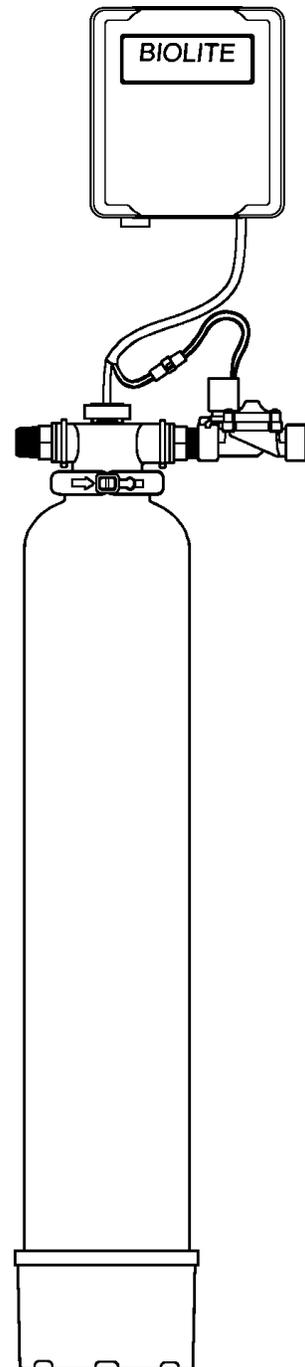


***ATTENTION:
BIOLITE INSTALLER***

*IT IS EXTREMELY IMPORTANT THAT THE
ACCOMPANYING INSTRUCTIONAL
MATERIALS BE REVIEWED WITH THE
CONSUMER AND RETAINED BY THEM
FOR FUTURE REFERENCE.
THE MAINTENANCE PROCEDURES
DESCRIBED MUST BE
FOLLOWED IN ORDER TO ASSURE THE
SYSTEM CONTINUES TO OPERATE
PROPERLY.*

INSTALLATION AND OPERATING INSTRUCTIONS

BIOLITE ULTRAVIOLET (UV) SYSTEM



Manufactured by:

Cuno Water Treatment
12628 U.S. 33 North, Churubusco, IN 46723
Water Treatment Division of 

IN185G (03-154)

PLEASE READ THIS MANUAL THOROUGHLY PRIOR TO PROCEEDING WITH INSTALLATION. RETAIN THEM FOR FUTURE REFERENCE.

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BEFORE INSTALLATION

The BIOLITE Ultraviolet System is designed to be used as a water sterilizer and should be installed on potable water supplies. This system must be installed in accordance with local and state regulations.

The BIOLITE System has some standard features not commonly found on other ultraviolet units:

- 1) Automatic shut-off to eliminate untreated water from being used should the UV lamp fail to illuminate.
- 2) Large exposure tank to maintain proper UV lamp temperature.
- 3) Utilizes easy to service Uniflex Tank* and components.
- 4) UV lamp can be quickly changed without relieving pressure or disconnecting plumbing.
- 5) Designed to treat the entire household without excessive pressure drop.
- 6) Indicator lamp and audible alarm to notify when UV lamp should be replaced.

Ultraviolet systems sterilize water by altering an organism's DNA and rendering the cell lifeless. It has the advantage of being a nonchemical form of treatment and, as such, will not alter the taste of the treated water and cannot be overdosed.

However, in order to be effective, the water entering the unit must meet certain requirements. The unit should be installed as the last treatment device prior to the water being consumed, except when a reverse osmosis system is installed. The water quality parameters are listed below:

TOTAL IRON	< 0.3 ppm
HYDROGEN SULFIDE	< 0.05 ppm
SUSPENDED SOLIDS	< 10 ppm
MANGANESE	< 0.05 ppm
HARDNESS	< 1.0 gpg*

*If total hardness is less than 7 gpg, the quartz sleeve will require periodic cleaning. Hardness levels above 7 gpg must be softened prior to the UV system.

A 5-micron sediment filter should be installed prior to the unit, large enough to meet the flow requirements of the specific application. The BIOLITE System incorporates a 12 gpm flow control to insure proper exposure time. Multiple systems can be installed in parallel to achieve higher flows, taking the higher flows into account when selecting the sediment filter.

The BIOLITE System should be installed only on cold water. It should be plugged into a 120v/60 Hz, properly grounded circuit, protected by a ground fault circuit interrupter. Install indoors or in a location protected from the weather.

Upon installation the entire water system must be sterilized with chlorine (household bleach) to destroy any bacteria in the plumbing lines, water heater, etc. The BIOLITE System is not intended to make non-potable water safe to drink.

