

AQUABLEND 1500 SOLAR THERMOSTATIC MIXING VALVE

Installation, Operating & Maintenance Instructions

ATM715



NOTE: THIS DOCUMENT IS TO BE LEFT ONSITE WITH FACILITY MANAGER AFTER INSTALLATION

I00005_Sep 20

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 **ENWARE**

SOLAR THERMOSTATIC MIXING VALVE

**THANK YOU FOR CHOOSING AN
ENWARE THERMOSTATIC MIXING VALVE**

**THE ENWARE AQUABLEND 1500
SOLAR THERMOSTATIC MIXING VALVE
IS A HIGH PERFORMANCE THERMOSTATIC
MIXING VALVE SUITABLE FOR USE WITH
SOLAR HOT WATER SYSTEMS.**

**THE VALVE IS DESIGNED TO COMPLY
WITH AS4032 - THERMOSTATIC
MIXING VALVES.**

PRODUCT FEATURES

- Complies with the requirements of AS4032 - Thermostatic Mixing Valves
- Provides high stability of mixed water temperature even under changing inlet conditions
- Ensures rapid shut down of mixed outlet flow in the event of hot or cold water supply failure
- Designed for quick and simple in-situ servicing
- Suitable for installation into AS3500 compliant systems with hot water temperature as low as 60°C
- Fitted with a Tamper Resistant temperature adjustment mechanism

The ENWARE AQUABLEND 1500 Solar Thermostatic Mixing Valve is a high performance valve designed to give stable and dependable operation, provided it is installed, commissioned, operated and maintained as per the recommendations outlined in this manual. It should be noted however that this valve should not be considered as an alternative to adequate supervision and duty of care during its use and operation.

Note: When installed, the mixing valve, inlet controls, pipework and the surrounding area may become hot, which may cause burn injuries. Precautions should be taken to ensure that these surfaces cannot cause such injuries.

SOLAR THERMOSTATIC MIXING VALVE

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DESCRIPTION

The ENWARE AQUABLEND 1500 Solar Thermostatic Mixing Valve is available complete with inlet service fittings. The inlets to the valve are DN15 compression fittings, and the outlet from the valve is a DN15 compression fitting with an optional DN20 compression fitting.

Strainers and high temperature check valves are located in the inlet ports to the valve.

Isolating ball valves are provided loose with the thermostatic mixing valve.

The inlet service fittings also incorporate union type fittings enabling the thermostatic mixing valve to be removed from its installation without disturbing its pipework. Refer to IMAGE 1 below.

For Installation schematic refer to IMAGE 5 on page 5

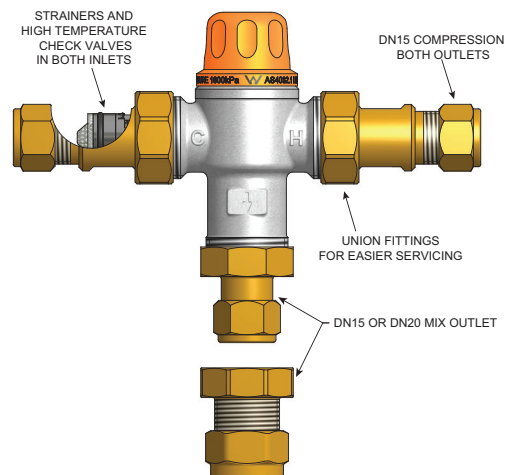


IMAGE 1
GENERAL ARRANGEMENT DRAWING

OPERATING DESCRIPTION

Hot and cold water is supplied to each side of the valve respectively. The hot water enters through a port below the Piston, the cold water enters above the Piston.

Upon entry the water begins to blend and enters the Mixing Tube. At this point the mixed water contacts the thermostatic wax Element.

The Element will extend or contract to match the water temperature it is exposed to causing the Piston to move, thereby regulating the amounts of hot and cold water entering the valve.

This thermostatic mechanism maintains the mixed water temperature at a constant temperature. If for example the inlet hot pressure dropped, the flow of hot water into the valve would be reduced and the valve would react as per the following sequence of events:

- Element is exposed to mixed water at a reduced temperature
- Thermostatic Element contracting
- Piston is pushed upwards by the return spring restricting cold flow, consequently opening more of hot port.
- Valve attempts to restore itself to original temperature setting.

