

VIZA



**BALL  
VALVE**

The Flow  
Control Expert  
For The  
21<sup>st</sup> Century

[www.vizavalve.com](http://www.vizavalve.com)

QUALITY VALVE  
RELIABLE  
AND GLOBAL SERVICE



Code No. C03-1805

## VIZA SERVICE

VIZA Valves has been serving for many global End users and EPCs for more than 10 years and has set a reliable, professional reputation among the valve industry. VIZA can offer more economic customized valve solutions for customers to respond to different working conditions.

VIZA can offer a series of service ranging from valve installation, onsite maintenance, onsite inspection to onsite technical and operation training, VIZA has a global service team that can offer easy and quick response through professional knowledge.



The Flow  
Control Expert  
for the  
21<sup>st</sup> Century



**BALL VALVE**

- ★ Headquarters
- ★ VIZA USA
- 📍 Production Bases

### COOPERATIVE PARTNER

- 📍 NORTH & SOUTH AMERICA
- 📍 EUROPE & AFRICA
- 📍 MIDDLE EAST
- 📍 ASIA PACIFIC



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**QUALITY VALVE  
RELIABLE  
AND GLOBAL SERVICE**

# COMPANY OVERVIEW

[www.vizavalve.com](http://www.vizavalve.com)

QUALITY VALVE, RELIABLE AND GLOBAL SERVICE

## VIZA VALVES

VIZA Valves is China's leading manufacturer of industrial valves. The head office, Suzhou VIZA Valve Co., Ltd., is located in Kunshan and has been manufacturing top-quality valves for more than 10 years. From its early days, VIZA Valves has always been an export-oriented manufacturer. All valves are designed, produced, and tested under rigorous international standards such as API, ANSI, ASTM, NACE, ISO, EN, BS, DIN, UNI, MSS, AWWA and JIS. VIZA Valves products are 100% exported to North America, Western Europe, Middle East, Australia and other Regions and are widely used in industries like Oil & Gas, Pipeline Transmission, Refining, Chemical and Petrochemical, Power Generation, Water and Waste Water Treatment etc.

## VIZA VALVES' GOAL

VIZA Valves' goal is to produce a zero defect product with a long and reliable service life and minimize cost for all customers, EPCs and End users through VIZA's professional work. VIZA Valves is dedicated to serving the global energy industry and working towards a sustainable new world.

**10+**

has been  
manufacturing  
top-quality valves  
for more than 10  
years.





### PRODUCTION RANGE

**1/2" -48"**  
**150-2500**

Size from 1/2" to 48"  
Class from 150 to 2500



## MANUFACTURING PLANTS

VIZA Valves has built its own manufacturing plants: one is Kunshan Viza Valve Co., Ltd. (refer to Kunshan Viza) located in Kunshan, nearby Shanghai focusing on high and middle pressure valves such as floating and trunnion mounted ball valves, cast steel gate, globe and check valves; another is Tianjin Tangu Viza Valve Co., Ltd. (refer to Tianjin Viza) located in Tianjin, nearby Beijing focusing on low pressure valves such as butterfly valves, resilient seat gate valves and cast iron valves.

## VIZA PRODUCTS

Kunshan Viza is specialized in manufacturing Forged Steel and Cast Steel Trunnion Mounted and Floating type Ball Valves , size from 1/2" to 48" , class from 150 to 2500, with body materials as A105N, LF2, WCB, LCB, LCC, F304, F304L, F316, F316L, CF8, CF3, CF8M, CF3M, F51, F53, F55, 4A, 5A, 6A & seat materials as PTFE, Nylon, Delrin, PEEK, etc. All valves are API607/6FA fire safe certified. VIZA factory has strict quality assurance system and is API 6D, ISO 9001:2008, CE/PED and ATEX certified.

# VIZA QUALITY

## QUALIFICATION & CERTIFICATION

### QUALITY CONTROL

VIZA Valves has a deep understanding that valve quality would make difference to customer and society so VIZA has set a complete system of internal quality assurance and implemented a strict quality control plan from raw material selection to finished product final inspection. VIZA has made continuous improvement for quality management.

VIZA Valves has obtained ISO9001: 2008 International Quality System Certification, ISO14001 Environmental System Certification, OHSAS18001 Occupational Health Safety Certification, European Union CE Certification, and American Petroleum Institute API System Certification.

### API



### ABS



### CE



### ISO



### TA-Luft



### TS



### ATEX

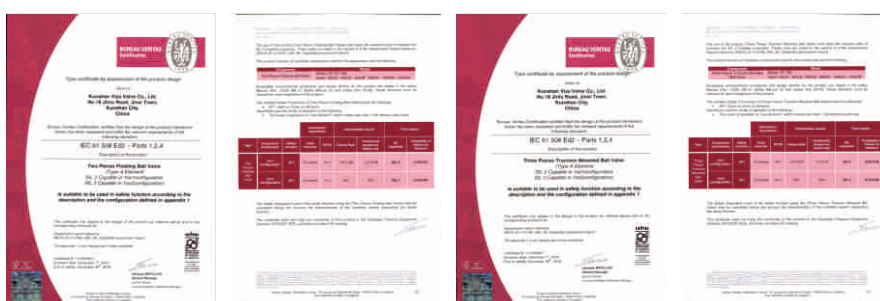


Product certification (API6D, API600), API607, API 6FA fire test certification, American classification society ABS certification, Russia CU-TR certification, AQSIQ TS certification.

### EAC



### SIL3



# PRODUCTION EQUIPMENT

## PRODUCTION CONCEPT

VIZA Valves combines advanced production equipment with professional team, effectively concentrate production resources, enhance production efficiency, improve processing technology and process control capacity through the use of the most advanced hardware and software. VIZA carries out advanced production concept, implements strict 7S field management so as to meet or surpass various requirements from different customers.





## FACTORY PRODUCTION FACILITY

VIZA factory has machining center, CNC machine tools, CNC boring and milling machine, general machine tool, large vertical lathe, spherical machine tool and other excellent mechanical processing equipment.



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VIZA Valves Integrates Advanced Production Equipment with Professional Team to optimize production.





### Make Sure The Product Is 100% Qualified

In order to ensure qualified product quality, VIZA has arranged full-time quality inspectors to do testing from the incoming material, process to the final production of the product.

VIZA has its own laboratory, having advanced equipment to ensure raw materials testing, process control and valve test, such as: Material mechanical performance test, Spectral analysis of material composition, Material metallographic analysis



## ADVANCED EQUIPMENT

VIZA has a full set of advanced inspection and testing equipment to control the quality of the valve from the rough casting to the finished product. These devices allow us to perform the following tests:



Radiographic test

Ultrasonic test

Magnetic particle test

Liquid penetrating test

Hydraulic test

High pressure gas test

Cryogenic test

Corrosion test

Fugitive emission test

High temperature cycling test



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# FIGURE NUMBERS

## Ball Valve

**Example:**

12	TF	1	R	A	52666	-G	-NC
1	2	3	4	5	6	7	8

**i.e.**

12 " 3PC Body Forged Trunnion Mounted Ball Valve, Class 150, Raised Face Flange End, A105 Body/Adapter, Nylon Seat Insert, Viton O-ring, 316 Stem, 316 Ball, 316 Seat Ring, Gear Operation, NACE MR0175 Standard.

### 1 Valve Size

**Full Bore**

NPS	1/2	3/4	1	1-1/2	2	2-1/2	3	4	5	6	8	10	12	14
DN	15	20	25	40	50	65	80	100	125	150	200	250	300	350
Symbol	1/2	3/4	1	1-1/2	2	2-1/2	3	4	5	6	8	10	12	14
NPS	16	18	20	22	24	26	28	30	32	34	36	40	42	48
DN	400	450	500	550	600	650	700	750	800	850	900	1000	1050	1200
Symbol	16	18	20	22	24	26	28	30	32	34	36	40	42	48

**Reduced Bore**

NPS	3/4*1/2	1*3/4	1-1/2*1	2*1-1/2	3*2	4*3	6*4	8*6	10*8
DN	20*15	25*20	40*25	50*40	80*50	100*80	150*100	200*150	250*200
Symbol	3/4*1/2	1*3/4	1-1/2*1	2*1-1/2	3*2	4*3	6*4	8*6	10*8
NPS	12*10	14*10	14*12	16*12	16*14	18*14	18*16	20*16	20*18
DN	300*250	350*250	350*300	400*300	400*350	450*350	450*400	500*400	500*450
Symbol	12*10	14*10	14*12	16*12	16*14	18*14	18*16	20*16	20*18
NPS	22*18"	24*20"	26*22"	28*24"	30*24	32*26"	34*28"	36*30"	40*34"
DN	550*450	600*500	650*550	700*600	750*600	800*650	850*700	900*750	1000*850
Symbol	22*18	24*20	26*22	28*24	30*24	32*26	34*28	36*30	40*34

### 2 Valve Type

Symbol	Floating Ball Valve
FC	2PC Body Cast Floating Ball Valve
FR	1PC Body Cast Floating Ball Valve
FF	2PC/3PC Body Forged Floating Ball Valve
FS	Small Sizes Forged Floating Ball Valve
FM	Metal to Metal Seat Floating Ball Valve
FM-H	High Temperature Metal Seat Floating Ball Valve
FY	Cryogenic Floating Ball Valve
TD	Twin Ball Trunnion Mounted Ball Valve

Symbol	Trunnion Mounted Ball Valve
TF	3PC Body Forged Trunnion Mounted Ball Valve
TW	Welded Body Trunnion Mounted Ball Valve
TT	Top Entry Forged Trunnion Mounted Ball Valve
TP	Pig Launcher/Receiver Ball Valve
TM	Metal To Metal Seat Trunnion Mounted Ball Valve
TM-H	High Temperature Metal Seat Trunnion Mounted Ball Valve
TY	Cryogenic Trunnion Mounted Ball Valve
TCS	Casting Trunnion Mounted Ball Valve

### 3 Nominal Pressure

Class	150	250	300	400	600	800	900	1500	2500
Symbol	1	2	3	4	6	8	9	15	25

### 4 End Type

Symbol	Type
R	Raised Face Flange
J	Ring Joint Flange
F	Flat Face Flange
B	Butt-Welding End

Symbol	Type
S	Socket Welding End
N	Screwed End
SN	Socket Welding End x Screwed End
W	Wafer

# FIGURE NUMBERS

## Ball Valve

### 5 Body/Adapter Material

Material	Cast Forged	WCB A105	WCC	LCB LF2	LCC	LC3	WC1	WC6 F11	WC9 F22	C5 F5	C12 F9
Symbol		A	B	C	D	V	U	I	J	K	L
Material	Cast Forged	CF8 F304	CF8M F316	CF3 F304L	CF3M F316L	CF8C F347	CN7M ALLOY 20	MONEL	F321	F51	F53
Symbol		F	E	H	G	Q	S	M	N	P	T

### 6 Body/Adapter Material

#### Floating Ball

Seat		O-Ring		Stem		Ball	
Symbol	Material	Symbol	Material	Symbol	Material	Symbol	Material
1	PTFE	1	NBR	1	F6a	1	F6a
2	Nylon 1010	2	Viton A	2	304	2	304
3	PEEK	3	Viton AED	3	A105/ENP*	3	A105/ENP*
4	Polyphenylene	4	Viton B	4	17-4PH	4	17-4PH
5	Nylon S	5	HSN(HNBR)	5	4140/ENP*	5	4140/ENP*
6	Devlon V	6	ELAST-O-LION 101	6	316	6	316
7	Nylon 12	7	PTFE Coated Viton	7	304L	7	304L
8	Delrin	8	Viton GLT +AED	8	316L	8	316L
9	RPTFE			9	LF2/ENP*	9	LF2/ENP*
				A	4130/ENP*	A	4130/ENP*
				B	13Cr/Hard Cr	B	13Cr/Hard Cr
				C	F51	C	F51

#### Trunnion Mounted Ball

Seat Insert		O-Ring Seals		Stem		Ball		Seat Ring	
Symbol	Material	Symbol	Material	Symbol	Material	Symbol	Material	Symbol	Material
1	PTFE	1	NBR	1	F6a	1	F6a	1	F6a
2	PCTFE	2	Viton A	2	304	2	304	2	304
3	PEEK	3	Viton AED	3	A105/ENP*	3	A105/ENP*	3	A105/ENP*
4	Polyphenylene	4	Viton B	4	17-4PH	4	17-4PH	4	17-4PH
5	Nylon S	5	HSN(H-NBR)	5	4140/ENP*	5	4140/ENP*	5	4140/ENP*
6	Devlon V	6	ELAST-O-LION 101	6	316	6	316	6	316
7	Nylon 12	7	PTFE Coated Viton	7	304L	7	304L	7	304L
8	Delrin	8	Viton GLT + AED	8	316L	8	316L	8	316L
9	RPTFE			9	LF2/ENP*	9	LF2/ENP*	9	LF2/ENP*
0	VitonGLT			A	4130/ENP*	A	4130/ENP*	A	4130/ENP*
				B	13Cr/Hard Cr	B	13Cr/HardCr	B	13Cr/Hard Cr
				C	F51	C	F51	C	F51

\* ENP thickness 0.003" is our standard ; thickness 0.001" is on request.

### 7 Valve Actuator

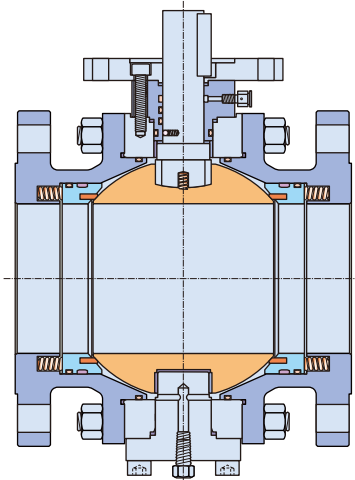
Type	Lever	Gear	Electric Actuator	Pneumatic Actuator	Bare Stem
Symbol	None	G	E	P	B

### 8 Special Code

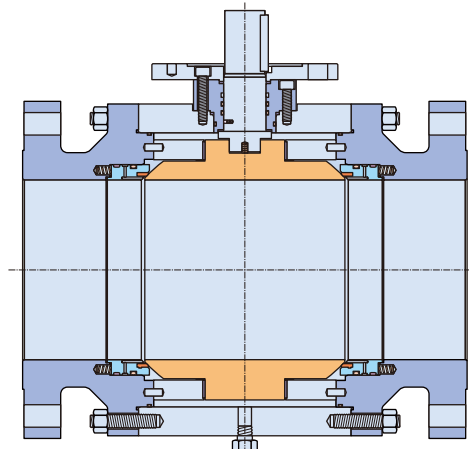
Description	Extend Stem	Locking Device	NACE MR-01-75	SHELL Standard
Symbol	ES	L	NC	SH

# DESIGN FEATURE

## Trunnion Mounted Ball Valves



TF 4" &amp; Smaller

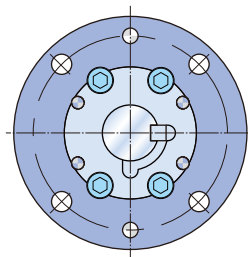


TF 6" &amp; Larger

### General Design

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

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



### Ball Seat Alignment

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

### AED O-ring

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

### Environmental-Friendly Valve

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

**Fire Safe**

**a) External leakage prevention**

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

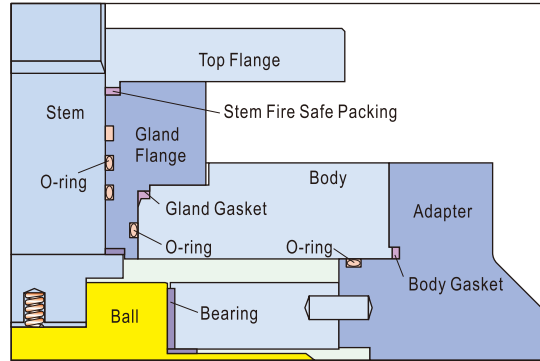


Fig.9

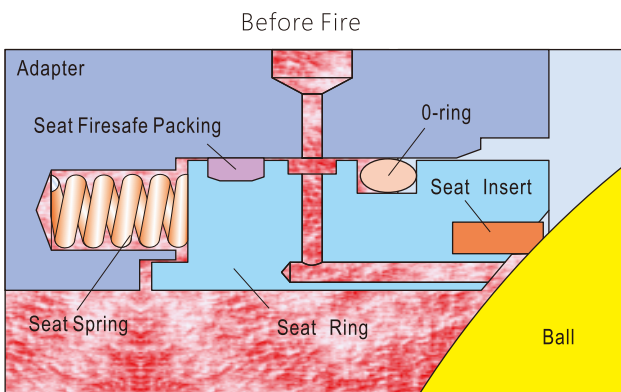


Fig.10

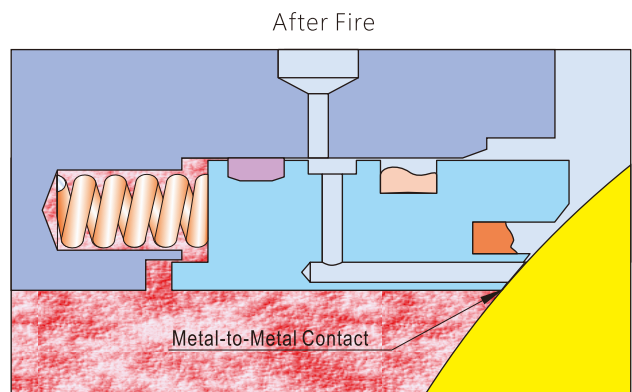


Fig.11

**b) Internal leakage prevention**

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

**Emergency Sealant Injection System**

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

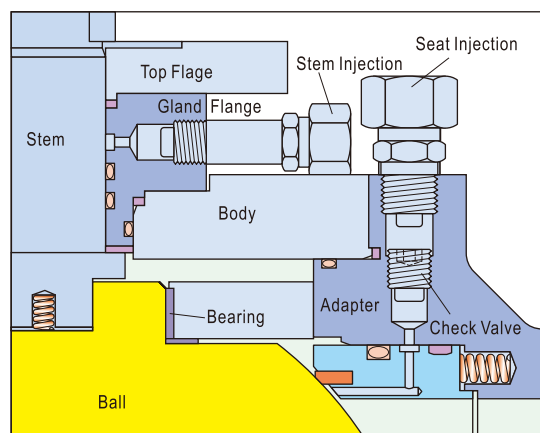


Fig.12



## Seat Design

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

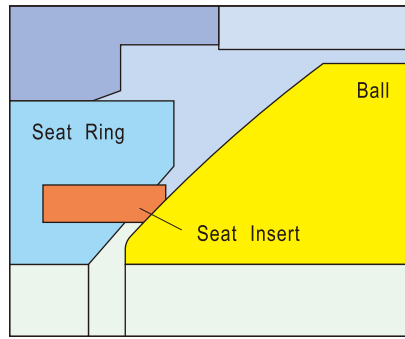


Fig.1

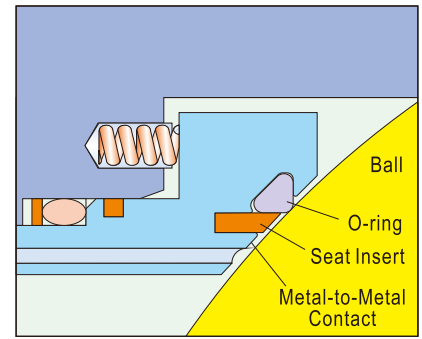


Fig.2

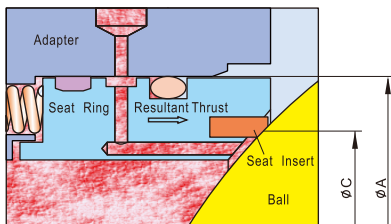


Fig.3

### a

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

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

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

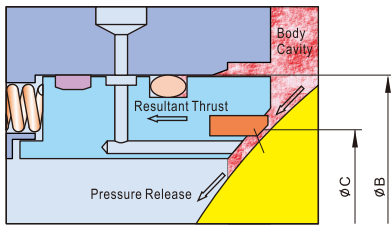


Fig.4

### b

#### Option 1: Double Piston Effect Seats

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

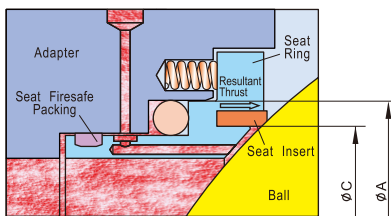


Fig.5

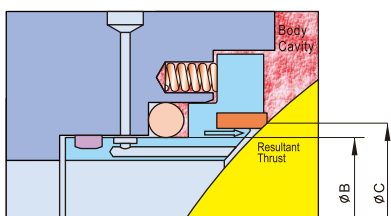


Fig.6

### c

#### Option 2: Combination Seats

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

### Double Block and Bleed

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

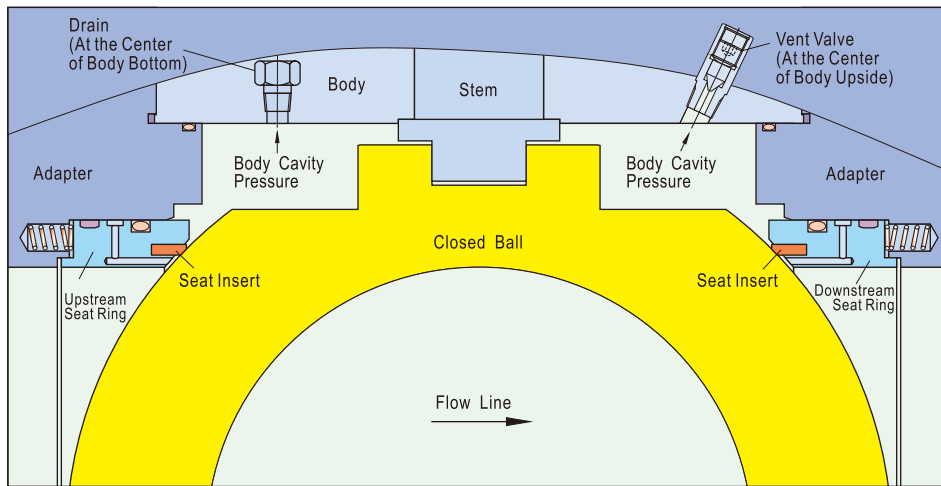


Fig.7

### Blow-out Proof Stem

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

### Anti-static Device

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

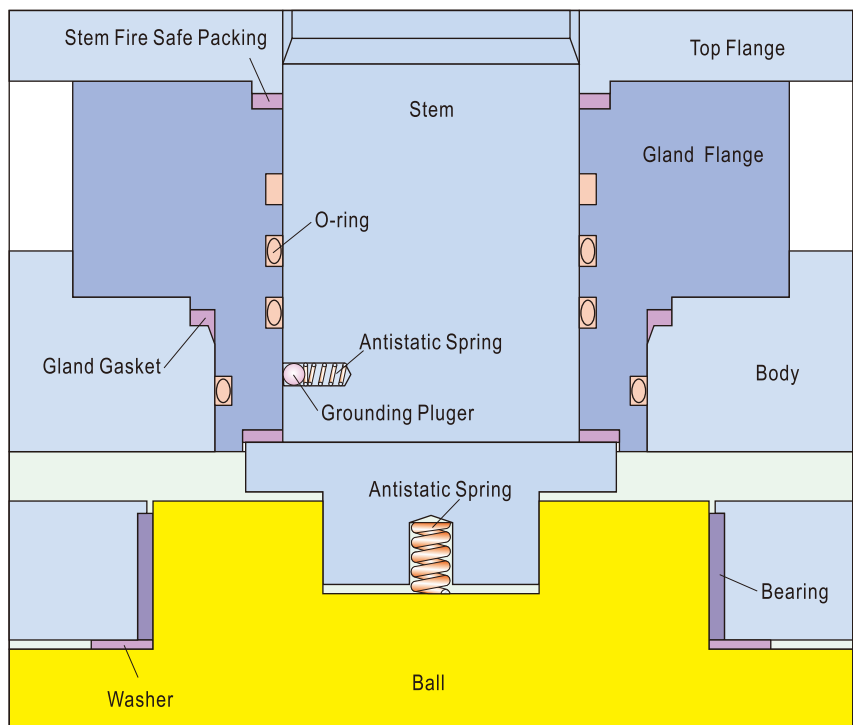
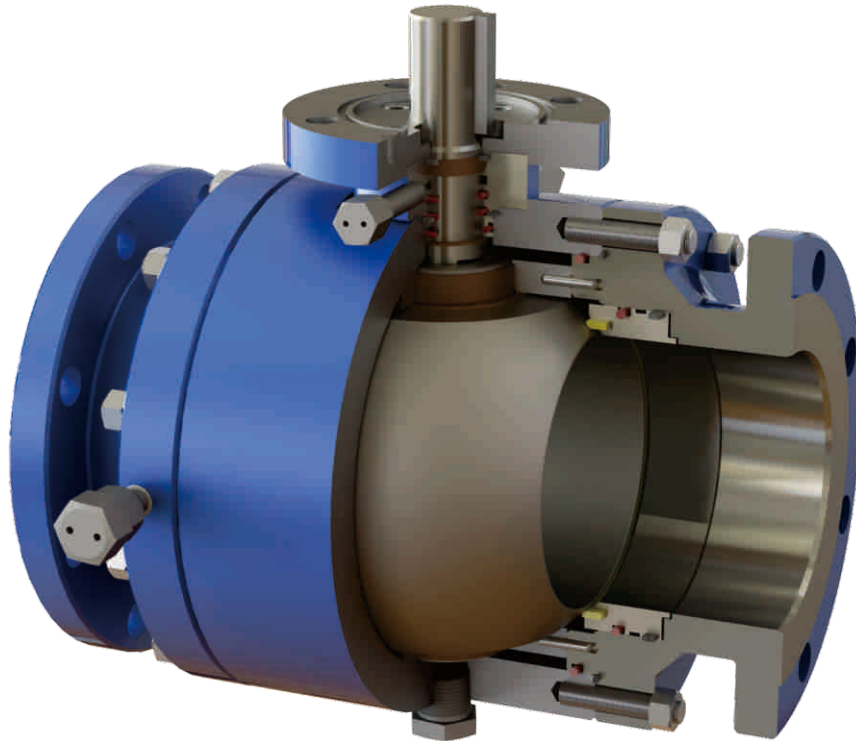


