Kurt J. Lesker® Company

Installation Instructions
Standard Angle/Inline Valves

Read All Instructions
Prior To Installation

Keep Instructions with the Valve
for Future Reference

Installation Information

Dimensions

Dimensions for all bellows sealed angle/inline valves can be found in the Kurt J. Lesker Company catalog and on the web at www.lesker.com.

Cleanliness and Flange Protection

Bellows sealed valves should be kept away from dust, fiber, oil and any contamination. When installing the valve, adequate clearance should be allowed between adjacent components so there is not any sliding of the flange seal surfaces against each other. Every valve is shipped with protective plastic caps on the flanges. These caps should be left on until installation, and should be replaced when the valve is removed from the piping line. A small scratch on the flange seal face of an elastomer sealed valve is enough to prevent a leak tight seal. On valves with CF flanges if the knife edge is scratched or dented the connection may not seal.

Installation and Orientation

The bottom port of the valve is typically oriented towards the vacuum environment. Mounting in this fashion minimizes the in-vacuum volume and also aids poppet sealing when the side port is vented to air.

Air Supply

Building or house air supplies often contain foreign material including rust, metal particles, oil and water. An in-line filter should be used to remove any particulate contamination. The valve actuating cylinder is lubricated, so clear dry air (CDA) may be used without harm to the valve. Operating air pressure for bellows sealed poppet valves is 60-80 psig. The air ports tapped directly into the valve body are 1/8" BSP (ISO-7) tapered. Use the brass adapters supplied to make 1/8" NPT connections.

Operating Principles

Manual Valve (Figure 1)

Manual bellows sealed angle valves are delivered in the closed position. Rotating the knob counter clockwise moves the valve opened into the open position. Travel in the upward direction is limited when the upper surface of seal plate reaches the lower surface of nut. As the valve is opened, the bellows serves as a hermetic seal while permitting the travel of the seal plate.
To close the valve, rotate the knob clockwise. The seal is made when the poppet o-ring reaches the bottom plate and the o-ring is compressed.

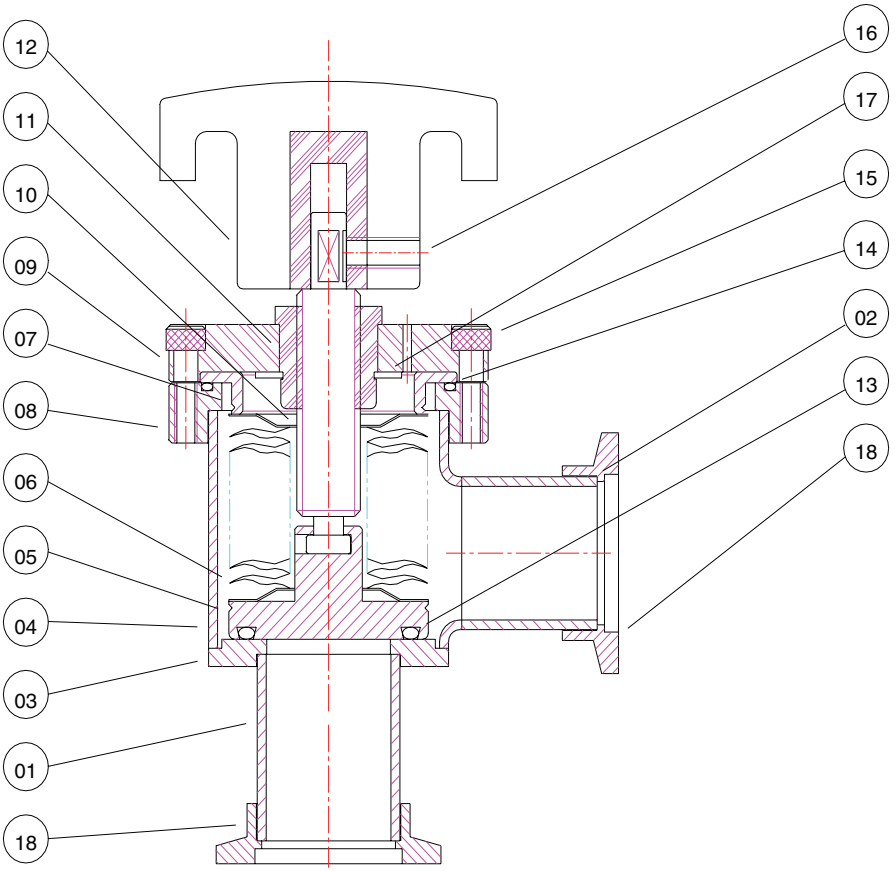
Pneumatic Valve

Electropneumatic inline and angle valves with port diameters up to and including 2" are air-to-open, spring-to-close. This allows for immediate valve closure if there is an electrical or air failure. Valves with port diameters larger than 2" incorporate air-to-open, air-to-close actuation. A normally closed solenoid valve will ensure that the valve will close in the event of electrical or air failure.

