



PRESSURE INDEPENDENT CONTROL VALVE

MSM Series

50-250 mm / 2" - 10"



FEATURES / CHARACTERISTICS

Valve:

Static pressure	: 4000 kPa / 580 psi
Ambient temperature	: -10°C to +50°C / +14°F to +122°C
Media temperature	: -20°C to +120°C / -4°F to +248°C

Material:

Housing and covers	: Ductile iron ASTM A395 Grade 60-40-18
Metal components (internal)	: Stainless steel
Stem seal and O-rings	: EPDM
Diaphragm	: Hydrogenated acrylonitrile-butadiene-rubber
Stroke	: 2160° (MSM.6: 3600°)
Maximum close off pressure	: 800 kPa / 116 psi
Maximum operational ΔP	: 800 kPaD / 116 psid
Maximum allowable operating pressure	: 1600 kPaD / 232 psid
Control characteristic	: Linear flow (may be converted to equal%, or linear signal on actuator)
linear rotation	: 1:1000 / IEC 60534
Control range	: >100:1
Rangeability	: 228:1
Turn down ratio	: ANSI / FCI 70-2 206 / IEC 60534-4 - Class IV
Shut-off leakage	: 1.48-76.8 l/sec / 23.4-1220 GPM
Flow rate range	: Universal flange connections which can be used with both ISO and ANSI flanges. Mounting kits are not supplied by Maplef
End connection	: 1/4" ISO
Body taps	



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FEATURES / CHARACTERISTICS

Maple Actuator:

Maple MSM.0.0.0.3, MSM.0.0.0.4, MSM.0.0.0.5 (with BACnet) and MSM.0.0.0.6 (with BACnet) actuators¹

Supply voltage	: 22-26V AC, 50/60 Hz or 22-26V DC
Type	: Electrical, Bi-directional synchronous motor
Power consumption	: 12VA
For failsafe versions	: 25VA (peak)
Control signal	: Analog 0(2)-10V DC or 0(4)-20mA and digital 3-point-floating or 2-position
Resolution	: 1:1000 (0-10V analog) and 1:800 (2-10V analog)
Feedback	: Linear signal Auto (equal to analog control signal), 0-10V DC, 2-10V DC or 4-20mA
Control mode	: Linear flow, Equal percentage, Linear rotation or Linear signal
Failsafe function	: Yes (on MSM.0.0.0.4 and MSM.0.0.0.6)
Manual override	: Yes
Position indicator	: No
Operation time	: MSM.3-5: 190 sec (from closed to fully open valve) MSM.6: 317 sec (from closed to fully open valve)
Ambient temperature	: -10°C to +50°C / +14°F to +122°F
Humidity rating	: 5..95% rH, no condensation
Protection	: IP54 including upside-down mounting
CE conformity	: EN 60730, class II
Housing material	: UL94 V0-rated plastic
Programming	: Programming of all settings on interface with buttons and display or via BACnet
Cable	: Fixed, 5 wires x 0.80 mm ² , halogen free, 1 meter Fixed, 5 wires x AWG18, halogen free, 3 ft Additional for BACnet versions: Fixed, 3 wires x 0.80 mm ² , halogen free, 1 meter Fixed, 3 wires x AWG18, halogen free, 3 ft
Calibration	: Automatic at startup
Valve-actuator coupling	: Easy snap coupling
BACnet device profile	: BACnet Application Specific Controller (B-ASC) type server
BACnet protocol	: BACnet Master Slave/Token passing (MS/TP)
BACnet baud rates supported	: 9600, 19200, 38400 and 76800
BACnet services (BIBBS) supported	: DS-RP-B, DS-WP-B, DM-DDB-B, DM-DOB-B and DM-DCC-B

Note 1: Maple warranty is voided using other actuators than supplied or recommended by Maple General Supplier.



