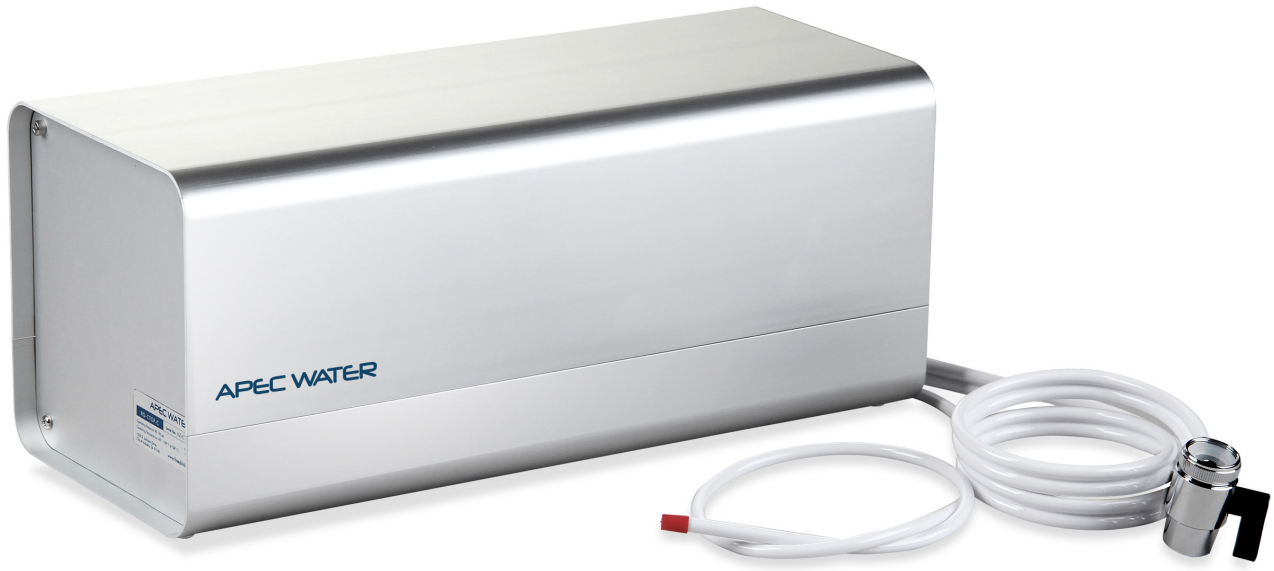
ULTIMATE **Countertop** REVERSE OSMOSIS SYSTEM

INSTALLATION INSTRUCTION & OWNER'S MANUAL

Models: RO-CTOP-C & RO-CTOP-PHC



APEC WATER®

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Please keep this Owner's Manual for future reference.

It contains useful information on how to maintain and care for your APEC Reverse Osmosis Water Filter System.

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Thank you for choosing APEC Reverse Osmosis Systems. You now own the finest reverse osmosis system in America!

Please read and become familiar with the instruction before proceeding with the installation.

Before Installation:

Inspect the system:
Please take the system and all the components out of box. Inspect the system and all the connection fittings carefully, making sure nothing was damaged during shipping. If any part is cracked or broken, please do not proceed with the installation and contact APEC or your distributor for an exchange or diagnosis.

Operating Parameter

- Operating pressure: 30 psi minimum to 85 psi maximum
- Feed water temperature: 40-100 °F (4-37 °C)
- **Do not** connect or run **HOT** water through this system.

Basic Terms

GPD = Gallons Per Day (flow rate)
PSI = Pounds Per Square Inch (pressure)
TDS = Total Dissolved Solids (contaminants)
PPM = Parts Per Million (unit used to measure TDS level)
TDS Meter = A digital meter for measuring the TDS level in the water

General Installation/Operation/Maintenance Requirements

- Installation needs to comply with state and local laws and regulations.
- Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after system. Systems certified for cyst reduction may be used on disinfected water that may contain filterable cysts.
- This reverse osmosis system contains a replaceable treatment component critical for effective reduction of total dissolved solids. The product water shall be tested periodically to verify that system is performing satisfactorily.

