

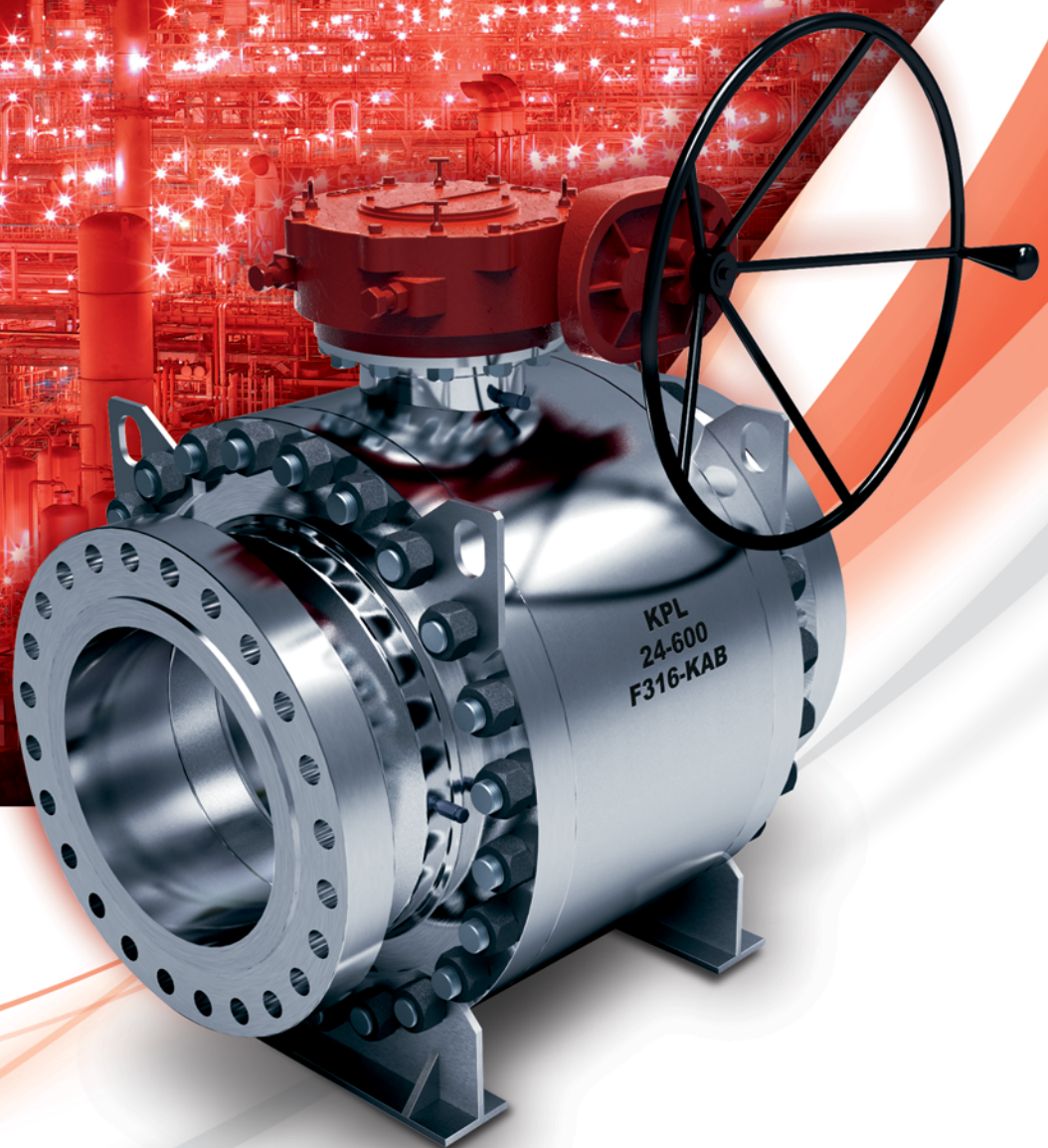
KPL API 6D TRUNNION MOUNTED BALL VALVES



API Q1, 6D
License # 6D-0694



Quality
ISO 9001
SAI GLOBAL



KPL VALVE IND. CO., LTD.

Introduction

We are very grateful to our valuable customers who have shown a deep attention on to KPL's growth and extended generous supports.

KPL VALVE IND. CO., LTD. was established in 1986 and for the past years, we KPL's as a specialized company to manufacture valves that were used pipe line and processed plant for instrumentation.

KPL became the leading company for its business productions in Korea with its qualified equipments, manpower and technical capability to design, manufacture and test in spite of young company.

These products are manufactured in our modern facilities where the quality is rigidly control in conformance to all application codes, standards and design criteria demanded by our licensors and clients.

We will do our best to accumulate advanced valve engineering technologies, to reduce production cost and improve quality assurance rules.

We promise that we will meet the needs and expectations of our valuable customers through the valve technology services and products of the highest quality.





API 6D High integrity trunnion ball valves

KPL trunnion mounted ball valve has been designed and manufactured with standards of industrial settings and clients' require based on API and ASME. We produce goods with various sizes, temperature, pressure condition that is able to be responded perfectly through our priority is safe and quality. Our valve has been used for gas, petrochemical, power plant and oil in industrial settings.

Basic materials of KPL trunnion mounted ball valve are carbon steel, low temperature carbon steel which is manufactured casting and Forging. Also special material is duplex stainless steel, monel 400, inconel, titanium that can be manufactured. All material steel and stainless of these have been managed from purchase in accordance with ASTM standards. According to ISO 9001, API, MSS standard. Quality management system of KPL valve industry has been administering process, assembling, test, purchase of materials, storage drastically.

Fields of Application

- Oil, Gas and product pipe lines
- Gas storages
- District Heating system
- Petrochemical industry
- On and offshore platforms
- Power plants
- Liquid gas launch and receiving station
- Suction and discharge isolation

Product Range

SIZE(Full Bore)		CLASS					
Inches	mm	150	300	600	900	1500	2500
2	50						
2-1/2	65						
3	80						
4	100						
6	150						
8	200						
10	250						
12	300						
14	350						
16	400						
18	450						
20	500						
22	550						
24	600						
26	650						
28	700						
30	750						
32	800						
34	850						
36	900						

SIZE(reduced Bore)		CLASS					
Inches	mm	150	300	600	900	1500	2500
2 x 1 1/2	50 x 40						
3 x 2	80 x 50						
4 x 3	100 x 80						
6 x 4	150 x 100						
8 x 6	200 x 150						
10 x 8	250 x 200						
12 x 10	300 x 250						
14 x 10	350 x 250						
14 x 12	350 x 300						
16 x 12	400 x 300						
16 x 14	400 x 350						
18 x 16	450 x 400						
20 x 16	500 x 400						
20 x 18	500 x 450						
24 x 20	600 x 500						
30 x 24	750 x 600						
36 x 30	900 x 750						

※ Other size, Class available on request.

CONFORMANCE STANDARDS

KPL Ball valves conform to the following standards and KPL is able to apply any other standard specified by the customer.

AMERICAN STANDARDS

ASME	B 16.5	- Pipe flanges and flanged fittings.
	B 16.10	- Face-to-face and end-to-end dimension of valves.
	B 16.25	- Butt-weld ends.
	B 16.34	- Valves - flanged, thread and weld ends.
	B 16.47	- Large diameter Steel Flanges.
	B 1.20.1	- Pipe threads, general purpose (inch).
	B 31.3	- Chemical plant and petroleum refinery piping.
	B 31.4	- Liquid transportation system for hydrocarbons.
		- Liquid petroleum gas, Anhydrous ammonia and alcohols.
	B 31.8	- Gas transmission and distribution system.
ASTM		- Material specifications of material used.
API	SPEC Q1	- Specification for quality programs.
	SPEC 6D	- Specification for pipeline valves.
		(Steel gate, Plug, ball and Check valves)
	SPEC 6FA	- Specification for fire test for valves.
	Std 607	- Fire test for soft-seated quarter-turn valves.
	Std 598	- Valve inspection and testing.
	SPEC 5L	- Specification for line pipe.
	SPEC RP6F	- Recommended practice for fire test for valves.
MSS	SP-6	- Standard finishes for contact of pipe flanges and connecting, end flanges of valves.
	SP-25	- Standard marking system for valves, fittings, flanges and unions.
	SP-44	- Steel pipeline flanges.
	SP-53	- Magnetic particle examination method.
	SP-54	- Visual method.
	SP-72	- Ball valves with flange or butt-weld ends for general service.
	SP-61	- Pressure testing of steel valves.
	SP-82	- Valves pressure testing method.
	SSPC, SP1~10	- Surface preparation specification.

INTERNATIONAL STANDARDS

ISO 9001	- Quality system. model of quality assurance in design, development, production, installation and servicing.
ISO 5211	- Part-turn valve actuator attachment.
7121	- Flanged steel ball valves.
EN 10204	- Type of inspection documents.
NACE-MR-01-75	- Sulfide stress cracking resistant materials.

BRITISH STANDARDS

BS 1560	- Circular flanges for pipes, flange and fittings.
BS 208	- Face to face, center-to-center, end-to-end and center-to end dimensions of valves.
BS 5146	- Inspection and tests of valves.
BS 5351	- Steel ball valves for the petroleum, petrochemical and allied instrument.
BS 6755 PT2	- Testing of valves. Specification for fire-type testing requirements.

GERMAN STANDARDS

DIN 1690	- Technical delivery conditions for casting of metallic materials.
2505	- Calculation of flange joints.
2544-48	- Cast steel flanges.
2526	- Finishing of flange packing surfaces.
3202	- Face-to-face dimension of flange valves.
3230	- Bodies of valves, calculation.
DIN XXXX	- Material specifications of materials used.

JIS / KS

JIS B 2002	- Face to face and end to end dimension of valve.
JIS B 2003	- General rules for inspection of valves.
JIS B 2220	- Steel welding pipe flanges.
KS B 2304	- Ball valve.
KS B 2308	- Korea standard flanged ball valves.