Similarly if the hot inlet temperature dropped, the element would again see blended water at a lower temperature and therefore the Element would again contract reducing the cold port piston gap and hence supply more hot water and less cold. Once again the valve attempts to restore itself to its original setting.

This will occur for all changing conditions including changes to flow rate, inlet temperatures and inlet pressures.

In the event of a sudden loss of the cold water supply the Piston will shut off the hot port thus stopping any flow through the valve. The valve will also shut down the cold supply if there is a hot water failure.

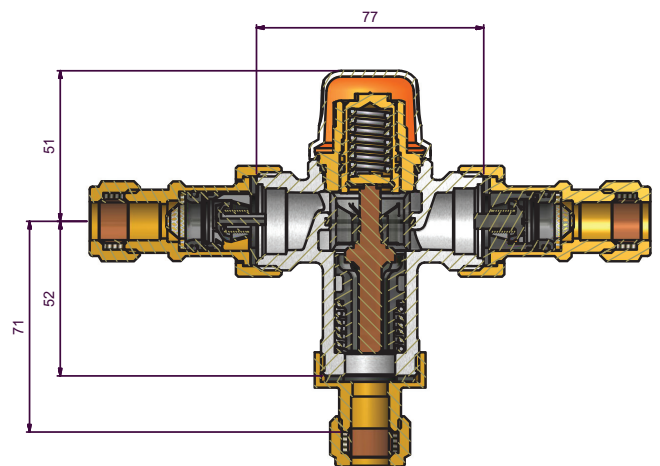


IMAGE 2
SECTIONAL VIEW AND DIMENSIONS



IMAGE 3
ISOLATION VALVE

TECHNICAL INFORMATION

TEMPERATURES

MIXED OUTLET TEMPERATURE	INLET TEMPERATURES	HOT TO MIX TEMPERATURES DIFFERENTIAL FOR STABLE OPERATION	COLD TO MIX TEMPERATURES DIFFERENTIAL FOR STABLE OPERATION
Temperature Adjustment Range 38° - 50°C	Cold Supply Minimum 5° C Maximum 30°C	Minimum 15° C	Minimum 5° C
	Hot Supply Minimum 60° C Maximum 99°C		

FLOW RATES

To Ensure Stable Outlet Conditions	Minimum 4l/minute	Maximum 39l/minute
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DYNAMIC INLET PRESSURES

Hot & Cold Inlet Pressures	Minimum 20 kPa	Maximum 500 kPa
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STATIC INLET PRESSURES

Hot & Cold Inlet Pressures	Minimum 20 kPa	Maximum 1600 kPa
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INLET PRESSURE LOSS RATIO

Maximum inlet pressure loss ratio for stable operation (Hot : Cold or Cold : Hot)	10:1 - either supply
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NOTE: For optimum operation it is recommended that the hot and cold water supply pressures be balanced to within +/- 10%. Notwithstanding the above, compliance with AS3500 must be maintained. Hot supply must not be steam.

FLOW SIZING GRAPH

The ENWARE AQUABLEND 1500 Solar Thermostatic Mixing Valve is suitable for many applications. The Pressure Loss Characteristic for Mixed Outlet Flowrate versus Balanced Inlet Pressure is shown below. It is important that the valve is not oversized for its intended application.

Note: To ensure optimum performance the minimum outlet flow of the mixing valve during operation should be at least 4 litres/minute

It is important that the valve is sized such that the flow rates from the outlets are not less than those listed in AS3500.1.2. The pipework between the valve and the system must be sized in accordance with AS3500.1.2 – Appendix B to ensure the water velocity in the pipework is within the allowed limit.

If the valve is to be installed and operated under unequal inlet pressures the lower inlet pressure determines the outlet flow rate. However, for optimum performance and stability it is recommended that the valve be installed with balanced dynamic inlet pressures (+/- 10%).