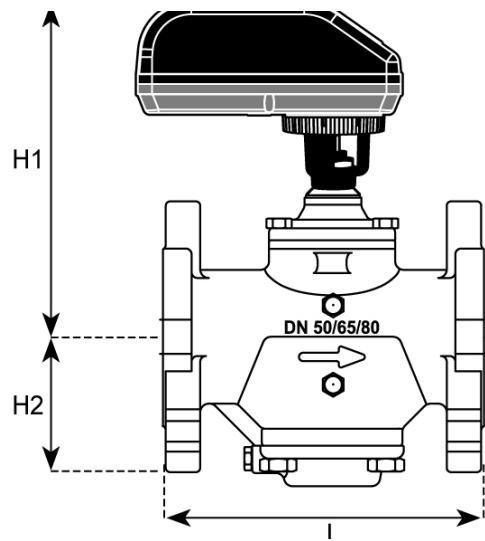
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DIMENSIONS AND WEIGHTS (NOMINAL)

Model No	Valve Size mm (in)	L mm (in)	H1 mm (in)	H2 mm (in)	Weight ² Kg (lb)
MSM.3.X	50 (2)	224 (8.82)	252 (9.92)	95.0 (3.74)	14.0 (30.9)
	65 (2 1/2)				
	80 (3)				
MSM.4.X	80 (3)	320 (12.6)	292 (11.5)	135 (5.31)	31.0 (68.3)
	100 (4)				32.0 - MSM4.3 (70.5 - MSM4.3)
MSM.5.X	125 (5)	422 (16.6)	343 (13.5)	180 (7.09)	61.0 (134)
	150 (6)				
MSM.6.2	200 (8)	725 (28.5)	472 (18.6)	292 (11.5)	248 (547)
	250 (10)				

Note 2: Weight includes valve and actuator.





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MODEL NUMBER SELECTION

Insert valve body size:

3=DN50-80 / 2"-3" **4**=DN80-100 / 3"-4" **5**=DN125-150 / 5"-6" **6**=DN200-250 / 8"-10"

Insert dP control range:

0=30-800 kPaD, 4.5-116 psid (MSM.3 only)

1=30-800 kPaD, 4.5-116 psid

2=35-800 kPaD, 5.1-116 psid

3=50-800 kPaD, 7.3-116 psid (MSM.4 only)

Insert actuator selection:

3=display (MSM.0.0.0.3) **4**=display and failsafe (MSM.0.0.0.4) **5**=display and BACnet (MSM.0.0.0.5) **6**=display, BACnet and failsafe (MSM.0.0.0.6)

Example: MSM.3.1.B.4=MSM 50-80 mm body for 30-800 kPaD with p/t plugs and failsafe actuator.

Note 3: Model no. and pressure range are indicated on label affixed to body.

FLANGE MATCH

Model no.	Flange size (inch)	ASME B16.5 weld neck		Flange size (mm)	EN 1092-1 Weld neck			
		Class 150	Class 300		PN10	PN16	PN25	PN40
MSM.3.X	2	-	-	50	X	X	X	X
	2 1/2	X	X	65	X	X	X	X
	3	X	X	80	X	X	X	X
MSM.4.X	3	X	X	80	X	X	X	X
	4	X	X	100	X	X	X	X
MSM.5.X	5	X	X	125	X	X	X	X
	6	X	-	150	X	X	X	X
MSM.6.2	8	-	X	200	-	-	X	X
	10	X	-	250	X	X	X	X

DESCRIPTION

The MSM series is a range of self-balancing dynamic flow control valves that are pressure independent and 2-way and ready to accept digital or analog input signals. Each valve has an adjustable maximum flow rate setting to enable flow limitation to and balancing of the coil or zone which the valve is controlling.

All MSM actuators are microprocessor based with a self-calibrating feature. The MSM actuator range includes standard incl. feedback, failsafe and BACnet. All MSM actuators are programmable and with display. The MSM actuators accept analog 0(2)-10V DC or 0(4)-20mA as well as digital 3-point floating or 2-position input signals and work with selectable control mode of Linear flow, Equal percentage, Linear rotation or Linear signal.

