



API 6D CAST BODY BALL VALVE



CALVARY VALVE INC

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, ,and 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.



APPLICATIONS

A wide variety of body designs, materials, and trim make CVI Cast body ball valves exceptionally versatile and suitable for a multitude of liquid and gas fluid applications.



Power Generation

Steam Condensate Boiler Feed Pumps Cooling Towers Service Water Recirculators River Water Intake

Steel/Primary Metals

Quench Lines De-Scaling Continuous Casters Steam Condensate Strippers Electro-Galvanizing

Chemicals

Chlorine Phosgene Aromatics Polymers Acids Air Separation Cauctics

Oil and Gas Production

Centrifugal Compressor Discharge Fire Water Lines Oil/Steam Separation Steam and CO Injection Gas/Oil Gathering Systems Flowlines Wellheads

Petrochemicals

Ethylene Propylene Steam Reboilers Gases

Pulp and Paper

Bleaching Lines Black Liquor Green Liquor White Water Steam Chemical Recovery



Petroleum Refining

Hydrogen Cracking Steam Crude Oil Gasoline Visbreakers Naptha Sulfur



Marine

Oil Tankers Tanker Loading Terminals Offshore Platforms Sub-Sea Manifolds Terminal Transfer Lines Barge Unloading Lines Shipboard Services

Water and Wastewater

Distribution Lines Pumping Stations Sewage Plant Blower Discharge Chemical Treatment Fire Protection Systems HVAC Systems





CVI entry cast ball valves are designed, manufactured and tested in accordance with API, ANSI, and ASME requirements. The following list contains the most important applicable standards.

CVI Vista valves may be produced in accordance with other standards on request.

ANSI-American National Standard Institute

ASME B 1.20.1 ASME B 16.5 ASME B16.10	Pipe threads,general purpose Steel pipe flanges and flanged fittings Face-to -face and end- to- end dimensions of ferrous valves.
ASME B 16.25 ASME B16.34 ASME B16.47 ASME B31.3	Butt welding ends Steel valves-flanged and butt welding ends Larger diameter steel flange(26" ~ 60") Technics pipeline ASME VIII division 1 ASME Boiler and PressureVessel code,SectionVIII, Division 1, rules for construction of pressure vessel
MESC SPE 76/0 MESC SPE 77/1 MESC SPE 77/3	 01 Surface roughness degree of flange gasket interface 30 Ball Valve to API SPEC. 6D 02 Material Acceptance Requirements for Valves in General Service

MESC SPE 77/315 Electroless Nickel Plating

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, section 2: capability character of flange and connector.
- ISO 5211-3 Executive institution accessories of quarter-turn valves, section 3: 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
- NACE-National Association of Corrosion Engineers
- Mr0175 Sulfide stress cracking resistant metallic materials for oil field equipment(Superceded by ISO15156)

MSS-ManufacturersStandardization 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 accessoriesMagnetic		
	-particle testing		
MSSSP-54	Cast steel quality standard of valve, flange		
	fitting and pipeline accessoriesRadiographic		
	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 32.36.0	1.17-GEN Control valves' choice, specification		
	and standard		



PRODUCTS RANGE

VALVE BALL SUPPORTING

Floating ball v	alve	Trunnion Mounted ball valve
Size	1/2 " to 8 "	Size 2 " to 42 "
Pressure	150# , 300#	Pressure 150#/300#/600#
Temperature	-46℃ to 500℃	900#/1500#/2500#
		Temperature -46 $^\circ\!\mathrm{C}$ to 500 $^\circ\!\mathrm{C}$

VALVE SEALING METHOD

Soft	seated	ball	valve	
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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		Fully welded body	
Size	1/2 " to 42 "	Size	6 " to 48 "
Pressure	150#/300#/600#	Pressure	300#/600#
	900#1500#/2500#		900#/1500#
Temperatur	e -46℃ to 500℃	Temperatu	re -46℃ to 150℃

VALVE BALL ENTRY THE BODY TYPE

Side entr	y ball valve	Top entry b	pall valve
Size	1/2 " to 42 "	Size	2 " to 24 "
Pressure	150#/300#/600#	Pressure	150#/300#/600#
	900#/1500#		900#/1500#
Temperatu	re -46°C to 500 °C	Temperatur	e -46℃ to 500℃

VALVE OPERATION

Handle/Lever	Gear Box
Electric actuation	Hydraulic actuation
Pneumatic 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.