Flow Performance

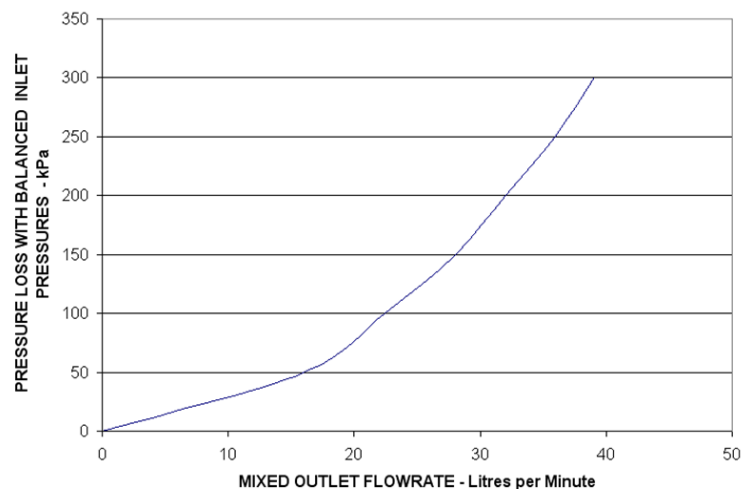


IMAGE 4
FLOW PERFORMANCE CHART

INSTALLATION PROCEDURE

The ENWARE AQUABLEND 1500 Solar Thermostatic Mixing Valve should be installed using the appropriate Standard, Code of Practice and legislation applicable to each state and following the details outlined in this section. Installation must be by a licensed plumber, or where applicable, a licensed plumber who has undertaken T.A.F.E. training in Thermostatic Mixing Valves.

Note: To effectively control microbial hazards during system design, installation, commissioning and maintenance, the requirements outlined in AS/NZS3666 and local legislation shall be adhered to.

Inlets and outlet connections of the valve are clearly marked.

The letters H and C cast into the valve body indicates the Hot and Cold Inlet respectively. An arrow cast into the body of the valve identifies the valve outlet direction.

If the valve is not installed correctly then it will not function correctly and may put the user in danger. It may also void the warranty of the valve.

Prior to the installation of the valve, the system must be checked to ensure that the system operating conditions fall within the recommended operating range as detailed on page 4.

If the hot water supply temperature is greater than 99°C or there is steam present the valve may be damaged. A suitable temperature limiting valve must be fitted to the hot water supply, prior to the inlet fittings, if the temperature of the hot water will rise above 99°C. This temperature limiting valve must be installed as per the manufacturer's instructions.

It is also important that both of the inlet dynamic supply pressures are 500kPa or less. If either supply pressure exceeds 500kPa then a suitable pressure reducing valve must be fitted prior to the inlet control valve to reduce the pressure to an acceptable limit. These pressure reducing valves must be installed as per the manufacturer's instructions. In order to achieve optimum performance from the valve it is recommended that the inlet pressures are balanced to within 10% of each other.

The water quality conditions should be checked to ensure they do not exceed the limits as listed in AS3500.4, Section 1.6 If they do exceed these limits then it will be necessary to install a water softener or water treatment device.

NOTE: In some installations certain types of devices such as flick mixers and solenoid valves are used, the water pressure may be seen to spike outside that recommended, for the valve, during rapid shut off conditions with these types of devices. Even if the spike only lasts a split second it is still considered to be outside the operating conditions

and may cause the valve to operate incorrectly. In the event that this does occur measures must be taken to control the spike, such as an inline pressure reducing valves directly before the valve inlets.

To ensure that the mixing valve operates correctly it is necessary that the pipework is thoroughly flushed with clean water before the valve is installed. This will remove any physical contaminants from the pipework, ensuring trouble-free operation. During the flushing procedure care should be taken to prevent water damage occurring to the surrounding area.

It is required by AS3500.4.2 that "Each thermostatic mixing valve shall have an isolating stop tap/valve, line strainer and non-return valve fitted to the hot and cold water supply lines". The inlet fittings supplied with each TMV will ensure this requirement is met.

If the ENWARE AQUABLEND 1500 Solar Thermostatic Mixing Valve is to be installed without the supplied inlet control valves then it will be necessary to install a separate isolating valve, non-return valve and strainer to both inlets to the valve. **Strainers must be fitted** to prevent any particulate contamination from entering the valve. These strainers should be 60 Mesh stainless steel. Isolating valves are required so that the water supply to the valve can be isolated in the event that servicing is required. Non-return devices must also be fitted to both the hot and cold inlets to prevent cross-connection.

The valve should be installed so it can be accessed easily for maintenance or servicing. The valve can be installed in a wall cavity, under a basin or on a wall, however, it is essential that the mixing valve and inlet fittings are easily accessible for servicing.

During installation or servicing heat must not be applied near the mixing valve or inlet fittings, as this will damage the valve and inlet fitting internals. Failure to comply with this requirement will damage the valve and fittings. It will put the user at risk, and it will void the warranty of the valve.

