

# Installation and Operating Instructions, SS15/SS30/SS55/SS75 SSi15/SSi30/SSi55/SSi75 Ultra Violet Systems

## Basic principles of UV

### INTRODUCTION

Thank you for purchasing a Wrekin UV Disinfection unit. The following pages contain information that will help you install, operate, and maintain this equipment. Before we discuss the installation procedure, we believe it will be beneficial for you to learn a little about the process of UV Disinfection.

### HOW UV DISINFECTION WORKS.

UV (Ultra Violet) Disinfection of water is achieved by simply exposing the water to UV light of a specific wavelength. This wavelength is known as the Germicidal Wavelength.

The output of the UV lamp is concentrated at 254 nanometres, the most effective wavelength for penetrating the outer skin of Bacteria and Virus cells.

Irradiating water in this manner damages the DNA of the cell, preventing it from reproducing. In effect, this action destroys any pathogenic properties the cell may possess.

The UV lamp is positioned inside a quartz sleeve, which prevents the water that passes through the UV chamber from coming into direct contact with the UV lamp, whilst at the same time allowing the UV light to pass through into the water without interference.

The effectiveness of the UV system is determined by the intensity of the UV light and the amount of time the water is exposed to that light.

1. Water enters and flows into the chamber, between the UV body and the quartz sleeve.
2. The quartz sleeve, positioned inside the UV chamber, prevents the UV bulb from coming into direct contact with the water. A rubber 'o' ring washer, Teflon washer and Gland Nut hold the quartz sleeve in place in the UV body
3. The UV lamp sits inside the quartz sleeve and is held in place by lamp connectors.

We recommend fitting a Pre-Filter of 5 micron before all UV systems. This filter will remove sediment from the water and will prevent an effect called shadowing, where contaminants can hide behind larger particles as they pass through the UV chamber.

To help monitor the performance of the UV system we recommend that the water sample points be installed either side of the unit. Simply comparing the quality of water at these points will provide an easy 'before and after' method for testing the effectiveness of the UV system.

The water sample point situated before the inlet to the UV system will also serve as a drain point for flushing through newly installed filters (if fitted). In addition we would also recommend that isolating valves be fitted either side of the UV system to facilitate servicing at a later date.

If you are installing a pre-filter, care should be taken to ensure you have adequate pressure to allow the filter to perform as specified. The optimum incoming pressure to the filter is in the region of 2 to 3 BAR. The maximum pressure must not exceed 5 BAR. If you are unsure of your water pressure, ask your water company (or plumber if you have a private water supply) for details.

Water passing through the UV will be disinfected, but there is no residual effect, so care has to be taken to ensure contamination does not occur downstream of the UV. For this reason it is recommended that the UV be installed as close to the point of use as is practical. When positioning your UV unit, you should allow sufficient room at one end of the UV body to remove and replace the quartz sleeve and UV lamp. The lamp will need replacing every 12 months

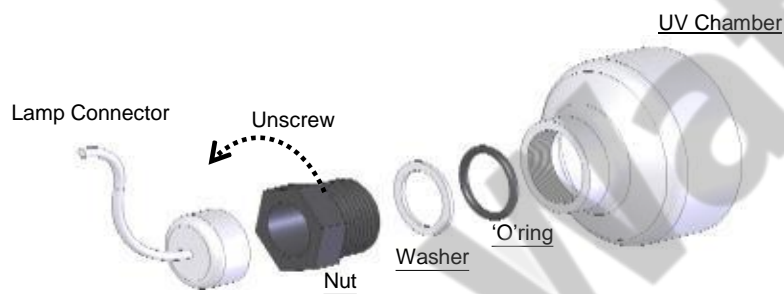
## Electrical Requirements

These UV units need to be connected to a 3 amp fused, 230v (50hz) supply. The spur must incorporate a switch to enable maintenance or repair of the equipment. The Power Supply unit should be installed above the main UV body when installed in the horizontal position to prevent condensation from dripping onto the PSU

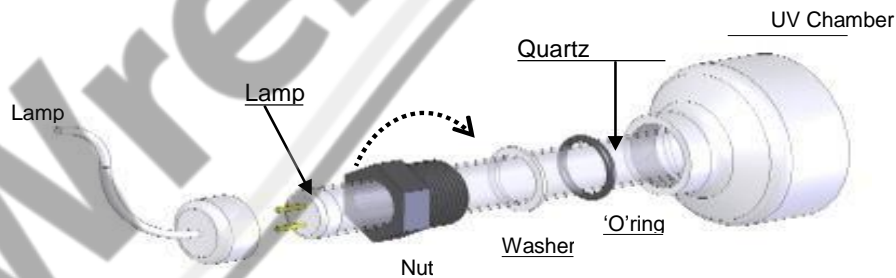
## ASSEMBLY OF QUARTZ SLEEVE AND UV LAMP.