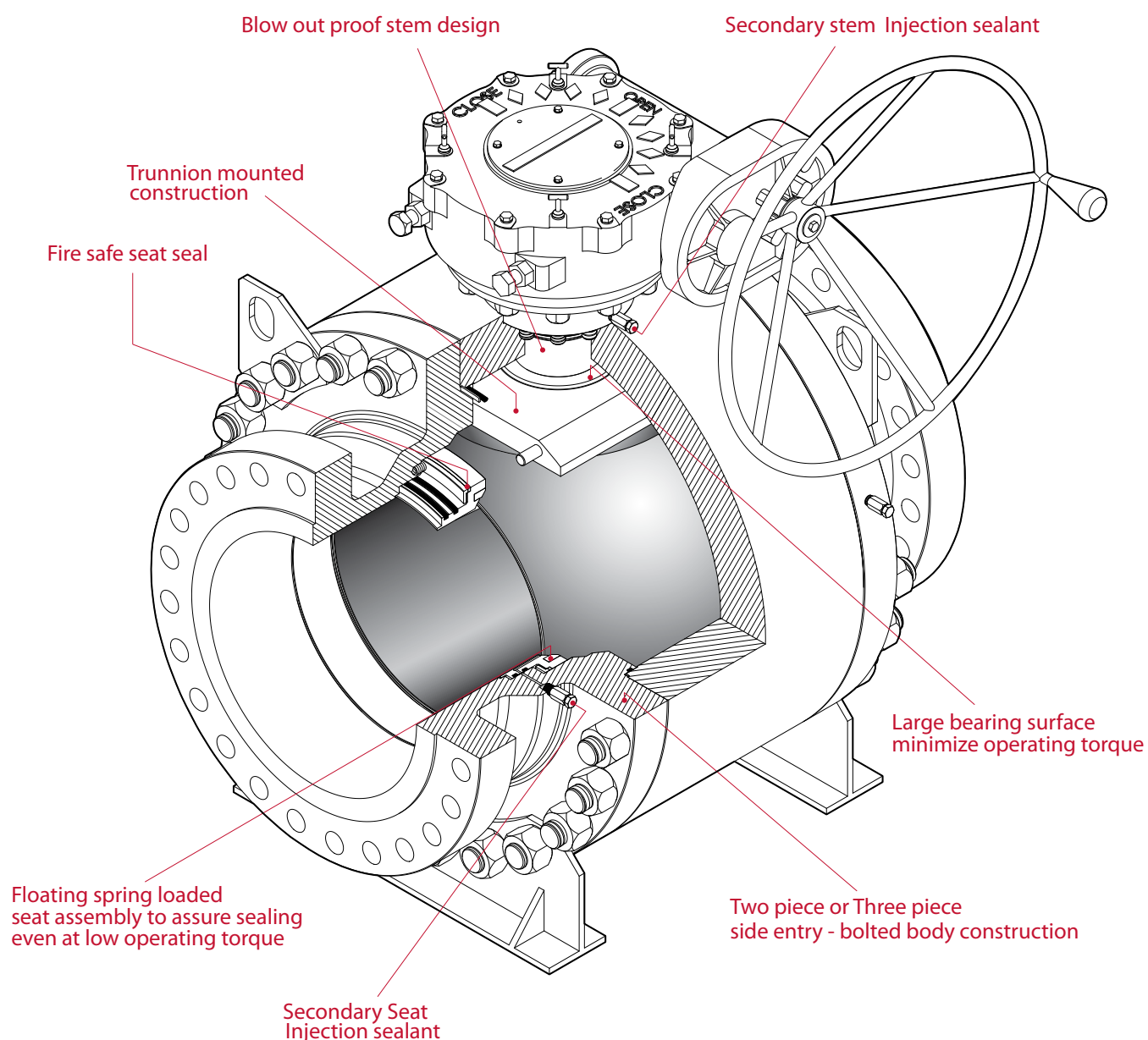
Design Features

For floating ball valve, due to the seat & ball surface of downstream side in contact got pressured mostly if pressured of fluid to upstream side flow. In result, as bore is larger, pressure is higher, seat and stem parts got much pressured. So operating torque is getting higher. Because of torque is higher so that durability is lower.

Design of trunnion mounted ball valve is structured for compensating defect. The ball is fixed at axial direction by trunnion or trunnion block and it is designed for only rotary motion. So it is able to prevent pressure of upstream side flow to put downstream side flows to put into downstream side as designed floating type. And that can be got low torque by trunnion bearing with low coefficient of friction.

KPL Trunnion mounted ball valve is structured side entry design of 2-piece and 3-piece.

It is based on bolted body type which means standard. Our valve has been manufacturing to meet wall thickness in accordance with ASME B16.34 and BS 5351. It is easy to be designed that disassemble of valve and replacement of parts of valve inside in the field. Leakage of valve body is shut off because of spiral wound gasket and o-ring that is made of a graphite or teflon with filler.

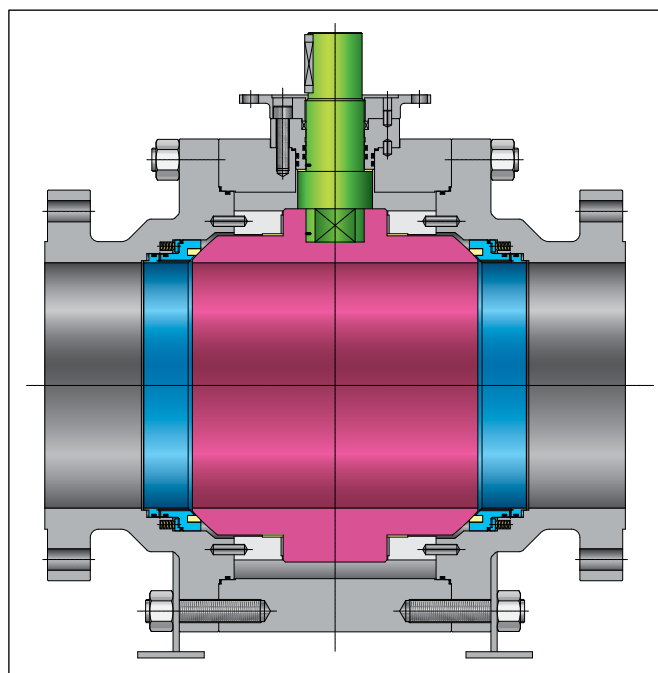


Design Features

Body Construction

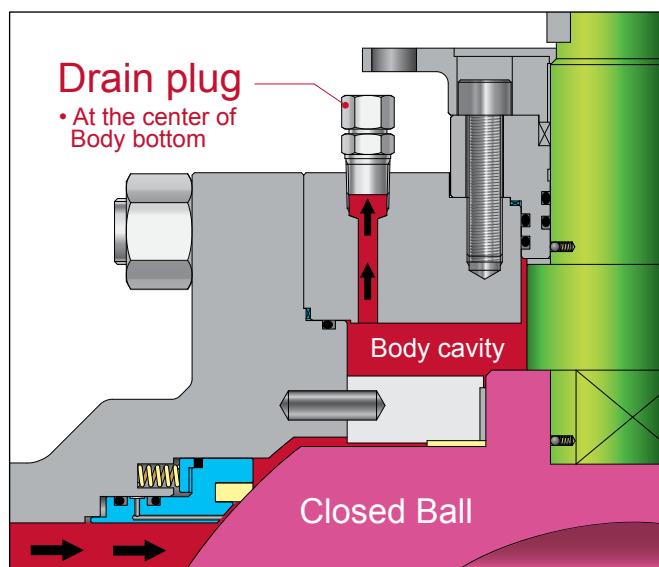
KPL Trunnion mounted ball valve is structured side entry design of two piece and three piece. It is based on bolted body type which means standard.

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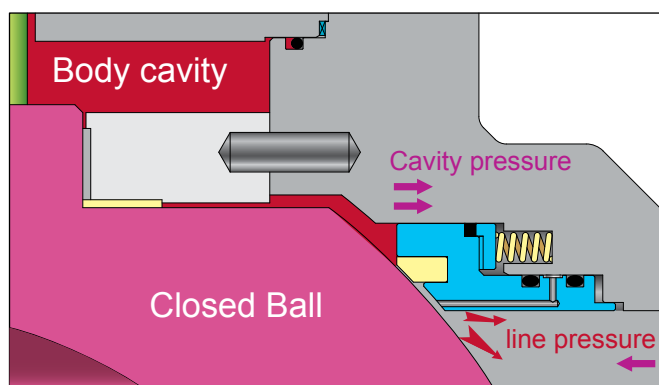
Double Block and Bleed Seat Design

Each seat works independently assuring a tight shut-off seal against ball on the upstream and downstream side, allowing double block operation when the pressure is simultaneously applied to both sides of the ball in closed position, the valve bore and the cavity will be isolate from each other, and the residue within the body cavity can be released through the drain plug.



Self Relieving Seat Design

When the body cavity pressure exceeds the spring and line pressure, automatic pressure relief will occur by relieving the body cavity pressure past the both seats. Any overpressure acting in the body cavity is discharged into the line to restore the balance between the body cavity and line.



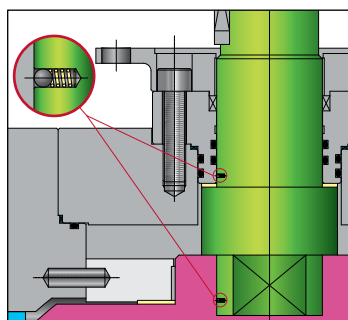
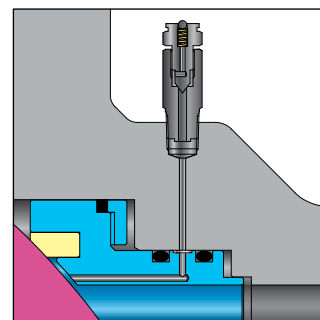
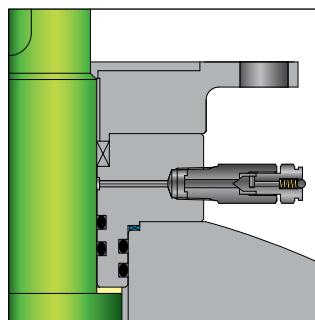
NACE Compliance

All materials supplied for KPL trunnion mounted ball valves meet the requirements of NACE MR-01-75. Compliance is ensured during the manufacturing process by strict inspection and material control.

Design Features

Emergency Sealant Injection System

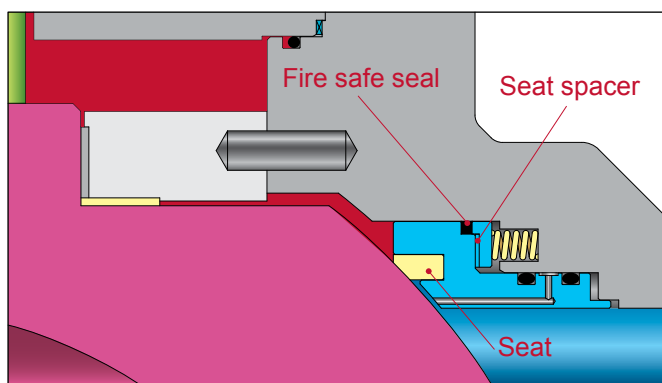
KPL Trunnion mounted ball valves are manufactured more than 6 inch which has options. And it can be equipped emergency sealant fitting can be replace the area which seat and stem as injecting sealant through sealant fitting when seat and stem sealing component is damaged. Emergency sealant injection system has been used gas transmission or critical system mainly.



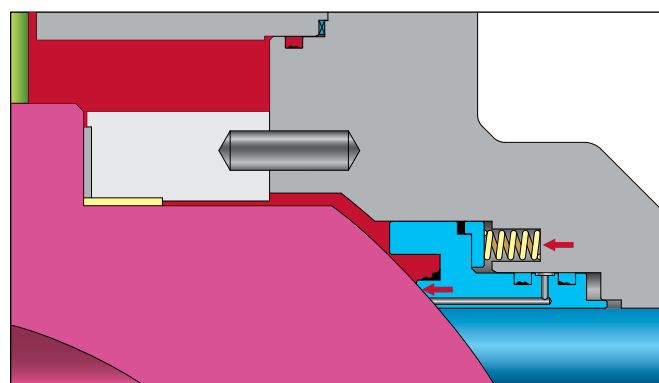
Anti-Static Design

During turning of the stem to open and close the valve, static electricity easily caused by and generated by friction that cause an accident. Anti-static devices between ball, stem, trunnion and body are assembly by spring and stainless steel ball, which ensure all metal valve parts are grounding.

