TECHNICAL DATA SHEET
309 Series Ball Valves

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DESCRIPTION

309 Series, three-way diverter or selector valve used in connecting multi-path piping systems. Easily adaptable to pneumatic or electric automation.

MATERIALS OF CONSTRUCTION

BODY: Cast Carbon Steel - ICI-1025, Cast Stainless Steel CF8M

BALL AND STEM: 316 Stainless Steel - ASTM A276

SEATS AND STEM SEAL: Glass Filled Reinforced P.T.F.E. (Teflon ®) Seats backed by Viton® O-rings. (optional EPR O-rings available)

CONNECTION / STYLE — SIZES

Pipe / N.P.T.F. (Dryseal National Pipe Taper)	1/2" & 3/4"
Pipe / B.S.P.T. (British Standard Pipe Taper)	1/2" & 3/4"
Pipe / J.I.S. (Japanese Imperial Standard)	1/2" & 3/4"

RATINGS

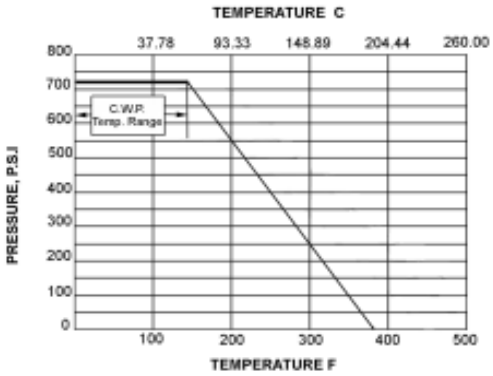
TEMPERATURE: -20°F to 380°F
(also see Pressure Temperature Chart)

PRESSURE: 720 p.s.i. C.W.P. (Cold Working Pressure to 150 F)
(also see Pressure Temperature Chart)

VACUUM: Not Rated

SATURATED STEAM: Not Recommended

Pressure Temperature Chart



RATINGS (continued)

FLOW CHARACTERISTICS

The approximate flow rate through a valve can be calculated as follows:

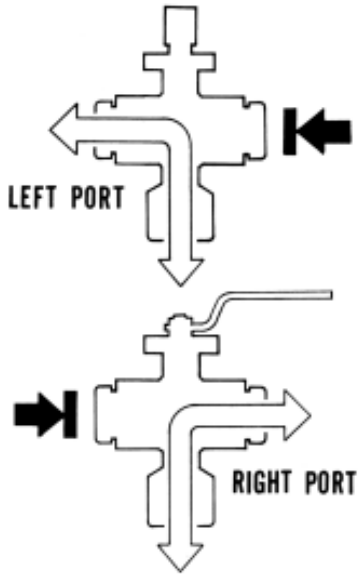
$$Q = Cv\sqrt{\frac{\Delta P}{G}}$$

where; Q = flow rate in gallons (U.S. Std.) per minute
Cv = valve constant
P = pressure drop across the valve in pounds per square inch
G = specific gravity of the media of relative to water

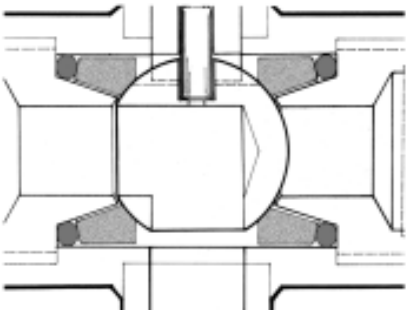
Note: The values derived from the flow equation are for estimating purposes only. Product variances or systemic factors may alter actual performance.

Size	1/2	3/4
Cv Value	5	8

FLOW DIAGRAM



FLOATING SEAT



The Gemini 309 utilizes a unique “floating” seat, backed by Viton seals which enable the seat to seek its optimum sealing position with relationship to the valve ball. The conical guide on the downstream side of the valve maintains centrality as the seat approaches it under the influence of upstream pressure. In addition the ball and stem are connected in such a manner as to assure proper ball port alignment while allowing adequate float between the ball and seats to assure optimum operation throughout the pressure range of the valve.

