Ultraviolet Water Disinfection System
Operation and maintenance Manual

Sunburst – SB Series

Siemens Water Technologies, Corp.
80 Commerce Drive
Allendale, NJ 07401
(201) 760-0364

Use this chart to record lamp replacement dates
Call your installer for lamp replacement

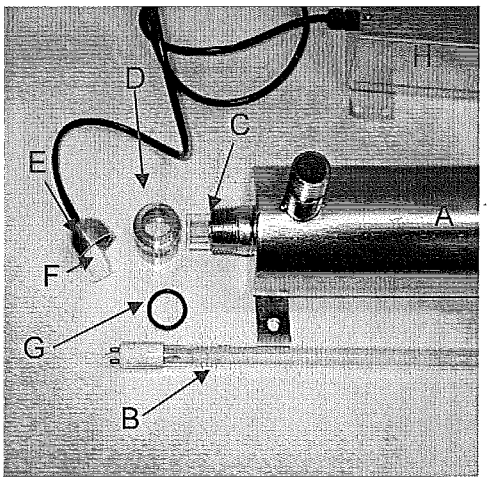
System Install Date:	
Lamp Change Date:	Lamp Change Date:

You should have received the following:

1. Pre-Installation

1.1. Equipment Checklist

A. A disinfection chamber
B. UV lamp(s)
C. Quartz sleeve(s)
D. Compression nut(s)
E. Lamp cap(s)
F. Lamp socket(s)
G. O-ring(s) (stainless washer for JTD system)
H. Power supply
I. Warranty (at end of this manual)



1.2. Your Disinfection Unit – Pre-Installation

Your Ultraviolet (UV) water disinfection system has been tested at Siemens Water Technologies' manufacturing facility. The unit has been hydrostatically pressure-tested to 75 psi. In some cases, a small amount of water may remain in the vessel. In order to ensure that the unit works at optimum performance, please follow the instructions outlined in this manual.

1.3. Warning

UV light is harmful to your eyes and skin. Do not look directly into the light. Always unplug (disconnect power) your unit before installing or removing a lamp. Your unit may have a green LED light that indicates that the lamp is operating (in some products like the SBH Series, an audible alarm will sound in the event of lamp failure). If the LED goes out, contact your dealer for service. If your unit has an audible alarm and it goes off, contact your dealer.

Since the unit is run by electricity, please remember to disconnect all power before servicing the equipment. Failure to do so may result in serious injury or death.

When handling lamps and quartz sleeve be sure to use gloves to prevent them from becoming dirty. If the lamp or quartz sleeve does become dirty, wipe them with isopropanol.

1.4. Inspection

Ensure that lamps and quartz sleeve have not been broken. We recommend that you use gloves when handling lamps and quartz sleeves to prevent them from becoming dirty as dirt and skin oils will impact the UV output.

A warranty card has been included. Please fill out the warranty and send back to manufacturer or dealer. This warrantees the chamber for 5-years and electrical components for 1-year.

1.5. Electrical Requirements

The electronics have been designed to work with standard power supplies. Since the unit is susceptible to power fluctuations, we recommend that the system be kept off any lines where there are surges. This includes pumps or motors. If there are fluctuations, please use a surge suppressor. Systems will come with plugs, which require no "hard wiring". Please refer to the equipment rating plate on the unit.

1.6. Location of the Unit

UV disinfection works best when it is installed closest to point of use. When installing, remember that you will need to be able to remove lamps and quartz sleeve as part of a maintenance schedule. Allow yourself enough room to accomplish these tasks. Unit can be mounted vertically or horizontally. Inlet and outlet can face up or down.

1.7. Your Water Supply

Siemens Water Technologies recommends that trained professionals test and maintain your water supply. In addition to testing the water to see if UV is appropriate, we recommend pre-filtering systems (softeners, carbon, or reverse osmosis) to help remove tastes, odors, minerals and cysts.

1.8. UV Effectiveness

Your disinfection unit needs to be maintained. Change your lamp on a yearly basis and ensure that the quartz sleeve is cleaned on a regular basis.

