

## A. SYSTEM COMPONENTS

The H<sub>2</sub>O DB-Series includes the following components:

1. Two SlimLine Filter Housings assembled on a bracket.
2. A 10" 5-micron Filter Cartridge (P-5) of Spun Polypropylene.
3. A 10" 0.5-micron (CBC-10) Carbon Briquette Cartridge.
4. Reverse Osmosis Membrane in Housing (Max. pressure: 100 psi.) with built-in check valve to protect from pressure drop.
5. Water Storage Tank with a 11.5 liter (3 gallon) capacity.
6. Polished Chrome Faucet with continuous and intermittent flow.
7. Carbon Post Filter (Final Filter) 8 cubic in. capacity.
8. Bag of Parts, including a Self-Piercing Inlet Saddle Valve, Plastic Drain Saddle, Tank Shut-Off Valve, R.O. Module Brackets, Waste Flow Control Capillary Tube, Plastic & Brass Compression Fittings and Tube Inserts, Screws.
9. Plastic Tubing -1/4" (approximately 25 feet).

## **B. TOOLS THAT MIGHT BE USEFUL FOR INSTALLATION**

1. Electric Drill with 3/8" chuck.
2. Hex Driver Bit for hex screws.
3. Long (12") 3/8" Drill Bit.
4. Masonry Drill Bit and Plastic Anchors & Screws
5. Assorted Drill Bits: 1/4", 1/2", 1/2" wood.
6. Relton Porcelain Drill Kit.
7. "Greenlee" Electrician's Knock-Out Tool.
8. Razor Blade, Screw Driver, Pliers, Adjustable Wrench.
9. Extension Cord, Flashlight
10. Teflon Tape, Household Bleach (liquid).
11. Basin Wrench, Center Punch & Hammer.

## **C. INSTALLATION STEPS**

### **1. INTRODUCTION: BRASS & PLASTIC COMPRESSION AND PIPE FITTINGS.**

The H<sub>2</sub>O System uses compression fittings to connect all plastic tubing. Fittings can be brass or plastic:

- a. A Brass Connector Nut uses a Brass Insert and a Plastic Ferrule.
- b. A Plastic Connector Nut has a built-in Ferrule, so it only requires a Plastic Tube Insert.

Note: The male pipe threads have all been taped with teflon to seal the leaks.

Occasionally there is a leak at the fitting due to improper taping. If this occurs, simply unscrew the fitting and retape it. Remember, teflon tape is wrapped in a clockwise direction around the threads as they face you. Pipe dope can also be used.

### **2. POSITIONING THE COMPONENTS OF THE H<sub>2</sub>O SYSTEM.**

The H<sub>2</sub>O System should not be thought of as only an "under- the sink" appliance. It can be installed anywhere that will not present a problem of freezing in the winter. Some homeowners may prefer their basement or crawlspace for an installation site. Such an installation would offer cooler water during the summer months. It would also provide easy access for filter changes and easier connection to a refrigerator icemaker or a second faucet in a bathroom. Furthermore, it does not

take up valuable space in your kitchen cabinets. It may also be a less worrisome location should a leak develop. In the warm weather areas of the country, an attached garage might offer a suitable location. However, since most installations are usually performed under a kitchen sink, this manual will describe that procedure. Below are listed the major components and some of the considerations in deciding on their position in your home. Think about your installation.

**a. FAUCET:** This should be located in a convenient and out-of-the-way spot on the kitchen sink. It should be situated so that the water can flow into the sink.

**b. FEED WATER CONNECTION:** Since the self-piercing saddle tap is usually turned off and on when servicing the equipment, this connection should be near the remainder of the equipment, whenever possible. Important: Cold Water Only!

**c. DRAIN CONNECTION:** A drain saddle is provided to run the waste water to a drain. The drain line may also run directly into a laundry tub or open floor drain. (Note: the drain line can run uphill and even distances of more than 100 feet.)