Part I. HOOK UP THE RO COUNTERTOP SYSTEM TO YOUR HOME FAUCET

System hook up: Remove your faucet's aerator (if there is one). Hook up the RO system's faucet adapter to your faucet (see **Figure A**). If the connection does not match, try using the other Valve Adapters provided.

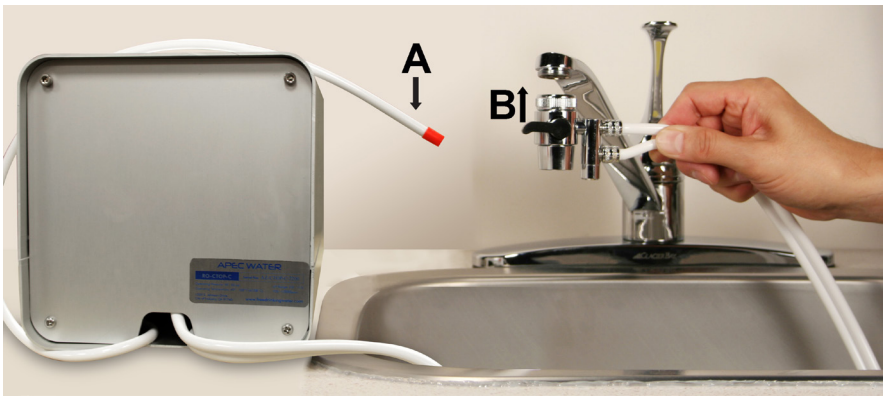


Figure A

Point A. This is the Pure Water Outlet Line. Please remove the Red Cap from the end of the tubing.

Point B. Please hook up faucet adapter to your kitchen faucet.



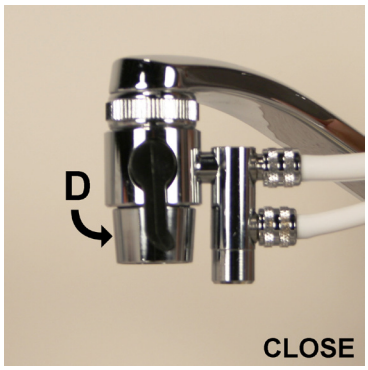


Figure B

1. **Feed water:** Turn the faucet on to **FULL** (cold water only) to supply maximum water pressure to the RO system. Tap water will flow out the bottom of the diverter head. Simply turn the black knob on the diverter head Clockwise to direct the water into the RO system (See Point C, Figure B). Turn back knob Counter Clockwise to shut off water to the RO unit (See Point D, Figure B).

   If input water is very cold, you can adjust the faucet to supply **Luke** warm water (**No Hot** Water Please!). Strong input water pressure and warm water temperature will help increase output flow rate.

2. **Pure Water:** Remove the red cap from end of the pure water output tubing (**See Point A, Figure A**). Place the tubing in your water container to catch the pure water.

3. **Drain water:** Drain (waste) water will drain through the drain outlet on the diverter head (all reverse osmosis systems need to generate drain water to make pure water).

4. **Flushing system:** Let the RO run for 10-15 minutes to flush out the new Membrane – discard the output water during the flush. When done flushing, the fresh pure water is now ready for your enjoyment!

Part II. System Maintenance

RO-CTOP-C & RO-CTOP-PHC FILTER CHANGE SCHEDULE

The system requires very little maintenance. Just change the filter cartridges regularly as suggested below. Keep the system indoors away from extreme hot or cold temperatures, and run the system within its reasonable output capacity (i.e. allow the system to rest at least a few hours a day).

Stage-1 & Stage-2 Pre-Filters: Replace every **6-8 months.**

(Private well water source: may need to replace pre-filters sooner than 8 months due to heavy sediments and other particles.)

Stage-3 Membrane: **City Water:** Replace every **2-3 years** depending on input water quality, water usage, and pre-filters change maintenance.

Private Well Water: Replace every **2 years** depending on well water quality, and pre-filters change maintenance.

Stage-4 Post-Filter: **For RO-CTOP-C System:** Replace every **2-3 years.** It's best to replace this filter when replacing the stage-4 membrane.

