

Maxifluss Rotary Plug Valves

VETEC Types 73.3/M and 73.7/M



Application

Double-eccentric control valve for process engineering, industrial applications and refineries

Nominal sizes DN 25 to 400 · NPS 1 to 16
Nominal pressure PN 63 to 160 · ANSI Class 600 to 900
Temperatures -100 to 400 °C · -148 to 752 °F

Maxifluss Type 73.3 and Type 73.7 Rotary Plug Valve with

- Single-acting VETEC Type M Rotary Diaphragm Actuator

Valve body made of

- Cast steel or
- Stainless cast steel

Seat versions

- Metal sealing

The control valves can be equipped with various accessories such as positioners, solenoid valves, and other devices conforming to VDI/VDE 3845.

Versions

Standard version

For temperatures from -100 to 400 °C (-148 to 752 °F)

- **Type 73.3/M** · DN 25 to 250 in flanged design with through holes in the flange, face-to-face dimensions according to EN 558-1 Series 2 with single-acting Type M Rotary Actuator
- **Type 73.7/M** · DN 25 to 400/NPS 1 to 16 in flanged design with tapped holes in the flange, face-to-face dimensions according to EN 558-1 Series 15 with single-acting Type M Rotary Actuator

Further versions with

- Double packing
- TA-Luft (German clean air act) packing
- Noise-reducing features
- Heating jacket
- Special body and trim materials
- Flanged version with groove or tongue, Male or female face according to DIN EN 1092-1 as well as RF and RTJ according to ANSI
- Sealing lens according to DIN 2696
- Electric actuators or handwheel
- Ceramic seat, plug and lining
- Versions for higher and lower temperatures



Fig. 1 · VETEC Maxifluss Type 73.3/M Rotary Plug Valve with tapped holes in the flange and Type M Pneumatic Actuator



Fig. 2 · VETEC Maxifluss Type 73.3/M Rotary Plug Valve, side view of Type M Pneumatic Actuator

Principle of operation

The shaft and the plug are arranged eccentrically, thus implementing the double-eccentric design of the Maxifluss rotary plug valve together with the offset fulcrum (Fig. 3). This double-eccentric design ensures that the plug clears the seat immediately without any initial breakaway torque or friction when the plug shaft is turned from closed to open position. The valve opens smoothly, providing a stable control response at small opening angles.

The process medium can flow through the Maxifluss rotary plug valve in either direction.

The standard direction of flow for

- Liquids = flow to open **FTO**
direction of flow "V"
- Gases and vapors = flow to close **FTC**
direction of flow "H"

The flow coefficient is determined by the opening angle of the plug.

