 This volume shows the pictures to provide a reference only. If some technical standards and the model number specification have variety, Forgive and don't go another notice.

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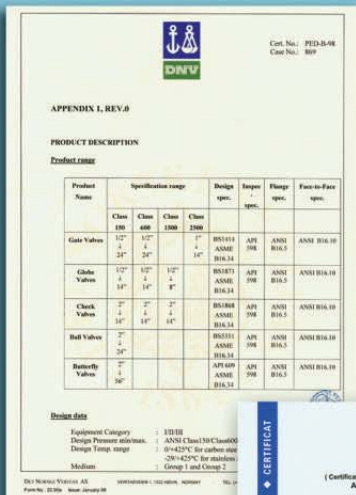
BALL VALVE



~ API 6D



~ CE/PED



~ CE/PED



~ ISO9001



~ Fire Safe Test



~ Fire Safe Test

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6D-0487

0575

ISO9001

ISO14001

API-607



Brief Introduction

COMPLETED SOLUTION FOR INDUSTRIAL VALVES

Today, SUNGO is one of the Asia's leading manufacturers of industrial steel valves with five specialized manufacturing plants, including three in Wenzhou, two in Shanghai. We have 680 employees. We owe much of our success to quality and innovation, which have been the cornerstone of SUNGO since its inception in 1980, and to our philosophy of dynamic leadership. We concentrate on one business—the design, manufacture and marketing of steel valves in a broad range of types and sizes, demanding advanced technology. has fulfilled all the qualifications to manufacture a wide range of industrial valves for the most severe and demanding services of the Oil, Gas, Refinery, Chemical, Marine, Power and Pipeline Industries.

SUNGO's products including: Gate, globe and check valve, We also offer plug valve and a advanced line of highly competitive ball valves with metal and resilient seats, as well as a complete range of cryogenic valves, bellows seal valves and triple offset metal-seated butterfly valves. Size range from 1/2"–120" (DN15–3000); Class rating from 150LB–2500LB; materials range from conventional cast or forged steel to special alloy material like Monel, Inconel, Hastelloy or Duplex steel. SUNGO are able to produce valves for working temperature -196°–650°, all available to fully comply with ASTM, ANSI, API, BS, DIN and JIS standards.

SUNGO FACILITIES

SUNGO's facilities in with five specialized manufacturing plants, one Foundry and the new established Technical Research Center. SUNGO employed a large number of CNC machine for most of valves fabrication and we are among the few manufactures who are able to perform in-house Fire Safe test, cryogenic test, High pressure gas test, High temperature test and Fugitive emission test.

QUALITY ASSURANCE

SUNGO's Quality Assurance is dedicated to pursuit of zero defect valve, and this has resulted in the company having more quality qualifications than most of our competitors. SUNGO is certified by ISO 9001, API6D, API607, CE/PED and SUNGO ball valwere fire safe tested & certified by TUV.

CORPORATE PHILOSOPHY

The SUNGO corporate philosophy is to bring the market new and innovative valve designs with special emphasis on quality, safety, ease of operation, simple in-line maintenance and most of all, long service life. All this combined with the use of high quality materials, advanced manufacturing technology and automation in all stages of manufacturing ensures the highest possible quality at a competitive price. SUNGO is strongly committed to defending its market position aggressively competing in all countries around the world. The company's impressive growth is testimony to the balanced competence in research, design, production and marketing with a firm determination to maintain its leadership in the valve industry - today and in the future.

Ball Valves

Outline Of Ball Valves

SUNGO, being with more than 25 years of historical experience in the design, manufacture, and quality control of ball valves, has continuously absorbed the advanced technology. Based upon further study and exploration of the ball valves, the company has developed many kinds of unique and new products, of which five sorts of the ball valves have been patented by the state.

The ball valves manufactured by SUNGO include the floating ball valve, trunnion(mounted)ball valve, metal to metal sealed ball valve, one piece ball valve, three way ball valve, female threaded ball valve, and high pressure forged ball valve. Of the above, the technical parameters and the applicable standards are as the following table.

Normal pressure or rating		Class150~Class2500 JIS 10K~20K PN10~PN420		
Normal diameter or bore		NPS1/4~36 DN6~900		
Applicable temperature		-196~540		
Operation type		Manual, worm gear, pneumatic, electric		
Standards and specification	Design & manufacture	API 6D API 608 ASME B16.34 ISO 5211 ANSI/AWWA C507 BFCI70-2 MSS SP-72 BS 5351 BS 6364 NACE MR0175	Connection ends	ASME B16.5 ASME B16.47 API 605 MSS SP-44 ISO 7005-1 JIS B2238 BS 12627 ASME B16.25 ASME B16.11 BS 12760
	Face to face dimension	ASME B16.10 ISO 5752 BS 558 BS 12982	Testing & inspection	API 598 API 6D API 607 API 6FA BS 6755 BS 12569 MSS SP-82 MSS SP-61

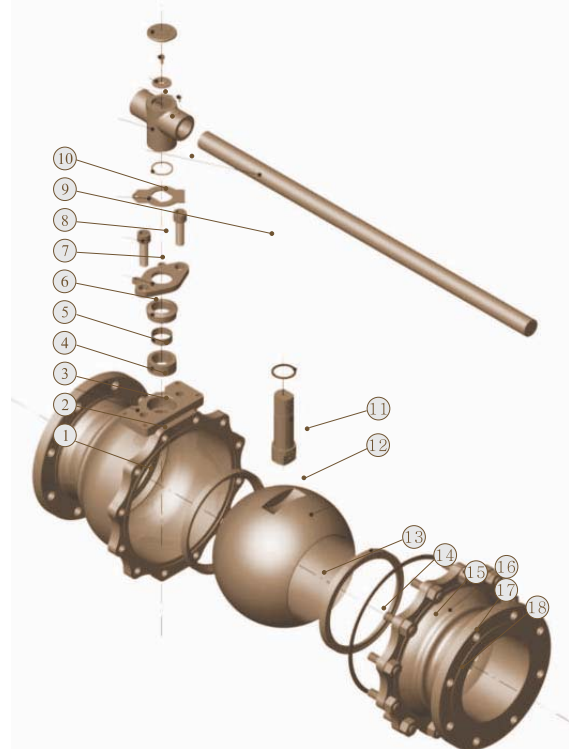
Type Number Code System For Ball Valve



Unit No	Indication	Code & description	
1	Exclusive function	D-Cryogenic use B-Temperature protection S-reduced bore T-Regulation type N-Valve with requirement of sulphur resistance(NACE)The code is omitted for the valve without special function	
2	Valve type	Q-Ball valve	
3	Auxiliary classification	Z-One piece body V-V type ball S-Three piece body L-Two piece body The code is omitted for the rest.	
4	Operation type	Manual-omitted 3-Worm gear 6-Pneumatic actuator 9-Electric actuator 8-Pneumatic/hydraulic operation 2-Electric/hydraulic operation 6S-Pneumatic actuator with manual	
5	Connection type	1-Female threads 2-Male threads 4-Flange connection 4J -Flange with ring joints 6-Butt welding 6C -Socket welding 7 -Wafer type connection 7J -Wafer type with ring joints	
6	Structure	1-Floating ball, through way 2-Floating ball, Y type three way 4 - Floating ball, L type three way 5 - Floating ball, T type three way 6 - Trunnion ball, four way 7 - Trunnion ball, through way 8 - Trunnion ball, T type three way 9 - Trunnion ball, L type three way	
7	Sealing surface materials	F - PTFE, reinforced PTFE FS - Polypropylene PK-PEEK N - Nylon FC - Carbon fiber Y - Stellite, nickel base alloy YS - Specially hardened TP - Ceramic	
8	Pressure rating	Normal pressure (euro system)	10 - PN10; 16 - PN16; 25 - PN25; 40 - PN40; 63 - PN63; 100 - PN100; 160 - PN160; 250 - PN250;
		Normal pressure (america system)	20-PN20; 50 -PN50; 110 - PN110; 150 - PN150; 260 - PN260; 420 - PN420
		PSI Class	A1 - Class150; A3 - Class300; A6 - Class600; A9 - Class900; A15 - Class1500; A25 - Class2500; A8 - Class800
		JIS K Class	K1 - JIS 10K; K2 - JIS 20K; K3 - JIS 30K; K4 -JIS 40K
9	Body material	C-WCB, A105; CC-WCC; C5-C5; C6-WC6, F11; C9-WC9, F22; CL-LCB, LF2; LC-LCC; L2-LC2; L3-LC3; P8-CF8, 304; P3-CF3,304L; R8-CF8M, 316; R3-CF3M, 316L; P-ZG1Cr18Ni9Ti,1Cr18Ni9Ti; R-ZG1Cr18Ni12Mo2Ti; 1Cr18Ni12Mo2Ti; A-CN7M,No.20 alloy, Ti-Titanium or Ti-alloy T-Copper&copper alloy Q-Ductile iron Z-Cast iron	
10	Trim material	The number code is omitted ,if no requirement by customers.(generally, carbon steel valve body with 13%Cr trim, and s.s. body with s.s. trim of the same property of corrosion resistance as the body Material.)P8-304;P3-304L;R8-316;R3-316L;M-Monel; A-No.20 alloy	

Floating Ball Valve

Typical Drawing Of Floating Ball Valve And Parts Composition



Parts And Material List

Parts No.	Parts name	Materials				
		WCB/13Cr	WCB/304	WCB/316	CF8	CF8M
1	Body	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M
2	Packing	PTFE	PTFE	PTFE	PTFE	PTFE
3	Stem bearing	PTFE	PTFE	PTFE	PTFE	PTFE
4	Gland	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 F304	ASTM A182 F316
5	Gland flange	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M
6	Gland bolt	ASTM A193 B7	ASTM A193 B7	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M
7	Stop collar	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
8	Circlip	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
9	Lever	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel
10	Nut or wrench head	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel
11	Thrust washer	PTFE	PTFE	PTFE	PTFE	PTFE
12	Stem	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 F304	ASTM A182 F316
13	Ball	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 F304	ASTM A182 F316
14	Seat	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE
15	Gasket	PTFE	PTFE	PTFE	PTFE	PTFE
16	Body nut	ASTM A194 2H	ASTM A194 2H	ASTM A194 2H	ASTM A194 8	ASTM A194 8M
17	Body bolting	ASTM A193 B7	ASTM A193 B7	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M
18	Closure	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M

Note: The chart above only lists out some common composition of steel ball valve parts. We may provide other different parts material composition according to the customer's request or the actual valve working condition.

