
DHV Industries, Inc.

3451 Pegasus Drive,
Bakersfield, CA 93308 USA
Call Toll Free: (877) DHV-USA1
Tel: (661) 392-8948
Fax: (661) 392-8947
E-mail: sales@dhvindustries.com
Website: www.dhvindustries.com

DHV Valve & Foundry Co., Ltd

No. 666, Ganquan West Road,
Wujiang Economic Development Zone,
Suzhou, Jiangsu,
215200, China
Tel: 86-512-82079288
Fax: 86-512-82079860
E-mail: sales@dhvfoundry.com
Website: www.dhvfoundry.com



Trunnion Mounted Ball Valves



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Introduction

Quality is our commitment, while competitive price and timely delivery is our promise.

From the beginning, the DHV name has become associated with quality in every step of our manufacturing process. For the past decades our customers worldwide have trusted us to provide them with consistent and reliable valve products in their most severe and critical service.

We at DHV are proud of our ability to meet the stringent requirements of Refining, Gas/Oil, Pipeline, Petrochemical and Power Plant.

DHV Ball Valves are designed, manufactured and tested to the latest manufacturing specifications of the American & International Standards Organizations. We welcome your challenges and look forward to serving your critical project needs.

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DHV Figure Numbers

Ball Valves

Type

- | | |
|--|--|
| 1 = Floating Ball Split Body, Full Bore | C3 = Trunnion Ball Valve, Fully Welded, Two-Piece Body, Full Bore |
| 2 = Floating Ball Split Body, Reduced Bore | C4 = Trunnion Ball Valve, Fully Welded, Two-Piece Body, Reduced Bore |
| 3 = Trunnion Ball Two-Piece Body, Full Bore | C5 = Trunnion Ball Valve, Fully Welded, Three-Piece Body, Full Bore |
| 4 = Trunnion Ball Two-Piece Body, Reduced Bore | C6 = Trunnion Ball Valve, Fully Welded, Three-Piece Body, Reduced Bore |
| 5 = Trunnion Ball Three-Piece Body, Full Bore | D = Rising Stem Ball Valves, Full Bore |
| 6 = Trunnion Ball Three-Piece Body, Reduced Bore | E = Rising Stem Ball Valves, Reduced Bore |
| 7 = Floating Ball One-Piece Body, Reduced Bore | X = Special |
| 8 = Small size Floating Ball valve. see* | |
| 9 = Top Entry Trunnion Ball Valves | |
| 0 = Three Way Ball Valves | |

Note: *For valve bore type note designated, For valve bore type not designated, add R for reduce bore, F for full bore. 8R is reduce bore small size ball valve, 8F is full bore small size ball valve.

Pressure Class

- 15 = Class 150
30 = Class 300
60 = Class 600
80 = Class 800
90 = Class 900
150 = Class 1500
250 = Class 2500
100=1000 WOG
200=2000 WOG
300=3000 WOG
500=5000 WOG
600=6000 WOG
1000=10000 WOG

Body Material

- 0 = ASTM A216 WCB
1 = ASTM A105
2 = ASTM A352 LCB
3 = ASTM A350 LF2
4 = ASTM A351 CF8M
5 = ASTM A182 F316
6 = ASTM A351 CF8
7 = ASTM A182 F304
8 = ASTM A890 4A
9 = ASTM A182 F51
A = ASTM A352 LCC
B = Inconel
C = Monel
D = Super Duplex S.S.
E = ASTM A240 UNS N08926
F = ASTM A216 WCC
X = Special

Code

- B = Ball Valves
L = Cryogenic Ball Valves
M = Metal-to-Metal Seat Ball Valves

8" Ball Valve, Trunnion Ball, Three-Piece Body, Full Bore, Class 600LB, A105 Body & Adapter Raised Face Flanged End, with C.S.+ENP Trim and Nylon+Viton / Graphite Seat and Seal, Gear Operated, Inconel 625 Overlay, Single Piston Seat.

Example: 8"-B5601F13-GO-I-SPE

End Connections

- F = Raised Face Flanged End
R = Ring Type Joint Flanged End
P = Plain Flat Face Flanged End
B = Butt-welded End
T = Threaded End
S = Socked-Welded End
X = Other Type End Connection
G = Grayloc Hub End
U = Pup Piece End

Trim Material

- | | |
|-----------------|-----------------------|
| 1 = C.S. + ENP | B = S.S.+ HCr |
| 2 = 304SS | C = Super Duplex S.S. |
| 3 = 316SS | D = S.S.+ T.C |
| 4 = 13Cr / F6 | E = C.S.+ T.C |
| 5 = Duplex S.S. | F = C.S.+ Ni |
| 6 = Monel | G = C.S.+ HCr |
| 7 = Inconel | H = C.S.+ CCC |
| 8 = B16 | I = S.S.+ CCC |
| 9 = B62 | X = Special |
| A = S.S.+ Ni | |

Seat Material

- 1 = PTFE
2 = R-PTFE
3 = NYLON
4 = VITON
5 = DEVLON
6 = NBR
7 = PEEK (HT4)
8 = Ni
9 = STL
A = CCC
B = T.C
M = NYLON-M
C = PCTFE
P = PAI
X = Special

Operator

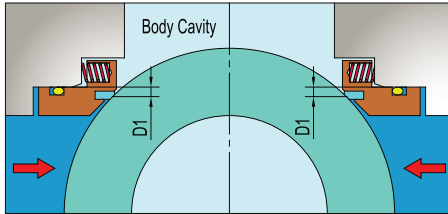
- NONE = Lever or Handwheel Operator
CO = Chain Wheel Operator
GO = Gear Operator
BS = Bare Stem
EM = Electric Motor Operator
PA = Pneumatic Actuator
HA = Hydraulic Actuator
PH = Pneumatic-Hydraulic Actuator

Internal Coating

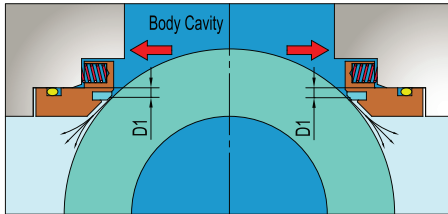
- None = No Coating
P=Plasite 7159
E = Enduro Bond
I = Inconel 625 Overlay
N = Inconel 825 Overlay
D = Duplex SS Overlay

Seat Function

- None = Self Relieving Seat
SPE = Single Piston Effect
DIB-1 = DPE x DPE
DIB-2 = SPE x DPE
BB = Block and Bleed
DPE = Double Piston Effect



Pressure acting upstream and/or downstream



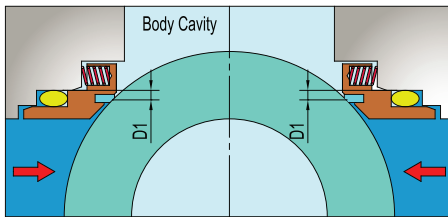
Pressure acting in the body cavity

Standard Seat Design (DBB) (Two Single Piston Effect (SPE) Seats)

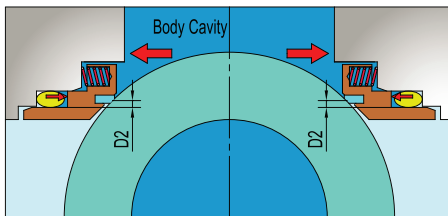
The DBB configuration is the most common seat configuration design for trunnion mounted ball valves, both upstream and downstream are single piston effect seats. During normal operation, upstream or downstream pressure in combination with the force of the seat springs, pushes the seat and the sealing surface against the ball creating positive shutoff on both sides of the ball for bi-directional seal.

As temperature increases, the pressure inside the ball cavity increases. As the pressure in the ball cavity exceeds the spring force plus the force created by the pressure from upstream or downstream side, the seat assembly “moves and releases or relieves” to the low pressure side of the valve, then reseats to the ball using the spring force and line pressure to create a positive seal.

The cavity pressure release is internal to the valve via either of the seats, and the customer can decide the final orientation of the valve accordingly.



Pressure acting upstream and/or downstream



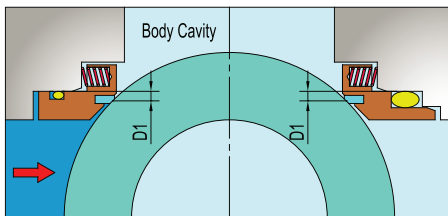
Pressure acting in the body cavity

Optional Seat Design (DIB-1) (Two Double Piston Effect (DPE) Seats)

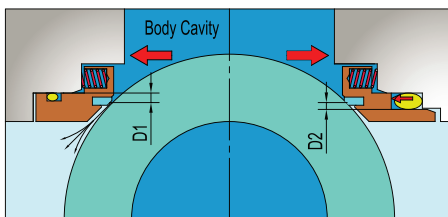
In DIB-1 style trunnion ball valves, the system pressure from the upstream side of the valve provides the primary energy required to provide the seating force for the upstream seat. The seat springs are also used to provide some seal force and these springs are primarily used for low pressure sealing.

The unique design of the DIB-1 style trunnions provides the ability for cavity pressure to be used to assist with the sealing of the downstream seat. When decreasing the downstream pressure to zero, the downstream seat will still seal using the energy from the cavity pressure.

The DIB-1 design provides positive seat sealing of at least one seat, even if one of the seats is damaged. DIB-1 style trunnion ball valves do not have a self-relieving function, so a liquid port will be needed to release body cavity pressure, as the drawing shown in page 5.



Pressure acting upstream



Pressure acting in the body cavity

Optional Seat Design (DIB-2) (One SPE Seat and One DPE Seat)

Generally, the DPE seat is placed on the downstream side of the DIB-2 valve, thus providing positive isolation on the downstream DPE seat and cavity relief via the upstream SPE seat.

In normal conditions, both the SPE seat and the DPE seat work in tandem incorporating cavity pressure to the downstream seat and seat spring force to provide dual positive sealing on both seat surfaces.

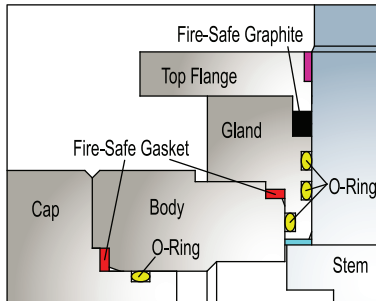
In case of cavity pressure build up, the upstream SPE seat relieves to the upstream side while the DPE seat maintains the sealing integrity.

DIB-2 valves do not need external cavity relief piping or relief systems.

Note: The seat design can be changed from SPE to DIB-1 and DIB-2 without any internal valve machining. This is accomplished using simple seat change out kits. These kits are available when specified by the customer.



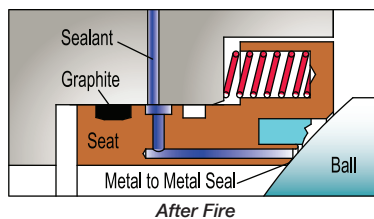
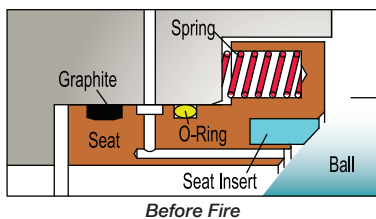
Design Features



Fire-Safe Design

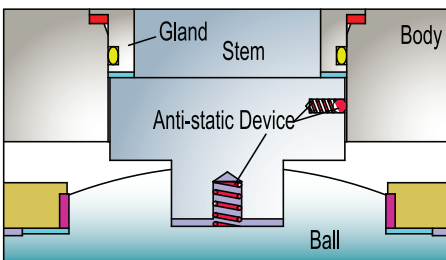
External leakage prevention

A gasket is designed in the body-cap and body-gland area and includes O-ring seals. Graphite packing is provided in the stem area and includes two O-ring seals. If an O-ring is destroyed by fire, the gasket and graphite packing will prevent external leakage.



Internal leakage prevention

If the soft sealing materials are damaged or destroyed by fire, the edge of the metal seat that is preloaded by the springs will make contact with the ball to create a closure. Special sealants can be injected into the seat and ball of valves equipped with injection fittings. Valves that do not have these fittings will seal utilizing the graphite packing.

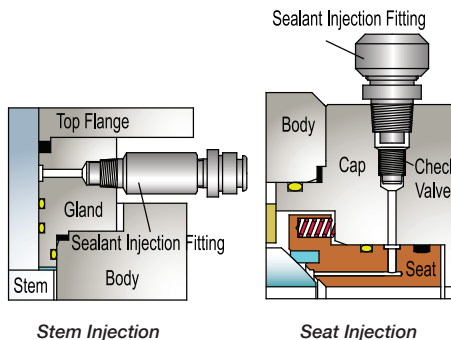


Blow-out Proof Stem

The stem is designed with a shoulder that is retained by the body preventing the stem from being blown out from internal pressure.

Anti-Static Device

The anti-static device is designed between the ball, stem, and body to maintain electrical continuity and avoid static charges.

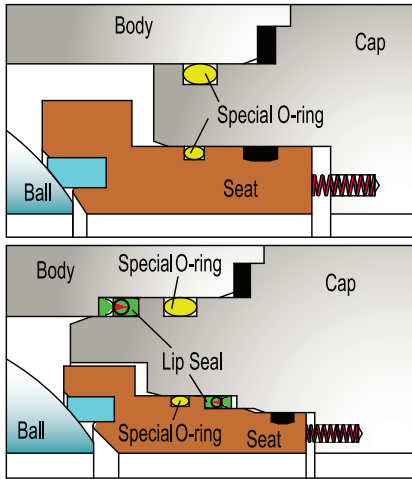


Emergency Sealant Injection System

Stem injection is provided on all DHV trunnion ball valves. Seat sealant/lubrication is also available, refer to the structure description for different valve series. The sealant injection system can be utilized in case of emergencies, O-ring damage, or seat sealing surface is damaged or requires lubrication. A second internal check valve is designed within the seat injection fitting to provide backup.



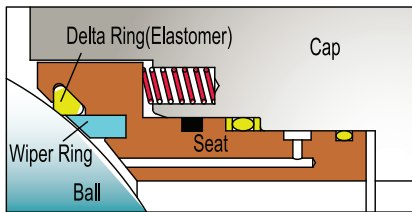
Design Features



H₂S Service

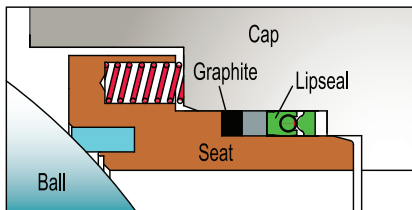
DHV can provide material solutions including optional seat and seals for process applications that exceed the limitations of our standard materials.

DHV has developed special Ultra High H₂S valve designs that include special seals, lip seal designs, internal overlays, and supplemental inspection and testing.



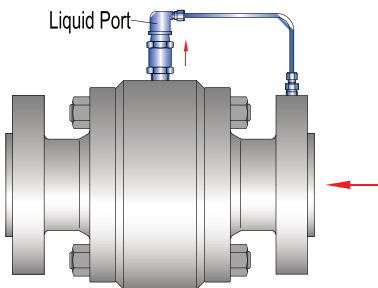
Delta Ring Seat Design (Optional)

DHV has developed an EDS (Elastomeric Delta Seat) trunnion. This design is specifically intended for gas/liquids and oil pipeline applications when the normal sealing and seating components such as Nylon, Devlon and HNBR may be compromised by the process conditions.



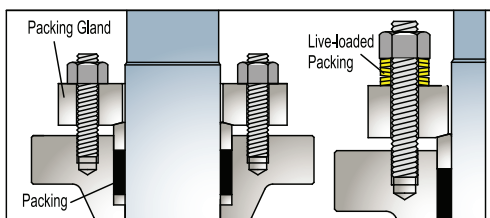
Lip Seal Design (Optional)

The lip seal is the spring-energized seal that includes an Elgiloy spring and PTFE jacket. It is effective in a wide range of applications, such as high resistance to corrosive chemical media, high sour gas, and low temperature or cryogenic service.



Liquid Port (Optional)

A liquid port is typically used with DIB-1 valves. With this liquid port, the body cavity is connected upstream to avoid an abnormal increase in cavity pressure. This design with the liquid port provides positive isolation downstream.



Adjustable Packing Design (Optional)

Adjustable packing can be provided where stem wear or temperature changes could impact the standard packing design. In situations where stem leakage may be caused by minor wear of the packing or temperature change, the bolts can be tightened to ensure sealing performance. The packing material can be graphite or PTFE V-packing.

A live-load packing design utilizing disc springs can also be provided for severe service in order to obtain a self-adjustment function.



Trunnion Mounted Ball Valves

Two-piece Cast Steel Body Ball Valves

Applicable Standards

Basic Design: **API 6D, ASME B16.34, API 608**
Compliance Is Optional From The Factory

Face to Face: **ASME B16.10, API 6D**

Flange End: **ASME B16.5 (up to 24"),**
ASME B16.47 series A (26" and above)

Butt Welding End: **ASME B16.25**

Test and Inspection: **API 6D, API 598**

Fire-safe Test: **API 6FA or API 607**

Fugitive Emission Test: **ISO 15848-2**

Type Testing for FE: **ISO 15848-1, API 641**

Manufacturing to NACE latest version on request

CSA Z245.15 latest version compliance is available



Specifications

Size Range: **2" ~ 48"**

Pressure Range: **150LB ~ 2500LB**

End Connection: **Flanged end / Butt welding end**

Bore: **Full bore / Reduced bore**

Seat Piston: **Single piston / Double piston**

Operation: **Manual operation, Actuated operation**

Material: **Body: Carbon steel, Stainless steel, Duplex Stainless steel, etc.**

Trim: Carbon steel+ENP, Alloy steel+ENP, Stainless steel,

Duplex stainless steel, etc.

Isolation Valve Features: **DBB: Two SPE (Single Piston Effect) seats**

DIB-1: Two DPE (Double Piston Effect) seats

DIB-2: One SPE seat and one DPE seat

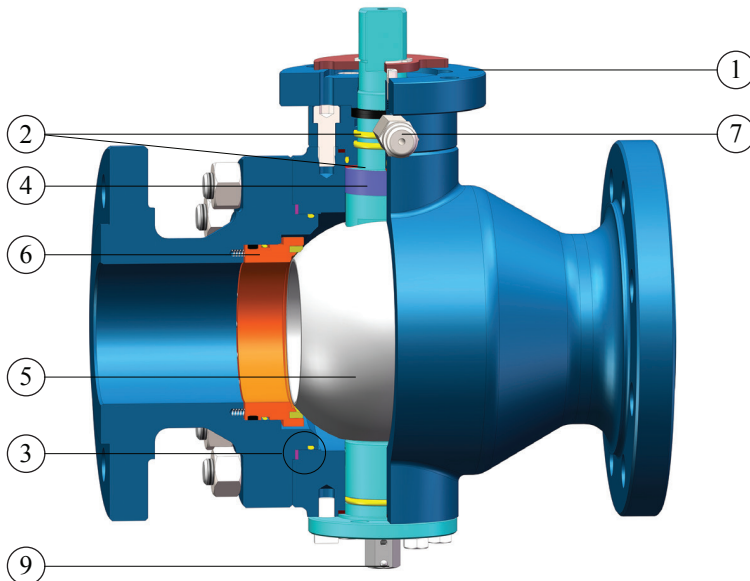
Note: Additional sizes and pressure classes are available upon request.



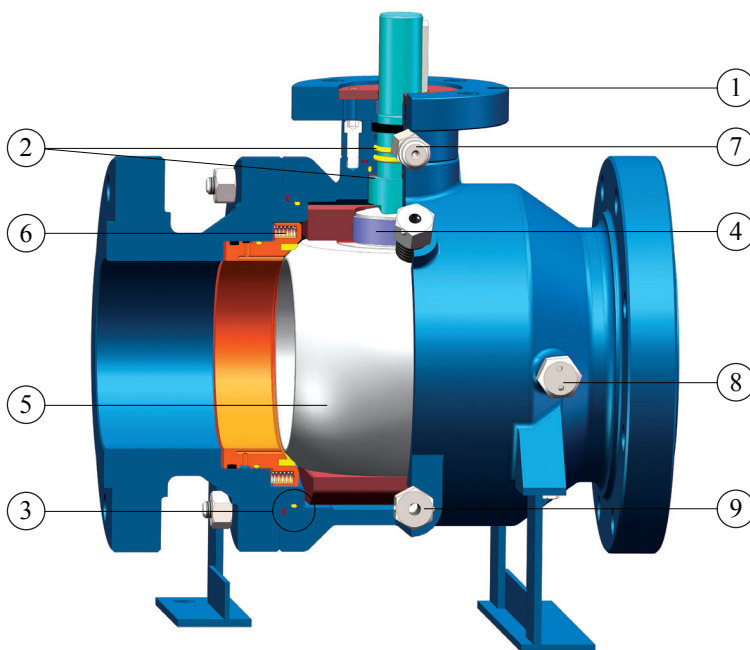
Trunnion Mounted Ball Valves

Two-piece Cast Steel Body Ball Valves

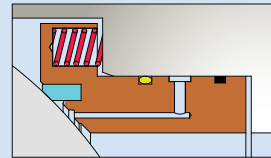
Typical Structure



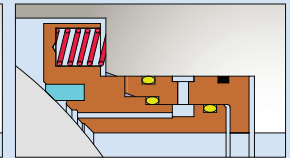
Trunnion structure (For size 4" and below)



Bearing retainer structure (For size 6" and above)



SPE Seat - TN Series



DPE Seat - TN Series

Main differences between TB series and TN series

- **TB** series ball valves are designed only for DBB valves.
- **TN** series ball valves are designed for DBB and DIB valves. The primary advantage of TN series is the SPE seat and DPE seat can be interchanged without changing any other valve parts, including the valve body and cap.

- ① ISO mounting pad for various actuators.
(Not applicable for TB series lever operated valves.)
- ② Anti-Blowout stem & double O-ring seals.
- ③ O-ring & gasket combination provides a tight seal.
- ④ Self-lubricating bearing reduces operating torque.
- ⑤ Smooth electroless nickel plated or solid S.S. ball for tight seal and low operational torque.
- ⑥ Spring loaded seats with secondary metal fire-safe seal.
- ⑦ Stem injection fitting for lubrication and emergency sealant.
- ⑧ Seat injection fittings with internal check valves for lubrication and emergency sealant. DHV standard valve designs that include seat injection fittings is listed below.
- ⑨ Drain fitting for double block & bleed and on-line testing.

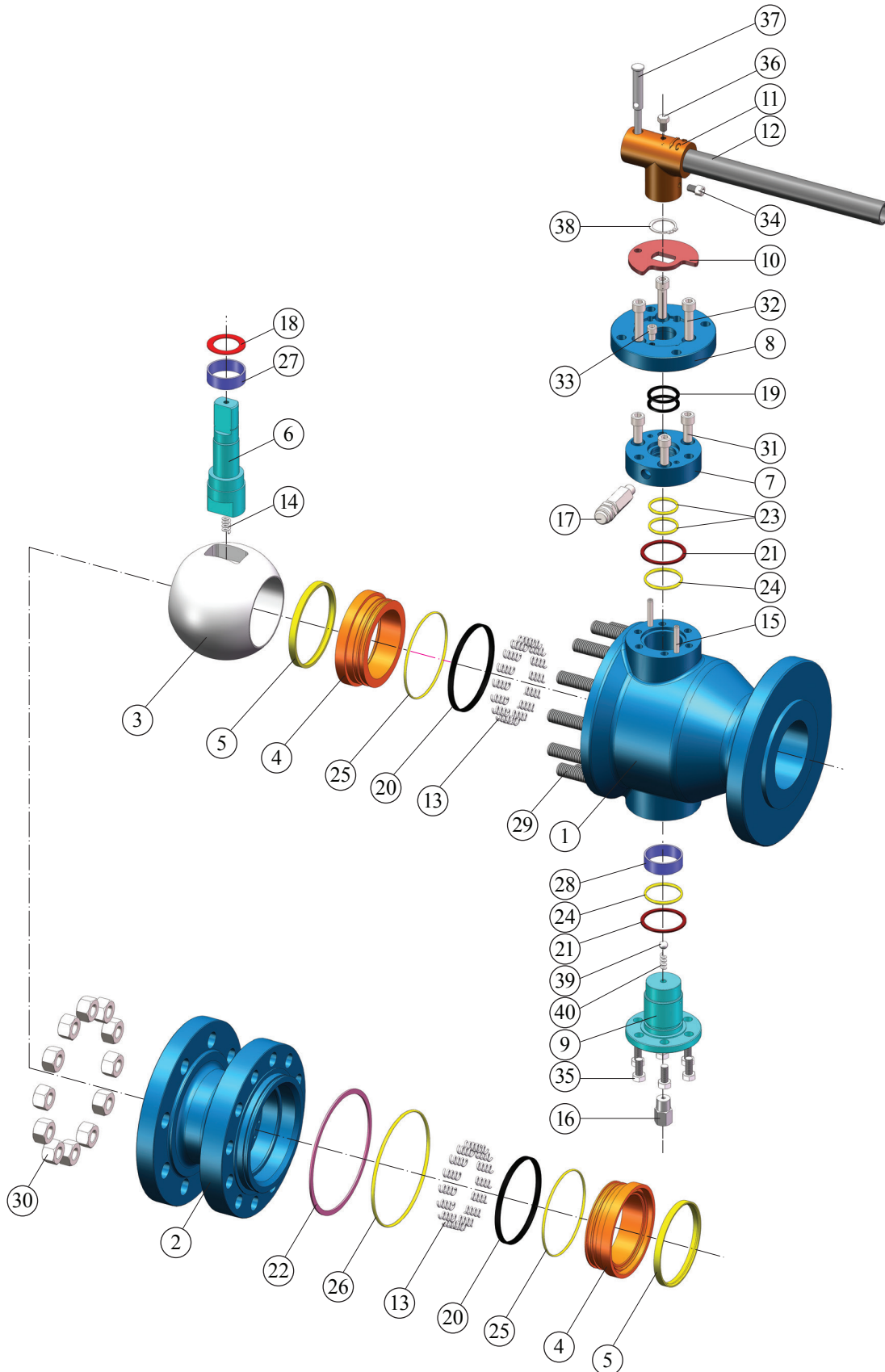
Class	150LB	300LB	600LB	900LB	1500LB	2500LB
Size	≥ 6"	≥ 6"	≥ 6"	≥ 6"	≥ 6"	≥ 3"

General Note: Structure shown in the illustration is typical, other configurations are available upon request.



