



## **stealthRO**150<sup>™</sup> Customized Reverse Osmosis Filter

# USER MANUAL

# **stealthRO**150<sup>TM</sup> Customized Reverse Osmosis Filter

## DESCRIPTION

The **stealthRO**150 is a customized Reverse Osmosis water filter that is capable of reducing up to 99% of most contaminants. This system is designed and built for use with hydroponic or horticultural applications. This system is built to give the maximum amount of flow from the membrane while sending less wastewater to the drain, compared to similar RO filters. Please read the following setup and maintenance guide to get the maximum results from your filter.

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## PRECAUTIONS

- Do not install the unit where the source/inlet pressure may be more than 80 psi or there are excessive water hammer/spike problems. If your inlet pressure is more than 80 psi, install a <sup>3</sup>/<sub>8</sub>" pressure regulator (**HL 10071** see pg. 15), available at your dealer or through HydroLogic.
- Keep out of direct sunlight or high intensity lights, which degrade the housing and fittings over time. For added protection use the Algae Block Sleeve (HL 26009 see pg. 15) to protect from sun or lights.
- When replacing filter cartridges, use the filter wrench to remove housings. Do not use the wrench to tighten the housings. Hand-tighten the housings only. Take care not to over-tighten.
- Do not install where leakage or failure may cause damage to property.
- If you are going to store or not use your stealthRO for an extended period of time (2 weeks+), remove your membranes, seal them in plastic and put in refrigerator.
- Protect unit against freezing to prevent cracking of the filter housings and water leakage.
- Replace both clear pre-filter housings every three years: HL 23165 from your local dealer or from HydroLogic.
- Do not drop or place heavy objects on top of unit.



## FILTER REPLACEMENT SCHEDULE

## BE SURE TO CHANGE YOUR PRE-FILTERS BASED ON THE FILTER REPLACEMENT SCHEDULE!

The Flowmaster filter capacity monitor is a great way to keep track of your filter changes. **(HL 19014** See pg. 15)

Filter	HydroLogic Part #	Replacement Schedule
Sediment filter—Pleated	HL 22125	clean regularly, change bi-annually
Green Coconut Carbon filter	HL 22110	1,250 gallons of purified water
KDF85/Catalytic Carbon Upgrade Filter	HL 22060	2,000 gallons of purified water
Membrane Element—150 GPD	HL 22121	6 months–2 years
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## OPTIONAL FILTER

## Chlora**Shield**®

Protect your roots! Many cities are switching to chloramines as their primary method of disinfection. Chloramines are most commonly formed when ammonia is added to chlorine to treat drinking water, making it harder to remove. While our Green Coconut Carbon filters work great for chlorine, the smaller molecule size of chloramines requires additional filtration to ensure your root-supporting microbes are happy and healthy.

- Specialty Carbon Filter for 100% Chloramines Removal
- Meets NSF/ANSI component certification standards
- Meets Prop 65 standards
- 1,500 Gallon Capacity
- 100% USA Made

Filter	HydroLogic Part #	Replacement Schedule
Chlora <b>Shield</b> ®	HL 22021	1,500 gallons of purified water

**Note:** Chloramines are a disinfecting agent that is being added by some cities to the water supply in place of, or in addition to, chlorine. They are a much more stable form of chlorine and do not dissipate from letting the water be exposed to air or bubble out with an airstone. They cause the same damage to all living things as does chlorine. Manufacturers of carbon block filters, such as the one that comes standard with the smallBoy, do not make specific claims for chloramines removal. If you are sure your water supply contains chloramines, you can completely remove them by upgrading the standard carbon filter to our ChloraShield<sup>\*</sup> carbon filter.



HL 22021









the  $\frac{3}{8}$ " QC pressure gauge titting. Connect the  $\frac{1}{4}$ " blue product water tubing to the blue outlet of the ASOV. Connect the  $\frac{1}{4}$ " black wastewater tubing to the outlet of the Flow Restrictor/Flush Kit Assembly. You are now ready to connect the included garden hose adapter to your source water and the other end of the  $\frac{3}{8}$ " white inlet tubing. There are a variety of feed valve options available to connect to any existing plumbing. Inquire at your dealer, or through HydroLogic.

