

TOMSON 15 or 20mm Thermostatic Mixing Valve

Installation

The Tomson 15 or 20mm Thermostatic Mixing Valve with Integrated Inlet Fittings is designed to comply with AS4032.1 Thermostatic Mixing Valves and NSW Health Department requirements. In addition to these instructions, the valve must be installed subject to the requirements of the relevant regulatory authorities.

- Check the site conditions** (temperature, pressure, etc.) against the valve specifications shown in Figure 1 below. Any discrepancies must be rectified prior to valve installation.
 - If there is a risk that the hot water supply temperature exceeds 90°C, a suitable temperature limiting valve must be fitted upstream of the inlet fitting.
 - If there is a risk that the dynamic inlet pressures exceed 600 kPa, a suitable pressure reducing valve must be fitted upstream of the inlet fitting.
 - It is recommended that the inlet pressures are balanced to within ±10% of each other for optimal performance.
- Flush the system** thoroughly before fitting the valve. It is critical that all debris is flushed from the pipework prior to valve installation. Debris and particulate contamination are the most common causes of valve failures.
- Ensure the installation allows **sufficient room for service and maintenance** procedures. Figure 2 shows the physical dimensions of the valve and fittings.
- Attach the supplied Integrated Inlet Fittings** to the valve using the sealing washer to provide a face seal (see figure 6 Exploded View). Tighten the inlet fitting nut to approximately 10Nm, excessive torque will damage the seal and is not required.
 - AS3500 requires that all thermostatic mixing valves are installed with isolating valves, line strainers, and non-return valves on the hot and cold supply lines. The supplied inlet fittings ensure this requirement is met. If the valve is to be used without the included inlet fittings, ensure that the relevant devices are installed as specified by the standard. Figure 3 shows the position of each device.
- Install the valve using the 1/2" or 3/4" compression fittings on the inlet fittings and outlet.
 - The valve and fittings must not be subject to excessive heat during the installation.

Figure 1 Thermostatic Mixing Valve Specifications

Factory Set Outlet Temperature:	43 +/- 2°C
Outlet Temperature Range:	35 – 50°C ¹
Hot Supply Temperature:	55 - 90°C
Cold Supply Temperature:	5 - 30°C
Hot to Mix Temp Differential:	Min 10°C
Cold to Mix Temp Differential:	Min 5°C
Static Supply Pressure:	Max 1600 kPa
Dynamic Inlet Pressure:	20 – 600 kPa
Recommended Supply Pressure Variation (Hot:Cold or Cold:Hot):	±10% ²
Supply Pressure Loss Ratio:	Max 10:1
Flow Rate to Ensure Stable Operation:	Min 4 L/min

- Notes :
- AS4032.1 – 2005: approved adjustment range 38 - 50°C.
 - For optimal performance it is recommended that the hot and cold water supply pressures be balanced to within ±10%. Excessive variation in supply pressures may cause changes in outlet temperature.

* Notwithstanding the above, compliance with AS3500 must be maintained.

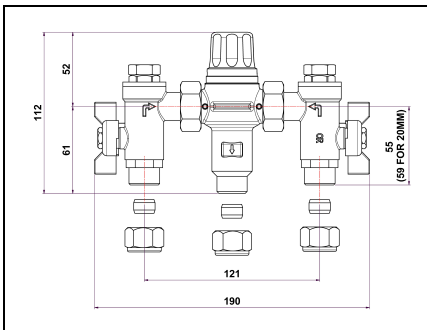


Figure 2 Physical Dimensions

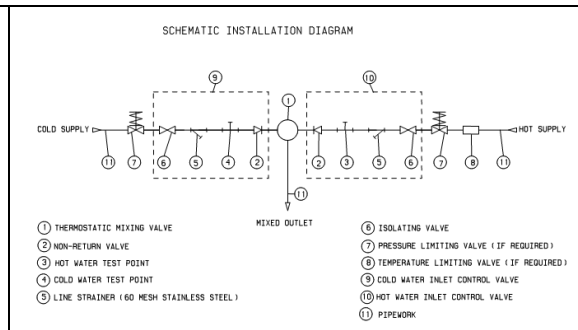


Figure 3 Installation Schematic

Commissioning of the Valve

Upon completion of the installation, the valve should be tested and commissioned as per the procedure outlined below or as specified by the local authority. The entire procedure should be read thoroughly prior to the commissioning of the valve. A calibrated digital thermometer having rapid response time with maximum temperature hold, small flat bladed screwdriver and the adjusting key (supplied with the TOMSON 15 or 20mm TMV) will be required to check and set the outlet mixed temperature of the valve.

