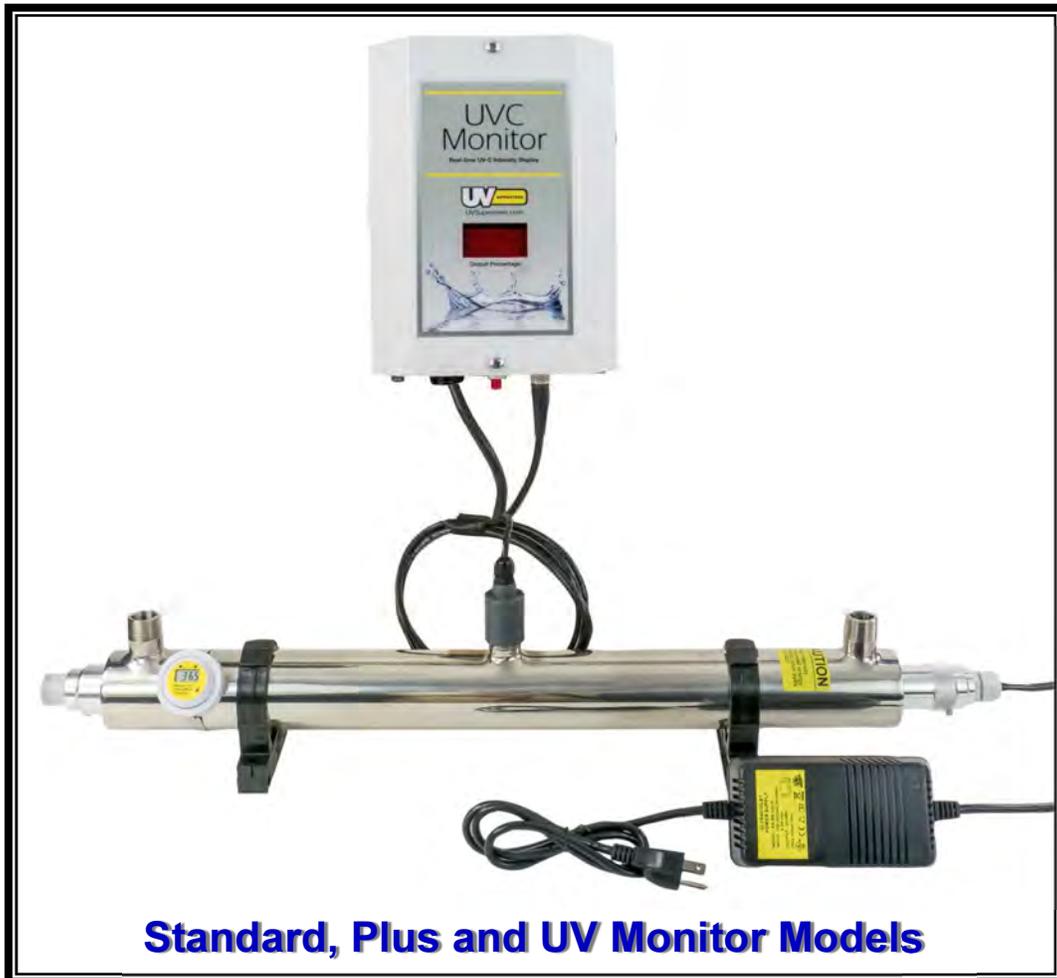


# BA Series

## Ultraviolet Water Disinfection System *Installation, Operation and Maintenance Manual*



**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.



*One Source for All Your UV Needs!*



Dear Customer:

Thank you for selecting UV Superstore, Inc. to provide the equipment for your ultraviolet water treatment needs. The BA Series is specifically intended for residential use and is designed to treat the whole house. Your BA Series system reflects our broad experience in UV water treatment and our commitment to quality craftsmanship. At the heart of the BA Series system is our premium quality UV lamps that are manufactured in the USA. These systems are built with the customer in mind and incorporate reliable parts from around the world. When properly installed and maintained, your UV Superstore, Inc. equipment will provide years of reliable service.

Please review the Installation, Operation and Maintenance (IOM) Manual carefully and keep it on hand for readily available assistance. UV Superstore, Inc. designs its models for service maintenance ease. The IOM manual provides essential information to safely install and service your system.

UV Superstore, Inc. manufactures ultraviolet equipment with the highest quality components available. Your equipment has met thorough testing procedures ensuring the efficiency of your system. As with any equipment regular maintenance procedures are required. You will have to replace your UV lamps and other items from time to time. UV Superstore, Inc. offers a complete line of replacement parts, not only for your products, but for most lines of ultraviolet water treatment equipment. Please call us for details.

UV Superstore, Inc. has built an industry-leading reputation by providing a reliable and knowledgeable technical support team. We stand by ready to assist you in all of your UV water treatment needs. Please contact us with any questions you may have regarding your system.

Best regards,

**The UV Superstore, Inc. Team**

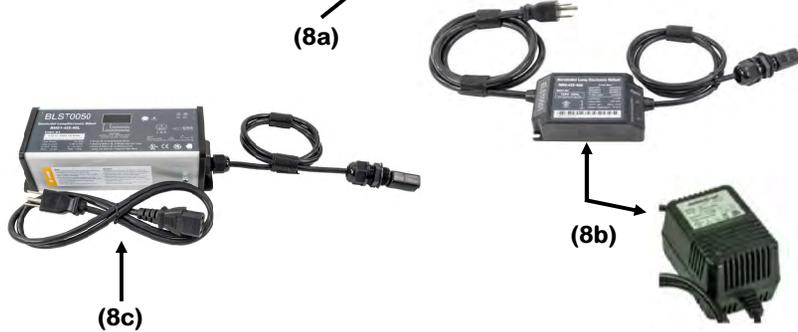
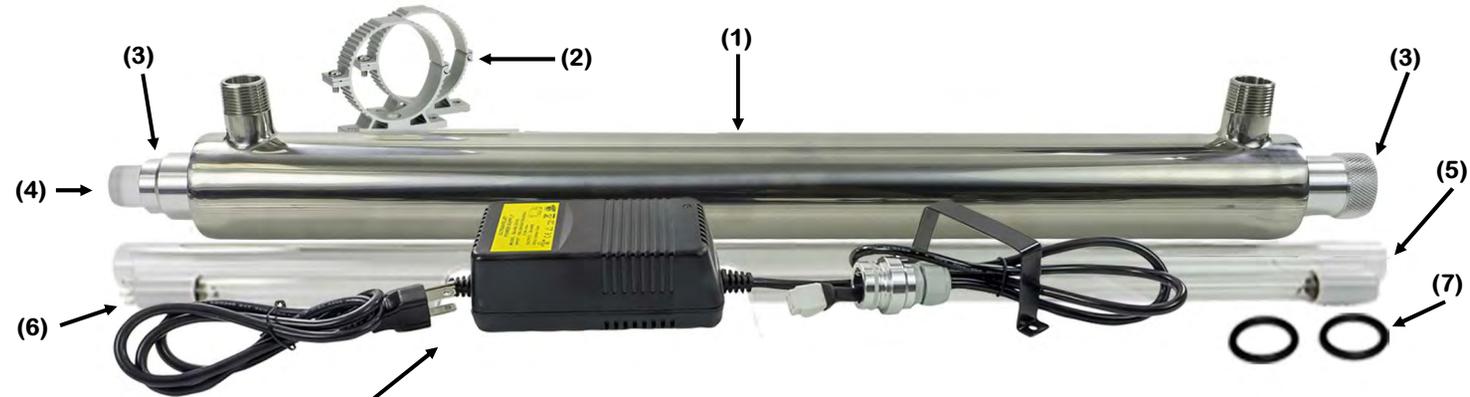


