



CALVARY VALVE INC
API 6D FORGED BODY BALL VALVE

FORGED BODY FLOATING BALL VALVE
FORGED BODY TRUNION MOUNTED BALL



www.calvaryvalve.com





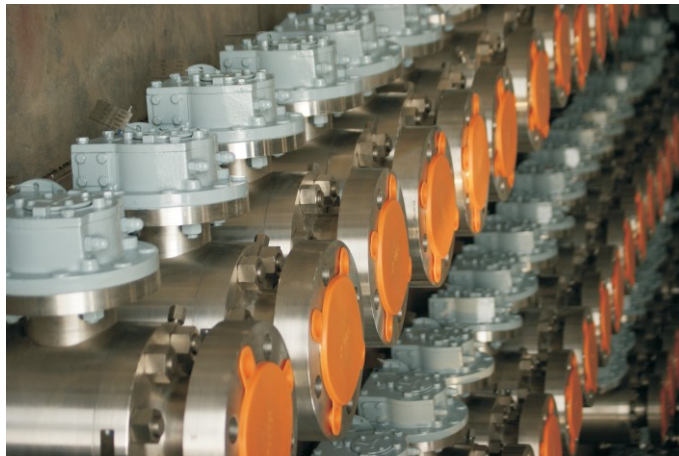
COMPANY INTRODUCTION

Calvary Valve Inc. A new company. A fresh outlook on the approach of taking care of clients requirements. Our goal at Calvary is to Provide clients the highest quality available in market ,manufactured, in API6D and ISO9001 facilities, with the most competitive price available, in the time frame to fit our clients needs.

The management and ownership team assembled at Calvary Valve is over 50years of collective experience in valve manufacturing and design. What additionally sets us apart from the pack ,is a full force of service personnel to handle our clients service needs, The market is full of valve providers, but not many will boast of 24 hour on call availability of not only sales assistance, but with service technicians to answer any questions, or go to the field to address our clients service needs.

Our inventory levels, coupled with a full shop capable of third party testing requirements ,sub sea modification ,trim conversions.

Our background, abilities, and sincere desire to service our clients will make us a leader in the industry and develop a legacy of what Calvary Valve, Inc. is.





CVI valves are designed, manufactured and tested in accordance with API, ANSI and ASME requirements. The following list contains the most important applicable standards. CVI valves may be produced in accordance with other standards on request.

ANSI-American National Standard Institute

ASME B 1.20.1 Pipe threads, general purpose
 ASME B 16.5 Steel pipe flanges and flanged fittings
 ASME B16.10 Face-to-face and end-to-end dimensions of ferrous valves.
 ASME B 16.25 Butt welding ends
 ASME B16.34 Steel valves-flanged and butt welding
 ASME B16.47 ends Larger diameter steel flange(26" ~ 60") Technics pipeline
 ASME B31.3 60") Technics pipeline
 ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, rules for construction of pressure vessel
 MESG SPE 76/001 Surface roughness degree of flange gasket interface
 MESG SPE 77/130 Ball Valve to API SPEC. 6D
 MESG SPE 77/302 Material Acceptance Requirements for Valves in General Service
 MESG SPE 77/315 Electroless Nickel Plating

British Standard

BS 1503 Pressure-containing forged parts (including semi finished) specification
 BS 6755-2 Valve test, section 2: fire test requirement specification
 BS 5351 Industrial valve, shell thickness, and bore
 BS 1560 dimension End flange dimensions and Flange
 BS 5146 gasket facing Pressure test

ISO9001-International Organization for Standardization

ISO9001 Quality systems-model for quality assurance in design, development, production, installation and servicing.
 ISO15156 Materials for use in H₂S containing environment in oil & gas production.
 ISO 5211-1 Executive institution accessories of quarter-turn valves, section1: flange dimension
 ISO 5211-2 Executive institution accessories of quarter-turn valves, section2: capability character of flange and connector.
 ISO 5211-3 Executive institution accessories of quarter-turn valves, section3: the dimension of drive parts
 ISO 10479 Valve test: fire-proof test requirement

API-American Petroleum Institute

API 6A Specification for wellhead valves
 API 6D Specification for pipeline valves
 API 6FA Specification for fire testing of valves
 API 607 Fire test for soft seated quarter-turn valves
 API Q1 Quality program
 API 5B EUE External upset tubing threads

MSS-Manufacturers Standardization Society

MSS SP-6 Standard finishes for contact faces of pipe flanges and connecting-end flanges of valves and fittings.
 MSS SP-25 Standard marking system for valves, fittings, flanges and unions.
 MSS SP-55 Quality standard for steel castings.
 MSS SP-45 Bypass, and drain connections standard
 MSS SP-53 Cast steel quality standard of valve, flange, fitting and pipeline accessories --
 Magnetic-particle testing
 MSS SP-54 Cast steel quality standard of valve, flange, fitting and pipeline accessories ---
 Radiographic testing
 MSS SP-93 Cast steel and forged steel quality standard of valve, flange, fitting and pipeline accessories ---
 Liquid Penetrant Testing
 PrEN 12116 Industry valve, executive institution accessories of quarter-turn valves
 DEP 31.38.01.11-GEN Standard of pipeline
 DEP 31.40.70.30-GEN Quarter-turn open/close executive institution
 DEP 32.36.01.17-GEN Control valves' choice, specification and standard

NACE-National Association of Corrosion Engineers

MR0175 Sulfide stress cracking resistant metallic materials for oil field equipment (Superseded by ISO15156)



● VALVE BALL SUPPORTING

Floating ball valve

Size 1/2 " to 8 "
Pressure 150# , 300#
Temperature -46°C to 500°C

Trunnion Mounted ball valve

Size 2 " to 42 "
Pressure 150#/300#/600#
900#/1500#/2500#
Temperature -46°C to 500°C

● VALVE SEALING METHOD

Soft seated ball valve

Size 1/2 " to 42 "
Pressure 150#/300#/600#
900#/1500#/2500#
Temperature -46°C to 150°C

Metal to metal seated ball valve

Size 2 " to 24 "
Pressure 150#/300#/600#
900#/1500#/2500#
Temperature -46°C to 500°C

● VALVE BODY CONNECTION

Bolted body

Size 1/2 " to 42 "
Pressure 150#/300#/600#
900#/1500#/2500#
Temperature -46°C to 500°C

Fully welded body

Size 6 " to 48 "
Pressure 300#/600#
900#/1500#
Temperature -46°C to 150°C

● VALVE BALL ENTRY THE BODY TYPE

Side entry ball valve

Size 1/2 " to 42 "
Pressure 150#/300#/600#
900#/1500#
Temperature -46°C to 500°C

Top entry ball valve

Size 2 " to 24 "
Pressure 150#/300#/600#
900#/1500#
Temperature -46°C to 500°C

● VALVE OPERATION

Handle/Lever
Electric actuation
Pneumatic actuation

Gear Box
Hydraulic actuation
Gas Over Oil actuation

CVI valves can be configured to match the general working conditions of our customers as shown above. And the following descriptions are for valves that are most commonly used in the industry. Upon request CVI can manufacture valves to meet any customer specifications that may be required.

CVI F120 TYPE FLOATING BALL VALVE

Content	Specification
General design standard	API6D/API608
Pressure-temperature rating	ASME B16.34
Face to face dimensions	ASME B16.10
Flange type and dimensions	ASME B16.5
Butt-welded end	ASME B16.25
Inspection and test	API6D/API598



FLOATING BALL VALVE FEATURES

● BLOW OUT-PROOF STEM CONSTRUCTION

The lower end of stem is terraced and is installed from the inside of the valve body. This construction insures a blow out proof stem and metal to metal seal in case of fire.

● ANTISTATIC DESIGN

During operation of valve, static electricity may accumulate on the ball. The special antistatic device can discharge the static electricity during opening and closing of the valve.

● FIRE-SAFE DESIGN: API607/API6FA

Each possible leaking part between Ball and Body, Middle flange, Stem and body are designed for metal to metal contact which conforms to the fire-proof requirements of API6FA and API 607. In case of extreme fire-proof conditions, the packing and gasket material shall be flexible graphite to insure zero leakage.

● LOCKING DEVICE

The valve is equipped with locking holes for the lever in the full open and full closed position, to prevent accidental opening and closing of the valve.

● MIDDLE FLANGE WITH NO LEAKAGE DESIGN

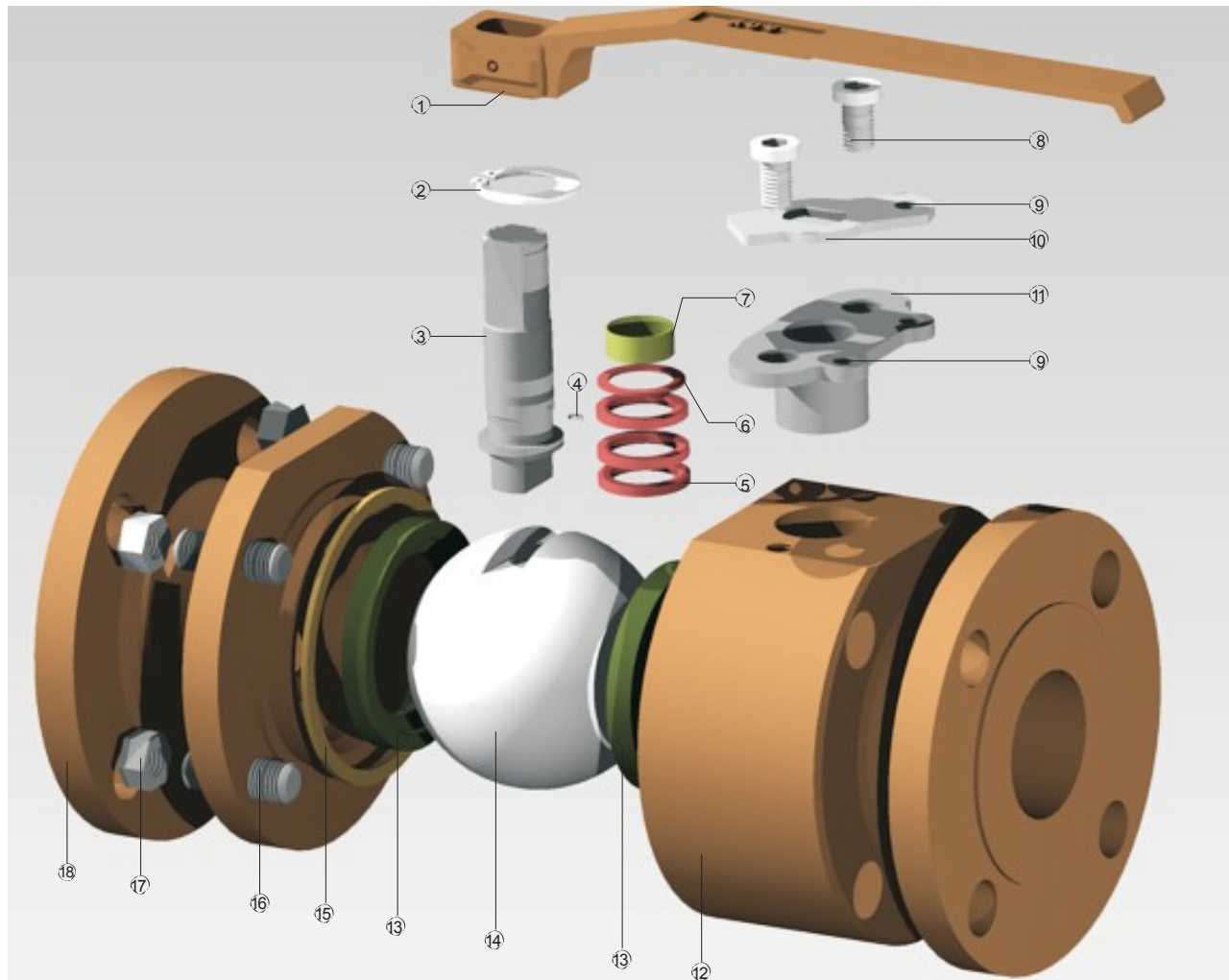
(Body and Cap connection)
Body and Cap connection are sealed by gaskets. To prevent leakage from fire, high temperature or vibrations, metal to metal sealing between the body and cap is maintained.

