



**Kiwa UK Type 2 Certification:
Guidance for the Installation,
Commissioning & in-service testing
of Type 2 certified Thermostatic
Mixing Valves (TMV) for use in
Domestic premises.**

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Introduction:

Thermostatic mixing valves (TMV's) certified as being Kiwa UK Type 2 certified <https://www.kiwa.com/gb/en/products/tmv-testing/> have been manufactured and tested to satisfy the performance requirements detailed in BS EN 1111 and or BS EN 1287 for use by able bodied users in domestic premises as defined by the risk assessment*. The range of certifiable products covers TMV's used for bidets, showers, washbasins, and tub/bath use and offer the user a thermostatically controlled stable water delivery temperature and offers protection from the risk of scalding.

This document specifies best practice for; installing, commissioning, in-service inspection and testing for Type 2 thermostatic mixing valves installed in domestic properties or other premises having domestic type appliances e.g., office buildings, shops, hotels and halls of residence.

**For Healthcare / residential care homes & less able-bodied applications Kiwa Type 3 certification scheme products are required.*

This document applies to thermostatic mixing valves installed for ablutionary purposes in which the hot and cold-water supplies comply with the limits specified in Table 1 and where the mixed water temperature is set in accordance with the values specified in Table 3 appropriate to the application/designation of use.

Legislation:

It is recognised that users of domestic hot water for ablutionary purposes in both commercial and private environments can be vulnerable to the risk of scalding. For that reason, Building Regulation Part G3 includes stated requirements (EN 1111 and EN 1287) for the use of devices to limit that risk when associated with full body immersion that will happen in bath/tubs and bidets in Scotland. Type 2 certified products are therefore compliant with Building Regulation G3.

In addition to scald prevention there is a requirement to ensure water quality is maintained throughout the entire plumbing system in order to prevent or control the risk of legionella bacteria in either the hot or cold-water supply. This is covered by the Health & Safety Executive document HSG274 part 2. The control of legionella bacteria in hot & cold-water systems and the Water Supply (Water Fittings) Regulations' 1999 and the Scottish Byelaws and relevant guidance.

Sometimes the need to satisfy all the various requirements appears to create a conflict, therefore the purpose of this guidance is to outline what should be done to ensure regulatory compliance and best practice where Type 2 thermostatic products are installed.

Scope:

This guidance applies to Thermostatic Mixing valves used for general domestic applications for use with washbasins, bidets, showers and bath/tub filling, providing that they:

- have correct water supply conditions, temperature and pressure
- have the correct application/designation of use for the application
- are correctly installed
- are correctly commissioned, maintained and in service tested annually

Supply conditions:

Thermostatic valves must be installed in a water supply system that has the correct supply conditions, if the supply conditions are not within the range as detailed in table 1 then the valves thermostatic performance may be affected.

Table 1: Recommended Conditions of use for Type 2 valves

	BS EN 1111 High Pressure (HP)	BS EN 1287 Low Pressure (LP)
Maximum Static Pressure – bar	10	10
Flow Pressure, Hot & Cold - bar	0.5 to 5	0.1 to 1
Hot Supply Temperature - °C	55 to 65	55 to 65
Cold Supply Temperature - °C	≤ 25°	≤ 25°
<p>Notes:</p> <p>i) Valves operating outside these conditions cannot be guaranteed by the Scheme to operate as Type 2 valves.</p> <p>ii) To ensure and maintain water quality system water supply temperature should be maintained within legal criteria detailed in HSE document HSG247 pt2</p> <p>iii) HSG247 part 2, Cold water should be stored at and distributed at less than 20°C. Hot water should be stored at least at 60°C and be delivered at 50°C in less than 1 minute of the outlet device being activated. NB: If the outlet device is a mixing valve, the temperature of the hot water 50°C, is measured at the hot water supply inlet to the mixing valve and not the mixing valve's outlet. TYPE 2 mixing valves require a 55°C minimum hot supply.</p>		

Application/Designation of use:

Thermostatic mixing valves (TMV's) are manufactured for a particular use and are certified depending on these applications/designations of use. A TMV certified for shower use may not be appropriate for supplying mixed water to a Tub/Bath. Therefore prior to installing a TMV it must be verified that the valve has been certified as being appropriate for that particular use. The designations of use are Bidet (**B**), Shower (**S**), Washbasin (**W**) and Tub/bath (**T**).