Fire Safety Construction With Secondary Metal Seat



Before Fire



After Fire

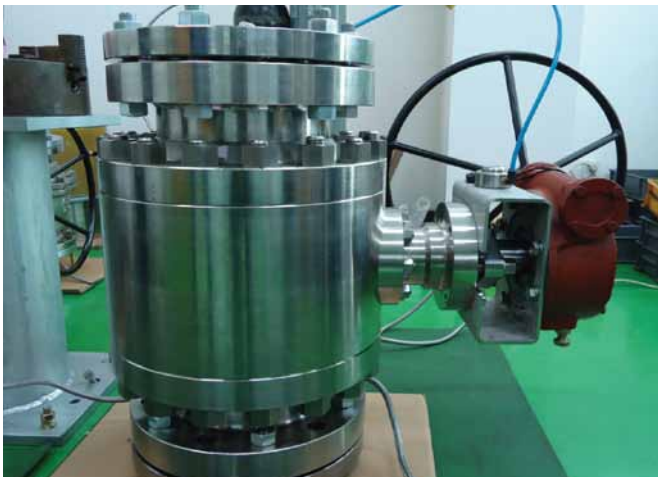
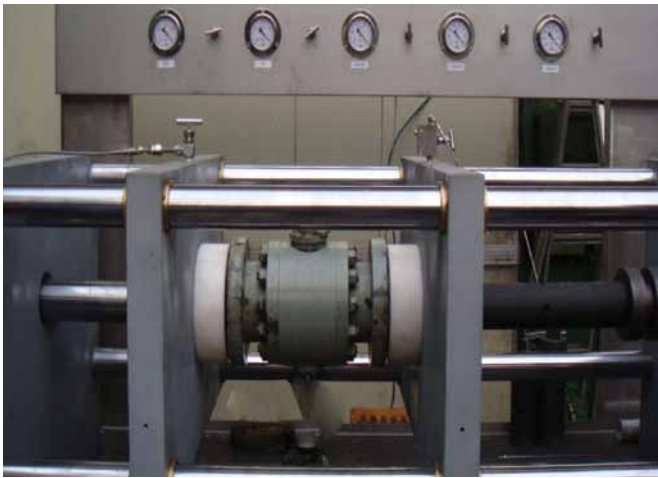
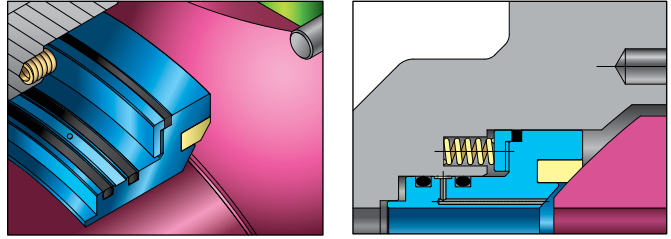
KPL Trunnion mounted ball valve can be adopted fire safety accordance with API 607. Soft seat insert, o-ring and seat spacer is melt down over temperature is getting higher inside of valve body by fire. It can occur leakage with the result that seat o-ring which involved sealing is melt down. At that time, spring push seat assembly as seat is being melt down. Fire safety seal is made of graphite material that is able to replace destroyed o-ring as seat spacer burns away.



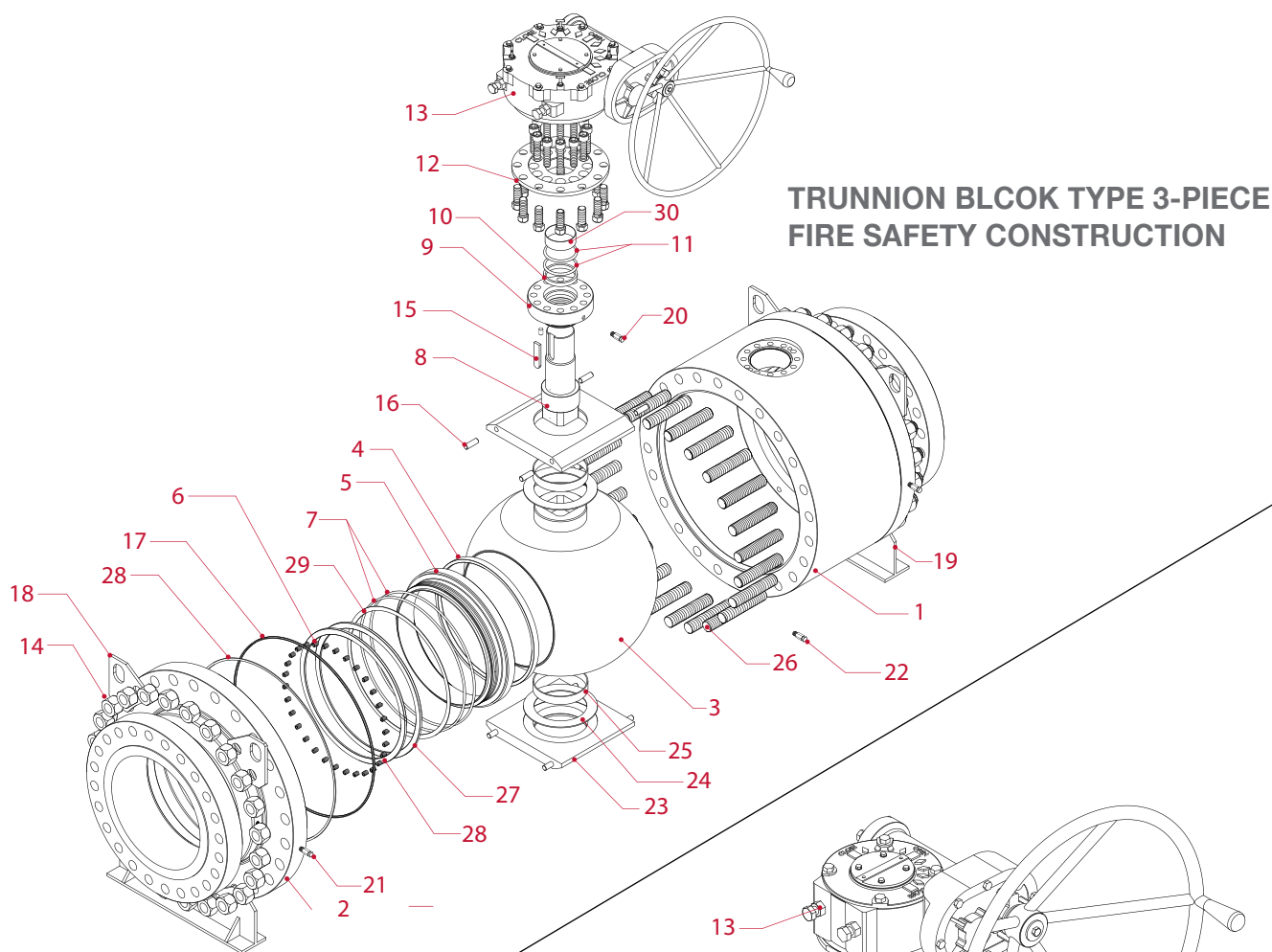
Design Features

Constrained Seat Assembly

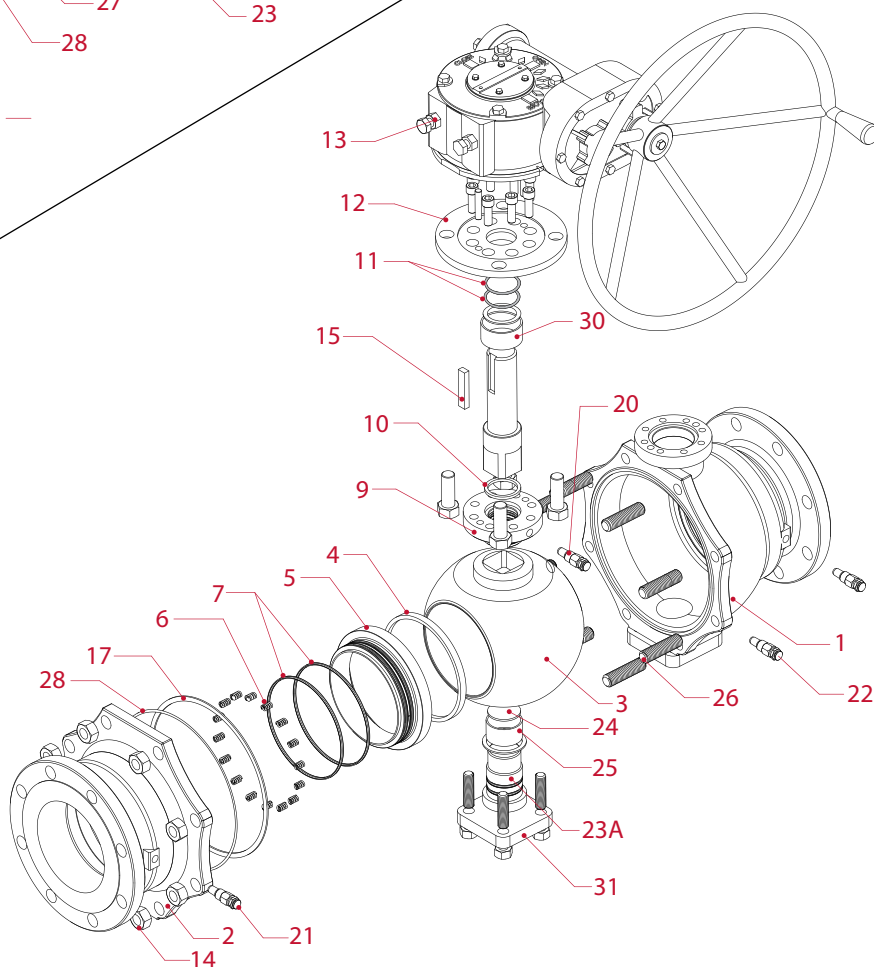
KPL Trunnion mounted ball valves have features that the constrained seat design which assures seat integrity under high differential pressures. It allows for seat interchangeability, lower torque and provision for emergency seat injection. The seat design has been qualified with high velocity blow-down testing and extended pressure temperature testing. The seat material of the standard for under class 600 valves are made PTFE, glass & carbon filled PTFE that allows service conditions to 110°C and NYLON & DEVLON used for class 900 and class 1500. PEEK & PCTFE used for class 2500. Other seat materials are available to customer specification.