● WRENCH WITH VALVE OPEN/CLOSE INDICATION

When the handle(lever) is on the same horizontal line with the pipe, this indicates the valve is at open position. When the handle(lever) is on the vertical line with the pipe, this indicates the valve is at closed position.

● ADVANCED AND EXCLUSIVE SEAT DESIGN

With many years of Ball Valve manufacturing experience and advanced technology from abroad, the cone sealing surface developed, makes the sealing more reliable. Our designs are available with various types of seat materials that offer low friction and low operational torque.



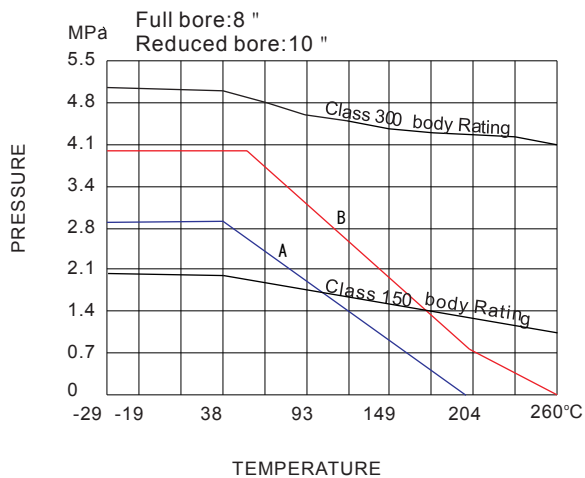
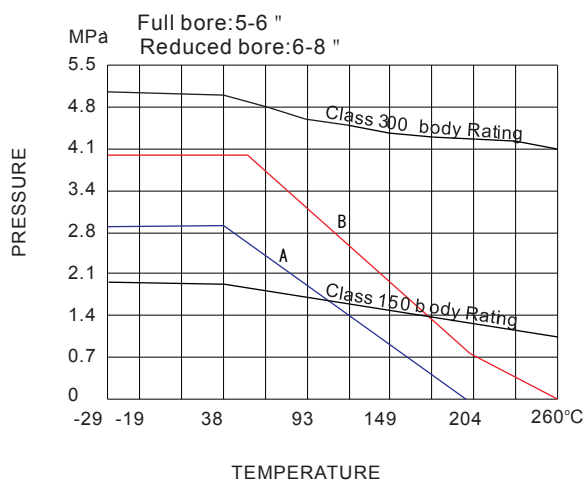
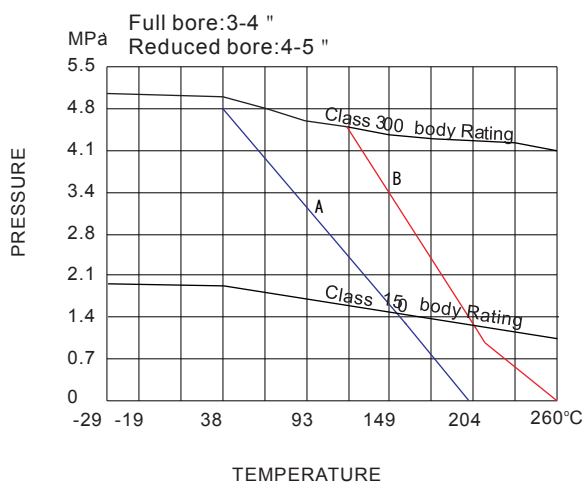
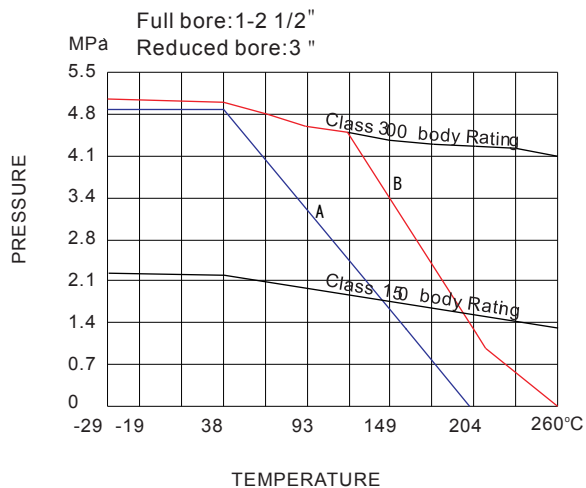
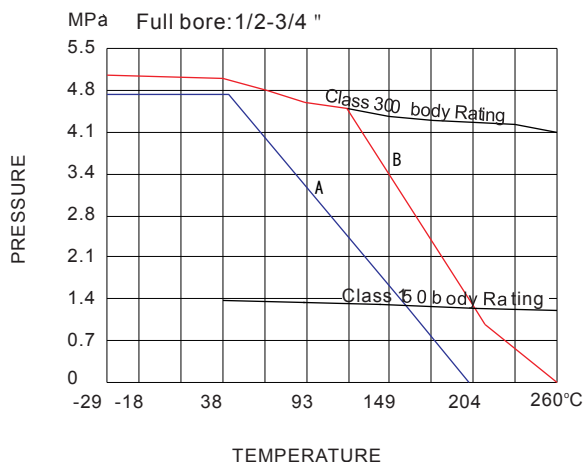
Item	Part Name	Item	Part Name	Item	Part Name
1	Lever	7	Stem bearing	13	Seat
2	Snap ring	8	Gland bolt	14	Ball
3	Stem	9	Locking hole	15	Gasket
4	Antistatic spring	10	Limited plate	16	Bolt
5	Thrust bearing	11	Packing gland	17	Nut
6	Packing	12	Body	18	Bonnet

Part	CS Series	Sulfur-proof Series	SS. Series NACE		LCC, LBB Series
Body	A105	A105	F304, F304L	F316, F316L	LF2, LF1
Ball	A105+HCR/ENP	A105+ENP	A182-F304, F304L+HCR	A182-F316, F316L+HCR	A182-F304+HCR
Stem	A182-F6A	ANSI 4140	A182-F304, F304L	A182-F316, F316L	A182-F304
Seat Insert	PTFE (standard) /PPL(high temperature)/PEEK/EPDM/VITON/DEVILON				
Packing	PTFE / PPL/Graphite				
Gasket	PTFE / PPL/Graphite				
Bearing	PTFE / PPL				
Stud	A193-B7	A193-B7M	A182-F304, F304L+HCR	A193-B8/8M	A320-L7
Nut	A194-2H	A194-2HM	A182-F304, F304L	A194-8/8M	A194-7M

Pressure Temperature Rating

The P-T rating is not only determined by the body material, but also the seat, packing and gasket material. Sealing material is made of macromolecule, asbestos or rubber. And the selection of sealing material is based upon the medium of the valve, working temperature, pressure and velocity of flow.

As the P-T rating changes according to different valve working conditions, the following P-T rating value is calculated out by stable valve working condition.

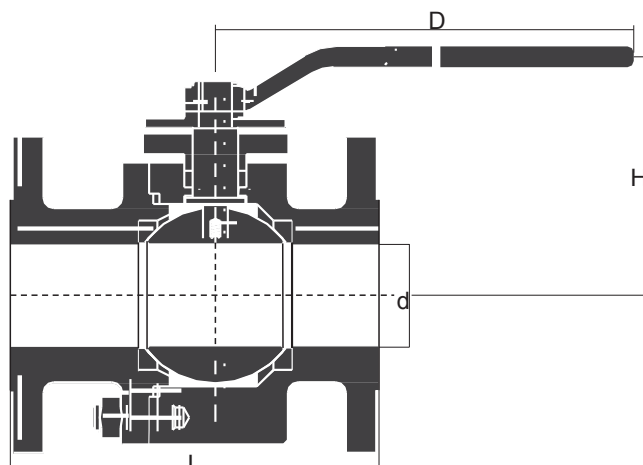


A: Pure PTFE B:
Reinforced PTFE

Notes: The valve body material in the above charts is A105. For other P-T rating of different body materials, please refer to ASME B16.34 (latest edition)

FLOATING BALL VALVE DIMENSIONS

FULL BORE TYPE



● CLASS 150 Dimensions

DN	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"
d	13	19	25	38	51	64	76	102	127	152	203
L	108	117	127	165	178	190	203	229	356	394	457
H	63	75	95	115	120	155	165	200	220	295	355
D	130	130	160	230	230	400	400	650	1050	1050	1410
Wt(Kg)	2.5	3	5	7	10.5	16	23	33	58	68	108

● CLASS 300 Dimensions

DN	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"
d	13	19	25	38	51	64	76	102	127	152	203
L	140	152	165	191	216	241	283	305	381	403	502
H	63	75	95	115	120	155	165	200	220	295	355
D	130	130	160	230	230	400	400	650	1050	1050	1410
Wt(Kg)	3	4	6	11	14.8	23.5	36	41.4	70	105	145

● CLASS 600 Dimensions

DN	1/2"	3/4"	1"	1 1/2"
d	13	19	25	38
L (RF)	165	190	216	241
H	105	108	130	135
D	160	160	230	230
Wt(Kg)	3.5	6	8	13

● CLASS 900/1500 Dimensions

DN	1/2"	3/4"	1"	1 1/2"
d	13	19	22	38
L (RF)	216	229	254	305
H	115	115	122	157
D	160	230	230	400
Wt(Kg)	10	11	14	16

Cv value

Right chart is the flow ratio of floating ball.

Cv indicates the gallons of water at temperature +60°F flowing through the valve bore in pressure differential down 1Lbs /Inch² (0.0068694757 Mpa).