UNPACKING

Use care when handling the UV components, especially the quartz sleeve and UV lamp. For shipping purposes, they have been packaged in separate tubes inside the shipping carton. To avoid damaging or getting dirt on these items, use a CLEAN PAPER TOWEL when handling them.

Remove the instruction packet, electronic control box and inlet solenoid valve assembly from the package and set aside. Remove the cardboard die cut around the top of the UV tank by cutting from the center to an outside corner. The quartz sleeve and UV lamp are packaged separately inside the unit carton. DO NOT remove them from the packaging until required for installation. Remove UV tank from unit carton. Before discarding any packaging, double check for any missed parts or assemblies.

*Uniflex tanks and components are covered under Patent #5584411.

INSTALLATION

1. The BIOLITE System must be installed in the plumbing system after any filters or softeners, but prior to any branch lines. Refer to "BEFORE INSTALLATION" for pretreatment requirements.
2. Remove quick release clip and plugs (factory installed) from INLET and OUTLET of UV head. Lubricate o-ring on solenoid valve assembly with silicone grease and insert into INLET port. Insert nipple with flow control inside into OUTLET port. Make sure assemblies are fully inserted into head before reinstalling quick release clip. See Figure 1.

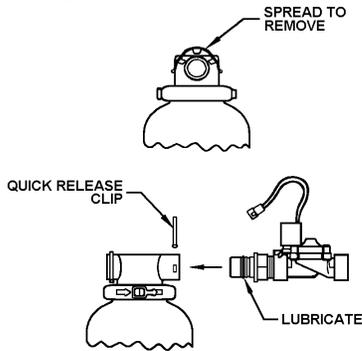


Figure 1.

3. Turn off power to well pump or close main water supply valve. Relieve pressure on system by opening faucet nearest point of installation and allow plumbing to drain. A MINIMUM 36 inches of clearance above the tank must be provided for installation and replacement of the quartz sleeve and UV lamp.

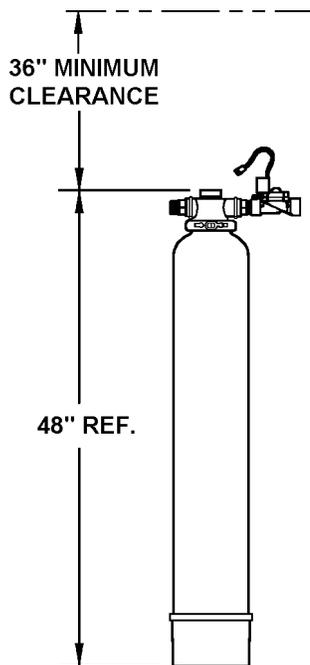


Figure 2.

4. Gently rock tank from side-to-side to evenly redistribute gravel (factory installed inside tank) across bottom of tank.

5. Cut plumbing, as required, to attach pipe to solenoid valve (INLET); DO NOT attach plumbing to OUTLET nipple until tank has been filled with water and the air around the sleeve and UV lamp has been purged. Use thread tape on plastic fittings. DO NOT use pipe paste, unless it is specifically designated by the manufacturer for use on plastics, as it will cause deterioration of the plastic. DO NOT OVERTIGHTEN FITTINGS.
6. Unscrew the clear acrylic closure from the top of the UV head and remove plug. Add approximately one (1) gallon of household bleach to the UV tank. Also terminate power to water heater, drain a few gallons and add approximately one (1) gallon of bleach directly into the heater. This bleach (chlorine) will be used to sanitize the plumbing system upon start-up. Remember to restore power to water heater after installation is complete.
7. Remove the quartz sleeve from its protective packaging using a CLEAN PAPER TOWEL to hold it.
8. Insert sleeve, with open end up, through the opening in the top of the UV head until it is resting on the pre-installed o-ring located about 1-1/2" down from the top of the sleeve. Carefully make sure sleeve passes through the centering device located inside the tank (Figure 3).

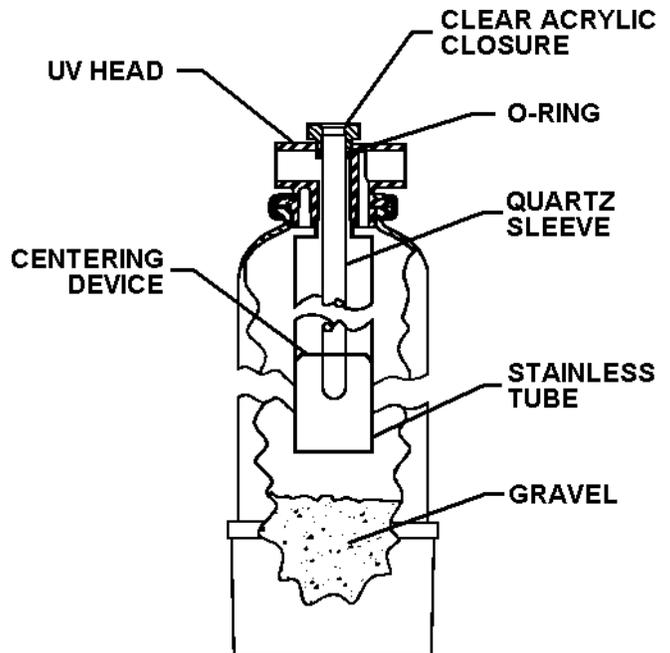


Figure 3.

