

WTA Series Ultraviolet Water Disinfection System

Installation, Operation and Maintenance Manual



Models WTA-4, WTA-7, WTA-10 & WTA-15

KEEP THIS MANUAL ON HAND

IMPORTANT: Anyone responsible for the installation, maintenance or operation of this equipment must have a thorough understanding of the instructions and safety requirements before attempting to install this system.

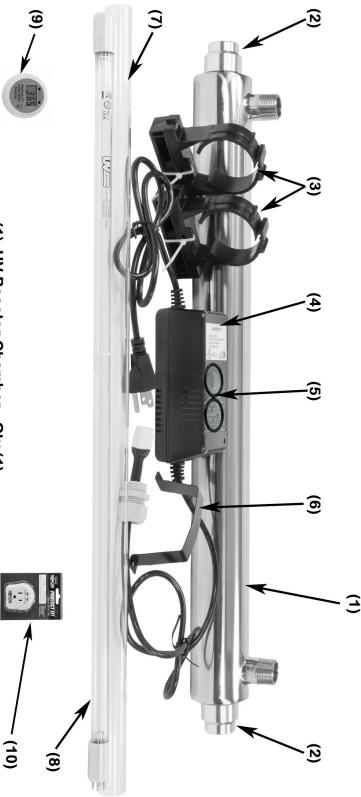
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What's in the Box

Before installing your UV unit, take a moment to make sure all parts are included in the box



- UV Reactor Chamber Qty (1)
 Compression Nuts Qty (2)
 Chamber Mounting Clips Qty (2)
 Ballast with Power Cord and Lamp Harness Qty (1)
- 5 O-Rings - Qty (2)
- 6
- Ballast Mounting Clip Qty (1) Quartz Sleeve Qty (1)
- E
- (8) UV Lamp Qty (1)
- (9) 365 Day Countdown Timer- Qty (1)
- (10) Surge Surpressor Qty (1)

SAFETY INSTRUCTIONS

In order to protect end users and operators from injury, safety precautions must be followed. This Installation, Operation and Maintenance Manual (IOM) outlines important safety issues. The following **WARNING SYMBOLS** will be found throughout the manual to alert the end users to take important precautions:



EYE PROTECTION

This symbol indicates that eye protection must be worn to protect from UV light as well as debris.



HAND PROTECTION

This symbol signifies that hand protection must be worn to protect the lamps from skin oils as well as protect the operator from UV light and sharp materials caused by a broken lamp/ quartz.



ELECTRIC SHOCK WARNING

This symbol signifies electrical shock possibility. Failure to observe this warning may lead to serious injury or death.



CAUTION

This symbol indicates a potentially dangerous situation. Failure to adhere to this warning may lead to serious injury and/or death.



INFORMATION

This symbol signifies helpful information.

I) Information



Please read this manual prior to installing, starting up and operating the equipment. The equipment uses the latest in UV technology, and has been designed to make operation and maintenance easy.

Your UV system needs to be maintained and does require annual replacement parts. We recommend that key spare and replacement parts be kept on hand. For best operation, correct replacement parts are recommended. Incorrect replacement parts could result in damage to the system and void the warranty.

2) About Ultraviolet (UV) Disinfection

The technology uses UV light to target and disable disease-causing microorganisms pathogens).

Over 100 years ago, scientists discovered that if you exposed pathogens to UV light, their reproduction was limited. The UV light source they used resided in the UVC range of the light spectrum. Specifically, they discovered that light in the 254 nanometer (NM) range was the most effective wavelength for this process.

When many pathogens are exposed to UV light, their cells become damaged and this damage inhibits reproduction. The UV light, produced by a special UV lamp, damages the cell's DNA and RNA and once damaged, they are unable to replicate. This physical process renders them harmless. The amount of damage is a result of the intensity of the UVC output multiplied by the time the pathogens are exposed to the light. The applied dosage is commonly referred to as microwatts or millijoules and is often expressed as μ Ws/cm² or mJ/cm². Most residential applications require a UV dosage ranging from 16,000 up to 40,000 μ Ws/cm² depending on the desired flow rate.