Cv			
Specification		Reduced Bore	Full Bore
Inch	Metric		
1/2"	15		25
3/4"	20		50
1"	25		100
1 1/2"	40		270
2"	50	165	490
2 1/2"	65	270	950
3"	80	350	1160
4"	100	550	2200
5"	125	670	3800
6"	150	765	5100
8"	200	1890	9300
10"	250	3900	

FUNCTIONS & FEATURES



Draining



Fire safe



Safe release



Reliable seal



Special seat



Cleaning pipe



Emergency seal



Extended stem



Reliable operation



Bonnet combined seal



Double block & bleed



Various operations



Various end connections



Diversity of body materials



Diversity of seat materials



Bearing pipe stress safety



Various kinds of control systems



Pressure: 150#, 300#, 600#,
900#, 1500#, 2500#

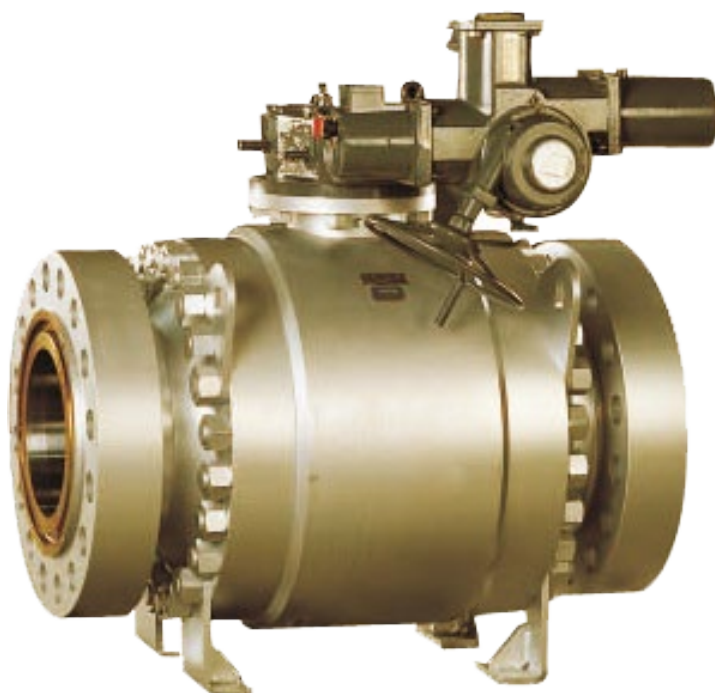
Size: 2"-42"

Working Gas, Oil, Steam,

Medium: Water, etc

Working Temperature

Range: -45°C to 150°C



CVI B220 TYPE TRUNNION MOUNTED BALL VALVE

Content	Specification
General design standard	API6D
Pressure-temperature rating	ASME B16.34
Face to face dimensions	ASME B16.10
End Flange	ASME B16.5
	ANSI B16.47
Butt-welded end	ASME B16.25
Inspection and test	API6D/API598

DESIGN FEATURE



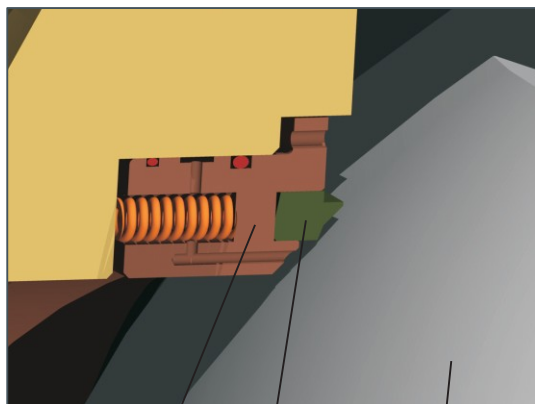
UP STREAM SEALING TWO-WAY VALVE

CVI trunnion mounted ball valve has two seats on both side. Each seat has springs loaded and make seat insert contact the ball surface for sealing. So the valve is bi-directional sealing, and no limitation for installation.



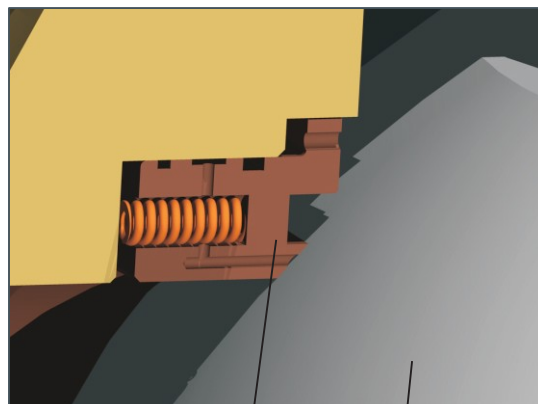
FIRE-SAFE DESIGN API607/API6FA

When the seat inserts are softened and burnt in case of the fire or unusual temperature increase, the seat retainer, under the duty of the spring, will touch with the ball and form a metal-to-metal contact, which can prevent internal leak. Meanwhile, the middle flange and the upper part and lower part of the stem will form a metal-to-metal contact which can prevent external leak and conform to API6FA or API607.



Seat ring Seat insert Ball

Valve in normal working condition



Seat ring Ball

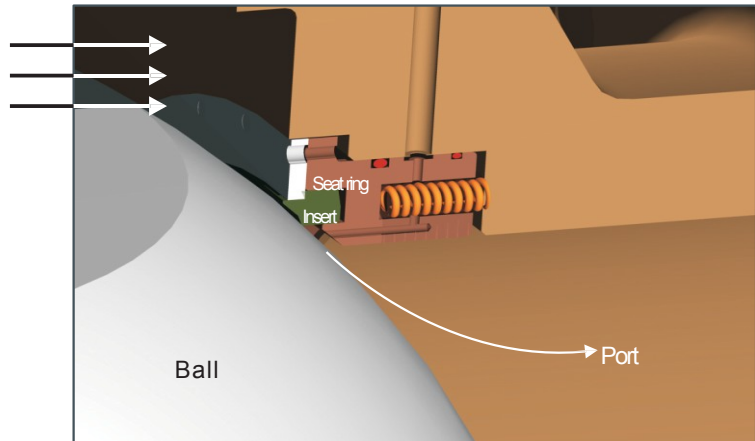
Valve after fire



VALVE CAVITY PRESSURE AUTOMATIC RELIEF

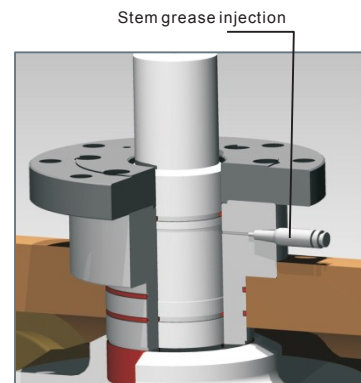
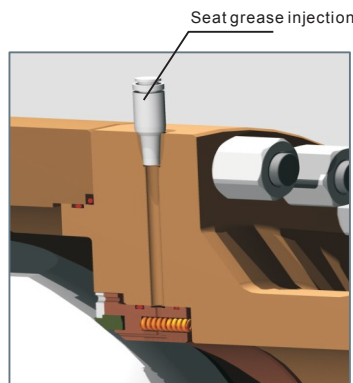
When the body cavity pressure exceeds the seat springs pressure by the thermal expansion of the fluid trapped in valve cavity, automatic pressure relief will occur by relieving the body cavity pressure past the downstream seat.

Until an equilibrium, seat ring will move back to contact the ball surface as a "Piston Effect" seat.



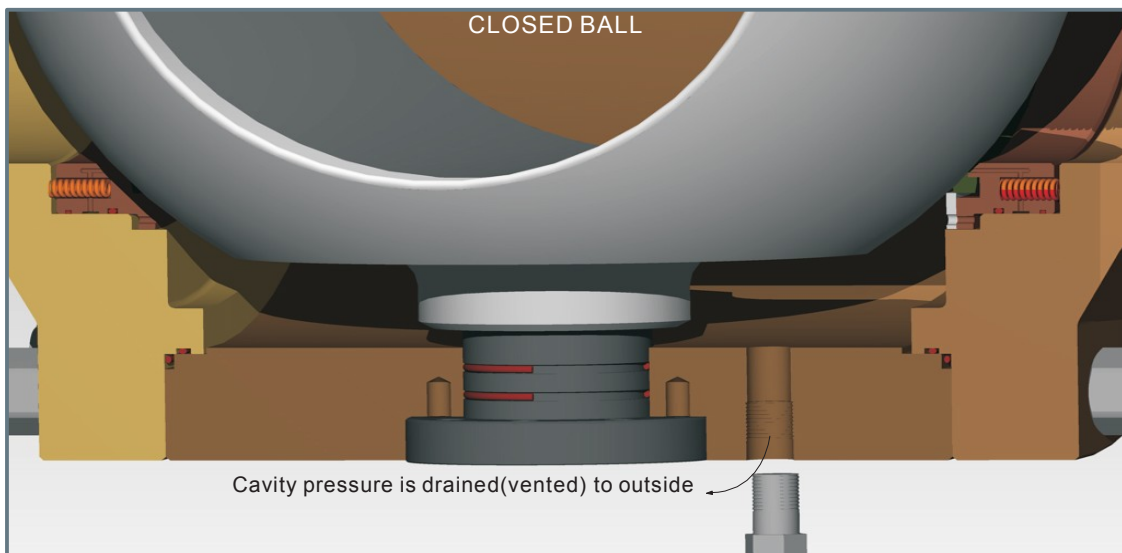
STEM AND SEAT EMERGENCY SEALANT INJECTION

The seat ring and the valve stem have a special grease injection valve. In case of the leakage, the grease will be injected to the valve ball surface and to the stem room, creates a temporary sealing.



