

7.10 Disinfection units

7.10.1 Ultraviolet irradiation

UV disinfection is discussed fully in Section 5.9.2. Point of use UV disinfection units are available for domestic use. These units are installed in-line. No residual disinfecting capacity is imparted to the treated water so the unit should be located as close as possible to the drinking water tap. UV devices are most effective when the water is of low colour and turbidity. UV devices are often installed together with other upstream treatments, such as filtration, to prepare the water for effective disinfection.

Manufacturers' recommendations must be followed regarding installation, operation and maintenance. In particular, the maximum design flow rate should not be exceeded, lamps should be allowed to reach their operating temperatures before water is passed through the unit and lamps should be cleaned and replaced as recommended. A continuous UV monitor and an alarm or fail-safe device is strongly recommended and although not usually fitted as standard on point of use units, they are usually available as an extra.

7.10.2 Chlorination

Chlorination is discussed fully in Section 5.9.3. Chlorination is generally unsuitable for point of use treatment.

7.10.3 Ozonation

Ozonation is discussed fully in Section 7.9.4. Small package ozone units are available, suitable for the treatment of water for a single home or business

7.10.4 Combination devices

Some point of use devices require a high quality water in order to operate effectively, for example reverse osmosis units and ultraviolet irradiation units require that the influent water is of very low turbidity. Where such devices are used on small supplies, pre-treatment of the water may be required. Combination devices are designed for this purpose and it is usual for point of use devices that require a high quality of water to include pre-treatment units. The Test Protocols described in Chapter 7 require that the device is tested in association with any pre-treatment unit that is specified by the manufacturer.

7.11 Maintenance requirements

Point of use water treatment equipment in general is not 'fit and forget' technology – regular maintenance is essential to ensure the continued supply of safe drinking water. Equipment manufacturers' maintenance instructions must be followed as a minimum requirement. Ideally maintenance requirements should reflect the raw water quality and flow, but this is often not the case and instructions may be vague. Manufacturers' maintenance instructions may be based on the assumption that the equipment will be used to treat mains drinking water. Raw waters used for private supplies will always be of worse quality than public supplies and maintenance requirements quoted for treatment of feed water of potable standard will be inadequate.

Maintenance requirements must be clear and the consequences of failing to maintain adequately should be highlighted. The majority of devices that fail do so as a result of inadequate maintenance. Special points to observe include:

- Power supplies should be disconnected prior to servicing.
- Filter cartridges must be changed on a regular basis. The water supply must be turned off before the housing is unscrewed and the cartridge is removed. The housing should be rinsed out with clean water (only use cleaning materials if specified by the manufacturer) and the new cartridge installed. The old cartridge may be contaminated and must be disposed of safely; precautions should be taken to prevent contamination of the replacement filter. Manufacturers of point of use devices should provide, within their instructions for filter units, guidance on the safe handling and disposal of used filter elements.
- UV lamps should be disconnected from the electricity supply and withdrawn carefully. Replacement is simply the reverse operation but care must be taken not to handle the glass. Exposure to UV irradiation must be avoided.
- Intermittent operation may reduce the life of a UV lamp and frequent on/off operation should be avoided (this may invalidate any warranty). Low pressure lamps give out little heat and will not be damaged by operation under no flow conditions. However, scale formation may be greater under these conditions and more frequent cleaning of the quartz sleeve may be required. Again care must be taken when withdrawing and installing the sleeve.