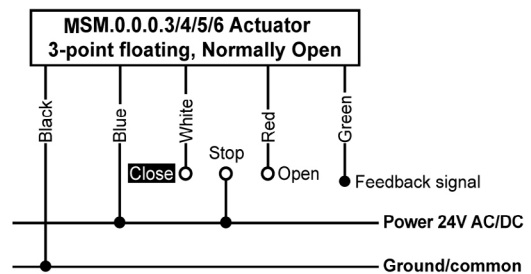
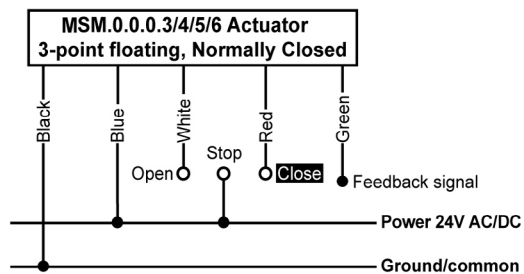
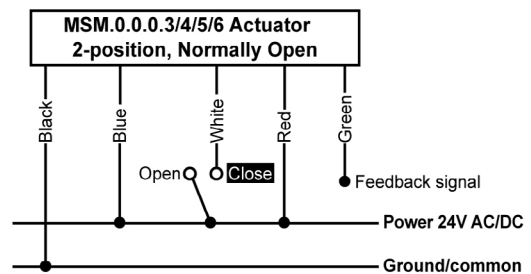
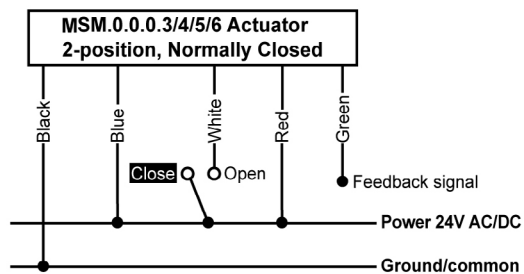
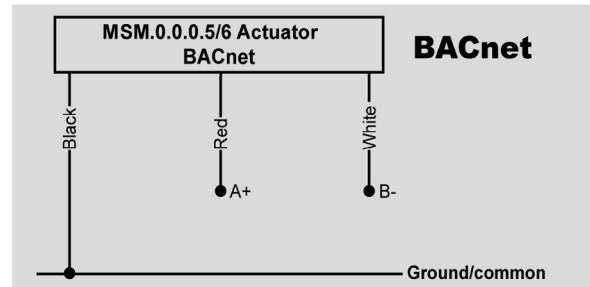
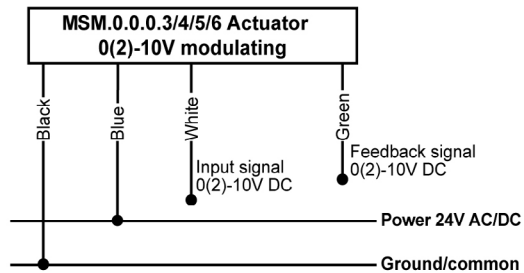
The larger range of MSM-valves are all designed for double flange connection. They are available in four different valve body sizes. All shall have snap connection for fast mounting of actuator.



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WIRING INSTRUCTION



Note: If feedback signal is not required, leave green wire detached.

FLOW RATE TABLE

Model no.	Valve Size		Control range		Lowest settable max flow			Turn down ratio low- est max flow	highest settable max flow			Turn down ratio high- est max flow
	mm	inch	kPaD	psid	l/sec	l/hr	GPM		l/sec	l/hr	GPM	
MSM.3.0	50/65/80	2/ 2 1/2 /3	30-800	4.5-116	1.48	5310	23.4	38.1	4.16	15000	65.9	228:1
MSM.3.1	50/65/80	2/ 2 1/2 /3	30-800	4.5-116	2.57	9240	40.7		7.15	25700	113	
MSM.3.2	50/65/80	2/ 2 1/2 /3	35-800	5.1-116	3.55	12800	56.3		9.89	35600	157	
MSM.4.1	80/100	3/4	30-800	4.5-116	3.49	12600	55.4		9.38	33800	149	
MSM.4.2	80/100	3/4	35-800	5.1-116	4.73	17000	75.0		14.2	51000	225	
MSM.4.3	80/100	3/4	50-800	7.3-116	3.68	13300	58.3		20.2	72700	320	
MSM.5.1	125/150	5/6	30-800	4.5-116	6.48	23400	103		23.3	83800	369	
MSM.5.2	125/150	5/6	35-800	5.1-116	7.10	25600	113		29.5	106000	468	
MSM.6.2	200/250	8/10	35-800	5.1-116	9.21	33100	146		76.8	277000	1220	

Accuracy: Greatest of either $\pm 5\%$ of controlled flow rate or $\pm 2\%$ of maximum flow rate.