Trunnion Mounted Ball Valves

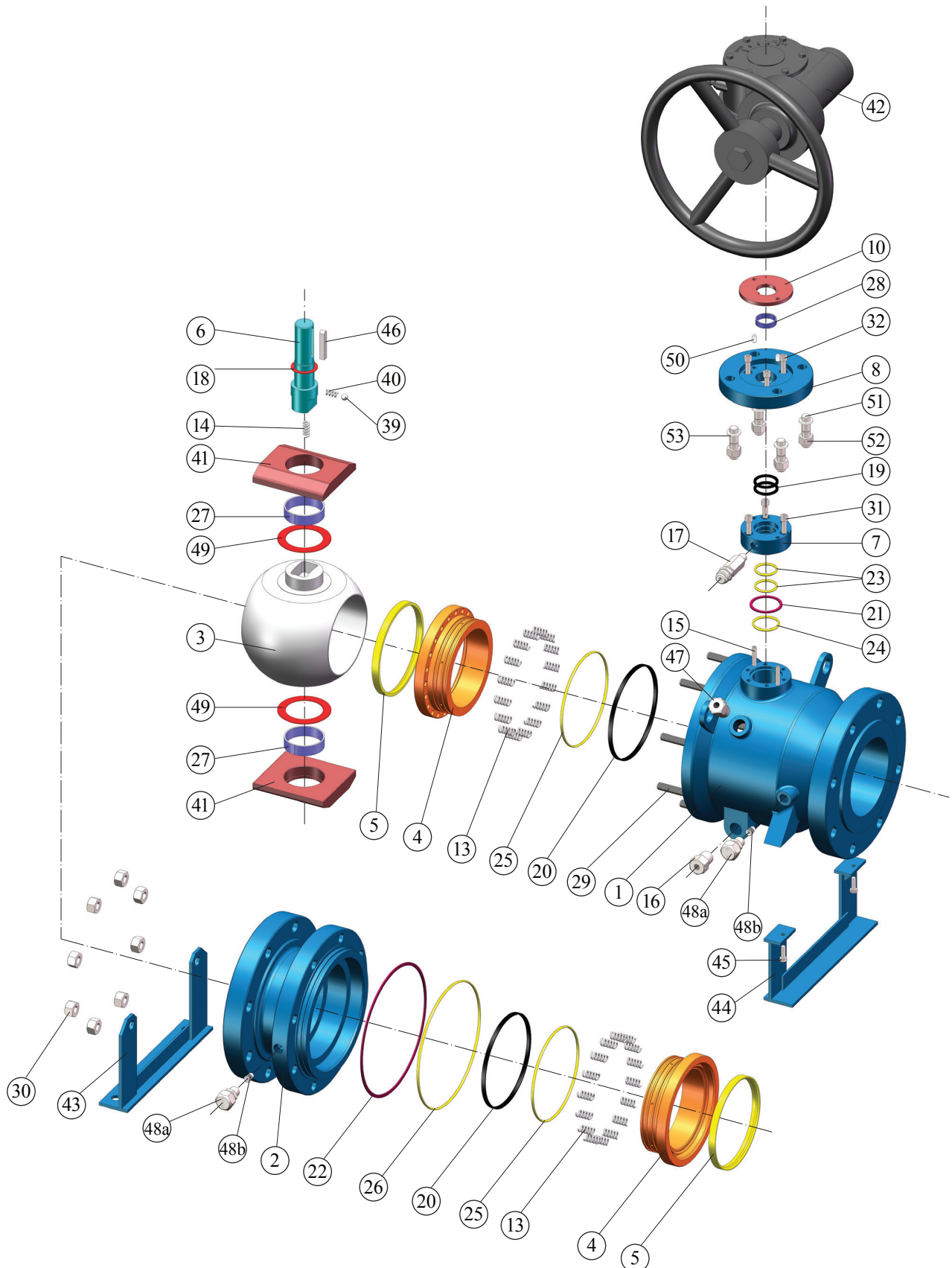
Two-piece Cast Steel Body Ball Valves, 4" and Below





Trunnion Mounted Ball Valves

Two-piece Cast Steel Body Ball Valves, 6" and Above

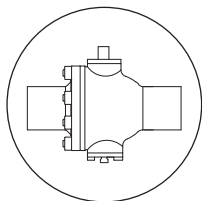




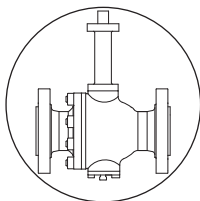
Trunnion Mounted Ball Valves

Two-piece Cast Steel Body Ball Valves

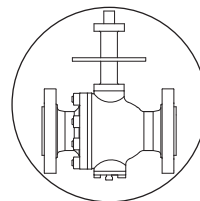
Options:



Pup Piece End



Extended Stem



Cryogenic Design

Material Specification

No.	Description	Carbon Steel		Stainless Steel	
1	Body	A216 WCB	A352 LCC	A351 CF8M	A995 4A
2	Cap	A216 WCB	A352 LCC	A351 CF8M	A995 4A
3	Ball	A105	A350 LF2	A182 F316	A182 F51
4	Seat	A105	A350 LF2	A182 F316	A182 F51
5	Seat Insert	R-PTFE / Nylon / Devlon / PEEK			
6	Stem	A105	A350 LF2	A182 F316	A182 F51
7	Gland	A105	A350 LF2	A182 F316	A182 F51
8	Top Flange	A105	A350 LF2	A182 F316	A182 F51
9	Trunnion	A105	A350 LF2	A182 F316	A182 F51
10	Stop Plate	Carbon Steel			
11	Handle Adapter	Carbon Steel			
12	Handle	Carbon Steel			
13	Spring	Inconel			
14	Anti-Static Device	Stainless Steel			
15	Pin	Alloy Steel		Stainless Steel	
16	Drain Fitting	Assembly			
17	Sealant Injection Fitting	Assembly			
18	Thrust Washer	R-PTFE / Metal Backed PTFE			
19	Fire-safe Seal	Graphite			
20	Gasket	Graphite			
21	Gasket	Metal & Flexible Graphite			
22	Gasket	Metal & Flexible Graphite			
23	O-Ring	As Page 48 O-Ring Material			
24	O-Ring	As Page 48 O-Ring Material			
25	O-Ring	As Page 48 O-Ring Material			
26	O-Ring	As Page 48 O-Ring Material			
27	Bearing	Metal Backed PTFE			
28	Bearing	Metal Backed PTFE			
29	Stud	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
30	Nut	A194 2H	A194 7	A194 8M	A194 8MLCuNa
31	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
32	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN

Material Specification

No.	Description	Carbon Steel		Stainless Steel	
33	Stop Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
34	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
35	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
36	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
37	Locking Pin	Carbon Steel		Stainless Steel	
38	Snap Ring	Carbon Steel		Stainless Steel	
39	Anti-Static Device	Stainless Steel			
40	Anti-Static Device	Stainless Steel			
41	Bearing Retainer	A105	A350 LF2	A182 F316	A182 F51
42	Gearbox	Carbon Steel			
43	Support Leg	Carbon Steel			
44	Support Leg	Carbon Steel			
45	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
46	Key	Carbon Steel			
47	Vent Fitting	Assembly			
48a	Sealant Injection Fitting	Assembly			
48b	Check Valve	Assembly			
49	Thrust Washer	R-PTFE			
50	Pin	Alloy Steel			
51	Stud	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
52	Nut	A194 2H	A194 7	A194 8M	A194 8MLCuNa
53	Washer	Carbon Steel		Stainless Steel	

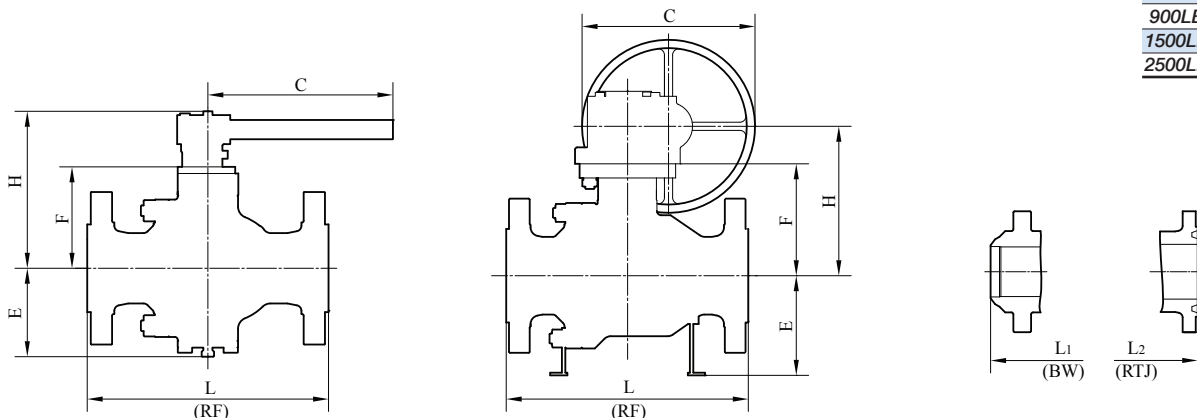
Note: Materials listed are based on typical configurations, other materials can be provided upon request.



Trunnion Mounted Ball Valves

Full Bore-Two-piece Cast Steel Body Ball Valves, TB Series

Class	Lever	Gear
150LB	≤ 4"	≥ 6"
300LB	≤ 4"	≥ 6"
600LB	≤ 4"	≥ 6"
900LB	≤ 3"	≥ 4"
1500LB	≤ 3"	≥ 4"
2500LB	≤ 2"	≥ 3"



150LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	7.00	8.00	9.00	15.50	18.00	21.00	24.00	27.00	30.00	34.00	36.00	42.00	51.00	54.00	60.00	69.00	70.50	78.50
	mm	178	203	229	394	457	533	610	686	762	864	914	1067	1295	1372	1524	1753	1790	1995
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	94.00
	mm	216	283	305	457	521	559	635	762	838	914	991	1143	1397	1524	1727	1956	2083	2388
Height F	in	4.96	5.94	6.73	8.50	10.63	12.68	13.90	15.94	17.24	19.61	20.79	25.59	28.56	30.67	33.57	36.34	38.07	44.29
	mm	126	151	171	216	270	322	353	405	438	498	528	650	726	779	853	923	967	1125
Height H	in	7.40	8.62	9.41	11.02	13.07	15.47	17.13	19.09	20.47	22.83	24.02	30.91	35.71	37.80	40.71	44.21	45.94	52.17
	mm	188	219	239	280	332	393	435	485	520	580	610	785	907	960	1034	1123	1167	1325
Handle Length / Handwheel Dia C	in	15.75	15.75	15.75	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37	39.37
	mm	400	400	400	500	500	500	500	500	700	700	700	700	700	700	700	1000	1000	1000
Height E	in	4.61	5.75	6.54	7.17	8.39	10.16	11.93	13.78	15.04	17.36	17.99	22.68	25.98	27.56	30.71	33.46	34.65	38.58
	mm	117	146	166	182	213	258	303	350	382	441	457	576	660	700	780	850	880	980
Weight	Kg	15	30	42	120	219	348	520	714	964	1262	1506	2610	3953	5155	6671	9521	10825	16602

300LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	8.50	11.13	12.00	15.88	19.75	22.38	25.50	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	85.50
	mm	216	283	305	403	502	568	648	762	838	914	991	1143	1397	1524	1727	1956	2083	2170
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	85.50
	mm	216	283	305	457	521	559	635	762	838	914	991	1143	1397	1524	1727	1956	2083	2170
RTJ L ₂	in	9.13	11.73	12.64	16.50	20.40	23.00	26.14	30.63	33.62	36.60	39.76	45.87	55.98	65.12	69.13	-	-	-
	mm	232	298	321	419	518	584	664	778	854	930	1010	1165	1422	1654	1756	-	-	-
Height F	in	5.12	5.83	6.81	8.50	10.98	12.68	13.90	16.14	17.64	19.61	20.98	25.59	28.94	30.80	33.58	36.34	38.07	44.29
	mm	130	148	173	216	279	322	353	410	448	498	533	650	735	782	853	923	967	1125
Height H	in	7.56	8.50	9.92	11.02	13.43	15.47	17.13	19.29	20.87	22.83	24.21	30.91	36.06	37.91	40.71	44.21	45.94	52.17
	mm	192	216	252	280	341	393	435	490	530	580	615	785	916	963	1034	1123	1167	1325
Handle Length / Handwheel Dia C	in	15.75	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37	39.37
	mm	400	500	500	500	500	500	700	700	700	700	700	700	700	700	700	1000	1000	1000
Height E	in	4.76	5.94	6.65	7.76	8.78	11.14	11.81	13.15	14.33	17.44	18.07	23.39	28.31	29.33	32.68	33.46	34.65	38.58
	mm	121	151	169	197	223	283	300	334	364	443	459	594	719	745	830	850	880	980
Weight	Kg	20	36	57	171	263	450	682	967	1340	1654	1844	2914	4982	5997	7630	10414	12175	18189



Trunnion Mounted Ball Valves

Full Bore-Two-piece Cast Steel Body Ball Valves, TB Series

600LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	81.90	85.63	95.87
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2080	2175	2435
Weld End L ₁	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	85.43	85.63	95.87
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2170	2175	2435
RTJ L ₂	in	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	55.38	65.50	70.63	82.63	85.43	85.63	95.87
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1407	1664	1794	2099	2170	2175	2435
Height F	in	5.08	6.06	7.05	9.65	11.50	13.78	15.08	16.30	18.43	20.24	23.43	26.38	31.30	31.65	35.08	39.96	40.76	46.30
	mm	129	154	179	245	292	350	383	414	468	514	595	670	795	804	891	1015	1035	1176
Height H	in	7.80	9.17	10.63	12.09	14.29	16.93	18.31	19.53	21.65	25.55	29.33	32.28	38.43	38.78	42.95	-	-	-
	mm	198	233	270	307	363	430	465	496	550	649	745	820	976	985	1091	-	-	-
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	-	-	-
	mm	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700	-	-	-
Height E	in	4.92	6.18	6.73	8.27	9.61	11.42	12.80	14.88	16.73	17.83	17.44	23.90	29.09	30.24	33.58	35.04	36.93	51.02
	mm	125	157	171	210	244	290	325	378	425	453	443	607	739	768	853	890	938	1296
Weight	Kg	30	53	90	218	347	594	812	1118	1535	2079	2772	3836	6785	7888	10771	13366	15569	23259

900LB

Description		Valve Size														
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032	2286
Weld End L ₁	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032	2286
RTJ L ₂	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	61.75	74.88	80.90	91.14
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1568	1902	2054	2315
Height F	in	5.83	6.14	7.72	10.24	11.93	13.82	16.65	18.19	19.88	22.44	24.13	26.89	31.06	33.95	36.72
	mm	148	156	196	260	303	351	423	462	505	570	613	683	789	862	933
Height H	in	8.94	9.72	11.22	13.03	15.16	17.05	19.88	23.50	25.20	28.35	30.04	34.02	38.94	41.81	43.27
	mm	227	247	285	331	385	433	505	597	640	720	763	864	989	1062	1099
Handle Length / Handwheel Dia C	in	27.56	29.53	29.53	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37
	mm	700	750	750	500	700	700	700	700	700	700	700	700	700	1000	1000
Height E	in	5.51	6.46	7.09	8.74	10.59	12.72	13.82	14.76	16.14	17.91	18.54	25.91	31.06	32.52	36.46
	mm	140	164	180	222	269	323	351	375	410	455	471	658	789	826	926
Weight	Kg	57	82	113	306	450	963	1449	1605	1838	2411	3924	5814	8652	10106	14544

1500LB

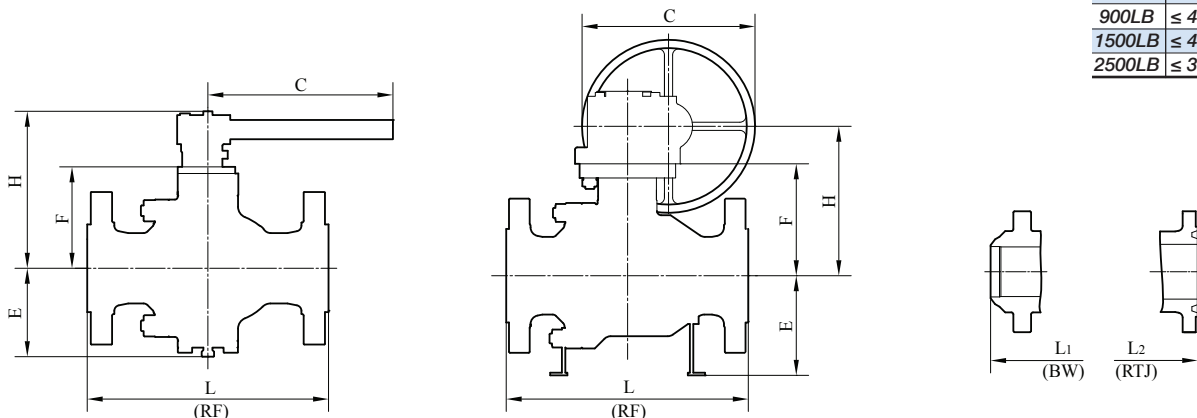
Description		Valve Size												2500LB							
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	2"	3"	4"	6"	8"	10"	12"	
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00	
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	451	578	673	914	1022	1270	1422	
Weld End L ₁	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00	
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	451	578	673	914	1022	1270	1422	
RTJ L ₂	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	77.63	17.88	23.00	26.88	36.50	40.88	50.88	56.88	
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1972	454	584	683	927	1038	1292	1445	
Height F	in	5.83	6.69	9.80	10.75	13.78	15.55	19.69	20.31	21.73	23.31	24.84	28.82	6.85	7.87	9.96	12.36	14.57	17.80	21.73	
	mm	148	170	249	273	350	395	500	516	552	592	631	732	174	200	253	314	370	452	552	
Height H	in	8.94	10.71	12.24	13.98	16.42	18.78	25.00	26.22	27.64	29.21	31.97	36.69	10.75	10.98	13.19	14.72	17.80	23.11	27.64	
	mm	227	272	311	355	417	477	635	666	702	742	812	932	273	279	335	374	452	587	702	
Handle Length / Handwheel Dia C	in	27.56	29.53	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	
	mm	700	750	500	700	700	700	700	700	700	700	700	700	750	500	500	700	700	700	700	
Height E	in	5.51	6.85	9.53	10.87	15.51	15.20	19.17	16.89	18.50	20.39	21.06	28.43	5.94	6.38	10.43	12.60	16.85	16.93	20.94	
	mm	140	174	242	276	394	386	487	429	470	518	535	722	151	162	265	320	428	430	532	
Weight	Kg	57	85	158	384	656	1200	1800	2280	3256	4956	7260	9139	70	150	304	616	1086	1680	2568	



Trunnion Mounted Ball Valves

Reduced Bore-Two-piece Cast Steel Body Ball Valves, TB Series

Class	Lever	Gear
150LB	≤ 6"x4"	≥ 8"x6"
300LB	≤ 6"x4"	≥ 8"x6"
600LB	≤ 6"x4"	≥ 8"x6"
900LB	≤ 4"x3"	≥ 6"x4"
1500LB	≤ 4"x3"	≥ 6"x4"
2500LB	≤ 3"x2"	≥ 4"x3"



150LB

Description		Valve Size															
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"
Flanged End L	in	7.00	8.00	9.00	15.50	18.00	21.00	24.00	27.00	30.00	34.00	36.00	36.00	42.00	51.00	60.00	69.00
	mm	178	203	229	394	457	533	610	686	762	864	914	914	1067	1295	1524	1753
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00
	mm	216	283	305	457	521	559	635	762	838	914	991	991	1143	1397	1727	1956
Height F	in	4.25	4.96	5.94	6.73	8.50	10.63	12.68	12.68	13.90	15.94	17.24	19.61	20.79	25.59	28.56	30.67
	mm	108	126	151	171	216	270	322	322	353	405	438	498	528	650	726	779
Height H	in	6.57	7.40	8.62	9.41	11.02	13.07	15.47	15.47	17.13	19.09	20.47	22.83	24.02	30.91	35.71	37.80
	mm	167	188	219	239	280	332	393	393	435	485	520	580	610	785	907	960
Handle Length / Handwheel Dia C	in	11.81	15.75	15.75	15.75	19.69	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56
	mm	300	400	400	400	500	500	500	500	500	500	700	700	700	700	700	700
Height E	in	3.94	4.61	5.75	6.54	8.39	10.16	11.93	13.78	15.04	17.36	17.99	17.99	22.68	25.98	30.71	33.46
	mm	100	117	146	166	213	258	303	350	382	441	457	457	576	660	780	850
Weight	Kg	15.5	21	40	67	170	222	336	414	548	684	945	1071	1786	2637	5050	7338

300LB

Description		Valve Size															
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"
Flanged End L	in	8.50	11.13	12.00	15.88	19.75	22.38	25.50	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00
	mm	216	283	305	403	502	568	648	762	838	914	991	991	1143	1397	1727	1956
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00
	mm	216	283	305	457	521	559	635	762	838	914	991	991	1143	1397	1727	1956
Height F	in	4.57	5.12	5.83	6.81	8.50	10.98	12.68	12.68	13.90	16.14	17.64	19.61	20.98	25.59	28.94	30.80
	mm	116	130	148	173	216	279	322	322	353	410	448	498	533	650	735	782
Height H	in	7.09	7.56	8.50	9.92	11.02	13.43	15.47	15.47	17.13	19.29	20.87	22.83	24.21	30.91	36.06	37.91
	mm	180	192	216	252	280	341	393	393	435	490	530	580	615	785	916	963
Handle Length / Handwheel Dia C	in	15.75	15.75	19.69	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56
	mm	400	400	500	500	500	500	500	500	700	700	700	700	700	700	700	700
Height E	in	4.17	4.76	5.94	6.65	8.78	11.14	11.81	13.15	14.33	17.44	18.07	18.07	23.39	28.31	32.68	33.46
	mm	106	121	151	169	223	283	300	334	364	443	459	459	594	719	830	850
Weight	Kg	21	27	50	96	185	350	424	514	694	930	1350	1441	2129	3163	6546	8206



Trunnion Mounted Ball Valves

Reduced Bore-Two-piece Cast Steel Body Ball Valves, TB Series

600LB

Description		Valve Size																	
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"	42x36"	48x42"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	81.90	85.63	95.87
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2080	2175	2435
Weld End L ₁	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	85.43	85.63	95.87
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2170	2175	2435
RTJ L ₂	in	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	47.25	55.38	65.50	82.63	85.43	85.63	95.87
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1200	1407	1664	2099	2170	2175	2435
Height F	in	4.57	5.08	6.06	7.05	9.65	11.50	13.78	13.78	15.08	16.30	18.43	20.24	23.43	26.38	31.30	31.65	35.08	40.76
	mm	116	129	154	179	245	292	350	350	383	414	468	514	595	670	795	804	891	1035
Height H	in	7.09	7.80	9.17	10.63	12.09	14.29	16.93	16.93	18.31	19.53	21.65	25.55	29.33	32.28	38.43	38.78	42.95	-
	mm	180	198	233	270	307	363	430	430	465	496	550	649	745	820	976	985	1091	-
Handle Length / Handwheel Dia C	in	15.75	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	-
	mm	400	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700	700	-
Height E	in	4.17	4.92	6.18	6.73	9.61	11.42	12.80	14.88	16.73	17.83	17.44	17.44	23.90	29.09	33.58	35.04	36.93	51.02
	mm	106	125	157	171	244	290	325	378	425	453	443	443	607	739	853	890	938	1296
Weight	Kg	36	40	75	120	350	460	700	730	1270	1450	1668	1900	2598	4615	8301	10627	13170	19414

900LB

Description		Valve Size														
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	52.00	61.00	74.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1321	1549	1880	2286
Weld End L ₁	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	52.00	61.00	74.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1321	1549	1880	2286
RTJ L ₂	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	52.50	61.75	74.88	91.14
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1334	1568	1902	2315
Height F	in	5.12	5.83	6.14	7.72	10.24	11.93	13.82	13.82	16.65	18.19	19.88	22.44	24.13	26.89	31.06
	mm	130	148	156	196	260	303	351	351	423	462	505	570	613	683	789
Height H	in	7.95	8.94	9.72	11.22	13.03	15.16	17.05	17.05	19.88	23.50	25.20	28.35	30.04	34.02	38.94
	mm	202	227	247	285	331	385	433	433	505	597	640	720	763	864	989
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	29.53	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56
	mm	500	700	750	750	500	700	700	700	700	700	700	700	700	700	700
Height E	in	5.12	5.51	6.46	7.09	10.59	12.72	13.82	14.76	16.14	17.91	18.54	18.54	25.91	31.06	36.46
	mm	130	140	164	180	269	323	351	375	410	455	471	471	658	789	926
Weight	Kg	55	70	104	186	396	572	975	992	1635	1885	2312	2850	4320	6960	12280