INSTALLATION INSTRUCTIONS

The following serves as a guideline for those experienced in pipe joint makeup. Otherwise, services of a certified pipe fitter should be utilized for installation.

1. Ensure that both the male pipe and female valve threads are free from dirt, debris and corrosion. Wire brushing of the male pipe threads is recommended to ensure a good metal-to-metal joint.

2. Apply a good quality thread lubricant (pipe dope) on the male threads. Lubricant reduces friction when pulling up the pipe joint. Note, thread lubricant is not intended to seal the joint and will not compensate for poor quality male pipe or fitting threads.

3. Turn the female valve threads onto the male pipe threads by hand. Upon free engagement of the threads, continue to turn the valve as far up as it will go (by hand). With the use of a wrench continue to tighten the valve onto the pipe. The pipe joint seal should occur within 1 to 3 turns after wrenching begins. Care should be taken not to exceed 3 turns in which damage to the threads can occur.

4. The pipe joint should be tested for leakage to ensure the pipe joint has been achieved.

MAINTENANCE

Like all Gemini Valves, the 309 Series utilizes our self compensating stem seal design. This design automatically compensates for wear as well as thermal expansion and contraction resulting in a leak tight, maintenance free, service life.

Once the stem seal has worn beyond the compensation afforded by the Belleville springs adjustment of the stem nut may enable valve to be returned to service. Holding the 'flats' of the stem, tighten the stem nut until Belleville springs become fully compressed (flattened); the torque required to tighten the nut further increases sharply when this point is reached. Do not tighten the stem nut beyond this point to avoid damage of the stem seal.

Gemini Series 309 Series Diverter valves cannot be repaired and once worn beyond service life must be replaced.

CONVERSION INSTRUCTIONS; MANUAL TO AUTOMATED

These instructions cover the conversion of manual (handle-operated) valves for actuated operation. In addition to the valve and actuator, a mounting kit is also necessary to complete the installation.

1. Turn valve handle so that it aligns with the pipe (or with long axis of loose valve).

2. See Figure 1. Remove valve handle nut, handle, stem nut, grounding spring, Belleville springs, socket-head screws and stop cup, without disturbing valve stem position.

3. See Figure 2. Replace Belleville springs on stem with concave faces together. Place drive key spacer on stem atop Belleville springs. Place drive key in position atop drive key spacer and secure finger tight with nut (stem nut) from kit.

4. See Figure 3. Tighten stem nut with 1/2" wrench until Belleville springs have just become fully compressed (flattened). Secure the stem from turning while tightening nut; this may be accomplish by inserting a wooden or plastic dowel in the ball port of a loose valve, or by engaging the stem with the valve handle just removed. Although the nut spins freely when first run onto the stem, the torque needed to continue tightening will increase progressively after the stem nut contacts the drive key and the Belleville springs begin to deflect. The torque required to tighten further will increase sharply once the Belleville springs have become fully flattened. Tightening beyond this point should not be attempted as damage to the stem seal may result.

5. The correct orientation of the stem nut to the drive key is shown in Figure 3; this orientation is necessary to permit engagement with the twelve-point socket in the actuator pinion driver. In order to achieve the desired orientation, loosen the stem nut until the nut / drive key relationship corresponds to either 'A' or 'B' in Figure 3. This adjustment should require less than one-twelfth (1/12) turn of the nut.