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FLOW RATE SETTINGS⁴ - VALVE SIZE DN50-DN100

Maximum Flow Rate									Maximum Flow Rate								
Valve size: DN50-DN80. 2"-3"									Valve size: DN50-DN80. 2"-3"								
30-800 kPaD 4.5-116 psid			30-800 kPaD 4.5-116 psid			35-800 kPaD 5.1-116 psid			30-800 kPaD 4.5-116 psid			30-800 kPaD 4.5-116 psid			35-800 kPaD 5.1-116 psid		
MSM.3.0			MSM.3.1			MSM.3.2			MSM.3.0			MSM.3.1			MSM.3.2		
l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM
1.48	5310	23.4	2.57	9240	40.7	3.55	12800	56.3	3.94	14200	62.5	6.39	23000	101	8.78	31600	139
1.58	5700	25.1	2.81	10100	44.6	3.85	13900	61.0	3.97	14300	63.0	6.42	23100	102	8.85	31900	140
1.69	6080	26.8	3.05	11000	48.3	4.13	14900	65.5	4.00	14400	63.4	6.46	23300	102	8.91	32100	141
1.79	6460	28.4	3.27	11800	51.9	4.41	15900	69.9	4.03	14500	63.8	6.50	23400	103	8.98	32300	142
1.90	6830	30.1	3.49	12500	55.2	4.67	16800	74.0	4.05	14600	64.2	6.54	23500	104	9.04	32600	143
2.00	7190	31.6	3.69	13300	58.4	4.92	17700	78.0	4.07	14700	64.5	6.58	23700	104	9.11	32800	144
2.09	7540	33.2	3.88	14000	61.5	5.16	18600	81.7	4.09	14700	64.8	6.62	23800	105	9.18	33000	145
2.19	7880	34.7	4.06	14600	64.3	5.38	19400	85.3	4.11	14800	65.1	6.67	24000	106	9.25	33300	147
2.28	8220	36.2	4.23	15200	67.0	5.60	20200	88.8	4.12	14800	65.3	6.72	24200	106	9.32	33500	148
2.37	8540	37.6	4.39	15800	69.6	5.81	20900	92.1	4.13	14900	65.5	6.77	24400	107	9.39	33800	149
2.46	8860	39.0	4.54	16300	72.0	6.01	21600	95.2	4.14	14900	65.7	6.82	24600	108	9.46	34100	150
2.55	9170	40.4	4.68	16900	74.2	6.19	22300	98.2	4.15	14900	65.8	6.88	24800	109	9.54	34300	151
2.63	9470	41.7	4.82	17300	76.4	6.37	22900	101	4.16	15000	65.9	6.94	25000	110	9.62	34600	153
2.71	9770	43.0	4.94	17800	78.4	6.54	23600	104	4.16	15000	65.9	7.01	25200	111	9.71	34900	154
2.79	10100	44.3	5.06	18200	80.2	6.71	24100	106	4.16	15000	65.9	7.08	25500	112	9.79	35300	155
2.87	10300	45.5	5.17	18600	82.0	6.86	24700	109	4.16	15000	65.9	7.15	25700	113	9.89	35600	157
2.95	10600	46.7	5.28	19000	83.7	7.00	25200	111									
3.02	10900	47.8	5.38	19400	85.2	7.14	25700	113									
3.09	11100	49.0	5.47	19700	86.6	7.28	26200	115									
3.16	11400	50.0	5.55	20000	88.0	7.40	26600	117									
3.22	11600	51.1	5.63	20300	89.2	7.52	27100	119									
3.29	11800	52.1	5.70	20500	90.4	7.63	27500	121									
3.35	12000	53.1	5.77	20800	91.5	7.74	27900	123									
3.41	12300	54.0	5.84	21000	92.5	7.84	28200	124									
3.46	12500	54.9	5.90	21200	93.5	7.94	28600	126									
3.52	12700	55.8	5.96	21400	94.4	8.03	28900	127									
3.57	12900	56.6	6.01	21600	95.2	8.12	29200	129									
3.62	13000	57.4	6.06	21800	96.0	8.20	29500	130									
3.67	13200	58.2	6.10	22000	96.8	8.28	29800	131									
3.72	13400	58.9	6.15	22100	97.5	8.36	30100	133									
3.76	13500	59.6	6.19	22300	98.2	8.44	30400	134									
3.80	13700	60.2	6.23	22400	98.8	8.51	30600	135									
3.84	13800	60.9	6.27	22600	99.4	8.58	30900	136									
3.88	14000	61.4	6.31	22700	101	8.65	31100	137									
3.91	14100	62.0	6.35	22900	101	8.72	31400	138									

Accuracy: Greatest of either $\pm 5\%$ of controlled flow rate or $\pm 2\%$ of maximum flow rate.

Maple recommends that MSM valves are selected to ensure that the set maximum flow rate is minimum 50% of the rated valve maximum capacity.