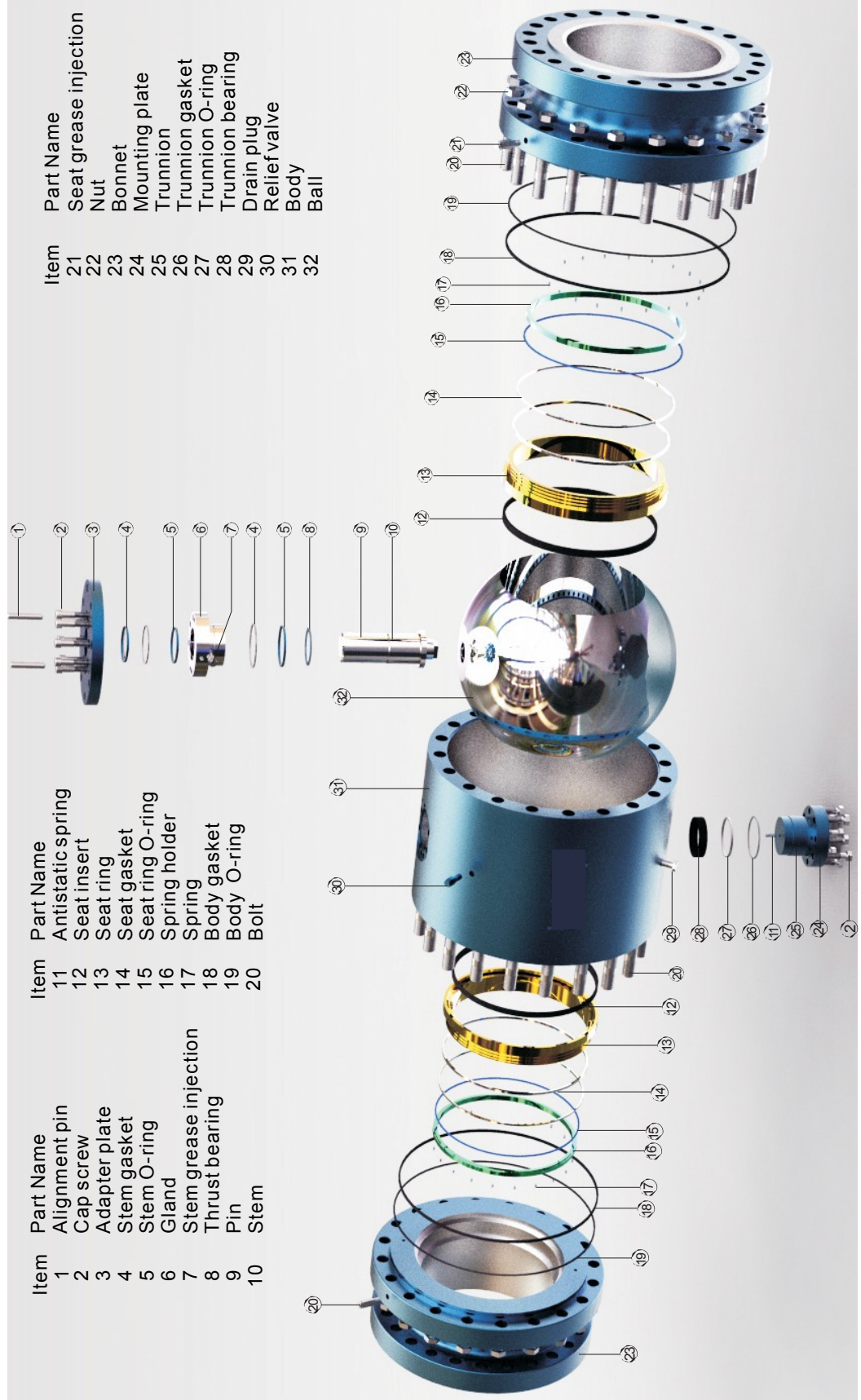
DOUBLE BLOCK AND BLEED DBB

The trapped cavity pressure can bleed out by vent fitting or drain plug when the valve is in fully open or fully closed position. The fluid is intercepted by seats of up stream and down stream side. So, the stem packing or O-ring may be replaced under working pressure. Each seat works independently assuring tight seal against ball on both upstream and downstream side.





CVI B220 TYPE
API6D THREE PIECES FORGED BODY TRUNNION MOUNTED BALL VALVE
SIZE 2 " - 16 " , PRESSURE 150# TO 2500#



● MATERIALS FOR MAIN PARTS

Parts	C.S Series	Sufur-Proof Series	S.S Series		LF2 Series
Body	A105	A105	A182 F304/F304L	A182 F316/F316L	A350 LF2
	A105	A105	A182 F304/F304L	A182 F316/F316L	A350 LF2
Packing Gland	A105	A105	A182 F304/F304L	A182 F316/F316L	A182-F304
Ball	A105+HCr	A105+ENP	A182 F304/F304L+HCr	A182 F316/F316L+HCr	A182-F304+HCr
Stem	A182-F6a	A182-410+ENP	A182-F304,F304L	A182-F316,F316L	A182-F304
Seat Insert	PTFE/PPL/NYLON/VITON/PEEK/EPDM/DEVLO				
Seat Retainer	A105+Zn	A105+ENP	A182-F304,F304L	A182-F316,F316L	A182-F304
Packing	PTFE/PPL/Graphite				
Gasket	PTFE/PPL/Graphite				
Bearing	PTFE/PPL				
Spring	316SS/Inconel X-750/17-4PH/35-CrMo				
Stud	A193-B7	A193-B7M	A193-B8,B8M	A193-B8,B8M	A320-L7
Nut	A194-2H	A194-2HM	A194-8,8M	A194-8,8M	A194-7M

REMARKS:

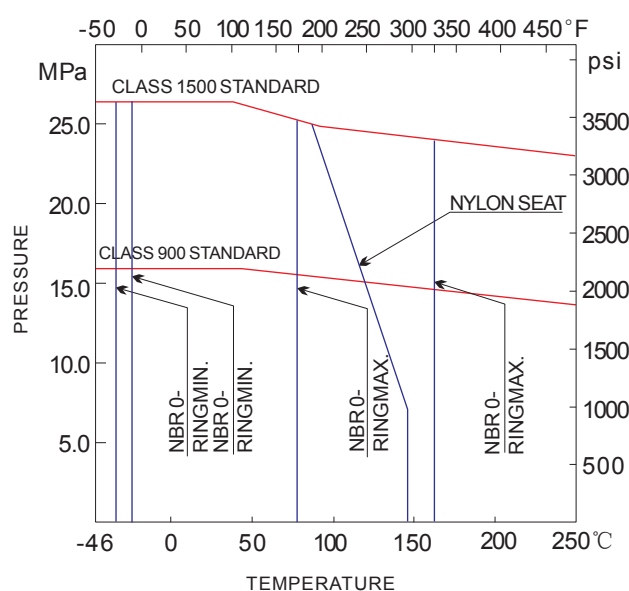
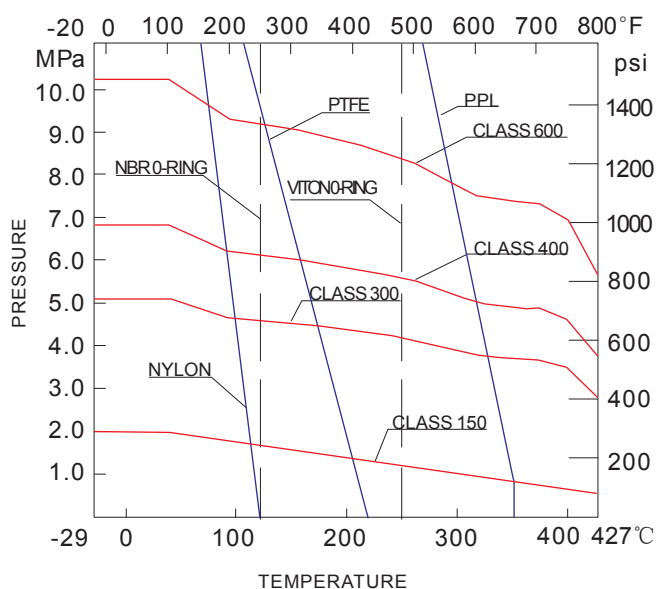
1. All materials conform to ASTM standard.
2. Materials above conform to general standard. We can apply other materials according to valve working condition or customer's requirement. We also reserve the rights to improve the valve material according to relating standard.
3. Zn-Galvanized ENP-Electroless Nickel Plated Hcr-Electroless Hard Chrome Plated
4. Under-30℃(-22°F), working condition, the valve stem need to be extended.
5. For NACE working requirements, spring strength ≤HRC28, body hardness≤HRC22.

PRESSURE-TEMPERATURE RATING

The following table indicates rated values of temperature and pressure for main materials of valves. These valves are determined according to American standard ASME/ANSI B16.34

Temp		Max. Working Pressure											
		150Lb		300Lb		400Lb		600Lb		900Lb		1500Lb	
°F	°C	A105,LF2	F316	A105,LF2	F316	A105,LF2	F316	A105,LF2	F316	A105,LF2	F316	A105,LF2	F316
Up to	Up to	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar
100	38	19.7	19	51	49.6	68.3	66.2	102	99.3	153.1	148.9	255.5	248.2
200	93	17.9	16.5	46.5	42.7	62.1	56.9	93.1	85.5	139.6	128.2	232.7	213.4
300	149	15.9	14.8	45.2	38.6	60.3	51.4	90.7	77.2	135.8	115.8	226.1	192.7
400	204	13.8	13.4	43.8	35.5	58.3	47.2	87.6	71	131	106.2	218.6	177.2
500	264	11.7	11.7	41.4	33.1	55.2	43.8	82.7	65.8	123.8	98.9	206.5	164.8

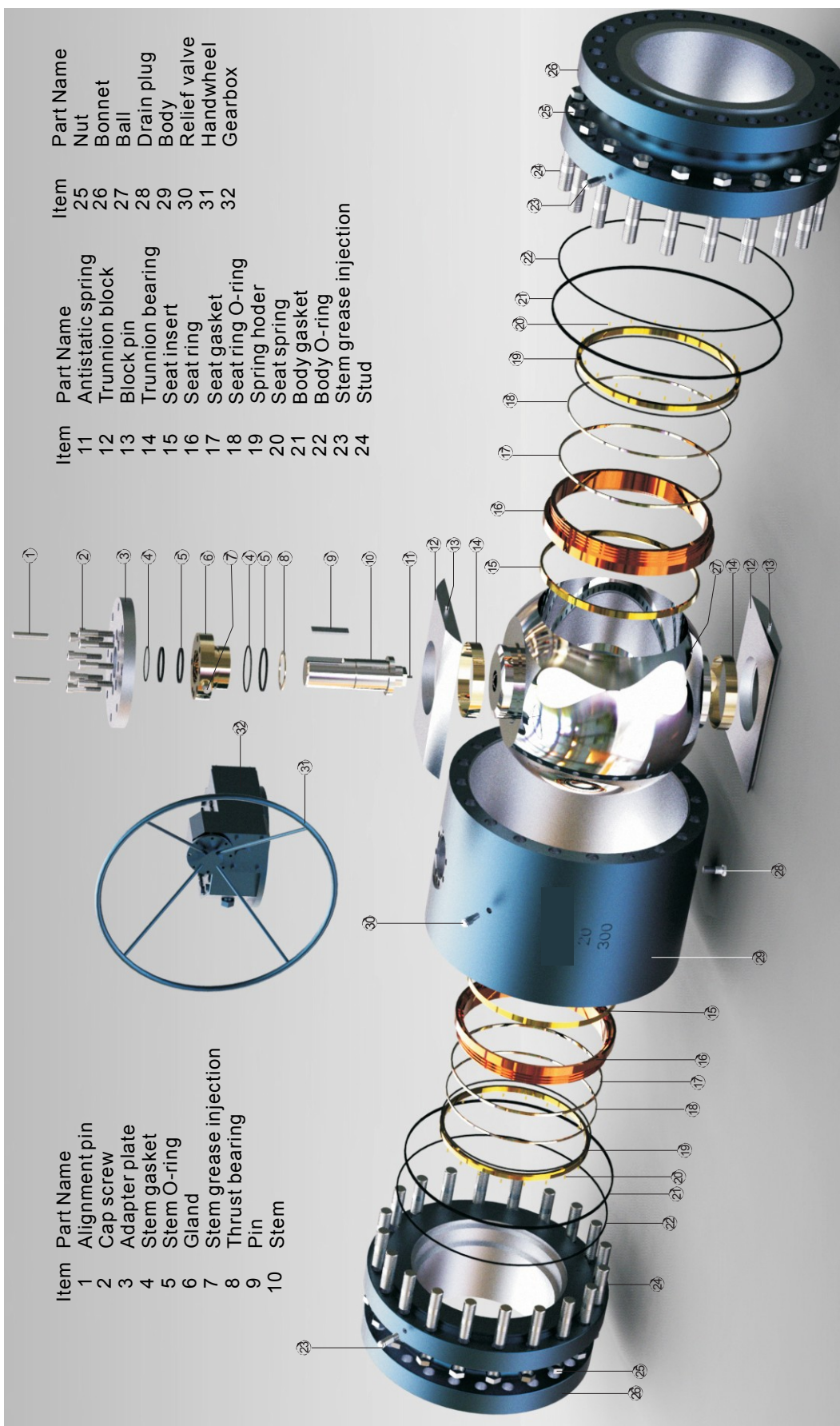
The CVI soft seated trunnion mounted ball valve P-T rating is not only related to the body material, but also related to the material of seat, packing and gasket. Sealing material is made of macromolecule, asbestos or rubber. And the selection of sealing material is depended upon the medium of the valve, valve working temperature, pressure and velocity of flow. As the P-T rating is varied on different valve working conditions, the following P-T rating value is calculated out by stable valve working condition.



