

Installation and Service Guide

Reverse Osmosis System with Quick Connect Fittings



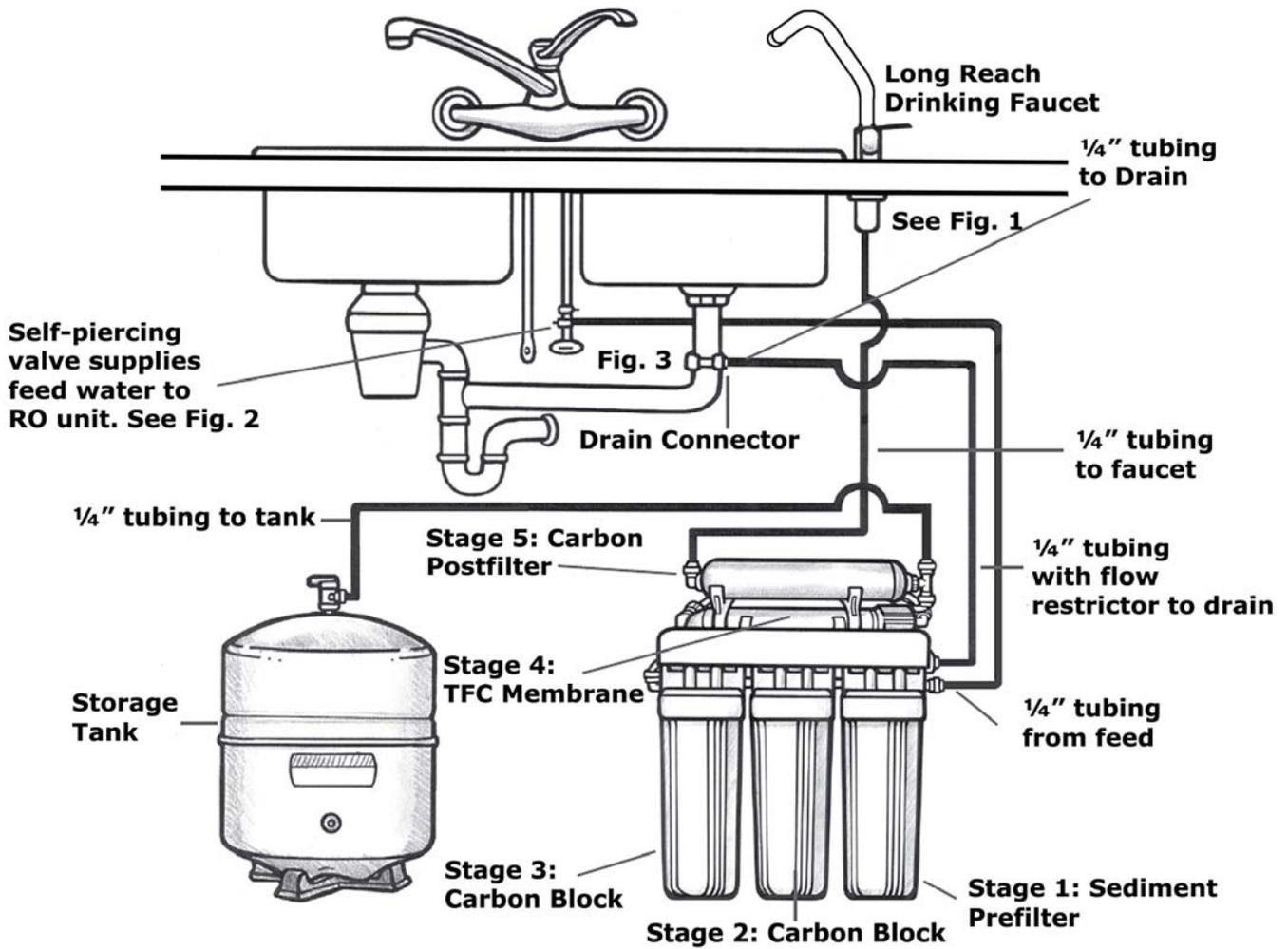
USRO4-60-QC



USRO5-60-QC

**Please read this manual carefully
before attempting installation**

System and Faucet Diagram



Your Reverse Osmosis System has been tested to ensure it will operate correctly. The following periodic maintenance is recommended so your system will provide years of trouble-free service:

