



PERMATECH

Sustainable Water Solutions

WATER FILTRATION SYSTEM (RO6)

OWNER'S MANUAL



INTRODUCTION

Congratulations on choosing Permatech to improve the quality of your water. You will immediately notice the numerous benefits of having quality water in your home or office.

This system uses household water pressure to reverse a natural physical process called osmosis. Water, under pressure, is forced through a semipermeable membrane where minerals and impurities are filtered out. Clean drinking water goes to the faucet or storage tank, while the impurities are sent to the drain. These impurities are measured in water as Total Dissolved Solids (TDS).

The system includes innovative and patented replaceable prefilters and convenient post filter cartridge. The prefilters remove sediment and chlorine from the water supply before they can enter the RO membrane. The postfilter removes any taste or odours that may remain in the water after passing through the RO membrane, and just before going to the RO faucet. To prevent water waste, an automatic shut-off valve closes when the RO faucet is closed and the storage tank is full.

This reverse osmosis system will provide you with a continuous supply of sparkling clear, delicious water for drinking, cooking and other uses. Having high quality RO water at hand eliminates the need to buy bottled water. The storage tank holds up RO water for your needs.

IMPORTANT SYMBOLS !



Symbol for places and activities, which should be paid special attention.



Symbol for the unconditional need to observe activities for security reasons or due to the occurrence of danger damage.



The reference to other places in the manual, which discussed the function is described in more deta



These chapters are designed primarily for installation and service.

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1. BEFORE YOU INSTALL RO SYSTEM

 **CAUTION:** A refrigerator icemaker may not operate properly when connected to RO system that has been installed on a water system which operates outside of the specified pressures listed on page 6.

 **CHECK YOUR WATER SUPPLY:** The cold water supply to the RO system must be within certain quality limits. See the specifications on page 6. If the supply water is not within the limits defined, the RO system will not make product water as it should and substantially reduced filter and membrane life will result.

 **CAUTION:** Chlorine in water will destroy the RO membrane. Most cities add chlorine to water supply to kill bacteria. The prefilters will remove the chlorine up to the limits shown in the specifications on page 6 before it enters the RO membrane. It is important to replace the prefilter cartridges at the recommended time intervals. See System Care and Maintenance starting on page 13.

 **CAUTION:** Before consuming any water from the RO system you must purge the RO membrane cartridge. The RO cartridge contains a food grade preservative that should be removed before consuming the water from the system. This procedure is explained on page 13.

2. SAFETY CONDITIONS

 Read all steps and guides carefully before installing and using your reverse osmosis system. Follow all steps exactly to correctly install. Reading this manual will also help you get all the benefits from your RO system.

 DO NOT attempt to use this product to make safe drinking water from non-potable water sources. Do not use the system on microbiologically unsafe water, or water of unknown quality without adequate disinfection before or after the system. This system is suitable for cyst reduction and may be used on disinfected water that may contain filterable cysts.

 Check with your local public works department for plumbing and sanitation codes. You must follow their guides as you install the system.

 This reverse osmosis system works on water pressure of 2,2 bar (32 psi) (minimum) to 6 bar (87 psi) (maximum). You must install a pressure reducing valve in the water supply pipe to the reverse osmosis system if the water pressure exceeds 6 bar (87 psi).

 DO NOT install this reverse osmosis system outdoors or in extreme hot or cold environments. Temperature of the feed water supply to the RO system must be between 2° C and 38° C. Do not install on hot water.

 The reverse osmosis membrane contains a food grade preservative for storage and shipment. Be sure to purge it according to the instructions on page 13.

3. HOW YOUR RO SYSTEM WORKS?

Connection scheme and the list of parts of the filtration system are on page 16.

Sediment cartridge (prefilter) – STAGE 1

Water from the cold water supply pipe enters the filter through sediment cartridge first. Sediment cartridge is the best solution to remove mechanical impurities such as: sand, fluvial silt, rust and other sediments that you may or may not be able to see in your water.

Sediment cartridge (prefilter) – STAGE 2

This prefilter has a replaceable meltblow or yarn sediment cartridge. This is the 2nd stage of the system with the higher gradation than 1st.