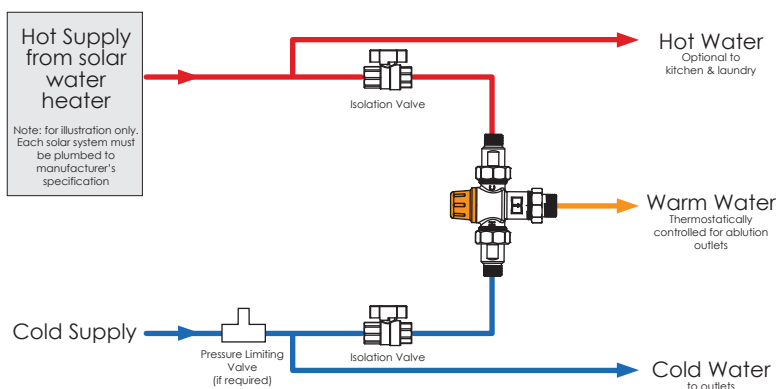


IMAGE 5
INSTALLATION SCHEMATIC

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 through 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 valve) will be required to check & set the outlet mixed temperature of the valve.

- Utilise commissioning report template on page 8
- 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, 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.
- Allow the mixed outlet to flow for at least 30 seconds to allow the temperature to stabilise before taking a temperature reading at the outlet with a digital thermometer. The flow rate can be measured with the use of an approved flow cup. The temperature should be taken at the closest outlet served by the thermostatic mixing valve.
- If temperature adjustment is required follow procedure below.
- Perform a shutdown test - refer to page 7

TEMPERATURE ADJUSTMENT

1. Using a small flat bladed screw driver lever the protective cover off the valve. **SEE IMAGE 6 and 7**

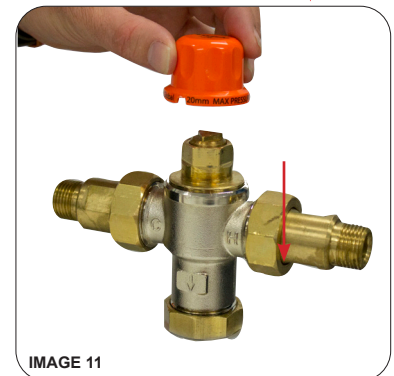
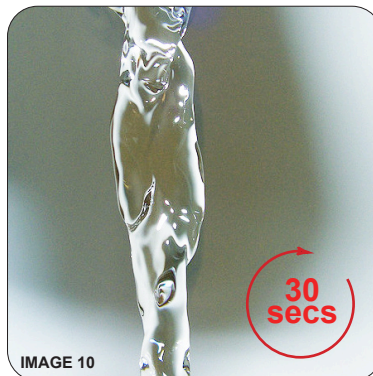
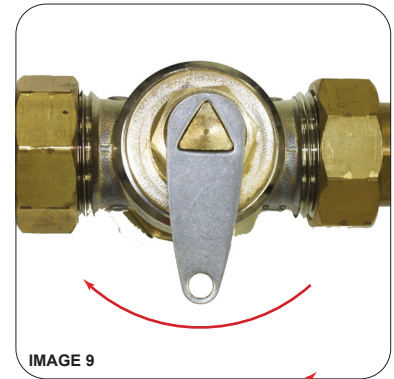
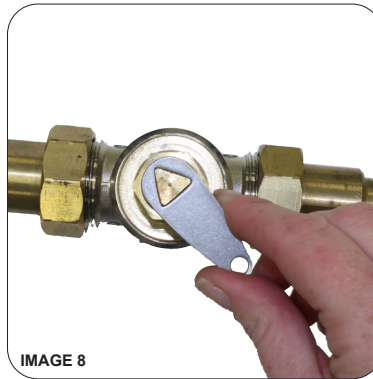
2. Fit the supplied key over the adjusting spindle **SEE IMAGE 8**

Before setting the temperature, rotate the spindle all the way clockwise then fully anti-clockwise. The valve is now ready to be set:

To **increase** the mixed outlet temperature, rotate the spindle anti clockwise. **SEE IMAGE 9**

To **decrease** the mixed outlet temperature, rotate the spindle clockwise. **SEE IMAGE 9**

3. Allow the mixed outlet temperature to stabilize for 30 seconds and once again take a temperature reading. Repeat the procedure until the desired temperature has been reached. **SEE IMAGE 10**
4. Push the top cover firmly on to the top of the valve until it 'snaps' back into place. **SEE IMAGE 11**
5. Check that the outlet temperature is stable over the full range of flow rates and that the flow rate is adequate for the application.
6. Close the outlet.
7. The mixing valve temperature is now set and locked.