**d. WATER STORAGE TANK:** The tank can be set upright or laid on its side. It can be 100 feet away from the faucet. However, the closer it is to the faucet, the better the flow.

**e. DOUBLE FILTER HOUSINGS:** The Pre -filters are mounted in a vertical position, usually on a side wall of a cabinet or just free-standing. They should be easily accessible.

**f. REVERSE OSMOSIS MODULE:** This is usually mounted on the double filter housing with the brackets that are provided. It can also be hung in a vertical position near the filters.

**g. CARBON POST FILTER:** This little filter is meant to take out any traces of taste or odor in the water that may have been picked up by the plastic or brass components in the drinking water system itself. The closer to the faucet it can be positioned, the better it can do its job. A bracket is provided to mount the POST FILTER on top of the R.O. Module. However, in some installations, the POST FILTER is simply hung 12 inches below the faucet without a bracket.

### 3. INSTALLING THE FAUCET

The Faucet requires a 1/2" hole. The large chrome washer on the faucet will cover a hole of 1.5" in diameter.

#### **a. Using an Unused Hole Already in the Sink:**

Many sinks have an extra hole with cover. Feel underneath the sink to determine if there is a nut holding the hole cover. If not, simply pry off the hole cover with a screw

driver.

**b. Drilling a Stainless Steel Sink:**

(1) Position the large chrome washer on your sink where you want to install it. Make certain there is enough room to fit.

(2) Feel underneath the sink to make certain there is no obstruction that would prevent proper faucet installation.

(3) Center-punch sink in the middle of large chrome washer.

(4) Using a standard steel drill bit, drill a 1/2" hole.

(5) A "Greenlee" Knockout Tool might be used to even out a drilled hole in stainless steel - but is unnecessary.

**c. Drilling a Countertop:**

(1) Position the faucet at the location to be drilled to make certain that the end of the spout will reach over the sink.

(2) Feel underneath the countertop to make certain there is no obstruction that would prevent proper faucet installation.

(3) For a "Formica-type" countertop, use a 1/2" wood bit.

(4) For Corian countertop, use a normal 1/2" steel drill bit.

(5) For ceramic tile, consult a tile store for the proper bit.

**d. Using a Spray Attachment Hole in the Sink:**

Some homeowners do not use the spray hose on their kitchen sink. If this is the case in your home, you may prefer to use the spray hose hole instead of drilling a new hole.

(1) Disconnect spray head. Unscrew the head, remove the two rubber washers, and use a screw driver to pry off the spring "c" clip. The neck of the spray head will now slip right off.

(2) Pull the hose down from under your sink through the holder bracket on the sink. Careful! The hose will drip a bit.

(3) Under sink, reassemble spray head the way you found it.

(4) A basin wrench can be used to remove the nut on the bottom side of the spray holder. (Note: this can be "a real pain" depending upon how long the bracket has been in place.)

(5) Coil the hose and tape it. Place the hose under the sink and out of the way. Remember, if the spray hose is pressed, it might cause a flood, since it is still connected.

**e. Drilling a Porcelain/Cast Iron Sink:**

Although some homeowners have been able to drill a porcelain/cast iron sink successfully without any special tool, I don't recommend that everyone try it. A Relton

Porcelain Drill Kit is really the proper tool to use. Since it is expensive to purchase, you may want to ask your dealer if you can borrow his.

Here is an overview on the use of the Relton Porcelain Drill Kit:

(1) The Pilot Drill makes a 1/4" hole completely through the sink. It provides a guide for both the Porcelain Saw and the Finish Hole Saw.

(2) The Porcelain Saw cuts through the porcelain surface only. The saw cuts a smooth, chip-free, beveled groove through the porcelain to the metal base.

(3) The Finish Hole Saw cuts the remaining cast iron to create a 7/8" hole.

#### **f. Attaching the Faucet:**

(1) Assemble those parts of the faucet that belong above the sink. First, the faucet spout. Some of the faucet spouts have threads and some do not. It is not necessary to tighten the faucet spout. It is preferable to let it move freely in order to be able to move it out of the way when necessary.