VALVE TAG & MARKINGS



VALVE MARKINGS



No.	Figure Number Code	Description
1	Figure Number	Identifies the detailed valve configuration (valve type, bore size, pressure class, materials, etc.)
2	Size/Pressure Class	Identifies bore size and pressure classifications per API requirements
3	Max. Pressure	Identifies the maximum operating pressure in PSI.
4	End Connection	Identifies the way of end connection
5	Temperature scop F	Identifies the maximum operating temperature in Fahrenheit
6	Manufacturing Date	Identifies the date the valve manufacturing completion date
7	Serial Number	Identifies certified manufacturers serial number
8	Valve Type	Identifies the type of valve
9	Body Materials	Identifies body metal material composition (A105, WCB, F51, CF8M, etc.)
10	Ball Materials	Identifies ball material composition (A105, 316SS, ENP, etc.)
11	Seat Materials	Identifies seat material composition (PEEK, Teflon, Nylon, etc.)
12	Stem Materials	Identifies stem material composition(A105, 410SS, 17-4pH, etc.)
13	Seals Materials	Identifies seals material composition





CVI F110 type floating ball valve has multi ways safety design, keep the pipe and working equipments in a safety protection. Especially keep the valuable human lives in safer working condition.

Г		Quarter turn limit plate
	/	Fire-safe gasket
	/	Lock device hole
		Blow out proof stem
		Fire safe design seat
/		



Functions & features

- B.B
- 1.Double block & bleed
- 2.Safe release

3.Reliable seal

4.Fire safe

5.Cleaning pipe



6.Emergency seal



9.Draining

7.Special seat

10.Extended stem

11.Various operations

12.Various end connections

- 13. Diversity of body materials
- 14.Diversity of seat materials





17.Bearing pipe stress safety

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F110 FLOATING BALL VALVE FEATURE



CVI F110 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 API 6FA and API 607. In case of extreme fire-proof conditions, the packing and gasket material shall be flexible graphite to insure zero leakage.

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.







1 /2" thru 8" ASME 150# 300# 1 /2" thru 4" ASME 600#

SPECIFICATION

General design standard	API6D/API608
-	
P-T Rating	ASME B16.34
Ŭ	
Eace to face dimensions	ASME B16 10
	FIGHTE BIOLING
Flanged end dimensions	ASME B16.5
r langea ena arriensiono	AGINE BIO.0
Butt-welded end	ASME B16 25
Duit Welded end	AGIVIL DT0.20
Inspection and test	API6D/ISO5208
inspection and test	AI 10D/1003200
Valve marking	MSS-SP25
valve marking	1000-01 20



FEATURES

- Blow-out proof stem
- Anti-static ball device
- Nil or lowest Emission
- Locking device
- Integral ISO mounting pad
- NACE MR.01-75 as Standard
- Lowest operating torques
- Advanced and exclusive seat design
- Fire safe according to API 607/ API 6FA
- Middle flange with no leakage design
- Wrench/lever with valve open/close indication
- Available in Uni-body and Split body designs
- Wide ranges of body/Internal/seat materials
- Designed according to ASME/ANSI B16.34 and BS5351.



Item	Name	Item	Name
1	Body	12	Mounting pad
2	Seat	13	Limit plate
3	Ball	14	Snap ring
4	Spiral wound	15	Handle
5	Сар	16	Washer
6	Bolt	17	Nut
7	Nut	18	Screw
8	Stem	19	Stem bearing
9	Thrust bearing	20	Antistatic spring
10	Packing	21	Antistatic bearing
11	Gland		





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



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.







