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708 Series

Fractional Flow Control Valves

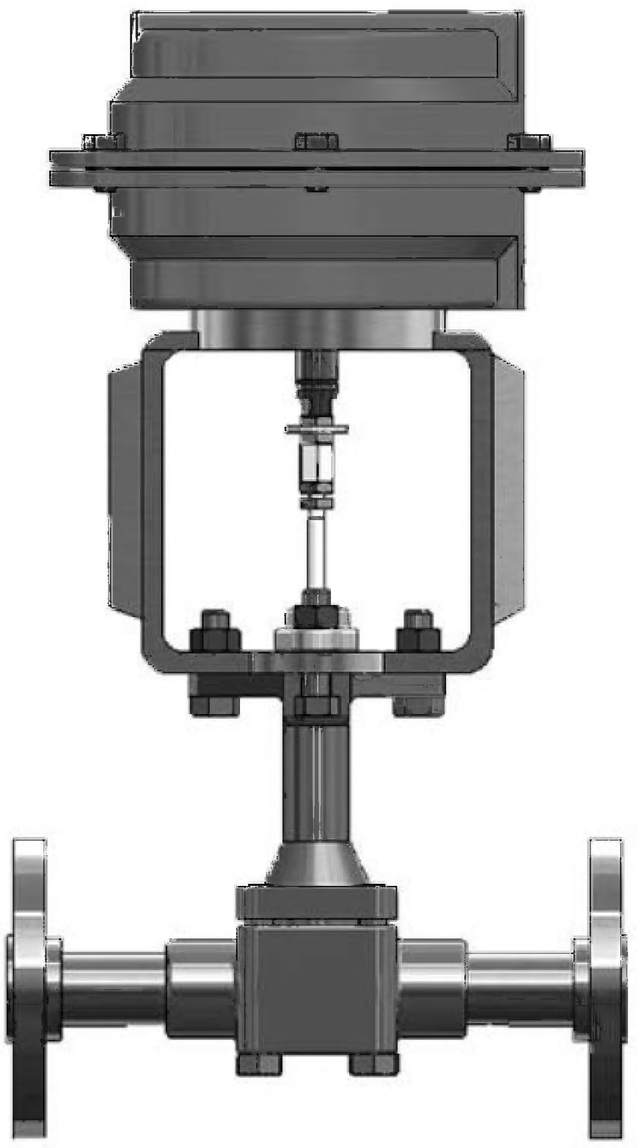
CRN Registration Number Available

FRACTIONAL FLOW CONTROL VALVES

The Mark 708 was developed by Jordan Valve to provide the most accurate control available for fractional flow services: whether for pilot plant installations, test stands, R & D facilities, or for specialized processes such as dosing, injection and venting applications.

With Cv's ranging from 0.00001 to 4.0 available in 1/4" through 3/4" lines sizes (0,000009 to 3,4 Kv in sizes DN8 through DN20), the Mark 708 offers design features that will provide enhanced performance to insure precision control on your most critical micro-flow flow applications.

The Mark 708 Series is a complete line of pneumatic and electric control valves developed specifically for the unique properties and conditions encountered in fractional flow services. The 708 Series comes standard with the quick change option - for applications requiring frequent trim changes without disturbing the actuator setting.



Features:

- Rolling diaphragm – the rolling diaphragm design ensures that the effective diaphragm area remains relatively constant, regardless of valve stem position. This increases accuracy of the actuator when positioning the valve by ensuring a linear response to input signal changes.
- Spring-loaded TFE/Chevron packing – the spring-loaded packing maintains a proper compression, while minimizing excessive friction. This alleviates the need for most field adjusting. The TFE packing is suitable for temperatures to 450°F (232°C), while braided or Graphite/Grafoil may be used for higher temperature requirements.
- Bolted body/bonnet connection – the bolting provides solid construction and secure connection. This bolting adds ease to maintenance, as bonnet/actuator assembly may be removed with the valve body in-line.
- Guided trim – extended orifice and plug guiding are standard and offers improved shutoff and accuracy equivalent to heavy duty trim option of competitors (not applicable to cv's below 0.05).
- Quick change trim – the secondary stem connection eliminates stroke adjustment when changing trim facilitating faster, easier trim changes (not applicable to cv's below 0.05).

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MK708 SERIES SPECIFICATIONS

Sizes: 1/4", 1/2", 3/4" (DN8, DN15, DN20)

End Connections

- Threaded – NPT, BSPT, BSPP
- Socket weld
- Integral tube ends
- Welded flanges (ANSI, DIN, JIS)
- Others upon request (contact factory)

Actuator

- 1/4" (DN8) – standard: 14M (14 in^2) multi-spring
- 1/2" (DN15) – standard: 14M
- 3/4" (DN20) – standard: 14M; optional 35M (35 in^2)

Diaphragm Material

- 14M – rolling (Nylon/Nitrile)
- Optional 35M Actuator: Buna-N fabric reinforced (3/4" only)

