank with water utilizing a hose or clean bucket. Proceed to Step # 5.
 - b. If utilizing Activated Carbon, Filter Ag, Birm or Multi Layer media that needs to be entirely replaced you will need to empty the 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 tank is emptied, you can rinse the mineral 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 mineral with gravel or filter media. Place the distributor into the mineral tank and ensure it is in the dimple on the bottom of the mineral 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 mineral tank. Hold the distributor tube and gently shake the mineral tank to level the gravel in the mineral tank. Next load the filter media into the mineral tank to the proper level. This can be determined by observing the media level line on the outside of the mineral tank. Gently shake the mineral tank to level the media. Using a hose or clean bucket fill the mineral tank with water to help saturate the filter media before placing the control valve on the mineral tank. Using a clean rag or paper towel, wipe the opening of the mineral tank to remove any mineral fines before attaching the control valve.
- 5) Reattach the control valve to the mineral tank by sliding the control valve pilot tube adapter over the distributor tube. Let the control valve rest on the flanged portion of the mineral tank. Then using a swift and downward motion push the control into the opening of the mineral 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.
- 6) Reattach the bypass valve to the control valve and slowly open the bypass. Allow the Backwashing Filter unit to fill with water and set for the required time period. Refer to Figure 5 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 by referring to Section 2. Backwash the media until the water runs clear. Observe the color of the water in the drain line discharge to determine if it 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 mineral tank is now complete.

SECTION 4: TROUBLESHOOTING

Problem	Cause	Solution
1) Timer does not display the correct time of day.	A) Transformer is unplugged B) No power at outlet C) Defective transformer D) Defective PC Board	1) Reconnect Transformer 1) Repair working outlet 2) Check circuit breaker in main power box. 1) Replace transformer 1) Replace PC Board
2) Timer does not display the correct time of day.	A) Outlet on a switched circuit B) Power outage C) Time of day set wrong	1) Use a non-switched circuit 1) Reset time of day 1) Reset to the correct time
3) Error followed by a code number Error Code E1 — Unable to recognize start of regeneration Error Code E2 — Unexpected stall Error Code E3 — Motor ran too long. Timed out trying to reach next cycle position.	A) Valve just serviced B) Foreign material stuck in valve C) Excessive piston resistance D) Position not in the home position	1) Press SET HOUR and ∇ for 3 seconds or momentarily unplug power source from PC Board 1) Check piston and spacer stack for obstruction 1) Replace piston and spacer assembly 1) Press Set Hour and ∇ or momentarily unplug PC Board
4) Excessive pressure drop through filter	A) Filter not backwashing B) Filter bed loaded with well sand C) Cementing or Channeling of Media Bed	1) Increase backwash frequency as needed 2) Check for uninterrupted power source 3) Check for backwash frequency on timer assembly on control valve 1) Verify sediment being removed is less dense than the filter media 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 B) Past power outage C) Time of regeneration wrong	1) Reset the time of day 1) Reset the time of day 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 B) Iron in treated water	1) Change regeneration programming to P8 or P9 1) Check raw water quality and correct with the appropriate products (contact technical services for help, 1-800-222-7880)
8) Taste in treated water	A) Media fines in treated water B) Hydrogen Sulfide in raw water C) Iron in raw water	1) Change regeneration program to P8 or P9 1) Check raw water quality and correct with the appropriate products (contact technical services for help) 1) Check raw water quality and correct with the appropriate products (contact technical services for help, 1-800-222-7880)

Problem	Cause	Solution
9) Media in aerators at the faucets	A) Unit installed backwards B) Distributor is damaged C) Media was loaded in distributor tube while loading filter unit.	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.) 1) Remove distributor tube from filter tank and inspect. Replace as needed 1) Remove distributor tube from filter tank, clean and reinstall correctly. Cover distributor tube with plug sent or something appropriate
10) Water leaking from mineral tank	A) Mineral tank was subjected to a vacuum condition B) Mineral tank has failed C) Pin hole in mineral tank	1) Replace mineral tank and check to see that either a check valve or back flow prevention device is installed and operating 1) Contact installing contractor to have evaluated and replaced 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 B) Transformer was unplugged from either wall outlet or PC Board C) SET HOUR was pressed	1) Reset the time of day 1) Reset the time of day 1) Reset the time of day
12) Valve stalled in regeneration	A) Motor not operating B) No power at the outlet C) Defective transformer D) Defective PC Board E) Broken drive gear or drive cap assembly F) Broken piston retainer G) Broken main piston	1) Replace motor 1) Repair outlet or use a working outlet 2) Check circuit breaker at the main power box 1) Replace transformer 1) Replace PC Board 1) Replace gear or drive cap assembly 1) Replace main piston assembly 1) Replace main piston assembly
13) Valve does not regenerate automatically when the Δ and ∇ button is pushed	A) Transformer unplugged B) No power at outlet C) Broken drive gear or drive cap assembly D) Defective PC Board	1) Connect transformer and the PC board power 1) Restore or repair power source 1) Replace gear or drive cap assembly 1) Replace PC Board
14) Valve does not regenerate automatically, but does when Δ and ∇ is depressed	A) Programming error B) Defective PC Board	1) Review programming of control valve 1) Replace PC board