For RO-CTOP-PHC System: Replace every **6-12 months.**

Important! It is important to change the 2 pre-filters timely, at least every 6-8 months. The pre-filters protect the stage-3 membrane. If they are not changed timely and become over-depleted, the membrane will be damaged and the RO system will be contaminated.

It's best to use APEC replacement filters. Using "non-APEC" and lesser quality filters may clog up the RO system and damage the membrane.

FILTER CHANGE INSTRUCTIONS

1. Removing Case: The system comes with a premium case. The top half of the case will need to be removed to replace the filters inside. To remove the top cover, you will need to remove the **2 bottom screws ONLY** on each end of the case. Please **DO NOT** remove the top 2 screws (See **Figure C** in the next page).

2. Filter Ports: All filters have Quick-Connect ports. Remove and connect tubing to filter ports as shown in the "Quick-Connect Guide" diagram. (See **Figure D1-D3** in the next page).

3. Removing Filters: Please change **one filter at a time** to avoid mixing up the filters. New filters come with 2" protective plugs on each end. You can take them out by pressing on the collet ring with one finger and using a pair of pliers or hand to pull out the protective tubing (See **Figure D1** in the next page).

Figure C

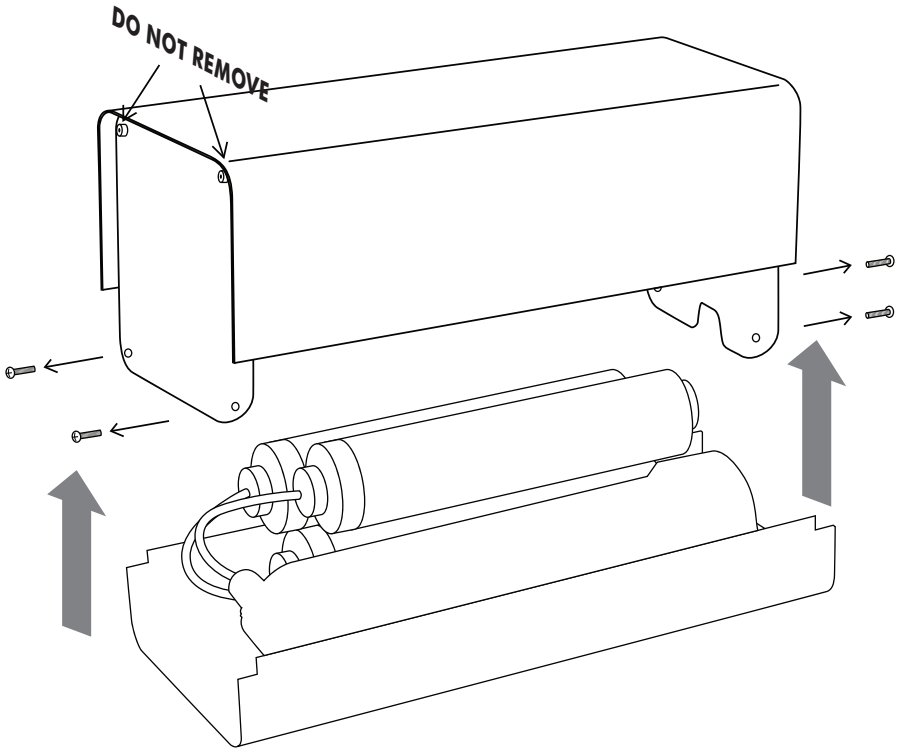
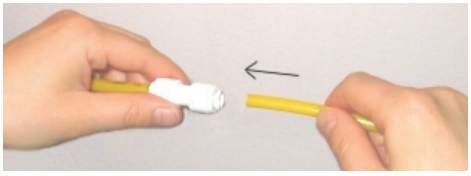
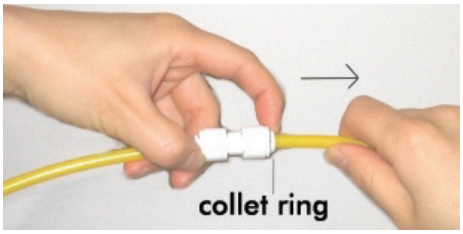




Figure D1



Connect Tubing Figure D2



Press down on collet to pull out tubing Figure D3

Quick-Connection Guide

How to Connect: - See **Fig. D2**. Push the tubing into the Quick-Connect fitting, then gently pull back on the tubing to make sure connection was secure.

