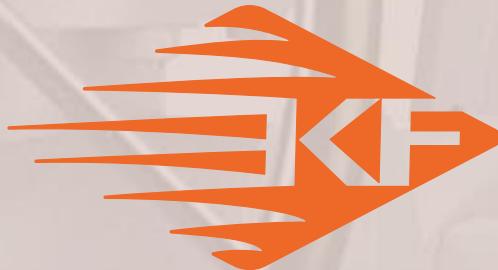


KF Series P3 Ball Valves



KF Industries



Superior Fluid Control Products for the Petrochemical and Industrial Markets

A division of **CIRCOR** International, Inc.

KF Series P3 Trunnion Mounted Ball Valves

A large trunnion design ensures central positioning under the highest working pressure. Independent floating spring loaded seats provide a tight seal even at low differential pressures. Service and maintenance is simplified with a bolted body design incorporating

double O-rings or a combination of O-rings and gaskets, suitable for buried or above ground installation. KF Series P3 valves are offered in 2"FP-24"FP, ANSI classes 150, 300 and 600, 2"FP-16"FP class 900 and 2"FP-12"FP, class 1500.*

*Consult factory for sizes not shown.

General Design Features

- Three-piece body design
- Double block and bleed
- Trunnion supported design reduces operating torque
- Antistatic device for grounding of the ball, stem and body
- Two sets of O-rings plus firesafe stem packing prevents leakage
- Corrosion resistant low friction bearings
- Inconel seat springs
- Sealant injection fittings for emergency stem or seal sealing
- Direct mount topworks pad for actuator or gear operator
- API Spec Q1, 6D, 6FA and 607
- ASME Section III Div. 1-NCA 4000
- BS 5351, 5750 and 6755
- ISO 9001/9002
- CSA-Z245.15-01
- 8" & larger valves are equipped with lifting lugs
- Locking device (lock not included)
- NACE MR0175 (Superseded by ISO 15156)
- Anti-blowout trunnion stem design

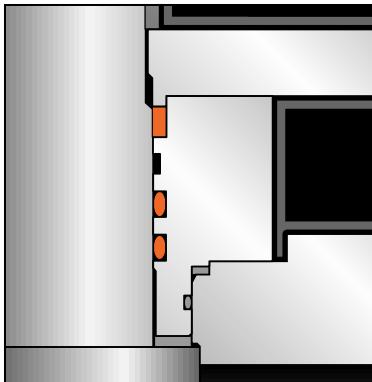


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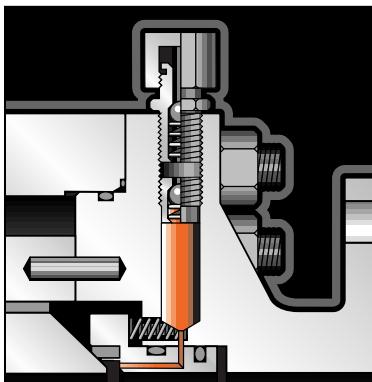


Design Features



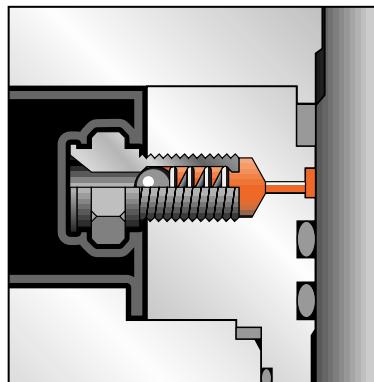
Anti-Blowout Stem Design

Stem seal integrity is achieved by the use of three o-rings (or two o-rings and a graphite gasket). Upper o-ring (or graphite gasket) can be replaced with the valve in line and under pressure.



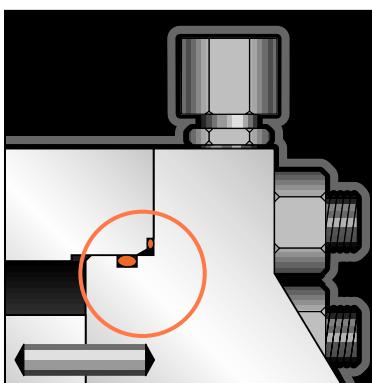
Emergency Seat Seal

Special sealants may be injected thru fittings that are located on the adapter flanges to restore sealing integrity if seat sealing surface is damaged. A second internal check valve provides backup to the fitting.



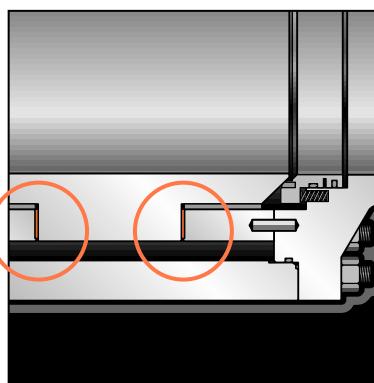
Emergency Sealant Injection System

The Sealant Injection System located on the bonnet can be utilized in case of emergencies, o-ring damage, or if stem leakage occurs.



Double Sealed Envelope Connections

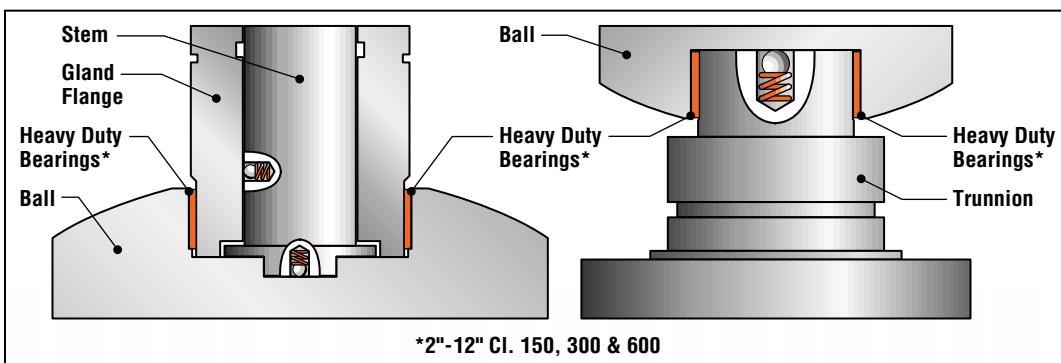
Double o-rings or a combination of an o-ring and firesafe gasket on body/adapter connections to ensure positive sealing. This makes the P3 suitable for above or below ground service.



Heavy Duty Bearings

Trunnions are supported by heavy duty Teflon® coated Steel Bearings. Thrust load on the ball is supported by large trunnions mounted within captured trunnion blocks, resulting in low operating torque and seat wear.

6"-12" Cl. 900 & 1500
14"-24" Cl. 150, 300 & 600



Antistatic Device

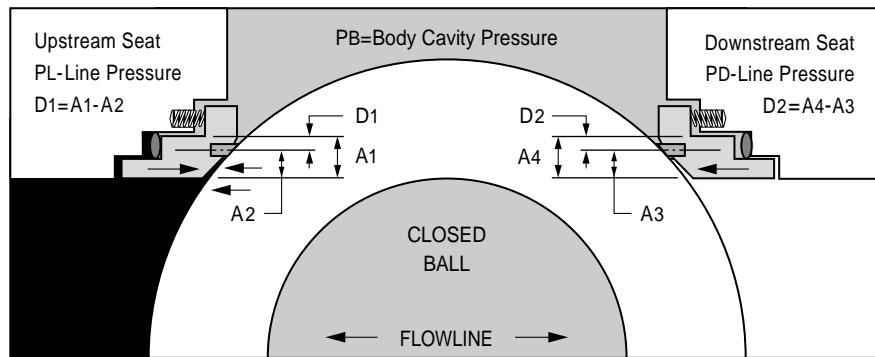
A spring between the trunnion and the ball or between the stem and the gland plate permits electrical continuity between all valve components.



Technical Seating Features

Double Piston Seat Design

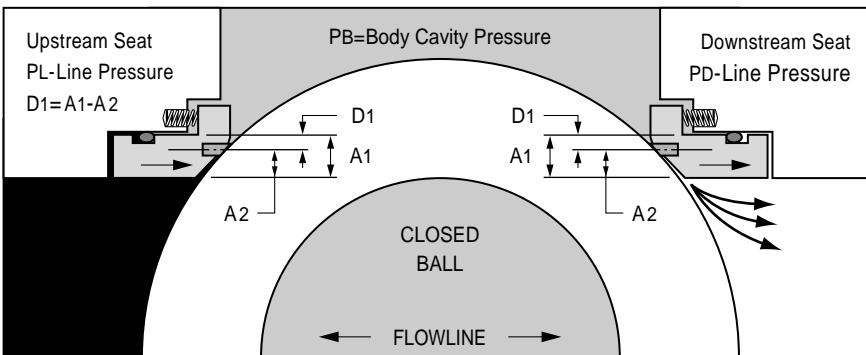
Upstream Seat: Line Pressure acting on the seat area (A1) does not equalize against the line pressure acting on the seat area (A2). The difference in the area (D1) times the line pressure creates a “piston effect” force which pushes the seat against the ball surface resulting in a tight effective seal.



Downstream Seat: When the body cavity pressure is greater than the downstream pressure, the body cavity pressure acts on the seal area (A4). The net pressure difference, acting over area (D2), pushes the downstream seat tightly against the ball creating a positive seal.

THE ULTIMATE BENEFIT OF USING THE “DOUBLE PISTON SEAT” DESIGN:

In case of upstream seat leakage, the downstream seat maintains a pressure assisted tight shut off by sealing against the ball surface.



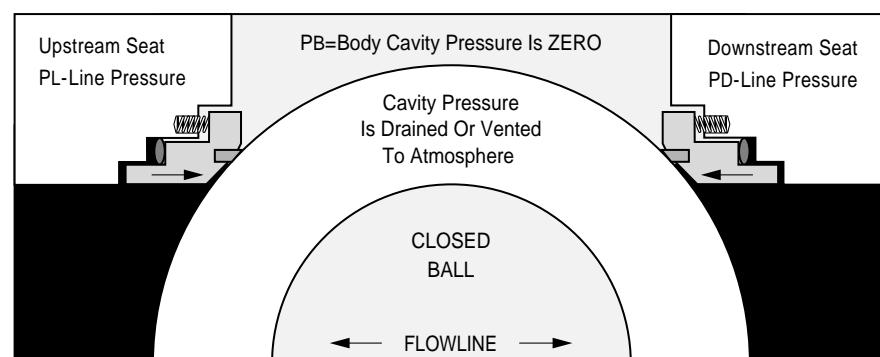
Self Relieving Seat Design

Upstream Seat: The difference in the area (D1) times the line pressure creates a “piston effect” which forces the seat against the ball surface. Also the springs behind the seat adds the force to the seat which keeps the seat in contact with the ball surface by providing the tight seal.

