

THREE PORT VALVES

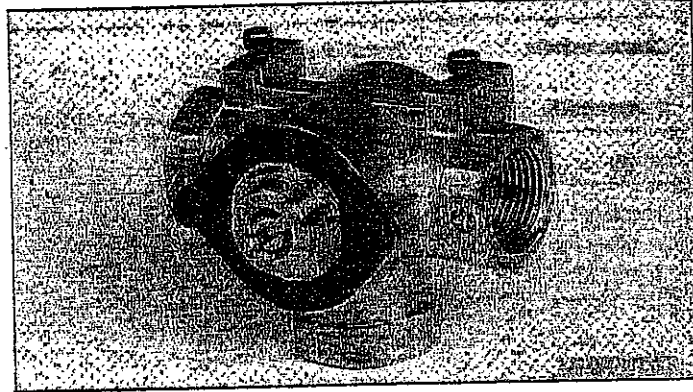
Type MBX

Specification no. MBX - 617-X-XXX*

MBX valves are of the 3-port rotary-shoe type. They are characterised for use as mixing or diverting valves in heating applications.

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

Note: They will operate satisfactorily as two-port valves if the bottom port is blanked off.



SPECIFICATIONS

Group	Size	Kv* or Cv	Type	Maximum Differential Pressure		Temperature Limits		Maximum Internal Pressure (gauge)		International Pressure Rating
				kPa	lbf/in ²	Min.	Max.	kPa	lbf/in ²	
MBX Screwed B.S.P. Parallel Female	1/2"	1.8	MBX 4401	30	4.35	2°C	110°C	600	87	PN 6 (ND 6)
	3/4"	4.0	MBX 4451	30	4.35					
	1"	8.0	MBX 4501	30	4.35					
	1 1/4"	12.0	MBX 4551	30	4.35					
	1 1/2"	20.0	MBX 4601	30	4.35					
2"	32.0	MBX 4651	30	4.35						

100kPa = 1Bar approximately equal to 1.02 kgf/cm² approximately equal to 14.5 lbf/in²

* Kv = Flow in m³/hr to produce 1 Bar pressure drop (Approx.)
Cv = Flow in UK gal/min to produce 1 lbf/in² pressure drop

For full TECHNICAL SPECIFICATION see table on page 2 which gives details of flange drilling, materials etc.

POSSIBLE ACTUATOR VALVE COMBINATIONS AND LINKAGES

ACTUATOR TYPE		'R' & 'CD' (See Data Sheet)	'AR' (See Data Sheet)
240V		RM (DS3.1)	ARM (DS 3.17)
24V		XRM (DS3.1) ZRM (DS3.1)	ARX (DS 3.17)
0-10V Signal		-	ARE (DS 3.17)
Controller Actuator		CD (DS 3.25)	-
Angular Stroke		90°C	90°C
VALVE	MBX 1/2" to 2"	Direct Coupling to valve - no linkage required.	Use linkage kit No. 826-1-702 (see DS 5.80)

Low pressure hot water

CONSTRUCTION AND TECHNICAL SPECIFICATION

TECHNICAL SPECIFICATION		MBX ½ - 1"	MBX 1¼"	MBX 1½ & 2"
Pipe Connections	Screwed Parallel (female) BSP to BS 21	•	•	•
Characteristic	Port 2 Modified	•	•	•
	Port 3 Linear	•	•	•
Rangeability	50:1	•	•	•
Let-by	< 0.5% (max) (% of Cv or % of Kv)	•	•	•
Temperature	See table on page 1	•	•	•
Working Pressure	See table on page 1	•	•	•
Test Pressure	2100 kPa (300 lbf/in ²)	•	•	•

MATERIAL

Body	Hot Pressed Brass to BS872 CZ122 Close Grained Cast Iron to BS1452 Grade 220	• —	— •	— •
Valve Plate Assembly	Stainless Steel to BS1449 1983 Grade 301S21 Bonnet: Brass to BS2874 CZ131	• •	• •	• •
Sleeve	Aluminium Brass Alloy to BS 2870 CZ110 or Arsenical Brass to BS2875 CZ105 or Gilding Brass to BS2870 CZ102	—	•	•
Shoe	PTFE Filled Sintered Shoe	•	•	•
	Driving Plate Brass to BS2873 CZ108	—	•	•
Spindle	High Tensile Brass to BS2874 CZ114	•	•	•
End Bearing	As body material Brass to BS2873 CZ108	• —	— •	— •
'O' Rings	Ethylene Propylene	•	•	•
Springs	Stainless Steel to BS2056 Grade 302S26	•	•	•