Exploded View



TRUNNION TYPE 2-PIECE CONSTRUCTION



Parts List				
No.	Description	Carbon Steel	Low Temperature Carbon Steel	Stainless Steel
01	Body	ASTM A105 / A216 WCB	ASTM A350 LF2 / A352 LCC	ASTM A351 CF8M / A182 F316
02	End Cap	ASTM A105 / A216 WCB	ASTM A350 LF2 / A352 LCC	ASTM A351 CF8M / A182 F316
03	Ball	ASTM A216 WCB +ENP ASTM A351 CF8M	ASTM A352 LCC+ENP ASTM A351 CF8M	ASTM A351 CF8M
04	Seat (150 to 600) Seat (900 to 1500) Seat (2500)	PTFE / RTFE NYLON / DEVLON PEEK / PCTFE	PTFE / RTFE NYLON / DEVLON PEEK / PCTFE	PTFE / RTFE NYLON / DEVLON PEEK / PCTFE
05	Seat Retainer	ASTM A216 WCB+ENP	ASTM A216 WCB +ENP	ASTM A351 CF8M / A182 F316
06	Seat Spring	Inconel X750	Inconel X750	Inconel X750
07	Seat O-Ring	NBR / VITON	NBR / VITON	NBR / VITON
08	Stem	ASTM A105 +ENP ASTM A276 304	ASTM A350 LF2+ENP ASTM A276 304	ASTM A276 316
09	Bonnet	ASTM A105 / A216 WCB	ASTM A350 LF2 / A352 LCC	ASTM A351 CF8M / A182 F316
10	Packing	PTFE / Graphite	PTFE / Graphite	PTFE / Graphite
11	Stem O-Ring	NBR / VITON	NBR / VITON	NBR / VITON
12	Gland Flange	ASTM A105 / A216 WCB	ASTM A350 LF2 / A352 LCC	ASTM A351 CF8M / A182 F316
13	Gear Box	Ductile Cast Iron	Ductile Cast Iron	Ductile Cast Iron
14	Body Connected Nut	ASTM A194 Gr7	ASTM A320 Gr7	ASTM A194 Gr8
15	Stem Key	ASTM A564 630	ASTM A564 630	ASTM A564 630
16	Trunnion block pin	ASTM A276 304	ASTM A276 304	ASTM A276 316
17	Body Gasket	SPWD 316ss / Graphite	SPWD 316ss / Graphite	SPWD 316ss / Graphite
18	Lift Lug	Carbon Steel	Carbon Steel	Stainless Steel
19	Support Leg	Carbon Steel	Carbon Steel	Stainless Steel
20	Stem Injection Fitting	AISI 1020+Zn Plate	AISI 1020+Zn Plate	ASTM A276 316
21	Seat Injection Fitting	AISI 1020+Zn Plate	AISI 1020+Zn Plate	ASTM A276 316
22	Bleed Plug	ASTM A105	ASTM A350 LF2	ASTM A276 316
23	Trunnion Block	ASTM A216 WCB +ENP	ASTM A216 WCB +ENP	ASTM A351 CF8M
23A	Trunnion	ASTM A216 WCB +ENP	ASTM A216 WCB +ENP	ASTM A351 CF8M
24	Ball Thrust washer	A105+Teflon Coating Nylon	LF2+Teflon Coating Nylon	316+Teflon Coating Nylon
25	Trunnion Bush	A105+Teflon Coating Du-Bush	LF2+Teflon Coating Du-Bush	316+Teflon Coating
26	Body Connect Bolt	ASTM A193 Gr7	ASTM A320 Gr7	ASTM A193-Gr8
27	Fire Safety Seat Seal *	Graphite	Graphite	Graphite
28	Seat Load Ring *	ASTM A105	ASTM A350 LF2	ASTM A276 316
29	Seat Spacer *	Nylon	Nylon	Nylon
30	Stem Bush	A105+Teflon Coating Du-Bush	LF2+Teflon Coating Du-Bush	316+Teflon Coating
31	Trunnion Flange	ASTM A105	ASTM A350 LF2	ASTM A276 316

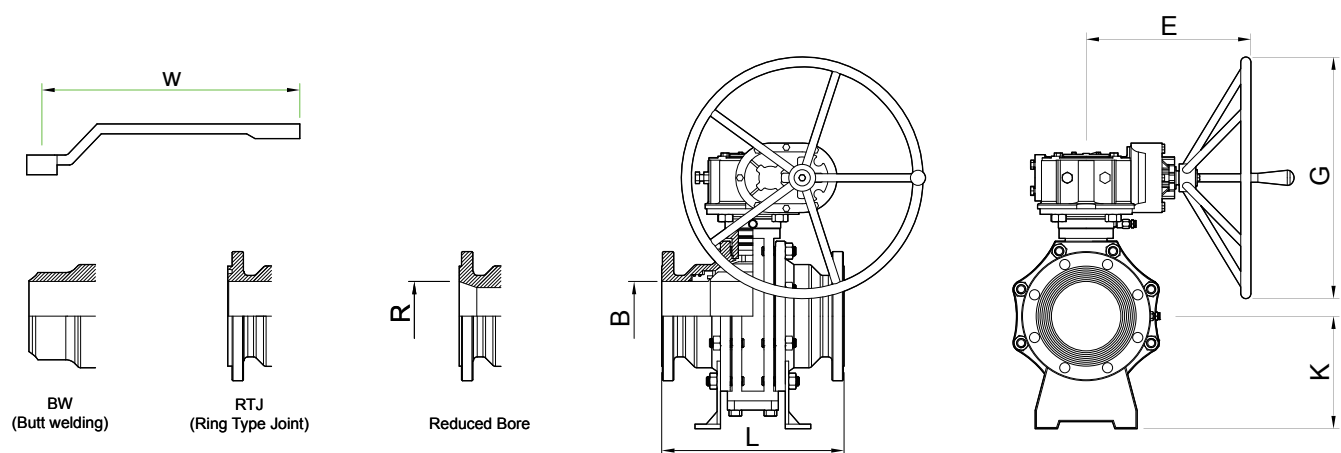
※ Note : ENP is Electroless Nickel Plating.

AED (Anti Explosive Decompression) O-Ring seals Available on request.

* Fire Safety Construction only.

All materials are for reference only, subject to change.

KPL Trunnion Mounted Ball Valve Dimensional Data



Unit: mm

Class 150 - Full Bore - Side Entry

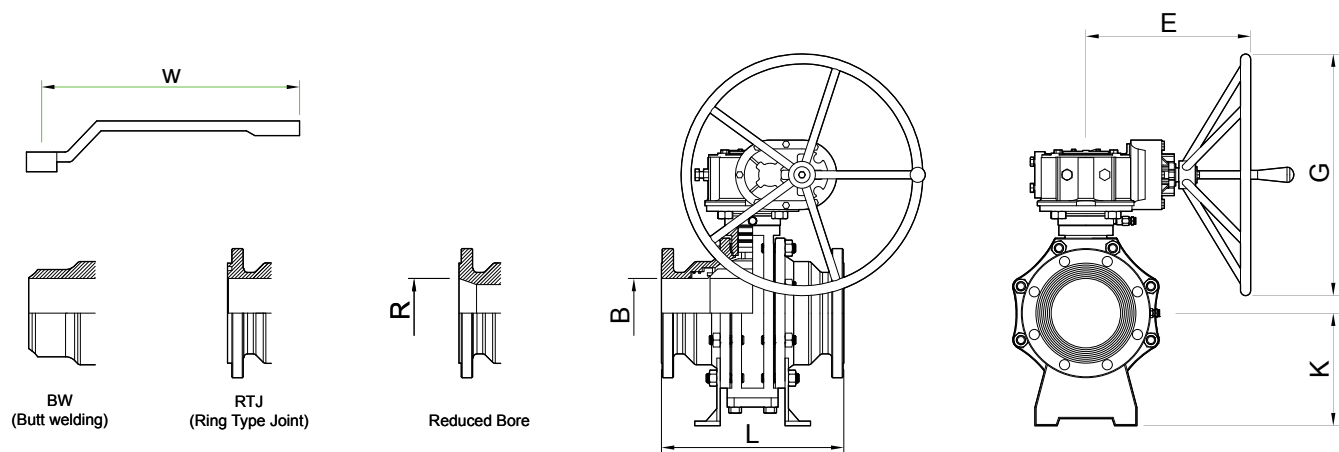
SIZE		L			B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ						
2	50	178	216	191	48	360	-	-	85	28
2-1/2	65	190	241	203	62	360	-	-	95	50
3	80	203	283	216	76	500	-	-	110	60
4	100	229	305	242	100	500	-	-	142	105
6	150	394	457	407	150	-	460	279	223	182
8	200	457	521	470	200	-	560	312	248	296
10	250	533	559	546	250	-	560	312	320	493
12	300	610	635	623	300	-	560	312	335	654
14	350	686	762	699	336	-	630	371	390	812
16	400	762	838	775	384	-	630	371	420	1220
18	450	864	914	877	435	-	630	371	477	1360
20	500	914	991	927	485	-	710	425	525	1835
22	550	991	1092	-	538	-	710	425	570	2460
24	600	1067	1143	1080	586	-	710	425	635	3190
26	650	1143	1245	-	630	-	800	513	650	3790
28	700	1244	1346	-	684	-	800	513	680	4560
30	750	1295	1397	-	732	-	800	513	730	4560
32	800	1371	1524	-	776	-	900	538	770	6950
34	850	1473	1626	-	830	-	900	538	800	7780
36	900	1524	1727	-	872	-	1000	615	820	7780

Class 150 - Reduced Bore - Side Entry

SIZE		L			R	B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ							
2 X 1 1/2	50 x 40	178	216	191	48	38	280	-	-	80	25
3 X 2	80 x 50	203	283	216	76	48	360	-	-	85	48
4 X 3	100 x 80	229	305	242	100	76	500	-	-	110	86
6 X 4	150 x 100	394	457	407	150	100	500	-	-	142	120
8 X 6	200 x 150	457	521	470	200	150	-	460	279	223	223
10 X 8	250 x 200	533	569	546	250	200	-	560	312	248	328
12 X 10	300 x 250	533	569	546	300	250	-	560	312	320	519
14 X 10	350 x 250	533	569	546	300	250	-	560	312	320	623
14 X 12	350 x 300	533	569	546	300	250	-	560	312	335	725
16 X 12	400 x 300	762	838	775	384	300	-	560	312	335	788
16 X 14	400 x 350	762	838	775	384	336	-	630	371	390	850
18 X 16	450 x 400	864	914	877	435	336	-	630	371	420	1180
20 X 16	500 x 400	914	991	927	485	336	-	630	371	420	1200
20 X 18	500 x 450	914	991	927	485	435	-	630	371	477	1380
24 X 20	600 x 500	1067	1143	1080	586	485	-	710	425	525	2220
30 X 24	750 x 600	1295	1397	-	732	586	-	710	425	635	3500
36 X 30	900 x 750	1524	1727	-	872	732	-	800	513	730	7150

※ Other size available on request. Dimension K, G, E & weights are subject to change without notice.

