

## Thursday 11 January - Steps to follow to correctly install an ultraviolet

Water can be disinfected by ultraviolet. UV exposes water-borne pathogens to a powerful high-output UV lamp that irradiates the organism with a lethal dose of germicidal UV light, rupturing its DNA (or RNA), rendering it incapable of causing infection!

A UV must be operational 24 hours a day to be functional. So a Solenoid valve is needed to prevent water from going by when the lamp is not working. If water goes by when electricity is out, you contaminated the plumbing and the water-borne pathogens will reproduce. If you have no solenoid valve you will need to disinfect all the plumbing every time the power goes off (when the power goes off, the pump stops but you have water in the pressure tank, if you open a faucet or flush a toilette you just contaminated the plumbing).

A flow reductor to have a good fluence (dose), the UV fluence (dose) delivered by a given reactor is dependent on many factors, including water quality and flow rate. As fluence is a product of UV intensity and residence time within the reactor, change in the flow rate in the reactor will change the delivered fluence.

Determine witch size of reactor is needed for the application. For the whole house a minimum of 8gpm is needed, to keep a proper flow rate for comfort.

A 5 micron filter must be installed in front of the UV to stop the passage of micro-organisms or bigger insoluble particles that would be used as shield for pathogens.

Water quality guidelines for proper functioning of the UV and continued protection of the water:

- Iron : < 0,3 ppm (0,3 mg/L)
- Hardness : < 7 g/gal (120 mg/L)
- Turbidity : < 1 unit NTU
- Manganese : < 0,05 ppm (0,05 mg/L)
- Tannins : < 0,1 ppm (0,1 mg/L)
- Sulfure : <0,05 ppm (0,05 mg/L)
- UV transmittance : >75%

If contaminants are superior than the characteristics above, or if water quality would change, proper prefiltration must be installed in front of ultraviolet.

The system must be maintained periodically. The UV lamp has to be changed every year or 8,000 hours, clean the interior of lamp (quartz sleeve) and change the 5 micron cartridge periodically and when needed verify prefiltration.

The proper installation : prefiltration if needed, 5 micron cartridge, solenoïd valve, flow reductor, and a validated ANSI/NSF 55 Class A ultraviolet.

It is recommended to disinfect surface water or a contaminated deep wells. If the installation standards are not respected, you risk having contaminated water, so it would be important to correct the situation. You are always protected when you have a validated system installed properly, and maintain periodically.