1500LB

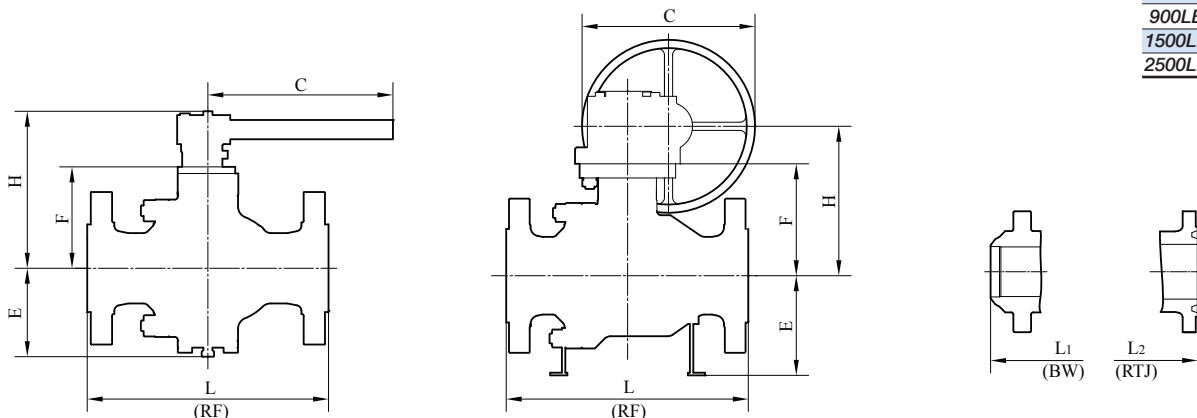
Description		Valve Size												Valve Size							
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	65.50	76.50	17.75	22.75	26.50	36.00	40.24	50.00	56.00
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1664	1943	451	578	673	914	1022	1270	1422
Weld End L ₁	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	65.50	76.50	17.75	22.75	26.50	36.00	40.24	50.00	56.00
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1664	1943	451	578	673	914	1022	1270	1422
RTJ L ₂	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	66.38	77.63	17.88	23.00	26.88	36.50	40.87	50.88	56.88
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1686	1972	454	584	683	927	1038	1292	1445
Height F	in	5.12	5.83	6.69	9.80	10.75	13.78	15.55	15.55	19.69	20.31	21.73	23.31	24.84	5.83	6.85	7.87	9.96	12.36	14.57	17.80
	mm	130	148	170	249	273	350	395	395	500	516	552	592	631	148	174	200	253	314	370	452
Height H	in	7.95	8.94	10.71	12.24	13.98	16.42	18.78	18.78	25.00	26.22	27.64	29.21	31.97	9.06	10.75	10.98	13.19	14.72	17.80	23.11
	mm	202	227	272	311	355	417	477	477	635	666	702	742	812	230	273	279	335	374	452	587
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	29.53	19.69	19.69	27.56	27.56	27.56
	mm	500	700	750	500	700	700	700	700	700	700	700	700	700	700	750	500	500	700	700	700
Height E	in	5.12	5.51	9.53	10.87	15.51	15.20	19.17	16.89	18.50	20.39	21.06	21.06	28.43	5.63	5.94	10.43	12.60	16.85	16.93	20.94
	mm	130	140	242	276	394	386	487	429	470	518	535	535	722	143	151	265	320	428	430	532
Weight	Kg	55	82	122	260	580	818	1532	1716	2650	3110	4108	6000	8700	87	124	211	408	872	1330	2044



Trunnion Mounted Ball Valves

Full Bore-Two-piece Cast Steel Body Ball Valves, TN Series

Class	Lever	Gear
150LB	≤ 4"	≥ 6"
300LB	≤ 4"	≥ 6"
600LB	≤ 4"	≥ 6"
900LB	≤ 3"	≥ 4"
1500LB	≤ 3"	≥ 4"
2500LB	≤ 2"	≥ 3"



150LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	7.00	8.00	9.00	15.50	18.00	21.00	24.00	27.00	30.00	34.00	36.00	42.00	51.00	54.00	60.00	69.00	70.50	78.50
	mm	178	203	229	394	457	533	610	686	762	864	914	1067	1295	1372	1524	1753	1790	1995
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	94.00
	mm	216	283	305	457	521	559	635	762	838	914	991	1143	1397	1524	1727	1956	2083	2388
Height F	in	5.24	6.18	7.09	8.50	10.98	12.68	14.69	16.10	17.28	19.88	20.91	26.10	29.57	31.65	34.57	37.32	39.06	45.28
	mm	133	157	180	216	279	322	373	409	439	505	531	663	751	804	878	948	992	1150
Height H	in	7.68	8.86	9.76	11.02	13.43	15.47	17.91	19.25	20.51	23.11	24.13	31.42	36.69	38.78	41.69	45.20	46.93	53.15
	mm	195	225	248	280	341	393	455	489	521	587	613	798	932	985	1059	1148	1192	1350
Handle Length / Handwheel Dia C	in	15.75	15.75	15.75	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37	39.37
	mm	400	400	400	500	500	500	700	700	700	700	700	700	700	700	700	1000	1000	1000
Height E	in	4.88	5.98	6.89	7.17	8.39	10.16	11.93	13.78	15.04	17.36	17.99	22.68	25.98	27.56	30.71	33.46	34.65	38.58
	mm	124	152	175	182	213	258	303	350	382	441	457	576	660	700	780	850	880	980
Weight	Kg	16	32	45	128	234	372	556	764	1031	1350	1611	2793	4230	5516	7138	10188	11583	17765

300LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	8.50	11.13	12.00	15.88	19.75	22.38	25.50	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	85.50
	mm	216	283	305	403	502	568	648	762	838	914	991	1143	1397	1524	1727	1956	2083	2170
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	85.50
	mm	216	283	305	457	521	559	635	762	838	914	991	1143	1397	1524	1727	1956	2083	2170
Height F	in	5.12	5.83	6.85	9.49	11.06	12.68	14.65	16.22	17.91	19.88	21.34	26.18	28.94	31.77	34.57	37.32	39.06	45.28
	mm	130	148	174	241	281	322	372	412	455	505	542	665	735	807	878	948	992	1150
Height H	in	7.56	8.50	9.96	12.01	13.50	15.47	17.87	19.37	21.14	23.11	24.57	31.50	36.06	38.90	41.69	45.20	46.93	53.15
	mm	192	216	253	305	343	393	454	492	537	587	624	800	916	988	1059	1148	1192	1350
Handle Length / Handwheel Dia C	in	15.75	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37	39.37
	mm	400	500	500	500	500	500	700	700	700	700	700	700	700	700	700	1000	1000	1000
Height E	in	4.76	5.94	6.69	7.76	8.78	11.14	11.81	13.15	14.33	17.44	18.07	23.39	28.31	29.33	32.68	33.46	34.65	38.58
	mm	121	151	170	197	223	283	300	334	364	443	459	594	719	745	830	850	880	980
Weight	Kg	21	39	61	183	281	482	730	1035	1434	1770	1973	3118	5331	6416	8164	11143	13028	19463



Trunnion Mounted Ball Valves

Full Bore-Two-piece Cast Steel Body Ball Valves, TN Series

600LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	81.90	85.63	95.87
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2080	2175	2435
Weld End L ₁	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	85.43	85.63	95.87
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2170	2175	2435
RTJ L ₂	in	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	55.38	65.50	70.63	82.63	85.43	85.63	95.87
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1407	1664	1794	2099	2170	2175	2435
Height F	in	5.28	6.06	7.32	9.72	11.50	14.21	15.67	17.32	18.90	20.71	23.27	27.09	32.68	33.03	36.46	41.34	42.13	47.87
	mm	134	154	186	247	292	361	398	440	480	526	591	688	830	839	926	1050	1070	1216
Height H	in	7.99	9.17	10.91	12.17	14.29	17.36	18.90	20.55	22.13	26.02	29.17	32.99	39.80	40.16	44.33	-	-	-
	mm	203	233	277	309	363	441	480	522	562	661	741	838	1011	1020	1126	-	-	-
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	-	-	-
	mm	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700	-	-	-
Height E	in	5.12	6.18	7.01	8.27	9.61	11.42	12.80	14.88	16.73	17.83	17.44	23.90	29.09	30.24	33.58	35.04	36.93	51.02
	mm	130	157	178	210	244	290	325	378	425	453	443	607	739	768	853	890	938	1296
Weight	Kg	32	57	96	233	371	636	869	1196	1642	2225	2966	4105	7260	8440	11525	14302	16658	24887

900LB

Description		Valve Size														
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032	2286
Weld End L ₁	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032	2286
RTJ L ₂	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	61.75	74.88	80.90	91.14
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1568	1902	2054	2315
Height F	in	6.46	6.93	8.46	10.35	13.11	15.04	17.28	18.74	20.31	22.99	24.80	27.99	32.83	35.71	38.50
	mm	164	176	215	263	333	382	439	476	516	584	630	711	834	907	978
Height H	in	9.57	9.92	11.97	13.15	16.34	18.27	20.51	24.06	25.63	28.90	30.71	35.12	40.71	43.58	45.04
	mm	243	252	304	334	415	464	521	611	651	734	780	892	1034	1107	1144
Handle Length / Handwheel Dia C	in	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37
	mm	700	750	500	500	700	700	700	700	700	700	700	700	700	1000	1000
Height E	in	6.14	6.65	7.09	8.74	10.59	12.72	13.82	14.76	16.14	17.91	18.54	25.91	31.06	32.52	36.46
	mm	156	169	180	222	269	323	351	375	410	455	471	658	789	826	926
Weight	Kg	64	92	127	343	504	1079	1623	1798	2059	2700	4395	6512	9690	11319	16289

1500LB

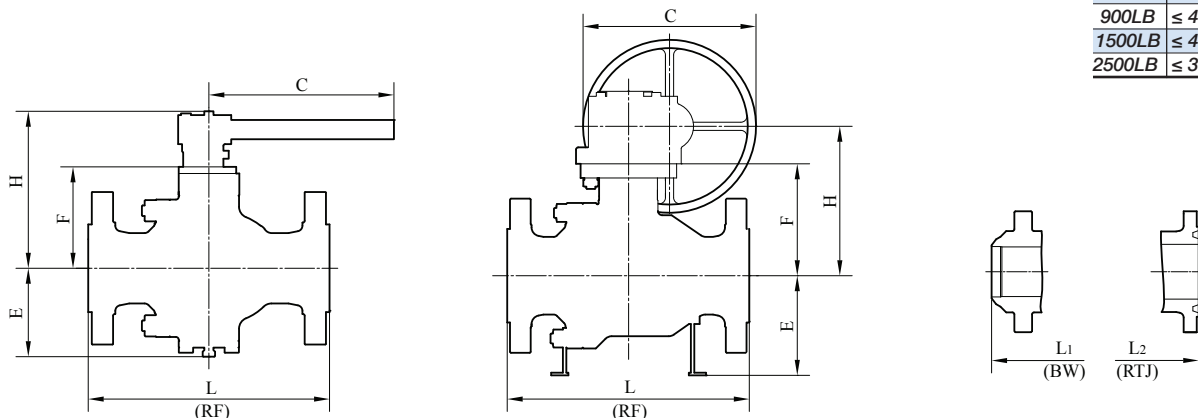
Description		Valve Size												2500LB							
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	2"	3"	4"	6"	8"	10"	12"	
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00	
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	451	578	673	914	1022	1270	1422	
Weld End L ₁	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00	
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	451	578	673	914	1022	1270	1422	
RTJ L ₂	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	77.63	17.88	23.00	26.88	36.50	40.88	50.88	56.88	
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1972	454	584	683	927	1038	1292	1445	
Height F	in	6.46	7.40	10.08	11.02	15.08	16.93	20.08	21.89	23.31	24.88	26.42	30.98	7.01	8.11	10.08	13.70	15.75	19.37	23.31	
	mm	164	188	256	280	383	430	510	556	592	632	671	787	178	206	256	348	400	492	592	
Height H	in	9.57	11.42	12.52	14.25	17.72	20.16	25.39	27.80	29.21	30.79	33.54	38.86	10.91	11.34	13.31	16.06	18.98	24.69	29.21	
	mm	243	290	318	362	450	512	645	706	742	782	852	987	277	288	338	408	482	627	742	
Handle Length / Handwheel Dia C	in	27.56	35.43	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	35.43	19.69	19.69	27.56	27.56	27.56	27.56	
	mm	700	900	500	700	700	700	700	700	700	700	700	700	900	500	500	700	700	700	700	
Height E	in	6.14	7.56	9.53	10.87	15.51	15.20	19.17	16.89	18.50	20.39	21.06	28.43	6.10	6.38	10.43	12.60	16.85	16.93	20.94	
	mm	156	192	242	276	394	386	487	429	470	518	535	722	155	162	265	320	428	430	532	
Weight	Kg	64	95	177	430	735	1344	2016	2554	3647	5551	8131	10236	79	168	340	690	1216	1882	2876	



Trunnion Mounted Ball Valves

Reduced Bore-Two-piece Cast Steel Body Ball Valves, TN Series

Class	Lever	Gear
150LB	≤ 6"x4"	≥ 8"x6"
300LB	≤ 6"x4"	≥ 8"x6"
600LB	≤ 6"x4"	≥ 8"x6"
900LB	≤ 4"x3"	≥ 6"x4"
1500LB	≤ 4"x3"	≥ 6"x4"
2500LB	≤ 3"x2"	≥ 4"x3"



150LB

Description		Valve Size															
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"
Flanged End L	in	7.00	8.00	9.00	15.50	18.00	21.00	24.00	27.00	30.00	34.00	36.00	36.00	42.00	51.00	60.00	69.00
	mm	178	203	229	394	457	533	610	686	762	864	914	914	1067	1295	1524	1753
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00
	mm	216	283	305	457	521	559	635	762	838	914	991	991	1143	1397	1727	1956
Height F	in	4.41	5.24	6.18	7.09	8.50	10.98	12.68	12.68	14.69	16.10	17.28	19.88	20.91	26.10	29.57	31.65
	mm	112	133	157	180	216	279	322	322	373	409	439	505	531	663	751	804
Height H	in	6.73	7.68	8.86	9.76	11.02	13.43	15.47	15.47	17.91	19.25	20.51	23.11	24.13	31.42	36.69	38.78
	mm	171	195	225	248	280	341	393	393	455	489	521	587	613	798	932	985
Handle Length / Handwheel Dia C	in	11.81	15.75	15.75	15.75	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56
	mm	300	400	400	400	500	500	500	500	700	700	700	700	700	700	700	700
Height E	in	4.09	4.88	5.98	6.89	8.39	10.16	11.93	13.78	15.04	17.36	17.99	17.99	22.68	25.98	30.71	33.46
	mm	104	124	152	175	213	258	303	350	382	441	457	457	576	660	780	850
Weight	Kg	17	22	43	72	182	238	360	443	586	732	1011	1146	1911	2822	5404	7852

300LB

Description		Valve Size															
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"
Flanged End L	in	8.50	11.13	12.00	15.88	19.75	22.38	25.50	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00
	mm	216	283	305	403	502	568	648	762	838	914	991	991	1143	1397	1727	1956
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00
	mm	216	283	305	457	521	559	635	762	838	914	991	991	1143	1397	1727	1956
Height F	in	4.72	5.12	5.83	6.85	9.49	11.06	12.68	12.68	14.65	16.22	17.91	19.88	21.34	26.18	28.94	31.77
	mm	120	130	148	174	241	281	322	322	372	412	455	505	542	665	735	807
Height H	in	7.24	7.56	8.50	9.96	12.01	13.50	15.47	15.47	17.87	19.37	21.14	23.11	24.57	31.50	36.06	38.90
	mm	184	192	216	253	305	343	393	393	454	492	537	587	624	800	916	988
Handle Length / Handwheel Dia C	in	11.81	15.75	19.69	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56
	mm	300	400	500	500	500	500	500	500	700	700	700	700	700	700	700	700
Height E	in	4.33	4.76	5.94	6.69	8.78	11.14	11.81	13.15	14.33	17.44	18.07	18.07	23.39	28.31	32.68	33.46
	mm	110	121	151	170	223	283	300	334	364	443	459	459	594	719	830	850
Weight	Kg	22	29	54	103	198	375	454	550	743	995	1445	1542	2278	3384	7004	8780



Trunnion Mounted Ball Valves

Reduced Bore-Two-piece Cast Steel Body Ball Valves, TN Series

600LB

Description		Valve Size																	
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"	42x36"	48x42"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	81.90	85.63	95.87
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2080	2175	2435
Weld End L ₁	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	85.43	85.63	95.87
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2170	2175	2435
RTJ L ₂	in	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	47.25	55.38	65.50	82.63	85.43	85.63	95.87
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1200	1407	1664	2099	2170	2175	2435
Height F	in	4.72	5.28	6.06	7.32	9.72	11.50	14.21	14.21	15.67	17.32	18.90	20.71	23.27	27.09	32.68	33.03	36.46	42.13
	mm	120	134	154	186	247	292	361	361	398	440	480	526	591	688	830	839	926	1070
Height H	in	7.24	7.99	9.17	10.91	12.17	14.29	17.36	17.36	18.90	20.55	22.13	26.02	29.17	32.99	39.80	40.16	44.33	-
	mm	184	203	233	277	309	363	441	441	480	522	562	661	741	838	1011	1020	1126	-
Handle Length / Handwheel Dia C	in	15.75	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	-
	mm	400	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700	700	-
Height E	in	4.33	5.12	6.18	7.01	9.61	11.42	12.80	14.88	16.73	17.83	17.44	17.44	23.90	29.09	33.58	35.04	36.93	51.02
	mm	110	130	157	178	244	290	325	378	425	453	443	443	607	739	853	890	938	1296
Weight	Kg	39	43	80	128	375	492	749	781	1359	1552	1785	2033	2780	4938	8882	11371	14092	20773

900LB

Description		Valve Size														
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	52.00	61.00	74.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1321	1549	1880	2286
Weld End L ₁	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	52.00	61.00	74.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1321	1549	1880	2286
RTJ L ₂	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	52.50	61.75	74.88	91.14
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1334	1568	1902	2315
Height F	in	5.28	6.46	6.93	8.46	10.35	13.11	15.04	15.04	17.28	18.74	20.31	22.99	24.80	27.99	32.83
	mm	134	164	176	215	263	333	382	382	439	476	516	584	630	711	834
Height H	in	8.11	9.57	9.92	11.97	13.15	16.34	18.27	18.27	20.51	24.06	25.63	28.90	30.71	35.12	40.71
	mm	206	243	252	304	334	415	464	464	521	611	651	734	780	892	1034
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56
	mm	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700
Height E	in	5.28	6.14	6.65	7.09	10.59	12.72	13.82	14.76	16.14	17.91	18.54	18.54	25.91	31.06	36.46
	mm	134	156	169	180	269	323	351	375	410	455	471	471	658	789	926
Weight	Kg	62	78	116	208	444	641	1092	1111	1831	2111	2589	3192	4838	7795	13754

1500LB

Description		Valve Size												2500LB Valve Size							
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	65.50	76.50	17.75	22.75	26.50	36.00	40.24	50.00	56.00
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1664	1943	451	578	673	914	1022	1270	1422
Weld End L ₁	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	65.50	76.50	17.75	22.75	26.50	36.00	40.24	50.00	56.00
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1664	1943	451	578	673	914	1022	1270	1422
RTJ L ₂	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	66.38	77.63	17.88	23.00	26.88	36.50	40.87	50.88	56.88
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1686	1972	454	584	683	927	1038	1292	1445
Height F	in	5.28	6.46	7.40	10.08	11.02	15.08	16.93	16.93	20.08	21.89	23.31	24.88	26.42	6.02	7.01	8.11	10.08	13.70	15.75	19.37
	mm	134	164	188	256	280	383	430	430	510	556	592	632	671	153	178	206	256	348	400	492
Height H	in	8.11	9.57	11.42	12.52	14.25	17.72	20.16	20.16	25.39	27.80	29.21	30.79	33.54	9.25	10.91	11.34	13.31	16.06	18.98	24.69
	mm	206	243	290	318	362	450	512	512	645	706	742	782	852	235	277	288	338	408	482	627
Handle Length / Handwheel Dia C	in	19.69	27.56	35.43	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	35.43	19.69	19.69	27.56	27.56	27.56
	mm	500	700	900	500	700	700	700	700	700	700	700	700	700	700	900	500	500	700	700	700
Height E	in	5.28	6.14	9.53	10.87	15.51	15.20	19.17	16.89	18.50	20.39	21.06	21.06	28.43	5.83	6.10	10.43	12.60	16.85	16.93	20.94
	mm	134	156	242	276	394	386	487	429	470	518	535	535	722	148	155	265	320	428	430	532
Weight	Kg	62	92	137	291	650	916	1716	1922	2968	3483	4601	6720	9744	97	139	237	457	977	1490	2289

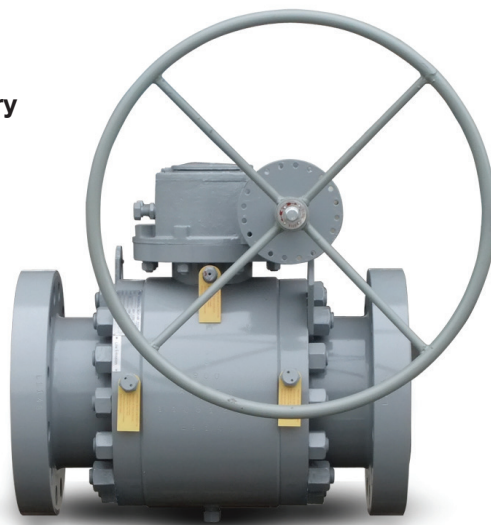


Trunnion Mounted Ball Valves

Three-piece Forged Steel Body Ball Valves

Applicable Standards

Basic Design:	API 6D, ASME B16.34, API 608
	Compliance Is Optional From The Factory
Face to Face:	ASME B16.10, API 6D
Flange End:	ASME B16.5 (up to 24"), ASME B16.47 series A (26" and above)
Butt Welding End:	ASME B16.25
Test and Inspection:	API 6D, API 598
Fire-safe Test:	API 6FA or API 607
Fugitive Emission Test:	ISO 15848-2
Type Testing for FE:	ISO 15848-1, API 641
Manufacturing to NACE latest version on request	
CSA Z245.15 latest version compliance is available	



Specifications

Size Range:	2" ~ 48"
Pressure Range:	150LB ~ 2500LB
End Connection:	Flanged end / Butt welding end
Bore:	Full bore / Reduced bore
Seat Piston:	Single piston / Double piston
Operation:	Manual operation, Actuated operation
Material:	Body: Carbon steel, Stainless steel, Duplex Stainless steel, etc. Trim: Carbon steel+ENP, Alloy steel+ENP, Stainless steel, Duplex stainless steel, etc.
Isolation Valve Features:	DBB: Two SPE (Single Piston Effect) seats DIB-1: Two DPE (Double Piston Effect) seats DIB-2: One SPE seat and one DPE seat

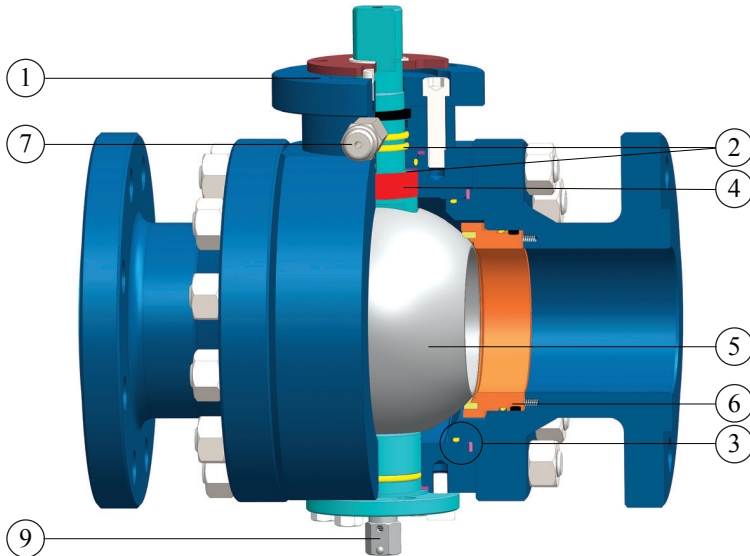
Note: Additional sizes and pressure classes are available upon request.



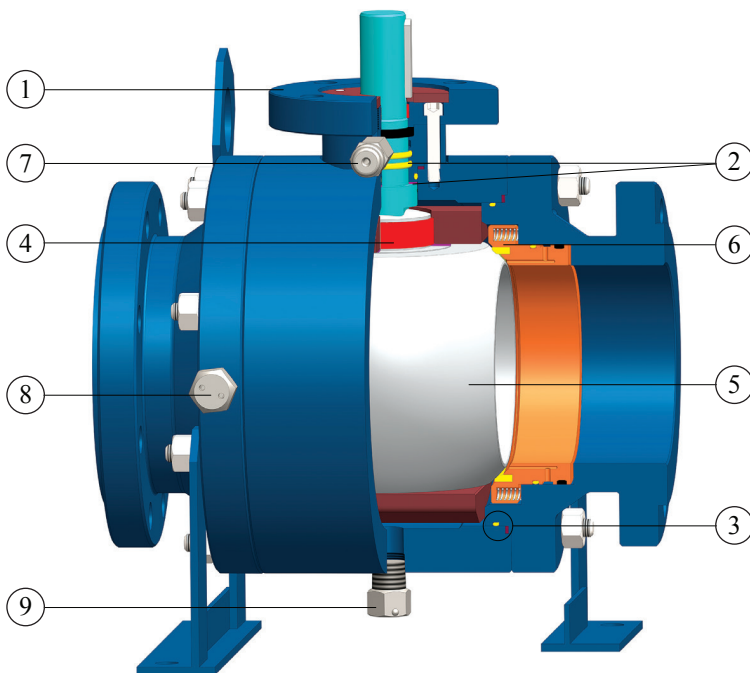
Trunnion Mounted Ball Valves

Three-piece Forged Steel Body Ball Valves

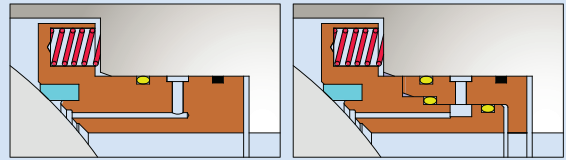
Typical Structure



Trunnion structure (For size 4" and below)



Bearing retainer structure (For size 6" and above)



SPE Seat - TP Series

DPE Seat - TP Series

Main differences between TC series and TP series

- **TC series** ball valves are designed only for DBB valves.
- **TP series** ball valves are designed for DBB and DIB valves. The primary advantage of TP series is the SPE seat and DPE seat can be interchanged without changing any other valve parts, including the valve body and cap.