- Ensure all outlets that will be serviced by the valve have adequate warning signs posted to ensure that no outlet is used during commissioning.
- Open the cold supply line to the valve, and then open the hot supply line, ensuring there are no leaks.
- Open the outlet that is serviced by the shortest length of pipe work between the mixing valve and outlet fixture.
- Ensure the hot and cold water supplies are stable and within the temperature specifications.
- Allow the mixed outlet to flow for at least 60 seconds** to allow the temperature to stabilise before taking a temperature reading at the outlet with a digital thermometer. The flow rate should be at least 4L/min. The flow rate can be checked with the aid of a known size container and a stopwatch. The temperature should be taken at the closest outlet served by the thermostatic mixing valve.
- If the outlet temperature requires adjustment the followings steps are required;

Temperature Adjustment

- Using a small flat bladed screw driver, pry the protective cover off the valve (figure 4).
- Fit the supplied key over the adjusting spindle (figure 4)
 - To **increase** the mixed outlet temperature, rotate the spindle **anti-clockwise**.
 - To **decrease** the mixed outlet temperature, rotate the spindle **clockwise**.
- Allow the mixed outlet temperature to stabilize for 60 seconds and once again take a temperature reading. Repeat the procedure until the desired temperature has been reached.
- Push the top cover firmly on to the top of the valve until it snaps back into place.
- Check that the outlet temperature is stable over the full range of flow rates and that the flow rate is adequate for the application.
- Close the outlet.
- The mixing valve is now set and locked.

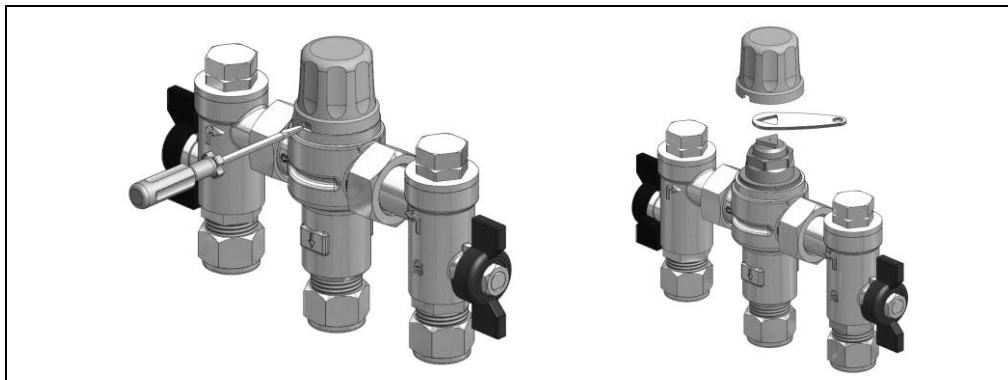


Figure 4 Increasing and Decreasing the Mixed Water Temperature

Shut Down Test

- Now that the mixing valve has been set and locked it is necessary to perform a shutdown check. Allow the mixed water temperature to stabilise and note the outlet temperature. While holding a digital thermometer in the outlet flow, quickly isolate the cold water supply to the valve. The outlet should quickly cease to flow. As a rule of thumb the flow should be less than 0.2L/min following the isolation. Restore the cold water supply and after the mixed water temperature has stabilised, record the outlet temperature and ensure it has remained within specification.
- Repeat the above test, except this time quickly isolate the hot water supply to the valve. The outlet flow should quickly slow to a trickle. As a rule of thumb the trickle should typically be less than 0.4L/min@500kPa down to less than 0.2L/min@100kPa following the isolation. Restore the hot water supply and after the mixed water temperature has stabilised, record the outlet temperature and ensure it has remained within specification.
- Ensure that all details of the Commissioning Service and Maintenance Report are completed.
- The valve is now commissioned and can be used within the technical limits of operation.

