

Isolation Valves - Genesis Stainless Steel Angle Valves



Genesis stainless steel poppet valves offer equipment designers the high performance and optimized conductance of Genesis modular valves in Nor-Cal's standard stainless steel poppet valve body. These simple, robust valves are available with standard and soft start air-to-open/spring-to-close actuation in port sizes from $\frac{3}{4}$ to 4 inches. Viton O-ring seals are standard. Other O-ring compounds, open/closed position indicators and air solenoids are available as options. Heater jackets and insulators are also available.

During testing, the valves were cycled millions of times while maintaining vacuum integrity. The welded bellows is AM-350 for corrosion resistance, longevity and flexibility. The bellows fully retracts from the side port when the valve is open, eliminating buildup of process by-products on the bellows and subsequent particle generation during operation. Valve center plates have been eliminated in order to provide precise alignment between the poppet and valve seat. A composite stem bushing resists wear even at high temperatures. Valve return springs are shot peened in order to provide millions of cycles without loss of force. Teflon coated air cylinders feature a 15 micron air filter to prevent particle migration either into or out of the air cylinder. All valves are designed for easy O-ring or bellows replacement. Design symmetry allows the air actuator to be oriented at 90° increments for easy access to the air solenoid and visibility of position indicators.

For reduced particle contamination in load locks and process chambers, Genesis stainless steel valves are offered with a patented low cost soft start actuator with no increase in valve size. A double-acting air piston, opens a soft start circuit inside the valve when air is supplied to the top of the air cylinder. The soft start by-pass opening can be provided fully open or with a specified orifice, depending on the desired pump down. After the chamber has been pumped from atmosphere to the desired cross over pressure, the main valve circuit is opened by supplying air to the bottom of the air cylinder. Each circuit can be operated independently and is air-to-open/spring-to-close. Soft start Genesis stainless steel valves are offered standard with no orifice. Various orifice size options and multiple size orifice kits are available.

Conductance

This table has been calculated in liters per second for air at room temperature using the formulas for tubes and elbows presented in the third edition of Roth's Vacuum Technology.

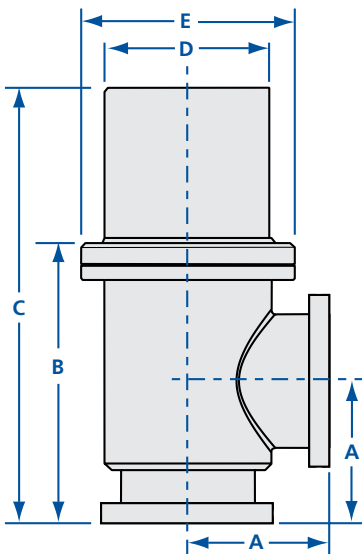
$$C_v = 182(D^4/L')P \text{ for viscous flow or } C_m = 12(D^3/L') \text{ for molecular flow}$$

Note: Calculations were based on port lengths without flanges and inner diameters for the valve sizes and configurations.

P = air at 1 Torr.

L' = Laxial + 1.33(0/180)D for elbows.

PORT OD	ANGLE VISCIOUS MOLECULAR		ANGLE-IN-LINE VISCIOUS MOLECULAR	
$\frac{1}{2}$	60	3	-	-
$\frac{3}{4}$	135	5	120	4
1	391	12	285	9
$1\frac{1}{8}$	-	-	-	-
$1\frac{1}{2}$	1925	37	1324	25
2	4677	65	3459	48
$2\frac{1}{2}$	12332	136	7505	83
3	23763	217	12558	115
4	57994	396	-	-



SPECIFICATIONS

Port ODs: $\frac{3}{4}$ to 4 inches.

Larger sizes and metric tubing diameters available on request

Mating flange s: NW -16 through ISO-100 standard

Air fittings: $\frac{5}{32}$ inch One-Touch

Materials

Body: 304 stainless steel

Bellows: Welded AM-350 stainless steel

O-rings: Viton standard

(Other compounds available.)

Air cylinder: Teflon coated aluminum

Service interval: One million cycles

Actuation: Normally closed

Air-to-open/spring-to-close

Operating pressure: 60-80 psi required

Differential pressure: 20 psi maximum across poppet

Helium leak rate: 1×10^{-9} Torr standard cc./sec. maximum

Operating temperature

Sustained: $\leq 150^\circ\text{C}$ Intermittent: $\leq 204^\circ\text{C}$

Option: Air solenoids, open/closed position indicators, soft start with various orifice sizes and various O-ring compounds

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MODEL NUMBER	ACTUATION	FLANGE TYPE	PORT OD	A	B	C	D	E
GNVS-072-NWB	Standard	NW-16	$\frac{3}{4}$	1.50	3.40	4.78	1.46	2.13
GNVS-072-NWB-SO	Soft Start	NW-16	$\frac{3}{4}$	1.50	3.40	4.78	1.46	2.13
GNVS-102-NWB	Standard	NW-25	1	2.42	4.19	5.57	1.46	2.13
GNVS-102-NWB-SO	Soft Start	NW-25	1	2.42	4.19	5.57	1.46	2.13
GNVS-152-NWB	Standard	NW-40	$1\frac{1}{2}$	2.49	4.51	6.20	1.88	2.50
GNVS-152-NWB-SO	Soft Start	NW-40	$1\frac{1}{2}$	2.49	4.51	6.20	1.88	2.50
GNVS-202-NWB	Standard	NW-50	2	3.22	5.56	7.66	2.25	3.25
GNVS-202-NWB-SO	Soft Start	NW-50	2	3.22	5.56	7.66	2.25	3.25
GNVS-302-ISO	Standard	ISO-80	3	3.86	7.33	10.85	4.13	5.45
GNVS-302-ISO-SO	Soft Start	ISO-80	3	3.86	7.33	10.85	4.13	5.45
GNVS-402-ISO	Standard	ISO-100	4	4.25	8.38	13.04	5.00	6.40
GNVS-402-ISO-SO	Soft Start	ISO-100	4	4.25	8.38	13.04	5.00	6.40



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