

UV Sterilizers come in many lengths and diameters

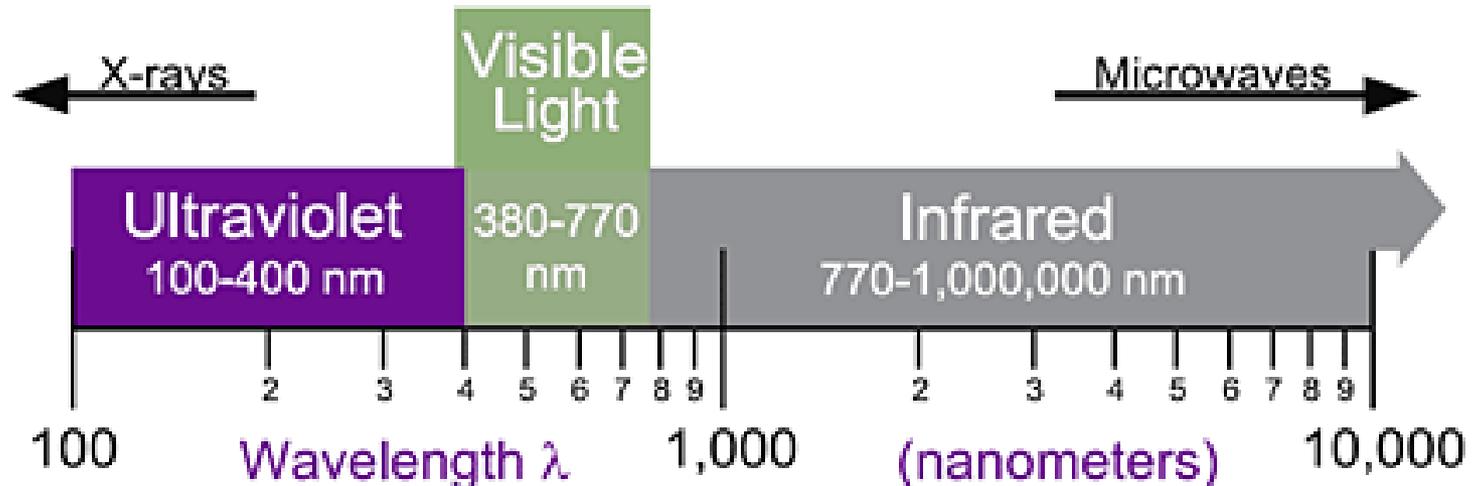
Delta UV Assembled



The Delta UV will be used as an example. Essentially spa water flows through the stainless tube housing which holds a light bulb which radiates passing germs and makes them incapable of reproducing.