- No inserts, sleeve, or nuts are needed to secure the connection.
- No Teflon tape!

To Disconnect: - See **Fig.D3**. Push in and hold down on the collet ring square against the fitting. With the collet held in this position the tube can be removed.

4. How to Replace Filters: The new unit will come with 2 plastic ties. Please cut the ties with a pair of scissors. This will then allow you to remove and replace the filters. Once the filters are replaced the unit does not have to be tied down, this is only for shipping purposes.

How to Replace Stage-1 Sediment Filter (CT-1SED)

Change every 6-8 months or after 600-800 gal pure water used:

The Stage-1 Sediment filter is under the Stage-2 Pre-Carbon filter (See **Figure E**). For ease of access, pull and lift both the 1st and 2nd stage filters to the top position. Then, do the following:

Step 1. Remove the tubing lock (red clip) first. Then disconnect the elbow fitting from Point **D** and disconnect tubing from Point **E** (See **Figure E**). Discard used filter. (Follow "Quick-Connection Guide" for connection tips)

Step 2. Snap on the new filter onto the 2 holding clips. Make sure the **Flow Direction "arrow ►"** on the filter is pointing toward the right direction (See **Figure E**). Re-connect elbow fitting and tubing to both ends of the new filter.

How to Replace Stage-2 Carbon Filter (CT-24CAB)

Change every 6-8 months or after 600-800 gal pure water used:

The Stage-2 Pre-Carbon filter is on top of Stage-1 Sediment filter (See **Figure E**).
Locate it, and follow these steps:

Step 1. Disconnect tubing from Point **F** & Point **G** (See **Figure E**). Discard used Filter.
(Follow "Quick-Connection Guide" for connection tips)

Step 2. Snap on the new filter onto the 2 holding clips. Make sure the **Flow Direction "◄ arrow "** on the filter is pointing towards the left direction (See **Figure E**). Re-connect tubing to both ends of the new filter.



Figure E

How to Replace Stage-3 Membrane (MEM-90)

Change every 2-3 years:

If Stage 1 & 2 pre-filters are changed regularly, the Stage-3 Membrane can last 2-3 years depending on your input water's quality. **The Membrane needs replacing when:** The **TDS** (total dissolved solids) level in the pure water starts to increase (detected by a TDS meter from APEC), or when the **water taste quality starts to decline.** Replace the Membrane as follows:

1. Locate the Membrane-Housing (with "Filmtec Membrane" label on it.)

2. Disconnect tubing from the Membrane-Housing Cap at Point **I**. Remove membrane-housing cap by turning it counter-clockwise (you can use membrane housing wrench to help opening it). Pull out the old membrane using pliers. Then insert the new membrane into the housing. **Make sure the end with "2 small black rings" goes in first as shown below** (See **Figure F**).

3. Close the cap on membrane-housing. Reconnect tubing to the cap at Point **I**. **Let RO run for 10-15 minutes to flush out the new membrane** – discard the output water. When done flushing, the pure water is ready for use.

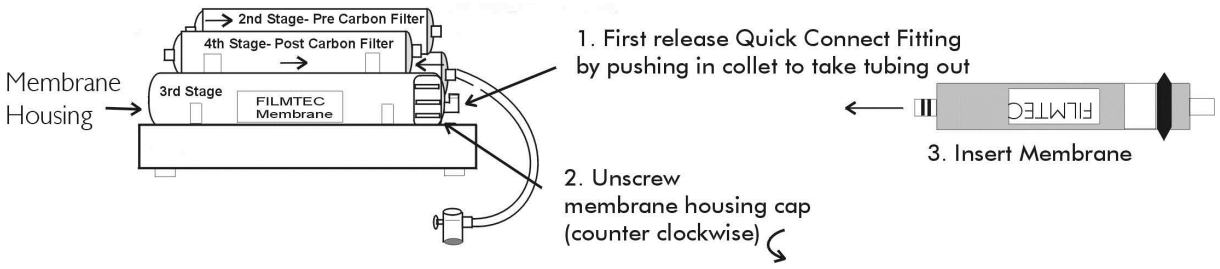




Figure F

NOTE: Please proceed to Section 1 if you own a RO-CTOP-C, or proceed to Section 2 if you own a RO-CTOP-PHC