Body/Bonnet Materials

- Carbon Steel
- Stainless Steel
- Hastelloy C
- Hastelloy B
- Alloy 20
- Monel
- Titanium
- Other materials upon request

Trim Materials

- Cv's 0.05 (0,04 Kv) and above: 17-4 plug, 316SS & seat
- Cv's below 0.05 (0,04 Kv): Nitronic 60 stem/plug & seat

Optional Trim Materials

- 17-4 plug, 416SS seat
- Stellite plug and Stellite seat (hard seat only)
- 316Ss stem/plug & seat

Actuator Materials

- Aluminum – 14M
- Steel – 35M

Stem Packing

- Standard: spring-loaded TFE/Chevron (to 450°F/232°C)
- Optional: braided or Graphite/Grafoil (with positioners on 14M)

Body/Bonnet Gasket: RPTFE or Grafoil (*matches packing material unless specified*)

Service: steam, air, gas, oil, water, chemicals

Shutoff

- Standard – Cv's 0.05 and greater: ANSI Class IV; Cv's 0.02 and lower: ANSI Class VI
- Optional – Cv's 0.05 and greater: ANSI Class VI (with PEEK seats)

Ranges: 3-15 or 6-30 psi (0,21-1,0 or 0,4-2,1 bar) split ranges are available with optional positioner

Action

- Direct (air signal closes valve)
- Reverse (air signal opens valve)

Flow Characteristic: linear (all Cv's), equal percentage (Cv ≥ 0.05/0,43 Kv only); or quick opening (Cv ≥ 0.05/0,43 Kv only)

For other options/materials, consult factory

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MK708 SERIES SPECIFICATIONS

Cv (Kv) Selection

4.0** (3,4)	2.0* (1,7)	1.25* (1,1)	1.0 (0,9)	0.5 (0,43)
0.2 (0,17)	0.2 (0,1)	0.05 (0,04)	0.02 (0,017)	0.01 (0,009)
0.005 (0,00043)	0.002 (0,0017)	0.001 (0,0009)	0.0005 (0,00043)	0.0002 (0,00017)
0.0001 (0,00009)	0.00005 (0,000043)	0.00002 (0,000017)	0.00001 (0,000009)	

* Available in 1/2" & 3/4" sizes (DN15 & DN20) only

** Available in 3/4" size (DN20) only

Maximum Allowable ΔP Ratings

- 14M Actuator

Cv (Kv)	ATO 3-15	ATO 6-30	ATO w/pos. @ 40 psi (2,8 bar)	ATC3-15 @ 20 psi (1,4bar)	ATC 6-30 @ 40 psi (2,8 bar)
4.0 (3,4)	264 (18)	532 (37)	532 (37)	432 (30)	864 (60)
2.0 (1,7)	400 (26)	800 (55)	800 (55)	650 (45)	1300 (90)
1.25 (1,1)	400 (26)	800 (55)	800 (55)	650 (45)	1300 (90)
0.32-1.0 0,3- 0,9)	1275 (88)	2350 (162)	2350 (162)	2065 (142)	4100 (283)
0.05-0.2 (0,04-0,2)	2700 (186)	5000 (345)	5000 (345)	5000 (345)	5000 (345)
<0.02 (0,017)	5000 (345)	5000 (345)	5000 (345)	5000 (345)	5000 (345)

Note: Cv < 0.02 (Kv 0,017) not available

- 35M Actuator

Cv (Kv)	ATO 3-15	ATO 6-30	ATO w/pos. @ 40 psi (2,8 bar)	ATC3-15 @ 20 psi (1,4bar)	ATC 6-30 @ 40 psi (2,8 bar)	ATC w/pos. @ 40 psi (2,8 bar)
4.0 (3,4)	440 (30)	880 (61)	880 (61)	704 (49)	1460 (101)	3600 (248)

Pressure & Temperature Ratings

Temp F° (°C)	1/4" & 1/2" (DN8 & 15) Body/Bonnet psi (bar)		3/4" (DN20) Body/Bonnet psi (bar)	
	CF8M, SST	A105, CS	CF8M, SST	A105, CS
100 (38)	5000 (345)	5000 (345)	4000 (276)	4000 (276)
200 (93)	4299 (296)	4555 (314)	3439 (237)	3644 (251)
300 (149)	3882 (268)	4426 (305)	3106 (214)	3541 (244)
400 (204)	3569 (246)	4278 (295)	2855 (199)	3422 (236)
500 (260)	3319 (229)	4042 (279)	2655 (183)	3234 (223)
600 (316)	3132 (216)	3691 (254)	2506 (173)	2953 (204)
650 (343)	3083 (213)	3623 (250)	2466 (170)	2898 (200)
700 (371)	3000 (207)	3596 (248)	2400 (165)	2877 (198)
750 (399)	2931 (202)	3401 (234)	2345 (162)	2721 (188)
800 (427)	2882 (199)	2780 (192)	2306 (159)	2224 (153)
850 (454)	2819 (194)	—	2255 (155)	—
900 (482)	2736 (189)	—	2189 (151)	—
950 (510)	2681 (185)	—	2145 (148)	—
1000 (538)	2528 (174)	—	2022 (139)	—