The TMV can then be further designated by the pressure conditions, these being High Pressure (**HP**) or Low Pressure (**LP**).

See website link for **Kiwa UK TYPE 2** certified valves: <https://www.kiwa.com/gb/en/about-kiwa/tmvs-certificate-search/>

The full range of designations of use can be found in table 2.

Table 2: Applications/designations of use

	High pressure (HP 0.5 to 5bar)	Low pressure (LP 0.1 to 1bar)
Bidet (B)	HP-B	LP-B
Shower (S)	HP-S	LP-S
Washbasin (W)	HP-W	LP-W
Tub (T)	HP-T	LP-T

Installation:

The following essential installation requirements will ensure the valves performance is maintained, **see the manufacturer’s instructions.**

- The installation of thermostatic mixing valves must comply with the requirements of the Water Supply (Water Fittings) Regulations’ 1999 and Scottish Water Byelaws.
- The Thermostatic mixing valve must be installed in such a location that maintenance of the TMV using its isolating valves and that the commissioning and testing of the TMV can be undertaken
- If isolation valves are not provided by the manufacturer, the fitting of isolation valves is required as close as is practicable to the water supply inlets of the thermostatic mixing valve
- If strainers are not provided by the manufacturer, the fitting of strainers is recommended as close as is practicable to the water supply inlets of the thermostatic mixing valve
- the temperature differential between the hot supply temperature and the maximum mixed water temperature is appropriate for the valve, see the manufacturer’s instructions
- Backflow prevention devices may be required to prevent contamination of the water supply from the downstream risk, see the Water Supply (Water Fittings) Regulations 1999, and Scottish Water Byelaws and the manufacturer’s instructions

Recommended outlet temperatures:

When installed the recommended mixed water outlet temperature must be set for the appropriate application/designation of use, see table 3, and then verified by undertaking the cold-water isolation test.

The Kiwa Type 2 certification scheme recommends the following ‘steady state’ maximum mixed water outlet temperatures for use in all premises. In the case of non-user adjustable valves (tee type valves), slightly lower temperatures should be considered to facilitate use by people with sensitive skin.

Table 3: Mixed water outlet temperature

Designation/Application	Set mixed water temperature (at point of discharge) °C
Bidet	38°C maximum.
Shower	41°C maximum.
Washbasin	41°C maximum.
Tub/Bath	44°C maximum.
Notes:	
i)	The maximum mixed water outlet temperature being delivered during normal use can deviate by 2°C above the recommended set outlet temperatures detailed in table 3.
ii)	The tub/bath fill temperature in table 3 is not a safe bathing temperature for adults or children, it is a value that allows for heat loss during tub/bath filling. The British Burns Association recommends 37 to 37.5°C as a comfortable bathing temperature for children. In premises covered by the Care Standards Act 2000, the maximum water outlet temperature is 43°C.
iii)	All temperature measuring equipment should be calibrated and appropriate for measurement.

Temperature override function:

The maximum temperature setting must be set when the temperature stop has been overridden as detailed in table 3. The temperature at the temperature stop prior to being overridden is a lower temperature.

Commissioning:

The first step in commissioning a thermostatic mixing valve is to check the following:

- The designation of the thermostatic mixing valve matches the application
- The supply pressures are within the valves operating range.
- The supply temperatures are within the valves operating range
- The temperature differential is appropriate for the supply conditions
- Isolating valves are fitted, accessible and open
- Strainers are fitted and clean
- Appropriate Backflow prevention devices are fitted

If all these conditions are met, proceed to set the mixed water outlet temperature (see table 3) by following the manufacturer installation instructions.

When satisfied that the mixed water outlet temperature is correct, check that it is consistently repeatable by turning the mixing valve on & off, a number of times and then re-check the mixed water outlet temperature. If the mixed water outlet is stable, then proceed to undertake the cold-water isolation test.

Cold water isolation test:

The purpose of the cold-water isolation test is to ensure that the thermal performance of the TMV is adequate at the time of installation and annually thereafter.