Failure to do periodic maintenance will impact your unit's effectiveness.

1.9. Flow Rate

Your unit has been designed to accommodate a certain flow rate. In order to work effectively, you may need to install a flow control device. This device attaches to the inlet and controls the water that enters the system. Note: your system may have come with a flow controller.

Failure to use a flow control (available at most plumbing supply stores) may reduce the effectiveness of your disinfection unit.

2. Types of Units

There are two basic types of units:

Close-ended units: where the quartz sleeve looks like a test tube and rests inside the unit.
See sections 3.3, 3.4, 3.5 for Closed Ended unit installation instructions

Open-ended units: where the quartz sleeve extends through both sides of the unit.
See sections 3.6, 3.7 for Open Ended unit installation instructions

3. Your Disinfection Unit – Installation

If you are attempting to install the unit by yourself and you have questions, please call your water quality or plumbing professional. Improper installation can cause potential water damage to your property and can also reduce the effectiveness of the UV disinfection system.

3.1. Recommended Supplies

Before getting started, you will need the following:

- Screws to bolt the unit into place
- Teflon tape to ensure quality sealing
- Shutoff valves for both the inlet and outlet
- Unions before and after the unit
- Flow control (from dealer or plumbing supply house) Note: many units come with this as a standard accessory and looks like a brass disk with a rubber insert. This will be press fit into the inlet and outlet.

3.2. Plumbing

Your unit may be installed under the sink or where the water enters the building. In either case, we recommend that shutoff valves be installed before the inlet and after the outlet. This allows for easier yearly servicing and allows you to shut off the water supply if you have a problem with the unit.

A damaged quartz sleeve can cause a potential leaking problem. An unchecked leak can lead to severe flooding.

3.3. Quartz sleeve for Close-ended Units (creating a watertight unit) SB-7, SB-10, SBW-7, SBW-10, and SLD-8

A sealed unit has one opening for the lamp and quartz sleeve to go into. The quartz sleeve has a dome on one end like a test tube.

Once the unit has been secured and the piping connections have been made, it is time to install the quartz sleeve.

The unit will come with compression nuts and o-rings attached to the chamber on one end. Remove the compression nut and the O-ring from the chamber.

Insert the dome end of the quartz sleeve into the chamber. Guide the dome quartz sleeve until it rests on the spring located at the end of the chamber.

Once on the dome quartz sleeve is firmly placed on the spring, you can hand tighten the compression nut to a snug fit (make sure that the O-ring is properly positioned in the nut).

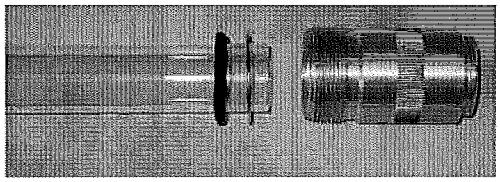
WARNING: Over tightening the compression nut can cause the quartz sleeve to crack.

In order to check the unit for leaks, slowly pressurize it by allowing water to run through it for five minutes. As this is happening, check to see if the seal is dry. If it is not, you will need to redo the seal by repeating the steps above. If the seal is dry, you are prepared to install the lamp.

3.4. Quartz Sleeve Installation for Close-ended Units (creating a watertight unit) JTD-7

Once the unit has been secured and the piping connections have been made, it is time to install the quartz sleeve.

The unit will come with compression nuts, stainless steel O-ring and O-ring attached to the chamber on one end. Remove the compression nut stainless steel O-ring and O-ring from the chamber.



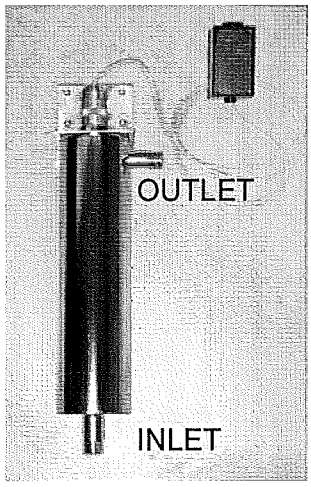
Insert the dome end of the quartz sleeve into the chamber. Guide the dome quartz sleeve until it rests on the spring located at the end of the chamber.