Activated carbon cartridge (prefilter) – STAGE 3

Activated carbon cartridge use the ability to absorb chemical pollutants in the activated carbon. Used for improving the quality of drinking water. Water flows through the entire filter bed for maximum absorption of pollutants. Activated carbon cartridge improve the taste and smell of water, reducing organic impurities, chlorine and its poisonous derivatives, eliminate lead and other toxic heavy metals.

Reverse Osmosis Membrane – STAGE 4

The RO membrane is a tightly wound special membrane. The membrane removes the dissolved solids such as calcium carbonate, chlorides, nitrates etc. and organic matter when the water is forced through the cartridge. High quality product water exits the RO cartridge and goes to the storage tank or to the postfilter and RO faucet. Rejected water with the dissolved solids and organic matter is routed through the flow restrictor and to the drain.

Inline Activated carbon cartridge (postfilter) – STAGE 5

This postfilter improves water taste and smell.

Inline Mineralizing cartridge (postfilter) – STAGE 6

Mineralizing cartridges saturate water with mineral salt ions. The appropriate dissipation of minerals contained in the cartridge filling causes their dissolution in water.

Storage Tank

The storage tank will hold pure water. A diaphragm inside the tank keeps the water pressurized to about 2,6 bar, when the tank is full. This pressure provides a fast flow to the RO faucet. The tank, when empty, is pressurized to 5-7psi (0,3-0,5 Bar).

Automatic shut-off valve

To conserve water, this drinking water system has an automatic shut-off valve system. When the storage tank is filled to capacity and the RO faucet is closed, pressure closes the shut-off valve to stop the flow to drain. Pressure in the storage tank is about half of the water supply pressure. After drinking water is used, and pressure in the system drops, the shut-off valve opens to allow water to flow again.

4. SYSTEM SPECIFICATION

Feed water pressure limits	2,2 – 6,0 bar
Feed water temperature limits	2 – 38 °C
Maximum total dissolved solids (TDS)	1500 ppm (*)
Maximum chlorine content	0,3 ppm
Feed water pH limits	2 - 11
Efficiency	75 GPD (**) 291 dm ³ / 24h
Rejection of TDS (new membrane)	90 – 95 %
Storage tank capacity	12,0 dm ³
Voltage	100 - 240V
Power frequency	50/60 Hz
Protection level	IP54

(*) Maximum levels:

- water hardness < 17 mg CaCO₃
- turbidity < 1NTU
- SDI index <5
- Fe < 0,01 mg/l
- Mn < 0,05 mg/l
- Si < 25 mg/l

(**) Pressure = 4 Bar

Temperature = 25°C

TDS = 250 ppm



5. WHERE CAN RO SYSTEM BE INSTALLED?

This RO system is designed for installation under the sink, usually in the kitchen or bathroom. The RO system can be mounted on a wall surface or can lie on the cabinet floor next to the storage tank. The RO faucet installs on the sink, into the counter next to the sink or in the special bracket on the wall.

You can also install the system in any remote location from the faucet, observing the safety guides. You will need a nearby water supply and drain point.

Water supply: To provide supply water to the RO system, use the included feed supply fittings as described on page 8.

Drain Point: A suitable drain point is needed for the reject water from the RO membrane. A floor drain, laundry tub, standpipe, sump, etc., is preferred for remote installations. A saddle drain adapter is included to install the system under the sink where codes permit, as an optional drain point.

NOTE: Tubing lengths supplied with the system allow for the easy moving of the filter assembly for servicing. If tubing lengths are shortened for a neater appearance, it may be necessary to keep the filter assembly in its installed location for service. Please keep connecting tubes as long as possible for convenient usage.

5.1 CHECK LIST:

- Filter RO6.2
- Water storage tank
- Pump
- One piece tubing – 6 meters
- Cartridges
- Tank ball valve
- Drain saddle valve
- Brass water feeder with valve
- Faucet with accessories
- RO Membrane

5.2 REQUIRED TOOLS AND MATERIALS:

- Variable speed drill
- Ø 4, Ø 6, Ø 10, Ø 13 drill bit
- 17, 24, 32 open-end wrench, or adjustable wrench, pliers
- Screwdriver
- Utility knife or scissor
- Teflon tape

6. USEFUL INSTALLATION TIPS

Filter System uses Quick Connection type style fittings. These fittings only require you to simply push the tubing firmly into each fitting.