Note 4: Above indicates selectable maximum flow rates defining the flow through the valve at maximum control signal, normally 10V. Each valve includes up to 1000 positions between the selected max. flow and closed valve with control signal selected to 0-10V.

PRESSURE INDEPENDENT CONTROL VALVE

MSM Series



FLOW RATE SETTINGS⁴ - VALVE SIZE DN50-DN100

Maximum Flow Rate									Maximum Flow Rate								
Valve size: DN80-DN100. 3"-4"									Valve size: DN80-DN100. 3"-4"								
30-800 kPaD 4.5-116 psid			35-800 kPaD 5.1-116 psid			50-800 kPaD 7.3-116 psid			30-800 kPaD 4.5-116 psid			35-800 kPaD 5.1-116 psid			50-800 kPaD 7.3-116 psid		
MSM.4.1			MSM.4.2			MSM.4.3			MSM.4.1			MSM.4.2			MSM.4.3		
l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM
3.49	12600	55.4	4.73	17000	75.0	3.68	13300	58.3	9.07	32600	144	13.5	48500	214	18.8	67600	297
3.88	14000	61.6	5.29	19000	83.8	4.42	15900	70.0	9.09	32700	144	13.5	48700	214	18.9	68200	300
4.26	15300	67.5	5.82	21000	92.3	5.13	18500	81.3	9.10	32800	144	13.6	48800	215	19.1	68700	303
4.61	16600	73.0	6.33	22800	100	5.82	21000	92.3	9.12	32800	145	13.6	49000	216	19.2	69200	305
4.94	17800	78.4	6.82	24500	108	6.50	23400	103	9.13	32900	145	13.7	49200	217	19.4	69700	307
5.26	18900	83.4	7.28	26200	115	7.15	25700	113	9.15	32900	145	13.7	49300	217	19.5	70200	309
5.56	20000	88.1	7.72	27800	122	7.78	28000	123	9.16	33000	145	13.7	49500	218	19.6	70600	311
5.84	21000	92.6	8.14	29300	129	8.40	30200	133	9.18	33000	145	13.8	49600	218	19.7	70900	312
6.11	22000	96.9	8.54	30700	135	8.99	32400	142	9.19	33100	146	13.8	49800	219	19.8	71300	314
6.36	22900	101	8.91	32100	141	9.57	34400	152	9.21	33200	146	13.9	49900	220	19.9	71600	315
6.60	23800	105	9.27	33400	147	10.1	36400	160	9.23	33200	146	13.9	50100	220	20.0	71900	316
6.82	24600	108	9.61	34600	152	10.7	38400	169	9.25	33300	147	14.0	50200	221	20.0	72100	317
7.03	25300	111	9.93	35700	157	11.2	40200	177	9.28	33400	147	14.0	50400	222	20.1	72300	318
7.23	26000	115	10.2	36800	162	11.7	42100	185	9.31	33500	148	14.1	50600	223	20.1	72500	319
7.41	26700	117	10.5	37800	167	12.2	43800	193	9.34	33600	148	14.1	50800	224	20.2	72600	320
7.58	27300	120	10.8	38800	171	12.6	45500	200	9.38	33800	149	14.2	51000	225	20.2	72700	320
7.73	27800	123	11.0	39700	175	13.1	47100	207									
7.88	28400	125	11.3	40500	178	13.5	48700	214									
8.01	28800	127	11.5	41300	182	13.9	50200	221									
8.14	29300	129	11.7	42000	185	14.3	51600	227									
8.25	29700	131	11.9	42700	188	14.7	53000	233									
8.35	30100	132	12.0	43400	191	15.1	54300	239									
8.45	30400	134	12.2	43900	194	15.4	55600	245									
8.53	30700	135	12.4	44500	196	15.8	56800	250									
8.61	31000	137	12.5	45000	198	16.1	58000	255									
8.68	31300	138	12.6	45500	200	16.4	59100	260									
8.75	31500	139	12.7	45900	202	16.7	60200	265									
8.80	31700	140	12.9	46300	204	17.0	61200	269									
8.85	31900	140	13.0	46700	205	17.3	62100	274									
8.90	32000	141	13.1	47000	207	17.5	63000	278									
8.94	32200	142	13.1	47300	208	17.8	63900	281									
8.97	32300	142	13.2	47600	209	18.0	64700	285									
9.00	32400	143	13.3	47800	210	18.2	65500	288									
9.03	32500	143	13.4	48100	212	18.4	66200	292									
9.05	32600	143	13.4	48300	213	18.6	66900	295									

Accuracy: Greatest of either $\pm 5\%$ of controlled flow rate or $\pm 2\%$ of maximum flow rate.