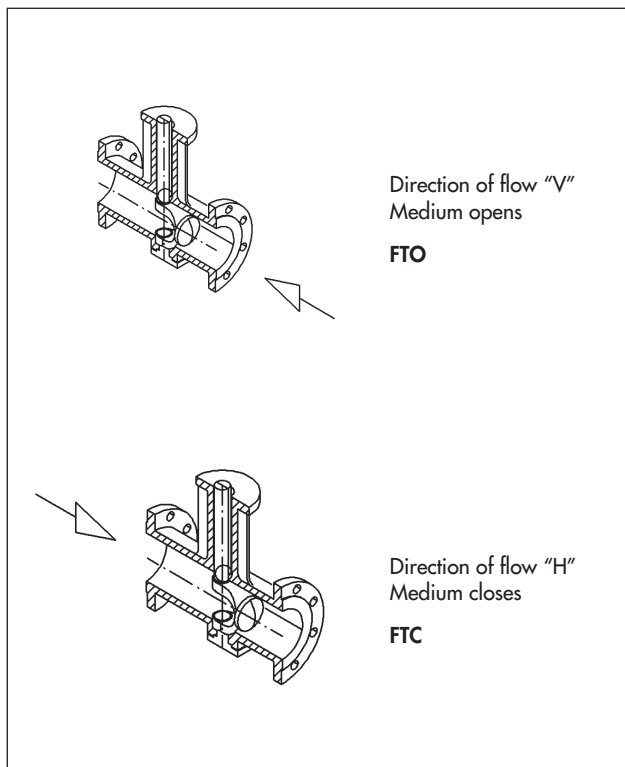
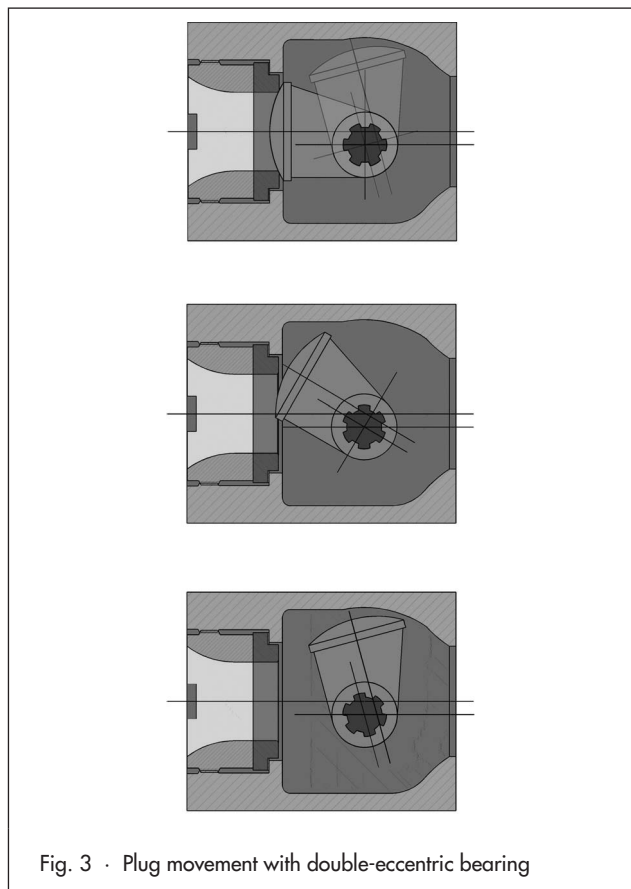
The inherent characteristic of the Maxifluss rotary plug valves can be converted into a linear or equal percentage characteristic using positioners and cam discs.

Fail-safe position

The control valve offers two possible fail-safe positions in combination with the VETEC Type M Rotary Diaphragm Actuator in case the supply air fails:

Valve CLOSED without supply air; the Maxifluss rotary plug valve is closed when the supply air fails.

Valve OPEN without supply air; the Maxifluss rotary plug valve is opened when the supply air fails.



Figs. 4 and 5 · Directions of flow V and H

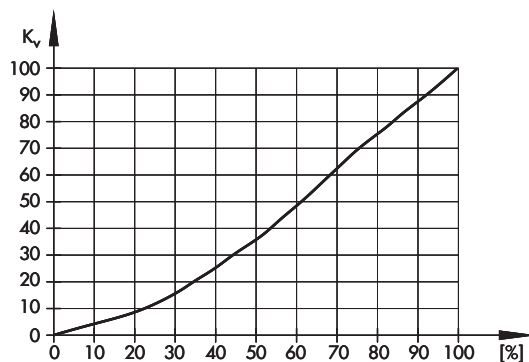


Fig. 6 · Inherent characteristic

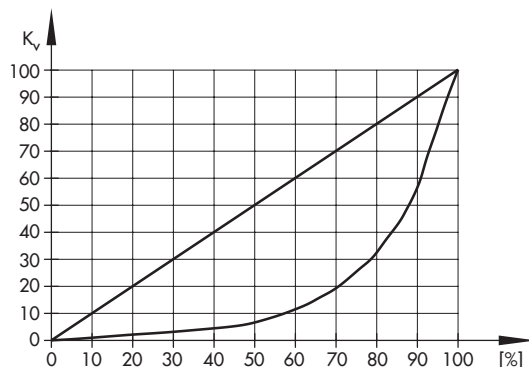


Fig. 7 · Linear or algorithmic characteristic achieved with the help of a positioner

Table 1 · Technical data for VETEC Type 73.3/7

Maxifluss Type	73.3		73.7	
	DN 25 to 250		DN 25 to 400	NPS 1 to 16
Design	Flanged with through holes		Flanged with tapped holes	
Face-to-face dimensions	EN 558-1 Series 2		EN 558-1 Series 15	
Flange bores according to	PN 63/100/160		PN 63/100/160	ANSI Class 600/900
Seat ring	Metal sealing			
Characteristic	Equal percentage or linear (with cam disc in the positioner)			
Rangeability	200 : 1			
Leakage class acc. to DIN EN 1349	IV-L1			
Temperature range				
With metal sealing	-100 to 400 °C · -148 to 752 °F			