The instructions below describe the procedure for the initial installation of the quartz sleeve and UV lamp.

1. Make sure the main plug from the control panel IS NOT connected to the mains supply. The power should not be switched on until the latter stages of the installation.
2. Remove the grey lamp connectors from each end of the UV chamber.
3. Unscrew the black PVC retaining nuts to expose the Teflon washers and 'O' ring seals. Remove both of these items.



4. Check the quartz sleeve for any signs of damage before continuing with installation. If the quartz sleeve is in good condition, insert the sleeve into one end of the body and carefully guide it through the chamber until it sits centrally. Make sure you can feel an equal length at each end. Please note; the quartz sleeve is very fragile and a great deal of care should be taken to ensure that it isn't damaged during this procedure.
5. Slide the rubber 'O' ring onto one end of the quartz sleeve. **Do NOT Use silicone grease.** Repeat this procedure on the other end of the quartz sleeve. Position the 'O' rings so they sit in the chamfer recess at each end of the UV chamber.
6. Slide the Teflon washers over the quartz sleeve until they touch the 'O' rings. Make sure the quartz sleeve sits centrally in the UV chamber.



7. Slide the Nuts over each end of the quartz sleeve and tighten until they touch the washers. Tighten each, alternately until they are hand tight. Complete the tightening of the gland nuts with grips to ensure a tight watertight seal.
8. Allow the UV chamber to fill with water, check for leaks and gently tighten the end nuts if required. Ensure all water connections to the unit remain dry. If possible, do this before inserting the bulb but certainly before switching on the power to avoid blowing the bulb
9. Check for water leaks.
10. Gently slide the UV lamp into the quartz sleeve. Avoid touching the UV lamp for longer periods as is absolutely necessary. The aim is to avoid leaving finger marks on the glass.
11. Attach the lamp connectors to the two pins at each end of the UV lamp. Make sure the UV lamp sits centrally in the quartz sleeve.
12. Connect the electrical supply and allow the UV lamp to warm up for 10 minutes before allowing water to pass at full flow.

## General maintenance

### Introduction

There are three components that need to be checked periodically; the UV lamp, pre-filter (if fitted) and the quartz sleeve.

### UV Lamp

The kill rate is determined by the amount of time water is exposed to the UV light and the intensity of that light. The intensity of the UV lamp reduces with age. For this reason we recommend that the UV lamp be changed at least every 12 months. It should be noted that frequently switching the UV system on and off, would rapidly diminish the life of the UV lamp. Used lamps should not be broken and should be disposed of thoughtfully.

### Pre-filter

This filter will remove sediment from the water and will prevent an effect called shadowing, where the contaminants can hide behind larger particles as they pass through the UV chamber. This filter will need replacing every 3 to 6 months, depending on the quantity of incoming water (see instructions that are supplied with filter for information on filter replacement). The pressure drop across the filter can be in the region 1.5 BAR which means it must be installed in a part of the system that is fed by a minimum of 2.5 3 BAR i.e. mains pressure. NB The filter should not be installed on the down service from a storage tank where the head of pressure is less than 2 BAR. (20 metres or 70 feet).

### Quartz sleeve

The UV lamp is positioned inside a quartz sleeve, which prevents the water that passes through the UV chamber from coming into direct contact with the UV lamp. Whilst at the same time allowing the UV light to pass through into the water without interference. To ensure full penetration of UV light into the water, the quartz sleeve should be cleaned at a minimum of 6 monthly intervals. It may be advisable to check the quartz sleeve more frequently if there is no pre-filter or in areas where the water is hard. Gloves should be worn when changing the quartz sleeve.

## ROUTINE MAINTENANCE

### MONTHLY

Visually check the lamp. The end of the lamp / quartz sleeve will glow during normal operation. It is safe to view UV light from the ends in this way, however you should not look directly at the surface of the UV lamp when it is switched on.

