Owner's Manual

Ultraviolet Disinfection Water System

Models

YEW-UV-22LPM

YEW-UV-45LPM

YEW-UV-75LPM

www.yewtech.ie

RoHS CE

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Marking

Be careful of the risk of severe or fatal electrical shock since water is present near this electrical system. Always disconnect power before performing any maintenance.

Systems must be grounded.

Avoid exposure to direct or strongly reflected germicidal ultraviolet rays. Germicidal ultraviolet rays are harmful to the eyes and skin. If necessary, please wear safety goggles to protect your eyes.

Please do not touch the UV lamp directly in case of burning. A pair of gloves would be better when taking off it.

All electrics to be carried out to Safe Electric standards.

This manual generally describes the installation, operation and maintenance of UV sterilizer system. **IN ORDER TO KEEP YOU AND THE EQUIPMENT SAFE, READ ALL INSTRUCTIONS CAREFULLY BEFORE BEGINNING INSTALLATION OR OPERATION.**

Product Application

UV water systems are a popular, highly effective, and easy to use way to protect your water from living organisms. It is trusted by thousands of people worldwide and widely used in homes, offices, and in many commercial and industrial applications. Comparing with other water disinfection systems, it is faster and healthier.

What is UV light and How It Works

UV light is comprised of electromagnetic radiation of wavelengths ranging from 100 to 400 nanometers (nm). The UV spectrum is divided into four regions, which are designated Vacuum UV, UV-A, UV-B, and UV-C. **UV-C** or short-wave ultraviolet occurs between 200-280nm and the optimum UV germicidal action at 265nm. It has strong disinfection ability, can physically kill microorganisms by altering or disrupting their DNA or RNA, effectively and chemical free.

CAUTION: UV light is not visible to the human eye, and harmful to eyes and skin.

Ultraviolet Disinfection Water System use Ultraviolet Lamp (UV Lamp) which can high effectively emit a germicidal UV-C ray (253.7nm) to disinfect water by killing bacteria, viruses, molds and algae etc. By properly implementing an Ultraviolet Disinfection Water System in-line, these organisms can be eradicated fast without any harmful residuals.

Product Advantages

• Effectively: Application of UV light triggers a reaction almost instantly; more effective than chlorination and other water disinfection systems on a wide range of pathogens
• Safe and chemical-free: UV light does not result in the creation of harmful disinfection by-products; UV does not alter water chemistry and its constituents, such as PH, taste, odor, color, etc.
• Low Cost: Capital cost is low and operating cost is low compared to alternative disinfection methods
• Simple to install and operate: no moving parts to wear out; installation flexibility

Water Quality Guidelines

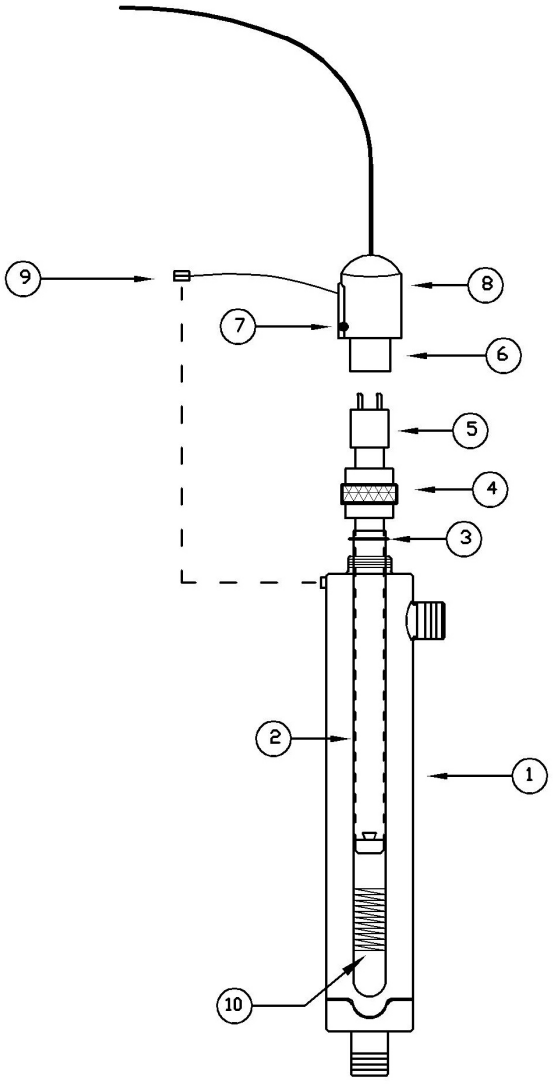
The UV water disinfection system is intended for the use with visually clear water, not colored, cloudy or turbid.