Downstream Seat: When the body cavity pressure exceeds the spring pressure, automatic pressure relief will occur by relieving the body cavity pressure past the downstream seat. This eliminates the need for the body relief valve.

Double Block and Bleed

The double block and bleed condition is available in all seat design configurations. When the ball is in the closed position the body cavity pressure may be drained down to ‘zero’ by opening the bleed valve and draining the fluid by removing the drain plug. Each seat works independently assuring tight shut off seal against ball on the upstream and downstream side.



KF Series P3 Applicable Standards

The following list contains the most important applicable standards for ball valves. KF valves may be designed,

manufactured and tested in accordance with other international standards on request.

API-American Petroleum Institute

- Spec. 6D** Specification for pipeline valves.
- Spec. RP6F** Recommended practice for fire testing of valves.
- Spec. 6FA** Specification for fire testing of valves.
- Std. 598** Valve inspection and test.
- Std. 605** Large diameter carbon steel flanges.
- Std. 607** Fire test for soft seated quarter-turn valves.

British Standard

- BS 1503** Specification for steel forgings for pressure purposes.
- BS 1504** Specification for steel castings for pressure purposes.
- BS 1560** Steel pipe flanges and flanged fittings.
- BS 2080** Face-to-face, center-to-face, end-to-end, and center-to-end dimensions of flanged and butt welding end steel valves for the petroleum, petrochemical and allied industries.
- BS 4504** Flanges and boltings for pipes, valves and fittings.
- BS 5146** Inspection and test of steel valves for the petroleum, petrochemical and allied industries.
- BS 5351** Steel ball valves for the petroleum, petrochemical and allied industries.
- BS 5750** Quality system.
- BS 6755** Testing of valves.

ASME/ANSI-American National Standard Institute

- B 16.5** Steel pipe flanges and flanged fittings.
- B 16.10** Face-to-face and end-to-end dimensions of ferrous valves.
- B 16.25** Butt welding ends.
- B 16.34** Steel valves- Flanged and butt welding ends.
- B 16.47** Steel Flanges.
- B 31.3** Chemical plant and petroleum refinery piping
- B 31.4** Liquid petroleum transportation piping systems.
- B 31.8** Gas transmission and distribution piping systems.
- B 46.1** Surface texture.

MSS-Manufacturers Standardization Society

- SP 6** Standard finishes for contact faces of pipe flanges and connecting - end flanges of valves and fittings.
- SP 25** Standard marking system for valves, fittings, flanges and unions.
- SP 45** Bypass and drain connection standard.
- SP 55** Quality standard for steel castings- visual method.

ASTM-American Society for Testing Materials

- ISO 9001** Quality systems-Model for quality assurance in design/development, production, installation and servicing.
- ISO 5211** Topworks Mounting Dimensions
- ISO 15156** Materials for use in H₂S containing environments in oil and gas production.

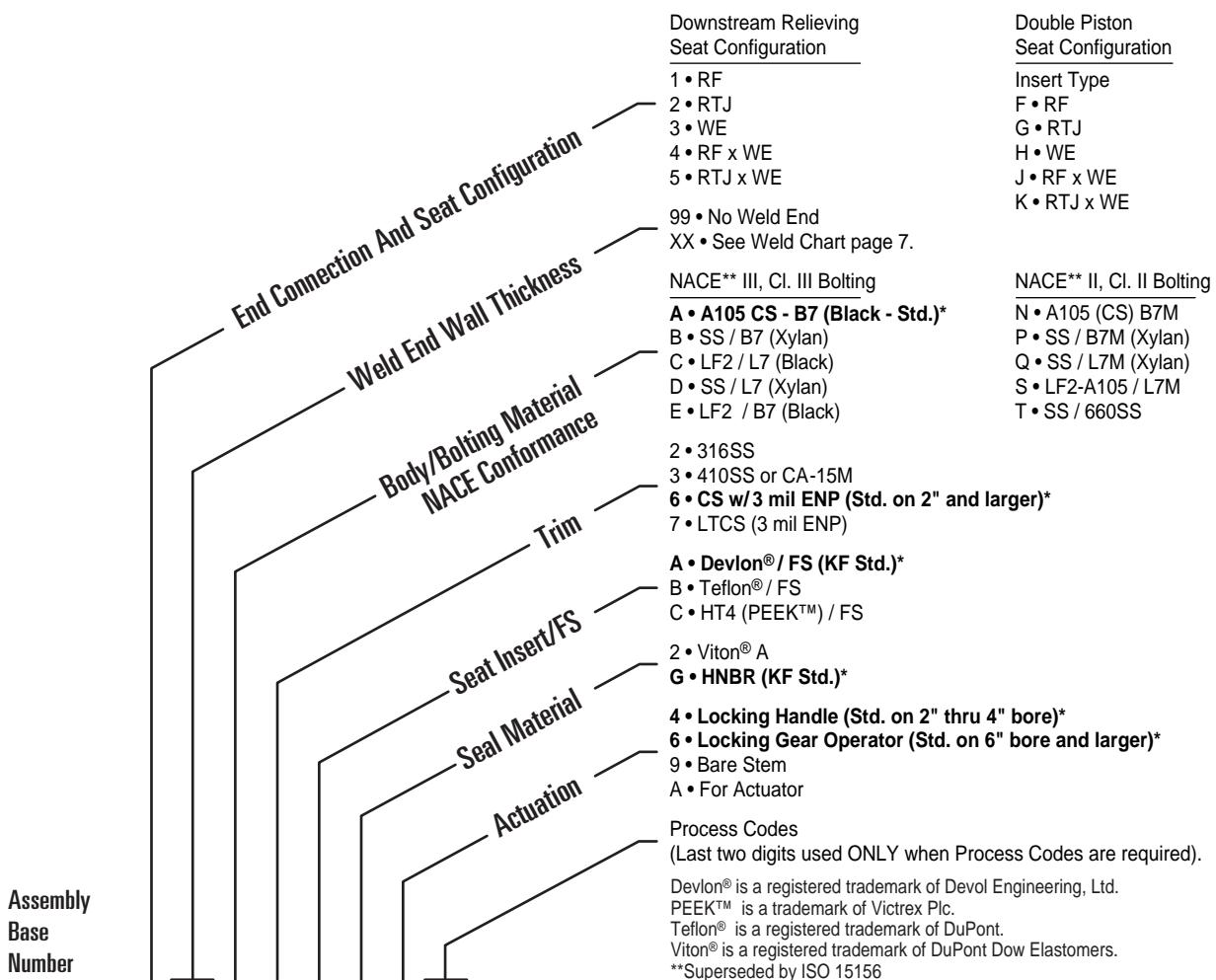
NACE-National Association of Corrosion Engineers

- MR0175** Sulfide stress cracking resistant metallic materials for oil field equipment.
(Superseded by ISO 15156)



KF Series P3 • Part Number Codes

2" FP- 48" FP, Class 150, 300, 600, 900, 1500 & 2500



*STANDARD TRIM CONFIGURATION

Asterisk (*) in lieu of dash (-) in Assembly Part Number indicates customer requires source inspection.. (i.e. VXXX * XXXXXXXXXXXX)

Series P3 Assembly Base Numbers, 2" FP – 48" FP

Class	Size (in.)																
	2 FP	3 RP	3 FP	4 RP	4 FP	6 RP	6 FP	8 RP	8 FP	10 RP	10 FP	12 RP	12 FP	14 RP	14 FP	16 RP	16 FP
150	V111	V112	V113	V114	V115	V116	V117	V118	V119	V120	V121	V122	V123	V124	V125	V126	V127
300	V211	V212	V213	V214	V215	V216	V217	V218	V219	V220	V221	V222	V223	V224	V225	V226	V227
600	V311	V312	V313	V314	V315	V316	V317	V318	V319	V320	V321	V322	V323	V324	V325	V326	V327
900	V411	V412	V413	V414	V415	V416	V417	V418	V419	V420	V421	V422	V423	V424	V425	V426	V427
1500	V511	V512	V513	V514	V515	V516	V517	V518	V519	V520	V521	V522	V523	V524	V525	V526	V527
2500	V611	V612	V613	V614	V615	V616	V617	V618	V619	V620	V621	V622	V623	—	—	—	—

Class	Size (in.)																
	18 FP	20 RP	20 FP	22 FP	24 RP	24 FP	26 FP	28 FP	30 RP	30 FP	32 FP	34 FP	36 RP	36 FP	40 FP	42 FP	48 FP
150	V129	V130	V131	V133	V134	V135	V137	V139	V140	V141	V143	V145	V146	V147	V148	V149	V150
300	V229	V230	V231	V233	V234	V235	V237	V239	V240	V241	V243	V245	V246	V247	V248	V249	V250
600	V329	V330	V331	V333	V334	V335	V337	V339	V340	V341	V343	V345	V346	V347	V348	V349	V350
900	V429	V430	V431	—	V434	V435	V437	V439	V440	V441	V443	V445	V446	V447	—	—	—
1500	V529	V530	V531	—	—	V535	—	—	—	—	—	—	—	—	—	—	—

Note: Consult factory for sizes in shaded areas.



KF Series P3 Butt-weld End Pipe Code

Pipe Wall Thickness Codes for Assembly Part Number

Pipe Description	Nominal Pipe Size (in.)/KF Schedule Code													
	2	Code	3	Code	4	Code	6	Code	8	Code	10	Code	12	Code
Outside Dia. (in.)	2.375		3.500		4.500		6.625		8.625		10.750		12.750	
(STD) Standard	—	—	—	—	.237	17	.280	22	.322	28	.365	32	.375	33
Schedule 40	.154	08	.216	14	.237	17	.280	22	.322	28	.365	32	.406	35
XS	.218	15	.300	24	.337	30	.432	36	.500	39	.500	39	.500	39
Schedule 80	.218	15	.300	24	.337	30	.432	36	.500	39	.593	43	.687	48
Schedule 160	.343	31	.438	38	.531	40	.718	49	.906	55	1.125	62	1.312	68
XXS	.436	37	.600	44	.674	47	.864	53	.875	54	1.000	58	1.000	58

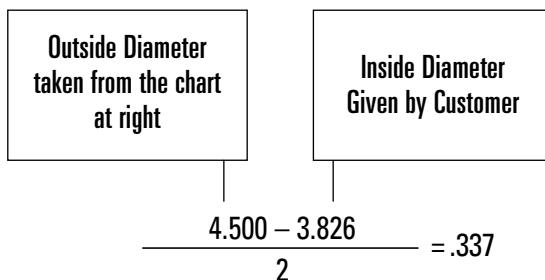
Pipe Description	Size (in.)/KF Schedule Code											
	14	Code	16	Code	18	Code	20	Code	22	Code	24	Code
Outside Dia. (in.)	14.000		16.000		18.000		20.000		22.000		24.000	
(STD) Standard	.375	33	.375	33	.375	33	.375	33	.375	33	.375	33
Schedule 40	.438	38	.500	39	.562	42	.593	43	—	—	.687	47
XS	.500	39	.500	39	—	—	—	—	0.500	39	—	—
Schedule 80	.750	50	.843	52	.937	56	1.031	59	1.125	62	1.218	65
Schedule 160	1.406	70	1.593	75	1.781	78	1.968	82	—	—	2.343	85
XXS	—	—	—	—	—	—	—	—	—	—	—	—

Consult factory for other wall thicknesses.

