Aqua-Pure®

INSTALLATION AND OPERATING INSTRUCTIONS

ASB SERIES RESIDENTIAL ARSENIC REDUCTION SYSTEM

MODELS:

ASB1001
ASB2001
ASB3001

Units Not for sale in California, Iowa, Wisconsin or Quebec.

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

INSTR2199 1211

3M

SAFETY INFORMATION

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

Intended use:

Aqua-Pure ASB Series Residential Arsenic Reduction Systems are intended for use in reducing arsenic levels in water in homes and have not been evaluated for other uses. The systems are intended for indoor installations near the entry point of a home water line, and must be installed by qualified professional installers in accordance with these installation instructions and local plumbing codes. Units Not for sale in California, Iowa, Wisconsin or Quebec.

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 filter 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 with skin, eye, and respiratory tract irritation from dust from filter media during installation:
- Titanium oxide granules and two grades of gravel are used for filter media in this product. During installation, dust may cause irritation to skin, eyes, and respiratory tract, and may affect lungs.
- 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 the media included with this product, call 203-238-8965 or go to www.3M.com, select country, and use the search engine to search MSDS. For emergencies, call 800-364-3577 or 651-737-6501 (24 hours).

CAUTION

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

- **Read and follow** Use instructions before installation and use of this water treatment system.
- Installation and use **MUST** comply with existing state or local plumbing codes.
- **Protect from freezing**, relieve pressure and drain system when temperatures are expected to drop below 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 125 psi (862 kPa). 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 overtightening 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 media 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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SECTION 1: BEFORE INSTALLATION

Inspecting And Handling Your Filter System:

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. Installation must comply with state and local laws and regulations.

Titanium Oxide

Titanium oxide filter media is used to reduce heavy metals in water. It is manufactured as a granular material, is white in color and shipped dry. Titanium oxide has the ability to reduce arsenic arsenate and arsenite (otherwise referred to as AS (V) and AS (III), if applied and installed properly. The material is sold in cubic foot equivalent quantities for use in backwashing vessels and performs its task by adsorption. Adsorption is performed as the water passes through the filter medium in the pressure vessel and the arsenic is attracted to the media. Once adsorption takes place, the arsenic is permanently retained by the titanium oxide granules. Occasional backwashing of the filter will prevent channeling of the filter media and wash away any sediment and color to a waste drain while not reducing any arsenic from the titanium oxide. This will help provide better quality water and help extend the life of the filter. The life of this filter medium can vary depending on the amount of other heavy metals in the water.

IMPORTANT NOTE

Have the water tested thoroughly prior to the installation of this filter system.

Test of the following constituents are recommended prior to installation, but are not limited to the following.

1. Arsenate (AS V)
2. Arsenite (AS III)
3. Total Hardness
4. Total Iron
5. Manganese
6. pH
7. Tannins
8. Total Dissolved Solids
9. Hydrogen Sulfide Gas
10. Silica
11. Zinc
12. Lead
13. Selenium
14. Vanadium
15. Cadmium
16. Phosphates

Only testing the finished water will determine when it is time to change out the filter media bed. The water should be tested at six (6) month intervals to confirm there is a reduction of arsenic in the treated water. The target level of arsenic reduction in the treated water is less than 10 ppb, which is the US EPA maximum contaminant level (mcl). Changing of the titanium oxide filter media should take place when test results shows greater than 10 ppb in the treated water. Dispose of exhausted titanium oxide in accordance with your state and local ordinances and regulations.

One can expect the useful life of titanium oxide to vary from various aspects. It should be understood that the higher the arsenic concentration in the water the shorter the life one could expect from the titanium oxide. The life expectancy can vary depending on the amount of other heavy metals that would compete for sites of the titanium oxide media, the amount of water being treated, and how well the filter unit is backwashed. Backwashing requirements are driven by a pressure drop. Usually backwashing once every 30 days is sufficient. The filtered arsenic cannot leach from the titanium oxide[1] during the backwashing process.

[1] Jing, Chuanyong, Sugin Liu, Manish Patel, and Xiaoguang Meng. “Arsenic Leachability in Water Treatment Adsorbents.” Environmental Science & Technology 39 (2005): 5481-5487.

Check Your Pumping Rate and Water Pressure:

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

1) MINIMUM water pressure required at the water inlet is 20 psi (138 kPa). IF WATER PRESSURE IS OVER 80 psi (552 kPa), A PRESSURE REDUCING VALVE MUST BE INSTALLED IN THE WATER SUPPLY LINE AHEAD OF THE SYSTEM.

CAUTION

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

- **Do not** install if water pressure exceeds 125 psi (862 kPa). If your water pressure exceeds 80 psi (552 kPa), you must install a pressure limiting valve. Contact a plumbing professional if you are uncertain how to check your water pressure.

NOTE: If you have a municipal or a community water supply and daytime water pressure is 80 psi (552 kpa) or more, nighttime pressure may exceed 125 psi (862 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 the high and low system pressure. Record your water pressure data below:

Water Pressure:

Low_____ psi High _____ psi

CAUTION

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

- **Do not** install system where water lines could be subjected to vacuum conditions without appropriate measures for vacuum prevention.

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

2) The pumping rate of your well must be sufficient for satisfactory operation and BACKWASHING of the system. **(See EQUIPMENT SPECIFICATION AND OPERATING DATA, Section 5)**

Locate Water Conditioning Equipment Correctly:

Select the location of your arsenic reduction 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 drain.
3) Locate in correct relationship to other water conditioning equipment (Figure 1, page 2-1).
4) Locate the arsenic reduction system in the supply line BEFORE the water heater. Temperatures above 110°F (43.3°C) will damage the arsenic reduction system and void the factory warranty.
5) DO NOT install the arsenic reduction system in a location where freezing temperatures occur. Freezing will cause permanent damage and will also void the factory warranty.
6) Allow sufficient space around the installation for easy servicing.
7) Provide a non-switched 110V, 60Hz (220V, 50Hz for specified systems) power source for the control valve.

⚠ WARNING

To reduce the risk associated with ingestion of contaminants:

- **Do not** use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

CAUTION

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

- **Protect from freezing**, relieve pressure and drain system when temperatures are expected to drop below 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).

Facts to Remember While Planning Your Installation:

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

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

3) Remember that the arsenic reduction system INLET is attached to the pipe that supplies water (i.e. runs to the pump) and the OUTLET is the line that runs toward the water heater.

CAUTION

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

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

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

⚠ WARNING

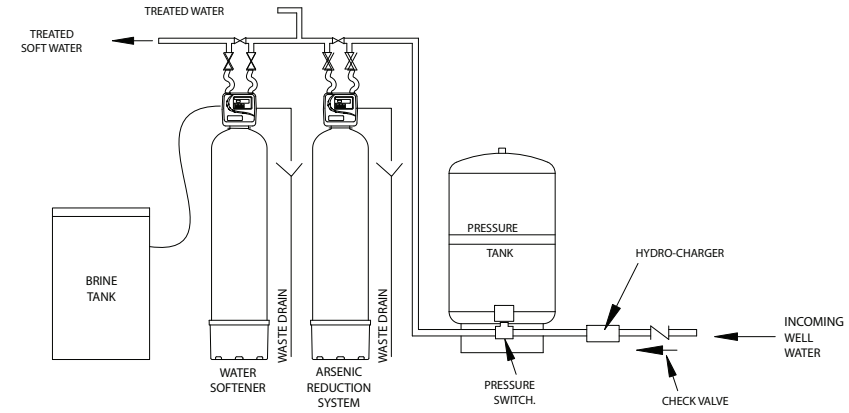
To reduce the risk associated with a hazardous voltage:

- 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 filter installation piping — refer installation to qualified personnel.