9. Place clear acrylic closure, removed in Step 6, over the end of the quartz sleeve. Gently push down until closure meets top of UV head. Screw closure down until snug, DO NOT overtighten as the joint uses an o-ring seal.

- The UV tank can now be filled with water by restoring power to the well pump or opening main supply valve. Open the INLET solenoid valve using the emergency, manual opening lever located on the valve (See Figure 4). Allow the tank to fill until water discharges from the OUTLET nipple and then close the manual lever. This will purge the air around the quartz sleeve. REMEMBER: the water inside the unit has a high chlorine content, therefore handle it carefully. DO NOT allow it to splash onto skin, clothing, carpeting, etc.

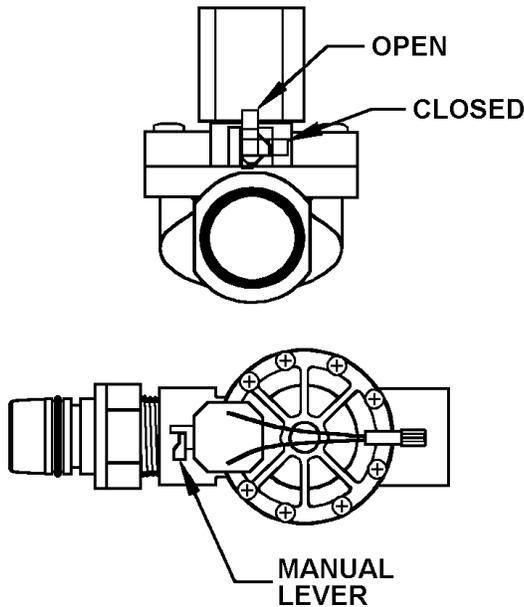


Figure 4.

The INLET solenoid valve is designed to close in the event of UV lamp failure or power failure to protect the household from unknowingly using untreated water. In the event of a power failure, the manual lever can be used to open the solenoid valve and allow water to be used. THIS WATER WILL BE UNTREATED AND, IF THIS PROCEDURE IS PERFORMED, THE PLUMBING SYSTEM MUST BE RE-SANITIZED, AS DESCRIBED IN STEP 6, AFTER RESTORATION OF POWER AND CLOSING THE MANUAL LEVER. When power is restored the Time of Operation indicator lamp will blink green, indicating the lamp has been in operation for less than 12 months. Actual time of operation is maintained in a non-volatile memory which is unaffected by power outages. (See OPERATIONAL NOTES for further explanation)

- Attach plumbing to OUTLET nipple using thread tape, being careful not to overtighten.
- Open solenoid valve on INLET by opening the manual lever and allow system to pressurize. Check for leaks and correct as necessary.

- Open the faucet in the household farthest away from the point of treatment, both hot and cold, until the smell of chlorine is detected and immediately close. Repeat this procedure with every faucet and water using appliance. Allow the plumbing system to set undisturbed while finishing the installation and for at least 30 minutes. This procedure will sanitize the interior of the plumbing system prior to start-up of the BIOLITE System. Depending on the size of the household, additional chlorine may be required. Close manual lever on solenoid valve.
- Mount the control box within 1-2 feet of the UV head using appropriate fasteners. Make sure INDICATOR LAMP and RESET SWITCH are clearly visible and can be easily reached. Mounting holes are predrilled through the control box bottom. The cover is held in place with velcro and can be removed by pulling out on the sides of the cover.
- Remove UV lamp from protective packaging using a CLEAN PAPER TOWEL to handle.
- Begin GENTLY lowering the lamp, through the clear acrylic closure, into the quartz sleeve installed in Step 8. BE CAREFUL not to drop the lamp inside the sleeve as damage could result to both. Attach wiring harness to lamp when it is sufficiently far enough into sleeve to allow it.
- Gently continue to lower the lamp (with wire attached) into quartz sleeve until it rests on the bottom of the sleeve. When properly installed, the lamp will be fully inserted inside of tank.