### 3 MONTHLY

If fitted, check and replace pre-filter if necessary. The pre-filter should be changed at least every 6 months.

### ANNUALLY

Replace UV lamp. Check water samples from pre and post UV water sample points (if installed) to ensure the UV product water is microbiologically safe. Depending on the quality of your incoming water, it may be advisable to check the quality of the product water more frequently than this.

### System Disinfection:

When the system is installed it may be advisable to disinfect the lines throughout the home or facility. To do this simply follow the simple steps below. You can also do this if there is any secondary infection downstream of the UV

- 1) Before performing this task, check there are no "Dead Ends" in the system as these can harbor bacteria. Ensure the UV is switched on and ready for operation before starting this procedure
- 2) Remove the cartridge from the filter sump and fill with 1-2 cups of household bleach. (Most household bleaches contain 5.2% of chlorine) Replace the filter sump and slowly turn on the water.
- 3) Go to each household location including outside taps and run water off until chlorine can be detected by smell. Ensure all taps are checked particularly taps that will dispense Drinking and cooking water. Allow the chlorine to sit in the line for at least 30 minutes.
- 4) After 30 minutes, reinstate the Filter in the Pre-Filter Housing and run through all taps until the chlorine smell cannot be detected. Your system has then be disinfected

## **LAMP REPLACEMENT**

Listed below are instructions for replacing the UV lamp

1. Isolate the electrical supply before removing the connectors from the two pins at either end of the UV lamp.
2. Isolate the water supply to ensure un-treated water does not pass into the system during maintenance.
3. Remove the UV lamp.
4. Remove the lamp connectors from each end of the UV lamp and withdraw the old / damaged UV lamp. Dispose of the UV lamp through your local recycling center.
5. Carefully slide the new UV lamp into the quartz sleeve. Keep the UV lamp straight. Avoid touching the glass of the UV lamp. The UV lamp is fragile, so handle with care.
6. Leaving one end of the UV lamp clear of the UV body, push the connectors onto the two pins at the end of the UV lamp.
7. Push the connector cable and lamp a few inches into the quartz sleeve until the opposite end is exposed; push the connector onto this exposed part of the UV.
8. Push the connector cable and lamp back into the quartz sleeve until the UV lamp sits centrally.
9. Turn on the electrical supply and ensure the ends glow blue. Allow the lamp to warm up for 10 minutes before turning on the water and allowing water to flow through the chamber.

## **QUARTZ SLEEVE REMOVAL AND CLEANING**

Listed below are instructions for removing and cleaning the quartz sleeve. Care should be taken to avoid damaging the quartz sleeve, as this component is very fragile

1. Isolate the water flow and electrical supply before removing the connectors from the two pins at either end of the UV lamp.
2. Having isolated the electrical supply, remove the UV lamp.
3. Allow as much water as possible to drain from the UV chamber before continuing with the next step.
4. Remove the nuts, Teflon washers and 'O' ring seals from each end of the quartz sleeve.
5. Withdraw the quartz sleeve taking care not to allow it to drop into the chamber. Failure to follow this instruction could lead to the ends of the quartz sleeve being damaged.
6. Inspect the quartz sleeve for discoloration and damage. If the quartz sleeve is damaged in any way then it must be replaced. Installing a damaged quartz sleeve can lead to water leakage at a later date.
7. If necessary, wash the quartz sleeve with soapy water. Use a bleach solution to remove any heavy stains. Take care not to damage the quartz sleeve during this process.
8. Dry the quartz sleeve thoroughly (inside and out) before re-installing into the UV chamber.
9. Centralise the quartz sleeve in the chamber.
10. Lubricate one of the 'O' ring washers with a small amount of washing up liquid (Do NOT Use Silicone Grease) and slide it onto one end of the quartz sleeve. Repeat this on the other end of the quartz sleeve. Position the 'O' rings so they sit in the chamfer recess at each end of the UV chamber.
11. Slide the Teflon washers over the quartz sleeve until they touch the 'O' rings. Make sure the quartz sleeve sits centrally in the UV chamber.
12. Slide the nuts over each end of the quartz sleeve and tighten until they touch the washers. Tighten each alternately until they are hand-tight. Using grips, tighten the Nuts further to ensure a good watertight seal.
13. Allow the UV chamber to fill with water, check for leaks and gently tighten the end nuts if required. Ensure all water connections to the unit remain dry. Ensure the inside of the quartz sleeve also remains dry.
14. Attach the lamp connectors to the two pins at each end of the UV lamp. Make sure the UV lamp sits centrally in the quartz sleeve.
15. Connect the electrical supply and allow the UV lamp to warm up for 10 minutes before allowing water to pass at full flow.
16. Check for water leaks.



