

Installation and Maintenance Manual



WATER QUALITY

Your UV disinfection system requires clean water for optimum performance. You should only operate your unit if the source water meets the following standards.

Turbidity	< 1 NTU
Suspended Solids	< 10mg/L
Colour	None
Total Iron	< 0.3 mg/L
Manganese	< 0.05 mg/L
Hardness	< 7 gpg



READ AND UNDERSTAND ALL INSTRUCTIONS BEFORE INSTALLING OR USING THIS PRODUCT



PERFORMANCE CONSIDERATIONS

The performance of the UVD400S UV disinfection chamber has been third party validated using accepted bioassay techniques. The UVD400S is equipped with both visible and audio lamp failure alarms. For your safety, it is necessary that you determine that the audio alarm can be heard where you use the water treated by the unit. It is possible to operate the unit with the lamp disconnected which will allow you to validate the adequacy of the audio alarm function in your installation. The UV power source used with the UVD400S is capable of controlling a solenoid valve, which can shut off the water flow and protect against using untreated water in case the UV power source loses power for any reason or the lamp fails prematurely. The use of the optional solenoid valve is highly recommended. In order to optimize disinfection performance, you must only use the unit with water that meets the minimum standard and replace the UV lamp at recommended intervals. Failure to follow these guidelines will result in reduced disinfection performance.



UV RADIATION HAZARD
NEVER OPERATE UV LAMP OUTSIDE OF THE UV DISINFECTION CHAMBER – EXPOSURE TO UV LIGHT CAN RESULT IN EXTREME BURNING OF SKIN AND EYES



Safety instructions – Please read carefully

Danger: Do not plug the unit in if any of the external surfaces or electrical parts is wet. Condensation on the disinfection chamber is normal.

Danger: To avoid possible electric shock, special care should be taken since water may be present near electrical equipment. Unless referred to in these instructions, do not attempt repairs yourself. Contact the manufacturer for service advice.

Danger: Do not operate this system if it has a damaged electrical cord or plug, is malfunctioning, or has been dropped or damaged in any way.

Caution: Do not use this unit for anything other than its intended potable water application. The use of attachments not recommended, approved or sold by the manufacturer/distributor may result in an unsafe condition.

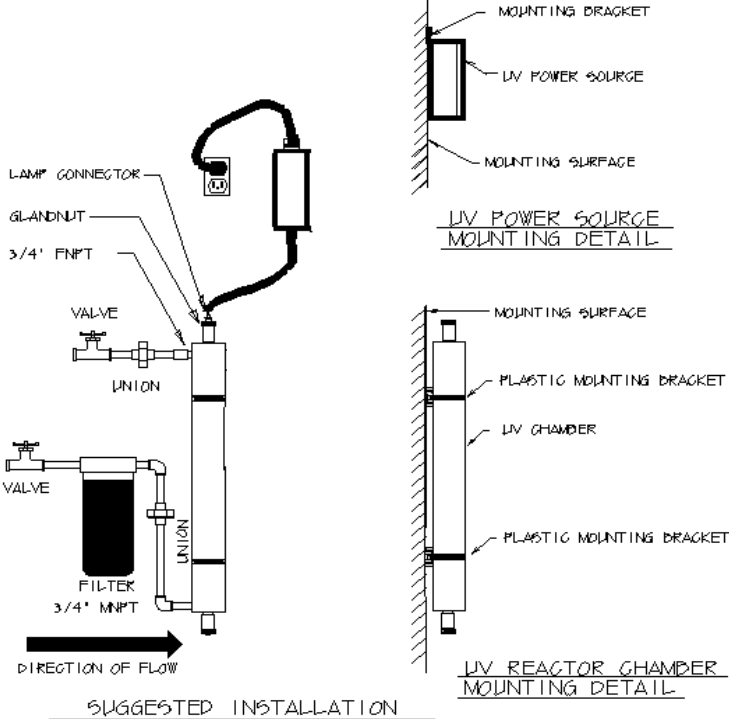
Caution: Before any cleaning or maintenance, always unplug the unit.

Caution: Protect your unit from freezing. Drain all water from the unit if freezing temperatures exist.



