KF Series P3 Ball Valves

KF Valves

Superior Fluid Control Products

A CIRCOR Energy Products Brand

KF Series P3 Trunnion Mounted Ball Valves

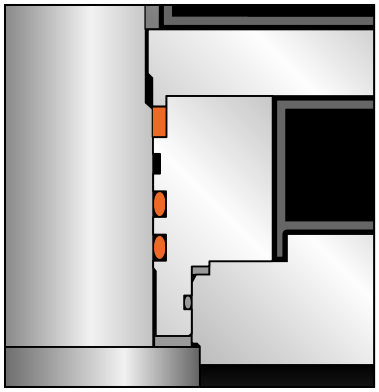
A large trunnion design ensures central positioning under the highest working pressure. Independent floating spring loaded seats provide a tight seal even at low differential pressures. Service and maintenance is simplified with a bolted body design incorporating double O-rings or a combination of O-rings and gaskets, suitable for buried or above ground installation. See page 6 for complete product offering.

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
- 6" & larger valves are equipped with lifting lugs
- Locking device (lock not included)
- NACE MR0175/ISO15156
- Anti-blowout trunnion stem design

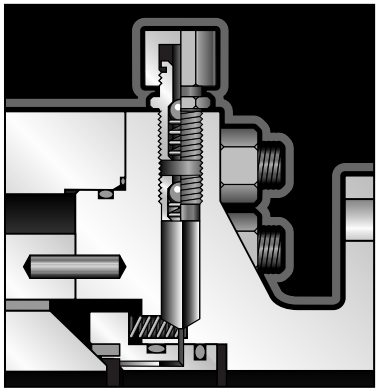
Contents

Design Features



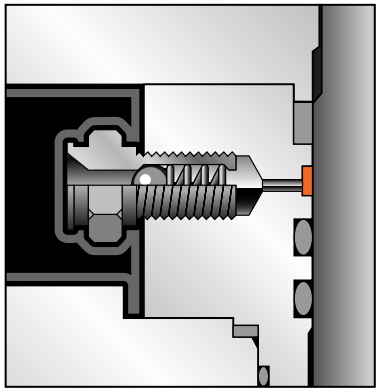
Anti-Blowout Stem Design

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.



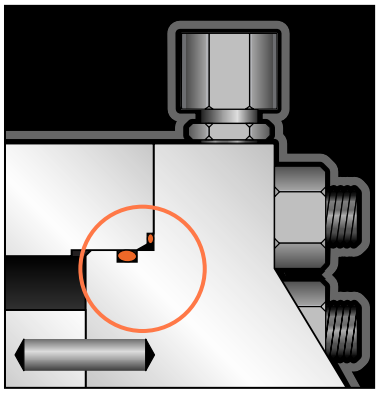
Emergency Seat Seal

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.



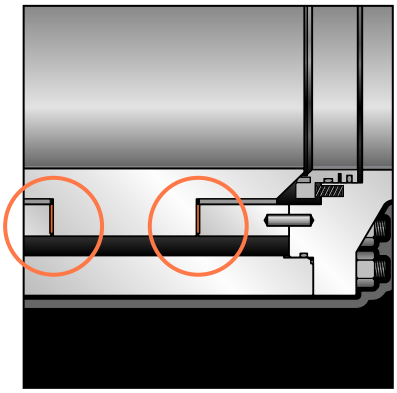
Emergency Sealant Injection System

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

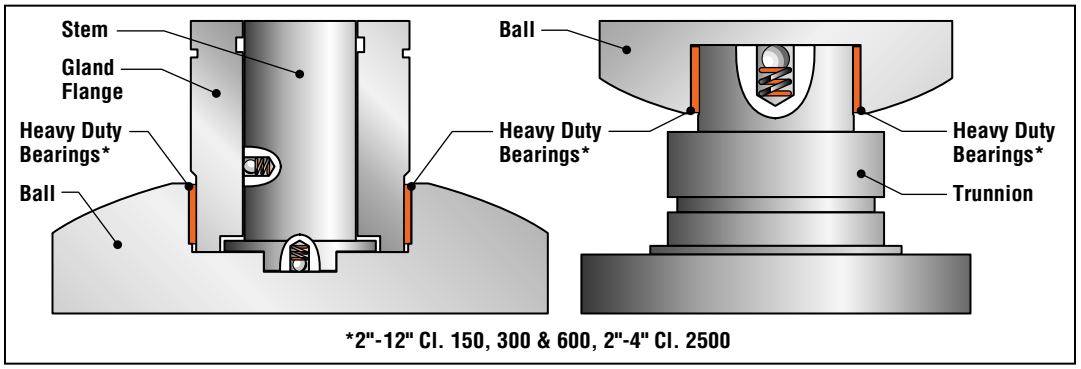
Double o-rings or a combination of an o-ring and firesafe gasket on body/adapter connections to ensure positive sealing. This makes the P3 suitable for above or below ground service.



6"-12" Cl. 900, 1500 & 2500
14"-24" Cl. 150, 300 & 600

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.

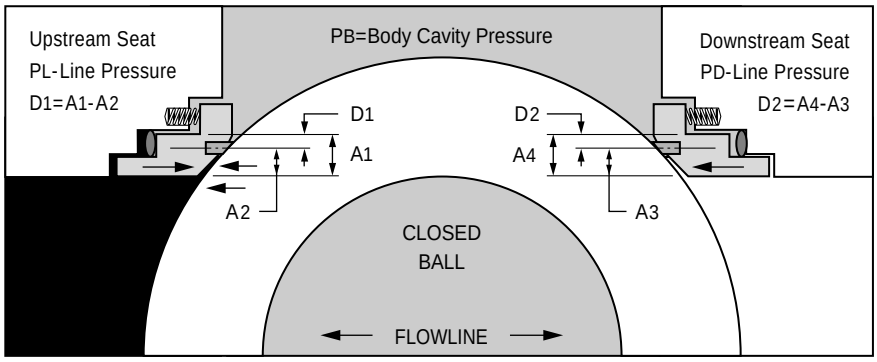


Antistatic Device

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

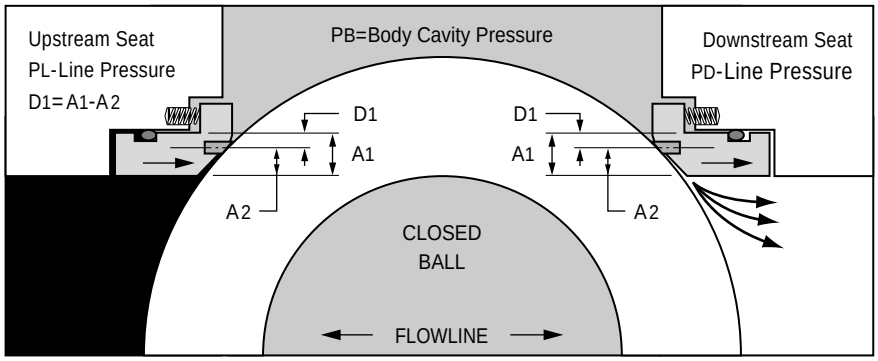
Double Piston Seat Design



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.



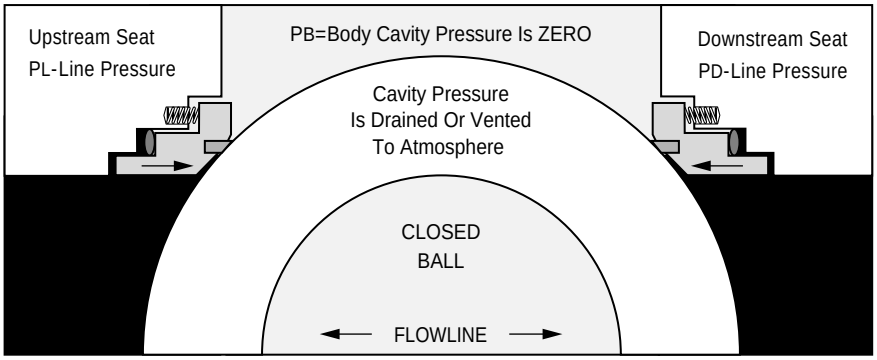
Self Relieving Seat Design

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

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

ASTM-American Society for Testing Materials

Consult factory for details.

ISO-International Organization for Standardization

ISO 9001: 2000	Quality systems - Model for quality assurance in design/development, production, installation and servicing.
ISO 5211	Topworks Mounting Dimensions
ISO 15156	For use in H_2S containing environments in oil and gas production.

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.

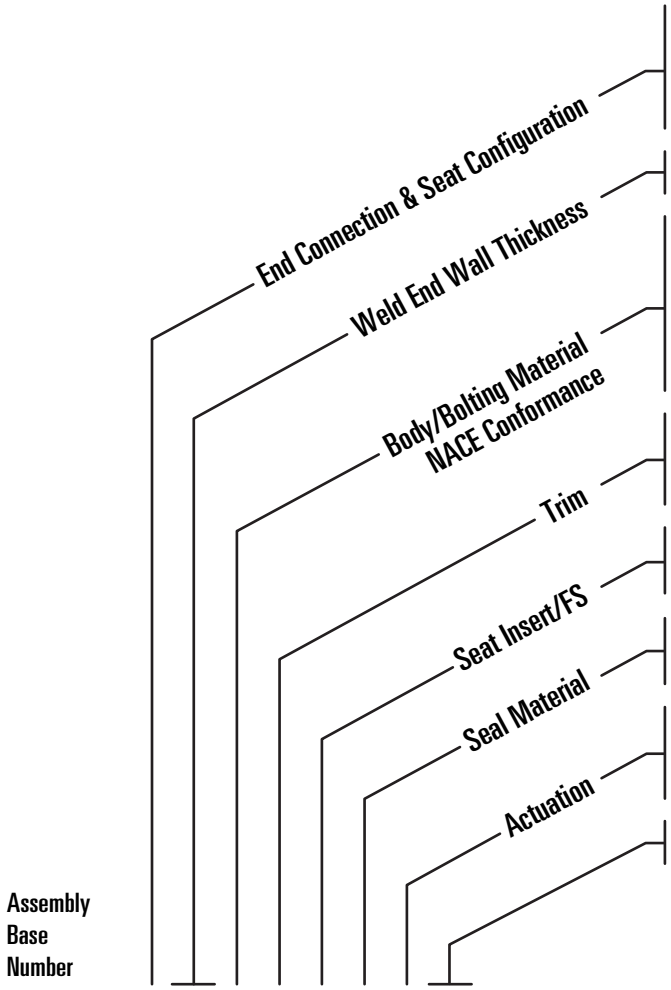
MSS-Manufacturers Standardization Society

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.

