

THREE-PORT SEAT VALVES

Specification No. 626-X-XXX*

These seat valves are of 'globe' construction with a linear moving spindle and a modified parabolic characterised plug operating against the upper seat which controls flow quantity to suit the load. The lower part of the plug has a linear characteristic operating against the lower seat controlling the bypass quantity. This arrangement gives the optimum performance for both mixing and diverting applications. For the latter the valve must be fitted in the return.

The valves are suitable for the control of hot or chilled water and brine or glycol solutions within the limits given in the table below. They are suitable for operation by the AVUM, AVUX and AVUE actuators only. For details of the actuators, refer to Data Sheets DS 3.23 and DS 3.24.

The 'MZX' range of valves fitted with appropriate Satchwell actuators will fully comply with all relevant European directives.

* For the full specification number replace the 4 X's with the appropriate figures from the TYPE column in the table on Page 2.



SPECIFICATIONS AND GUIDE TO SELECTION

VALVE					SUITABLE ACTUATORS - see DS 3.23 and DS 3.24		CONTROL MEDIUM				
					AVUX 2202 AVUM 2601 AVUE 2304 AVUE 2354		Brine, 15% max. NaCl or CaCl ₂ (freeze protection) Glycol Solution, 25% max. (freeze protection)				
Group	Size	Type	*Cv _s	Stroke	Maximum differential pressure (Δp)	Water ↓	Temperature limits		Maximum internal pressure	International Pressure Rating	
							Min	Max			kPa
MZX Screwed Bronze	½"	MZX 4402	2.5	12.7mm (½")	1180	●	2°C	120°C	1600	PN 16 (ND 16)	
	¾"	MZX 4452	4		720						
	1"	MZX 4501	8		340						
	1¼"	MZX 4551	12		200						
	1½"	MZX 4601	20		120						
	2"	MZX 4651	32		60						

* Cv_s = Flow in UK gal/min to produce 1 lbf/in² pressure drop when the valve is fully open Kv_s = Cv_s x 1.03
 Kv_s = Flow in m³/hr to produce 1 bar pressure drop when the valve is fully open
 100 Kpa 1 Bar = 1.02 kgf/cm² = 14.5 lbf/in²

For full TECHNICAL SPECIFICATION see table on Page 2 which gives details of pipe connections, materials etc.

CONSTRUCTION & TECHNICAL SPECIFICATION

Technical Specification				MZX ½" & ¾"	MZX 1" to 2"
Pipe Connections	Screwed B.S.P. to BS 21 female - taper Screwed B.S.P. to BS 21 female - parallel			● —	— ●
Characteristic	Port 2 Modified Parabolic Port 3 Linear			● ●	● ●
Rangeability	50:1			●	●
Let-by	Based on:- % Cv at 1 lbf/in ² pressure drop % Kv at 1 bar pressure drop	Ports 2-1	0.05% max. 0.1% max.	● —	— ●
		Ports 3-1	0.5% max.	●	●
Temperatures	See table on Page 2			—	—
Working Pressure	See table on Page 2			—	—
Test Pressure	2400kPa			●	●
Body Material	Bronze: leaded gunmetal BS 1400 LG2			●	●
Seats	Top: Integral with body Bottom: Copper alloy BS 2874 CZ 132 or BS 2871 CZ 110 Bottom: Leaded gunmetal BS 1400 LG2			● ● —	● — ●
Plug	Copper alloy BS 2874 CZ 132 or BS 2871 CZ 110			●	●
Spindle	Stainless Steel: BS 970 Grade 303 S42			●	●
Guide	Leaded gunmetal BS 1400 LG2			—	●
Bonnet	Integral with body			●	●
Gland (non-adjustable spring-loaded)	Packing chevrons: PTFE BS 4271 Grade B Scraper rings: PTFE BS 4271 Grade B Headers: Copper alloy BS 2874 CZ 132 or BS 2871 CZ 110 Spring: Austenitic Stainless steel BS 2056 302S26 Gland Nut: Copper alloy BS 2874 CZ 132 or BS 2871 CZ 110			● ● ● ● ●	● ● ● ● ●
Gland 'O' Ring	Ethylene Propylene			●	●
Replacement Gland Kit	626-9-203			●	●

GOOD DESIGN PRACTICE

CONTROL MEDIUM

The table on Page 2 lists suitable fluids and which valves are appropriate.

Other fluids e.g. seawater, oils etc: Satchwell cannot accept responsibility for use of these valves with fluids other than those listed in table on Page 2. Detailed specifications of all materials in contact with the fluid are given in table on Page 2 and it is the responsibility of the specifier to check their suitability.

Note that all brass components used in valve construction, which are in contact with the fluid, are manufactured from dezincification resistant materials.

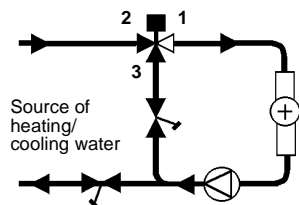
The valves are intended to be used in closed circuits; if the circuit is open e.g. mains water or from exposed cooling tower ponds, it is possible that a build-up of mineral deposits may impair the operation of the valve and frequent maintenance will be necessary. Appropriate precautions should be taken.

MIXING AND DIVERTING APPLICATIONS

These valves must always be installed with two inlet streams and one outlet stream i.e. as mixers. Reversal of this direction will cause vibration and water hammer which will damage both valve and actuator.