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### What's in the Box

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



- (1) UV Reactor Chamber—Qty 1
- (2) Chamber Mounting Clips—Qty 2
- (3) Compression Nut—Qty 2
- (4) View Port—Qty 1
- (5) Quartz Sleeve—Qty 1
- (6) UV Lamp—Qty 1
- (7) O-Rings—Qty 2
- (8a) Ballast (For Models BA-10, BA-15)—Qty 1
- (8b) Ballast (For Models BA-4, BA-7)—Qty 1
- (8c) Ballast (For all BA Plus and Monitor Models) - Qty 1
- (9) Countdown Timer (Optional)—Qty 1
- (10) UV Monitor with Sensor (Optional)—Qty 1

## SAFETY INSTRUCTIONS

In order to protect end users and operators from injury, safety precautions must be followed. This Installation, Operation and Maintenance (IOM) manual 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 or 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.

## 1) 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.

The quality of the liquid entering the UV system needs to be monitored. Based on your water quality, the UV system will need to be cleaned on a periodic basis. Maintenance of the UV system will require replacement parts. It is suggested that key spare and replacement parts be kept on hand. For best operation, it is recommended to use the correct replacement parts. 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 and 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 (NM) nanometer 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  $\mu\text{Ws}/\text{cm}^2$  or  $\text{mJ}/\text{cm}^2$ . Most residential applications require a UV dosage ranging from 16,000 up to 40,000  $\mu\text{Ws}/\text{cm}^2$  depending on water quality.

*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

### **3) Disinfection Chamber**

The disinfection treatment chamber is manufactured from 304 stainless steel. Each chamber comes with two aluminum mounting clips. For Standard and Plus models, the chamber has an MPT (male pipe thread) inlet and outlet connection. For models equipped with a UV Monitor, the chamber has an MPT inlet and outlet connection and a sensor port.



**Chamber for Standard and Plus Models**

**BA-4, BA-7, BA-10, BA-15**

**BA-4P, BA-7P, BA-10P, BA-15P**



**Chamber for UV Monitor Models**

**BA-10M, BA-15M**

## 4) 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. Hand-tighten compression fittings only! Do not use wrenches or other tools.**

	<ul style="list-style-type: none"> <li>• 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.</li> <li>• BA 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.</li> <li>• BA 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.</li> <li>• BA Series UV System is intended for indoor use only.</li> </ul>
	<ul style="list-style-type: none"> <li>• To avoid possible electric shock, take special care when using water with this equipment. Always shut off and disconnect power to the unit before:             <ol style="list-style-type: none"> <li>1. Making repairs—We strongly recommend that a qualified individual who fully understands the IOM Manual perform service and/or repairs to your system.</li> <li>2. Cleaning</li> <li>3. Replacing a UV Lamp</li> </ol> </li> <li>• 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.</li> <li>• 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. <b>DO NOT</b> under any circumstances cut or remove the third prong from the power cord.</li> <li>• Always unplug the disinfection system from outlet when not in use. Never unplug by pulling on the power cord. Always grip plug firmly and pull straight out of the outlet.</li> <li>• Shut down system before servicing:             <ol style="list-style-type: none"> <li>1. Turn off water supply to the BA Series UV disinfection system</li> <li>2. Disconnect all power to the BA Series UV disinfection system</li> <li>3. Drain water from the system.</li> </ol> </li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Eye protection must be worn!</b> UV light is extremely harmful to eyes and skin and will cause burns. Do not look directly or indirectly at the UV light.</li> <li>• Never operate the UV lamp outside of the UV system.</li> <li>• Do not expose your skin for any prolonged time. Use protective clothing and eyewear (make sure it is UV resistant) when servicing equipment.</li> <li>• 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.</li> </ul>
	<ul style="list-style-type: none"> <li>• 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.</li> <li>• If the sleeves become dirty, wipe them with a lint free cloth with denatured alcohol.</li> </ul>

## 5) Preparation for Installing UV System



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

### **a) System Inspection**

Ensure that your BA Series system is correctly sized for your desired dosage and flow capacity.

**(Refer to Table 2 in Technical Specifications for more information on dosage)**

### **b) Water Quality**

For optimum performance of your UV system, water quality is extremely important. Following proper pretreatment procedures 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 methods. All BA 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**

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

### **c) Water Supply Pressure Check**

Check the pressure of the water supply. The BA 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.

***For proper installation, refer to the Installation Orientation Diagram, Figure 1 and Figure 2***

- The disinfection unit can be installed either horizontally or vertically.

***For correct water flow direction, refer to Installation Orientation Diagram, Figure 1 and Figure 2***

- 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. UV Superstore, Inc. is not responsible for water damage.
- Vibration of ultraviolet equipment will damage lamps and lead to premature system failure. Choose a location for your BA Series 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.

***For additional clearance requirements, refer to the Installation Instructions section and Figure 5 in Technical Specifications***

## 6) Installation Instructions

### a) *General Guidelines*



It is recommended that all installation and maintenance procedures should be done in accordance with state and local electrical and building codes.

**UV System can be mounted either vertically or horizontally.**



#### **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.

### b) *Installation Orientation for Treatment Chamber*

For vertical installation, water flow must be from the bottom to the top of the unit. For horizontal installation, inlet and outlet must be pointing upward.