Calculating Pipe Wall Thickness

To find the "Pipe Wall Thickness" for butt-weld valves, subtract the Inside Diameter from the "Pipe Outside Diameter" for the appropriate size, listed to the right. Then divide the outcome by two (2).

EXAMPLE: For a 4" valve with a 3.826 Inside Diameter:



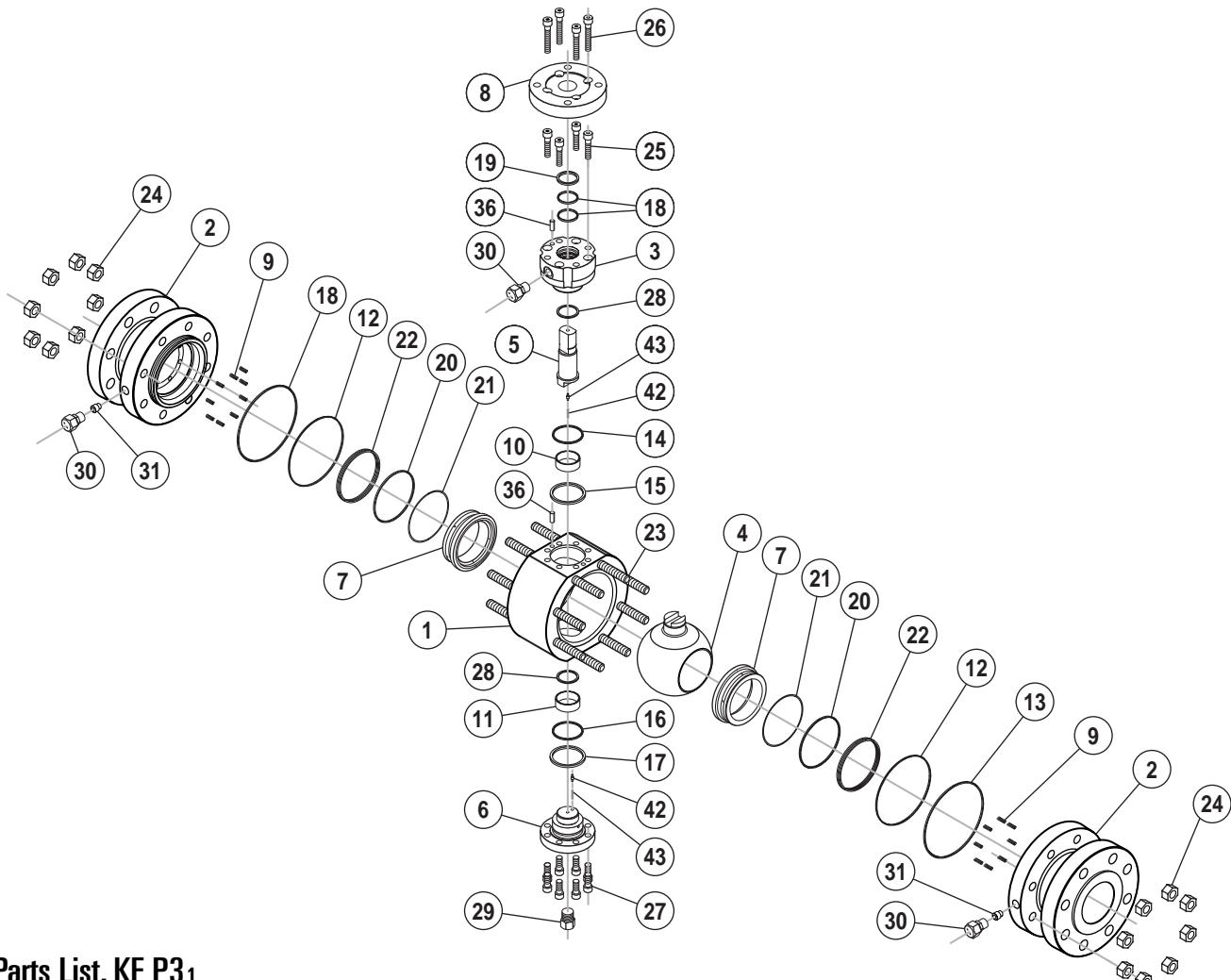
Pipe Outside Dia. (O.D.)

Size (in.)	in.	mm
2	2.375	60.33
3	3.500	88.90
4	4.500	114.30
6	6.625	168.28
8	8.625	219.08
10	10.750	273.05
12	12.750	323.85
14	14.000	355.60
16	16.000	406.40
18	18.000	457.20
20	20.000	508.00
24	24.000	609.60

Once you have determined the "Pipe Wall Thickness", find that number in the chart above. The two-digit number to the left should then be used in the "Pipe Wall Thickness" digits of the valve Assembly Part Number. In this example that would be 30.



KF Series P3₁ • Component Parts • 2", 3" & 4" (All Classes)



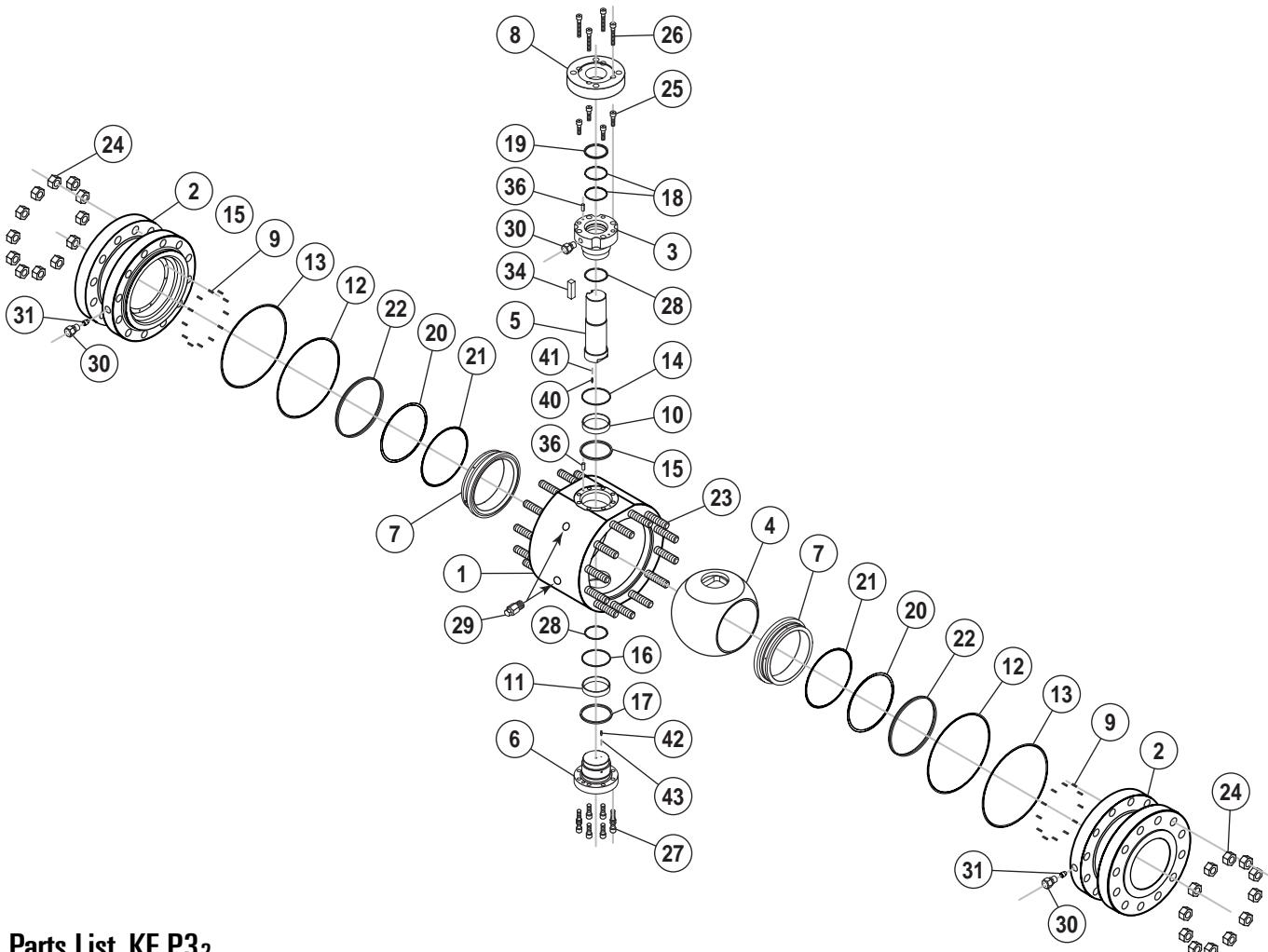
Parts List, KF P3₁

Part No.	Description
1	Body
2	Adapter
3	Bonnet
4	Ball
5	Stem
6	Lower Trunnion
7	Seat Assembly
8	Top Cover
9	Seat Springs
10	Stem Bearing
11	Lower Trunnion Bearing
12	Adapter Primary Seal
13	Adapter Sub-Seal
14	Bonnet Primary Seal
15	Bonnet Sub-Seal
16	Lower Trunnion Primary Seal
17	Lower Trunnion Sub-Seal
18	Stem Seal

Part No.	Description
19	Stem Sub-Seal
20	Seat Seal
21	Seat Seal Backup
22	Seat Sub-Seal
23	Stud, Body
24	Nut, Body
25	Cap Screw, Bonnet
26	Cap Screw, Top Cover
27	Cap Screw, Lower Trunnion
28	Thrust Bearing
29	Bleed/Drain Valve
30	Injection Fitting
31	Ball Check
32	Drain Plug
34	Key
36	Alignment Pin, Bonnet
42	Antistatic Pin
43	Antistatic Spring



KF Series P3₂ • Component Parts • 6"-12" (Class 150, 300 & 600)