SPARES*

SPINDLE ASSEMBLY KIT				
Spindle and Plate	617-9-301	•	—	—
Assemblies, 'O' Rings	617-9-302	—	•	—
Assembly Tool and Grease	617-9-303	—	—	•

*Other spares are available

PACKED WEIGHTS

MBX ½"	1.1 kg
MBX ¾"	0.9 kg
MBX 1"	1.1 kg
MBX 1¼"	2.1 kg
MBX 1½"	3.1 kg
MBX 2"	3.9 kg

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

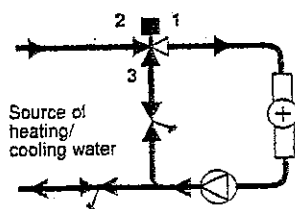
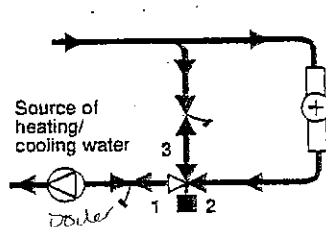


Fig.1

Diverting



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

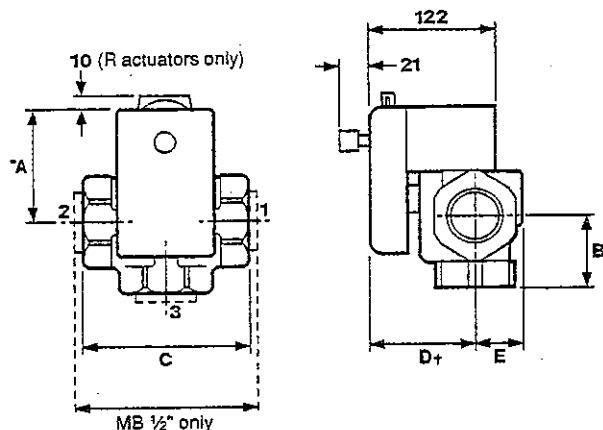
ISOLATE VALVE CONTROL MEDIUM AND RELIEVE PRESSURE BEFORE REMOVING THE ACTUATOR.

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.

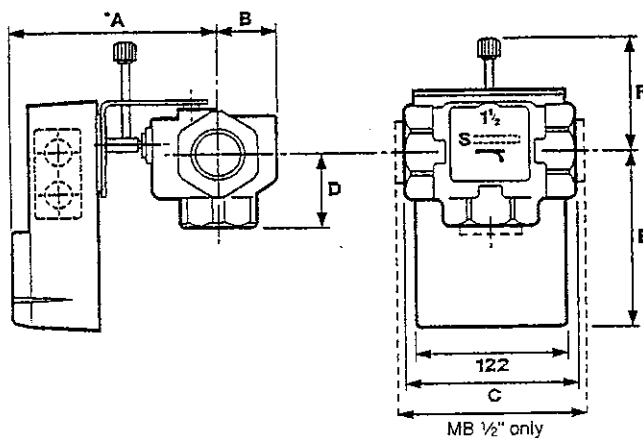
DIMENSIONS

IBX



RM, XRM, ZRM, actuator or CD controller - actuators

Valve Size	*A mm	B mm	C mm	D† mm	E mm
1/2 in	86	55	110	77	24+
3/4 in	86	45	91	77	24+
1 in	86	47	94	77	24+
1 1/4 in	90	49	115	85	30
1 1/2 in	94	52	134	104	49
2 in	100	63	148	104	49



ARM, ARX, ARE

Valve Size	*A mm	B mm	C mm	D mm	E mm	F mm
1/2 in	139	24	110	55	156	95
3/4 in	139	24	90	45	156	95
1 in	139	24	94	47	156	95
1 1/4 in	145	30	115	50	151	100
1 1/2 in	164	49	134	53	148	103
2 in	164	49	148	64	141	110

* Access and fitting clearance: allow additional 150mm to dimension A

† Add 29mm for CD

+ Add 23mm for actuator projection

All dimensions in mm

CAUTION

- Observe recommendations under 'Good Design Practice' - see page 3.
- Observe limits of water temperature, system pressure and maximum differential pressure - see page 1.
- Interference with parts under sealed covers renders the guarantee void.
- 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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