Why are more consumers selecting UV technology?

- a) UV is considered a green technology
- b) No chemicals are added, so there is no need for chemical removal
- c) No chemical storage
- d) UV works instantly without requiring a residence time
- e) Easy maintenance

What are the limitations of UV technology?

- a) The quality of the liquid entering UV system needs to be monitored.
- b) The UV system needs to be cleaned on a periodic basis based on liquid conditions.

3) Important Safety Precautions

Read and follow all safety precautions to guard against injury. Basic safety precautions must be observed. Keep on hand for future reference.

UV lamps and their quartz sleeves can become razor sharp if broken. Take care when installing and removing lamps and quartz sleeves. Only hand-tighten compression fittings. Do not use wrenches or other tools.

 Ultraviolet light (UVC) is harmful to eyes and skin. Use UV lamps only inside the disinfection chamber with the appropriate protective covering. Avoid exposure to UVC radiation. WTA Series UV System should only be used for its' intended purposes as described in the IOM Manual. The use of attachments not recommended or sold by manufacturer may cause an unsafe condition. WTA Series UV System must be properly installed in accordance with the IOM Manual and in compliance with all applicable local and state regulations before use. Read and observe all important notices on the disinfection system. WTA Series UV System is intended for indoor use only.
 To avoid possible electric shock, take special care when using water with this equipment. Always shut off and disconnect power to the unit before: Making repairs—We strongly recommend that a qualified individual who fully understands the IOM Manual perform service and/or repairs to your system. Cleaning Replacing a UV Lamp Do not operate disinfection system if it has a damaged cord or plug, if it is malfunctioning, or if it is dropped or damaged in any way. The power cord of disinfection system is equipped with a 3-prong grounding plug that mates with a standard 3-prong grounded wall outlet to minimize the possibility of electric shock. Be sure the outlet for the disinfection system is wired and grounded properly. DO NOT under any circumstances cut or remove the third prong from the power cord. Always unplug the disinfection system from outlet when not in use, before putting on or taking off parts, and before cleaning. Never unplug by pulling on the power cord. Always grip plug firmly and pull straight out of the outlet. Shut down system before servicing: Turn off water supply to the WTA Series UV disinfection system Disconnect all power to the WTA Series UV disinfection system Drain water from the system.
 Eye protection must be worn! UV light is extremely harmful to eyes and skin and will cause burns. Do not look directly or indirectly at the UV light. Never operate the UV lamp outside of the UV system. Do not expose your skin for any prolonged time. Use protective clothing and eyewear (make sure it is UV resistant) when servicing equipment. If accidentally exposed to UV light for an extended period, immediately seek medical attention. Symptoms for eye exposure include burning, itching and redness. Symptoms for skin exposure are similar to sun burn.
 Use cotton gloves when handling lamps and quartz sleeves. Skin oils will adhere to the lamps and sleeves and prevent UV light from properly emanating. If the sleeves become dirty, wipe them with a lint free cloth with denatured alcohol.

4) Preparation for Installing UV System

Before you begin, perform the following pre-installation steps:

a) System Inspection

Ensure that your WTA Series system is correctly sized for your desired dosage and flow capacity. (See Table 3 in Technical Specifications.)

b) Water Quality

For optimum performance of your UV system, water quality is extremely important. Proper pretreatment is essential for the UV disinfection system to operate as intended.

UV disinfection dosages are dependent upon the quality and clarity of incoming water. Impurities in water can interfere with UV intensity and cause dosage to fall to unsafe levels. Have your water tested to determine it meets the standards in the below table. If any of the elements exceed the maximum levels shown in the table, contact your water professional for recommendations for proper pretreatment. All WTA Series models are rated for a UV Transmission (UVT) rate of 95% or greater. If your UVT is less than 95%, contact your water professional.

