

# Thermostatic Blending Valve

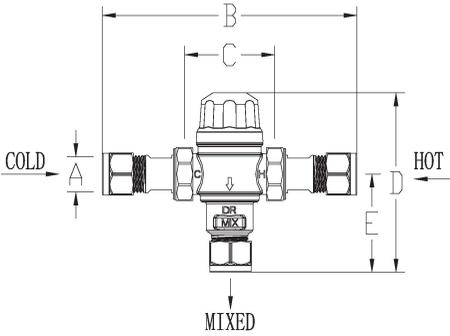


This document should be stored in a safe place for future reference.



Installer – after installation please ensure that this document is left with the installation.

# Installation Instructions and Use Guide



DN Size	A	B	C	D	E
15	15	137	55	99	53
20	22	161	55	99	53

## Thermostatic Mixing Valve – TMV3

### I . Introduction

The valves covered by these instructions have been specifically designed and manufactured as being in compliance with, BS EN 1111 and NHS Estates Model Engineering Specification D 08 for High Pressure. It has been independently tested and approved as a TYPE 3 valve under TMV3 scheme.

**Note:** The National Health Service Estates (NHSE) and Health Guidance Note (HGN) make reference to three types of valves:

Type 1: having both flow control and user adjustment of mixed water temperature

Type 2: having flow control and pre-set mixed water temperature

Type 3: without flow control and with pre-set mixed water temperature

### II . Approvals

This thermostatic mixing valve is certified under the NSFT MV3 scheme and has been independently tested by the recognized test laboratory NSF and is a WRAS approved product and listed in the Water fittings and Materials Directory.

Designation of use: HP-B/S/W and LP-BE/SE/WE.

### III . Technical Specification

**Table 1:**

Factory Temperature Setting	38°C
Mix Temperature Setting Range	30°C-46°C
Max. Hot Inlet Temperature	85°C
Inlet Temperature Range	Hot Supply: 52°C-65°C
	Cold Supply: 5°C-20°C
Mix Temperature Stability	±2°C
Min.Temp.Differential(Hot to Mix)	10°C
Max.Static Pressure	10bar

**Note 1:** Valves operating outside the requirements of these standards are not covered by the TMV3 Scheme and are not guaranteed to operate as TYPE 3 valves.

**Note 2:** To ensure full closure of the mix water flow, the Min.Temp. Differential (Mix to Hot) MUST be at least 10°C.

**Note 3:** To ensure the valve could work efficiently, the min. flow rate MUST be at least 4L/min.

## IV. Condition for Normal Use

In accordance with BS EN1111 and NHS Estates Model Engineering Specification D 08, the TMV3 product is suitable for use on the following condition:

**Table 2:**

Operating pressure range	High Pressure	Low Pressure
Maximum Static Pressure	10 bar	10 bar
Hot & Cold Flow Pressure	1.0 bar to 5.0 bar	0.2 bar to 1.0 bar
Hot supply temperature	52°C to 65°C	52°C to 65°C
Cold supply temperature	5°C to 20°C	5°C to 20°C

**Note 1:** The valve may perform adequately outside these conditions but the TMV3 scheme approval does not apply. If it is required to work with other conditions, an engineer must carry out his own risk assessment and satisfy himself that the valve is still suitable for use.

**Note 2:** The highest flow rates will be achieved under balanced pressure conditions, but the pressure at the valve inlets must be within a ratio of 2:1 under flow conditions and the size and layout of pipe work and fittings must take this into account.

NSF TMV3 scheme recommends the following set maximum mixed water temperatures for use in all premises:

**Table 3:**

Designation	Application	Maximum Temperature °C
HP-B, LP-BE	Bidet	38
HP-S, LP-SE	Shower	41
HP-W, LP-WE	Washbasin	41

**Note 1:** HP: High Pressure LP: Low Pressure

## Thermostatic Mixing Valve-TMV2

### I . Introduction

The valves covered by these instructions have been specifically designed and manufactured as being in compliance with BS EN 1111.

**Note:**The National Health Service Estates (NHSE) and Health Guidance Note (HGN) make reference to three types of valves:

**Type 1:**having both flow control and user adjustment of mixed water temperature.

**Type 2:**having flow control and pre-set mixed water temperature.

**Type 3:**without flow control and with pre-set mixed water temperature.

## II. Approvals

This thermostatic mixing valve is certified under the NSFT MV2 scheme and has been independently tested by the recognized test laboratory NSF and is a WRAS approved product and listed in the Water fittings and Materials Directory.