1. How to Replace Stage-4 Post-Carbon Filter (CT-24CAB) For RO-CTOP-C

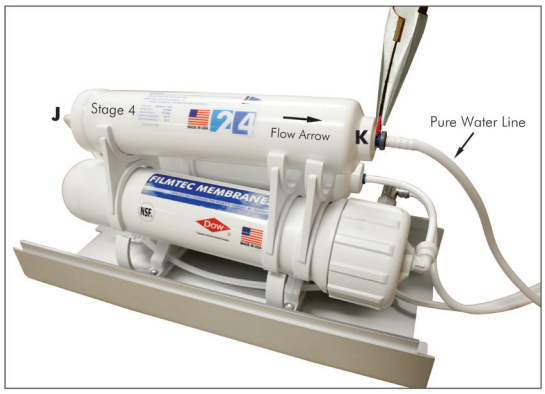


Figure G



Figure H

Follow the same procedures as for changing the **Stage-2** carbon filter.

To remove the pure water output line, first use a pair of pliers and remove the tubing lock (red clip) from Point **K** (See **Figure G**).

Use a flat head screwdriver to push and hold the collet ring into the stage 4 filter. Then pull out the pure water line. Discard the old filter and reconnect pure water line to new filter. Make sure the **Flow direction "arrow ▶ "** on the filter is pointing towards the right direction (See **Figure H**).

2. How to Replace Stage-4 pH Filter (FI-PHPLUS-QC) For RO-CTOP-PHC

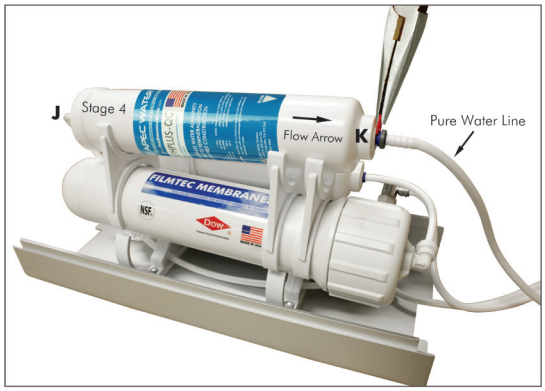


Figure I



Figure J

Follow the same procedures as for changing the **Stage-2** carbon filter.

To remove the pure water output line, first use a pair of pliers and remove the tubing lock (red clip) from Point **K** (See **Figure I**).

Use a flat head screwdriver to push and hold the collet ring into the stage 4 filter. Then pull out the pure water line. Discard the old filter and reconnect pure water line to new filter. Make sure the **Flow direction "arrow ▶ "** on the filter is pointing towards the right direction (See **Figure J**).

Part III. Trouble-Shoot Guide

After installation, if you encounter any of the problems described below, please follow this guide to trouble-shoot. In most cases, the problem is quickly solved by following this guide.