TEMPERATURE





Full bore:1-2 1/2"

TEMPERATURE

A: Pure PTFE B: Reinforced PTFE

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







FULL BORE TYPE

General design standard	API6D/API608
P-T Rating	ASME B16.34
Face to face dimensions	ASME B16.10
Flanged end dimensions	ASME B16.5
Butt-welded end	ASME B16.25
Inspection and test	API6D/ISO5208
Valve marking	MSS-SP25

• 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
Н	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
Н	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)	16 5	1 90	216	241
Н	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
Н	115	115	122	157
D	160	230	230	400
Wt (Kg)	10	11	14	16

F110 FLOATING BALL VALVE DIMENSIONS







General design standard	API6D/API608
P-T Rating	ASME B16.34
Face to face dimensions	ASME B16.10
Flanged end dimensions	ASME B16.5
Butt-welded end	ASME B16.25
Inspection and test	API6D/ISO5208
Valve marking	MSS-SP25

CLASS 150 Dimensions

DN	2"	2 1/2"	3"	4"	5"	6"	8"	10"
d	51	64	76	102	127	152	203	254
d1	38	51	64	76	102	127	152	203
L	178	190	203	229	254	267	292	330
Н	115	120	155	165	200	220	295	355
D	230	230	400	400	650	1050	1050	1410
Wt (Kg)	10.5	16	18.9	31.5	37.5	54.9	73	121.5

CLASS 300 Dimensions

DN	2"	2 1/2"	3"	4"	5"	6"	8"	10"
d	51	64	76	102	127	152	203	254
d1	38	51	65	76	102	127	152	203
L	216	241	283	305	381	403	419	457
Н	115	120	155	165	200	260	295	355
D	230	230	400	400	650	1050	1050	1410
Wt (Kg)	16	25	34.2	38.2	51.8	67.1	94.5	144

Cv								
Specif	ication	Reduce	Full					
Inch	Metric	Bore	Bore					
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						

Cv value

Left 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 down1Lbs/Inch2 (0.0068694757Mpa).



B210 TRUNNION MOUNTED BALL VALVE

DESIGN FEATURE





B210 TRUNNION MOUNTED BALL VALVE FEATURE

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 bidirectional sealing, and no limitation for installation.



Valve in normal working condition

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.



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.





API6D TWO PIECE CAST STEEL BODY TRUNNION MOUNTED BALL VALVE SIZE 2 " - 24 " PRESSURE 150# TO 1500#



Item	Part Name	Item	Part Name	Item	Part Name
1	Cap screw	11	Stem bearing	21	Drain plug
2	Gland flange	12	Outer ring	22	Body
3	Stem gasket	13	Seat insert	23	Trunnion
4	Stem O-ring	14	Seat ring	24	Trunnion bearing
5	Stem seal ring	15	Spring	25	Trunnion O-ring
6	Thrust bearing	16	Seat ring O-ring	26	Ball
7	Seals	17	Stud	27	Gasket
8	Stem	18	Stem Grease injection	28	Bonnet
9	Pin	19	Relief plug	29	Nut
10	Antistatic spring	20	Seat grease injection		