6.1 Connecting standard the QC push-in fitting

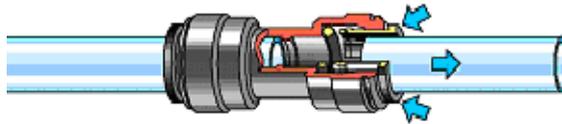


1. Remove yellow locking clip from the fitting.
2. Push the pipe into the fitting, until you feel resistance. The collet (gripper) has stainless steel teeth which hold the pipe firmly in position whilst the o-ring provides a permanent leak-proof seal. Pull on the pipe to check whether it is secured. It is a good practice to test the system prior to leaving the site and/or before use.
3. Place the yellow locking clip back to lock the pipe and prevent it from accidental slip-out.

6.2 Disconnecting standard the QC push-in fitting

Make sure that the system is depressurized before removing fittings.

1. If present, remove locking clip from the fitting.

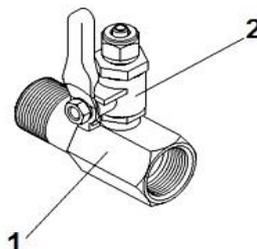


2. Push in the collet against the face of the fitting. With the collet held in this position the pipe can be removed. The fitting can then be re-used.

7. SYSTEM INSTALLATION

7.1 STEP 1: INSTALLATION AT COLD WATER INLET

7.1.1 1/2" water feeder – installation at water inlet



**Water feeder connection set
(1 - connector element 1/2" , 2 - ball valve)**

1. Locate the cold water valve under the kitchen sink (if water feeder is to be installed behind the valve) or main shut-off valve, and then turn off water inlet. Open the cold water tap in the faucet in order to release the remaining water.
2. Unscrew the nut on the installation tube or shut-off valve. Put on rubber gasket and mount the water feeder element. Tighten firmly.
3. Screw in the ball valve into the water feeder element.
4. Install the connection tube to water feeder element or mount the shut-off valve.
5. Close the ball valve and then open the main shut-off valve or cold water inlet valve in order to check for possible leakages.
6. Use teflon tape to seal the threaded connections.
7. Connect the ball valve with first Prefilter – Sediment cartridge (scheme on page 16 by the use of 1/4" elastic tube, which is included in the filter set).

7.2 STEP 2: INSTALLING THE FAUCET

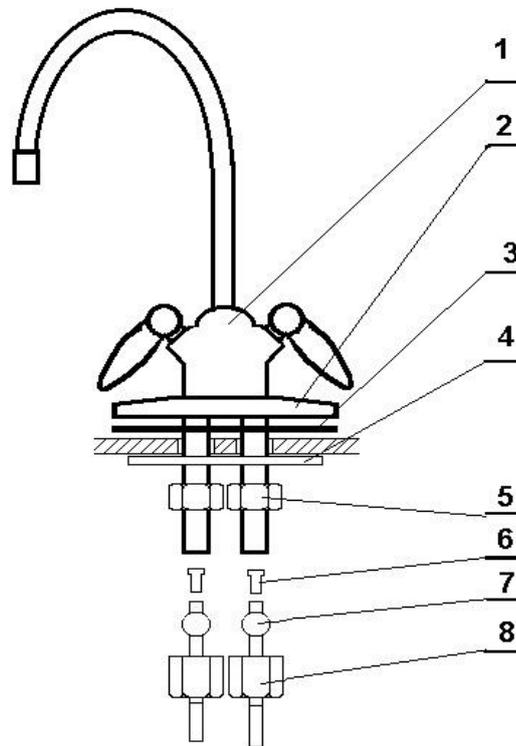
The faucet should be positioned with aesthetics, function and convenience in mind. A sample flat surface is required for the faucet base so that it can be installed firmly. Also, check the under sink area of the desired location to see if there is enough space to complete the faucet installation.

If the space is not available on the upper sink area, the faucet could be positioned on the counter top at the edge of the sink. Be sure to watch for obstructions below, i.e., drawers, cabinet walls, support braces, etc. If the counter top is made of ceramic tile, the method for drilling the holes should be the same as for porcelain sink.



NOTE: The sink drilling process, although not complicated, requires a certain amount of caution and forethought. A porcelain sink can crack if care is not exercised.