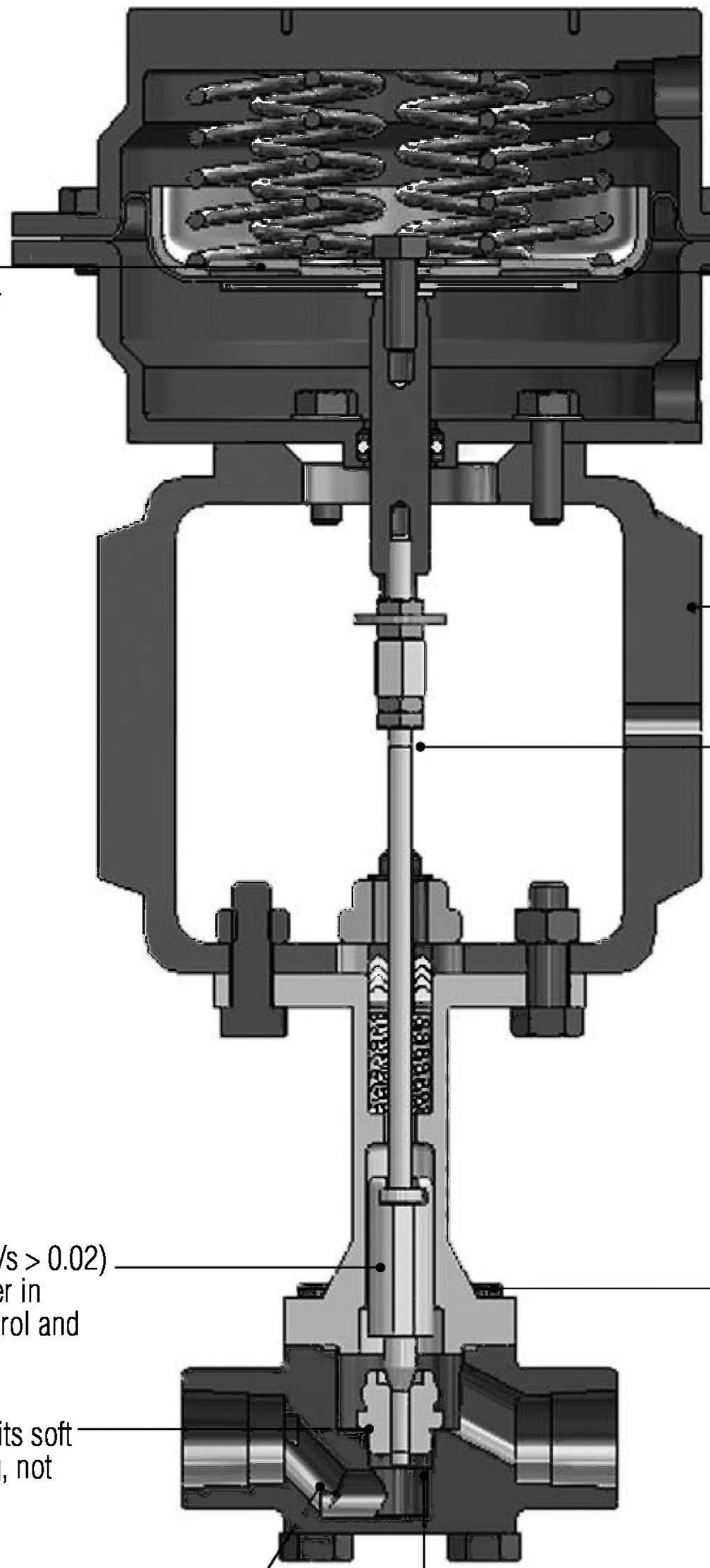
Body Rating Tables

Valve pressure rating based on body/bonnet material and bolting material. Units in psi (bar)

Bolting Material	Body/Bonnet Material				
	At 100°F/38°		At Maximum Temperature		
	CF8M	A105	CF8M	A105	Max °F/°C
1/4" (DN8) Mark 708					
ASTM A354, Gr. BD	5000 (345)	5000 (345)	3083 (213)	3623 (250)	650 (343)
ASTM 193, Gr. B6 (410 SST)	3000 (207) —	— 3705 (255)	2995 (206) —	— 2995 (206)	200 (93) 500 (260)
ASTM A193, Gr. B7	— 5000 (345)	5000 (345) —	— 2736 (189)	2780 (192) —	800 (427) 450 (232)
1/2" (DN15) Mark 708					
ASTM A354, Gr. BD	5000 (345)	5000 (345)	3083 (213)	3623 (250)	650 (343)
ASTM 193, Gr. B6 (410 SST)	5000 (345) —	— 5000 (345)	— 2736 (189)	2780 (192) —	800 (427) 900 (482)
ASTM A193, Gr. B7	— 5000 (345)	5000 (345) —	— 2736 (189)	2780 (192) —	800 (427) 900 (482)
3/4" (DN20) Mark 708					
ASTM A354, Gr. BD	4000 (276)	4000 (276)	2466 (170)	2898 (200)	650 (343)
ASTM 193, Gr. B6 (410 SST)	— 4000 (276)	4000 (276) —	— 2917 (201)	2224 (153) —	800 (427) 375 (191)
ASTM A193, Gr. B7	— 4000 (276)	4000 (276) —	— 2400 (165)	2224 (153) —	800 (427) 700 (371)