KPL Trunnion Mounted Ball Valve Dimensional Data



Class 300 - Full Bore - Side Entry

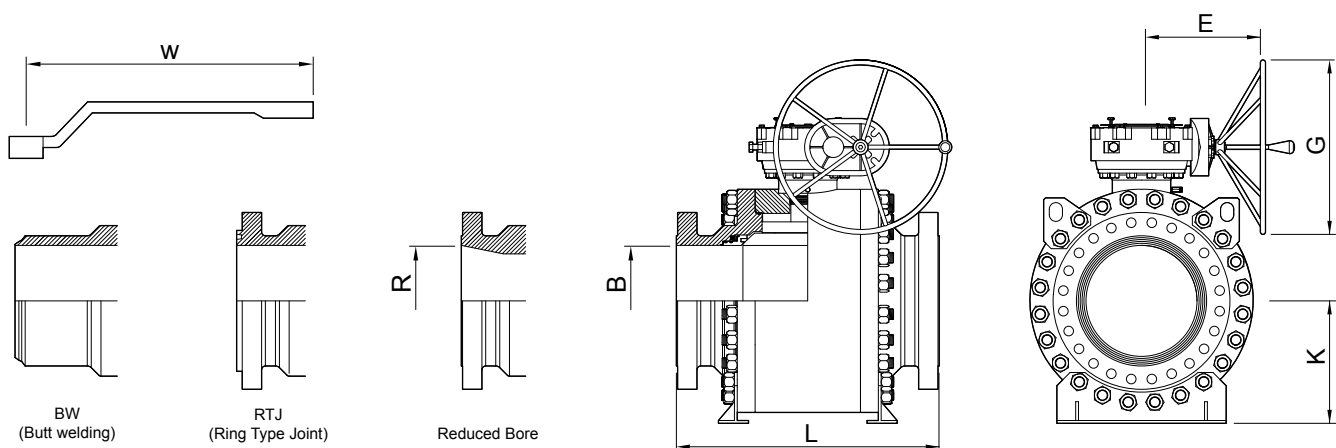
SIZE		L			B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ						
2	50	216	216	232	48	360	-	-	85	29
2-1/2	65	241	241	257	62	360	-	-	95	48
3	80	283	283	298	76	500	-	-	110	65
4	100	305	305	321	100	500	-	-	142	95
6	150	403	457	419	150	-	460	279	223	220
8	200	502	521	518	200	-	560	312	248	315
10	250	568	559	584	250	-	560	312	320	580
12	300	648	635	664	300	-	560	312	335	780
14	350	762	762	778	336	-	630	371	390	1029
16	400	838	838	854	384	-	630	371	420	1553
18	450	914	914	930	435	-	630	371	477	1705
20	500	991	991	1010	485	-	710	425	525	2345
22	550	1092	1092	1165	538	-	710	425	570	3013
24	600	1143	1143	1165	586	-	710	425	635	3675
26	650	1245	1245	1270	630	-	800	513	650	4853
28	700	1346	1346	1372	684	-	800	513	680	6030
30	750	1397	1397	1422	732	-	800	513	730	7228
32	800	1524	1524	1552	776	-	900	538	770	8563
34	850	1626	1626	1654	830	-	900	538	800	9950
36	900	1727	1727	1756	872	-	1000	615	820	10393

Class 300 - Reduced Bore - Side Entry

SIZE		L			R	B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ							
2 x 1 1/2	50 x 40	216	216	232	48	38	280	-	-	80	28
3 x 2	80 x 50	241	241	298	76	48	360	-	-	85	39
4 x 3	100 x 80	283	283	321	100	76	500	-	-	110	95
6 x 4	150 x 100	403	457	419	150	100	500	-	-	142	135
8 x 6	200 x 150	502	521	518	200	150	-	460	279	223	245
10 x 8	250 x 200	568	559	554	250	200	-	560	312	248	388
12 x 10	300 x 250	648	635	664	300	250	-	560	312	320	650
14 x 10	350 x 250	762	762	778	300	250	-	560	312	320	711
14 x 12	350 x 300	762	762	778	300	250	-	560	312	335	883
16 x 12	400 x 300	838	838	854	384	300	-	560	312	335	1053
16 x 14	400 x 350	838	838	854	384	336	-	630	371	390	1325
18 x 16	450 x 400	838	838	854	435	336	-	630	371	420	1683
20 x 16	500 x 400	991	991	1010	485	336	-	630	371	420	1766
20 x 18	500 x 450	991	991	1010	485	435	-	630	371	477	1936
24 x 20	600 x 500	1143	1143	1165	586	485	-	710	425	525	3011
30 x 24	750 x 600	1397	1397	1422	732	586	-	710	425	635	5013
36 x 30	900 x 750	1727	1728	1756	872	732	-	800	513	730	9931

※ Other size available on request. Dimension K, G, E & weights are subject to change without notice.

KPL Trunnion Mounted Ball Valve Dimensional Data



Unit: mm

Class 600 - Full Bore - Side Entry

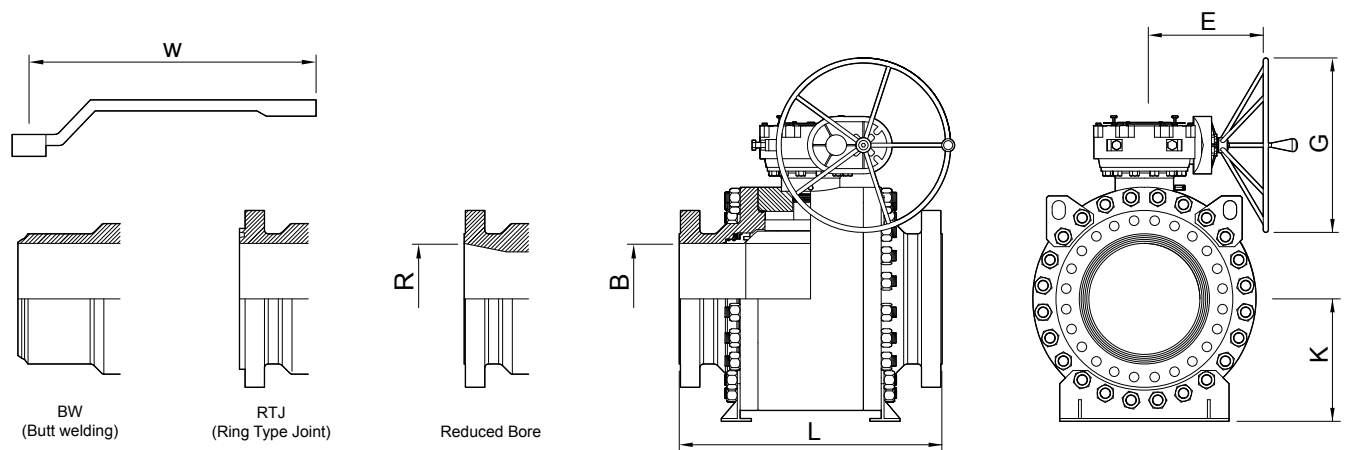
SIZE		L			B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ						
2	50	292	292	295	48	360	-	-	85	38
2-1/2	65	330	330	333	62	360	-	-	95	56
3	80	356	356	359	76	500	-	-	110	72
4	100	432	432	435	100	500	-	-	142	135
6	150	559	559	562	150	-	460	279	228	285
8	200	660	660	664	200	-	560	312	257	518
10	250	787	787	791	250	-	630	371	320	820
12	300	838	838	841	300	-	630	371	355	1120
14	350	889	889	892	336	-	630	371	400	1221
16	400	991	991	994	384	-	710	425	440	1630
18	450	1092	1092	1095	435	-	710	425	495	2220
20	500	1194	1194	1200	485	-	800	513	540	2839
22	550	1296	1296	1305	538	-	900	536	586	3900
24	600	1397	1397	1406	586	-	900	536	624	4942
26	650	1448	1448	1460	630	-	1000	615	655	5850
28	700	1549	1549	1562	684	-	1000	615	693	6930
30	750	1684	1684	1697	732	-	1000	690	736	8700
32	800	1778	1778	1794	776	-	1000	690	775	9953
34	850	1930	1930	1946	830	-	1000	814	820	11683
36	900	2083	2083	2098	872	-	1000	857	850	13955

Class 600 - Reduced Bore - Side Entry

SIZE		L			R	B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ							
2 x 1 1/2	50 x 40	216	216	232	48	38	280	-	-	80	34
3 x 2	80 x 50	241	241	298	76	48	360	-	-	85	48
4 x 3	100 x 80	283	283	321	100	76	500	-	-	110	99
6 x 4	150 x 100	403	457	419	150	100	500	-	-	142	165
8 x 6	200 x 150	502	521	518	200	150	-	460	279	228	323
10 x 8	250 x 200	568	559	554	250	200	-	560	312	257	610
12 x 10	300 x 250	648	635	664	300	250	-	630	371	320	859
14 x 10	350 x 250	762	762	778	300	250	-	630	371	320	960
14 x 12	350 x 300	762	762	778	300	250	-	630	371	355	1200
16 x 12	400 x 300	838	838	854	384	300	-	630	371	355	1450
16 x 14	400 x 350	838	838	854	384	336	-	630	371	400	1560
18 x 16	450 x 400	838	838	854	435	336	-	710	425	440	1750
20 x 16	500 x 400	991	991	1010	485	336	-	710	425	440	2220
20 x 18	500 x 450	991	991	1010	485	435	-	710	425	495	2495
24 x 20	600 x 500	1143	1143	1165	586	485	-	800	513	540	3567
30 x 24	750 x 600	1397	1397	1422	732	586	-	900	536	624	5850
36 x 30	900 x 750	1727	1728	1756	872	732	-	1000	615	693	10706

※ Other size available on request. Dimension K, G, E & weights are subject to change without notice.

KPL Trunnion Mounted Ball Valve Dimensional Data



Class 900 - Full Bore - Side Entry

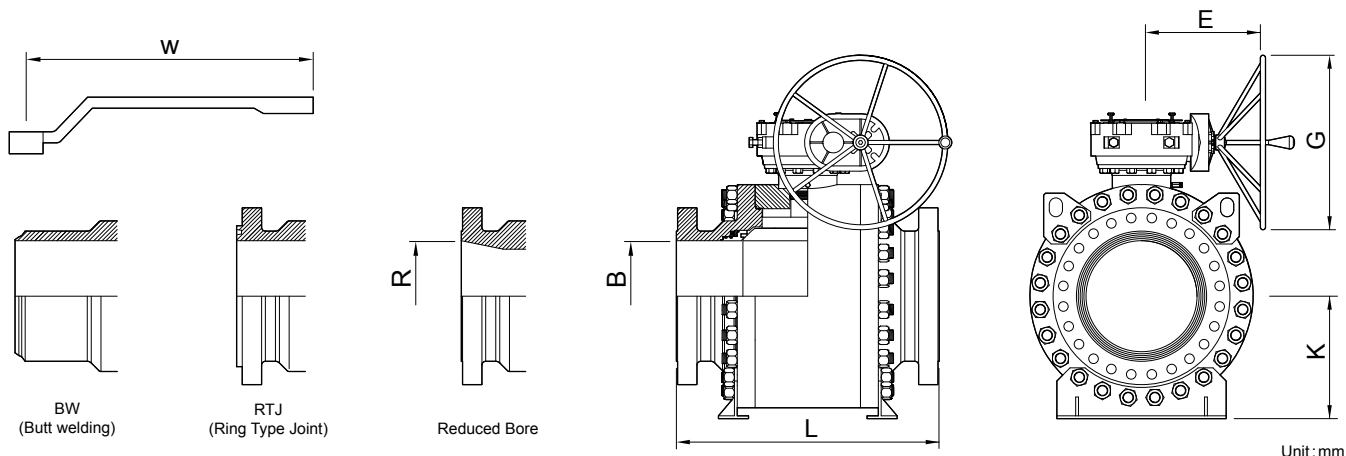
SIZE		L			B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ						
2	50	368	368	371	48	360	-	-	100	52
2-1/2	65	419	419	422	62	360	-	-	125	65
3	80	381	381	384	76	500	-	-	141	78
4	100	457	457	460	100	-	460	279	152	159
6	150	610	610	613	150	-	460	279	240	387
8	200	737	737	740	200	-	560	312	285	622
10	250	838	838	841	250	-	560	312	335	1022
12	300	965	965	968	300	-	560	312	385	1560
14	350	1029	1029	1038	316	-	630	371	418	1500
16	400	1130	1130	1140	358	-	630	371	470	2305
18	450	1219	1219	1232	420	-	710	425	510	3010
20	500	1321	1321	1333	465	-	710	425	565	4325
24	600	1549	1549	1568	568	-	1000	615	655	7010