# STEALTH-RO150 SETUP, CONT.

Be sure the Flow Restrictor/Flush Kit Assembly's blue valve is open (handle is parallel with tubing, see figure **E**). Next, slowly turn the source water on until both the Carbon and Sediment filters have water in the housings. Once both pre-filter housings are full, open source water up all the way (do not exceed 80 psi). Power flush the system for 2–3 minutes when the system is new and/or when you replace your carbon filter. Next, close the blue valve and continue to flush the membrane for 30–45 minutes. This will flush out the food grade preservative in the membrane.

After the initial 30–45 minute flush, turn the inline shut-off valve (pre-installed on the blue purified water line) to the off position (perpendicular to the tubing). This will shut the water off on both the blue and black lines, and pressurize the system. This is a good way to make sure that all the fittings and connections are secured properly and that there are no leaks. It is also a good way to make sure that the ASOV is working properly, meaning the black drain line is also shutting off shortly after the blue line shuts off. If there are problems of any kind please contact HydroLogic directly at 888-426-5644

Note: It may take up to 24 hours of running the system for the PPM of the purified water to stabilize at the lowest rejection reading.

## WARNING: USING NON-ORIGINAL REPLACEMENT FILTERS OR MEMBRANES WILL VOID THE WARRANTY

## QUICK CONNECT FITTINGS (QC)



Scan To View Instruction Video



Push tubing firmly into the fitting, all the way until the tube stops. The collet (gripper) has stainless steel teeth which hold the tube firmly in position while the O-ring provides a leak proof seal. Pull tubing to check for security. If some tube pulls out, then push it all the way in again until it stops. It is good practice to test the system prior to leaving site and/or before use.

### **Disconnecting QC Fittings:**



Ensure system is depressurized before removing fittings then push in the collet evenly against the face of the fitting. With the collet held in this position the tube can be removed by simply pulling. You can use a collet release tool (**HL 24010**, available from your dealer). The fitting can then be re-used. If the tubing has been removed several times you may see score marks on the ends, and this can lead to leaks. It is best to cut the end off of the tubing with a sharp blade, being careful to cut straight across. Any angle to the cut can cause a leak.

Please visit www.hydrologicsystems.com/resources for

tutorial videos on the stealthRO.

## FILTER CHANGES / MAINTENANCE

It is essential that you change your pre-filters regularly. The Green Coconut Carbon filter has a rated life of approximately 1,250 gallons\* of purified water produced. The Sediment filter can be cleaned at your faucet or with a garden hose as often as you like. You should change the Sediment filter at least every 6 months.

\*2,000 gallon filter life with KDF85/Catalytic Carbon upgraded filter

Dirt can become embedded in your pre-filters and cause slower flow rates. To rinse the pre-filters, use the included filter wrench to loosen the clear pre-filter housings. Be careful not to over-tighten when reinstalling. It is preferable to hand-tighten filter housings.

The Reverse Osmosis membrane has a useful lifespan of 6 months to 2 years depending on how high your source water PPM is, if there are high levels of certain contaminants (such as iron & silica), how much water you produce and regular pre-filter maintenance. If your water is highly contaminated, then you may need to change the membrane more often. If your water is relatively clean and you keep up with your pre-filter changes, they may last 2 years+. There are two indications as to when to change your membrane:

- PPM rejection %: Test the RO product and source/inlet water to see what % of the inlet water's PPM the stealthRO is filtering out (rejection %). You should see approximately 98% of the inlet PPM being removed when the membrane is new. If the rejection % falls under an acceptable level (typically 90%), it's time to change the membrane.
- 2. The flow rate of the product water slows down significantly. This can also happen if your pre-filters are clogged. If you change your pre-filters and the product water still flows slowly, this is an indication you need a new membrane. When in doubt, contact HydroLogic at 888.426.5644 or email us at techsupport@hydrologicsystems.com.