Prefilters (sediment) Once per year
Prefilter (carbon block(s)) Once per year
RO Membrane Usually Every 2 years
Post filter (carbon) Once per year

The following components make up your reverse osmosis system:

Prefilter #1 (sediment) Melt Blown Polypropylene filter removes larger particles such as dirt, rust & sediment.

Prefilter #2 (& 3 if applicable) 10 Micron Carbon Block removes chlorine and chemical contaminants in the feed water and protects the RO membrane.

Reverse Osmosis Membrane Thin Film Composite Membranes reduces dissolved minerals, metals, and salts. In this process, harmful compounds are separated by the membrane from the water, and the contaminants are flushed to the drain.

A coconut shell activated carbon **post-filter** is provided for a final "polish" and to remove tastes, odors and to provide great tasting water.

The **Filter housings** and **RO module** hold the prefilters and membrane. A bracket is provided so they can be mounted under the sink or in a basement.

Storage tank holds RO purified water, ready to use.

Automatic shut-off valve closes when the storage tank is full and shuts off the water supply to conserve water.

The **RO Faucet** is used to dispense purified water when you want it.

Feed water saddle valve is connected to the cold water line to supply water to the RO system.

Wastewater saddle valve is connected to the drain to remove reject water from the RO system.

Tubing supplies feed and reject water.

Quick-Connect fittings are used for necessary tubing connections. These fittings connect by pushing the tube into the fitting past a slight resistance until the tube bottoms out in the fitting. Simply make a clean cut in your tubing and gently push in the tubing until it will not go any further. To ensure that your tubing has made a snug fit, pull back gently on the tubing; it should catch. Always check for leaks to ensure a watertight connection.

Tools

The following tools may be necessary, depending on each particular installation:

3/8" variable speed electric drill; 1/8", 1/4" & 1/2" metal cutting bits
1/8", 1/4" & 1/2" Concrete drill bits (for porcelain sinks)
Phillips head screw driver
Adjustable wrench
Teflon tape & Plastic tubing cutter
Hammer & Center punch

System location

Your RO system may be installed under a sink or in a basement. Do not install unit where it would be exposed to freezing temperatures. Connecting to an icemaker can also be considered if a connection can be made without using more than 10'-12" of tubing, otherwise a pump may be needed.

Guidelines for component placement are as follows:

Faucet should be placed near the sink where drinking/cooking water is normally required. A 2" flat surface is required to mount faucet if an existing hole is not available. The thickness of the mounting surface should not exceed 1 1/4".

Storage Tank maybe placed where it is convenient, within ten feet of the faucet. Under the sink or in a nearby cabinet or in a nearby cabinet are excellent choices. Full tanks can weigh more than thirty pounds; so make sure any shelving used is secure.

RO unit may be mounted on either side of the sink, in the back of a cabinet, or in the basement. Mounting the unit on the left or the right side of the cabinet under the sink provides for easier access to the unit for future maintenance.

A Self Piercing Valve is used to make a feed water connection to the RO unit. Locate this assembly as close to the RO unit as possible. Connect to a portable, cold water supply line only. A self-piercing valve can be used on copper or chrome plated copper tubing, CPVC, & flexible gray riser tubes at least 3/8" in size. It should not be used on ribbed, corrugated, reinforced plastic or steel braided tubing. Ask your local dealer what alternatives can be used in place of the self-piercing valve if one cannot be used under your sink.