SECTION 5: SPECIFICATION AND OPERATING DATA

ITEM	CBF100 MCBF1001	CBF150 MCBF1501	CBF200 MCBF2001	CBF250 MCBF2501
Filter Media Volume, cu. ft. (cu. mtr.) (Note 1):	1.0 (0.03)	1.5 (0.04)	2.0 (0.06)	2.5 (0.07)
Gravel Underbed, lbs. (kg)	13 (5.9)	13 (5.9)	18 (8.2)	22 (9.9)
Operating Flow Rate, gpm (lpm) (Note 2):	3 (11.4)	3 (11.4)	4 (15.1)	5 (18.9)
Backwash Flow Rate, gpm (lpm) Note 3	5.3 (20.1)	5.3 (20.1)	7.5 (28.4)	10 (37.9)
Service Pipe Size, in. (cm) (Note 4)	1 (2.5)	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)	13 x 54 (33 x 137)
Minimum Space Required, in. (cm):				
Width	10 (26)	10 (26)	12 (31)	13 (33)
Depth (w/Bypass)	16 (41)	16 (41)	16 (41)	16 (41)
Height	53 (135)	63 (160)	63 (160)	63 (160)
Approximate Shipping Weight, lbs. (kg)	53 (24)	59 (26.7)	62 (28.1)	64 (29)
Maximum Operating Temperature 100°F (38°C); Electrical requirements 110V/60Hz; Operating Pressure 20 -100 psi (138-689 kPa). Specifications subject to change without notice.				

IMPORTANT NOTES

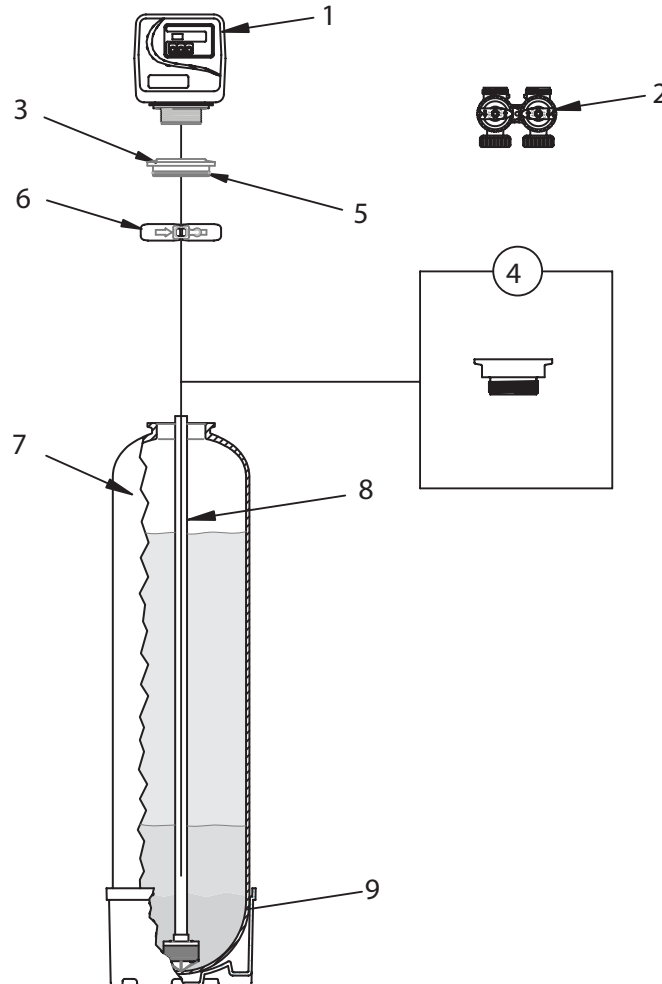
- 1) Replenishment of pH adjusting component of media may be required periodically, the frequency of which is dependent on raw water pH, manganese concentration and water consumption rate. Consult dealer for more information.
- 2) For satisfactory performance, indicated durations should not be exceeded. Flow rates specified are adequate for normal residential applications. Do not use listed flow rates when sizing commercial applications or if treated water is to supply a geothermal heat pump, swimming pool, etc. (contact dealer before selecting equipment).
- 3) For system to operate properly, pumping rate of well pump MUST be sufficient to backwash unit at rate specified.

