



# Valve Solutions

WWW.MKSINST.COM

## 3-Way High Vacuum Ball Valves

The MKS 3-way high vacuum ball valves are designed to divert flow from either of two inlet ports to a single, common outlet port. The 3-way high vacuum ball valve components - body, stem, L-port ball, and three end caps are machined from corrosive resistant 316L stainless steel. Fluoroelastomers seal the stem and end caps from atmosphere while PTFE Teflon® seats cold flow around the ball to isolate one inlet port while diverting flow through the other. Flow through the valve is diverted manually or pneumatically by 1/4 turn, quick actuation. During actuation, the PTFE Teflon seats wipe across the ball, reducing particulate build-up and making this valve robust in particle-rich effluent streams.

### Features & Benefits

#### 3-Way Difference

The MKS 3-way high vacuum ball valves maximize design efficiencies in high vacuum systems and coating tools when compared to multi-valve systems with equivalent functionality:

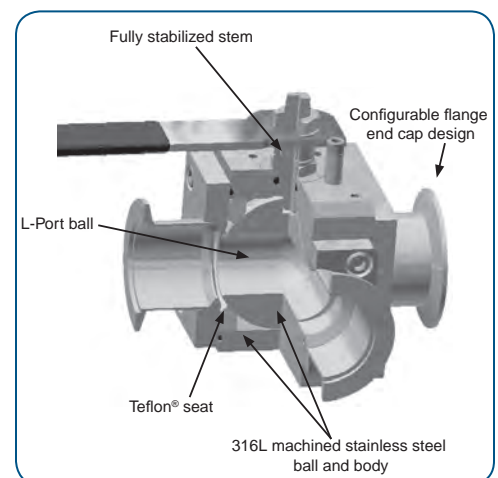
- Reduced bill of materials, footprint, overall weight, and design complexity
- Fewer actuated components and leak paths
- Less total area to heat
- MRO parts reduce maintenance costs

#### Patented Extended Life (XL) Design

- Increased stem lifetime
- Reduced wetted components
- Fully stabilized stem

### Applications

The corrosion-resistant design of the MKS 3-way high vacuum ball valves make them ideal for diverting flow or isolating pumping lines, reactors, traps, and scrubbers on vacuum coating tools used for MOCVD, PVD, and other thin-film coating processes.



## Dimensional Drawings

Manual Ball Valves															
Part Number	Actuation	Ball Port	End Cap Type	End Cap Tube Size	Conduct (L/SEC)	Accessories	O-ring Material	A	B	C	D	E	F	G	H
BALL-33408	Manual	1.375"	KF40	1½" O.D.	29	None	Viton	5.33	5.9	3.7	7.9	5.2	3.9	3.9	3.28
BALL-33416	Manual	1.375"	KF50	2" O.D.	34	None	Viton	6.31	5.9	3.7	7.9	5.7	3.9	4.4	3.78

Note: Unless otherwise specified, dimensions are nominal values in inches.

Pneumatic Ball Valves															
Part Number	Actuation	Ball Port	End Cap Type	End Cap Tube Size	Conduct (L/SEC)	Accessories	O-ring Material	A	B	C	D	E	F	G	H
BALL-33412	Air Open/Air Close	1.375"	KF40	1½" O.D.	29	None	Viton	5.33	10.1	3.7	7.8	5.2	8.1	3.9	3.28
BALL-33420	Air Open/Air Close	1.375"	KF50	2" O.D.	34	None	Viton	6.31	10.1	3.7	7.8	5.7	8.1	4.4	3.76

Note: Unless otherwise specified, dimensions are nominal values in inches.



## Additional Part Numbers

Part Number	Actuation	End Cap Type	Accessories	O-ring Material
BALL-33409	Manual	KF40	Lock Kit	Viton
BALL-33410	Manual	KF40	Position Indicator	Viton
BALL-33411	Manual	KF40	Lock Kit & Position Indicator	Viton
BALL-33413	Air-to-Open, Air-to-Close	KF40	Lock Kit	Viton
BALL-33414	Air-to-Open, Air-to-Close	KF40	Position Indicator	Viton
BALL-33415	Air-to-Open, Air-to-Close	KF40	Lock Kit & Position Indicator	Viton
BALL-33417	Manual	KF50	Lock Kit	Viton
BALL-33418	Manual	KF50	Position Indicator	Viton
BALL-33419	Manual	KF50	Lock Kit & Position Indicator	Viton
BALL-33421	Air-to-Open, Spring-to-Close	KF50	None	Viton
BALL-33422	Air-to-Open, Air-to-Close	KF50	Lock Kit	Viton
BALL-33423	Air-to-Open, Air-to-Close	KF50	Position Indicator	Viton
BALL-33424	Air-to-Open, Air-to-Close	KF50	Lock Kit & Position Indicator	Viton



# Specifications and Ordering Information

## Vacuum and Temperature Ratings

Vacuum	Rated to $1 \times 10^{-8}$ Torr
Helium Leak Atmosphere to Vacuum and Across Ball Standard Fluoroelastomer Seal	Rated $< 1 \times 10^{-9}$ std. ss/sec -26°C to 150°C (-15°F to 302°F)

## Materials

Valve Body, Ball, Stem, and End Caps	Machined from solid 316L stainless steel
Standard Seal	Fluoroelastomer
Seats	PTFE Teflon®
Lubricant	Dow Corning® High Vacuum Grease

## Pneumatic

Actuator Operating Pressure	80 - 120 psig
Actuator Temperature Range Moist Air Dry Air	0°C to 150°C (32°F to 302°F) -20°C to 150°C (-4°F to 302°F)
Actuators Single Acting Double Acting	Air-to-Open, Spring-to-Close Air-to-Open, Air-to-Close
Air Line Hook-up	1/8 NPT
Solenoids	120VAC, 240VAC or 24VDC

## Additional Accessories

Position Indicators	Visual and mechanical
Lock Kit	Safety lock to prevent unwanted actuation

Please contact your local MKS sales office for price and availability.



### MKS Instruments, Inc. Global Headquarters

2 Tech Drive, Suite 201  
Andover, MA 01810  
Tel: 978.645.5500  
Tel: 800.227.8766 (in U.S.A.)  
Web: [www.mksinst.com](http://www.mksinst.com)

### MKS Instruments, Inc. Valve Solutions

Six Shattuck Road  
Andover, MA 01810  
Tel: 978.975.2350