The following table shows levels that are recommended for installation:

Table 1					
Element	Recommended Maximum Levels (1mg/L=1ppm)	Actual Value			
Turbidity	<5 NTU				
Suspended Solids	<5 mg/l				
Color	None				
Iron	0.3 mg/l				
Manganese	0.05 mg/l				
рН	6.5 to 9.5				
Hardness	<120 ppm				

c) Water Supply Pressure Check

Check the pressure of the water supply. The WTA Series UV system is designed for a maximum water pressure of 100 PSI. If your water pressure exceeds 100 PSI, install a pressure reduction valve before installing the UV system.

d) Location Selection

Select a location that meets the following guidelines:

- The unit must be installed between the cold water source and the water heater as inlet temperature must not exceed 100°F. (See Figure 1 for proper installation sequence.)
- The disinfection unit can be installed either horizontally or vertically. (See Figure 1 for water flow direction.)
- The unit must be within 5' of an electrical outlet. A 6' cord is included with the system.
- The power supply contains sensitive electronic components. It is recommended that the unit be plugged into a surge suppressor to help protect electronic components.
- The unit must be protected from freezing. Freezing damage will void the warranty.
- The unit should be placed where a potential leak will not cause water damage. Water Treatment & Accessories is not responsible for water damage.
- Vibration of ultraviolet equipment will damage lamps and lead to premature system failure. Choose a
 location for your WTA system that is isolated from vibration. Potential vibration sources include heavy
 equipment, poorly connected pipes and erratic or improper pumps. A water hammer may cause O-Ring
 failure. If your system is subject to water hammer conditions, we recommend that you install a water
 surge suppressor.
- There must be enough clearance to remove the UV lamp and the quartz sleeve for replacement and regular maintenance.
- Recommended clearance is length of unit plus four inches. (See figures 1 & 4 for additional clearance requirements)

e) Environmental Issues Relating to UV Lamps



UV lamps need to be recycled like fluorescent lamps because they contain mercury. Please follow your local recycling laws. Please visit <u>www.lamprecycle.org</u> for help finding a recycling center in your area. In the event that you are unable to find a disposal location, please contact manufacturer's representative.

5) INSTALLATION INSTRUCTIONS

Your WTA Series UV System can be mounted either horizontally or vertically.



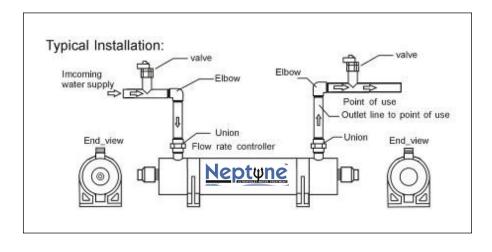
WATCH FOR CLEARANCE! Be sure to allow a minimum clearance of the length of the unit plus 4" from the unit to any obstruction on one end in order to be able to replace the lamp and quartz sleeve.

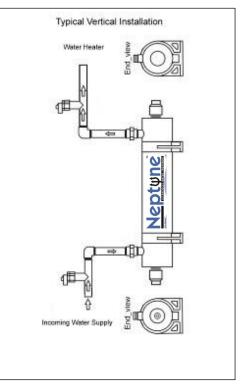


ELECTRICAL SHOCK! Check for hidden electrical wiring before drilling holes.

INSTALLATION ORIENTATION! Water flow must be from the bottom to the top of the unit for a vertical installation. Inlet and outlet must be pointing upward for horizontal installation.

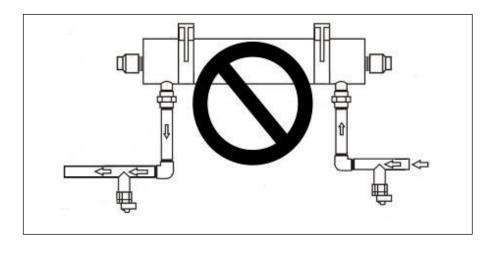
TYPICAL CORRECT INSTALLATION (Figure 1)

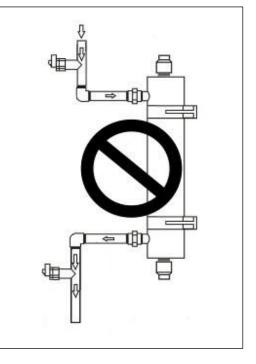




INCORRECT INSTALLATION (Figure 2)

Installing your unit horizontally with the inlet and outlet facing downward or vertically with the unit filling from the top to the bottom can affect disinfection performance.





a) Quartz Sleeve Installation

The quartz sleeve surrounds the lamp and prevents water from contacting the lamp and electrical parts. The sleeve is made of pure fused quartz which allows 99% of the ultraviolet light to pass through.