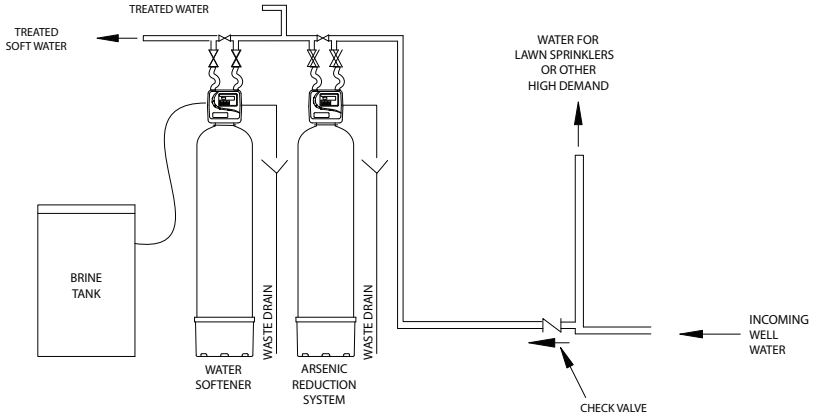
5) Sweep the floor to eliminate objects that could pierce the media tank.

SECTION 2: INSTALLATION

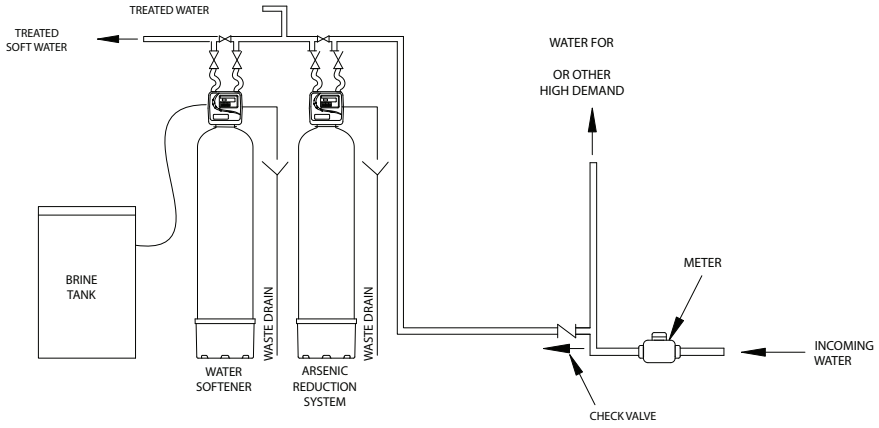
Proper installation sequence of water conditioning equipment is very important. Refer to the following diagram for your particular water supply. Installation may vary depending upon water quality.



TYPICAL WELL INSTALLATION



SPLIT-STREAM INSTALLATION



PUBLIC WATER SUPPLY INSTALLATION

Figure 1

CAUTION

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

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

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

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

Step 1

a) Remove the filter unit from the shipping box, and carefully remove the control valve from the cardboard structure/frame attached to the filter vessel and set aside. Ensure that the following items have been shipped entirely with the unit to allow for installation.

i. Control valve
ii. Media tank w/ base (also a reducing bushing and flanged adapter on ASB3001)
iii. Bypass valve
iv. 1" Plumbing Connection Fitting Kit
v. Titanium Oxide (amount will vary by filter size)
vi. Distributor Tube
vii. QC gravel (Gravel Underbed)
viii. QF Filter gravel (#16 Filter Gravel)
ix. Parts bag
x. Installation and Operating Instruction
xi. Funnel
xii. Tube extension device and cap

Gravel and Titanium Oxide Schedule			
Unit Model Number	ASB1001	ASB2001	ASB3001
Titanium Oxide Filter Media	TO-10B (1)	TO-10B (2)	TO-10B (3)
QC gravel	QC-12P (1)	QC-15P (1)	QC-18P (1)
QF gravel	QF-7 (1)	QF-7 (1)	QF-7 (2)

⚠ CAUTION

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

- Titanium oxide granules and two grades of gravel are used for filter media in this product. During installation, dust may cause irritation to skin, eyes, and respiratory tract, and may affect lungs.
- 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 the media included with this product, call 203-238-8965 or go to www.3M.com, select country, and use the search engine to **search MSDS. For emergencies, call 800-364-3577 or 651**-737-6501 (24 hours).

b) Remove the control valve by rotating the valve head assembly to the left or counter-clockwise and set aside to reassemble after media is loaded into the tank.

c) Install the distributor tube in the media tank and ensure the tube is centered in the tank; a dimple is usually in the center of the media tank to help it do so. Using the tube extension device and cap, cover the distributor tube to prevent gravel and titanium oxide from entering the distributor tube during the loading process.

d) Place the funnel provided in the opening of the media tank to aid in loading the gravel and titanium oxide. Pour the QC gravel into the media tank slowly. While holding the distributor tube in place shake the media tank from side to side gently, to aid in leveling the QC gravel. Pour the QF gravel slowly into the media tank. While holding the distributor gently shake the media tank from side to side to evenly distribute the filter gravel in the media tank. Lastly, locate the titanium oxide and slowly pour into the media tank; again, gently shake the media tank from side to side to level out the titanium oxide while holding the distributor tube to prevent it from lifting or moving. Next, using a hose or clean pail, fill the media tank with water to saturate the titanium oxide and expel air within the titanium oxide and media tank. Remove the tube extension device and funnel from the media tank opening, saving for future service or maintenance of the arsenic reduction system. It is recommended that the media be allowed to saturate for a minimum of twenty four (24) hours prior to initial backwash.

e) Using a dry rag, clean the opening of the media tank to remove any dust or residue from the opening to receive the control valve. Apply a silicone based lubricant the tank and control valve o-rings that seal against the media tank and the distributor tube in the center of the control valve. Place the center of the control valve over the distributor tube and slide down until it contacts the media tank. Secure the control valve onto the media tank. Insert the distributor tube into the pilot tube adapter and screw the control valve down until the valve is flush with the opening of the media tank. Locate the installation assembly packet and assemble as the enclosed instructions dictate. Figure 2 represents the final assembly of the bypass. Attach the bypass assembly and connection fitting to the control valve and hand tighten only.

Step 2

Shut off the power to the water well pump or close the water supply on a municipal water supply to the home. Turn off the electrical supply or gas to the water heater or water boiler to prevent damage. Down stream from the pressure tank or water meter, open a water fixture or valve and drain the water line to aid in draining the home or facility to facilitate installing the arsenic reduction system.

Step 3

Cut the main water line supply as required to fit plumbing to INLET and OUTLET connections of the bypass valve.