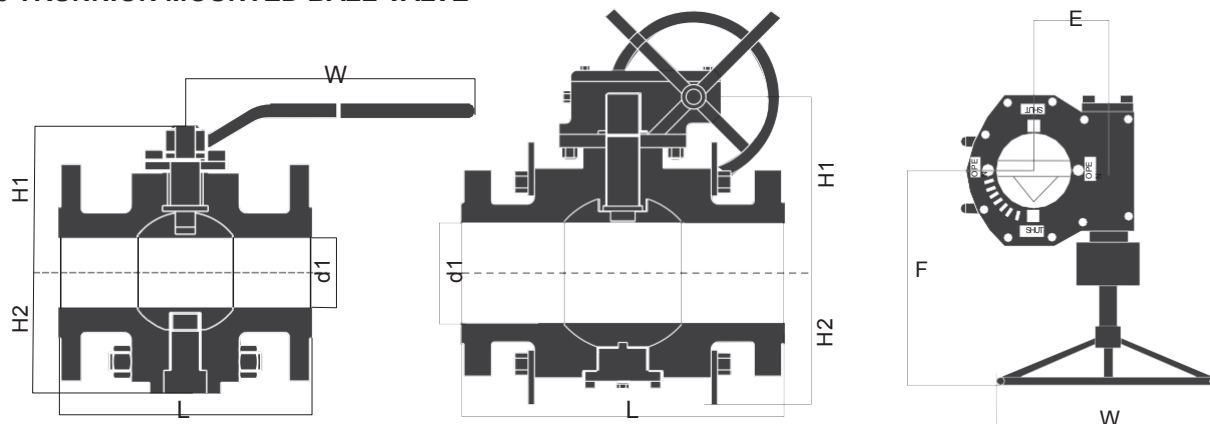
Note: The valve body material in the above chart is A105. For other P-T rating of different body material, please refer to ASME B16.34 (lasted edition)



CVI B220 TYPE
API6D THREE PIECES FORGED BODY TRUNNION MOUNTED BALL VALVE
SIZE 16 " - 42 " PRESSURE 150# TO 2500#



B220 TRUNNION MOUNTED BALL VALVE



● CLASS 150 Dimensions

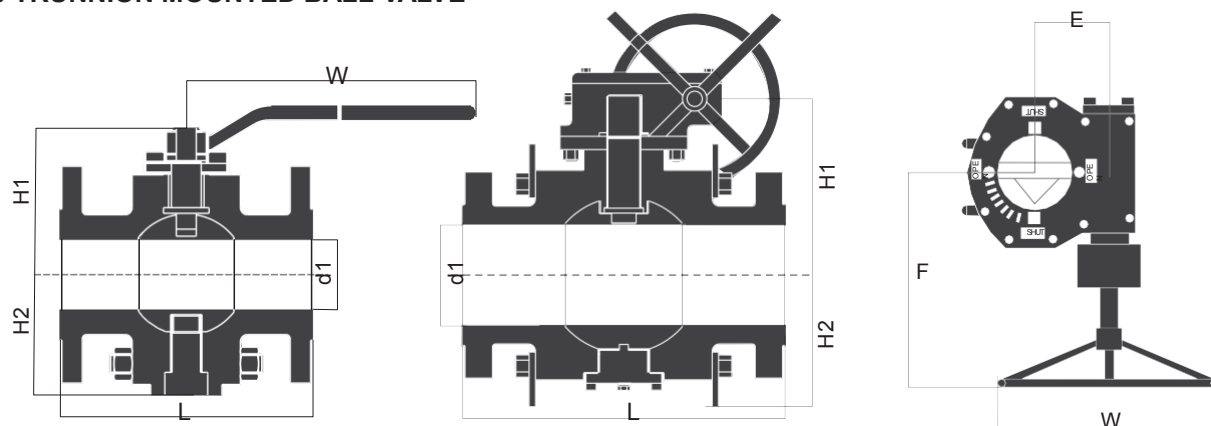
DN	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"
d1	51	64	76	102	127	152	203	254	305	337	387	438	489	591	686
L	RF	178	191	203	229	356	394	457	533	610	686	762	864	914	1067
	BW	216	241	283	305	381	457	521	559	635	762	838	914	991	1143
H1	80	80	100	115	184	260	300	325	365	400	440	500	555	700	780
H2	150	150	200	240	300	340	389	405	455	490	550	620	680	870	955
E	/	/	/	/	/	/	116	116	171	171	257	257	257	150	83
F	/	/	/	/	/	/	350	350	420	420	400	400	400	410	650
W	230	400	400	650	1050	1050	600	600	800	800	800	800	800	800	800
Wt (kg)	16	16	36	70	88	145	346	540	850	1060	1380	1910	2300	3180	4480

● CLASS 300 Dimensions

DN	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"
d1	51	64	76	102	127	152	203	254	305	337	387	438	489	591	686
L	RF	216	241	283	305	381	403	502	568	648	762	838	914	991	1143
	BW	216	241	283	305	381	457	521	559	635	762	838	914	991	1143
H1	80	80	100	115	184	260	300	325	365	400	440	500	555	700	780
H2	150	150	200	240	300	340	389	405	455	490	550	620	680	870	955
E	/	/	/	/	/	/	116	116	171	171	257	257	257	150	83
F	/	/	/	/	/	/	350	350	420	420	400	400	400	410	650
W	230	400	400	650	1050	1050	600	600	800	800	800	800	800	800	800
Wt (kg)	33	33	41	81	100	155	260	585	890	1160	1560	2420	2610	5025	5170

● CLASS 400 Dimensions

DN	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	20"	24"	28"
d1	51	64	76	102	152	203	254	305	337	387	489	591	686
L	RF	292	330	356	406	495	597	673	762	826	902	1054	1232
	BW	292	330	356	406	495	597	673	762	826	902	1054	1232
H1	93	93	122	152	215	294	370	420	460	505	630	685	810
H2	190	190	230	280	327	374	445	515	550	615	810	845	1010
E	168	155	197	235	300	374	445	512	550	615	810	1010	1180
F	/	/	/	/	116	171	171	257	257	257	150	83	123
W	/	/	/	/	350	420	420	400	400	400	410	650	735
Wt (kg)	39	39	83	120	301	520	760	1360	1620	1860	2900	3825	7030

B220 TRUNNION MOUNTED BALL VALVE

● CLASS 600 Dimensions

DN	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	20"	24"	28"
d1	51	64	76	102	152	203	254	305	337	387	489	591	686
L	RF&BW	292	330	356	432	559	660	787	838	889	991	1194	1549
	RJ	295	333	359	435	562	664	791	841	892	994	1200	1562
H1	93	93	122	152	215	294	370	420	460	505	630	825	970
H2	190	190	230	280	327	374	445	515	550	615	810	1010	1180
E	/	/	/	/	116	171	171	257	257	257	150	83	123
F	/	/	/	/	350	420	420	400	400	400	410	650	735
W	400	650	650	1050	600	800	800	800	800	800	800	800	800
Wt(kg)	39	39	83	150	377	650	950	1700	2050	2325	3400	4500	8280

● CLASS 900 Dimensions

DN	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
d1	51	64	76	102	152	203	254	305	324	375	426	473	572
L	RF&BW	368	419	381	457	610	737	838	965	1029	1130	1219	1549
	RJ	371	422	384	460	613	740	841	968	1038	1140	1232	1569
H1	126	126	191	216	270	322	420	470	510	600	700	720	810
H2	217	217	259	297	360	394	502	572	675	762	866	894	956
E	/	116	116	116	171	171	257	169	42	42	72	72	91
F	/	350	350	350	420	420	400	573	696	696	745	745	830
W	650	600	600	600	800	800	800	700	700	700	700	700	700
Wt(kg)	43	43	65	102	254	562	671	1065	1406	1723	2562	3651	4876

● CLASS 1500 Dimensions

DN	2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
d1	51	64	76	102	146	194	241	289	318	362	395	440	504
L	RF&BW	368	419	470	546	705	832	991	1130	1257	1384	1537	2043
	RJ	371	422	473	549	711	841	1000	1146	1276	1407	1559	1972
H1	126	126	191	216	296	378	495	542	590	670	710	750	850
H2	217	217	259	297	365	475	578	696	761	831	900	950	1080
E	/	116	116	116	171	257	169	42	42	72	91	91	280
F	/	350	350	350	420	400	573	696	696	745	830	830	/
W	650	600	600	600	800	800	700	700	700	700	700	700	700
Wt(kg)	43	43	84	127	409	616	1088	682	1959	3485	5191	7940	10660

C_v VALUE

The following chart is the flow ratio of trunnion mounted ball valve.

c_v indicates the gallons of water at temperature +60° F flowing through the valve bore in pressure differential down 1LBS/inch² (0.0068694757MPa).

SIZE	CLASS150	CLASS300	CLASS600	CLASS900	CLASS1500
2"	500	470	400	360	360
3"	1300	1100	1000	1000	900
4"	2300	2200	1800	1800	1600
6"	5400	5400	4500	4300	4000
8"	10000	10000	8900	8400	7900
10"	17800	17100	14500	14000	13000
12"	26000	25000	22000	21000	19000
14"	32000	31000	28000	26000	24000
16"	44000	42000	39000	36000	33000
18"	58000	56000	51000	47500	42000
20"	75000	72000	66000	60000	52000
24"	111200	102000	92000	86000	81000
26"	123000	108000	98000	91000	
28"	143000	123000	12200	112000	

CVI GDR TRUNNION MOUNTED BALL VALVE TORQUE

Size		Unit	Class 150		Class 300		Class 400		Class 600		Class 900	
DN	IN		Torque at 20 bar	MAST	Torque at 50 bar	MAST	Torque at 64 bar	MAST	Torque at 100 bar	MAST	Torque at 150 bar	MAST
150	6	N.m	320	2040	480	2040	640	2850	950	2850	1600	4800
200	8		640	2550	850	2550	1200	4800	1600	4800	2800	8400
250	10		970	4350	1450	4350	2000	8100	2700	8100	4800	14400
300	12		1735	6900	2300	6900	3200	12900	4300	12900	7200	21600
350	14		2060	9900	3300	9900	4238	18600	6200	18600	11000	33000
400	16		3441	14400	4800	14400	6400	26400	8800	26400	14400	43200
450	18		3978	19200	6400	19200	8208	36000	12000	36000	19200	57600
500	20		5017	24000	7825	2400	10355	42000	14000	42000	27200	81600

1. This table of the torque is the valve breaking torque at maximum pressure differential, for choosing the operators.
2. 50% Safety factor should be considered when choose the actuators.
3. All the datas above are just for reference. Contact CVI engineers to get actual datas.