**(Refer to the Installation Orientation Diagram, Figure 1 & 2)**

### c) *Chamber Mounting*

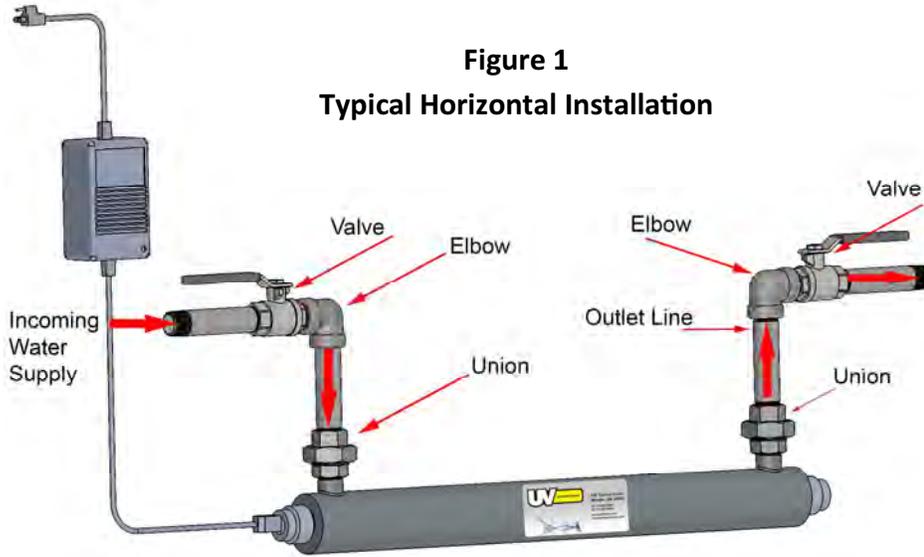
Once the location for the unit has been determined and orientation of unit has been selected, the chamber can now be mounted. Use the two metal clips provided with unit to mount and secure the treatment chamber.

### d) *Power Supply Mounting*

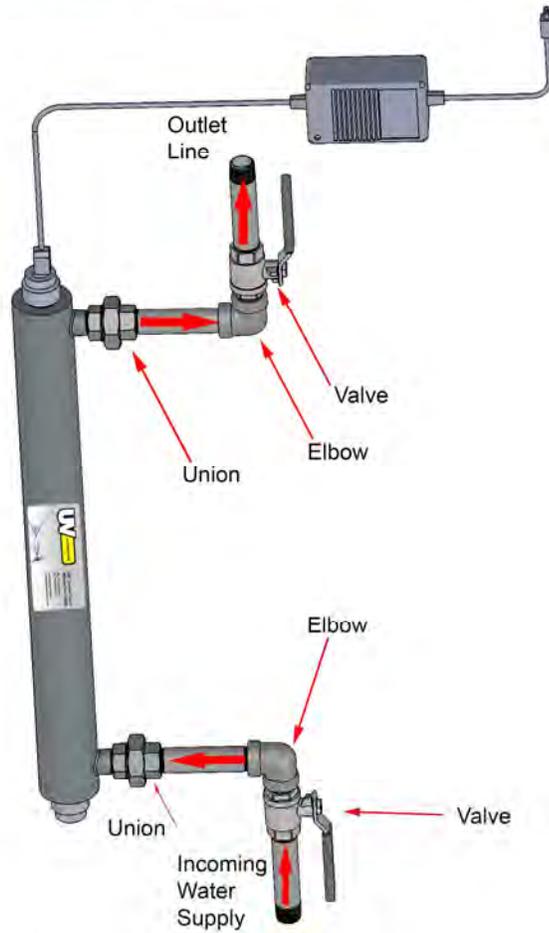
The power supply should be mounted to the wall and near the disinfection treatment chamber. It is recommended to place the power supply above the chamber and away from any water connection point(s). This will block water from potentially leaking onto the power supply by means of a leak at a connection point or a “sweating” system. To prevent any water from potentially entering the power supply, make sure you allow for a “drip-loop” on the lamp and power cord.

## Installation Orientation Diagram

**Figure 1**  
Typical Horizontal Installation



**Figure 2**  
Typical Vertical Installation



### e) 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 when handling quartz sleeves or UV lamps to avoid putting fingerprints on them.



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

After the ultraviolet unit has been secured and the inlet/outlet piping connections have been made, complete the following steps for the quartz sleeve installation process.

First, remove the compression nuts from each end of the disinfection unit.

Slowly and carefully slide the quartz sleeve through the chamber head until it protrudes equally beyond the nipple on each end of the chamber making sure it is centered inside 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 compression nuts over the quartz sleeve. Tighten each compression nut simultaneously by hand, making sure that the sleeve protrudes from each nipple equally.

**ONLY TIGHTEN BY HAND – NEVER USE PLIERS.** Make sure as you tighten the compression nuts that you maintain a clearance between the stop ridge machined in the compression nut and the edge of the quartz sleeve.

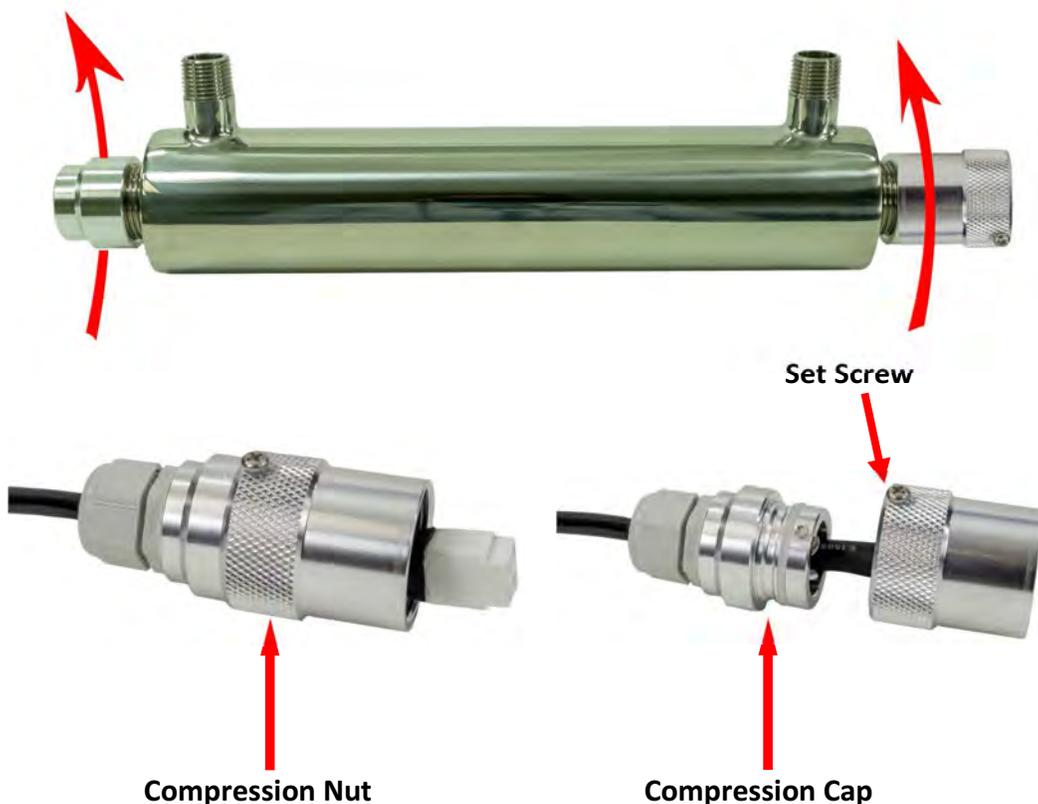
After you have tightened the compression nuts, verified placement of the O-rings, and all other plumbing connections, open the outlet valve. Slowly open the inlet valve and flush out all remaining air. Then, close the outlet valve and open the inlet valve fully. Check the unit for leaks.

