Satchwell

MZ, MZF, MJF

THREE-PORT SEAT VALVES

Specification No. 626-3-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 on Page 2. The information given in this Data Sheet covers operation using the 'AL' and 'AL-S' ranges of linear actuators.

The 'MZ', 'MJF' and 'MZF' ranges of valves fitted with appropriate Satchwell actuators will fully comply with all relevant European directives.

SPECIFICATIONS AND GUIDE TO SELECTION

VALVE					SUITABLE ACTUATORS - See DS 3.401, 3.501, 3.601				CONTROL MEDIUM				
					ALM 1601 ALM 1626 ALX 1201 ALX 1226 ALE 1302 ALE 1327 ALE 1376	ALM 1651 ALX 1251 ALE 1352	ALMS 1601 ALMS 1651 ALXS 1201 ALXS 1251 ALES 1302 ALES 1352	ALi 1576 ALi 1577	Brine, 15% max. NaCl or $CaCl_2$ (freeze protection) Glycol solution, 25% max. (freeze protection) Water ↓				
Group	Size	Type	*Cv_S	Stroke	Maximum differential pressure (Δ p)					Temperature limits		Maximum internal pressure	International Pressure Rating
					kPa	kPa	kPa	kPa		Min.	Max.	kPa	
MZ Screwed Bronze	½" ¾"	**MZ 3402** **MZ 3452**	2.5 4	9.5mm ($^3/_8$")	1600 1600	1000 750	1000 750	1600 1600					
	1" 1¼" 1½" 2"	**MZ 3501** **MZ 3551** **MZ 3601** **MZ 3651**	8 12 20 32	15.9m ($^5/_8$")	970 580 410 240	440 290 200 110	440 290 200 110	1262 755 533 312	●	2ºC	200ºC at 1300 120ºC at 1600		PN 16 (ND 16)
MJF Flanged Cast Iron	15mm 15mm	**MJF 3426** **MJF 3427**	1.0 4.0	9.5mm ($^3/_8$")	1600 1600	840 840	840 840	1600 1600					
	20mm 25mm	**MJF 3476** **MJF 3526**	6.3 10	15.9mm ($^5/_8$")	1300 850	610 420	610 420	1600 1106	●	2ºC	200ºC at 1300 120ºC at 1600		PN 16 (ND 16 to DIN 2401)
	32mm 40mm 50mm	**MJF 3576** **MJF 3626** **MJF 3676**	16 25 40	24.5mm (1")	550 350 220	— — —	270 170 110	716 455 286					
MZF Flanged Cast Iron	65mm 80mm 100mm	**MZF 3729** **MZF 3779** **MZF 3854**	63 80 125	25.4mm (1")	140 100 50	— —	80 50 20	182 130 65	●	2ºC	200ºC at 1300 120ºC at 1600		PN 16 (ND 16 to DIN 2401)
	125mm 150mm	**MZF 3904** **MZF 3958**	200 315	38mm (1½")	28 18	— —	— —	36 23					

*. Cv_S = Flow in UK gal/min to produce 1 lbf/in^2 pressure drop when the valve is fully open $KV_S = CV_S \times 1.03$
Kv_S = Flow in m^3/hr to produce 1 bar pressure drop when the valve is fully open
100 kPa = 1 Bar ≡ 1.02 Kgf/cm^2 ≡ 14.5 lbf/in^2

For full TECHNICAL SPECIFICATION see table on Page 3 which gives details on flange drillings, materials etc.

ACCESSORIES

LINKAGE KITS

SPECIFICATION	VALVE	ACTUATOR	ACTUATOR MANUFACTURER
LNK 1541	MJF, 32mm to 50mm	SKD62	Landis & Gyr
LNK 1542	MZ ½", ¾", 1" to 2", MJF,VSF 20mm, 25mm, MJF 15mm	SKD62	Landis & Gyr
LNK 1543	MZF, 65mm to 150mm	SKD62	Landis & Gyr
LNK 1544	MZ ½" to 2", VSF 20mm, 25mm	M6425C	Honeywell
LNK 1545	MZF, 65mm to 150mm	M6425C	Honeywell
LNK 1547	MZ ½" to 2", VSF, 15mm to 25mm	MVL 56, MVL 56A/C	Controlli
LNK 1548	MZF, 65mm to 150mm, VSF, 32mm to 50mm	MVL 56, MVL 56A/C	Controlli