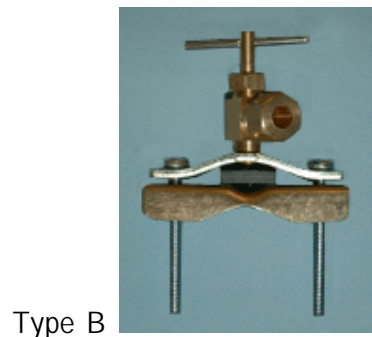
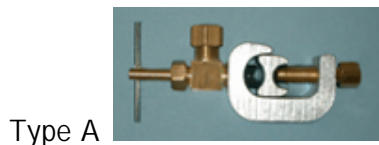
(2) The small black rubber washer goes underneath the faucet body, then the large chrome washer, and the large black rubber washer.

(3) Insert the faucet stem into the hole. No plumber's putty is needed, since the rubber washers will provide the seal.

(4) From under the sink, assemble the bottom parts of the faucet. The black "locating" washer may help in centering the faucet in the hole. Then screw on the locknut and the retaining nut. Tighten firmly into place once the faucet is properly aligned. If a small adjustment is needed from above, pad the jaws of the wrench, so as not to scratch the chrome finish.

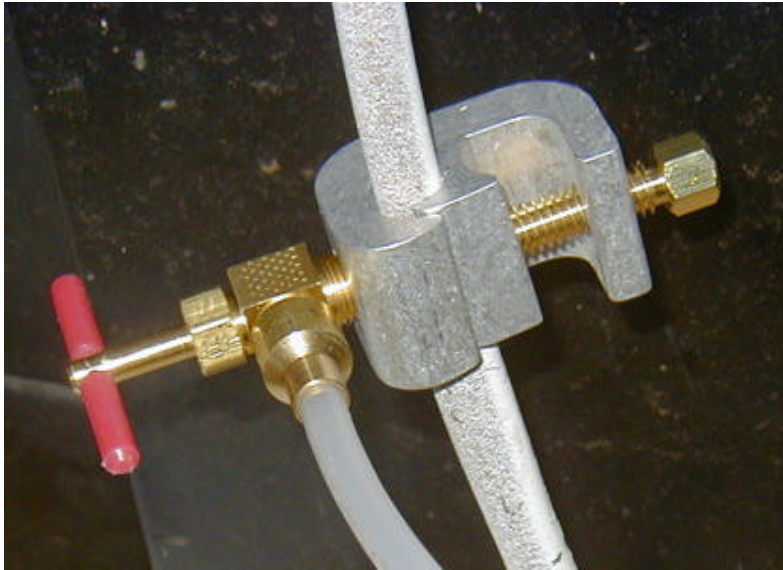
## **4. INLET WATER CONNECTION**

Your system will come with one of these feed water saddle valves:



The inlet saddle works on both copper tube and steel pipe. When using the valve on

steel pipe, the water must be shut off and the line ought to be drained. Then drill.  
(Note: see the instructions on valve package for both steel pipe and copper tube. Also note that the back plate of the inlet valve can accommodate a 3/8" O.D. to a 1.315 O.D. pipe just by just turning it around.) Here is a picture of how the Type A valve should look when installed:

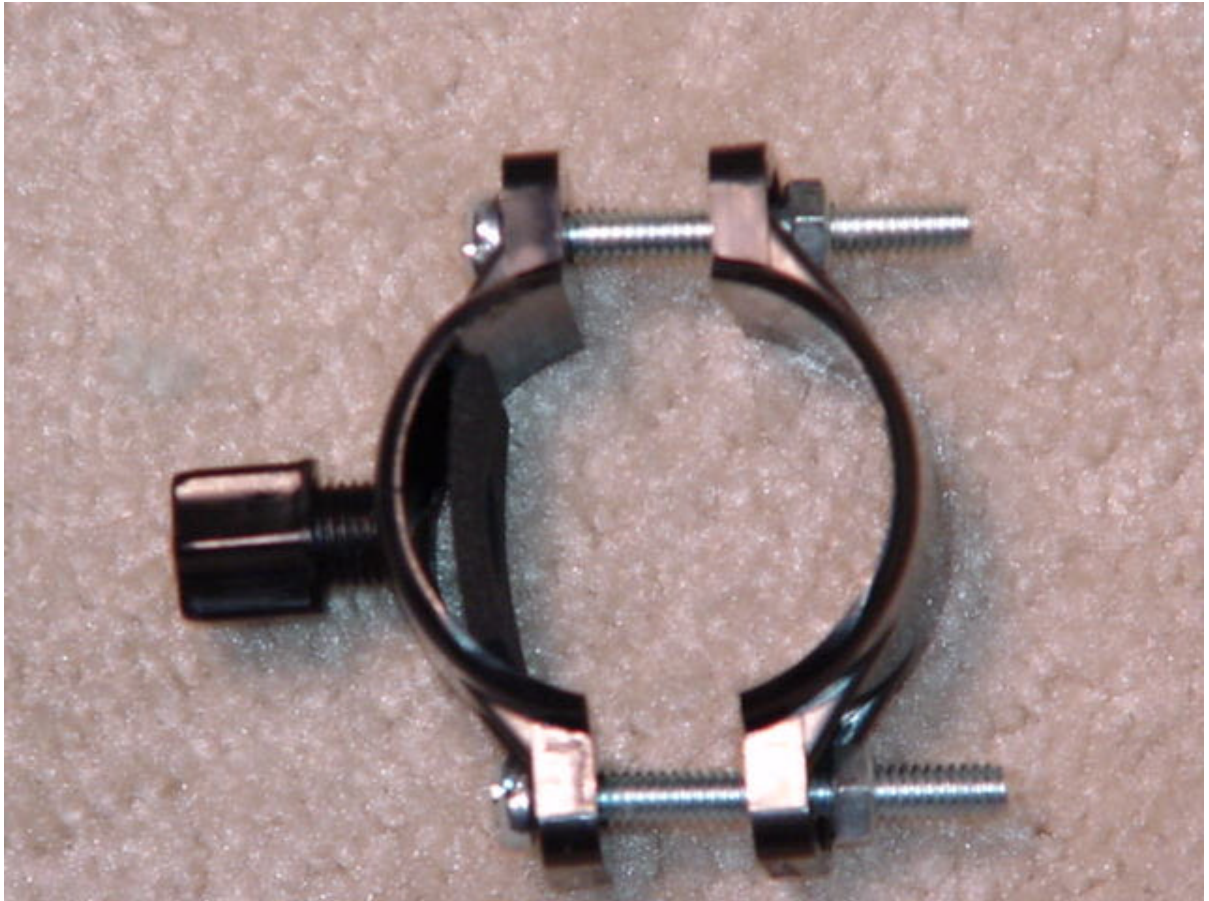


[Optional water connection.](#)

Note: Don't turn on the valve until later!

## **5. WASTE DRAIN CONNECTION**

The waste water from the H<sub>2</sub>O System must flow to the drain at a slow but continuous rate (somewhere between 5 drops per second to a very slow steady stream). This flow of contaminants will help keep the membrane surface free from mineral deposits and fouling. Although drain water can be directed to a floor drain, a laundry tub sink, or a garden, the most common method of providing a drain connection is through the use of the drain saddle clamp.



a. Position the saddle at the point of a drain line which permits the use of a drill. It should be located above the drain P-Trap and as high on the drain line as possible. Try to keep the saddle as far away from the dish washer and waste disposal drains as you can.

b. Drill a 1/4" or a 3/8" hole in the pipe. Do not use the body of the saddle as a guide for your drill. The threads of the drain saddle may be damaged.

c. Attach the drain saddle to the pipe, aligning it with the drilled hole. It may be necessary to remove the fitting from the saddle in order to do this accurately. Note that you do not need a plastic insert on the end of the tube that attaches to the drain saddle.