- Ambient Water Temperature: 2-45℃
- Iron: <0.3ppm (0.3mg/l)
- Hardness: <7gpg (120mg/l)
- Turbidity: <1NTU
- Manganese: 0.05ppm (0.05mg/l)
- UV Transmittance: >75%

Product Specification

Ultraviolet Disinfection Water Systems come in a variety of sizes and can be used to purify the water for a single faucet or for an entire home or larger building.

This simple, safe equipment is suitable for both small flow residential applications as well as large flow commercial projects.



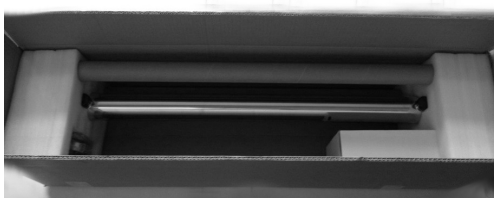
① Reactor Chamber (304SS)
② Quartz Tube
③ O-ring
④ Open End Nut
⑤ UV Lamp
⑥ 4-pin Electrical Socket
⑦ Screw Hole
⑧ Cover Cap
⑨ Earth Lead
⑩ Spring

System Installation

NOTE: All units are quality tested from the factory. All units are rated up to 12bar. Mount your Ultraviolet Sterilizer horizontally or vertically on a level and firm surface. Do not lay the system on the ground or where water may puddle. Do not submerge. Install sterilizer equipment in a readily accessible and well-lit location to facilitate inspection and maintenance. On all units allow space to change the UV Lamp and Quartz Sleeve (typically leave a maintenance space equal to the overall UV system length) and other parts.

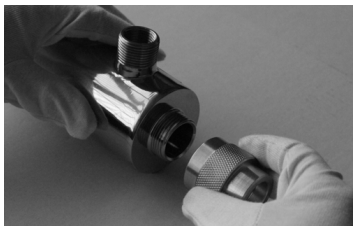
Installation Instructions

Step 1: Open package to check all components inside: Reactor Chamber, UV Lamp, Quartz Tube, O-ring, Electronic Ballast and Support.

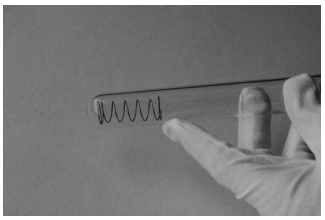


Step 2: Make sure the Quartz Tube and UV Lamp are clean before installation (clean with alcohol or mild detergent). Wear soft non-abrasive gloves to keep any finger marks away from them.

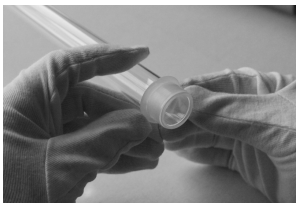
Step 3: Remove End Nut from Reactor Chamber.



Step 4: Input spring into the Quartz Tube.



Step 5: Install O-ring onto the open end of Quartz Tube.

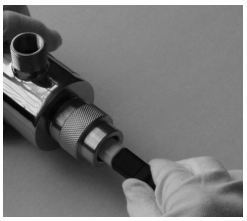


Step 6: Insert the Quartz Tube into the Reactor Chamber.

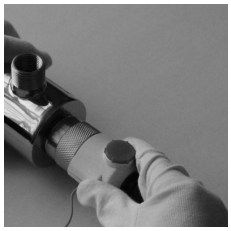
Step 7: Hand-screw End Nut on the Reactor Chamber. To protect the O-ring, do not over tighten.

Step 8: Connect 4-pin Electrical Socket with UV Lamp pins tightly.

Step 9: Carefully insert the UV Lamp into the Quartz Tube through End Nut.



Step 10: Install the Cover Cap onto End Nut.