If you find a leak at the compression nut, first, slowly and carefully hand tighten the nut further. If the leak continues, drain the unit. Then, remove the compression nuts from both ends to allow visibility to the quartz sleeve and sealing O-Ring. Inspect both the sealing O-Ring and quartz sleeve for correct placement and possible damage. It is important to ensure the quartz sleeve is centered inside the unit. Make sure the sealing O-Ring has been placed correctly onto the quartz and chamber nipple. The sealing O-ring should look similar on both ends. If both ends are not similar, reinstall the sleeve until they are alike.

Once completed, carefully reinstall the compression nuts and tighten by hand. Re-pressurize the unit and check again for leaks.



**DO NOT** install the lamp or ballast until all leaks have been corrected.



### f) 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. First, loosen the set screw on the compression nut. This does not have to be completely removed. Slowly and carefully slide the lamp into the quartz sleeve. Attach the ultraviolet lamp to the socket and ensure the socket is pushed all the way down to the base of the lamp for proper contact. Then slide the compression cap onto the compression nut and tighten the set screw.

### g) Plumbing System Sanitization Procedure



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

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 can 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 chlorinated water.



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 ½ 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.

Turn the UV system on, then open hot and cold water taps throughout the house and let the water run until the chlorine odor disappears.

#### ***h) Countdown Timer and Timer Holder ( Optional for Standard Models)***

Standard BA models have an option for a countdown timer and timer holder. The CDT-365 countdown timer is used to remind you when you need to replace your UV lamp. The timer is equipped with an audible alarm that sounds after 365 days has lapsed. The timer also has the ability to count up once the time has expired.

Attach the timer onto the holder by pushing it down or by snapping it in place. The timer holder needs to be attached to the chamber. To attach the holder, unscrew one side of the metal mounting strap and place on the chamber and then tighten the screw to hold it in place. Set the timer by pressing the reset button using the tip of a paper clip or something similar.



## **7) Operation and Monitoring**

### **a) *General System***

Your BA Series Ultraviolet Disinfection System will provide years of safe, effective and reliable disinfection with minimal maintenance. Establish and implement a routine physical monitoring and maintenance schedule. A maintenance log has been provided in back of the IOM manual.

### **b) *Power Supply***

The ballast power supply will monitor the status of the ultraviolet lamp and ballast on the display. 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. If a lamp or ballast power supply fault occurs, refer to the procedures listed in the Troubleshooting Section.

#### ***Power Supply—120V 60Hz Input Voltage***

##### ***Standard Models***

##### ***Models BA-4, BA-7***

##### ***P/N BA-RB1***

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.



##### ***P/N BLST0051***

The power supply located midway on the power cord has built-in monitoring functions to indicate lamp operational status and is equipped with an audible alarm.

- 1) The “green” LED will glow when the lamp is operational.
- 2) The “red” LED will glow when the lamp is in a fault state. The audible alarm will sound to indicate lamp fault.



**Power Supply—100V-240v 50/60Hz Input Voltage**

**Standard Models**

**BA-10, BA-15**

**P/N BA-RB & BLST0037**

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.



**Power Supply—110V-240v 50/60Hz Input Voltage**

**Plus & Monitor Models**

**BA-4P, BA-7P, BA-10P, BA-15P, BA-10M, BA-15M**

**P/N BLST0050**

The power supply contains built-in monitoring functions to indicate lamp life, lamp operational status and is equipped with a run time meter and audible alarm.



1) The display screen will scroll to show the total number of days of lamp operation and the number of days remaining in lamp life.

2) The ballast operation button is used to scroll through the display screen, for resetting the lamp life timer, and silencing the end of lamp life alarm.

To operate the display screen, press the button to scroll. To Reset Lamp Life Timer, press and hold on the operation button. To Silence End of Lamp Life Alarm, press and hold on the operation button. The alarm has the ability to silence in 7 day increments with a maximum of 4 times. After the 4 time max, you must replace your lamp. Refer to UV Lamp Maintenance section for complete instructions on lamp replacement. Once replaced, the Lamp Life Timer will need to be reset.

3) The “green” LED glows when the lamp is operational and the “red” LED glows when the lamp is in a fault state. The audible alarm will sound when the lamp has reached its’ end of life or has failed.