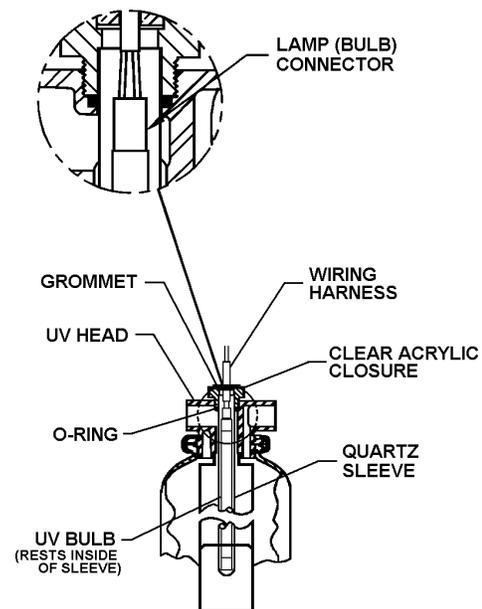


Figure 5.

18. Push rubber grommet on wiring harness down into clear acrylic closure to create a light proof seal.
19. Attach solenoid valve wire to connector on wiring harness. The solenoid valve is 24V/60Hz and is powered from a transformer located inside the control box.
20. Plug the control box power cord into a properly grounded 120V/60Hz outlet, protected by a ground fault circuit interrupter.
21. The audible alarm will sound momentarily, until the lamp illuminates, as can be seen by the glow of the clear acrylic closure. The system has a built-in two (2) minute delay before opening the solenoid valve to allow the lamp to reach the proper bactericidal intensity before water is allowed to flow through the unit.

NOTE: NEVER LOOK DIRECTLY AT AN ILLUMINATED UV LAMP AS DAMAGE TO EYES MAY OCCUR. When power is first applied the indicator lamp will begin to blink Green automatically. (See Figure 6). This indicates that the UV lamp has been in operation less than twelve (12) months. When twelve months of operation have accrued, the Indicator Lamp on the Control Box will illuminate continuously RED and the audible alarm will sound intermittently. It is important to note that the blinking green Indicator Lamp does not indicate that the UV lamp is illuminated, rather that the UV lamp has been in operation less than twelve months. It is critical that the Reset Switch not be pressed unless the used UV lamp has been replaced with a new lamp. (See OPERATIONAL NOTES for further explanation).

22. Following the delay, the plumbing system should be flushed to remove the chlorine from the pipes. Depending on the age of the pipes and quality of water previously passing through, the flushing water may be extremely turbid and discolored. Continue to flush until the water is clear or the odor of chlorine disappears.
23. The BIOLITE System is now ready for service. Refer to the "Maintenance" section of this manual for important procedures to ensure continued effective operation.

OPERATIONAL NOTES:

The BIOLITE System is equipped with a integral sensor which "monitors" operation of the UV lamp. This sensor works in conjunction with the INLET solenoid valve and an audible alarm. If the lamp should fail to illuminate when power is applied, the solenoid valve will close and the alarm will sound. If a louder or remote alarm is desired, one can be operated via a 12 volt DC relay connected to the same terminals where the factory installed buzzer is attached. These items can be purchased at a local electronic/electrical supplies retailer (i.e. Radio Shack).

The BIOLITE System is also equipped with an Elapsed Time of Operation Monitor, which provides its owner with both visual and audible notification that the UV lamp should be changed. Over time the intensity of the UV lamp will begin to fade, therefore, the lamp should be replaced every twelve (12) months, even if the lamp is still illuminated. During normal operation the Indicator Lamp will blink GREEN (See Figure 6). This indicates the installed UV lamp has been in operation less than twelve months. It is important to note that the blinking green Indicator Lamp does not indicate that the UV lamp is illuminated, but that the UV lamp has been in operation less than twelve months. It is critical that the Reset Switch not be pressed unless the used UV lamp has been replaced with a new lamp. When twelve months have elapsed the Indicator Lamp will switch to continuous RED illumination and the audible alarm will sound intermittently. When this occurs, the UV lamp has been in operation twelve months and should be replaced.

In order to ensure continued proper operation of the BIOLITE System, replacement items should be ordered specifically from the parts list provided later in this manual.

In the event of a power outage and water is required, the solenoid valve can be manually opened by turning the manual lever up to the open position (Figure 4). THIS WATER WILL BE UNTREATED. IN THE EVENT OF PERFORMING THIS PROCEDURE THE PLUMBING SYSTEM MUST BE RE-SANITIZED, AS DESCRIBED IN STEP 6, UPON RESTORATION OF POWER AND CLOSING THE MANUAL LEVER BEFORE WATER IS USED.