- ① ISO mounting pad for various actuators.
(Not applicable for TC Series lever operated valves.)
- ② Anti-Blowout stem & double O-ring seals.
- ③ O-ring & gasket combination provides a tight seal.
- ④ Self-lubricating bearing reduces operating torque.
- ⑤ Smooth electroless nickel plated or solid S.S. ball for tight seal and low operational torque.
- ⑥ Spring loaded seats with secondary metal to metal fire-safe seal.
- ⑦ Stem injection fitting for lubrication and emergency sealant.
- ⑧ Seat injection fittings with internal check valves for lubrication or emergency sealant. DHV standard designs that include seat injection fittings is listed below.

Class Size	150LB	300LB	600LB	900LB	1500LB	2500LB
2"	"N"		"O"			
3"						
4"						
≥ 6"	"Y"					

Note:

"N" - Design cannot be fitted with seat injection fittings.

"O" - Seat injection fittings are not standard, but can be provided as an option.

"Y" - Seat injection fittings are included as the standard design.

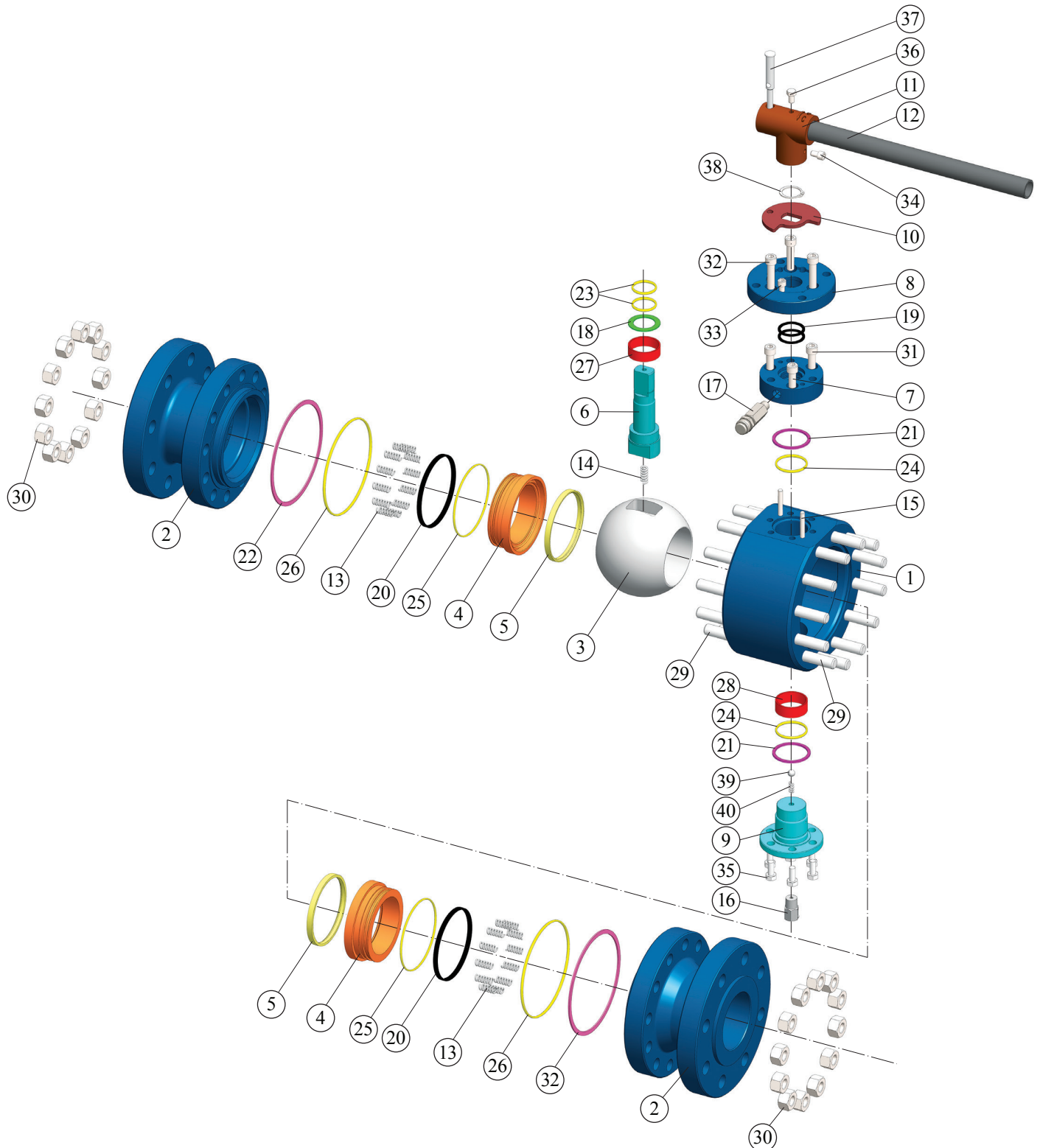
- ⑨ Drain fitting for double block & bleed and on-line testing.

General Note: Structure shown in the illustration is typical structure, other configurations are available upon request.



Trunnion Mounted Ball Valves

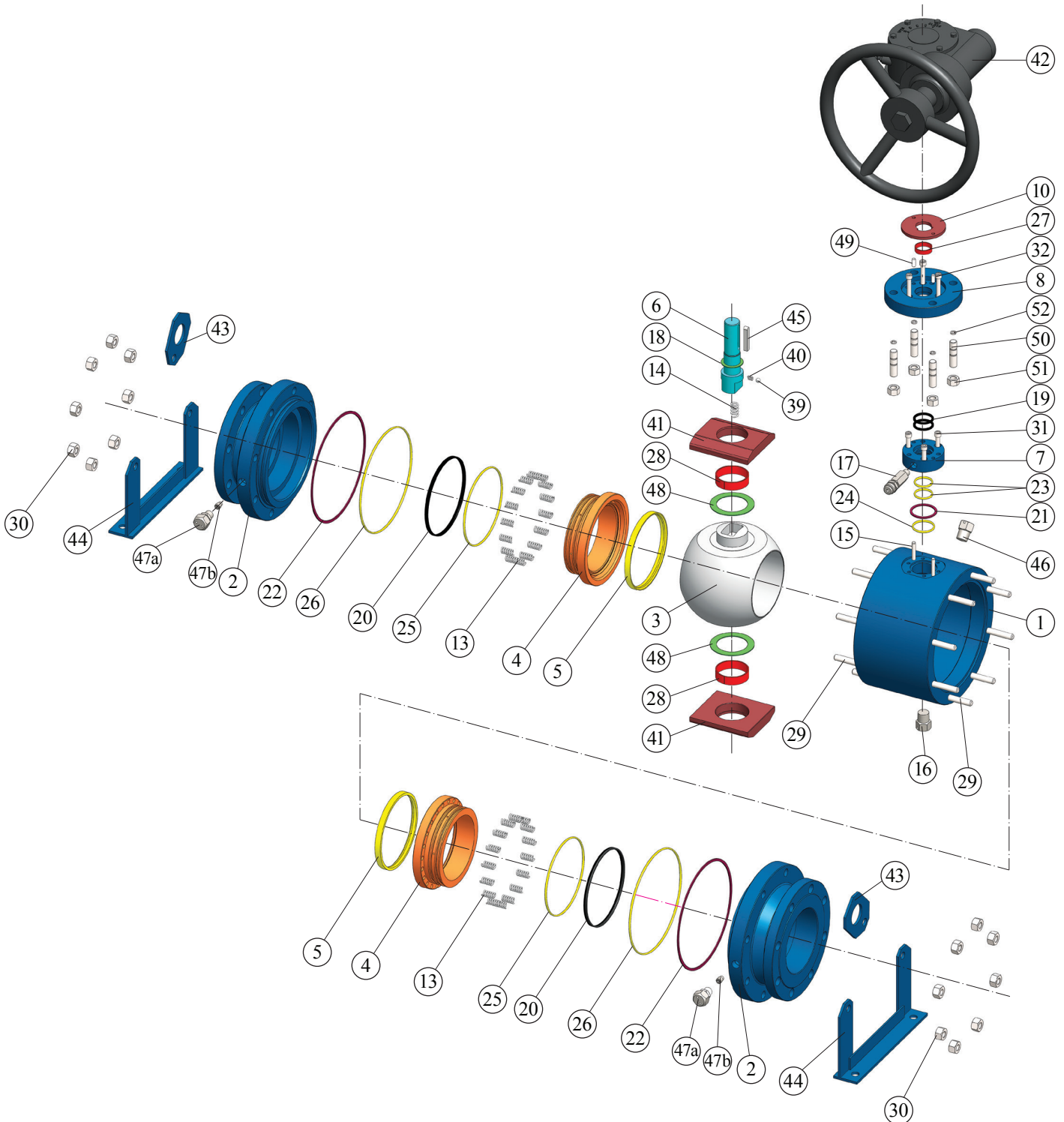
Three-piece Forged Steel Body Ball Valves, 4" and Below





Trunnion Mounted Ball Valves

Three-piece Forged Steel Body Ball Valves, 6" and Above

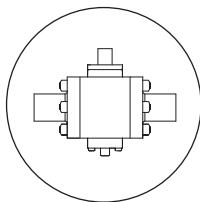




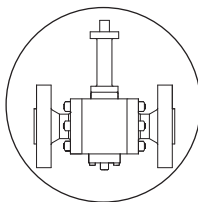
Trunnion Mounted Ball Valves

Three-piece Forged Steel Body Ball Valves

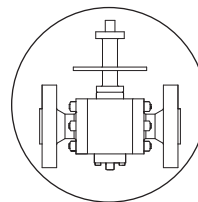
Options:



Pup Piece End



Extended Stem



Cryogenic Design

Material Specification

No.	Description	Carbon Steel		Stainless Steel	
1	Body	A105	A350 LF2	A182 F316	A182 F51
2	Cap	A105	A350 LF2	A182 F316	A182 F51
3	Ball	A105	A350 LF2	A182 F316	A182 F51
4	Seat	A105	A350 LF2	A182 F316	A182 F51
5	Seat Insert	R-PTFE / Nylon / Devlon / PEEK			
6	Stem	A105	A350 LF2	A182 F316	A182 F51
7	Gland	A105	A350 LF2	A182 F316	A182 F51
8	Top Flange	A105	A350 LF2	A182 F316	A182 F51
9	Trunnion	A105	A350 LF2	A182 F316	A182 F51
10	Stop Plate	Carbon Steel			
11	Handle Adapter	Carbon Steel			
12	Handle	Carbon Steel			
13	Spring	Inconel			
14	Anti-Static Device	Stainless Steel			
15	Pin	Alloy Steel		Stainless Steel	
16	Drain Fitting	Assembly			
17	Sealant Injection Fitting	Assembly			
18	Thrust Washer	R-PTFE / Metal Backed PTFE			
19	Fire-safe Seal	Graphite			
20	Gasket	Graphite			
21	Gasket	Metal & Flexible Graphite			
22	Gasket	Metal & Flexible Graphite			
23	O-Ring	As Page 48 O-Ring Material			
24	O-Ring	As Page 48 O-Ring Material			
25	O-Ring	As Page 48 O-Ring Material			
26	O-Ring	As Page 48 O-Ring Material			
27	Bearing	Metal Backed PTFE			
28	Bearing	Metal Backed PTFE			
29	Stud	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
30	Nut	A194 2H	A194 7	A194 8M	A194 8MLCuNa
31	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
32	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN

Material Specification

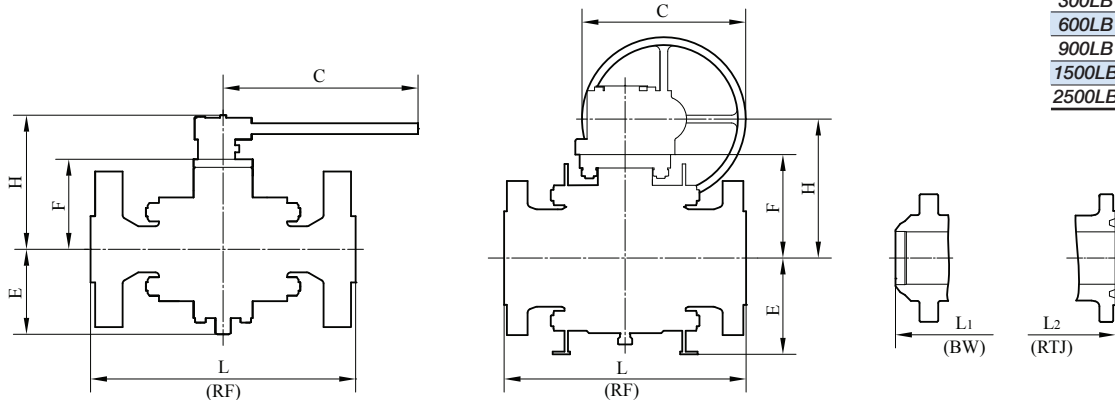
No.	Description	Carbon Steel		Stainless Steel	
33	Stop Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
34	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
35	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
36	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
37	Locking Pin	Carbon Steel		Stainless Steel	
38	Snap Ring	Carbon Steel		Stainless Steel	
39	Anti-Static Device	Stainless Steel			
40	Anti-Static Device	Stainless Steel			
41	Bearing Retainer	A105	A350 LF2	A182 F316	A182 F51
42	Gearbox	Carbon Steel			
43	Lifting Lug	Carbon Steel			
44	Support Leg	Carbon Steel			
45	Key	Carbon Steel			
46	Vent Fitting	Assembly			
47a	Sealant Injection Fitting	Assembly			
47b	Check Valve	Assembly			
48	Thrust Washer	R-PTFE			
49	Pin	Alloy Steel			
50	Stud	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
51	Nut	A194 2H	A194 7	A194 8M	A194 8MLCuNa
52	Washer	Carbon Steel		Stainless Steel	

Note: Materials listed are based on typical configurations, other materials can be provided upon request.



Trunnion Mounted Ball Valves

Full Bore-Three-piece Forged Steel Body Ball Valves, TC Series



Class	Lever	Gear
150LB	≤ 4"	≥ 6"
300LB	≤ 4"	≥ 6"
600LB	≤ 4"	≥ 6"
900LB	≤ 3"	≥ 4"
1500LB	≤ 3"	≥ 4"
2500LB	≤ 2"	≥ 3"

150LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	7.00	8.00	9.00	15.50	18.00	21.00	24.00	27.00	30.00	34.00	36.00	42.00	51.00	54.00	60.00	69.00	70.50	78.50
	mm	178	203	229	394	457	533	610	686	762	864	914	1067	1295	1372	1524	1753	1790	1995
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	94.00
	mm	216	283	305	457	521	559	635	762	838	914	991	1143	1397	1524	1727	1956	2083	2388
Height F	in	4.65	5.39	6.18	8.11	9.92	12.09	13.50	15.51	17.17	18.86	20.51	24.57	30.83	32.87	34.25	36.34	38.07	44.29
	mm	118	137	157	206	252	307	343	394	436	479	521	624	783	835	870	923	967	1125
Height H	in	7.13	8.11	8.86	10.63	12.44	14.88	16.73	18.66	20.39	21.46	23.74	29.88	37.95	40.00	41.38	44.21	45.94	52.17
	mm	181	206	225	270	316	378	425	474	518	545	603	759	964	1016	1051	1123	1167	1325
Handle Length / Handwheel Dia C	in	15.75	15.75	15.75	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37	39.37
	mm	400	400	400	500	500	500	700	700	700	700	700	700	700	700	700	1000	1000	1000
Height E	in	4.53	4.65	5.35	9.09	10.39	13.90	15.43	17.09	18.62	20.08	25.39	32.87	38.39	39.37	41.85	43.50	46.61	47.99
	mm	115	118	136	231	264	353	392	434	473	510	645	835	975	1000	1063	1105	1184	1219
Weight	Kg	17	31	62	122	253	454	705	760	1017	1596	1832	3148	5102	6890	9890	12434	14137	20850

300LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	8.50	11.13	12.00	15.88	19.75	22.38	25.50	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	85.50
	mm	216	283	305	403	502	568	648	762	838	914	991	1143	1397	1524	1727	1956	2083	2170
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	85.50
	mm	216	283	305	457	521	559	635	762	838	914	991	1143	1397	1524	1727	1956	2083	2170
RTJ L ₂	in	9.13	11.73	12.64	16.50	20.40	23.00	26.14	30.63	33.62	36.60	39.76	45.87	56.00	61.14	69.13	-	-	-
	mm	232	298	321	419	518	584	664	778	854	930	1010	1165	1422	1553	1756	-	-	-
Height F	in	4.84	5.51	6.38	8.11	10.20	12.24	13.70	15.59	17.09	19.13	20.51	24.80	30.83	32.87	33.58	36.34	38.07	44.29
	mm	123	140	162	206	259	311	348	396	434	486	521	630	783	835	853	923	967	1125
Height H	in	7.13	8.66	9.49	10.63	12.64	15.04	16.93	18.74	20.31	22.32	23.74	30.12	37.91	40.00	40.71	44.21	45.94	52.17
	mm	181	220	241	270	321	382	430	476	516	567	603	765	963	1016	1034	1123	1167	1325
Handle Length / Handwheel Dia C	in	15.75	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37	39.37
	mm	400	500	500	500	500	500	700	700	700	700	700	700	700	700	700	1000	1000	1000
Height E	in	4.53	5.12	5.98	9.09	10.39	14.02	15.91	17.09	18.66	20.00	21.50	33.23	38.78	39.37	41.85	43.50	46.61	47.99
	mm	115	130	152	231	264	356	404	434	474	508	546	844	985	1000	1063	1105	1184	1219
Weight	Ka	27	46	69	149	289	494	751	1036	1465	1813	2176	3430	7550	7678	10179	13637	15944	22060



Trunnion Mounted Ball Valves

Full Bore-Three-piece Forged Steel Body Ball Valves, TC Series

600LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	81.90	85.63	95.88
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2080	2175	2435
Weld End L1	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	85.43	85.63	95.88
	mm	292	356	432	559	660.00	787	838	889	991	1092	1194	1397	1651	1778	2083	2170	2175	2435
RTJ L2	in	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	55.38	65.50	70.63	82.63	85.43	85.63	95.88
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1407	1664	1794	2099	2170	2175	2435
Height F	in	4.72	5.67	6.65	9.21	10.91	13.11	14.57	15.63	17.91	20.79	22.76	26.38	31.30	33.23	35.08	39.96	40.76	46.30
	mm	120	144	169	234	277	333	370	397	455	528	578	670	795	844	891	1015	1035	1176
Height H	in	7.40	8.78	10.55	11.65	13.70	16.26	17.80	18.86	21.14	26.10	28.66	32.28	38.43	40.35	42.95	-	-	-
	mm	188	223	268	296	348	413	452	479	537	663	728	820	976	1025	1091	-	-	-
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	-	-	-
	mm	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700	-	-	-
Height E	in	4.53	5.28	6.34	9.41	11.02	14.53	16.46	17.56	19.13	21.14	22.60	33.98	38.90	40.94	43.27	45.79	48.94	51.02
	mm	115	134	161	239	280	369	418	446	486	537	574	863	988	1040	1099	1163	1243	1296
Weight	Kg	31	57	117	266	423	732	1011	1311	1718	2610	3338	5545	7675	9842	12853	17418	21142	29252

900LB

Description		Valve Size														
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032	2286
Weld End L1	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032	2286
RTJ L2	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	61.75	74.88	80.90	91.13
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1568	1902	2054	2315
Height F	in	5.28	5.91	7.20	9.65	11.34	13.11	15.91	17.76	19.45	21.73	23.46	26.89	31.81	33.95	36.72
	mm	134	150	183	245	288	333	404	451	494	552	596	683	808	862	933
Height H	in	8.43	9.41	11.22	12.44	14.57	16.30	19.13	23.07	24.76	27.64	29.37	34.02	38.94	41.81	43.27
	mm	214	239	285	316	370	414	486	586	629	702	746	864	989	1062	1099
Handle Length / Handwheel Dia C	in	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37
	mm	700	750	500	500	700	700	700	700	700	700	700	700	700	1000	1000
Height E	in	4.92	5.59	6.73	10.08	11.46	15.47	17.40	18.27	20.04	21.61	31.42	34.61	39.29	41.39	45.95
	mm	125	142	171	256	291	393	442	464	509	549	798	879	998	1051	1167
Weight	Kg	59	84	122	337	566	907	1391	1644	2128	2850	4142	6679	9230	10820	15842

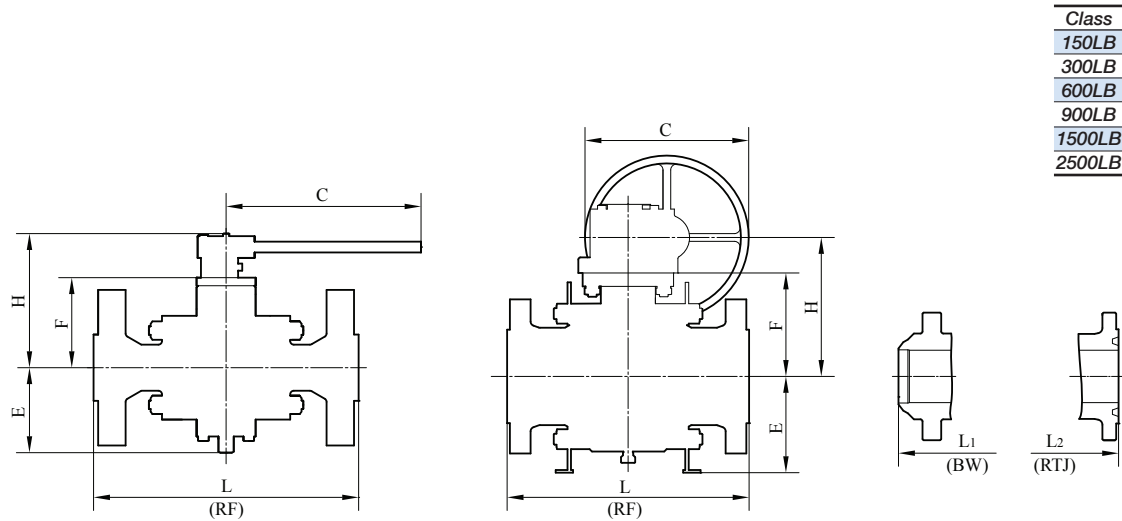
1500LB

Description		Valve Size												2500LB							
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	2"	3"	4"	6"	8"	10"	12"	
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00	
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	451	578	673	914	1022	1270	1422	
Weld End L1	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00	
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	451	578	673	914	1022	1270	1422	
RTJ L2	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	77.63	17.88	23.00	26.88	36.50	40.88	50.88	56.88	
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1972	454	584	683	927	1038	1292	1445	
Height F	in	5.28	6.69	9.17	10.12	11.93	15.16	18.19	20.31	21.73	23.31	24.84	28.82	6.50	7.87	9.96	12.36	14.57	17.80	21.73	
	mm	134	170	233	257	303	385	462	516	552	592	631	732	165	200	253	314	370	452	552	
Height H	in	8.43	10.71	11.61	13.35	15.16	18.39	23.50	25.79	27.64	29.21	31.97	36.69	10.00	10.98	13.19	14.72	17.80	23.11	27.64	
	mm	214	272	295	339	385	467	597	655	702	742	812	932	254	279	335	374	452	587	702	
Handle Length / Handwheel Dia C	in	27.56	29.53	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	
	mm	700	750	500	700	700	700	700	700	700	700	700	700	750	500	500	700	700	700	700	
Height E	in	4.92	6.06	8.19	10.28	12.60	16.46	18.58	19.96	21.77	23.50	33.07	39.37	5.87	6.81	9.80	12.01	14.45	18.98	20.67	
	mm	125	154	208	261	320	418	472	507	553	597	840	1000	149	173	249	305	367	482	525	
Weight	Kg	59	111	225	471	819	1328	1902	2990	4047	6080	8835	13823	83	204	387	789	1363	2109	3183	



Trunnion Mounted Ball Valves

Reduced Bore-Three-piece Forged Steel Body Ball Valves, TC Series



Class	Lever	Gear
150LB	≤ 6"x4"	≥ 8"x6"
300LB	≤ 6"x4"	≥ 8"x6"
600LB	≤ 6"x4"	≥ 8"x6"
900LB	≤ 4"x3"	≥ 6"x4"
1500LB	≤ 4"x3"	≥ 6"x4"
2500LB	≤ 3"x2"	≥ 4"x3"

