Change your water. Change your life.

HALO
WATER SYSTEMS

Ultraviolet Sterilization System Installation Instructions & Owners Manual

For Model: H-UV12-HD

TABLE OF CONTENTS

CAUTION

EYE PROTECTION

ELECTRICAL WARNING

PROTECTIVE GROUND

FRAGILE

SCAN FOR MORE INFO

HALO UV

SAFETY INSTRUCTIONS

WARNING - to guard against injury, basic safety precautions should be observed, including the following:

1. **READ AND FOLLOW ALL SAFETY INSTRUCTIONS.**
2. **CAUTION -** Disconnect power before servicing.
3. **DANGER -** To avoid possible electric shock, special care should be taken since water is present near electrical equipment. Unless a situation is encountered that is explicitly addressed by the provided maintenance and troubleshooting sections, do not attempt repairs yourself, refer to an authorized service technician.
4. Carefully examine the disinfection system after installation. It should not be plugged in if there is water on parts not intended to be wet.
5. Do not operate the disinfection system if it has a damaged cord or plug, if it is malfunctioning or if it is dropped or damaged in any manner.
6. Always disconnect water flow and unplug the disinfection system before performing cleaning or maintenance activities. Never yank the cord to remove from an outlet; grasp the wall plug and pull to disconnect.
7. Do not use this disinfection system for other than intended use (potable water applications). The use of attachments not recommended or sold by the manufacturer/distributor may cause an unsafe condition.
8. Intended for indoor use only. Do not install this disinfection system where it will be exposed to the weather or to temperatures below freezing. Do not store this disinfection system where it will be exposed to the weather. Do not store this disinfection system where it will be exposed to temperatures below freezing unless all water has been drained form it and the water supply has been disconnected.
9. Read and observe all the important notices and warnings on the water disinfection system.
10. If an extension cord is necessary, a cord with a proper rating should be used. A cord rated for less Amperes or Watts than the disinfection system rating may overheat. Care should be taken to arrange the cord so that it will not be ripped over or pulled.
11. **SAVE THESE INSTRUCTIONS.**

WARNING: The UV light given off by this unit can cause serious burns to unprotected eyes and skin. Never look directly at an illuminated UV lamp. When performing any work on the UV disinfection system always unplug the unit first. Never operate the UV system while the UV lamp is outside of the UV chamber.

Note: The UV lamp inside of the disinfection system is rated at an effective life of approximately 9000 hours. To ensure continuous protection, replace the UV lamp annually.

OPERATION & MAINTENANCE INSTRUCTIONS

- Always disconnect power before performing any work on the ultraviolet disinfection system.
- Regularly inspect your disinfection system unit to ensure the UV light is still glowing.
- Replace the UV lamp annually to ensure a high bacteria and virus kill rate.
- Always drain the UV system when closing a cabin/cottage or leaving the unit in an area subject to freezing temperatures.

A. UV Lamp Replacement

To replace the lamp, there is NO need to disconnect the system from the water supply, nor to drain the water from the reactor chamber. Lamp replacement is a quick and simple procedure requiring no special tools. The UV lamp must be replaced after 9,000 hours of continuous operation (approximately one year) in order to ensure adequate disinfection.

1. Disconnect main power source and allow the unit to power down. Remove the lamp connector by sliding the metal retaining ring away from the body of the connector. Remove the lamp from the reactor chamber. Separate the lamp from the connector. Do not twist the lamp from the connector, simply slide the two apart. Avoid touching the lamp on the glass portion. Handling the lamp at the ceramic ends is acceptable, however if you must touch the lamp glass, please use gloves, or soft cloth. Fully remove the lamp from the reactor chamber being careful not to angle the lamp as it is removed from the chamber. If the lamp is removed on an angle, pressure will be applied on the inside of the quartz sleeve, causing the sleeve to fracture.