Once on the dome quartz sleeve is firmly placed on the spring, you can hand tighten the compression nut to a snug fit (make sure that the O-ring is properly positioned in the nut).

WARNING: Over tightening the compression nut can cause the quartz sleeve to crack.

In order to check the unit for leaks, slowly pressurize it by allowing water to run through it for five minutes. As this is happening, check to see if the seal is dry. If it is not, you will need to redo the seal by repeating the steps above. If the seal is dry, you are prepared to install the lamp.

NOTE: The inlet side of the JTD-7 unit is located on the opposite side of the compression nipple. The outlet side of the unit is located closest to the compression nipple.



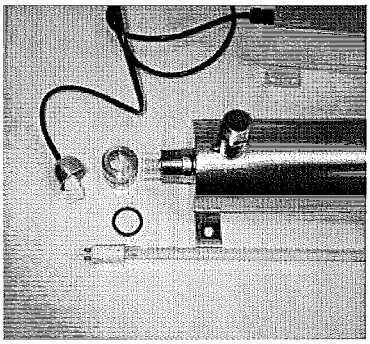
3.5. Lamp Installation for Closed End Units SB-7, SB-10, SBW-7, SBW-10, SLD-8, and JTD-7

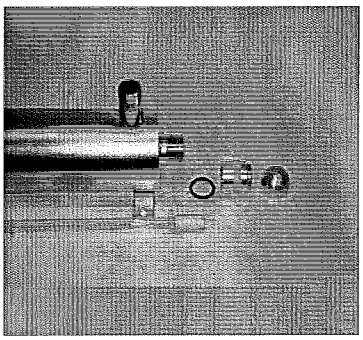
WARNING: Ensure the power to the unit is disconnected before proceeding with lamp installation. UV light is harmful to the eyes and skin.

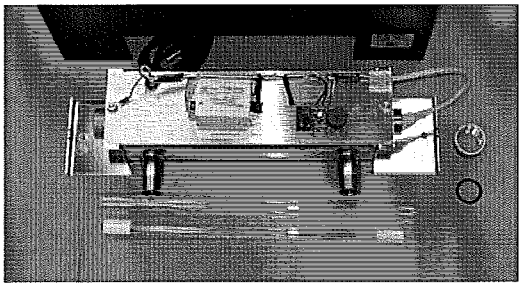
1. Connect the lamp to the socket.
2. Carefully slide the lamp into the end of the dome quartz sleeve. **NOTE: Dropping the lamp can break the quartz sleeve.**
3. Tighten the cap to the compression nut
4. Connect power to the unit

3.6. Quartz sleeve for Open-ended Units (creating a watertight unit) SBH-7 to SBH-20, SB-30 to SB-50, SBW-30 to SBW-50

An open-ended unit has openings on each end of the chamber and the quartz sleeve.







The unit will come with compression nuts and o-rings attached to the chamber on both ends. Remove the compression nut and the O-ring from the chamber.

NOTE: The SB, SBW and SBH units will have a brass cap installed on the nipple to prevent dirt and dust from entering the quartz sleeve.

Insert the quartz sleeve into the chamber. Use your fingers on both sides of the chamber to guide the quartz sleeve into place. The quartz sleeve has to be properly aligned such that both ends of the quartz sleeve extend an equal amount beyond the ends of the chamber.

Making sure that the O-ring is sitting properly in the compression nut, loosely tighten each nut into place by hand. Before tightening, re-check to ensure that the quartz sleeve extends an equal amount beyond the ends of the chamber. Once done, hand tighten until you have a snug fit and have created a tight seal.

WARNING: Over tightening the compression nut can cause the quartz sleeve to crack.

Now that the quartz sleeve is in place, you can test the unit to see if it is watertight. In order to check the unit for leaks, slowly pressurize the unit by allowing water to run through the unit for five minutes. As this is happening, check to see if the seal is dry. If it is not, you will need to redo the seal by repeating the steps above. If the seal is dry, you are prepared to install the lamp.