RO DIAGRAM

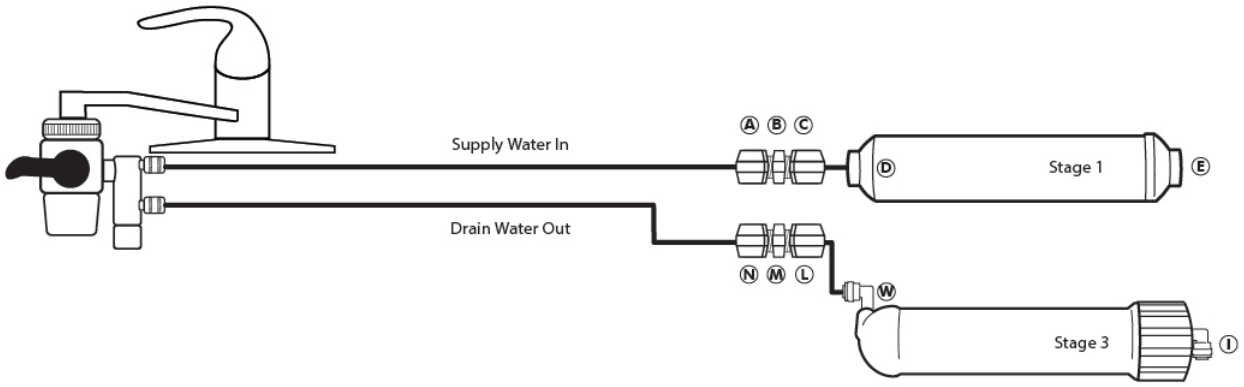
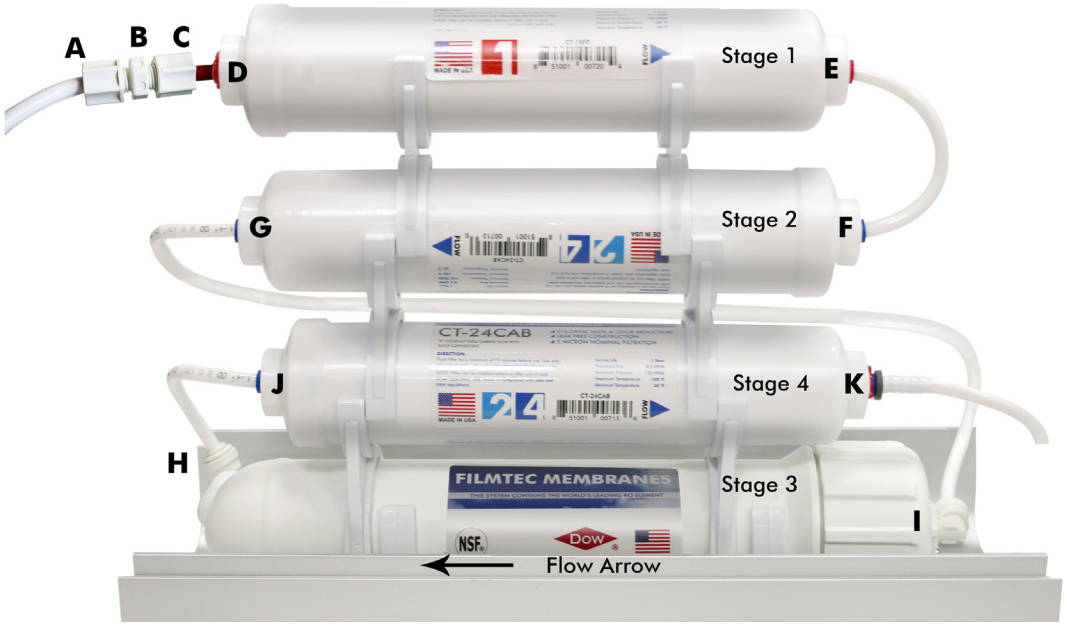


Figure K



(Stage 1-2, 4 filter flow arrow ▶ = water output)

Figure L1



Figure L2

RO Points Identification:

Point A: Compression nut #1

Point B: Male adapter for compression nut

Point C: Compression nut #2

Point D: Feed water inlet to stage 1 Sediment filter CT-1SED (red tubing)

Point E: Stage 1 Sediment filter CT-1SED outlet

Point F: Stage 2 CT-24CAB inlet

Point G: Stage 2 CT-24CAB outlet

Point H: Stage 3 membrane pure water outlet

Point I: Stage 3 membrane housing inlet

Point J: Stage 4 CT-24CAB inlet.

Point K: Stage 4 CT-24CAB outlet.

Point L: Compression nut #1

Point M: Male adapter for compression nut

Point N: Compression nut #2

Point W: Drain water outlet (Do not remove flow controller inside)

TDS Meter (Option) -- How to Test Your Water Quality

The TDS meter is used to test your water's quality before and after the RO system. It also tells you when the membrane needs to be changed.