NACE-National Association of Corrosion Engineers

MR0175	Sulfide stress cracking resistant metallic materials for oilfield equipment.

KF Series P3 • Part Number Codes
2" FP- 36" FP, Class 150, 300, 600, 900, 1500 & 2500



End Connection & Seat Configuration

Downstream Relieving Seat Configuration

1 • RF	4 • RF x WE
2 • RTJ	5 • RTJ x WE
3 • WE	

Double Piston Seat Configuration Insert Type

F • RF	J • RF x WE
G • RTJ	K • RTJ x WE
H • WE	

Weld End Wall Thickness

99 • No Weld End
XX • See Weld Chart page 7.

Body/Bolting Material NACE Conformance

NACE** III, Cl. III Bolting	NACE** II, Cl. II Bolting
A • A105/B7 (Black - Std.)*	N • A105/B7M
B • SS/B7 (Xylan)	P • SS/B7M (Xylan)
C • LF2/L7 (Black)	Q • SS/L7M (Xylan)
D • SS/L7 (Xylan)	R • A105/B7M Cad
E • LF2/B7 (Black)	S • LF2/L7M
L • A105/B7 (Xylan)	T • SS/660SS

Trim

2 • 316SS
3 • 410SS or CA-15M
6 • CS w/ 3 mil ENP (Std. on 2" & larger)*
7 • LTCS (3 mil ENP)

Seat Insert/FS

A • Devlon® / FS (KF Std.)*
B • Teflon® / FS
C • PEEK™ / FS

Seal Material

2 • Viton® A	A • James Walker Viton®
4 • EPDM	F • ELAST-O-LION 985
5 • AFLAS®	**G • HNBR (Std.)**

Actuation

4 • Locking Handle (Std. on 2" thru 4" bore)*
6 • Locking Gear Operator (Std. on 6" bore and larger)*
9 • Bare Stem
A • For Actuator

Process Codes
(Last two digits used ONLY when Process Codes are required).

Devlon® is a registered trademark of Devol Engineering, Ltd.
Teflon® is a registered trademark of DuPont.
PEEK™ is a trademark of Victrex Plc.
Viton® is a registered trademark of DuPont Dow Elastomers.
Aflas® is a registered trademark of Asahi Glass.
**Nace indicates compliance to NACE MR0175

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

*STANDARD TRIM CONFIGURATION

Series P3 Assembly Base Numbers, 2" FP – 36" 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
150	V111	V112	V113	V114	V115	V116	V117	V118	V119	V120	V121	V122	V123	V124	V125	V126
300	V211	V212	V213	V214	V215	V216	V217	V218	V219	V220	V221	V222	V223	V224	V225	V226
600	V311	V312	V313	V314	V315	V316	V317	V318	V319	V320	V321	V322	V323	V324	V325	V326
900	V411	V412	V413	V414	V415	V416	V417	V418	V419	V420	V421	V422	V423	V424	V425	V426
1500	V511	V512	V513	V514	V515	V516	V517	V518	V519	V520	V521	V522	V523	V524	V525	V526
2500	V611	V612	V613	V614	V615	V616	V617	V618	V619	V620	V621	V622	V623	—	—	—

Class	Size (in.)														
	16 FP	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
150	V127	V129	V130	V131	V133	V134	V135	V137	V139	V140	V141	V143	V145	V146	V147
300	V227	V229	V230	V231	V233	V234	V235	V237	V239	V240	V241	V243	V245	V246	V247
600	V327	V329	V330	V331	V333	V334	V335	V337	V339	V340	V341	V343	V345	V346	V347
900	V427	V429	V430	V431	—	V434	V435	V437	V439	V440	V441	V443	V445	V446	V447
1500	V527	V529	V530	V531	—	—	V535	—	—	—	—	—	—	—	—

Note: Shaded items are not available at this time. (Consult factory for verification)

KF Series P3 Buttweld 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

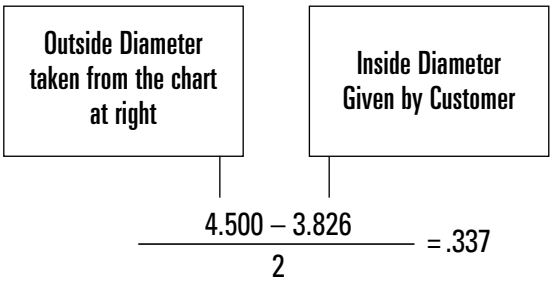
Pipe Description	Size (in.)/KF Schedule Code											
	14	Code	16	Code	18	Code	20	Code	22	Code	24	Code
Outside Dia. (in.)	14.000		16.000		18.000		20.000		22.000		24.000	
(STD) Standard	.375	33	.375	33	.375	33	.375	33	.375	33	.375	33
Schedule 40	.438	38	.500	39	.562	42	.593	43	—	—	.687	47
XS	.500	39	.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 buttweld 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:

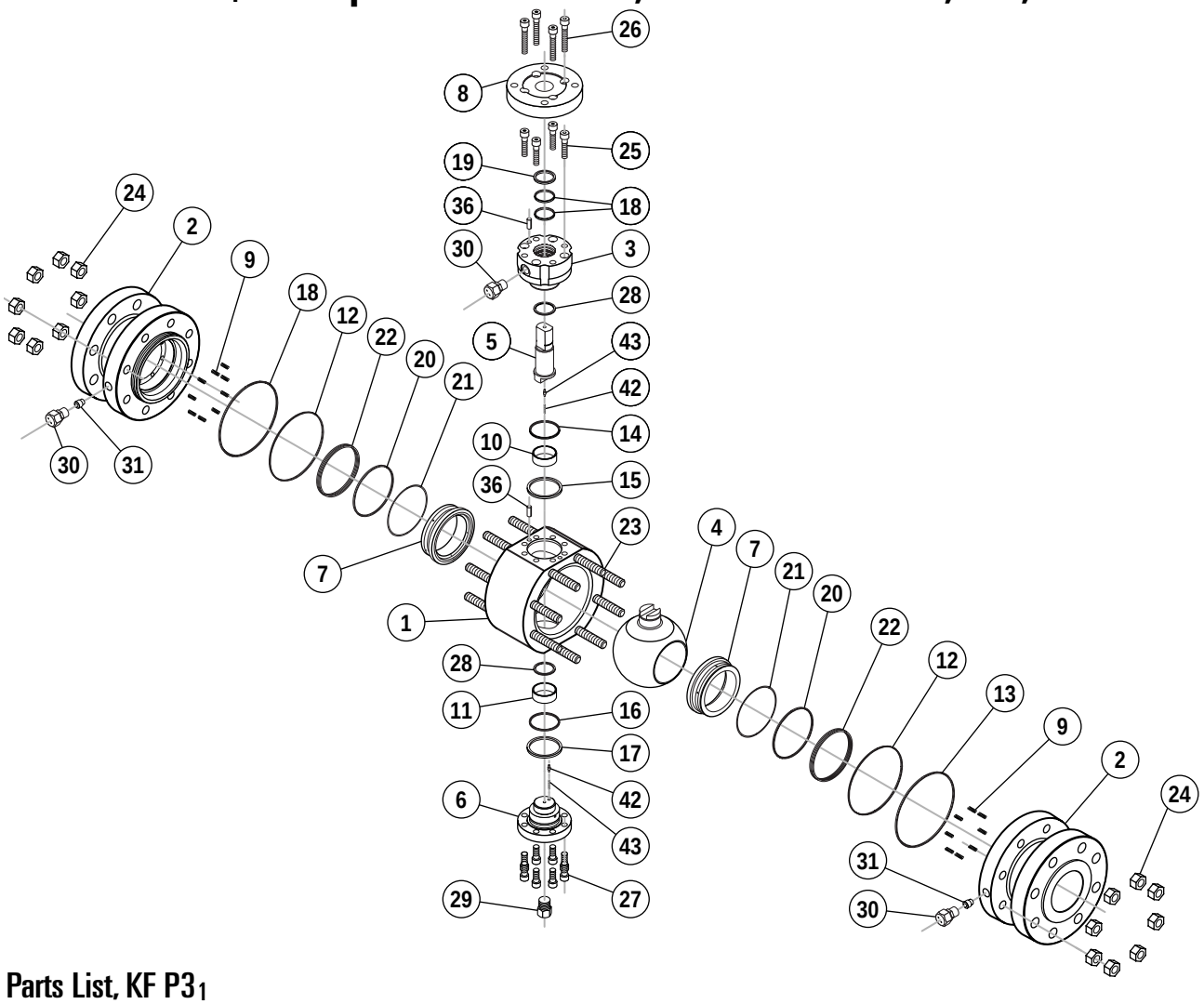


Once you have determined the "Pipe Wall Thickness", find that number in the chart above. The two-digit number to the left should then be used in the "Pipe Wall Thickness" digits of the valve Assembly Part Number. In this example that would be 30.