Floating Ball Valve

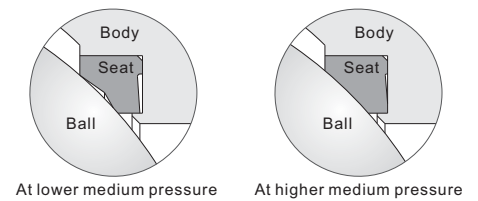
Application

Floating ball valves are suitable for use on various kinds of pipelines of Class 150 to Class 1500, PN16 to PN100, and JIS 10K to JIS 20K to turn on or off the pipeline medium, of which the operation types include manual, worm gear and pneumatic or electric actuators.

Construction and features of floating ball valve

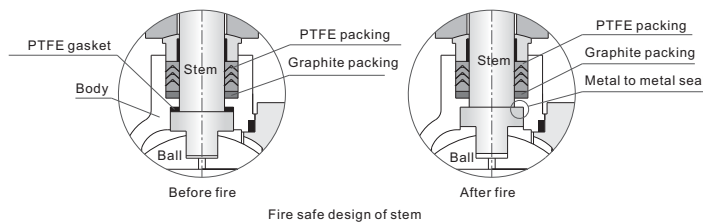
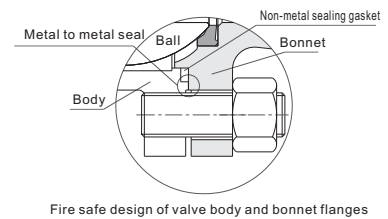
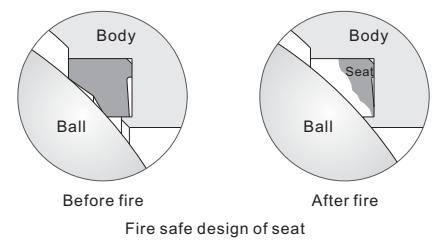
Reliable Seat Seal

The structure design of elastic sealing ring has been adopted for floating ball valves. This seat design features a bigger sealing pressure ratio between the ring surface and the ball when medium pressure gets lower, where the contacting area is smaller. Thus, the reliable seal is ensured. When the medium pressure gets higher, the contacting area between seat ring and ball becomes bigger as the sealing ring transforms elastically to undertake the bigger force pushed by the medium without any damage.



Fire Safe Design

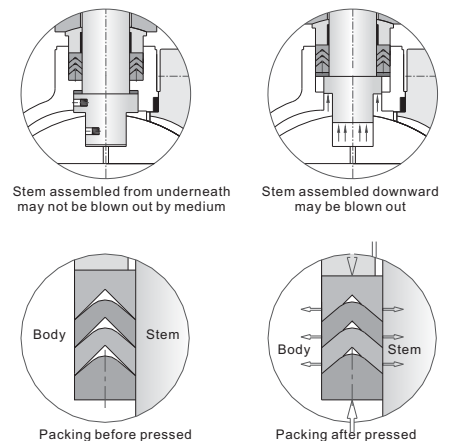
With the valve heated in a fire application, the non-metal material parts such as seat sealing ring of PTFE, stem back seat gasket, gland packing, and the sealing gasket between body and bonnet might disintegrate or be damaged due to high temperature. SUNGO's specially designed structure of auxiliary metal to metal seal is provided to effectively prevent both internal and external leakage of the valve. As required by customers, SUNGO's floating ball valves with fire safe design can meet the requirement of API607, API 6FA, BS 6755 and JB/T 6899.



Reliable Stem Seal

The blow-out proof design has been adopted for the stem to ensure that even if the pressure in the body cavity is risen accidentally and the packing flange becomes invalid, the stem may not be blown out by medium. The stem features the design with a backseat, being assembled from underneath. The sealing force against the backseat gets higher as the medium pressure becomes higher. So the reliable seal of the stem can be assured under variable medium pressure.

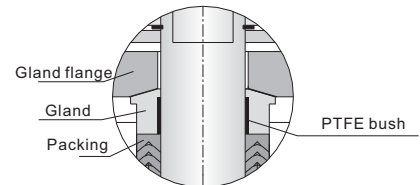
V type packing structure has been employed to effectively transform the pushing force of the gland flange and the medium pressure into the sealing force against the stem.



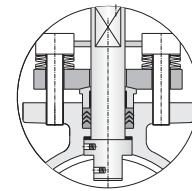
Floating Ball Valve

The traditional packing flange design has been improved to be of two piece structure, i.e., being as a gland flange and gland, the latter contacts the gland flange with spherical surface. Thus, the gland remains vertical always, and is lined internally with a PTFE bush to prevent the galling against and friction between the stem, which can also reduce the operation torque of the valve.

Based on customers' requirement, a packing tightening design may be employed to obtain more reliable stem packing seal, which is loaded by bevelling spring.

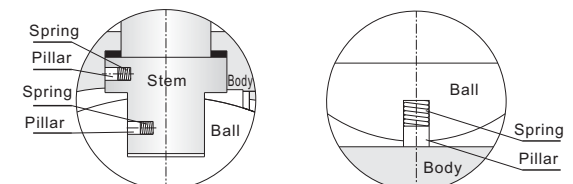


Stem galling prevented in application



Anti-static Feature

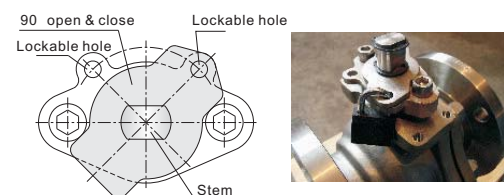
The traditional packing flange design has been improved to be of two piece structure, i.e., being as a packing flange plate and a follower, the latter contacts the flange plate with spherical surface. Thus, the follower remains vertical always, and is lined internally with a PTFE bush to prevent the galling against and friction between the stem, which can also reduce the operation torque of the valve.



Anti-Static design for ball valve 32mm Anti-Static design for ball valve 25mm

Wrong Operation Prevention

To prevent the ball valve from wrong operation, the key lock with 90° of open and close positioning pad has been provided, which can be lockable as required. At the stem head, where the lever fixes, a flat is so designed that the valve opens with the lever in parallel to piping, and with the lever right-angled to the piping, the valve is closed. So, it is ensured that the valve indicator of open and close can never make mistake.



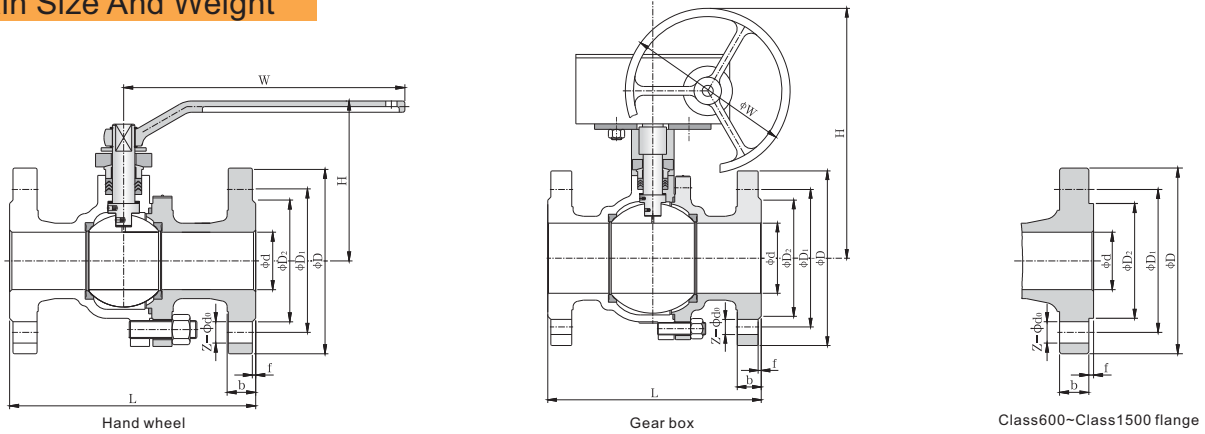
Mounting Pad Provided

SUNGO company has provided for floating ball valve with a mounting pad, through which it is easy to fix the actuators, such as worm gear, pneumatic and electric actuators,