CONNECTION PIPE INFORMATION

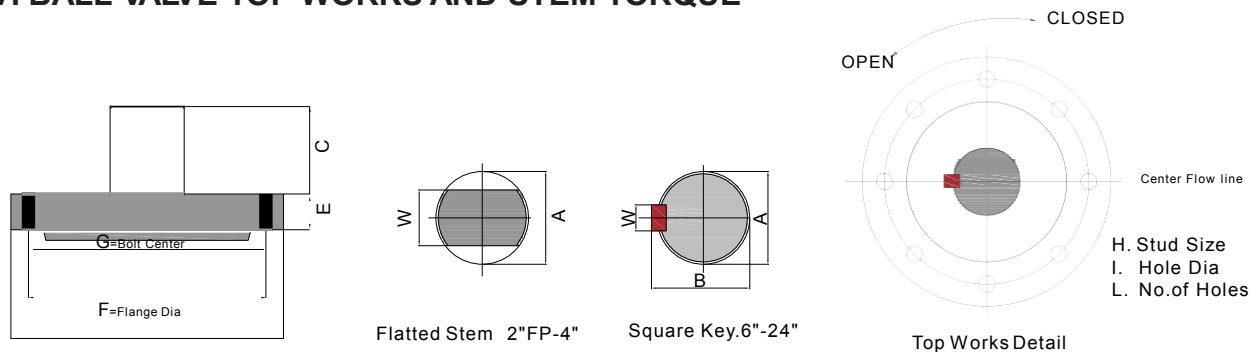
Pipe Description	Nominal Pipe Size(in.)						
	2	3	4	6	8	10	12
Outside Dia.(in.)	2.375	3.500	4.500	6.625	8.625	10.750	12.750
(STD)Standard	---	---	.237	.280	.322	.365	.375
Sch 40	.154	.216	.237	.280	.322	.365	.406
XS	.218	.300	.337	.432	.500	.500	.500
Sch 80	.218	.300	.337	.432	.500	.593	.687
Sch 160	.343	.438	.531	.718	.906	1.125	1.312
XXS	.436	.600	.674	.864	.875	1.000	1.000

Pipe Description	Size(in.)					
	14	16	18	20	22	24
Outside Dia.(in.)	14.000	16.000	18.000	20.000	22.000	24.000
(STD)Standard	.375	.375	.375	.375	.375	.375
Sch 40	.438	.500	.562	.593	---	.687
XS	.500	.500	---	---	.500	---
Sch 80	.750	.843	.937	1.031	1.125	1.218---
Sch 160	1.406	1.593	1.781	1.968	---	2.343
XXS	---	---	---	---	---	---

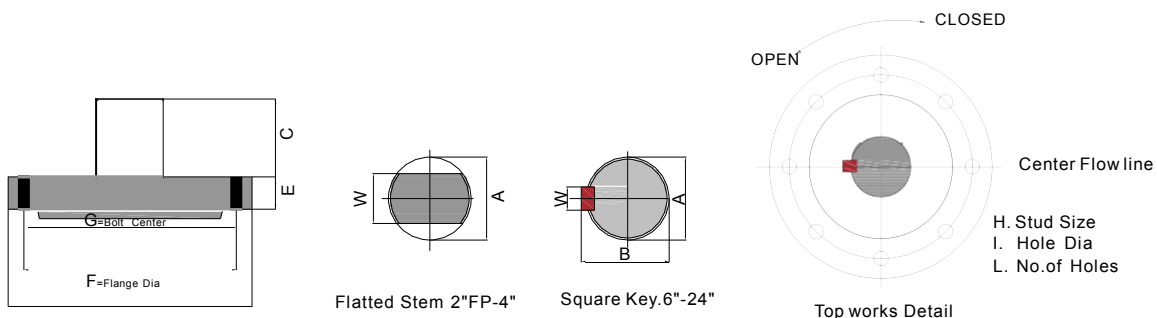
CONNECTION PIPE OUTSIDE DIA.(O.D)

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

CVI BALL VALVE TOP WORKS AND STEM TORQUE

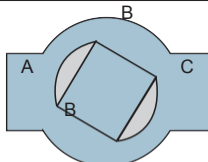
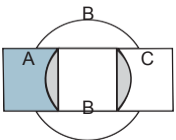
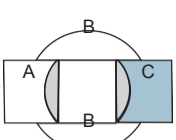
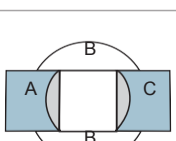
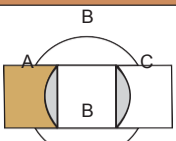
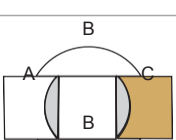


ANSI Class	Valve Size(in.)	A	B	C	E	F	G	I Hole Dia.	L No.of Holes	W	ISO5211 Mounting pad
150# 300#	2 "	0.787	----	1.496	0.394	3.622	----	----	----	----	F07
	3 "	1.024	----	1.89	0.63	3.622	----	----	----	----	F07
	4 "	1.339	----	1.89	0.787	4.921	----	----	----	----	F10
	6 "	1.732	----	3.307	1.299	6.69	5.512	0.748	4	1.063	F14
	8 "	1.969	----	2.598	1.732	8.268	6.496	0.906	4	0.551	F16
	10 "	1.969	2.106	2.598	0.984	8.268	6.496	0.906	8	0.551	F16
	12 "	2.52	2.74	3.268	1.201	11.811	10	0.748	8	0.709	F25
	14 "	2.52	2.74	3.268	1.299	11.811	10	0.748	8	0.709	F25
	16 "	2.953	3.173	4.522	1.299	11.811	10	0.748	8	0.787	F25
	18 "	2.953	3.173	4.522	1.299	11.811	10	0.748	8	0.787	F25
	20 "	3.346	3.646	4.522	1.575	11.811	10	0.748	8	0.945	F25
	24 "	3.937	4.276	5.433	1.417	13.78	11.732	0.906	8	1.102	F30



ANSI Class	Valve Size(in.)	A	B	C	E	F	G	Hole Dia.	No. of Holes	W	ISO5211 Mounting pad
600#	2 "	1.024	----	1.89	0.394	3.543	2.756	0.315	4	0.669	F07
	3 "	1.339	----	1.89	0.394	4.646	4.016	0.394	4	0.866	F10
	4 "	1.732	----	3.346	1.22	6.89	5.512	0.748	4	1.063	F14
	6 "	1.969	----	2.598	1.299	8.268	6.496	0.906	4	0.551	F16
	8 "	2.52	2.74	3.346	1.732	11.811	10	0.748	4	0.709	F25
	10 "	2.52	2.74	3.346	0.984	11.811	10	0.748	8	0.709	F25
	12 "	2.953	3.173	4.252	1.319	11.811	10	0.748	8	0.787	F25
	14 "	2.953	3.173	4.252	1.299	11.811	10	0.748	8	0.787	F25
	16 "	3.346	3.646	4.252	1.299	11.811	10	0.748	8	0.945	F25
	18 "	3.937	4.276	5.433	1.299	13.811	11.732	0.906	8	1.102	F30
	20 "	3.937	4.276	5.433	1	13.78	11.732	0.906	8	1.102	F30
	24 "	4.724	5.102	7.48	2.362	13.78	14.016	1.299	8	1.26	F35
900#	2 "	1.339	----	1.89	0.394	4.724	4.016	0.394	4	0.866	F10
	3 "	1.732	----	3.346	0.394	6.89	5.512	0.784	4	1.063	F14
	4 "	1.969	----	2.598	1.22	8.268	6.496	0.906	4	0.551	F16
	6 "	1.969	----	2.598	1.378	8.268	6.496	0.906	4	0.551	F16
	8 "	2.52	2.74	3.346	1.575	11.811	10	0.748	8	0.709	F25
	10 "	2.953	3.173	4.252	1.26	11.811	10	0.748	8	0.787	F25
	12 "	3.346	3.646	4.522	1.811	11.811	10	0.748	8	0.945	F25
	14 "	3.937	4.276	5.433	1.378	13.78	11.732	0.906	8	1.102	F30
	16 "	3.937	4.276	5.433	1	13.78	11.732	0.906	8	1.102	F30
1500#	2 "	1.339	----	1.89	1.102	4.724	14.016	0.394	4	0.866	F10
	3 "	1.969	----	2.598	1.181	8.268	6.496	0.906	4	0.511	F16
	4 "	1.969	----	2.598	1.22	8.268	6.496	0.906	4	0.511	F16
	6 "	2.52	----	3.346	1.181	11.811	10	0.748	8	0.709	F25
	8 "	2.953	3.173	4.522	1.575	11.811	10	0.748	8	0.787	F25
	10 "	3.346	3.646	4.522	1.457	11.811	10	0.748	8	0.945	F25
	12 "	3.937	4.276	5.433	1.811	13.78	11.732	0.906	8	1.102	F30

CVI TRUNNION MOUNTED BALL VALVE TEST PROCEDURE

HYDROSTATIC SEAL TEST API6D 10.3 and 10.4						
Sequence		Area Pressure		Duration(min)		Description
SHELL TEST		A	1.5x PN	6 " -10 "	5	1. Valve in partial open. 2. Set the pressure to 150% PN. 3. Reduce the pressure to 50% PN. 4. Reset the pressure to 150% PN. 5. Hold the pressure for the duration of testing.
		B	1.5xPN	12 " -18 "	15	
		C	1.5xPN	20 " -60 "	30	
SEAT TEST		A	1.1xPN	5		Seat hydro seal test at A end toawrds body B
		B	Atmospheric			
		C	Atmospheric			
		A	Atmospheric	5		Seat hydro seal test at C end toawrds body B
		B	Atmospheric			
		C	1.1xPN			
		A	1.1xPN	5		Seat hydro seal test for both A and C DBB
		B	Atmospheric			
		C	1.1xPN			
AIR SEAL TEST API6D 10.4						
SEAT TEST		A	Atmospheric	5		Seat air seal test at A end toawrds body B
		B	Atmospheric			
		C	80PSIG(5.5bar)			
		A	80PSIG(5.5bar)	5		Seat air seal test at C end toawrds body B
		B	80PSIG(5.5bar)			
		C	Atmospheric			

PN= Nominal Pressure Blue=Liquid Yellow=Air



HOW TO SPECIFY AND ORDER CVI FORGED BODY BALL VALVES

A	TYPE
F	Forged Body Ball Valve
T	Top Entry Ball Valve
F120	Floating Ball Valve
B220	Trunnion Ball Valve

B	DN
FB	Full Port 03 3"
RB	Reduced Port 06 6"
01	1" 12 12"
02	2" 24 24" etc.