## Warranty information

Except for the UV lamp and quartz sleeve, all parts of your UV system are covered by a 12-month warranty. The warranty period starts from the date of despatch. All components should be inspected on receipt and supplier contacted immediately if damage is found. This warranty covers workmanship in manufacture only. Under the terms of our warranty, any faulty part should be returned to Wrekin Water Softeners Ltd directly. We reserve the right to replace or repair the part at our discretion.

### UV Lamp life

The Lamp should change every 12 months. It should be noted that lamp life would be significantly reduced if the UV lamp were frequently switched on and off.

### Quartz sleeve

The quartz sleeve is very fragile. The warranty applies to shipment only. You should check the quartz sleeve on delivery and report any damage before installation. The warranty does not include damage sustained during quartz sleeve assembly or replacement.

**The warranty excludes labour costs and does not extend to accidental damage, misuse, or normal wear and tear. The above terms do not affect your statutory rights.**



The New intelligent controller offers a number of additional features;

- 1) Lamp countdown from 365 days
- 2) Lamp Failure and End of lamp Life Alarms
- 3) At the end of Lamp Life, the system can be reset for a maximum of 4 times. Each reset will give 7 days
- 4) A3 in the display will remain in the display until the lamp is changed and the full system reset is done.
- 5) When the new lamp is fitted, press and hold down the reset button for up to 30 secs. During this time the display will go through the reset procedure and release as soon as the 365 days appears back in the display

In the event of a power cut it may be necessary to power down the unit for 30 secs before turning back on

## Troubleshooting guide

PROBLEM	POSSIBLE CAUSE	ACTION
UV lamp fails to light	No power	Check fuse. Replace or repair. Check electrical supply
	Starter has failed	Isolate power. Open power pack and replace starter
	Connectors not properly pushed home	Check to ensure green neon light is illuminated. Isolate power. Check and refit connectors at both ends of the UV lamp
	Faulty UV lamp	Replace UV lamp.
	Blown fuse	Check your power supply
	Age of UV lamp	Replace UV lamp
	Water leakage due to damaged quartz sleeve.	Following the procedure set out in early pages, remove the quartz sleeve. Replace if necessary.
UV lamp illuminates, but flickers	Faulty or bad contact on starter	Isolate power. Refit or replace the starter
Water leaks from end nuts	End nuts not tightened properly	Gently tighten end nuts
	Damaged 'O' ring	Replace 'O' ring
	Teflon washer damaged or not fitted	Replace or install as required.
	Quartz sleeve damaged	Remove and check quartz sleeve for chips and cracks. The quartz sleeve is very fragile and the smallest of chips or cracks could lead to a leak. Refit or replace quartz sleeve as necessary.
Water sample fails microbiological test	Problem with test procedure	Ensure all receptacles are properly sterilised before use. Clean sample points thoroughly before taking sample.
	Ingress of contaminated water after UV system. NB UV light does not have a residual effect, therefore your UV system can only be checked by taking a water sample immediately after the outlet to the UV	Check your water system to ensure contaminated water has not infested the UV disinfected water downstream of your UV system (perhaps through a crack in the pip-work or as a result of a dead-leg).
	Pipe-work or fittings contaminated down line of UV system. NB See note above.	Using an approved treatment method, chemically disinfect the system. Speak to Environmental Health for advice.
	Wrong UV lamp size fitted	Check and replace
	UV lamp connectors are wet	Remove and dry out lamp connectors
	Quartz sleeve is dirty	Remove and check quartz sleeve. Replace or clean as required
	Lamp not allowed sufficient time to warm up NB If contaminated water has passed through the system whilst the UV lamp is switched off, or is not properly warm, the system may need to be re-chlorinated before a water test will show an appropriate reading down line of the UV system	Allow lamp to warm up for 10 minutes before passing water through the UV system.
Water flow stops	Blocked pre-filter	Check pre-filter. Replace if necessary.