Step 11: Install the earth lead tightly.

Step 12: Tighten the screw.

Step 13: Select a readily accessible and well-lit location to fix the system. The system should always be located closest to the point of use and can either be installed horizontally or vertically.

Step 14: When all plumbing connections are finished, slowly turn on the water supply and check for leaks.

Step 15: Allow the water to run for a few minutes to clear any air or dust that may be in the Reactor Chamber.

Step 16: Connect the power for starting up.

System Operation

1. Recheck the installation before plugging the sterilizer into power.
2. Ultraviolet Disinfection Water Systems are designed for continuous operation and frequent switching will reduce Ultraviolet radiation and service life. Do not electrically cycle the UV unit more than THREE on/off cycles in a 24-hour period.
3. If this unit falls into the water, turn main power off and then retrieve it. Do not attempt to use this sterilizer if it has been submerged.
4. Do not operate this unit if it has a damaged cord or plug, if it is malfunctioning or if it has been dropped or been damaged in any manner.
5. The UV system should be installed after the filter on the return line. This helps ensure that the water is clear of debris and impurities that could inhibit the disinfection process. The UV can be installed before the filter, however, it will take longer to work. Meanwhile, you increase the risk of breakage to the Quartz Sleeve and Lamp.
6. Prevent eye injury: Never look directly at the light tube while device is in operation. Do not remove the UV Lamp from the chamber when applying electrical power. Wear SAFETY GOGGLES if you need to look necessary.
7. If water demand can possibly exceed the rated flow, install a flow restrictor (available separately) on the inlet side of the device.
8. If water pressure is above 15bar, add a PRESSURE REGULATING VALVE on the inlet side of the equipment to protect the Quartz Sleeve.
9. Always disconnect the water supply and completely drain the water purifier if it will be subjected to temperatures below freezing for extended periods of time.

Plumbing System Disinfection Procedure

UV disinfection is a physical disinfection process and does not add any potentially harmful chemicals to the water. As UV does not provide a disinfection residual, it is imperative that the entire distribution system located after the UV be chemically disinfected to ensure that the water is free from any bacteriological contaminants. The disinfection process must be performed immediately after the UV unit is installed and repeated thereafter whenever the UV is shut down for service, without power, or inoperative for any reason. The procedure for sanitizing the plumbing system is readily accomplished as follows:

1. Shut off the upstream water supply that feeds water into the reactor chamber and depressurize water system.
2. Remove the pre-filter cartridge and add 250-500ml(1-2 cups) of household (5.25%) bleach (chlorine) into the empty filter housing and re-attaching– Do NOT use hydrogen peroxide.
3. Verify that the UV System is connected to the AC power voltage and operating properly.
4. Open all faucets, fixtures and appliances and allow cold water to run until you smell chlorine. Shut the faucet off and leave the solution sit for a period of 30-60 minutes. You must ensure that all taps, including outside faucets, dishwashers, shower heads, washing machines, toilets, hot water heater, etc., and any device or appliance attached to the plumbing system pass chlorinated water.
5. Open the upstream water supply and reinstall the filter cartridge into the filter and then flush the chlorine solution from the system until no chlorine smell is detectable.

Note: The consumption of system water during this process is not advised due to the extremely high concentrations of chlorine. It is important to remember that in the event that a UV is briefly shut down for routine cleaning or during power interruptions where water could have passed through the system, the aforementioned procedure must also be followed.

System Maintenance

General Maintenance

1. Testing monthly or before each use.
2. Lamp replacement is recommended every 9000 hours of operation. After 9000 hours, the lamp may still light, but the UV intensity has diminished.
3. Cleaning of the quartz sleeve once every 3-6 months with alcohol or a mild detergent.

Lamp Replacement

CAUTION: DO not touch the Lamp with your fingers. Handle by the ends only or wear soft non-abrasive gloves to prevent any finger marks.