3.7. Lamp Installation for Open Ended SBH-7 to SBH-20, SB-30 to SB-50, SBW-30 to SBW-50

WARNING: Ensure the power to the unit is disconnected before proceeding with lamp installation. UV light is harmful to the eyes and skin.

5. Connect the lamp to the socket.
6. Carefully slide the lamp into the quartz sleeve such that it is centered within the chamber. **NOTE: Dropping the lamp can break the quartz sleeve.**
7. Tighten the cap to the compression nut
8. Connect power to the unit

3.8. Maintenance

As noted in this manual, your lamp needs to be replaced on a yearly basis the quartz sleeve cleaned on a more frequent basis.

The quartz sleeve may have "build up" on it. If it does, clean it with soap and water. If the quartz sleeve is stained, use a product like CLR or Lime Away (both available at the grocery store).

When you remove the quartz sleeve, please follow the same instructions as above.

A Maintenance Tracking Form has been included at the beginning of this manual on page 2 so you can easily record the maintenance history of your unit.

3.9. Operation Status and Alarms - Basic

The unit may optionally have come with an audible and / or visual lamp status alarm. In the event of a lamp out, the audible alarm will sound. If the unit has a visual alarm, a green LED light will indicate the lamp is on. If the LED light is not on, then the lamp is not functioning properly and you should contact your water professional to see if the lamp needs to be replaced.

WARNING: If the audible and / or visual alarm is on, the water may not be safe to drink.

If the lamp is working, suspect that the alarm board has been damaged and is in need of repair.

3.10. Recommendations

- Use a licensed plumber or qualified water professional for the installation of the UV system.
- Check the unit on a regular basis to see if the lamp is on (the green LED indicator will tell you if the lamp is working).
- When first installing the unit, you will need to make sure that all plumbing after the unit has been sanitized. This will make ensure all microorganisms have been destroyed. Plumbers often fill the UV chamber with disinfectant and flush out the pipes. They do this by opening all spigots and allowing the disinfectant to run its course through the pipes. Only professionals should do this because many disinfectants can be harmful or fatal if swallowed.
- Install carbon filters, softeners, or reverse osmosis systems BEFORE the UV system. These types of filters can breed microorganisms and should NOT be installed AFTER the UV system.
- Use a flow control device that is rated for your unit's GPM flow rate.

4. Options

Your system may have come with optional equipment. Below are instructions for the various options offered for the UV systems.

4.1. Quartz Sleeve Cleaning System for SB and SB DOH Systems

Your system may have come with an optional manual quartz sleeve cleaning system. This device will allow you to clean the quartz sleeve without having to disassemble the disinfection chamber.

WARNING: The manual wiping plunger installed on the system may be forced out when water pressure builds up. When installing the unit, make sure that you stand clear of the plunger when pressurizing the system.

The quartz sleeve in your UV system should be cleaned a minimum of two (2) times per month to ensure optimum performance. To clean quartz sleeve, pull the plunger toward you and then push it in again. Repeat this process 2-3 times per cleaning.

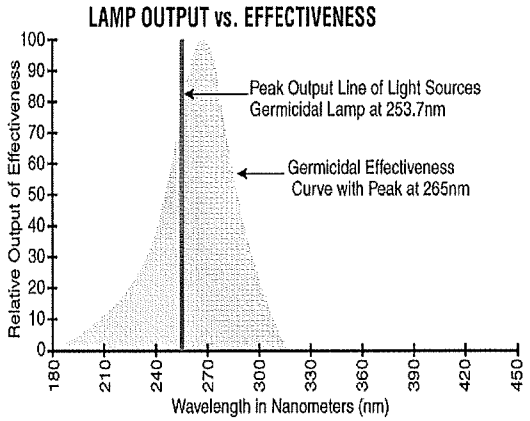
You may need to change the O-rings on the wiper periodically. Please open the system once a year to inspect the quartz sleeve and the wiper rings.