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

KF Series P3$_1$ • Component Parts • 2", 3" & 4" Class 600, 900, 1500 & 2500

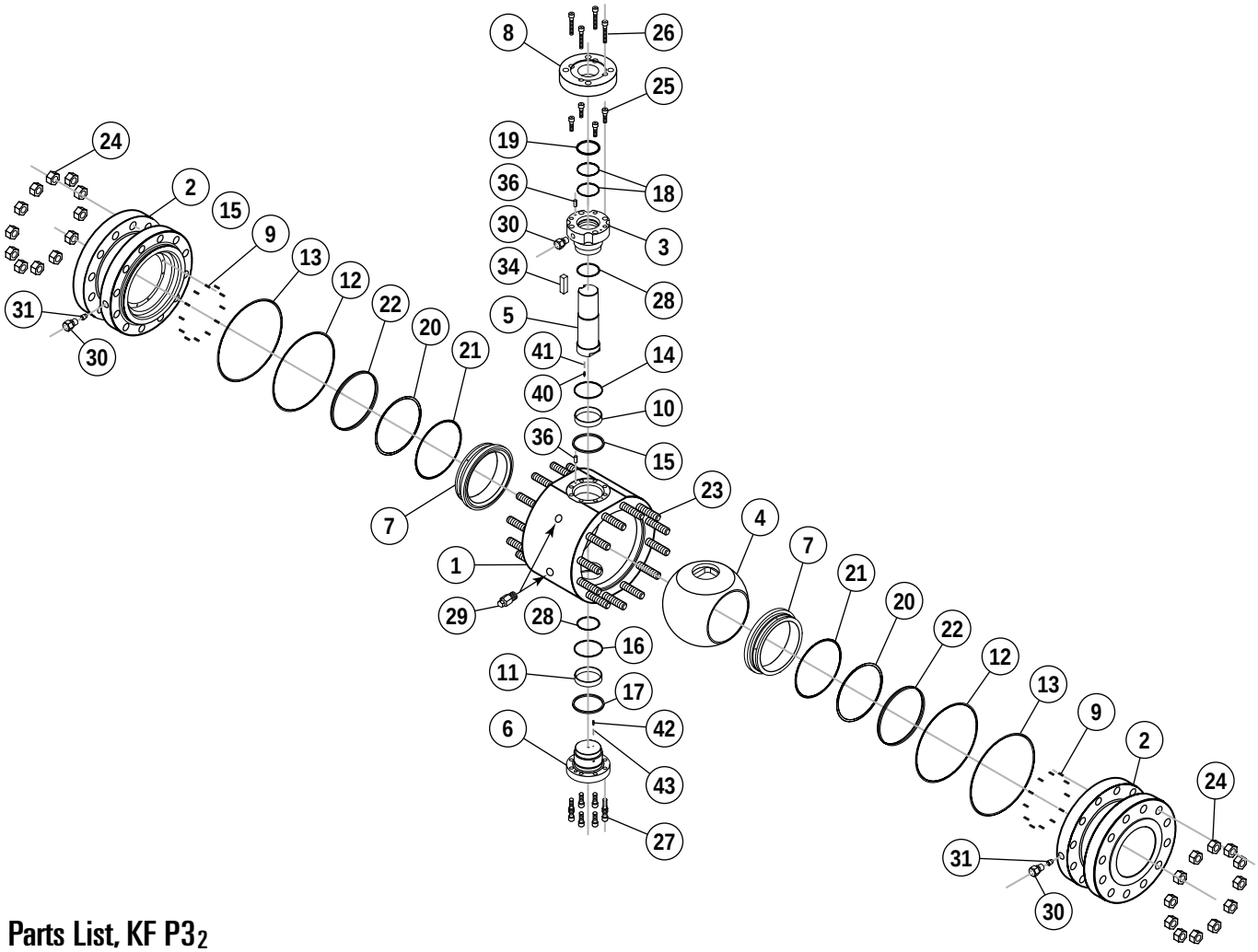


Parts List, KF P3$_1$

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 P3$_2$ • Component Parts • 6"-12", Class 600

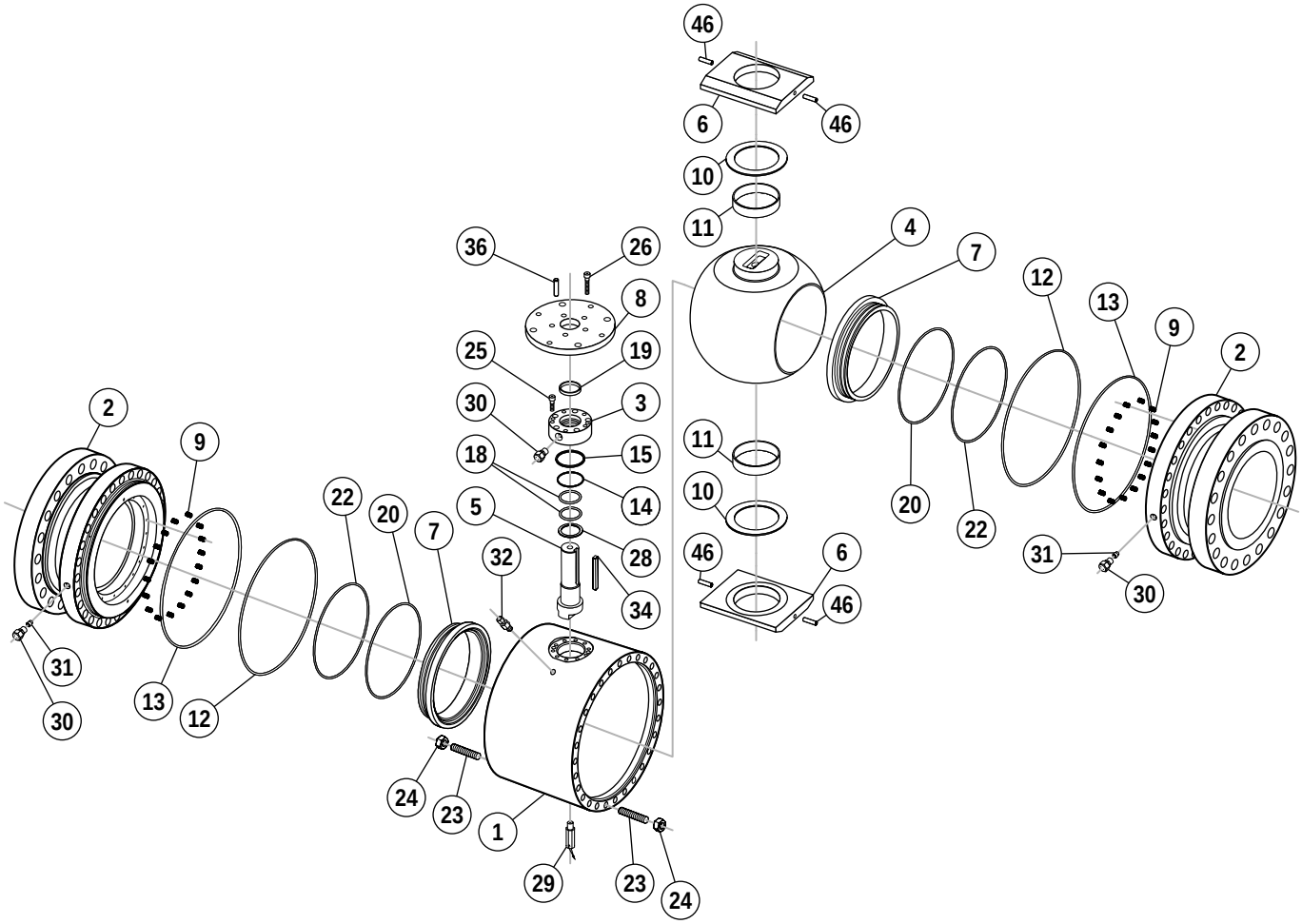


Parts List, KF P3$_2$

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 P3$_3$ • Component Parts • 6"-12", Class 900, 1500 & 2500
14" & Larger, All Classes

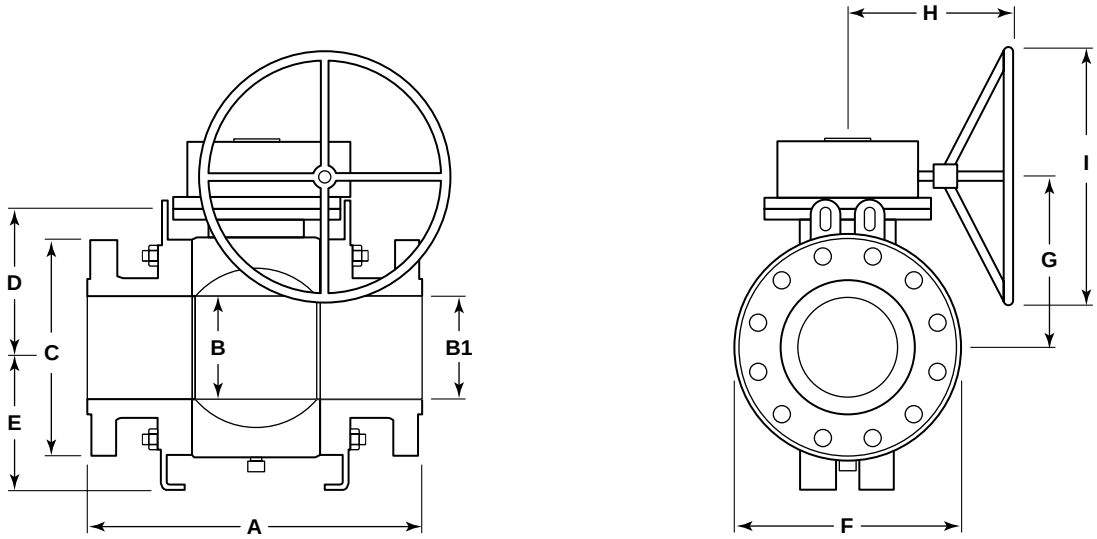


Parts List, KF P3$_3$

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 & 300 • Dimensional Data (in., mm)



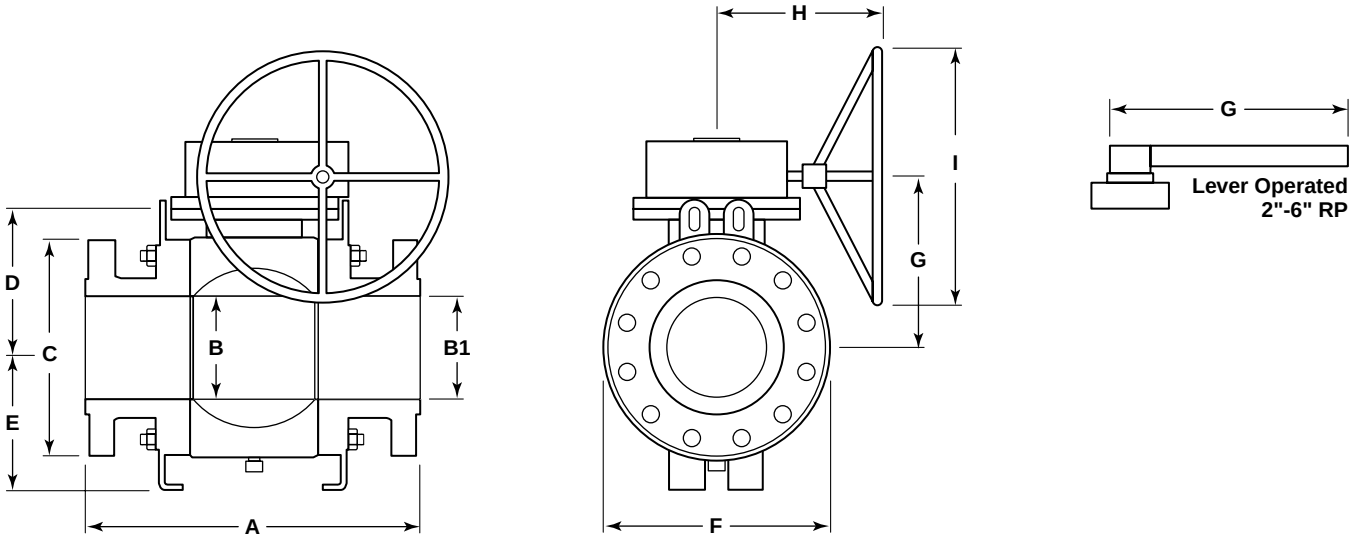
Dimensional Data,14"FP-24"FP, Class 150

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
14	27.0	686	27.5	698.5	30.0	762	13.3	337	13.3	337	21.0	533.4	15.7	400	15.3	388.0	25.1	638	18.5	470	20.4	518	23.6	600
16	30.0	762	30.5	775	33.0	838	15.3	387.4	15.3	387.35	23.5	596.9	16.7	423	17.7	450.0	28.0	710	19.4	493	18.7	475	27.6	700
20x16	36.0	914	36.5	927	39.0	991	15.3	387.4	19.3	489	27.5	698.5	16.7	423	17.7	450.0	28.0	710	19.4	493	18.7	475	27.6	700
18	34.0	864	34.5	876	36.0	914	17.2	438	17.2	438	25.0	635.0	19.1	485	19.5	495.0	31.9	810	22.3	566	22.6	575	27.6	700
20	36.0	914	36.5	927	39.0	991	19.3	489	19.3	489	27.5	698.5	21.1	537	21.4	542.5	34.1	865	24.3	618	22.6	575	27.6	700
24x20	42.0	1067	42.5	1080	45.0	1143	19.3	489	23.3	591	32.0	812.8	21.1	537	21.4	542.5	34.1	865	24.3	618	22.6	575	27.6	700
24	42.0	1067	42.5	1080	45.0	1143	23.3	591	23.3	591	32.0	813.0	24.3	616	23.2	590.5	40.4	1025	27.8	705	23.3	592	31.5	800