Table 2a · Materials for VETEC Types 73.3/73.7

Body	1.0619/1.4581	1.0619/1.4581 A 216 WCC/A 351 CF8M
Seat	1.4571 Optionally with stellite facing	
Plug	1.4581 Optionally with stellite facing or Stellite 6	
Shaft	1.4571	
Packing	PTFE/graphite	
Seals	Graphite/stainless steel	

Table 2b · Materials for Type M Actuator

Housing	Steel
Diaphragms	NBR
Diaphragm plate	Aluminum
Springs	Spring steel

Table 3 · Control valve sizing and noise level calculation

Table 3a K_{VS} , C_V and x_{Fz} coefficients

Flanged version with male face or female face acc. to DIN EN 1092-1 as well as RF and RTJ acc. to ANSI

Seat with metal sealing, direction of flow "V", FTO

For direction of flow "H", FTC, K_{VS} is reduced by 20 %

Size	DN/NPS	25/1	40/1½	50/2	80/3	100/4	150/6	200/8	250/10	300/12	400/16
100 % K_{VS}	K_{VS}	16	40	80	245	370	685	950	1925	2680	4200
	C_V	19	47	94	286	430	800	1110	2252	3135	4914
	Seat Ø	18	26	36	60	76	105	135	170	210	290
	$x_{Fz 0.75}$	0.3	0.3	0.25	0.2	0.2	0.2	0.2	0.2	0.2	0.18
60 % K_{VS}	K_{VS}	10	24	48	147	220	410	570	1230	1640	2520
	C_V	12	28	56	171	256	477	663	1439	1918	2948
	Seat Ø	16	21.5	29.5	50	60	86	106	146	163	225
	$x_{Fz 0.75}$	0.34	0.34	0.3	0.25	0.25	0.25	0.22	0.22	0.22	0.19
40 % K_{VS}	K_{VS}	6	16	33	105	150	275	380	770	1070	1680
	C_V	7	19	38	122	174	320	442	900	1252	1965
	Seat Ø	14	18.5	25.5	44	53	73	88	126	133	184
	$x_{Fz 0.75}$	0.39	0.39	0.34	0.30	0.30	0.30	0.24	0.24	0.24	0.20
25 % K_{VS}	K_{VS}	4	12	20	63	93	179	240	480	670	1070
	C_V	5	14	23	73	108	208	279	561	784	1252
	Seat Ø	10	16	21	37	45	62	73	102	116	160
	$x_{Fz 0.75}$	0.43	0.43	0.38	0.35	0.35	0.35	0.26	0.26	0.26	0.21

Table 3b · K_{VS} , C_V and x_{Fz} coefficients · Flanged version with sealing lens according to DIN 2696

Size	DN/NPS	25/1	40/1½	50/2	80/3	100/4	150/6	200/8	250/10	300/12	400/16	
100 % K_{VS}	K_{VS}							685	950	1925	2680	4200
	C_V							800	1110	2252	3135	4914
	Seat Ø							105	135	170	210	290
	$x_{Fz 0.75}$							0.2	0.2	0.2	0.2	0.18
60 % K_{VS}	K_{VS}	-	32	48	147	220	410	570	1230	1640	2520	
	C_V		37	56	171	256	477	663	1439	1918	2948	
	Seat Ø		24	29.5	50	60	86	106	146	163	225	
	$x_{Fz 0.75}$		0.26	0.3	0.25	0.25	0.25	0.22	0.22	0.22	0.19	
40 % K_{VS}	K_{VS}	-	16	33	105	150	275	380	770	1070	1680	
	C_V		19	38	122	174	320	442	900	1252	1965	
	Seat Ø		18.5	25.5	44	53	73	88	126	133	184	
	$x_{Fz 0.75}$		0.39	0.34	0.30	0.30	0.30	0.24	0.24	0.24	0.20	
25 % K_{VS}	K_{VS}	2	12	20	63	93	179	240	480	670	1070	
	C_V	3	14	23	73	108	208	279	561	784	1252	
	Seat Ø	7	16	21	37	45	62	73	102	116	160	
	$x_{Fz 0.75}$	0.43	0.43	0.38	0.35	0.35	0.35	0.26	0.26	0.26	0.21	