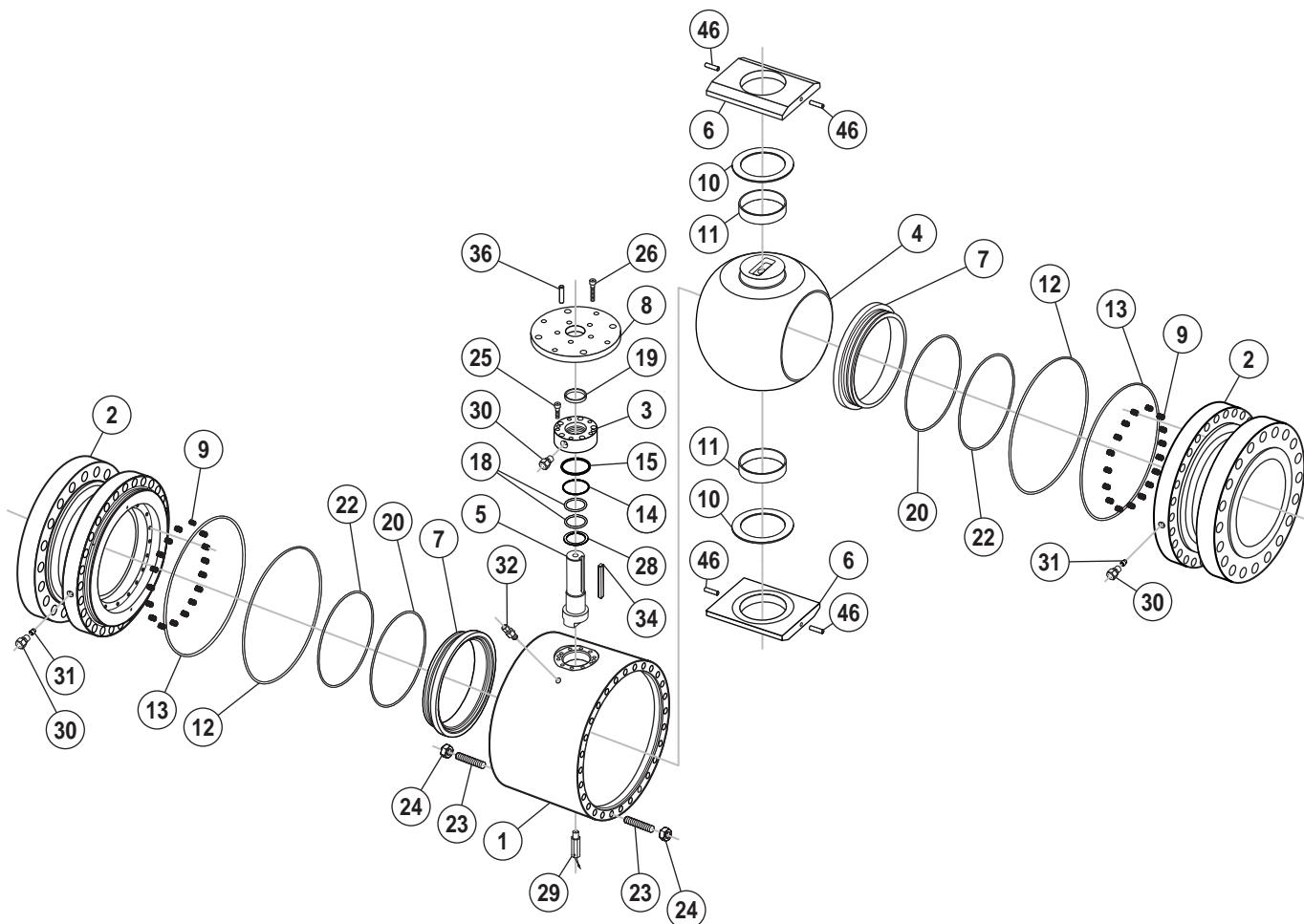
Parts List, KF P3₂

Part No.	Description
1	Body
2	Adapter
3	Bonnet
4	Ball
5	Stem
6	Lower Trunnion
7	Seat Assembly
8	Top Cover
9	Seat Springs
10	Stem Bearing
11	Lower Trunnion Bearing
12	Adapter Primary Seal
13	Adapter Sub-Seal
14	Bonnet Primary Seal
15	Bonnet Sub-Seal
16	Lower Trunnion Primary Seal
17	Lower Trunnion Sub-Seal
18	Stem Seal

Part No.	Description
19	Stem Sub-Seal
20	Seat Seal
21	Seat Seal Backup
22	Seat Sub-Seal
23	Stud, Body
24	Nut, Body
25	Cap Screw, Bonnet
26	Cap Screw, Top Cover
27	Cap Screw, Lower Trunnion
28	Thrust Bearing
29	Bleed/Drain Valve
30	Injection Fitting
31	Ball Check
32	Drain Plug
34	Key
36	Alignment Pin, Bonnet
42	Antistatic Pin
43	Antistatic Spring



KF Series P3₃ • Component Parts • 6"-12" (Class 900 & 1500) 14" & Larger (All Classes)



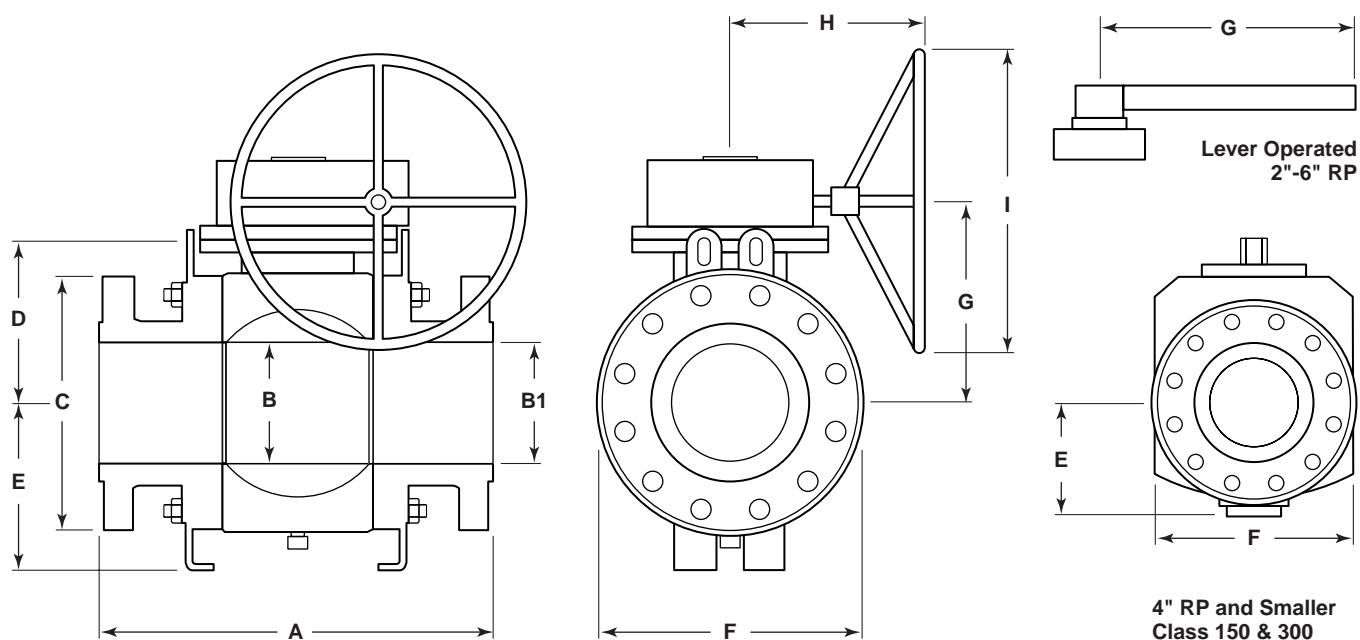
Parts List, KF P3₃

Part No.	Description
1	Body
2	Adapter
3	Bonnet
4	Ball
5	Stem
6	Trunnion Block
7	Seat Assembly
8	Top Cover
9	Seat Springs
10	Stem Bearing
11	Lower Trunnion Bearing
12	Adapter Primary Seal
13	Adapter Sub-Seal
14	Bonnet Primary Seal
15	Bonnet Sub-Seal
16	Lower Trunnion Primary Seal
17	Lower Trunnion Sub-Seal

Part No.	Description
18	Stem Seal
19	Stem Sub-Seal
20	Seat Seal
21	Seat Seal Backup
22	Seat Sub-Seal
23	Stud, Body
24	Nut, Body
25	Cap Screw, Bonnet
26	Cap Screw, Top Cover
28	Thrust Bearing
29	Bleed/Drain Valve
30	Injection Fitting
31	Ball Check
32	Drain Plug
34	Key
36	Alignment Pin, Bonnet
46	Trunnion Block Pin



KF Series P3 Class 150 • Dimensional Data (in., mm)