Dimensional Data, 14"FP-24"FP, Class 300

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
14	30.0	762	30.6	778	30.0	762	13.3	337	13.3	337	23.0	584	15.7	400	15.3	388	25.1	638	18.5	470	20.4	518	23.6	600
16	33.0	838	33.6	854	33.0	838	15.3	387.4	15.3	387.4	25.5	648	16.7	423	16.7	425	28.0	710	19.4	493	22.6	575	27.6	700
20x16	39.0	991	39.8	1010	39.0	991	15.3	387.4	19.3	489	30.5	775	16.7	423	16.7	425	28.0	710	19.4	493	22.6	575	27.6	700
18	36.0	914	36.6	930	36.0	914	17.2	438	17.2	438	28.0	711	19.2	488	19.6	498	32.3	820	22.4	569	22.6	575	27.6	700
20	39.0	991	39.8	1010	39.0	991	19.3	489	19.3	489	30.5	774.7	21.2	538	21.6	549	34.4	874	24.7	627	23.3	592	31.5	800
24x20	45.0	1143	45.9	1165	45.0	1143	19.3	489	23.3	591	36.0	914	21.2	538	21.6	549	34.4	874	24.7	627	23.3	592	31.5	800
24	45.0	1143	45.9	1165	45.0	1143	23.3	591	23.3	591	36.0	914	24.6	624	23.4	593.8	40.9	1040	29.3	744	27.3	693	35.4	900

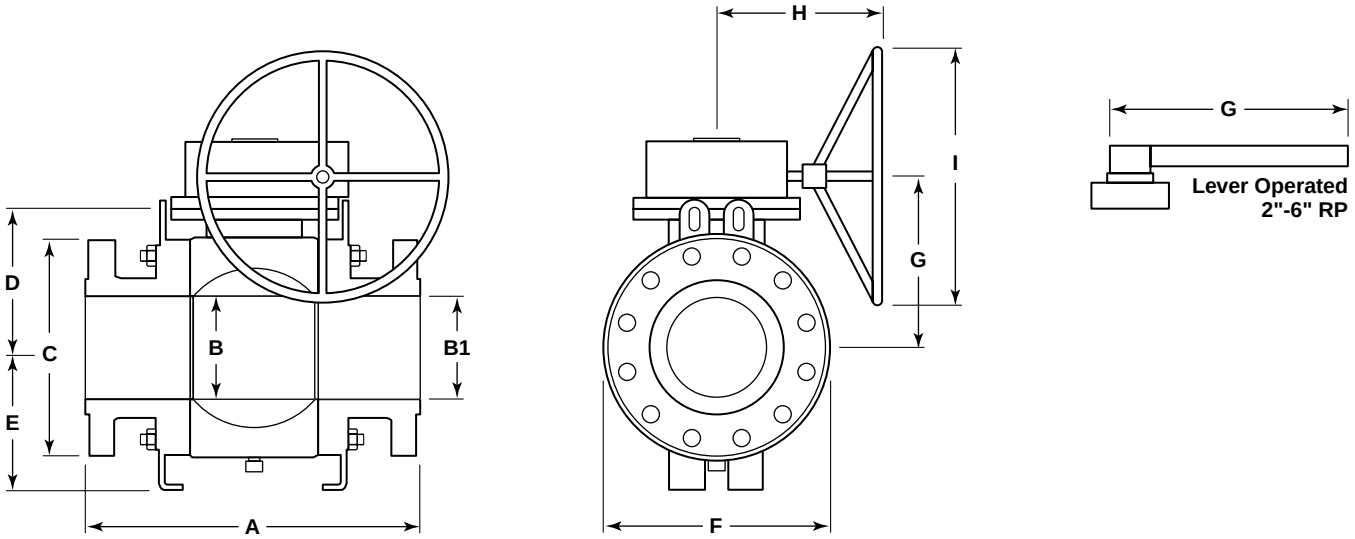
KF Series P3 Class 600 • Dimensional Data (in., mm)



Dimensional Data, 2"FP-36"FP, Class 600

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
2	11.5	292	11.6	295	11.5	292	2.0	51.0	2.0	51.0	6.5	165	6.1	155.0	4.2	106.3	6.5	165	22.8	580.0	—	—	—	—
3x2	14.0	356	14.1	359	14.0	356	2.0	51.0	3.0	76.2	8.3	210	6.1	155.0	4.2	106.3	6.5	165	22.8	580.0	—	—	—	—
3	14.0	356	14.1	359	14.0	356	3.0	76.2	3.0	76.2	8.3	210	6.7	170.0	5.4	136.3	9.0	229	27.6	700.0	—	—	—	—
4x3	17.0	432	17.1	435	17.0	432	3.0	76.2	4.0	101.6	10.7	273	6.7	170.0	5.4	136.3	9.0	229	27.6	700.0	—	—	—	—
4	17.0	432	17.1	435	17.0	432	4.1	103.4	4.1	103.3	10.8	273.1	8.0	201.0	6.4	162.3	10.4	264	27.8	704.9	—	—	—	—
6x4	22.0	559	22.1	562	22.0	559	4.1	103.4	6.0	152.4	14.0	356	8.0	201.0	6.4	162.3	10.4	264	27.8	704.9	—	—	—	—
6	22.0	559	22.1	562	22.0	559	6.0	152.4	6.0	152.4	14.0	356	9.1	230.0	9.2	234.5	12.6	319	11.2	285.0	14.2	360	19.7	500
8x6	26.0	660	26.1	664	26.0	660	6.0	152.4	8.0	203.2	16.5	419.1	9.1	230.0	9.2	234.5	12.6	319	11.2	285.0	14.2	360	19.7	500
8	26.0	660	26.1	664	26.0	660	8.0	203.0	8.0	203.2	16.5	419.1	11.4	290.5	12.4	316.0	17.0	432	13.5	342.5	15.0	380	23.6	600
10x8	31.0	787	31.1	791	31.0	787	8.0	203.0	10.0	254.0	20.0	508	11.4	290.5	12.4	316.0	17.0	432	13.5	342.5	15.0	380	23.6	600
10	31.0	787	31.1	791	31.0	787	10.0	254.0	10.0	254.0	20.0	508	13.0	329.0	15.7	399.0	20.4	518	15.5	393.0	16.5	418	23.6	600
12x10	33.0	838	33.1	841	33.0	838	10.0	254.0	12.0	304.8	22.0	559	13.0	329.0	15.7	399.0	20.4	518	15.5	393.0	16.5	418	23.6	600
12	33.0	838	33.1	841	33.0	838	12.0	304.8	12.0	304.8	22.0	558.8	15.9	404.7	17.8	451.0	24.5	622	18.7	474.7	21.5	545	27.6	700
14x12	35.0	889	35.1	892	35.0	889	12.0	304.8	13.3	337.0	23.7	603	15.9	404.7	17.8	451.0	24.5	622	18.7	474.7	21.5	545	27.6	700
16x12	39.0	991	39.1	994	39.0	991	12.0	304.8	15.3	387.4	27.0	686	15.9	404.7	17.8	451.0	24.5	622	18.7	474.7	21.5	545	27.6	700
14	35.0	889	35.1	892	35.0	889	13.3	337.0	13.3	337.0	23.7	603	15.7	400.0	15.3	388.5	25.1	638	18.9	481.0	23.1	588	31.5	800
16	39.0	991	39.1	994	39.0	991	15.3	387.4	15.3	387.4	27.0	686	17.4	443.0	17.6	445.8	28.9	735	20.6	524.0	22.6	575	27.6	700
20x16	47.0	1194	47.2	1200	47.0	1194	15.3	387.4	19.3	489.0	32.1	815	17.4	443.0	17.6	445.8	28.9	735	20.6	524.0	22.6	575	27.6	700
18	43.0	1092	43.1	1095	43.0	1092	17.2	438.0	17.2	438.0	29.3	743	19.6	498.0	20.1	510.5	33.1	840	23.1	587.0	23.3	592	31.5	800
20	47.0	1194	47.2	1200	47.0	1194	19.3	489.0	19.3	489.0	32.0	812.8	22.2	565.0	21.3	542.0	36.2	920	27.0	685.0	27.3	693	35.4	900
22	51.0	1295	51.4	1305	51.0	1295	21.3	539.8	21.3	539.8	34.3	870	22.1	561.8	22.2	563.0	36.8	935	26.7	677.2	29.7	753	31.5	800
24x20	55.0	1397	55.4	1407	55.0	1397	19.3	489.0	23.3	591.0	37.0	940	22.2	565.0	21.3	542.0	36.2	920	27.0	685.0	27.3	693	35.4	900
24	55.0	1397	55.4	1407	55.0	1397	23.3	591.0	23.3	591.0	37.0	940	24.6	624.5	23.5	596.0	41.1	1045	30.8	781.5	37.4	950	27.6	700
26	57.0	1448	57.5	1461	57.0	1448	25.0	635.0	25.0	635.0	40.0	1016	25.1	638.1	25.1	638.6	43.2	1097	29.7	753.7	28.6	726	31.5	800
30	65.0	1651	65.5	1664	65.0	1651	29.0	736.6	29.0	736.6	44.5	1130.3	28.3	719.2	31.5	799.7	49.4	1254.8	32.9	834.7	28.6	726	31.5	800
36	82.0	2083	82.6	2099	82.0	2083	34.5	876.3	34.5	876.3	51.8	1314.5	32.9	834.6	34.1	865.0	58.7	1490	37.4	950.2	28.6	726	35.4	900