Maintenance and Service Requirements

The following testing and maintenance procedures must be carried out on the valve at intervals not exceeding 12 months:

A. Strainer cleanliness:

- Isolate the hot and cold supplies to the mixing valve by closing the inlet ball valves.
- Remove the inlet fitting strainer cap with a suitable spanner and then remove the mesh strainer, as shown in Fig. 5 below.
- The strainers should be cleaned with a dilute water solution of suitable descaling solvent (such as CLR), checked for physical damage and then thoroughly rinsed with clean water.
- The strainers can then be re-installed into the valve, and the top cover replaced and tightened to a maximum torque of 15Nm into the inlet valve bodies.

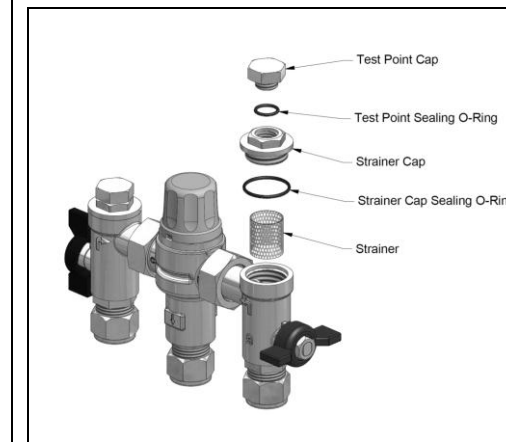


Figure 5 Servicing the Inlet Fittings

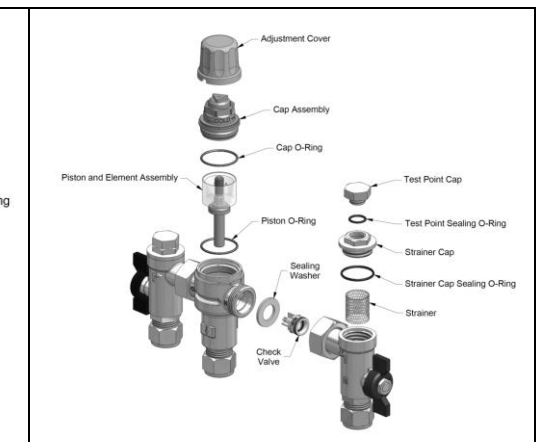


Figure 6 Exploded View

B. Non-return valve operation:

- Isolate the cold water supply by closing the cold inlet fitting ball valve.
- Remove the cold inlet fitting test point cap with a suitable spanner.
- Check for leakage; after the initial pressure is released, water should not flow out of the strainer cap hole. If water continues flowing out, replace the cap, then replace the non-return valve on the cold inlet fitting and restart the test. If water does not flow out, continue to the next step.
- Remove the adjustment cover with a flat bladed screw driver. See figure 4.
- Using the adjustment spanner and method described in *Temperature Adjustment*, turn the spindle one full revolution clockwise, then two full revolutions anti clockwise. Then turn the spindle one full revolution clockwise to return it to the starting position. At no time should water flow out of the inlet fitting strainer cap hole. If water flows out, replace the cap, then replace the non-return valve on the cold inlet fitting and restart the test. If water does not flow out, the non-return valve is operating correctly.
- Replace the test point cap and open the cold inlet fitting ball valve.
- Isolate the hot water supply by closing the hot inlet fitting ball valve.
- Remove the hot inlet fitting test point cap with a suitable spanner.
- Check for leakage; after the initial pressure is released, water should not flow out of the strainer cap hole. If water continues flowing out, replace the cap, then replace the non-return valve on the hot inlet fitting and restart the test. If water does not flow out, continue to the next step.
- Using the adjustment spanner, turn the spindle one full revolution clockwise and then two full revolutions anti clockwise. Then turn the spindle one full revolution clockwise to return it to the starting position. At no time should water flow out of the inlet fitting strainer cap hole. If water flows out, replace the cap, then replace the non-return valve on the hot inlet fitting and restart the test. If water does not flow out, the hot inlet fitting non-return valve is operating correctly.
- Replace the test point cap and open the hot inlet fitting ball valve.
- Leave the adjustment cover off for access to the temperature adjustment spindle for the next test.

C. **Measure the discharge temperature** at the nearest outlet to the valve. Use the procedure described in *Commissioning of Valve*. Measure both at a low and high flow rate. Adjust if necessary and then replace the adjustment cover.