Step 4

a) Attach the bypass to the control valve.

b) Asssemble the 1" NPT male connection fittings before you attach them to the bypass valve. Please refer to Figure 3 below to correctly assemble the connection fitting. Attach connection fittings to the bypass by inserting the connection fittings into the inlet/outlet connections of the bypass valve and hand tightening the fitting nut.

c) Attach plumbing to connection fittings based on local state or federal plumbing codes.

d) Make certain the water enters the inlet and discharges through the outlet sides of the bypass valve. Arrows on the bypass valve indicate water flow. Refer to SECTION 6: COMPONENT LIST AND ASSEMBLIES for an assembly drawing on the connector (Page 6-5).

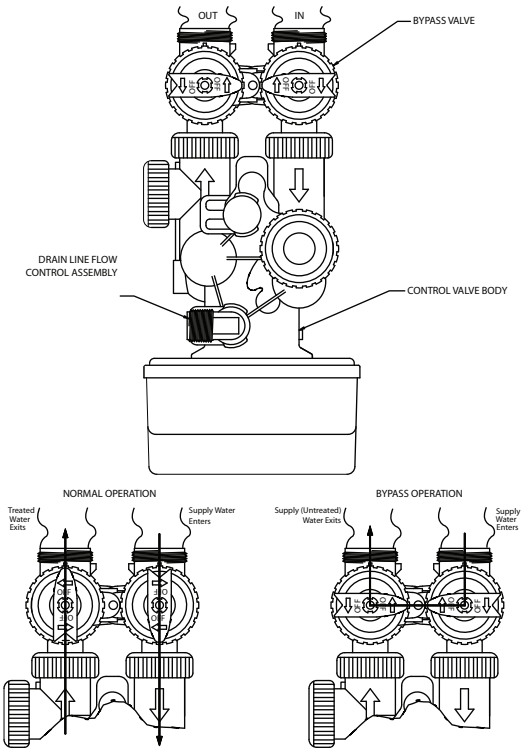


Figure 2

CAUTION

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

- Installation and use **MUST** comply with existing state or local plumbing codes.
- **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 overtightening occurs.

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

- **Leave the bypass valve in the bypass position until you are ready to backwash the arsenic reduction system after the proper saturation time (twenty-four hours).**

Fitting Installation Instructions

1. The installation fittings are designed to accommodate minor plumbing misalignments, but are not designed to support the weight of a system or plumbing line and fittings.
2. Thread tape is the only type of thread sealant allowed to be used; the use of paste of any kind will void the factory warranty.
3. Slide the nut on first (closed and against the threads), then slip the split ring onto the fitting, ensuring it set correctly in groove, then the o-ring last. Use silicone lubricant to allow for easier insertion of parts into one another.
4. Hand tighten the nut only, the use of pliers or wrenches of any type will void the factory warranty and may cause an unexpected failure and water leak in your home or facility.

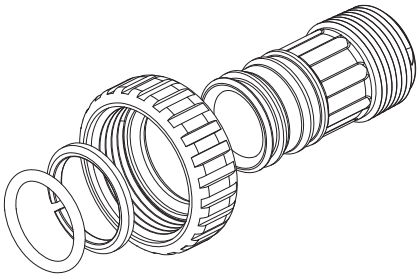


Figure 3

Step 5

The drain line flow control elbow is designed to accept either 5/8" polyethylene tubing or 3/4" NPT pipe fittings. To utilize the NPT connection, set aside the supplied nut and insert sleeve. Use customer supplied fittings to adapt drain line to elbow. Support of the drain line is required or the elbow could be damaged unexpectedly and cause a water leak in the home or facility. Copper, PVC or CPVC pipe can be used to adapt to the 3/4" NPT threads on the elbow for long or high drain lines. Use only thread sealing tape to seal the threads, hand tighten the fitting.

To use polyethylene tubing as a drain line, remove the supplied nut and find the insert that was shipped in the part kit box. Slide the nut over the polyethylene tubing and insert the sleeve into the tubing. Slide the end of the tubing into the elbow and using your hand thread the nut onto the elbow and **hand tighten only**. Overtightening could cause the nut to fail unexpectedly and cause a water leak in the home or facility.

Typical examples of proper drain line diameters are:

1/2" ID up to 15 feet when discharge is lower than the inlet.
5/8" ID up to 15 feet when discharging is slightly higher than the inlet.
3/4" ID when drain is 25 feet away and not higher than 4 feet above control valve.

Avoid installing drain line overhead or using flexible vinyl turing; either may result in system not operating properly and reducing arsenic sufficiently. Some areas prohibit the use of flexible drain lines. Check with local code officials prior to installation to ensure you conform to local plumbing codes.

Step 6

Position DRAIN LINE over drain and secure firmly. To prevent back-siphoning of sewer water, provide an air gap of at least two (2) inches or two (2) pipe diameters between end of drain hose and drain (Figure 4). Do not raise DRAIN LINE more than ten (10) ft. above floor.

Step 7

Plug control valve into properly grounded 110V 60 Hz non-switched electrical outlet. Check with your local code enforcement officer to determine if it meets local code.

Step 8

Set the time of day by referring to Section 2 Installation **"How To Set Time Of Day"** on page 2-5.

Step 9

Open the valve on the water supply as required to repressurize the water line to the home or facility. Do not forget to turn the electricity to the water heater or water boiler on once water has been allowed to flow into that device. Check for leaks on all connections, correct as necessary.

Step 10

Manually initiate backwashing of the arsenic reduction system by referring to the **"How To Manually Initiate Regeneration (Backwashing)"** section of Control Valve settings on page 2-7.

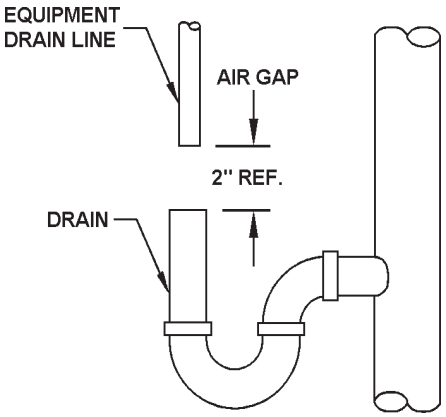


Figure 4

Step 11

Once the valve is in the backwash position (C1 appears on the display) slowly open the inlet side of the bypass valve to allow water to flow into the filter. Water should start to flow to drain. Allow for any air that might have been trapped (or vent from the titanium oxide) to leave the filter and go to the drain. This will be detected by changes in noise in the drain line or is visible in the semi-transparent tubing. Once the air is gone, open a drain port, spigot or faucet slightly, slowly open fully and run to drain. Allow the control valve to cycle on its own and return to service. This should take about 14 minutes to complete.

IMPORTANT NOTE

It is normal to see milky colored water when the valve is in the backwash position (the display will read C1). If the fast rinse water continues to appear milky, contact Technical Support Services @ 1-800-222-7880 for resolution.

Step 12: Determining Frequency of Backwash:

The frequency of backwash is factory set at 12 days. Due to the nature of any backwash filter it will act as a sediment reduction filter. If the water contains a high sediment concentration, it is recommended to install a high flow inline sediment filter ahead of the arsenic reduction system. (Examples include the AP902 SQC Whole House Filter). To change from factory frequency to another frequency refer to **"SETTING DAYS BETWEEN REGENERATION"** on page 2-5.