Note: standard bolting is Grade 6B

MK708 SERIES FEATURES & BENEFITS



Field reversible, multi-spring actuator for standard Mark 708

Rolling diaphragm provides constant surface area throughout entire stroke

Rugged 304SST NAMUR yoke provides flexible mounting options for accessories

Quick change trim eliminates stroke adjustment when changing trim (not applicable to Cv's below 0.05)

"Free floating" plug (CV/s > 0.02) allows plug to self-center in the seat, improving control and shutoff

Modular seat design permits soft seat field retrofit by adding, not replacing, two parts

Optimized flow geometry aids precision control even in laminar flow regimes

Bolted body bonnet enhances safety, ensures proper alignment and permits removal without disassembly of control signal connections on the actuator

Standard 11/16" deep-well socket for 1/4" – 1/2", 7/8" socket for 3/4" size needed to replace seat - no special tools required

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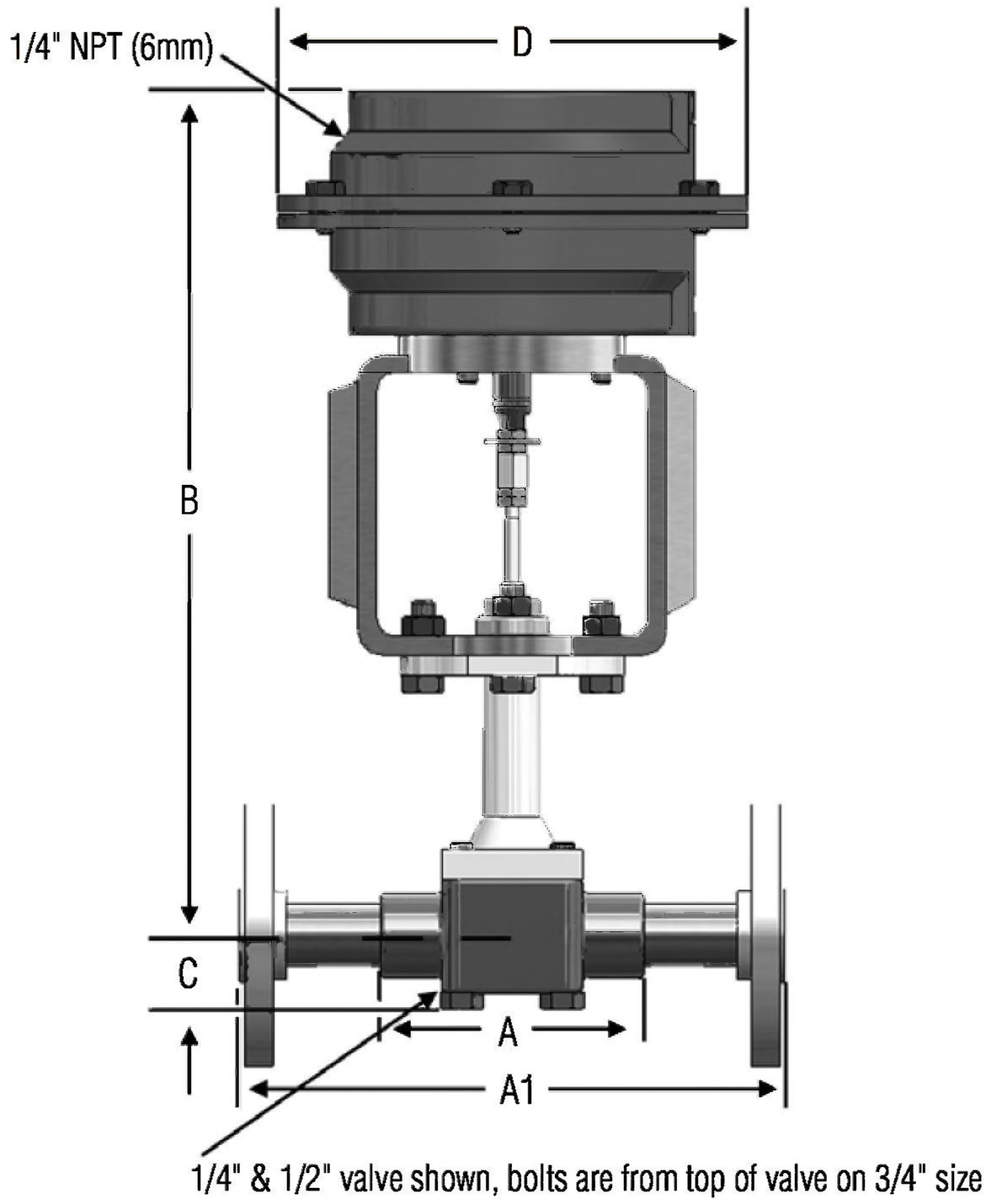
MK708 SERIES DIMENSIONS