## 8) UV Monitor (Optional)

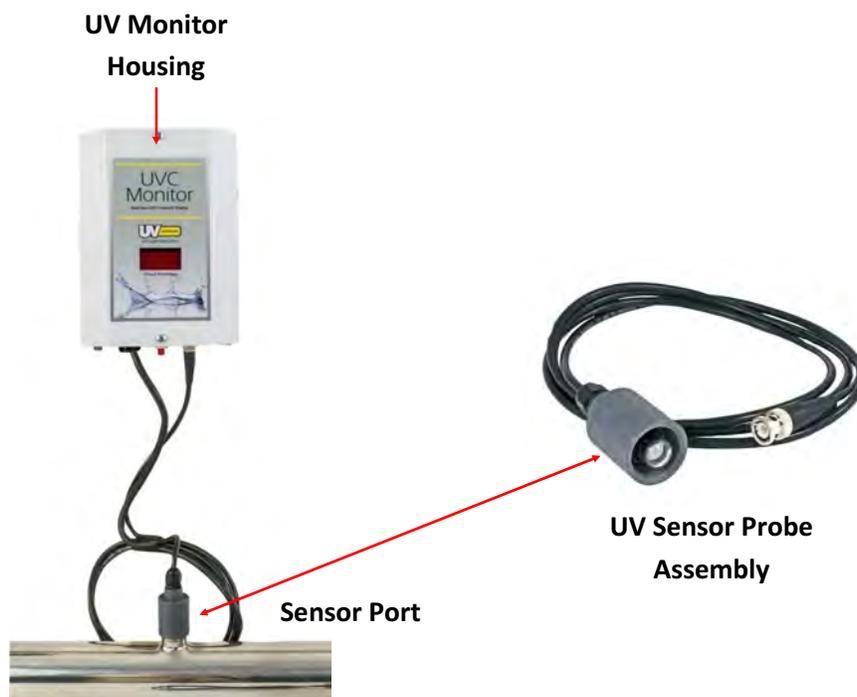


### a) *General Monitor Operation*

The UV Monitor option consists of a UV sensor probe, a UV monitor board, and a UV digital display. Ultraviolet light output is measured from the UV Lamp at the top of the cylinder by the UV sensor probe. The sensor probe is connected to the UV System on the treatment chamber where the UV sensor port is located. The close proximity of the sensor probe to the UV lamp constantly monitors UV intensity output of the lamp. A signal is sent to the UV meter board for processing, and is displayed as a percentage value from 0-100% on the digital display.

When new lamps are installed, the board must be calibrated for the new lamps to 100%. As the lamp ages, the ability to generate UV diminishes. Lamp effectiveness is measured at the Beginning of life (BOL) or initial start up, and its end of effectiveness or End of Lamp Life (EOL). The UV display will reflect the lowered UV intensity.

The sensors constant monitoring of the UV intensity on a 0%-100% scale allows the system user to identify abnormalities in UV output such as lamp or quartz sleeve fouling or the normal declining levels of UV intensity over time. These thresholds are set to activate an alarm system notifying the system user of a potential problem.



## b) Monitor Installation

All installation and maintenance should be done in accordance with state and local electrical and building codes.



1) Determine a suitable location to install the UVC Monitor. Mounting location should be in close proximity to the ultraviolet treatment chamber.

It is recommended to place the monitor above the chamber and away from any water connection point(s). This will block water from potentially leaking onto the monitor by means of a leak at a connection point or a “sweating” system. To prevent any water from potentially entering the monitor, make sure you allow for a “drip-loop” on the lamp and power cord.

2) Before installing and tightening the sensor probe,

a) UV System must be depressurized and drained of water.

*(Refer to Plumbing Sanitization Procedure in Installation Instructions Section)*

b) Attach the sensor probe assembly to the sensor port on the UV chamber. **DO NOT** use a wrench to tighten the sensor probe. This can only be done by **hand tightening**. Ensure the sensor probe is as tight as possible by hand. Overtightening may result in breakage and damage to the sensor probe.

3) Once the sensor probe has been installed and secured to the sensor port, connect the female BNC connector from the sensor probe to the male BNC connector on the UVC Monitor.

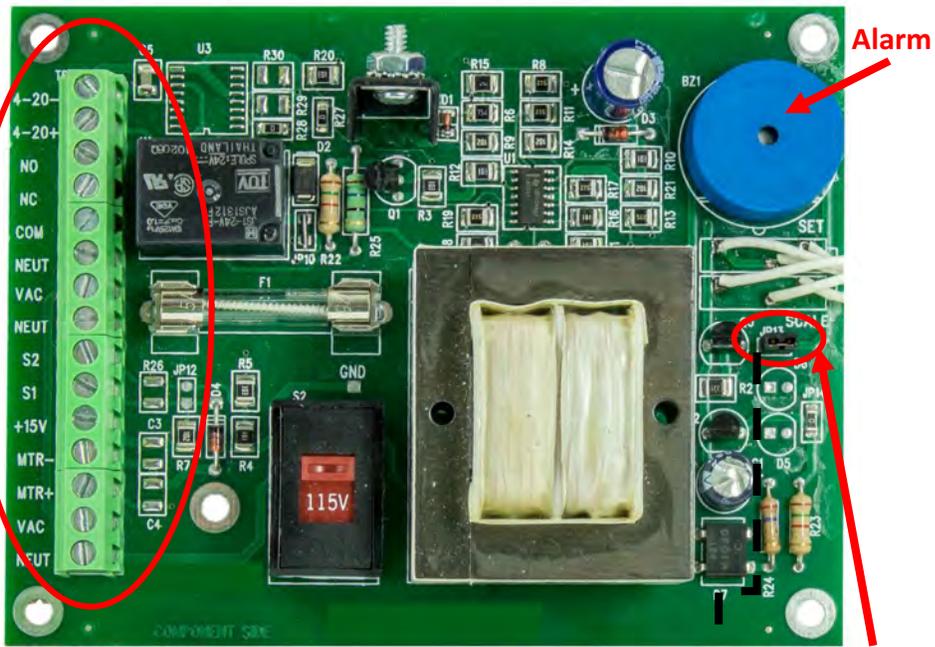
4) Plug the power cord into the wall outlet with the appropriate required voltage.

5) The audible alarm will sound for approximately 3 minutes when the UV monitor is turned on. This time delay is designed to allow the ultraviolet lamp to heat up and reach the safe output level.

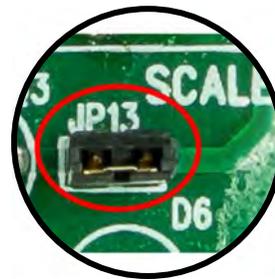
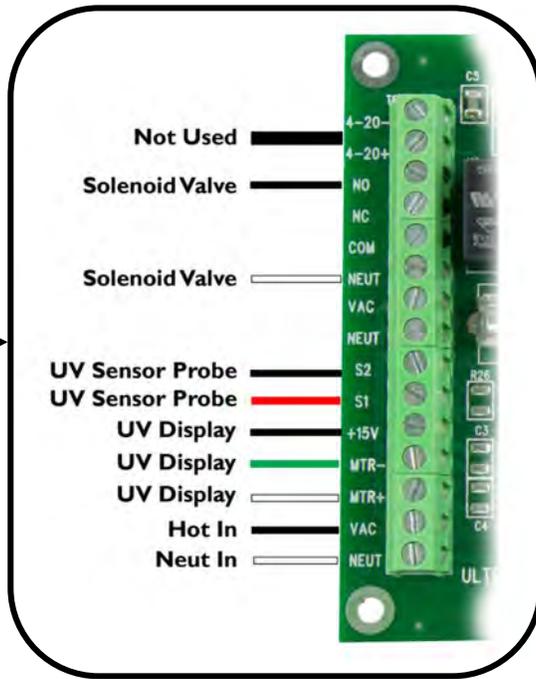
6) During periods of no flow, the UV lamp will heat up causing the UV intensity to drop below the set point. When water flow resumes, allow the system to run for at least three minutes before checking UV intensity.