2. To install a new lamp, first remove the lamp from its protective packaging, again being careful not to touch the lamp glass itself. Carefully insert the lamp into the reactor vessel (actually inside the quartz sleeve). Insert the lamp fully into the chamber leaving about two inches of the lamp protruding from the chamber. Next, attach the connector to the UV lamp. The connector is “keyed” and will only allow correct installation in one position. Ensure the connector is fully seated onto the UV lamp.

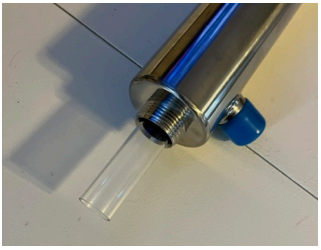
3. Once the lamp is fully seated on the connector, slide the connector over the aluminum retaining nut. Make sure the metal retaining ring on the connector is pulled away from the body of the connector in order that the connector may slide fully over the retaining nut. Once the connector is located fully over the retaining nut, slide the metal ring back into lock the connector in place. As this connector is keyed to the reactor chamber, make sure the depression on the connector is located over the ground lug located on the reactor chamber.

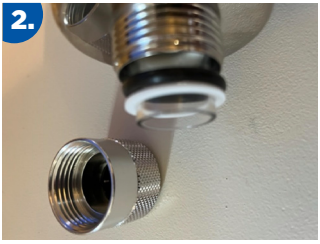
UV LAMP ASSEMBLY INSTRUCTIONS

Unbox HALO UV System and inspect all parts to ensure everything is in proper order. Parts should include the following:

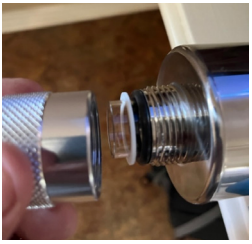
- 1 UV chamber
- 1 quartz sleeve
- 1 ballast
- 2 O-rings
- 1 ultraviolet bulb
- 2 teflon washers
- 2 gland nuts
- 1 power cord

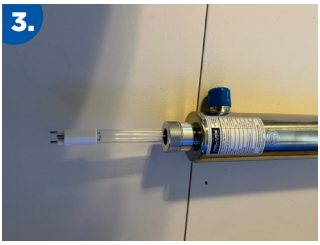
Slide quartz sleeve into stainless UV chamber. Align quartz sleeve so it protrudes equal distance on both side of stainless UV chamber. It should protrude approximately 1/2". (rt.)





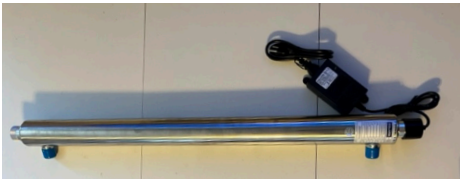
Place O-ring and teflon washer on quartz sleeve. The O-ring is placed on first towards the stainless UV chamber. Next, install Gland nuts on both ends of the stainless chamber. Hand tighten gland nuts only. (rt.)
DO NOT use wrench to tighten as sleeve failure is possible.





Slide bulb into quartz sleeve and slowly lower into to the bottom of the chamber. **DO NOT DROP BULB INTO SLEEVE** as damage may occur. Next, plug ballast in to UV bulb and slide protective cover over gland nut. (rt.)

Plug power cord into ballast. Now your uv system is ready to be plumbed and connected to 110 volt power source.



OPERATION & MAINTENANCE INSTRUCTIONS

B. Quartz Sleeve Replacement And/Or Cleaning:

If the water contains any hardness minerals (calcium or magnesium), iron or manganese, the quartz sleeve will require periodic cleaning. To remove the quartz sleeve, first the UV lamp as outlined above:

⚠ a) Drain the UV chamber (use a small bucket under the unit to prevent a spill), using drain port provided.

b) Remove nuts from chamber, checking for the free floating spring inside sleeve at the opposite end to the lamp connection (do not allow quartz sleeve to fall).

