

Multiport Valves

3-Way, 4-Way, or 5-Way 1.5"
Ball Valves for High Vacuum
Applications



Multiport Valves Overview

ANCORP's Multiport valve is a 1.5" high vacuum valve designed for 3-way, 4-way, or 5-way flow in demanding semiconductor and coating processes. Its modular design and configurable components enable a variety of flow patterns through the valve.

The Multiport valve consists of a cube-shaped valve body, a fully stabilized *Extended Life* (XL) valve stem, a fully ported ball, and end caps (body ports), all machined from corrosive-resistant 316L stainless steel. Flanged body ports or blank end caps are installed on the sides or bottom of the valve body to create a 3, 4, or 5-way valve. An L-port, T-port, or other ported ball rotates within the valve to switch flow between body ports.

FKM or FFKM O-rings seal the valve stem and end caps from atmosphere while PTFE valve seats cold flow around the ball to seal the desired body port(s) from the other body ports. The PTFE sealing surfaces are protected from direct deposition or contact with process matter, maintaining a clean, dynamic seal to prevent failure due to contamination.



Manually Actuated Multiport Valve

Allows for easy rotation in 90° increments

Features and Benefits

- **Patented *Extended Life* (XL) valve stem** – stabilized stem seal eliminates atmospheric intrusion into the process line and provides high cycle life and reliable high temperature performance with FFKM O-rings
- **Fully ported ball** – maximum conductance with no restriction in flow path reduces particle buildup
- **Evac holes on ball and blank end caps** – valve interior always under vacuum, prevents virtual leaks
- **Recessed fasteners and flat surfaces** – improved heat transfer from heater jacket
- **Faster servicing** – valve stem housing can be swapped out in the field
- **ISO 5211 mounting pattern** – compatible with all modern valve actuators
- **NAMUR VDI/VDE 3845 compliant stem detail** – compatible with all modern valve position indicators

Actuation

The valve can be actuated manually or pneumatically. Manual valves can be actuated by turning the handle in 90° increments, with full 360° rotations possible. Spring return actuators use compressed air to turn the ball 90° counterclockwise, and spring forces to rotate the ball 90° clockwise back to its starting position. In the event the actuator loses air pressure, the springs will rotate the valve back to its starting position. For that reason, these actuators are often referred to as fail-safe actuators. Double-acting actuators use compressed air to cycle the valve 90° counterclockwise as well as to cycle the valve 90° clockwise back to its starting position. The valves can be customized with other actuation methods, such as electrical actuation or 180° pneumatic actuation, upon request.

Applications

The corrosive-resistant, fast-actuating design of ANCORP's multiport valve makes it ideal for diverting, switching, combining, or splitting flow in and around reactors, traps, scrubbers, and exhaust lines on vacuum coating, etch, and abatement tools.

With a fully ported ball and minimally wetted internal components, the multiport valve resists particulate buildup and valve contamination in harsh or dirty downstream environments. 3-Way, 4-Way, and 5-way multiport valves can replace multiple 2-way valves and additional fittings on vacuum lines and manifolds.

Specifications

Vacuum and Temperature Ratings

- Vacuum rated to 1×10^{-8} Torr
- Helium leak rated less than 1×10^{-9} std. cc/s
- Standard fluoroelastomer (FKM) seal: -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 (FKM)
- Seats: PTFE
- Lubricant: Dow Corning®/DuPont Molykote High Vacuum Grease