CONSTRUCTION & TECHNICAL SPECIFICATION

Technical Specification			MZ ½" & ¾"	MZ Bronze 1" to 2"	MJF 15 to 50mm	VZF 65 to 150mm
Pipe Connections	Screwed B.S.P. to BS 21 female — taper		●	–	–	–
	Screwed B.S.P. to BS 21 female — parallel		–	●	–	–
	Flanged BS 4504 16/11. = DIN 2533 ND 16		–	–	●	●
	Face to Face dimension to DIN 3300		–	–	●	–
Characteristic	Port 2 Modified parabolic		●	●	●	●
	Port 3 Linear		●	●	●	●
Rangeability	50:1		●	●	●	●
Let-by	Based on: % Cv at 1 lb/in^2 pressure drop % Kv at 1 bar pressure drop	Ports 2—1 0.05% max.	●	–	–	–
		Ports 2—1 0.1% max.	–	●	–	–
		Ports 2—1 0.2% max.	–	–	●	●
		Ports 3—1 0.5% max.	●	●	●	●
Temperature	See Page 2		–	–	–	–
Working Pressure	See Page 2		–	–	–	–
Test Pressure	2400 kPa		●	●	●	●
Body Material	Bronze: leaded gunmetal BS 1400 LG2		●	●	–	–
	Close grained cast iron BS 1452 Grade 14 or 17		–	–	●	●
Seat	Top: Integral with body		●	●	–	–
	Bottom: Copper alloy BS 2874 CZ 132 or BS 2871 CZ110		●	–	–	–
	Bottom: Leaded gunmetal BS 1400 LG2		–	●	–	–
	Top & Bottom: Copper alloy BS 2874 CZ 132 or BS 2871 CZ 110		–	–	●	–
	Top & Bottom: Leaded gunmetal BS 1400 LG2		–	–	–	●
Plugs	Copper alloy BS 2874 CZ 132 or BS 2871 CZ 110		●	●	●	–
	Leaded gunmetal BS 1400 LG2		–	–	–	●
Spindle	Stainless Steel: BS 970 Grade 303 S42		●	●	●	●
Guide	Leaded gunmetal BS 1400 LG2		–	●	●	–
	Leaded brass BS 2874 CZ 121		–	–	–	●
Bonnet	Integral with body		●	●	–	–
	Close grained cast iron BS 1452 Grade 14 or 17		–	–	●	–
	Copper alloy BS 2874 CZ 132		–	–	–	●
Gland (non-adjustable spring-loaded)	Packing chevrons: PTFE BS 4271 Grade B		●	●	●	●
	Scraper rings: PTFE BS 4271 Grade B		●	●	●	●
	Headers: Brass BS 2874 CZ 121		–	–	–	●
	Headers: Copper alloy BS 2874 CZ 132 or BS 2871 CZ 110		●	●	●	–
	Spring: Austenitic stainless steel BS 2056 302 S26		●	●	●	●
	Gland Nut: Copper alloy BS 2874 CZ 132 or BS 2871 CZ 110		●	●	●	–
	Gland Nut: Leaded brass BS 2874 CZ 122		–	–	–	●
Gland 'O' Ring	Fluoroelastomer		●	●	●	●
Replacement Gland Kit	626-9-203		●	●	●	–
	626-9-311		–	–	–	●

.

VALVE STROKE TIME

This table gives total stroke time related to type, size and stroke of valve with type of actuator used

VALVE TYPE AND SIZE		VALVE STROKE	VALVE STROKE TIME (Secs.)					
			Actuator speed 8.5 s/mm	Actuator speed 5.0 s/mm	Actuator speed 2.5 s/mm	Actuator speed 7.0 s/mm	Actuator speed 0.3 s/mm	Actuator speed 1.8 s/mm
MZ MJF	½" & ¾" 15mm	9.5mm ($^3/_8$")	81	48	24	67	3	17
MZ MJF	1" – 2" 20, 25mm	15.9mm ($^5/_8$")	135	80	40	111	5	29
MJF MZF	32– 50mm 65 –100mm	25.4mm (1")	216	–	64	178	8	46
MZF	125, 150mm	38mm (1½")	323	–	95	–	–	69

For information relating to the following associated products see the Data Sheets listed:

Actuators, mains voltage (ALM), 24 volt (ALX) or with electronic positioner (ALE) – DS 3.401

Power Failure Return Actuators, mains voltage (ALMS), 24 volt (ALXS) or with electronic positioner (ALES) – DS 3.501

Intelligent Linear Actuators, 24 volt (ALi) – DS 3.601

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 the table on Page 3; 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 his 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.)

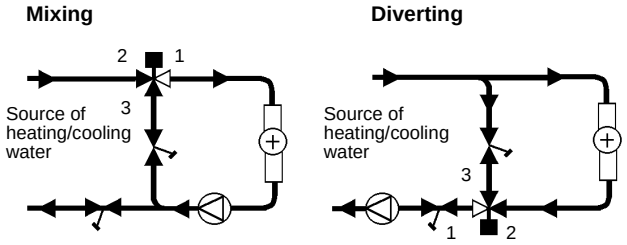


Fig.1

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.

For Sizing Charts see DS 4.950.

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:

– Strainers 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.

– Strainers 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)

– The screen perforation diameter should be in the range of 1.5 to 1.8mm for sizes over DN 50 (50mm).

– Strainers should be installed in parallel to enable on line maintenance to be carried out.

- Ensure system is efficiently vented, particularly for low flow rates.

INSTALLATION

Caution

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 electric actuators to valve are packed with actuator.

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

Cast iron valves used in chilled water systems which are subject to the formation of condensation should also be protected against corrosion by a further coat of suitable paint.