⚠ c) Carefully remove O-rings from the quartz sleeve. As the O-ring may tend to adhere to the quartz sleeve, it is recommended to replace the O-rings annually.

d) Clean the quartz sleeve with a cloth soaked in CLR, vinegar or some other mild acid and then rinse avoiding the introduction of any water to the inside of the sleeve.

e) Re-assemble the quartz sleeve with spring in the UV chamber allowing the sleeve to protrude an equal distance from both ends of the UV chamber.

f) Wet the O-rings and slide onto each end of the quartz sleeve and reassemble the gland nuts (hand tight is sufficient).

g) Re-tighten all connections, turn on water and check for leaks.

h) Re-install the UV lamp and lamp connector as per prior instructions.

i) Reconnect system to power source.

Note: If the system is put on a temporary by-pass or if it becomes contaminated after the disinfection system**,** it will be necessary to shock the system with household bleach for a full 20 minutes before resuming use of the water.

WARNING SYSTEMS

C. Lamp Failure System

The audible alarm and indicator lights on the systems continuously monitor a lamp operation. If the lamp does not start at any time, the indicator red light will glow and audible alarm will sound. This alarm indicated the UV lamp is no longer operating and must be corrected. Please refer to Troubleshooting Guide for corrective procedures.

Ultraviolet MonitO-ring System

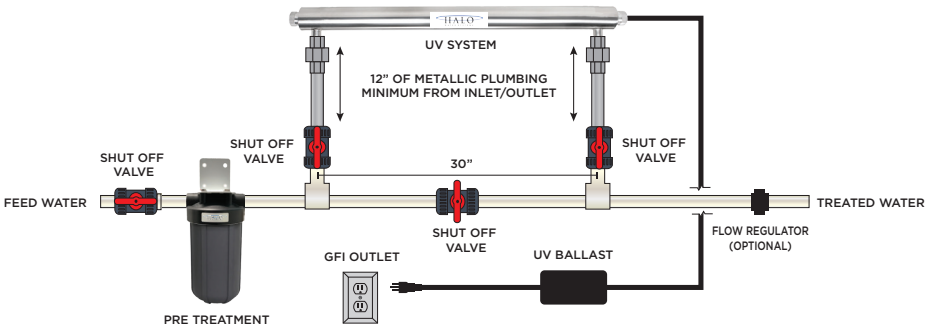
The ultraviolet system features a complete warning system for continuous water protection by constantly sensing the UV light operation. The system features a single LED indicator light, which will operate two distinct colors, **GREEN** and **RED**. When the UV output level changes, the warning system will operate in the following manner:

GREEN - indicates that the UV lamp is satisfactory and the unit is in good working order.

RED - indicates that the unit needs immediate attention, the audible alarm will automatically sound when the LED monitor light switches to red If the lamp has been in service for a year or more it should be replaced. The quartz sleeve and/or sensor probe may require cleaning. The alarm will continue until the sensor detects adequate UV intensity. When a lamp is replaced it is recommended to clean the quartz sleeve and sensor probe prior to returning the system to service.

THIS ADVANCED WARNING SYSTEM HAS BEEN INSTALLED TO PROVIDE YOU WITH THE OPTIMUM PRECAUTIONS TO ENSURE HIGH EFFICIENCY IN THE PROTECTION AGAINST MICROBIOLOGICAL CONTAMINATION IN YOUR WATER. DO NOT DISREGARD THE WARNING LIGHTS.

THE BEST WAY TO CHECK UV OPERATION IS TO HAVE THE WATER TESTED FOR BACTERIA BY A RECOGNIZED TESTING AGENCY ON A REGULAR BASIS.



INSTALLING YOUR DISINFECTION SYSTEM

- The complete water system, including any pressure or hot water tanks, must be sterilized before start up by flushing with chlorine (household bleach) to destroy any residual contamination.
- The disinfection system should be connected to a ground fault interrupter.
- The disinfection system is intended for indoor use only, do not install disinfection system where it may be exposed to the weather.
- Install the disinfection system on cold water line only.
- If treating the entire house, install the disinfection system before any branch lines.
- Ideally, your disinfection system should be the last treatment your water receives prior to use.
- A 5 micron sediment filter must precede the disinfection system.
- 12" of metallic plumbing must be added to the inlet and outlet of the system to create a light trap. Do not install pex, pvc or non metallic plumbing directly to the UV system as direct ultraviolet light will cause damage.

