

# 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 1" 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).



**MK708**

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## MK708 SERIES SPECIFICATIONS

**Sizes:** 1/4", 1/2", 3/4", 1" (DN8, DN15, DN20, DN25)

### End Connections

- Threaded – NPT, BSPT, BSPP
- Socket weld
- Integral tube ends (max Cv or 0.2 on 1/4" TN option)
- Welded flanges (ANSI, DIN, JIS)
- Others upon request (contact factory)

### Actuator

- 1/4" (DN8) – standard: 14M (14 in<sup>2</sup>) multi-spring
- 1/2" (DN15) – standard: 14M
- 3/4" (DN20) – standard: 14M; optional 35M (35 in<sup>2</sup>)
- 1" (DN25) – standard: 35M

### Diaphragm Material

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

### Body/Bonnet Materials

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

### Trim Materials

For other options/materials, consult factory

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

### Optional Trim Materials

- 316SS Stem, 17-4 plug, 416SS seat
- 316SS Stem, Stellite plug and Stellite seat (hard seat only)
- 316SS Stem/plug & seat
- 316SS Stem plug, PEEK 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  $\geq$  0.05/0,43 Kv only); or quick opening (Cv  $\geq$  0.05/0,43 Kv only)

## 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)	0.1 (0,09)	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 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)

- 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)	1160 (80)

### Pressure & Temperature Ratings

Temp F° (°C)	1/4" & 1/2" (DN8 & 15) Body/Bonnet psi (bar)		3/4" & 1" (DN20 & DN25) 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)	—