- **Mark 708 Threaded & FSW Ends**

VALVE SIZE	ACTUATOR	DIMENSIONS, INCHES A	B	C	D	WEIGHT LBS
1/4"	14M	3.50	11.6	0.9	6.3	7.0
1/2"	14M	3.50	11.6	0.9	6.3	7.0
3/4"	14M	4.38	11.7	1.2	6.3	9.0
3/4"	35M	4.38	13.5	1.2	9.5	18.0

- **Mark 708 Flanged Ends**

VALVE SIZE	ANSI FLANGE	DIMENSIONS, INCHES A1	B	C	D	WEIGHT LBS
1/2" (14M)	150#	7.25	11.6	0.9	6.3	10.5
	300#	7.50	11.6	0.9	6.3	11.5
3/4" (14M)	150#	7.25	11.7	1.2	6.3	13.5
	300#	7.62	11.7	1.2	6.3	15.5
3/4" (35M)	150#	7.25	13.5	1.2	9.5	22.5
	300#	7.62	13.5	1.2	9.5	24.5

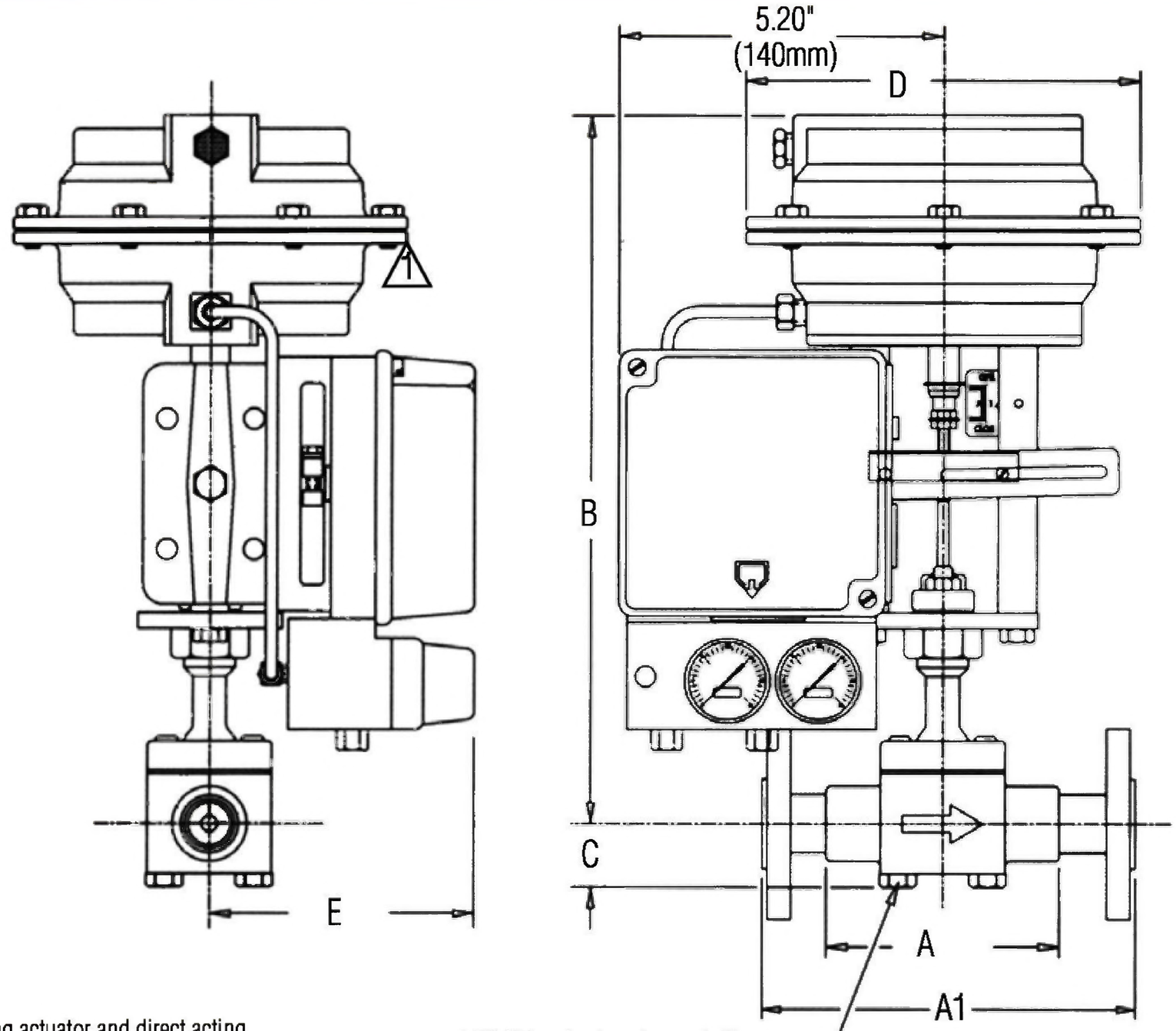
- **Mark 708 Threaded & FSW Ends, Metric**