Table 3c · F_L and x_T coefficients

Size	DN/NPS	25/1	40/1½	50/2	80/3	100/4	150/6	200/8	250/10	300/12	400/16
100 % K_{VS}	F_L	0.76	0.76	0.70	0.64	0.64	0.64	0.64	0.64	0.64	0.61
	x_T	0.5	0.5	0.5	0.35	0.35	0.35	0.30	0.30	0.30	0.30
60 % K_{VS}	F_L	0.81	0.81	0.76	0.70	0.70	0.66	0.66	0.66	0.66	0.62
	x_T	0.6	0.6	0.6	0.5	0.5	0.50	0.35	0.35	0.35	0.35
40 % K_{VS}	F_L	0.86	0.86	0.81	0.76	0.76	0.76	0.69	0.69	0.69	0.64
	x_T	0.70	0.70	0.70	0.60	0.60	0.60	0.50	0.50	0.50	0.45
25 % K_{VS}	F_L	0.89	0.89	0.85	0.82	0.82	0.82	0.72	0.72	0.72	0.65
	x_T	0.75	0.75	0.75	0.65	0.65	0.65	0.55	0.55	0.55	0.50

Table 4 · Type M Actuator

Type		MN 450/100	MN 450/100V	MN 700/130	MN 700/130V
Max. opening angle at travel	mm	100	100	130	130
Bench range	bar	0.4 ... 1.2	1.0 ... 2.0	0.4 ... 1.2	0.68 ... 1.95
Max. spring torque in Nm at $\varphi = 0^\circ$		545	1362	1531	2603
Supply pressure	bar	Max. 3	Max. 3	Max. 3	Max. 3
Ambient temperature	$^\circ\text{C}$	-20 ... 70	-20 ... 70	-20 ... 70	-20 ... 70
	$^\circ\text{F}$	-4 ... 158	-4 ... 158	-4 ... 158	-4 ... 158
Weight	kg	165	165	510	510

Table 5 · Max. torques in Nm for shafts depending on temperature with Type M Actuator

Table 5a · Shaft material 1.4571 (standard material)

Size DN/NPS	Packing Ø mm	Shaft Ø mm	Medium temperature in °C										
			20	120	150	200	250	300	350	400	450	500	550
			Torque in Nm										
25/1	20	17	131	85	82	78	74	70	67	65	64	63	63
40/1½	20	17	131	85	82	78	74	70	67	65	64	63	63
50/2	20	17	131	85	82	78	74	70	67	65	64	63	63
80/3	28	23	325	211	204	195	185	174	168	163	159	157	156
100/4	35	28	586	382	369	351	333	314	303	294	287	283	281
150/6	42	36	1246	812	785	747	709	667	644	625	610	602	598
200/8	42	36	1246	812	785	747	709	667	644	625	610	602	598
250/10	65	58	4516	3398	3286	3127	2967	2792	2696	2616	2552	2520	2504
300/12	72	62	5140	4151	4014	3819	3624	3410	3293	3196	3118	3079	3059
400/16	72	62	5140	4151	4014	3819	3624	3410	3293	3196	3118	3079	3059

Table 5b · Shaft material 1.4462 for higher torques · Higher temperatures on request

Size DN/NPS	Packing Ø mm	Shaft Ø mm	Medium temperature in °C					
			20	50	100	150	200	250
			Torque in Nm					
25/1	20	17	154	154	144	134	126	120
40/1½	20	17	154	154	144	134	126	120
50/2	20	17	154	154	144	134	126	120
80/3	28	23	383	383	358	333	313	298
100/4	35	28	691	691	646	601	565	538
150/6	42	36	1468	1468	1373	1278	1201	1144
200/8	42	36	1468	1468	1373	1278	1201	1144
250/10	65	58	6142	6142	5743	5344	5025	4786
300/12	72	62	7502	7502	7015	6528	6138	5846
400/16	72	62	7502	7502	7015	6528	6138	5846

Note on Table 6

Permissible differential pressures for versions with additional O-Ring or TA-Luft packing available on request

Table 6 · Max. permissible differential pressure when the valve is closed
Table 6a · Valve CLOSED without supply air - "Spring closes"