Fig.8

# SERIES TF

## 3PC Body Forged Trunnion Mounted Ball Valve



### Features

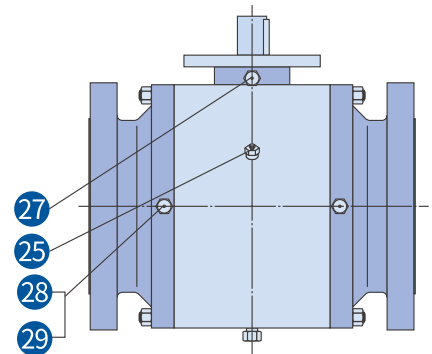
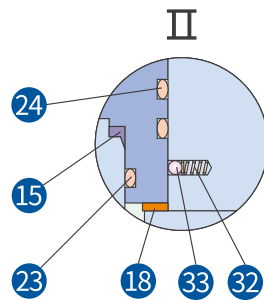
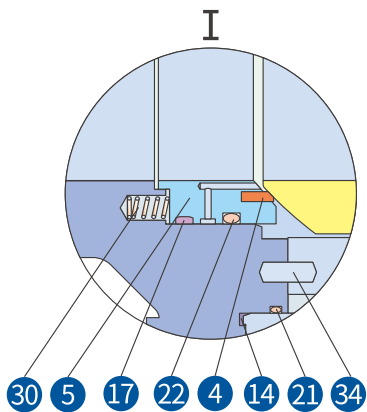
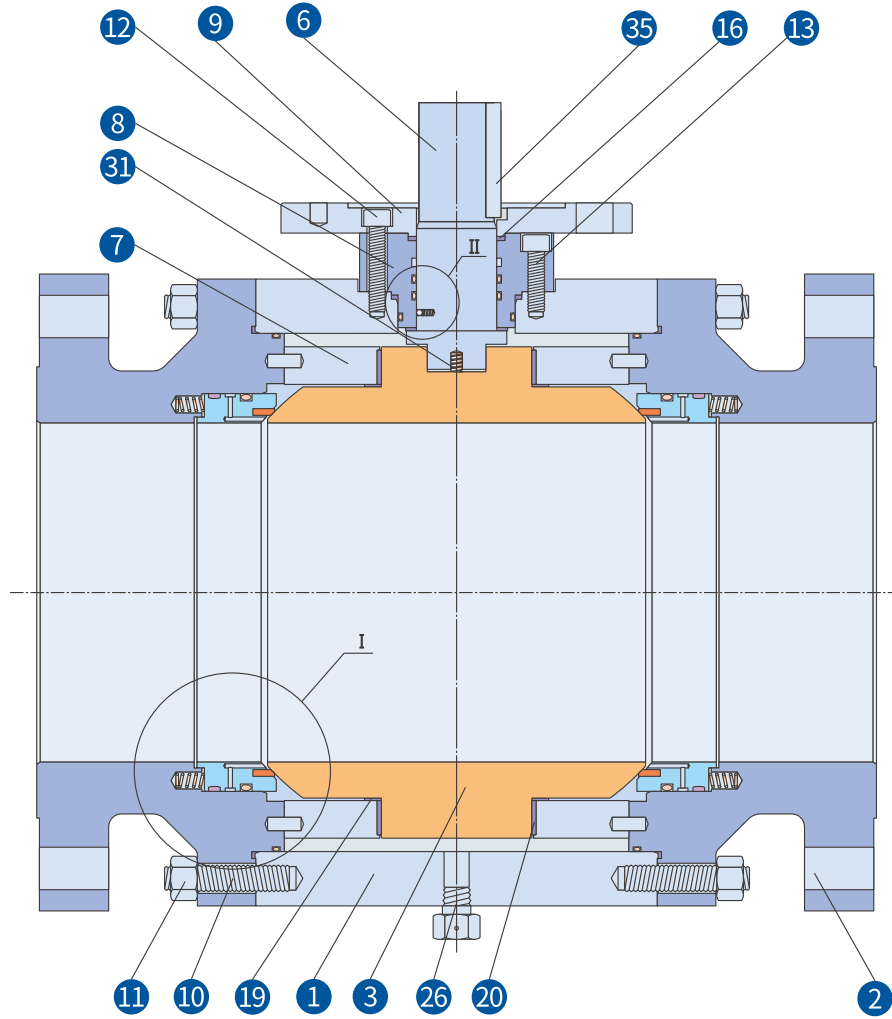
Size: 2"-48"  
Class: 150-2500  
Three Pieces Forged Steel Body  
Trunnion Mounted Ball, Full & Reduced Bore  
Anti-static Device  
Blow-out Proof Stem  
Double Block and Bleed  
Fire Safe Design  
Emergency Sealant Injector (6" & Larger)  
Vent Valve and Safety Valve  
Lifting Lugs & Supporting Feet (8" & Larger)  
Seat Pocket SS Overlay (Optional)  
Seals Area ENP Coated

### Specifications

Design	ASME B16.34/API 6D
Face to Face	ASME B16.10/API 6D
End to End	ASME B16.10/API 6D
End Flange	ASME B16.5/B16.47A
BW End	ASME B16.25
Test	API 6D
Fire Safe Test	API 607/API 6FA
Special	NACE MR 01 75

# SERIES TF

## Material Specification



# TF BALL VALVE

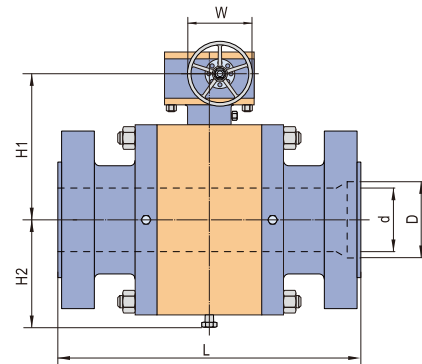
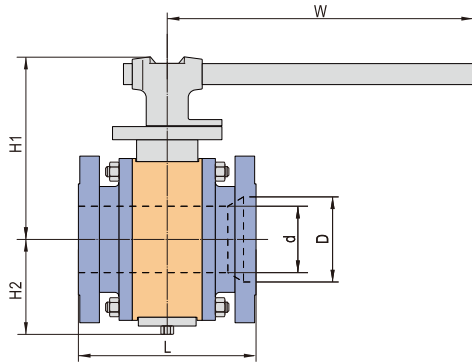
## 3PC Body Forged Trunnion Mounted Ball Valve

NO.	PART	A105/ENP	A105/316	F316/316	LF2/316-NACE
1	Body	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
2	Adapter	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
3	Ball	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
		AISI 4140/ENP	ASTM A182-F51	ASTM A182-F51	ASTM A182-F51
		(2500LB)	(900LB~2500LB)	(900LB-2500LB)	(900LB-2500LB)
4	Seat Insert	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK
5	Seat Ring	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
6	Stem	AISI 4140/ENP	ASTM A182-F51	ASTM A182-F51	ASTM A182-F51
7	Trunnion Support	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
8	Gland Flange	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
9	Top Flange	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
10	Body Stud	ASTM A193-B7	ASTM A193-B7	ASTM A193-B8	ASTM A320-L7M
11	Body Nut	ASTM A194-2H	ASTM A194-2H	ASTM A194-8	ASTM A194-7M
12	Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
13	Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
14	*Body Gasket	Braided Graphite	Braided Graphite	Braided Graphite	Braided Graphite
15	*Gland Gasket	Graphite	Graphite	Graphite	Graphite
16	*Stem Firesafe Packing	Graphite	Graphite	Graphite	Graphite
17	*Seat Firesafe Packing	Braided Graphite	Braided Graphite	Braided Graphite	Braided Graphite
18	Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
19	Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
20	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
21	*O-ring	Viton	Viton	Viton	Viton
22	*O-ring	Viton	Viton	Viton	Viton
23	*O-ring	Viton	Viton	Viton	Viton
24	*O-ring	Viton	Viton	Viton	Viton
25	Vent Valve	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
26	Drain	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
27	Stem Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
28	Seat Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
29	Check Valve	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
30	Seat Spring	Inconel X-750	Inconel X-750	Inconel X-750	Inconel X-750
31	Antistatic Spring	Inconel X-750	Inconel X-750	Inconel X-750	Inconel X-750
32	Antistatic Spring	Inconel X-750	Inconel X-750	Inconel X-750	Inconel X-750
33	Grounding Plunger	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
34	Alignment Pin	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
35	key	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel

\*Recommended Spare Parts

# DIMENSIONS AND WEIGHT

## 3PC Body Forged Trunnion Mounted Ball Valve



FULLBORE		CLASS 150				
SIZE	d	L	H1	H2	W	WEIGHT
in	mm	mm	mm	mm	mm	Kg
2	51	178	176	96	350	10
3	76	203	220	119	400	31
4	102	229	241	139	450	46
6	152	394	230	167	*300	128
8	203	457	285	210	*400	234
10	254	533	335	251	*400	406
12	305	610	384	290	*400	596
14	337	686	414	319	*610	829
16	387	762	454	354	*610	1092
18	438	864	498	397	*610	1577
20	489	914	623	435	*610	2001
22	538	991	662	464	*610	2535
24	591	1067	635	515	*700	3075
26	635	1143	750	550	*760	3862
28	686	1245	753	585	*760	4429
30	737	1295	895	656	*760	5782
32	781	1372	900	659	*760	6356
34	832	1473	940	700	*760	7911
36	876	1524	975	735	*760	8712
40	976	1727	1046	810	*760	11737
42	1020	1987	1074	835	*800	12200
48	1168	2120	1722	1040	*800	18400

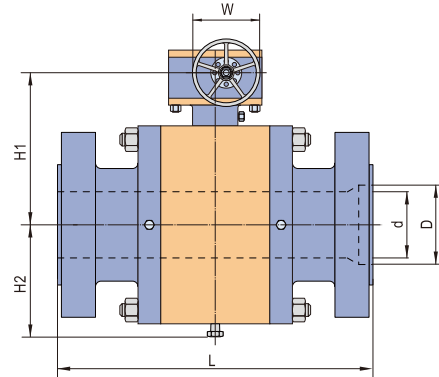
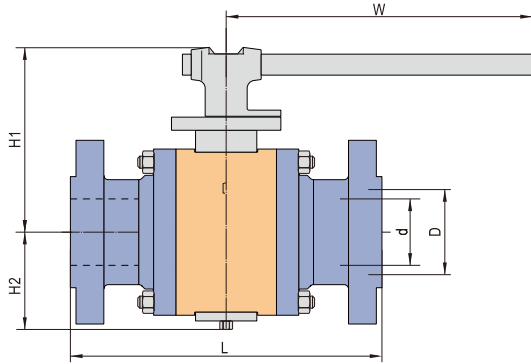
\* Gear Operation

REDUCE BORE		CLASS 150					
SIZE	d	D	L	H1	H2	W	WEIGHT
in	mm	mm	mm	mm	mm	mm	Kg
2*1-1/2	38	51	178	168	87	350	13
3*2	51	76	203	176	96	350	21
4*3	76	102	229	220	119	400	38
6*4	102	152	394	241	139	450	73
8*6	152	203	457	230	167	*300	160
10*8	203	254	533	285	210	*400	260
12*10	254	305	610	335	251	*400	444
14*10	254	337	686	335	251	*400	520
14*12	305	337	686	384	290	*400	664
16*12	305	387	762	384	290	*400	734
16*14	337	387	762	414	319	*610	907
18*14	337	438	864	414	319	*610	986
18*16	387	438	864	454	354	*610	1214
20*16	387	489	914	454	354	*610	1316
20*18	438	489	914	498	397	*610	1728
22*18	438	538	991	498	397	*610	1783
24*20	489	591	1067	623	435	*610	2258
26*22	538	635	1143	662	464	*610	2904
28*24	591	686	1245	635	515	*700	3508
30*24	591	737	1295	635	515	*700	3733
32*26	635	781	1372	750	550	*760	4493
34*28	686	832	1473	753	585	*760	5198
36*30	737	876	1524	895	656	*760	6302
40*34	832	976	1727	940	700	*760	9824

FULLBORE		CLASS 300				
SIZE	d	L	H1	H2	W	WEIGHT
in	mm	mm	mm	mm	mm	Kg
2	51	216	177	89	400	23
3	76	283	220	119	450	42
4	102	305	243	137	500	60
6	152	403	228	167	*305	154
8	203	502	286	206	*400	282
10	254	568	335	252	*500	449
12	305	648	391	289	*610	658
14	337	762	422	323	*610	986
16	387	838	467	367	*610	1440
18	438	914	635	411	*610	1908
20	489	991	684	450	*700	2425
22	538	1092	637	488	*700	3213
24	591	1143	674	519	*760	3710
28	686	1346	794	602	*760	5618
30	737	1397	810	655	*760	7396
32	781	1524	872	685	*800	8469
34	832	1626	900	720	*800	9908
36	876	1727	1031	740	*800	10771
40	976	1956	1109	818	*800	13632
42	1020	2032	1133	848	*800	13000
48	1168	2170	1346	969	*1016	19000

\* Gear Operation

REDUCE BORE		CLASS 300					
SIZE	d	D	L	H1	H2	W	WEIGHT
in	mm	mm	mm	mm	mm	mm	Kg
2*1-1/2	38	51	216	168	75	350	17
3*2	51	76	283	177	89	400	35
4*3	76	102	305	220	119	450	55
6*4	102	152	403	243	137	500	91
8*6	152	203	502	228	167	*305	184
10*8	203	254	568	286	206	*400	320
12*10	254	305	648	335	252	*500	500
14*10	254	337	762	335	252	*500	579
14*12	305	337	762	391	289	*610	763
16*12	305	387	838	391	289	*610	862
16*14	337	387	838	422	323	*610	1109
18*14	337	438	914	422	323	*610	1231
18*16	387	438	914	467	367	*610	1547
20*16	387	489	991	467	367	*610	1632
20*18	438	489	991	635	411	*610	2060
22*18	438	538	1092	635	411	*610	2251
24*20	489	591	1143	684	450	*700	2821
28*24	591	686	1346	674	519	*760	4373
30*24	591	737	1397	674	519	*760	4577
34*28	686	832	1626	794	602	*760	5664
36*30	737	876	1727	810	655	*760	9083
40*34	832	976	1956	900	720	*800	12005



**FULLBORE CLASS 600**

SIZE in	d mm	L mm	H1 mm	H2 mm	W mm	WEIGHT Kg
2	51	292	176	100	400	27
3	76	356	223	125	500	61
4	102	432	268	148	650	107
6	152	559	259	181	*400	269
8	203	660	304	225	*500	423
10	254	787	366	278	*610	741
12	305	838	412	323	*610	1074
14	337	889	521	339	*610	1264
16	387	991	609	398	*610	2008
18	438	1092	620	443	*700	3720
20	489	1194	612	490	*760	3650
22	538	1295	686	513	*760	3816
24	591	1397	741	555	*810	5373
28	685	1549	966	643	*810	8076
30	737	1651	1018	688	*810	9664
32	781	1778	900	775	*1016	12030
34	832	1930	940	820	*1016	14399
36	874	2083	1177	800	*1016	16013
40	976	2159	1267	883	*1219	20553
42	1020	2175	1213	918	*1219	16400
48	1168	2435	1765	1070	*1219	24200

\* Gear Operation

**REDUCE BORE CLASS 600**

SIZE in	d mm	D mm	L mm	H1 mm	H2 mm	W mm	WEIGHT Kg
2*1-1/2	38	51	292	168	75	350	21
3*2	51	76	356	176	100	400	41
4*3	76	102	432	223	125	500	76
6*4	102	152	559	268	148	650	158
8*6	152	203	660	259	181	*400	334
10*8	203	254	787	304	225	*500	574
12*10	254	305	838	366	278	*610	836
14*10	254	337	889	366	278	*610	894
14*12	305	337	889	412	323	*610	1177
16*12	305	387	991	412	323	*610	1306
16*14	337	387	991	521	339	*610	1531
18*14	337	438	1092	521	339	*610	1629
18*16	387	438	1092	609	398	*610	2208
20*16	387	489	1194	609	398	*610	2438
20*18	438	489	1194	620	443	*700	2960
22*18	438	538	1295	620	443	*700	3214
24*20	489	591	1397	612	490	*760	4241
28*24	591	685	1549	741	555	*810	6022
30*24	591	737	1651	741	555	*810	7669
34*28	685	832	1930	966	643	*810	11238
36*30	737	874	2083	1018	735	*800	12838
40*34	832	976	2159	940	820	*1016	17876

**FULLBORE CLASS 900**

SIZE in	d mm	L mm	H1 mm	H2 mm	W mm	WEIGHT Kg
2	51	368	216	115	450	60
3	76	381	255	125	650	77
4	102	457	217	165	*406	138
6	152	610	274	195	*400	340
8	203	737	328	245	*610	588
10	254	838	485	302	*610	1022
12	305	965	517	334	*610	1378
14	324	1029	588	369	*710	1828
16	375	1130	613	426	*710	1999
18	425	1219	635	458	*760	3456
20	473	1321	810	510	*812	4760
24	572	1549	954	598	*800	5497
28	667	1753	1063	668	*1016	10202
30	712	1880	1085	713	*1016	11442
32	760	2032	1036	752	*1219	17462
36	855	2286	1130	836	*1219	20154

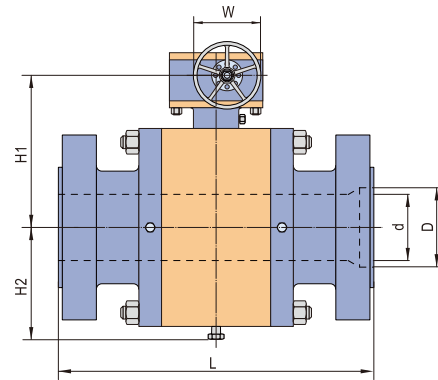
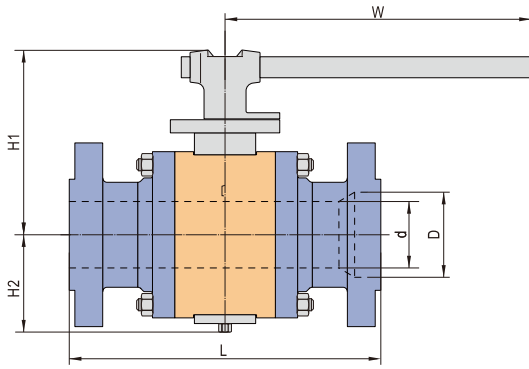
\* Gear Operation

**REDUCE BORE CLASS 900**

SIZE in	d mm	D mm	L mm	H1 mm	H2 mm	W mm	WEIGHT Kg
2*1-1/2	38	51	368	168	75	400	48
3*2	51	76	381	216	115	450	60
4*3	76	102	457	255	125	650	106
6*4	102	152	610	217	165	*400	208
8*6	152	203	737	274	195	*400	430
10*8	203	254	838	328	245	*610	738
12*10	254	305	965	485	302	*610	1145
14*10	254	324	1029	485	302	*610	1081
14*12	305	324	1029	517	334	*610	1495
16*12	305	375	1130	517	334	*610	1742
16*14	324	375	1130	588	369	*710	2123
18*16	375	425	1219	613	426	*710	2299
20*16	375	473	1321	613	426	*710	2596
20*18	425	473	1321	635	458	*760	3749
24*20	473	572	1549	810	510	*812	5793
28*24	572	667	1753	954	598	*800	7580
30*24	572	712	1880	954	598	*800	7981
36*30	712	855	2286	1085	713	*1016	15653

# DIMENSIONS AND WEIGHT

3PC Body Forged Trunnion Mounted Ball Valve



FULLBORE		CLASS 1500				
SIZE in	d mm	L mm	H1 mm	H2 mm	W mm	WEIGHT Kg
2	51	368	216	105	450	68
3	76	470	270	132	650	130
4	102	546	244	159	*406	219
6	146	705	308	200	*610	474
8	194	832	366	262	*610	904
10	241	991	479	294	*710	1442
12	289	1130	551	360	*710	2348
14	318	1257	558	390	*760	3066
16	362	1384	657	462	*760	4563
18	406	1537	823	490	*812	5916
20	456	1664	933	596	*1016	6700
24	546	1944	1068	654	*1016	7151

\* Gear Operation

REDUCE BORE		CLASS 1500					
SIZE in	d mm	D mm	L mm	H1 mm	H2 mm	W mm	WEIGHT Kg
2*1-1/2	38	51	368	191	98	400	45
3*2	51	76	470	216	105	450	96
4*3	76	102	546	270	132	650	142
6*4	102	146	705	244	159	*406	306
8*6	146	194	832	308	200	*610	592
10*8	194	241	991	366	262	*610	1142
12*10	241	289	1130	479	294	*710	1719
14*10	241	318	1257	479	294	*710	1992
14*12	289	318	1257	551	360	*710	2638
16*12	289	362	1384	551	360	*710	2993
16*14	318	362	1384	558	390	*760	3432
18*16	362	406	1537	657	462	*760	5042
20*16	362	456	1664	657	462	*760	5601
20*18	406	456	1664	823	490	*812	6482
24*20	456	546	1944	933	596	*1016	5850

FULLBORE		CLASS 2500				
SIZE in	d mm	L(RTJ) mm	H1 mm	H2 mm	W mm	WEIGHT Kg
2	44	454	247	108	650	80
3	64	584	241	152	*400	243
4	89	683	270	172	*500	389
6	133	927	365	233	*610	1145
8	181	1038	561	305	*610	1675
10	223	1292	600	370	*710	2871
12	265	1445	638	465	*760	3267

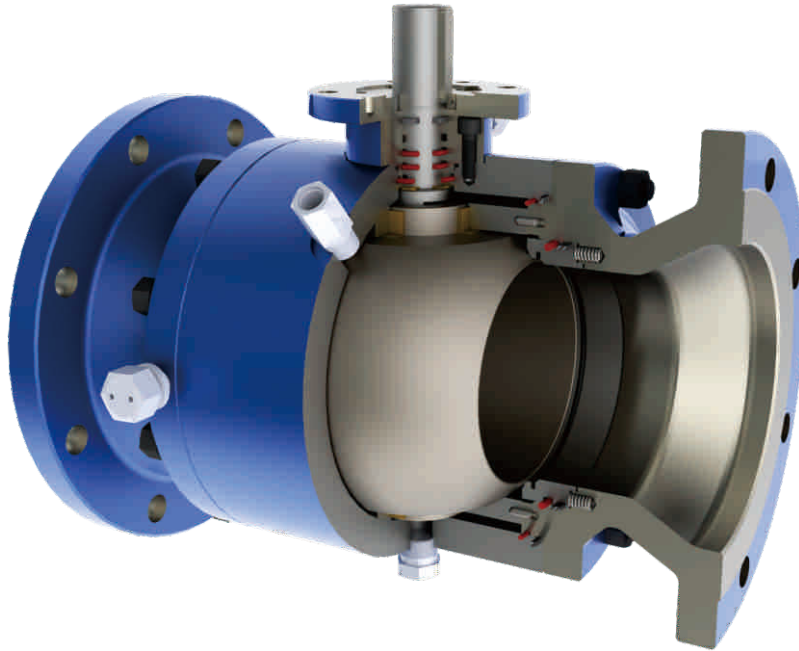
\* Gear Operation

REDUCE BORE		CLASS 2500					
SIZE in	d mm	D mm	L(RTJ) mm	H1 mm	H2 mm	W mm	WEIGHT Kg
2*1-1/2	38	44	454	216	110	450	79
3*2	44.5	64	584	247	108	650	130
4*3	64	89	683	241	152	*400	260
6*4	89	133	927	270	172	*500	578
8*6	133	181	1038	365	233	*610	1074
10*8	181	223	1292	561	305	*610	2173
12*10	223	265	1445	600	370	*710	3500



# SERIES TM

## Metal to Metal Seat Trunnion Mounted Ball Valve



### Severe Service

Normal soft-seated valve can not be used for abrasive service or/and for operation under high temperature that prohibits the use of a resilient material. VIZA metal-to-metal seated trunnion mounted ball valve (series TM, range 2"~24" class 150~2500) is designed for this type of severe service that seating action is provided by the metal to metal contacting and seating action is emerged between ball and seat ring.

### General Design

Blow-out proof stem, anti-static device, double block & bleed, self relieving seats, Mechanical stops for ball seat alignment are designed as standard requirements; while for fire safe and sealant injection system will be supplied upon service request.

### Superior Sealing

High precision machining and seat to ball rubbing result in superior ball and seat interfacing for reliable sealing conforming to ANSI/FCI 70-2 class V

### Reliable Operations

Spring-loaded seats maintain close contacting with the ball ensuring tight sealing even at low pressures. This also results in stable operating torques at high differential pressures over a wide range of temperatures or/and high frequency.

### Material Selection

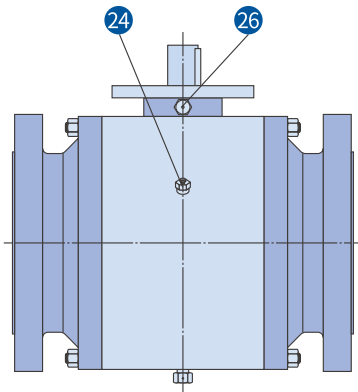
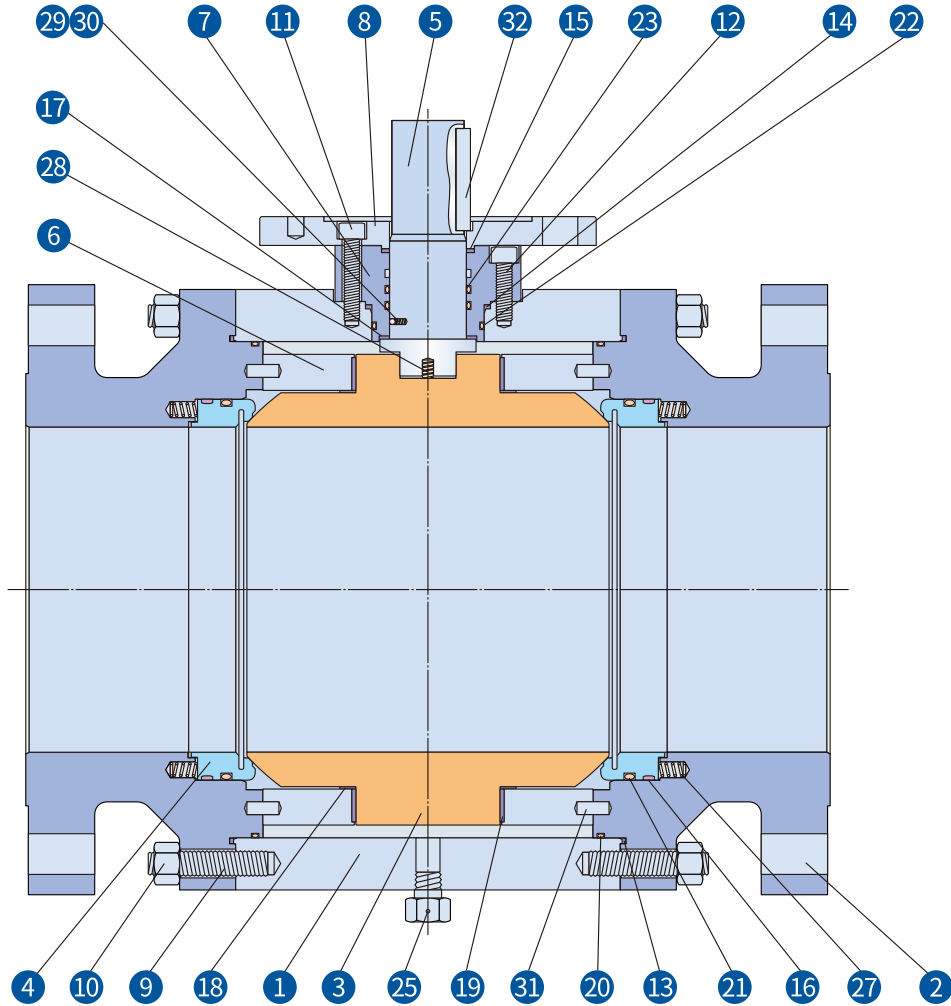
Various materials can be chosen for the service up to 500°C. For service temperature above 300°C, the extension bonnet is required.

### Applications

Hard faced ball and seats (TCC as standard, other special coatings are available on request) allow the valve to be used in more severe services such as slurries, pulp stock, mining and other abrasive media in long life.