7.2.1 DRILLING HOLE IN A PORCELAIN ENAMEL/ STAINLESS STEEL/ALUMINIUM SINK



- 1 - faucet
- 2 - chrome cover plate
- 3 - rubber gasket
- 4 - plastic washer
- 5 - metal washer
- 6 - nut
- 7 - collet
- 8 - tube fastening nut

1. Porcelain enamel sink / stainless steel sink / aluminium sink
2. A $\text{\O} 13\text{mm}$ hole is required for the faucet. It is recommended that you obtain a special ceramic drill bit for a porcelain and/or tile sink/counter. When drilling the faucet hole for the sink/counter, you should wear eye protection and exercise caution by following the below steps carefully.
3. Place a piece of masking tape or duct tape on the determined location where the hole is to be drilled.
4. Use a variable speed drill at slow speed with $\text{\O} 6\text{mm}$ drill bit, and drill a centering hole in the center of the desired faucet location. Use lubricating oil to keep the drill bit cool while drilling.
5. Enlarge the hole using a $\text{\O} 10\text{mm}$ drill bit.
6. Enlarge the hole using $\text{\O} 13\text{mm}$ drill bit. Keep bit well oiled and cool, then drill slowly.
7. File or clean the surrounding area and then remove the masking or duct tape. (NOTE: the metal chips on porcelain will stain very fast).
8. Pass the chrome cover plate and rubber washer according to the picture the threaded mounting tube at the base of the faucet.
9. Under the sink, install the white plastic locating washer, small metal washer and screw on the nut until it is tight against the underside of the sink/ counter.
10. With all fittings in place, thread the Tube Fastening Nut and Collet, insert the tubing into the faucet inlet and tighten the nut.
11. Connect the other free ends of the $1/4''$ tubing according to schemes on page 16.

7.3 STEP 3: INSTALLATION OF DRAIN SADDLE

Drain saddle fits the majority of standard \varnothing 50 mm sewage pipes. Drain saddle should be mounted above the siphon trap on the vertical or horizontal pipe under the sink drain.

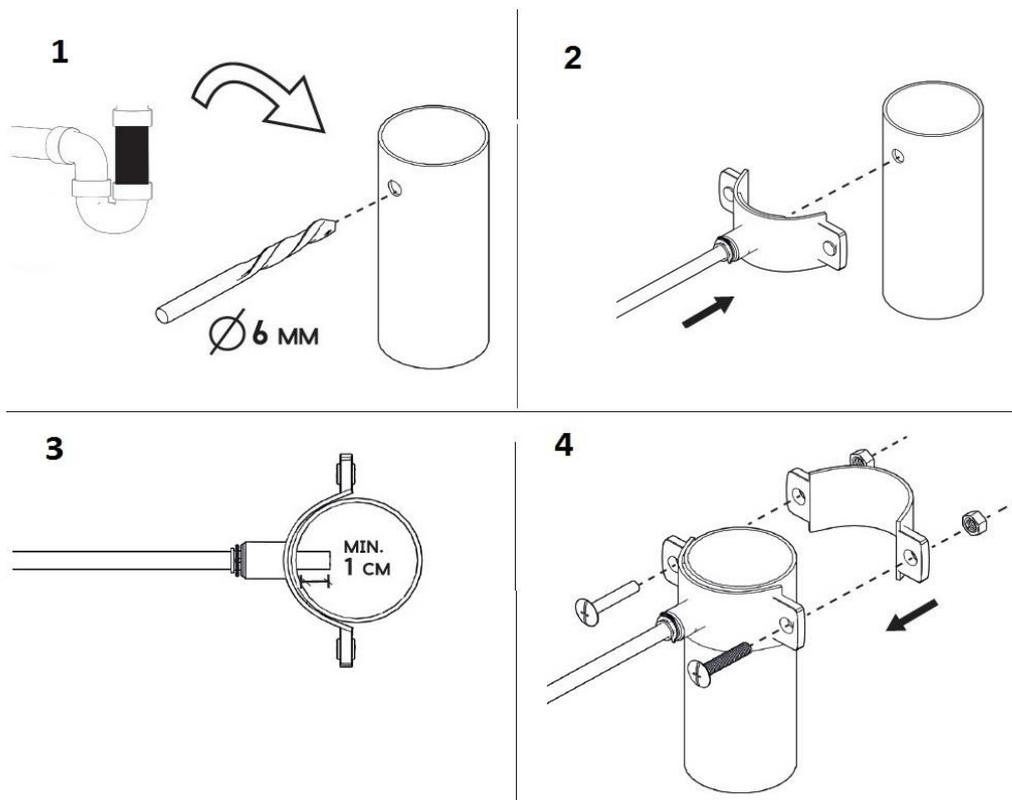
Remove the nuts and bolts from the front half of the saddle, position and hold it in the desired location on the drain pipe above the siphon trap and water line and mark the spot for drilling with a \varnothing 4 mm drill bit or awl through the whole in the clamp. Do not mount the drain saddle near the garbage disposal, as this may cause the drain line to clog. You should carefully consider the route and available space for the 1/4" drain line tubing before you drill the 1/4" hole.