VALVE SIZE	ACTUATOR	DIMENSIONS, MM A	B	C	D	WEIGHT KGS
DN8	14M	89	295	23	160	3,2
DN15	14M	89	295	23	160	3,2
DN20	14M	111	297	30	160	4,1
DN20	35M	111	343	30	241	8,2

- **Mark 708 Flanged Ends, Metric**

VALVE SIZE	FLANGE PN	DIMENSIONS, INCHES A1	B	C	D	WEIGHT LBS
DN15 (14M)	10/16	130	295	23	160	4,8
	25/40	130	295	23	160	5,2
DN20 (14M)	10/16	184	297	30	160	6,1
	25/40	194	297	30	160	7,0
DN20 (35M)	10/16	184	343	30	241	10,2
	25/40	194	343	30	241	11,1

MK708SP SERIES DIMENSIONS



Shown with reverse acting actuator and direct acting positioner. Other combinations change orientation of positioner

1/2" (15mm) valve shown, bolts are from top of valve on 3/4" size

• Mark 708SP Threaded & FSW Ends

VALVE SIZE	DIMENSIONS, INCHES A	B	C	D	E	WEIGHT LBS
1/2"	3.50	11.6	0.9	6.3	4.75	7.3
3/4"	4.38	11.7	1.2	6.3	4.75	9.3

• Mark 708SP Flanged Ends

VALVE SIZE	ANSI FLANGE	DIMENSIONS, INCHES A1	B	C	D	E	WEIGHT LBS
1/2"	150#	7.25	11.6	0.9	6.3	4.75	9.3
	300#	7.50	116	0.9	6.3	4.75	11.3
3/4"	150#	7.25	11.7	1.2	6.3	4.75	13.3
	300#	7.62	11.7	1.2	6.3	4.75	15.3

• Mark 708SP Threaded & FSW Ends, Metric

VALVE SIZE	DIMENSIONS, MM A	B	C	D	E	WEIGHT KGS
DN15	89	295	22,9	160	121	3,3
DN20	111	297	35,6	160	121	4,2

• Mark 708SP Flanged Ends, Metric

VALVE SIZE	ANSI PN	DIMENSIONS, MM A1	B	C	D	E	WEIGHT KGS
DN15	10/16	130	295	22,9	160	121	4,2
	25/40	130	295	22,9	160	121	5,1
DN20	10/16	184	297	35,6	160	121	6,0
	25/40	194	297	35,6	160	121	6,9

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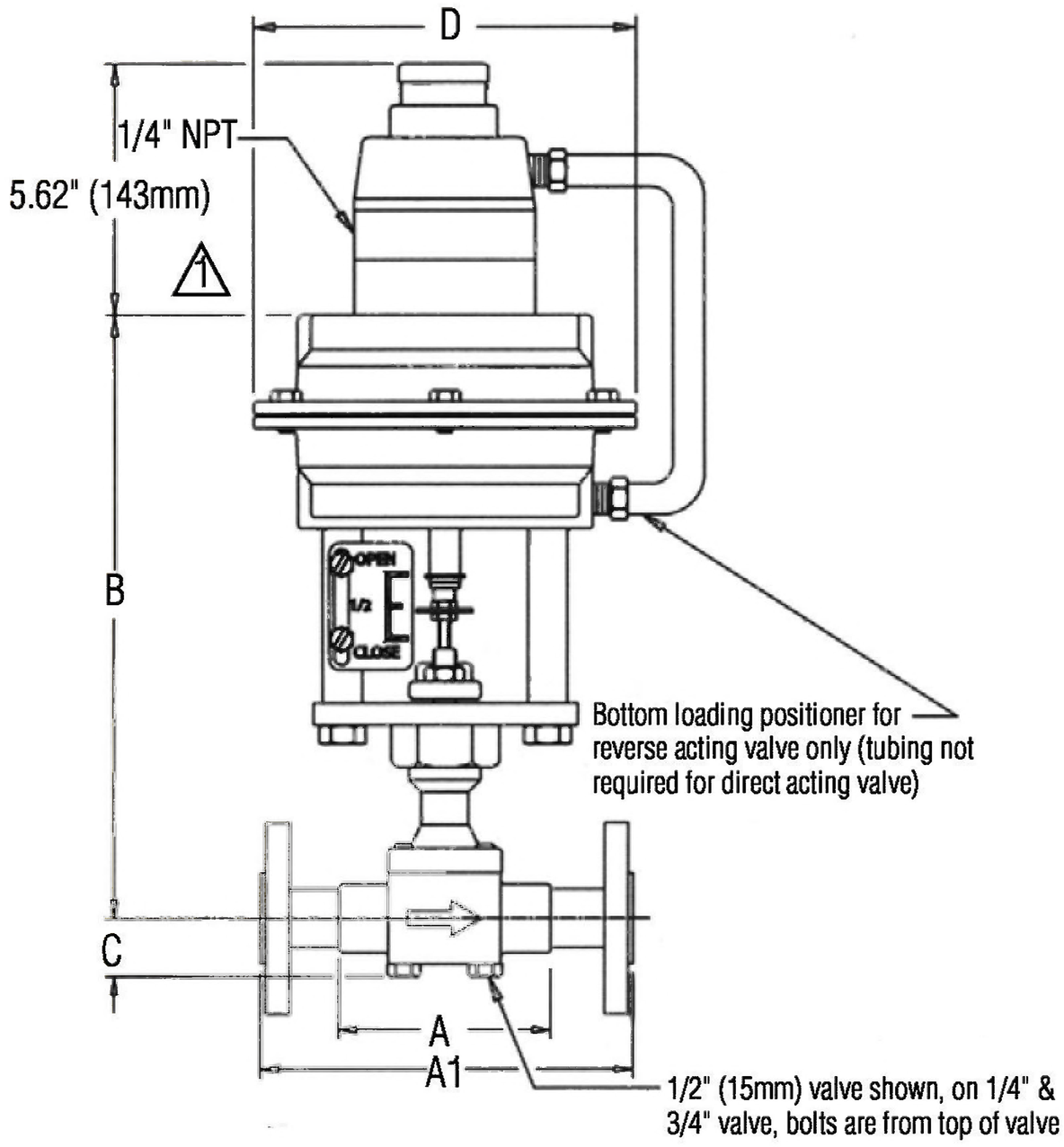
MK708TP SERIES DIMENSIONS