# SERIES TM

## Material Specification



**BALL VALVE**

Metal To Metal Seat Trunnion Mounted Ball Valve

NO.	PART	Standard Materials	Standard Materials
1	Body	ASTM A105N	A182-F316
2	Adapter	ASTM A105N	A182-F316
3	Ball	ASTM A105N+TCC	A182-F316+TCC
4	Seat	ASTM A105N+TCC	A182-F316+TCC
5	Stem	AIS14140 ENP	A182-F51
6	Trunnion Supprot	Carbon Steel	Stainless Steel
7	Gland Flange	ASTM A105N	A182-F316
8	Top Flange	ASTM A105N	A182-F316
9	Body stud	ASTM A193-B7	A193-B8
10	Body Nut	ASTM A194-2H	A194-8
11	Screw	Carbon Steel	Stainless Steel
12	Screw	Carbon Steel	Stainless Steel
13	*Body gasket	Graphite	Graphite
14	*Gland gasket	Graphite	Graphite
15	*Stem Firesafe Packing	Graphite	Graphite
16	*Seat Firesate packing	Carbon Fibre+ Graphite	Carbon Fibre+ Graphite
17	Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE
18	Washer	SS+COPPER+PTFE	SS+COPPER+PTFE
19	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE
20	*O-ring	Viton	Viton
21	*O-ring	Viton	Viton
22	*O-ring	Viton	Viton
23	*O-ring	Viton	Viton
24	Vent Valve	Stainless Steel	Stainless Steel
25	Drain	Stainless Steel	Stainless Steel
26	Stem Injection	Stainless Steel	Stainless Steel
27	Seat Spring	Inconel X -750	Inconel X -750
28	Antistatic Spring	Inconel X -750	Inconel X -750
29	Antistatic Spring	Inconel X -750	Inconel X -750
30	Grounding Plunger	Stainless Steel	Stainless Steel
31	Alignment Pin	Stainless Steel	Stainless Steel
32	Key	Carbon Steel	Stainless Steel

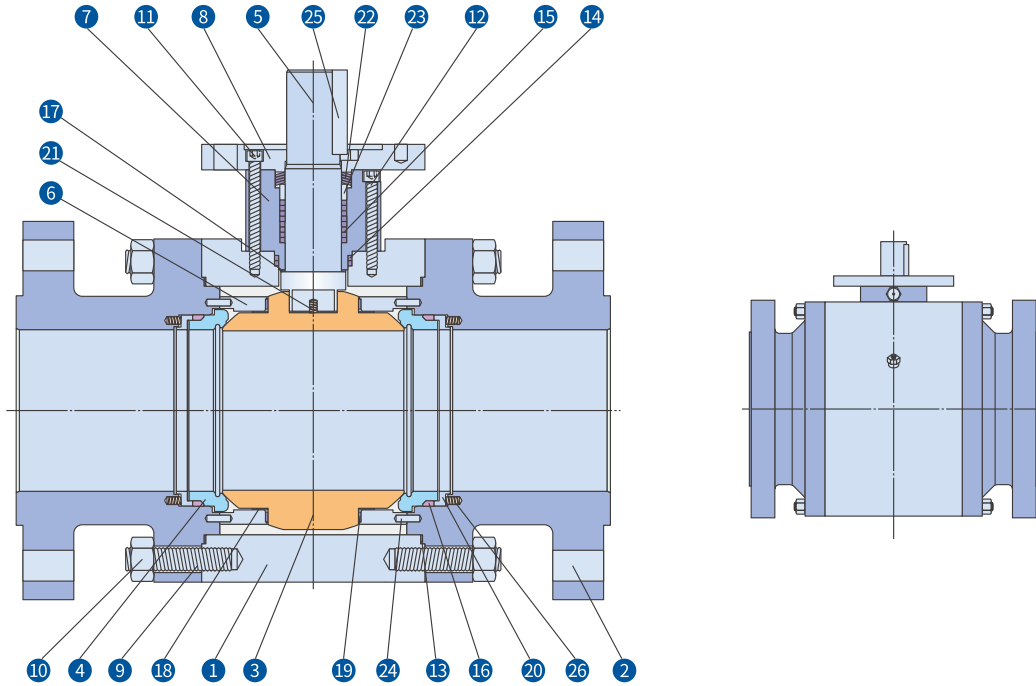
1. \*Recommended Spare Parts

2. TCC: Tungsten Carbide Coating

3. Customer shall order the valve according to service condition

# SERIES TM-H

## Material Specification



## TM-H BALL VALVE

High Temperature Metal Seat Trunnion Mounted Ball Valve

NO. PART	Standard Materials	NO. PART	Standard Materials
1 Body	ASTM A105N or A182-F316	14 *Gland Gasket	Graphite
2 Adapter	ASTM A105N or A182-F316	15 *Stem Firesafe Packing	Graphite
3 Ball	ASTM A105N+TCC or A182-F316+TCC	16 Seat Firesafe Packing	Graphite
4 Seat	ASTM A105N+TCC or A182-F316+TCC	17 Thrust Washer	316SS+COPPER
5 Stem	AISI 4140 ENP/A182 F6a	18 Washer	316SS+COPPER
6 Trunnion Support	Carbon Steel or Stainless Steel	19 Bearing	316SS+COPPER
7 Gland Flange	ASTM A105N or A182-F316	20 Push ring	316
8 Top Flange	Carbon Steel or Stainless Steel	21 Antistatic Spring	Inconel X-750
9 Body stud	ASTM A193-B7 or A193-B8	22 Disc Spring	17-7PH
10 Body Nut	ASTM A194-2H or A194-8	23 Gland	316
11 Screw	Carbon Steel or Stainless Steel	24 Alignment Pin	Stainless Steel
12 Screw	Carbon Steel or Stainless Steel	25 Key	Carbon Steel or Stainless Steel
13 *Body Gasket	Graphite or SW Graphite	26 Seat Spring	Inconel X-750

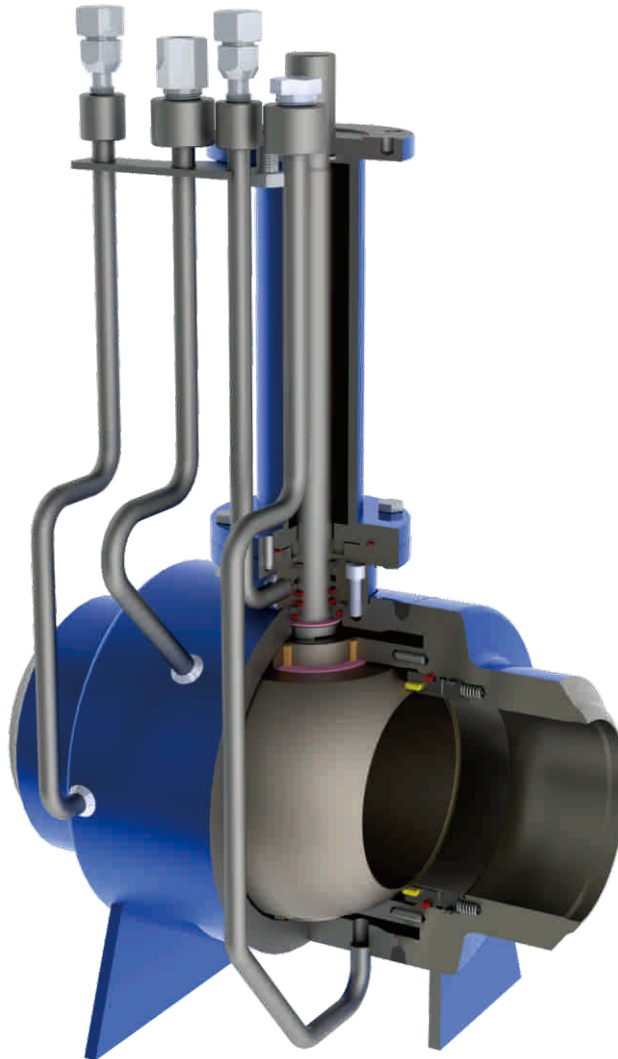
1. \* Recommended Spare Parts

3. Customer shall order the valve according to service condition

2. TCC: Tungsten Carbide Coating

# SERIES TW

## Welded Body Trunnion Mounted Ball Valve



### Features

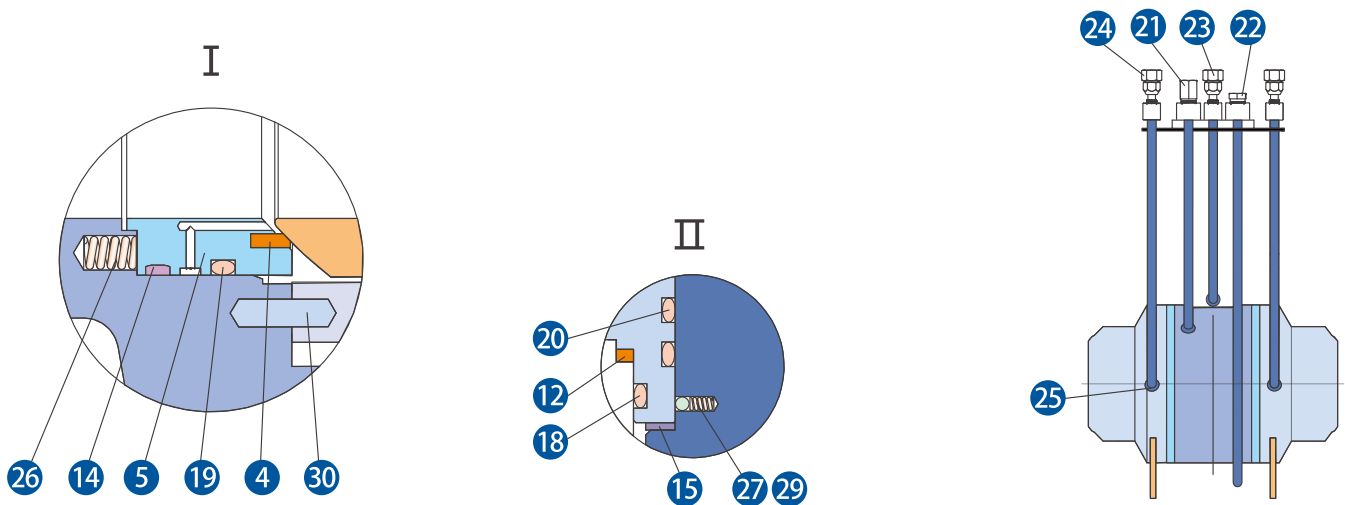
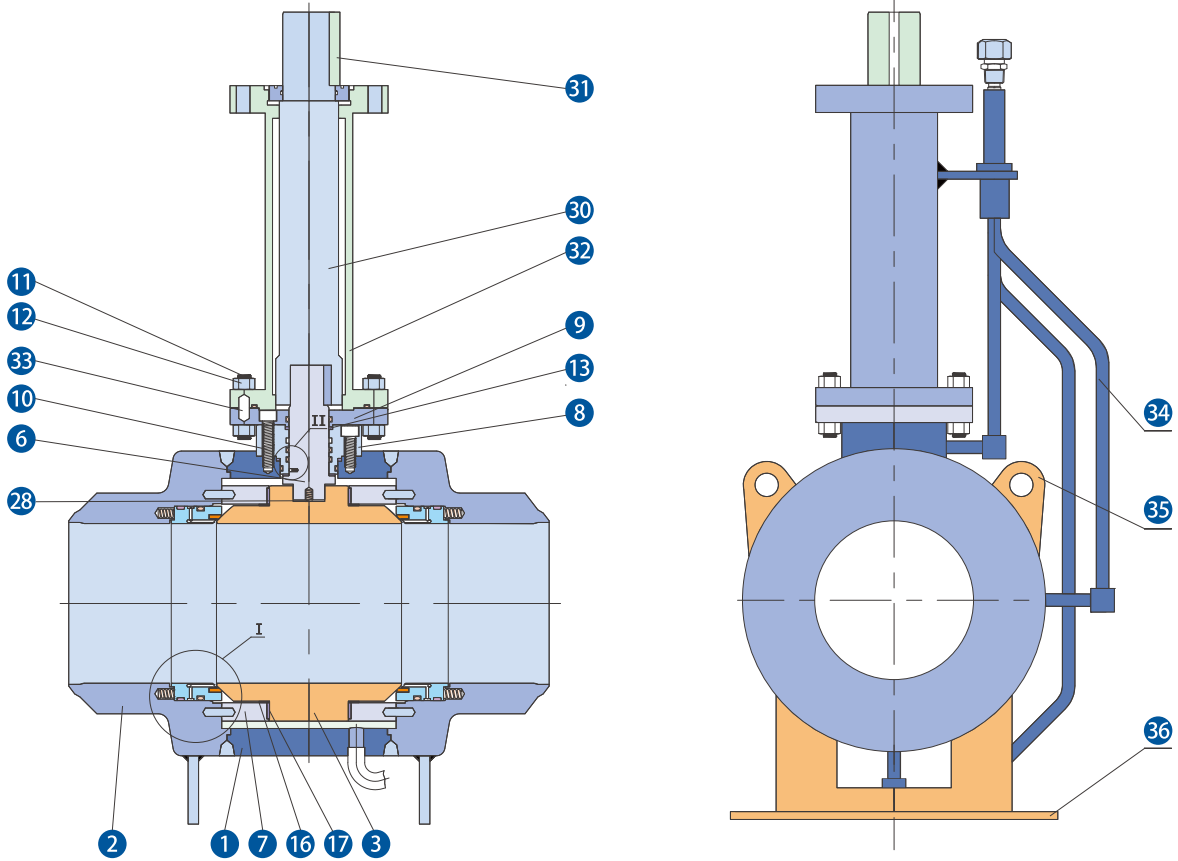
Size: 2"~48"  
Class: 150~2500  
Welded Forged Steel Body  
Trunnion Mounted Ball  
Anti-static Device  
Blow-out Proof Stem  
Fire Safe Design  
For Underground Use (On Request)

### Specifications

Design	ASME B16.34/API6D
Face to Face	ASME B16.34/API6D
End to End	ASME B16.34/API6D
End Flange	ASME B16.5/B16.47A
BW End	ASME B16.25
Test	API 6D
Fire Safe Test	API 607/API 6FA
Special	NACE MR0175

# SERIES TW

## Material Specification



# TW BALL VALVE

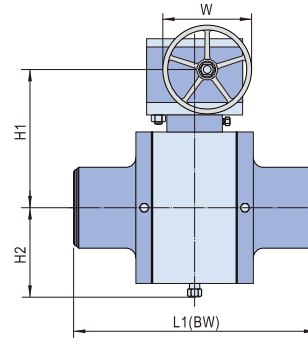
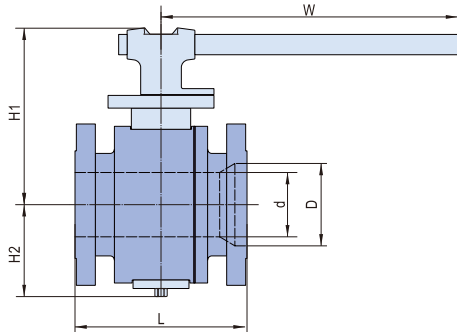
Welded Body Trunnion Mounted Ball Valve

NO. PART	A105/ENP	A105/316	F316/316	LF2/316NACE
1 Body	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
2 Adapter	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
3 Ball	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
4 Seat Insert	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK
5 Seat Ring	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
6 Stem	AISI 4140/ENP	ASTM A182-F51	ASTM A182-F51	ASTM A182-F51
7 Trunnion Support	Carbon Steel	Carbon Steel	ASTM A182-F316	Carbon Steel
8 Gland Flange	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
9 Top Flange	Carbon Steel	Carbon Steel	ASTM A182-F316	Carbon Steel
10 Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
11 Stud	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
12 Nut	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
13 *Stem Firesafe Packing	Graphite	Graphite	Graphite	Graphite
14 *Seat Firesafe Packing	Braided Graphite	Braided Graphite	Braided Graphite	Braided Graphite
15 Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
16 Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
17 Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
18 *O-Ring	Viton	Viton	Viton	Viton
19 *O-Ring	Viton	Viton	Viton	Viton
20 *O-Ring	Viton	Viton	Viton	Viton
21 Vent Valve	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
22 Drain	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
23 Stem Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
24 Seat Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
25 Check Valve	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
26 Seat Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
27 Antistatic Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
28 Antistatic Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
29 Steel Ball	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
30 Driving Tube	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
31 key	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
32 Yoke Tube Assy.	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
33 Pin	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
34 Education Tube 1	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
35 Lifting Lugs	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
36 Supporting Feet	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel

\*Recommended Spare Parts

# DIMENSIONS AND WEIGHT

## Welded Body Trunnion Mounted Ball Valve



### FULL BORE CLASS 150

SIZE	d	L	L1	H1	H2	W	RF Weight	BW Weight
in	mm	mm	mm	mm	mm	mm	Kg	Kg
2	51	178	216	155	85	350	30	29
3	76	203	283	191	110	400	60	54
4	102	229	305	211	130	450	91	83
6	152	394	457	231	160	*305	189	177
8	203	457	521	282	235	*406	344	325
10	254	533	559	336	290	*406	492	461
12	305	610	635	373	315	*406	702	657
14	337	686	762	413	345	*406	854	807
16	387	762	838	457	383	*600	1014	948
18	438	864	914	501	435	*600	1431	1338
20	489	914	991	551	495	*600	1907	1783
22	538	991	1092	600	555	*600	2338	2186
24	591	1067	1143	635	590	*700	2789	2607
26	635	1143	1245	710	620	*700	3181	2974
28	686	1245	1346	760	670	*760	4021	3759
30	737	1295	1397	800	710	*760	4791	4479
32	781	1372	1524	840	745	*760	5457	5102
34	832	1473	1626	890	775	*760	6664	5230
36	876	1524	1727	930	805	*760	7569	7077
40	976	1727	1956	1010	900	*760	10209	9545

\*Gear Operation

### REDUCE BORE CLASS 150

SIZE	d	D	L	L1	H1	H2	W	RF Weight
in	mm	mm	mm	mm	mm	mm	mm	Kg
2*1-1/2	38	51	178	216	152	80	350	26
3*2	51	76	203	283	155	85	350	34
4*3	76	102	229	305	191	110	400	62
6*4	102	152	394	457	211	130	450	101
8*6	152	203	457	521	231	160	*305	224
10*8	203	254	533	559	282	235	*406	372
12*10	254	305	610	635	336	290	*406	530
14*10	254	337	686	762	336	290	*406	623
14*12	305	337	686	762	373	315	*406	727
16*12	305	387	762	838	373	315	*406	787
16*14	337	387	762	838	413	345	*406	839
18*14	337	438	864	914	413	345	*406	1005
18*16	387	438	864	914	457	383	*600	1089
20*16	387	489	914	991	457	383	*600	1109
20*18	438	489	914	991	501	435	*600	1143
22*18	438	538	991	1092	501	435	*600	2332
24*20	489	591	1067	1143	551	495	*600	2046
26*22	538	635	1143	1245	600	555	*600	2201
28*24	591	686	1245	1346	635	590	*700	2784
30*24	591	737	1295	1397	635	590	*700	2779
32*26	635	781	1372	1524	710	620	*700	3976
34*28	686	832	1473	1626	760	670	*760	4412
36*30	737	876	1524	1727	820	710	*760	4955
40*34	832	976	1727	1956	935	775	*760	8154

### FULL BORE CLASS 300

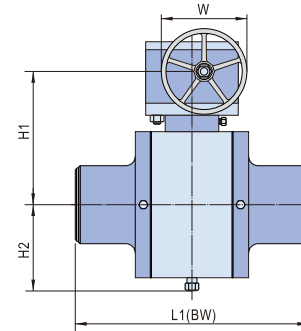
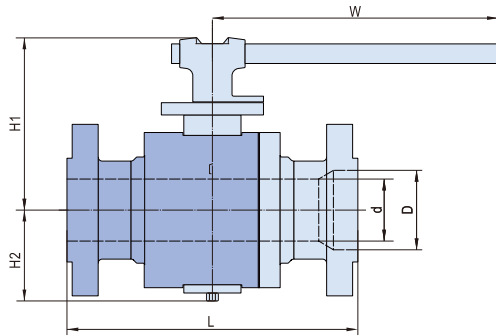
SIZE	d	L	L1	H1	H2	W	RF Weight	BW Weight
in	mm	mm	mm	mm	mm	mm	Kg	Kg
2	51	216	216	155	85	400	30	26
3	76	283	283	191	110	450	68	62
4	102	305	305	211	130	500	108	97
6	152	403	457	229	160	*305	208	193
8	203	502	521	291	235	*406	370	347
10	254	568	559	340	290	*406	531	498
12	305	648	635	375	315	*500	760	713
14	337	762	762	417	345	*600	895	830
16	387	838	838	466	400	*600	1294	1214
18	438	914	914	506	440	*600	1706	1618
20	489	991	991	563	495	*600	2079	1966
22	538	1092	1092	605	560	*700	2206	2068
24	591	1143	1143	684	590	*760	2876	2717
28	686	1346	1346	770	680	*760	4552	4297
30	737	1397	1397	810	720	*760	5562	5251
32	781	1524	1524	850	760	*800	6209	5861
34	832	1626	1626	900	790	*800	7333	6922
36	876	1727	1727	940	820	*800	8393	7923
40	976	1956	1956	1025	915	*800	11144	10528

\*Gear Operation

### REDUCE BORE CLASS 300

SIZE	d	D	L	L1	H1	H2	W	RF Weight
in	mm	mm	mm	mm	mm	mm	mm	Kg
2*1-1/2	38	51	216	216	152	80	350	30
3*2	51	76	283	283	155	85	400	36
4*3	76	102	305	305	191	110	450	72
6*4	102	152	403	457	211	130	500	139
8*6	152	203	502	521	229	160	*305	247
10*8	203	254	568	559	291	235	*406	401
12*10	254	305	648	635	340	290	*406	577
14*10	254	337	762	762	340	315	*406	678
14*12	305	337	762	762	375	315	*500	825
16*12	305	387	838	838	375	360	*500	1045
16*14	337	387	838	838	417	360	*600	1116
18*14	337	438	914	914	417	400	*600	1309
18*16	387	438	914	914	466	400	*600	1516
20*16	387	489	991	991	466	420	*600	1766
20*18	438	489	991	991	506	440	*600	1807
22*18	438	538	1092	1092	506	440	*600	1982
24*20	489	591	1143	1143	563	495	*600	2189
28*24	591	686	1346	1346	684	590	*760	3163
30*24	591	737	1397	1397	684	590	*760	3158
34*28	686	832	1626	1626	770	680	*760	4789
36*30	737	876	1727	1727	810	720	*760	5525
40*34	832	976	1956	1956	900	790	*800	8112





FULL BORE		CLASS 600						
SIZE	d	L	L1	H1	H2	W	RF Weight	BW Weight
in	mm	mm	mm	mm	mm	mm	Kg	Kg
2	51	292	292	155	400	400	44	41
3	76	356	356	193	500	500	79	73
4	102	432	432	239	700	700	148	138
6	152	559	559	266	*406	*406	243	227
8	203	660	660	310	*406	*406	432	408
10	254	787	787	354	*600	*600	690	655
12	305	838	838	411	*600	*600	841	790
14	337	889	889	435	*600	*600	1211	1141
16	387	991	991	493	*600	*600	1511	1424
18	438	1092	1092	544	*700	*700	2106	1997
20	489	1194	1194	629	*760	*760	2605	2473
22	538	1295	1295	683	*800	*800	3318	3162
24	591	1397	1397	728	*800	*800	3901	3703
28	686	1549	1549	810	*800	*800	5969	5671
30	737	1651	1651	863	*800	*800	6590	6261
32	781	1778	1778	900	*800	*800	7708	7323
34	832	1930	1930	940	*800	*800	8333	7916
36	876	2083	2083	990	*800	*800	10490	9966
40	978	2337	2337	1070	*900	*900	14480	13756

\* Gear Operation

REDUCE BORE		CLASS 600						
SIZE	d	D	L	L1	H1	H2	W	RF Weight
in	mm	mm	mm	mm	mm	mm	mm	Kg
2*1-1/2	38	51	292	292	152	80	350	40
3*2	51	76	356	356	155	85	400	53
4*3	76	102	432	432	193	112	500	98
6*4	102	152	559	559	239	140	700	210
8*6	152	203	660	660	266	175	*406	299
10*8	203	254	787	787	310	250	*406	504
12*10	254	305	838	838	354	290	*600	783
14*10	254	337	889	889	354	345	*600	832
14*12	305	337	889	889	411	345	*600	896
16*12	305	387	991	991	411	370	*600	951
16*14	337	387	991	991	435	370	*600	1291
18*14	337	438	1092	1092	435	410	*600	1501
18*16	387	438	1092	1092	493	420	*600	1616
20*16	387	489	1194	1194	493	440	*600	2041
20*18	438	489	1194	1194	544	462	*700	2241
22*18	438	538	1295	1295	544	462	*700	2401
24*20	489	591	1397	1397	629	515	*760	3405
28*24	591	686	1549	1549	728	610	*800	4191
30*24	591	737	1651	1651	728	610	*800	4671
34*28	686	832	1930	1930	810	695	*800	7109
36*30	737	876	2083	2083	863	735	*800	8500
40*34	832	978	2337	2337	940	820	*800	9903

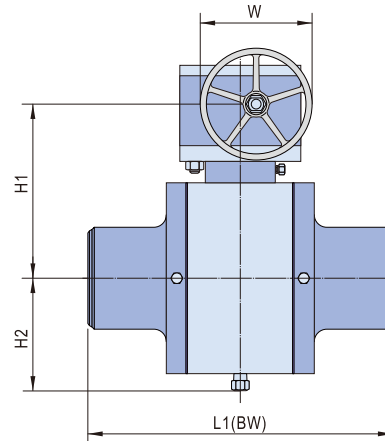
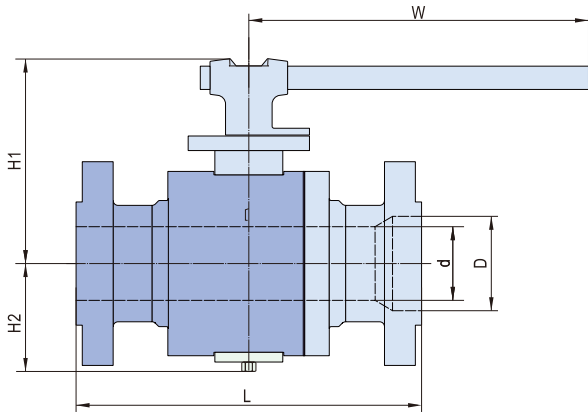
FULL BORE		CLASS 900						
SIZE	d	L	L1	H1	H2	W	RF Weight	BW Weight
in	mm	mm	mm	mm	mm	mm	Kg	Kg
2	51	368	368	178	100	450	50	47
3	76	381	381	221	125	600	85	78
4	102	457	457	215	150	*305	156	142
6	152	610	610	268	215	*406	379	351
8	203	737	737	324	260	*600	554	512
10	254	838	838	371	305	*600	809	738
12	305	965	965	425	360	*600	1110	1027
14	324	1029	1029	463	390	*600	1591	1491
16	375	1130	1130	513	440	*710	1986	1844
18	425	1219	1219	614	500	*760	2781	2605
20	473	1321	1321	644	530	*760	3416	3193
24	572	1549	1549	745	630	*800	5443	5113
28	667	1753	1753	830	720	*800	10132	9473
30	712	1880	1880	880	755	*800	11385	10645
32	760	2159	2159	970	850	*900	17375	16246
36	855	2286	2286	1030	930	*900	20053	18750

\* Gear Operation

REDUCE BORE		CLASS 900						
SIZE	d	D	L	L1	H1	H2	W	RF Weight
in	mm	mm	mm	mm	mm	mm	mm	Kg
2*1-1/2	38	51	368	368	152	80	400	44
3*2	51	76	381	381	178	100	450	54
4*3	76	102	457	457	221	125	600	92
6*4	102	152	610	610	215	150	*305	222
8*6	152	203	737	737	268	260	*406	474
10*8	203	254	838	838	324	305	*600	644
12*10	254	305	965	965	371	335	*600	857
14*10	254	324	1029	1029	371	360	*600	1039
14*12	305	324	1029	1029	425	360	*600	1295
16*12	305	375	1130	1130	425	390	*600	1370
16*14	324	375	1130	1130	463	390	*600	1811
18*16	375	425	1219	1219	513	440	*710	2181
20*16	375	473	1321	1321	513	470	*710	2711
20*18	425	473	1321	1321	614	500	*760	3111
24*20	473	572	1549	1549	644	550	*760	3766
28*24	572	667	1753	1753	745	630	*800	7526
30*24	572	712	1880	1880	745	665	*800	7927
34*28	667	810	2159	2159	830	750	*800	11132
36*30	712	855	2286	2286	880	780	*800	15596

# DIMENSIONS AND WEIGHT

## Welded Body Trunnion Mounted Ball Valve



FULL BORE		CLASS 1500						
SIZE	d	L	L1	H1	H2	W	RF Weight	BW Weight
in	mm	mm	mm	mm	mm	mm	Kg	Kg

2	51	368	368	178	100	450	50	47
3	76	470	470	226	130	700	112	100
4	102	546	546	241	162	*406	190	215
6	146	705	705	319	255	*600	574	460
8	194	832	832	345	280	*600	742	900
10	241	991	991	411	345	*600	1184	1086

12	289	1130	1130	478	405	*600	1952	1818
14	318	1257	1257	517	435	*700	2224	2070
16	362	1384	1384	599	485	*760	2717	2528
18	406	1537	1537	663	545	*800	3584	3317
20	456	1664	1664	695	580	*800	4421	4088
24	546	1944	1944	842	730	*900	7029	6383

\* Gear Operation

REDUCE BORE		CLASS 1500						
SIZE	d	D	L	L1	H1	H2	W	RF Weight
in	mm	mm	mm	mm	mm	mm	mm	Kg