COMMISSIONING OF THE VALVE continued

SHUT DOWN TEST

1. If the mixing valve temperature has been adjusted allow the mixed water temperature to stabilise and note the outlet temperature.
2. While holding a digital thermometer in the outlet flow, quickly isolate the cold water supply to the valve. The outlet flow should quickly cease flowing. As a rule of thumb the flow should be less than 0.1L/min following the isolation.
3. Restore the cold water supply to the valve. After the mixed water temperature has stabilised note the outlet temperature ensuring the outlet temperature has re established.
4. 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 0.1L/min@100kPa following the isolation.
5. Restore the hot water supply to the valve and measure and record the outlet temperature after the mixed water temperature has stabilised for 30 seconds ensuring the outlet temperature has re established.
6. Ensure that all details of the Commissioning Report are completed & signed by the relevant signatories & a copy is kept with the installer and owner of the premises.

The valve is now commissioned and it can be used within the technical limits of operation.

MAINTENANCE & SERVICING

The ENWARE AQUABLEND 1500 Solar Thermostatic Mixing Valve will only require minimal preventative maintenance work to ensure it operates at its optimum level of performance. The valve should be commissioned and serviced annually, unless the installed conditions dictate more frequent servicing is necessary.

ANNUAL MAINTENANCE PROCEDURE

Every 12 months the ENWARE AQUABLEND 1500 Solar should be inspected and tested. The valve should be given a light wipe down of the external surface. The valve & surrounding area should be inspected for leaks or water damage and appropriate action taken if required.

1. Ensure a clean dry work area is available
2. Isolate the hot and cold supplies to the mixing valve by closing the inlet ball valves.
3. Remove the inlet fitting top caps with a suitable spanner and then remove the mesh strainer.
4. 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.
5. The strainers can then be re-installed into the inlet fittings and the top caps re-installed. Take care not to over tighten.
6. If the valve fails to shut down or fails to maintain its set temperature then refer to the trouble shooting solutions outlined on pages 9 and 10.
7. **The valve piston 'O' ring and thermostatic element / piston assembly must be replaced at intervals not exceeding 5 years.**
8. The valve must then be recommissioned as per page 6, including temperature adjustment and the shut down test.



THERMOSTATIC MIXING VALVE COMMISSIONING AND/OR MAINTENANCE REPORT

- NOTE:
1. In all cases the Licensee is to submit this report within seven working days after commissioning and/or servicing the valve.
 2. Use a separate form for each valve.
 3. The original report is to be given to the owner/occupier and retained on site for a minimum of 7 years.
 4. All details are to be filled in. Incomplete reports will not be accepted

PRINT ALL DETAILS or MARK WITH A X IN BOXES TO INDICATE CHOICE

Name of Establishment				
Address	Suburb	State	Post Code	
Contact	Phone	Date		

Work Order No	Make & Model of Hot Water Unit			
Make of Mixing Valve	Model No	Size		
Valve Identification No	Total No of Mixing Valves on Site/Building			
Valve Location/Building				
Area Served by the Valve				
Number of outlets served	baths	sinks	showers	basins

Mixing Valve installed to the requirements of:

The HOSPLAN Code of Practice for Thermostatic Mixing Valves in Health Care Facilities	<input type="checkbox"/> Yes <input type="checkbox"/> No	Hot Pressure kPa	
The valve manufacturer/supplier requirements	<input type="checkbox"/> Yes <input type="checkbox"/> No	Hot Temperature °C	
The NSW Code of Practice Plumbing and Drainage	<input type="checkbox"/> Yes <input type="checkbox"/> No	Cold Pressure kPa	
If NO, give details and action taken		Cold Temperature °C	

Details of work carried out:

- | | |
|--|--|
| <input type="checkbox"/> Serviced | <input type="checkbox"/> Commissioned |
| <input type="checkbox"/> Visually inspected & clean valve components | <input type="checkbox"/> Checked function of non return valve |
| <input type="checkbox"/> Replaced O rings and lubricate | <input type="checkbox"/> Reassemble <input type="checkbox"/> Dismantle |
| <input type="checkbox"/> Set Temperature | <input type="checkbox"/> Thermal Shutdown Test Passed |

List of items replaced and part numbers during this visit:

Service Kit No	
Other Parts	

Temperature range of warm water at outlet Neonatal and Children - 38-40°C Adult 40.5-43.5°C Set Temp °C

Date of this service/commissioning	Date next service due
Previous service carried out by:	Date of previous service
Valve installed by:	Date of installation

It is hereby certified that all work has been carried out by the undersigned in accordance with the requirements of the HOSPLAN Codes of Practice for Thermostatic Mixing Valves.