## CHANGING THE RO MEMBRANE, CONT.



#### **STEP 2:**

Firmly grip the membrane housing and twist the membrane cap counter clockwise using the provided filter wrench.

#### STEP 3:

You can now remove the membrane with either a strong set of needle nose pliers or something similar. Hold onto the membrane housing body and pull straight out until it releases the membrane. It may seem tight, but with even pressure it will come out.



## CHANGING THE RO MEMBRANE, CONT.

#### STEP 4:

Push the new membrane back into the housing with the end that has the two black O-rings going in first. Push firmly until it bottoms out and can't go in further. Then thread the cap back on tightly and reconnect the white ¼" tubing. Be sure the O-ring in the cap is in place.



**STEP 5:** 

Run the system for 30–45 minutes, discarding all purified and wastewater before using.

## TFC Membrane Rejection Chart

The TFC membrane rejection chart can be very helpful as a general guideline, but is not a guarantee. Every water source has a different chemistry, temperature and TDS, and it is best to test your water thoroughly to determine your unique water profile.

A good place to start is EWG. org, just type in your zip-code to determine what contaminants (if any) you may be dealing with.

lon	Symbol	% Rejection
Aluminum	Al+3	97 – 98
Ammonium	NH4+	85 – 95
Borate	B4O2-2	30 – 50
Boron	В	60 – 70
Bromide	Br -	93 – 96
Cadmium	Cd+2	93 – 97
Calcium	Ca+2	95 – 98
Chloride	CI -	92 – 98
Chromate	CrO4 <sup>-2</sup>	85 – 95
Copper	Cu+2	96 – 98
Fluoride	F-	93 – 95
Iron	Fe <sup>+2</sup>	96 – 98
Lead	Pb+2	95 – 98
Manganese	Mn+2	97 – 98
Magnesium	Mg <sup>+2</sup>	95 – 98
Mercury	Hg+2	95 – 97
Nickel	Ni+2	97 – 98
Nitrate	NO3-	90 – 95
Phosphate	PO4-3	95 – 98
Polyphosphate	PolyP	96 – 98
Potassium	K*	92 – 96
Silica	Si	85 – 90
Silicate	SiO2 <sup>-2</sup>	92 – 95
Silver	Ag*	95 – 97
Sodium	Na*	92 – 98
Sulfate	SO4 <sup>-2</sup>	96 – 98
Thiosulfate	\$2O3 <sup>-2</sup>	97 – 98
Zinc	Zn+2	97 – 99
Arsenic	As	90 - 95

## ACCESSORIES



#### Booster Pump with High Pressure Switch HL 29020

Boosts pressure to 65+ psi for increased flow rate of purified water. For low pressure situations (below 40 psi) or those wanting higher flow rates.



#### Pressure Regulator HL 10071

For high inlet pressure. Limits pressure to below 85 psi. Simply connects onto the source/inlet line.



#### Float Valve HL 27015

Fill any tank or reservoir unattended. Can be Installed in lid or sidewall of tank. Never flood your garden again!



#### Flowmaster for stealthRO150 HL 19014

Gallonage & filter capacity monitor. Alerts you when It's time to change your filters and measures total number of gallons of purified water produced.



#### KDF85/Catalytic Carbon Upgraded Filter HL 22060

Reduces chlorine, iron, sulfur and heavy metals, Recommended for well water.



#### Algae Block Sleeve HL 26009

Neoprene sleeve that covers all standard clear housings. Blocks light so no algae can grow. Easily removed to check status of filters.



#### TDS Monitor HL 19006

Measures source/inlet water's PPM going into the RO system and purified water's PPM coming out. Monitors the performance of your RO system. Instantly displays values and allows you to switch back and forth between dirty and clean water TDS readings.