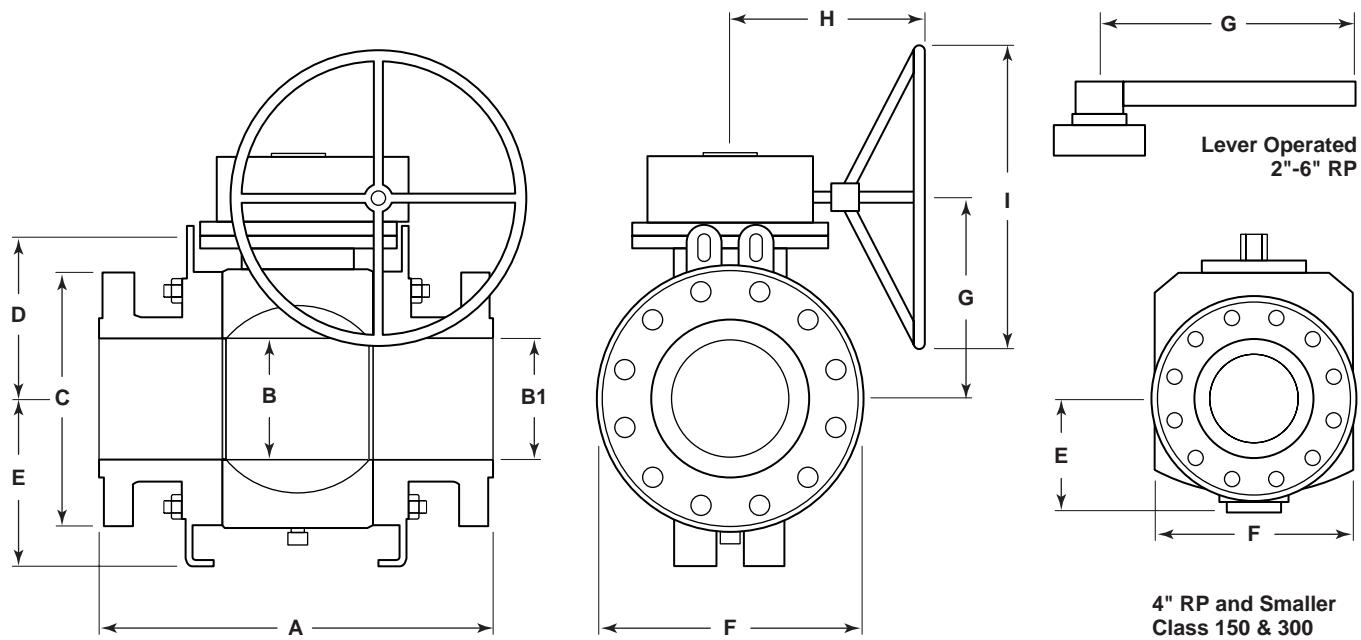
Dimensional Data, 2"FP-24"FP, Class 150

Size (in.)	Dimension (in./mm)																							
	A				B				B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm		
2	7.0	178.0	7.5	191	8.5	216	2.0	51	2.0	51	6.0	152.4	4.268	108.4	4.862	123.5	5.906	150	8.504	216	—	—		
3 x 2	8.0	203.0	8.5	216	11.1	283	2.0	51	3.0	76.2	7.5	190.5	4.268	108.4	4.862	123.5	5.906	150	8.504	216	—	—		
3	8.0	203.0	8.5	216	11.1	283	3.0	76.2	3.0	76.2	7.5	190.5	6.004	152.5	5.776	146.7	7.244	184	15	381	—	—		
4 x 3	9.0	229.0	9.5	241	12.0	305	3.0	76.2	4.0	101.6	9.0	228.6	6.004	152.5	5.776	146.7	7.244	184	15	381	—	—		
4	9.0	229.0	9.5	241	12.0	305	4.0	101.6	4.0	101.6	9.0	228.6	7.48	190	6.469	164.3	10.433	265	9.409	239	9.055	230	7.874	200
6 x 4	15.5	394.0	16.0	406	18.0	457	4.0	101.6	6.0	152.4	11.0	279.4	7.48	190	6.469	164.3	10.433	265	9.409	239	9.055	230	7.874	200
6	15.5	394.0	16.0	406	18.0	457	6.0	152.4	6.0	152.4	11.0	279.4	9.055	230	9.232	234.5	12.559	319	10.571	268.5	12.874	327	15.748	400
8 x 6	18.0	457.0	18.5	470	20.5	521	6.0	152.4	8.0	203.2	13.5	342.9	9.055	230	9.232	234.5	12.559	319	10.571	268.5	12.874	327	15.748	400
8	18.0	457.0	18.5	470	20.5	521	8.0	203	8.0	203.2	13.5	342.9	11.378	289	12.717	323	16.339	415	13.543	344	12.638	321	15.748	400
10 x 8	21.0	533.0	21.5	546	22.0	559	8.0	203	10.0	254	16.0	406.4	11.378	289	12.717	323	16.339	415	13.543	344	12.638	321	15.748	400
10	21.0	533.0	21.5	546	22.0	559	10.0	254	10.0	254	16.0	406.4	12.598	320	14.567	370	19.685	500	15.118	384	14.173	360	19.685	500
12 x 10	24.0	610.0	24.5	622	25.0	635	10.0	254	12.0	304.8	19.0	482.6	12.598	320	14.567	370	19.685	500	15.118	384	14.173	360	19.685	500
12	24.0	610.0	24.5	622	25.0	635	12.0	304.8	12.0	304.8	19.0	482.6	15.106	383.7	16.417	417	23.228	590	17.626	447.7	16.457	418	23.622	600
14 x 12	27.0	686.0	27.5	699	30.0	762	12.0	304.8	13.3	337	21.0	533.4	15.106	383.7	16.417	417	23.228	590	17.626	447.7	16.457	418	23.622	600
16 x 12	30.0	762.0	30.5	775	33.0	838	12.0	304.8	15.2	387	23.5	596.9	15.106	383.7	16.417	417	23.228	590	17.626	447.7	16.457	418	23.622	600
14	27.0	686.0	27.5	699	30.0	762	13.3	337	13.3	337	21.0	533.4	15.748	400	15.276	388	25.118	638	18.504	470	20.394	518	23.622	600
16	30.0	762.0	30.5	775	33.0	838	15.3	387.4	15.2	387	23.5	596.9	16.654	423	16.654	423	27.953	710	19.409	493	18.701	475	27.559	700
20x16	36.0	914.0	36.5	927	39.0	991	15.3	387.4	19.3	489	27.5	698.5	16.654	423	16.654	423	27.953	710	19.409	493	18.701	475	27.559	700
18	34.0	864.0	34.5	876	36.0	914	17.2	438	17.2	438	25.0	635	19.094	485	19.492	495.1	31.89	810	22.283	566	22.638	575	27.559	700
20	36.0	914.0	36.5	927	39.0	991	19.3	489	19.3	489	27.5	698.5	21.142	537	18.209	462.5	34.055	865	24.331	618	22.638	575	27.559	700
24x20	42.0	1067.0	42.5	1080	45.0	1143	19.3	489	23.3	591	32.0	812.8	21.142	537	18.209	462.5	34.055	865	24.331	618	22.638	575	27.559	700
24	42.0	1067.0	42.5	1080	45.0	1143	23.3	591	23.3	591	32.0	812.8	24.252	616	23.248	590.5	40.354	1025	27.756	705	22.795	579	27.559	700

Note: Consult factory for sizes in shaded area.



KF Series P3 Class 300 • Dimensional Data (in., mm)



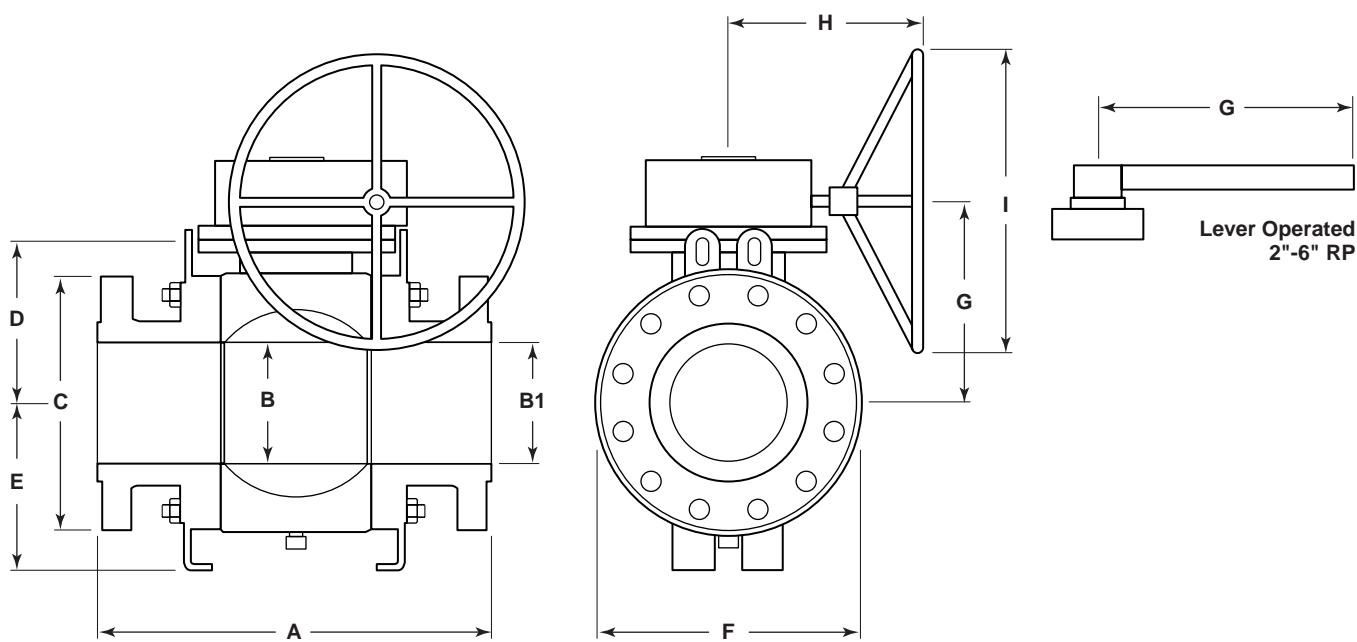
Dimensional Data, 2"FP-24"FP, Class 300

Size (in.)	Dimension (in./mm)																						
	A				B				B1		C		D		E		F		G		H		
	RF		RTJ		WE																		
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	
2	8.5	216.0	9.1	232.0	8.5	216.0	2	51.0	2	51.0	6.5	165	4.268	108.4	4.88	124.0	4.961	126.0	8.5	215.9	—	—	
3x2	11.1	283.0	11.7	298.0	11.1	283.0	2	51.0	3	76.2	8.3	210	4.268	108.4	4.88	124.0	4.961	126.0	8.5	215.9	—	—	
3	11.1	283.0	11.7	298.0	11.1	283.0	3	76.2	3	76.2	8.3	210	6.004	152.5	5.795	147.2	7.244	184.0	15	381.0	—	—	
4x3	12	305.0	12.6	321.0	12	305.0	3	76.2	4	101.6	10.0	254	6.004	152.5	5.795	147.2	7.244	184.0	15	381.0	—	—	
4	12	305.0	12.6	321.0	12	305.0	4	101.6	4	101.6	10.0	254	7.48	190.0	6.469	164.3	10.433	265.0	23.622	600.0	—	—	
6x4	15.9	403.0	16.5	419.0	15.9	403.0	4	101.6	6	152.4	12.5	318	7.756	197.0	6.39	162.3	10.394	264.0	23.622	600.0	—	—	
6	15.9	403.0	16.5	419.0	15.9	403.0	6	152.4	6	152.4	12.5	318	9.055	230.0	9.843	250.0	12.559	319.0	10.571	268.5	12.874	327.0	15.748
8x6	19.8	502.0	20.4	518.0	20.5	521.0	6	152.4	8	203.2	15.0	381	9.055	230.0	9.843	250.0	12.559	319.0	10.571	268.5	12.874	327.0	15.748
8	19.8	502.0	20.4	518.0	20.5	521.0	8	203.0	8	203.2	15.0	381	11.378	289.0	12.717	323.0	16.339	415.0	13.543	344.0	14.173	360.0	19.685
10x8	22.4	568.0	23	584.0	22	559.0	8	203.0	10	254.0	17.5	445	11.378	289.0	12.717	323.0	16.339	415.0	13.543	344.0	14.173	360.0	19.685
10	22.4	568.0	23	584.0	22	559.0	10	254.0	10	254.0	17.5	445	12.717	323.0	14.685	373.0	19.882	505.0	15.236	387.0	14.173	360.0	19.685
12x10	25.5	648.0	26.1	664.0	25	635.0	10	254.0	12	304.8	20.5	520.7	12.717	323.0	14.685	373.0	19.882	505.0	15.236	387.0	14.173	360.0	19.685
12	25.5	648.0	26.1	664.0	25	635.0	12	304.8	12	304.8	20.5	520.7	15.618	396.7	18.504	470.0	24.213	615.0	18.138	460.7	16.457	418.0	23.622
14x12	30	762.0	30.6	778.0	30	762.0	12	304.8	13.3	337.0	23.0	584	15.618	396.7	18.504	470.0	24.213	615.0	18.138	460.7	16.457	418.0	23.622
16x12	33	838.0	33.6	854.0	33	838.0	12	304.8	15.3	387.4	25.5	648	15.618	396.7	18.504	470.0	24.213	615.0	18.138	460.7	16.457	418.0	23.622
14	30	762.0	30.6	778.0	30	762.0	13.3	337.0	13.3	337.0	23.0	584	15.748	400.0	15.276	388.0	25.118	638.0	18.504	470.0	20.394	518.0	23.622
16	33	838.0	33.6	854.0	33	838.0	15.3	387.4	15.3	387.4	25.5	648	16.654	423.0	16.732	425.0	27.953	710.0	19.409	493.0	22.638	575.0	27.559
20x16	39	991.0	39.8	1010.0	39	991.0	15.3	387.4	19.3	489.0	30.5	775	16.654	423.0	16.732	425.0	27.953	710.0	19.409	493.0	22.638	575.0	27.559
18	36	914.0	36.6	930.0	36	914.0	17.2	438.0	17.2	438.0	28.0	711	19.213	488.0	19.606	498.0	32.283	820.0	22.402	569.0	22.638	575.0	27.559
20	39	991.0	39.8	1010.0	39	991.0	19.3	489.0	19.3	489.0	30.5	775	21.181	538.0	21.614	549.0	34.409	874.0	24.685	627.0	22.795	579.0	27.559
24x20	45	1143.0	45.9	1165.0	45	1143.0	23.3	591.0	23.3	591.0	36.0	914	21.181	538.0	21.614	549.0	34.409	874.0	24.685	627.0	22.795	579.0	27.559
24	45	1143.0	45.9	1165.0	45	1143.0	23.3	591.0	23.3	591.0	36.0	914	24.567	624.0	23.378	593.8	40.945	1040.0	29.291	744.0	26.378	670.0	27.559