2*1-1/2	38	51	368	368	152	80	400	55
3*2	51	76	470	470	178	100	450	80
4*3	76	102	546	546	226	130	700	147
6*4	102	146	705	705	241	162	*406	291
8*6	146	194	832	832	319	270	*600	684
10*8	194	241	991	991	345	325	*600	920

12*10	241	289	1130	1130	411	370	*600	1329
14*10	241	318	1257	1257	411	405	*600	1829
14*12	289	318	1257	1257	478	405	*600	2052
16*12	289	362	1384	1384	478	435	*600	2502
16*14	318	362	1384	1384	517	435	*700	2644
18*16	362	406	1537	1537	599	485	*760	2907
20*16	362	456	1664	1664	599	545	*760	3782
20*18	407	456	1664	1664	663	545	*800	4088
24*20		546	1944	1944	695	640	*800	5774

FULL BORE		CLASS 2500						
SIZE	d	L(RTJ)	L1	H1	H2	W	RF Weight	BW Weight
in	mm	mm	mm	mm	mm	mm	Kg	Kg

2	44	454	451	214	118	700	87	71
3	64	584	578	216	150	*406	194	159
4	89	683	673	265	180	*406	375	320

6	133	927	914	371	305	*600	756	614
8	181	1038	1022	426	360	*600	1319	1108
10	223	1292	1270	463	390	*710	2096	1688
12	265	1445	1422	550	465	*760	3216	2639

\* Gear Operation

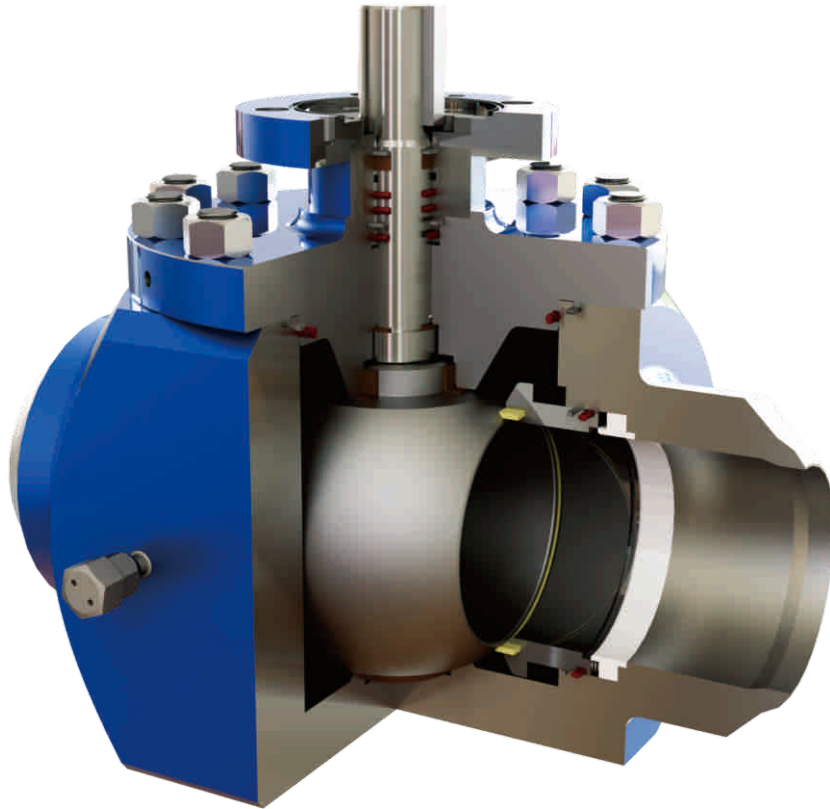
REDUCE BORE		CLASS 2500						
SIZE	d	D	L(RTJ)	L1	H1	H2	W	RF Weight
in	mm	mm	mm	mm	mm	mm	mm	Kg

2*1-1/2	38	44	454	451	175	95	450	78
3*2	44	64	584	578	214	118	700	157
4*3	64	89	683	673	216	150	*406	314

6*4	89	133	927	914	265	270	*406	630
8*6	133	181	1038	1022	371	305	*600	1148
10*8	181	223	1292	1270	426	370	*600	1886
12*10	223	265	1445	1422	463	415	*710	2921

# SERIES TT

## Top Entry Forged Trunnion Mounted Ball Valve



### Features

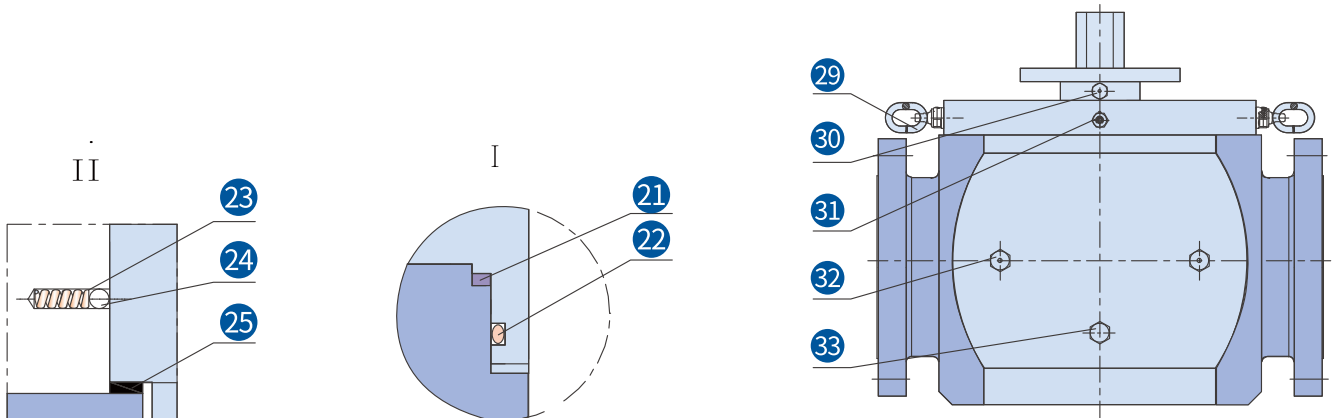
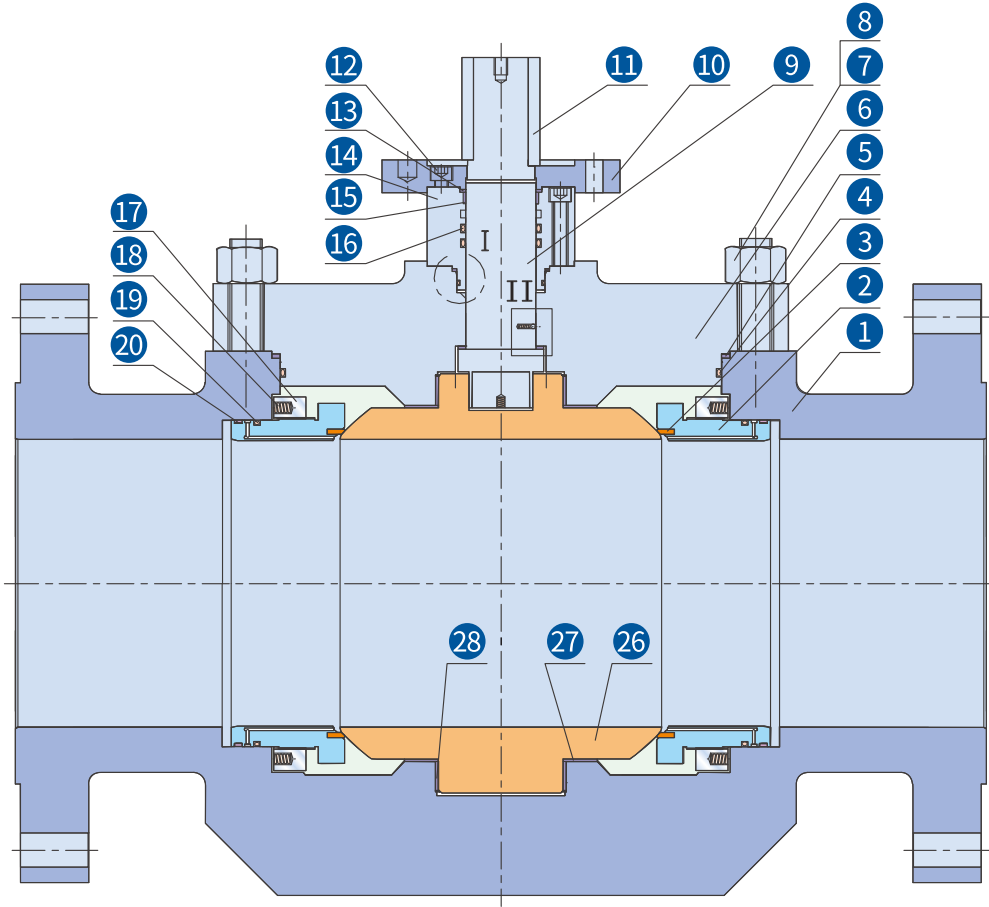
Size: 2" ~ 28"  
Class: 150-1500  
Top Entry Forged Steel Body  
Trunnion Mounted Ball, Full & Reduced Bore  
Anti-static Device  
Blow-out Proof Stem  
Fire Safe Design  
Emergency Sealant Injector ( 6" & Larger)

### Specifications

Design	ASME B16.34/API6D
Face to Face	ASME B16.10/API6D
End to End	ASME B16.10/API6D
End Flange	ASME B16.5
BW End	ASME B16.25
Test	API 6D
Fire Safe Test	API 607/API 6FA
Special	NACE MR0175

# SERIES TT

## Material Specification



**BALL VALVE**

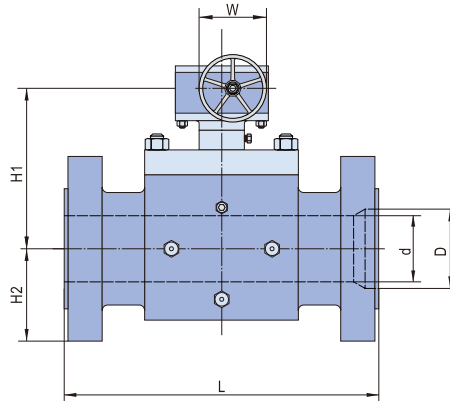
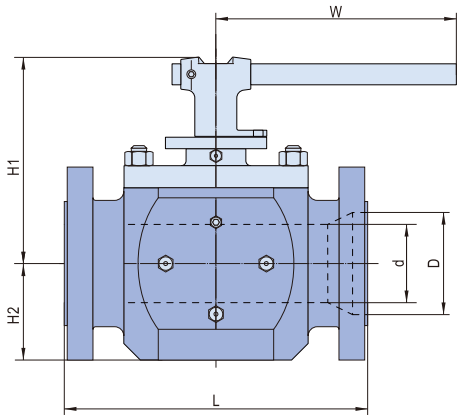
Top Entry Forged Trunnion Mounted Ball Valve

NO.	PART	A105/ENP	A105/316	F316/316	LF2/316NACE
1	Body	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
2	Seat Ring	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
3	Seat Insert	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK
4	*O-Ring	Viton	Viton	Viton	Viton
5	*Body Gasket	Graphite	Graphite	Graphite	Graphite
6	Cover	ASTM A105	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
7	Body Stud	NASTM A193-B7	ASTM A193-B7	ASTM A193-B8	ASTM A320-L7M
8	Body Nut	ASTM A194-2H	ASTM A194-2H	ASTM A194-8	ASTM A194-7M
9	Stem	AISI 4140 /ENP	ASTM A182-F51	ASTM A182-F51	ASTM A182-F51
10	Top Flange	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
11	key	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
12	Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
13	*Stem Firesafe Packing	Graphite	Graphite	Graphite	Graphite
14	Gland Flange	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
15	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
16	*O-Ring	Viton	Viton	Viton	Viton
17	Spring Seat Ring	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
18	Seat Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
19	*O-Ring	Viton	Viton	Viton	Viton
20	*Seat Firesafe Packing	Braided Graphite	Braided Graphite	Braided Graphite	Braided Graphite
21	*Gland Gasket	Graphite	Graphite	Graphite	Graphite
22	*O-Ring	Viton	Viton	Viton	Viton
23	Antistatic Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
24	Steel Ball	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
25	Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
26	Ball	ASTM A105N/ENP	ASTM A182 F316	ASTM A182 F316	ASTM A182 F316
27	Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
28	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	S+COPPER+PTFE	SS+COPPER+PTFE
29	Lifting Lugs	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
30	Stem Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
31	Vent Valve	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
32	Seat Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
33	Drain	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel

\*Recommended Spare Parts

# DIMENSIONS AND WEIGHT

## Top Entry Trunnion Mounted Ball Valve



FULL BORE		CLASS 150				
SIZE in	d mm	L mm	H1 mm	H2 mm	W mm	Weight Kg
2	51	292	210	83	350	46
3	76	356	225	110	400	83
4	102	432	260	143	450	156
6	152	559	295	217	*305	256
8	203	660	322	264	*406	453
10	254	787	357	313	*406	622
12	305	838	405	372	*406	747
14	337	889	455	430	*406	959
16	387	991	470	452	*600	1220
18	438	1092	500	470	*600	1640
20	489	1194	555	583	*600	2118
24	591	1397	600	594	*700	2950

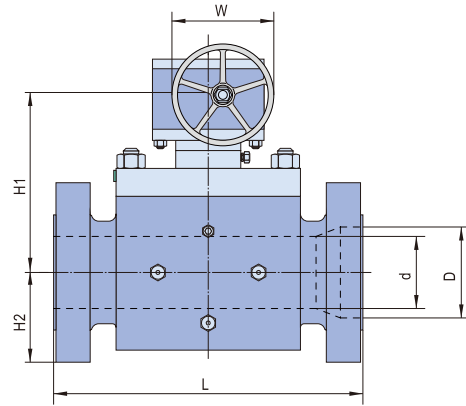
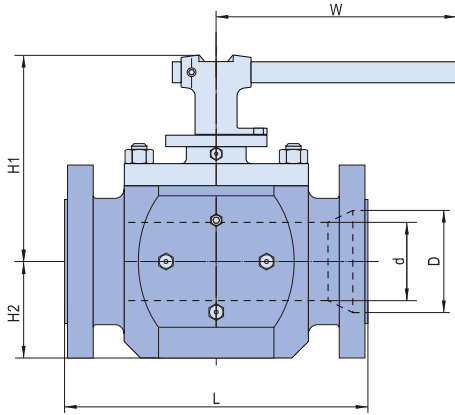
\* Gear Operation

REDUCE BORE		CLASS 150					
SIZE in	d mm	D mm	L mm	H1 mm	H2 mm	W mm	Weight Kg
2*1-1/2	38	51	292	180	78	250	41
3*2	51	76	356	210	83	350	58
4*3	76	102	432	225	110	400	104
6*4	102	152	559	260	143	450	228
8*6	152	203	660	295	217	*305	320
10*8	203	254	787	322	264	*406	536
12*10	254	305	838	357	313	*406	685
14*10	254	337	889	357	313	*406	740
14*12	305	337	889	405	372	*406	840
16*12	305	387	991	405	372	*406	924
16*14	337	387	991	455	430	*406	1070
18*14	337	438	1092	455	430	*406	1177
18*16	387	438	1092	463	452	*600	1430
20*16	387	489	1194	463	452	*600	1681
20*18	438	489	1194	500	470	*600	1850
24*20	489	591	1397	555	583	*600	2450

REDUCE BORE		CLASS 300					
SIZE in	d mm	D mm	L mm	H1 mm	H2 mm	W mm	Weight Kg
2*1-1/2	38	51	292	180	78	250	44
3*2	51	76	356	210	83	400	62
4*3	76	102	432	225	110	450	110
6*4	102	152	559	260	143	500	243
8*6	152	203	660	295	217	*305	343
10*8	203	254	787	330	264	*406	559
12*10	254	305	838	365	313	*406	725
14*10	254	337	889	365	313	*406	798
14*12	305	337	889	415	400	*500	890
16*12	305	387	991	415	400	*500	1052
16*14	337	387	991	460	430	*600	1120
18*14	337	438	1092	460	430	*600	1288
18*16	387	438	1092	480	452	*600	1480
20*16	387	489	1194	480	452	*600	1728
20*18	438	489	1194	523	470	*600	1960
24*20	489	591	1397	585	583	*600	2650

FULL BORE		CLASS 300				
SIZE in	d mm	L mm	H1 mm	H2 mm	W mm	Weight Kg
2	51	292	210	83	400	49
3	76	356	225	110	450	87
4	102	432	260	143	500	164
6	152	559	295	217	*305	272
8	203	660	330	264	*406	479
10	254	787	365	313	*406	657
12	305	838	415	400	*500	783
14	337	889	460	430	*600	1007
16	387	991	480	452	*600	1281
18	438	1092	523	470	*600	1722
20	489	1194	585	583	*600	2224
24	591	1397	635	594	*760	3100

\* Gear Operation



FULL BORE		CLASS 600				
SIZE in	d mm	L mm	H1 mm	H2 mm	W mm	Weight Kg
2	51	292	210	83	400	52
3	76	356	225	110	500	92
4	102	432	260	143	700	173
6	152	559	295	217	*406	285
8	203	660	330	264	*406	504
10	254	787	370	313	*600	680
12	305	838	425	400	*600	819

\* Gear Operation

REDUCE BORE		CLASS 600					
SIZE in	d mm	D mm	L mm	H1 mm	H2 mm	W mm	Weight Kg
2*1-1/2	38	51	292	180	78	350	46
3*2	51	76	356	210	83	400	74
4*3	76	102	432	225	110	500	120
6*4	102	152	559	260	143	700	249
8*6	152	203	660	295	217	*406	380
10*8	203	254	787	330	264	*406	587
12*10	254	305	838	370	313	*600	752

FULL BORE		CLASS 900				
SIZE in	d mm	L mm	H1 mm	H2 mm	W mm	Weight Kg
2	51	368	210	83	450	60
3	76	381	225	110	600	100
4	102	457	260	143	*305	204
6	152	610	295	225	*406	420
8	203	737	335	270	*600	644
10	254	838	377	320	*600	943
12	305	965	510	415	*600	1295

\* Gear Operation

REDUCE BORE		CLASS 900					
SIZE in	d mm	D mm	L mm	H1 mm	H2 mm	W mm	Weight Kg
2*1-1/2	38	51	368	180	78	400	54
3*2	51	76	381	210	83	450	80
4*3	76	102	457	225	110	600	148
6*4	102	152	610	260	143	*305	305
8*6	152	203	737	295	225	*406	552
10*8	203	254	838	335	270	*600	748
12*10	254	305	965	377	320	*600	1048

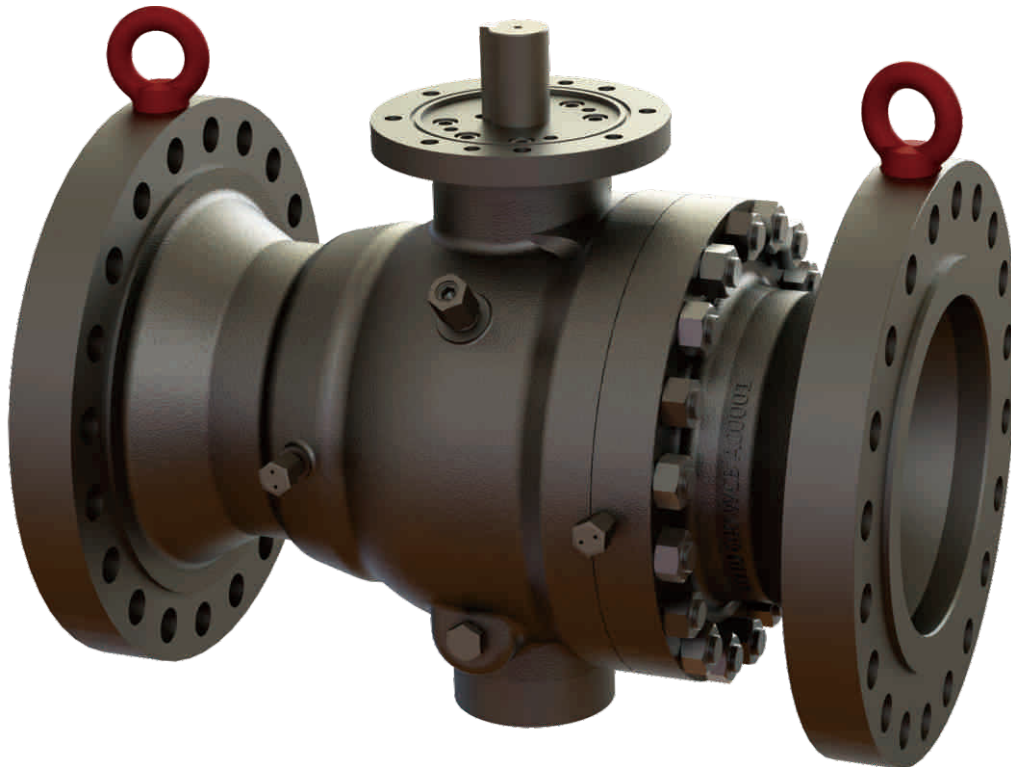
FULL BORE		CLASS 1500				
SIZE in	d mm	L mm	H1 mm	H2 mm	W mm	Weight Kg
2	51	368	210	83	450	69
3	76	470	235	120	700	133
4	102	546	290	153	*406	256
6	146	705	300	235	*600	667
8	194	832	350	282	*600	865
10	241	991	400	335	*600	1375
12	289	1130	525	425	*600	2175

\* Gear Operation

REDUCE BORE		CLASS 1500					
SIZE in	d mm	D mm	L mm	H1 mm	H2 mm	W mm	Weight Kg
2*1-1/2	38	51	368	180	78	400	63
3*2	51	76	470	235	120	450	95
4*3	76	102	546	290	153	700	183
6*4	102	146	705	300	235	*406	359
8*6	146	194	832	350	282	*600	794
10*8	194	241	991	400	335	*600	1070
12*10	241	289	1130	525	425	*600	1541

# SERIES TCS

## Casting Trunnion Mounted Ball Valve



### Features

- Size: 2" - 36"
- Class: 150 - 600
- Two Pieces Casting Steel Body
- Trunnion Mounted Ball, Full bore & Reduced bore
- Anti-static Device
- Blow-out Proof Stem
- Double Block and Bleed
- Fire safe design
- Emergency Sealant injector (6" & larger)
- Vent & Safety Valve

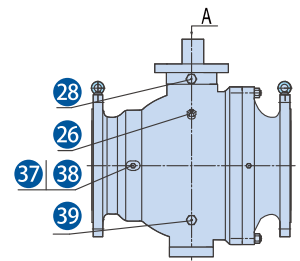
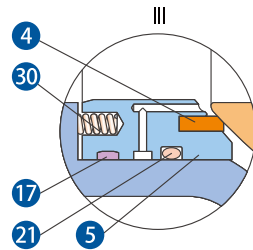
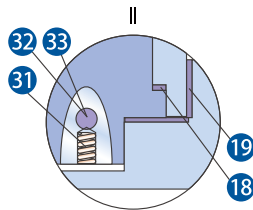
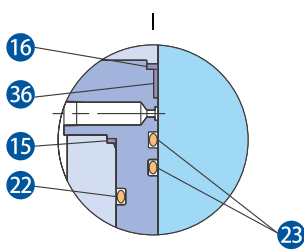
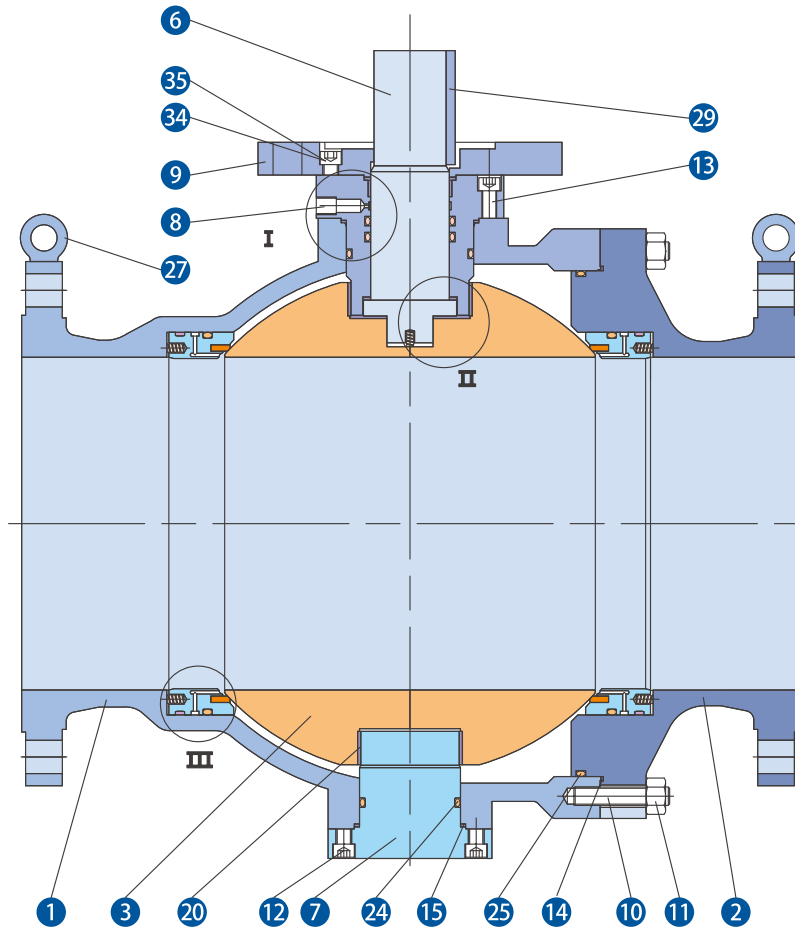
### Specifications

Design	ASME B16.34/API 6D
Face to face	ASME B16.10/API 6D
End to end	ASME B16.10/API 6D
End flange	ASME B16.25/b16.47A
Test	API 6D
Fire safe test	API 607/API 6FA
Special	NACE MR 0175



# SERIES TCS

## Material Specification



- 1.The valve is designed in accordance with API 6D.
- 2.The inspection and test of the valve shall be in accordance with API 6D.
- 3.The marking of the valve shall be in accordance with MSS SP-25.