D. **Cold water shut-off operation**. Use the procedure described in *Commissioning of Valve*.

E. **Hot water shut-off operation**. Use the procedure described in *Commissioning of Valve*.

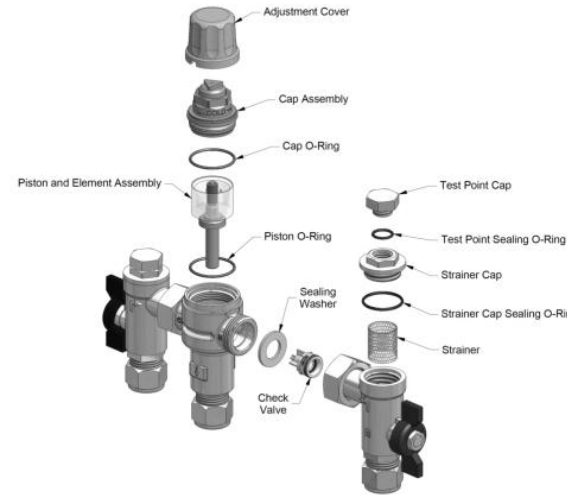
The results of the maintenance and service inspection must be recorded on the Commissioning, Service and Maintenance Report (next page).

TOMSON 15 or 20mm Thermostatic Mixing Valve

O-rings and Thermostatic Element/Piston Assembly - MANDATORY 5 YEAR SERVICE

At intervals not exceeding 5 years, the piston o-ring and thermostatic element/piston assembly must be replaced and lubricated. Lubricant must be potable water approved silicon-based grease (supplied with the spare parts kit). Procedure:

1. Isolate the hot and cold supplier by closing the inlet ball valves.
2. Pry off the plastic cover using a small flat bladed screw driver or similar.
3. Remove the brass cap assembly with a suitable spanner.
4. Remove the element/piston assembly.
5. Remove the piston o-ring. Care must be taken to ensure the internal surfaces of the valve body are not damaged.
6. Dispose of plastic cover, brass cap assembly, element/piston assembly and piston O-Ring.
7. Replace both o-rings with the parts provided in the spare parts kit (both o-rings are the same size). Ensure new o-rings are clean and lightly greased with the lubricant provided.
8. Insert the new element/piston assembly taking great care not to damage the external surfaces of the piston. Refit the cap assembly to the body and tighten to a maximum torque of 10Nm.
9. Clean the isolator strainers as shown on page 1. If needed, the 5 YR kit contains new strainers.
10. Fully recommission the valve. Fit the provided plastic cover.



Fault Finding

Fault / Symptom	Cause	Rectification
1. The desired mixed water temperature cannot be obtained or the valve is difficult to set	<ul style="list-style-type: none"> • Hot and cold supplies are fitted to the wrong connections • Valve contains debris • Strainers contain debris • Non-return devices are damaged 	<ul style="list-style-type: none"> • Refit the valve with Hot/Cold supplies fitted to the correct connections • Clean valve ensuring debris is removed and components are not damaged • Clean strainers ensuring debris is removed • Check non-return device is not jammed. Clean if necessary
2. The valve will not shut down	<ul style="list-style-type: none"> • The hot to mix temperature differential is not high enough • Sealing seat is damaged or fouled by debris 	<ul style="list-style-type: none"> • Raise hot water temperature • Replace piston o-ring • Clean seat using suitable descaling solution • Replace element assembly
3. Mix temperature is unstable	<ul style="list-style-type: none"> • Debris is fouling valve • Flow rate below 4L/min • Strainers are fouled • Systems may be fluctuating outside valve parameters 	<ul style="list-style-type: none"> • Clean the valve ensuring that all debris is removed and components are not damaged • Rectify any pressure deterioration • Clean strainers • Check system pressure, install pressure control valves to ensure inlet conditions are within specification
4. Mix temperature changing over time	<ul style="list-style-type: none"> • Inlet conditions (pressures or temperatures) are fluctuating • Strainers contain debris 	<ul style="list-style-type: none"> • Install suitable pressure control valves to ensure inlet conditions are within specification • Clean strainers ensuring debris is removed
5. Either full hot or cold flowing from outlet fixture	<ul style="list-style-type: none"> • Valve is incorrectly set • Hot/Cold water has migrated to other inlet 	<ul style="list-style-type: none"> • Adjust mix temperature between 35 - 50°C as required • Replace faulty non-return valves
6. No flow from the valve outlet	<ul style="list-style-type: none"> • Hot or cold water failure • Strainers are fouled 	<ul style="list-style-type: none"> • Valve functioning correctly. Restore inlet supplies and check mix temperature • Clean strainers
7. Flow rate reduced or fluctuating	<ul style="list-style-type: none"> • Valve or inlet fittings fouled by debris • Dynamic inlet pressures are not within those recommended limits 	<ul style="list-style-type: none"> • Check valve and inlet fittings for blockages • Ensure the dynamic inlet pressures are nominally balanced to within +/- 10%
8. Mixed water temperature too hot or cold	<ul style="list-style-type: none"> • Valve has been tampered with • Valve incorrectly set • Inlet temperatures are not within specified limits 	<ul style="list-style-type: none"> • Readjust valve to required set temperature • Ensure inlet temperatures are within required limits
9. Warm water temperature adjuster difficult to move	<ul style="list-style-type: none"> • Adjuster at maximum mix temperature stop • Valve piston into over stroke 	<ul style="list-style-type: none"> • Mixed water is at maximum temperature. No higher mix temperature adjustment is available • Wind adjuster out until the required set temperature is achieved
10. Hot water flows into the cold water system or vice versa	<ul style="list-style-type: none"> • Non-return valves faulty 	<ul style="list-style-type: none"> • Replace non-return valves
11. Valve is noisy	<ul style="list-style-type: none"> • Water velocity above velocity requirements of AS3500 	<ul style="list-style-type: none"> • Reduce water velocity