150LB

Description		Valve Size																	
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"	42x36"	48x42"
Flanged End L	in	7.00	8.00	9.00	15.50	18.00	21.00	24.00	27.00	30.00	34.00	36.00	36.00	42.00	51.00	60.00	69.00	70.50	78.50
	mm	178	203	229	394	457	533	610	686	762	864	914	914	1067	1295	1524	1753	1790	1995
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00	82.00	94.00
	mm	216	283	305	457	521	559	635	762	838	914	991	991	1143	1397	1727	1956	2083	2388
Height F	in	4.25	4.65	5.39	6.18	8.11	9.92	12.09	12.09	13.50	15.51	17.17	18.86	20.51	24.57	30.83	32.87	34.25	38.07
	mm	108	118	137	157	206	252	307	307	343	394	436	479	521	624	783	835	870	967
Height H	in	6.57	7.13	8.11	8.86	10.63	12.44	14.88	14.88	16.73	18.66	20.39	21.46	23.74	29.88	37.95	40.00	41.38	45.94
	mm	167	181	206	225	270	316	378	378	425	474	518	545	603	759	964	1016	1051	1167
Handle Length / Handwheel Dia C	in	11.81	15.75	15.75	15.75	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37
	mm	300	400	400	400	500	500	500	500	700	700	700	700	700	700	700	700	700	1000
Height E	in	3.94	4.53	4.65	5.35	9.09	10.39	13.90	13.90	15.43	17.09	18.62	20.08	25.39	32.87	38.39	39.37	41.85	46.61
	mm	100	115	118	136	231	264	353	353	392	434	473	510	645	835	975	1000	1063	1184
Weight	Kg	20	25	39	65	190	307	501	558	769	905	1198	1710	2079	3259	6128	9662	12014	17494

300LB

Description		Valve Size																	
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"	42x36"	48x42"
Flanged End L	in	8.50	11.13	12.00	15.88	19.75	22.38	25.50	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00	82.00	85.50
	mm	216	283	305	403	502	568	648	762	838	914	991	991	1143	1397	1727	1956	2083	2170
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00	82.00	85.50
	mm	216	283	305	457	521	559	635	762	838	914	991	991	1143	1397	1727	1956	2083	2170
RTJ L ₂	in	9.13	11.73	12.64	16.50	20.40	23.00	26.14	30.63	33.62	36.60	39.76	39.76	45.87	56.00	69.13	-	-	-
	mm	232	298	321	419	518	584	664	778	854	930	1010	1010	1165	1422	1756	-	-	-
Height F	in	4.57	4.84	5.51	6.38	8.11	10.20	12.24	12.24	13.70	15.59	17.09	19.13	20.51	24.80	30.83	32.87	33.58	38.07
	mm	116	123	140	162	206	259	311	311	348	396	434	486	521	630	783	835	853	967
Height H	in	7.09	7.13	8.66	9.49	10.63	12.64	15.04	15.04	16.93	18.74	20.31	22.32	23.74	30.12	37.91	40.00	40.71	45.94
	mm	180	181	220	241	270	321	382	382	430	476	516	567	603	765	963	1016	1034	1167
Handle Length / Handwheel Dia C	in	15.75	15.75	19.69	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37
	mm	400	400	500	500	500	500	500	500	700	700	700	700	700	700	700	700	700	1000
Height E	in	4.17	4.53	5.12	5.98	9.09	10.39	14.02	14.02	15.91	17.09	18.66	20.00	21.50	33.23	38.78	39.37	41.85	46.61
	mm	106	115	130	152	231	264	356	356	404	434	474	508	546	844	985	1000	1063	1184
Weight	Kg	21	36	52	92	202	327	589	659	960	1347	1789	1865	2613	4399	7430	10658	13062	19002



Trunnion Mounted Ball Valves

Reduced Bore-Three-piece Forged Steel Body Ball Valves, TC Series

600LB

Description		Valve Size																	
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"	42x36"	48x42"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	81.90	85.63	95.88
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2080	2175	2435
Weld End L1	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	85.43	85.63	95.88
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2170	2175	2435
RTJ L2	in	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	47.25	55.38	65.50	82.63	85.43	85.63	95.88
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1200	1407	1664	2099	2170	2175	2435
Height F	in	4.17	4.72	5.67	6.65	9.21	10.91	13.11	13.11	14.57	15.63	17.91	20.79	22.76	26.38	31.30	33.23	35.08	40.76
	mm	106	120	144	169	234	277	333	333	370	397	455	528	578	670	795	844	891	1035
Height H	in	6.69	7.40	8.78	10.55	11.65	13.70	16.26	16.26	17.80	18.86	21.14	26.10	28.66	32.28	38.43	40.35	42.95	-
	mm	170	188	223	268	296	348	413	413	452	479	537	663	728	820	976	1025	1091	-
Handle Length / Handwheel Dia C	in	15.75	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	-
	mm	400	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700	700	-
Height E	in	3.78	4.53	5.28	6.34	9.41	11.02	14.53	14.53	16.46	17.56	19.13	21.14	22.60	33.98	38.90	40.94	43.27	48.94
	mm	96	115	134	161	239	280	369	369	418	446	486	537	574	863	988	1040	1099	1243
Weight	Kg	30	46	79	161	318	527	856	912	1353	1583	1813	2925	3714	5815	10031	13630	16998	25197

900LB

Description		Valve Size														
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	52.00	61.00	74.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1321	1549	1880	2286
Weld End L1	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	52.00	61.00	74.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1321	1549	1880	2286
RTJ L2	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	52.50	61.75	74.88	91.13
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1334	1568	1902	2315
Height F	in	4.61	5.28	5.91	7.20	9.65	11.34	13.11	13.11	15.91	17.76	19.45	21.73	23.46	26.89	31.81
	mm	117	134	150	183	245	288	333	333	404	451	494	552	596	683	808
Height H	in	7.44	8.43	9.41	11.22	12.44	14.57	16.30	16.30	19.13	23.07	24.76	27.64	29.37	34.02	38.94
	mm	189	214	239	285	316	370	414	414	486	586	629	702	746	864	989
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56
	mm	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700
Height E	in	4.61	4.92	5.59	6.73	10.08	11.46	15.47	15.47	17.40	18.27	20.04	21.61	31.42	34.61	39.29
	mm	117	125	142	171	256	291	393	393	442	464	509	549	798	879	998
Weight	Kg	48	66	103	177	418	669	1071	1240	1617	1847	2617	3366	4310	6748	11638

1500LB

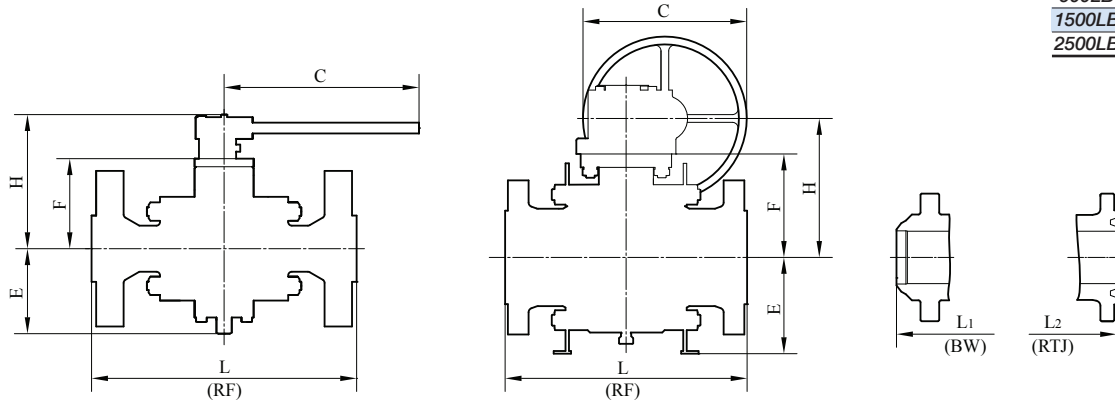
Description		Valve Size												Valve Size							
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1664	1943	451	578	673	914	1022	1270	1422
Weld End L1	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1664	1943	451	578	673	914	1022	1270	1422
RTJ L2	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	66.38	77.64	17.88	23.00	26.88	36.50	40.88	50.88	56.88
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1686	1972	454	584	683	927	1038	1292	1445
Height F	in	4.61	5.28	6.69	9.17	10.12	11.93	15.16	15.16	18.19	20.31	21.73	23.31	24.84	5.31	6.50	7.87	9.96	12.36	14.57	17.80
	mm	117	134	170	233	257	303	385	385	462	516	552	592	631	135	165	200	253	314	370	452
Height H	in	7.44	8.43	10.71	11.61	13.35	15.16	18.39	18.39	23.50	25.79	27.64	29.21	31.97	8.54	10.00	10.98	13.19	14.72	17.80	23.11
	mm	189	214	272	295	339	385	467	467	597	655	702	742	812	217	254	279	335	374	452	587
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	29.53	19.69	19.69	27.56	27.56	27.56
	mm	500	700	750	500	700	700	700	700	700	700	700	700	700	700	750	500	500	700	700	700
Height E	in	4.61	4.92	6.06	8.19	10.28	12.60	16.46	16.46	18.58	19.96	21.77	23.50	33.07	5.12	5.87	6.81	9.80	12.01	14.45	18.98
	mm	117	125	154	208	261	320	418	418	472	507	553	597	840	130	149	173	249	305	367	482
Weight	Kg	48	80	157	311	592	1056	1469	2145	2746	3970	5135	7500	9450	87	157	308	513	1027	1663	2624



Trunnion Mounted Ball Valves

Full Bore-Three-piece Forged Steel Body Ball Valves, TP Series

Class	Lever	Gear
150LB	≤ 4"	≥ 6"
300LB	≤ 4"	≥ 6"
600LB	≤ 4"	≥ 6"
900LB	≤ 3"	≥ 4"
1500LB	≤ 3"	≥ 4"
2500LB	≤ 2"	≥ 3"



150LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	7.00	8.00	9.00	15.50	18.00	21.00	24.00	27.00	30.00	34.00	36.00	42.00	51.00	54.00	60.00	69.00	70.50	78.50
	mm	178	203	229	394	457	533	610	686	762	864	914	1067	1295	1372	1524	1753	1790	1995
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	94.00
	mm	216	283	305	457	521	559	635	762	838	914	991	1143	1397	1524	1727	1956	2083	2388
Height F	in	4.92	5.63	6.54	8.11	10.28	12.05	14.29	15.67	17.20	19.13	20.63	25.08	31.81	33.86	35.24	37.32	39.06	45.28
	mm	125	143	166	206	261	306	363	398	437	486	524	637	808	860	895	948	992	1150
Height H	in	7.83	8.78	9.69	10.59	12.76	15.08	16.73	18.11	19.80	21.73	23.74	30.39	39.25	40.98	42.68	45.20	46.93	53.15
	mm	199	223	246	269	324	383	425	460	503	552	603	772	997	1041	1084	1148	1192	1350
Handle Length / Handwheel Dia C	in	15.75	15.75	15.75	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37	39.37
	mm	400	400	400	500	500	500	700	700	700	700	700	700	700	700	700	1000	1000	1000
Height E	in	4.53	5.35	6.26	9.37	10.98	13.98	15.83	17.32	19.06	20.39	21.69	33.43	39.37	40.35	42.83	44.49	47.60	48.98
	mm	115	136	159	238	279	355	402	440	484	518	551	849	1000	1025	1088	1130	1209	1244
Weight	Kg	18	33	66	131	271	486	754	813	1088	1708	1960	3368	5459	7372	10582	13304	15127	22310

300LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	8.50	11.13	12.00	15.88	19.75	22.38	25.50	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	85.50
	mm	216	283	305	403	502	568	648	762	838	914	991	1143	1397	1524	1727	1956	2083	2170
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	45.00	55.00	60.00	68.00	77.00	82.00	85.50
	mm	216	283	305	457	521	559	635	762	838	914	991	1143	1397	1524	1727	1956	2083	2170
Height F	in	4.84	5.51	6.42	9.09	10.28	12.05	14.45	15.67	17.36	19.41	20.87	25.39	31.97	33.86	34.57	37.32	39.06	45.28
	mm	123	140	163	231	261	306	367	398	441	493	530	645	812	860	878	948	992	1150
Height H	in	7.76	8.66	9.96	11.57	12.76	15.08	16.89	18.11	19.96	22.01	23.98	30.71	39.41	41.30	41.69	45.20	46.93	53.15
	mm	197	220	253	294	324	383	429	460	507	559	609	780	1001	1049	1059	1148	1192	1350
Handle Length / Handwheel Dia C	in	15.75	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37	39.37
	mm	400	500	500	500	500	500	700	700	700	700	700	700	700	700	700	1000	1000	1000
Height E	in	4.41	5.28	6.14	9.76	11.14	14.13	16.46	17.40	19.13	20.67	21.81	33.82	38.82	40.35	42.83	44.49	47.60	48.98
	mm	112	134	156	248	283	359	418	442	486	525	554	859	986	1025	1088	1130	1209	1244
Weight	Kg	29	49	74	159	309	529	804	1109	1568	1940	2328	3670	8079	8215	10892	14592	17060	23604



Trunnion Mounted Ball Valves

Full Bore-Three-piece Forged Steel Body Ball Valves, TP Series

600LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	81.90	85.63	95.88
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2080	2175	2435
Weld End L1	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	85.43	85.63	95.88
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2170	2175	2435
RTJ L2	in	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	55.38	65.50	70.63	82.63	85.43	85.63	95.88
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1407	1664	1794	2099	2170	2175	2435
Height F	in	4.92	5.63	6.93	9.29	10.71	13.54	15.16	16.65	18.39	21.26	22.60	27.09	32.68	34.61	36.46	41.34	42.13	47.87
	mm	125	143	176	236	272	344	385	423	467	540	574	688	830	879	926	1050	1070	1216
Height H	in	8.07	9.02	11.38	11.77	13.74	15.98	17.76	19.25	21.50	26.57	28.50	32.99	40.12	41.73	46.02	-	-	-
	mm	205	229	289	299	349	406	451	489	546	675	724	838	1019	1060	1169	-	-	-
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	-	-	-
	mm	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700	-	-	-
Height E	in	4.65	5.35	6.50	9.65	11.34	15.83	16.93	17.99	19.80	21.57	22.76	34.69	40.28	42.32	44.65	47.17	50.31	52.60
	mm	118	136	165	245	288	402	430	457	503	548	578	881	1023	1075	1134	1198	1278	1336
Weight	Kg	33	61	125	285	453	783	1082	1403	1838	2793	3572	5933	8212	10531	13753	18637	22622	31300

900LB

Description		Valve Size														
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032	2286
Weld End L1	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032	2286
RTJ L2	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	61.75	74.88	80.90	91.13
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1568	1902	2054	2315
Height F	in	5.91	6.10	7.95	9.76	12.52	14.33	16.54	18.31	19.88	22.28	24.13	27.99	33.58	35.71	38.50
	mm	150	155	202	248	318	364	420	465	505	566	613	711	853	907	978
Height H	in	9.41	10.51	10.43	12.80	14.96	16.93	19.65	23.62	25.20	28.19	30.04	35.43	43.15	43.58	45.04
	mm	239	267	265	325	380	430	499	600	640	716	763	900	1096	1107	1144
Handle Length / Handwheel Dia C	in	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37
	mm	700	750	500	500	700	700	700	700	700	700	700	700	700	1000	1000
Height E	in	5.59	5.67	7.20	10.12	12.40	16.06	18.07	19.13	20.28	21.54	31.46	36.06	41.06	43.15	47.72
	mm	142	144	183	257	315	408	459	486	515	547	799	916	1043	1096	1212
Weight	Kg	66	94	137	377	634	1016	1558	1841	2383	3192	4639	7480	10338	12118	17743

1500LB

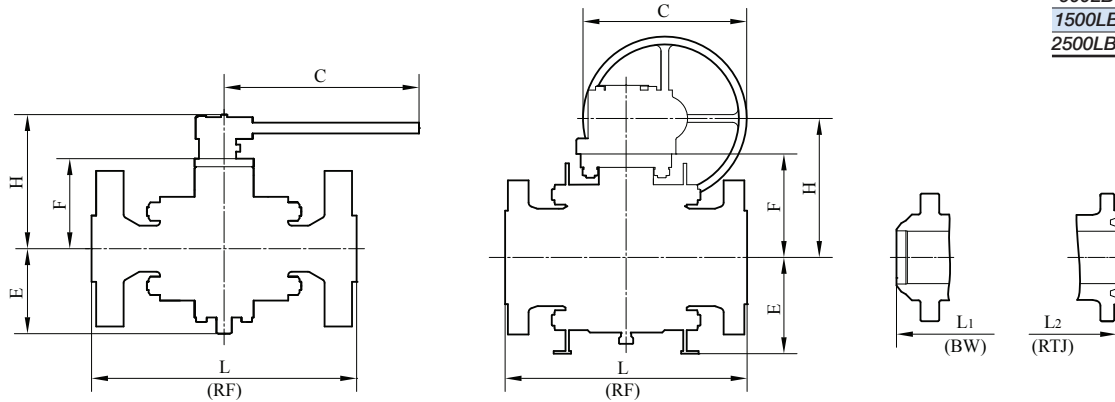
Description		Valve Size												Valve Size							
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	2"	3"	4"	6"	8"	10"	12"	
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00	
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	451	578	673	914	1022	1270	1422	
Weld End L1	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00	
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	451	578	673	914	1022	1270	1422	
RTJ L2	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	77.63	17.88	23.00	26.88	36.50	40.88	50.88	56.88	
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1972	454	584	683	927	1038	1292	1445	
Height F	in	5.91	7.40	9.45	10.39	13.23	16.54	18.58	21.89	23.31	24.88	26.42	30.98	6.65	7.99	10.08	13.70	15.75	19.37	23.31	
	mm	150	188	240	264	336	420	472	556	592	632	671	787	169	203	256	348	400	492	592	
Height H	in	9.41	11.73	11.93	12.83	15.83	19.65	23.90	27.80	29.21	30.79	33.86	40.55	11.30	10.43	12.52	16.30	18.86	24.69	29.21	
	mm	239	298	303	326	402	499	607	706	742	782	860	1030	287	265	318	414	479	627	742	
Handle Length / Handwheel Dia C	in	27.56	35.43	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	35.43	19.69	19.69	27.56	27.56	27.56	27.56	
	mm	700	900	500	700	700	700	700	700	700	700	700	700	900	500	500	700	700	700	700	
Height E	in	5.59	6.77	9.17	10.47	14.25	17.83	18.62	21.54	23.35	25.08	34.65	41.54	6.18	8.35	9.80	13.50	15.63	20.55	22.24	
	mm	142	172	233	266	362	453	473	547	593	637	880	1055	157	212	249	343	397	522	565	
Weight	Kg	66	124	252	528	917	1487	2130	3349	4533	6810	9895	15482	93	228	433	884	1527	2362	3565	



Trunnion Mounted Ball Valves

Reduced Bore-Three-piece Forged Steel Body Ball Valves, TP Series

Class	Lever	Gear
150LB	≤ 6"x4"	≥ 8"x6"
300LB	≤ 6"x4"	≥ 8"x6"
600LB	≤ 6"x4"	≥ 8"x6"
900LB	≤ 4"x3"	≥ 6"x4"
1500LB	≤ 4"x3"	≥ 6"x4"
2500LB	≤ 3"x2"	≥ 4"x3"



150LB

Description		Valve Size																	
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"	42x36"	48x42"
Flanged End L	in	7.00	8.00	9.00	15.50	18.00	21.00	24.00	27.00	30.00	34.00	36.00	36.00	42.00	51.00	60.00	69.00	70.50	78.50
	mm	178	203	229	394	457	533	610	686	762	864	914	914	1067	1295	1524	1753	1790	1995
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00	82.00	94.00
	mm	216	283	305	457	521	559	635	762	838	914	991	991	1143	1397	1727	1956	2083	2388
Height F	in	4.41	4.92	5.63	6.54	8.11	10.28	12.05	12.05	14.29	15.67	17.20	19.13	20.63	25.08	31.81	33.86	35.24	39.06
	mm	112	125	143	166	206	261	306	306	363	398	437	486	524	637	808	860	895	992
Height H	in	7.17	7.83	8.78	9.69	10.59	12.76	15.08	15.08	16.73	18.11	19.80	21.73	23.74	30.39	39.25	40.98	42.68	46.93
	mm	182	199	223	246	269	324	383	383	425	460	503	552	603	772	997	1041	1084	1192
Handle Length / Handwheel Dia C	in	11.81	15.75	15.75	15.75	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37
	mm	300	400	400	400	500	500	500	500	700	700	700	700	700	700	700	700	700	1000
Height E	in	4.21	4.53	5.35	6.26	9.37	10.98	13.98	13.98	15.83	17.32	19.06	20.39	21.69	33.43	39.37	40.35	42.83	47.60
	mm	107	115	136	159	238	279	355	355	402	440	484	518	551	849	1000	1025	1088	1209
Weight	Kg	21	27	42	70	203	328	536	597	823	968	1282	1830	2225	3487	6557	10338	12855	18719

300LB

Description		Valve Size																	
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"	42x36"	48x42"
Flanged End L	in	8.50	11.13	12.00	15.88	19.75	22.38	25.50	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00	82.00	85.50
	mm	216	283	305	403	502	568	648	762	838	914	991	991	1143	1397	1727	1956	2083	2170
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	39.00	45.00	55.00	68.00	77.00	82.00	85.50
	mm	216	283	305	457	521	559	635	762	838	914	991	991	1143	1397	1727	1956	2083	2170
Height F	in	4.53	4.84	5.51	6.42	9.09	10.28	12.05	12.05	14.45	15.67	17.36	19.41	20.87	25.39	31.97	33.86	34.57	39.06
	mm	115	123	140	163	231	261	306	306	367	398	441	493	530	645	812	860	878	992
Height H	in	7.28	7.76	8.66	9.96	11.57	12.76	15.08	15.08	16.89	18.11	19.96	22.01	23.98	30.71	39.41	41.30	41.69	46.93
	mm	185	197	220	253	294	324	383	383	429	460	507	559	609	780	1001	1049	1059	1192
Handle Length / Handwheel Dia C	in	11.81	15.75	19.69	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37
	mm	300	400	500	500	500	500	500	500	700	700	700	700	700	700	700	700	700	1000
Height E	in	4.33	4.41	5.28	6.14	9.76	11.14	14.13	14.13	16.46	17.40	19.13	20.67	21.81	33.82	38.82	40.35	42.83	47.60
	mm	110	112	134	156	248	283	359	359	418	442	486	525	554	859	986	1025	1088	1209
Weight	Kg	22	39	56	98	216	350	630	705	1027	1441	1914	1996	2796	4707	7950	11404	13976	20332



Trunnion Mounted Ball Valves

Reduced Bore-Three-piece Forged Steel Body Ball Valves, TP Series

600LB

Description		Valve Size																	
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"	42x36"	48x42"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	81.90	85.63	95.88
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2080	2175	2435
Weld End L ₁	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	85.43	85.63	95.88
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2170	2175	2435
RTJ L ₂	in	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	47.25	55.38	65.50	82.63	85.43	85.63	95.88
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1200	1407	1664	2099	2170	2175	2435
Height F	in	4.25	4.92	5.63	6.93	9.29	10.71	13.54	13.54	15.16	16.65	18.39	21.26	22.60	27.09	32.68	34.61	36.46	42.13
	mm	108	125	143	176	236	272	344	344	385	423	467	540	574	688	830	879	926	1070
Height H	in	7.24	8.07	9.02	11.38	11.77	13.74	15.98	15.98	17.76	19.25	21.50	26.57	28.50	32.99	40.12	41.73	46.02	-
	mm	184	205	229	289	299	349	406	406	451	489	546	675	724	838	1019	1060	1169	-
Handle Length / Handwheel Dia C	in	15.75	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	-
	mm	400	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700	700	-
Height E	in	4.02	4.65	5.35	6.50	9.65	11.34	15.83	15.83	16.93	17.99	19.80	21.57	22.76	34.69	40.28	42.32	44.65	50.31
	mm	102	118	136	165	245	288	402	402	430	457	503	548	578	881	1023	1075	1134	1278
Weight	Kg	32	49	85	172	340	564	916	976	1448	1694	1940	3130	3974	6222	10733	14584	18188	26961

900LB

Description		Valve Size														
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	52.00	61.00	74.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1321	1549	1880	2286
Weld End L ₁	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	52.00	61.00	74.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1321	1549	1880	2286
RTJ L ₂	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	52.50	61.75	74.88	91.13
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1334	1568	1902	2315
Height F	in	4.72	5.91	6.10	7.95	9.76	12.52	14.33	14.33	16.54	18.31	19.88	22.28	24.13	27.99	33.58
	mm	120	150	155	202	248	318	364	364	420	465	505	566	613	711	853
Height H	in	7.56	9.41	10.51	10.43	12.80	14.96	16.93	16.93	19.65	23.62	25.20	28.19	30.04	35.43	43.15
	mm	192	239	267	265	325	380	430	430	499	600	640	716	763	900	1096
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56
	mm	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700
Height E	in	4.72	5.59	5.67	7.20	10.12	12.40	16.06	16.06	18.07	19.13	20.28	21.54	31.46	36.06	41.06
	mm	120	142	144	183	257	315	408	408	459	486	515	547	799	916	1043
Weight	Kg	54	74	115	198	468	749	1200	1389	1811	2069	2931	3770	4827	7558	13035

1500LB

Description		Valve Size												2500LB							
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1664	1943	451	578	673	914	1022	1270	1422
Weld End L ₁	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1664	1943	451	578	673	914	1022	1270	1422
RTJ L ₂	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	66.38	77.63	17.88	23.00	26.88	36.50	40.88	50.88	56.88
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1686	1972	454	584	683	927	1038	1292	1445
Height F	in	4.72	5.91	7.40	9.45	10.39	13.23	16.54	16.54	18.58	21.89	23.31	24.88	26.42	5.51	6.65	7.99	10.08	13.70	15.75	19.37
	mm	120	150	188	240	264	336	420	420	472	556	592	632	671	140	169	203	256	348	400	492
Height H	in	7.56	9.41	11.73	11.93	12.83	15.83	19.65	19.65	23.90	27.80	29.21	30.79	33.86	8.74	11.30	10.43	12.52	16.30	18.86	24.69
	mm	192	239	298	303	326	402	499	499	607	706	742	782	860	222	287	265	318	414	479	627
Handle Length / Handwheel Dia C	in	19.69	27.56	35.43	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	35.43	19.69	19.69	27.56	27.56	27.56
	mm	500	700	900	500	700	700	700	700	700	700	700	700	700	700	900	500	500	700	700	700
Height E	in	4.72	5.59	6.77	9.17	10.47	14.25	17.83	17.83	18.62	21.54	23.35	25.08	34.65	5.31	6.18	8.35	9.80	13.50	15.63	20.55
	mm	120	142	172	233	266	362	453	453	473	547	593	637	880	135	157	212	249	343	397	522
Weight	Kg	54	90	176	348	663	1183	1645	2402	3076	4446	5751	8400	10584	97	176	345	575	1150	1863	2939



Trunnion Mounted Ball Valves

One-piece Cast Steel Body Top Entry Ball Valves

Applicable Standards

Basic Design: **API 6D, ASME B16.34, API 608**
Compliance Is Optional From The Factory

Face to Face: **ASME B16.10, API 6D for class $\geq$ 600LB. For 150LB and 300LB, In Compliance With Dimensions of 600LB**

Flange End: **ASME B16.5 (up to 24"), ASME B16.47 series A (26" and above)**

Butt Welding End: **ASME B16.25**

Test and Inspection: **API 6D, API 598**

Fire-safe Test: **API 6FA or API 607**

Fugitive Emission Test: **ISO 15848-2**

Type Testing for FE: **ISO 15848-1, API 641**

Manufacturing to NACE latest version on request

CSA Z245.15 latest version compliance is available



Specifications

Size Range: **2" ~ 48"**

Pressure Range: **150LB ~ 2500LB**

End Connection: **Flanged end / Butt welding end**

Bore: **Full bore / Reduced bore**

Seat Piston: **Single piston / Double piston**

Operation: **Manual operation, Actuated operation**

Material: **Body: Carbon steel, Stainless steel, Duplex Stainless steel, etc.**

Trim: Carbon steel+ENP, Alloy steel+ENP, Stainless steel, Duplex stainless steel, etc.