Floating Ball Valve

Main Size And Weight



Pressure rating	Size		Dimensions(mm)										Weight(kg)				
	DN	NPS	L		d	D	D ₁	D ₂	b	f	Z- d ₀	W		H		Weight(kg)	
			RF	RTJ								Hand wheel	Gear box	Hand wheel	Gear box	Hand wheel	Gear box
Class150 PN20	15	1/2	108	119	14	89	60.5	35	11.5	1.6	4-15	140	-	85	-	3	-
	20	3/4	117	130	19	98	70	43	11.5	1.6	4-15	140	-	90	-	4	-
	25	1	127	140	25	108	79.5	51	11.5	1.6	4-15	150	-	99	-	5	-
	32	1 1/4	140	153	32	117	89	64	13	1.6	4-15	180	-	105	-	7	-
	40	1 1/2	165	178	38	127	98.5	73	14.5	1.6	4-15	200	-	126	-	8	-
	50	2	178	191	51	152	120.5	92	16	1.6	4-19	250	-	140	-	12	-
	65	2 1/2	190	203	64	178	139.5	105	17.5	1.6	4-19	300	-	165	-	18	-
	80	3	203	216	76	190	152.5	127	19.5	1.6	4-19	350	-	178	-	24	-
	100	4	229	242	102	229	190.5	157	24	1.6	8-19	500	305	230	380	38	53
	125	5	356	369	127	254	216	186	24	1.6	8-22	800	305	280	405	60	79
Class300 PN50	150	6	394	407	152	279	241.5	216	25.5	1.6	8-22	800	305	310	460	82	102
	200	8	457	470	203	343	298.5	270	29	1.6	8-22	1000	305	350	550	145	185
	250	10	533	546	254	406	362	324	31	1.6	12-25	-	400	-	706	-	280
	15	1/2	140	151	14	95	66.5	35	14.5	1.6	4-15	140	-	85	-	3	-
	20	3/4	152	165	19	117	82.5	43	16	1.6	4-19	140	-	90	-	5	-
	25	1	165	178	25	124	89	51	17.5	1.6	4-19	150	-	99	-	6	-
	32	1 1/4	178	191	32	133	98.5	64	19.5	1.6	4-19	180	-	105	-	8	-
	40	1 1/2	190	203	38	156	114.5	73	21	1.6	4-22	200	-	126	-	11	-
	50	2	216	232	51	165	127	92	22.5	1.6	8-19	250	-	142	-	16	-
	65	2 1/2	241	257	64	190	149	105	25.5	1.6	8-22	300	-	165	-	24	-
Class600 PN110	80	3	283	299	76	210	168.5	127	29	1.6	8-22	350	-	178	330	34	52
	100	4	305	321	102	254	200	157	32	1.6	8-22	500	305	230	380	56	76
	125	5	381	397	127	279	235	186	35	1.6	8-22	800	305	280	420	86	124
	150	6	403	419	152	318	270	216	37	1.6	12-22	800	305	310	480	125	163
	200	8	502	518	203	381	330	270	41.5	1.6	12-25	1000	305	350	560	222	267
	15	1/2	165	164	14	95	66.5	35	14.5	6.4	4-15	140	-	79	-	5	-
	20	3/4	190	190	19	118	82.5	43	16	6.4	4-19	140	-	83	-	7	-
	25	1	216	216	25	124	89	51	17.5	6.4	4-19	200	-	114	-	9	-
	32	1 1/4	229	229	32	133	98.5	64	21	6.4	4-19	200	-	120	-	13	-
	40	1 1/2	241	241	38	156	114.5	73	22.5	6.4	4-22	250	-	125	-	17	-
Class900 PN150	50	2	292	295	51	165	127	92	25.5	6.4	8-19	300	-	156	-	25	-
	65	2 1/2	330	333	64	190	149	105	29	6.4	8-22	350	-	172	-	42	-
	80	3	356	359	76	210	168	127	32	6.4	8-22	500	305	220	370	56	76
	100	4	432	435	102	273	216	157	38.5	6.4	8-25	650	305	250	400	85	123
	15	1/2	216	216	14	121	82.5	35	22.5	6.4	4-23	150	-	98	-	9	-
Class1500 PN260	20	3/4	229	229	20	130	88.9	43	25.5	6.4	4-23	150	-	105	-	13	-
	25	1	254	254	25	149	101.6	51	29	6.4	4-26	200	-	110	-	16	-
	32	1 1/4	279	279	32	159	111.1	64	29	6.4	4-26	250	-	120	-	24	-
	40	1 1/2	305	305	38	178	123.8	73	32	6.4	4-29	250	-	125	-	31	-
	50	2	368	371	50	216	165.1	92	38.5	6.4	8-26	350	-	160	-	45	-
Class1500 PN260	15	1/2	216	216	14	121	82.5	35	22.5	6.4	4-23	182	-	98	-	10	-
	20	3/4	229	229	20	130	88.9	43	25.5	6.4	4-23	200	-	105	-	14	-
	25	1	254	254	25	149	101.6	51	29	6.4	4-26	250	-	110	-	17	-
	32	1 1/4	279	279	32	159	111.1	64	29	6.4	4-26	300	-	120	-	25	-
	40	1 1/2	305	305	38	178	123.8	73	32	6.4	4-29	350	-	130	-	33	-
50	2	368	371	50	216	165.1	92	38.5	6.4	8-26	500	-	160	-	48	-	

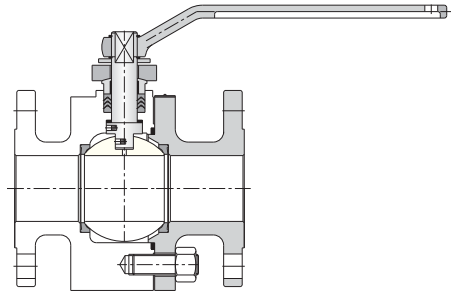
Floating Ball Valve

Pressure rating	DN	15	20	25	32	40	50	65	80	100	125	150	200	250	
PN16	L	130	140	150	165	180	200	220	250	280	320	360	400	-	
	W	Hand wheel	140	140	150	180	200	250	300	350	500	800	800	1000	-
		Gear box	-	-	-	-	-	-	-	-	305	305	305	305	-
	H	Hand wheel	85	90	99	105	126	140	165	178	230	280	310	350	-
		Gear box	-	-	-	-	-	-	-	-	380	405	460	550	-
Weight (kg)	Hand wheel	3	4	5	7	8	12	17	23	35	52	76	134	-	
	Gear box	-	-	-	-	-	-	-	-	53	79	102	185	-	
PN25	L	130	140	150	165	180	200	220	250	320	400	400	550	-	
	W	Hand wheel	140	140	150	180	200	250	300	350	500	800	800	1000	-
		Gear box	-	-	-	-	-	-	-	-	305	305	305	305	-
	H	Hand wheel	85	90	99	105	126	140	165	178	230	280	310	350	-
		Gear box	-	-	-	-	-	-	-	-	380	405	460	550	-
Weight (kg)	Hand wheel	3	4	5	7	9	12	19	23	45	67	95	170	-	
	Gear box	-	-	-	-	-	-	-	-	53	79	102	185	-	
PN40	L	130	140	150	180	200	220	250	280	320	400	400	550	-	
	W	Hand wheel	140	140	150	180	200	250	300	350	500	800	800	1000	-
		Gear box	-	-	-	-	-	-	-	-	305	305	305	400	-
	H	Hand wheel	85	90	99	105	126	142	165	178	230	280	310	350	-
		Gear box	-	-	-	-	-	-	-	-	330	380	420	480	560
Weight (kg)	Hand wheel	3	4	5	8	11	15	20	29	48	68	98	178	-	
	Gear box	-	-	-	-	-	-	-	-	47	68	88	136	223	
PN63	L	140	152	165	178	190	216	241	283	305	-	-	-	-	
	W	Hand wheel	140	140	200	200	250	300	350	500	650	-	-	-	-
		Gear box	-	-	-	-	-	-	-	305	305	-	-	-	-
	H	Hand wheel	79	83	114	120	125	156	172	220	250	-	-	-	-
		Gear box	-	-	-	-	-	-	-	390	440	-	-	-	-
Weight (kg)	Hand wheel	5	7	9	13	17	25	42	56	85	-	-	-	-	
	Gear box	-	-	-	-	-	-	-	76	123	-	-	-	-	
PN100	L	165	190	216	229	241	292	330	356	432	-	-	-	-	
	W	Hand wheel	140	140	200	200	250	300	350	500	650	-	-	-	-
		Gear box	-	-	-	-	-	-	-	305	305	-	-	-	-
	H	Hand wheel	79	83	114	120	125	156	172	220	250	-	-	-	-
		Gear box	-	-	-	-	-	-	-	390	440	-	-	-	-
Weight (kg)	Hand wheel	5	7	9	13	17	25	42	56	85	-	-	-	-	
	Gear box	-	-	-	-	-	-	-	76	123	-	-	-	-	
JIS 10K	L	108	117	127	140	165	178	190	203	229	356	394	457	533	
	W	Hand wheel	140	140	150	180	200	250	300	350	500	800	800	1000	-
		Gear box	-	-	-	-	-	-	-	-	305	305	305	305	400
	H	Hand wheel	85	90	99	105	126	140	165	178	230	280	310	350	-
		Gear box	-	-	-	-	-	-	-	-	380	405	460	550	706
Weight (kg)	Hand wheel	3	4	5	7	8	12	18	24	38	60	82	145	-	
	Gear box	-	-	-	-	-	-	-	-	53	79	102	185	280	
JIS 20K	L	140	152	165	178	190	216	241	283	305	381	403	502	-	
	W	Hand wheel	140	140	150	180	200	250	300	350	500	800	800	1000	-
		Gear box	-	-	-	-	-	-	-	-	305	305	305	400	-
	H	Hand wheel	85	90	99	105	126	142	165	178	230	280	310	350	-
		Gear box	-	-	-	-	-	-	-	-	330	380	420	480	560
Weight (kg)	Hand wheel	3	5	6	8	11	15	23	33	53	82	120	212	-	
	Gear box	-	-	-	-	-	-	-	-	52	76	124	163	267	