INSTALLER/USER DISPLAYS

SETTING DAYS BETWEEN REGENERATION

Step 1) Begin in normal mode and press SET + ▲ for three seconds simultaneously.

Step 2) Set the hours for regeneration using ▲ or ▼. Press SET and proceed to step 3.

Step 3) Set the minutes for regeneration using ▲ or ▼. Press SET and proceed to step 4.

Step 4) Set the days for regeneration between 1 and 99. Press SET to exit Installer/User Displays and Settings.

GENERAL OPERATION

When operating, the system will either display the current time of day or the days remaining until the next regeneration. Use ▲ or ▼ to toggle between the two displays. If the remaining days is at 1, the system will regenerate at the preset time.

An arrow will appear pointing to REGEN when the system calls for regeneration.

REGENERATION MODE

When the system is regenerating, untreated water will be used. Therefore, systems are typically set to regenerate during times of low water usage—such as when the household is asleep.

During regeneration, the arrow will point to REGEN and the display will change to Regeneration Cycle Display, indicating the time remaining. The system automatically runs through the steps of regeneration; upon completion, treated water is ready for use.

HOW TO MANUALLY INITIATE REGENERATION

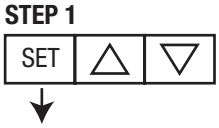
If a system needs to be regenerated before the next scheduled time, manual regeneration can be initiated. This may be necessary during times of heavy water usage, including house guests or heavy laundry days.

To initiate a manual regeneration at the preset delay time, press ▲ and ▼ simultaneously. Release. An arrow will point to REGEN if regeneration is expected "tonight." To cancel, press ▲ and ▼ simultaneously. Release.

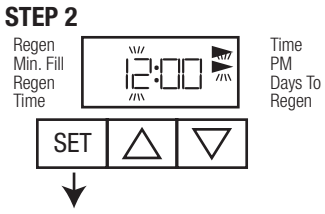
To initiate an immediate manual regeneration, press ▲ and ▼ simultaneously for three seconds. This request cannot be cancelled.

HOW TO SET TIME OF DAY

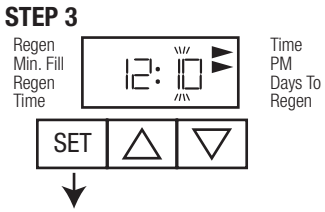
Step 1) Press SET



Step 2) Use ▲ and ▼ to adjust the current time hour. Time display will be 12 hour with PM indicator with 60 Hz line frequency detection on power-up. Time display will be 24 hour without the PM indicator with 50 Hz line frequency on power-up. Press SET and proceed to step 3.



Step 3) Use ▲ and ▼ to adjust the current time minutes. Press SET to exit Set Time of Day.

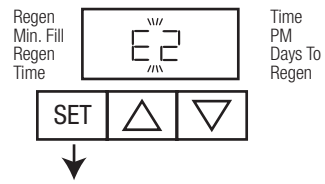


Power Loss

If power is lost for more than 8 hours, the current time of day will need to be reset. If the system is in the middle of regeneration upon power loss, the control will continue regeneration at the point of interruption when power is restored.

Error Message

Contact your Dealer/Installer or our Customer Service Department at 1-800-222-7880 for assistance if the display shows "E1," "E2," "E3" or "E4." These messages are indications the valve did not function properly.



SECTION 3: MAINTENANCE

Failure to follow installation, operation, and maintenance instructions may result in property damage due to water leakage and will void warranty.

1) At least once every six (6) months you should test your water both before and after the arsenic reduction system for both arsenite (AS III) and arsenate (AS V). This can be accomplished by using an arsenic test kit sold as an accessory by 3M Purification Inc. as part number ARS-TEST — or a sample of your water may be taken to a qualified lab for analysis. Both a before and an after water sample is needed to check the performance of the filter. If the results are above the US EPA limit of 10 ppb, contact the installing contractor, as servicing of this product may be necessary.

2) Check the "time of day" setting on the time clock of the control valve frequently. Correct if necessary, follow the steps on "**HOW TO SET TIME OF DAY**" in Section 2 of manual.

3) As the arsenic reduction system becomes saturated with arsenic, both arsenite (AS III) and arsenate (AS V), reduction efficiency is reduced and the titanium oxide will need to be changed out. It may require a qualified service company to change out the titanium oxide. Please contact the contractor who installed the system for help in changing out. The following items are required to properly change out the titanium oxide in this filter.

Gravel and Titanium Oxide Schedule			
Unit Model Number	**ASB1001**	**ASB2001**	**ASB3001**
Titanium Oxide Filter Media	TO-10B (1)	TO-10B (2)	TO-10B (3)
QC gravel	QC-12P (1)	QC-15P (1)	QC-18P (1)
QF gravel	QF-7 (1)	QF-7 (1)	QF-7 (2)

⚠ CAUTION

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

- Titanium oxide granules and two grades of gravel are used for filter media in this product. During installation, dust may cause irritation to skin, eyes, and respiratory tract, and may affect lungs.
- 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 the media included with this product, call 203-238-8965 or go to www.3M.com, select country, and use the search engine to **search MSDS. For emergencies, call 800-364-3577 or 651**-737-6501 (24 hours).

4) The following procedures will describe how to replace the exhausted titanium oxide with new titanium oxide.

a. Shut off the flow of water to the filter system by rotating the bypass knobs to the bypass position as shown in Figure 2 in section 2. Manually initiate a REGEN to relieve the water pressure in the arsenic reduction system. The display will read C1 to indicate that the control valve is in the backwash position. Once the valve motor stops, unplug the cord from the electrical outlet.

b. Separate the bypass from the control valve by unscrewing the retaining nuts and pulling the bypass valve assembly away from the control valve. Remove the retaining clip holding the drain line flow control elbow in the control valve body, pull up on the elbow to remove and secure to prevent damage to the drain line and elbow. Remove the control valve by rotating the valve head assembly to the left or counter-clockwise and set aside to reassemble after media is loaded into the tank.

c. Using a 1/2" flexible tube, insert it to the bottom of the distributor tube and siphon out the water from the media tank to lighten the weight of the media tank to aid in handling. Care should be taken in handling as the unit could weigh 200 pounds. Once the water is removed from the tank, dump the spent titanium oxide and gravel into pails or plastic bags. Dispose of in accordance with state and local regulations.

d. Wash out the media tank with water and inspect for any remaining media, gravel or damage to any components. Any fines that are lodged in the slots of the distributor basket need to be washed out. To aid in the process, you can loosen the screw on the bottom of the basket assembly and gently tap to remove, retighten the screws when completed. At this time, you can disinfect your media tank and distributor tube with a 1/2 cup of unscented household laundry bleach and fill the remainder of the media tank with water and let stand for 20 minutes. Discard the water when the time period has been reached.

e. Ensure the distributor tube is free from gravel and media and insert into the media tank. The tube needs to be placed in the center of the media tank at the bottom; a dimple is usually present to help in this step. Using the tube extension device and red cap, cover the distributor tube to prevent any gravel or titanium oxide from entering the tube during the reloading of the media tank.

