

What is a Thermostatic Mixing Valve?

A thermostatic mixing valve (TMV) is a specially designed plumbing valve that carefully mixes hot and cold water to control hot water outlet

temperatures to safe levels. TMVs are used in schools, health and social care environments to protect people by reducing the risk of scalding from very hot water from showers, baths and wash hand basins.



Example TMV

TMV2 or TMV3

TMV3 valves are designed, manufactured and tested to offer improved thermal performance including a faster failsafe function and improved control when the TMV3 is subject to variable water flow and temperature fluctuations.

TMV3 valves are designed, manufactured and tested to comply with the NHS Model Engineering Specification D08 standards.

TMV2 valves offer a lower standard of thermal performance to TMV3's and are suitable for use in most domestic properties and under certain circumstances, schools and sheltered housing accommodation.

How does a TMV Work

TMVs are precision mechanical valves that are designed to regulate and maintain water temperatures to safe levels even when water pressures or flow rates fluctuate.

How do they work? As hot and cold water enters the mixing valve it is carefully blended using an internal thermal element to output a mixed water stream at a pre-set temperature that is typically between 39°C and 43°C. This is the recommended temperature range for hot water outlets where a TMV is installed.

TMVs also incorporate an essential failsafe mechanism that will automatically shut down the valve if either the cold water or hot water supplies fail. This ensures that people are protected from dangerously high hot water temperatures (interrupted cold water supply), and thermal shock from cold water (interrupted hot water supply).

Why are TMVs Important for Safety

Children and the elderly are particularly at risk from scalding from hot water with accident statistics showing that nearly 600 people suffered serious scald injuries in the UK each year. 75% of the victims of severe scalds were children under five years of age. Additionally, the figures also show that older people are at particular risk with those over the age of 65 accounting for almost two thirds of all fatalities in the UK.

TMV Maintenance

Regular in-service testing of TMVs is essential to ensure they operate correctly, delivering safe water temperatures between 39°C and 43°C. This is the recommended temperature range for hot water outlets where a TMV is installed.

All TMVs should be tested and the results compared to those recorded during the original commissioning stage. Where there is no significant change to the outlet temperature ($\leq 2^{\circ}\text{C}$) and the failsafe shut-off activates as it should, the TMV is considered to be operating correctly. However, if the water temperature has increased by more than 2°C or the failsafe does not work, a full TMV service plus recommissioning, or valve replacement will be required.

All TMV's should be maintained in accordance with the manufacturer's guidance. In the absence of this guidance the following testing regime should be followed:

Annually or on a frequency defined by the risk assessment, taking into account any manufacturers recommendations.

Isolate each TMV and clean, descale and disinfect valve components and fine mesh strainers, (only to be undertaken by a competent person).

Measure the mixed water temperature at the outlet.

Carry out the cold water supply isolation test by isolating the cold water supply to the TMV, wait for five seconds if water is still flowing check that the temperature is below 46°C.

If there is no significant change to the set outlet temperature ($\pm 2^{\circ}\text{C}$ or less change from the original settings) and the fail-safe shut off is functioning, then the valve is working correctly and no further service work is required.

In essence, what is required by TMV2 is an annual functionality check. Several factors may determine the required service frequency of a TMV, most notably water hardness and frequency of use. If in doubt then further guidance can be sought from the schools maintenance service providers, the schools legionella risk assessment and the PSDU.

Further guidance can be found at:

Part 2 The control of legionella bacteria in hot and cold water systems:

<http://www.hse.gov.uk/pubns/priced/hsg274part2.pdf>

HSE Information sheet 6: <http://www.heattracing.co.uk/blog/article/nhs-d08-regulations-thermostatic-mixing-valves>