The quartz must be kept clean and free of organic buildup to ensure optimum ultraviolet transmission. The quartz sleeves need periodic cleaning with the frequency of such cleanings determined by the quality of the water passing through the system. Use cloth gloves to handle quartz sleeves and UV lamps to avoid putting fingerprints on the sleeves and lamps.

After the ultraviolet unit has been secured and the inlet/outlet piping connections have been made, remove gland nuts from each end of the disinfection unit.

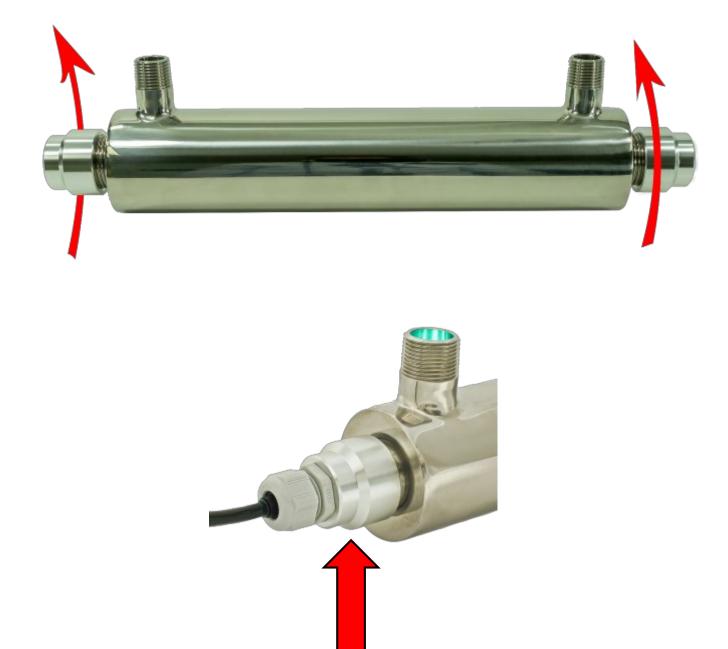
Take great care when removing the quartz sleeve from the packing carton.

Slowly and carefully slide the quartz through the head until it protrudes equally beyond the nipple on each end of the chamber. Place the O-Ring over the end of the quartz and push the O-Ring back until it stops at the nipple.





Be very careful when installing the gland nuts over the quartz sleeve. Tighten each gland nut simultaneously by hand making sure that the sleeve protrudes from each nipple equally. **ONLY TIGHEN BY HAND – NEVER USE PLIERS.** Make sure as you tighten the gland nut that you maintain a clearance between the stop ridge machined in the gland nut and the edge of the quartz sleeve.



Compression Nut

After you have tightened the gland nuts and all other plumbing connections, open the outlet valve. Slowly open the inlet valve and flush out all remaining air. Then, close the outlet valve and open the inlet valve fully. Check the unit for leaks. If you find a leak at the gland nut, tighten the nut further. If the leak continues, drain the unit and inspect the quartz O-Ring and quartz sleeve for possible damage. Once you complete checking the unit, carefully reassemble O-Ring and tighten gland nut. Re-pressurize the unit and check again for leaks.

b) UV Lamp Installation



The UV lamp is very fragile. Do not handle it with bare hands. Use **clean cotton gloves or cloth** when handling lamp to keep it free of dust or fingerprints. If dust or fingerprints get on the lamp, wipe it with a clean cloth and denatured alcohol.