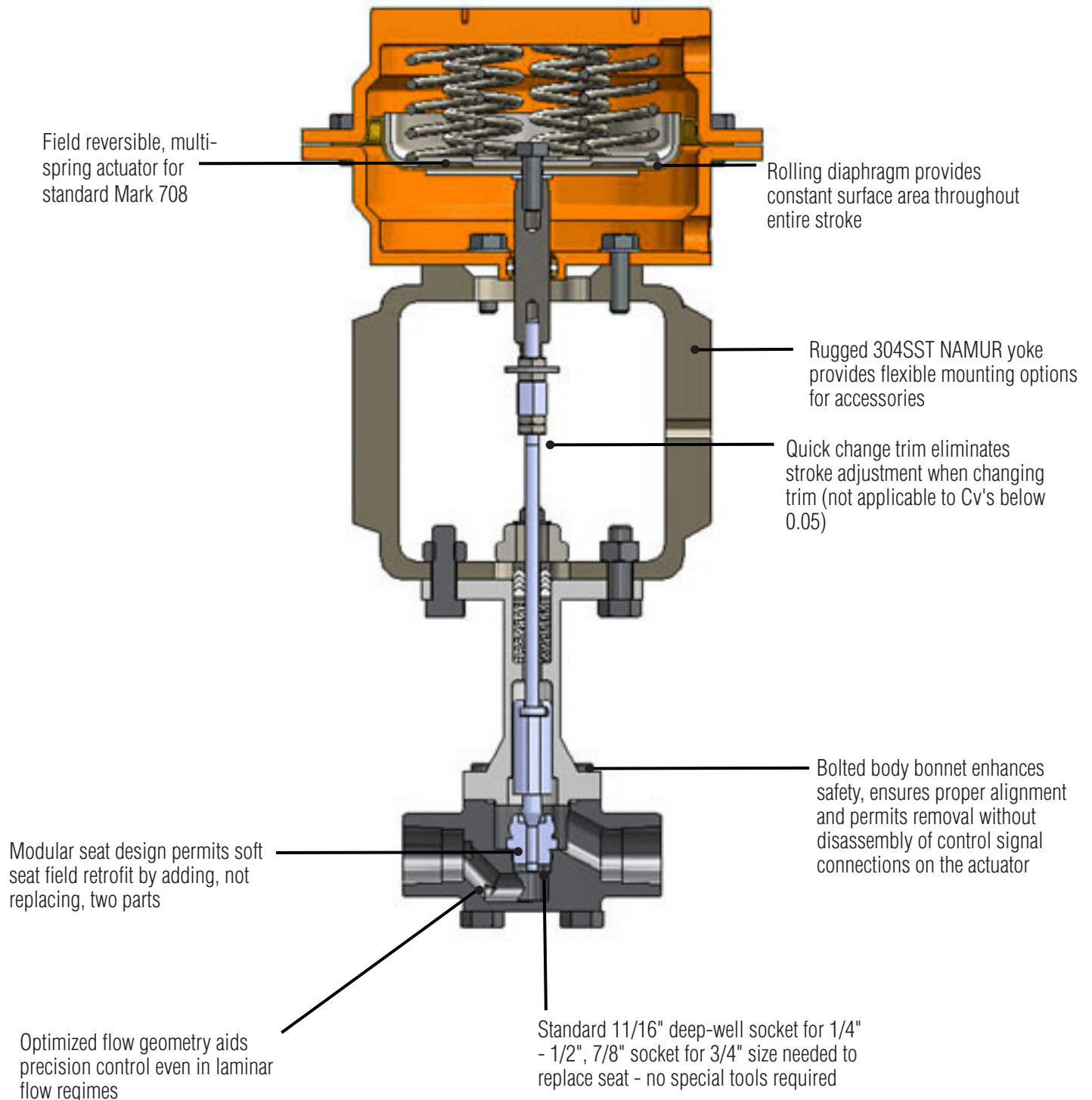
### Body Rating Tables

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

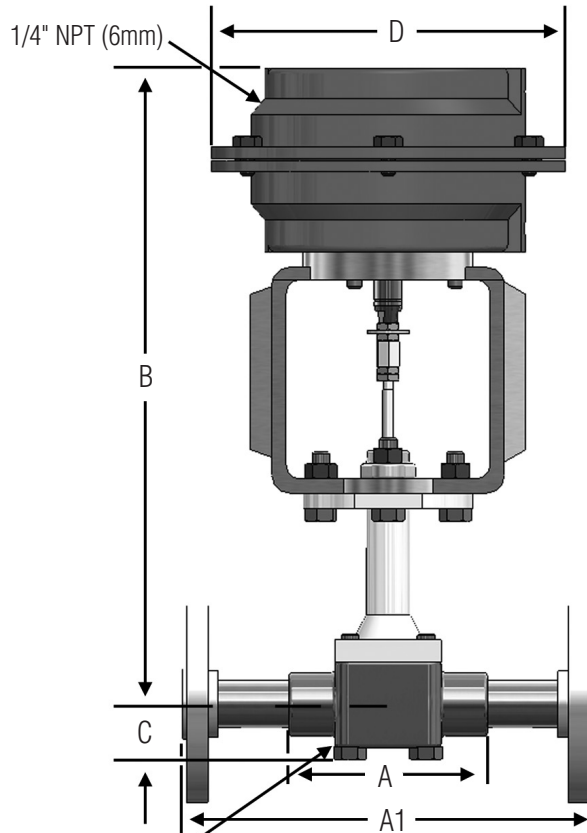
Bolting Material	Body/Bonnet Material				
	At 100°F/38°		At Maximum Temperature		
	CF8M	A105	CF8M	A105	Max °F/°C
<b>1/4" (DN8) Mark 708</b>					
ASTM A354, Gr. BD	5000 (345)	5000 (345)	3083 (213)	3623 (250)	650 (343)
ASTM 193, Gr. B6 (410 SST)	3000 (207)	—	2995 (206)	—	200 (93)
	—	3705 (255)	—	2995 (206)	500 (260)
ASTM A193, Gr. B7	—	5000 (345)	—	2780 (192)	800 (427)
	5000 (345)	—	2736 (189)	—	450 (232)
<b>1/2" (DN15) Mark 708</b>					
ASTM A354, Gr. BD	5000 (345)	5000 (345)	3083 (213)	3623 (250)	650 (343)
ASTM 193, Gr. B6 (410 SST)	5000 (345)	—	—	2780 (192)	800 (427)
	—	5000 (345)	2736 (189)	—	900 (482)
ASTM A193, Gr. B7	—	5000 (345)	—	2780 (192)	800 (427)
	5000 (345)	—	2736 (189)	—	900 (482)
<b>3/4" &amp; 1" (DN20 &amp; DN25) Mark 708</b>					
ASTM A354, Gr. BD	4000 (276)	4000 (276)	2466 (170)	2898 (200)	650 (343)
ASTM 193, Gr. B6 (410 SST)	—	4000 (276)	—	2224 (153)	800 (427)
	4000 (276)	—	2917 (201)	—	375 (191)
ASTM A193, Gr. B7	—	4000 (276)	—	2224 (153)	800 (427)
	4000 (276)	—	2400 (165)	—	700 (371)