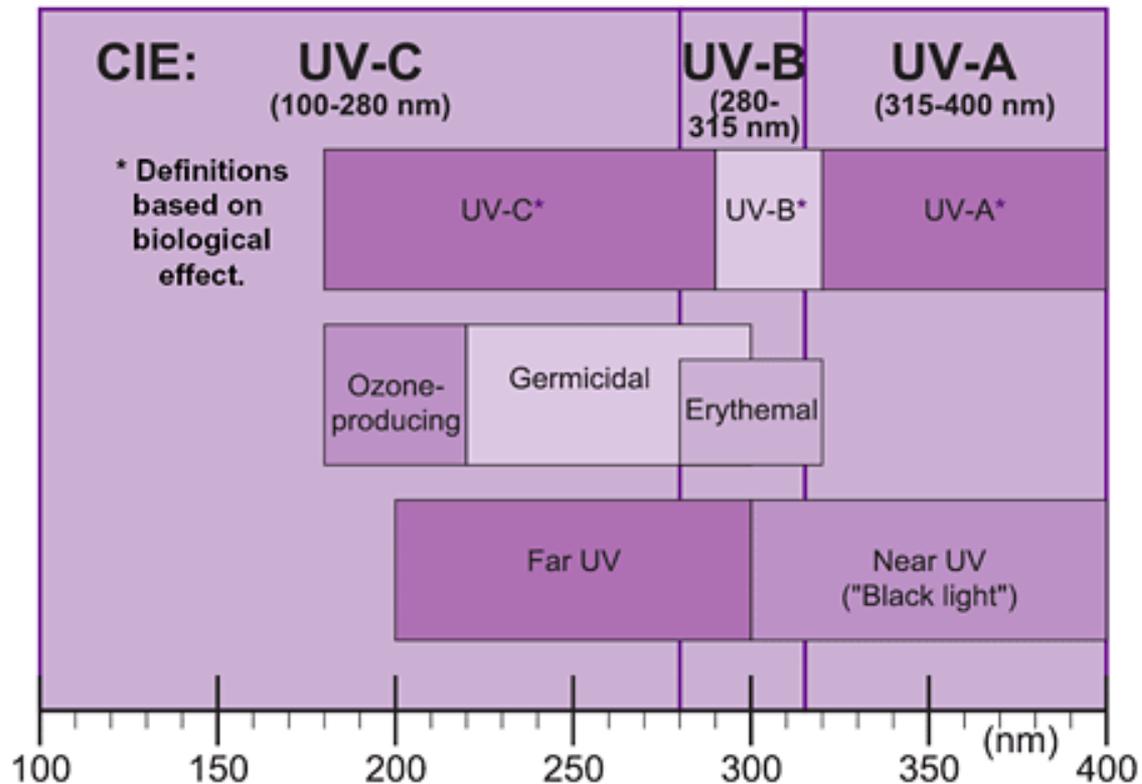
UV Sterilizer (Light Spectrum)

UV is an abbreviation for Ultraviolet light, which is a spectrum of light just below the range visible to the human eye. That is to say UV light is below the blue spectrum of visible light. So UV light cannot be seen by the human eye, and for that reason is often called UV energy.



UV Sterilizer (Light Spectrum)

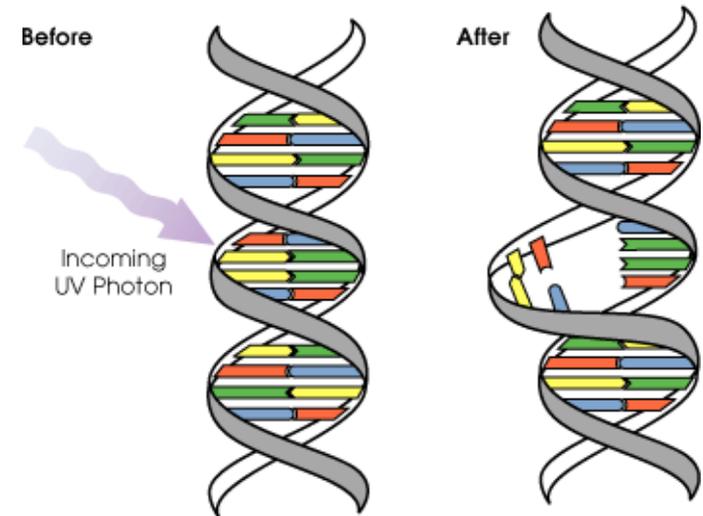
UV light is divided into four groups as measured by wavelength:
(1) Vacuum UV with wavelengths from 100 to 200 nanometers,
(2) UV-C at 200 to 280 nanometers, (3) UV-B at 280 to 315
nanometers, and (4) UV-A at 315 to 400 nanometers.



UV Sterilizer

The UV-C spectrum (200 to 280 nanometers) is the most lethal wavelength for microorganisms, because it disrupts the bonds in the between the atoms in the chemicals in microorganisms. This range of wavelengths, with 264 nanometers being the peak germicidal wavelength, is known as the Germicidal Spectrum.

UV light is a safe and natural method to reduce pathogens and algae. UV is as natural as sunlight and does not leave any residuals in the water. It works in harmony with the spa sanitizer by killing some algae and destroying the DNA in others. With the DNA damaged the microorganism can not multiply.