Take care when removing the ultraviolet lamp from the packing carton. Slowly and carefully slide the lamp into the quartz sleeve. Attach the ultraviolet lamp socket and ensure the socket is pushed all the way down to the base of the lamp for proper contact. Then screw the strain relief into the threads of the compression nut.

c) Plumbing System Sanitization Procedure

It is recommended before the initial use of your UV disinfection system and after routine maintenance procedures, to sanitize your water system to ensure that no organisms are present. Water in the well and storage tank should be treated with a strong chlorine solution to destroy disease organisms. All pipelines and fixtures in the distribution system should be rinsed and flushed with

Ordinary household liquid laundry bleach (about 5.25% available chlorine) can be used to sanitize the plumbing system. The quantity required depends on the volume of water to be treated. The United States Environment Protection Agency (EPA) indicated that about 100 parts of chlorine, by weight, mixed in a million parts of water will destroy essentially all water-borne disease organisms.

The amount of chlorine depends upon the diameter and depth of your well. As a general rule of thumb, use 1/2 gallon to treat an 8" diameter/80' deep well and one gallon for anything larger. Pour household bleach into your water system. If you have a filter container, fill it with bleach. If you have no filter then introduce chlorine directly into your well. You may contact your State Extension Service or a water treatment specialist for additional information.

Open hot and cold water taps throughout the house and let the water run until you detect a chlorine odor. To ensure that the hot water heater is also purged, allow the hot water to run until the water becomes cold. Turn off the taps and allow the water to stay in the pipeline for about six hours or overnight but not more than 36 hours to avoid corrosion.

Open hot and cold water taps throughout the house and let the water run until the chlorine odor disappears.

Flush the UV system for 5 minutes prior to start-up.



chlorinated water.

NOTE: Always follow the sanitizing procedures required by applicable state or local laws.



6) <u>OPERATION</u>

Your WTA Series ultraviolet disinfection system will provide years of safe, effective and reliable disinfection with minimal routine maintenance. Establish and implement a routine physical monitoring and maintenance schedule. Monitor the ultraviolet lamp display on the ballast. Immediately replace any failed lamp.

The ballast located midway on the power cord has built-in monitoring functions to indicate lamp operation. The LED will glow green when the lamp is operational and red when the lamp has failed. There is also an audible alarm that will sound when the lamp has failed. It is strongly recommended that a surge suppressor be installed between the power cord and the outlet, or the unit to be plugged into a GFI outlet to protect the sensitive electronics in the ballast.

7) <u>MAINTENANCE</u>

a) UV Lamp Maintenance

Your WTA Series ultraviolet disinfection system will give many years of safe and effective disinfection service with minimal routine maintenance.

Replace your UV lamp on an annual basis

UV lamps lose intensity over the 9000 hours rated life, roughly one year of continuous use. Your UV lamp will still be glowing after the years worth of use, but the glow that you can see is not in the UV spectrum that provides the microorganism reduction the system is designed

for. The Ultraviolet light is not visible to the naked eye, and the system has been sized to provide enough UV intensity to disinfect for up to the 9,000 hours of use. Using lamps longer than this can cause your system to not provide UV intensity high enough for proper dosage for disinfection. Knowing that the UV intensity will fall from the original levels at the end of one year, your UV system is designed to provide rated dosage **at the end of lamp life to provide safe and effective disinfection**.

When a new lamp is installed, it is providing dosage higher than rated at, falling down to rated dosage at the end of one year. This is the reason it is highly recommended for you or your water professional to keep accurate records of when lamps are replaced and replace them annually. For your convenience, a maintenance log has been provided in the back of the IOM Manual.



The UV lamp is very fragile. Do not handle it with bare hands. Use **clean cotton gloves or cloth** when handling lamp to keep it free of dust or fingerprints. If dust or fingerprints get on the lamp, wipe it with a clean cloth and denatured alcohol.