**PROPER EYE PROTECTION SHOULD BE WORN WHEN WORKING WITH UV LAMPS.**



To disable alarm, remove jumper JP13



**NOTE: ANY EXTERNAL ACCESSORIES CONNECTED TO UV METER BOARD IS NOT TO EXCEED 5 AMPS**

### c) Monitor Calibration



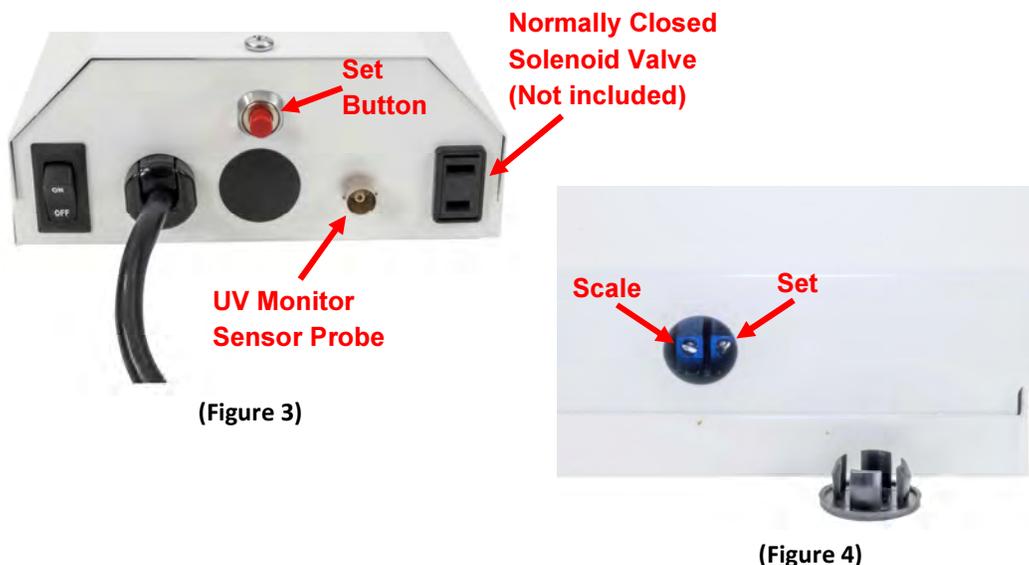
The ultraviolet meter can only be calibrated when the power switch is in the ON position, lamps are operational and water is flowing through the system. Allow the lamp to warm up for at least three minutes prior to any calibration while water is running through the system. During this three minute warm up, the buzzer will sound. Calibration should be complete once the lamps have been operational for 100 hours.

To set the low UV intensity alarm find the **SET** Push Button (**See Figure 3**)

1. Push and hold down the **SET** button (**See Figure 3**)
2. The low set point of the meter should be set at 85%. If adjustment is needed, turn the set point until the digital display reads 85% according to the manufacturers recommendations.  
Adjust the set point by turning the potentiometer. (**See Figure 4**)

Turn **SET** Adjustment to right (clockwise) to raise the **SET POINT**  
Turn to **Left** (counterclockwise) to lower the **SET POINT**  
Release **SET** Push Button to run position.

3. To test for Low UV intensity turn the scale Potentiometer adjusting 0-100% meter scale down below the % set point level.
4. Adjust **Scale / Run** display to 100% (**See Figure 4**)



#### d) **Wiring for 230V**

The meter board of the UVC Monitor is capable of operating on 115V or 230V. The unit has been supplied with a 115V power cord.



To run at 230V:

- 1) Locate the internal voltage adjustment switch on the monitor board
- 2) Switch to the desired position of 230V

#### **Wiring Diagram**



**Voltage  
Adjustment  
Switch**

## 9) Maintenance

***Always disconnect power before servicing the system. It is recommended that all installation and maintenance should be done in accordance with state and local electrical and building codes.***

### a) **UV Lamp Maintenance**



Your BA Series ultraviolet disinfection system will give many years of safe, reliable and effective disinfection with minimal routine maintenance.

#### **Replace your UV lamp on an annual basis**

UV lamps lose intensity over the 10,000 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. 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 10,000 hours of use. Using lamps longer than this can cause your system to not provide UV intensity high enough for the proper dosage required 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 the 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. First, loosen the set screw on the compression nut. Disconnect the old lamp from the lamp socket and remove old lamp. If unit requires quartz sleeve maintenance, refer to the quartz sleeve maintenance procedures for complete instructions.

Slowly and carefully slide the new lamp into the quartz sleeve. Attach the ultraviolet lamp socket to the lamp base. Ensure the lamp socket is pushed all the way down to the base of the lamp for proper contact. Then slide the compression cap onto the compression nut and tighten the set screw.

## **b) Quartz Sleeve Maintenance**

### **Cleaning Procedures & Replacement**

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 inlet valve. Open a tap to relieve pressure and then turn off the outlet valve. Turn off the power to the ultraviolet system. Drain the vessel. Loosen the set screw on the compression nut and pull apart the compression cap from the compression nut. Slide the lamp out about 2" from the compression nut and remove the lamp connector from the lamp and then 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 sleeve 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.