Drill a \varnothing 6 mm hole in the location marked in point 7.3.2 into the drain pipe and clean the surface of the pipe.

Remove the paper protection and round inner part from the foam gasket that is included in the set. Stick it to the drain pipe exactly in the place where the hole in gasket covers the hole in the pipe.

Align the drilled hole in the drain pipe with the front half of the drain saddle using a \varnothing 4 mm bit or a narrow screwdriver. Now locate the complementary piece of the drain saddle assembly clamp and join them together with the bolts. Tighten the two bolts evenly.

Connect 1/4" tubing to the drain saddle and the other free end to the connector „Drain” on the filter.

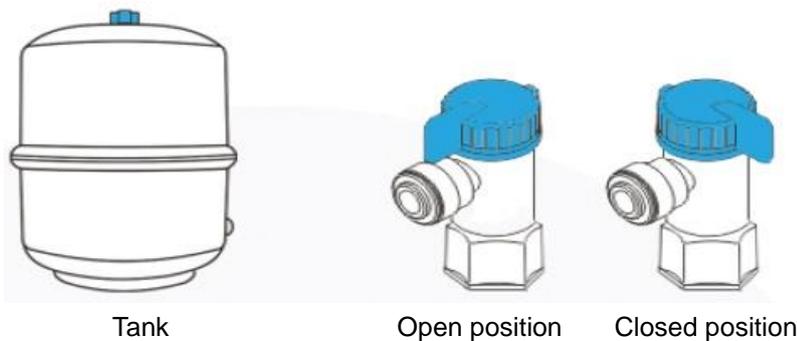


7.4 STEP 4: MOUNTING THE TANK BALL VALVE

 **NOTE:** Do not tamper with the air valve on the lower side of the storage tank. It has been preset to 0,3-0,5 bar (5-7 psi) at the factory.

1. Unplug the plastic cap on top of the tank if present.
2. Put the Teflon tape around the thread.
3. Connect the ball valve to the thread. Hand-tighten only. Do not use a wrench or overtighten it.
4. Connect the other free end of the 1/4" white tubing to the Inline Mineralizing cartridge (postfilter) – according to the scheme on page 16.

 **CAUTION:** Be careful not to damage plastic thread of the tank ball valve.



7.5 STEP 5: RINSING PREFILTERS

1. Connect 1/4" tube to the Activated carbon cartridge (third prefilter). Put the other free ends of the 1/4" tubing into sink.
2. Open the cold water valve.
3. Rinsing for 5 minutes.
4. Then close the cold water valve.
5. Connect free end of the 1/4" tubing with pump.

7.6 STEP 6: CONNECTING THE PUMP

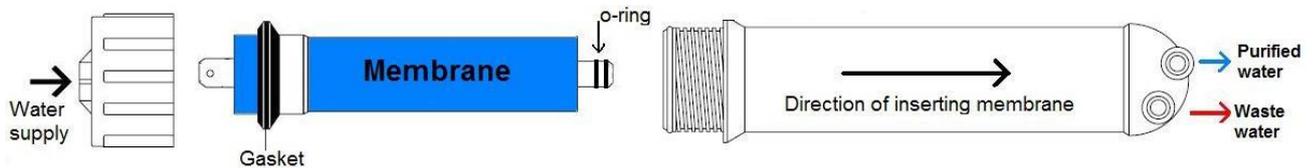
1. Place the pump on the determined location where you can simply plugged into a electrical outlet and connect with filter.
2. Use tubing 1/4" for connecting pump with filter according to the scheme on page 16.
3. Connect the AC adapter to socket.