Maple recommends that MSM valves are selected to ensure that the set maximum flow rate is minimum 50% of the rated valve maximum capacity.

Note 4: Above indicates selectable maximum flow rates defining the flow through the valve at maximum control signal, normally 10V. Each valve includes up to 1000 positions between the selected max. flow and closed valve with control signal selected to 0-10V.



PRESSURE INDEPENDENT CONTROL VALVE

MSM Series

FLOW RATE SETTINGS⁴ - VALVE SIZE DN50-DN100

Maximum Flow Rate					
Valve size: DN125 and DN150. 5"-6"					
30-800 kPaD 4.5-116 psid			35-800 kPaD 5.1-116 psid		
MSM.5.1			MSM.5.2		
l/sec	l/hr	GPM	l/sec	l/hr	GPM
6.48	23300	103	7.10	25600	113
7.24	26100	115	8.06	29000	128
7.98	28700	126	8.98	32300	142
8.70	31300	138	9.87	35500	157
9.39	33800	149	10.7	38600	170
10.1	36200	160	11.6	41600	183
10.7	38600	170	12.4	44500	196
11.4	40900	180	13.1	47300	208
12.0	43100	190	13.9	50000	220
12.6	45200	199	14.6	52600	232
13.1	47300	208	15.3	55100	243
13.7	49300	217	16.0	57500	253
14.2	51200	226	16.6	59800	264
14.8	53100	234	17.2	62100	273
15.3	54900	242	17.8	64200	283
15.7	56600	249	18.4	66300	292
16.2	58300	257	19.0	68300	301
16.6	59900	264	19.5	70200	309
17.1	61500	271	20.0	72100	317
17.5	63000	277	20.5	73800	325
17.9	64400	284	21.0	75500	333
18.3	65800	290	21.4	77200	340
18.6	67100	295	21.9	78700	347
19.0	68300	301	22.3	80200	353
19.3	69500	306	22.7	81700	360
19.6	70700	311	23.1	83100	366
19.9	71700	316	23.4	84400	372
20.2	72800	320	23.8	85700	377
20.5	73800	325	24.1	86900	383
20.7	74700	329	24.5	88100	388
21.0	75600	333	24.8	89200	393
21.2	76400	336	25.1	90300	398
21.4	77200	340	25.4	91400	402
21.6	77900	343	25.7	92400	407
21.8	78600	346	25.9	93400	411
22.0	79200	349	26.2	94300	415

Maximum Flow Rate					
Valve size: DN125 and DN150. 5"-6"					
30-800 kPaD 4.5-116 psid			35-800 kPaD 5.1-116 psid		
MSM.5.1			MSM.5.2		
l/sec	l/hr	GPM	l/sec	l/hr	GPM
22.2	79800	351	26.5	95200	419
22.3	80300	354	26.7	96100	423
22.5	80800	356	26.9	97000	427
22.6	81300	358	27.2	97800	431
22.7	81700	360	27.4	98600	434
22.8	82100	361	27.6	99400	438
22.9	82400	363	27.8	100000	441
23.0	82700	364	28.1	101000	445
23.0	83000	365	28.3	102000	448
23.1	83200	366	28.5	102000	451
23.2	83400	367	28.7	103000	455
23.2	83500	368	28.9	104000	458
23.2	83600	368	29.1	105000	461
23.3	83700	369	29.3	105000	464
23.3	83800	369	29.5	106000	468

Accuracy: Greatest of either $\pm 5\%$ of controlled flow rate or $\pm 2\%$ of maximum flow rate.

Maple recommends that MSM valves are selected to ensure that the set maximum flow rate is minimum 50% of the rated valve maximum capacity.

Note 4: Above indicates selectable maximum flow rates defining the flow through the valve at maximum control signal, normally 10V. Each valve includes up to 1000 positions between the selected max.flow and closed valve with control signal selected to 0-10V.