A Drain Saddle is used to make a wastewater connection with your drain under the sink, which is designed to fit around a standard 1-1/2" OD drainpipe. The drain saddle valve should always be installed before (above) the p-trap and on the vertical or horizontal tailpiece. Do not install the drain saddle near a garbage disposal to avoid clogging the drain line with debris.

Unit preparation

Open shipping carton, remove components and check that all parts are present.

Note: Hand tighten all fitting connections to be sure they are tight.

Installation Steps

All plumbing must be completed in accordance with state and local plumbing codes. Some municipalities may require installation by a local plumber. Check local authority prior to installation.

1. Faucet Installation

If the sink has a sprayer it may be disconnected for faucet installation. A pipe cap or plug will be necessary to seal the sprayer connection or sprayer can be left connected under the sink.

To make the faucet-mounting hole (if sprayer hole is not used), check below to make sure the drill will not interfere with anything below. A 2" flat surface is required, not exceeding 1-1/4" thickness.

The faucet should be positioned so it empties into the sink and the spout swivels freely for convenience. If the sink has a hole that can accommodate the RO faucet, no drilling is required. Proceed with mounting the faucet.

Porcelain, Enamel, Ceramic on Metal, or Cast Iron:

Precautions must be taken to penetrate the porcelain through to the metal base and prevent chipping or scratching.

Procedures:

1. Mark the center with center punch for the 1/4" pilot hole.
2. Carefully drill pilot hole with masonry bit through porcelain and stop when metal shows. (Use light pressure and slow speed)
3. Switch the bit to a standard metal cutting bit to continue to cut through the metal below the porcelain surface.
4. Continue to enlarge the pilot hole with larger masonry & metal cutting bits until the hole is 1/2".

Installation procedures for stainless steel sinks

Procedures

1. Mark the center with center punch for the 1/4" pilot hole.
2. Drill the pilot hole
3. Continue to enlarge hole with larger size drill bit until it is 1/2".
4. Clean up sharp edges

Note: Air Gap Faucets are required by some municipalities. These faucets require a 1 1/4" hole in the sink rather than the 1/2" hole required by the standard faucet included with the RO system. To make a 1 1/4" hole to accommodate an air gap faucet requires special tools such as a chassis punch or a Relton cutter if a large enough hole is not already available. Ask your local dealer for more information.

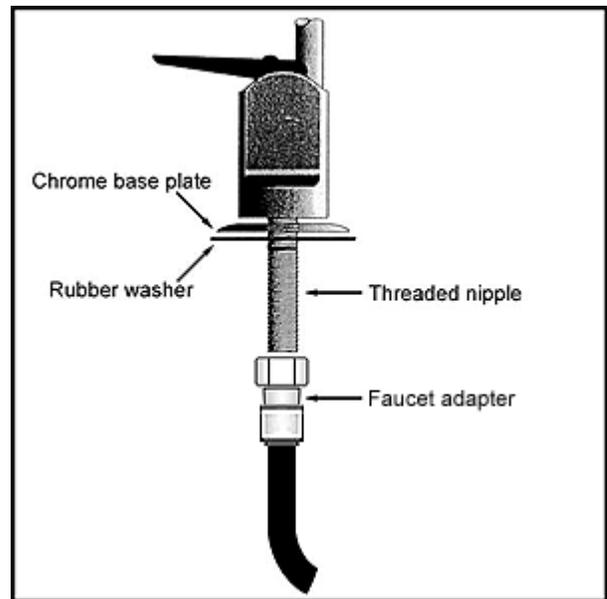


Fig 1

2. Mounting the Faucet

Disassemble hardware from the threaded nipple, except for chrome base plates and rubber washers. Slide these up the nipple to the faucet body.

Feed threaded nipple through the sink hole and orient the faucet. From below sink, slide lock washer and hex nut over threaded nipple and tighten with a wrench.

Note: It is best to have someone hold the faucet from above the sink to keep it from moving out of place. If this is not possible then tighten the hex nut until it is just slightly less than completely tight. Then turn the faucet base from above the sink, tightening it while orienting the faucet in the desired location.