**Lamp and quartz sleeve are fragile**

**It is recommended to sanitize the entire system after servicing**  
*(Refer to instructions on sanitizing the plumbing system)*

## **c) Lamp Recycling**

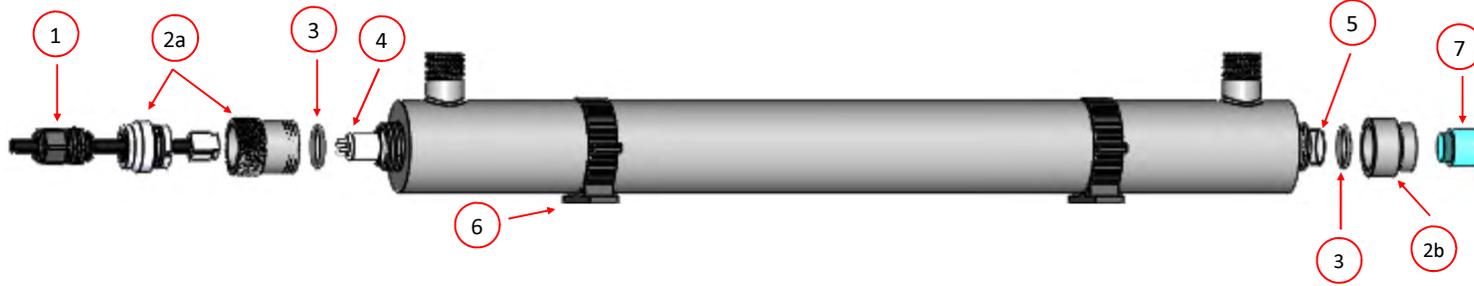


UV lamps need to be recycled like fluorescent lamps because they contain mercury. Please follow your local recycling laws. For assistance finding a recycling center in your area, visit [www.lamprecycle.org](http://www.lamprecycle.org). Please contact your manufacturer's representative in the event that you are unable to find a disposal location.

## **d) Countdown Timer (Optional for BA Standard Models)**

A countdown timer is used as a reminder to replace the UV lamp in your system after 365 days (one year). When time has lapsed, the timer will sound. After routine maintenance and UV lamp replacement, press the reset button located on the front cover using the tip of a paper clip or something similar to start the next 365 days. To replace the battery, pull apart the top cover from the bottom of the timer. Replace with a LR44 or similar type battery. Snap the cover back on to the bottom and reset.

### BA Series Parts Breakdown



1

**BA-RB**  
or  
**BLST0037**  
(Water Proof)  
100-240V 50/60Hz

**BLST0050**  
110-240V 50/60Hz

This block contains two power supply units. The top one is a black rectangular unit with a yellow label, identified as BLST0050. The bottom one is a smaller, grey rectangular unit with a black label, identified as BLST0037. Both are connected to cables with specific connectors.

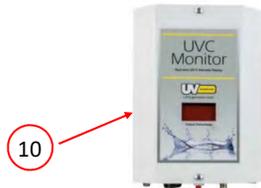


1

**BA-RB1**  
120V 60Hz

**BLST0051**  
120V 60Hz

This block contains two power supply units. The top one is a black rectangular unit with a green label, identified as BA-RB1. The bottom one is a smaller, black rectangular unit with a black label, identified as BLST0051. Both are connected to cables with specific connectors.



## Replacement Parts List

Standard Models: BA-4, BA-7, BA-10, BA-15

Plus Models: BA-4P, BA-7P, BA-10P, BA-15P

UV Monitor Models: BA-10M, BA-15M

Item #	Description	BA-4 BA-4P	BA-7 BA-7P	BA-10 BA-10P BA-10M	BA-15 BA-15P BA-15M
1	Power Supply (Standard Models)	BA-RB1 or BLST0051	BLST0051	BA-RB	BA-RB
1	Power Supply (Plus & Monitor Models)	BLST0050	BLST0050	BLST0050	BLST0050
1	Power Supply—(Waterproof)		BLST0037	BLST0037	BLST0037
2a	Compression Nut & Compression Cap	BA-CN2	BA-CN2	BA-CN2	BA-CN2
2b	Compression Nut (Viewport end)	BA-CN	BA-CN	BA-CN	BA-CN
3	O-Ring EPDM	ORNG0009	ORNG0009	ORNG0009	ORNG0009
4	Lamp	GL330/4	GL463/4	GL650/4	GPH843T5L/4C
5	Quartz Sleeve	G10-3150	BA-Q7	BA-Q10	BA-Q15
6	Chamber Clip—Aluminum	BRKT0012	BRKT0012	BRKT0012	BRKT0012
7	Viewport	BA-VP	BA-VP	BA-VP	BA-VP
Not Shown	Ballast Clip	BA-BC (for BA-RB1)		BA-BC (for BA-RB)	BA-BC (for BA-RB)
8	Timer Holder*	BA-TH	BA-TH	BA-TH	BA-TH
9	Count Down Timer*	CDT-365	CDT-365	CDT-365	CDT-365
10	UV Monitor**			BA-MON	BA-MON
11	Sensor Assembly ** (Requires UV Monitor Model)			4-0008	4-0008

\*Optional for all standard models

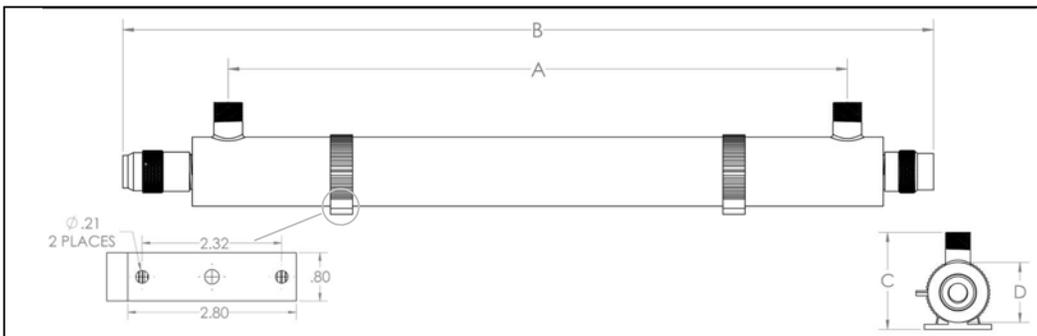
\*\*UV Monitor Models

## Technical Specifications

**Table 2**

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

**Figure 5**



**Dimensions in inches**

Model	A	B	C	D	Inlet/Outlet	Operating Voltage
BA-4, BA-4P	10.23	16.40	4	2.5	1/2" MPT	120V 60Hz
BA-7, BA-7P	17.32	23.25	4	2.5	3/4" MPT	120V 60Hz
BA-10, BA-10P, BA-10M	23	29	4	2.5	3/4" MPT	100-240V 50/60Hz
BA-15, BA-15P, BA-15M	31.50	38.05	4	2.5	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 B) plus 4 inches.