Floating Ball Valve

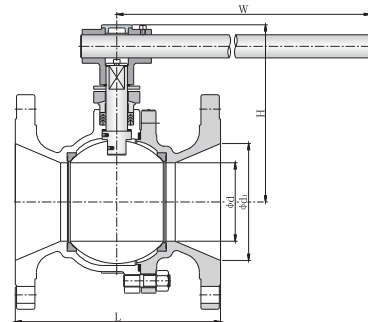
Forged Steel Ball Valve

The floating ball valve manufactured by SUNGO company is generally employing casted steel valve body, however, as required by customers, forged steel valve body is also available, of which the main sizes such as flange connections and face to face dimensions are the same as that of the cast steel ball valve.



Ball Valve With Reduced Bore

In addition to the full bore floating ball valve, SUNGO company is also manufacturing the floating ball valve with reduced bore to satisfy different requirement of customers, which can not only lower the cost and the pricing, but also meet customers' special requirement.



Size		Class150 PN20						Class300 PN50						Class600 PN110				
DN	NPS	L		d	d ₁	H	W	L		d	d ₁	H	W	L	d	d ₁	H	W
		Long	Short					Long	Short									
15	1/2	108		10	14	80	140	140		10	14	80	140	165	10	14	75	140
20	3/4	117		14	19	85	140	152		14	19	85	140	190	14	19	79	140
25	1	127		20	25	90	140	165		20	25	90	140	216	20	25	83	140
32	1 1/4	140		25	32	99	150	178		25	32	99	150	229	25	32	114	150
40	1 1/2	165		32	38	105	180	190		32	38	105	180	241	32	38	120	200
50	2	178		38	51	126	200	216		38	51	126	200	292	38	51	125	250
65	2 1/2	190		51	64	140	250	241		51	64	140	250	330	51	64	156	300
80	3	203		64	76	165	300	283		64	76	165	300	356	64	76	172	350
100	4	229		76	102	178	350	305		76	102	178	350	432	76	102	220	500
125	5	356		102	127	230	500	381		102	127	230	500	508	102	127	250	650
150	6	394	267	127	152	280	800	403		127	152	280	800	-	-	-	-	-
200	8	457	292	152	203	310	800	502	419	152	203	310	800	-	-	-	-	-
250	10	533	330	203	254	350	1000	568	457	203	254	350	1000	-	-	-	-	-

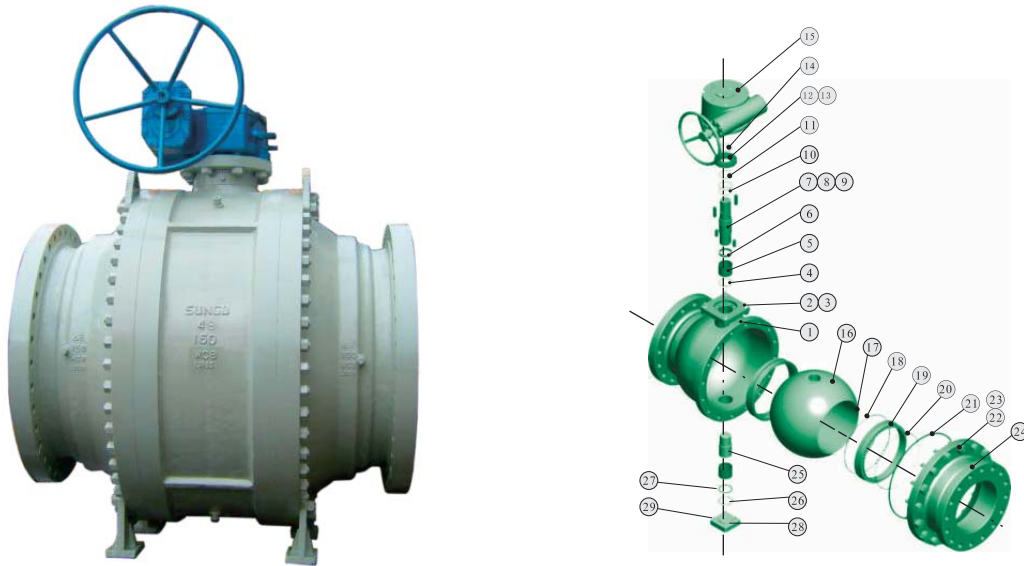
Note: 1. Sizes of flange connection of the ball valve with reduced bore are the same as that of full bore ball valves.
 2. There are two series of face to face dimensions, in the long series and the short series, for some of ball valves with reduced bore.

Trunnion Ball Valve

Application

Trunnion ball valves are suitable for use on various kinds of pipelines of Class 150~Class 2500, PN16~PN160, JIS10K~JIS20K to cut off or turn on the pipeline medium, of which the operation types include worm gear, manual, pneumatic or electric actuators, being in general of flange connection, and butt welding ends connection as well.

Typical Drawing Of Trunnion Ball Valve And Parts Composition



Parts And Material List

Parts No.	Parts name	Materials					
		WCB/13Cr	WCB/304	WCB/316	CF8	CF8M	
1	Body	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	
2	Nut	ASTM A194 2H	ASTM A194 2H	ASTM A194 2H	ASTM A194 2H	ASTM A194 2H	
3	Bolting	ASTM A193 B7	ASTM A193 B7	ASTM A193 B7	ASTM A193 B7	ASTM A193 B7	
4	O ring	Viton	Viton	Viton	Viton	Viton	
5	Stem bearing	Metal backed PTFE	Metal backed PTFE	Metal backed PTFE	Metal backed PTFE	Metal backed PTFE	
6	Gasket	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 F304	ASTM A182 F316	
7	Stem	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 F304	ASTM A182 F316	
8	Key	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel	
9	Key	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel	
10	O ring	Viton	Viton	Viton	Viton	Viton	
11	Gasket	PTFE	PTFE	PTFE	PTFE	PTFE	
12	Cover	ASTM A105	ASTM A105	ASTM A105	ASTM A182 F304	ASTM A182 F316	
13	Capscrew	ASTM A193 B7	ASTM A193 B7	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M	
14	O ring	Viton	Viton	Viton	Viton	Viton	
15	Gear	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel	
16	Ball	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 F304	ASTM A182 F316	
17	Seat	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE	
18	O ring	Viton	Viton	Viton	Viton	Viton	
19	Seat retainer	ASTM A105	ASTM A105	ASTM A105	ASTM A182 F304	ASTM A182 F316	
20	Spring	SS304 or Inconel 750	SS304 or Inconel 750	SS316 or Inconel 750	SS304 or Inconel 750	SS316 or Inconel 750	
21	Gasket	Viton or PTFE or Graphite	Viton or PTFE or Graphite	Viton or PTFE or Graphite	Viton or PTFE or Graphite	Viton or PTFE or Graphite	
22	Body bolting	ASTM A193 B7	ASTM A193 B7	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M	
23	Body nut	ASTM A194 2H	ASTM A194 2H	ASTM A194 2H	ASTM A194 8	ASTM A194 8M	
24	Closure	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A351	ASTM A351 CF8M	
25	Lower trunnion	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 CF8 304	ASTM A182 F316	
26	O ring	Viton	Viton	Viton	Viton	Viton	
27	Gasket	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 F304	ASTM A182 F316	
28	Lower cover	ASTM A105	ASTM A105	ASTM A105	ASTM A182 F304	ASTM A182 F316	
29	Capscrew	ASTM A193 B7	ASTM A193 B7	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M	

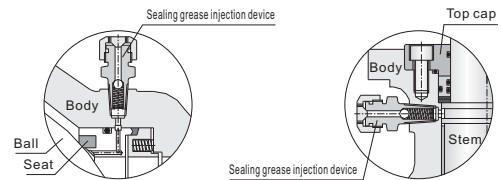
Note: The chart above only lists out some common composition of steel ball valve parts. We may provide other different parts material composition according to the customer's request or the actual valve working condition.