SECTION 5: COMPONENT PARTS LIST

Ref. No.	Description	CBF100 MCBF1001	CBF150 MCBF1501	CBF200 MCBF2001	CBF250 MCBF2501
1	Control Valve, Complete, Less Bypass Valve (MCBF Series)	W217530-003-0C	W217530-003-0C	W217750-003-0C	W217A00-003-0C
	(CBF Series)	W217530-003-0N	W217530-003-0N	W217750-003-0N	W217A00-003-0N
2	Bypass Valve	V3006	V3006	V3006	V3006
3	Threaded Tank Adapter	FA45TX	FA45TX	FA45TX	FA45TX
4	Tank Adapter Coupling 4" x 8 x 2.5" - 8	-	-	-	FA45RX
5	O-ring (Included with Item #3)	ORG-234	ORG-234	ORG-234	ORG-234
6	Clamp Assembly	FC45XX	FC45XX	FC45XX	FC45XX
7	Media Tank w/ Base	MTP1044FB	MTP1054FB	MTP1254FB	MTP1354B
8	Distributor Tube	C37S-16-44	C37S-16-54	C37S-16-54	T37S-16-54
9	Gravel Underbed	QC-15P	QC-15P	QC-18P	QC-25P

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

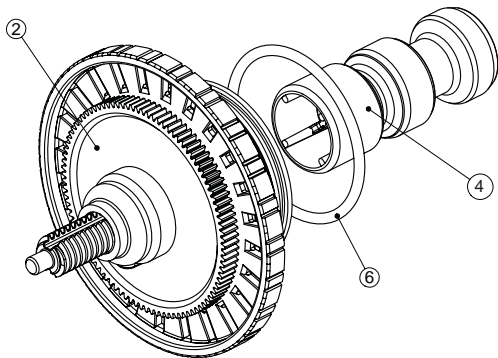
* see assembly drawings for individual components.