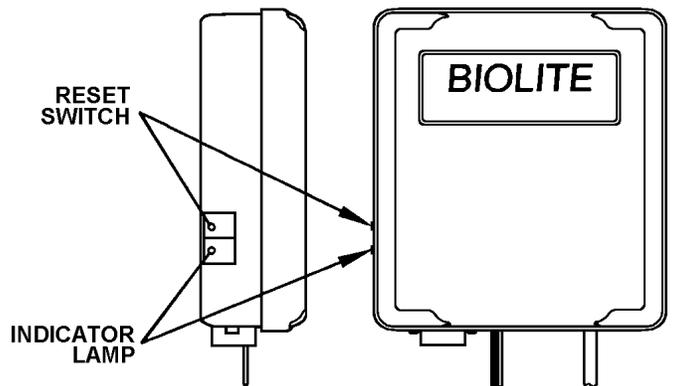


Figure 6. RESET SWITCH & INDICATOR LAMP

MAINTENANCE

The BIOLITE System will require periodic maintenance. Routine maintenance procedures include annual UV lamp replacement and periodic cleaning of the quartz sleeve. The BIOLITE System must be reset, as described below, each time the UV lamp is replaced.

UV LAMP REPLACEMENT:

The BIOLITE System is equipped with an Elapsed Time of Operation Monitor, which provides its owner with visual and audible notification that the UV lamp should be changed. Over time the intensity of the UV lamp will begin to fade, therefore, the lamp should be replaced every twelve (12) months, even if the lamp is still illuminated. This procedure should be performed even if the lamp is still illuminated. A log for noting the replacement dates has been provided inside the control box cover. **IMPORTANT:** Disconnect power to the system whenever servicing the equipment. During normal operation the Indicator Lamp will blink GREEN (See Figure 5). This indicates the installed UV lamp has been in operation less than twelve months. It is important to note that the blinking green Indicator Lamp does not indicate that the UV lamp is illuminated, but that the UV lamp has been in operation less than twelve months. It is critical that the Reset Switch not be pressed unless the used UV lamp has been replaced with a new lamp. When twelve months have elapsed the Indicator Lamp will switch to continuous RED illumination and the audible alarm will sound intermittently. When this occurs, the UV lamp has been in operation twelve months and should be replaced.

In the event of power failure or interruption the Indicator Lamp will continue to blink GREEN as soon as power is restored. The unit stores time of operation information in a non-volatile memory which is unaffected by power outages. The BIOLITE System should not be reset if this occurs. The BIOLITE System must not be reset unless the UV Lamp has been replaced. Resetting the unit prematurely will begin a new twelve-month cycle, resulting in a false indication of the lamp operating time.

PROCEDURE:

1. Unplug the power cord to the control box. The solenoid valve will close terminating the flow of water through the system.
2. Disconnect the solenoid valve wire from the wiring harness to the control box.
3. Remove the rubber grommet from the clear acrylic closure. **DO NOT REMOVE THE CLOSURE, IT IS UNDER PRESSURE.**

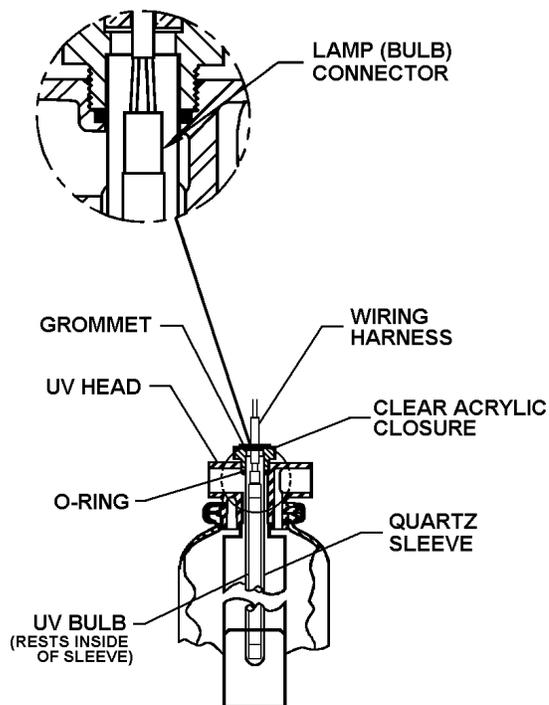


Figure 7.