PRESSURE INDEPENDENT CONTROL VALVE

MSM Series



FLOW RATE SETTINGS⁴ - VALVE SIZE DN50-DN100

Maximum Flow Rate						Maximum Flow Rate		
Valve size: DN200 and DN250. 8"-10"						Valve size: DN200 and DN250. 8"-10"		
35-800 kPaD 5.1-116 psid						35-800 kPaD 5.1-116 psid		
MSM.6.2						MSM.6.2		
l/sec	l/hr	GPM	l/sec	l/hr	GPM	l/sec	l/hr	GPM
9.21	33100	146	43.0	210000	924	68.9	248000	1090
9.69	34900	154	44.1	213000	936	69.4	250000	1100
10.2	36800	162	45.2	215000	948	69.8	251000	1110
10.8	38900	171	46.2	218000	960	70.2	253000	1110
11.5	41200	182	47.2	221000	972	70.6	254000	1120
12.1	43700	192	48.3	223000	983	71.0	256000	1130
12.9	46300	204	49.3	226000	994	71.4	257000	1130
13.6	49100	216	50.2	228000	1000	71.8	258000	1140
14.5	52000	229	51.2	230000	1010	72.1	260000	1140
15.3	55100	242	52.2	233000	1020	72.5	261000	1150
16.2	58200	256	53.1	235000	1030	72.8	262000	1150
17.1	61500	271	54.0	237000	1040	73.2	263000	1160
18.0	64900	286	54.9	239000	1050	73.5	265000	1170
19.0	68400	301	55.8	241000	1060	73.8	266000	1170
20.0	71900	317	56.6	243000	1070	74.2	267000	1180
21.0	75600	333	57.5	245000	1080	74.5	268000	1180
22.0	79300	349	58.4	246000	1080	74.8	269000	1190
23.1	83100	366	59.1	207000	911	75.1	270000	1190
24.1	86900	383	58.3	210000	924	75.5	272000	1200
25.2	90800	400	59.1	213000	936	75.8	273000	1200
26.3	94700	417	59.8	215000	948	76.1	274000	1210
27.4	98700	435	60.6	218000	960	76.5	275000	1210
28.5	103000	452	61.3	221000	972	76.8	277000	1220
29.6	107000	470	62.0	223000	983			
30.8	111000	488	62.7	226000	994			
31.9	115000	506	63.4	228000	1000			
33.0	119000	523	64.0	230000	1010			
34.2	123000	541	64.6	233000	1020			
35.3	127000	559	65.2	235000	1030			
36.4	131000	577	65.8	237000	1040			
37.5	135000	595	66.4	239000	1050			
38.6	139000	613	66.9	241000	1060			
39.8	143000	630	67.4	243000	1070			
40.9	147000	648	68.0	245000	1080			
41.9	151000	665	68.4	246000	1080			

Accuracy: Greatest of either $\pm 5\%$ of controlled flow rate or $\pm 2\%$ of maximum flow rate.

Maple recommends that MSM valves are selected to ensure that the set maximum flow rate is minimum 50% of the rated valve maximum capacity.

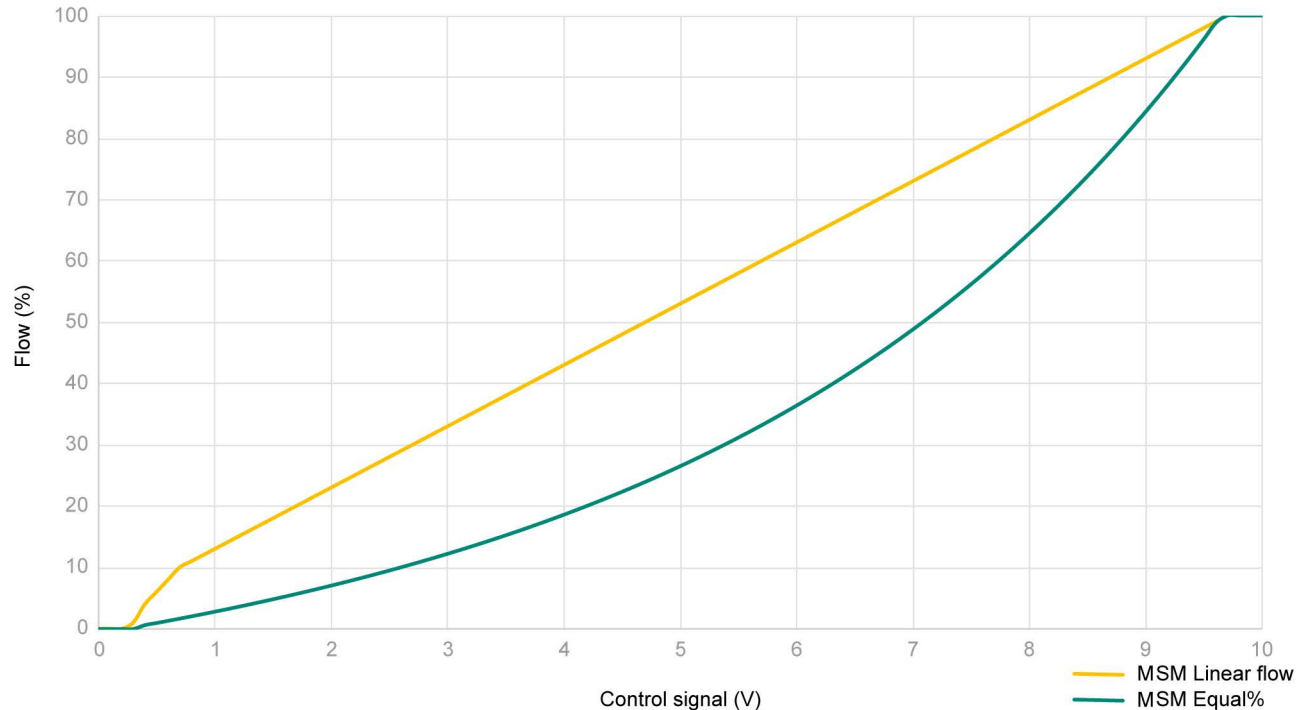
Note 4: Above indicates selectable maximum flow rates defining the flow through the valve at maximum control signal, normally 10V. Each valve includes up to 1000 positions between the selected max.flow and closed valve with control signal selected to 0-10V.