SECTION 5: COMPONENTS ASSEMBLIES

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

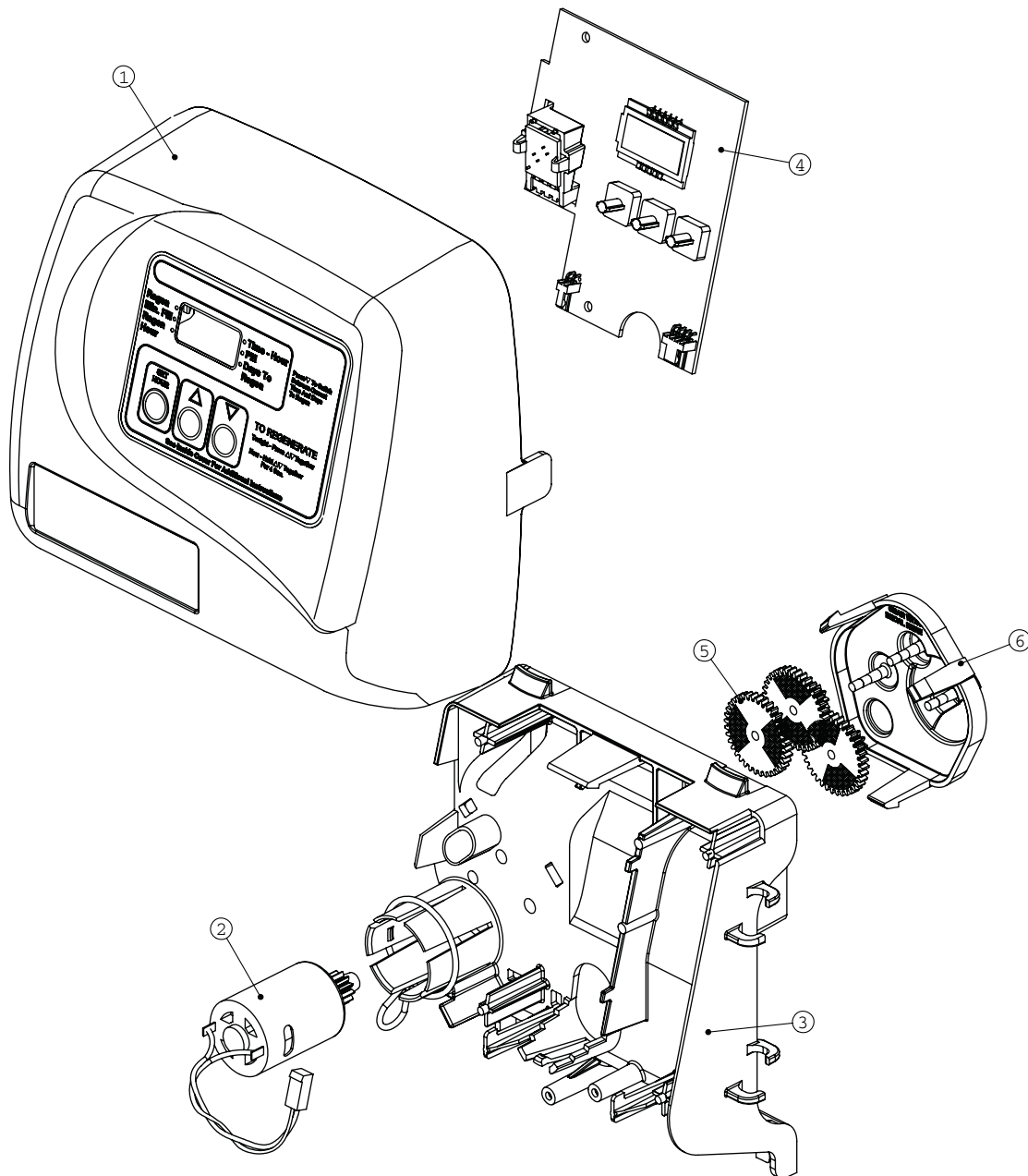
Reference No.	Part No.	Description	Quantity
1	V3005	Spacer Stack Assembly	1
2	V3004	Drive Cap Assembly	1
3	V3178	Drive Back Plate	1
4	V3011	Piston Downflow Assembly	1
6	V3135	O-ring 228	1
7	V3180	O-ring 337	1
8	V3105	O-ring 215 Pilot Tube	1
NOT SHOWN	V3001	Downflow body Assembly	1



SECTION 5: 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.