f. Using the funnel provided, place in the opening of the media tank to aid in loading the gravel and titanium oxide. Pour the QC gravel into the media tank slowly. While holding the distributor tube in place shake the media tank from side to side gently, to aid in leveling the QC gravel. Pour the QF gravel slowly into the media tank, while holding the distributor gently shake the media tank from side to side to evenly distribute the filter gravel in the media tank. Lastly, locate the titanium oxide and slowly pour into the media tank, again gently shake the media tank from side to side to level out the titanium oxide while holding the distributor tube to prevent it from lifting or moving. Next, using a hose or clean pail, fill the media tank with water to saturate the titanium oxide and expel air within the titanium oxide and media tank. Remove the tube extension device and funnel from the media tank opening, saving for future service or maintenance of the arsenic reduction system.

g. Using a dry rag, clean the opening of the media tank to remove any dust or residue from the opening to receive the control valve. Using lubricant provided, apply to the tank and control valve o-rings that seal against the media tank and the distributor tube in the center of the control valve. Place the center of the control valve over the distributor tube and slide down until it contacts the media tank. Secure the control valve onto the media tank. Insert the distributor tube into the pilot tube adapter and screw the control valve down until the valve is flush with the opening of the media tank. If pinching or rolling of the o-ring occurs, remove the control valve and try again. Attach the bypass assembly and connection fitting to the control valve and hand tighten only.

h. Plug control valve in the original electrical outlet. Open water inlet valve. The valve should continue where it left off. Backwash the unit as describe in step 12 on page 2-4.

i. Once the waste water is clear, open the outlet side of bypass valve and check the water color and pressure at a sink or lavatory to ensure the filter is completely ready to use.

j. Check clock to ensure the correct time of day is set. If not refer to section 2 of this manual to set correctly.

Note: *It is normal to see milky colored water when the valve is in the backwash position (the display will read C1). However, at the end of the second fast rinse (the display will read C4) the line should be clear. If the fast rinse water continues to appear milky, contact* ***Technical Support Services @ 1-800-222-7880 for resolution****.*

SECTION 4: TROUBLESHOOTING

Problem	Possible Cause	Solution
1. Timer does not display.	A. Transformer is unplugged.	1. Reconnect transformer.
	B. No power at outlet.	1. Repair or use 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. Damaged PC board.	1. Replace PC board.
	D. Time of day set wrong.	1. Reset to the correct time.
3. Error followed by a code number. Error Code E1 — Unable to recognize start of backwashing. Error Code E2 — Unexpected stall Error Code E3 — Motor ran too long. Timed out trying to reach next cycle position If other codes appear, contact factory.	A. Valve just serviced.	1. Press SET HOUR and ▽ for 3 seconds or momentarily unplug power source from PC board.
	B. Foreign material stuck in valve.	1. Check piston and spacer stack for obstruction.
	C. Excessive piston resistance.	1. Replace piston and spacer assembly.
	D. Position not in the home position.	1. Press SET HOUR and ▽ or momentarily unplug power source from PC board.
4. Excessive pressure drop through filter.	A. Filter not backwashing.	1. Increase backwash frequency as needed. 2. Check source 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 treated 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. Inadequate arsenic reduction.	A. Leaking bypass valve.	1. Check bypass valve is in “Service” position, replace or repair as necessary.
	B. Internal valve leak.	1. Check piston and seal and spacers — replace as necessary.
	C. Distributor tube not properly seated in control valve.	1. Make sure distributor tube is in the pilot tube adapter protruding from bottom of control valve. 2. Check distributor o-ring for damage or if missing — replace as required.
	D. Flow rate too high for filter size.	1. Check demand requirements against filter recommended flow rates.
6. Regenerates at 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 backwashing set wrong.	2. Reset the time of backwashing.
7. Water runs to drain in the service position.	A. Piston and seal assembly damaged.	1. Replace piston and seal assembly together.
8. Discoloration in treated water drain upon start up of filter.	A. Media not sufficiently washed to P8 or P9.	1. Change backwashing programming.
	B. Iron in treated water.	1. Check raw water quality and correct with the appropriate products (contact technical services for help.)
9. Taste in treated water.	A. Media fines in treated water.	1. Change backwashing program to P8 or P9.
	B. Hydrogen Sulfide in raw water.	1. Check raw water quality and correct with the appropriate products (contact technical services for help)
	C. Iron in raw water.	1. Check raw water quality and correct with the appropriate products (contact technical services for help)
10. 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 filter tank and inspect. Replace as needed.
	C. Media was loaded in distributor tube while loading filter unit.	1. Remove distributor tube from filter tank, clean and reinstall correctly. Cover distributor tube opening to prevent media from entering tube.
11. 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 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.

12. Time of day flashes on and off.	A. Power has been off for more than eight hours.	1. Reset the time of day.
	B. Transformer was unplugged from either wall outlet or from PC board.	1. Reset the time of day.
	C. SET HOUR was pressed.	1. Reset the time of day.
13. Valve stalled in backwashing.	A. Motor not operating.	1. Replace motor.
	B. No power at the outlet	1. Repair outlet or use a working one. 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.
14. Valve does not regenerate automatically when the △ and ▽ buttons are 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.
15. Valve does not regenerate automatically, but does when △ and ▽ are depressed.	A. Programming error.	1. Review programming of control valve.
	B. Damaged PC board.	1. Replace PC board.

SECTION 5: EQUIPMENT SPECIFICATION AND OPERATING DATA

ITEM	ASB1001	ASB2001	ASB3001
Nominal Media Volume, cu. ft. (cu. mtr.)	1.0 (0.03)	2.0 (0.06)	3.0 (0.08)
Gravel Underbed			
QC lbs (kg)	12 (5.44)	15 (6.8)	18 (8.16)
QF lbs (kg)	7 (3.18)	7 (3.18)	14 (6.35)
Operating Flow Rate, (Note 1)			
gpm (lpm) @ 1.5 minute EBCT	5.0 (18.9)	10.0 (37.9)	15.0 (56.8)
gpm (lpm) @ 2 minute EBCT	3.7 (14.0)	7.5 (28.4)	11.2 (42.4)
gpm (lpm) @ 3 minute EBCT)	2.5 (9.5)	5.0 (18.9)	7.5 (28.4)
Pressure Drop @ 3 minute EBCT, PSI (kPa)	3 (21)	6 (41)	8 (55)
Backwash Rate, (Note 2), gpm (lpm)	2.7 (10.2)	3.2 (12.1)	5.3 (20.1)
Service Pipe Size, inches (cm)	1 (2.5)	1 (2.5)	1 (2.5)
Tank Diameter x Height, inches (cm)	10 x 44 (25.4 x 112)	12 x 54 (30.5 x 137)	14 x 65 (35.6 x 165)
Minimum Space Required			
Width, inches (cm)	10 (25.4)	12 (30.5)	14 (35.6)
Depth, inches (cm)	14 (35.6)	14 (35.6)	14 (35.6)
Height, inches (cm)	53 (134.6)	63 (160)	74 (188)
Approximate Shipping Weight, lbs (kg)	93 (42.3)	148 (67.3)	205 (93)

Maximum operating temperatures 110°F (43.3°C); Electrical requirements 110 Volt (60 Hz); Operating pressure 20-125 psi (138-862 kPa).