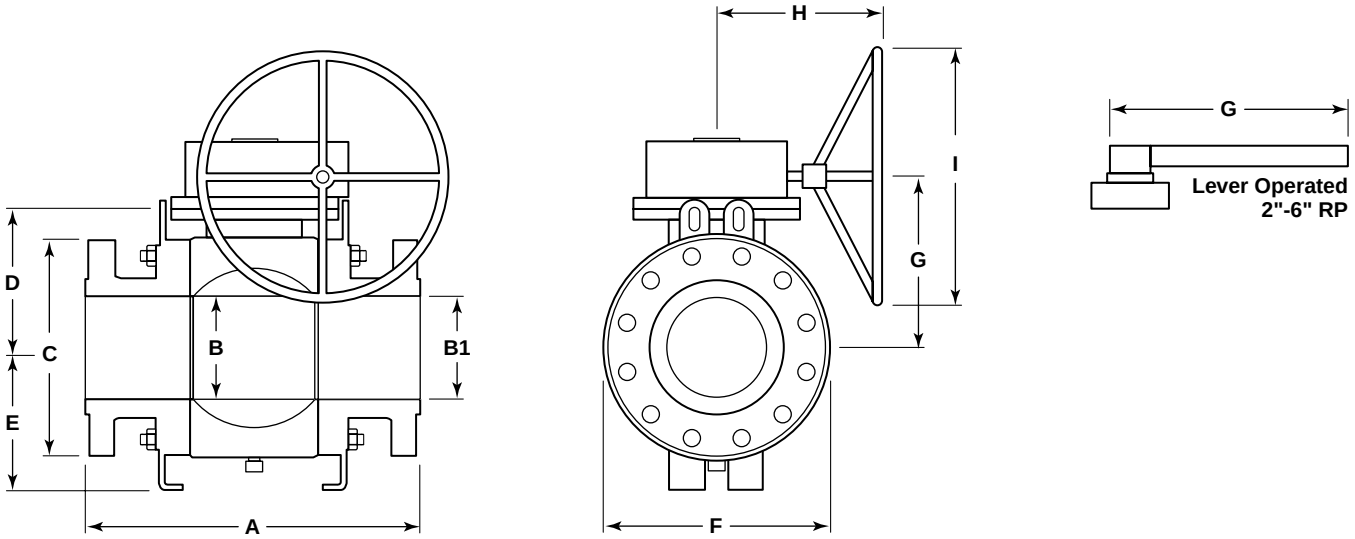
KF Series P3 Class 900 • Dimensional Data (in., mm)



Dimensional Data, 2"FP-26"FP, Class 900

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
2	14.5	368	14.6	371	14.5	368	2.0	50.8	2.0	50.8	8.5	215.9	5.8	148.5	4.6	116.8	7.3	185	22.8	580	—	—	—	—
3x2	15.0	381	15.1	384	15.0	381	2.0	50.8	3.0	76.2	9.5	241.3	5.8	148.5	4.6	116.8	7.3	185	22.8	580	—	—	—	—
3	15.0	381	15.1	384	15.0	381	3.0	76.2	3.0	76.2	9.5	241.0	7.0	179.0	5.7	144.3	9.3	237	27.6	700	—	—	—	—
4x3	18.0	457	18.1	460	18.0	457	3.0	76.2	4.0	101.6	11.5	292.1	7.0	179.0	5.7	144.3	9.3	237	27.6	700	—	—	—	—
4	18.0	457	18.1	460	18.0	457	4.1	103.3	4.1	103.3	11.5	292.0	8.5	216.2	6.9	176.3	11.3	288	33.7	856.2	—	—	—	—
6x4	24.0	610	24.1	613	24.0	610	4.1	103.3	6.0	152.4	15.0	381.0	8.5	216.2	6.9	176.3	11.3	288	33.7	856.2	—	—	—	—
6	24.0	610	24.1	613	24.0	610	6.0	152.4	6.0	152.4	15.0	381.0	10.0	255.0	10.0	255.0	14.2	360	12.1	307	14.8	377	23.6	600
8x6	29.0	737	29.1	740	29.0	737	6.0	152.4	8.0	203.2	18.5	470.0	10.0	255.0	10.0	255.0	14.2	360	12.1	307	14.8	377	23.6	600
8	29.0	737	29.1	740	29.0	737	8.0	203.2	8.0	203.2	18.5	469.9	11.7	296.0	12.6	320.0	17.3	440	14.2	360	21.5	545	27.6	700
10x8	33.0	838	33.1	841	33.0	838	8.0	203.2	10.0	254.0	21.5	546.0	11.7	296.0	12.6	320.0	17.3	440	14.2	360	21.5	545	27.6	700
10	33.0	838	33.1	841	33.0	838	10.0	254.0	10.0	254.0	21.5	546.0	13.5	342.0	16.0	406.0	20.9	532	16.2	412	20.4	518	23.6	600
12x10	38.0	965	38.1	968	38.0	965	10.0	254.0	12.0	304.8	24.0	610.0	13.5	342.0	16.0	406.0	20.9	532	16.2	412	20.4	518	23.6	600
12	38.0	965	38.1	968	38.0	965	12.0	304.8	12.0	304.8	24.0	609.6	16.4	416.0	18.2	462.5	25.4	645	19.6	497	23.1	588	31.5	800
14x12	40.5	1029	40.9	1038	40.5	1029	12.0	304.8	12.8	324.0	25.3	642.0	16.4	416.0	18.2	462.5	25.4	645	19.6	497	23.1	588	31.5	800
16x12	44.5	1130	44.9	1140	44.5	1130	12.0	304.8	14.8	374.7	27.8	705.0	16.4	416.0	18.2	462.5	25.4	645	19.6	497	23.1	588	31.5	800
14	40.5	1029	40.9	1038	40.5	1029	12.8	324.0	12.8	324.0	25.3	641.4	15.6	395.0	16.5	420.0	24.8	630	18.7	476	23.1	588	31.5	800
16	44.5	1130	44.9	1140	44.5	1130	14.8	374.7	14.8	374.65	27.8	705.5	18.3	465.5	19.4	491.9	29.3	745	21.8	554.5	23.3	592	31.5	800
18	48.0	1219	48.5	1232	48.0	1219	16.8	425.5	16.8	425.5	31.0	787.4	19.5	495.0	20.4	517.6	32.0	812	25.7	652.0	28.1	713.7	35.4	900
20	52.0	1321	52.5	1334	52.0	1321	18.6	473.1	18.6	473.1	33.8	857.3	21.5	547.0	22.7	577.6	36.0	915	27.7	704.0	28.1	713.7	35.4	900
24	61.0	1549	61.8	1568	61.0	1549	22.5	571.5	22.5	571.5	41.0	1041.4	24.9	632.5	29.7	754.7	42.3	1075	31.1	789.5	37.4	950.0	27.6	700
26	65.0	1651	66.0	1676	65.0	1651	24.4	619.1	24.4	619.8	42.8	1086.0	27.0	685.2	27.1	688.3	47.0	1195	31.3	793.8	28.6	726.4	35.4	900

KF Series P3 Class 1500 & 2500 • Dimensional Data (in., mm)



Dimensional Data, 2"FP-16"FP, Class 1500

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
2	14.3	368	14.6	371	14.5	368	2.0	50.8	2.0	50.8	8.5	215.9	6.8	172	5.3	134.3	8.4	214	22.0	558.8	—	—	—	—
3x2	18.3	470	18.6	473	18.5	470	2.0	50.8	3.0	76.2	10.5	266.7	6.8	172	5.3	134.3	8.4	214	22.0	558.8	—	—	—	—
3	18.3	470	18.6	473	18.5	470	3.0	76.2	3.0	76.2	10.5	266.7	8.6	219	7.1	180.3	11.8	300	27.6	700	—	—	—	—
4x3	21.2	546	21.6	549	21.5	546	3.0	76.2	4.1	103.3	12.2	311	8.6	219	7.1	180.3	11.8	300	27.6	700	—	—	—	—
4	21.2	546	21.6	549	21.5	546	4.1	103.3	4.1	103.3	12.2	311	9.2	234.5	7.8	197.3	13.0	330	39.4	1000	—	—	—	—
6x4	27.4	705	28.0	711	27.8	705	4.1	103.3	5.7	146.0	15.5	394	9.2	234.5	7.8	197.3	13.0	330	39.4	1000	—	—	—	—
6	27.4	705	28.0	711	27.8	705	5.7	146	5.7	146.0	15.5	394	11.3	288	11.2	285	16.5	420	13.9	352	20.4	518	23.6	600
8x6	32.8	832	33.1	841	32.8	832	5.7	146	7.6	194.0	19.0	483	11.3	288	11.2	285	16.5	420	13.9	352	20.4	518	23.6	600
8	32.8	832	33.1	841	32.8	832	7.6	194	7.6	193.7	19.0	482.6	13.7	347	14.5	369	21.2	538	16.4	417	22.6	575	27.6	700
10x8	39.0	991	39.4	1000	39.0	991	7.6	194	9.5	241.0	23.0	585	13.7	347	14.5	369	21.2	538	16.4	417	22.6	575	27.6	700
10	39.0	991	39.4	1000	39.0	991	9.5	241	9.5	241.3	23.0	585	15.6	397	17.9	455	24.8	630	18.8	478	23.1	588	31.5	800
12x10	44.5	1130	45.1	1146	44.5	1130	9.5	241	11.4	289.0	26.5	673	15.6	397	17.9	455	24.8	630	18.8	478	23.1	588	31.5	800
12	44.5	1130	45.1	1146	44.5	1130	11.4	289	11.4	289.0	26.5	673	19.1	486	20.9	530	30.7	780	22.3	567	23.1	588	31.5	800
16	54.5	1384	55.4	1407	54.5	1384	14.2	368.3	14.2	368.3	32.5	825.5	20.6	523.9	21.2	539	34.6	877.9	24.2	614.4	27.3	693.4	35.4	900