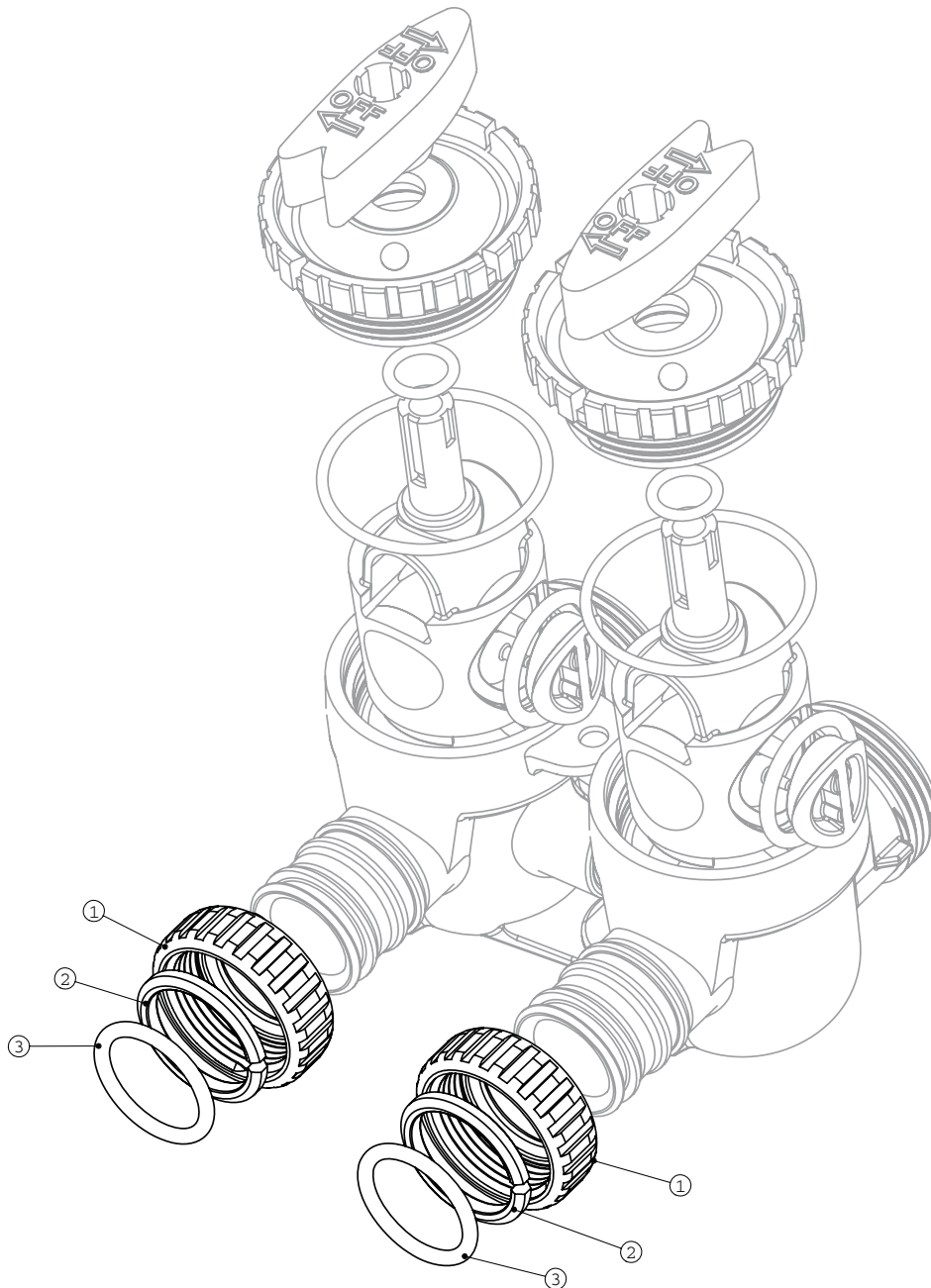
SECTION 5: QUICK CONNECT BYPASS

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

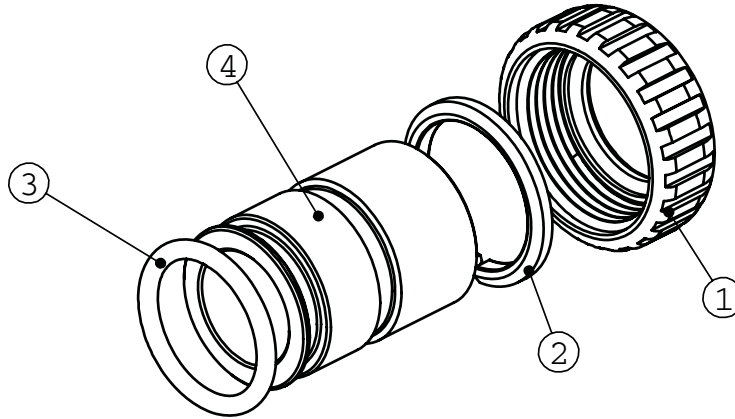
V3151	1" Quick Connect Nut	2
V3150	Split Ring	2
V3105	O-ring 215	2
V3191	Vertical Bypass Adapter	1



SECTION 5: INSTALLATION FITTING AND ASSEMBLIES

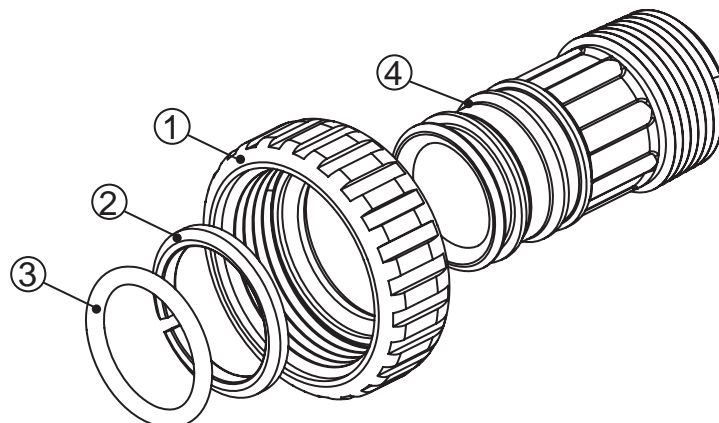
Quick Connect Assemblies Part # V3007-02 1" Copper Brass Sweat Adapter