Size DN/NPS	Shaft Ø	Max. shaft torque [Nm] at 20 °C	Actuator Type	Bench range in bar	Supply pressure [bar] required to open	Δp_{max} in bar	Torque at plug in Nm at $\varphi = 0^\circ$
25/1...50/2	20	130	Use Type R Actuator, Type MN is not suitable.				
80/3	28	335					
100/4	35	450					
150/6	42	1280	MN 450/100	0.4 ... 1.2	3	40	542
			MN 450/100V	1.0 ... 2.0		110	1340
			MN 700/130	0.4 ... 1.2		160	1910
			MN 700/130V	0.68 ... 1.95		160	1910
200/8	42	1280	MN 450/100	0.4 ... 1.2	3	22	560
			MN 450/100V	1.0 ... 2.0		60	1379
			MN 700/130	0.4 ... 1.2		100	2241
			MN 700/130V	0.68 ... 1.95		115	2564
250/10	65	5200	MN 450/100	0.4 ... 1.2	3	10	533
			MN 450/100V	1.0 ... 2.0		30	1321
			MN 700/130	0.4 ... 1.2		55	1391
			MN 700/130V	0.68 ... 1.95		60	2502
300/12	72	6300	MN 450/100	0.4 ... 1.2	3	6	570
			MN 450/100V	1.0 ... 2.0		18	1391
			MN 700/130	0.4 ... 1.2		30	2212
			MN 700/130V	0.68 ... 1.95		35	2554
400/16	72	6300	MN 450/100	0.4 ... 1.2	3	3	626
			MN 450/100V	1.0 ... 2.0		8	1404
			MN 700/130	0.4 ... 1.2		14	2337
			MN 700/130V	0.68 ... 1.95		15	2492

Table 6b · Valve CLOSED without supply air - "Spring opens"

Size DN/NPS	Shaft Ø	Max. shaft torque [Nm] at 20 °C	Actuator Type	Bench range in bar	Supply pressure [bar] required to open	Δp_{max} in bar	Torque at plug in Nm at $\varphi = 0^\circ$
25/1...50/2	20	130	Use Type R Actuator, Type MN is not suitable.				
80/3	28	335					
100/4	35	450					
150/6	42	1280	MN 450/100	0.4 ... 1.2	3	160	1910
			MN 450/100V	1.0 ... 2.0		110	1340
			MN 700/130	0.4 ... 1.2		160	1910
			MN 700/130V	0.68 ... 1.95		160	1910
200/8	42	1280	MN 450/100	0.4 ... 1.2	3	110	2456
			MN 450/100V	1.0 ... 2.0		60	1379
			MN 700/130	0.4 ... 1.2		160	3534
			MN 700/130V	0.68 ... 1.95		160	3534
250/10	65	5200	MN 450/100	0.4 ... 1.2	3	60	2502
			MN 450/100V	1.0 ... 2.0		30	1321
			MN 700/130	0.4 ... 1.2		160	6439
			MN 700/130V	0.68 ... 1.95		100	4077
300/12	72	6300	MN 450/100	0.4 ... 1.2	3	35	2554
			MN 450/100V	1.0 ... 2.0		18	1391
			MN 700/130	0.4 ... 1.2		100	7002
			MN 700/130V	0.68 ... 1.95		55	3923
400/16	72	6300	MN 450/100	0.4 ... 1.2	3	15	2492
			MN 450/100V	1.0 ... 2.0		8	1404
			MN 700/130	0.4 ... 1.2		45	7157
			MN 700/130V	0.68 ... 1.95		25	4047

Table 7 · Dimensions in mm

Table 7a · Type 73.3/M Control Valve · Face-to-face dimensions according to EN 558 Series 2

Valve			Actuator	MN 450			MN 700		
DN	L	B	A	E	F	H3	E	F	H3
25	230	118	132	Use Type R Actuator, Type MN is not suitable.					
40	260	142	137						
50	300	152	147						
80	380	174	197						
100	430	189	217						
150	550	237	294	317	115	1441	378	115	1586
200	650	259	309						
250	775	300	395						
300	900	325	495						
400	On request								

Table 7b · Type 73.7/M Control Valve · Face-to-face dimensions according to EN 558 Series 15

Valve			Actuator	MN 450			MN 700		
DN/NPS	L	B	A	E	F	H3	E	F	H3
25/1	150	118	132	Use Type R Actuator, Type MN is not suitable.					
40/1½	240	142	137						
50/2	250	152	147						
80/3	280	174	197						
100/4	300	189	217						
150/6	350	237	294	317	115	1441	378	115	1586
200/8	400	259	309						
250/10	450	300	395						
300/12	500	325	495						
400/16	On request								