UV Sterilizer

- Water is pumped through the UV chamber where it is exposed to the UV-C band. (Germicidal range).
- The UV-C light penetrates the cell walls of bacteria, viruses and other microorganisms, altering the DNA or the RNA as in the case of viruses.
- This process kills cells so they are no longer able to replicate.
- A spa with a properly sized UV system will kill 99.9% of all the bacteria and microorganisms in the water.
- Because UV does such an efficient job of sanitizing the water, there is less bacteria in the water and therefore less chemicals are needed to sanitize the water.



UV Sterilizer (Bulb)

To remove the bulb, unscrew the large black nut on the end of the UV Unit and then carefully pull out the bulb.



This should only be performed by a qualified spa technician.

UV Sterilizer (Bulb)

Note: the bulb is enclosed in a crystal tube that allows you to remove it with out closing the in and out valves.

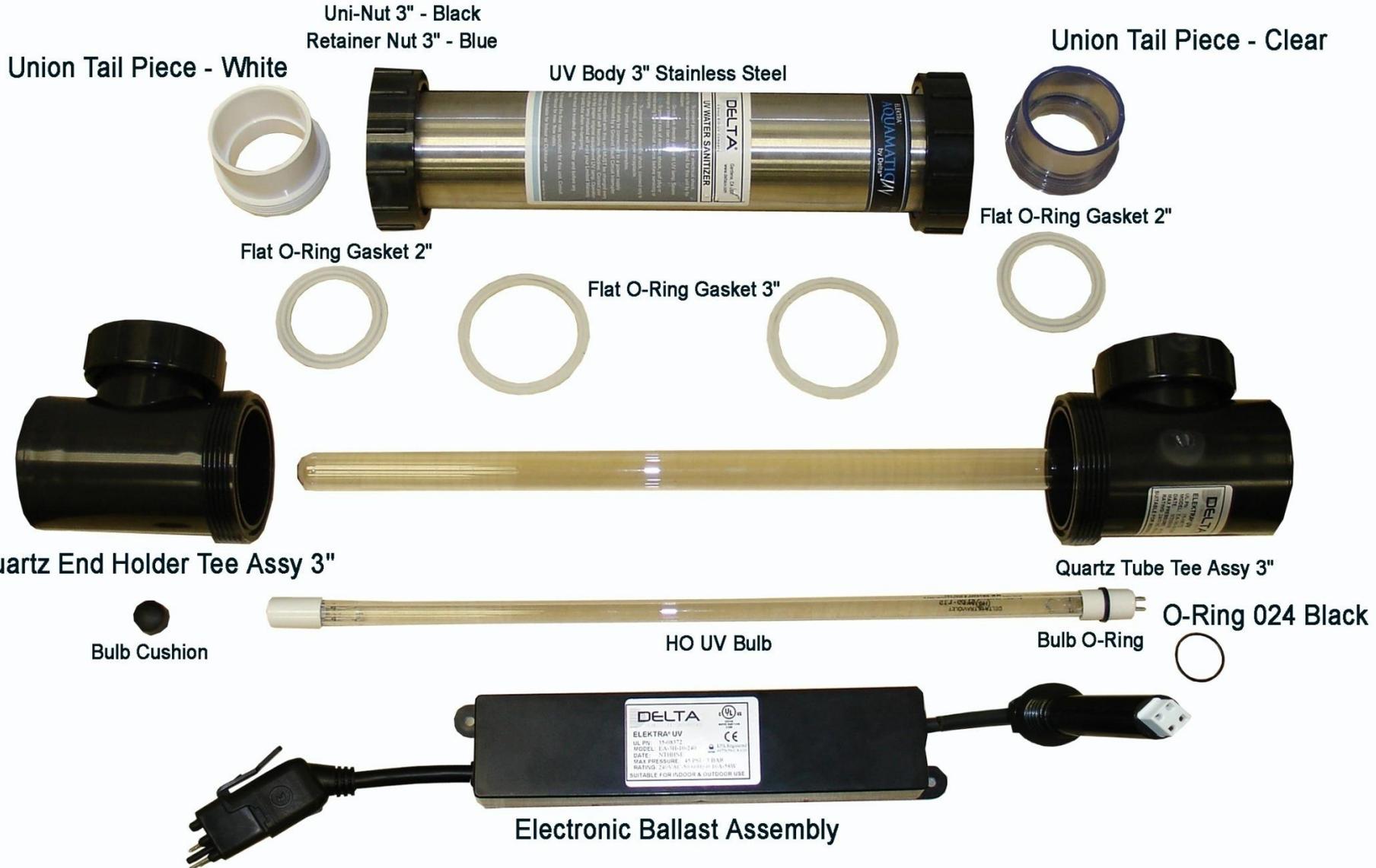
Note: do not touch the new bulb with anything including your fingers or damage to the bulb will occur. Always wear gloves when replacing the bulb and only make contact with the tipped ends and not the glass.