Contractor's Name (print)	Contractor's Licence No
Contractor's Signature	Date
Contractor's Phone No.	
Owner/Occupier Signature	Date

Distribution: White – Owner/Occupier Green – Licensed Person Blue – Where required by the Water Utility
 NOTE: A copy of this report is to be retained at the site for any inspection by authorised persons.

TROUBLESHOOTING

FAULT/SYMPTOM	CAUSE	RECTIFICATION
The desired mixed water temperature cannot be obtained or valve is difficult to set	Hot and cold supplies are fitted to wrong connections.	Refit the valve with Hot/Cold supplies fitted to the correct connections
	Valve contains debris	Clean the valve ensuring that all debris is removed and all components are not damaged
	Strainers contain debris	Clean the strainer ensuring that all debris is removed
	Non-return devices are damaged	Check non-return device is not jammed. Clean it if necessary
	Top Cap and/or Piston O-rings are damaged	Check Top Cap and Piston O-rings for damage. Replace if necessary
The valve will not shut down	The hot to mix temperature differential is not 10°C or greater	Raise hot water temperature
	The piston O-ring is damaged	Replace piston O-ring
	Rubber sealing seat is damaged or fouled by debris	Clean seat using mild descaling solution.
	Debris fouling flow adjustment screw	Replace element
	Thermostatic element has failed	Remove blockage
Mix temperature unstable	Debris is fouling valve	Clean the valve ensuring that all debris is removed and components are not damaged
	Flow rate below 4L/min	Rectify any pressure deterioration
	Strainers are fouled	Clean strainers
Mix temperature changing over time	Inlet conditions (pressures or temperatures) are fluctuating	Install suitable pressure control valves to ensure inlet conditions are within those stated on page 4
	Strainers contain debris	Clean strainers ensuring debris is removed
Either full hot or cold flowing from outlet fixture	Valve is incorrectly set	Adjust mix temperature between 38 - 50°C as required.
	Hot/Cold water has migrated to other inlet.	Replace faulty non-return valves
	Refer also to fault/ symptom 1 & 2	
No flow from the valve outlet	Hot or cold water failure.	Valve functioning correctly. Restore inlet supplies and check mix temperature.
	Strainers are fouled	Clean strainers

TROUBLESHOOTING

FAULT/SYMPTOM	CAUSE	RECTIFICATION
Flow rate reduced or fluctuating	Valve or inlet fittings fouled by debris	Check valve and inlet fittings for blockages
	Dynamic inlet pressures are not within recommended limits	Ensure operating conditions are within specified limits and the dynamic inlet pressures are nominally balanced to within +/- 10%.
Mixed water temperature too hot or cold	Valve has been tampered with	Readjust valve to required set temperature
	Valve incorrectly set.	Readjust valve to required set temperature.
	Inlet temperatures are not within specified limits	Ensure inlet temperatures are within the specified limits as listed on page 4
Mixed water temperature doesn't change when the temperature adjuster is altered	Return spring is missing	Install return spring
	Thermostatic element has failed	Replace thermostatic element
Mixed water temperature adjuster difficult to move	Adjuster at maximum mix temperature stop.	Mixed water is at maximum temperature. No higher mix temperature adjustment is available.
	Valve piston into overstroke	Wind adjuster out until set temperature required is achieved.
Hot water flows into the cold water system or vice versa	Non-return valves	Replace non-return
Valve is noisy	Water velocity above velocity requirements of AS3500.1.2	Reduce water velocity

SPARE PARTS

PART	REPLACEMENT TIME	PART NUMBER
O-Ring Kit	5 years	ATMS123
Thermostatic Element / Piston Assembly	5 years	ATMS1400S
Non-return Valve	when required	ATMS4716
Top Cap Assembly	when required	ATMS1401
Mixing Tube	when required	ATMS228
Return Spring	when required	ATMS190
Wall Mounted Bracket		ATMS728
Temperature Adjuster Key		ATMS514



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