Trunnion Ball Valve

Design features of trunnion ball valve

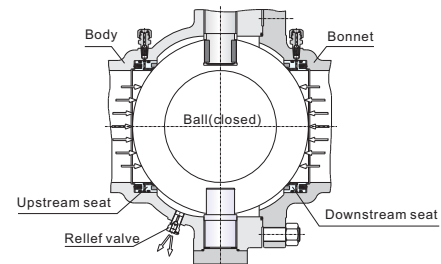
Urgent Grease Injection Device

According to customers' requirement, the trunnion ball valves made by SUNGO company are provided with devices for urgent grease injection, which are on both the stem and seat for the trunnion ball valves of DN 150mm(NPS6), and in the body cavity for the valve of DN 125mm. When the O ring of stem or the body seat ring is damaged due to accident, the medium leakage between body and stem can be prevented by injecting the sealing grease through the



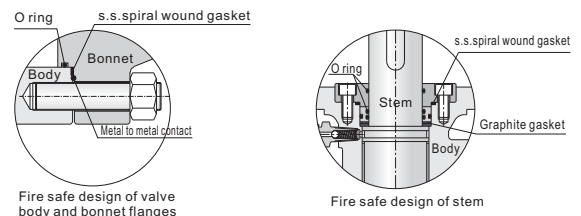
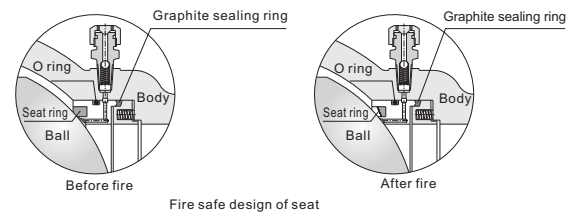
Double-block And Bleed Functions

In general, SUNGO's trunnion ball valve features the front ball sealing design structure. Each seat of the ball valve can separately cut off the medium at both inlet and outlet of the valve to realize double-block functions. When the ball valve is closed, body cavity and two of the body ends can be blocked with each other even if both the inlet and outlet are under pressure, when the medium left in the body cavity might be bled through the relief valve.



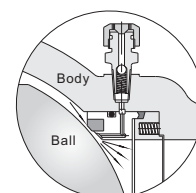
Fire Safe Design

With the valve heated in a fire application, the non-metal material parts such as seat sealing ring of PTFE, O ring for the stem, and sealing gasket for body and bonnet, might be damaged due to high temperature. SUNGO's special design of auxiliary metal to metal or the graphite seal is provided for the trunnion ball valve to effectively prevent both internal and external leakage of the valve. As required by customers, SUNGO's fire safe design for the trunnion ball valve meets the requirement of API 607, API 6Fa, BS 6755 and JB/T 6899.



Self-relief In The Body Cavity

As the liquid medium left in the body cavity gasifies due to increased temperature, the pressure in the body cavity becomes abnormally higher, when the medium itself in the cavity would propel the seat and self-relieves the pressure to ensure the safety of valve.



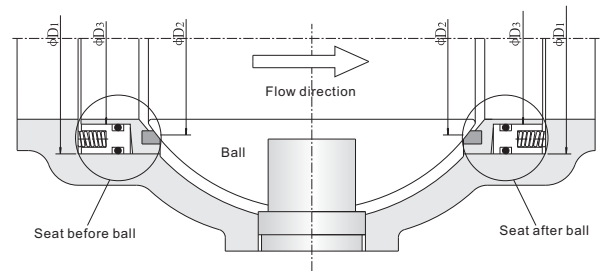
Trunnion Ball Valve

Trunnion ball valve with the Bi-sealing design structure, i.e. seat sealing in front of the ball and seat sealing behind the ball

According to some special working conditions and customers' requirement, SUNGO has provided the trunnion ball valve with the Bi-sealing design structure, i.e. seat sealing in front of the ball and seat sealing behind the ball, thus the reliable sealing of the valve is ensured because the valve can perform normally even if one of the effective sealing designs becomes lost due to the abnormal condition.

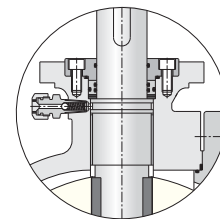
Regarding the seat in front of the ball, the piston effect formed by the area difference between D_1 and D_2 , plus the pre-tightened force of a spring would cause the seat in front of the ball by the pressure difference of the medium before and after the valve to touch the ball closely to form the tightness, of which the sealing force will become bigger as the pressure difference gets higher.

Regarding the seat after the ball, the piston effect formed by the area difference between D_2 and D_3 , plus the pretightened force of a spring would cause the seat behind the ball to touch the ball closely to form the tightness, of which the sealing force will become bigger as the pressure difference gets higher.



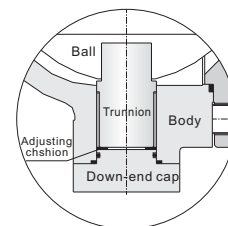
Blow-out Proof Stem

Blow - out proof structure is provided for the stem, which is positioned by the up - end cap and screw, being guaranteed not to be blown - out by the medium even if at abnormal risen pressure in the cavity.



Anti-static Design

The ball of the trunnion ball valve gets close contact with each other through the trunnion, adjusting cushion, and down-end cap, the passage of static electricity thus forms together with the valve, which may lead the static electricity caused by sparks generated by friction between the ball and seat during on and off performance to the ground to prevent the possible risk of fire or explosion.



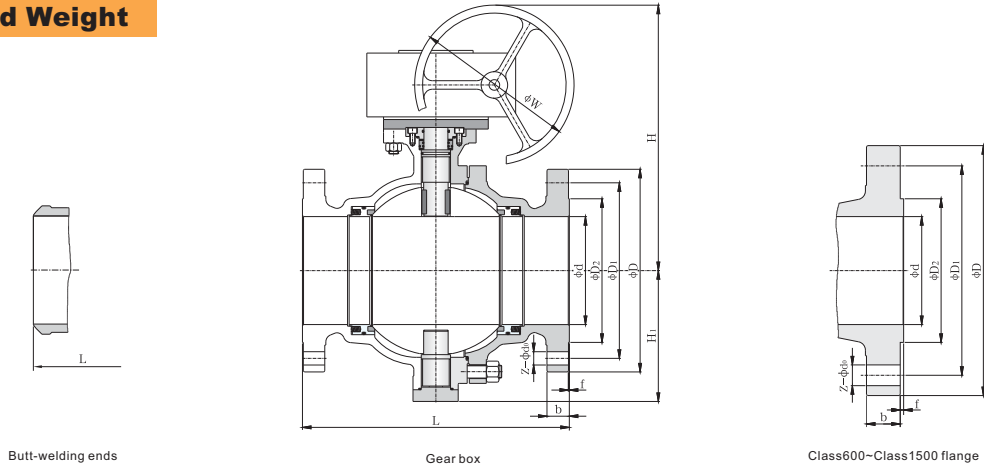
Mounting Pad Provided

SUNGO company has provided for trunnion ball valve with a mounting pad for fixing the actuators, such as worm gear, pneumatic, electric, hydraulic, and pneumatic&hydraulic actuators.



Trunnion Ball Valve

Main Size And Weight



Pressure rating	Size		Dimensions(mm)												Weight (kg)
	DN	NPS	L		d	D	D ₁	D ₂	B	F	Z- d ₀	H	H ₁	W	
			R F	BW											
Class150 PN20	100	4	229	305	102	229	190.5	157	24	1.6	8-19	330	135	300	60
	125	5	356	381	127	254	216	186	24	1.6	8-22	360	165	300	80
	150	6	394	457	152	279	241.5	216	25.5	1.6	8-22	392	193	300	101
	200	8	457	521	203	343	298.5	270	29	1.6	8-22	492	240	300	166
	250	10	533	559	254	406	362	324	31	1.6	12-25	548	293	300	283
	300	12	610	635	305	483	432	381	32	1.6	12-25	688	340	400	463
	350	14	686	762	337	533	476	413	35	1.6	12-29	722	372	400	622
	400	16	762	838	387	597	540	470	37	1.6	16-29	722	415	400	900
	450	18	864	914	438	635	578	533	40	1.6	16-32	804	462	500	1150
	500	20	914	991	489	699	635	584	43	1.6	20-32	952	511	600	1360
	600	24	1067	1143	591	813	749.5	692	48	1.6	20-35	1154	601	750	2514
	650	26	1143	1245	633	786	744.5	711	40	1.6	36-22	1300	700	750	3200
	700	28	1245	1346	684	837	795.5	762	43	1.6	40-22	1550	780	750	4000
	750	30	1295	1397	735	887	846	813	43	1.6	44-22	1650	830	750	4800
800	32	1372	1524	779	941	900	864	44	1.6	48-22	1740	870	750	5800	
900	36	1524	1727	874	1057	1009.5	972	51	1.6	44-26	1950	970	750	8000	
Class300 PN50	100	4	305	305	102	254	200	157	32	1.6	8-22	340	140	300	70
	125	5	381	381	127	279	235	186	35	1.6	8-22	370	170	300	95
	150	6	403	457	152	318	270	216	37	1.6	12-22	402	192	300	128
	200	8	502	521	203	381	330	270	41.5	1.6	12-25	498	246	300	234
	250	10	568	559	254	445	387.5	324	48	1.6	16-29	655	303	400	403
	300	12	648	635	305	521	451	381	51	1.6	16-32	658	348	400	602
	350	14	762	762	337	584	514.5	413	54	1.6	20-32	686	378	400	803
	400	16	838	838	387	648	571.5	470	58	1.6	20-35	880	429	600	1273
	450	18	914	914	438	711	628.5	533	61	1.6	24-35	1050	518	750	1450
	500	20	991	991	489	775	686	584	64	1.6	24-35	1110	540	750	1700
	600	24	1143	1143	591	914	813	692	70	1.6	24-41	1400	650	750	3100
	650	26	1245	1245	633	867	803.5	737	87	1.6	32-35.5	1500	750	750	4500
	700	28	1346	1346	684	921	857	787	87	1.6	36-35.5	1600	800	750	6000
	750	30	1397	1397	735	991	921	845	92	1.6	36-39	1720	860	750	7500
800	32	1524	1524	779	1054	978	902	102	1.6	32-42	1800	900	750	9000	
900	36	1727	1727	874	1172	1089	1010	102	1.6	32-45	2200	1020	600	12000	