- 4.The flange dimension for size < 24 inch shall be in accordance with ASME B16.5  
The flange dimension for size > 26 inch shall be in accordance with ASME B16.47A

# TCS BALL VALVE

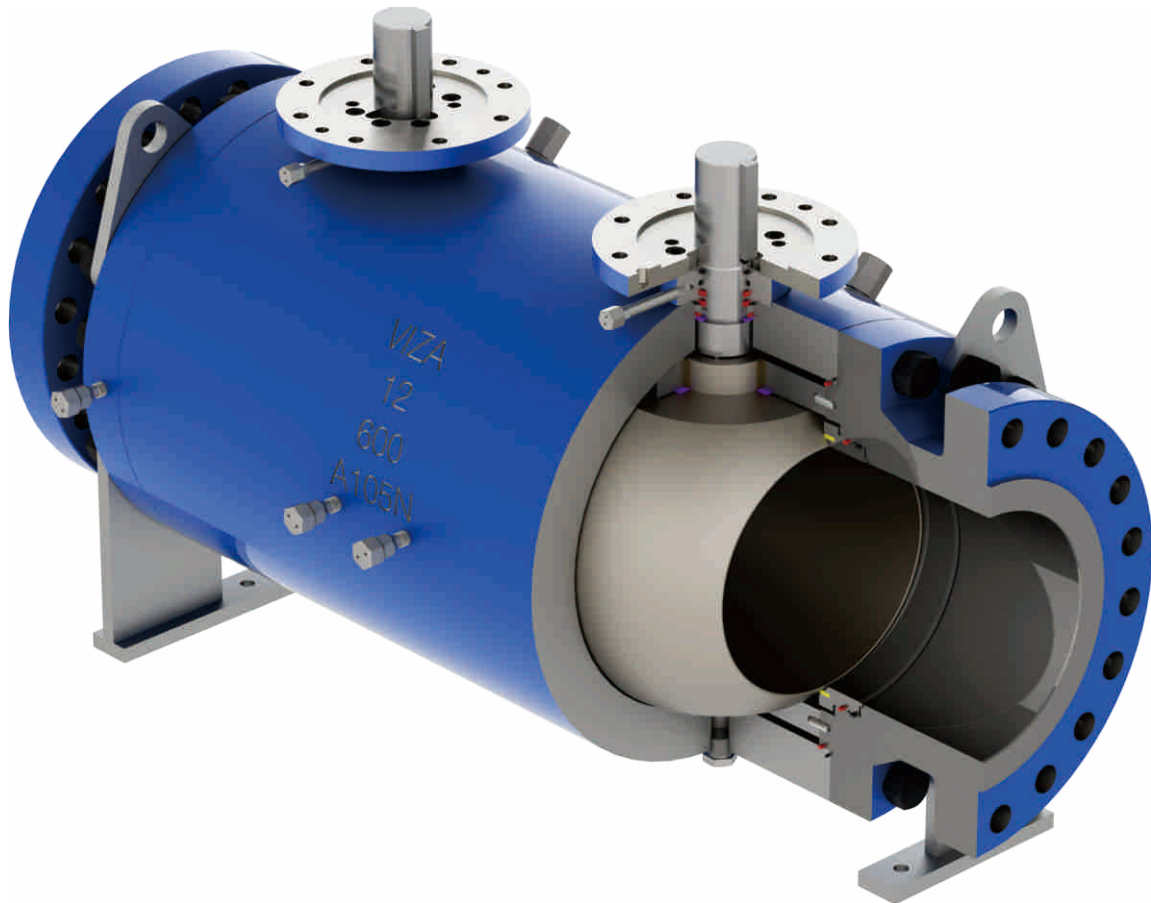
Casting Trunnion Mounted Ball Valve

NO.	PART	A105/ENP	A105/316	F316/316	LF2/316NACE
1	Body	ASTM A216-WCB	ASTM A216-WCB	ASTM A351-CF8M	ASTM A352-LCC
2	Adapter	ASTM A216-WCB	ASTM A216-WCB	ASTM A351-CF8M	ASTM A352-LCC
3	Ball	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
4	Seat Insert	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK
5	Seat Ring	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
6	Stem	AISI 4140/ENP	ASTM A182-F51	ASTM A182-F51	ASTM A182-F51
7	Trunnion	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
8	Gland Flange	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
9	Top Flange	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
10	Body Stud	ASTM A193-B7	ASTMA19-B7	ASTMA193-B8	ASTM A350-L7M
11	Body Nut	ASTM A194-2H	ASTM A194-2H	ASTM A194-8	ASTM A194-7M
12	Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
13	Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
14	*Body Gasket	Braided Graphite	Braided Graphite	Braided Graphite	Braided Graphite
15	*Gland Gasket	Graphite	Graphite	Graphite	Graphite
16	*Stem Firesafe Packing	Graphite	Graphite	Graphite	Graphite
17	*Seat Firesafe Packing	Braided Graphite	Braided Graphite	Braided Graphite	Braided Graphite
18	Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
19	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
20	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
21	*O-Ring	Viton	Viton	Viton	Viton
22	*O-Ring	Viton	Viton	Viton	Vibm
23	*O-Ring	Viton	Viton	Viton	Viton
24	*O-Ring	Viton	Viton	Viton	Vibm
25	*O-Ring	Viton	Viton	Viton	Viton
26	Vent Valve	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
27	Eye Bolt	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
28	Stem Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
29	key	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
30	Seat Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
31	Antistatic Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
32	Antistatic Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
33	Grounding Plunger	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
34	Alignment Pin	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
35	Screw	Carbon Steel	Carbon Steel	Stainless Steel	ASTM A320-L7M
36	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
37	Seat Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
38	Check Valve	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
39	PIug	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel

\*Recommended Spare Parts

# SERIES TD

## Twin Ball Trunnion Mounted Ball Valve



### Features

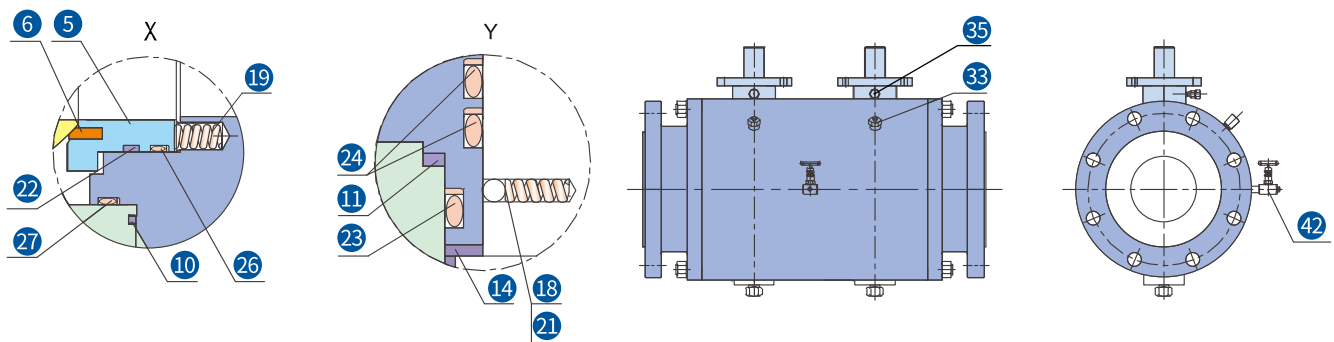
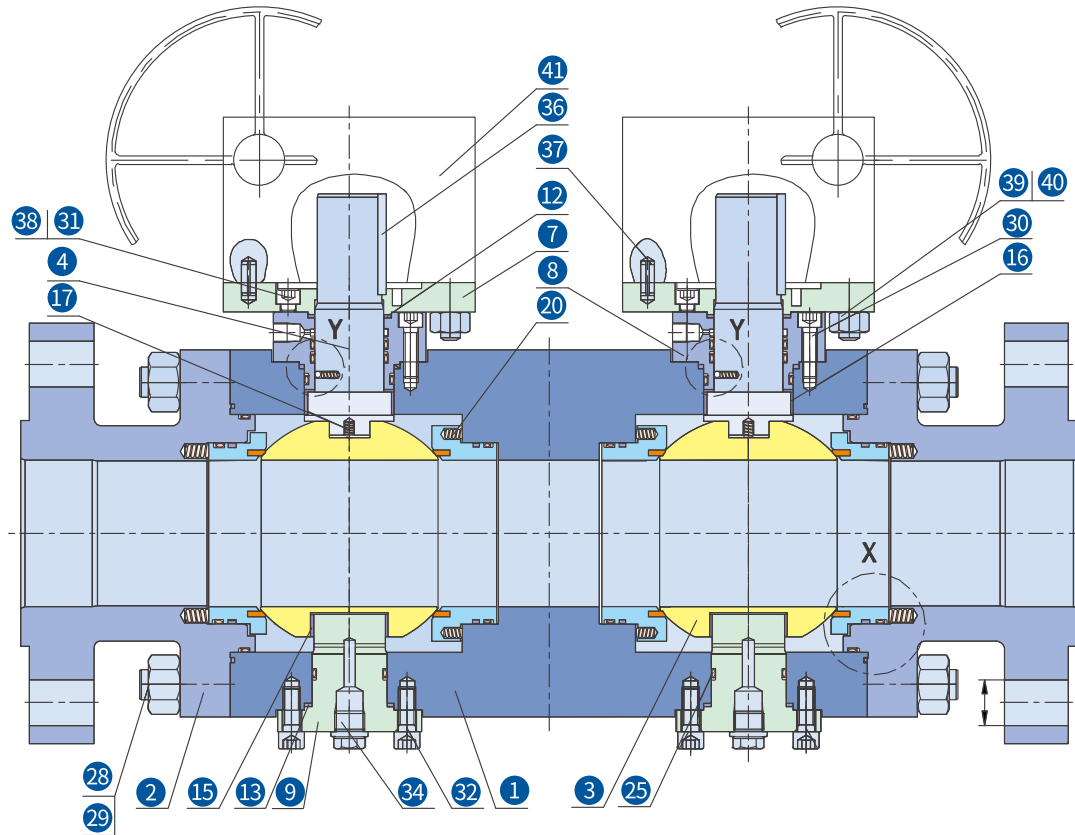
- Size: 2" - 24"
- Class: 150 - 1500
- Twin Ball for length limited pipeline
- Trunnion mounted ball
- Anti-static device
- Blow-out proof stem
- Fire safe design
- Emergency Sealant injector (6" & larger)

### Specifications

- Design: ASME B16.34/API 6D
- Face to face: Manufacturer standard / Customized
- End to end: Manufacturer standard / Customized
- End flange: ASME B16.25
- Test: API 6D
- Fire safe certified: API 607

# SERIES TD

## Material Specification



1. The valve is designed in accordance with API 6D.
2. The inspection and test of the valve shall be in accordance with API 6D.

3. The marking of the valve shall be in accordance with MSS SP-25.

**BALL VALVE**

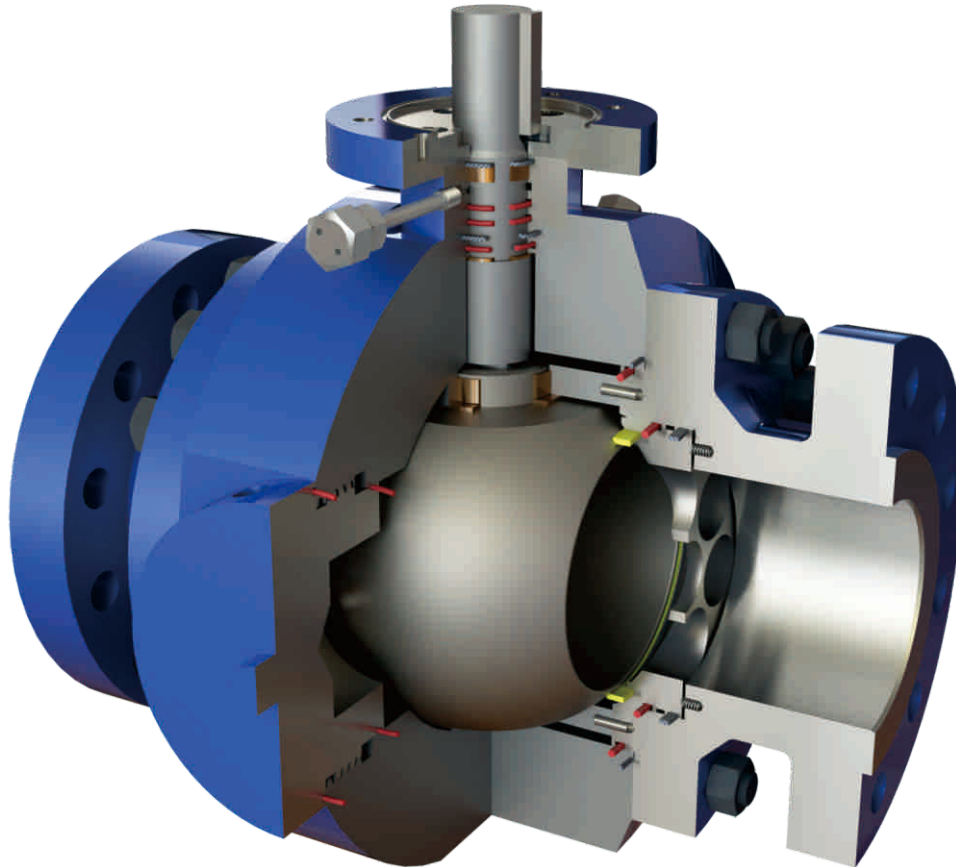
Twin Ball Trunnion Mounted Ball Valve

NO.	PART	A105/ENP	A105/316	F316/316	LF2/316NACE
1	Body	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
2	Adapter	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
3	Ball	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
4	Stem	AISI 4140/ENP	ASTM A182-F51	ASTM A182-F51	ASTM A182-F51
5	Seat Ring	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
6	Seat Insert	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK
7	Top Flange	Carbon Steel	Carbon Steel	ASTM A182-F316	Carbon Steel
8	Gland Flange	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
9	Trunnion Support	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
10	*Body Gasket	Braided Graphite	Braided Graphite	Braided Graphite	Braided Graphite
11	*Gland Gasket	Graphite	Graphite	Graphite	Graphite
12	*Stem Firesafe Packing	Graphite	Graphite	Graphite	Graphite
13	*Gasket	Graphite	Graphite	Graphite	Graphite
14	Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
15	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
16	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
17	Antistatic Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
18	Antistatic Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
19	Seat Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
20	Seat Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
21	Steel Ball	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
22	Seat Firesafe Packing	Braided Graphite	Braided Graphite	Braided Graphite	Braided Graphite
23	*O-Ring	Viton	Viton	Viton	Viton
24	*O-Ring	Viton	Viton	Viton	Viton
25	*O-Ring	Viton	Viton	Viton	Viton
26	*O-Ring	Viton	Viton	Viton	Viton
27	*O-Ring	Viton	Viton	Viton	Viton
28	Body Stud	ASTM A193-B7	ASTM A193-B7	ASTM A193-B8	ASTM A320-L7M
29	Body Nut	ASTM A194-2H	ASTM A194-2H	ASTM A194-8	ASTM A194-7M
30	Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
31	Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
32	Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
33	Vent Valve	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
34	Drain	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
35	Stem Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
36	Key	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
37	Pin	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
38	Gland Pin	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
39	Stud	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
40	Nut	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
41	Gear Box	COMPONENT	COMPONENT	COMPONENT	COMPONENT
42	Needle Valve	COMPONENT	COMPONENT	COMPONENT	COMPONENT

\*Recommended Spare Parts

# SERIES TP

## Pig Launcher/Receiver Ball Valve



### Operation

360 degree seat grease system makes long term actuation more consistent;  
 Side or top pig loading option allows for more flexible installation;  
 Gear Operator option is offered for easier actuation.

### Safety

Trunnion, Double Block and Bleed API 6D allows for environmental-friendly gas bleed-off  
 Non-Impact Vented Safety Cap eliminates spark hazards and reduces risk of blow-off

### Maintenance

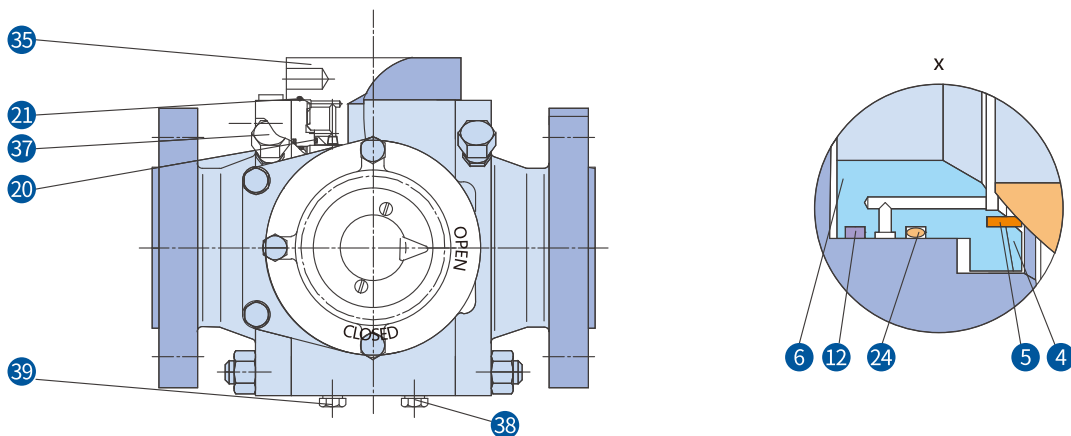
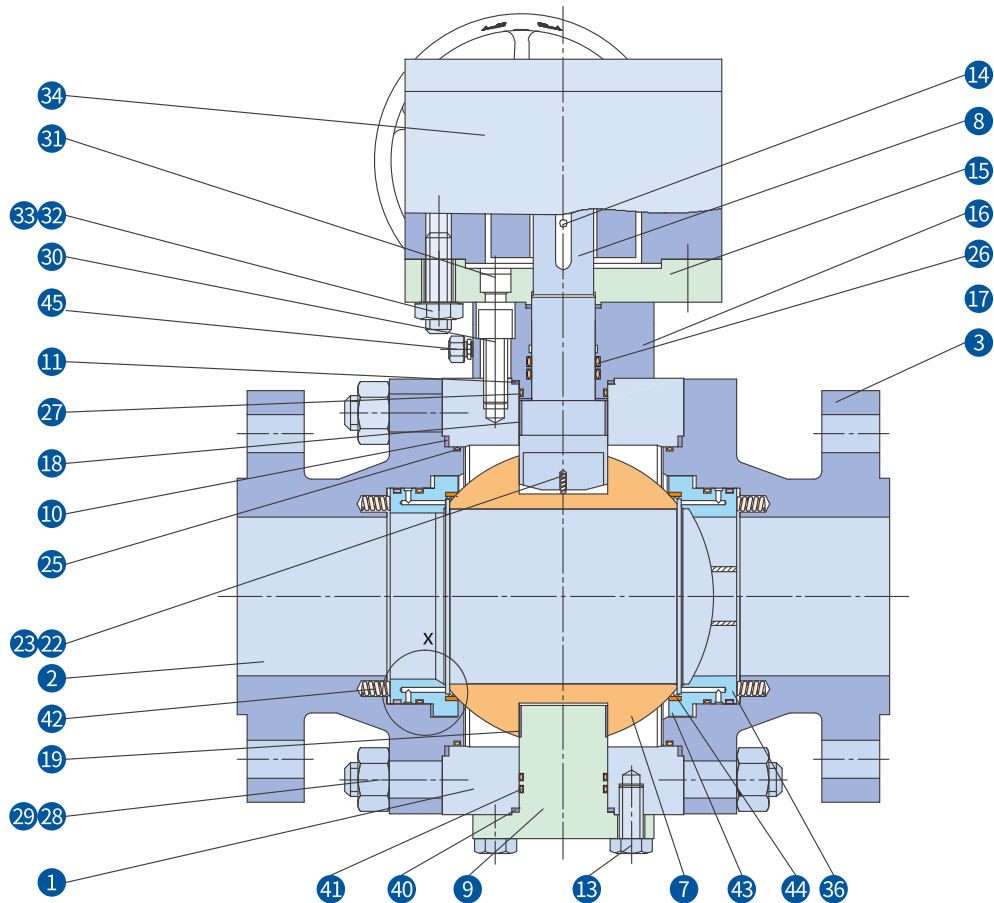
Bolted body and bolt on end flanges are set for easy repair and conversion from launcher to receiver;  
 Seat sealant injection fittings allow for safer, more flexible servicing intervals.

### Technical Data

Design type: Trunnion  
 Size: 2"~24"  
 Pressure: Class 150~900  
 Body material: CS, SS

# SERIES TP

## Material Specification



1. The valve is designed in accordance with API 6D.
2. The inspection and test of the valve shall be in accordance with API 6D.

3. The marking of the valve shall be in accordance with MSS SP-25.

# TP BALL VALVE

Pig Launcher/Receiver Ball Valve

NO.	PART	A105/ENP	A105/316	F316/316	LF2/316NACE
1	Body	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
2	Left Closure	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
3	Right Closure	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
4	Seat Assembly	ASSEMBLED BY 5 &6	ASSEMBLED BY 5 &6	ASSEMBLED BY 5 &6	ASSEMBLED BY 5 &6
5	Seat Insert	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK
6	Seat Retainer	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
7	Ball	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
8	Stem	AISI4140/ENP	ASTM A182-F51	ASTM A182-F51	ASTM A182-F51
9	Trunnion Support	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
10	*Body Gasket	Braided Graphite	Braided Graphite	Braided Graphite	Braided Graphite
11	*Gland Gasket	Graphite	Graphite	Graphite	Graphite
12	*Seat Firesafe Packing	Braided Graphite	Braided Graphite	Braided Graphite	Braided Graphite
13	Bolt	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
14	Key	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
15	Top Flange	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
16	Gland Flange	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
17	Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
18	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
19	Bearing	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
20	*O-Ring	Viton	Viton	Viton	Viton
21	*O-Ring	Viton	Viton	Viton	Viton
22	Antistatic Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
23	Steel Ball	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
24	*O-Ring	Viton	Viton	Viton	Viton
25	*O-Ring	Viton	Viton	Viton	Viton
26	*O-Ring	Viton	Viton	Viton	Viton
27	*O-Ring	Viton	Viton	Viton	Viton
28	Body Stud	ASTM A193-B7	ASTM A193-B7	ASTM A193-B8	ASTM A320-L7M
29	Body Nut	ASTM A194-2H	ASTM A194-2H	ASTM A194-8	ASTM A194-7M
30	Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
31	Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
32	Stud	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
33	Nut	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
34	Gear Box	COMPONENT	COMPONENT	COMPONENT	COMPONENT
35	Cap	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
36	Seat Retainer	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
37	Seat Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
38	Vent Valve	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
39	Plug	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
40	*Gasket	Graphite	Graphite	Graphite	Graphite
41	*O-Ring	Viton	Viton	Viton	Viton
42	Seat Spring	INCONELX-750	INCONELX-750	INCONELX-750	INCONELX-750
43	Seat Assembly	ASSEMBLED BY 36&44	ASSEMBLED BY 36&44	ASSEMBLED BY 36&44	ASSEMBLED BY 36&44
44	Seat Insert	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK
45	Stem Injection	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel

\*Recommended Spare Parts



# SERIES FY/TY

## Cryogenic Ball Valve



### Cryogenic Service

Cryogenic valves are demanded widely for application between -196 and -50 °C , including LNG that is fast becoming a better alternative source of clean energy. VIZA develops its cryogenic floating (Series FY) and Trunnion mounted (Series TY) ball valve accordingly.

### Standards

ASME B16.34, ASME B16.5, API 6D, BS EN ISO 17292, BS 6364, Shell MESC 77/200, BS EN 12266, Shell MESC 77/306

### Applications

Ethane:-89°C  
Ethylene:-104°C  
Methane:-162°C  
Liquefied Natural Gas (LNG):-162°C  
Oxygen:-183°C  
Nitrogen:-196°C

### Cryogenic Test

Valves can be tested by in-house testing facility and the report can be provided per request.

### General Features

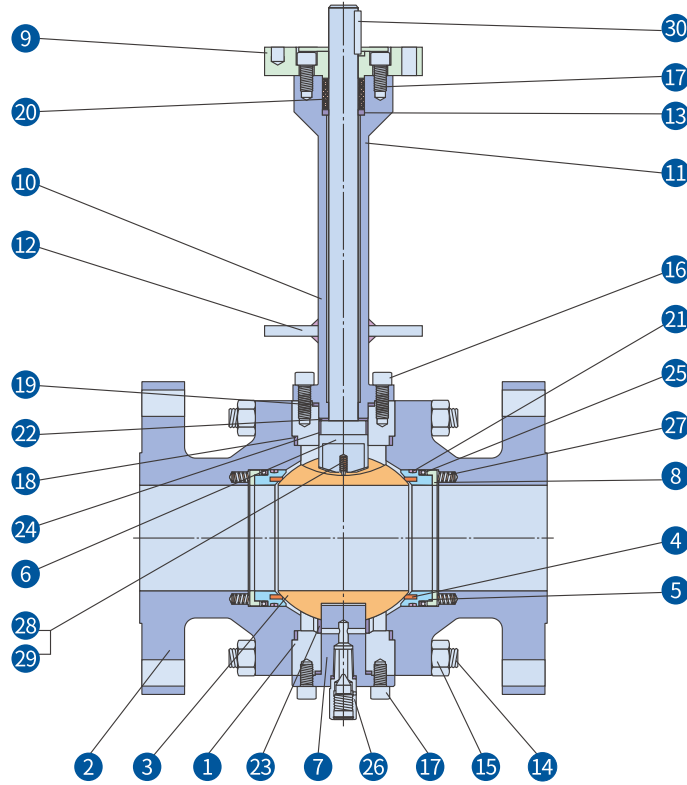
Extension bonnet gives enough vapour space to maintain the stem packing at a temperature high enough to protect the stem packing against malfunctioning due to freezing;  
Cavity pressure relief;  
Low operating torque for smoother operations;  
Blow-out proof stem, anti-static device and fire safe design;  
Double block & Bleed (Series TY);  
Low fugitive emission compliance.

### Technical Data

Design type: Floating, Trunnion  
Sizes: 1/2"~24"  
Pressure: class 150~600  
Temperature: -196°C to ambient temperature  
Body material: A351 Gr CF8/CF8M, A182 F304/F316(-196°C)

# SERIES FY/TY

## Material Specification



### TY/FY BALL VALVE

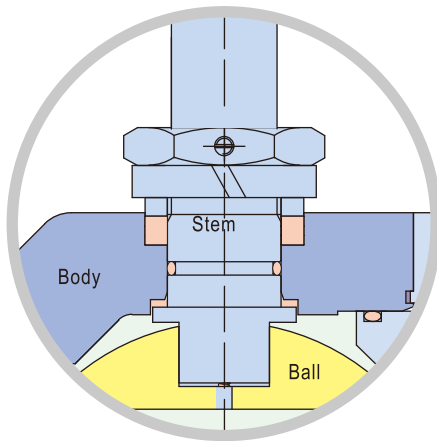
Cryogenic Ball Valve

NO.	PART	STANDARD MATERIALS	NO.	PART	STANDARD MATERIALS
1	Body	ASTM A182-F316	16	Screw	ASTM A320-B8
2	Adapter	ASTM A182-F316	17	Screw	ASTM A320-B8
3	Ball	ASTM A182-F316	18	*Body Gasket	316SS+Graphite
4	Seat Insert	PCTFE	19	*Gasket	316SS+Graphite
5	Seat ring	ASTM A182-F316	20	*Stem Packing	Graphite
6	Stem	ASTM A182-F316	21	*Seat Packing	Carbon Fibre+Graphite
7	Trunnion	ASTM A182-F316	22	Thrust Washer	PTFE/316SS+PTFE+MoS2
8	Seat Follower	ASTM A182-F316	23	Bearing	316SS+PTFE+MoS2
9	Top Flange	ASTM A182-F316	24	Stem Bearing	316SS+PTFE+MoS2
10	Extension	Assembled by 14&15	25	Lip-Seal	PTFE+Spring
11	Extended Bonnet	ASTM A182-F316	26	Vent Valve	Stainless Steel
12	Adiabatic Plate	ASTM A182-F316	27	Seat Spring	Inconel X-750
13	Packing Washer	ASTM A276-316	28	Antistatic Spring	Inconel X-750
14	Body Stud	ASTM A320-B8	29	Grounding Plunger	Stainless Steel
15	Body Nut	ASTM A194-8	30	Key	Stainless Steel

\*Recommended Spare Parts

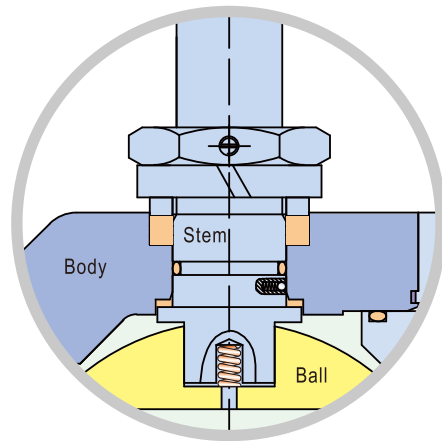
# DESIGN FEATURE

## Floating Ball Valves



### Blow-out Proof Stem

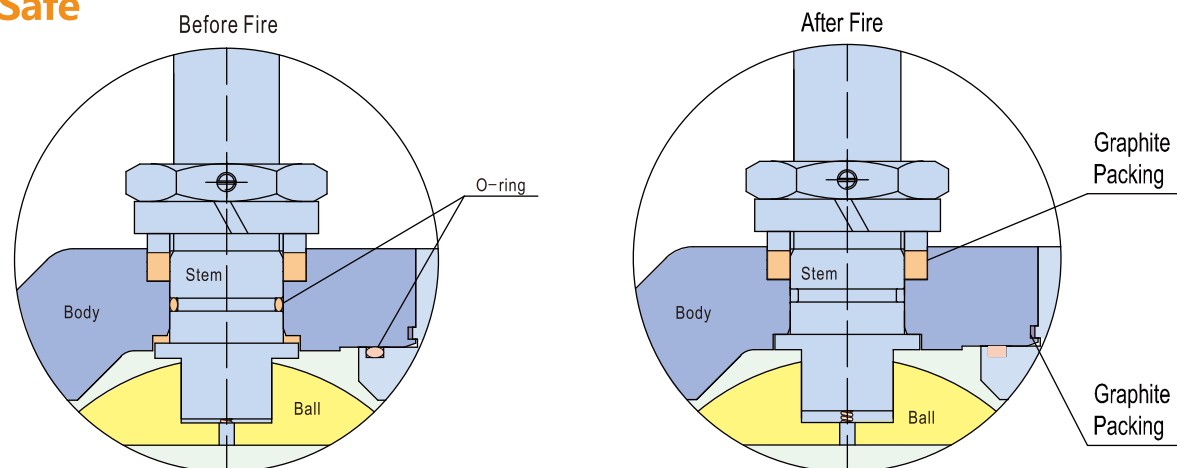
The stem is made separately from the ball with integral T-type round shoulder, installed internally from body side, retained by body to assure sealing safety at all pressure.