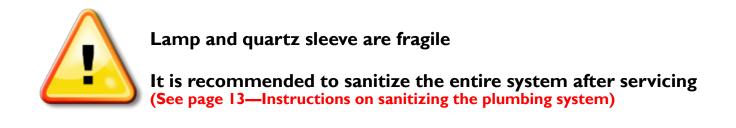
Take care when removing the ultraviolet lamp from the packing carton. Slowly and carefully slide the lamp into the quartz sleeve. Attach the ultraviolet lamp socket and ensure the socket is pushed all the way down to the base of the lamp for proper contact.

b) Quartz Sleeve Cleaning Procedure

Significant film or debris deposits formed on the quartz sleeves will impair the ability of the Ultraviolet rays to penetrate through the quartz and into the water. To a great extent, your frequency of cleaning will depend upon the water quality. The more minerals present in the water, the more frequently the quartz will require cleaning. A periodic visual inspection of the quartz will be necessary to determine the frequency of cleaning. Initial inspection should take place after thirty (30) days of operation. If the quartz is dirty, shorten the cleaning intervals. If the quartz is clean, lengthen the cleaning intervals.

To clean quartz sleeves, depressurize the unit by first turning off the valves on the inlet and then the outlet of the vessel. Turn off the power to the Ultraviolet system. Drain the vessel. Unscrew the strain relief securing the lamp connector from the compression nut and slide the lamp out about 2" from the compression nut. Remove the lamp connector from the lamp and carefully remove the lamp. Unscrew the compression nuts from the nipples. Remove the O-rings and slide the quartz sleeve out of the unit, taking care to not let the quartz bump against any metal parts. The quartz sleeves may be cleaned with warm soapy water and rinsed thoroughly. If this is not sufficient, denatured alcohol may be used.

Assembly is the reverse of removal.

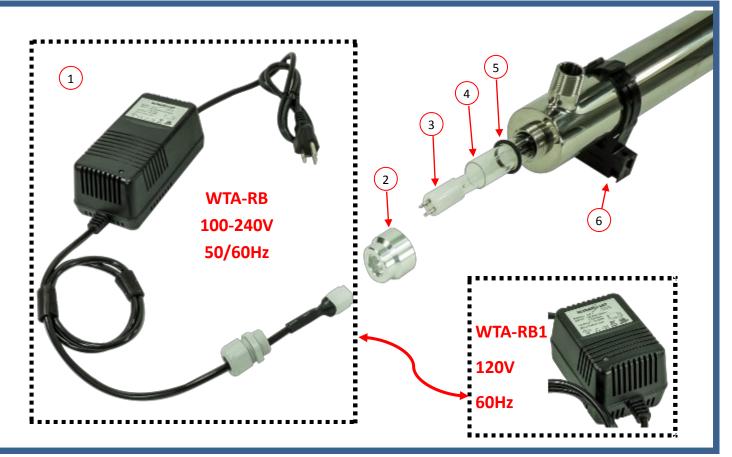


c) Lamp Recycling



UV lamps need to be recycled like fluorescent lamps because they contain mercury. Please follow your local recycling laws. Please visit <u>www.lamprecycle.org</u> for help finding a recycling center in your area. In the event that you are unable to find a disposal location, please contact manufacturer's representative.

WTA Series Replacement Parts List





WARNING:

Ultraviolet rays are harmful to the eyes and skin.

UV system must be unplugged before performing any maintenance.

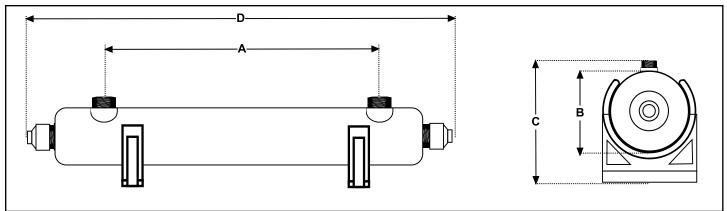
ltem #	Description	WTA-4	WTA-7	WTA-10	WTA-15
1	Power Supply	WTA-RB1	WTA-RB1	WTA-RB	WTA-RB
2	Compression Nut	WTA-CN	WTA-CN	WTA-CN	WTA-CN
3	Lamp	05-0340-1	05-0294-1	05-0343-1	05-0319-1
4	Quartz Sleeve	WTA-Q4	WTA-Q7	WTA-Q10	WTA-Q15
5	O-Ring EPDM	42213	42213	42213	42213
6	Chamber Clip	WTA-CC	WTA-CC	WTA-CC	WTA-CC
	Ballast Clip	WTA-BC	WTA-BC	WTA-BC	WTA-BC
	Count Down Timer	CDT-365	CDT-365	CDT-365	CDT-365
	Surge Protector	TRPL16E	TRPL16E	TRPL16E	TRPL16E