4.2. UV Monitoring System

The UV monitoring system that may have been provided with your system is designed to provide the relative UV output of your systems lamp(s) and provide a representative overview of how the lamp(s) is performing. Low readings may indicate:

1. the lamp is coming to the end of life
2. the quartz sleeve is dirty
3. the sensor window is dirty
4. the transmission of the water has changed.

The UV monitoring system is a true ultraviolet (UV) sensing system as it senses only the germicidal energy spectrum as shown on the following chart. Unlike light sensors, which register any wavelength including daylight, the UV monitor is a precision instrument designed to work on a particular wavelength.



Standard low-pressure lamps produce close to 95% of its light in the 254-nanometer range. The sensor head contains a quartz-filtering device that blocks all wavelengths except those required for the destruction of microorganisms.

The UV monitoring system provides a normally open and a normally closed contact, which may be used for remote monitoring purposes. For instance, the normally closed contact will keep a normally closed valve open. Upon alarm, it will cut power and close the valve. At the same time, the normally open could trigger a remote alarm.

Note: the UV monitoring system does not provide a 4-20 mA output.

4.2.1. Operation and Maintenance

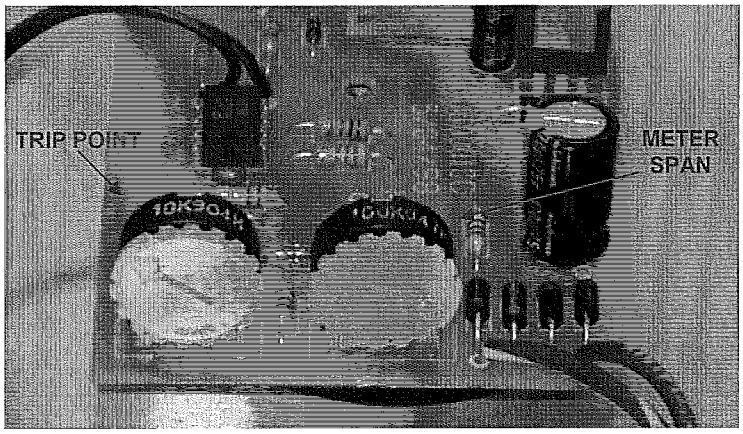
The UV monitoring system has been factory calibrated and should not need to be re-calibrated for many years. If you experience a problem, use the following procedures to re-install or re-calibrate the system. You will need to keep the sensor and quartz sleeves clean to get better and more accurate readings. If at all possible, let your water quality professional do the maintenance.

A black plastic cap on the side of the chamber retains the sensor head. The sensor head is plugged into a mating receptacle on the meter control assembly. Note: any calibration should be made with new UV lamps and clean quartz sleeves.

4.2.2. Installation and Calibration

1. Locate the stainless steel sensor port on the side of the chamber.

2. Dry the inside of the port with a lint free cloth.
3. Insert the O-ring into the port.
4. Insert the glass into the port over the O-ring (do not get finger prints on glass).
5. Insert the sensor head and loosely tighten the black retainer cap over the sensor head.
6. Connect the sensor to the UV monitor with the plastic clip connectors.
7. Turn on the UV light with the chamber empty.
8. The meter electronics and faceplate will be contained in the control box.
9. When working on the electronics remember that 120 or 220 VAC is present.
10. On the back of the meter faceplate is a printed circuit board. On one end of the circuit board there are two thumb wheels to adjust the meter span and trip point. The thumb wheel in the center of the board is for meter span. The thumb wheel located near the edge of the board sets the relay trip point.