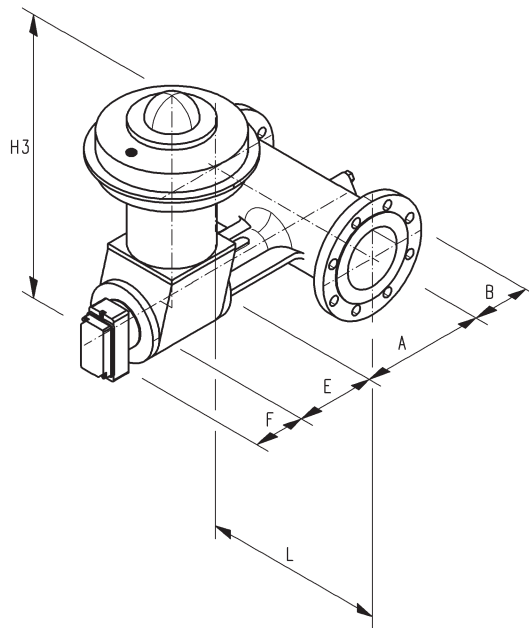
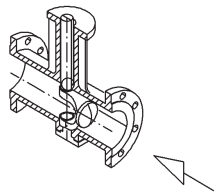
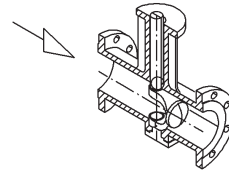


Fig. 8 · Dimensional drawing for VETEC Types 73.3 M and 73.7 M Rotary Plug Valves

Table 8 · Mounting positions for Type R Actuator



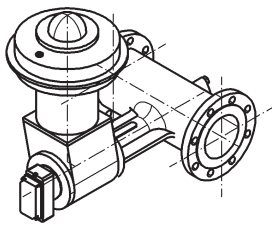
Medium opens
Direction of flow "V"
FTO



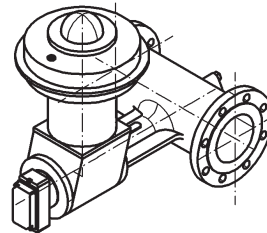
Medium closes
Direction of flow "H"
FTC

Mounting Po · Valve CLOSED without supply air
Air-to-open - Spring closes

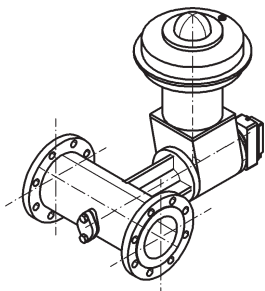
Mounting Ps · Valve CLOSED without supply air
Air-to-close - Spring opens



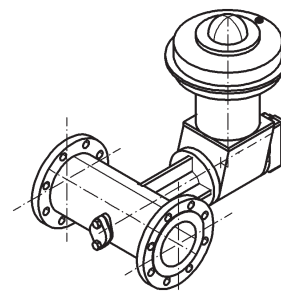
Mounting B-Po



Mounting B-Ps



Mounting D-Po



Mounting D-Ps

Table 9 · Weights in kg for Type 73.3 Valve, PN 63 to 160 with DIN face-to-face dimensions and for Type 73.7 Valve, PN 63 to 160/ANSI Class 600 to 900 in short version

Valve	DN/NPS	25/1	40/1½	50/2	80/3	100/4	150/6	200/8	250/10	300/12	400/16	
Type	73.3	kg	15	24	40	60	75	220	290	470	620	On req.
	73.7	kg	12	20	28	45	60	180	250	390	510	965
Actuator	Type	MN 450					MN 700					
		kg	165					510				

Ordering text

Type	According to Table 1
Nominal size	DN/NPS
Nominal pressure	PN/Class
Body material	According to Table 2a
Seat version	With metal sealing
Characteristic	Equal percentage or linear
K _{vs} /C _v coefficient	According to Tables 3a or 3b
Direction of flow	Standard: Flow to open = V (FTO) Reverse: Flow to close = H (FTC)
Actuator	Type M According to Tables 4 and 5
Mounting position	According to Table 8
Fail-safe position	Valve CLOSED or valve OPEN
Max. differential pressure for actuator bar
Supply pressure bar
Bench range bar
Accessories	Positioner, limit switch, solenoid valve
Optionally	Special versions, certificates, inspections, etc.

Specifications subject to change without notice.



SAMSON AG · MESS- UND REGELTECHNIK
Weismüllerstraße 3 · 60314 Frankfurt am Main · Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507
Internet: <http://www.samson.de>

T 9920 EN