Note: standard bolting is Grade SA193-B7 Plated

**MK708 SERIES FEATURES & BENEFITS**



## MK708 SERIES DIMENSIONS



1/4" & 1/2" valve shown, bolts are from top of valve on 3/4" size

- Mark 708 Threaded & FSW Ends**

VALVE SIZE	ACTUATOR	DIMENSIONS, INCHES				WEIGHT LBS
		A	B	C	D	
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
1"	35M	4.375	13.6	1.2	9.5	19.0

- Mark 708 Threaded & FSW Ends, Metric**

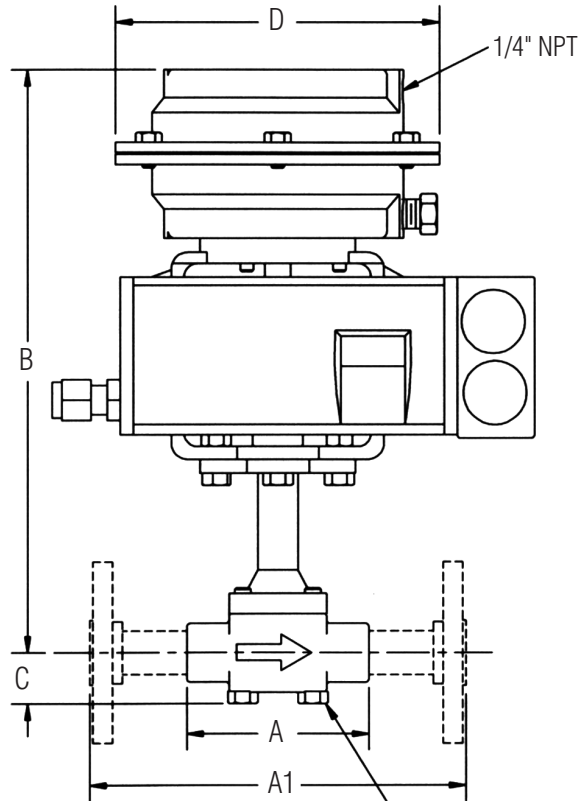
VALVE SIZE	ACTUATOR	DIMENSIONS, MM				WEIGHT KGS
		A	B	C	D	
DN8	14M	89	295	23	160	3,2
DN15	14M	89	295	23	160	3,2
DN20	14M	111	297	30	160	4,1
DN20	35M	111	343	30	241	8,2
DN25	35M	111	346	30	241	8.6

- Mark 708 Flanged Ends**

VALVE SIZE	ANSI FLANGE	DIMENSIONS, INCHES				WEIGHT LBS
		A1	B	C	D	
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
1" (35M)	150#	7.62	13.6	1.2	9.5	26.5
	300#	7.62	13.6	1.2	9.5	26.5

- Mark 708 Flanged Ends, Metric**

VALVE SIZE	FLANGE PN	DIMENSIONS, INCHES				WEIGHT LBS
		A1	B	C	D	
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
DN25 (35M)	10/16	194	346	30	241	12,0
	25/40	194	346	30	241	12,0

**MK708SP SERIES DIMENSIONS**


1/4" & 1/2" valve shown, bolts are from top of valve on 3/4" size

**Mark 708SP Threaded & FSW Ends**

VALVE SIZE	DIMENSIONS, INCHES				WEIGHT LBS
	A	B	C	D	
1/4"*	3.50	11.6	0.9	6.3	7.0
1/2"*	3.50	11.6	0.9	6.3	7.0
3/4"*	4.38	11.7	1.2	6.3	9.0
3/4"***	4.38	13.5	1.2	9.5	18.0
1"	4.38	13.6	1.2	9.5	19.0