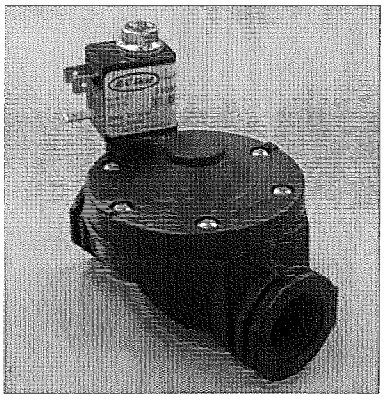
11. To insure that the meter is functioning, turn power on (make sure no water or water pressure is present).
12. Watch the meter face and slowly withdraw the sensor away from the holder.
13. At the meter reading where the trip point has been factory set, you should hear the relay actuate.
14. If the relay does not actuate, you will need to make an adjustment. Adjusting the edge thumb wheel with your hand.
15. This trip point is where a solenoid or other warning device like an audible alarm will be triggered.
16. To lower the meter reading, slowly withdraw the sensor head from the chamber assembly while observing the meter and listening for the relay click. By inserting and removing the sensor head a little at a time, the meter will move over the trip point area. Adjust the thumb wheel to the desired setting
17. Now, tighten the sensor probe to the chamber.
18. The meter reading should be near or above full-scale reading. It may take one to two minutes for the meter to read full scale.

After 100-hour burn-in, the UV display will need to be re-set to Full-Scale (100%). This is done during nominal operating and water quality conditions. This UV reading is not NIST calibrated to absolute mW/cm2 intensity. It cannot be used directly in calculating dosages. It is simply a relative % of its nominal specified operating performance. Initial setup is obviously 100 % of nominal performance, since everything is brand new. Subsequently, any decline in UV Relative % Intensity is likely any combination of:

- fouling quartz sleeves
- fouling UV probe face
- lamp aging
- water quality (% UV Transmission)
- UV detector aging
- eroding electrical connections.

A low UV Relative % Intensity Threshold setting may optionally* be used to activate a Common Alarm.

4.3. Automatic Shut-off Valve



Your system may have come with an optional automatic solenoid valve.

This device will stop the water flow if the UV lamp goes out or if the UV intensity falls. The solenoid will work off of a signal from the ballast, which indicates lamp out. If the lamp fails, then the solenoid will shut off the water supply. It is considered a "normally closed" valve meaning if there is no power applied to the system, the solenoid valve will close and restrict the flow of water through the system. This will occur during a power outage or lamp failure. If the UV intensity of the lamp falls to an unsafe level the solenoid valve will close preventing the flow of water through the system. Whether the water flow is stopped due to power issues or UV intensity issues, you will need to investigate the cause of the stoppage and repair accordingly.

Typical reasons for water flow stoppage include:

- Power failure
- UV Lamp failure
- Ballast failure
- Solenoid damage

There is a manual override on some of the valves depicted with a white toggle switch. Call your water professional in case of an emergency. In order to open the valve, the system must have power. This is generally provided by the UV system, but in emergencies, power can be brought directly to the valve.

The main power box control will have leads for attaching the solenoid and these leads will need to be connected to the leads on the actual solenoid valve. The solenoid will have come with connectors.

Note: The solenoid valve will have an arrow on it indicating flow direction. Please install it the solenoid so that the path of the water goes with the arrow.