Trunnion Ball Valve

Pressure rating	Size		Dimensions(mm)													Weight (kg)
	DN	NPS	L		BW	d	D	D ₁	D ₂	b	F	Z- d ₀	H	H ₁	W	
			RF	RTJ												
Class600 PN110	50	2	292	295	292	51	165	127	92	26	6.4	8-19	240	94	300	32
	65	2 1/2	330	333	330	64	190	149	105	29	6.4	8-22	290	115	300	47
	80	3	356	359	356	76	210	168	127	32	6.4	8-22	340	136	300	68
	100	4	432	435	432	102	273	216	157	38	6.4	8-25	358	152	300	106
	125	5	508	511	508	127	330	266.5	186	45	6.4	8-29	400	180	300	170
	150	6	559	562	559	152	356	292	216	48	6.4	12-29	445	209	400	241
	200	8	660	664	660	203	419	349	270	56	6.4	12-32	498	263	400	444
	250	10	787	791	787	254	508	432	324	64	6.4	16-35	653	312	400	668
	300	12	838	841	838	305	559	489	381	67	6.4	20-35	665	354	500	1050
	350	14	889	892	889	334	603	527	413	70	6.4	20-38	738	389	600	1317
	400	16	991	994	991	385	686	603	470	77	6.4	20-41	920	440	750	1800
	450	18	1092	1095	1092	436	743	654	533	83	6.4	20-44	1100	530	750	2400
500	20	1194	1200	1194	487	813	724	584	89	6.4	24-44	1200	560	750	3000	
600	24	1397	1407	1397	538	940	838	692	102	6.4	24-52	1480	670	750	5400	
Class900 PN150	50	2	368	371	368	51	216	165.1	92	38.5	6.4	8-26	250	98	300	45
	65	2 1/2	419	422	419	64	244	190.5	105	41.5	6.4	8-29	300	120	300	55
	80	3	381	384	381	76	241	190.5	127	38.5	6.4	8-26	345	140	300	94
	100	4	457	460	457	102	292	234.9	157	44.5	6.4	8-32	415	162	300	141
	125	5	559	562	559	127	349	279.4	186	51	6.4	8-35	446	188	300	230
	150	6	610	613	610	152	381	317.5	216	56	6.4	12-32	477	213	400	325
	200	8	737	740	737	203	470	393.7	270	63.5	6.4	12-39	520	270	400	580
	250	10	838	841	838	254	545	469.9	324	70	6.4	16-39	628	322	400	850
	300	12	965	968	965	305	610	533.4	381	79.5	6.4	20-39	680	360	500	1330
	350	14	1029	1038	1029	322	640	558.8	413	86	6.4	20-42	750	400	600	1660
400	16	1130	1140	1130	373	705	615.9	470	89	6.4	20-45	940	460	750	2280	
Class1500 PN260	40	1 1/2	305	305	305	38	178	123.8	73	32	6.4	4-29	280	100	300	44
	50	2	368	371	368	51	216	165.1	92	38.5	6.4	8-26	320	113	300	67
	65	2 1/2	419	422	419	64	244	190.5	105	41.5	6.4	8-29	340	125	300	80
	80	3	470	473	470	76	267	203.2	127	48	6.4	8-32	385	138	300	130
	100	4	546	549	546	102	311	241.3	157	54	6.4	8-35	415	171	300	192
	125	5	673	676	673	125	375	292.1	186	73.5	6.4	8-42	480	200	400	335
	150	6	705	711	705	144	394	317.5	216	83	6.4	12-39	580	222	400	475
	200	8	832	841	832	192	483	393.7	270	92	6.4	12-45	584	280	400	820
250	10	991	1000	991	239	585	482.6	324	108	6.4	12-51	650	340	500	1320	
300	12	1130	1146	1130	287	675	571.5	381	124	6.4	16-54	700	370	600	2050	
Class2500 PN420	40	1 1/2	384	387	384	38	203	146	73	44.5	6.4	4-32	290	105	300	72
	50	2	451	454	451	42	235	171.4	92	51	6.4	8-29	320	120	300	104
	65	2 1/2	508	514	508	52	267	196.8	105	57.5	6.4	8-32	350	130	300	140
	80	3	578	584	578	62	305	228.6	127	67	6.4	8-35	400	150	300	202
	100	4	673	683	673	87	356	273	157	76.5	6.4	8-42	425	180	400	305
	125	5	794	807	794	100	419	323.8	186	92.5	6.4	8-48	500	210	400	530
	150	6	914	927	914	131	483	368.3	216	108	6.4	8-54	590	230	500	760
	200	8	1022	1038	1022	179	550	438.1	270	127	6.4	12-54	610	290	500	1200
250	10	1270	1292	1270	223	675	539.7	324	165.5	6.4	12-67	660	350	600	2080	

Note: 1. RF indicates raised flange, RFJ means ring joint flange, and BW is butt welding ends connection.
 2. Flange dimensions of the above table for valves of NPS 24 conforms to ASME B 16.5
 3. For valves of NPS 26, the flange dimensions of above table conforms to B series of ASME B16.47 and API 605. As required by customers, flange dimensions may also conform to A series of ASME B16.47 and MSS-SP-44

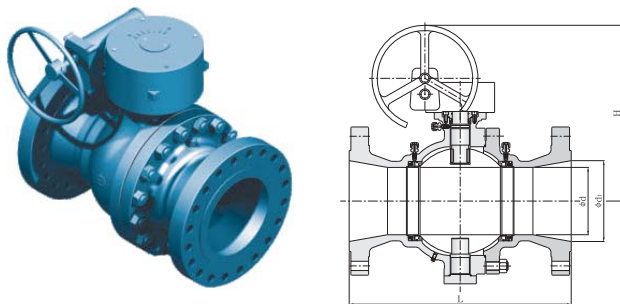
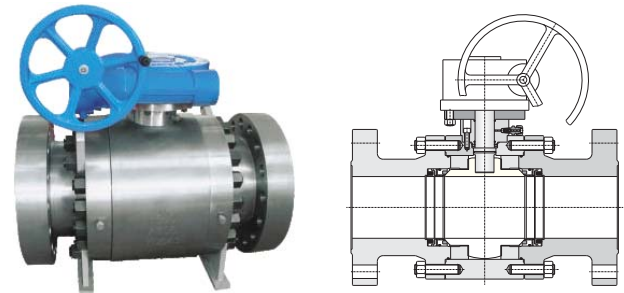
Trunnion Ball Valve

Pressure rating	DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600		
PN16	L	Flange	-	-	-	-	-	394	457	533	610	686	762	864	914	1067	
		BW	-	-	-	-	-	457	521	559	635	762	838	914	991	1143	
	H	-	-	-	-	-	392	492	548	688	722	722	804	952	1154		
	H ₁	-	-	-	-	-	193	240	293	340	372	415	462	511	601		
	W	-	-	-	-	-	300	300	300	400	400	400	500	600	750		
	Weight(kg)	-	-	-	-	-	98	160	282	455	615	889	1150	1360	2530		
PN25	L	Flange	-	-	-	-	-	394	457	533	610	686	762	864	914	1067	
		BW	-	-	-	-	-	457	521	559	635	762	838	914	991	1143	
	H	-	-	-	-	-	392	492	548	688	722	722	804	952	1154		
	H ₁	-	-	-	-	-	193	240	293	340	372	415	462	511	601		
	W	-	-	-	-	-	300	300	300	400	400	400	500	600	750		
	Weight(kg)	-	-	-	-	-	108	175	295	475	638	930	1200	1400	2580		
PN40	L	Flange	-	-	-	-	-	403	502	568	648	762	838	914	991	1143	
		BW	-	-	-	-	-	457	521	559	635	762	838	914	991	1143	
	H	-	-	-	-	-	402	498	655	658	686	880	1050	1110	1400		
	H ₁	-	-	-	-	-	192	246	303	348	378	429	518	540	650		
	W	-	-	-	-	-	300	300	400	400	400	600	750	750	750		
	Weight(kg)	-	-	-	-	-	120	228	395	598	790	1278	1440	1680	3000		
PN63	L	Flange	-	-	-	-	305	381	403	502	568	648	762	838	-	-	-
		BW	-	-	-	-	305	381	457	521	559	635	762	838	-	-	-
	H	-	-	-	-	402	498	655	658	686	880	1050	1110	-	-	-	
	H ₁	-	-	-	-	192	246	303	348	378	429	518	540	-	-	-	
	W	-	-	-	-	300	300	400	400	400	600	750	750	-	-	-	
	Weight(kg)	-	-	-	-	70	99	135	248	416	612	820	1300	-	-	-	
PN100	L	Flange	292	330	356	432	508	559	660	787	838	889	991	-	-	-	
		BW	292	330	356	432	508	559	660	787	838	889	991	-	-	-	
	H	240	290	340	358	400	445	498	653	665	738	920	-	-	-		
	H ₁	94	115	136	152	180	209	263	312	354	389	440	-	-	-		
	W	300	300	300	300	300	300	300	400	400	500	600	-	-	-		
	Weight(kg)	36	52	72	104	162	238	448	660	1070	1335	1835	-	-	-		
PN160	L	Flange	368	419	381	457	559	610	737	838	965	-	-	-	-	-	
		BW	368	419	381	457	559	610	737	838	965	-	-	-	-	-	
	H	250	300	345	415	446	477	520	628	680	-	-	-	-	-		
	H ₁	98	120	140	162	188	213	270	322	360	-	-	-	-	-		
	W	300	300	300	300	300	300	400	400	500	-	-	-	-	-		
	Weight(kg)	44	56	99	148	240	338	595	878	1400	-	-	-	-	-		
JIS 10K	L	-	-	-	-	229	356	394	457	533	610	686	762	864	914	1067	
	H	-	-	-	-	330	360	392	492	548	688	722	722	804	952	1154	
	H ₁	-	-	-	-	135	165	193	240	293	340	372	415	462	511	601	
	W	-	-	-	-	300	300	300	300	300	400	400	400	500	600	750	
	Weight(kg)	-	-	-	-	57	77	98	160	279	448	604	880	1120	1310	2480	
JIS 20K	L	-	-	-	-	305	381	403	502	568	648	762	838	914	991	1143	
	H	-	-	-	-	340	370	402	498	655	658	686	880	1050	1110	1400	
	H ₁	-	-	-	-	140	170	192	246	303	348	378	429	518	540	650	
	W	-	-	-	-	300	300	300	300	400	400	400	600	750	750	750	
	Weight(kg)	-	-	-	-	65	91	120	220	388	580	780	1220	1400	1640	3000	