4. Pull wiring harness with UV lamp attached up out of the quartz sleeve. The wiring harness must be disconnected from the lamp before it can be fully removed from the unit.
5. Discard the used UV lamp properly (it is a low pressure mercury vapor lamp similar to a fluorescent light bulb).
6. Handle the replacement lamp with care, using a CLEAN PAPER TOWEL to hold it. Gently lower the replacement lamp down into the quartz sleeve, reattaching the wiring harness when possible.
7. Continue to lower the lamp, with the wiring harness attached, until it rests on the bottom of the quartz sleeve.
8. Reinstall the rubber grommet into the clear acrylic closure.
9. Plug power cord back into outlet. The audible alarm will sound until the lamp illuminates and the solenoid valve will not open for approximately two (2) minutes. This delay will allow the lamp to reach full intensity prior to water being allowed to flow through the unit. When re-assembly is complete, press and hold RESET BUTTON for five (5) seconds. INDICATOR LAMP will begin blinking GREEN. System is reset and ready for service. **NEVER LOOK DIRECTLY AT AN ILLUMINATED UV LAMP.**

CLEANING THE QUARTZ SLEEVE

The quartz sleeve around the UV lamp will require periodic cleaning. The frequency of cleaning is determined by the quality of the water being fed into the BIOLITE System. The feed water must meet the requirements as discussed in the 'BEFORE INSTALLATION' section of this manual. The quartz sleeve must be kept clean in order to ensure proper exposure of the water to the UV light. It is recommended that this procedure be performed at least every six (6) months and more frequently if necessary.

PROCEDURE:

1. Cleaning of the quartz sleeve will require that pressure be relieved from the unit before disassembly. Unplug the BIOLITE System control box. This will cause the INLET solenoid valve to close.
2. Open a faucet close to the unit installation point and allow the plumbing to drain.
3. Disconnect the solenoid valve wire from the wiring harness.
4. Remove the rubber grommet, around the wires, from the clear acrylic closure.
5. Pull the wiring harness with the lamp attached, up out of the quartz sleeve (Figure 8). Use a CLEAN PAPER TOWEL to handle the lamp. The wire must be disconnected from the lamp before it can be fully removed.
6. Place the lamp aside to be reinstalled after cleaning the sleeve.

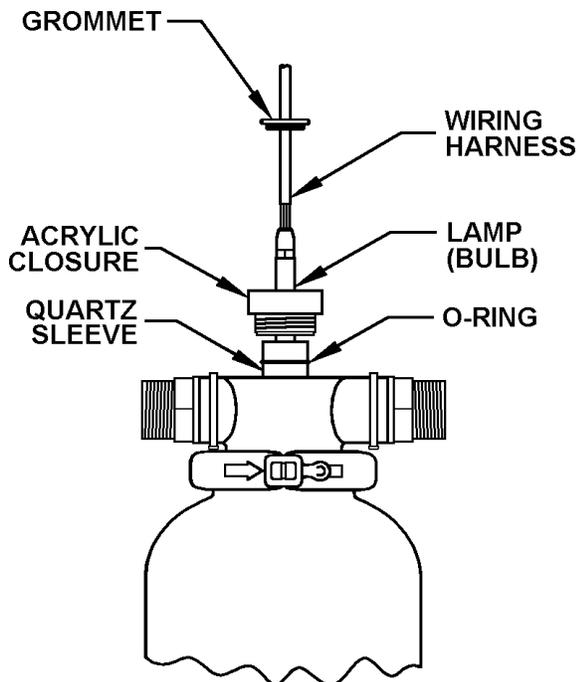


Figure 8.

7. Verify pressure has been relieved, then unscrew the clear acrylic closure from the UV head. The quartz sleeve will float up as the closure is removed. Use a CLEAN PAPER TOWEL to handle the sleeve.
8. After removing the sleeve, it should be cleaned using a soft cloth. If necessary, vinegar can be used to clean the sleeve. DO NOT use an abrasive cleaner which could scratch the sleeve.
9. Make sure o-ring is in place approximately 1-1/2" down from the top of the sleeve. Re-insert sleeve into unit carefully making sure it passes through the centering device inside the tank. Removal of some of the water inside the tank may facilitate reinstallation of the sleeve.
10. Place the clear acrylic closure over the open end of the sleeve, gently push down until the closure meets the UV head and screw closure down until snug, DO NOT overtighten as the joint uses an o-ring seal (Figure 9).
11. Reinstall the UV lamp.