1. No need to shut off water supply to UV system.
2. Disconnect main power source and allow the unit to power down for 30 seconds.
3. Remove the cover cap.
4. Withdraw wire with lamp carefully until approximately 2 inches of the lamp is exposed. Lamp case can be very hot-be carefully and do not drop the Lamp into the Quartz Sleeve as both are easily broken.
5. Remove the 2-pin electrical socket from the lamp pins and keep a firm hold of the UV lamp.
6. Withdraw Lamp from Quartz Sleeve carefully. Be sure to withdraw lamp straight out without angling until completely clear of Quartz Sleeve.
7. Follow up Lamp installation steps (step 7 to step 11) to reinstall new lamp.

NOTE: RESET LAMP LIFE TIMER AFTER LAMP REPLACEMENT (PG 10)

Quartz Sleeve Replacement

1. Turn off power.
2. Shut off water supply to UV system via inlet and outlet valves.
3. Drain chamber by removing drain plug. Once the chamber is completely drained, remove any old Teflon tape from the threads of the drain plug, rewrap with Teflon tape, reinstall and tighten the drain plug.
4. Follow lamp replacement steps to remove UV lamp.
5. Twist off nuts from reactor chamber.
6. Remove O-ring
7. Rotate quartz sleeve and withdraw it from chamber carefully.
8. Once the quartz sleeve is removed, clean with alcohol or a mild, non-abrasive detergent. Stubborn stains usually can be removed with a dilute hydrochloric acid.
9. In cases where the quartz sleeve is broken, please follow next steps before reinstallation.

a. Remove the input/output water pipe connector and withdraw the reactor chamber

b. Carefully remove as much of the broken quartz sleeve as possible from both ends of the chamber.

c. To remove fragments of quartz sleeve, hold the system vertically and shake. The quartz fragments will break and drop out from threaded fitting of the chamber. Flush water through chamber, being careful to remove all quartz fragments from the interior of the chamber.

d. Carefully discard all pieces of the broken quartz sleeve.

10. Follow installation steps (step 4 to step 6) to reinstall Quartz Sleeve into the chamber.
11. Follow lamp installation steps to reinstall new lamp.
12. Slowly restore water supply to UV system and check for leaks.
13. Turn power back on.

UV FAQs

In order to maintain the UV unit in optimum operation condition, if specific problems are detected during the routine inspection, refer to applicable maintenance instructions for recommended repair procedure.

FAQs	Possible Causes	Solutions
Pressure drop	Pre-filter clogged	Replace filter cartridges
High bacteria counts	Quartz Sleeve is stained or dirty	Clean the Quartz Sleeve
	Feed water quality changed	Have raw water tested to ensure that water quality is still within bounds
	Contamination in water after UV system	It is imperative that effluent water stream be shocked with chlorine(bleach) before water leaves UV system-disinfection system must have a bacterial free distribution system to work effectively
	Possible break-through of sediment through pre-filter	Have source water test for turbidity-use cartridges with higher filtration precision
Heated product water	Common problem caused by infrequent use of water	Run water until it returns to ambient temperature
Water appears milky	Caused by air in the water lines	Run water till air is purged
Unit leaking at end caps	Problem with O-ring	Ensure o-ring is in place; clean them then re-install; replace them if necessary. Do not use a pipe wrench, pliers or any other tool. Hand-tighten only. Do not use any lubricant.
Unit leaking at inlet or outlet opening	Inadequate inlet/outlet ports connections	Check thread connections, reseal with Teflon tape and re-tighten
Moisture inside the Quartz Sleeve	Quartz Sleeve is broken or cracked	Visually inspect the Quartz Sleeve. If broken or cracked, replace
System shutting down intermittently	Interrupted power supply	Ensure system has installed on its own circuit, as other equipment may be drawing power away from UV (ie. pump or fridge)
		UV system should not be installed on a circuit which is incorporated into a light switch
Lamp failure alarm on--new lamp	Loose connection between lamp base and socket	Reconnect the lamp with a tight fit
	Moisture build up in connector may keep lamp and socket from making a solid connection	Eliminate chance of any moisture getting to the socket and/or lamp pins

UV Parts

Philips UV Lamp

Philips is the largest manufacturer of standard low pressure mercury lamps. These Philips TUV lamps consist of a tubular glass envelope emitting short-wave ultraviolet radiation with a peak at 254 nm (UVC) for germicidal action. The Philips in-house made glass filters out the 185 nm ozone forming line thus preventing the creation of ozone. A protective coating on the inside limits the depreciation of the useful UVC output. This allows application manufacturers to design their systems to the highest efficiency. Philips invented and pioneered the use of technology to reduce the mercury level of the lamps. As a result this has been brought down to by far the lowest mercury level in UV lamps in the industry.