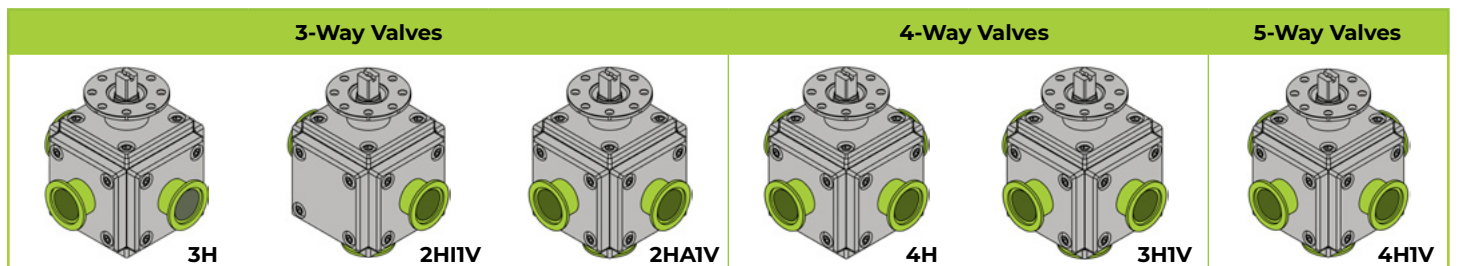
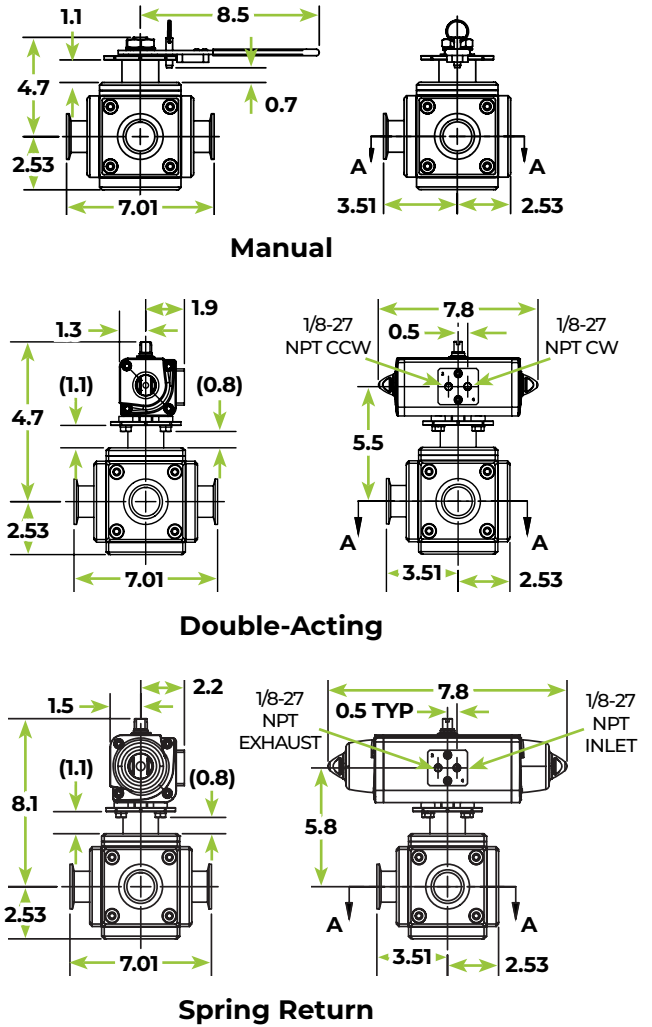
Pneumatic

- Actuator operating pressure: 80 - 120 psig
- Actuator temperature range:
 - Moist air: 0°C to 150°C (32°F to 302°F)
 - Dry air: -20°C to 150°C (-4°F to 302°F)
- Spring return actuators and double-acting actuators are available
- 1/8 NPT air line hook-up
- Visual and electrical position indicators available
- Solenoids available for 120VAC or 24VDC versions

Custom Options

- Contact us for custom options including centerlines, vacuum grease, position indicators, and o-rings.

Body Port Configurations



H - Horizontal A - Angled I - Inline V - Vertical

Multiport Valve Configuration

The Multiport valve's modular design allows for six body port configurations and six ball configurations. Body ports or blank end caps can be configured on the sides and bottom of the valve body to make a 3, 4, or 5-way valve.

Ball types include L-port, T-port, vertical L-port, vertical T-port, double L-port, and double T-port. Body ports, ball ports, ball position, and actuation type can be specified to enable a variety of flow switching, diverting, or mixing operations between source and destination ports.

The position of the actuation device, whether manual or pneumatic, can be specified to avoid interference problems in tight spaces and allow for the convenient connection of air lines.

Standard Reference Number Configurator

1	2	3	4	5	6	7	8	9	10
Series	Size	Body Port Config	Flanges (F1 X F2 X F3 X F4 X F5)	Standard	Actuation Type	Actuation Device Position	Ball Port	Ball Position	Solenoid
MP	150	_____	__X__X__X__X__	S	___	___	___	___	___
		3H	QF40		M	1	L	1	S3A
		2HA1V	Custom		AA	2	T	2	S3C
		2HI1V			AS	3	VL	3	S4A
		4H				4	VT	4	S4C
		3H1V				5	LL	5	
		4H1V					TT		

4 Flanges

- Flange 1 (F1) is defined as the flange with the most successive clockwise flange neighbors. If there are equivalent clockwise neighbors, naming is arbitrary. Flange 2 (F2) is the next clockwise flange from Flange 1, and so on.
- When a vertical body port is present, it will be assigned the last flange number.
- Blank end caps will be numbered such that the next unused flange number (4 or 5) will be applied to the end cap immediately clockwise from the last horizontal flange number. I.E., number the flanges, then number the end caps.
- A blank bottom cap is not numbered.

6 Actuation Type

- Pneumatic actuators rotate counter-clockwise from their default, unenergized state.

7 Actuation Device Position

- The actuation device position is defined by the flange or end cap number to which either the valve handle or the actuator air inlet/cable entry is aligned.

8 Ball Port

- The primary ball port is the horizontal port with its axis perpendicular to the ball's stem slot and with the most successive clockwise port neighbors. If there are equivalent clockwise neighbors, naming is arbitrary.

9 Ball Position

- The ball position is defined by the flange or end cap number to which the primary ball port is aligned in the valve assembly's default state.