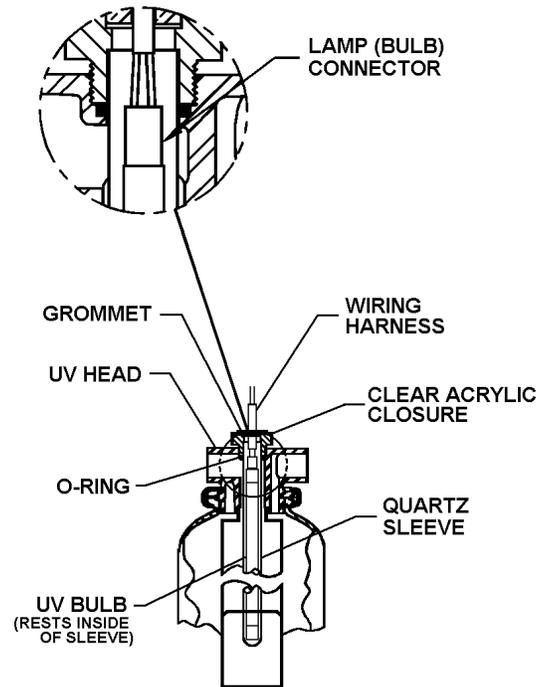
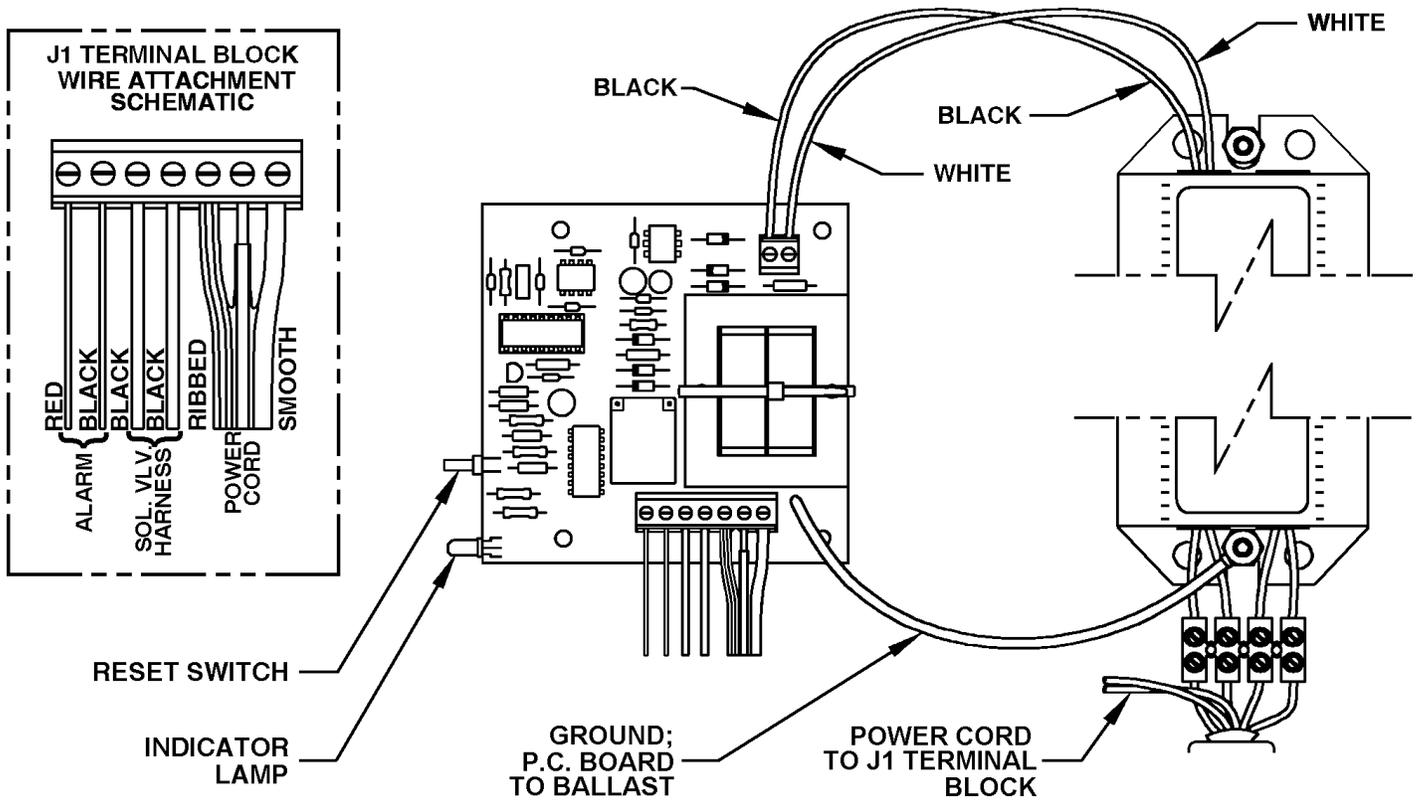


Figure 9.