Isolation Valve Features: **DBB: Two SPE (Single Piston Effect) seats**
DIB-1: Two DPE (Double Piston Effect) seats
DIB-2: One SPE seat and one DPE seat

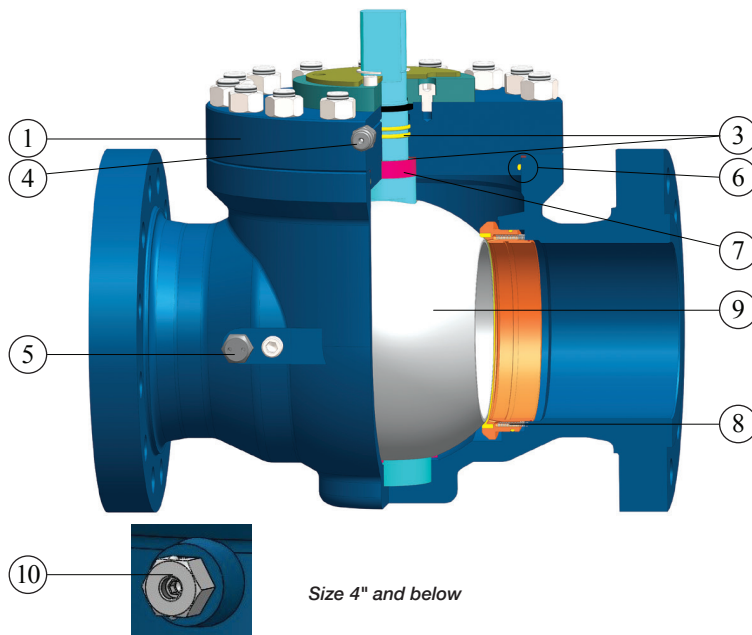
Note: Additional sizes and pressure classes are available upon request.



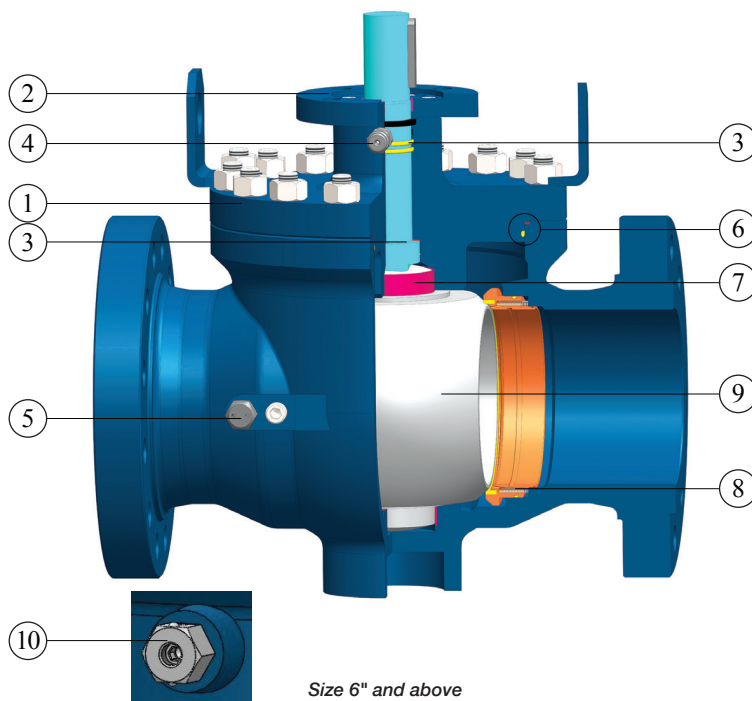
Trunnion Mounted Ball Valves

One-piece Cast Steel Body Top Entry Ball Valves

Typical Structure



Size 4" and below



Size 6" and above

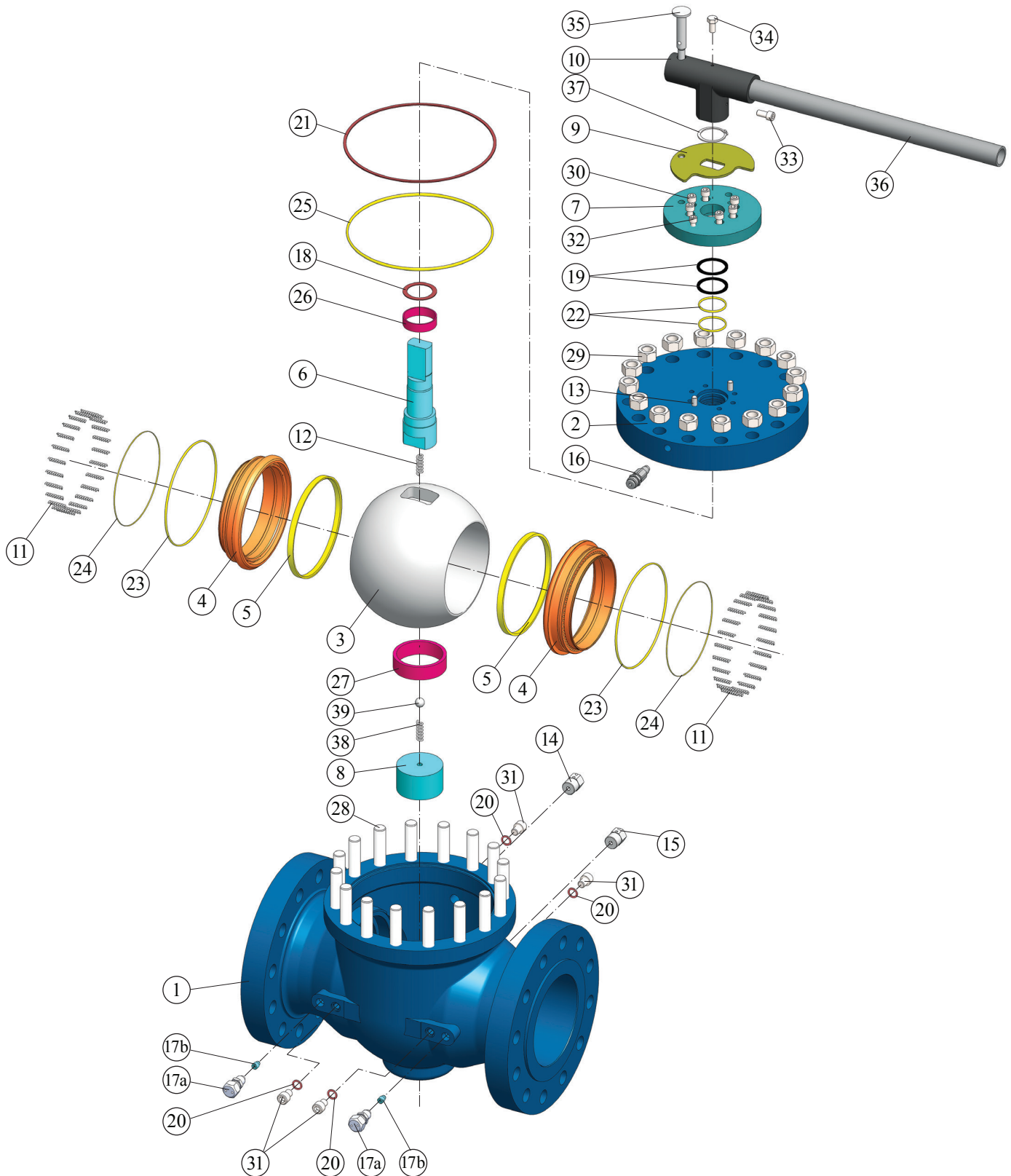
- ① Top entry design offers easy on-line maintenance.
- ② ISO mounting pad for various actuators.
(Not applicable for lever operated valves.)
- ③ Anti-Blowout stem & double O-ring seals.
- ④ Stem injection fitting for lubrication and emergency sealant.
- ⑤ Seat injection fitting with internal check valve for lubrication and emergency sealant.
- ⑥ O-ring & gasket combination provides a tight seal.
- ⑦ Self-lubricating bearing reduces operating torque.
- ⑧ Spring loaded seats with secondary metal to metal fire-safe seal.
- ⑨ Smooth electroless nickel plated or solid S.S. ball for tight seal and low operational torque.
- ⑩ Drain fitting for double block & bleed and on-line testing.

General Note: Structure shown in the illustration is a typical, other configurations are available upon request.



Trunnion Mounted Ball Valves

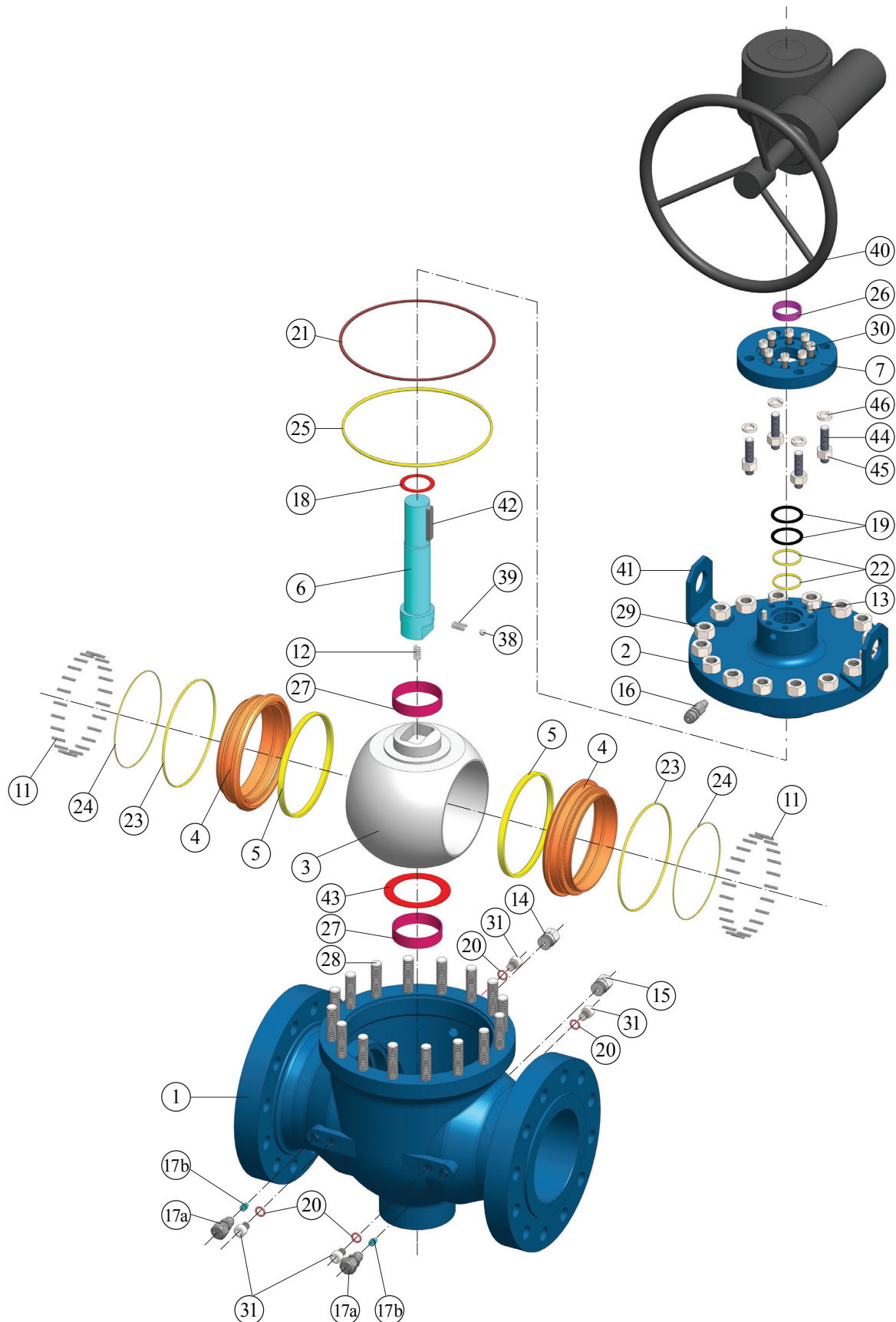
One-piece Cast Steel Body Top Entry Ball Valves, 4" and Below





Trunnion Mounted Ball Valves

One-piece Cast Steel Body Top Entry Ball Valves, 6" and Above

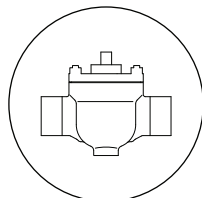




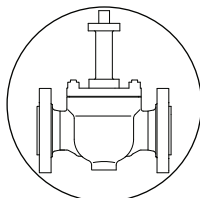
Trunnion Mounted Ball Valves

One-piece Cast Steel Body Top Entry Ball Valves

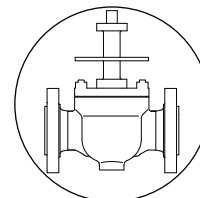
Options:



Pup Piece End



Extended Stem



Cryogenic Design

Material Specification

No.	Description	Carbon Steel		Stainless Steel	
1	Body	A216 WCB	A352 LCC	A351 CF8M	A995 4A
2	Bonnet	A105	A350 LF2	A182 F316	A182 F51
3	Ball	A105	A350 LF2	A182 F316	A182 F51
4	Seat	A105	A350 LF2	A182 F316	A182 F51
5	Seat Insert	R-PTFE / Nylon / Devlon / PEEK			
6	Stem	A105	A350 LF2	A182 F316	A182 F51
7	Top Flange	A105	A350 LF2	A182 F316	A182 F51
8	Trunnion	A105	A350 LF2	A182 F316	A182 F51
9	Stop Plate	Carbon Steel			
10	Handle Adapter	Carbon Steel			
11	Spring	Inconel			
12	Anti-Static Device	Stainless Steel			
13	Pin	Alloy Steel		Stainless Steel	
14	Vent Fitting	Assembly			
15	Drain Fitting	Assembly			
16	Sealant Injection Fitting	Assembly			
17a	Sealant Injection Fitting	Assembly			
17b	Check Valve	Assembly			
18	Thrust Washer	R-PTFE / Metal Backed PTFE			
19	Fire-safe Seal	Graphite			
20	Gasket	Metal & Flexible Graphite			
21	Gasket	Metal & Flexible Graphite			
22	O-ring	As Page 48 O-Ring Material			
23	O-ring	As Page 48 O-Ring Material			
24	O-ring	As Page 48 O-Ring Material			
25	O-ring	As Page 48 O-Ring Material			
26	Bearing	Metal Backed PTFE			
27	Bearing	Metal Backed PTFE			
28	Stud	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
29	Nut	A194 2H	A194 7	A194 8M	A194 8MLCuNa
30	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN

Material Specification

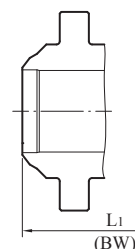
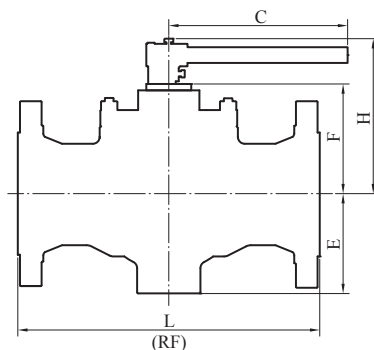
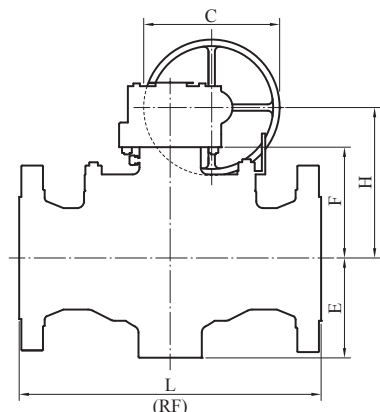
No.	Description	Carbon Steel		Stainless Steel	
31	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
32	Stop Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
33	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
34	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
35	Locking Pin	Carbon Steel		Stainless Steel	
36	Handle	Carbon Steel			
37	Snap Ring	Carbon Steel		Stainless Steel	
38	Anti-Static Device	Stainless Steel			
39	Anti-Static Device	Stainless Steel			
40	Gearbox	Carbon Steel			
41	Lifting Lug	Carbon Steel			
42	Key	Carbon Steel			
43	Thrust Washer	R-PTFE			
44	Stud	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
45	Nut	A194 2H	A194 7	A194 8M	A194 8MLCuNa
46	Washer	Carbon Steel		Stainless Steel	

Note: Materials listed are based on typical configurations, other materials can be provided upon request.



Trunnion Mounted Ball Valves

One-piece Cast Steel Body Top Entry Ball Valves



Class	Lever		Gear	
150LB	≤ 4"	≤ 6"x4"	≥ 6"	≥ 8"x6"
300LB	≤ 4"	≤ 6"x4"	≥ 6"	≥ 8"x6"
600LB	≤ 4"	≤ 6"x4"	≥ 6"	≥ 8"x6"
900LB	≤ 3"	≤ 4"x3"	≥ 4"	≥ 6"x4"
1500LB	≤ 3"	≤ 4"x3"	≥ 4"	≥ 6"x4"
2500LB	≤ 2"	≤ 3"x2"	≥ 3"	≥ 4"x3"

150LB / 300LB

Description		Valve Size																	
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"	48"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	81.90	85.63	95.90
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2080	2175	2435
Weld End L ₁	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	85.43	85.63	95.90
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2170	2175	2435
Height F	in	5.31	5.71	7.17	10.31	12.05	13.31	14.33	17.01	17.99	18.82	20.94	22.83	29.92	31.65	34.96	37.83	40.04	44.53
	mm	135	145	182	262	306	338	364	432	457	478	532	580	760	804	888	961	1017	1131
Height H	in	7.76	8.39	10.39	12.83	14.49	16.10	17.56	20.16	21.22	22.05	24.17	28.15	37.05	38.78	42.09	45.71	47.91	52.40
	mm	197	213	264	326	368	409	446	512	539	560	614	715	941	985	1069	1161	1217	1331
Handle Length / Handwheel Dia C	in	15.75	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37	39.37
	mm	400	500	500	500	500	500	700	700	700	700	700	700	700	700	700	1000	1000	1000
Height E	in	3.54	4.53	5.51	6.69	8.07	9.45	11.42	12.60	13.78	15.16	16.54	20.47	24.02	25.00	27.36	29.33	30.12	32.28
	mm	90	115	140	170	205	240	290	320	350	385	420	520	610	635	695	745	765	820
Weight	Kg	32	57	95	199	371	509	689	995	1367	1742	1932	2984	5074	6383	8201	11518	13602	20353

600LB

Description		Valve Size																
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"	40"	42"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	81.90	85.63
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2080	2175
Weld End L ₁	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00	82.00	85.43	85.63
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778	2083	2170	2175
RTJ L ₂	in	11.61	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	55.38	65.50	70.63	82.63	85.43	85.63
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1407	1664	1794	2099	2170	2175
Height F	in	5.04	5.83	7.01	10.59	13.07	15.51	15.94	17.44	19.09	21.85	23.82	27.56	32.95	34.49	38.23	41.38	43.82
	mm	128	148	178	269	332	394	405	443	485	555	605	700	837	876	971	1051	1113
Height H	in	7.99	9.76	10.83	13.39	15.87	18.66	19.17	20.67	22.32	27.17	29.72	33.46	40.08	41.61	46.10	-	-
	mm	203	248	275	340	403	474	487	525	567	690	755	850	1018	1057	1171	-	-
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	-	-
	mm	500	700	750	500	500	500	700	700	700	700	700	700	700	700	700	-	-
Height E	in	3.74	4.53	5.91	7.48	8.66	10.63	11.42	12.99	14.37	16.54	18.11	21.46	24.61	25.98	28.35	29.92	30.91
	mm	95	115	150	190	220	270	290	330	365	420	460	545	625	660	720	760	785
Weight	Kg	37	60	99	203	375	601	842	1210	1545	2128	2783	3935	6795	7912	11385	13686	15965



Trunnion Mounted Ball Valves

One-piece Cast Steel Body Top Entry Ball Valves

900LB

Description		Valve Size														
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"	36"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032	2286
Weld End L ₁	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032	2286
RTJ L ₂	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	61.75	74.88	80.90	91.13
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1568	1902	2054	2315
Height F	in	5.83	8.11	11.10	12.64	14.69	16.22	17.76	19.29	20.75	22.36	24.09	31.10	34.57	36.22	45.47
	mm	148	206	282	321	373	412	451	490	527	568	612	790	878	920	1155
Height H	in	8.86	11.69	13.46	15.43	17.91	19.45	20.98	24.61	26.06	28.27	30.00	38.23	42.44	44.09	52.01
	mm	225	297	342	392	455	494	533	625	662	718	762	971	1078	1120	1321
Handle Length / Handwheel Dia C	in	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37	39.37
	mm	700	750	500	500	700	700	700	700	700	700	700	700	700	1000	1000
Height E	in	4.72	5.31	6.69	8.07	9.84	11.42	12.99	13.78	14.96	16.73	18.11	23.82	26.57	28.35	32.68
	mm	120	135	170	205	250	290	330	350	380	425	460	605	675	720	830
Weight	Kg	47	99	180	387	720	900	1170	1526	2304	3060	3960	6480	11588	14355	18540

1500LB

2500LB

Description		Valve Size												Valve Size							
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	2"	3"	4"	6"	8"	10"	12"	
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00	
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	451	578	673	914	1022	1270	1422	
Weld End L ₁	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00	
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943	451	578	673	914	1022	1270	1422	
RTJ L ₂	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	77.63	17.88	23.00	26.88	36.50	40.88	50.88	56.88	
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1972	454	584	683	927	1038	1292	1445	
Height F	in	5.83	6.69	11.93	13.43	15.83	17.72	23.15	24.49	25.12	26.34	28.94	32.36	8.43	9.65	12.32	14.13	16.85	20.00	23.39	
	mm	148	170	303	341	402	450	588	622	638	669	735	822	214	245	313	359	428	508	594	
Height H	in	8.86	10.71	14.37	16.65	18.94	20.94	28.46	30.39	31.02	32.24	36.06	39.49	12.32	12.87	15.16	16.50	20.08	25.31	29.29	
	mm	225	272	365	423	481	532	723	772	788	819	916	1003	313	327	385	419	510	643	744	
Handle Length / Handwheel Dia C	in	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	
	mm	700	750	500	500	700	700	700	700	700	700	700	700	750	500	500	700	700	700	700	
Height E	in	4.72	5.71	6.89	8.27	10.04	12.20	14.37	15.75	17.52	19.29	20.67	24.41	5.12	6.50	7.48	10.04	11.42	13.78	15.75	
	mm	120	145	175	210	255	310	365	400	445	490	525	620	130	165	190	255	290	350	400	
Weight	Kg	50	138	250	540	990	1294	1815	2351	3501	4590	6010	10530	108	221	423	843	1269	2340	3780	

150LB / 300LB

Description		Valve Size																	
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"	42x36"	48x42"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	81.90	85.63	95.90
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2080	2175	2435
Weld End L ₁	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	85.43	85.63	95.90
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2170	2175	2435
Height F	in	4.06	5.31	5.71	7.17	10.31	12.05	13.31	13.31	14.33	17.01	17.99	18.82	20.94	22.81	29.92	31.65	34.96	40.04
	mm	103	135	145	182	262	306	338	338	364	432	457	478	532	580	760	804	888	1017
Height H	in	6.57	7.76	8.39	10.39	12.83	14.49	16.10	16.10	17.56	20.16	21.22	22.05	24.17	28.15	37.05	38.78	42.09	47.91
	mm	167	197	213	264	326	368	409	409	446	512	539	560	614	715	941	985	1069	1217
Handle Length / Handwheel Dia C	in	15.75	15.75	19.69	19.69	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	39.37
	mm	400	400	500	500	500	500	500	500	700	700	700	700	700	700	700	700	700	1000
Height E	in	3.43	4.53	5.51	6.69	8.07	9.45	11.42	12.60	13.78	15.16	16.54	16.54	20.47	24.02	27.36	29.33	30.12	32.28
	mm	87	115	140	170	205	240	290	320	350	385	420	420	520	610	695	745	765	820
Weight	Kg	26	42	72	140	271	418	548	598	740	1205	1685	1806	2304	3592	6132	8951	10902	16978