Please follow instructions below:

Use 2 clean glasses, fill one glass with Tap water, fill the other glass with Product (filtered) water (rinse this glass with filtered water several times to get an accurate reading). Remove the Sensor cap on the TDS meter and rinse the meter sensor with filtered water several times, then Turn on the meter.

The meter will show "000" reading on its screen. Place the TDS meter into the Product water. Record Product water's TDS reading. Then do the same for the Tap water. Record the Tap water's reading. Compare the 2 readings.

The Product water's TDS should be about 3%-10% of your Tap water's TDS. This is a normal range.

For example:

Your Tap water's TDS: 100 ppm
Your Product water's TDS should read within: 10% of 100ppm <= 10ppm

This means that with 100 ppm input, the RO system has removed 90% of the contaminants (TDS) from the source, leaving only 10% (10 ppm) residual TDS in the Product water. This is a normal range. Which means the RO membrane is in good condition.

If your Product water TDS reads less than 10%, that is a very good and normal reading.

You should test your water once or twice a year to monitor the membrane condition. As the membrane gets depleted overtime, its rejection capacity will decrease. When this happens, the TDS in the Product water will increase.

When your Product water TDS creeps up to 15%- 20% of input water's TDS, it's time to replace the membrane.

RO-CTOP-C / RO-CTOP-PHC Pure Water Production Rate

Input Water Pressure	Time to fill 8 oz cup	Time to fill 1 gallon jug	Gallons Per Day
60 psi	60 seconds	16 minutes	90 gpd
50 psi	72 seconds	19.2 minutes	75 gpd
40 psi	90 seconds	24 minutes	60 gpd
30 psi	120 seconds	32 minutes	45 gpd

* Production rate is based on input water temperature of 77 °F.

The RO-CTOP-C / RO-CTOP-PHC runs solely on the input water pressure from your water pipe line. The higher the feed pressure, the faster the unit can produce water. High pressure will also improve TDS rejection.

The chart above shows how different water pressure may effect the performance of the unit. Water pressure can be determined by using a water pressure gauge. You can also use the pure water production rate as a simple guide.

For example, it should take approximately 60 seconds to fill an 8oz cup at 60 psi. For very low water pressure, an optional booster pump (sold separately) can be added to help increase the output rate of the system.

* * * End of Owner's Manual * * *

LIMITED PRODUCT WARRANTY

Scope

APEC takes pride in selling a superb line of products, including this reverse osmosis system ("Product"). As such, APEC expressly warrants to the original purchaser that, for a period of one (1) year from the date of purchase, the Product will be reasonably free of defects in materials and workmanship. Within that one (1) year period from the original purchase, APEC will, at its option, repair or replace the Product without charge, or refund the cost of the Product, if the Product fails or does not perform as warranted solely due to a manufacturing defect within the warranty period, subject to the limitations and exclusions set forth in this Limited Product Warranty. This Limited Product Warranty only applies when the Product is used, stored, handled, fabricated and/or installed in the manner recommended by APEC in the Installation Instruction & Owner's Manual ("Manual").

Repair or Replacement

Repair or replacement during this one (1) year warranty shall include reasonable labor charges necessary to repair or replace the defective Product, but shall not include freight charges or any other local labor charges from third parties other than APEC, unless APEC expressly approves such charges in writing. During the entire one (1) year warranty, APEC's obligation to repair or replace shall further be limited to repair or replacement with the styles, models, products, colors, etc. of the Product that are available at the time of the repair or replacement, and shall be limited to the repair or replacement of only the specific Product that fails due to a manufacturing defect. Any repaired or replaced product shall also remain subject to the original one (1) year warranty from the date of the original purchase, and any repair or replacement shall not extend the original warranty period in any manner or start a new warranty period.