TECHNICAL SPECIFICATIONS

Table 3

Dosage vs Flow Rate – WTA UV Series	<u>WTA-4</u>	<u>WTA-7</u>	<u>WTA-10</u>	<u>WTA-15</u>
Flow rate for UV dosage of 40 mJ/cm ² at end of lamp life (9,000 hours-1 year)*	2 GPM	3.5 GPM	5 GPM	8 GPM
Flow rate for UV dosage of 30 mJ/cm ² at end of lamp life (9,000 hours-1 year)*	2.5 GPM	5 GPM	8 GPM	11 GPM
Flow rate for UV dosage of 16 mJ/cm ² at end of lamp life (9,000 hours-1 year)*	4 GPM	7 GPM	12 GPM	16 GPM
*Flow rate based on 95% UVT for clear fresh water				

(Figure 4)



Model	А	В	С	D	Inlet/Outlet	Operating Voltage
WTA-4	10.23"	2.5″	4.25″	15.15"	1/2" MPT	120V 60Hz
WTA-7	17.32"	2.5″	4.25″	22.00"	3/4" MPT	120V 60Hz
WTA-10	23″	2.5″	4.25″	27.75″	3/4" MPT	100-240V 50/60Hz
WTA-15	31.5″	2.5″	4.3″	36.8″	1" MPT	100-240V 50/60Hz



Be sure to leave unobstructed clearance on one end of the UV unit for removal of lamp and quartz sleeve. Recommended clearance is length of unit (Dimension D) plus 4 inches.

Table 4

Model Characteristics	WTA Series
Effective microbiological protection	•
Stainless steel disinfection chamber	•
High efficiency electronic ballast power supply	•
Lamp operation indicator	•
Audible alarm upon lamp failure	•
Horizontal or vertical mounting	•

Troubleshooting

<u>Situation</u>	Recommended Action			
Unit is leaking	 Check to see that the compression nut is tight. Verify that inlet pressure does not exceed 100 PSI. Make sure the O-Ring is seated properly. Lubricate O-Ring with food grade silicone. Check O-Ring for cracks or tears. Replace if necessary. Check quartz sleeve for possible cracks or chips. If sleeve is cracked or chipped, call dealer for replacement. 			
Poor bacterial performance	 Replace lamp if it is more than 365 days old or nearing the end of its lamp life. Perform routine maintenance. Check water quality. If water quality has changed, take corrective action. Water supply cannot exceed maximum concentration levels as shown in Table 1 in Pre-Installation Instructions. Verify flow rate vs disinfection levels as shown in Technical Specifications Table 3. 			
Lamp Operation LED is red	Lamp has failed. Replace Lamp.			
Lamp Operation LED is not glowing	Check for power at outlet. If power is present, replace ballast.			
Audible Alarm Sounds	Lamp has failed. Replace Lamp.			
Power Fails	 Unit will restart automatically when power is restored. The unit is designed for continuous operation. Never connect the unit to a timer or other device, which will cause the unit to cycle on and off. Excessive cycling will reduce lamp life. 			
Unit gives faulty alarms	Ballast is faulty. Call dealer for replacement.			

If questions still remain after completing a troubleshooting procedure, please contact the manufacturer.