Notes: **EBCT is used to estimate the contact time with titanium oxide.**

(1) For satisfactory performance, indicated durations should not be exceeded; Flow rates specified are adequate for normal residential applications. This filter system is not intended to treat commercial applications. For the optimum reduction of arsenic, 3 minute EBCT should be used to size the filter.

(2) For systems to operate properly, the pumping rate of the well pump ***MUST*** *equal or exceed published rate.*

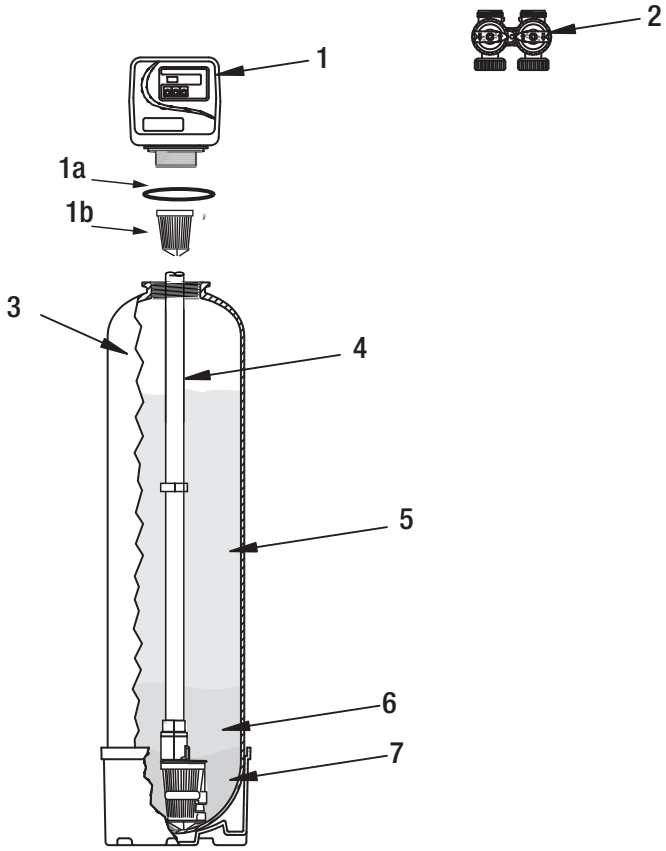
SECTION 6: COMPONENT LIST AND ASSEMBLIES

REF NO.	DESCRIPTION	ASB1001	ASB2001	ASB3001
1	Control Valve, Complete, Less Bypass Valve (ASB Series)	W217270-003-ON	W217320-003-ON	W217530-003-ON
1a	O-ring	V3180	V3180	V3180
1b	Basket	D1203	D1203	D1203
2	Bypass Valve	V3006	V3006	V3006
	Tank Adapter Coupling 4" x 8 x 2.5" - 8	-	-	2752-2
3	Media Tank w/Base	6236001-1044	6236001-1252	MTF1465B
4	Distributor Tube	6236435	6236436	C37-16-65
5	Filter Media	TO-10B (1)	TO-10B (2)	TO-10B (3)
6	Gravel Underbed 1/4" x 1/8"	QC-12P (1)	QC-15P (1)	QC-18P (1)
7	# 16 Filter Gravel	QF-7 (1)	QF-7 (1)	QF-7 (2)

Note: *When ordering replacement or repair components be sure to always specify by the unit or model number to ensure the correct parts are ordered.*

Items Not Shown	
Description of Item	Part Number
Wrench	V3193- 01
Funnel	U1006
Tube Extension Device & Cap	CENTERINGTOOLS
1" Plumbing Connection Fitting Straight Male NPT Fitting Straight Brass Sweat Fitting	 V3007-04 V3007-02
Tank Reduction Bushing (For ASB & MASB 3001) Thread to Flange Adapter	FA45RX 2752-2
Arsenic Test Kit	481297-2
Adapter Kit - 1" NPT - 1" Sweat Fittings	V3007-02* V3007-04*
Cover	V3175-WCA

*See assemblies drawing for individual components

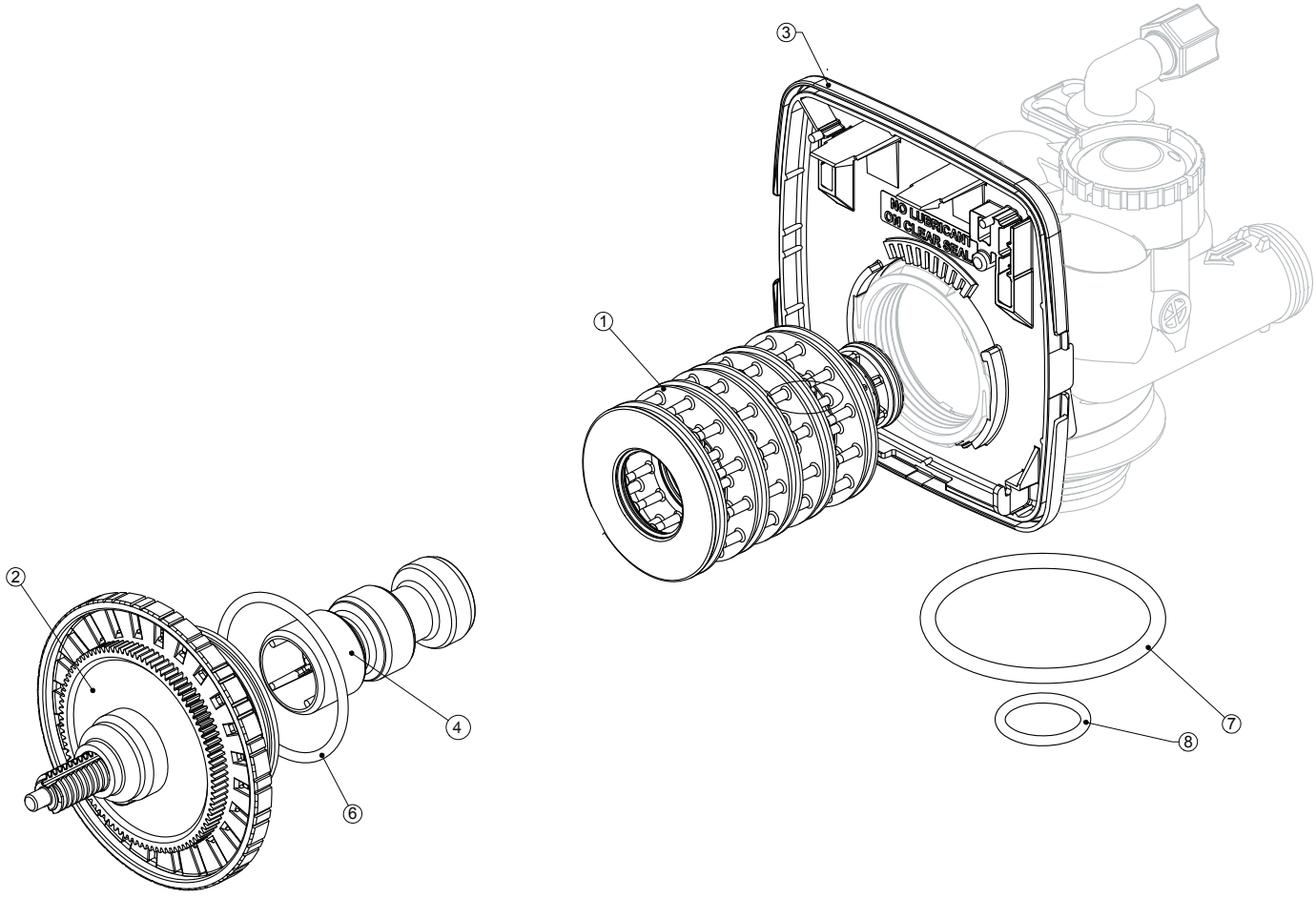


VALVE ASSEMBLIES

Arsenic Reduction System DRIVE CAP ASSEMBLY, DOWNFLOW PISTON, AND SPACE STACK ASSEMBLY