1. **Remove the disinfection system from the shipping carton. For shipping purposes, the UV lamp is packed in a separate tube.** Set the lamp aside for use later. The disinfection system should be mounted in the horizontal position, with the inlet/outlet ports facing up. If the system must be installed in the vertical position, make sure the inlet port is the one at the bottom of the system. Mount the unit in a clear space with at least 36" (91.5 cm) of space at the lamp end to facilitate lamp and or quartz sleeve removal. Fasten the disinfection system to a suitable mounting platform with reinforcements.
2. It is recommended to install a suitable flow restricter in order to not flow more than the rating of the UV system. The use of a by-pass with shut-off valves is recommended for emergency use of untreated water when your disinfection system is being serviced. Apply two turns of Teflon tape around the port threads to ensure a tight join before connecting unions.

   Note: When the UV unit has been by-passed for service, the complete water system must be sterilized once again with chlorine to destroy any contamination that may have passed during by-pass.

DO NOT SOLDER CONNECTIONS WHILE ATTACHED TO THE DISINFECTION SYSTEM AS THIS COULD DAMAGE THE O-RING SEALS.

3. When all plumbing connections are made, slowly turn on the water supply and check for leaks. The most likely cause for leaks is from the O-ring seal. In case of a leak, shut water off, drain cell, remove the retainer nut, wipe the O-ring and threads clean and re-install.
4. Once it is determined that there are no leaks, very carefully slide the UV lamp into the UV chamber making sure the lamp pins are accessible for connection with the lamp connector cable. Attach the lamp connector to the UV lamp, as outlined in "UV Lamp Replacement" on page 5. Plug the disinfection system into the ground fault interrupter, and check to see if the UV lamp is illuminated. **NEVER LOOK DIRECTLY AT THE BURNING UV LAMP.** Allow the water to run for a few minutes to clear any air or dust that may be in the cell.

INSTALLATION NOTES & TROUBLESHOOTING GUIDE

Installation Notes

When there is no flow, the water in the cell will become warm, as the UV disinfection system lamp is always on. To remedy this, run cold water tap anywhere in the house for a minute to flush out the warm water.

As the system requires time to reach its full operating capacity, please allow the disinfection system to operate 3-5 minutes prior to using the water from unit. In addition, to clear any air or debris from the system, open the faucet and allow water to run through the disinfection system for 2-3 minutes.

Troubleshooting Guide

***CAUTION:** When performing any work on the disinfection system unplug the unit first and never look directly at the burning UV lamp.*

SYMPTOM	POSSIBLE CAUSES	REMEDY
PRESSURE DROP	The sediment pre-filter is clogged	Replace filter cartridge with appropriate five micron cartridge. NOTE: Check source of water supply as fluctuations may occur in source pressure
HIGH BACTERIA COUNT	Quartz sleeve is stained or dirty	Clean sleeve with scale cleaner and eliminate source staining problem
	The UV lamp is spent	Replace UV lamp
	Change in feed water quality	Have the source water tested to ensure it is still within the allowable parameters for use with this unit
	Contamination after disinfection system	It is imperative that the effluent water stream be shocked with chlorine after the water leaves the disinfection system the disinfection system must have a bacteria free distribution system to work effectively
WARM PRODUCT WATER	Common problem caused by infrequent use by infrequent use	Run water
MILKY WATER	Air in the lines	Run water until air is purged
UNIT LEAKING WATER	Problem with O-ring seals (on gland nuts and/or sensor probe on monitored units)	Ensure the O-ring is in place, check for cuts or abrasions, clean O-ring, moisten with water and re-install, replace if necessary
	Condensation on reactor chamber caused by excessive humidity	Check location of disinfection system and control humidity
	Inadequate inlet/outlet port connections	Check thread connections, re-seal with Teflon tape and re-tighten