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

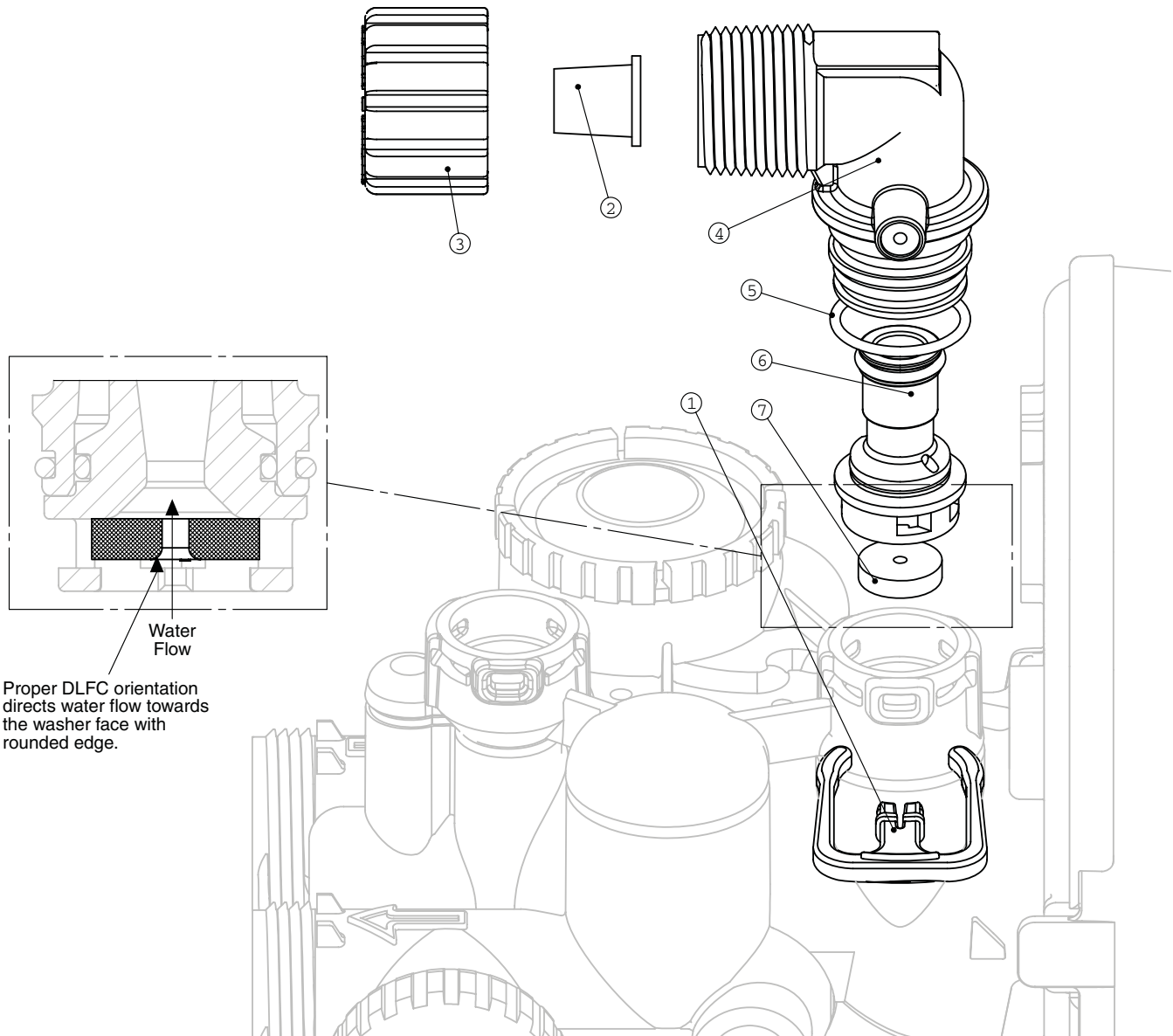


Part # V3007-04 1" Plastic Male NPT Assembly

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



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