#### ChloraShield Carbon Filter HL 22021

Specialty Carbon Filter for 100% Chloramines Removal. Meets NSF/ANSI component certification standards. 100% USA Made



#### UV Sterilizer Kit HL 35015

Kills 100% of all bacteria and viruses. Ensures the safest water.



#### stealthRO150 to stealthRO300 Upgrade Kit HL 33016

Convert your **stealthRO**150 into a **stealthRO**300 with this kit. Double your RO capacity!



#### Drinking Water Upgrade Kit HL 26016

The **stealthRO** drinking water add-on kit is for the horticulture enthusiast who also wants to use their system for home drinking water.



#### Fittings see website

Various fittings are available to customize your setup. Visit www.hydrologicsystems.com



#### Leak Detector & Shut Off Valve HL 19023

Installs on source/inlet line. If there is a leak anywhere in the system and water reaches the pad on the bottom of the leak protector the valve shuts off all incoming water, preventing further damage from the leak.



#### De-lonization Kit HL 33005

DI post filters are a necessity for reducing TDS to absolute zero. The color-changing DI resin will remove any leftover contaminants giving you the purest H2O possible.



#### Tubing see website

Extra tubing is available to customize your setup. Visit www.hydrologicsystems.com.

## COMPONENT SPECIFICATIONS

## Pleated, Cleanable Sediment Filter-HL 22125

- Exceptionally low pressure drop
- Industry leading performance
- Improved system performance
- Superior quality and cost savings

### Green Coconut Carbon Filter—(Earth Friendly) HL 22110 (

HydroLogic is proud to introduce the first Carbon Block to use NSF61 listed green carbon. This high performance coconut shell carbon is manufactured using a patented process that significantly reduces harmful greenhouse gas emissions.

These carbon blocks are made using coconut shell green carbon which has more micropores than other types of carbon and a unique binder system, delivering a product with superior absorption capacity and kinetic dynamics.

This combination of high performance carbon, unique binders, and proprietary manufacturing processes delivers exceptionally low pressure drop, high dirt holding capacity, and excellent contaminant reduction.

No release of carbon finesExceptionally low pressure drop

• Meets NSF61 standards

- Meets NSF material safety standards
- Industry leading performance
- Made in the USA
- Meets WQA standards of performance

## KDF85/Catalytic Carbon upgraded filter HL 22060 (

HydroLogic only uses the highest grade materials to make our KDF85/Catalytic Carbon upgraded filter.

- KDF: 0.5 lb copper/zinc media
- Reduces Iron, sulfur and heavy metals.
- Carbon has enhanced catalytic capability
- KDF neutralizes chlorine
- Bacteriostatic qualities do not allow microbes to breed in filter
- Made in the USA

## RO Membrane: HL 22121

**stealthRO** HydroLogic Membranes are recognized as one of the industry's most reliable and highest performing membrane elements that deliver consistent performance and quality. Advanced membrane technology and manufacturing processes allow these elements to deliver consistent results.

- DOW flat sheet material
- 98% PPM Rejection
- Improved system performance
- Hand-rolled

- Superior quality and cost savings
- Individually tested and sanitized
- Made in the USA

## COMPONENT SPECIFICATIONS, CONT.

## ChlorgShield Carbon Filter: HL 22021

Protect your roots! Many cities are switching to chloramines as their primary method of disinfection. Chloramines are most commonly formed when ammonia is added to chlorine to treat drinking water, making it harder to remove. While our Green Coconut Carbon filters work great for chlorine, the smaller molecule size of chloramines requires additional filtration to ensure your root-supporting microbes are happy and healthy.