7.7 STEP 7: INSTALLING MEMBRANE

1. Disconnect 1/4" tube from the head housing of the membrane housing according to the instructions provided on page 11.
2. Unscrew the head of the membrane housing turning it counterclockwise. Make sure that rubber o-rings remained on the thread of the housing in their original position.
3. Unpack the membrane from any protection foil.

CAUTION: Lubricate food-grade silicone grease on o-ring of the membrane seals before membrane installation.

4. With a pair of pliers, gently grab the membrane plastic tube end and pull it out.
5. Insert the membrane into the membrane housing and use your thumbs to apply pressure to the membrane in the direction shown making sure the brine seal and permeate O-rings seat into the housing completely.
6. Screw the head of the membrane housing.
7. Connect 1/4" tube with head housing of the membrane.



Insert membrane into the housing in this direction

7.8 STEP 8: PRESSURE TESTING AND PURGING

1. Check all tubing to be sure there are no kinks.
2. Turn the Storage Tank Valve to OFF position.
3. Turn RO faucet lever to continuous flow ON position (handle pointed up).
4. Turn the cold water supply main valve on slowly. When the system is pressurized, check for leaks.
5. You will hear the air purging from the system and within 5 minutes, the water should start dripping from RO faucet. Once the water starts to drip, allow 20 more minutes for the water to flow through the system and purge all the air trapped inside the system.
6. After 10 minutes, turn the Storage Tank Valve to the ON position (handle is parallel to the tubing).
7. Turn the RO faucet handle to the OFF position. Now the purified water will start going into the storage tank.

CAUTION: You must purge the first two tanks of water from the system prior to consumption of the product water. **Do not drink the first 2 tanks of water produced by the system!**

8. Allow the storage tank to fill for 2 hours. Then open the faucet until the tank is empty and the flow just drips from the faucet.
9. Close the faucet and allow the storage tank to fill again for 2 hours. Then open the RO faucet and empty the tank again. After discharging the contents of the Storage Tank twice, you can start enjoying the pure water.



NOTE: Check for leaks daily for the first week after installation.

8. SYSTEM CARE AND MAINTENANCE

8.1 PREFILTERS CHANGE

To change the prefilter cartridge, follow these instructions:

CAUTION: Any Replacement filters or membranes not recommended by the producer can cause severe damage to the system and void all warranties.

1. Shut off the feed water supply to the system by turning cold water valve to close position.
2. Close the storage tank ball valve by turning the handle perpendicularly to the valve body.
3. Press down on the faucet handle to release pressure.
4. Leave the system for 3-5 minutes in order to lower the pressure to the minimum.
5. Unscrew the prefilter cartridges to the left (counterclockwise). Do it carefully, as the cartridges are filled with water.
6. Unpack new cartridges from any protection foil and line up the new cartridge with the center of the head.
7. Turn the cartridge clockwise to tighten it.

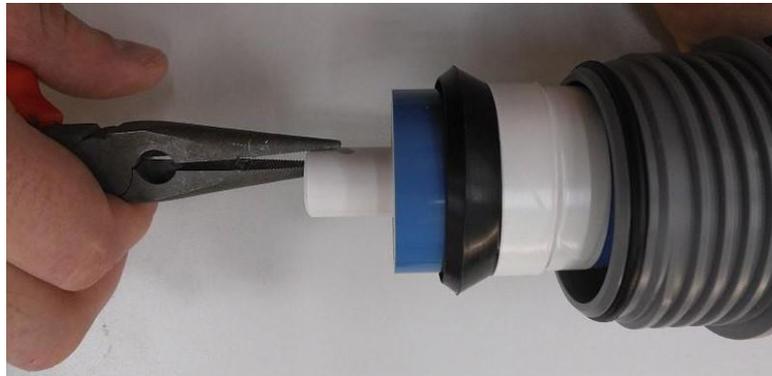
 **CAUTION:** Rinse the new cartridge for about 5 minutes before usage.

 **CAUTION:** A higher frequency of filter changes may be necessary, dependent upon your feed water quality. You should inspect the filters periodically and maintain a service record to establish a maintenance schedule that is unique to your water conditions.