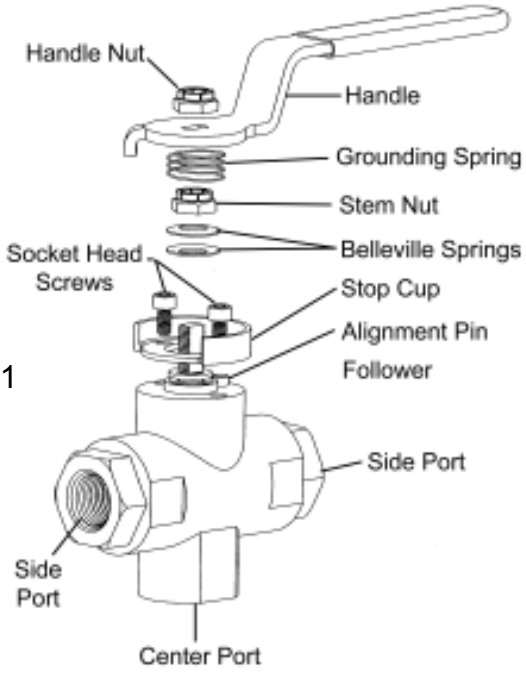


Figure 1

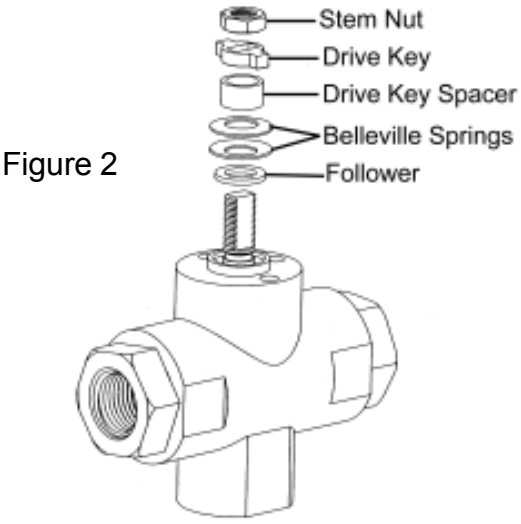


Figure 2

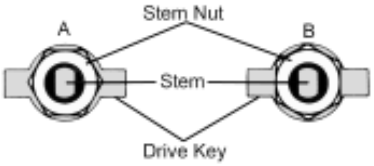
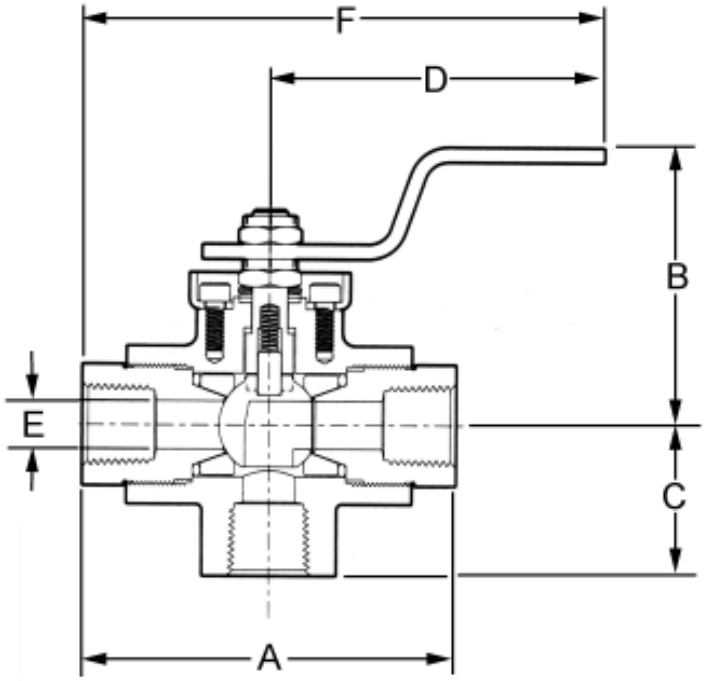


Figure 3

DIMENSIONS



DIMENSIONS IN INCHES						
Valve Size	A	B	C	D	E-Port	F
1/2" & 3/4"	3.85	2.86	1.55	5.38	0.500	7.30