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UV Sterilizer (Mount)



UV Sterilizer (components)



UV Sterilizer (Troubleshooting)

The UV Bulb Will Not Light - If this occurs upon initial start-up, the problem could be caused by a number of issues.

- a. **The bulb has become disconnected from the bulb connector** - Disconnect the power cord from the electrical outlet, open the electrical enclosure bonnet and confirm the bulb connector is firmly in place. At the same time, check all exposed wires for a possible loose connection. Plug the electrical cord back into the electrical outlet **ONLY** after the electrical enclosure bonnet has been re-installed on the EA unit, and the pump is ON.
- b. **Verify that the electrical cord is plugged into a hot outlet** - Test the electrical outlet. You should confirm the availability of the same power as indicted on the electrical label on your EA unit.
- c. **Make sure you have not plugged your unit into any power source other than that specified on your unit's electrical label** - If you have done so in error, the ballast has been damaged and needs to be replaced. Contact your supplier for the correct replacement ballast.



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UV Sterilizer (Troubleshooting)

The GFCI Has Tripped - The GFCI protects the system from any fault to ground, as the electrical breaker protects the electrical circuit. When it trips, it is an indication that there is an electrical problem that must be corrected to provide a safe operating environment in your pool or pond.

- a. **Test the GFCI** - Disconnect the EA unit from the electrical receptacle. Reset the GFCI at the breaker panel or at the receptacle. If the GFCI does not reset, replace the GFCI. If the GFCI does reset, plug the EA unit into the electrical receptacle and make sure the pump is on. If the GFCI trips, it is an indication that there is a ground fault inside the EA unit. Follow instructions previously given for replacing the bulb.
- b. **Inspect the EA unit's electrical assembly** - If water is present inside the electrical enclosure or quartz tube, it will trip the GFCI. Following instructions given previously, remove the quartz tube, inspect it for cracks or breakage or for a bad quartz tube seal. Replace the quartz tube if it is cracked.
- c. **UV Bulb is causing GFCI tripping** - You can check the UV bulb for GFCI trip cause by unplugging the bulb from the bulb connector, then plugging the electrical plug back into the electrified electrical outlet (make sure the outlet is powered). Reset the GFCI and if it does not trip, it indicates that the UV bulb is causing the fault to ground. Replace the UV bulb. If the GFCI does not reset, then the problem is with the ballast or the electrical power cord. Replace the ballast/cord assembly.

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UV Sterilizer (Troubleshooting)

The EA Unit Makes Noise When Operating - This is an indication of the EA unit not being properly attached to a firm mounting base of wood or concrete with the mounting stands and band clamps provided. It can also indicate that the UV bulb was installed without the required bulb cushion and/or bulb O-Rings. Attach the EA unit correctly to a firm base as described in Sec. 5.5, or install the bulb cushion and/or bulb O-Rings as described in Sec. 9.1.

Water Is Coming Out Of Electrical Enclosure - Water exiting the unit through the electrical enclosure assembly can be attributed to either (a) a bad quartz tube seal (Factory installed), or (b) a broken or cracked quartz tube. Check the quartz tube for cracks or breakage as instructed in Sec. 7.0 and Sec. 8.0. Replace the quartz tube assembly if cracks in the quartz tube are found upon inspection.



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