Thread nut with compression ring and stiffener on threaded nipple and tighten to the bottom of the sink until secure hand tight. Then turn 1/2 to 3/4 turn with a wrench. (see Fig 1)

3. Self Piercing Valve and tubing installation

The self-piercing valve, which is supplied, is designed for use with 3/8" to 1/2" OD copper or chrome plated copper tubing, CPVC, & flexible gray riser tubes at least 3/8" in size. It should not be used on ribbed, corrugated, reinforced plastic or steel braided tubing. Ask your local dealer what alternatives can be used in place of the self-piercing valve if one cannot be used under your sink.

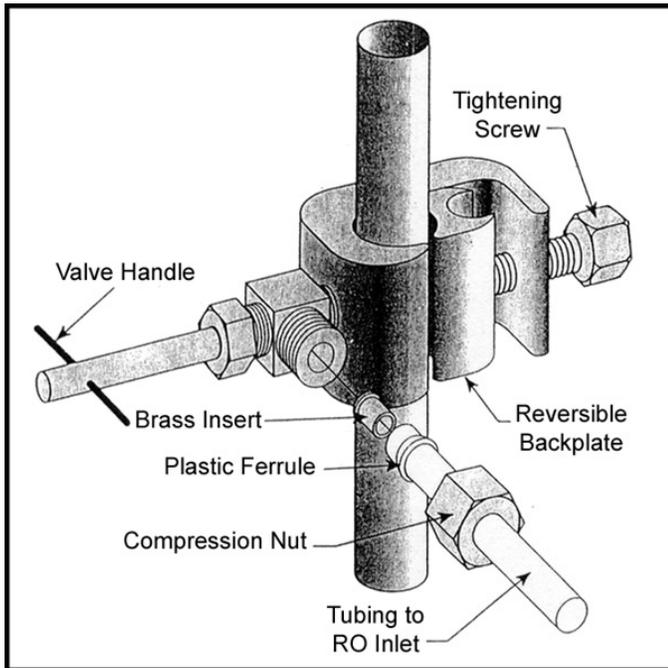


Fig 2

Installation procedures using copper tubing/pipe or tubing, CPVC, and gray flexible riser tubes: (See Figure 2)

1. Turn off cold-water valve from under the sink or main water line valve for whole house.
2. Before installing saddle valve, make sure piercing lance does not protrude beyond rubber gasket.
3. Assemble saddle valve on tube/pipe
4. Turn handle clockwise to pierce tube/pipe until valve is firmly seated, (Valve is closed in this position)
5. Turn on water supply to pressure cold water line.
6. Snug nut/seal with wrench around valve stem.
7. Connect tubing to feed water valve using brass compression nut, stiffener insert and plastic sleeve.

Saddle valve installations with other metal pipe:

1. Turn off cold water supply.
2. Drill 3/16" hole at desired location.
3. At this point, make sure piercing lance does not protrude beyond rubber gasket.
4. Assemble saddle valve on pipe, aligning with hole.
5. Turn saddle valve handle clockwise to close valve.
6. Tighten nut/seal around valve stem with wrench.

7. Connect tubing to feed water valve using brass compression nut, stiffener insert and plastic sleeve.

8. Turn on cold water supply.

9. To open valve, turn handle counterclockwise and check for leaks.

4. Drain saddle valve installation (see Figure 3)

Prior to proceeding it is important to inspect the condition of drainpipes to make sure they are not thin and frail.

A Drain Saddle is used to make a wastewater connection with the drain under the sink, which is designed to fit around a standard 1-1/2" OD drainpipe. The drain saddle valve should always be installed before (above) the p-trap and on a vertical or horizontal drain. Do not install the drain saddle near a garbage disposal to avoid clogging the drain line with debris.