Class 600 - Reduced Bore - Side Entry

SIZE		L			R	B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ							
2 X 1 1/2	50 X 40	368	368	371	48	38	280	-	-	80	52
3 X 2	80 X 50	381	381	384	76	48	360	-	-	85	58
4 X 3	100 X 80	457	457	460	100	76	500	-	-	110	105
6 X 4	150 X 100	610	610	613	150	100	500	-	-	142	222
8 X 6	200 X 150	737	737	740	200	150	-	460	279	223	460
10 X 8	250 X 200	838	838	841	250	200	-	560	312	287	720
12 X 10	300 X 250	965	965	968	300	250	-	560	312	330	1290
14 X 10	350 X 250	1029	1029	1038	316	250	-	560	312	330	1380
14 X 12	350 X 300	1130	1130	1140	316	300	-	560	312	360	1723
16 X 12	400 X 300	1130	1130	1140	384	300	-	560	312	360	1850
16 X 14	400 X 350	1219	1219	1232	358	316	-	630	371	390	1820
18 X 16	450 X 400	1219	1219	1232	435	358	-	630	371	470	2560
20 X 16	500 X 400	1321	1321	1333	485	358	-	630	371	470	2950
20 X 18	500 X 450	1321	1321	1333	485	420	-	630	371	510	3473
24 X 20	600 X 500	1549	1549	1568	586	465	-	710	425	535	5620

※ Other size available on request. Dimension K, G, E & weights are subject to change without notice.

KPL Trunnion Mounted Ball Valve Dimensional Data



Unit : mm

Class 1500 - Full Bore - Side Entry

SIZE		L			B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ						
2	50	368	368	371	48	450	-	-	108	60
2-1/2	65	419	419	422	62	600	-	-	130	85
3	80	470	470	473	76	700	-	-	145	110
4	100	546	546	549	100	-	460	279	160	220
6	150	705	705	711	150	-	560	312	250	520
8	200	832	832	841	190	-	560	312	295	915
10	250	991	991	1000	238	-	630	371	360	1580
12	300	1130	1130	1146	286	-	710	425	433	2450
14	350	1257	1257	1276	316	-	1000	615	450	3135
16	400	1384	1384	1499	358	-	1000	615	505	4560

Class 1500 - Reduced Bore - Side Entry

SIZE		L			R	B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ							
2 X 1 1/2	50 X 40	368	368	371	48	38	400	-	-	80	54
3 X 2	80 X 50	381	381	384	76	48	450	-	-	85	75
4 X 3	100 X 80	457	457	460	100	76	650	-	-	110	155
6 X 4	150 X 100	737	737	740	150	100	-	460	279	160	302
8 X 6	200 X 150	838	838	841	200	150	-	560	312	250	650
10 X 8	250 X 200	965	965	968	238	200	-	560	312	295	1220
12 X 10	300 X 250	1029	1029	1038	286	238	-	630	371	360	1920
14 X 10	350 X 250	1130	1130	1140	316	238	-	630	371	360	2353
14 X 12	350 X 300	1130	1130	1140	316	286	-	710	425	433	2891
16 X 12	400 X 300	1219	1219	1232	358	286	-	710	425	433	3108
16 X 14	400 X 350	1219	1219	1232	358	316	-	1000	615	450	3569

Class 2500 - Full Bore - Side Entry

SIZE		L			B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ						
2	50	451	451	454	42	450	-	-	128	95
3	80	578	578	584	62	650	-	-	200	196
4	100	673	673	683	86	-	560	312	240	423
6	150	914	914	927	132	-	560	312	265	850
8	200	1022	1022	1038	178	-	630	371	350	1560

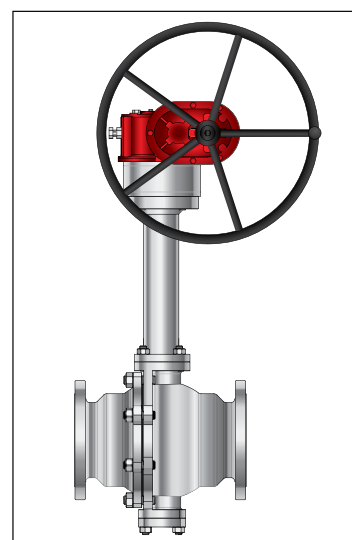
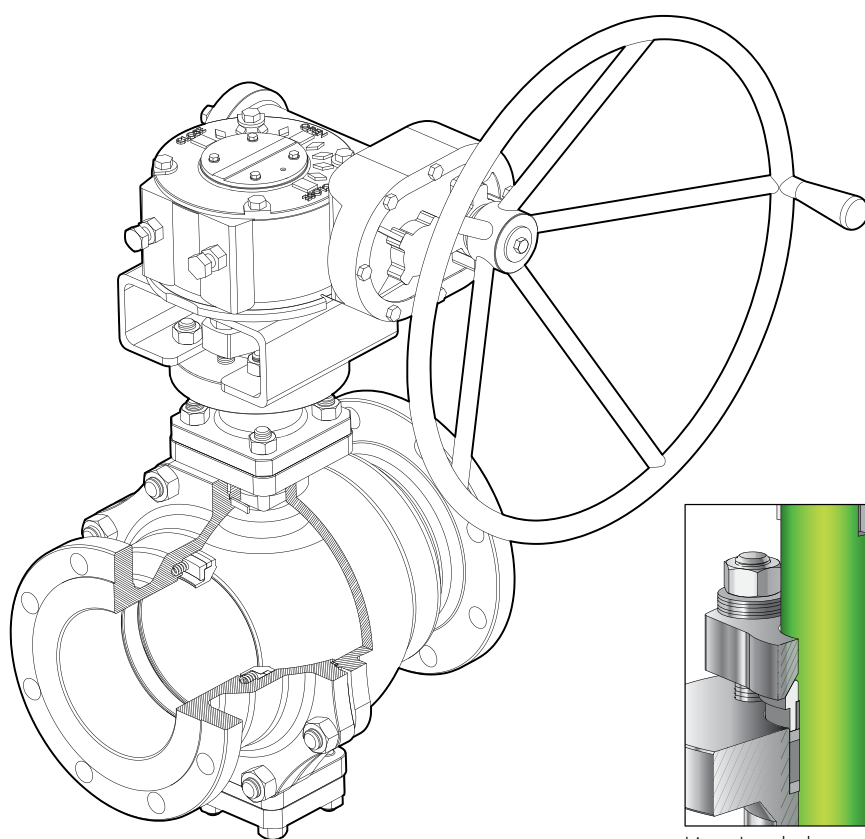
Class 2500 - Reduced Bore - Side Entry

SIZE		L			R	B	W	G	E	K	APPROX WEIGHT(kg)
Inches	mm	RF	BW	RTJ							
2 X 1 1/2	50 X 40	451	451	454	42	32	360	-	-	104	68
3 X 2	80 X 50	578	578	584	62	48	450	-	-	128	180
4 X 3	100 X 80	673	673	683	86	62	650	-	-	200	289
6 X 4	150 X 100	914	914	927	132	86	-	560	312	240	611
8 X 6	200 X 150	1022	1022	1038	175	132	-	560	312	265	1350

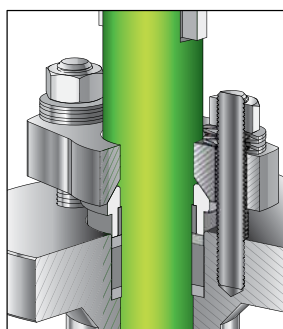
※ Other size available on request. Dimension K, G, E & weights are subject to change without notice.

Metal Seated Trunnion Mounted Ball Valves For High Temperature & Abrasive Service

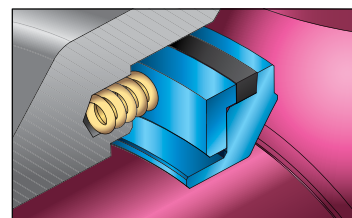
KPL Metal seated Trunnion mounted ball valves are specially coated matched balls and seats to stand up to high temperatures, high pressures and abrasive service. The valves are typically provided with Tungsten Carbide 316ss ball and seats or Electroless Nickel plated (ENP) 17-4PH ball and seats. High precision machining and seat to ball rubbing result in superior ball and seat interfacing for reliable sealing conforming ANSI/FCI 70-2 class V, class VI and API 598.



Extended bonnet design for high temperature service.



Live Loaded stem packing with dual anti - extrusion rings ensures zero emissions.



Mate-lapped 100% sealing contact ensures a leak free seat system and low torque operation.

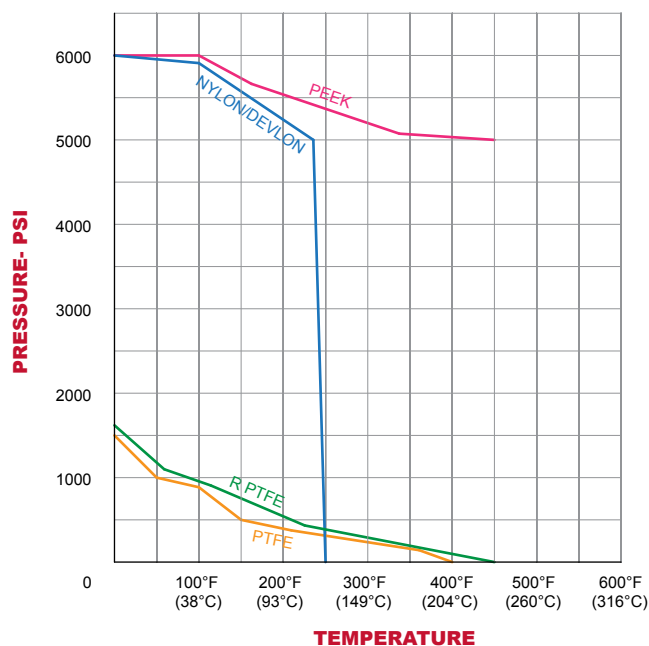
Coating Materials Data

Coating	Description	Temp • Limit	Process	Hardness(HRC)	Base Metal
ENP	Electroless Nickel plating	280°C	Electroplated	60-65	17- 4PH (A564 Gr630)
CrC	Chromium Carbide	550°C	HVOF (High Velocity Oxygen Fuel)	60-65	Stainless Steel Nickel Base alloys
WC-Co	Tungsten Carbide	800°C		68-72	
(W/Cr)C	Tungsten Chromium Carbide	350°C		68-72	