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	V3001	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

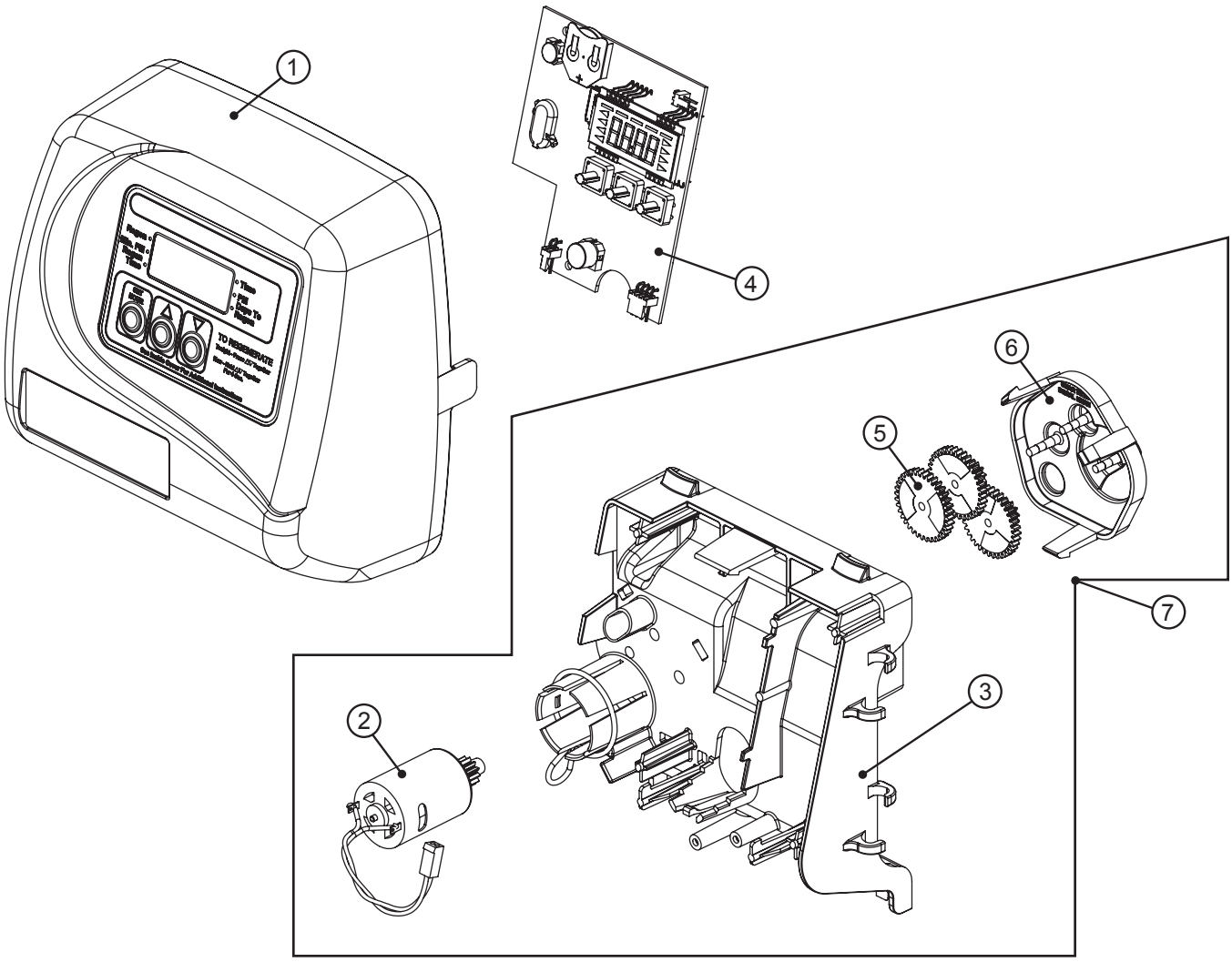
Notes: Ref #3, 2 Not available separately.



Front Cover and Drive Assembly

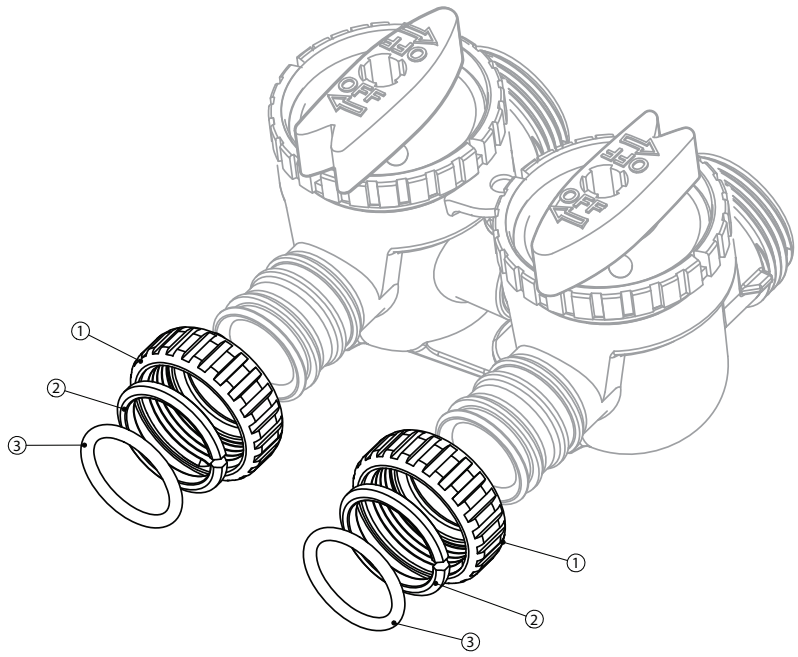
Reference No.	Part No.	Description	Quantity
1	V3175TC-01	Display Front Cover Assembly	1
2	V3107-01	Motor	1
3	V3106-01	Drive Bracket & Spring Clip	1
4	V3818TC	Time Clock PC Board	1
5	V3110	Drive Gear 12 x 36	1
6	V3109	Time Clock Cover	1
NOT SHOWN	V3002TC	Time Clock Drive Assembly	1
NOT SHOWN	V3186	AC Adapter 110V - 12V	1
NOT SHOWN	V3175-WCA	Cover	1