## Troubleshooting

Situation	Recommended Action
Unit is leaking	<ul style="list-style-type: none"> <li>• Check to see that the compression nut is tight.</li> <li>• Verify that inlet pressure does not exceed 100 PSI.</li> <li>• Verify O-Ring is seated properly, follow manual instructions.</li> <li>• Lubricate O-Ring with food grade silicone.</li> <li>• Check O-Ring for cracks or tears. Replace if necessary.</li> <li>• Check quartz sleeve for possible cracks or chips. Replace if sleeve is cracked or chipped.</li> </ul>
Poor bacterial performance	<ul style="list-style-type: none"> <li>• Replace lamp if it is more than 365 days old or nearing the end of its lamp life.</li> <li>• Inspect quartz sleeve(s) and make sure it is clean.</li> <li>• Perform routine maintenance.</li> <li>• 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.</li> <li>• Verify flow rate vs disinfection levels as shown in Table 2 in Technical Specifications.</li> </ul>
Lamp status LED is red	<ul style="list-style-type: none"> <li>• Lamp has failed. Replace lamp.</li> </ul>
Lamp status LED is not glowing	<ul style="list-style-type: none"> <li>• Check for power at outlet. If power is present, replace ballast.</li> </ul>
Audible Alarm Sounds	<ul style="list-style-type: none"> <li>• Lamp has failed. Replace Lamp.</li> </ul>
Power Fails	<ul style="list-style-type: none"> <li>• Unit will restart automatically when power is restored.</li> <li>• 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.</li> </ul>
Low UV Monitor Reading (Less than 85% transmission)  (Models BA-10M & BA-15M)	<ul style="list-style-type: none"> <li>• Check water quality. Ensure that color, turbidity, and iron content are within normal parameters.</li> <li>• Ensure input voltage matches requirements.</li> <li>• Verify lamp is on and less than 1 year old.</li> <li>• Replace old or defective lamp(s).</li> <li>• Clean quartz sleeve(s).</li> <li>• Clean UV sensor lens.</li> <li>• If reading is at 0%, ensure UV sensor cable is connected.</li> </ul>

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

#### **Limited Warranty**

UV Superstore's BA Series Residential Water Treatment systems 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. Additionally, these units carry a four year warranty for the treatment chamber and a two year warranty for the electronic power supply. If the product fails or malfunctions during the warranty period, UV Superstore shall inspect the inoperative product and have the option to repair or replace any components, which, in the assessment of UV Superstore were originally defective or became so under normal conditions of use and service. Customers must first call UV Superstore and be issued a Return Authorization number before returning any product or component. The equipment or component must be returned to UV Superstore freight prepaid and insured to the address below.

#### **Warranty Statement**

UV Superstore 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, UV Superstore 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. UV Superstore 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.

UV Superstore, Inc. does not assume any liability for personal injury or property damage caused by the use or misuse of any of the above products. UV Superstore, Inc. shall not in any event be liable for special, incidental, indirect or consequential damages. UV Superstore 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.

For all warranty claims you must contact UV Superstore at the below address. All claims must be filed within 30 days.



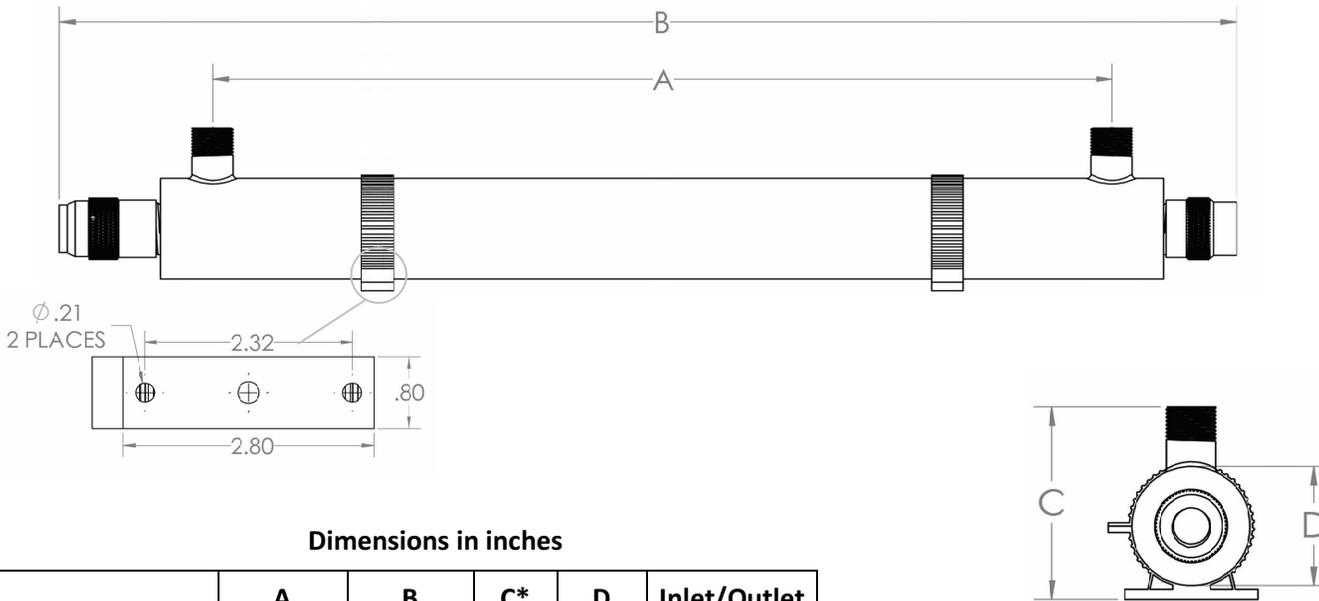
820 Tucker Court, Winder, GA 30680

**Phone: 770-307-3882**

**Fax: 770-307-3872**

**[sales@uvsuperstore.com](mailto:sales@uvsuperstore.com)**

**[www.uvsuperstore.com](http://www.uvsuperstore.com)**



Dimensions in inches

Model	A	B	C*	D	Inlet/Outlet
BA-4, BA-4P	10.23	16.40	4	2.5	1/2" MPT
BA-7, BA-7P	17.32	23.25	4	2.5	3/4" MPT
BA-10-, BA-10P, BA-10M	23	29	4	2.5	3/4" MPT
BA-15, BA-15P, BA-15M	31.5	38.05	4	2.5	1" MPT

\* - Dimensions may vary slightly depending on Inlet/Outlet connection size

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[www.uvsuperstore.com](http://www.uvsuperstore.com)

TITLE: BA VESSEL

MATERIAL: 304 STAINLESS STEEL

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DWG. NO. MV-BA  
 3/10/16 BY: RWD

REV A  
 SHEET 1 OF 1



**Model Number**

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**Serial Number**

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