### Anti-static Device

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

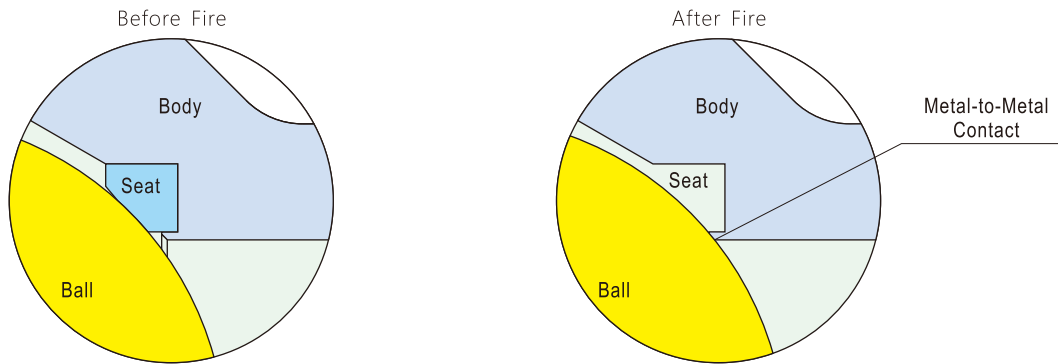
## Fire Safe



### a) External Leakage Prevention

All the possible external leakage point between stem and body, body and adapter are made with primary O-ring seal and secondary graphite packing or gasket seal. When fire burned out the primary O-ring seal, the secondary graphite packing/gasket seal still can prevent the process medium without external leakage.

**Fire Safe**



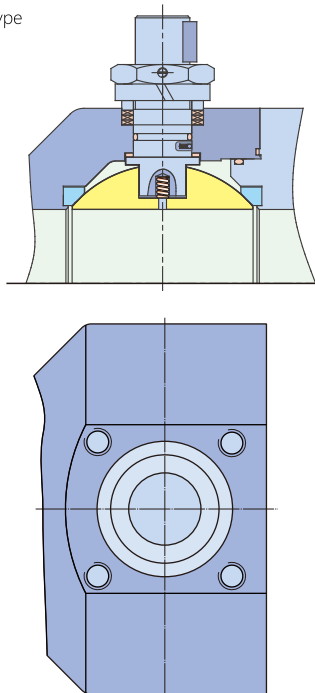
**b) Internal leakage prevention**

When fire burned out the primary soft seat seal, the upstream medium pressure push the ball to downstream against the secondary metal seat lip to shut off the process medium and prevent internal leakage through the valve bore.

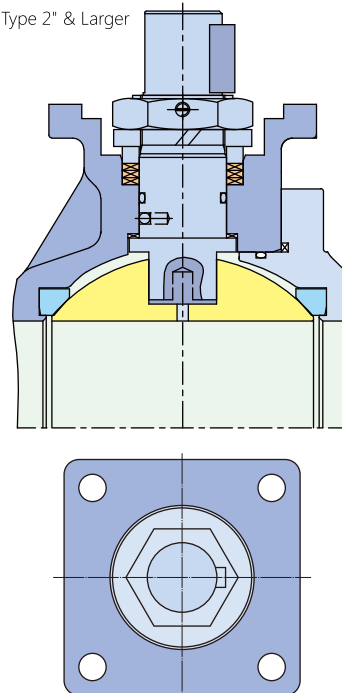
**Top Mounting**

All valves are designed and manufactured with ISO 5211 top mounting, for 2" & larger cast floating ball valve, actuator can be directly mounted on the valve.

Forged FF Type



Cast FC Type 2" & Larger



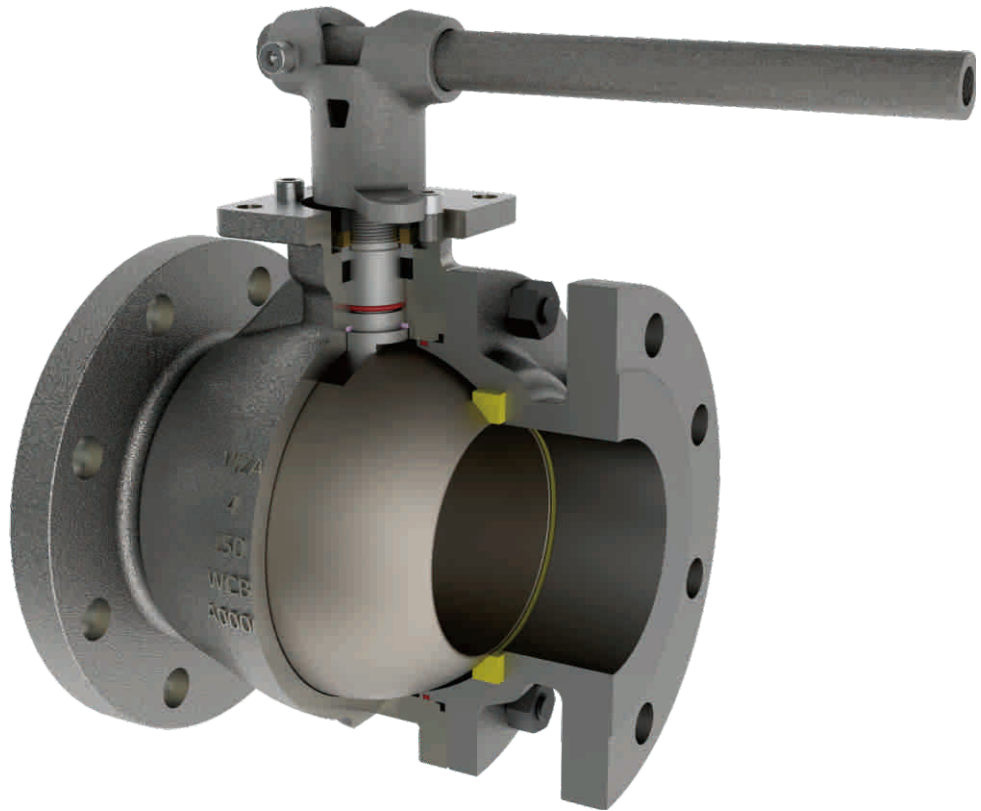
**Environmental-Friendly Valve**

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

# SERIES FC

## Material Specification

### 2PC Body Cast Floating Ball Valve



## Features

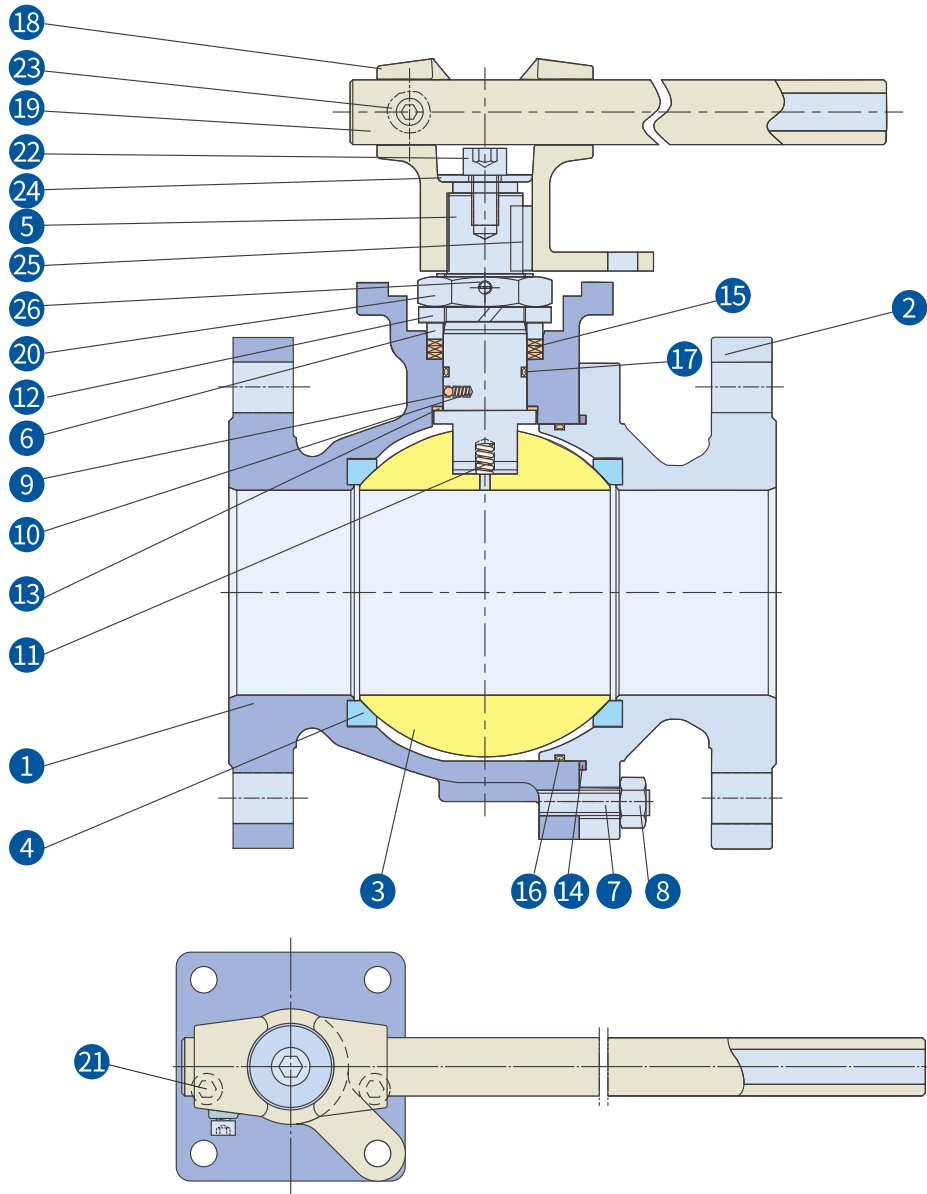
Size: 1/2"-10"  
 Class: 150-300  
 Two Pieces Cast Steel Body  
 Floating Ball, Full / Reduced Bore  
 Anti-static Device  
 Blow-out Proof Stem  
 Fire Safe Design  
 Low Emission

## Specifications

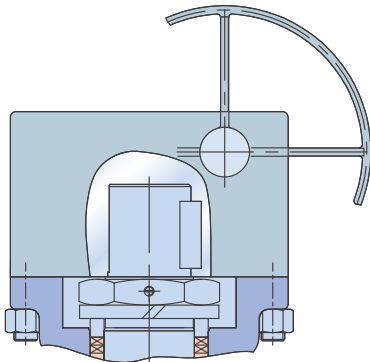
Design	ASME B16.34/API6D BS ISO 17292(BS5351)
Face to Face	ASME B16.10
End to End	ASME B16.10
End Flange	ASME B16.5
BW End	ASME B16.25
Test	API 598/BS EN 12266(BS 6755)
Fire Safe Test	API607/API6FA
Special	NACE MR 01 75

# SERIES FC

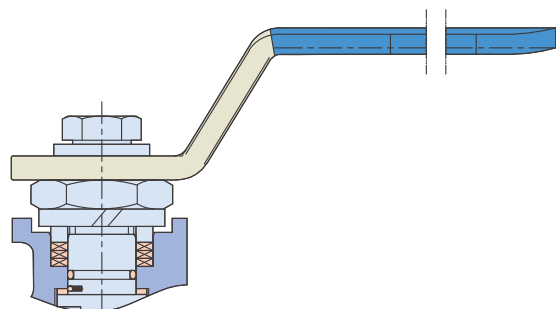
## Material Specification



Gear Standard for 6" & Larger



Lever for 1/2"~1-1/2"



# FC BALL VALVE

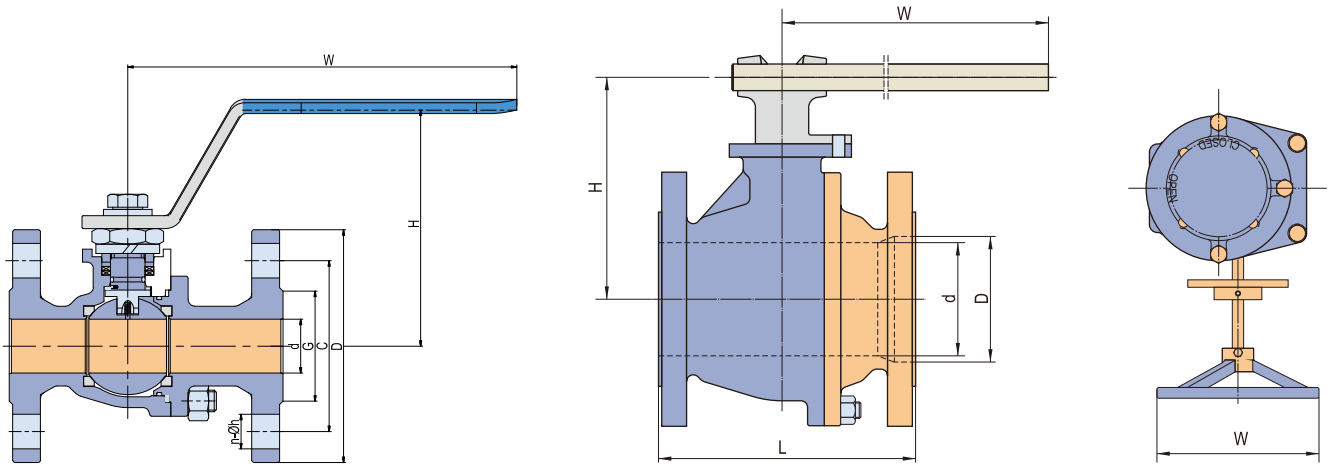
## 2PC Body Cast Floating Ball Valve

NO.	PART	WCB/ENP	WCB/316	CF8M/316	LCC/316NACE
1	Body	ASTM A216-WCB	ASTM A216-WCB	ASTM A351-CF8M	ASTM A352-LCC
2	Adapter	ASTM A216-WCB	ASTM A216-WCB	ASTM A351-CF8M	ASTM A352-LCC
3	Ball	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
4	Seat Ring	PTFE	PTFE	PTFE	PTFE
5	Stem	AISI 4140/ENP	ASTM A182-F51	ASTM A182-F51	ASTM A182-F51
6	Gland Ring	ASTM A276-316	ASTM A276-316	ASTM A276-316	ASTM A276-316
7	Body Stud	ASTM A193-B7	ASTM A193-B7	ASTM A193-B8	ASTM A320-L7M
8	Body Nut	ASTM A194-2H	ASTM A194-2H	ASTM A194-8	ASTM A194-7M
9	Steel Ball	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
10	Antistatic Spring	Inconel X-750	Inconel X-750	Inconel X-750	Inconel X-750
11	Antistatic Spring	Inconel X-750	Inconel X-750	Inconel X-750	Inconel X-750
12	Spring Washer	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel
13	Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
14	*Gasket	Graphite	Graphite	Graphite	Graphite
15	*Packing	Graphite	Graphite	Graphite	Graphite
16	*O-ring	Viton	Viton	Viton	Viton
17	*O-ring	Viton	Viton	Viton	Viton
18	Lever Head	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
19	Lever Pipe	Carbon Steel Zinc Plated	Carbon Steel Zinc Plated	Carbon Steel Zinc Plated	Carbon Steel Zinc Plated
20	Nut	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
21	Position Screw	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
22	Screw	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
23	Screw	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
24	Washer	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
25	Key	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
26	Screw	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel

\*Recommended Spare Parts

# DIMENSIONS AND WEIGHT

## 2PC Body Cast Floating Ball Valve



FULL BORE		CLASS 150			
SIZE	d	L	H	W	WEIGHT
in	mm	mm	mm	mm	Kg
1/2	13	108	85	160	2
3/4	19	117	93	160	2
1	25	127	112	180	4
1-1/2	38	165	132	240	6
2	51	178	138	350	12
2-1/2	62	191	152	400	15
3	76	203	175	400	24
4	102	229	200	450	36
5	125	356	246	650	58
6	152	394	263	*300	94
8	203	457	299	*400	115
10	254	533	343	*400	282
12	303	610	409	*600	-

REDUCE BORE		CLASS 150				
SIZE	d	D	L	H	W	WEIGHT
in	mm	mm	mm	mm	mm	Kg
3/4*1/2	13	19	117	85	160	2.5
1*3/4	19	25	127	93	160	4.0
1-1/2*1	25	38	165	112	180	6.2
2*1-1/2	38	51	178	132	240	8.5
2-1/2*2	51	62	191	138	350	13
3*2	51	76	203	138	350	16
4*3	76	102	229	175	400	26
6*4	102	152	394	200	450	55
8*6	152	203	457	263	*300	83
10*8	203	254	533	299	*400	122

FULL BORE		CLASS 300			
SIZE	d	L	H	W	WEIGHT
in	mm	mm	mm	mm	Kg
1/2	13	140	85	160	2.5
3/4	19	152	93	160	4
1	25	165	112	180	5
1-1/2	38	190	132	240	10
2	51	216	138	400	13.5
2-1/2	62	241	155	400	21
3	76	283	175	450	30
4	102	305	200	500	50
5	125	381	246	550	65
6	152	403	263	*300	122
8	203	502	299	*400	150
10	254	568	501	*400	230

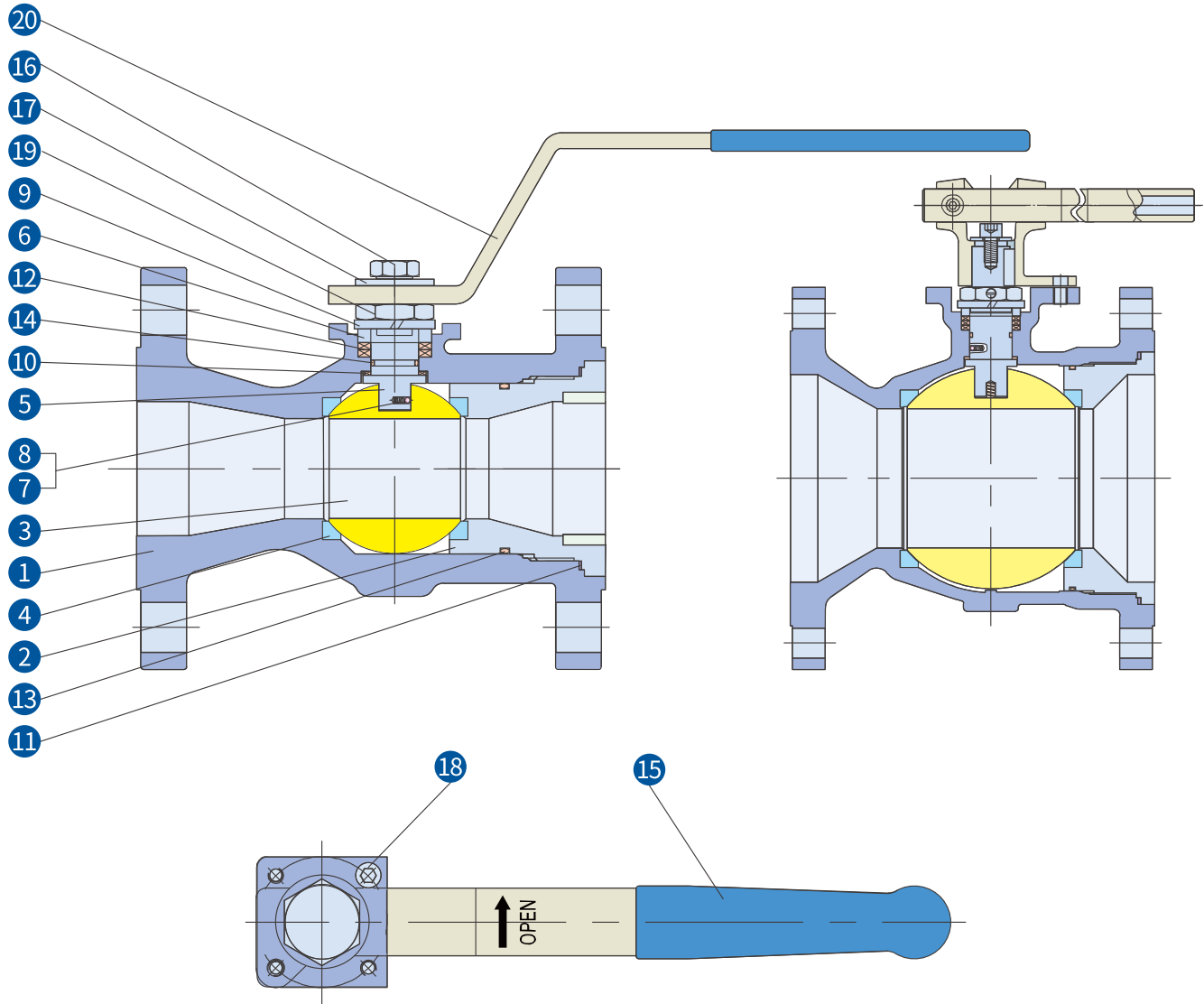
REDUCE BORE		CLASS 300				
SIZE	d	D	L	H	W	WEIGHT
in	mm	mm	mm	mm	mm	Kg
3/4*1/2	13	19	152	85	160	2.5
1*3/4	19	25	165	93	160	3.5
1-1/2*1	25	38	190	112	180	8.0
2*1-1/2	38	51	216	132	240	12
2-1/2*2	51	62	241	138	400	19
3*2	51	76	283	138	400	22
4*3	76	102	305	175	450	38
6*4	102	152	403	200	500	75
8*6	152	203	502	263	*300	130
10*8	203	254	568	299	*400	200

\* Gear Operated



# SERIES FR

## Material Specifications



### Features

- Size: 3/4"~6"
- Class: 150-300
- One Pieces Cast Steel Body
- Floating Ball, Reduced Bore
- Anti-static Device
- Blow-out Proof Stem
- Fire Safe Design

### Specifications

Design	ASME B16.34/API 608
Face to Face	ASME B16.10
End to End	ASME B16.10
End Flange	ASME B16.5
Test	API 598
Fire Safe Test	API607/API6FA
Special	NACE MR 0175

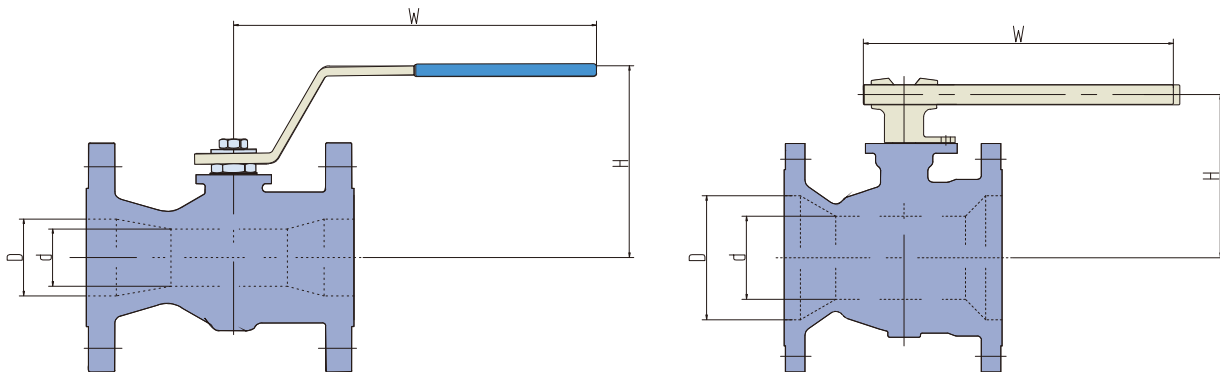
# FR BALL VALVE

## 1PC Body Cast Floating Ball Valve

NO.	PART	WCB/ENP	WCB/316	CF8M/316	LCC/316 NACE
1	Body	ASTM A216-WCB	ASTM A216-WCB	ASTM A351-CF8M	ASTM A352-LCC
2	Adapter	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
3	Ball	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
4	Seat Ring	PTFE	PTFE	PTFE	PTFE
5	Stem	AISI 4140/ENP	ASTM A182-F51	ASTM A182-F51	ASTM A182-F51
6	Gland Ring	ASTM A276-316	ASTM A276-316	ASTM A276-316	ASTM A276-316
7	Steel Ball	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
8	Antistatic Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750	INCONEL X-750
9	Spring Washer	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel
10	Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
11	* Gasket	Graphite	Graphite	Graphite	Graphite
12	* Packing	Graphite	Graphite	Graphite	Graphite
13	*O-ring	Viton	Viton	Viton	Viton
14	*O-ring	Viton	Viton	Viton	Viton
15	Lever Cover	Plastic	Plastic	Plastic	Plastic
16	Bolt	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
17	Washer	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
18	Position Screw	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
19	Nut	Carbon Steel	Carbon Steel	Stainless Steel	Carbon Steel
20	Lever	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel

\* Recommended Spare Parts

## DIMENSIONS AND WEIGHT



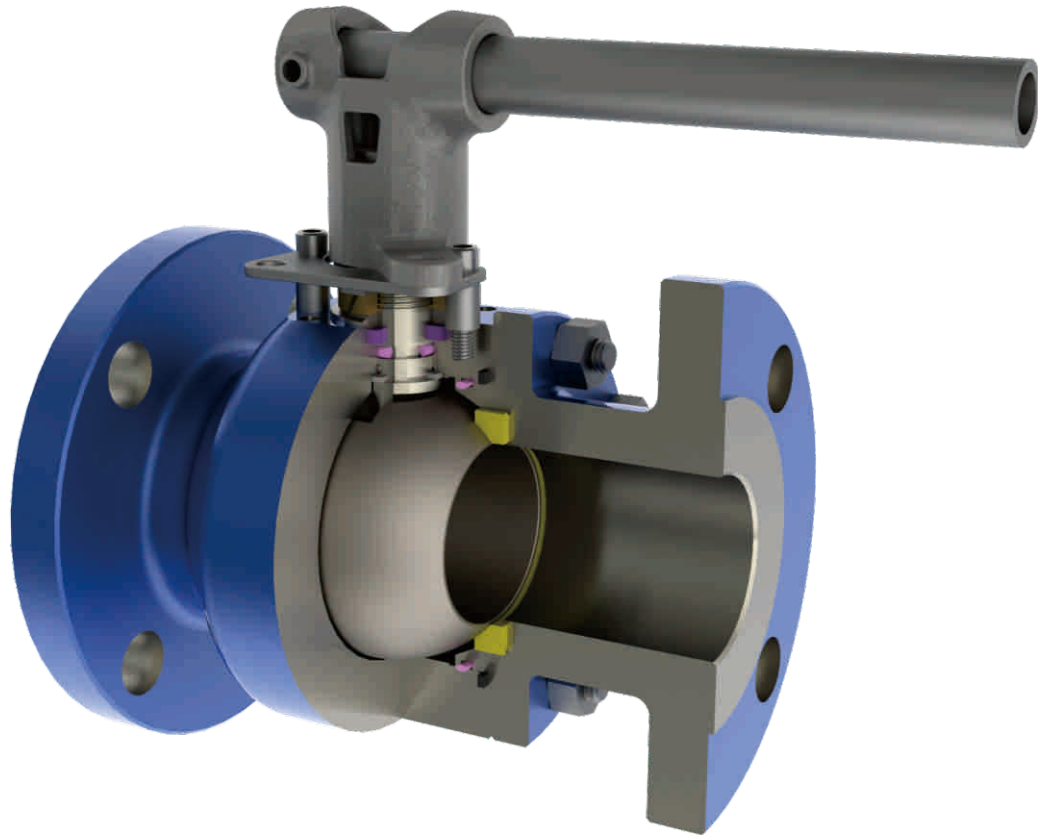
CLASS 150						
SIZE	d	D	L	H	W	WEIGHT
in	mm	mm	mm	mm	mm	Kg
3/4	13	19	117	89	160	2
1	19	25	127	90	160	3
1-1/2	25	38	165	106	240	5
2	38	51	178	131	240	8
3	62	76	203	160	400	16
4	76	102	229	186	400	26
6	102	152	267	284	500	41