1 Add 2" (50mm) fror reverse acting 3-9 / 9-15 ranges

- **Mark 708TP Threaded & FSW Ends**

VALVE SIZE	ACTUATOR	DIMENSIONS, INCHES A	B	C	D	WEIGHT LBS
1/4"*	14M	2.06	8.5	0.4	5.0	4.4
1/2"**	14M	2.06	8.5	0.4	6.3	5.3
3/4"**	14M	3.50	9.6	0.9	6.3	7.0
3/4"**	35M	4.38	9.7	1.2	6.3	9.0

- **Mark 708TP Flanged Ends**

VALVE SIZE	ANSI FLANGE	DIMENSIONS, INCHES A1	B	C	D	WEIGHT LBS
1/2" (14M)	150#	7.25	9.6	0.9	6.3	10
	300#	7.50	9.6	0.9	6.3	11
3/4" (14M)	150#	7.25	9.7	1.2	6.3	13
	300#	7.62	9.7	1.2	6.3	15

- **Mark 708TP Threaded & FSW Ends, Metric**

VALVE SIZE	ACTUATOR	DIMENSIONS, MM A	B	C	D	WEIGHT KGS
DN8*	14M	89	295	23	160	3,2
DN15**	14M	89	295	23	160	3,2
DN20**	14M	111	297	30	160	4,1
DN20**	35M	111	343	30	241	8,2

- **Mark 708TP Flanged Ends, Metric**

VALVE SIZE	FLANGE PN	DIMENSIONS, MM A1	B	C	D	WEIGHT KGS
DN15 (14M)	10/16	130	244	22,9	160	4,5
	25/40	130	244	22,9	160	4,8
DN20 (14M)	10/16	184	246	35,6	160	5,9
	25/40	194	246	35,6	160	6,8

* Valve with 7M Actuator

** Valve with 14M Actuator

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ORDERING SCHEMATIC

MK708 SERIES ORDERING SCHEMATIC

Model No.	Size	Body Mat'l	/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

MODEL	
708	Standard

SIZE	
025	1/4" (DN8)
050	1/2" (DN15)
075	3/4" (DN20)

BODY MATERIAL	
CB	Carbon Steel (A105)
S6	Stainless Steel (CF8M)
MN	Monel
A2	Alloy 20

1 & 2	END CONNECTIONS
PT	NPT
SW	FSW
F5	150# FE
F3	300# FE
TN	Integral Tube Nuts
ZZ	Non-standard

3 & 4	TRIM
T6	316SS/Teflon Packing
TM	Monel/Teflon Packing
TA	Alloy 20/Teflon Packing
G6	316SS/Graphite
ZZ	Non-standard

5 & 6	PLUG SEAT		
	Material of Stem/Plug/Seat		Cv
A	Standard - Linear Hard	A	0.00001
B	Standard =% Hard	B	0.00002
C	Standard Q.O. Hard	C	0.00005
D	Standard Linear Soft (PEEK)	D	0.0001
E	Standard =% Soft (PEEK)	E	0.0002
F	Standard Q.O. Soft (PEEK)	F	0.0005
M	316/Stellite/Stell-Lin. Hard	G	0.001
N	316/Stellite/Stell =% Hard	H	0.002
P	316/Stellite/Stell Q.O. Hard	I	0.005
		J	0.01
		K	0.02
		L	0.05
		M	0.1
		N	0.2
		P	0.5
		Q	1.0
		R	2.0
		S	4.0
		T	3.0
ZZ	Non-standard		