TROUBLESHOOTING GUIDE & WATER CHEMISTRY

SYSTEM STATUS			REMARKS
LAMP STATUS (GREEN LED)	AUDIBLE ALARM	UV LAMP	
ON	**OFF**	**ON**	Correct operating conditions, units is functioning properly
OFF	**ON**	**OFF**	The UV lamp is spent, requires replacement lamp. UV lamp not connected to power source. Check connection and reconnect lamp. Ballast has switched off. To reset ballast remove power to unit by disconnecting power cord from electrical plug for a minimum of 30 seconds then reapply power. LED indicator burnt out or wire lead broken. Replace LED assembly.
OFF	**OFF**	**ON**	LED indicator burnt out or wire lead broken. Replace LED assembly.

WATER CHEMISTRY

Water quality is extremely important for the optimum performance of your UV system. The following levels are recommended for installation:

- Iron:<0.3 ppm (0.3 mg/L)
- Hardness *:< 7 GPG (120 mg/L)
- Turbidity: < 1 NTU
- Manganese: < 0.05 ppm (0.05 mg/L)
- Tannins: < 0.1 ppm (0.1 mg/L)
- UV Transmittance: > 75%
  (Call factory for recommendations on applications where UVT < 75%)

**** Where total hardness is less than 7 gpg, the UV unit should operate efficiently provided the quartz sleeve is cleaned periodically. If total hardness is over 7 gpg, the water should be softened or treated.***

If your water chemistry contains levels in excess of those mentioned above, proper pre-treatment is recommended to correct these water problems prior to the installation of your UV disinfection system. These water quality parameters can be tested by your local contractor, or by most private analytical laboratories. Proper pre-treatment is essential for the UV disinfection system to operate as intended.

WARRANTY & PATENT INFORMATION

HALO Ultraviolet warrants the ultraviolet disinfection system's hardware and electrical systems to be free from defects in material and workmanship for a period of five (5) years from the date of purchase by the original owner on a pro-rated basis. HALO ultraviolet lamps, quartz sleeve, and ballast to be free of defects for a period of (1) year and the reactor chamber for a period of five (5) years. The warrantor will at its option and expense, either repair or replace such units subject to the following conditions, exceptions, and exclusions.

Conditions, Exceptions, And Exclusions
The foregoing limited Warranty is subject to the following terms and conditions:

1. Water passed through the unit must fall within the following parameters:
   a) Iron: <0.3 ppm (0.3 mg/L)
   b) Hardness*:<7 GPG (120 mg/L)
   c) Turbidity: < 1 NTU
   d) Manganese: < 0.05 ppm (0.05 mg/L)
   e) Tannins: < 0.1 ppm (0.1 mg/L)
   f) UV Transmittance: > 75% (call factory for recommendations on applications where UVT < 75%)

   ** Where total hardness is more than 7 gpg, the water should be softened or treated.* **Warranty will be void, if the proper steps are not taken to ensure that these impurities are not present.**

2. This limited Warranty shall not apply to any unit which has been repaired or altered by anyone other than the Warrantor or by a person authorized by the Warrantor, nor to any units which have been subject to misuse, neglect, or accident. Do not remove any of the products labels. Warranty will be deemed null and void if any of the products original labels are removed.

3. This limited Warranty runs exclusively to the original Consumer and with respect to the original installation only.

4. **WARRANTOR SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

5. This limited Warranty excludes the cost of labor in removing any defective unit or installing any replacement unit. This limited Warranty applies only to a unit when returned to the Warrantor at the owner's expense and in accordance with shipping instructions received from the Warrantor.

UV-HD-SLEEVE
Electronic Ballast for
24W-39W 100/240V AC-

UV-HD-BALLAST
Electronic Ballast for
24W-39W 100/240V AC-

UV-HD-LAMP
39W 843mm Germicidal Lamp
Single End Patented 4 Pin 254nm
for Models UVA-12C

HALO
WATER SYSTEMS

www.HALOwater.com 800-591-0538