For diverting applications the valve must therefore be fitted in the return pipe. The water will be diverted with respect to the load, but will mix in the valve. (See Fig.1 Schematic only.)

Mixing



Diverting

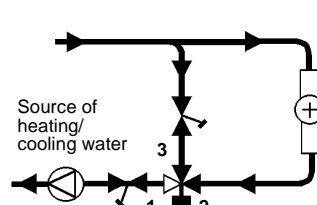


Fig.1

VALVE SIZING

The valve should have an authority of not less than approximately 0.5. That is, the pressure drop through the valve should be as near as practicable equal to the pressure drop through either of the parallel paths in which the flow quantity is varied.

SIZING CHARTS ARE GIVEN IN V110.

PLANNING THE INSTALLATION

In planning pipework layout the following considerations apply when deciding on the valve position:-

- Allow sufficient access for actuator and wiring.
- Avoid spindle pointing vertically downwards to avoid risk of condensation or leakage damaging actuator.
- Observe the upper ambient temperature limitation of actuators (50°C).
- Where fluid in valve exceeds 100°C actuator must not be above valve. Therefore valve should be mounted with spindle horizontal.
- Observe correct direction of flow through valve as indicated by arrow cast on body. Fit valve in return pipe for diverting applications.
- Regulating valves are recommended to be installed in the bypass pipe to each 3-way control valve, in addition to those for pump sets and branches etc.
- It is suggested that strainers should be fitted to protect the valves.

When strainers are fitted the following recommendations should be observed:-

- Strainer bodies for line sizes up to DN 50 (50mm) should be Bronze to BS 1400, PB1 or cast iron to BS 1452, class 180.
- Strainer pressure ratings should be at least 150% of the maximum pressure expected in the application.
- Strainer screens should be of a suitable stainless steel construction.
- The strainer screen should have a free area at least 250% of the line cross sectional area.
- The screen perforation diameter should be in the range of 0.7 to 0.9mm for sizes up to DN 50 (50mm)
- Strainers should be installed in parallel to enable online maintenance to be carried out.
- Ensure system is efficiently vented, particularly for low flow rates.

INSTALLATION

The system should be thoroughly flushed out to remove foreign matter before fitting the valve.

The fitting of strainers is NOT a substitute for flushing the system out fully. Failure to fully flush the system can result in frequent clogging of the strainers.

Step-by-step installation instructions are packed with each valve and the precautions listed under 'Planning the Installation' must be observed.

Instructions for fitting actuator to valve are packed with the actuator.

It is recommended that valve insulation covers should be fitted to conserve energy.

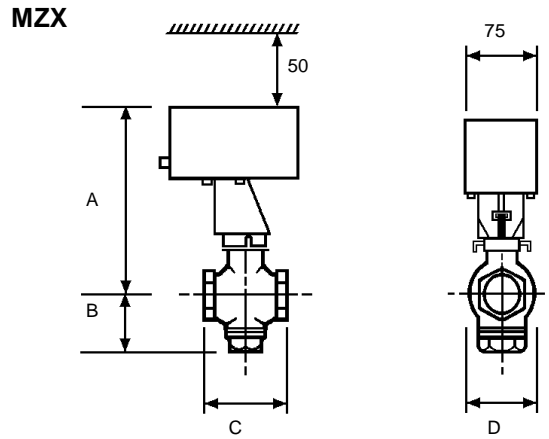
MAINTENANCE

ISOLATE VALVE CONTROL MEDIUM AND RELIEVE PRESSURE BEFORE REMOVING THE ACTUATOR.

THE VALVE TO ACTUATOR LINKAGE NUT LOCATED ON THE TOP OF THE VALVE SPINDLE IS PRESET AND MUST NOT BE ADJUSTED.

A periodic check of the valve should be made for general condition and leakage. For replacement gland kit see table on Page 2.

DIMENSION DRAWING



Valve Size	A mm	B mm	C mm	D mm
1/2"	181	48	62	36
3/4"	182	42	74	43
1"	186	76	97	51
1 1/4"	191	76	108	72
1 1/2"	194	76	121	77
2"	202	89	145	93

Note: Allow 50mm between top of actuator and nearest obstruction to permit fitting and removal of actuator.



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CAUTION

- Observe recommendations under 'Good Design Practise' - see Page 3.
- Observe limits of water temperature, system pressure and maximum differential pressure - see Page 2.
- The system should be thoroughly flushed out to remove foreign matter before fitting the valve.
- ISOLATE VALVE CONTROL MEDIUM AND RELIEVE PRESSURE BEFORE REMOVING THE ACTUATOR. THE VALVE TO ACTUATOR LINKAGE NUT LOCATED ON THE TOP OF THE VALVE SPINDLE IS PRESET AND MUST NOT BE ADJUSTED
- Interference with those parts under sealed covers renders the guarantee void.
- When the valve plug/spindle assemblies are changed after factory test or replaced in service, the original specified percentage let-by can no longer be guaranteed.
- Information is given for guidance only and Satchwell do not accept responsibility for the section or installation of its products unless information has been given by the Company in writing relating to a specific application.
- Design and performance of Satchwell equipment are subject to continual improvement and therefore liable to alteration without notice.
- A periodic system and tuning check of the control system is recommended. Please contact your local Satchwell Service Office for details.