CLASS 300						
SIZE	d	D	L	H	W	WEIGHT
in	mm	mm	mm	mm	mm	Kg
3/4	13	19	152	89	160	3
1	19	25	165	90	160	7.2
1-1/2	25	38	191	106	240	9
2	38	51	216	131	240	11
3	62	76	283	160	400	30
4	76	102	305	186	400	37
6	102	152	403	284	500	108

# SERIES FF

Material Specification

## 2PC/3PC Body Forged Floating Ball Valve



### Features

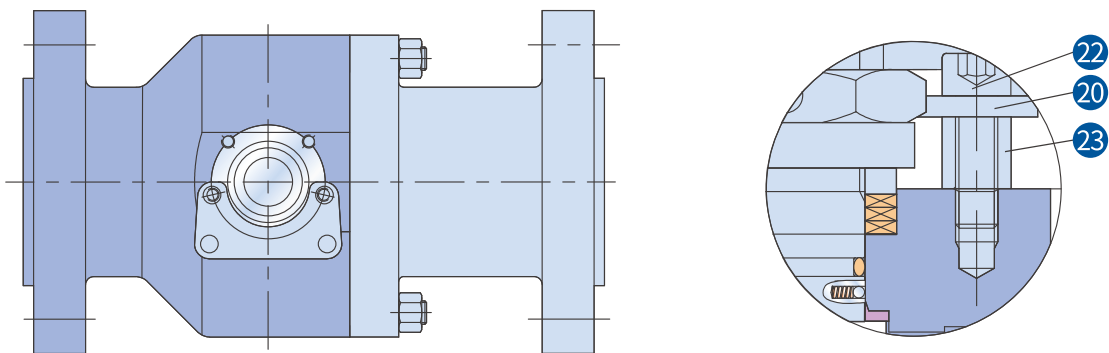
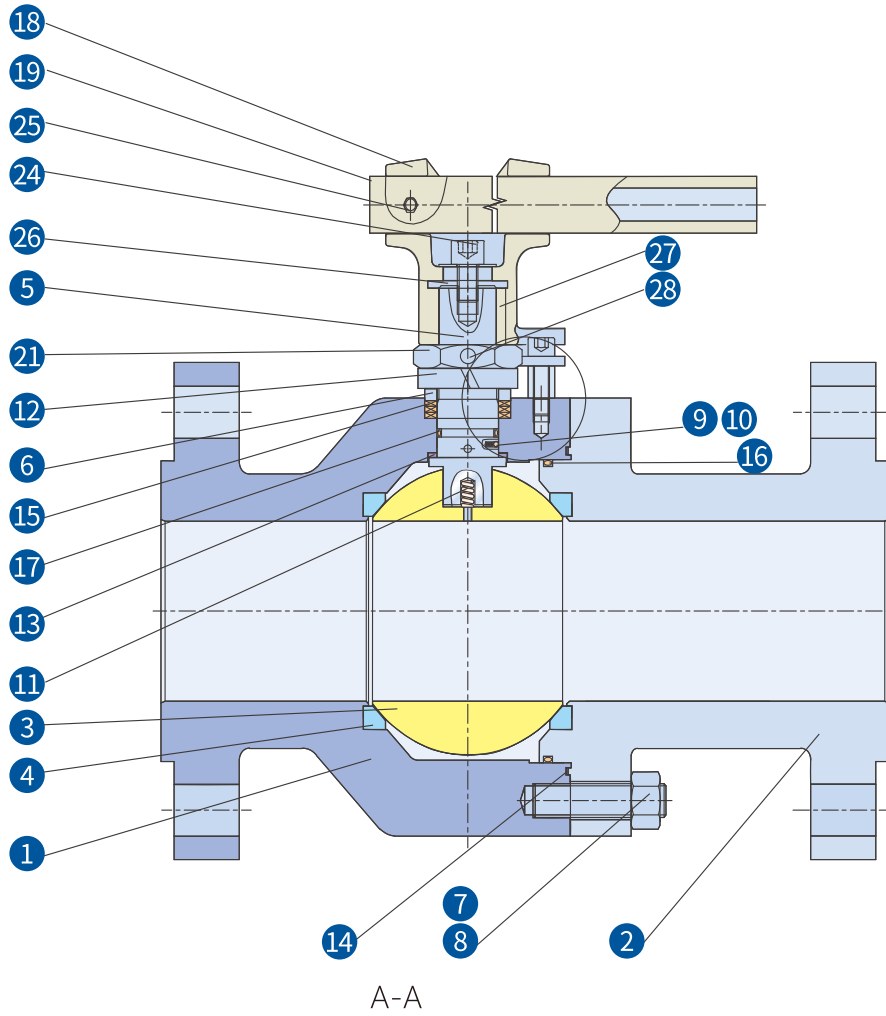
Size: 1/2"-10"  
 Class: 150-2500  
 2PC/3PC Body Forged Steel Body  
 Floating Ball, Full & Reduced Bore  
 Anti-static Device  
 Blow-out Proof Stem  
 Fire Safe Design  
 Low Emission

### Specifications

Design	ASME B16.34/API6D BS EN ISO 17292(BS5351)
Face to Face	ASME B16.10
End to End	ASME B16.10
End Flange	ASME B16.5
BW End	ASME B16.25
Test	API 598/BS EN 12266(BS 6755)
Fire Safe Test	API607/API6FA
Special	NACE MR 0175

# SERIES FF

## Material Specifications



**BALL VALVE**

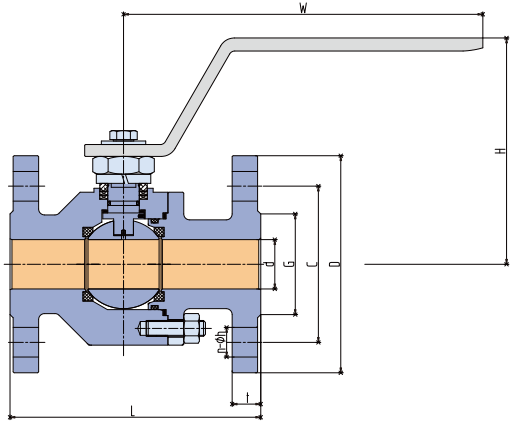
2PC/3PC Body Forged Floating Ball Valve

NO.	PART	A105/ENP	A105/316	F316/316	FL2/316 NACE
1	Body	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
2	Adapter	ASTM A105N	ASTM A105N	ASTM A182-F316	ASTM A350-LF2
3	Ball	ASTM A105N/ENP	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
4	Seat Ring	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK	PTFE/NYLON/PEEK
5	Stem	AISI4140/ENP	ASTM A182-F51	ASTM A182-F51	ASTM A182-F51
6	Gland Ring	ASTM A276-316	ASTM A276-316	ASTM A276-316	ASTM A276-316
7	Body Stud	ASTM A193-B7	ASTM A193-B7	ASTM A193-B8	ASTM A320-L7M
8	Body Nut	ASTM A194-2H	ASTM A194-2H	ASTM A194-8	ASTM A194-7M
9	Steel Ball	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
10	Antistatic Spring	Inconel X-750	Inconel X-750	Inconel X-750	Inconel X-750
11	Antistatic Spring	Inconel X-750	Inconel X-750	Inconel X-750	Inconel X-750
12	Spring Waasher	Alloy Steel	Alloy Steel	Alloy Steel	Alloy Steel
13	Thrust Washer	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE	SS+COPPER+PTFE
14	* Gasket	Graphite	Graphite	Graphite	Graphite
15	* Packing	Graphite	Graphite	Graphite	Graphite
16	*O-ring	Viton	Viton	Viton	Viton
17	*O-ring	Viton	Viton	Viton	Viton
18	Lever Head	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
19	Lever Pipe	Carbon Steel Zinc Plated	Carbon Steel Zinc Plated	Carbon Steel Zinc Plated	Carbon Steel Zinc Plated
20	Lock Plate	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
21	Nut	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
22	Screw	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
23	Pipe	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
24	Screw	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
25	Screw	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
26	Washer	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
27	Key	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
28	Screw	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel

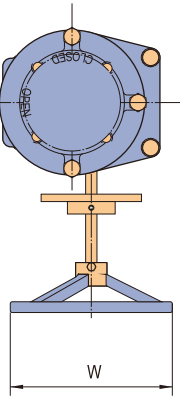
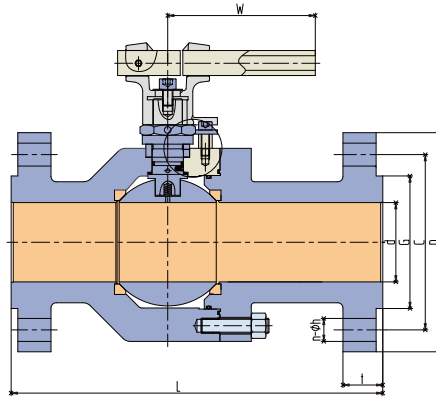
\*Recommended Spare Parts

# DIMENSIONS AND WEIGHT

2PC/3PC Body Forged Floating Ball Valve



Lever Operation



Gear Operation

FULLBORE		CLASS 150			
SIZE	d	L	H	W	WEIGHT
in	mm	mm	mm	mm	Kg
1/2	13	108	85	*160	2.8
3/4	19	117	93	*160	3.7
1	25	127	112	*180	5.3
1-1/2	38	165	125	*240	8.3
2	51	178	126	350	11.2
2-1/2	64	191	139	400	18.4
3	76	203	164	400	23.0
4	102	229	185	450	39.3
6	152	394	270	**300	90
8	203	457	360	**400	140
10	254	533	410	**400	230

REDUCE BORE		CLASS 150				
SIZE	d	D	L	H	W	WEIGHT
in	mm	mm	mm	mm	mm	Kg
3/4*1/2	13	19	117	85	*160	3.5
1*3/4	19	25	127	93	*160	5.0
1-1/2*1	25	38	165	112	*180	7.5
2*1-1/2	38	51	178	125	*240	10
2-1/2*2	51	64	191	126	350	16
3*2	51	76	203	126	350	21
4*3	76	102	229	164	400	35
6*4	102	152	394	185	450	73
8*6	152	203	457	270	**300	120
10*8	203	254	533	360	**400	200

FULLBORE		CLASS 300			
SIZE	d	L	H	W	WEIGHT
in	mm	mm	mm	mm	Kg
1/2	13	140	85	*160	3.0
3/4	19	152	93	*160	4.0
1	25	165	112	*180	6.6
1-1/2	38	190	125	*240	12.9
2	51	216	126	400	18.9
2-1/2	64	241	139	400	28
3	76	283	166	450	39
4	102	305	185	500	60
6	152	403	275	**300	130
8	203	502	360	**400	195
10	254	568	410	**400	290

REDUCE BORE		CLASS 300				
SIZE	d	D	L	H	W	WEIGHT
in	mm	mm	mm	mm	mm	Kg
3/4*1/2	13	19	152	85	*160	3.5
1*3/4	19	25	165	93	*160	5.3
1-1/2*1	25	38	190	112	*180	9.8
2*1-1/2	38	51	216	125	*240	15.9
2-1/2*2	51	62	241	126	400	23.5
3*2	51	76	283	126	400	29
4*3	76	102	305	166	450	49.5
6*4	102	152	403	185	500	95
8*6	152	203	502	275	*300	162.5
10*8	203	254	568	360	*400	242.5

\* Lever Operation  
\*\* Gear Operated

FULL BORE		CLASS 600			
SIZE in	d mm	L mm	H mm	W mm	WEIGHT Kg
1/2	13	165	85	*160	3.5
3/4	19	191	93	*180	5.0
1	25	216	112	*240	7.5
1-1/2	38	241	125	350	15
2	51	292	130	400	23
3	76	356	170	500	48
4	102	432	216	700	80

REDUCE BORE		CLASS 600				
SIZE in	d mm	D mm	L mm	H mm	W mm	WEIGHT Kg
3/4*1/2	13	19	191	85	*160	4.0
1*3/4	19	25	216	93	*180	5.5
1-1/2*1	25	38	241	112	*240	10.5
2*1-1/2	38	51	292	125	350	20
3*2	51	76	356	130	400	29
4*3	76	102	432	170	500	59
6*4	102	152	559	216	700	95

FULL BORE		CLASS 900			
SIZE in	d mm	L mm	H mm	W mm	WEIGHT Kg
1/2	13	216	85	*160	5.0
3/4	19	229	93	*180	8.0
1	25	254	115	*240	10.0
1-1/2	38	305	128	400	20
2	51	368	148	450	25
3	76	381	196	600	50

REDUCE BORE		CLASS 900				
SIZE in	d mm	D mm	L mm	H mm	W mm	WEIGHT Kg
3/4*1/2	13	19	229	85	*160	7.0
1*3/4	19	25	254	93	*180	9.5
1-1/2*1	25	38	305	115	*240	16.5
2*1-1/2	38	51	368	128	400	23
3*2	51	76	381	148	450	42
4*3	76	102	457	196	600	65

FULL BORE		CLASS 1500			
SIZE in	d mm	L mm	H mm	W mm	WEIGHT Kg
1/2	13	216	85	*160	5.0
3/4	19	229	112	*180	8.0
1	25	254	115	*240	10.0
1-1/2	38	305	123	400	20
2	51	368	132	450	30

REDUCE BORE		CLASS 1500				
SIZE in	d mm	D mm	L mm	H mm	W mm	WEIGHT Kg
3/4*1/2	13	19	229	85	*160	7.0
1*3/4	19	25	254	112	*180	9.5
1-1/2*1	25	38	305	115	*240	16.5
2*1-1/2	38	51	368	123	400	23
3*2	51	76	473	132	450	50

FULL BORE		CLASS 2500			
SIZE in	d mm	L mm	H mm	W mm	WEIGHT Kg
1/2	13	264	93	*180	7.5
3/4	19	273	96	*240	12.0
1	25	308	117	*350	15.0
1-1/2	38	384	132	450	30
2	44	451	138	550	37.5

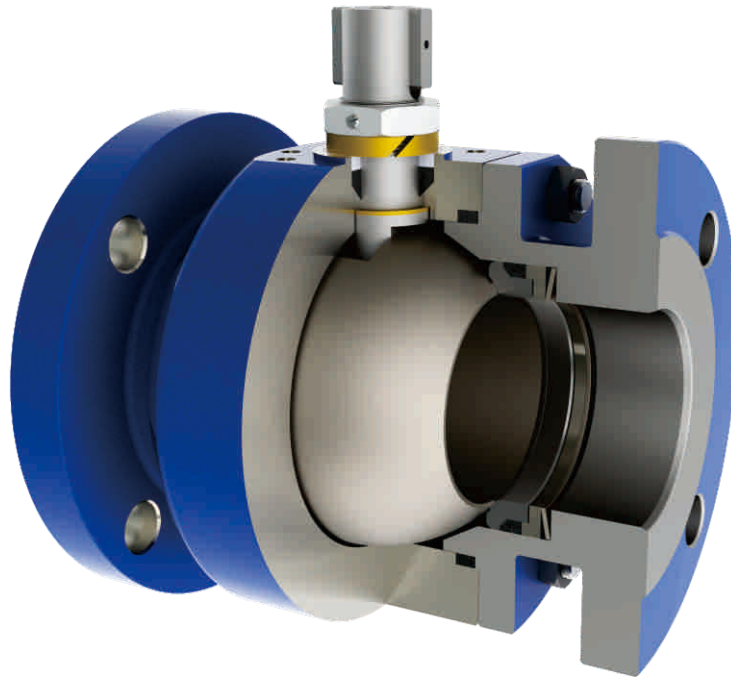
REDUCE BORE		CLASS 2500				
SIZE in	d mm	D mm	L mm	H mm	W mm	WEIGHT Kg
3/4*1/2	13	19	273	93	*180	11.0
1*3/4	19	25	308	96	*240	14.0
1-1/2*1	25	38	384	117	*350	25.0
2*1-1/2	38	44	451	132	450	35
3*2	44	64	578	138	550	60

\* Gear Operated

# SERIES FM

## Material Specification

### Metal to Metal Seat Floating Ball Valve



#### Severe Service

Normal soft-seated valve can not be used for abrasive service or for operation under high temperature that prohibits the use of a resilient material. VIZA metal to-metal seated floating ball valve (series FM/FM-H, range 1/2"~4" class 150 & 300, 1/2"~2" class 600) is designed for this type of severe service that seating action is provided by the metal to metal contacting and seating action is emerged between ball and seat ring.

#### General Design

Blow-out proof stem, anti-static device are designed as standard requirements.

#### Superior Sealing

High precision machining and seat to ball rubbing, as well as seat spring structure, push up stream seat tightly against the ball surface, which resulted in reliable sealing performance of ball and seat and a superior sealing conforming to ANSI/FCI 70-2 class V.

#### Stem Seal

Belleville spring acted gland provides live-loading on stem packing. Equipped with Special low emission packing, the environmental-friendly valve is available on request.

#### Reliable Operations

Spring-loaded seats maintain close contacting with the ball ensuring tight sealing even at low pressures. This also results in stable operating torques at high differential pressures over a wide range of temperatures or/and high frequency.

#### Fire Safe

The features of metal seated and graphite sealing are to ensure the pass requirement of fire safe testing.

#### Material Selection

Various materials can be chosen for the service up to 500°C. For service temperature above 300°C the extension bonnet is required.

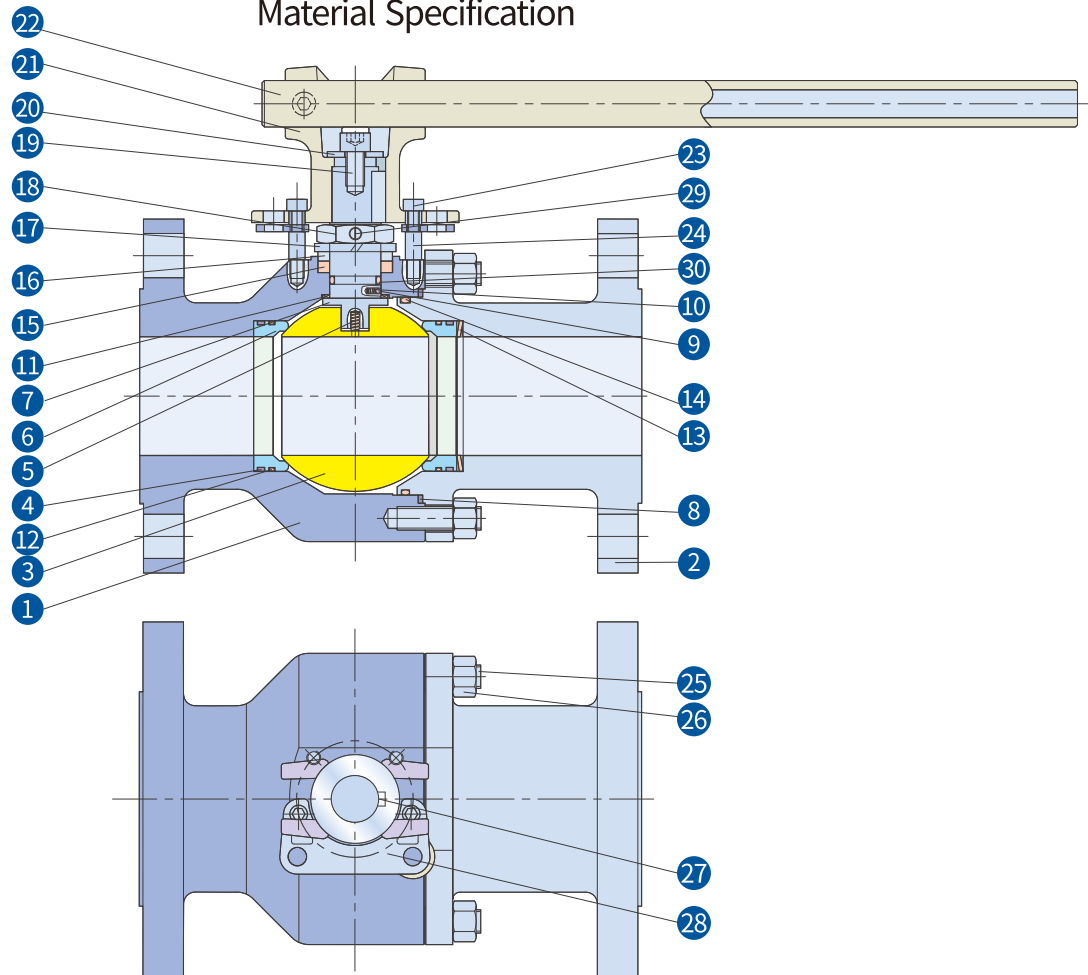
#### Applications

Hard faced ball and seats (TCC as standard, other special coatings are available on request) allow the valve to be used in more severe services such as slurries, pulp stock, mining and other abrasive media in long life.



# SERIES FM

## Material Specification



## FM BALL VALVE

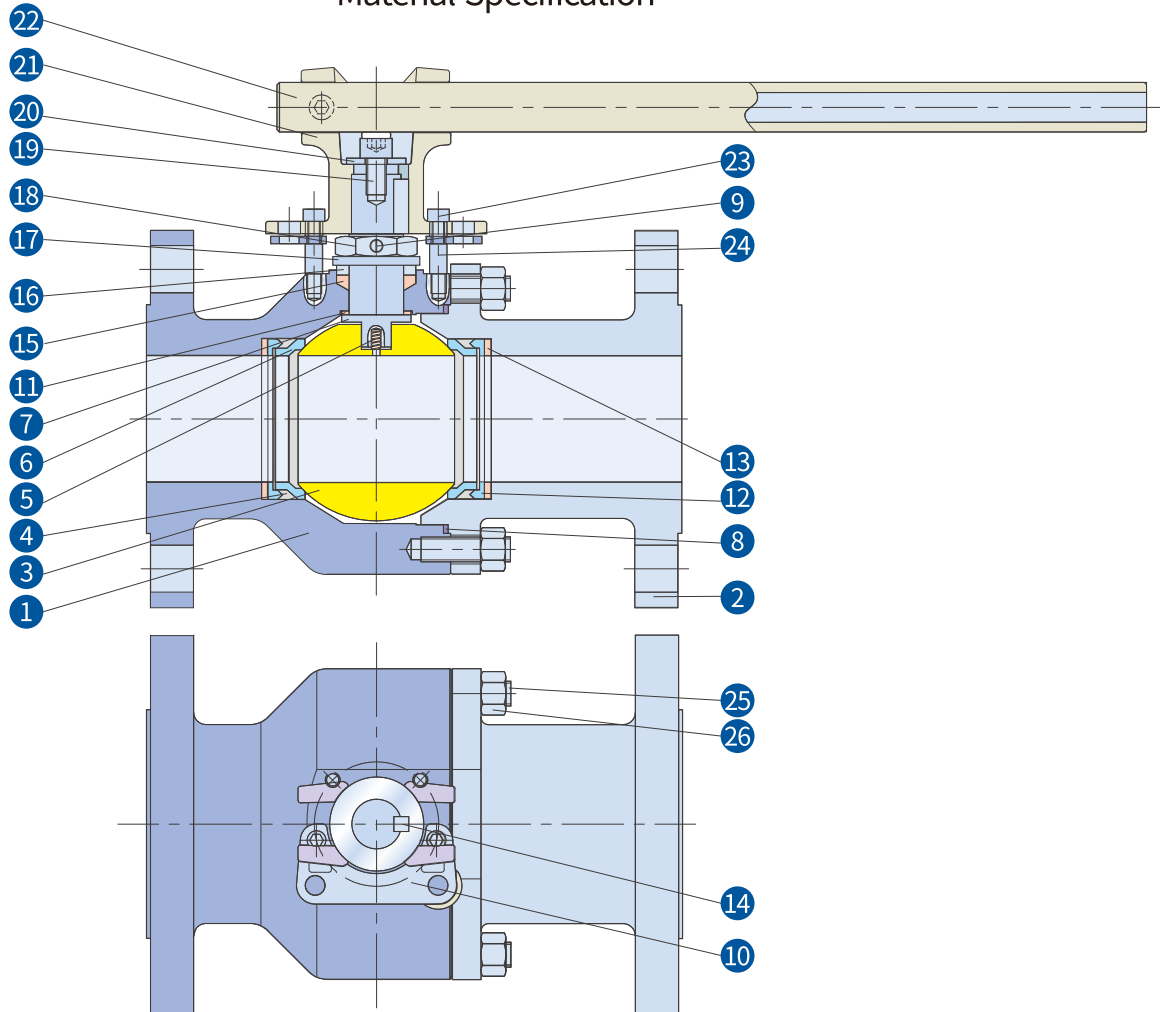
Metal to Metal Seat Floating Ball Valve

NO.	PART	A105/ENP	NO.	PART	A105/ENP
1	Body	ASTM A105N	16	Gland	Stainless Steel
2	Adapter	ASTM A105N	17	Spring Washer	Alloy Steel
3	Ball	ASTM A182 F6a/TCC	18	Nut	Steel
4	Seat Packing	Graphite	19	Screw	Stainless Steel
5	Antistatic Spring	INCONEL X-750	20	Washer	Carbon Steel
6	Seat Ring	ASTM A182 F6a/TCC	21	Tee Head	Carbon Steel
7	Stem	17-4PH	22	Lever Pipe	Carbon Steel
8	*Gasket	Graphite	23	Screw	Carbon Steel
9	Steel Ball	Stainless Steel	24	Pipe	Carbon Steel
10	Antistatic Spring	Inconel X-750	25	Body Stud	ASTM A194 2H
11	Thrust Washer	SS+COPPER+PTFE	26	Body Nut	ASTM A193 B7
12	*O-Ring	Viton	27	Key	Carbon Steel
13	Belleville Spring	Alloy Steel	28	Lock Plate	Carbon Steel
14	*O-ring	Viton	29	Screw	Stainless Steel
15	*Packing	Graphite	30	O-ring	Viton