- Specialty Carbon Filter for 100% Chloramines Removal 1,500 Gallon Capacity
- Meets NSF/ANSI component certification standards
- Meets Prop 65 standards

100% USA Made

## Membrane Operating Limits: Very Important

- MEMBRANE TYPE: Thin Film Composite
- MAXIMUM OPERATING TEMPERATURE: 113° F (45° C)
- MAXIMUM OPERATING PRESSURE: 100 psi
- MAXIMUM FEED FLOW RATE: 2 GPM
- MAXIMUM TDS: <1000 PPM
- MAXIMUM HARDNESS: <10 Grains Per Gallon (170 PPM) •
- PH RANGE, CONTINUOUS •
- OPERATION: 2-11
- MAXIMUM FEED WATER TURBIDITY: 1 NTU
- MAXIMUM FEED SILT DENSITY INDEX (SDI): 5 SDI
- CHLORINE TOLERANCE: 0 PPM
- CHLORAMINE TOLERANCE: 0 PPM
- MANGANESE TOLERANCE: 0 PPM
- IRON TOLERANCE: <1 PPM</li>
- SILICA TOLERANCE: <10 PPM</li>

NOTE: Operating your membranes outside of the parameters voids the warranty. Use only with microbiologically safe water. Do not use with water of any unknown origin or water quality. When in doubt contact HydroLogic to order a water analysis kit.

## PERFORMANCE

## **Important Information & Performance Parameters**

Reverse Osmosis is the most efficient and cost-effective way to remove the majority of all contaminants from your water. The key component of the system are the RO membranes composed of tightly wrapped sheets of a semi-permeable material. Under pressure, the membrane allows pure water to pass through it and rejects, or flushes away, most impurities down the drain. That is why all RO systems have a certain amount of wastewater. The ratio of wastewater is determined by the Flow Restrictor installed in the Flow Restrictor/Flush Kit Assembly. The system comes with a choice of **1:1** and **2:1** Flow Restrictors. Refer to pg. *7*.

The flow of purified water is determined by the GPD rating of the membrane, inlet pressure and inlet temperature. The **stealthRO**150 has the capacity to produce 150 gallons per day (approx. 6.25 gallons/hour when your inlet water is at 77°F, 65 psi, 500 PPM). If your inlet pressure is less than 65 psi, you may experience less than the rated 150 GPD flow rate. A minimum of 40 psi is required to operate the system. The higher the inlet pressure, the better the flow. A booster pump is available as an option in case of low pressure and is necessary if your pressure is below 40 psi (**HL 29020** see pg. 15).

## You will notice that in colder areas or in the winter, when water temperatures are lower, the flow rate will be slower.

Inlet water that is very high in total PPM or very hard with calcium or magnesium, or high in certain contaminants such as iron or silica, may shorten the life of the membranes and/ or cause slower flow rates. The RO membranes can handle inlet water up to 1,000 PPM and with a hardness up 10 grains per gallon (170 PPM). Note that this is considered both very contaminated and very hard water and may result in a shorter membrane lifespan. At these levels of contamination and hardness, and especially beyond, you may consider pre-treatment in the form of a water softener or other equipment. Softened water can be run through your **stealthRO** system for optimal performance. The membrane in the **stealthRO** is capable of removing up to 99% of salts that are introduced by the softener. Contact HydroLogic for more info at 888-426-5644.

All RO systems exhibit "TDS creep." The first few ounces of RO water produced are higher in PPM than after the system has run for a few minutes. Take any PPM readings a full five minutes after turning the system on to ensure accuracy.

## WARRANTY AND SUPPORT

A one year warranty against manufacturer's defects comes with each unit.

This does not include clogged or damaged pre-filters or RO membranes due to lack of regular maintenance or excessive sediment, chlorine, chloramines, iron, silica, manganese, sulfur or PPM in the source water. This warranty also excludes damage caused by using the unit outside of the specified operating parameters listed on page 18. Do not operate unit if incoming pressure exceeds 80 psi or there is problem with water hammer or pressure spikes.

Change both clear pre-filter housings every three years, available through your local dealer or HydroLogic. HL 23165

Do not bring unit back to the dealer without contacting HydroLogic first.