12. Reinstall rubber grommet into acrylic closure.
13. Reattach solenoid valve to wiring harness.
14. Plug power cord back into power source. The audible alarm will sound until the lamp illuminates, as indicated by a glow in the clear closure, but the solenoid valve will not open for approximately two (2) minutes to allow lamp to reach full intensity before water is allowed to pass through the unit. NEVER LOOK DIRECTLY AT AN ILLUMINATED UV LAMP.

WIRING SCHEMATIC



TROUBLESHOOTING

PROBLEM	CAUSE	REMEDY
UV Lamp is Not Illuminated.	<p>A. Unit is not plugged into electrical outlet.</p> <p>B. GFCI (ground fault circuit interrupter) is tripped.</p> <p>C. The UV lamp is spent.</p> <p>D. Improper lamp connection.</p> <p>E. Ballast not functioning.</p>	<p>1. Plug unit into properly grounded power source.</p> <p>1. Reset.</p> <p>1. Replace lamp.</p> <p>1. Verify proper connection and check for loose wire.</p> <p>1. Replace ballast.</p>
High Bacteria in Treated Water	<p>A. UV lamp has lost its effectiveness.</p> <p>B. Quartz sleeve is dirty.</p> <p>C. Change in feed water quality.</p> <p>D. Contamination after the BIOLITE System.</p>	<p>1. Replace lamp. Perform at least annually.</p> <p>1. Remove and clean as described in the "Maintenance" Section.</p> <p>1. Verify feed water meets required specifications and pretreatment is functioning properly.</p> <p>1. Entire plumbing system must be shock treated with chlorine after the installation of the UV unit.</p> <p>2. Check for bypass around UV unit and correct. Shock plumbing system with chlorine.</p> <p>3. Inlet valve was opened during a power outage. Entire plumbing system must be re-shocked with chlorine.</p>
Pressure Drop	<p>A. Pre-filter is dirty.</p>	<p>1. Replace pre-filter with proper micron rating.</p>
No Water To Service, UV Lamp is Illuminated	<p>A. Inlet solenoid valve is closed.</p> <p>B. Inlet solenoid valve is closed and alarm is sounding.</p>	<p>1. Check for 24 VAC power to solenoid:</p> <ul style="list-style-type: none"> a. No power, check for loose wire. b. No power, unit is in two minute delay after power interruption. Wait two minutes and check again. c. No power, replace circuit board in control box. d. Proper power, replace solenoid valve. <p>1. Sensor inoperable. Replace circuit board.</p>

PROBLEM	CAUSE	REMEDY
Alarm is Sounding, Water Still Flows, UV Lamp Not Illuminated	A. Manual bypass on solenoid valve open. B. Defective solenoid valve.	1. Close by turning it down. 2. Re-sterilize system with chlorine. 1. Replace as necessary. 2. Re-sterilize system with chlorine.
Alarm Is Sounding, No Water Flows, UV Lamp Not Illuminated	A. UV lamp is spent. B. Defective ballast.	1. Replace as necessary. 1. Replace as necessary.
UV Lamp Not Illuminated, Water Flows, Alarm Not Sounding	A. Circuit board defective.	1. Replace as necessary. 2. Re-sterilize system with chlorine.
UV Lamp Not Illuminated, No Water Flows, Alarm Not Sounding	A. Defective alarm. B. Defective circuit board.	1. Replace as necessary. 1. Replace as necessary.
Alarm is sounding intermittently, Indicator lamp RED	A. UV Lamp in service for 1 year.	1. Replace UV lamp and reset.

COMPONENT PARTS LIST

REF. NO.	DESCRIPTION	BIO12
1	Cap, Clear Acrylic	UVTHC-1X
2	O-ring	ORG-118
3	Ultraviolet Lamp	UVLB-1X
4	Nipple Kit, 1" (Incl. 2 ea. Ref. 4,6 & 12)	PKNPL100
5	Flow Control Retainer (Incl. Ref. 13 & 14)	FCR-1X-120
6	Quick Release Clip	QRC20
7	Control Box Assy. (Incl. Ref. 8-11)	UVCTL-1X
8	Circuit Board	UVPCB-2X
9	Buzzer	BUZZER-1X
10	Wiring Harness Assy.	UVWH-2X
11	Ballast	UVBA-1X
12	O-ring	ORG-214
13	O-ring	ORG-017
14	Flow Control Button, 12 gpm	FCB2-120
15	O-ring	ORG-234
16	Head Assembly (Incl. ref. 15)	FH45VX
17	Solenoid Valve w/Wiring Harness	UVSOL-1X
18	Quartz Sleeve (Incl. Ref. 2)	UVQS-1X
19	Latch, Clamp	FC45C
20	Clamp Assembly (Incl. Ref. 19)	FC45XX
21	Tank w/Base	MTP0744FB
22	Gravel	QC-12