INSTALLATION CAUTIONS

- 1 Connect your UV unit to a grounded (3 pronged) receptacle (120V, 60HZ) (**a GFI is highly recommended**) and ensure that the lamp connector ground wire is connected to the ground stud on the top of the reactor vessel. Note: Power source for applications outside of North America must match requirements of the unit (eg. 240V, 50Hz).
- 2 UV Dynamics disinfection devices are designed to be installed on the cold water line only.
- 3 Vertical orientation of the disinfection chamber with the lamp connector pointing upwards is the preferred mounting configuration—the water source should only be connected to the inlet port on the bottom of the unit. **CAUTION:** When installing the unit horizontally be sure to have the inlet and outlet connections pointing up to insure that air can be completely purged from the disinfection chamber.
- 4 Install your UV Dynamics disinfection system indoors in a protected area where the temperature does not fall below 4°C. (40°F) and the humidity level is low (to prevent condensation on the chamber). This unit functions ideally in a temperature range from 9°C - 29°C. (49 – 85F)
- 5 Use teflon tape on all pipe connections. **DO NOT USE ANY OTHER SEALANT.**



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Installation Procedure

The UV disinfection system should be the last step of your water treatment system. Choose a location for installation with a close electrical outlet. Note the direction of water flow in the supply line. Refer to the plumbing diagram and check that you have all necessary fittings for installation. **Note:** A minimum of 23" clearance at lamp cord end of the chamber will allow most maintenance procedures to be accomplished without removing the disinfection chamber from its mounting bracket.

- 1 Shut off the main water supply valve.
- 2 Mount the unit to the wall using the mounting brackets provided. Mount ballast beside the chamber.
- 3 Install new plumbing as per diagram. **Note:** When installing the 5-micron pre-filter, make sure the flow arrows on them point in the same direction as the water flow. **WARNING: if soldering, do not allow heat near plastic threads or fittings.**
- 4 Place the thinner "O" ring into the groove of the gland nut holder, and the thicker "O" ring on the open end of the quartz sleeve. Then push the quartz sleeve into the gland nut until the sleeve touches the top.
- 5 Place the quartz sleeve into the opening at the top of the UV chamber and screw it into place.
- 6 Place the lamp spring and the lamp into the quartz sleeve, and holding the top of the lamp, attach lamp to the lamp connector. Push down the lamp connector snugly into the gland nut.
- 7 Remove the nut from the ground stud at the top of the unit. Next place the ground wire (green wire with yellow stripe) over the stud and re-install nut and tighten. **FAILURE TO GROUND CHAMBER MAY RESULT IN ERRATIC UV SENSOR BEHAVIOUR**
- 8 Install UV detector probe. The probe must be tightened down completely to insure accurate calibration. The UV detector probe should be hand tightened only. Connect UV detector probe plug into port labeled UV sensor on the UV power source. **Caution – Do not over tighten.**
- 9 Open valves on either side of the disinfection chamber. Check for leaks. Open supply valve slowly and bleed air from system.
- 10 Connect UV power source to AC line. UV power source audio alarm will sound three times before igniting the lamp.

Your UV Dynamics disinfection system is now ready for service. Before service begins, all household plumbing lines should be chemically disinfected.



DISINFECTION PROCEDURE

THE FOLLOWING DISINFECTION PROCEDURE IS GENERALLY ACCEPTED AS BEING SUITABLE FOR THE DISINFECTION OF PLUMBING SYSTEMS KNOWN TO BE CONTAMINATED.

IF YOU ARE UNCERTAIN ABOUT THE EFFICACY OF THIS PROCEDURE YOU ARE ADVISED TO CONTACT THE LOCAL HEALTH AUTHORITY RESPONSIBLE FOR WATER SAFETY.

As the UV disinfection process takes place only in the UV disinfection chamber and the process provides no residual disinfection capability, **therefore it is necessary to chemically disinfect the entire plumbing system before using water treated by the UV system.**

- 1 The disinfection of the plumbing system is most readily accomplished by removing the 5 micron sediment filter cartridge and adding 250ml - 500ml (1 –2 cups) of standard 5.25% concentration un-scented chlorine bleach to the empty filter housing and re-installing.
- 2 Verify that the UV disinfection unit is connected to the AC supply voltage and operating properly.
- 3 Operate **all faucets, fixtures and appliances** until you clearly smell chlorine and shut off. *This includes showerheads, outside taps, dishwashers, laundry equipment and any appliance connected to the plumbing system.*
- 4 Leave the bleach solution for 30 minutes.
- 5 Re-install the sediment filter cartridge and thoroughly flush the system at all fixtures and appliances connected to the system.

Note: The introduction of a chlorine disinfection solution to a hot water heater that has been used with untreated hard water or water with excessive iron, manganese or other organic contaminants may lead to oxidization of these materials. If you feel that these conditions may apply to your installation, a thorough flushing of the hot water tank should be undertaken to eliminate the oxidized material from the system.