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

VALVE SIZE	DIMENSIONS, INCHES				WEIGHT LBS
	A	B	C	D	
DN8**	88,9	295	22,9	160	3,2
DN15**	88,9	295	22,9	160	3,2
DN20**	111,3	297	30,5	160	4,1
DN20***	111,3	343	30,5	241	8,2
DN25***	111,3	346	30,5	241	8,6

**Mark 708SP Flanged Ends**

VALVE SIZE	ANSI FLANGE	DIMENSIONS, INCHES				WEIGHT LBS
		A1	B	C	D	
1/2"*	150#	7.25	11.6	0.9	6.3	9.3
	300#	7.50	11.6	0.9	6.3	11.3
3/4"*	150#	7.25	11.7	1.2	6.3	13.3
	300#	7.62	11.7	1.2	6.3	15.3
3/4"***	150#	7.25	13.5	1.2	9.5	22.5
	300#	7.62	13.5	1.2	9.5	24.5
1"***	150#	7.62	13.6	1.2	5.5	26.5
	300#	7.62	13.6	1.2	5.5	26.5

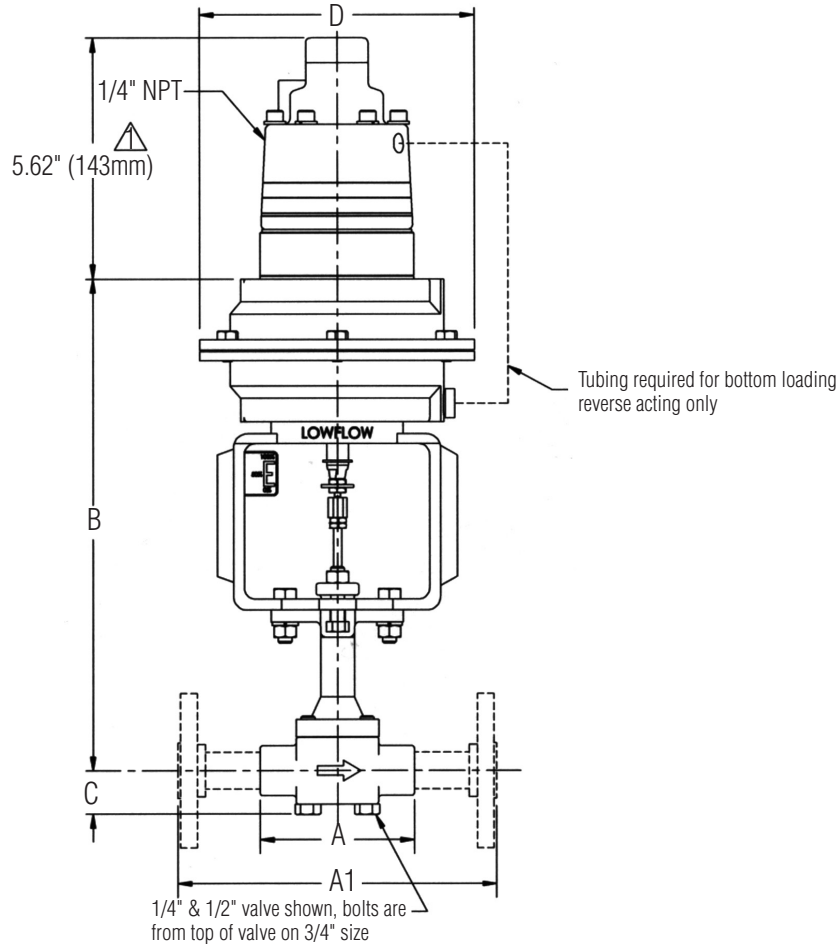
**Mark 708SP Flanged Ends, Metric**

VALVE SIZE	ANSI PN	DIMENSIONS, MM				WEIGHT KGS
		A1	B	C	D	
DN15*	10/16	184	295	22,9	160	4,8
	25/40	191	295	22,9	160	5,2
DN20*	10/16	184	297	30,5	160	6,1
	25/40	194	297	30,5	160	7,0
DN20**	10/16	184	343	30,5	241	10,2
	25/40	194	343	30,5	241	11,1
DN25**	10/16	194	346	30,5	241	12,0
	25/40	194	346	30,5	241	12,0