Designation of use:HP-B/S/W/T.

## III. Technical Specification

**Table 1:**

	High Pressure BS EN1111
Factory Temperature Setting	38°C
Mix Temperature Setting Range	30°C-46°C
Hot Supply Temperature	52°C-65°C
Cold Supply Temperature	5°C-25°C
Mix Temperature Stability	2°C
Min.Temp.Differential (Hot to Mix)	10°C
Max.Static Pressure	16bar
Flow Pressure (Hot & Cold)	0.5-5.0bar
Working Pressure Dynamic	1.0-5.0bar

**Note 1:**Valves operating outside the requirements of these standards are not covered by the TMV2 Scheme and are not guaranteed to operate as TYPE 2 valves.

**Note 2:**To ensure full closure of the mix water flow,

the Min.Temp.Differential (Mix to Hot) MUST be at least 10°C.

**Note 3:**To ensure the valve could work efficiently,the min. flow rate MUST be at least 4L/min.

## IV. Condition for Normal Use

In accordance with BS EN1111, the TMV2 product is suitable for use on the following condition :

**Table 2:**

Operating pressure range	High Pressure
Maximum Static Pressure	10 bar
Hot & Cold Flow Pressure	0.5 bar to 5.0 bar
Hot supply temperature	55°C to 65°C
Cold supply temperature	≤ 25°C

**Note 1:**Valves approved for designation of use H.P only,must state:If a water supply is fed by gravity then the supply pressure should be verified to ensure the conditions of use are appropriate for the valve.

NSF TMV2 scheme recommends the following set maximum mixed water temperatures for use in all premises.

**Table 3:**

Designation	Application	Maximum Temperature°C
HP-B	Bidet	38
HP-S	Shower	41
HP-W	Washbasin	41
HP-T44	Bath*	44
HP-T46	Bath*(assisted)	46

The mixed water temperature must never exceed 46°C.The maximum mixed water temperature can be 2°C above the recommended maximum set outlet temperatures.

**Note 1:** HP:High Pressure

**Note 2:** 46 °C is the maximum recommended mixed water temperature from the bath tap.The maximum temperature takes account of the allowable temperature tolerances inherent in thermostatic mixing valves and temperature losses in metal baths.46 °C is not a safe bathing temperature for adults or children.

**Note 3:** 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 mixed water outlet temperature is 43°C.

## Installation

The thermostatic mixing valve must be installed in accordance with the regulations of the local water company and the Water Supply (Water Fittings) Regulations 1999.

Separate isolating valves must be installed on the hot and cold water inlet supplies.To ensure proper performance of the thermostatic mixing valve, the isolating valves should preferably be full bore and always be fully open during operation.

The thermostatic mixing valve is supplied with filter elements but it is advisable to additionally install Y-strainers on the hot and cold water supplies. The insulating valves and strainers should be installed as close as practicable to the location of the mixing valve and should always be in an accessible location.

Before installation, the hot and cold water supply systems **MUST** be thoroughly flushed to remove any dirt/debris that may have accumulated. Failure to do so may adversely affect the performance of the mixing valve.

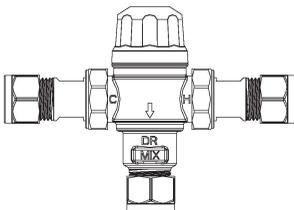
## Assembly Procedure

1. Before installation, the system operating conditions of inlet pressures, hot water temperature and hot water flow rates should be determined and confirmed to be within the expected conditions of normal use.

**Note:** Valves must operate in either a high pressure setting or a low pressure setting. Valves are not capable if operation with, for instance hot water supply in one pressure range and cold water supply in the other pressure range. In these conditions, an assessment of risk should be carried out, it is necessary to either boost one pressure or reduce the other so that both supplies are within a common pressure range. (See Table 2)

2. Before installation, the hot and cold water inlet of the mixing valve must be deaired and confirmed. The valve must be correctly connected to the respective supplies.

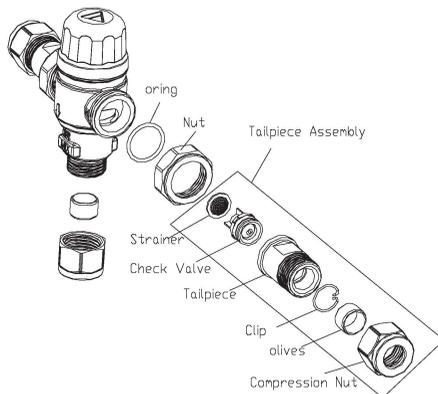
Chart 1:



**Note:** The valve body is clearly marked with "C" for Cold and a blue indicator and "H" for Hot and a red indicator. Failure to do so is dangerous and invalidates the guarantee. The use of sealing compounds is not recommended.