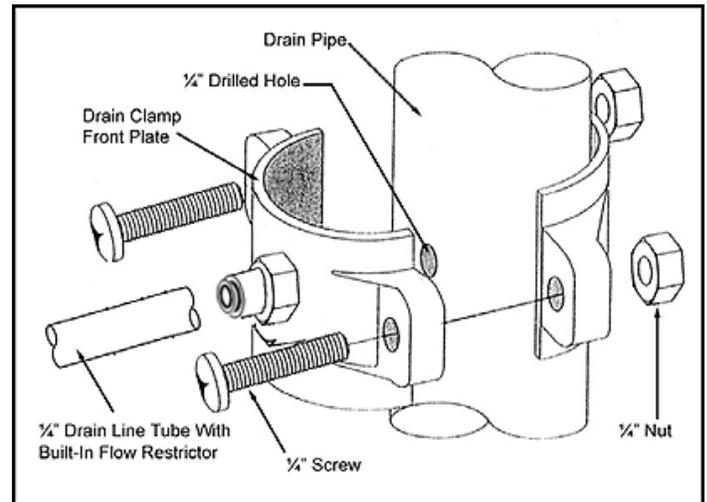


Fig 3

Procedures

1. Position threaded half of drain saddle valve at selected location and mark for the opening.
2. Drill 1/4" hole at mark through one side of pipe.
3. Position both halves of drain saddle on drain pipe so threaded opening lines with hole. (Hint) Hold a drill bit in your hand and use it verify that drain clamp is properly aligned.
4. Secure drain saddle clamp on valve with bolts and nuts provided. (Do not over tighten and make sure there is equal space between saddle halves on each side)

5. Initial tubing connections

For convenience on under sink installations it may be advisable to complete under sink tubing connections at this time.

6. RO component installation.

Install RO membrane, carbon pre filter and sediment pre filter in modules of RO unit. Be sure RO Membrane is pushed into Membrane housing as far as it will go. It is recommended that you not touch the filters and membranes with bare hands.

7. RO unit installation

The RO unit is normally mounted to the right or left sink cabinet sidewall, depending on where supply tank is to be located. Generally the unit is installed at the front of the cabinet and the tank at the rear.

To mount the unit, elevate it at least 2" off the floor, level it and mark the location of mounting holes needed. Drill hole for mounting screws and install screws allowing the mounting bracket slots to slip over them.

Note: If the cabinet sidewalls are not solid, unit may sit on the floor with screws to keep it against the cabinet in a vertical position.

8. Pre-fill, sanitizing and supply tank placement

Pre-filling the storage tank is always recommended so there is sufficient pressure to check for leaks and sufficient water to flush the carbon post filter. To do this connect the feed line that will serve the RO unit and connect it directly to the bladder tank. Allow the water to fill the bladder until it stops. Then close to tank valve and let this stand for 15 minutes. Remove the tube and connect to inlet fitting of the RO unit.

The supply tank should be placed under the counter or within 10 feet of the RO unit.

Note: Tanks are pre-pressurized at 7 psi.

9. Final tubing connections

With all components in place, complete final tubing connections with these guidelines:

1. Tubing should follow contour of the cabinets.
2. Cut tubing to correct length using square cuts and a proper cutting tool
3. Make sure there are no crimps in the tubing.
4. Keep tubing from the RO unit to the tank and faucet as short as possible for good flow.
5. The Drain line is a short ¼" tube connected to the membrane housing. At the end is a 3" cylindrical drain flow restrictor. This is where the drain line connects to the RO unit. Do not remove the drain flow restrictor as this will cause a failure in the system.

Icemaker hookup (optional and requires a T fitting and additional shut-off valve not supplied with RO unit)

The RO unit can be connected to any standard refrigerator icemaker or ice maker/water dispenser. (Do not connect to a commercial type bar icemaker)

To complete this operation, connect a T with a shut off valve into the faucet tubing and route tubing to the refrigerator. (Hooking up to existing copper tubing is not recommended due to possible corrosion) Turn off icemaker inside freezer prior to turning off the existing tap water supply line to the refrigerator. Turn on the icemaker after the RO system has been drained several times and the tank has a full supply of water.

