

# 709 Series Three-Way Valves

## Fractional Flow Control Valves

CRN Registration Number Available

### *FRACTIONAL FLOW CONTROL VALVES*

The Mark 709 is a lightweight control valve for use as a mixing valve in low flow process applications. Featuring a three-way body design, it is constructed with two inlets to blend two separate flow streams into a common outlet, creating a third fluid.

#### **Features:**

- For low flow process applications requiring a three way body for mixing two separate flow sources into one common line
- Compact, lightweight design for precise control in pilot plants, R & D facilities, and low flow process applications
- With multiple spring actuators in a choice of sizes for differential pressures up to 1460 psi (100 bar)

#### ***SPECIFICATIONS***

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**Sizes:** 1/2" & 3/4" (DN15 & DN20)

#### **End Connections**

- Threaded – NPT
- Others upon request

#### **Actuator**

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

#### **Body/Bonnet Materials**

- Carbon Steel
- Stainless Steel
- Hastelloy C
- Hastelloy B
- Alloy 20
- Monel
- Titanium



**MK709 SERIES THREE WAY SPECIFICATIONS (CON'T)**
**Trim Material**

- Standard trim – 316SS stem, plug & seat

**Actuator Material:** Aluminum

**Diaphragm Material:**

- 14M Actuator: Nylon/Nitrile
- Optional 35M Actuator: Buna-N fabric reinforced

**Stem Packing Material:** PTFE

**Bonnet/Body Seal Material:** PTFE

**Service:** Air, gas, chemicals, oil, water

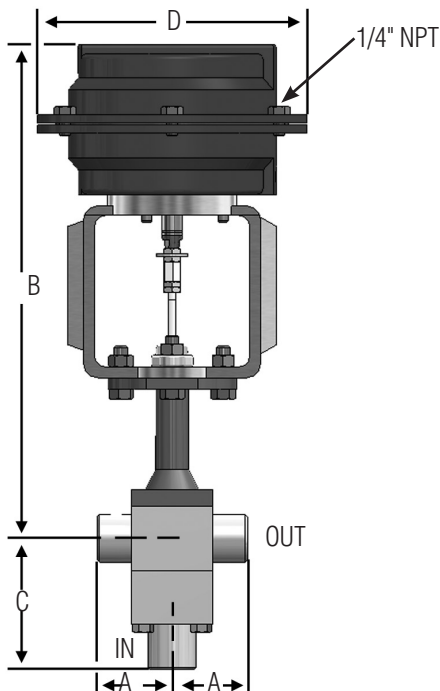
**Shutoff**

- Standard – ANSI Class IV
- Optional – ANSI Class VI (with PEEK seats)

**Ranges:** 3-15 (0,2-1,0) or 6-30 (0,4-2,1) psi (bar)

**Valve Action**

- Direct (ATC)
- Reverse (ATO)


**Flow Characteristics:**

- Linear/linear
- Equal percentage/equal percentage
- Others upon request

**Cv (Kv) Selection**

1/2" (DN15)	2.0 (1,7)	1.5 (1,3)	1.25(1,1)	
3/4" (DN20)	4.0 (3,4)	3.5 (3,0)	3.0 (2,6)	2.5 (2,2)

**Maximum Allowable ΔP Ratings**

Cv (Kv)	ATO 3-15	ATO 6-30	ATC3-15 @ 20 psi (1,4bar)	ATC 6-30 @ 40 psi (2,8 bar)
14M Actuator				
2.5 - 4.0 (2,2-3,4)	264 (18)	532 (37)	432 (30)	864 (60)
1.25 - 2.0 (1,1-1,7)	400 (28)	800 (55)	650 (45)	1300 (90)
35M Actuator				
2.5 - 4.0 (2,2-3,4)	440 (30)	880 (61)	707 (49)	1460 (101)

**Pressure/Temperature Rating (PSI/BAR)**

Temp °F (°C)	1/2" (DN15)		3/4" (DN20)	
	CS	SS	CS	SS
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 (197)	3422 (236)
500 (260)	3319 (229)	4042 (279)	2655 (183)	3234 (223)

**Mark 709 Series Three-Way Ends**

VALVE SIZE	ACTUATOR	DIMENSIONS, INCHES				WEIGHT LBS
		A	B	C	D	
1/2"	14M	1.8	11.6	2.7	6.3	9.5
3/4"	14M	2.2	12.0	3.3	6.3	11.5
	35M	2.2	13.8	3.3	9.5	20.5

**Mark 709 Series Three-Way Ends, Metric**

VALVE SIZE	ACTUATOR	DIMENSIONS, MM				WEIGHT KGS
		A	B	C	D	
DN15	14M	46	295	69	160	4,3
DN20	14M	56	305	84	160	5,2
DN20	35M	56	351	84	241	9,3

**MK709 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	
709	Standard
709TP	with top positioner
709SP	with side positioner

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

BODY MATERIAL	
CB#	Carbon Steel
SB#	316/ 316L Stainless Steel Barstock

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

3 & 4 TRIM	
T6	316SS/Teflon Packing
ZZ	Non-standard

5 & 6 PLUG SEAT			
	Material of Stem/Plug/Seat		Cv
A	Standard - Linear Hard	A	1.25
B	Standard =% Hard	B	1.5
		C	2.0
		D	2.5
		E	3.0
		F	3.5
		G	4.0
		H	1.0
ZZ	Non-standard		

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

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

11 & 12 ACTUATOR			
	Type	Size	
<b>709</b>			
D	Air - to - close	4	14M
R	Air - to - open	3	35M
ZZ	Non-Standard		
<b>709SP</b>			
S	w/SMP		
ZZ	Non-Standard		

13 & 14 ACCESSORIES	
00	None
AR	Air Regulator
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 ACCESSORIES #2	
0	None
4	I/P 14M Actuator
3	I/P 35M Actuator

17 SMP	
G	SMP-16IQ-S DIR/REV
H	MK16IQ-B DIR/REV