MAINTENANCE

WARNING -

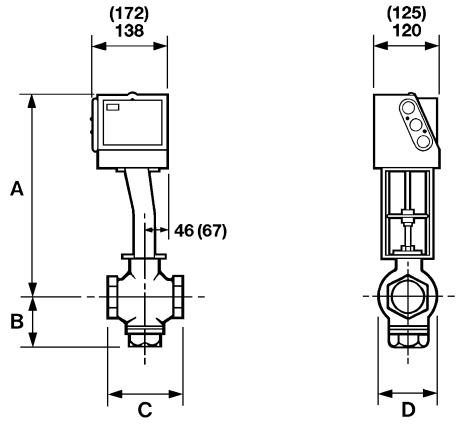
ISOLATE VALVE CONTROL MEDIUM AND RELIEVE PRESSURE BEFORE REMOVING THE ACTUATOR OR WORKING ON THE VALVE.

A periodic check of the valve should be made for general condition and leakage. For replacement gland kits see table on Page 3.

DIMENSION DRAWINGS

MZ

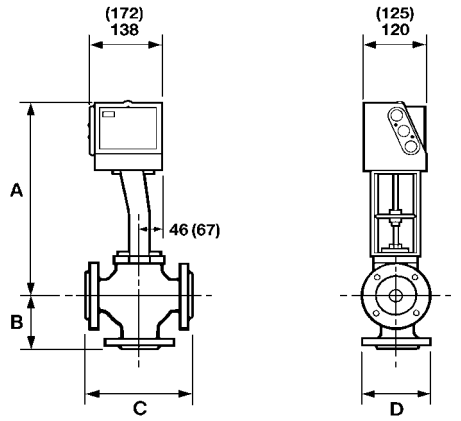
Dimensions in brackets are for 'AL-S' actuators only



Valve Size	A mm			B mm	C mm	D mm
	ALM 1601, ALX 1201, ALE 1302, 1327 ALE 1376, ALi 1576, 1577	ALX 1251 ALE 1352	ALMS ALXS ALES			
½"	361	311	429	48	62	36
¾"	362	312	430	41	74	43
1"	366	316	434	76	97	54
1¼"	371	321	439	76	108	73
1½"	375	325	443	76	121	79
2"	382	332	450	89	145	96

MJF

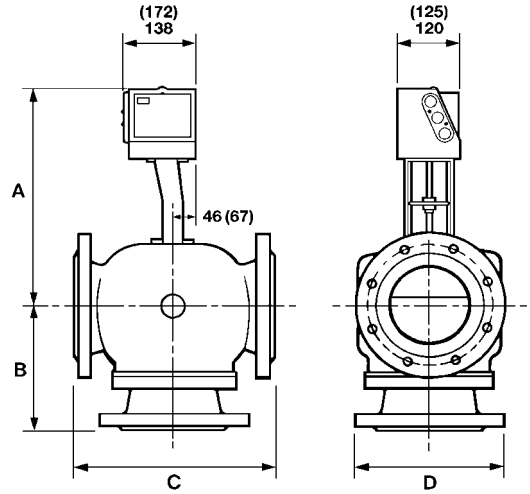
Dimensions in brackets are for 'AL-S' actuators only



Valve Size	A mm			B mm	C mm	D mm
	ALM 1601, ALX 1201, ALE 1302, 1327 ALE 1376, ALi 1576, 1577	ALX 1251 ALE 1352	ALMS ALXS ALES			
15mm	374	324	442	75	130	95
20mm	372	322	440	75	150	105
25mm	394	344	462	95	160	115
32mm	395	—	463	115	180	140
40mm	395	—	463	115	200	150
50mm	395	—	463	115	230	165

MZF

Dimensions in brackets are for 'AL-S' actuators only



Valve Size	A mm		B mm	C mm	D mm
	ALM 1601, ALX 1201, ALE 1302, 1327 ALE 1376, ALi 1576, 1577	ALMS ALXS ALES			
65mm	384	422	162	238	185
80mm	385	423	181	254	200
100mm	401	439	205	292	220
125mm	435	—	227	347	250
150mm	447	—	248	396	285

Note: MZF 65mm has 4-hole flange drilling.

Notes:

- Allow 110mm between top of actuator and nearest obstruction to permit fitting and removal of actuator, also access to manual operator.
- Allow 150mm clearance for access to actuator terminal cover.

WARNINGS -
THESE VALVES CONTAIN FLUOROELASTOMER 'O' RINGS WHICH ARE COMPLETELY SAFE WHILST IN NORMAL OPERATION. DO NOT INCINERATE.

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

Cautions

- **Observe recommendations under 'Good Design Practice' — See Page 4.**
- **The system should be thoroughly flushed out to remove foreign matter before fitting the valve.**
- **Observe limits of water temperature, system pressure and maximum differential pressure - see Page 2.**
- **Interference with those parts under sealed covers renders the guarantee void.**
- **When valve plug/spindle assemblies are changed after factory test or replaced in service, the original specific percentage let-by can no longer be guaranteed.**
- **Information is given for guidance only and Satchwell do not accept responsibility for the selection 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.**

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