Icemaker lines are often run in the rafters of unfinished basements or finished basements with drop ceilings and then up to the fridge. If the basement has a hard ceiling, this won't be an option and the line would have to be run through cabinets. In some cases icemaker connections cannot be made.

Note: Before any service is performed on the RO system, turn off icemaker valve and icemaker unit. Turn back on only after RO tank is full.

System start-up

Prior to start-up

1. Check all fitting connections.
2. Open self-piercing valve, allow system to pressurize and check for leaks.
3. Open valve on bladder tank and open faucet until water flows.
4. Close faucet and wait five minutes and check for leaks.

Flushing system and checking operation

1. Flipping the faucet lever up will keep faucet on. Allow tank to completely drain of sanitizing solutions. You can also press the faucet tab down and hold it for filling a glass at a time.

Do not use this water

Note: When tank is empty, faucet will steadily drip. This is the rate the RO system makes water.

2. With faucet handle in "open" position, measure the rate of the steady drip from spout. Use a graduated cylinder and watch with a second hand to calculate approximate production in gallons per day.

Note:
Milliliters per minute × 0.38 = GPD
Ounces per day × 11.2 = GPD

3. Proceed to check reject flow rate by disconnecting tubing at drain connection and measure flow as described above.

Note: Proper ratio should be 3-4 parts of reject water to 1 part of product water, on average.

4. Close faucet and re-inspect system for leaks.
5. Allow system to process water for 4 hours, at this point the bladder tank will be full.
6. Open faucet again and allow tank to empty for a second time.

Do not use this water

7. Wait another four hours to allow tank to re-fill.
8. At this point supply line to ice maker connection (optional) may be opened.

Replacing Filters & Sanitizing The System

Each year the filters in the system should be replaced. Usually the membrane can be replaced every other year, but the prefilters and post-filter should be changed annually and in some cases more often.

Filter Replacement

1. Turn off valve on RO bladder tank.
2. Turn off feed water pressure.
3. Open RO faucet to relief pressure.
4. Using the supplied housing wrench remove the filter housing.
5. Discard old filters.
6. Clean filter housings with a cleaning brush
7. Install new filters in system.
8. Remove and replace GAC Post filter. Remove fittings from old post filter, re-apply Teflon tape and install fittings in new post filter.
9. Turn on feed pressure.
10. Open tank valve.
11. Allow water in tank to flush out post filter and run to drain until empty. Run 2 more complete batches to drain before using water.

Membrane Replacement

1. Remove the supply tube from the end of the membrane housing that has only 1 tube.
2. Unthread the cap from the membrane housing.
3. Remove membrane using a pair of pliers.
4. Clean membrane housing with a brush.

Note: When installing a new membrane be sure to push the membrane into the housing as far as it will go.

Every time the membrane is replaced it is recommended that the system be sanitized. Some experts recommend doing this procedure every year.

Sanitizing the System

After all filters are removed from the system, housings have been cleaned, tank is empty, and faucet is open...

1. Add 1 gallon of water to a clean bucket.
2. Add 1 teaspoon of unscented household bleach.
3. Add 1 cup of this solution to each filter housing.
4. Tighten filter housings with solution on RO assembly.
5. Connect membrane housing and feed tube.
6. Open tank valve and feed pressure valve.
7. Allow water to fill the RO housing assembly until water comes out of faucet.
8. Close the faucet
9. Allow water to run for 5 minutes.
10. Shut-off feed pressure.
11. Allow solution to stand for 30 minutes.
12. Open faucet and allow system to drain.
13. Remove water from housings before installing new filters and membrane.
14. Install new filters, tighten housings, and reconnect all tubing connections.
15. Open feed pressure valve and check for leaks.
16. Allow the system to make a full tank of water.
17. Run 2 cycles to drain to rinse out sanitizing solution before using water.