7,8,9,10,11,12	ACTUATOR		
	Range	Diaphragm	Actuator
N4Q4N4	3-15 DIR	Nylon/Nitrile	14M
Q4Q4N4	3-15 REV		
G4T4D4	6-30 DIR		
H4T4R4	6-30 REV		
A3B3D3	3-15 DIR	Buna-N	35M
B3B3R3	3-15 REV		
G3B3D3	6-30 DIR		
H3B3R3	6-30 REV		
ZZ	Non-standard		

13 & 14	ACCESSORIES
00	None
A7	Air Regulator for 14M Actuator
A5	Air Regulator for 35M Actuator
G2	Two Gages on TMP
S6	316SS Bolting
SH	304SS Strain Hardened
S2	3-way Solenoid Energize to Open
S3	3-way Solenoid Energize to Close
ZZ	Non-standard

15	ACTION
D	Air-to-close
R	Air-to-open

16	I/P
0	None
4	I/P 14M Act. 4-20Ma/3-15 psi
3	I/P 35M Act. 4-20Ma/3-15 psi
9	I/P 14M Act. 4-20Ma/6-30 psi
Z	Non-standard

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ORDERING SCHEMATIC

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MK708TP/708SP SERIES ORDERING SCHEMATIC

Model No.	Size	Body Mat'l	/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

MODEL	
708TP	Top Mount Positioner
708SP	Side Mount Positioner

SIZE	
025	1/4" (DN8)
050	1/2" (DN15)
075	3/4" (DN20)

BODY MATERIAL	
CB	Carbon Steel (A105)
S6	Stainless Steel (CF8M)
MN	Monel
A2	Alloy 20

1 & 2	END CONNECTIONS		
PT	NPT	F3	300# FE
SW	FSW	TN	Integral Tube Nuts
F5	150# FE	ZZ	Non-standard

3 & 4	TRIM
T6	316SS/Teflon Packing
TM	Monel/Teflon Packing
TA	Alloy 20/Teflon Packing
G6	316SS/Graphite
ZZ	Non-standard

5 & 6	PLUG SEAT		
	Material of Stem/Plug/Seat		Cv
A	Standard - Linear Hard	A	0.00001
B	Standard =% Hard	B	0.00002
C	Standard Q.O. Hard	C	0.00005
D	Standard Linear Soft (PEEK)	D	0.0001
E	Standard =% Soft (PEEK)	E	0.0002
F	Standard Q.O. Soft (PEEK)	F	0.0005
M	316/Stellite/Stell-Lin. Hard	G	0.001
N	316/Stellite/Stell =% Hard	H	0.002
P	316/Stellite/Stell Q.O. Hard	I	0.005
		J	0.01
		K	0.02
		L	0.05
		M	0.1
		N	0.2
		P	0.5
		Q	1.0
		R	2.0
		S	4.0
		T	3.0
ZZ	Non-standard		

7 & 8	RANGE		
	Range/Action	Actuator	
A	3-15 DIR		
B	3-15 REV	4	14M
C	3-9 DIR	3	35M
D	3-9 REV		
E	9-15 DIR		
F	9-15 REV		
G	6-30 DIR		
H	6-30 REV		
ZZ	Non-standard		
ZZ	Non-standard		

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ORDERING SCHEMATIC

MK708TP/708SP SERIES ORDERING SCHEMATIC (CON'T)

Model No.	Size	Body Mat'l	/	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

9 & 10	DIAPHRAGM		
	Material	Size	
T	Nylon/Nitrile	4	14M
B	Buna-N	3	35M
ZZ	Non-standard		

11 & 12	ACTUATOR		
	Type	Size	
	708TP, 708BS		
D	Air-to-close		
R	Air-to-open	4	14M
		3	35M
	708SP		
S	w/SMP		
ZZ	Non-standard		

13 & 14	ACCESSORIES
00	None
A7	Air Regulator for 14M Actuator
A5	Air Regulator for 35M Actuator
G2	Two Gages on TMP
S6	316SS Bolting
SH	304SS Strain Hardened
S2	3-way Solenoid Energize to Open
S3	3-way Solenoid Energize to Close
ZZ	Non-standard

15	ACTION
D	Air-to-close
R	Air-to-open

16	I/P
0	None
4	I/P 14M Act. 4-20Ma/3-15 psi
3	I/P 35M Act. 4-20Ma/3-15 psi
9	I/P 14M Act. 4-20Ma/6-30 psi
Z	Non-standard

17	SMP
G	SMP - 16IQ-S Dir/Rev
0	None
A	SMP - P/P Dir/Rev 3-15
D	SMP - I/P Dir/Rev 4-20
H	MK16IQ-B Dir/Rev
J	MK16IQ-FF Dir/Rev
Z	Non-standard

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