MATERIAL SPECIFICATIONS

VAL	VEPARTS			TRIM						
		STANDARD SWEET SERVICE -29°C to +121°C	STNLS.TRIM SWEET SERVICE -29°C to +121°C	CS NACE* SOUR SERVICE -29°C to +121°C	STD. LOW TEMP. SWEET SERVICE -46°C to +121°C	LOWTEMP NACE* SOUR SERVICE -46°C to +121°C				
1	BODY	Carbon Stee	I - ASTM A216 Gr. WCB/WC	С	LOWTEMP. CARBON ST	EEL-ASTMA 352 Gr. LCC				
2	BONNET	Carbon Stee	I - ASTM A216 Gr. WCB/WC	C						
3	ADAPTER	Carbon Stee	I - ASTM A216 Gr. WCB/WC	00						
4	BALL (3MilHcr)	CARBON STEEL-ASTM ASTM A216 Gr. WCB/WG WCB/WCC CARBON STEEL-ASTM	STAINLESSSTEEL-AST CC A351 Gr. CF8M STAINLESSSTEEL-AST	M CARBON STEEL- A216 Gr.	LOWTEMP. CARBON ST	TEEL-ASTMA352 Gr. LCC TEEL-ASTMA350 Gr. LF2				
E	STEM	ASTM A105	A182Gr.F316							
5	(3Mil ENP)	ASTM 4140	STEEL-ASTM A276 Gr. 316	ASTM 4140						
6	LOWER TRUNNION (3Mil ENP)	ASTM 4140		STEEL-ASTM 4140						
7	TRUNNIÓN COVER	CARBONS	TEEL-ASTMA516 Gr. 70	-	CARBON STEEL-ASTMA	516 Gr. 70 (Impact tested)				
8	TRUNION BEARINGS			PTFE						
9	THRUST BEARINGS			PTFE						
10	SEAT INSERTS		NYLON, REINFO	DRCED TEFLON, (PEEI	<),PPL					
11	SEALS	BUI	NA N	VITON	LOW TEMP. BUNA N					
12	SEATS (3Mil ENP)	A105	F316	A105	F	316				
13	SEAT SPRINGS	STAINLESSS	TEEL17-7PH	INCONEL X- 750	STAINLESS STEEL 17-7PH	INCONEL X-750				
14	CAP SCREWS	CARBON STE	EL-ASTMA 193 Gr. B7M	1	CARBON ASTMA 32	STEEL 20 Gr. L7				
15	HEX NUTS	CARBON STE	EL - ASTMA 194 Gr. 2HM							
16	STUDS	CARBON STE	EL-ASTMA 193 Gr. B7M							
17	INJECTION FITTINGS	F304		STAINLESSST	EELAISI 316					
18	INTERNAL BALL CHECKS	F304								
19	BLEED VALVE	F304	STAINLESS STEEL AISI 316	CARBON STEEL	STAINLESSS	STEELAISI 316				
20	GEAR** OPERATOR	CAST	IRON CASE, CARBON STE	ELWORM&SEGMEN	TGEAR					
21	KEY		CARBO	N STEELAISI 1018						
22	VENT PLUG	F304	STAINLESS STEEL AISI 316	CARBON STEEL	STAINLESS	STEELAISI 316				
23	DOWEL		17-4PH STAINLES	S STEEL (6", 8", 10" 8	12")					

* Materials conform to requirements of NACE specification MR- 01-75 ** Gear Operator Assembly not shown in Dynamic View.

NOTES:

- 1. For "Firesafe Trim" assemblies Graphite Impregnated Carbon Packing is substituted for one Stem Seal, and one Trunnion Seal. Also, Bonnet Gasket and Trunnion Gasket utilize a Stainless Steel/Grafoil Spiral Wound Gasket, rather than an O-ring. All other materials are as specified in the Assembly Part Number Suffix.
- 2. Body, Bonnet and Adapters are available in Stainless Steel (ASTM A 352 Gr. CF8M) upon request.



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

TE	MP					MAX.	WORKIN	IG PRESS	SURE				
		150)Lb	300)Lb	400)Lb	600)Lb	900)Lb	150	0Lb
°F	°C	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M
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

As the P-1 rating is varied on different valve working conditions, the following P-1 rating value is calculated out by stable valve working condition.



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









• 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
	RF	178	191	203	229	356	394	457	533	610	686	762	864	914	1067	1245
L	BW	216	241	283	305	381	457	521	559	635	762	838	914	991	1143	1346
	H1	102	114	127	152	184	219	273	360	395	430	470	550	580	700	800
	H2	107	125	152	178	300	330	398	495	580	625	670	698	840	1050	1100
	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
W	t (kg)	12	16	22	35	58	74	205	322	460	576	864	1280	1600	3540	4500