Fig. 2 shows the components of the KF25 pneumatic valve. The components of other sized poppet valves may be a little different, but the operating principles are the same. This operation starts from the initially closed position, with the admission of compressed air to the cylinder (08) by the 1/8" BSP port in the upper cover of the valve body (05). The path from the air inlet to the cylinder interior is through a small hole and when the air pressure acting on piston (09) reaches a value sufficient to overcome the force of spring (10), the piston will start to rise. The shaft (6) is attached to the piston with a nut (19). At the lower end of the shaft, the poppet (02) is connected to the shaft, and it carries the o-ring seal (13). As the shaft travels upward the closing spring is compressed.

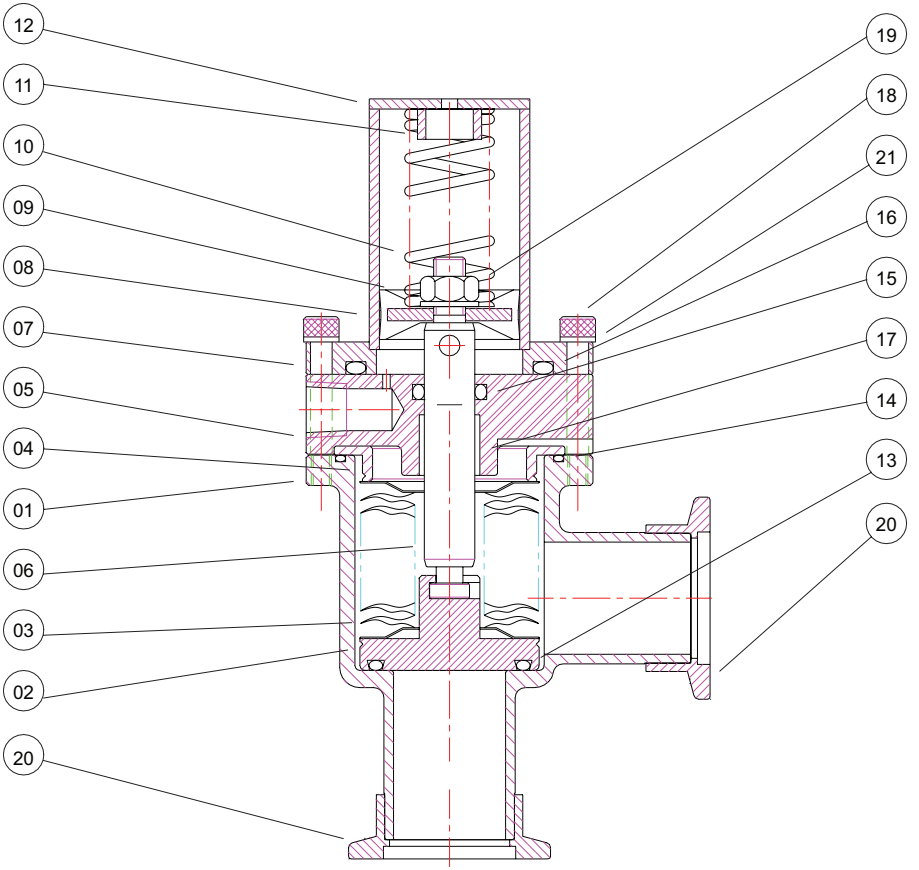
To close the valve, the cylinder is vented via the 1/8" BSP port. As the air pressure falls below the value for full opening, the poppet begins to descend. As venting continues, the poppet reaches its seat and the valve is closed. Full seal force is reached when the pressure in the cylinder is equal to the atmospheric pressure.

Manual Angle Valve



01- Lower Port
02- Side Port
03- Bottom Plate
04- Valve Body
05- Poppet
06- Welded Bellows
07- Upper Flange of Bellows
08- Bonnet Plate
09- Upper Cover of Body
10- Screw
11- Nut
12- Knob
13- Poppet Seal
14- Bonnet Seal
15- Socket Head Cap Bolt
16- Socket Set Screw
17- Retainer
18- Flange

Pneumatic Angle Valve
(Air to open, Spring to Close)



01- Valve Body
02- Poppet
03- Welded Bellows
04- Upper Flange of Bellows
05- Bonnet Plate
06- Shaft
07- Flange of Cylinder
08- Cylinder
09- Piston
10- Spring
11- Spacer
12- Air Cylinder
13- Poppet Seal
14- Bonnet Seal
15- Shaft Seal
16- Cylinder Flange O-ring
17- Dry Bearing
18- Socket Head Cap Bolt
19- Nut
20- Flange
21- Spring Washer

General Specifications

Materials:

Valve body:	304 stainless steel	
Welded bellows:	AM-350	
Bonnet/Poppet Seals:		
	HV	Viton/Viton
	UHV	Copper/Viton

Pressure Range:

Elastomer sealed bonnet	1 X 10^{-9} Torr to ATM
Metal sealed bonnet	1 X 10^{-10} Torr to ATM

Leak Rate: 2 X 10^{-9} std. cc/sec.

Differential pressure: 1 ATM

Maximum$^{\Delta}$ pressure before opening: 1 Bar

Bakeout Temperatures:

Viton sealed bonnet	150°C	
Copper bonnet		
	Open Position	200°C
	Close Position	120°C

Air Pressure: 60-80 psi

Solenoid: Required (Sold Separately)

Notes

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