Trunnion Mounted Ball Valves

One-piece Cast Steel Body Top Entry Ball Valves

600LB

Description		Valve Size																
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"	40x32"	42x36"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	81.90	85.63
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2080	2175
Weld End L1	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	47.00	55.00	65.00	82.00	85.43	85.63
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1194	1397	1651	2083	2170	2175
RTJ L2	in	11.61	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	47.25	55.38	65.50	82.63	85.43	85.63
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1200	1407	1664	2099	2170	2175
Height F	in	4.06	5.04	5.83	7.01	10.59	13.07	15.51	15.51	15.94	17.44	19.09	21.85	23.82	27.56	32.95	34.49	38.23
	mm	103	128	148	178	269	332	394	394	405	443	485	555	605	700	837	876	971
Height H	in	6.57	7.99	9.76	10.83	13.39	15.87	18.66	18.66	19.17	20.67	22.32	27.17	29.72	33.46	40.08	41.61	46.10
	mm	167	203	248	275	340	403	474	474	487	525	567	690	755	850	1018	1057	1171
Handle Length / Handwheel Dia C	in	15.75	19.69	27.56	29.53	19.69	19.69	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56
	mm	400	500	700	750	500	500	500	500	700	700	700	700	700	700	700	700	700
Height E	in	3.43	4.53	5.91	7.48	8.66	10.63	11.42	12.99	14.37	16.54	18.11	18.11	21.46	24.61	28.35	29.92	30.91
	mm	87	115	150	190	220	270	290	330	365	420	460	460	545	625	720	760	785
Weight	Kg	34	46	76	150	355	465	706	735	1272	1455	1995	2335	3514	5815	8805	10799	13675

900LB

Description		Valve Size														
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	30x24"	36x30"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	52.00	61.00	74.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1321	1549	1880	2286
Weld End L1	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	52.00	61.00	74.00	90.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1321	1549	1880	2286
RTJ L2	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	52.50	61.75	74.88	91.13
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1334	1568	1902	2315
Height F	in	4.65	5.83	8.11	11.10	12.64	14.69	16.22	16.22	17.76	19.29	20.75	22.36	24.09	31.10	34.57
	mm	118	148	206	282	321	373	412	412	451	490	527	568	612	790	878
Height H	in	8.98	8.86	11.69	13.46	15.43	17.91	19.45	19.45	20.98	24.61	26.06	28.27	30.00	38.23	42.44
	mm	228	225	297	342	392	455	494	494	533	625	662	718	762	971	1078
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56
	mm	500	700	750	500	500	700	700	700	700	700	700	700	700	700	700
Height E	in	4.37	5.31	6.69	8.07	9.84	11.42	12.99	13.78	14.96	16.73	18.11	18.11	23.82	26.57	32.68
	mm	111	135	170	205	250	290	330	350	380	425	460	460	605	675	830
Weight	Kg	50	70	133	270	526	769	983	1280	1568	2069	2826	3335	5400	8153	13595

1500LB

Description		Valve Size												2500LB							
		2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"	14x10"	16x12"	18x14"	20x16"	20x18"	24x20"	2x1.5"	3x2"	4x3"	6x4"	8x6"	10x8"	12x10"
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1664	1943	451	578	673	914	1022	1270	1422
Weld End L1	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	65.50	76.50	17.75	22.75	26.50	36.00	40.25	50.00	56.00
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1664	1943	451	578	673	914	1022	1270	1422
RTJ L2	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	66.38	77.63	17.88	23.00	26.88	36.50	40.88	50.88	56.88
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1686	1972	454	584	683	927	1038	1292	1445
Height F	in	4.65	5.83	6.69	11.93	13.43	15.83	17.72	17.72	23.15	24.49	25.12	26.34	28.94	6.69	8.43	9.65	12.32	14.13	16.85	20.00
	mm	118	148	170	303	341	402	450	450	588	622	638	669	735	170	214	245	313	359	428	508
Height H	in	8.98	8.86	10.71	14.37	16.65	18.94	20.94	20.94	28.46	30.39	31.02	32.24	36.06	9.84	12.32	12.87	15.16	16.50	20.08	25.31
	mm	228	225	272	365	423	481	532	532	723	772	788	819	916	250	313	327	385	419	510	643
Handle Length / Handwheel Dia C	in	19.69	27.56	29.53	19.69	19.69	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	27.56	29.53	19.69	19.69	27.56	27.56	27.56
	mm	500	700	750	500	500	700	700	700	700	700	700	700	700	700	750	500	500	700	700	700
Height E	in	4.37	5.71	6.89	8.27	10.04	12.20	14.37	15.75	17.52	19.29	20.67	20.67	24.41	5.12	6.50	7.48	10.04	11.42	13.78	15.75
	mm	111	145	175	210	255	310	365	400	445	490	525	525	620	130	165	190	255	290	350	400
Weight	Kg	50	89	184	375	727	1085	1477	1996	2398	3132	4292	5035	7464	80	156	306	601	1003	1714	2907



Trunnion Mounted Ball Valves

Fully Welded Ball Valves

Applicable Standards

Basic Design:	API 6D, API 608, ASME B16.34
Face to Face:	ASME B16.10, API 6D
Flange End:	ASME B16.5 (up to 24"), ASME B16.47 series A (26" and above)
Butt Welding End:	ASME B16.25
Test and Inspection:	API 6D, API 598
Fire-safe Test:	API 6FA or API 607
Fugitive Emission Test:	ISO 15848-2
Type Testing for FE:	ISO 15848-1, API 641
Manufacturing to NACE latest version on request	
CSA Z245.15 latest version compliance is available	



Specifications

Size Range:	2" ~ 32"
Pressure Range:	150LB ~ 2500LB
End Connection:	Flanged end / Butt welding end
Bore:	Full bore / Reduced bore
Seat Piston:	Single piston / Double piston
Operation:	Manual operation, Actuated operation
Material:	Body: Carbon steel, Stainless steel, Duplex Stainless steel, etc. Trim: Carbon steel+ENP, Alloy steel+ENP, Stainless steel, Duplex stainless steel, etc.
Isolation Valve Features:	DBB: Two SPE (Single Piston Effect) seats DIB-1: Two DPE (Double Piston Effect) seats DIB-2: One SPE seat and one DPE seat

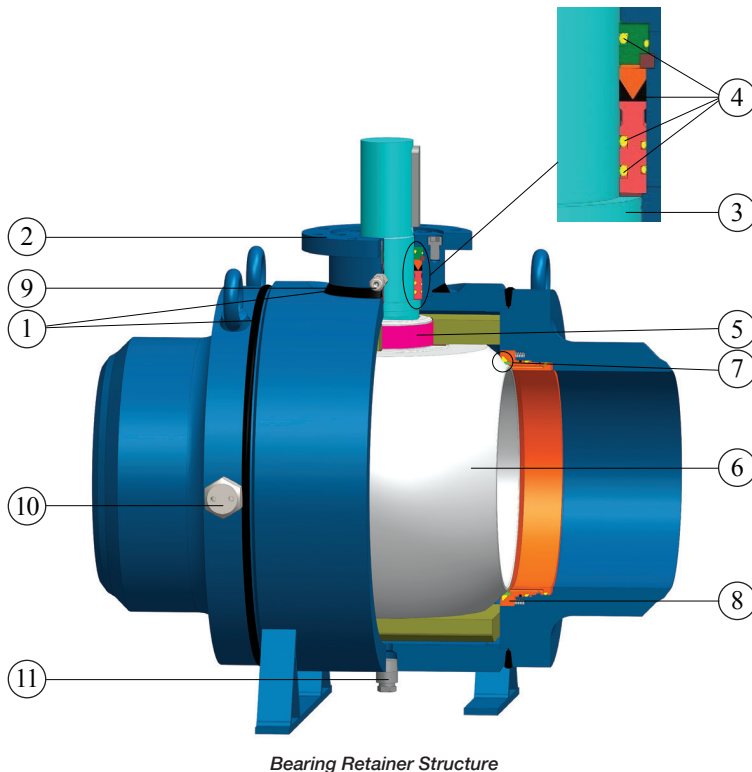
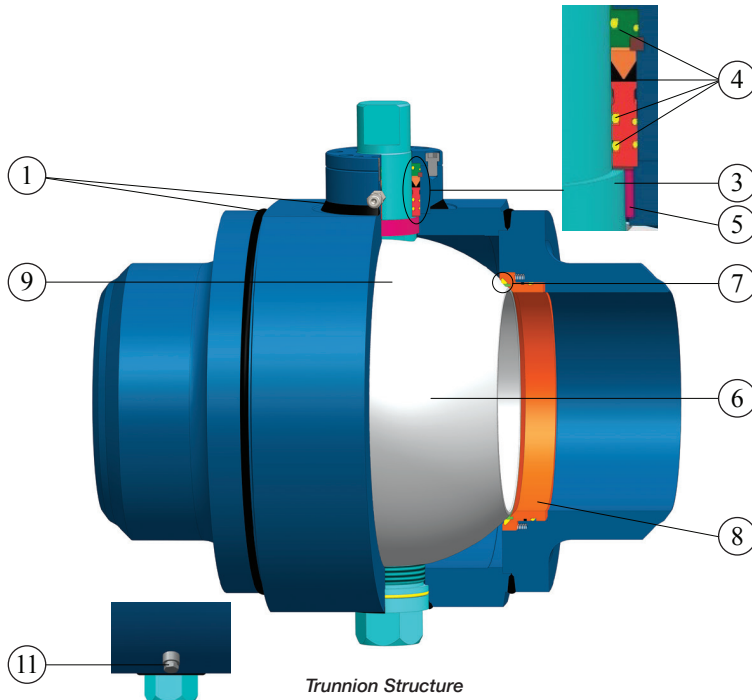
Note: Additional sizes and pressure classes are available upon request.



Trunnion Mounted Ball Valves

Fully Welded Ball Valves

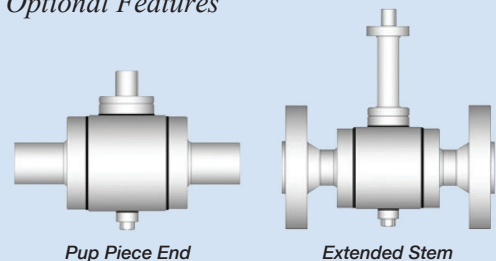
Typical Structure



- ① Fully welded body and cap. Option for welded gland.
- ② ISO mounting pad for various actuators. (Not applicable for lever operated valves.)
- ③ Anti-Blowout stem.
- ④ Triple level stem seal design including fire-safe graphite packing for compliance to low fugitive emission requirements.
- ⑤ Self-lubricating bearing reduces operating torque.
- ⑥ Smooth electroless nickel plated or solid S.S. ball for tight seal and low operation torque.
- ⑦ Delta ring seat design is the most widely used seat structure of fully welded ball valves. Other seat designs are available.
- ⑧ Spring loaded seats with secondary metal to metal fire-safe seal.
- ⑨ Stem injection fitting for lubrication and emergency sealant.
- ⑩ Seat injection fittings with internal check valves for lubrication and emergency sealant. The seat injection fitting is a standard design for valves $\geq 6"$.
- ⑪ Drain fitting for double block & bleed and on-line testing.

General Note: Structure shown in the illustration is typical structure, other configurations are available upon request.

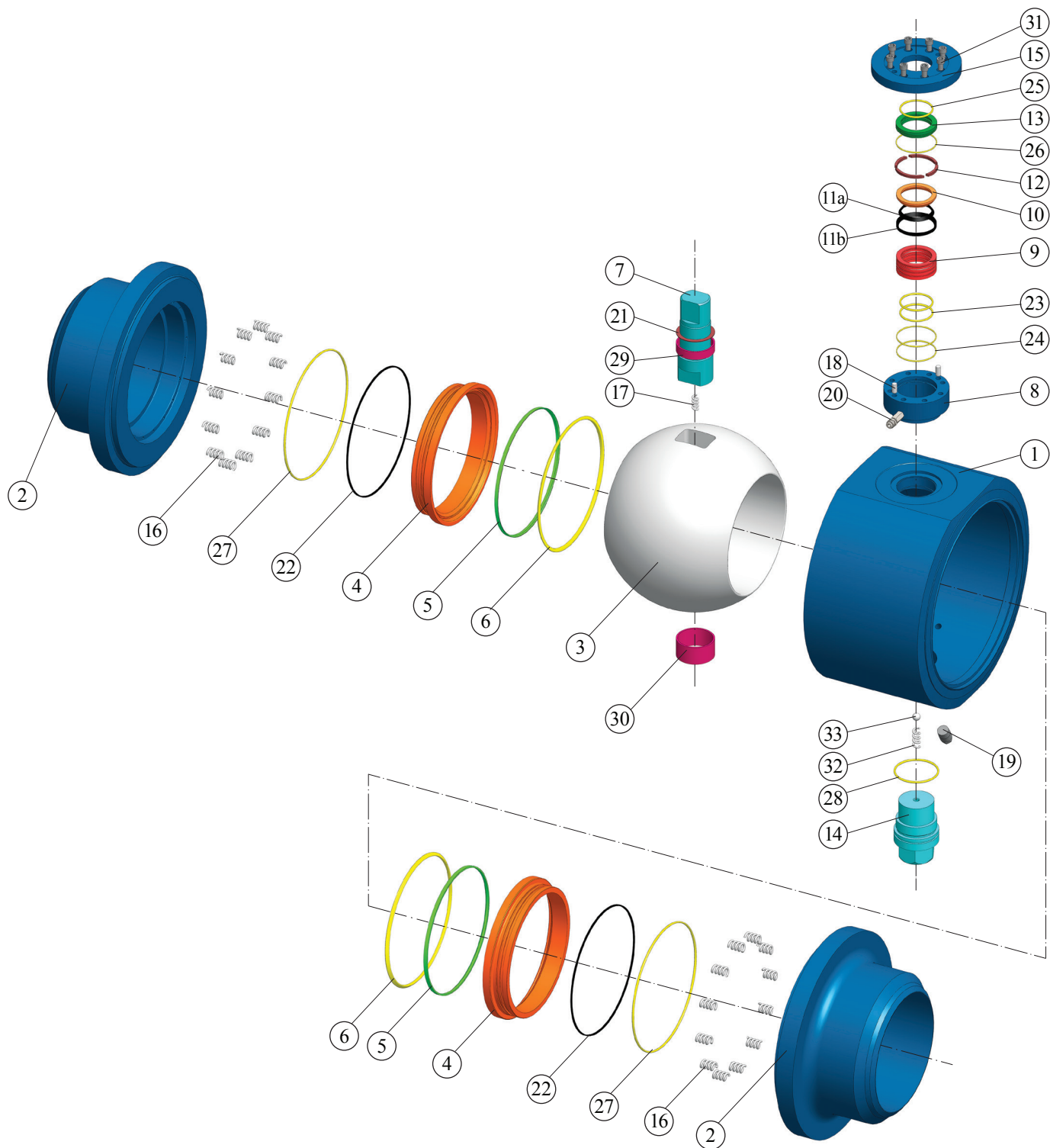
Optional Features





Trunnion Mounted Ball Valves

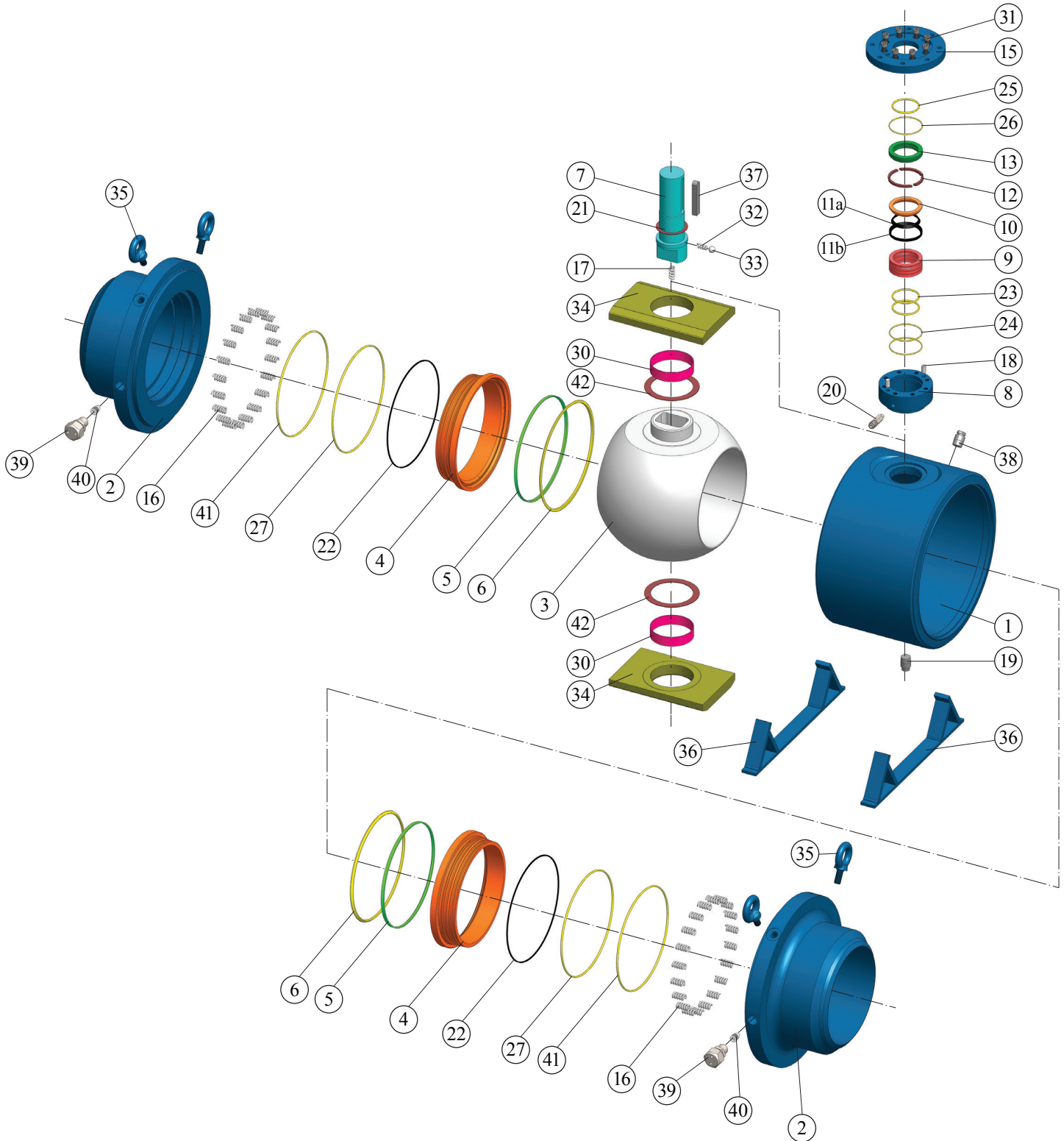
Fully Welded Ball Valves, Trunnion Structure





Trunnion Mounted Ball Valves

Fully Welded Ball Valves, Bearing Retainer Structure





Trunnion Mounted Ball Valves

Fully Welded Ball Valves

Material Specification					
No.	Description	Carbon Steel		Stainless Steel	
1	Body	A105	A350 LF2	A182 F316	A182 F51
2	Cap	A105	A350 LF2	A182 F316	A182 F51
3	Ball	A105	A350 LF2	A182 F316	A182 F51
4	Seat	A105	A350 LF2	A182 F316	A182 F51
5	Wiper Ring	R-PTFE / Nylon / Devlon / PEEK			
6	Delta Ring	Viton GLT AED			
7	Stem	A105	A350 LF2	A182 F316	A182 F51
8	Gland	A105	A350 LF2	A182 F316	A182 F51
9	Packing Ring	A105	A350 LF2	A182 F316	A182 F51
10	Junk Ring	A105	A350 LF2	A182 F316	A182 F51
11a	Fire-safe Seal	Graphite			
11b	Fire-safe Seal	Graphite			
12	Anti-blowout Ring	Stainless Steel			
13	Packing Ring	A105	A350 LF2	A182 F316	A182 F51
14	Trunnion	A105	A350 LF2	A182 F316	A182 F51
15	Top Flange	A105	A350 LF2	A182 F316	A182 F51
16	Spring	Inconel			
17	Anti-Static Device	Stainless Steel			
18	Pin	Carbon Steel		Stainless Steel	
19	Drain Fitting	Assembly			
20	Sealant Injection Fitting	Assembly			
21	Thrust Washer	Metal Backed PTFE			
22	Fire-safe Seal	Graphite			
23	O-Ring	As Page 48 O-Ring Material			
24	O-Ring	As Page 48 O-Ring Material			
25	O-Ring	As Page 48 O-Ring Material			
26	O-Ring	As Page 48 O-Ring Material			
27	O-Ring	As Page 48 O-Ring Material			
28	O-Ring	As Page 48 O-Ring Material			
29	Bearing	Metal Backed PTFE			
30	Bearing	Metal Backed PTFE			
31	Bolt	A193 B7	A320 L7	A193 B8M	A193 B8MLCuN
32	Anti-Static Device	Stainless Steel			
33	Anti-Static Device	Stainless Steel			
34	Bearing Retainer	A105	A350 LF2	A182 F316	A182 F51
35	Lifting Lug	Carbon Steel			

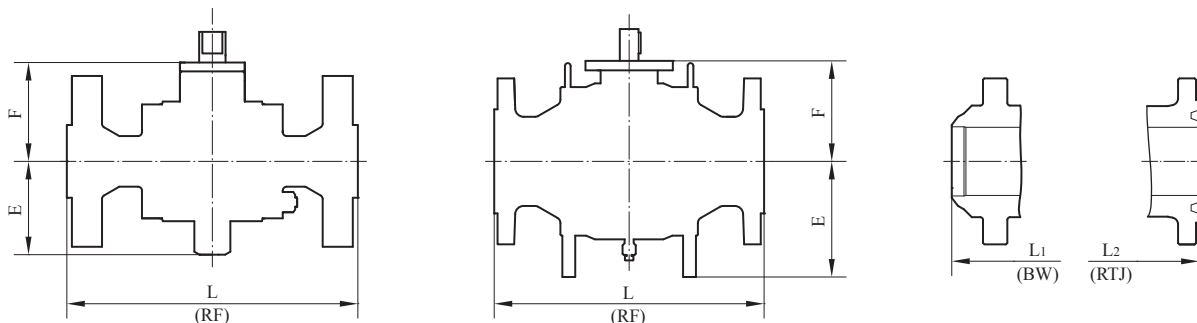
Note: Materials listed are based on typical configurations, other materials can be provided upon request.