UV POWER SOURCE FEATURES

The microprocessor controlled UV power source supplied with the UVD400S has both audio and visual alarm indicators to indicate the lamp operation and an integral annual lamp change reminder timer.

UV power source initialization sequence: When AC power is applied to the UV power source, the lamp is ignited as indicated by the green lamp-on LED after which a self test of the annual lamp change reminder timer LED and alarm buzzer consisting of, three buzzer beeps and three red timer LED flashes. If a solenoid is connected to the UV power source it will activate when the UV level exceeds 50%. This may take several minutes dependent on water temperature, UV transmission of the water and age of the lamp

Normal Operation: During normal operation only the green lamp-on LED is illuminated.

Lamp failure: When The UV power source detects a lamp failure or enters the auto shut down mode due to abnormal operating conditions, the alarm buzzer sounds and the green lamp-on LED is extinguished. If connected, the solenoid valve will terminate the water flow.

Lamp timer operation: The annual lamp change reminder timer will run for approximately one full year. At the end of the one-year period the lamp change reminder timer will flash and the buzzer will sound. The flashing led indicates that the timer function is in the 28-day grace period. Pushing the timer button during this grace period will silence the buzzer for a seven-day period but the LED will continue to flash. The buzzer reset can be activated a maximum of four times during the 28 day grace period. Under no circumstance does the grace period exceed 28 days. At the expiry of the 28-day grace period the UV power source indicates the lamp change alarm mode by illuminating the red timer LED continuously and sounding the buzzer. **Note:** *The UV lamp is not shut down in this alarm mode and the solenoid valve drive is not disabled.*

Time remaining: When the lamp change reminder timer is not in the grace period or lamp change alarm mode, the number of months of lamp life remaining can be determined by pressing the timer push button and counting the number of red timer LED flashes.

Note: The UV power source is designed to shut down if the AC input voltage is outside of operating limits. When a lamp failure alarm is active the unit should be unplugged from the AC power source, wait for fifteen seconds and then reconnect to the AC power source. If the failure was due to out of limit AC power, the unit will re-ignite the lamp and operate normally.

Low UV Intensity: If the output of the UV detection system falls below 50%, a low UV alarm will be initiated. If a solenoid valve is installed it will be deactivated to stop the flow of water. Displays error code **E1**

Solenoid Override: The UV power source has a solenoid override feature to enable emergency water flow when the system has entered a low UV alarm state. The override is active for six minutes but can be reset indefinitely. The solenoid override feature will not function if the lamp has failed. Displays error code **E4**



CAUTION: The water treated by the unit will not be properly disinfected when the solenoid override is in operation.

Solenoid Valve Output: The UV power source is capable of directly powering a solenoid valve, which will shut off water flow during lamp failure alarm conditions.

UV Sensor Error: If the UV sensor is not connected to the UV power source or if the sensor is malfunctioning, the sensor error code **E3** will be displayed. Verify that the sensor plug is fully inserted into the UV power source before replacing the UV Detector.

I.R. Data Output: The UV power source is equipped with an IR (infrared) data output. This output can be utilized with the UVDynamics remote IR alarm to provide system status indication at the point of water use.

UV power source ERROR codes

- E1 – Low UV Intensity
- E3 – Sensor Error
- E4 – Solenoid Override Active
- E5 – Change Lamp

Operating and Maintenance

Your UV system is on continuously during normal use.

After periods of not using your water supply exceeding 2-3 days, it is recommended to open all faucets and flush your plumbing lines for a minute or two.

Caution: Protect your unit from freezing. Drain all water from the unit if freezing temperatures exist.

Ultraviolet lamp replacement-The ultraviolet lamp located inside the chamber will operate effectively, round the clock, for approximately one year or 9000 hours. The lamp will light longer than that. However, the UV light penetration may fall below the prescribed safety level. Therefore, annual lamp replacement is necessary regardless of apparent condition.

Replacing the UV lamp and cleaning the quartz sleeve



THE QUARTZ SLEEVE SHOULD BE REPLACED EVERY THREE YEARS

Note: Do not touch the lamp or the quartz sleeve with your fingers. Handle by ends only or wear soft gloves.

- 1 Unplug the system from the electrical outlet and turn off all water supplies to the unit.
- 2 Carefully extract the lamp connector from the sleeve gland nut assembly to just expose the top of the lamp. While holding the lamp base firmly, remove the lamp power connector. **Caution:** lamp base can be very hot – be careful not to drop lamp into quartz sleeve as it easily broken.
- 3 Carefully slide the UV lamp out of the quartz sleeve and discard.