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
	RF	216	241	283	305	381	403	502	568	648	762	838	914	991	1143	1346
L	BW	216	241	283	305	381	457	521	559	635	762	838	914	991	1143	1346
	H1	102	114	127	152	184	219	273	360	395	430	470	550	580	700	800
	H2	107	125	152	178	300	330	398	495	580	625	670	698	840	1050	1100
	E	1	1	/	/	1	/	116	116	171	171	257	257	257	150	83
	F	/	/	/	/	1	/	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
W	t (kg)	15	14	30	56	87	118	256	370	533	640	1030	1542	2100	4200	5300

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 BW	292	330	356	406	495	597	673	762	826	902	1054	1232	1397
H1	295	333	359	410	498	600	676	765	829	905	1060	1241	1410
H2	114	124	133	159	250	294	395	445	500	530	660	800	900
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)	400	650	650	1050	600	800	1120	1568	2195	3073	4302	6024	8433









CLASS 600 Dimensions

L	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
	RF&BW	292	330	356	432	559	660	787	838	889	991	1194	1397	1549
	RJ	295	333	359	435	562	664	791	841	892	994	1200	1407	1562
	H1	114	124	133	159	250	294	395	445	500	530	660	800	900
	H2	108	155	197	235	300	374	445	512	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
V	Vt(kg)	35	38	55	102	232	390	710	960	1700	1970	3250	5800	6700

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
	RF&BW	368	419	381	457	610	737	838	965	1029	1130	1219	1321	1549
L	R.I	371	422	384	460	613	740	841	968	1038	1140	1232	1334	1569
	H1	126	158	191	216	270	322	420	470	510	600	700	720	810
	H2	217	241	259	297	360	394	502	572	675	762	866	894	956
	E	1	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)		50	60	80	125	270	540	930	1302	1822	2551	3573	5001	7002

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
	RF&BW	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	2043
L	BI	371	422	473	549	711	841	1000	1146	1276	1407	1559	1686	1072
	H1	126	158	191	216	296	378	495	542	590	670	710	750	850
	H2	217	241	259	297	365	475	578	696	761	831	900	950	1080
	E	1	116	116	116	171	257	169	42	42	72	91	91	280
	F	1	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)	50	75	117	216	380	680	952	1332	1866	2612	3657	5120	7168



Cv 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 TRUNNION MOUNTED BALL VALVE TORQUE

Siz	Size Unit Class 150		0	Class 30	00	Class 4	100	Class	600	Class 9	00	
DN	IN		Formula	Torque	Formula	Torque	Formula	Torque	Formula	Torque	Formula	Torque
				at 20		at 50		at 64		at 100		at 150
				bar		bar		bar		bar		bar
150	6	N.m	176+7.36P	355	176+7.36P	612	176+7.36P	712	176+7.36P	1008	569+9.46P	2243
200	8		415+11.6P	712	415+11.6P	1095	415+11.6P	1272	415+11.62P	2395	982+24.93P	5125
250	10		500+19.1p	970	552+25.4p	2005	552+25.4p	2396	552+25.4p	3401	1318+30.6p	6657
300	12		901+33.8p	1735	901+33.8p	2851	901+33.8p	3370	901+33.8p	4752	2384+5488p	12410
350	14		973+45p	2060	973 + 45p	7500	973 + 45p	4238	1287+61.7p	8155	2896+74.97p	16225
400	16		1582+77.3p	3441	1582+77.3p	5990	1582+77.3p	7182	1582+77.3p	11250	3789+103.4p	23410
450	18		1897+86p	3978	1897+86p	6816	1897 + 86p	8208	4907+97.3p	16220	4907+116.6p	25125
500	20		2385+108.8p	5017	2385+108.8p	7825	2385+108.8p	10355	5488+141.3p	23040	2385+108.8p	29965

1. This table of the torque is the valve breaking torque at maximum pressure differential, for choosing the operators.

2. Formula in the table can be used to calculate the stem torques at other pressure differential. Example: calculated stem torque of DN250, PN100 valve at 70bar pressure differential. The corresponding table can be used formula:552+25.4Xp, p=70, Torque=2330N.m

3. 50% Safety factor should be considered when choose the actuators.