Note: Consult factory for sizes in shaded area.



KF Series P3 Class 600 • Dimensional Data (in., mm)

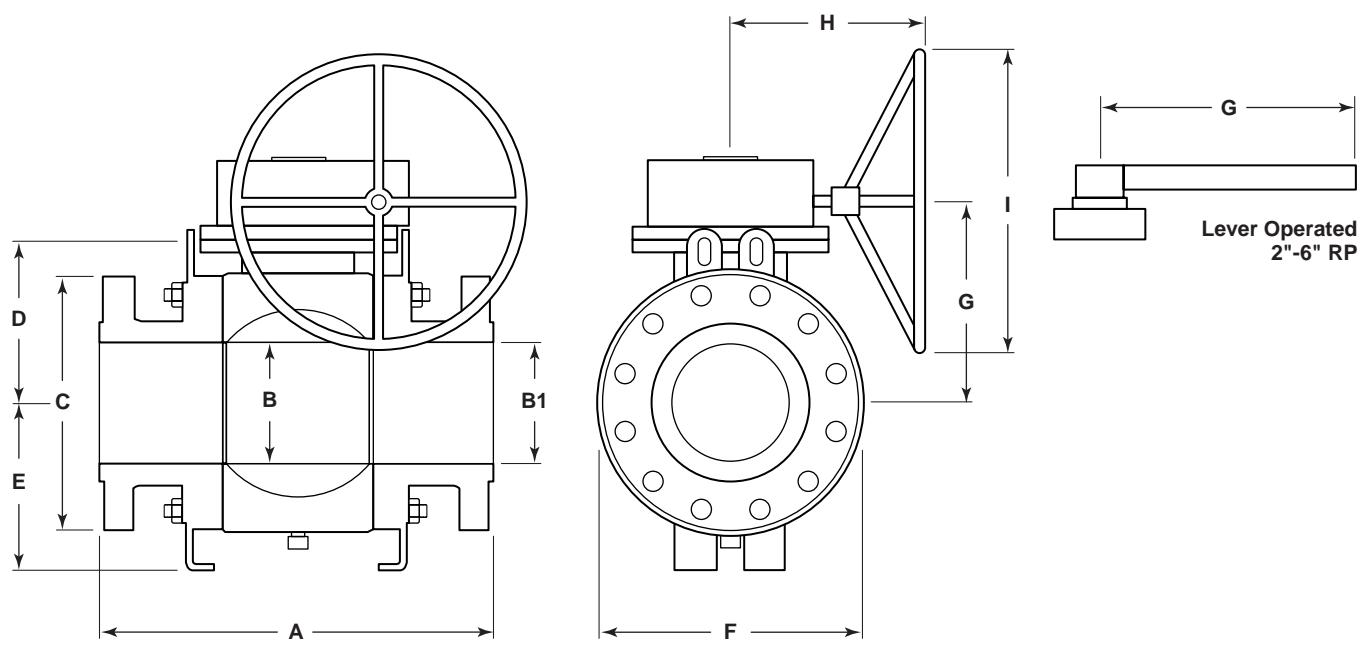


Dimensional Data, 2"FP-24"FP, Class 600

Size (in.)	Dimension (in./mm)																							
	A				B		B1		C		D		E		F		G		H					
	RF		RTJ		WE																			
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm				
2	11.5	292.0	11.6	295.0	11.5	292.0	2.0	51.0	2.0	51.0	6.5	165.0	6.102	155	4.180	106.18	6.496	165.0	22.835	580				
3x2	14.0	356.0	14.1	359.0	14.0	356.0	2.0	51.0	3.0	76.2	8.3	210.0	6.102	155	4.180	106.18	6.496	165.0	22.835	580				
3	14.0	356.0	14.1	359.0	14.0	356.0	3.0	76.2	3.0	76.2	8.3	210.0	6.693	170	5.361	136.18	9.016	229.0	27.559	700				
4x3	17.0	432.0	17.1	435.0	17.0	432.0	3.0	76.2	4.0	101.6	10.7	273.0	6.693	170	5.361	136.18	9.016	229.0	27.559	700				
4	17.0	432.0	17.1	435.0	17.0	432.0	4.1	103.3	4.1	103.3	10.7	273.0	7.756	202	6.390	162.3	10.394	264.0	9.469	240.5	12.874	327	15.748	400
6x4	22.0	559.0	22.1	562.0	22.0	559.0	4.1	103.3	6.0	152.4	14.0	356.0	7.756	202	6.390	162.3	10.394	264.0	9.469	240.5	12.874	327	15.748	400
6	22.0	559.0	22.1	562.0	22.0	559.0	6.0	152.4	6.0	152.4	14.0	356.0	9.055	230	9.232	234.5	12.559	319.0	11.220	285	14.173	360	19.685	500
8x6	26.0	660.0	26.1	664.0	26.0	660.0	6.0	152.4	8.0	203.2	16.5	419.0	9.055	230	9.232	234.5	12.559	319.0	11.220	285	14.173	360	19.685	500
8	26.0	660.0	26.1	664.0	26.0	660.0	8.0	203.0	8.0	203.2	16.5	419.0	11.437	290.5	12.441	316	17.008	432.0	13.484	342.5	14.843	377	23.622	600
10x8	31.0	787.0	31.1	791.0	31.0	787.0	8.0	203.0	10.0	254.0	20.0	508.0	11.437	290.5	12.441	316	17.008	432.0	13.484	342.5	14.843	377	23.622	600
10	31.0	787.0	31.1	791.0	31.0	787.0	10.0	254.0	10.0	254.0	20.0	508.0	12.953	329	15.709	399	20.394	518.0	15.472	393	16.457	418	23.622	600
12x10	33.0	838.0	33.1	841.0	33.0	838.0	10.0	254.0	12.0	304.8	22.0	559.0	12.953	329	15.709	399	20.394	518.0	15.472	393	16.457	418	23.622	600
12	33.0	838.0	33.1	841.0	33.0	838.0	12.0	304.8	12.0	304.8	22.0	559.0	15.933	404.7	17.756	451	24.488	622.0	19.122	485.7	21.457	545	27.559	700
14x12	35.0	889.0	35.1	892.0	35.0	889.0	12.0	304.8	13.3	337.0	23.7	603.0	15.933	404.7	17.756	451	24.488	622.0	19.122	485.7	21.457	545	27.559	700
16x12	39.0	991.0	39.1	994.0	39.0	991.0	12.0	304.8	15.3	387.4	27.0	686.0	17.087	443	16.024	407	28.937	735.0	20.630	524	22.638	575	27.559	700
14	35.0	889.0	35.1	892.0	35.0	889.0	13.3	337.0	13.3	337.0	23.7	603.0	15.866	400	15.295	388.5	25.118	638.0	18.937	481	22.638	575	27.559	700
16	39.0	991.0	39.1	994.0	39.0	991.0	15.3	387.4	15.3	387.4	27.0	686.0	17.087	443	16.024	407	28.937	735.0	20.630	524	22.638	575	27.559	700
20x16	47.0	1194.0	47.2	1200.0	47.0	1194.0	15.3	387.4	19.3	489.0	32.1	815.0	17.087	443	16.024	407	28.937	735.0	20.630	524	22.638	575	27.559	700
18	43.0	1092.0	43.1	1095.0	43.0	1092.0	17.2	438.0	17.2	438.0	29.3	743.0	19.606	498	20.098	510.5	33.071	840.0	23.110	587	22.795	579	27.559	700
20	47.0	1194.0	47.2	1200.0	47.0	1194.0	19.3	489.0	19.3	489.0	32.1	815.0	22.244	565	21.340	542.03	36.220	920.0	26.969	685	26.378	670	27.559	700
24x20	55.0	1397.0	55.4	1407.0	55.0	1397.0	23.3	591.0	23.3	591.0	37.0	940.0	28.858	733	23.465	596	41.142	1045.0	30.768	781.5	27.165	690	27.559	700
24	55.0	1397.0	55.4	1407.0	55.0	1397.0	23.3	591.0	23.3	591.0	37.0	940.0	28.858	733	23.465	596	41.142	1045.0	30.768	781.5	27.165	690	27.559	700