Quartz Sleeve

Quartz sleeve is a special industrial technology glass made by SiO2, has good physical and chemical properties. It can stop the spectrum transmission less than 220 nm and prevent radiation of high-density UV rays but generate no ozone. UV transmission at 254nm is more than 95%, which can sterilize effectively.

It is:

High temperature resistant

Good corrosion resistant

Low thermal expansion coefficient

Good electric insulation performance

Long time to use

High purity, Silicon Dioxide>99.99%

Transmittance of visible light>95%

UV Electronic Ballast

1. All are normally working:

i. Green lamp is on;

ii. Default screen display: lamp life, degressive counting (0365~0 days);

iii. Ballast operation time: incremental counting (0~9999 days), press switch button less than 2 seconds to show; press switch button again or after 10 seconds, then screen will return default display

2. When Lamp life is approaching the end:

i. At “0” day, screen will display “A3”

ii. Alarm: red lamp is discontinuously on while buzzer sound for 1 second and stop sounding for 5 seconds continuously.

iii. Alarm cancel: if lamp is not replaced, there are still four times which the sounds are canceled. Shortly press button for 5 seconds, buzzer’s sounding will be stopped, lamp life will be reset to 7 days, but displaying “A3” will go on, continuously working, and red indicating lamp is still discontinuously lightening; as lamp life turns to 0 again, red lamp is discontinuously on, buzzer is discontinuously sounding again. In this way these steps can repeated till 4th time, when it is the 4th time, as lamp life turns to 0, buzzer sound alarming cannot be canceled, buzzer keeps sounding all the time, Unless lamp life resetting operation.

3. When Lamp fails

i.the time of lamp life will stop counting, while ballast life counting continues.

ii. Alarm: the red light will be flashing while buzzer sounds for 1 second and stops sounding for 1 second.

4. Replace the lamp and reset the time.
i. Disconnect power supply.
ii. Remove expired (or failed) lamp then install new lamp.
iii. Press and hold on the switch button for 10 second until the screen displays “reset”, after 2 seconds, the screen will read “365” and there will be an audible tone, then release the switch button.

5. When equipment fails
i. Ballast fails: blank screen

Disinfection Times

Species	Name	100%kill(s)	Name	100%kill(s)
Bacteria	Anthraces	0.30	Tuberculosis	0.41
	Diphtheria	0.25	Vibrio Cholera	0.64
	Clostridium Botulism	0.80	Pseudo monas Bacteria	0.37
	Tetanus	0.33	Salmonella	0.51
	Dysentery Bacillus	0.15	Fever Bacteria	0.41
	Colibacillus	0.36	Bacillus Typhi murium	0.53
	Hook-side Pylon Bacillus	0.20	Shigella	0.28
	Legion Ella	0.20	Staphyloccus	1.23
	Micro co	0.4-1.53	Streptococcus	0.45
Virus	Adenovirus	0.10	Influenza Virus	0.23
	Phagocyte Cell Virus	0.20	Polio Virus	0.80
	Coxsackie Virus	0.08	Rota Virus	0.52
	ECHO Virus	0.73	Tobacco Mosaic Virus	16
	ECHO Virus 1	0.75	Hepatitis B Virus	0.73
Mold Spores	Aspergillums Niger	6.67	Soft Spores	0.33
	Aspergillums	0.73-8.80	Penicillium	0.87-2.93
	Dung Fungi	8.0	Penicillium Chrysogenum	2.00-3.33
	Mucor	0.23-4.67	Other Fungi Penicillium	0.87
Water Algae	Blue-green algae	10-40	Paramecium	7.30
	Chlorella	0.93	Green Algae	1.22
Fish Disease	Line Ovum	3.40	Protozoan	4-6.70
	Fung 1 Disease	1.60	Infectious Pancreatic Necrosis	4.00
	Leukodermia	2.67	Hemorrhagic	1.60

Typical Installation

Warranty for one year.

For more information visit our website: www.yewtech.ie

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Distribution of the following products:

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