## **6. DOUBLE FILTER HOUSINGS**

The Double Filter Housing usually stands on the bottom of a cabinet or on a wall. Screws are provided to fasten the bracket to a wall. If it is put under a kitchen cabinet, extra tubing in its connection might be advisable, since you could remove it for filter

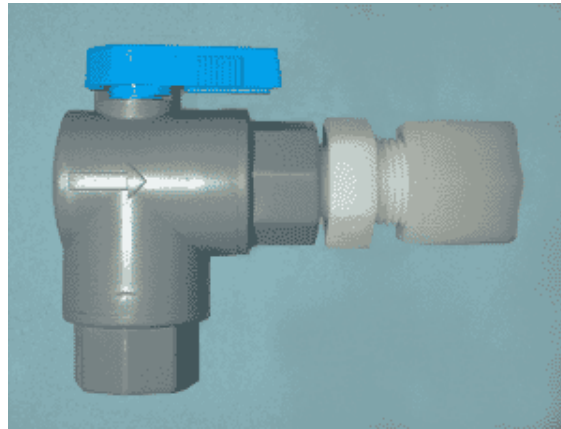
changes without disconnecting it.

## 7. THE WATER STORAGE TANK

Before making the permanent connection on the water storage tank, it is necessary to sanitize and flush it in order to remove any impurities that may have resulted from the manufacturing process. Here is the procedure:

- a. Using teflon tape wrap the neck of the tank in a clock-wise direction.

Screw on the tank valve:



- b. Assemble 2 plastic tubes, each with these connections: a brass insert and a brass nut with a plastic ferrule on one end; a plastic connector nut and plastic insert on the other end.

- c. Using one tube, connect the inlet saddle to the "IN" side of the left filter.

- d. Connect the "OUT" of the right filter housing to the water storage tank.

- e. Open the right filter, remove the carbon cartridge, and pour in 1/4 cup of liquid household bleach. Make certain the "O" ring is in its groove. Close.

- f. Open the valve on top of the water storage tank.

- g. Pierce the inlet pipe or tubing by first turning the inlet saddle valve clockwise. Then counter-clockwise to permit the piercing needle to retract from the hole and the water to flow. Check for leaks as the filters and tank fill up.

- h. Once the tank is full (approx. 5 minutes), shut off the tank valve and inlet water. Disconnect the plastic tube from the right filter. Move the tank out of the way. In 30 minutes, the bleach will have killed any bacteria in the tank.

## **8. SMALL CARBON POST FILTER**

A bracket is provided to mount the POST FILTER on top of the R.O. Module. However, in some installations, the POST FILTER is simply hung 12 inches below the faucet without a bracket. Take your choice.

a. Cut a tube long enough to connect the "tee" on the R.O. Module to the Post Filter. Use plastic nuts and inserts for both ends. Note the arrow on the Post Filter marking for "IN" and "OUT."

b. Cut a tube long enough to connect the Post Filter to the faucet. Use a Brass nut, insert, and a plastic ferrule on one end. Put a plastic nut and insert on the other end.

## **9. REVERSE OSMOSIS MODULE CONNECTION**

Although the R.O. Module can be separated from the filter housings, it's best to mount it on top of the metal bracket.

a. Cut a 15" length of plastic tube and put a plastic insert and a plastic connector nut on each end. Use this tube to connect the right filter housing "OUT" to the "INLET" fitting of the R.O. Module.

b. Cut a tube long enough to connect the R.O. Module "WASTE" fitting to the drain. Both ends must have plastic connector nuts. While one end of the tubing should have a plastic insert, the other end of the tubing should have a Waste Flow Control Capillary Tube inserted in it. (Note: the red rubber end of the Waste Flow Control Capillary Tube fits up into the fitting of the R.O. Module. The "tail" of the capillary fits inside the 1/4" tubing heading towards the drain.)