Dimensional Data, 2"FP- 8"RP, Class 2500

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
2	17.8	451	17.9	454	17.8	451	1.8	44.5	1.8	44.5	9.3	235.0	7.2	183	5.1	130	9.4	238	27.6	700	—	—	—	—
3	22.8	578	23.0	584	22.8	578	2.5	63.5	2.5	63.5	12.0	304.8	8.8	223	6.6	168.5	12.1	308	33.5	850	—	—	—	—
4	26.5	673	26.9	683	26.5	673	3.5	88.9	3.5	88.9	14.0	355.6	9.8	249	7.1	181	13.8	350	12.3	313	16.5	418.1	23.6	600
6x4	36.0	914	36.5	927	36.0	914	3.5	88.9	5.3	133.4	19.0	482.6	9.8	249	7.1	181	13.8	350	12.3	312.4	16.5	418.1	23.6	600
6	36.0	914	36.5	927	36.0	914	5.3	133.4	5.3	133.4	19.0	482.6	13.4	341	10.4	265	15.0	380	16.2	411	22.6	575.1	27.8	700
8x6	40.3	1022	40.9	1038	40.3	1022	5.3	134.6	7.1	180.3	21.8	552.5	13.4	341	10.4	265	15.0	380	16.2	411	22.6	575.1	27.8	700

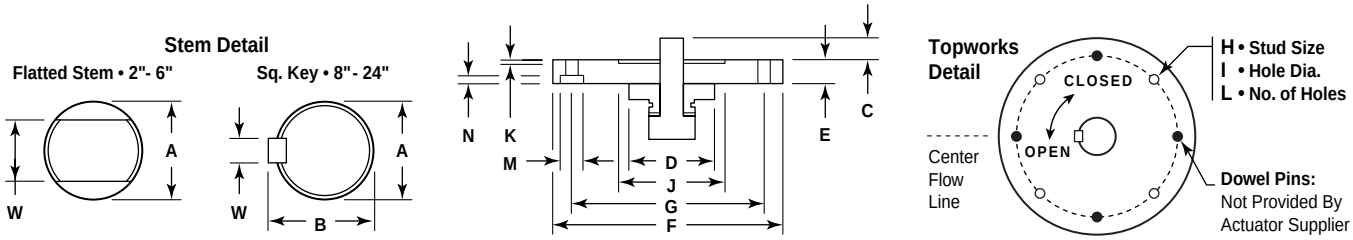
KF Series P3 Weights

Valve Size (in.)	Port	ANSI Class	Weight (lbs.)				Weight (kg)			
			Valve Only	With Handle	GOP Wt.	With GOP	Valve Only	With Handle	GOP Wt.	With GOP
2	FP	600	81	86	38	119	37	39	18	55
2	FP	900	114	118	54	168	52	54	25	77
2	FP	1500	169	173	54	223	77	79	25	101
2	FP	2500	478	—	65	543	217	220	30	246
3	RP	600	96	101	38	134	44	46	18	62
3	FP	600	160	168	54	214	73	76	25	98
3	RP	900	147	152	54	201	67	69	25	92
3	FP	900	216	223	54	270	98	101	25	123
3	RP	1500	210	214	54	264	95	97	25	120
3	FP	1500	386	390	45	431	175	179	21	196
3	RP	2500	Consult Factory				Consult Factory			
3	FP	2500	539	—	65	604	245	248	30	274
4	RP	600	216	223	54	270	98	101	25	123
4	FP	600	286	295	45	331	130	134	21	151
4	RP	900	288	296	54	342	131	134	25	156
4	FP	900	385	395	45	430	175	179	21	196
4	RP	1500	485	494	45	530	220	224	21	241
4	FP	1500	617	—	81	698	280	—	37	317
4	RP	2500	Consult Factory				Consult Factory			
4	FP	2500	807	—	90	897	366	—	41	407
6	RP	600	368	377	45	413	167	171	21	188
6	FP	600	498	—	84	582	226	—	38	264
6	RP	900	529	538	45	574	240	244	21	261
6	FP	900	762	—	92	854	346	—	42	388
6	RP	1500	816	—	81	897	370	—	37	407
6	FP	1500	1157	—	115	1272	525	—	53	577
6	RP	2500	847	—	90	937	384	—	41	425
6	FP	2500	1111	—	168	1279	504	—	76	580
8	RP	600	604	—	84	688	274	—	38	312
8	FP	600	992	—	90	1082	450	—	41	491
8	RP	900	912	—	92	1004	414	—	42	456
8	FP	900	1344	—	112	1456	610	—	51	661
8	RP	1500	1356	—	115	1471	615	—	53	668
8	FP	1500	2149	—	196	2345	975	—	89	1064
8	RP	2500	1554	—	168	1722	705	—	76	781
10	RP	600	1256	—	90	1346	570	—	41	611
10	FP	600	1653	—	115	1768	750	—	53	803
10	RP	900	1499	—	112	1611	680	—	51	731
10	FP	900	2010	—	198	2208	912	—	90	1002
10	RP	1500	2628	—	196	2824	1192	—	89	1281
10	FP	1500	3440	—	300	3740	1560	—	136	136
12	RP	600	1834	—	115	1949	832	—	53	885
12	FP	600	2535	—	288	2823	1150	—	131	1281

Valve Size (in.)	Port	ANSI Class	Weight (lbs.)				Weight (kg)			
			Valve Only	With Handle	GOP Wt.	With GOP	Valve Only	With Handle	GOP Wt.	With GOP
12	RP	900	2226	—	198	2424	1010	—	90	1100
12	FP	900	2865	—	299	3164	1300	—	136	1436
12	RP	1500	4156	—	300	4456	1885	—	136	2021
12	FP	1500	4012	—	300	4312	1820	—	136	1956
14	FP	150	1781	—	198	1979	808	—	90	898
14	FP	300	2380	—	198	2578	1080	—	90	1170
14	RP	600	2491	—	288	2779	1130	—	131	1261
14	FP	600	3020	—	288	3308	1370	—	131	1501
14	FP	900	3339	—	198	3537	1515	—	90	1605
16	RP	150	1610	—	198	1808	730	—	90	820
16	FP	150	2799	—	198	2997	1270	—	90	1360
16	RP	300	2332	—	198	2530	1058	—	90	1148
16	FP	300	2870	—	194	3064	1302	—	88	1390
16	RP	600	3042	—	288	3330	1380	—	131	1511
16	FP	600	3791	—	293	4084	1720	—	133	1853
16	RP	900	3947	—	198	4145	1790	—	90	1880
16	FP	900	4596	—	476	5072	2085	—	216	2301
16	FP	1500	9393	—	842	10,235	4261	—	382	4643
18	FP	150	2921	—	293	3214	1325	—	133	1458
18	FP	300	4634	—	293	4927	2102	—	133	2235
18	FP	600	5742	—	476	6218	2605	—	216	2821
18	FP	900	6614	—	842	7456	3001	—	382	3383
20	RP	150	2667	—	198	2865	1210	—	90	1300
20	FP	150	4805	—	289	5094	2180	—	131	2311
20	RP	300	4909	—	293	5202	2227	—	133	2360
20	FP	300	5608	—	476	6084	2544	—	216	2760
20	RP	600	4785	—	646	5431	2170	—	293	2464
20	FP	600	6130	—	842	6972	2781	—	382	3163
20	RP	900	6549	—	842	7391	2971	—	382	3353
20	FP	900	9614	—	842	10,456	4361	—	382	4743
22	FP	600	7762	—	904	8666	3521	—	410	3931
24	RP	150	5343	—	289	5632	2424	—	131	2555
24	FP	150	7680	—	476	8156	3484	—	216	3700
24	RP	300	6063	—	289	6352	2751	—	131	2882
24	FP	300	7960	—	842	8802	3611	—	382	3993
24	RP	600	7475	—	842	8317	3391	—	382	3773
24	FP	600	12,125	—	870	12,995	5500	—	395	5895
24	RP	900	12,303	—	842	13,145	5581	—	382	5963
24	FP	900	15,500	—	870	16,370	7031	—	395	7426
26	FP	600	11,951	—	904	12,855	5421	—	410	5831
26	FP	900	17,320	—	915	18,235	7856	—	415	8271
30	FP	600	17,960	—	915	18,875	8147	—	415	8562
36	FP	600	28,919	—	915	29,834	13,117	—	415	13,532

Note: All weights listed are estimated. Consult factory for sizes not shown.

KF Series P3 Topworks (in.) & Stem Torque Data (in.-lbs.)