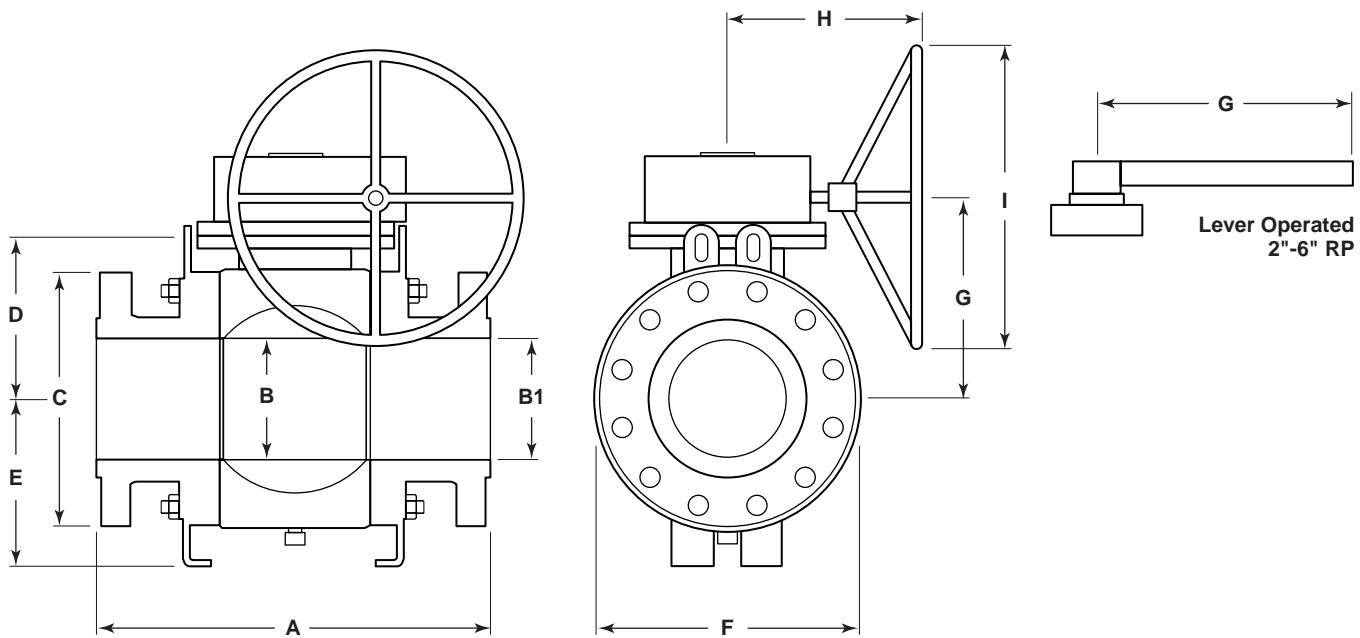
KF Series P3 Class 900 • Dimensional Data (in., mm)



Dimensional Data, 2"FP-16"FP, Class 900

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	14.5	368.0	14.6	371.0	14.5	368.0	2.0	50.8	2.0	50.8	8.5	215.9	5,846	148.5	4,528	115.0	7,283	185.0	22,835	580.0	—	—	—	—
3x2	15.0	381.0	15.1	384.0	15.0	381.0	2.0	50.8	3.0	76.2	9.5	241.3	5,846	148.5	4,528	115.0	7,283	185.0	22,835	580.0	—	—	—	—
3	15.0	381.0	15.1	384.0	15.0	381.0	3.0	76.2	3.0	76.2	9.5	241.3	7,047	179.0	5,630	143.0	9,331	237.0	27,559	700.0	—	—	—	—
4x3	18.0	457.0	18.1	460.0	18.0	457.0	3.0	76.2	4.0	101.6	11.5	292.1	7,047	179.0	5,630	143.0	9,331	237.0	27,559	700.0	—	—	—	—
4	18.0	457.0	18.1	460.0	18.0	457.0	4.1	103.3	4.1	103.3	11.5	292.1	8,504	216.0	6,929	176.0	11,339	288.0	33,465	850.0	—	—	—	—
6x4	24.0	610.0	24.1	613.0	24.0	610.0	4.1	103.3	6.0	152.4	15.0	381.0	8,504	216.0	6,929	176.0	11,339	288.0	33,465	850.0	—	—	—	—
6	24.0	610.0	24.1	613.0	24.0	610.0	6.0	152.4	6.0	152.4	15.0	381.0	10,039	255.0	10,039	255.0	14,173	360.0	12,087	307.0	14,843	377	23,622	600
8x6	29.0	737.0	29.1	740.0	29.0	737.0	6.0	152.4	8.0	203.2	18.5	470.0	10,039	255.0	10,039	255.0	14,173	360.0	12,087	307.0	14,843	377	23,622	600
8	29.0	737.0	29.1	740.0	29.0	737.0	8.0	203.2	8.0	203.2	18.5	470.0	11,654	296.0	12,598	320.0	17,323	440.0	14,173	360.0	21,457	545	27,559	700
10x8	33.0	838.0	33.1	841.0	33.0	838.0	8.0	203.2	10.0	254.0	21.5	546.0	11,654	296.0	12,598	320.0	17,323	440.0	14,173	360.0	21,457	545	27,559	700
10	33.0	838.0	33.1	841.0	33.0	838.0	10.0	254.0	10.0	254.0	21.5	546.0	13,465	342.0	15,984	406.0	20,945	532.0	16,220	412.0	20,394	518	23,622	600
12x10	38.0	965.0	38.1	968.0	38.0	965.0	10.0	254.0	12.0	304.8	24.0	610.0	13,465	342.0	15,984	406.0	20,945	532.0	16,220	412.0	20,394	518	23,622	600
12	38.0	965.0	38.1	968.0	38.0	965.0	12.0	304.8	12.0	304.8	24.0	610.0	16,378	416.0	18,209	462.5	25,394	645.0	19,567	497.0	22,638	575	27,559	700
14x12	40.5	1029.0	40.9	1038.0	40.5	1029.0	12.0	304.8	12.8	324.0	25.3	641.4	16,378	416.0	18,209	462.5	25,394	645.0	19,567	497.0	22,638	575	27,559	700
16x12	44.5	1130.0	44.9	1140.0	44.5	1130.0	12.0	304.8	14.8	374.7	27.8	705.0	16,378	416.0	18,228	463.0	25,394	645.0	19,567	497.0	22,638	575	27,559	700
14	40.5	1029.0	40.9	1038.0	40.5	1029.0	12.8	324.0	12.8	324.0	25.3	641.4	15,551	395.0	16,535	420.0	24,803	630.0	18,740	476.0	22,638	575	27,559	700
16	44.5	1130.0	44.9	1140.0	44.5	1130.0	14.8	374.7	14.8	374.7	27.8	705.0	17,835	453.0	18,898	480.0	28,346	720.0	21,339	542.0	22,795	579	27,559	700

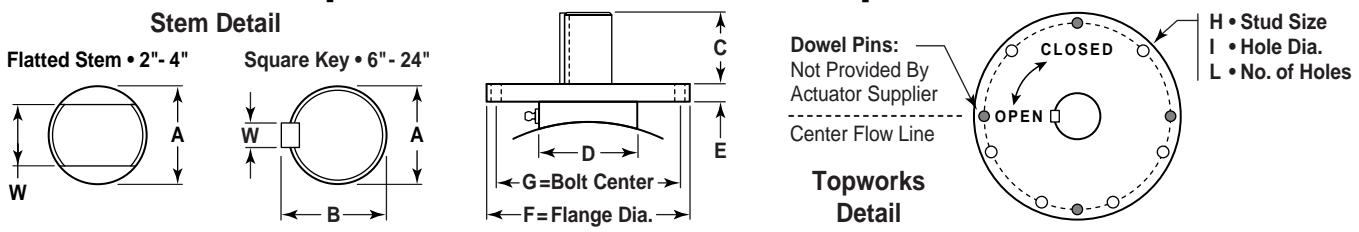
KF Series P3 Class 1500 • Dimensional Data (in., mm)



Dimensional Data, 2"FP-12"FP, Class 1500

Size (in.)	Dimension (in./mm)																							
	A				B				B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm		
2	14.5	368.0	14.6	371.0	14.5	368.0	2.0	50.8	2.0	50.8	8.5	215.9	6.811	173.0	5.236	133.0	8.425	214.0	21.969	558	—	—		
3x2	18.5	470.0	18.6	473.0	18.5	470.0	2.0	50.8	3.0	76.2	10.5	266.7	6.811	173.0	5.236	133.0	8.425	214.0	21.969	558	—	—		
3	18.5	470.0	18.6	473.0	18.5	470.0	3.0	76.2	3.0	76.2	10.5	266.7	8.622	219.0	7.047	179.0	11.811	300.0	10.138	257.5	12.874	327	15.748	400
4x3	21.5	546.0	21.6	549.0	21.5	546.0	3.0	76.2	4.1	103.3	12.2	311	8.622	219.0	7.047	179.0	11.811	300.0	10.138	257.5	12.874	327	15.748	400
4	21.5	546.0	21.6	549.0	21.5	546.0	4.1	103.3	4.1	103.3	12.2	311	9.232	234.5	7.520	191.0	12.992	330.0	11.398	289.5	14.173	360	19.685	500
6x4	27.8	705.0	28.0	711.0	27.8	705.0	4.1	103.3	5.7	146	15.5	394	9.232	234.5	7.520	191.0	12.992	330.0	11.398	289.5	14.173	360	19.685	500
6	27.8	705.0	28.0	711.0	27.8	705.0	5.7	146	5.7	146	15.5	394	11.339	288.0	11.417	290.0	16.535	420.0	13.386	340	21.457	545	27.559	700
8x6	32.8	832.0	33.1	841.0	32.8	832.0	5.7	146	7.6	194	19.0	483	11.339	288.0	11.417	290.0	16.535	420.0	13.386	340	21.457	545	27.559	700
8	32.8	832.0	33.1	841.0	32.8	832.0	7.6	194	7.6	194	19.0	483	13.661	347.0	14.528	369.0	21.181	538.0	16.417	417	22.638	575	27.559	700
10x8	39.0	991.0	39.4	1000.0	39.0	991.0	7.6	194	9.5	241	23.0	585	13.661	347.0	14.528	369.0	21.181	538.0	16.417	417	22.638	575	27.559	700
10	39.0	991.0	39.4	1000.0	39.0	991.0	9.5	241	9.5	241	23.0	585	15.630	397.0	17.913	455.0	24.803	630.0	18.819	478	22.638	575	27.559	700
12x10	44.5	1130.0	45.1	1146.0	44.5	1130.0	9.5	241	11.4	289	26.5	673	15.630	397.0	17.913	455.0	24.803	630.0	18.819	478	22.638	575	27.559	700
12	44.5	1130.0	45.1	1146.0	44.5	1130.0	11.4	289	11.4	289	26.5	673	19.134	486.0	20.866	530.0	30.709	780.0	22.323	567	22.638	575	27.559	700

KF Series P3 Topworks (mm) & Stem Torque Data (Nm)