\* Valve with 14M actuator

\*\* Valve with 35M actuator

## MK708TP SERIES DIMENSIONS



- Mark 708TP Threaded & FSW Ends**

VALVE SIZE	DIMENSIONS, INCHES				WEIGHT LBS
	A	B	C	D	
1/4"	3.50	11.6	0.9	6.3	7.0
1/2"	3.50	11.6	0.9	6.3	7.0
3/4"	4.38	11.7	1.2	6.3	9.0
1"	4.38	13.6	1.2	9.5	19.0

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

VALVE SIZE	DIMENSIONS, MM				WEIGHT KGS
	A	B	C	D	
DN8	89	295	23	160	3,2
DN15	89	295	23	160	3,2
DN20	111	297	30	160	4,1
DN25	111	346	30	241	8,6

- Mark 708TP Flanged Ends**

VALVE SIZE	ANSI FLANGE	DIMENSIONS, INCHES				WEIGHT LBS
		A1	B	C	D	
1/2"	150#	7.25	11.6	0.9	6.3	10
	300#	7.50	11.6	0.9	6.3	11
3/4"	150#	7.25	11.7	1.2	6.3	13
	300#	7.62	11.7	1.2	6.3	15
1"	150#	7.62	13.6	1.2	5.5	26.5
	300#	7.62	13.6	1.2	5.5	26.5

- Mark 708TP Flanged Ends, Metric**

VALVE SIZE	FLANGE PN	DIMENSIONS, MM				WEIGHT KGS
		A1	B	C	D	
DN15	10/16	184	295	22,9	160	4,5
	25/40	191	295	22,9	160	5,0
DN20	10/16	184	297	30,5	160	5,9
	25/40	194	297	30,5	160	6,8
DN25	10/16	194	346	30,5	241	12,0
	25/40	194	346	30,5	241	12,0

## 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)
100	1" (DN25)

BODY MATERIAL	
CB#	A105 Carbon Steel Barstock
CS#	WCB Carbon Steel
HC#	Hastelloy C
SB#	316/316L Stainless Steel Barstock
S6#	CF8M Stainless Steel
MN#	Monel
A2#	Alloy 20

1 & 2 END CONNECTIONS			
PT	NPT	BT	BSPT
SW	FSW	BP	BSPP
F5	150# FE	F7	PN10
F3	300# FE	F8	PN16
TN*	Integral Tube Nuts	F6	PN25
ZZ	Non-standard	F4	PN40

\*max Cv of 0.2

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	17-4Stellite/Stell-Lin. Hard	G	0.001
N	17-4/Stellite/Stell =% Hard	H	0.002
P	17-4/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 (1/4" - 3/4")
Q4Q4N4	3-15 REV	
G4T4D4	6-30 DIR	
H4T4R4	6-30 REV	
A3B3D3	3-15 DIR	Buna-N 35M (3/4" - 1")
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
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



# ORDERING SCHEMATIC



## 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)
100	1" (DN25)

BODY MATERIAL	
CB#	A105 Carbon Steel Barstock
CS#	WCB Carbon Steel
SB#	316/316L Stainless Steel Barstock
S6#	CF8M Stainless Steel
HC#	Hastelloy C
MN#	Monel
A2#	Alloy 20

1 & 2 END CONNECTIONS			
PT	NPT	BT	BSPT
SW	FSW	BP	BSPP
F5	150# FE	F7	PN10
F3	300# FE	F8	PN16
TN	Integral Tube Nuts	F6	PN25
ZZ	Non-standard	F4	PN40

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	17-4/Stellite/Stell-Lin. Hard	G	0.001
N	17-4/Stellite/Stell =% Hard	H	0.002
P	17-4/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	Non-standard	

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	SH	304SS Strain Hardened
A7	Air Regulator for 14M Act.	S2	3-way Solenoid Energize to Open
A5	Air Regulator for 35M Act.	S3	3-way Solenoid Energize to Close
G2	Two Gages on TMP	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