Valve Bore Sz. (in.)	ANSI Class	A	B	C	D	E	F	G	H Stud Sz. UNC	I Hole Dia.	J	K	L No. Of Holes	M C. Line Bore	N Bore Depth	W	Max Stem Sheer Torq. ft.-lbs.	Break Torq. in.-lbs.	Torq. Express. (1) For P<=2160 PSI in.-lbs. (2) (3)
2	600	0.871	—	1.319	3.760	0.709	5.906	4.921	1/2-13	0.531	—	—	4	0.787	0.512	*0.558	134	1314	0.409*P+708.20
2	900	0.871	—	1.345	3.858	0.709	5.906	4.921	1/2-13	0.531	—	—	4	0.787	0.512	*0.558	135	1616	
2	1500	1.103	—	1.988	4.094	1.063	5.906	4.921	1/2-13	0.531	—	—	4	0.787	0.551	*0.746	306	2224	
2	2500	1.378	—	2.089	5.118	0.787	8.287	6.496	3/4-10	0.827	—	—	4	—	—	*0.994	3769	5213	0.507*P+2170.91
3	600	1.378	—	2.010	4.429	0.787	6.240	5.433	1/2-13	0.531	—	—	4	—	—	*0.994	405	4151	1.758*P+1548.75
3	900	1.378	—	2.000	4.941	0.945	6.713	5.433	1/2-13	0.531	—	—	4	0.807	0.500	*0.994	630	5452	
3	1500	1.493	—	1.973	4.921	1.181	6.693	5.512	5/8-11	0.657	—	—	4	1.024	0.650	*0.993	726	8062	
3	2500	1.493	—	1.890	4.921	0.591	8.268	6.496	3/4-10	0.827	5.124	0.157	4	—	—	*0.993	5551	13,957	1.892*P+2604.56
4	600	1.497	—	1.687	5.020	1.220	6.890	5.512	5/8-11	0.657	3.939	0.118	4	0.984	0.630	*0.996	725	6043	2.319*P+2610.75
4	900	1.497	—	1.687	5.020	1.220	6.890	5.512	5/8-11	0.657	3.939	0.118	4	0.984	0.630	*0.996	728	7759	
4	1500	1.774	—	2.402	5.925	1.220	8.268	6.496	3/4-10	0.787	5.120	0.118	4	1.181	0.787	*1.247	1337	11,203	
4	2500	1.774	—	2.303	6.713	1.299	11.811	10.000	5/8-11	0.650	7.880	0.118	8	—	—	*1.247	9094	17,387	2.319*P+3472.74
6	600	1.931	—	2.179	4.921	1.299	6.909	5.512	5/8-11	0.657	3.939	0.118	4	1.000	0.669	*1.247	1624	14,580	7.446*P+3559.47
6	900	1.992	—	1.991	4.921	1.378	8.287	6.496	3/4-10	0.787	5.120	0.118	4	1.181	0.787	*1.247	1695	20,090	
6	1500	2.493	—	2.795	6.299	1.181	11.811	10.000	5/8-11	0.669	7.880	0.118	8	—	—	*1.747	3722	31,147	
6	2500	2.493	—	2.874	7.087	1.378	11.811	10.000	5/8-11	0.669	7.880	0.118	8	—	—	*1.747	14,702	48,687	6.957*P+6945.48
8	600	2.870	3.191	3.588	6.297	1.732	8.287	6.496	3/4-10	0.787	5.120	0.157	4	1.165	0.787	0.750	7460	22,628	11.535*P+5556.03
8	900	2.870	3.191	3.780	6.496	1.575	11.811	10.000	5/8-11	0.669	7.877	0.157	8	—	—	0.750	7460	31,164	
8	1500	2.870	3.191	3.299	6.496	1.575	11.811	10.000	5/8-11	0.669	7.877	0.118	8	—	—	0.750	7460	48,293	
10	600	3.240	3.613	3.581	6.900	0.986	11.319	10.000	5/8-11	0.657	7.877	0.118	8	—	—	0.875	10,631	29,042	14.402*P+ 7726.94
10	900	3.240	3.617	3.972	7.096	1.260	11.811	10.000	5/8-11	0.657	7.877	0.118	8	—	—	0.875	10,631	39,699	
10	1500	3.240	3.617	3.775	7.490	1.457	11.811	10.000	5/8-11	0.669	7.877	0.118	8	—	—	0.875	10,631	61,086	
12	600	3.994	4.426	4.244	8.500	1.319	12.000	10.000	5/8-11	0.657	7.877	0.118	8	—	—	1.000	20,315	34,639	16.6*P+10071.30
12	900	3.994	4.426	4.210	9.051	1.813	13.780	11.732	3/4-10	0.787	9.057	0.199	8	—	—	1.000	20,315	46,923	
12	1500	3.990	4.426	4.210	9.445	1.813	13.780	11.732	3/4-10	0.787	9.057	0.199	8	—	—	1.000	20,315	71,574	
14	150	3.240	3.613	3.603	8.071	1.299	11.811	10.000	5/8-11	0.657	7.875	0.118	8	—	—	0.875	7444	25,000	28.32*P+16929.17
14	300	3.240	3.613	3.603	8.071	1.299	11.811	10.000	5/8-11	0.657	7.875	0.118	8	—	—	0.875	7444	37,886	
14	600	3.240	3.613	3.603	8.071	1.299	13.780	11.732	3/4-10	0.787	9.057	0.118	8	—	—	0.875	10,631	58,843	
14	900	3.240	3.613	3.287	7.874	1.457	13.780	11.732	3/4-10	0.827	9.057	0.118	8	—	—	0.875	10,631	79,800	
16	150	3.240	3.613	3.838	8.228	1.299	11.811	10.000	5/8-11	0.657	7.875	0.118	8	—	—	0.875	10,631	33,602	37.48*P+22919.73
16	300	3.240	3.613	3.838	8.228	1.299	11.811	10.000	5/8-11	0.657	7.875	0.118	8	—	—	0.875	10,631	50,655	
16	600	4.333	4.749	4.114	8.898	1.299	13.228	11.732	3/4-10	0.787	9.057	0.118	8	—	—	1.000	26,103	78,390	
16	900	4.333	4.749	4.568	8.543	1.000	13.780	11.732	3/4-10	0.787	9.057	0.118	8	—	—	1.000	26,103	106,125	
16	1500	3.541	3.743	5.785	9.071	1.299	16.339	14.016	M30-3.5	1.299	—	—	8	—	—	0.984	24,849	157,839	
18	150	4.333	4.749	3.996	9.055	1.299	13.228	11.732	3/4-10	0.787	9.057	0.118	8	—	—	1.000	26,103	45,663	62.74*P+27781.92
18	300	4.333	4.749	3.996	9.055	1.299	13.228	11.732	3/4-10	0.787	9.057	0.118	8	—	—	1.000	26,103	74,210	
18	600	4.333	4.749	3.996	9.055	1.299	13.780	11.732	3/4-10	0.787	9.057	0.118	8	—	—	1.000	26,103	120,637	
18	900	4.742	5.284	3.267	11.807	1.000	18.701	15.984	1 1/2-8	1.575	11.819	0.315	8	—	—	1.250	60,984	167,065	
20	150	4.333	4.749	4.528	9.248	1.000	13.386	11.732	3/4-10	0.787	9.057	0.118	8	—	—	1.000	26,103	57,608	91.86*P+31428.12
20	300	4.323	4.749	4.449	9.248	1.417	13.780	11.732	3/4-10	0.787	9.057	0.118	8	—	—	1.000	26,103	99,405	
20	600	4.333	4.749	4.382	9.839	1.000	13.780	11.732	3/4-10	0.787	9.057	0.118	8	—	—	1.000	26,103	167,381	
20	900	4.742	5.284	5.118	11.807	1.000	18.701	15.984	1 1/2-8	1.575	11.819	0.315	8	—	—	1.250	60,984	235,357	
22	600	4.723	5.003	7.340	10.055	1.496	13.386	11.732	M20-2.5	0.866	—	—	8	—	—	1.260	47,841	214,061	116.82*P+45840.34
24	150	4.333	4.749	4.429	9.248	1.417	13.780	11.732	3/4-10	0.787	9.057	0.118	8	—	—	1.000	26,103	110,228	141.23*P+69976.95
24	300	4.333	4.749	4.429	9.248	1.417	13.780	11.732	3/4-10	0.787	9.057	0.118	8	—	—	1.000	26,103	174,487	
24	600	4.725	5.257	4.331	11.020	2.362	18.701	15.984	1 1/2-8	1.575	11.819	0.394	8	—	—	1.250	33,100	278,997	
24	900	5.741	6.391	6.259	12.386	1.181	18.701	15.984	1 1/2-8	1.575	11.817	0.118	8	—	—	1.500	108,306	383,508	
26	600	4.723	5.003	7.264	10.055	1.496	16.339	14.016	M30-3.5	1.299	—	—	8	—	—	1.260	47,841	311,407	152.59*P+9167.15
26	900	5.904	6.223	8.915	13.205	1.496	18.701	15.984	M36-4	1.535	—	—	8	—	—	1.417	75,721	421,272	
30	600	5.904	6.223	8.935	12.614	1.496	18.701	15.984	M36-4	1.535	—	—	8	—	—	1.417	75,721	370,245	176.69*P+115811.10
36	600	5.904	6.223	6.592	12.614	1.496	18.701	15.984	M36-4	1.535	—	—	8	—	—	1.417	75,721	462,561	222.41*P+142290.30

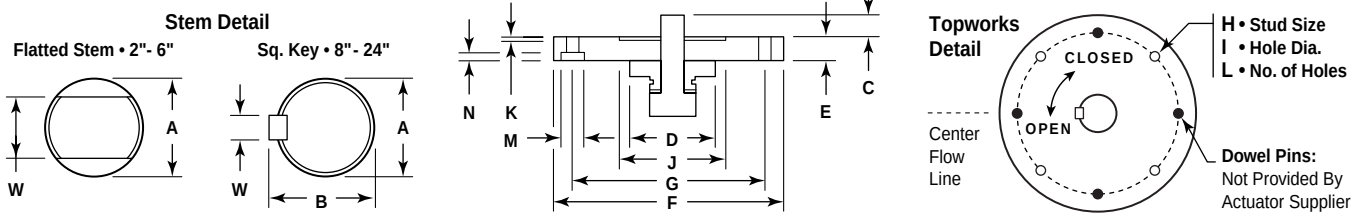
* Stem with Double 'D' Flat Style

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 PSI

Pressure ratings are according to API 6D/ASME 16.34

Class 150	P = 285	Class 900	P = 2220
Class 300	P = 740	Class 1500	P = 3705
Class 600	P = 1480		