Conditions of Validity of this Limited Product Warranty

Even though the Product has extremely high endurance for operating conditions such as pH, maximum TDS, temperature, and optimum water pressure, THIS LIMITED PRODUCT WARRANTY SHALL ONLY BE VALID IF:

1. The replaceable filters and membrane are changed and maintained on a regular basis as directed in the Manual. Moreover, depending on local water input water quality, regular maintenance may need to be increased.

2. The Product is operated within the confines of the following standard operating conditions:

	Water Pressure	pH Range	Max. TDS	Water Temperature
Countertop System	30- 85 psi	2-11	2000 ppm	40-100 °F

Any information or suggestion by APEC with respect to the Product concerning applications, specifications or compliance with codes and standards is provided solely for your convenient reference and is made without any representation as to accuracy or suitability. You must verify and test the suitability of any information with respect to the Product for your specific application.

Non-Covered Defects

THIS LIMITED PRODUCT WARRANTY DOES NOT COVER DEFECTS CAUSED BY:

1. Improper storage, installation, maintenance, handling, use and/or alterations of the Product, including, but not limited to, non-compliance with the installation, maintenance and standard operation conditions stated in the Manual and this Limited Product Warranty.

2. Unreasonable use, unintended use, or misuse of the Product for something other than its intended purpose as a reverse osmosis system.

3. Use of replacement parts, filters, membranes or other accessories that are not sold or manufactured by APEC for use with this particular Product.

4. Damage not resulting from manufacturing defects that occur while the Product is in the original purchaser's possession.

5. Installation of the Product with known or visible manufacturing defects at the time of installation.

6. Damage caused by freezing, flood, fire or Act of God.

CONDITIONS THAT RENDER THIS LIMITED PRODUCT WARRANTY VOID

THIS LIMITED PRODUCT WARRANTY SHALL BE VOID IF:

1. The Product is not operated in compliance with normal municipal water conditions for which the particular model of this Product is intended.
2. The person seeking to invoke the warranty is not the original purchaser. That is, this Limited Product Warranty only extends to original purchasers.
3. The product is purchased used. That is, this Limited Product Warranty only covers new products.
4. The Product is purchased from someone other than APEC or one of APEC's authorized dealers. This is because, unless the Product was sold by APEC or one of its authorized dealers, APEC cannot verify or guarantee the integrity or authenticity of the Product.

General Conditions

The warranties set forth herein are the only warranties made by APEC in connection with the product. APEC cannot and does not make any implied or express warranties with respect to the product, and disclaims all other warranties, including, but not limited to, any warranty of merchantability or fitness for a particular purpose. Products sold by APEC are sold only to the specifications specifically set forth by APEC in writing. Other than the limited product warranty set forth herein, APEC makes no other warranties, express or implied. APEC's sole obligation under this warranty shall be repair or replacement of a non-conforming product or parts of the product, or at the option of APEC, return of the product and a refund of the purchase price. Buyer assumes all risk whatsoever as to the result of the use of the product purchased, whether used singularly or in combination with any other products or substances.

No claim by the buyer/owner of any kind, including claims for indemnification, shall be greater in amount than the purchase price of the products in respect to which damages are claimed. In no event shall APEC be liable to buyer/owner in tort, contract or otherwise, for any special, indirect, incidental, consequential, reliance, statutory, special, punitive or exemplary damages, including, but not limited to, lost profits, loss of use, loss of time, inconvenience, damage to good will or reputation, or loss of data, even if advised of the possibility of such damages or such damages could have been reasonably foreseen, in connection with, arising out of, or as a result of, the sale, delivery, servicing, use or loss of use of the products sold hereunder, or for any liability of buyer to any third party with respect thereto.

Obtaining Warranty Coverage or General Inquiries

If coverage is available, you may obtain coverage under this Limited Product Warranty by providing APEC with proof of original purchase, and that you are the original purchaser. For service under this Limited Product Warranty, you must notify APEC by phone at 1-800-880-4808, by email at techsupport@freedrinkingwater.com, or in writing at 301 Brea Canyon Road, City of Industry, CA 91789. In making the claim, please provide your name, address, phone number, a description of the product involved, and an explanation of the defect.

California Proposition 65 Warning

⚠ WARNING: This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

APEC WATER®

www.FreeDrinkingWater.com

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