3. Check the main valve assembly bores are free of debris and the end sealing faces are clean.
4. Check the two tailpieces and confirm they are complete with union nuts and compression nuts and olives.
5. Insert the sealing washer into the inlet and outlet and screw the inlet and outlet fittings onto the valve body, taking care not to over tighten.
6. Remove the compression nuts and olives from the tailpieces. Locate the inlet filter screens and insert them into the bore of the tailpieces up to the shoulder.
7. Assemble the valve to the pipe work and ensure the hot and cold water pipes have full penetration into the tailpiece. The compression fittings supplied allow for direct connection to BS 22mm OD tube or BS 15mm OD tube (See Appendix).
8. Tighten the compression nuts ensuring that the end of the pipe remains in contact with the fitter element.
9. After installation check carefully for leaks.

Chart 2:



## Adjustment and Commissioning

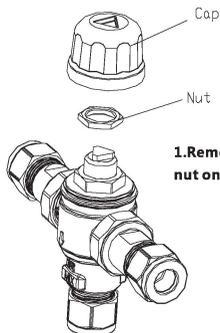
The thermostatic mixing valve is supplied factory pre set temperature at 38°C. However, installation conditions will dictate, that the product be adjusted on site.

Prior to commencing commissioning, the following checks should be carried out

1. The designation of the thermostatic mixing valve matches the application.
2. The supply pressures and temperatures are within the operating range of the valve.
3. Isolating valves and strainers are provided.
4. The supply temperatures are within the range permitted for the valve and by guidance information on the prevention of legionella etc.

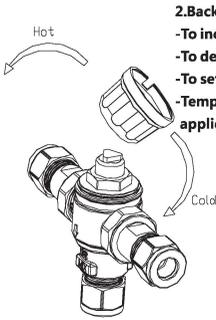
If all these conditions are met, proceed to set the temperature as described below.

Chart 3:



1. Remove the plastic protective cap and nut on top of the valve .

Chart 4:



2. Back-out the nut, using the cap,
- To increase the temperature turn anti-clockwise.
  - To decrease the temperature turn clockwise.
  - To set the valve to a maximum mixed water.
  - Temperature in accordance with the valve application (See Table 3).

3. When the valve has been installed with the correct conditions of use it is advised that the valve is subjected to exercise prior to the commissioning at the application temperature, Operate the valve from full hot at least three times.

4. With the valve at the full cold position bring the valve to the correct application temperature by turning the clockwise. If the valve overshoots this temperature, return the valve to the full cold condition, and reset it to the correct temperature +0-2°C. Do not set a valve lowered temperature as this will not provide consistent operation.

5. After adjustment replace the cap to lock the valve in position and prevent tampering.

**6. Commissioning Test Sequence**

After adjusting the temperature of the mixed water in accordance with the valve application (See Table 3) carry out the following sequence:

- a. Record the temperature of the hot and cold water supplies.
- b. Record the temperature of the mixed water at the largest draw-off flow rate.
- c. Record the temperature of the mixed water flow at a smaller draw-off flow rate, which shall be measured.
- d. Isolate the cold water supply to the mixing valve and monitor the mixed water temperature recording the maximum temperature achieved and the final stabilized temperature.
- e. Record the equipment, thermometer etc. use for the measurements.

Note: The final stabilized temperature should not exceed the values in Table 4

**Table 4:**

Application	Maximum Temperature°C
Bidet	38
Shower	41
Washbasin	41
Bath*	44
Bath*(assisted)	46

To ensure the valve maintains a high level of protection, we advise the following in service testing is conducted (the same equipment used to commission the valve initially must be used in the following tasks):