Note: The Waste Flow Control Capillary Tube looks like a piece of clear nylon fishing line, held by a piece of red rubber stuck in a plastic insert. The Capillary Tube has an I.D. of .022". As insignificant as it may seem, the H<sub>2</sub>O could not operate without it. Its purpose is threefold:

(1) The Capillary Tube is a metering device that limits the flow of waste water down the drain. Without it, hundreds of gallons of water would run directly to the drain each day.

(2) It permits a slow but continuous flow to wash the membrane surface of contaminants.

(3) It provides back-pressure on the water at the membrane surface, which forces the water molecules through the surface of the membrane and into the water storage tank.

The worse your incoming water is, the longer the capillary tube should be. It is recommended that with extremely bad water -- TDS of 1500 ppm -- that the Capillary Tube be cut to a 15" length. This restricts the water running down the drain and allows a greater stream of water to flush the membrane surface which will lengthen its life. When cutting the Capillary Tube, use a sharp razor blade and cut on a diagonal.)

## **10. TIGHTENING THE FITTINGS**

Before moving the Water Storage Tank into position, tighten all the fittings. Plastic fittings should be hand tightened and then tightened one more full turn with a wrench. With brass fitting, the plastic ferrule must be compressed by tightening with a wrench. If you over-tighten, you might cut the plastic tubing. If you are unsure whether the ferrule is compressed, loosen the fitting and examine it. After you have tightened all the fittings, move the tank into position and connect it to the tee of the R.O. Module.

## **11. TESTING THE H<sub>2</sub>O SYSTEM**

Let's see how good a plumber you are:

- a. Put Carbon cartridge (Matrikx +1) in the right Filter Housing.
- b. Turn the Inlet Saddle Valve to full open. Check for leaks.
- c. Turn Tank Shut-Off Valve to full open and check for leaks.
- d. Press the Faucet handle and allow a glass of water to flow into the sink; again check for leaks and remedy them.
- e. Check the Faucet adjustment. But before you proceed with any "improvements," you should remember the old adage, "if it ain't broke, don't fix it." The Faucet may be adjusted for drips and stiffness of operation by removing the faucet spout (unscrew counter-clockwise, then pull up) and by sliding the handle forward over the faucet spout hole. Beneath the handle is an adjustable "tee" bar nut. Turn the "Tee" bar one-half turn counter-clockwise to stop a drip. Turn clockwise to stiffen the handle action. (Note: the Faucet has a dual action. Press the handle down and the water will flow as long as you are holding it. Lift the handle straight up and the water will flow continuously without holding.)
- f. Lift up the Faucet handle and allow all the water in the Water Storage Tank to empty out. You may see carbon specs (very fine black powder) in the water. Although the carbon dust is harmless, if it continues beyond a couple of days, contact your dealer. It may be a defective carbon filter.

g. The Water Storage Tank should take about 5 minutes to empty. Once it is empty, the flow of water dripping from the faucet will be at the system's normal rate of production. It should drip out between one to five drops per second. If so, shut off the faucet and the H<sub>2</sub>O will begin accumulating water in the Water Storage Tank. If it fails to produce any water or the water continues to come out in a strong stream, you may have a problem. Contact your dealer.

h. Now verify that the H<sub>2</sub>O System is running waste water to the drain (somewhere between 5 drops per second to a very slow steady stream). You can observe the waste water by removing the waste line from the drain saddle connection.

i. If the Drain Saddle connection is noisy, adjust position of the drain line tubing. A more direct run will normally eliminate the "gurgling" sound that sometimes is heard.

## **12. OPTIONAL CONNECTIONS**

The H<sub>2</sub>O System can accommodate several faucets or other water dispensing outlets, such as a refrigerator cold water tap and icemaker. All that is required is a plastic or brass compression tee for every additional water outlet. The tee should be placed just before the faucet. Second floor faucets are not a problem if you can run the tubing up there. Contact your dealer for additional faucets.

**CONGRATULATIONS!!! YOU'RE DONE!!!**