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



Quick Connect Bypass Valve

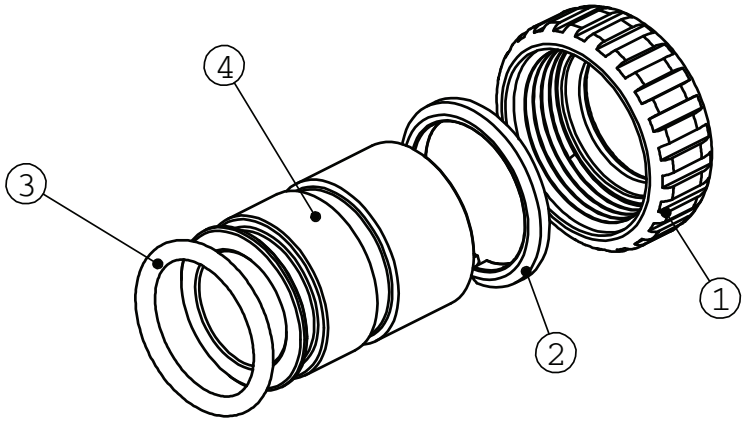
Reference No.	Part No.	Description	Quantity
1	V3151	Nut 1” Quick Connect	2
2	V3150	Split Ring	2
3	V3105	O-ring	2



Installation Fitting Assemblies
Quick Connect Assemblies

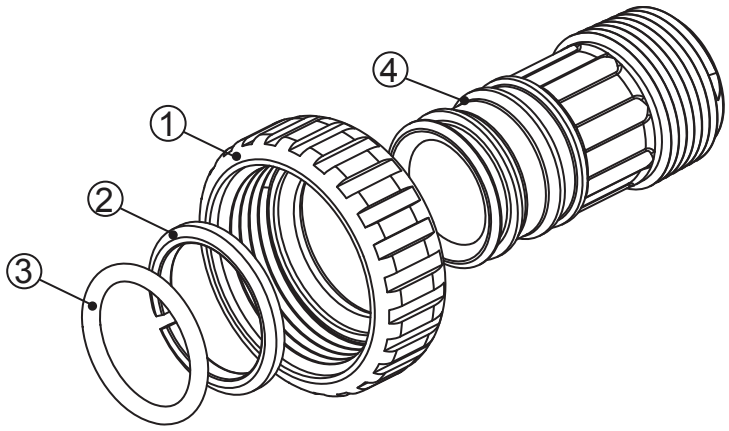
Part # V3007-02

Reference No.	Part No.	Description	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” Brass Sweat Assembly	2



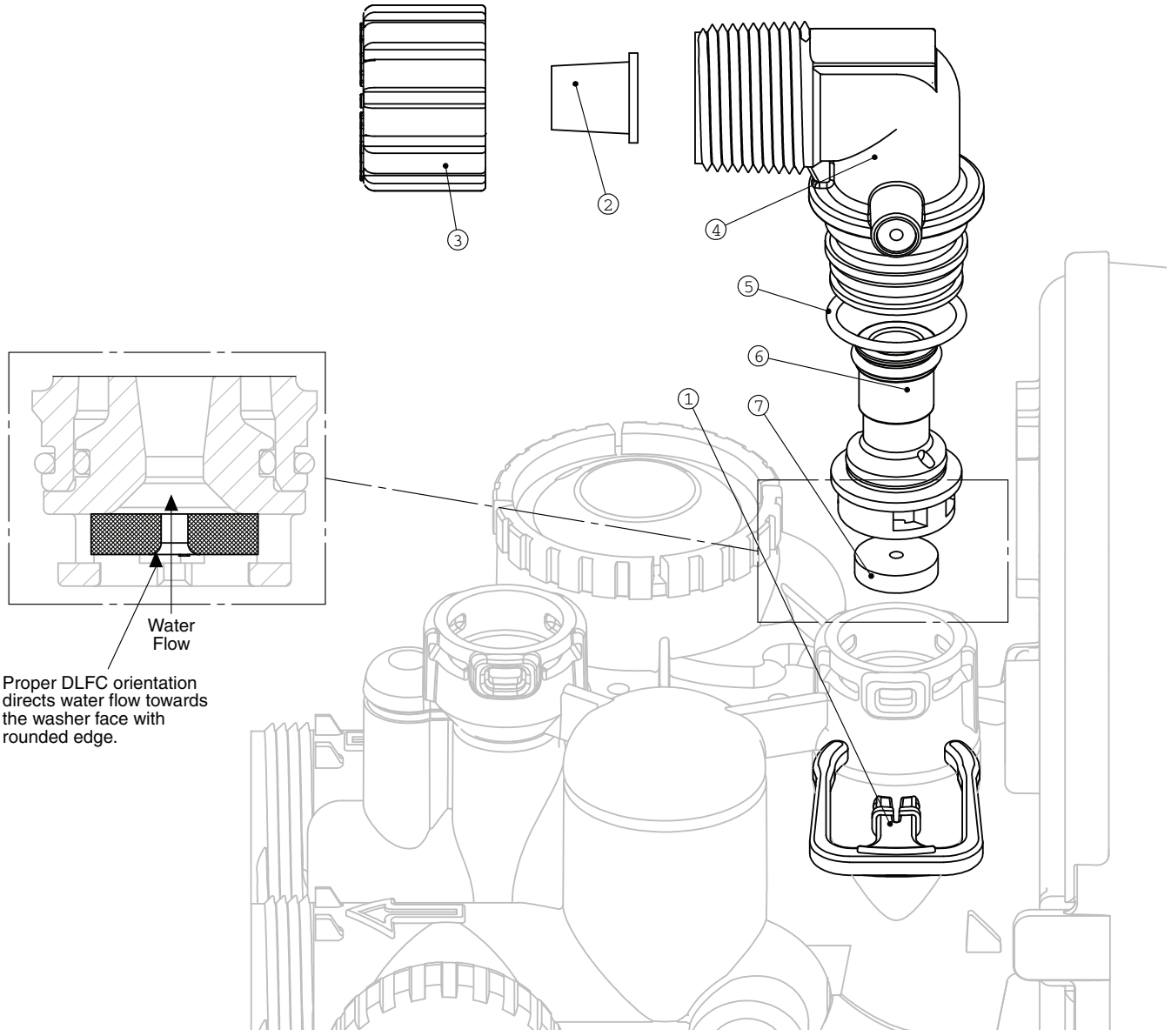
Part # V3007-04
Description: 1” Plastic Male NPT Assembly

Reference No.	Part No.	Description	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	V3164	1” NPT Quick Connect Plastic Male Assembly	2



Quick Connect 3/4” Drain Line Housing

Reference No.	Part No.	Description	Quantity
1	H4615	Elbow Locking Clip	1
2	PKP10T58-BLK	5/8” Insert Sleeve	
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	V3162-027	2.7 gpm Drain Line Flow Control Button	1
7	V3162-032	3.2 gpm Drain Line Flow Control Button	1
7	V3162-53	5.3 gpm Drain Line Flow Control Button	1



SECTION 7: LIMITED WARRANTY

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

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

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

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

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

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

* Water Softeners only

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