\*Recommended Spare Parts

# SERIES FM-H

## Material Specification



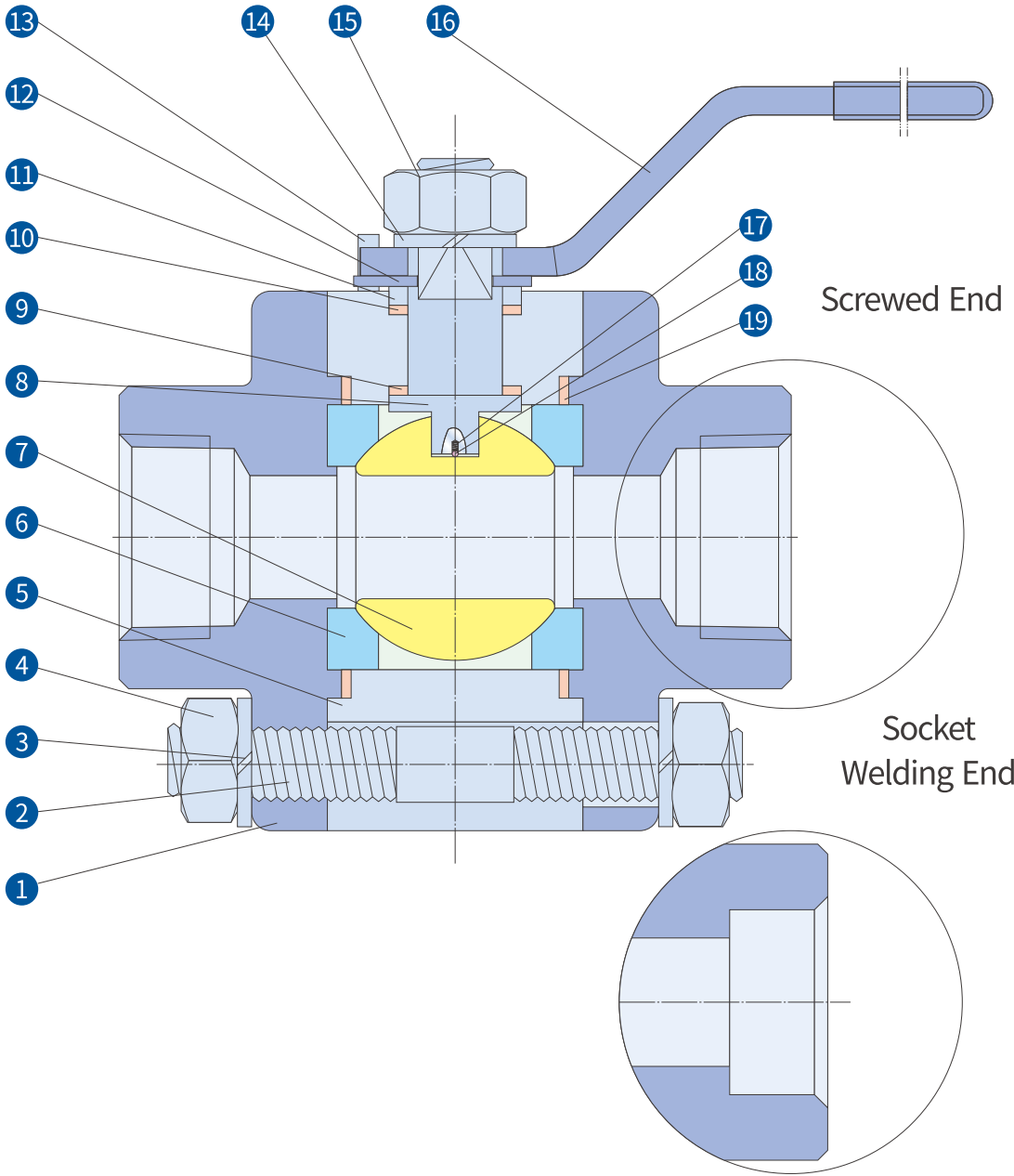
### FM-H BALL VALVE

High Temperature Metal Seat Floating Ball Valve

NO.	PART	A105/ENP	NO.	PART	A105/ENP
1	Body	ASTM A105N	14	Key	Carbon Steel
2	Adapter	ASTM A105N	15	Packing	Graphite
3	Ball	ASTM A182 F6A/TCC	16	Gland	Stainless Steel
4	Seat Packing	Graphite	17	Spring Washer	Alloy Steel
5	Antistatic Spring	INCONEL X-750	18	Nut	Steel
6	Seat Ring	ASTM A182 F6a/TCC	19	Screw	Stainless Steel
7	Stem	17-4PH	20	Washer	Carbon Steel
8	Gasket	Graphite	21	Tee Head	Carbon Steel
9	Screw	Stainless Steel	22	Lever Pipe	Carbon Steel
10	Lock Plate	Carbon Steel	23	Screw	Carbon Steel
11	Thrust	SS+COPPER+PTFE	24	Pipe	Carbon Steel
12	Push Ring	Stainless Steel	25	Body Stud	ASTM A194 2H
13	Belleville Spring	Alloy Steel	26	Body Nut	ASTM A193 B7

# SERIES FS

## Material Specifications



### Features

- Size: 1/2"-2"
- Class: 800-1500
- Three Pieces Forged Steel Body
- Floating Ball
- Anti-static Device
- Blow-out Proof Stem

### Specifications

Design	ASME B16.34/ BS EN ISO 17292(BS5351)
End to End	Manufacturer Standard
Screwed End	ASME B1.20.1
Socket Welding End	ASME B16.11
Test	API 598/BS EN 12266(BS 6755)
Special	NACE MR 01 75

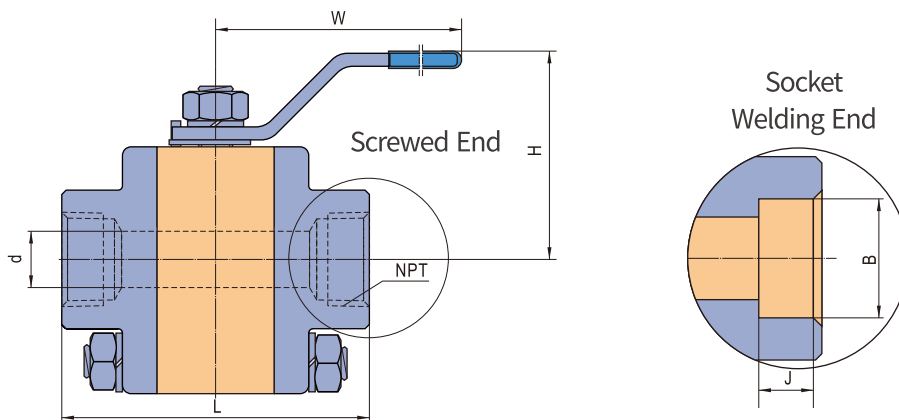
# FS BALL VALVE

Small Sizes Forged Floating Ball Valve

NO.	PART	A105/304	A105/316	F316/316	LF2/316NACE
1	Adapter	ASTM A105	ASTM A105	ASTM A182-F316	ASTM A350-LF2
2	Body Bolt	ASTM A193-B7	ASTM A193-B7	ASTM A193-B8	ASTM A320-L7M
3	Spring Washer	Carbon Steel	Carbon Steel	Stainless Steel	Stainless Steel
4	Body Nut	ASTM A194-2H	ASTM A194-2H	ASTM A194-8	ASTM A194-7M
5	Body	ASTM A105	ASTM A105	ASTM A182-F316	ASTM A350-LF2
6	Seat	PTFE	PTFE	PTFE	PTFE
7	Ball	ASTM A182-F304	ASTM A182-F316	ASTM A182-F316	ASTM A182-F316
8	Stem	ASTM A276-304	ASTM A276-316	ASTM A276-316	ASTM A276-316
9	Thrust Washer	PTFE	PTFE	PTFE	PTFE
10	* Stem Packing	PTFE	PTFE	PTFE	PTFE
11	Gland	ASTM A276-410	ASTM A276-410	ASTM A276-316	ASTM A276-316
12	Stop Plate	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
13	Stop Pin	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
14	Spring Washer	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
15	Lever Nut	ASTM A194-2H	ASTM A194-2H	ASTM A194-8	ASTM A194-7H
16	Lever	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
17	Antistatic Spring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
18	Steel ball	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
19	* Body Gasket	PTFE	PTFE	PTFE	PTFE

\* Recommended Spare Parts

## DIMENSIONS AND WEIGHT



CLASS 800 / 1500								
SIZE in	d mm	L mm	H mm	W mm	B mm	J mm	NPT mm	WEIGHT Kg
1/2	13	92	65	140	21.8	10	1/2	1.5
3/4	18	111	75	140	27.1	13	3/4	1.7
1	23.5	127	85	200	33.8	13	1	3.3
1-1/4	28	140	98	230	42.6	13	1-1/4	7.0
1-1/2	35	152	105	240	48.7	13	1-1/2	8.0
2	49	172	115	240	61.2	16	2	11.0

# AUTOMATION VALVE PACKAGE

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## Product Range:

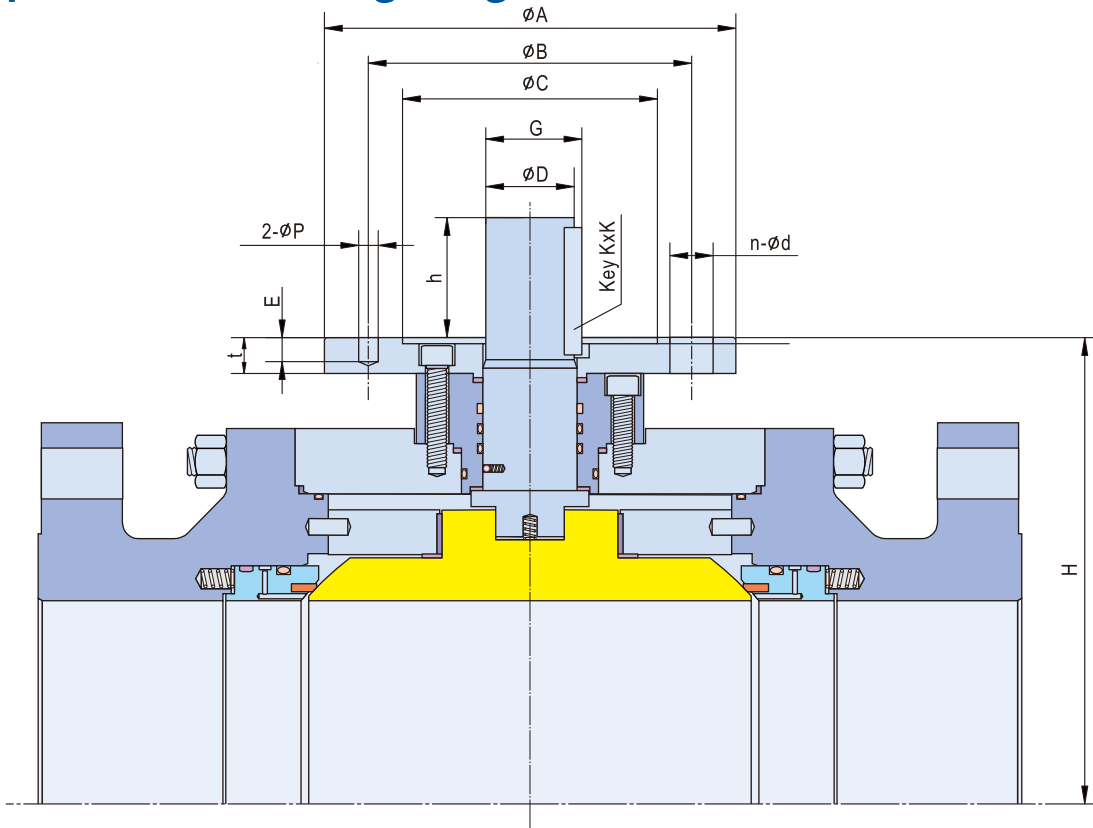
- Valve Type: Gate/Globe/Ball/Butterfly Valves
- Actuator Model: Motor, Pneumatic, Hydraulic, Gas over oil, etc
- Accessories: Solenoid, Filter, Regulator, Air Control Valve etc.

## VIZA Features:

- Accurate torque data / control
  - Advanced sizing program
  - Actuator is always optimized and the most economical solution is selected
  - FAT at factory to minimize the risk of problem exploring at site
  - Rotork, Biffi, Auma, Bettis , etc all brands available
- 



# Torque Value & Mounting Flange Dimensions



SIZE inch	Class	Torque		Flange Dimensions								ISO 5211 Flange No.	Key Size KxK	G mm	D mm	h mm	H mm
		N.m	lb.ft	A	B	C	f	E	t	n-d	p						
2*1-1/2	150	24	18	90	70	55	3	8	13	4-9	6	F07	6x6	23	20	25	94
	300	61	45	90	70	55	3	8	13	4-9	6	F07	6x6	23	20	25	94
	600	109	80	90	70	55	3	8	13	4-9	6	F07	6x6	23	20	25	98
	900	144	106	90	70	55	3	10	15	4-9	6	F07	6x6	28	22	25	121
	1500	233	172	90	70	55	3	10	15	4-9	6	F07	6x6	28	22	25	121
2	150	50	37	90	70	55	3	8	13	4-9	6	F07	6x6	25	22	26	106
	300	94	69	90	70	55	3	8	13	4-9	6	F07	6x6	25	22	26	107
	600	166	122	90	70	55	3	8	13	4-9	6	F07	6x6	25	22	25	106
	900	267	197	125	102	70	4	10	17	4-11	8	F10	8x8	32	28	30	133
	1500	429	316	125	102	70	4	10	17	4-11	8	F10	8x8	36	28	30	133
	2500	451	333	150	125	85	3	12	20	4-13	10	F12	10x10	41	36	41	140
3	150	113	83	125	102	70	4	10	17	4-11	8	F10	8x8	32	28	30	137
	300	224	165	125	102	70	4	10	17	4-11	8	F10	8x8	32	28	30	137
	600	204	150	125	102	70	4	10	17	4-11	8	F10	8x8	32	28	30	140
	900	617	455	150	125	85	3	14	18	4-13	10	F12	10x10	41	36	41	140
	1500	784	578	150	125	85	4	12	18	4-13	10	F12	10x10	46	36	55	163
	2500	1159	855	175	140	100	4	18	24	4-18	10	F14	12x12	51	45	65	190

SIZE inch	Class	Torque		Flange Dimensions(mm)								ISO 5211 Flange No.	Key Size KxK mm	G mm	D mm	h mm	H mm
		N.m	lb.ft	A	B	C	f	E	t	n-d	p						
4	150	171	126	125	102	70	4	10	17	4-11	8	F10	8x8	32	28	30	158
	300	354	261	125	102	70	4	10	17	4-11	8	F10	8x8	32	28	30	150
	600	684	505	150	125	85	3	14	18	4-13	10	F12	10x10	41	36	40	160
	900	888	655	175	140	100	4	12	20	4-18	10	F14	12x12	51	45	62	174
	1500	1548	1142	210	165	130	5	15	24	4-22	12	F16	14x14	57	50	75	193
	2500	2083	1536	210	165	130	5	15	26	4-22	12	F16	14x14	62	55	80	215
6	150	432	319	150	125	85	3	10	18	4-13	10	F12	10x10	41	36	55	188
	300	927	684	150	125	85	3	10	18	4-13	10	F12	10x10	41	36	55	188
	600	1800	1328	175	140	100	4	12	20	4-18	10	F14	12x12	51	45	65	208
	900	2443	1802	210	165	130	5	15	22	4-22	12	F16	14x14	62	55	82	220
	1500	3340	2464	210	165	130	5	18	24	4-22	14	F16	16x16	68	60	90	248
	2500	5054	3728	300	254	200	5	22	31	8-18	16	F25	18x18	88	70	115	304
8	150	798	589	210	165	130	5	12	20	4-22	10	F16	12x12	51	45	60	233
	300	1733	1278	210	165	130	5	12	20	4-22	10	F16	12x12	51	45	60	233
	600	3364	2481	210	165	130	5	15	22	4-22	12	F16	14x14	69	55	80	249
	900	4825	3559	210	165	130	5	14	22	4-22	14	F16	16x16	76	60	95	268
	1500	6568	4845	300	254	200	5	20	28	8-18	16	F25	18x18	88	70	105	306
	2500	13377	9867	350	298	230	5	20	42	8-22	20	F30	20x20	100	80	100	376
10	150	1334	984	210	165	130	5	15	22	4-22	12	F16	14x14	62	55	80	280
	300	2929	2160	210	165	130	5	15	30	4-22	12	F16	14x14	62	55	80	280
	600	5140	3791	210	165	130	5	18	24	4-22	14	F16	16x16	68	60	90	305
	900	7706	5684	300	254	200	5	20	28	8-18	16	F25	18x18	88	70	100	339
	1500	12120	8940	350	298	230	5	20	32	8-22	20	F30	20x20	105	85	125	349
	2500	18406	13576	350	298	230	5	25	60	8-22	20	F30	24x24	119	95	120	470
12	150	1876	1384	210	165	130	5	18	25	4-22	14	F16	16x16	68	60	90	330
	300	4112	3033	210	165	130	5	18	25	4-22	14	F16	16x16	68	60	90	330
	600	7134	5262	300	254	200	5	18	25	8-18	16	F25	18x18	79	70	105	351
	900	9284	6848	300	254	200	5	20	28	8-18	16	F25	18x18	93	75	110	372
	1500	15337	11313	350	298	230	5	26	38	8-22	20	F30	24x24	119	95	140	421
	2500	33596	24780	415	356	260	6	26	65	8-22	20	F35	32x32	152	120	150	529
14	150	2465	1818	300	254	200	5	20	26	8-18	16	F25	16x16	73	65	95	535
	300	5415	3994	300	254	200	5	20	26	8-18	16	F25	16x16	73	65	105	360
	600	8205	6052	300	254	200	5	20	28	8-18	16	F25	18x18	93	75	110	376
	900	12258	9042	350	298	230	5	20	30	8-22	20	F30	20x20	105	85	129	411
	1500	19859	14648	350	298	230	5	30	36	8-22	20	F30	24x24	129	105	140	449
16	150	3247	2395	300	254	200	5	20	28	8-18	16	F25	18x18	84	75	110	393
	300	7110	5244	300	254	200	5	20	28	8-18	16	F25	18x18	84	75	110	406
	600	11386	8398	300	254	200	5	20	28	8-18	16	F25	20x20	105	85	125	432
	900	18748	13829	350	298	230	5	20	35	8-22	20	F30	24x24	119	95	140	475
	1500	25929	19125	415	356	260	5	24	42	8-33	22	F35	32x32	136	120	158	544

SIZE inch	Class	Torque		Flange Dimensions								ISO 5211 Flange No.	Key Size KxK	G mm	D mm	h mm	H mm
		N.m	lbf.ft	A	B	C	f	E	t	n-d	p						
18	150	4011	2959	300	254	200	5	22	28	8-18	16	F25	18x18	84	75	115	436
	300	9257	6828	300	254	200	5	20	28	8-18	16	F25	20x20	95	85	122	450
	600	14570	10747	300	254	200	5	20	32	8-18	16	F25	24x24	119	95	140	481
	900	27742	20462	415	356	260	5	24	42	8-33	22	F35	32x32	136	120	163	526
	1500	46244	34110	475	406	300	8	40	63	8-38	28	F40	36x36	176	140	170	583
20	150	4991	3681	300	254	200	5	20	30	8-18	16	F25	20x20	90	80	120	477
	300	11337	8362	300	254	200	5	20	30	8-18	16	F25	24x24	107	95	140	488
	600	22735	16769	350	298	230	5	25	32	8-22	20	F30	28x28	119	105	170	532
	900	36369	26826	475	406	300	8	40	63	8-38	28	F40	36x36	176	140	170	569
	1500	62183	45866	475	406	300	8	40	63	8-38	30	F40	40x40	200	160	202	694
22	150	6293	4642	300	254	200	5	20	30	8-18	16	F25	20x20	90	80	120	517
	300	14259	10517	350	298	230	5	22	38	8-22	20	F30	28x28	107	95	134	537
	600	28561	21067	415	356	260	5	24	38	8-33	22	F35	32x32	136	120	180	577
24	150	9063	6685	300	254	200	5	22	32	8-18	16	F25	24x24	102	90	135	562
	300	20151	14863	350	298	230	5	25	32	8-22	20	F30	28x28	124	110	165	565
	600	41458	30579	415	356	260	5	30	52	8-33	28	F35	36x36	176	140	181	628
	900	58002	42782	475	406	300	8	35	63	8-38	28	F40	40x40	200	160	192	682
	1500	113754	83905	560	483	370	8	40	63	12-38	35	F48	45x45	225	180	250	771
26	150	10824	7984	350	298	230	5	25	32	8-22	20	F30	28x28	119	150	155	595
	300	23570	17385	415	356	260	5	24	38	8-33	22	F35	32x32	136	120	180	635
	600	45973	33910	475	406	300	8	40	63	8-38	28	F40	36x36	176	140	155	679
28	150	9711	7163	350	298	230	5	25	32	8-22	20	F25	28x28	119	105	123	625
	300	21502	15860	415	356	260	5	24	42	8-33	22	F35	32x32	136	120	165	675
	600	49553	36550	475	406	300	8	40	63	8-38	28	F40	36x36	176	140	170	726
30	150	18662	13765	350	298	230	5	28	42	8-22	20	F30	32x32	136	120	160	705
	600	68172	50285	475	406	300	8	40	63	8-38	28	F40	40x40	190	150	228	778
32	150	16508	12176	350	298	230	5	28	42	8-22	20	F30	32x32	136	120	160	720
	300	35207	25969	415	356	260	5	30	52	8-33	28	F35	36x36	176	140	180	759
36	150	21850	16117	415	356	260	5	24	42	8-33	22	F35	32x32	136	120	166	808
	300	48885	36058	475	406	300	8	40	63	8-38	28	F40	40x40	200	160	130	830
40	150	25236	18614	415	356	260	5	24	42	8-33	22	F35	32x32	136	120	162	884
	300	55754	41124	475	406	300	8	40	63	8-38	28	F40	40x40	200	160	150	909
42	150	29970	22106	415	356	260	5	30	52	8-33	28	F35	36x36	158	140	165	909
	300	65508	48319	560	483	370	8	40	63	8-38	35	F48	45x45	205	180	196	933
48	150	42388	31265	560	483	370	8	40	63	12-38	35	F48	45x45	245	200	225	1030
	300	95559	70484	560	483	370	8	40	63	12-38	35	F48	45x45	205	200	225	1054

Notes: 1.The above table is for TF, TW&TT series valves, which are with ISO 5211 mounting flange and adaptability for all types actuators mounting.  
 2.The torque is for valves with NYLON seat as per different size/class selection, other applications please contact manufacturer.  
 3.The torque value showed in above table is the valve torque at normal temperature. For customer's sizing actuator:  
 a.If medium temperature is -10°C ~40°C , the output torque of actuator should be 1.5 times larger than the valve torque;  
 b.If medium temperature is less than -10°C , the output torque of actuator should be 2 or 2.5 times larger than the valve torque.



## Floating Ball Valve Design Torque

Size (inch)	Design Torque									
	Class 150		Class 300		Class 600		Class 900		Class 1500	
	N.m	Lbf.ft	N.m	Lbf.ft	N.m	Lbf.ft	N.m	Lbf.ft	N.m	Lbf.ft
1/2	12	9	17	13	30	22	38	28	51	38
3/4	14	10	23	17	38	28	56	41	71	52
1	27	20	48	35	66	49	98	72	130	96
1-1/2	55	41	89	66	120	89	189	139	238	176
2	75	55	100	74	160	118	240	177	350	258
2-1/2	125	92	141	104	233	172	390	288	550	406
3	162	119	216	159	308	227	610	450	980	723
4	234	173	476	351	635	468	-	-	-	-
6	804	593	1338	987	1944	1434	-	-	-	-
8	1410	1040	3100	2286	-	-	-	-	-	-
10	2600	1918	5400	3983	-	-	-	-	-	-

- \* 1. For FC, FR & FF series valves, torque is the same.
- 2. All valves are in normal temperature, with PTFE seat for Class 150-300 and Nylon seat for Class 600-1500.
- 3. For cryogenic ball valve, torque will be 2~2.5 times larger than the above torque.
- 4. Torque shown in this table is to be used as a guide for actuator selection. A safety factor of 1.5 is recommended for actuator sizing.
- 5. Torque may be changed according to different medium and trim material.

## Ball Valve Flow Coefficient (Cv)

Size (inch)	Cv					
	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
1/2	24	24	24	24	24	24
3/4	53	53	53	53	53	53
1	92	92	92	92	92	92
1-1/2	211	211	211	211	211	211
2	381	381	381	381	381	283
3	845	845	845	845	845	600
4	1523	1523	1523	1523	1523	1160
6	3381	3381	3381	3381	3120	2590
8	6031	6031	6031	6031	5508	4795
10	9442	9442	9442	9442	8500	7410
12	13614	13614	13614	13614	12223	10433
14	16621	16621	16621	15363	14800	-
16	21920	21920	21920	20581	19178	-
18	28076	28076	28076	26435	24243	-
20	34995	34995	34995	32743	30565	-
22	42676	42676	42676	40184	35860	-
24	51117	51117	51117	47884	41733	-
26	59012	59012	59012	56076	-	-
28	68872	68872	68872	65110	-	-
30	79493	79493	79493	74610	-	-
32	89268	89268	89268	84977	-	-
34	101307	101307	101307	96020	-	-
36	112306	112306	112306	107487	-	-
40	139982	139982	139982	-	-	-

- Note: 1. The flow coefficient "Cv" of a valve is the flow rate in Gallons /minute of 60°F water through a fully opened valve, at a pressure drop of 1 psi across the valve.  
 2. All the ball valves are in full bore.

## Soft Materials Data

### Specifications for Seat Materials

Properties	PTFE (TFM1700)	RPTFE(TFM1700 + 15%GF)KT-7A	RPTFE(TFM1700 + 15%CF)KT-009	PCTFE
Tensile Strength (MPa)	32	14.5-16.5	22-28	65
Compressive Strength (MPa)	25-35	30-40	30-40	65
Elongation (%)	530-710	240-250	280	140
Hardness(Shore D)	57±5	60±5	60-70	80
Water Absorption (%)	<0.01	<0.01	<0.01	/
Specific Gravity (g/cm <sup>3</sup> )	2.16	2.22-2.3	2.1-2.2	2.1-2.2
Temperature Range	-196 ~ +200°C -320 ~ +392°F	-100~ +180°C -148 ~ +356°F	-100 ~ +180°C -148 ~ +356°F	-196 ~ +150°C -320 ~ +302°F
Pressure Rating (Class)	150-300	150-300	150-300	150-900
Valve Type	Floating,Trunnion	Floating,Trunnion	Floating, Trunnion	Floating, Trunnion
Size Range (Inch)	1/2"-12"	1/2"-6"	1/2"-6"	Any Size
Service Application	Chemical	Chemical	Chemical	Cryogenic

Properties	PEEK	NYLON S	NYLON 1010	DEVLON V
Tensile Strength (MPa)	75-80	60-70	50	79.9
Compressive Strength (MPa)	100-130	100	60-70	139.9
Elongation (%)	25	30-60	180	5.37
Hardness(Shore D)	80-90	72-78	75±5	78-80
Water Absorption (%)	<0.14	<0.3	<0.3	0.3
Specific Gravity (g/cm <sup>3</sup> )	1.32	1.15	1.01	1.14
Temperature Range	-196~ +320°C -320 ~ +608°F	-50~ +120°C -58 ~ +248°F	-40 ~ +100°C -40 ~ +212°F	-50~ +120°C -58 ~ +248°F
Pressure Rating (Class)	150-2500	150-1500	600-1500	600-1500
Valve Type	Floating, Trunnion	Trunnion	Floating	Floating, Trunnion
Size Range (Inch)	Any Size	Any Size	Any Size	Any Size
Service Application	High Pressure, HighTemperature, Water,Steam	Oil, Gas	Oil, Gas	Oil, Gas

### Specifications for Seal Materials

Properties	Viton A	Viton B	Viton AED	HNBR(HSN75)	HNBR (HSN 90)
Temperature Range	-25~+250°C -13~+482°F	-18~+250°C 0~+482°F	-10~+250°C +14~+482°F	-40~+150°C -40 ~ + 302°F	-25~ + 150°C -13~+302°F
Hardness (Shore A)	75 ± 5	85 ± 5	90 ± 5	75 ± 5	88 ± 5
Specific Gravity (g/cm <sup>3</sup> )	1.85	1.85	1.85	1.33	1.25
Service Application	-Petroleum Oils, -Silicone Fluids -Acids(Black only) -Aromatic solvents -Halogenated hydrocarbons -Air	-Petroleum Oils, -Silicone Fluids -Acids(Black only) -Aromatic solvents -Halogenated hydrocarbons -Air	-Petroleum Oils, -Silicone Fluids -Acids(Black only) -Aromatic solvents -Halogenated hydrocarbons -Air	-R-134a -Petroleum oils -Silicone Fluids -Air -Hot water	-R-134a -Petroleum oils -Silicone Fluids -Air -Hot water

### Specifications for Gasket Materials

Properties	Flexible Graphite	Spiral Wound 316+Graphite	Braided Graphite+316	PTFE
Temperature Range	-184~+482°C -300~+900°F	-184~+482°C -300~+900°F	-184~+482°C -300~+900°F	-184~+204°C -300~400°F
PH	0~14	0-14	0~14	0~14
Service Application	Fire-safe	Fire-safe	Fire-safe	Cryogenic, High Corrosive

\* Due to quick develop, we reserve the right to institute changes in material, design and specifications for all VIZA designed valves without prior notice.

# HISTORIC EVENTS



**1998**

VIZA Suzhou Founded



**2000**

VIZA Tianjin Founded



**2003**

Kunshan Factory Founded



**2004**

API Certified



**2008**

VIZA USA Founded



**2010**

Taibo Foundry Founded



**2014**

BP Approval

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for the 21<sup>st</sup> Century**

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RELIABLE  
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