#### Contact HydroLogic directly for questions and warranty issues.

The manufacturer believes the information and data contained herein to be accurate and useful. The information and data are offered in good faith, but without guarantee, as conditions and methods of use of products are beyond the manufacturer's control. The manufacturer assumes no liability for results obtained or damages incurred through the application of the presented information and data. It is the user's responsibility to determine the suitability of the products for the user's specific end uses.

Tech Support Contact: techsupport@hydrologicsystems.com 1-888-426-5644

Visit us on the web at: www.hydrologicsystems.com There are a variety of videos under the resources tab

## WARNING: USING NON-ORIGINAL REPLACEMENT FILTERS OR MEMBRANES WILL VOID THE WARRANTY

## TROUBLESHOOTING

#### Q: The system is brand new, why is the flow rate of purified water so slow?

**A:** The system's GPD capacity is achieved when you have the following conditions for your source water: 77°F, 500 PPM, 60 psi. If your source water is colder than this, or your inlet pressure is lower, or your PPMs are significantly higher, then you will experience less than the rated GPD flow rates. HydroLogic provides solutions to these less-than-desirable source water conditions. For instance, we have a pressure booster pump for low psi, and additional pre-filtration for high PPM.

#### Q: Why has the flow rate of purified water slowed down over time?

**A:** This can be due to multiple factors, such as a clogged sediment or carbon prefilter, clogged or fouled membranes, or changes to source water conditions. The quality of your water, frequency of use, and timeliness of pre-filter changes will determine how long your system performs at peak capacity.

#### Q: Why have the PPMs of the purified water increased over time?

**A:** This is typically due to deterioration of the membranes as a result of exposure to chlorine. The purpose of the carbon filter is to remove chlorine and chloramines from the water. If it isn't changed on schedule, chlorine/chloramines will pass through to the membranes and degrade them, causing more water to flow out of the purified line and an increase in PPM.

#### Q: Why is the waste line running faster than the purified water line?

**A:** If you're using the **2:1** Flow Restrictor, that means the system will produce 2 parts wastewater to one part purified water. If you're using the **1:1** Flow Restrictor, you should have equal parts waste to purified water.

## Q: Why does the waste line continue to run when the purified water line is closed off?

**A:** Over time, the automatic shut-off valve (ASOV) can accumulate scale and become clogged, causing it to malfunction. If you experience your waste line continuing to run after the purified water line is closed, it is an indication of high PPM and you may need to replace it, available from your local dealer or HydroLogic.

## TROUBLESHOOTING, CONT.

#### Q: Why is the system leaking?

A: This can be due to various reasons, including lack of Teflon tape at threaded fittings, tubing not being pushed in all the way to the quick connect fittings, or improperly seated O-rings in pre-filter and membrane housings. It is also important to make sure the ends of the tubing have a clean cut before inserting them into the quick connect fittings (see pg. 11) Please call us if you're experiencing any leaks.

#### Q: Why did the clear pre-filter housing crack?

A: This can be due to freezing conditions, excessive pressure spikes, or long-term exposure to high intensity lighting. Replacement housings are available.

#### Q: Why is the pH of the purified water higher/lower than the source water?

A: The pH of the purified water depends entirely on source water chemistry. Customers can experience either slightly lower or higher pH after filtration. This is completely normal for Reverse Osmosis technology. Since RO water is almost pure  $H_2O$  and has no ability to buffer pH, the actual pH reading will not be accurate until you add minerals back.

#### Q: Why are both the 1:1 and 2:1 Flow Restrictors included in the box?

A: The Flow Restrictor(s) determines your waste to purified water ratio. HydroLogic has always provided two options for the waste to purified water ratio, because water conditions vary across the world; one fixed ratio would not work for every water condition. Please see pg. 7 for more detailed information.



# Tech Support / Contact:

If you have a particular application or steup question, you can call or email HydroLogic:

## techsupport@hydrologicsystems.com

## 1-888-H2O-LOGIC

(1-888-426-5644)

Visit us on the web at: www.hydrologicsystems.com

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