5. Replacement Parts List

Systems

Model	Lamp	Quartz sleeve	O-Rings	Compression Fitting	Wiper Rings
SB-7	AAE1193	AAE1592	AAE5312	AAE2420	N/A
SB-10	AAE1295	AAE1592	AAE5312	AAE2420	N/A
SB-15	AAE1166	AAE1613	AAE5312	AAE2420	N/A
SB-20	AAE1298	AAE1613	AAE5312	AAE2420	N/A
SB-30	AAE1286	AAE1613	AAE5312	AAE2420	N/A
SB-40	AAE1430	AAE1613	AAE5312	AAE2420	N/A
SB-50	AAE1298	AAE1613	AAE5312	AAE2420	N/A
SBW-7	AAE1193	AAE1592	AAE5312	AAE2420	AAE5519
SBW-10	AAE1295	AAE1592	AAE5312	AAE2420	AAE5519
SBW-15	AAE1166	AAE1613	AAE5312	AAE2420	AAE5519
SBW-20	AAE1298	AAE1613	AAE5312	AAE2420	AAE5519
SBW-30	AAE1286	AAE1613	AAE5312	AAE2420	AAE5519
SBW-40	AAE1430	AAE1613	AAE5312	AAE2420	AAE5519
SBW-50	AAE1298	AAE1613	AAE5312	AAE2420	AAE5519
SB-7-DOH	AAE1193	AAE1592	AAE5312	AAE2420	AAE5519
SB-10-DOH	AAE1295	AAE1592	AAE5312	AAE2420	AAE5519
SB-15-DOH	AAE1166	AAE1613	AAE5312	AAE2420	AAE5519
SB-20-DOH	AAE1298	AAE1613	AAE5312	AAE2420	AAE5519
SB-30-DOH	AAE1286	AAE1613	AAE5312	AAE2420	AAE5519
SB-40-DOH	AAE1430	AAE1613	AAE5312	AAE2420	AAE5519
SB-50-DOH	AAE1298	AAE1613	AAE5312	AAE2420	AAE5519
SBH-7	AAE5432	AAE1553	AAE5312	AAE5195	N/A
SBH-10	AAE5435	AAE1553	AAE5312	AAE5195	N/A
SBH-15	AAF5429	AAE1583	AAE5312	AAE5195	N/A
SBH-20	AAF4856	AAE1583	AAE5312	AAE5195	N/A
SLD-8	AAE1193	AAE1592	AAE5312	AAE2420	N/A
SLD-12	AAE1271	AAE1610	AAE5312	AAE2420	N/A
JTD-7	AAE1193	AAE1571	AAE5309	AAE2384	N/A

Optional Equipment

UV Monitor

Sensor Glass	Sensor O-Ring	UV Sensor	Face Plate	Monitor Board	Black Retainer Cap
AAE5306	AAE5315	AAE5297	AAF5306	AAE3533	AAE3878

DOH Alarm Tower

Base and Cap	Red Lens	Bulb	Alarm Module
AAE3017	AAE3011	AAE2903	AAE3125

NOTE: Please contact Siemens Water Technologies for components not listed here.

Warranty Registration

MODEL NUMBER/TYPE: _____

DEALER NAME: _____

PURCHASE DATE: _____

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ POSTAL CODE: _____

COUNTRY: _____

PHONE: _____ EMAIL:_____

Please fill out the above information and forward it to your dealer or to Siemens Water Technologies. This will provide you with a 5-year warranty on the stainless steel chamber and a 1-year warranty on the electrical components. UV lamps are warranted for 30 days. After the initial 30 days of operation, replacement or refund will be pro-rata based on the expected lamp life of 9,000 hours.

In addition, this will allow your dealer to remind you when it is time to replace your lamp and quartz sleeve.

This warranty applies to equipment that has been installed and maintained according to the instructions in this manual. Siemens Water Technologies is not responsible for damage due to improper use, operation or installation.

This warranty needs to be received by Siemens Water Technologies within 20 days of initial operation. The warranty applies to replacing defective equipment.

Siemens Water Technologies shall have no liability hereunder, either direct or contingent, for any consequential damages. Water Technologies recommends that you use pre-filters, flow-control devices and inspect the lamp to ensure that it is functioning.

80 Commerce Drive
Allendale, NJ 07401
(201) 760-0364 Fax (201) 760-0586

BASIC TROUBLESHOOTING FOR SB (Sunburst) UV Systems

Symptom ***Cause***

Green LED not illuminated on power supply

IF:	THAN:
1) Audible alarm sounding (SB-20 and lower)	Faulty or incorrect lamp installed
	NOTE: If correct lamp is installed and a known good lamp has been tested, and the Alarm is still sounding, contact Siemens. There are rare situations where failed power supplies can mimic lamp outage symptoms
2) Audible alarm not sounding (SB-20 and lower)	Failure of power supply
For SB-30 and larger, troubleshooting must be done by a trained service technician. **WARNING: Never remove or expose a UV lamp to open air unless all proper precautions and PPE are available as per the Siemens Manual.**	
NOTE) For SB-30 and larger units, visual lamp status condition must be checked.	Verify lamp outages and replace lamp/power supply as required.