Engineering Data

Pressure Temperature Data



Seat pressure ratings

- **Class 150** - PTFE or R PTFE (Glass reinforced) seated
Max. working pressure : 20 Bar
- **Class 300** - PTFE or R PTFE (Glass reinforced) seated
Max. working pressure : 51 Bar
- **Class 600** - PTFE or R PTFE (Glass reinforced) seated
Max. working pressure : 103 Bar
- **Class 900** - Nylon or Devlon seated
Max. working pressure : 155 Bar
- **Class 1500** - Nylon or Devlon seated
Max. working pressure : 255 Bar
- **Class 2500** - PEEK seated
Max. working pressure : 425 Bar

Low Temperature Limits

BODY MATERIAL	°F	°C
A216 WCB / A105	-20	-29
A352 LCC / A350 LF2	-58	-50
A351 CF3 / A182 F304	-200	-328
A351 CF8M / A182 F316		

SEAT MATERIAL	°F	°C
Nylon	-22	-30
PEEK	-40	-40
PCTFE (Kel-F)	-320	-196
RTFE	-48	-50

Trunnion Mounted Ball valves Torque Values

Unit : N-m

BORE SIZE		CLASS					
Inches	mm	150	300	600	900	1500	2500
2	50	48	80	115	158	300	680
2-1/2	65	107	150	260	300	510	895
3	80	138	210	330	440	880	1400
4	100	220	360	460	830	1700	3515
6	150	365	680	1050	1880	3350	5300
8	200	623	1195	1980	3600	5500	7350
10	250	1200	2120	3550	5500	7580	
12	300	1600	2490	5390	7440	9800	
14	350	2752	4225	6520	8900	17500	
16	400	3555	5630	8600	11750	28930	
18	450	5125	8200	13350	19020		
20	500	6411	11025	18500	26000		
22	550	8500	14350	22300	33900		
24	600	13000	19500	30900	43250		
26	650	14200	22800	34500			
28	700	15700	26375	38100			
30	750	17310	31000	41800			
32	800	18820	32500	45000			
34	850	20230	33925	47500			
36	900	22935	36200	51000			

※ A minimum factor of 1.3 is recommended for directly actuated valves.

Typical service factor commonly used in the industry are : water and other liquids - 1.0 / dry gasses - 1.5~2.0

Engineering Data

Flow Coefficients (Cv)

The flow coefficient, Cv, is the volume (in gallons) of clean water at 60F that will flow per minute through a valve with a pressure drop 1 psi across the fully open valve. To find the flow of a liquid or gas through a valve from the Cv, use the following formulas.

FOR LIQUIDS

$$Q_L = \sqrt{\frac{\Delta P}{G_L}} \quad \Delta P : \text{differential pressure across the valves}$$

$$Q_L : \text{flow rate of liquid (gallon/minute)}$$

$$\Delta P = \left(\frac{G_L}{C_v} \right)^2 \quad G_L : \text{specific gravity of liquid (water=1)}$$

FOR GASES

$$Q_g = 1360 C_v \sqrt{\frac{\Delta P}{G_g T}} \times \sqrt{\frac{P_1 + P_2}{2}} \quad Q_g : \text{volumetric flow of gas (CFH at STP)}$$

$$\Delta P = P_1 - \sqrt{P_2 - G_g T \left(\frac{Q_g}{1360 C_v} \right)^2} \quad Q_g : \text{specific gravity of gas at standard conditions}$$

$$T : \text{absolute temperature of gas}$$

Flow Coefficients (Cv) Values

SIZE(Full Bore)		CLASS					
Inches	mm	150	300	600	900	1500	2500
2	50	400	400	390	300	300	230
2-1/2	65	650	650	610	510	510	330
3	80	1150	1150	1100	880	880	550
4	100	2050	2050	1890	1780	1700	1000
6	150	4980	4980	4700	4210	4080	2600
8	200	9320	9320	8800	8320	7250	5220
10	250	14500	14500	13900	13250	13050	
12	300	22000	22000	21000	20500	17800	
14	350	27500	27500	26000	23500	20000	
16	400	35000	35000	33500	31830	27360	
18	450	49000	49000	47500	43000		
20	500	58000	58000	58000	53250		
22	550	66000	66000	66000	58500		
24	600	90000	90000	90000	82300		
26	650	105000	105000	105000			
28	700	119000	119000	119000			
30	750	140000	140000	140000			
32	800	165000	165000	165000			
34	850	189000	189000	189000			
36	900	203000	203000	203000			

SIZE(reduced Bore)		CLASS					
Inches	mm	150	300	600	900	1500	2500
2 x 1 1/2	50 x 40	350	350	320	290	290	235
3 x 2	80 x 50	190	190	190	185	185	190
4 x 3	100 x 80	620	620	620	600	535	510
6 x 4	150 x 100	960	960	960	900	830	800
8 x 6	200 x 150	2220	2220	2220	1980	1880	1800
10 x 8	250 x 200	3980	3980	3980	3850	3800	
12 x 10	300 x 250	7400	7400	7400	7600	7350	
14 x 10	350 x 250	6900	6900	6900	6500	6320	
14 x 12	350 x 300	13500	13500	13500	11560	12500	
16 x 12	400 x 300	11200	11200	11200	11000	9750	
16 x 14	400 x 350	14500	14500	14500	12280		
18 x 16	450 x 400	19900	19900	19900	17800		
20 x 16	500 x 400	14230	14230	14230	12560		
20 x 18	500 x 450	27000	27000	27000	23200		
24 x 20	600 x 500	29020	29020	27750			
30 x 24	750 x 600	35600	35600	35600			
36 x 30	900 x 750	58700	58700	53230			

Engineering Data

LIST OF MATERIAL SPECIFICATIONS - ASME / ANSI B16.34

Applicable ASTM Specification

Material Group No.	Nominal Designation	Forgings Spec.-Grade Notes	Castings Spec.-Grade Notes	Tubular Products Spec.-Grade Notes
1.1	Carbon	A 105 (1) (2) A 350 - LF	A 216 - WCB (1)	A 672 - B 70 A 672 - V 70
1.10	21/4 Cr - Mo	A 182 - F 22 (4)	A 217 - WC 9 (3) (5)	
2.1	18 Cr - 8 Ni	A 182 - F 304 (7) A 182 - F 304H	A 351 - CF 3 (8) A 351 - CF 8 (7)	A 312 - TP 304 (7) A 312 - TP 304H A 358 - 304 (7) A 376 - TP 304H A 430 - FP 304 (7) A 430 - FP 304H
2.2	16 Cr - 12 Ni - 2 Mo	A 182 - F 316 A 182 - F 304H		A 312 - TP 316(7) A 312 - TP 316H A 358 - 316 (7) A 312 - TP 316 (7) A 376 - TP 316H A 430 - FP 316 (7) (9) A 430 - FP 316H
	18 Cr - 8 Ni		A 351 - CF 3A (10)	A 351 - CF 8A (10)
	18 Cr - 13 Ni - 3 Mo			A 312 - TP 317(7)
	18 Cr - 9 Ni - 2 Mo		A 351 - CF 3M (11) A 351 - CF 8M (7)	
2.3	18 Cr - 8 Ni	A 182 - F 304L		A 312 - TP 304L (8)
	16 Cr - 12 Ni - 2 Mo	A 182 - F 316L		A 312 - TP 316L
2.8	22 Cr - 5 Ni - 3 Mo - N	A 182 - F 51		A 789 - S 31803 A 790 - S 31803

- NOTES:**
- 1 Upon prolonged exposure to temperatures above 800°F (425°C), the carbide phase of carbon steel may be converted to graphite.
 - 2 Only killed steel shall be used above 850°F (455°C)
 - 3 Use normalized and tempered material only.
 - 4 Permissible, but not recommended for prolonged usage above about 1100°F (595°C)
 - 5 Not to be used over 1100°F (595°C)
 - 6 At temperatures over 1000°F (540°C), use only when the carbon is 0.04% or higher.
 - 7 Not to be used over 800°F (425°C)
 - 8 For temperatures above 1000°C (540°C), use only if the material is heat treated by heating it to a minimum temperature of 1900°F (1040°C) and quenching in water or rapidly cooling by other means.
 - 9 Not to be used over 650°F (345°C)
 - 10 Not to be used over 850°F (455°C)

PRESSURE - TEMPERATURE RATINGS FOR STANDARD CLASS VALVES - ASME / ANSI B16.34

Ratings for Group 1.1 Materials

(°F/psi)

Temperature, °F	Working Pressure by Classes, psi					
	150	300	600	900	1500	2500
-20 to 100	285	740	1,480	2,220	3,705	6,170
200	260	675	1,350	2,025	3,375	5,625
300	230	655	1,315	1,970	3,280	5,470
400	200	635	1,270	1,900	3,170	5,280
500	170	600	1,200	1,795	2,995	4,990
600	140	550	1,095	1,640	2,735	4,560
650	125	535	1,075	1,610	2,685	4,475
700	110	535	1,065	1,600	2,665	4,440
750	95	505	1,010	1,510	2,520	4,200
800	80	410	825	1,235	2,060	3,430
850	65	270	535	805	1,340	2,230
900	50	170	345	515	860	1,430
950	35	105	205	310	515	860
1000	20	20	105	155	260	430

Ratings for Group 1.10 Materials

(°F/psi)

Temperature, °F	Working Pressure by Classes, psi					
	150	300	600	900	1500	2500
-20 to 100	290	750	1,500	2,250	3,750	6,250
200	260	750	1,500	2,250	3,750	6,250
300	230	730	1,455	2,185	3,640	6,070
400	200	705	1,410	2,115	3,530	5,880
500	170	665	1,330	1,995	3,325	5,540
600	140	605	1,210	1,815	3,025	5,040
650	125	590	1,175	1,765	2,940	4,905
700	110	570	1,135	1,705	2,840	4,730
750	95	530	1,065	1,595	2,660	4,430
800	80	510	1,015	1,525	2,540	4,230
850	65	485	975	1,460	2,435	4,060
900	50	450	900	1,350	2,245	3,745
950	35	375	755	1,130	1,885	3,145
1000	20	260	520	780	1,305	2,170
1050	20(1)	175	350	525	875	1,455
1100	20(1)	110	220	330	550	915
1150	20(1)	70	135	205	345	570
1200	20(1)	40	80	125	205	345

Engineering Data

Pressure - Temperature Ratings For Standard Class Valves - ASME B16.34

Ratings for Group 2.1 Materials

(°F/psi)

Temperature, °F	Working Pressure by Classes, psi					
	150	300	600	900	1500	2500
-20 to 100	275	720	1,440	2,160	3,600	6,000
200	230	600	1,200	1,800	3,000	5,000
300	205	540	1,055	1,585	2,640	4,400
400	190	495	940	1,410	2,350	3,920
500	170	485	875	1,310	2,185	3,640
600	140	435	830	1,245	2,075	3,460
650	125	430	815	1,225	2,040	3,400
700	110	425	805	1,210	2,015	3,360
750	95	425	795	1,195	1,990	3,320
800	80	405	790	1,180	1,970	3,280
850	65	395	780	1,165	1,945	3,240
900	50	390	770	1,150	1,920	3,200
950	35	380	750	1,125	1,870	3,120
1000	20	320	645	965	1,610	2,685
1050	20(1)		620	925	1,545	2,570
1100	20(1)	255	515	770	1,285	2,145
1150	20(1)	200	390	585	980	1,630
1200	20(1)	155	310	465	770	1,285
1250	20(1)	115	220	330	550	915
1300	20(1)	85	165	245	410	685
1350	20(1)	60	125	185	310	515
1400	20(1)	50	95	145	240	400
1450	20(1)	35	70	105	170	285
1500	20(1)	25	50	70	120	120

- NOTES:**
- 1 All pressures are given as gage pressure.
 - 2 Pressure in kg/cm² are shown for convenience.
 - 3 Material groups are as listed in page 32.
 - 4 For temperature limitations, see footnotes on page 32.