C	PRESSURE CLASS
15	Class 150 90 Class 900
30	Class 300 150 Class 1500
60	Class 600 250 Class 2500
80	800 20 2 M

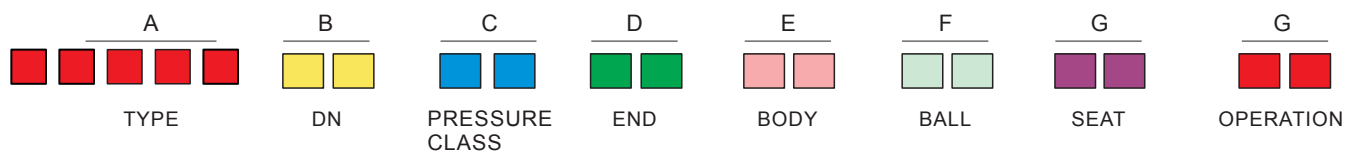
D	END
RJ	Ring joint
BW	Butt weld
RF	Raised face
SE	Screwed In

E	BODY
A1	WCB A5 CF8M B1 A105
A2	WCC A6 CF8 B2 F316
A3	LCB A7 WC6 B3 F304
A4	LCC A8 WC9 B4 LF2

F	BALL/SEAT
C1	A105+ENP C4 LF2+ENP
C2	316 C5 A105+HCr
C3	304 C6 TUNGSTEN COATED

G	SEAT INSERT
D1	TEFLON D5 PPL
D2	NYLON D6 VITON
D3	DEVILON D7 HNBR
D4	PEEK D8 EPDM

H	OPERATION
0	Bare stem 4 Pneumatic
1	Lever 5 Hydraulic
2	Gear 6 Gas over oil
3	Electric



EXAMPLES

F F 1 2 0 F B 0 8 9 0 R F A 1 C 1 D 3 2

Forged, Floating Ball Valve, Full Port, 8", 900 Class, Raised Face, Body WCB, Ball And Seat A105+ENP, Seats Devlon, Operation Gear

F B 2 2 0 F B 1 2 6 0 R T J B 4 C 4 D 1 2

Forged, Trunnion Ball Valve, Full Port, 12", 600 Class, Ring Joint, Body LF2, Ball And Seat LF2+ENP, Seat Insert Teflon, Operation Gear



TERMS AND CONDITIONS OF SALE

SCOPE

These terms and conditions apply to all Calvary Valve Inc valve products, and supersedes all previously published terms and conditions.

Hereafter, Calvary Valve Inc Company shall be referred to as CVI.

Special terms and conditions printed on a buyer's order will only apply in so far as they conform to the terms and conditions detailed on these pages. Terms and conditions of an order that change or modify those on this sheet shall not be binding on CVI.

APPROVAL

All quotations, contracts, orders, or agreements are subject to approval and/or acceptance by the main office of CVI.

We reserve the right to correct clerical or stenographic errors in quotations, orders, invoices, and other contracts, agreements, or documents.

PRICES

Possession of price lists will not be accepted by CVI as an obligation, or offer to sell the goods listed therein to anyone.

All prices contained therein are subject to change without notice, and supersede all previous lists. All orders will be invoiced at prices in effect at the time of shipment unless quoted in writing.

CHANGES

Orders cannot be cancelled or specifications be changed without the consent of CVI, and then only in terms indemnifying CVI against loss.

QUOTATIONS

Goods quoted F.O.B. our service center are subject to prior sale. Prices quoted are valid only for the duration indicated in the quotation. Quoted prices supersede all previous prices, quotations, or contracts, and are subject to change without notice.

CANCELLATIONS

Orders placed with us cannot be cancelled without our prior written consent. A cancellation charge will be applicable as outlined in our quotation.

CLAIMS

All claims for shortages, corrections, or deductions must be made within 10 days after receipt of goods. Responsibility for goods lost or damaged in transit rests with carrier, and claims should be filed with the carrier by the consignee. Delivery of material to a common carrier shall be considered delivery to the buyer, and shall be at the buyers risk thereafter.

DELIVERY DELAYS

We assume no responsibility for delays in delivery, or defaults resulting from strikes, work stoppages, fires, floods, accidents, war, inability to obtain materials, or any other cause unavoidable and beyond our control.

TAXES

CVI quotations and/or contracts do not include any municipal, state, or federal sales, excise, use occupational, or other taxes, and any such tax, if paid by us will be charged to the purchaser.

CATALOG ILLUSTRATIONS

Catalog illustrations are actual representations of a certain size of each product line, but do not necessarily represent all sizes in details. We reserve the right to institute changes in materials, designs, and specifications without notice in keeping with our policy of continuing product improvement.

CATALOG WEIGHTS

Catalog weights represent average weights of products and are in no sense guaranteed.

RETURNS

See Return Goods Policy on next page.

SPECIAL ORDERS

Orders for special goods must be in writing and accompanied with detailed prints and/or sets of specifications, unless specifications on the orders are definite and complete. Orders will not be entered with the factory unless this is adhered to. Cancellation charges will be as outlined in our quotations.

FREIGHT TERMS

All shipments are F.O.B. our service centers. See current bulletin for freight allowance.

WARRANTY

See warranty on next page



RETURN GOODS POLICY

This policy supersedes all other policies for return goods.

I. Goods returned at customers request:

- A. Material must be:
 - 1. Of our manufacture.
 - 2. In clean, new and saleable condition. It must have been stored inside out of the weather
 - 3. Shipped from one of our service centers within the 12 calendar months preceding the request for return, and the return will not cause inventory to exceed maximum allowable levels.
 - 4. Personally inspected by a CVI representative prior to its return.
 - 5. Special or non-standard items are non-returnable.
- B. Return shipments must be prepaid.
- C. Credit will be allowed at invoice price, less 25% handling cost, and less any freight paid by CVI.
- D. A Return Goods Card must be furnished by a CVI representative after inspection of the material, and must be returned with the shipment.
- E. Shipments received without a Return Goods Authorization Card will be refused. Customer will be responsible for any storage and/or return freight.
- F. Material returned which is not of CVI manufacture, not in clean and saleable condition, or not authorized for return will be returned to the customer freight collect.

II. Goods returned because of an error by CVI

- A. Material must be in a clean, new, saleable condition.
- B. Return shipment should be made freight collect.
- C. Full credit will be allowed.
- D. Customer must receive Return Goods authorization prior to the return of the material. Return Goods Authorization Card must accompany shipment. Shipments received without Return Goods Authorization Card will be refused. Return Goods Authorization Card should be attached to the packing list.

All requests to return material to CVI Company must be submitted in writing to our National Sales Manager for authorization.

WARRANTY

CVI warrants each product sold, if the products are of our manufacture, against defects in material and workmanship under normal use and service for a period of one year after date of shipment.

This warranty is made to the buyer only, and does not extend to any other party. The obligation of CVI Company under this warranty

F.O.B. the factory or service center; (c) refund of the purchase price. In the case of product or parts not wholly of CVI's manufacture, CVI's liability under this warranty shall be limited to the extent of CVI's recovery from the manufacturer of such parts under its warranty to CVI. This warranty does not extend to any claims for labor, consequential damages, down time, or any other loss, damage, or expense of any kind arising out of the defect. We do not allow claims for unauthorized repairs, labor, or material. We are not responsible for loss of use, personal injury, lost profits, or any other damages whatsoever in connection with the warranties set forth.

No warranty shall apply to any product which has been modified or changed in design or function after leaving CVI's facilities or which should consult knowledgeable advisors in the selection of product type and material of construction for their specific use. The buyer assumes all risk of this selection.

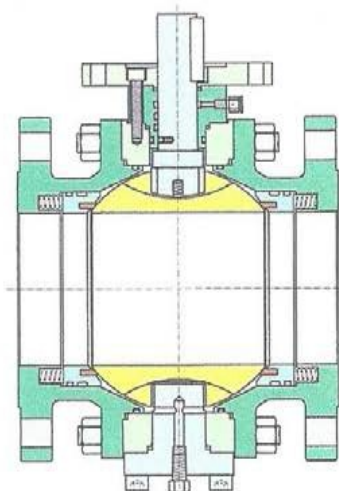
No material may be returned without first obtaining written permission from CVI Company. The foregoing is the only warranty and no other is expressed or implied.



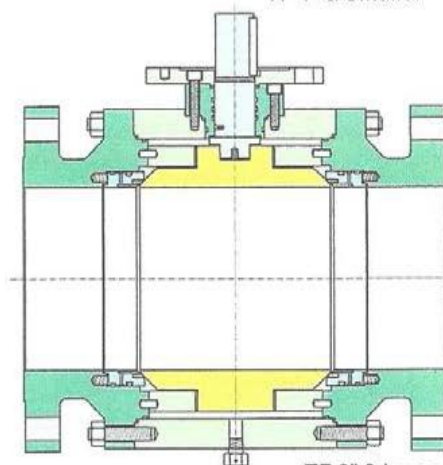
- **General Design**

The ball is fixed by trunnion (size 4" & smaller) or trunnion support (size 6" & larger), and the seat rings are floating, free to move against the ball along the valve centerline. The trunnion / trunnion support together with bearings adsorb the side load created by the pressure acting on the ball. At low pressure, the seat tight sealing is ensured by the preload of the springs acting on the seat rings. Along with the pressure increasing, the process medium pressure pushes the seat rings against the ball to provide additional load for tight sealing.

The ball and stem are independent with each other to minimize the effect of the side thrust generated by the pressure acting on the ball.



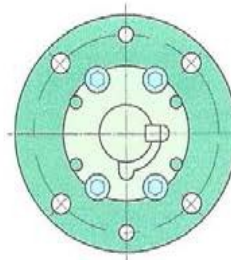
TF 4" & Smaller



TF 6" & Larger

- **Ball Seat Alignment**

Mechanical stops are equipped on all valves to ensure the ball is never to be over rotated.



- **AED O-Ring**

When valves are used under high pressure gas applications, e.g. hydrocarbon gas service under class 600lb and above, the gas may be absorbed into the molecular structure of elastomeric O-rings. If the valve is subjected to sudden decompression, the O-rings may be destroyed by the rapidly expanded gas. To avoid this possibility, special AED O-rings or Lip seals, suitable for such service conditions, are available on request.

- **Environment Friendly Valve**

Accurate machining of stem, gland and body sealing surfaces with double sealing (O-ring primary seal plus graphite gasket seal) ensure the low emission which is complying with the most severe pollution-control regulations. The test certifications are available on request.