Procedure:

- 1) Operate the TMV and achieve a normal flowrate for the application and record the initial mixed water outlet temperature.
- 2) Isolate the cold-water supply to the valve.
- 3) Collect the water discharged from the TMV outlet for 5 seconds.
- 4) Continue to collect the water discharged from the TMV outlet in a second vessel for a further period of 30 seconds.
- 5) Re-open (restore) the cold-water supply and after 30 seconds measure the mixed water temperature.

Acceptance criteria for Tub/Bath:

The volume collected in the first period of 5 s shall not exceed 400 ml.

The volume collected in the second period of 30 s shall not exceed an additional 500 ml.

After restoration of the cold-water supply (30 s) the mixed water outlet temperature shall not differ by more than 2°C from the initial set mixed water temperature.

Acceptance criteria for all other outlets:

The volume collected in the first period of 5 s shall not exceed 200 ml.

The volume collected in the second period of 30 s shall not exceed an additional 300 ml.

After restoration of the cold-water supply (30 s) the mixed water outlet temperature shall not differ by more than 2°C from the initial set mixed water temperature.

In-service testing:

It is recommended that all TYPE 2 approved valves are tested and evaluated against the commissioning setting results once a year. Whilst this is a recommendation in user / owner domestic dwellings, a duty of care obligation should be considered in commercial bathroom or subletting situations. When in-service testing is undertaken the following performance checks shall be carried out.

- 1) The supply conditions (temperatures & pressures) are broadly the same as they were at the time of installation.
- 2) Measure the mixed water temperature at the outlet(s).
- 3) Carry out the cold-water isolation test.

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 cold-water isolation test criteria is achieved, then the valve is working correctly, and no further service work is required. If the performance falls outside of that acceptance criteria, then service or adjust the valve in line with the manufacturer's instructions.

Note:

Any TMV that has been adjusted or serviced must be re-commissioned and re-tested in accordance with the manufacturers' instructions.

Commissioning, maintenance and in-service test records must be kept for public buildings in accordance with any water safety plan.

References documents

HSG 274 <https://www.hse.gov.uk/pubns/books/hsg274.htm>

Water Supply (Water Fittings) Regulations 1999 and Scottish Water Byelaws
<http://www.legislation.gov.uk/ukxi/1999/1148/regulation/3/made>

BEAMA Water Safety & Hygiene (WASH) R
recommended code of Practice for Safe Water Temperatures
<http://www.beama.org.uk/resourceLibrary/recommended-code-of-practice-for-safe-water-temperatures---.html>

HTM 04-01 <https://www.gov.uk/government/publications/hot-and-cold-water-supply-storage-and-distribution-systems-for-healthcare-premises>



TMV RECORD SHEET FOR ON SITE TEST

Test Date:

Valve Reference:		Location:
Mixed water outlet temperature:	°C	Installation Date:
Designation of use, i.e., HP/LP Bath/washbasin/shower:		Test frequency:
Valve min temperature differential:	°C	Engineers Name:

Remedial actions required:

COMMISSIONING & IN-SERVICE TEST READINGS & RESULTS

Supply Conditions and isolation test details	Result	Observation/comment
Hot Supply Temperature	°C	
Cold Supply Temperature	°C	
Hot Supply Pressure	bar	
Cold Supply Pressure	bar	
Initial stable mixed water temp at normal Flow	°C	
Isolate the cold-water supply		
Volume of water collected up to 5s*	ml	
Volume of water collected 5s to 35s**	ml	
Mixed Water Temperature after supply restored	°C	
Deviation from initial stable mixed water temp***	°C	

* If the volume of water collected is > 400ml for bath or > 200ml for other outlets then re-check the supply conditions or re-adjust the valve according to the manufacturer's instructions and then re-commission and re-test.

** If the volume of water collected is > 500ml for bath or > 300ml for other outlets then re-check the supply conditions or re-adjust the valve according to the manufacturer's instructions and then re-commission and re-test.

*** If the deviation is greater than 2°C then service or adjust the valve in line with the manufacturer's instructions and then re-commission and re-test.

Next In-Service Test date:	
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