8.2 MEMBRANE EXCHANGE

Follow the instructions below in order to exchange membrane:

1. Cut off water supply by turning the ball valve located on the water supply to close position.
2. Remove 1/4" tube from the head side of the membrane housing according to the instructions provided on page 11.
3. Unscrew the head of the membrane housing turning it counterclockwise. Make sure that rubber o-rings remained on the thread of the housing in their original position.
4. Using a pair of pliers take the plastic end of the membrane core and take the membrane out. This activity may entail slight turnings to the left and right, because the membrane is well fitted inside the housing.



5. Unpack the membrane from foil before installation.

 **CAUTION:** Use vaseline for membrane sealings before membrane installation!

With a pair of pliers, gently grab the membrane plastic end tube and pull it out. This procedure may require a little back and forth twisting and pulling motion, as the membrane is press-fitted into the housing. Be careful not to damage the inside walls of the membrane housing.

Insert the new membrane into the membrane housing and use your thumbs to apply pressure to the membrane in the direction shown making sure the brine seal and permeate o-rings seat into the housing completely.

8.3 Postfilters change

1. To change the postfilter, follow these instructions:
2. Shut off the feed water supply to the system by turning cold water valve to closed position.
3. Close the storage tank ball valve by turning the handle perpendicularly to the valve body.
4. Open the faucet to release pressure.
5. Leave the system for 3-5 minutes in order to lower the pressure to the minimum.
6. Remove the 1/4" tubing from the ends of the postfilter you want to change by following the instructions on page 8 of this manual.
7. Take off postfilter from clips.

8. Wrap the Teflon tape eight times the threaded end of each connector. Use the universal wrench, screw connectors for the new postfilter end.
9. Unpack new postfilters from any protection foil and use an adjustable wrench to screw the male connector into the new postfilter.
10. New postfilter put into clips and reconnect the hoses to the connectors at the ends of the new postfilters.

9. TROUBLE SHOOTING

1. Prefilters: 3-6 months
2. Inline postfilters: 6 months
3. RO membrane: 2-5 years



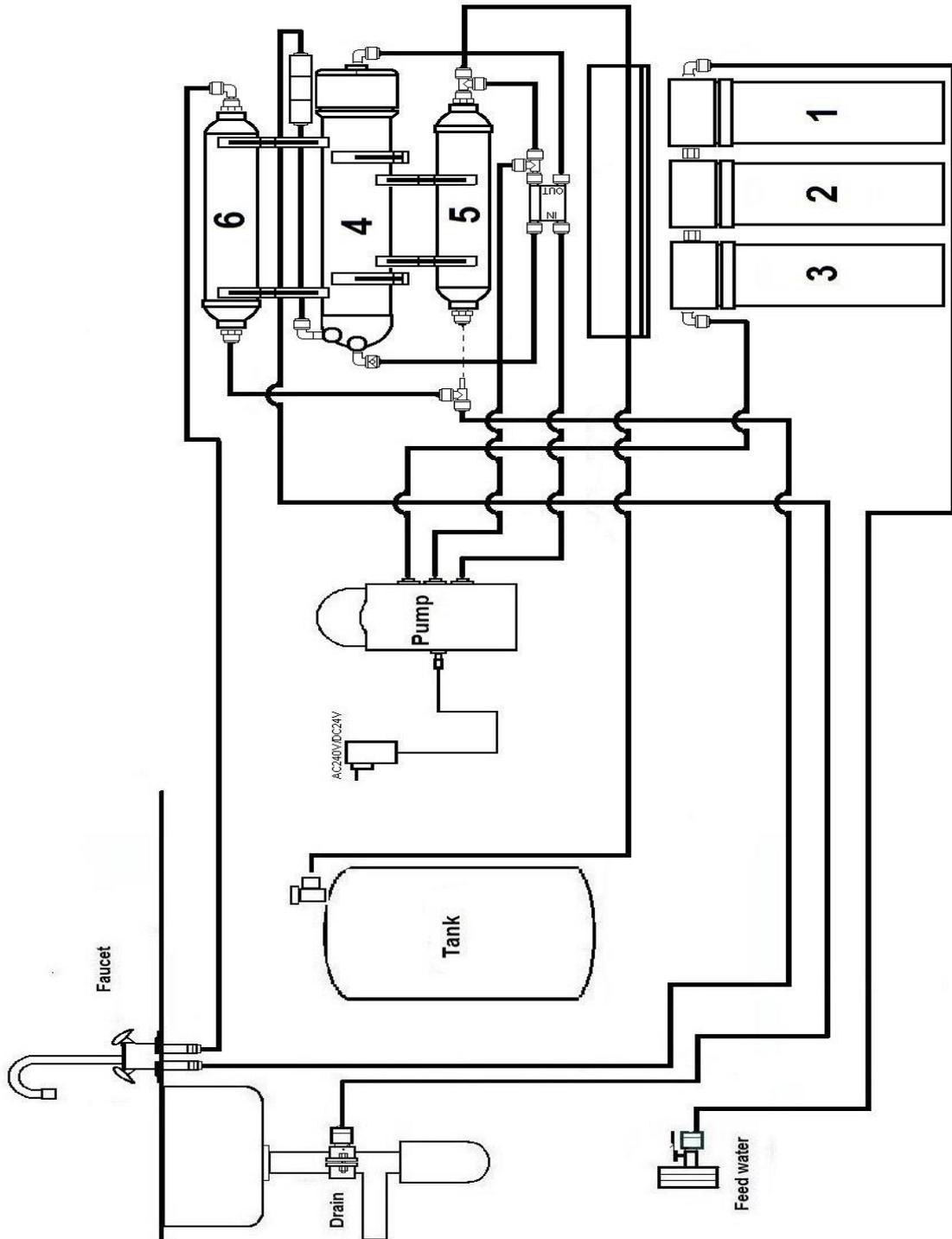
CAUTION: Regularly (eg. Once per month) check your TDS* level of feed water and purified water. Results will keep you updated about the filtration efficiency and the filters condition. RO membrane should lower TDS value of the feed water by around 90%. If the TDS level of purified water is out of range prefilters, postfilters and/or membrane should be exchanged.