1. After a period of between 6 to 8 weeks from commissioning carry out the following:
  - 1.1 Record the temperature of the hot and cold water supplies.
  - 1.2 Record the temperature of the mixed water at the largest draw off flow rate.
  - 1.3 Record the temperature of the mixed water at the smallest draw off flow rate.
2. If the mixed water temperature has changed significantly from the previous test results (e.g. >1k), record the change and before re-adjusting the mixed water temperature carry out the following checks;
  - 2.1 All the strainers are clean.
  - 2.2 All the check valves are in good working order.
  - 2.3 The isolation valves are fully open.
3. If the mixed water temperatures are acceptable, carry out the following:
  - 3.1 Record the temperature of the hot and cold water suppliers.
  - 3.2 Record the temperature of the mixed water at the largest draw off flow rate.
  - 3.3 Record the temperature of the mixed water at the smallest draw off flow rate.
  - 3.4 Isolate the cold water supply to the mixing valve and monitor the mixed water temperature.
  - 3.5 Record the maximum temperature achieved as a result of (3.4) and the final temperature (the final temperature should not exceed the values quoted in Table 5)
  - 3.6 Record the equipment used during these tests.
4. If the mixed water temperature is bigger than the values quoted in Table 5 or the maximum temperature exceeds the corresponding values from previous test results by more than 2K, the valve must be serviced.
5. For TMV2, after a period of 1 year from commissioning, and for TMV3, After a period of 12 to 15 weeks from commissioning, carry out the sequence of tests as described in Maintenance sections 1, 2, 3, and 4.
6. Dependent upon the result obtained from the first two periods of tests; Frequency of in-service testing can be determined as following Table 5:

**Table 5:**

Temperature Variation(K)	Comment	Service Frequency(weeks)
±1K	/	24-28 weeks
±1K to 2K	In either one period	24-28 weeks
±1K to 2K	In both period	18-21 weeks
±Exceed 2K	In either period	18-21 weeks

6.1 If no significant change in the mixed water temperatures (1K) is recorded between commissioning and maintenance section 1 or between commissioning and maintenance section 5, the next in service testing should be carried out at a period of 24 of 28 weeks after initial commissioning.

6.2 If a small change (1K to 2K) in the mixed water temperature is recorded in either one period, necessitating adjustment of the mixed water temperature, then the next in service can be deferred to 24 to 28 weeks after commissioning.

6.3 If a small change ( 1K to 2K) in the mixed water temperature is recorded in both periods, necessitating adjustment of the mixed water temperature, then the next in service can be deferred to 18 to 21 weeks after commissioning.

6.4 If a significant change (Exceed 2K) in the mixed water temperature is recorded in either one period, necessitating adjustment of the mixed water temperature, then the next in service test should be carried out at 18 to 21 weeks after commissioning.

7. The general principle to be observed after the first 2 or 3 in service tests is that the intervals for future tests should be set to those which previous tests have shown can be achieved with no more than a small change in mixed water temperature.

8. In all areas periodic maintenance of the valve and associated firings i.e, strainers, check valves will ensure optimum performance levels are maintained.

9. The inlet strainers on both the hot and cold water supplies can be removed for cleaning by unscrewing the inlet union nuts and carefully pulling apart the connecting pipe work.

10. The built in check valves can be accessed to ensure freedom and correct searing.

13. Carefully re-fit all components and perform the commissioning sequence.

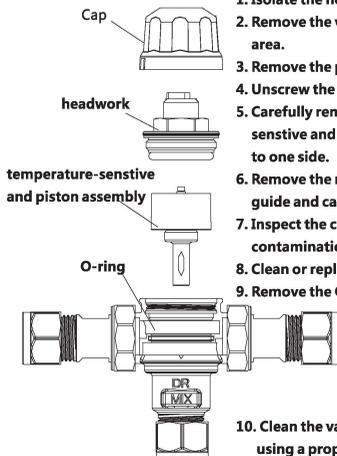
If after cleaning the valve, and replacing the O-ring seals, the valve does not function correctly, it may be necessary to replace thermal element.

## TMV Cleaning Instructions

Most domestic water supplies contain calcium which will separate out when the water is heated in a system. The degree and speed of scaling may vary depending on factors such as water flow rates, system design, the hardness of the water and the temperature to which the water is heated.

Deposits of scale may over time form in the valve, particularly at the hot inlet. The formation of the scale may adversely affect the performance of the valve which will be detected during the in-service testing. If this occurs it will be necessary to remove the valve for de-scaling and service.

Chart 5:



### Cleaning Procedure

1. Isolate the hot and cold supply
2. Remove the valve to a clean working area.
3. Remove the protective cap.
4. Unscrew the headwork of the valve.
5. Carefully remove the temperature-sensitive and piston assembly and put to one side.
6. Remove the main spring and flow guide and carefully put to one side.
7. Inspect the components for contamination or damage.
8. Clean or replace as necessary.
9. Remove the O-ring.
10. Clean the valve body and headwork using a propriety de-scaler.
11. Thoroughly rinse the body and headwork in clean water.
12. Carefully fit new O-ring to body.