Trunnion Ball Valve

Forged Steel Trunnion Ball Valve

SUNGO company manufactures in general trunnion ball valve of casted steel valve body. However, if required by customers, forged steel valve body is also available, of which the flange dimensions and face to face dimensions are the same as that of cast steel trunnion ball valve.



Ball Valve With Reduced Bore

Except for full bore ball valves, SUNGO company manufactures also the ball valve with reduced bore to meet different requirement of customers, which not only lowers the cost and pricing, but also satisfies the special requirement of customers.

Size		Pressure rating												
DN	NPS	Class150 PN20				Class300 PN50				Class600 PN110				
		Dimensions(mm)												
		L	d	d ₁	H	L	d	d ₁	H	L		d	d ₁	H
										RF	RJ			
125	5	356	102	127	330	381	102	127	340	508	511	102	127	358
150	6	394	102	152	330	403	102	152	340	559	562	102	152	358
200	8	457	152	203	392	502	152	203	402	660	664	152	203	445
250	10	533	203	254	492	568	203	254	498	787	791	203	254	498
300	12	610	254	305	548	648	254	305	655	838	841	254	305	653
350	14	686	305	305	688	762	305	337	658	889	892	305	337	665
400	16	762	305	337	688	838	305	387	658	991	994	305	387	665
450	18	864	337	387	722	914	337	438	686	1092	1095	337	438	738
500	20	914	387	489	750	991	387	489	880	1194	1200	387	489	920
600	24	1067	489	591	952	1143	489	591	1110	1397	1407	489	591	1200
650	26	1143	538	633	1050	1245	538	633	1250	-	-	-	-	-
700	28	1245	591	684	1154	1346	591	684	1400	-	-	-	-	-
750	30	1295	633	735	1300	1397	633	735	1500	-	-	-	-	-
800	32	1372	684	779	1550	1524	684	779	1600	-	-	-	-	-
900	36	1524	779	874	1740	1727	779	874	1800	-	-	-	-	-

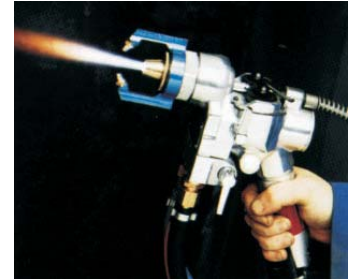
Size		Class900 PN150					Class1500 PN260					Class2500 PN420				
DN	NPS	L		d	d ₁	H	L		d	d ₁	H	L		d	d ₁	H
		RF	RJ				RF	RJ				RF	RJ			
65	2 1/2	419	422	50	64	250	419	422	50	64	320	508	514	42	52	320
80	3	381	384	64	76	300	470	473	64	76	340	578	584	52	62	350
100	4	457	460	76	102	345	546	549	76	102	385	673	683	62	87	400
125	5	559	562	102	127	415	673	676	102	127	415	794	807	87	100	425
150	6	610	613	102	152	415	705	711	102	144	480	914	927	87	131	500
200	8	737	740	152	203	477	832	841	144	192	580	1022	1038	131	179	590
250	10	838	841	203	254	520	991	1000	192	239	584	1270	1292	179	223	610
300	12	965	968	254	305	628	1130	1146	239	287	650	1422	1445	223	265	660
350	14	1029	1038	305	322	680	-	-	-	-	-	-	-	-	-	-
400	16	1130	1140	305	373	680	-	-	-	-	-	-	-	-	-	-

Note: Flange dimensions of ball valve with reduced bore are the same as that of full bore ball valve.

Metal To Metal Sealed Ball Valve

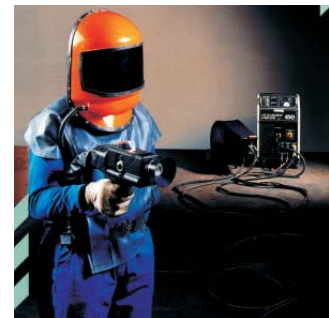
Brief Description

The seat material of general purpose ball valve employs generally non-metal material, such as PTFE. Limited by the seat material, the general purpose ball valve can not be used in case of high temperature application, and application medium with solid articles, and ash dregs neither. So, the application scope of general purpose ball valve is restricted partially. Taking this into consideration, SUNGO company has developed successfully after years of hard study full range of metal to metal sealed ball valve, including floating ball valve and trunnion ball valve, which have found extensive applications in such industries as petroleum, chemistry, power, metallurgy, and light industry.



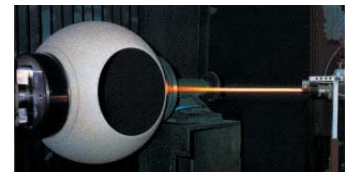
Design features of metal to metal sealed ball valve

Except for such features as wrong operation prevention, stem blow-out proof, mounting pad provided, the metal to metal sealed ball valves made by SUNGO possess the following unique features.



Advanced Hardening Technology Employed For Ball And Seat

Metal to metal sealed design has been employed perfectly for the ball and seat, which has also adopted the advanced hardening technologies, such as ultra-sonic spray coating, nickel base spray welding, surface specially hardening, stellite spray welding, ceramic material with high strength and hardness, and so on. Surface hardness of the ball and seat may generally reach more than HRC60, Maximum is up to HRC74, and application temperature of the material may be up to 540 °C, Maximum is 980 °C. Combining strength of the material gets to more than 10000 PSI. Besides, the surface materials possess also very good resistance properties of friction and impact. Metal to metal sealed ball valves made by SUNGO are suitable for use in most critical working conditions.



Ultra-sonic spray coating
for ball and seat

Metal To Metal Sealed Ball Valve

Valve Stuck Under High Temperature Prevented

In the case of high temperature working condition, the valve seat and ball would easily get stuck due to heat expansion, and the valve could not be open. Metal to metal sealed ball valves made by SUNGO employ the patented design of bevelling spring loading, which would absorb the heat expansion of parts caused by the bevelling spring. So, it is ensured that the valve would not get stuck and be open and close easily in the case of high temperature condition.

Excellent Tightness Function

A unique technique has been employed for the ball grinding, which makes the ball surface reach extreme round and smooth by rotating the ball and grinding apparatus at different directions in space. The tightness function of the valve meets completely and exceeds the standard requirement.

An Entire Fire Safe Structure

The metal to metal sealed structure has been adopted for the valve sealing surface design. Packing is so designed with graphite, and gasket is so designed with stainless steel, plus graphite that the valve can assure reliable tightness even if under fire condition.

Natural anti-static structure

Metal to metal sealed ball valve with its body seat, ball, other metal parts, and so forth, closely contact with each other, having naturally formed a static electricity passage. In this respect, there is no need to provide special anti-static device.