Material Specification			
No.	Description	Carbon Steel	Stainless Steel
36	Support Leg	Carbon Steel	
37	Key	Carbon Steel	
38	Vent Fitting	Assembly	
39	Sealant Injection Fitting	Assembly	
40	Check Valve	Assembly	
41	O-Ring	As Page 48 O-Ring Material	
42	Thrust Washer	Metal Backed PTFE	



Trunnion Mounted Ball Valves

Fully Welded Ball Valves



150LB

Description		Valve Size													
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"
Flanged End L	in	7.00	8.00	9.00	15.50	18.00	21.00	24.00	27.00	30.00	34.00	36.00	42.00	51.00	54.00
	mm	178	203	229	394	457	533	610	686	762	864	914	1067	1295	1372
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	45.00	55.00	60.00
	mm	216	283	305	457	521	559	635	762	838	914	991	1143	1397	1524
Height F	in	4.65	5.39	6.18	8.86	10.39	11.93	13.74	14.72	16.30	18.15	19.76	23.31	28.46	29.92
	mm	118	137	157	225	264	303	349	374	414	461	502	592	723	760
Height E	in	4.53	5.71	7.62	9.69	11.42	12.83	14.96	15.55	17.32	19.09	20.87	24.41	29.72	31.30
	mm	115	145	194	246	290	326	380	395	440	485	530	620	755	795

300LB

Description		Valve Size													
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"
Flanged End L	in	8.50	11.13	12.00	15.88	19.75	22.38	25.50	30.00	33.00	36.00	39.00	45.00	55.00	60.00
	mm	216	283	305	403	502	568	648	762	838	914	991	1143	1397	1524
Weld End L ₁	in	8.50	11.13	12.00	18.00	20.50	22.00	25.00	30.00	33.00	36.00	39.00	45.00	55.00	60.00
	mm	216	283	305	457	521	559	635	762	838	914	991	1143	1397	1524
Height F	in	4.65	5.39	6.18	8.86	10.39	11.93	13.74	14.72	16.30	18.15	19.76	23.31	28.46	29.92
	mm	118	137	157	225	264	303	349	374	414	461	502	592	723	760
Height E	in	4.53	5.71	7.62	9.69	11.42	12.83	14.96	15.55	17.32	19.09	20.87	24.41	29.72	31.30
	mm	115	145	194	246	290	326	380	395	440	485	530	620	755	795

600LB

Description		Valve Size													
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"
Flanged End L	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778
Weld End L ₁	in	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00	65.00	70.00
	mm	292	356	432	559	660	787	838	889	991	1092	1194	1397	1651	1778
RTJ L ₂	in	11.63	14.13	17.13	22.13	26.13	31.13	33.13	35.13	39.13	43.13	47.25	55.38	65.50	70.63
	mm	295	359	435	562	664	791	841	892	994	1095	1200	1407	1664	1794
Height F	in	5.20	6.02	7.68	9.37	10.75	12.28	14.09	15.31	16.89	19.25	20.91	24.72	29.37	30.83
	mm	132	153	195	238	273	312	358	389	429	489	531	628	746	783
Height E	in	4.69	6.10	8.03	9.92	11.73	12.99	15.55	16.34	18.11	19.88	21.18	25.20	30.71	32.87
	mm	119	155	204	252	298	330	395	415	460	505	538	640	780	835



Trunnion Mounted Ball Valves

Fully Welded Ball Valves

900LB

Description		Valve Size													
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	32"
Flanged End L	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032
Weld End L1	in	14.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00	74.00	80.00
	mm	368	381	457	610	737	838	965	1029	1130	1219	1321	1549	1880	2032
RTJ L2	in	14.63	15.13	18.13	24.13	29.13	33.13	38.13	40.88	44.88	48.50	52.50	61.75	74.88	80.90
	mm	371	384	460	613	740	841	968	1038	1140	1232	1334	1568	1902	2054
Height F	in	5.47	6.10	7.40	9.84	11.54	13.31	16.10	17.95	19.65	21.93	23.66	27.09	32.01	34.13
	mm	139	155	188	250	293	338	409	456	499	557	601	688	813	867
Height E	in	4.53	5.20	6.34	10.43	12.60	15.16	16.93	17.91	18.70	20.08	22.13	25.51	32.28	33.86
	mm	115	132	161	265	320	385	430	455	475	510	562	648	820	860

1500LB

Description		Valve Size											
		2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
Flanged End L	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943
Weld End L1	in	14.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50
	mm	368	470	546	705	832	991	1130	1257	1384	1537	1664	1943
RTJ L2	in	14.63	18.63	21.63	28.00	33.13	39.38	45.13	50.25	55.38	61.38	66.38	77.63
	mm	371	473	549	711	841	1000	1146	1276	1407	1559	1686	1972
Height F	in	5.47	6.89	9.37	10.31	12.13	15.35	18.39	20.51	21.93	23.50	25.04	29.02
	mm	139	175	238	262	308	390	467	521	557	597	636	737
Height E	in	4.53	5.67	7.80	10.71	12.99	16.06	17.52	18.70	19.69	20.55	22.44	25.79
	mm	115	144	198	272	330	408	445	475	500	522	570	655

2500LB

Description		Valve Size					
		2"	3"	4"	6"	8"	10"
Flanged End L	in	17.75	22.75	26.50	36.00	40.25	50.00
	mm	451	578	673	914	1022	1270
Weld End L1	in	17.75	22.75	26.50	36.00	40.25	50.00
	mm	451	578	673	914	1022	1270
RTJ L2	in	17.88	23.00	26.88	36.50	40.88	50.88
	mm	454	584	683	927	1038	1292
Height F	in	6.69	8.07	10.16	12.56	14.76	17.99
	mm	170	205	258	319	375	457
Height E	in	5.47	6.42	9.41	11.61	14.06	18.58
	mm	139	163	239	295	357	472

DHV trunnion mounted ball valves are available in a variety of manual and actuated operator configurations. These options include: gearboxes, electric actuators, pneumatic actuators, hydraulic actuators. and more.



Handle



Gearbox



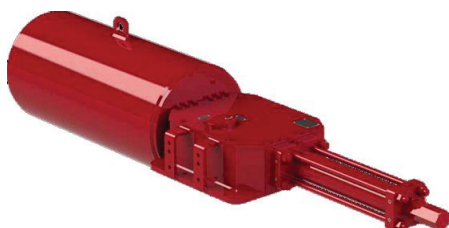
Electric Actuator



Electric Actuator with Gearbox



Pneumatic Actuator



Hydraulic Actuator



Gas-over-oil Actuator

ISO 5211 Flange Type for Trunnion Mounted Ball Valves - Soft Seat

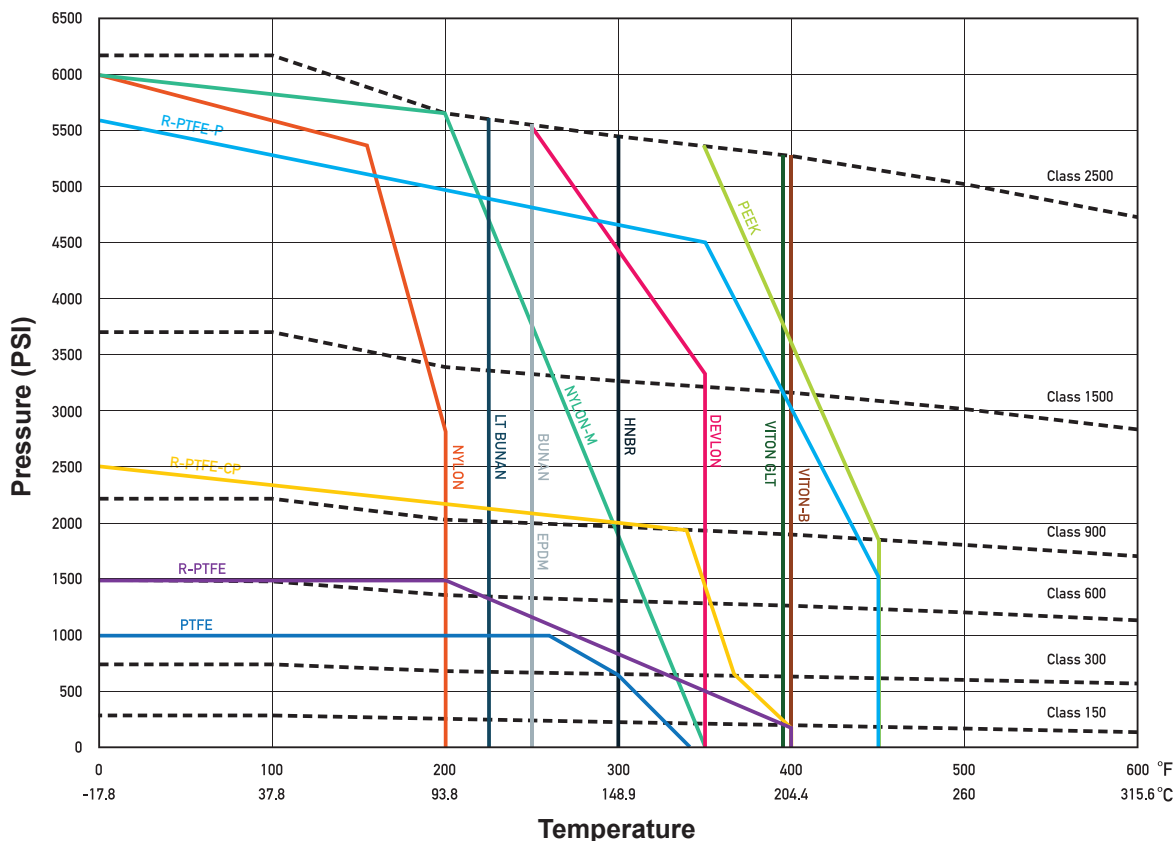
Size \ Class	150LB	300LB	600LB	900LB	1500LB	2500LB
2"	-	-	-	-	-	F14
3"	-	-	-	F12	F14	F25
4"	-	-	F12	F14	F14	F25
6"	F14	F14	F14	F16	F25	F25
8"	F14	F14	F16	F25	F25	F30
10"	F16	F16	F25	F25	F30	F35
12"	F25	F25	F25	F30	F35	F35
14"	F25	F25	F25	F35	F35	-
16"	F25	F25	F30	F35	F35	-
18"	F25	F25	F35	F35	F35	-
20"	F30	F30	F35	F35	F40	-
24"	F35	F35	F35	F40	F48	-
30"	F40	F40	F40	F48	-	-
36"	F40	F40	F48	F60	-	-

Note: Data listed above is for reference only. For detailed product data, please consult DHV.



Materials Pressure-Temperature Chart

Pressure-Temperature Chart



Note: R-PTFE-P = PEEK + PTFE R-PTFE-CP = PEEK + RPTFE
Please consult with a DHV representative for further details.

Low Temperature Limits

Body Material	°F	°C
WCB/WCC/A105	-20	-29
LCB/LCC/LF2	-50	-46
CF8M/F316	-320	-196
CF8/F304	-320	-196

O-Ring Material	°F	°C
VITON B	-20	-29
VITON GLT	-50	-46
BUNA N	-15	-26
EPDM	-60	-51
AFLAS	+32	0
HNBR (ED Resistant)	-50	-46

Seat Material	°F	°C
R-PTFE	-100	-73
R-PTFE-P	-100	-73
R-PTFE-CP	-100	-73
NYLON(PA12)	-50	-46
NYLON-M	-20	-29
PTFE	-100	-73
PEEK	-148	-100
DEVLON	-50	-46



Terms & Conditions

1. DEFINITIONS

(a) "The CONTRACT" - The General Conditions of Orders together with COMPANY'S quote and any exhibits, attachments and other documents incorporated by reference.

(b) "The PRODUCT'S" - valves and related products and services as well as their packaging that form the subject-matter of the CONTRACT.

(c) "The COMPANY" - DHV Industries, Inc. or DHV Valve Company, Inc. or alternatively any affiliated company named in COMPANY'S quotation.

(d) "The CUSTOMER" - The individual, firm, partnership, company or other party with whom the Company contracts.

(e) "FORCE MAJEURE" - Any cause or circumstances (including but not limited to, act of God, fire, storm, flood, drought, earthquake, malicious damage, shortage of material, manufacturer's inability to provide the Product, embargo, riot, strike, look-out, trade dispute, civil disturbance, war, compliance with any law or government order, rule or direction or any other event or accident) beyond the reasonable and direct control of COMPANY.

2. SCOPE

(a) These General Conditions set out the standard terms on which the COMPANY supplies PRODUCTS to the CUSTOMER. Accordingly, these General Conditions apply to all quotations and sales unless otherwise agreed in writing.

(b) The legality, validity, and enforceability of other clauses in these General Conditions will not be affected if one of the clauses is, or becomes illegal, invalid, or unenforceable.

(c) We reserve the right to institute changes in material, design and specification without notice.

3. QUOTATIONS AND ORDERS

(a) Unless otherwise expressly stipulated, all of the COMPANY'S quotations and prices are subject to change without notice, and to availability. Prices are valid only for the duration indicated in the quotation and are subject to change without notice.

(b) Any written or oral purchase order received from the CUSTOMER by the COMPANY ("Order") shall be interpreted as a written acceptance of the COMPANY'S offer to sell, and shall be filled in accordance with the terms and conditions of the sale set forth herein. The terms and conditions of the Company's proposal (if at all any) shall prevail over any conflicting or different terms in CUSTOMER'S orders unless the CUSTOMER notifies the COMPANY in writing of its objections thereto within the earlier of the date of shipment of the Product or fifteen (15) days from receipt of COMPANY'S General Conditions. CUSTOMER'S standard terms of purchase will not be considered as a counter-offer to COMPANY'S terms and conditions of sale. The COMPANY will not be bound by conflicting purchasing conditions or reservations made by the CUSTOMER even if the COMPANY does not explicitly contradict the conditions or reservations.

(c) No order in pursuance of any quotation or otherwise shall be binding on the COMPANY unless and until such an order is accepted by the COMPANY. The COMPANY may reject any order in whole or part. A contract between the COMPANY and CUSTOMER is finalized once the COMPANY issues a telephonic, electronic, or written order confirmation to the CUSTOMER or ships the Product to the CUSTOMER. Except as otherwise specifically provided herein, the Order is the final and complete expression of the agreement between the parties, setting forth the entire agreement between the parties regarding this transaction and including all promises and representations both express and implied. Any matters not contained herein, or otherwise referenced or incorporated herein, are not part of the Order.

(d) Subject to the specific procedures for changes to the Order, none of the terms and conditions contained herein may be added to, modified, superseded, or otherwise altered except by a written instrument specifically referencing the affected provision of the Order signed by the President or Vice President of the COMPANY.

4. PRICES

(a) All prices shown are in U.S. dollars and are F.O.B. COMPANY'S shipping point, unless otherwise expressly agreed to by COMPANY.

(b) Prices exclude any duties, federal, state or local taxes or other government charges and delivery costs, which the CUSTOMER must pay unless the law specifically provides that the COMPANY must make such payment in which case the CUSTOMER shall reimburse the COMPANY for such payments as part of the purchase price. All prices include the COMPANY'S

standard packing, but not pallets or crating for export goods.

5. PAYMENTS AND LICENSES

(a) Payment must be made in the currency specified in COMPANY'S invoice.

(b) The CUSTOMER must pay the full invoice amount before the shipment from the date of the invoice unless otherwise agreed in writing. The COMPANY is entitled to charge interest on overdue payments at the greater of the following two rates: (a) 1.5% monthly or (b) 2% annually above the current monthly base rate of the COMPANY'S bank. In no event shall the interest rate be higher than the maximum rate permitted by applicable law.

(c) In addition to exercising its rights at common law or under statute, the COMPANY is entitled to terminate the CONTRACT by written notice to the CUSTOMER if the CUSTOMER is in material breach of its obligations under the CONTRACT or any other agreements with the COMPANY. The CUSTOMER is in material breach:

- If it fails to meet its liabilities when they fall due;
- If it seeks a composition with its creditors;
- If all or part of its property is subject to receivership; or
- If a petition for liquidation, winding-up or administration is filed in respect of the CUSTOMER.

(d) The CUSTOMER is not entitled to withhold, set off or deduct claims against the COMPANY from an amount that it owes the COMPANY under the CONTRACT or other agreement with the COMPANY.

(e) The COMPANY is obligated to deliver a PRODUCT only if the CUSTOMER has made due payment of all amounts that it owes to the COMPANY at the date of delivery under the CONTRACT or other agreement with the COMPANY. The COMPANY is entitled to suspend delivery of a PRODUCT if the CUSTOMER is in default without this affecting the COMPANY'S other rights under the CONTRACT or other agreement with the CUSTOMER. The COMPANY is not obligated to resume deliveries until the CUSTOMER has paid all overdue amounts, including all expenses and accrued interest.

(f) It is the CUSTOMER'S exclusive responsibility to obtain all licenses, exchange control documents and other consents needed for the import and use of the PRODUCTS as well as for payment of the PRODUCTS. The CUSTOMER will not be discharged from his obligations under these General Conditions because he fails to obtain a license or other consents.

6. DELIVERY AND FORCE MAJEURE

(a) While the COMPANY will endeavor to deliver the PRODUCTS by any date or within any period agreed upon, such dates and periods are estimates only given in good faith and the COMPANY will not be liable for any failure to deliver by such date or within such a period. Time for delivery shall not be of the essence of the CONTRACT.

(b) Should the COMPANY be delayed in or prevented from making the delivery of the PRODUCTS due to Force Majeure, the COMPANY may terminate the CONTRACT or suspend the Order without incurring any liability for any loss or damage arising there from, but without prejudice in any such case to rights accrued to the COMPANY for deliveries already made.

(c) Unless otherwise agreed to in writing by the COMPANY, the COMPANY shall deliver the PRODUCTS by the means most convenient to the COMPANY to the address or addresses specified by the CUSTOMER at the time of placing the Order or (in the event that the CUSTOMER fails so to specify an address) to an address at which the CUSTOMER resided or carries on business. The PRODUCTS are considered to be delivered when they are physically handed over to 1) the CUSTOMER, 2) the CUSTOMER'S agent or a person that the CUSTOMER has authorized to take delivery, or (3) the carrier, regardless of who pays shipping costs. The COMPANY shall be entitled to add to the contract price a reasonable charge for packaging, delivery and insurance. Off-loading will be at CUSTOMER'S expense.

(d) The CUSTOMER is obligated to pay all costs that the COMPANY incurs because of the CUSTOMER'S failure to take delivery either 1) on the date stated in the invoice or the COMPANY'S confirmation, or 2) when the PRODUCTS are ready, if the COMPANY has notified the CUSTOMER in writing of their readiness and the CUSTOMER has not taken delivery within seven days or any period to which the parties agree.

(e) If the COMPANY is responsible for delivery, the CUSTOMER must thoroughly inspect the PRODUCTS sent at the COMPANY'S risk. The CUSTOMER is to notify the COMPANY in writing immediately of loss, damage or shortage of PRODUCTS. If the CUSTOMER does not receive the PRODUCTS on the agreed date of delivery, it is to notify the COMPANY within 48 hours of the agreed date of delivery. The COMPANY disclaims all liability, and the CUSTOMER waives its rights of recovery, under this provision unless the CUSTOMER'S information is sufficient to



Terms & Conditions

allow the COMPANY to make a valid claim against the carrier of the PRODUCTS for their loss or damage.

(f) If the CUSTOMER is responsible for delivery, the COMPANY will not be responsible for delays or failure to deliver by the carrier set up by the CUSTOMER or due to causes beyond the COMPANY control. Delivery of material to a common carrier shall be considered delivery to the Buyer. Claims for loss or any damage to material in transit shall be filed by the Buyer direct with the carrier. Claims for any shortage, corrections or deductions must be made in writing within 48 hours after receipt of goods.

7. PASSING OF RISK AND TITLE, CANCELLATION AND RETURNS

The COMPANY'S liability for the PRODUCTS passes from the COMPANY to the CUSTOMER on the earlier of the following two dates: 1) the date when the PRODUCTS are delivered to the CUSTOMER, the CUSTOMER'S agent, or a person that the CUSTOMER has authorized to accept delivery, or 2) the agreed date of delivery, if the CUSTOMER fails to take delivery as required.

(a) Under the CONTRACT.

(b) The COMPANY remains the owner of the PRODUCTS until it receives full payment for all PRODUCTS whether or not the PRODUCTS are delivered to the CUSTOMER. If the CUSTOMER sells the PRODUCTS to a third party before the COMPANY receives full payment, the proceeds of the sale shall first apply to pay all amounts due to the COMPANY. The COMPANY or its representative is entitled to recover or resell the PRODUCTS and to enter the CUSTOMER'S premises for that purpose, without this affecting its other rights; if the CUSTOMER has not paid the full purchase price or if insolvency proceedings are commenced against the CUSTOMER.

(c) Purchase Orders once placed by CUSTOMER and accepted by COMPANY can be cancelled only with COMPANY'S written consent and upon terms which will save COMPANY from loss. No PRODUCTS may be returned for credit or adjustment without written permission from COMPANY'S officer authorized to issue such permission.

(d) All sales are final. This means that the CUSTOMER is not entitled to credit for returned PRODUCTS whether or not the CUSTOMER has made a complaint or a claim. If the Company expressly agrees in writing that the COMPANY will credit the CUSTOMER for returned PRODUCTS, the CUSTOMER must return the PRODUCTS promptly, carriage-paid, and in the COMPANY'S opinion in good condition to receive the credit. If the COMPANY expressly agrees in writing that the CUSTOMER can return the PRODUCTS, cancel order or change order, the CUSTOMER will be charged for work performed, based on the following schedule. All freight for return or cancelled/changed goods shall be prepaid by CUSTOMER.

- Twenty Five (25%) percent of price on stock items.
- Fifty (50%) percent of price of stock items ordered in quantities which exceed normal inventory levels.
- Twenty Five (25%) percent of price prior to drawing submittal on made to order items.
- Forty (40%) percent on drawing approval, but prior to start of castings.
- Seventy (70%) percent during casting cycle, dependent on the state of completion.
- One Hundred (100%) percent on castings that are not standard materials used by COMPANY in daily sales; i.e. Stainless Steel, Duplex, Nickel, etc.
- Eighty (80%) during machining and assembly operations, this is dependent on the state of completion.
- One Hundred (100%) percent after final assembly and test.
- Special Product Orders: or non standard products are not subject to any schedule level of cancellation, except on such terms as COMPANY may specify on application only.

8. WARRANTY AND LIMITATIONS OF LIABILITY

(a) As to all PRODUCTS sold hereunder, the COMPANY expresses no warranties whatsoever but only assigns to CUSTOMER all transferable warranties and remedies granted by the manufacturer of such PRODUCTS to which COMPANY is entitled and CUSTOMER agrees to look solely to such manufacturers with regard to claims and remedies relating to such PRODUCTS. THE COMPANY SPECIFICALLY DISCLAIMS ALL WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND SATISFACTORY QUALITY. THE COMPANY MAKES NO WARRANTIES AND REPRESENTATIONS, AS TO QUALITY, CAPABILITIES, OPERATIONS, NONINFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS, PERFORMANCE AND SUITABILITY OF THE PRODUCTS.

(b) LIMITATION OF LIABILITY. CUSTOMER'S EXCLUSIVE REMEDY AGAINST COMPANY FOR DEFECTS IN THE PRODUCTS IS THE MANUFACTURER'S WARRANTY SET FORTH IN SECTION 8 (a). THE PARTIES AGREE THAT UNDER NO CIRCUMSTANCE SHALL THE

COMPANY HAVE ANY LIABILITY WHATSOEVER FOR ANY CLAIM ARISING FROM OR RELATING TO THE ORDERS OR THE PRODUCTS FOR AN AGGREGATE AMOUNT IN EXCESS OF THE INVOICED PRICE FOR THE PRODUCTS.

(c) The COMPANY shall not be liable for any damage resulting from delays, failure of the PRODUCTS, loss of profit or revenues, loss of time or loss of use, cost of capital, diminution of goodwill, or claims of CUSTOMER'S customers.

(d) IN NO CIRCUMSTANCES WILL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, PUNITIVE OR INDIRECT LOSS OR DAMAGE WHATSOEVER.

(e) The COMPANY is not liable if the CUSTOMER'S use of the PRODUCTS infringes on a third party's patent rights.

(f) Any exclusions or limitations of liability in this CONTRACT in favor of the COMPANY are agreed to be extended for the benefit of all COMPANY'S and/or individuals within the COMPANY'S group of COMPANIES. The CUSTOMER agrees in the appointment of the COMPANY as its agent or trustee solely for the extension of the benefit of the exclusions and limitations of liability. All duties, liabilities and obligations that would otherwise result from this agency are expressly excluded.

(g) The COMPANY warrants the PRODUCTS provided to the original CUSTOMER, not any third party, for a period of one year after date of shipment, that PRODUCTS will be free from defects in materials and workmanship under proper and normal installation and use. Any claim for defect goods should be by written notice to the COMPANY immediately upon discovery. NO warranty shall apply to PRODUCTS which has been modified or changed in design or function, misused, or improperly maintained. The COMPANY shall be able to inspect claimed defects at original CUSTOMER's facility to determine its obligation. Without written authorization of COMPANY, any repair labor or material is not allowed. No PRODUCTS may be returned without written permission from COMPANY.

9. SPECIFICATION, INSTRUCTIONS AND/OR DESIGN

If PRODUCTS are modified to a specification, instruction or design supplied by CUSTOMER or any third party on behalf of CUSTOMER, then:

(a) The suitability and accuracy of that specification, instruction and/or design will be CUSTOMER'S responsibility.

(b) The CUSTOMER will indemnify COMPANY against any infringement or alleged infringement of any third party's intellectual property rights including but not limited to patent, design right, registered design, trademark, trade name or copyright and any loss, damage or expense which it may incur by reason of any such infringement or alleged infringement in any county, and

(c) The CUSTOMER will indemnify COMPANY against any loss, damage or expense in respect of any liability arising in any country by reasons of the PRODUCTS being made to such specification, instruction or design.

10. CHOICE OF LAW AND JURISDICTION

(a) The laws of the State of California, including the Uniform Commercial Code, shall govern this CONTRACT. Jurisdiction and venue shall be the Superior Court of Kern County, Bakersfield, California. However, the CUSTOMER expressly agrees that the COMPANY may take action in another jurisdiction to obtain security for the COMPANY'S claims under the CONTRACT.

(b) The CONTRACT constitutes the entire agreement between the COMPANY and the CUSTOMER concerning the supply of the PRODUCTS. The CUSTOMER agrees that he has no other rights of recourse to the COMPANY other than those expressly stated in these General Conditions. The General Conditions apply whether or not the CUSTOMER has a cause of action because the COMPANY or its representative has acted negligently.

11. ATTORNEY'S FEES

In the event of any litigation or arbitration or any quasi-judicial or administrative proceeding involving the parties hereto to enforce any provision of this Agreement, to enforce any remedy available upon default hereunder, or seeking a declaration of the rights of either party hereunder, the prevailing party shall be entitled to recover from the other such attorney's fees and costs as may be reasonably incurred, including the costs of reasonable investigation, preparation and professional or expert consultation incurred by reason of such litigation, arbitration or proceeding. Sums actually expended in the prosecution or defense of any litigation, arbitration or proceeding within the meaning of the foregoing sentence shall be prima facie evidence of reasonable attorneys' fees, costs and disbursements.

Seeking a Great Name in Valve Technology

Please visit our DHV website: www.dhvindustries.com or www.dhvvalve.com for a copy of our API 6D monogram certificate. Customer and Project referrals are available upon request. For certified data and current specifications, please contact us or your local DHV agent. Information provided in this catalog is for general purposes only.

DHV reserves the right to discontinue the manufacture or change and modify our design and construction of any DHV product, in due course of our manufacturing procedure without incurring any obligation to accept for credit, to replace or furnish or install such changes or modifications on products previously or subsequently sold.



DHV Industries, Inc.

3451 Pegasus Drive, Bakersfield, CA 93308 USA
Call Toll Free: (877) DHV-USA1
Tel: (661) 392-8948 Fax: (661) 392-8947
E-mail: sales@dhvindustries.com
Website: www.dhvindustries.com

DHV Valve & Foundry Co., Ltd

No. 666, Ganquan West Road,
Wujiang Economic Development Zone,
Suzhou, Jiangsu,
215200, China
Tel: 86-512-82079288
Fax: 86-512-82079860
E-mail: sales@dhvfoundry.com
Website: www.dhvfoundry.com

Your local DHV agent