Spare Parts

Kit	Contents	Part Number
1 Year Service Kit	<ul style="list-style-type: none"> • Body & Cap O-Rings, Grease Sachet and Face Seals 	MS232 (1 Year Kit)
5 Year Service Kit	<ul style="list-style-type: none"> • Complete Thermostatic Assembly, O-Rings, Face Seals, Strainers and Grease. 	MS241 (5 Year Kit)

Commissioning, Service and Maintenance Report

This report must be completed as per AS 4032.3, Appendix B and shall be -

- Provided to the owner/occupier or responsible person.
- Retained by the tester.
- Where required, forwarded to the relevant authority.

Installation Details

Owner/Occupier:		Address:
Specific Installation Requirements:		

Valve Details

Size	Model (Select with checkmark)	
15 or 20MM	15MM TMV with 4 in 1 inlet fittings <input type="checkbox"/>	20MM TMV with 4 in 1 inlet fittings <input type="checkbox"/>
Location of Valve:		

Commissioning and Service Details

	Commissioning	Service 1	Service 2	Service 3	Service 4	Service 5
Authorised Tester:						
Licenser Number:						
Date:						
Next Service Due	(≤1 yr)	(≤1 yr)	(≤1 yr)	(≤1 yr)	(≤1 yr)	(≤1 yr)
Test						
Hot Water Temp (°C)						
Cold Water Temp (°C)						
Mixed Water Temp – Low Flow (°C)						
Mixed Water Temp – High Flow (°C)						
Hot Water Isolation	Pass <input type="checkbox"/>	Pass <input type="checkbox"/>	Pass <input type="checkbox"/>	Pass <input type="checkbox"/>	Pass <input type="checkbox"/>	Pass <input type="checkbox"/>
Cold Water Isolation	Pass <input type="checkbox"/>	Pass <input type="checkbox"/>	Pass <input type="checkbox"/>	Pass <input type="checkbox"/>	Pass <input type="checkbox"/>	Pass <input type="checkbox"/>
Service						
Strainers Clean		Checked <input type="checkbox"/> Replaced <input type="checkbox"/>	Checked <input type="checkbox"/> Replaced <input type="checkbox"/>	Checked <input type="checkbox"/> Replaced <input type="checkbox"/>	Checked <input type="checkbox"/> Replaced <input type="checkbox"/>	Checked <input type="checkbox"/> Replaced <input type="checkbox"/>
Non-return valve		Checked <input type="checkbox"/> Replaced <input type="checkbox"/>	Checked <input type="checkbox"/> Replaced <input type="checkbox"/>	Checked <input type="checkbox"/> Replaced <input type="checkbox"/>	Checked <input type="checkbox"/> Replaced <input type="checkbox"/>	Checked <input type="checkbox"/> Replaced <input type="checkbox"/>
O-ring Replacement	Due Date: (≤5 yrs)					Replaced <input type="checkbox"/>
Thermostatic Element/Piston assembly Replacement	Due Date: (≤5 yrs)					Replaced <input type="checkbox"/>
Authorised Tester's signature:						