4 Remove the quartz sleeve by loosening the gland nuts and carefully extracting from unit. **Caution:** The quartz sleeve is fragile and is easily chipped or broken – use care when removing or installing.

5 Clean the quartz sleeve with a vinegar solution or a readily available scale removal product (*Limeaway, CLR etc.*)

6 Re-install the quartz sleeve – replace “O” rings if they appear damaged.

7 Install new lamp by reversing procedure described in step 2 above.

8 Slowly open water supply valve and purge air from system – verify that there are no leaks before reconnecting to AC power.

RESETTING THE LAMP CHANGE TIMER

1 The lamp change reminder timer is reset by disconnecting the UV power source from the AC supply, waiting for fifteen seconds and reconnecting to the AC supply with the timer button depressed. The UV power source will emit a solid three-second beep indicating that the reset was successful.

It is not possible to reset the lamp change timer unless the timer is in the grace or lamp change alarm mode. If you need to reset the lamp change reminder timer prior to the full one-year time period expiring due to premature lamp failure, there are special instructions included with all replacement lamps describing the necessary procedure.

Product Specification	UVD400/S
Rated Flow Rate	10gpm (38lpm) (2.3m ³ /hr)
Dynamic Flow Regulator	optional
Isolated Solenoid Drive	yes
AC Supply Voltage	120V 47-63Hz .7A (240V 47-63Hz .35A)
Annual Lamp Change Timer	yes
Lamp Change Grace Period	28 days maximum
Grace Period Audio Alarm Disable	yes (7day increments)
Reactor Chamber Material	304 SS
Maximum Operating Pressure	100psi
Maximum Ambient Temperature	50C (122F)
Water Temperature Range	4 – 37C (40 – 99F)
Lamp Service Life	9000hrs
Chamber Dimensions (L x D)	23" x 3.5"
Controller Dimensions (L x D x W)	7" x 1.7" x 2.3"
Shipping Weight	15lbs
Inlet/Outlet Port Size	¾" MNPT

REPLACEMENT PARTS

UV Lamp 400128
Quartz Sleeve 400129
"O" Ring Set 400202
UV Power Source 400206
UV sensor Probe 400195

Warranty

UV Dynamics water disinfection systems are supported with a 'free from defects' **Workmanship and Material** warranty as follows:

- A ten year pro-rated warranty on the stainless steel disinfection chamber
- A three year warranty on the UV power source
- A one year warranty on UV lamps, sleeves, and sensor
- Warranty commences from date of purchase. Proof of purchase required

UV Dynamics will repair or replace, at its option, any defective parts covered by the warranty. Shipping and handling are not included in this warranty. They will be collected from you by your Dealer. Replacement parts provided under warranty will be sent to your UV Dynamics dealer.

Parts repaired or replaced under the pro-rated warranty will be covered under warranty to the end of the original warranty period. This warranty is also subject to the conditions and limitations outlined under the heading "General Conditions and Limitations" below.

Warranty for Replacement Lamps and Parts

UV Dynamics warrants replacement lamps, purchased for annual routine maintenance and other parts purchased to repair product components that are no longer covered by the original warranty, to be free from defects in material and workmanship for a period of three (3) months from the date of purchase. During this time, UV Dynamics will repair, or replace at its option, a defective replacement lamp or part free of charge except for shipping and handling charges. The warranty period on replacement lamps and parts will be verified using date codes and/or purchase receipts. Your UV Dynamics Dealer will advise you on whether the defective item needs to be returned to UV Dynamics for failure analysis.

General Conditions and Limitations

None of the above warranties cover damage caused by improper use or maintenance, accidents, acts of God or minor scratches or imperfections that do not materially impair the operation of the product. The warranties also do not cover products that are not installed as outlined in the applicable Owner's manual.

These limited warranties outline the exclusive remedy for all claims based on a failure or defect in any of these products. They are in lieu of all other warranties whether written, oral or implied or statutory.

Under no circumstance shall UV Dynamics have any liability for liquidated damages for collateral, consequential or special damages or for loss of profits, or for actual losses or for loss of production or progress of construction, regardless of the cause of such damages or losses. In any event, UV Dynamics aggregate total liability shall not exceed the specific product purchase price. The purchaser agrees to indemnify and hold harmless UV Dynamics from all claims by third parties in excess of these limitations.

UV Dynamics does not assume any liability for personal injury or property damage caused by the use or misuse of any of its products. UV Dynamics shall not in any event be liable for special, incidental, indirect or consequential damages. UV Dynamics liability shall, in all instances, be limited to replacement of the defective product or part and this liability will terminate upon expiration of the applicable warranty period.