Ratings for Group 2.2 Materials

(°F/psi)

Temperature, °F	Working Pressure by Classes, psi					
	150	300	600	900	1500	2500
-20 to 100	275	720	1,440	2,160	3,600	6,000
200	235	620	1,240	1,860	3,095	5,160
300	215	560	1,120	1,680	2,795	4,660
400	195	515	1,025	1,540	2,570	4,280
500	170	480	955	1,435	2,390	3,980
600	140	450	900	1,355	2,255	3,760
650	125	445	890	1,330	2,220	3,700
700	110	430	870	1,305	2,170	3,620
750	95	425	855	1,280	2,135	3,560
800	80	420	845	1,265	2,110	3,520
850	65	420	835	1,255	2,090	3,480
900	50	415	830	1,245	2,075	3,460
950	35	385	775	1,160	1,930	3,220
1000	20	350	700	1,050	1,750	2,915
1050	20(1)	345	685	1,030	1,720	2,865
1100	20(1)	305	610	915	1,525	2,545
1150	20(1)	235	475	710	1,185	1,970
1200	20(1)	185	370	555	925	1,545
1250	20(1)	145	295	440	735	1,230
1300	20(1)	115	235	350	585	970
1350	20(1)	95	190	290	480	800
1400	20(1)	75	150	225	380	630
1450	20(1)	60	115	175	290	485
1500	20(1)	40	85	125	205	345

Ratings for Group 2.3 Materials

(°F/psi)

Temperature, °F	Working Pressure by Classes, psi					
	150	300	600	900	1500	2500
-20 to 100	230	600	1,200	1,800	3,000	5,000
200	195	505	1,015	1,520	2,530	4,220
300	175	455	910	1,360	2,270	3,780
400	160	415	825	1,240	2,065	3,440
500	145	380	765	1,145	1,910	3,180
600	140	360	720	1,080	1,800	3,000
650	125	350	700	1,050	1,750	2,920
700	110	345	685	1,030	1,715	2,880
750	95	335	670	1,010	1,680	2,800
800	80	330	660	985	1,645	2,740
850	65	320	645	965	1,610	2,680

- NOTES:**
- 1 All pressures are given as gage pressure.
 - 2 Pressure in kg/cm² are shown for convenience.
 - 3 Material groups are as listed in page 32.
 - 4 For temperature limitations, see footnotes on page 32.

Ratings for Group 2.8 Materials

(°F/psi)

Temperature, °F	Working Pressure by Classes, psi					
	150	300	600	900	1500	2500
-20 to 100	290	750	1,500	2,250	3,750	6,250
200	260	720	1,440	2,160	3,600	6,000
300	230	665	1,330	1,995	3,325	5,540
400	200	615	1,230	1,845	3,070	5,120
500	170	575	1,150	1,730	2,880	4,800
600	140	555	1,115	1,670	2,785	4,640
650	125	550	1,100	1,650	2,750	4,580
700	110	540	1,085	1,625	2,710	4,520
750	95	530	1,085	1,595	2,660	4,430

Engineering Data

STEEL STANDARDS COMPARISON

ASTM	UNS/AISI	DIN	AFNOR	BS	JIS
A105	AISI 1020	C22 1.0402	A4 8 - XC18S	1503-221-490(En 3A)	SF50 (SC30)-(S2BC)
A182 - F1	K12822	15 Mo 3 1.5415	-	1503-240-420	SFHV 12B - G 3213
- F5	K41545	12 CrMo 19.5 1.7362	Z 12CD 5	1503-625-520	SFHV 25 - G 3213
- F11	K11572	24 CrMoV-55 1.7733	15 CD 5.05	1506-661-440	SFHV 23B - G 3213
- F22	K21590	10 CrMo 9.10 1.7380	12 CD 9.10	1503-622-490	SFHV 24B - G 3213
- F304	S30400	X5 CrNi 18.9 1.4301	26 CN 18.09	1503-304-S15	SUS 304 - G 4303
- F304H	S30409	X5 CrNi 18.9 1.4301	26 CN 18.09	1503-304-S49	SUS 304H - G 4303
- F304L	S30403	X2 CrNi 18.9 1.4306	22 CN 18.10	1503-304-S12	SUS 304L - G 4303
- F316	S31600	X5 CrNiMo 18.10 1.4401	26 CND 17.11	1503-316-S16	SUS 316 - G 4303
- F316H	S31609	X5 CrNiMo 18.12	-	1503-316-S49	SUS 316H - G 4303
- F316L	S31603	X2 CrNiMo 18.10 1.4404	22 CND 17.12	1503-316-S12	SUS 316L - G 4303
- F321	S32100	X10 CrNiTi 18.9 1.4541	26 CNT 18.10	1503-321-S31	SUS 321
- F347	S34700	X10 CrNiNb 18.9 1.4550	26 CN Nb 18.10	1503-347-S17	SUS 347
A193 - B6 (A276. Type 410)	AISI 410 S41000	X10 Cr 13 1.4006	Z10 C 13	410-S21	SUS 410 - G 4303
- B7	AISI 4140	42 CrMo 4 1.7225	42 CD 4	1506-621- A	SNB 7 - G 4107 (SMC 4)
- B8	AISI 304	X5 CrNi 18.9 1.4301	26 CN 18.09	1506-801-B	SUS 304 - G 4303
- B8M	AISI 316	X5 CrNiMo 18.10 1.4401	26 CNT 18.10	1506-845	SUS 316 - G 4107
- B16	-	24 CrMoV 55 1.7733	38 CDV 4.05	1506-661	SNB 16 - G 4107
A194 - 2H		C45 1.0503	A60/CC45	1506-162	S45C - G 4051
Gr 4	-	24 CrMo 5 1.7258	40 D2	1506-240	-
Gr 8	AISI 304	X5 CrNi 18.9 1.4301	26 CN 18.09	1506-801-B	SUS 304 - G 4303
Gr 8M	AISI 315	X5 CrNiMo 18.10 1.4401	26 CND 17.11	1506-845	SUS 316 - G 4303
A276 - Type 420	AISI 420 S42000	X30 Cr 13 1.4028	Z30 C13	420-S45	SUS 420 J2
A320 - L7	AISI 4140	42 CrMo 4 1.7225	42 CD 4	1506-621- A	SCM3 - G 4105
A350 - LF2	-	TT St E 36 1.0508	A48 FPI (A 36-208)	1503-223-410 (32A LT50)	-
A582 - Type 303	AISI 303 S30300	X10 CrNiS 18.9 1.4305	Z10 CNF 18.09	303-S21	SUS 303
- Type 416	AISI 416 A41600	X12 CrS 13 1.4005	Z12 CF 13	416-S21	SUS 418

Above comparison is to be intended as a guide.

A light difference in material requirements may be found between one standard and other.

Therefore, the use of an equivalent standard is always subject to Customer's agreement.

How To Order

1 VALVE MODEL

Code	Description
KD	KPL Trunnion Mounted Ball valve

2 PRESSURE RATING

Code	Class
A	ASME 150
B	ASME 300
C	ASME 600
D	ASME 900
E	ASME 1500
F	ASME 2500
Z	Others

3 VALVE SIZE

Code	Size	Code	Size
2	2	2 X 2H	2 X 1/2
2H	2-1/2	3 X 2	3 X 2
3	3	4 X 3	4 X 3
4	4	6 X 4	6 X 4
6	6	8 X 6	8 X 6
8	8	10 X 8	10 X 8
10	10	12 X 10	12 X 10
12	12	14 X 10	14 X 10
14	14	14 X 12	14 X 12
16	16	16 X 12	16 X 12
18	18	16 X 14	16 X 14
20	20	18 X 16	18 X 16
22	22	20 X 16	20 X 16
24	24	20 X 18	20 X 18
26	26	24 X 20	24 X 20
28	28	30 X 24	30 X 24
30	30	36 X 30	36 X 30
32	32	Z	Others
34	34		
36	36		

4 BODY MATERIAL

Code	Description	Code	Description
C	A216 WCB	F5	A182 F51(UNS S31803)
A	A105	F3	A182 F53(UNS S31750)
LC	A352 LCC	F4	A182 F44(UNS S31254)
LF	A350 LF2	AN	C95800
F6	A182 F316	M4	MONEL 400
CM	A351 CF8M	I6	INCONEL 625
F4	A182 F304	I8	INCOLOY 825
C8	A351 CF8	I9	INCOLOY 925
FL	A182 F316L	IH	INCOLOY 800 HT
C3	A351 CF3M	T2	TITANIUM Gr 2
F0	A182 F304L	F2	A182 F22
C3	A351 CF3	W9	A217 WC9
F9	A182 F91	Z	Others

5 TRIM MATERIAL

Code	Description	Code	Description
01	A105+ENP	04	304 SS
02	A350 LF2+ENP	05	316L SS
03	316 SS	06	304L SS
		07	17-4PH
		08	A182 F51
		09	A182 F53
		10	A182 F44
		11	MONEL 400
		12	INCONEL 625
		13	INCOLOY 825
		14	INCOLOY 925
		15	INCOLOY 800 HT
		16	TITANIUM Gr 2
		17	C95800
		18	316ss Ball+STL6
		19	316ss Ball+TCC
		20	316ss Ball+CCC
		21	17-4PH Ball+ENP
		Z	Others

6 CONNECTION

Code	Description
F	RF Flange
R	Ring Type joint
B	Butt Weld
S	Stub End
T	Thread End
O	Socket Weld
Z	Others

7 OPERATING

Code	Description
01	Lever
02	Gear
03	Pneumatic Actuator Single Acting
04	Pneumatic Actuator Double Acting
05	Electric Actuator
06	Bare Stem
Z	Others

8 SEAT MATERIAL

Code	Description
P	PTFE
RG	RPTFE(Glass Filled)
RC	RPTFE(Carbon Filled)
N	Nylon
D	Devlon
P	PEEK
DE	Derlin
PC	PCTFE
M6	316+STL6
MT	316+TCC
MC	316+CCC
6E	17-4PH+ENP
Z	Others

9 SEAL MATERIAL

Code	Description
P	PTFE
G	Graphite
Z	Others

10 OPTIONS

Code	Description
01	Sealant Injection
02	Fire Safety
03	Extended Bonnet
04	Locking Device
05	Oil Free
06	Anti Static Device
Z	Others

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