Limited Warranty

Quality industrial water treatment products are provided with a limited warranty. These units carry a warranty to be free from defects in materials and workmanship for one year from date of purchase under the conditions of normal usage and service for the complete system and a four year warranty for the treatment chamber. If the product fails or malfunctions during the warranty period, the inoperative product shall be inspected and have the option to repair or replace any components, which, in the assessment of Water Treatment & Accessories were originally defective or became so under normal conditions of use and service. Customers must first call Water Treatment & Accessories and be issued a Return Authorization number before returning any product or component. The equipment or component must be returned to Water Treatment & Accessories freight prepaid and insured to the address below.

Warranty Statement

Manufacturer warrants replacement lamps, purchased for routine maintenance, to be free from defects in material and workmanship for a period one year from the date of purchase. During this time, Water Treatment & Accessories will repair or replace, at its option, a defective lamp free of charge except for shipping and handling charges and any prorated charges (where applicable).

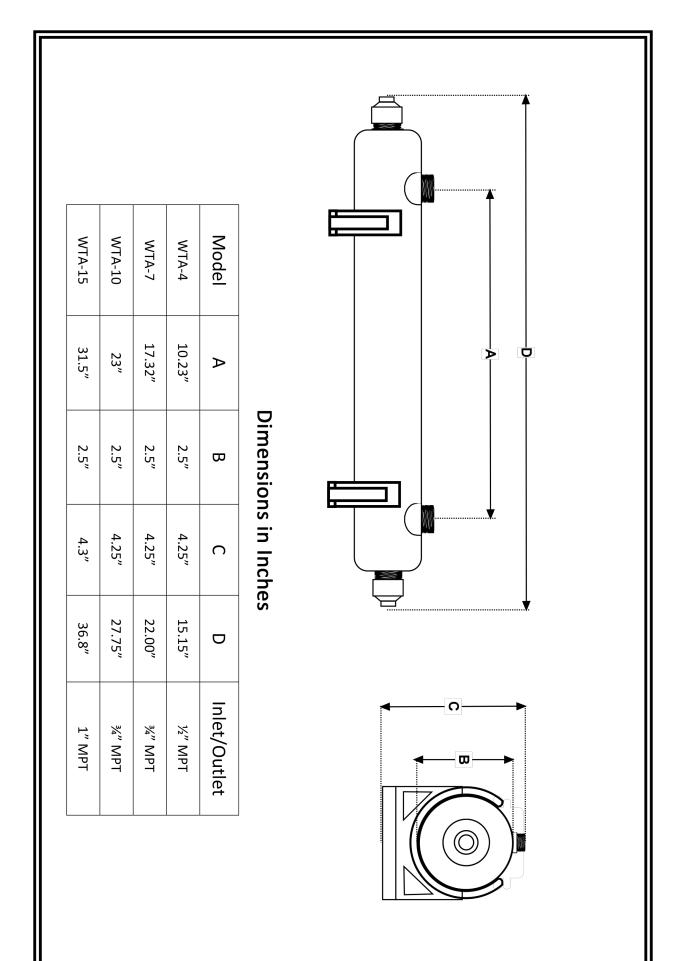
The warranty period on replacement lamps will be verified using date codes and/or purchase receipts. Water Treatment & Accessories will advise whether the defective item needs to be returned for failure analysis.

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 lamp. The warranties also do not cover products that are not installed as outlined in the applicable IOM Manual.

The limited warranties described above are the only warranties applicable to the lamps outlined. These limited warranties outline the exclusive remedy for all claims based on a failure of or defect in any of these lamps, whether the claim is based on contract, tort (including negligence), strict liability or otherwise. These warranties are in lieu of all other warranties whether written, oral, implied or statutory. Without limitation, no warranty of merchantability or of fitness for a particular purpose shall apply to any of these lamps.

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





Maintenance Log

You must perform routine maintenance in order to achieve optimum performance levels from your WTA Series water treatment system. As you perform routine maintenance or necessary service on your system, record the dates in the maintenance log. The maintenance section of the IOM Manual provides instructions for servicing and maintenance procedures.

Replace Lamp	Clean Sleeve	Replace Quartz Sleeve	Replace O-Rings
(every 365 days)	(as needed)	(every 3 years)	(with Quartz sleeve change)

Model Number

Serial Number

NOTES:			