PRESSURE INDEPENDENT CONTROL VALVE

MSM Series

CONTROL CURVE



GENERAL SPECIFICATIONS

1. PRESSURE INDEPENDENT DYNAMIC CONTROL VALVES – MAPLEF MSM

- 1.1. Contractor shall install pressure independent dynamic control valves where indicated in drawings.
- 1.2. Valve shall be an electronic, dynamic, modulating, 2-way pressure independent control device.
- 1.3. Valve shall accurately control flow, independent of system pressure fluctuation.

2. VALVE ACTUATOR

- 2.1. Valve-actuator coupling shall be snap coupling for fast mounting and de-mounting.
- 2.2. Actuator housing shall be rated to IP54 including upside-down mounting.
- 2.3. Actuator shall be driven by a 24V AC/DC motor and shall accept 0(2)-10V, 0(4)-20mA, 3-point floating or 2-position control signal.
- 2.4. Actuator control mode shall be selectable to Linear flow, Equal percentage, Linear rotation or Linear signal.
- 2.5. Actuator shall be capable of providing linear feedback signal to the control system. Feedback signal shall be selectable to Auto (equal to input signal), 4-20mA, 0-10V DC or 2-10V DC.
- 2.6. Automatic calibration of valve position shall be standard.
- 2.7. Actuator shall include buttons for external programming of all settings.
- 2.8. Actuator display showing current valve flow, maximum valve flow, input signal, feedback signal, operational direction and control mode shall be standard.



PRESSURE INDEPENDENT CONTROL VALVE

MSM Series

GENERAL SPECIFICATIONS (..continued)

- 2.9. Optional failsafe versions shall be available. Failsafe versions shall be able to operate valve to either open(max. setting) or closed position from any position in case of power failure.
- 2.10. Optional BACnet versions shall be available. BACnet versions shall provide remote setting and control of actuator.

3. VALVE HOUSING

- 3.1. Housing shall consist of ductile iron ASTM A395 Grade-40-18 rated at no less than 4000 kPa (580 psi) static pressure and +120°C (+248°F).
- 3.2. Housing shall be permanently marked to show direction of flow.
- 3.3. Housing shall be for installation between flanges.
- 3.4. Dual pressure/temperature test plugs for verifying accuracy of flow performance shall be standard on all valve sizes.
- 3.5. Identification label according to PED-requirements shall be available for all valves.

4. FLOW REGULATOR / AUTOMATIC BALANCING UNIT

- 4.1. Maximum flow setting shall be adjustable to minimum 51 different settings within the range of the valve size.
- 4.2. Flow regulation unit shall be manufactured of stainless steel and hydrogenated acrylonitrile-butadienerubber and shall be capable of controlling flow within $\pm 5\%$ of controlled flow rate of $\pm 2\%$ of maximum flow rate.
- 4.3. Flow regulation unit shall be accessible for change-out or maintenance.

APPLICATION AND SCHEMATIC EXAMPLE