4. All the datas above are just for reference. Contact CVI engineers to get actual datas.



TRUNNION MOUNTED BALL VALVE PIPE SIZE

CONNECTION PIPE INFORMATION

Pipe Description			Nor	ninal 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
Sch40	.438	.500	.562	.593		.687
XS	.500	.500			.500	
Sch80	.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.)	ln.	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





Flatted Stem 2"FP-4"



Square Key.6"-24"



ANSI Class	V a I v e Size(in.)	A	В	С	E	F	G	l Hole Dia.	L No.of Holes	W	ISO5211 Mounting pad
150#	2 "	0.787		1.496	0.394	3.622					F07
300#	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

TRUNNION MOUNTED BALL VALVE TOP WORKS AND STEM TORQUE







Flatted Stem 2"FP-4"

≥

Square Key.6"-24"



- CLOSED

Top works Detail

ANSI Class	Valve Size(in.)	A	В	С	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
4500"	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

HYD	HYDROSTATIC SEAL TEST API6D 10.3 and 10.4							
	Sequence	Are	a Pressure	Duratio	on(min)	Description		
SHELL	B	A	1.5x PN	6 " -10 "	5	 Valve in partial open. Set the pressure to 150% PN. 		
1531		В	1.5xPN	12 " -18 "	15	 Reduce the pressure to 50% PN. Reset the pressure to 150% PN. 		
		С	1.5xPN	20 " -60 "	30	5. Hold the pressure for the duration of testing.		
SEAT	В	A	1.1xPN		5	Seat hydro seal test at A end toawrds body B		
TEST	A C	В	Atmospheric					
		С	Atmospheric					
	B	A	Atmospheric	5		Seat hydro seal test at C end toawrds body B		
		В	Atmospheric					
		С	1.1xPN					
	В	A	1.1xPN		5	Seat hydro seal test for both A and C DBB		
	A C	В	Atmospheric					
	В	С	1.1xPN					
ARI	SEAL TEST A	PI6D	10.4			-		
SEAT	B	A	Atmospheric	5		Seat air seal test at A end toawrds body B		
TEST	В	В	Atmospheric					
		С	80PSIG(5.5bar)					
	В	A	80PSIG(5.5bar)	5	;	Seat air seal test at C end toawrds body B		
	А	В	80PSIG(5.5bar)					
		С	Atmospheric					

PN= Nominal Pressure Blue=Liquid Yellow=Air



А	ТҮРЕ
С	Cast body ball valve
F	Forged body ball valve
W	Fully welded body ball valve
Т	Top entry ball valve

С	PRESSURE CLASS					
15	Class 150	90	Class 900			
30	Class 300	150	Class 1500			
60	Class 600	250	Class 2500			

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	

G	SEAT			
D1	TEFLON	D5	EPDM	
D2	NYLON	D6	VITON	
D3	PEEK	D7	STELLITE COATED	
D4	PPL	D8	TUNGSTEN COATED	





F B 3 0 6 0 R F B 1 C 2 D 3 P 0

HOW TO SPECIFY CVI BALL VALVES

В	DN				
FB	Full port	02	02"		
RB	Reduced port	10	10"		
01	1"	12	12" etc.		

D	END
RJ	Ring joint
BW	Butt weld
RF	Raised face

F	BALL				
C1	105+ENP	C4	LF2+ENP		
C2	316	C5	105+HCr		
C3	304	C6	TUNGSTEN COATED		

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

O---Operation

EXAMPLES



Cast body ball valve, Class1500, Ring joint, with seat of NYLON and body materials constructed using WCB,Ball constructed with304, full port, nominal size 8 inch, operated by gear box.

Forged body ball valve, Class600, Ring joint, with seat of PEEK and body materials constructed using A105, Ball constructed with material of 316,Full port, nominal size 30 inch, operated by bare stem.

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 refered 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



SALES TERM

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 forreturn 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 Man ager 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 warray

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.