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



Valve Bore Sz. (in.)	ANSI Class	A	B	C	D	E	F	G	H Stud Sz. UNC	I Hole Dia.	J	K	L No. Of Holes	M C. Line Bore	N Bore Depth	W	Max Stem SheerTorq. Nm	Break Torq. Nm	Torq. Express. (1) For P<=10.21 MPa-Nm (2)(3)
2	600	22.1	—	33.5	95.5	18.0	150.0	125	1/2-13	13.5	—	—	4	20.0	13.0	*14.17	181.7	148.45	6.702*P+80.022
2	900	22.1	—	34.2	98.0	18.0	150.0	125	1/2-13	13.5	—	—	4	20.0	13.0	*14.17	183.0	182.70	
2	1500	28.0	—	50.5	104.0	27.0	150.0	125	1/2-13	13.5	—	—	4	20.0	14.0	*18.95	414.9	251.12	
2	2500	35.0	—	53.1	130.0	20.0	210.5	165	3/4-10	21.0	—	—	4	—	—	*25.25	5110	589	8.308*P+245.31
3	600	35.0	—	51.1	112.5	20.0	158.5	138	1/2-13	13.5	—	—	4	—	—	*25.25	549.1	469.13	28.808*P+175
3	900	35.0	—	50.8	125.5	24.0	170.5	138	1/2-13	13.5	—	—	4	20.5	12.7	*25.25	854.2	616.34	
3	1500	37.9	—	50.1	125.0	30.0	170.0	140	5/8-11	16.7	—	—	4	26.0	16.5	*25.22	984.3	910.47	
3	2500	37.9	—	48.0	125.0	15.0	210.0	165	3/4-10	21.0	130.1	4.0	4	—	—	*25.22	7526	1577	31.004*P+294.32
4	600	38.0	—	42.9	127.5	31.0	175.0	140	5/8-11	16.7	100.1	3.0	4	25.0	16.0	*25.30	983.0	682.99	38.001*P+295
4	900	38.0	—	42.9	127.5	31.0	175.0	140	5/8-11	16.7	100.1	3.0	4	25.0	16.0	*25.30	987.0	877.18	
4	1500	45.1	—	61.0	150.5	31.0	210.0	165	3/4-10	20.0	130.0	3.0	4	30.0	20.0	*31.67	1812.7	1265.17	
4	2500	45.1	—	58.5	170.5	33.0	300.0	254	5/8-11	16.5	200.2	3.0	8	—	—	*31.67	12330	1964	38.001*P+392.42
6	600	49.0	—	55.3	125.0	33.0	175.5	140	5/8-11	16.7	100.1	3.0	4	25.4	17.0	*31.67	2201.8	1648	122.018*P+402.2
6	900	50.6	—	50.6	125.0	35.0	210.5	165	3/4-10	20.0	130.0	3.0	4	30.0	20.0	*31.67	2298.1	2271.52	
6	1500	63.3	—	71.0	160.0	30.0	300.0	254	5/8-11	17.0	200.2	3.0	8	—	—	*44.37	5046.4	3517.32	
6	2500	63.3	—	73.0	180.0	35.0	300.0	254	5/8-11	17.0	200.2	3.0	8	—	—	*44.37	19933	5501	114.004*P+787.84
8	600	72.9	81.1	91.1	159.9	44.0	210.5	165	3/4-10	20.0	130.0	4.0	4	29.6	20.0	19.05	10,114.4	2557.74	189.024*P+627.8
8	900	72.9	81.1	96.0	165.0	40.0	300.0	254	5/8-11	17.0	200.1	4.0	8	—	—	19.05	10,114.4	3523.65	
8	1500	72.9	81.1	83.8	165.0	40.0	300.0	254	5/8-11	17.0	200.1	3.0	8	—	—	19.05	10,114.4	5453.58	
10	600	82.3	91.8	91.0	175.3	25.0	287.5	254	5/8-11	16.7	200.1	3.0	8	—	—	22.23	14,413.7	3282.72	236.006*P+873.101
10	900	82.3	91.9	100.9	180.2	32.0	300.0	254	5/8-11	16.7	200.1	3.0	8	—	—	22.23	14,413.7	4488.71	
10	1500	82.3	91.9	95.9	190.2	37.0	300.0	254	5/8-11	17.0	200.1	3.0	8	—	—	22.23	14,413.7	6898.33	
12	600	101.4	112.4	107.8	215.9	33.5	304.8	254	5/8-11	16.7	200.1	3.0	8	—	—	25.40	27,543.4	3915.37	272.024*P+1138
12	900	101.4	112.4	106.9	229.9	46.1	350.0	298	3/4-10	20.0	230.0	5.0	8	—	—	25.40	27,543.4	5305.41	
12	1500	101.3	112.4	106.9	239.9	46.1	350.0	298	3/4-10	20.0	230.0	5.0	8	—	—	25.40	27,543.4	8082.77	
14	150	82.3	91.8	91.5	205.0	33.0	300.0	254	5/8-11	16.7	200.0	3.0	8	—	—	22.23	10,092.7	2822.50	464.080*P+1912.901
14	300	82.3	91.8	91.5	205.0	33.0	300.0	254	5/8-11	16.7	200.0	3.0	8	—	—	22.23	10,092.7	4284.35	
14	600	82.3	91.8	91.5	205.0	33.0	350.0	298	3/4-10	20.0	230.0	3.0	8	—	—	22.23	14,413.7	6651.16	
14	900	82.3	91.8	83.5	200.0	37.0	350.0	298	3/4-10	21.0	230.0	3.0	8	—	—	22.23	14,413.7	9022.61	
16	150	82.3	91.8	97.5	209.0	33.0	300.0	254	5/8-11	16.7	200.0	3.0	8	—	—	22.23	14,413.7	3793.60	614.185*P+2589.8
16	300	82.3	91.8	97.5	209.0	33.0	300.0	254	5/8-11	16.7	200.0	3.0	8	—	—	22.23	14,413.7	5728.29	
16	600	110.1	120.6	104.5	226.0	33.0	336.0	298	3/4-10	20.0	230.0	3.0	8	—	—	25.40	35,390.9	8860.63	
16	900	110.1	120.6	116.0	217.0	25.4	350.0	298	3/4-10	20.0	230.0	3.0	8	—	—	25.40	35,390.9	11,999.11	
16	1500	89.9	95.1	146.9	230.4	33.0	415.0	356	M30-3.5	33.0	—	—	8	—	—	24.99	33,691.0	17,833	
18	150	110.1	120.6	101.5	230.0	33.0	336.0	298	3/4-10	20.0	230.0	3.0	8	—	—	25.40	35,390.9	5154.32	1028.12*P+3139.2
18	300	110.1	120.6	101.5	230.0	33.0	336.0	298	3/4-10	20.0	230.0	3.0	8	—	—	25.40	35,390.9	8392.89	
18	600	110.1	120.6	101.5	230.0	33.0	350.0	298	3/4-10	20.0	230.0	3.0	8	—	—	25.40	35,390.9	13,636.31	
18	900	120.4	134.2	83.0	299.9	25.4	475.0	406	1 1/2-8	40.0	300.2	8.0	8	—	—	31.75	82,683.2	18,890	
20	150	110.1	120.6	115.0	234.9	25.4	340.0	298	3/4-10	20.0	230.0	3.0	8	—	—	25.40	35,390.9	6501.61	1505.31*P+3551.2
20	300	109.8	120.6	113.0	234.9	36.0	350.0	298	3/4-10	20.0	230.0	3.0	8	—	—	25.40	35,390.9	11,243.33	
20	600	110.1	120.6	111.3	249.9	25.4	350.0	298	3/4-10	20.0	230.0	3.0	8	—	—	25.40	35,390.9	18,920.42	
20	900	120.4	134.2	130.0	299.9	25.4	475.0	406	1 1/2-8	40.0	300.2	8.0	8	—	—	31.75	82,683.2	26,612.55	
22	600	120.0	127.1	186.4	255.4	38.0	340.0	298	M20-2.5	22.0	—	—	8	—	—	32.00	64,864.0	24,186	1914.329*P+5179.96
24	150	110.1	120.6	112.5	234.9	36.0	350.0	298	3/4-10	20.0	230.0	3.0	8	—	—	25.40	35,390.9	12,443.10	2314.356*P+7907
24	300	110.1	120.6	112.5	234.9	36.0	350.0	298	3/4-10	20.0	230.0	3.0	8	—	—	25.40	35,390.9	19,733.26	
24	600	120.0	133.5	110.0	279.9	60.0	475.0	406	1 1/2-8	40.0	300.2	10.0	8	—	—	31.75	44,877.6	31,536.37	
24	900	145.8	162.3	159.0	314.6	30.0	475.0	406	1 1/2-8	40.0	300.2	3.0	8	—	—	38.10	146,843.2	43,362.63	
26	600	120.0	127.1	184.5	255.4	38.0	415.0	356	M30-3.5	33.0	—	—	8	—	—	32.00	64,864.0	35,184	2500.492*P+1035.8
26	900	150.0	158.1	226.4	335.4	38.0	475.0	406	M36-4	39.0	—	—	8	—	—	35.99	102,664	47,597	
30	600	150.0	158.1	227.0	320.4	38.0	475.0	406	M36-4	39.0	—	—	8	—	—	35.99	102,664	41,832	2895.419*P+13086.65
36	600	150.0	158.1	167.4	320.4	38.0	475.0	406	M36-4	39.0	—	—	8	—	—	35.99	102,664	52,262	3644.633*P+16078.80

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

Pressure ratings are according to API 6D/ASME 16.34
Class 150 P = 1.96 Class 900 P = 15.32
Class 300 P = 5.11 Class 1500 P = 25.53
Class 600 P = 10.21

* Stem with Double 'D' Flat Style

KF Series P3 Engineering Data

Flow Coefficient (C_V)

Size (in.)	Cv Value				
	285 psi	740 psi	1480 psi	2220 psi	3705 psi
2	—	—	350	320	330
3 x 2	—	—	190	185	187
3	—	—	1000	910	830
4 x 3	—	—	560	505	510
4	—	—	1850	1760	1660
6 x 4	—	—	800	730	742
6	—	—	4400	4300	4167
8 x 6	—	—	2150	2010	2033
8	—	—	8450	8400	8013
10 x 8	—	—	4500	4160	4051
10	—	—	14,250	14,160	13,309
12 x 10	—	—	8000	7300	7117
12	—	—	22,790	21,230	17,073
14 x 12	—	—	13,990	—	—
16 x 12	—	—	—	—	—
14	32,600	30,900	28,600	26,600	—
16 x 14	14,780	14,750	14,720	14,690	—
16	44,700	42,600	39,250	36,600	33,215
20 x 16	14,870	14,860	14,850	14,830	—
18	57,825	56,225	57,410	48,665	—
20	74,775	71,800	65,463	62,239	—
22	—	—	81,305	—	—
24	113,284	109,414	98,963	93,993	—
26	—	—	114,650	102,940	
30	—	—	158,900	—	—
36	—	—	226,300	—	—

Note: Consult factory for sizes not shown.

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
A105	-20	-29
LF2	-50	-46
F316	-50	-46

Seal Material	°F	°C
Viton®	-20	-29
HNBR	-40	-40

Seat Material	°F	°C
Devlon V	-50	-46
PEEK™	-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

QL = flow rate of liquid (gal./min.)
ΔP = differential pressure across the valve (psi)
G = specific gravity of liquid (for water, G=1)

$$QL = C_V\sqrt{\frac{\Delta P}{G}}$$

Gas Flow

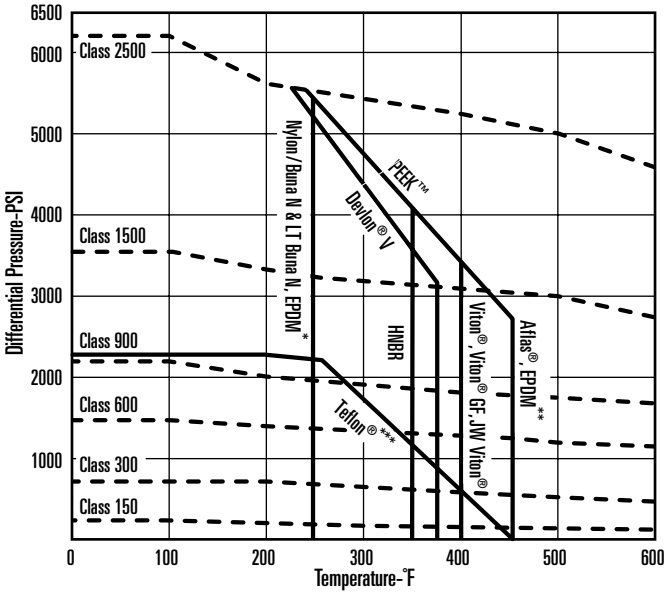
Qg = flow rate of gas (CFH at STP)
P2 = outlet pressure (psia)
g = Specific gravity of gas (for air, g=1.000)

$$Qg = 61C_V\sqrt{\frac{P_2\Delta P}{g}}$$

For non-critical flow

$$\left\{\frac{\Delta P}{P_2} < 1.0\right\}$$

Pressure Temperature Chart (Carbon Steel)



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** Water & Steam service only
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