Valve Size (in.)	ANSI Class	A	B	C	D	E	F	G	H Stud Size	I Hole Dia.	L No. of Holes	W	Max. Stem Shear Torque Nm	Break Torque Nm	Torque Expressions (1) for P<=2160 PSI in.-lbs. (2) (3)
2	150	22.10	—	26.7	—	10	104.8	—	—	—	—	—	182.5	92.6	6.702*P+80.022
2	300	22.10	—	18.8	—	10	104.8	—	—	—	—	—	182.5	113.3	
2	600	22.12	—	33.4	95	10	128	125	1/2	13.5	4	14.17	182.1	146.5	
2	900	22.12	—	34.2	98	10	128	125	1/2	13.5	4	14.17	182.8	179.9	
2	1500	28.00	—	49.5	104	28	150	125	1/2	13.5	4	18.97	414.6	246.4	
3	150	31.32	—	31.9	—	16	110	—	—	—	—	—	455.3	229.6	28.808*P+175
3	300	31.32	—	30.8	—	16	110	—	—	—	—	—	455.3	318.1	
3	600	35.00	—	50.8	112	10	150	138	1/2	13.5	4	25.20	548.8	460.9	
3	900	35.00	—	50.8	125	10	170	138	1/2	13.5	4	25.20	854	604	
3	1500	37.88	—	49.7	125	30	170	140	5/8	16.7	4	25.17	984	890	
4	150	31.32	—	51.0	105	20	145	—	—	—	—	—	470.5	366.9	38.001*P+295
4	300	31.32	—	51.0	105	20	145	—	—	—	—	—	470.5	483.6	
4	600	37.98	—	47.7	127	31	175	140	5/8	16.7	4	25.25	982.7	672.3	
4	900	37.98	—	42.7	127	31	175	140	5/8	16.7	4	25.25	987.3	860.9	
4	1500	45.00	—	61.0	150	31	210	165	3/4	20	4	31.62	1812.9	1238.2	
6	150	50.55	—	55.2	125	33	175	140	5/8	16.7	4	31.62	2201.4	633.5	122.018*P+402.2
6	300	50.55	—	55.2	125	33	175	140	5/8	16.7	4	31.62	2201.4	1007.9	
6	600	50.55	—	55.2	125	33	175	140	5/8	16.7	4	31.62	2201.4	1613.6	
6	900	50.55	—	50.5	125	35	210	165	3/4	20	4	31.62	2298.5	2219.4	
6	1500	63.28	—	71.0	160	30	300	254	5/8	17	8	44.32	5046.4	3430.8	
8	150	63.37	—	61.3	160	44	210	165	3/4	20	4	44.28	5034.4	986.1	189.024*P+627.8
8	300	63.37	—	61.3	160	44	210	165	3/4	20	4	44.28	5034.4	1566.1	
8	600	72.90	81.13	91.1	160	44	210	165	3/4	20	4	19.05	10101.4	2504.4	
8	900	72.90	81.13	96.0	165	40	300	254	5/8	17	8	19.05	10101.4	3442.9	
8	1500	72.90	81.08	83.8	165	40	300	254	5/8	17	8	19.05	10101.4	5319.6	
10	150	72.90	81.20	78.3	175	25	300	254	5/8	18	8	19.05	10101.4	1320.5	236.006*P+873.101
10	300	72.90	81.20	78.3	175	25	300	254	5/8	18	8	19.05	10101.4	2044.6	
10	600	82.30	91.83	91.0	175	25	287	254	5/8	16.7	8	22.23	14413.8	3216.2	
10	900	82.30	91.83	101.0	180	32	300	254	5/8	16.7	8	22.23	14413.8	4387.7	
10	1500	82.30	92.00	96.0	190	37	300	254	5/8	17	8	22.23	14413.8	6731	
12	150	82.30	91.83	92.5	217.6	30.5	300	254	5/8	16.7	8	22.23	14413.8	1653.6	272.024*P+1138
12	300	82.30	91.83	92.5	217.6	30.5	300	254	5/8	16.7	8	22.23	14413.8	2488.3	
12	600	101.40	112.40	107.8	215.9	33.5	304.8	254	5/8	16.7	8	25.40	27542.8	3838.7	
12	900	101.40	112.40	107.0	230	46	350	298	3/4	20	8	25.40	27542.8	5188.9	
12	1500	101.30	112.50	107.0	240	46	350	298	3/4	20	8	25.40	27542.8	7869.9	
14	150	82.30	91.83	91.5	205	33	300	254	5/8	16.7	8	22.23	14413.8	2792.8	464.080*P+1912.901
14	300	82.30	91.83	91.5	205	33	300	254	5/8	16.7	8	22.23	14413.8	4216.6	
14	600	82.30	91.83	91.5	205	33	350	298	3/4	20	8	22.23	14413.8	6520.3	
14	900	82.30	91.83	113.5	200	35	350	298	3/4	21	8	22.23	14413.8	8687.4	
16	150	82.30	91.83	97.5	209	33	300	254	5/8	16.7	8	22.23	14413.8	3754.3	614.185*P+2589.8
16	300	82.30	91.83	97.5	209	33	300	254	5/8	16.7	8	22.23	14413.8	5638.6	
16	600	110.00	120.60	104.5	230	33	336	298	3/4	20	8	25.40	35390.9	8687.4	
16	900	110.00	120.60	146.0	217	25.4	350	298	3/4	21	8	25.40	35390.9	11736.4	
18	150	110.00	120.60	101.5	230	33	336	298	3/4	20	8	25.40	35390.9	5088.3	1028.12*P+3139.2
18	300	110.00	120.60	101.5	230	33	336	298	3/4	20	8	25.40	35390.9	8242.8	
18	600	110.00	120.60	101.5	230	33	350	298	3/4	20	8	25.40	35390.9	13346.6	
20	150	110.00	120.60	115.0	235	40	340	298	3/4	20	8	25.40	35390.9	6405.1	
20	300	110.00	120.60	113.0	235	36	350	298	3/4	20	8	25.40	35390.9	11023.6	1505.31*P+3551.2
20	600	110.00	120.60	111.3	250	25.4	350	298	3/4	20	8	25.40	35390.9	18496	
24	150	110.00	120.60	112.5	235	36	350	298	3/4	20	8	25.40	35390.9	12295	
24	300	110.00	120.60	112.5	235	36	350	298	3/4	20	8	25.40	35390.9	19395.3	2314.336*P+7907
24	600	120.00	133.75	110.0	280	60	475	406	11/2	40	8	31.75	44877.6	30883.7	

Note: (1) Torque at maximum differential pressure are tabulated
(2) Torques expressions are suggested for other differential pressure
(3) Differential pressure "P" in torque expressions is in MPa
(4) Consult factory for sizes in shaded areas.

Pressure ratings are according to API 6D
Class 150 P = 1.896 Class 900 P = 14.892
Class 300 P = 4.964 Class 1500 P = 24.821
Class 600 P = 9.928



KF Series P3 Engineering Data

Flow Coefficient (C_v)

Size (in.)	C_v Value				
	285 psi	740 psi	1480 psi	2220 psi	3705 psi
2	500	420	350	320	330
3 x 2	220	210	190	185	187
3	1390	1050	1000	910	830
4 x 3	630	600	560	505	510
4	2550	2000	1850	1760	1660
6 x 4	925	910	800	730	742
6	5249	5186	4400	4300	4167
8 x 6	2500	2498	2150	2010	2033
8	10,750	10,262	8450	8400	8013
10 x 8	5000	4990	4500	4160	4051
10	17,775	17,220	14,250	14,160	13,309
12 x 10	8400	8390	8000	7300	7117
12	26,750	25,950	22,790	21,230	17,073
14 x 12	14,080	14,040	13,990	13,920	14,180
16 x 12	9030	9020	9010	9000	—
14	32,600	30,900	28,600	26,600	24,276
16 x 14	14,780	14,750	14,720	14,690	14,247
16	44,700	42,600	39,250	36,600	33,215
20 x 16	14,870	14,860	14,850	14,830	14,795
18	57,825	56,225	57,410	48,665	43,402
20	74,775	71,800	65,463	62,239	55,931
24 x 20	26,768	26,755	25,698	26,659	—
22	91,789	88,537	81,305	—	—
24	113,284	109,414	98,963	93,993	83,926

Note: Consult factory for sizes in shaded area.

Body & Trim Materials

Part	Material
Body/Adapter	A105, LF2, F316SS
Ball/Stem	F316SS or CS+3 mil ENP
Seat	Devlon® TM , Teflon®, HT4 (PEEK™)

Pressure Rating (psig)

Material	ANSI Cl. 150	ANSI Cl. 300	ANSI Cl. 600	ANSI Cl. 900	ANSI Cl. 1500
A105, LF2	285	740	1480	2220	3705
F316	275	720	1440	2160	3600

Low Temperature Limits

Body Material	°F	°C	Seat Material	°F	°C	Seal Material	°F	°C
A105	-20	-29	Devlon V	-50	-46	Viton®	-20	-29
LF2	-50	-46	HT4 (PEEK™)	-50	-46	HNBR	-40	-40
F316	-50	-46	Teflon®	-50	-46			

Method of Calculating Flow

The Flow Coefficient " C_v " of a valve is the flow rate of water (gallons/minute) through a fully opened valve, with a pressure drop of 1 psi across the valve. To find the flow of liquid through valve from the C_v , use the following formulas:

Liquid Flow

$$Q_L = \text{flow rate of liquid (gal./min.)}$$

$$\Delta P = \text{differential pressure across the valve (psi)}$$

$$G = \text{specific gravity of liquid (for water, } G=1)$$

$$Q_L = C_v \sqrt{\frac{\Delta P}{G}}$$

Gas Flow

$$Q_g = \text{flow rate of gas (CFH at STP)}$$

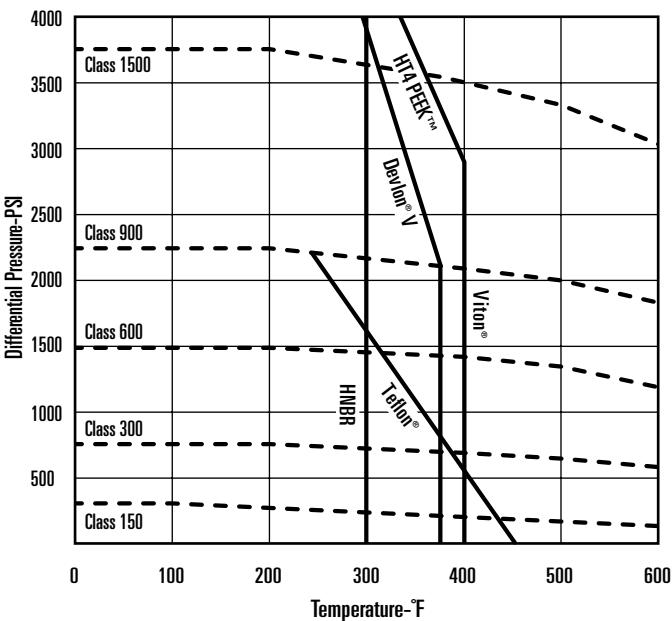
$$P_2 = \text{outlet pressure (psia)}$$

$$g = \text{Specific gravity of gas (for air, } g=1.000)$$

$$Q_g = 61 C_v \sqrt{\frac{P_2 \Delta P}{g}}$$

For non-critical flow
 $\left\{ \frac{\Delta P}{P_2} < 1.0 \right\}$

Pressure Temperature Chart**



**Teflon® not offered for Class 1500.



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