Seat Design

Standard seat design is primary soft seal, and secondary metal to metal seal. Seat insert is designed as pressed-in type which is easy for maintenance. (Fig. 1) Optional design with primary metal to metal seal and secondary soft seal seat design is also available upon request. (Fig. 2)

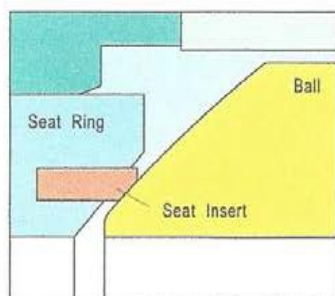


Fig.1

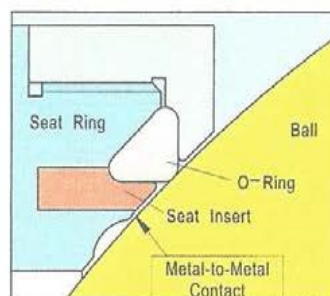


Fig.2

a) Standard: Single Piston Effect Seats (Self Relieving Seats)

Medium pressure, both upstream and downstream, creates a resultant thrust to the seat rings against the ball to assure tight sealing; Medium pressure acting in the body cavity creates a resultant thrust to push the seat rings away from the ball.

The single piston design permits the automatic release of any over pressure in the body cavity when the valve is in the fully open or fully closed position. (Fig. 3, 4)

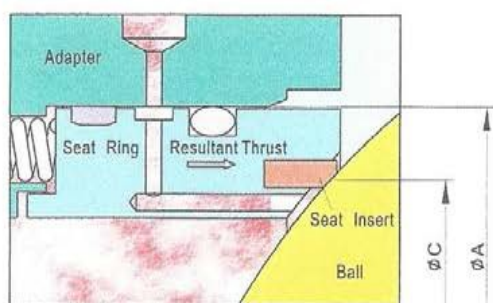


Fig.3

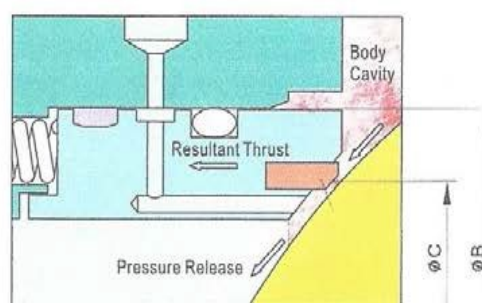


Fig.4

b) Option 1: Double Piston Effect Seats

Medium pressure, both upstream and downstream as well as in the body cavity, creates a resultant thrust that pushes the seat rings against the ball. Valves with double piston effect seat rings require a cavity pressure relief device to reduce the build-up of over pressure in the body cavity. (Fig. 5, 6)

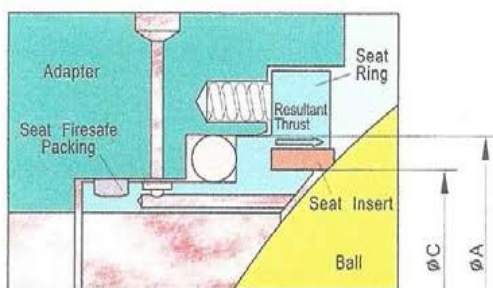


Fig.5

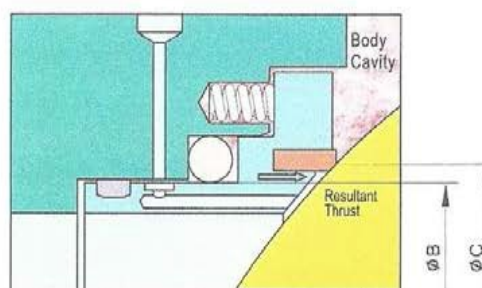


Fig.6

c) Option 2: Combination Seats

Combination seats design is available on request. That is a standard seat design used for upstream side and a double piston effect seats design used for downstream. The advantage is it can reach double piston effect seats design function without cavity pressure relief device to saves the cost, meanwhile only need a little care to install valve per flow direction arrow. (Fig. 3, 6)



Double Block and Bleed

When the ball is in the closed position, each seat seals off the process medium independently at the same time between the up/down stream and body cavity; it allows bleeding of the trapped cavity pressure (DBB) through drain or vent valve. The double block and bleed function makes it possible to flush the valve under pressure and verify that the seats are sealing properly.(Fig. 7)

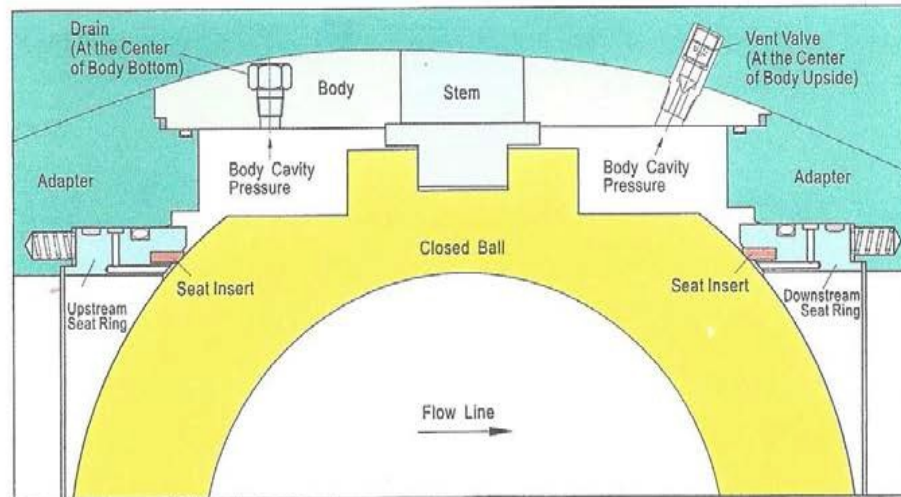


Fig.7

Blow-out Proof Stem

The stem is made separately from the ball with integral T-type round shoulder, retained by gland. (other designs are available on request).(Fig. 8)

Anti-static Device

Spring plus graphite type anti-static device are applied between the ball, stem, gland flange and body, to keep the electrical continuity between all the metallic components, and ensure the resistance lower than the most severe service requirement.(Fig. 8)

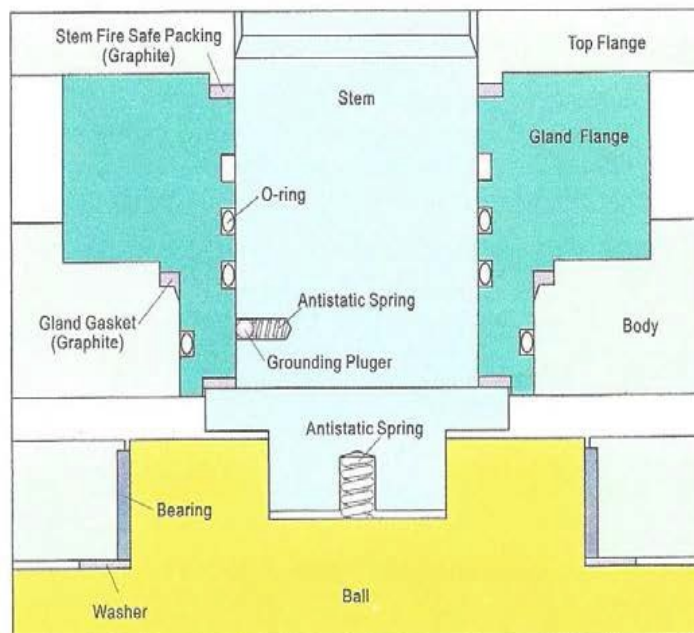


Fig.8

Fire Safe

a) External leakage prevention

All the possible external leakage point between stem and gland flange, gland flange and body, body and adapter are sealed with primary O-ring then secondary graphite gasket. When fire burned out the primary O-ring seal, the secondary graphite gasket seal still can prevent the process medium from external leakage. (Fig. 9)

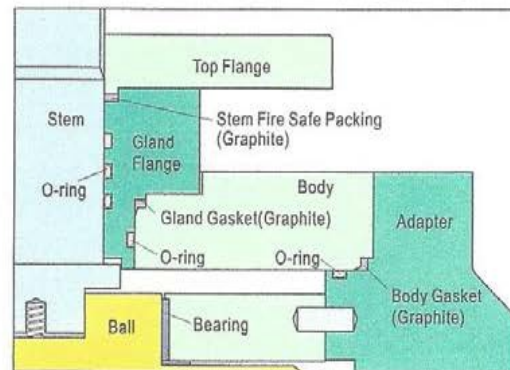


Fig.9

b) Internal leakage prevention

When fire burned out the primary O-ring seal between the floating seat ring and adapter, also the seat insert between seat ring and ball, the secondary graphite seal between seat ring and adapter, and seat ring & ball metal to metal contact preloaded by spring will minimize the internal process medium leakage. (Fig. 10, 11)

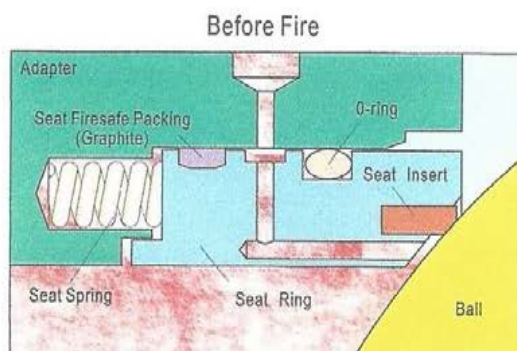


Fig.10

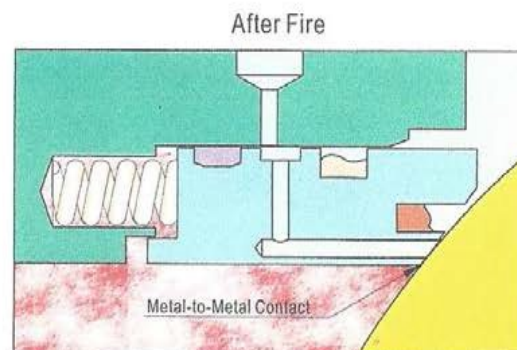


Fig.11

Emergency Sealant Injection System

Each valve of size 6" and larger (or smaller size on request), is equipped with sealant injection located at stem and seats area. The injection is integrated with check valve to provide backup sealing, also a check valve is equipped at front of seat sealant injection to avoid blowing out in case wrong operation. When the soft sealing materials (seat inserts and o-rings) are damaged and leakage happened by fire or other accident, the sealant can be injected through the injection fittings. (Fig. 12)

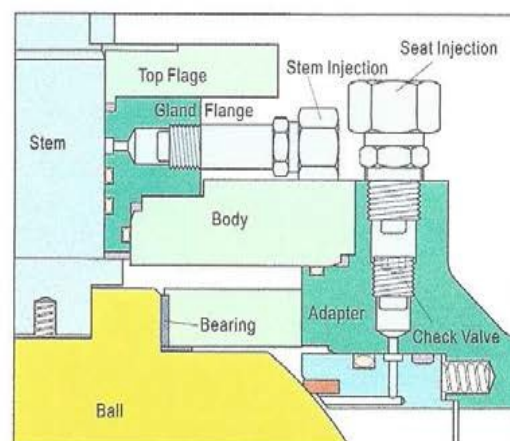


Fig.12

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