*TDS (Total Dissolved Solids) – total content of substances dissolved in water measured in ppm (parts per milion =mg/l)

Please check selected cases for general solution ideas:

PROBLEM	CAUSE	SOLUTION
Taste and/or smell of chlorine in clean water	<ul style="list-style-type: none"> • Concentration of chlorine in feed water is above the limit, which damaged the membrane. • Prefilter does not work – does not remove chlorine from feed water. 	<ul style="list-style-type: none"> • If the concentration of chlorine in feed water is above 0,3 ppm an additional prefiltration should be used. • Exchange the pre- and postfilters; membrane and flow restrictor.
Changed smell and taste of clean water	<ul style="list-style-type: none"> • Used postfilters. • Used membran. 	<ul style="list-style-type: none"> • Exchange the postfilter. If the changed smell and taste lingers, exchange the membrane and flow restrictor. • Disinfect the whole system and storage tank.
Low system capacity	<ul style="list-style-type: none"> • Prefilters or membrane are clogged with sediments. • Feed water does not comply with the standard requirements. 	<ul style="list-style-type: none"> • Exchange the prefilters. If the capacity does not mprove, exchange the postfilters, membrane and flow restrictor. • Increase water pressure, carry out additional filtration etc. before doing the service.
Filtration speed is lower than usual	<ul style="list-style-type: none"> • Water pressure in the storage tank is below 5-7 psi 	<ul style="list-style-type: none"> • Open the faucet valve and empty the tank completely. Check the pressure in the storage tank (keeping the faucet valve open). If the pressure is low, then increase it up to 0,4 bar (6 psi). Close the faucet in order to fill in the tank.
High TDS value of clean water	<ul style="list-style-type: none"> • Feed water does not comply with the standard requirements. • Used membrane. 	<ul style="list-style-type: none"> • Increase water pressure, carry out additional filtration etc. • Exchange the prefilters, membrane and flow restrictor.
Constant water flow to the drain	<ul style="list-style-type: none"> • Shut-off valve is clogged. 	<ul style="list-style-type: none"> • Clean or exchange, if necessary.

10. CONNECTION SCHEME



1. Prefilter Sediment cartridge
2. Prefilter Sediment cartridge
3. Prefilter Activated carbon cartridge
4. Reverse Osmosis Membrane
5. Postfilter Inline Activated carbon
6. Postfilter Inline Mineralizing cartridge