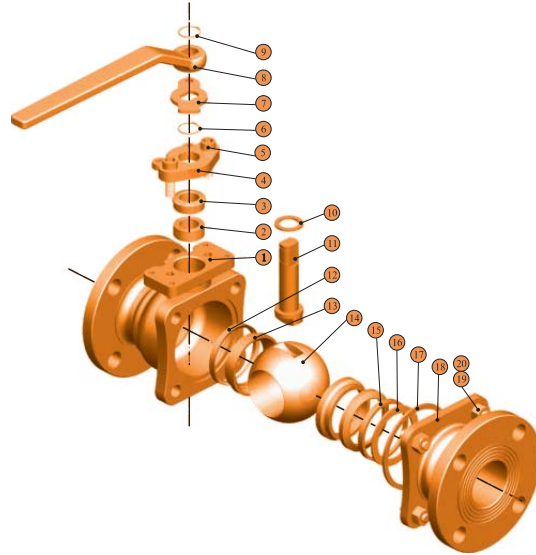
Double-block And Bleed Function

SUNGO's metal to metal sealed trunnion ball valve is in general of the front ball sealing structure. Actually, two seats of the metal to metal sealed trunnion ball valve can both cut off separately the medium at inlet and outlet to realize double-block function. When the valve is closed, the body cavity and both the bore ends can be blocked with each other even if both ends of the valve are under pressure at the same time, whereas the medium left in the body cavity may relieve through the relief valve.

SUNGO's metal to metal sealed floating ball valve is of behind ball sealing structure, employing in general single direction tightness. The flow direction is indicated on the valve body. If specially required by customers, SUNGO's patent of bi-direction sealing design may be selected.

Metal To Metal Sealed Floating Ball Valve

Metal To Metal Sealed Floating Ball Valve



Parts And Material list

Parts No.	Parts name	Materials				
		WCB/13Cr	WCB/304	WCB/316	CF8	CF8M
1	Body	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M
2	Packing	Graphite	Graphite	Graphite	Graphite	Graphite
3	Gland	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 F304	ASTM A182 F316
4	Gland flange	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M
5	Gland bolt	ASTM A193 B7	ASTM A193 B7	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M
6	Circlip	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
7	Stop collar	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
8	Lever	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel
9	Circlip	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel
10	Thrust washer	304 Sheet+Graphite	304 Sheet+Graphite	316 Sheet+Graphite	304 Sheet+Graphite	316 Sheet+Graphite
11	Stem	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 F304	ASTM A182 F316
12	Seat seal	Graphite	Graphite	Graphite	Graphite	Graphite
13	Seat	ASTM A182 F6a +WC - Co	ASTM A182 F304 +WC - Co	ASTM A182 F316 +WC - Co	ASTM A182 F304 +WC - Co	ASTM A182 F316 +WC - Co
14	Ball	ASTM A182 F6a +WC - Co	ASTM A182 F304 +WC - Co	ASTM A182 F316 +WC - Co	ASTM A182 F304 +WC - Co	ASTM A182 F316 +WC - Co
15	Seat seal gland	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F316	ASTM A182 F304	ASTM A182 F316
16	Spring	Inconel 750	Inconel 750	Inconel 750	Inconel 750	Inconel 750
17	Gasket	304 Sheet + Graphite	304 Sheet + Graphite	316 Sheet + Graphite	304 Sheet + Graphite	316 Sheet + Graphite
18	Closure	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M
19	Body bolting	ASTM A193 B7	ASTM A193 B7	ASTM A193 B7	ASTM A193 B8	ASTM A193 B8M
20	Body nut	ASTM A194 2H	ASTM A194 2H	ASTM A194 2H	ASTM A194 8	ASTM A194 8M

Note: The chart above only lists out some common composition of steel ball valve parts. We may provide other different parts material composition according to the customer's request or the actual valve working condition.

Metal To Metal Sealed Floating Ball Valve

Main Sizes And Weights

Refer to that of floating ball valve for main dimensions and weights of metal to metal sealed floating ball valve. The flange dimensions and face to face dimensions are the same as that of floating ball valve.

Products Range

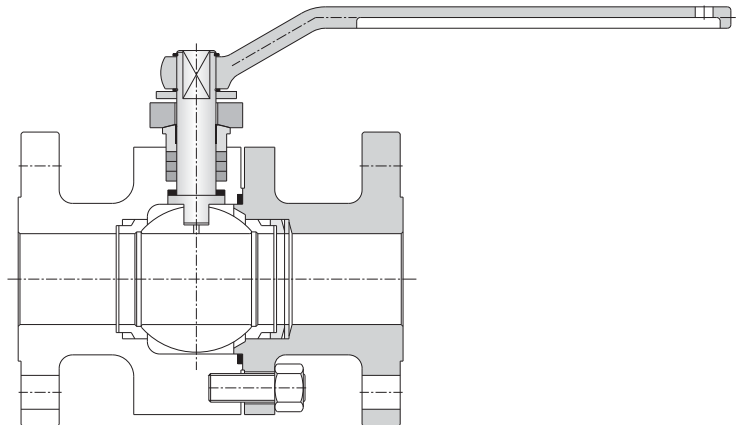
Products range of metal to metal sealed floating ball valve as follows.

Size	NPS	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
	DN	15	20	25	32	40	50	65	80	100	125	150
Pressure rating	Class150/PN20									ÿ	ÿ	
	Class300/PN50									ÿ	-	-
	Class600/PN110									-	-	-
	Class900/PN150								-	-	-	-
	Class1500/PN260							-	-	-	-	-
	PN16									ÿ	ÿ	
	PN25									ÿ	ÿ	
	PN40									ÿ	-	-
	PN63									-	-	-
	PN100									-	-	-

Note: For the manual ball valve, ÿ indicates that Lever is suggested, - indicates that worm gear is suggested.

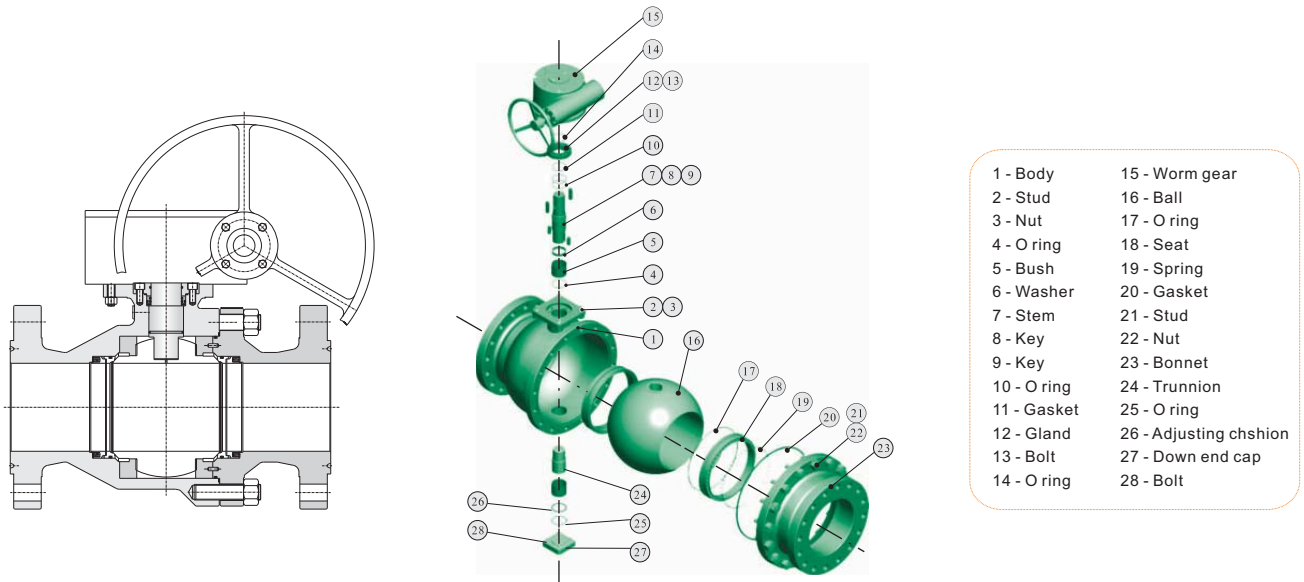
Forged Steel Metal To Metal Sealed Floating Ball Valve

SUNGO's metal to metal sealed floating ball valve is in general employing casted steel valve body. If required by customers, forged steel valve body is also available, of which the flange dimensions and face to face dimensions are the same as that of cast steel ball valve.



Metal To Metal Sealed Trunnion Ball Valve

Typical Drawing Of Metal To Metal Sealed Trunnion Ball Valve And Parts Composition



Main Sizes And Weights

Refer to that of trunnion ball valve for main sizes and weights of metal to metal sealed trunnion ball valve, of which the flange dimensions and face to face dimensions are the same as that of trunnion ball valve.

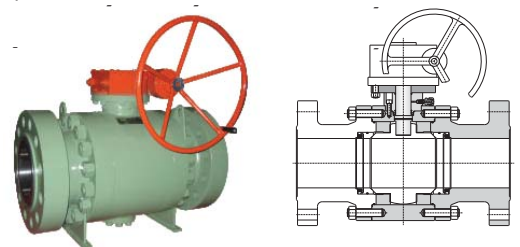
Products Range

Products range of metal to metal sealed trunnion ball valve is as below table.

Size	NPS	4	5	6	8	10	12	14	16	18	20	24	
	DN	100	125	150	200	250	300	350	400	450	500	600	
Pressure rating	Class150/PN20		✓			✓	✓			✓			
	Class300/PN50		✓			✓	✓			✓		-	
	Class600/PN110		✓			✓	✓			-	-	-	
	Class900/PN150							-	-	-	-	-	
	Class1500/PN260		✓			✓	✓			-	-	-	
	Class2500/PN420		✓			✓	✓			-	-	-	
	PN16		✓				-	-	✓	✓	✓	-	-
	PN25		✓				✓	✓	✓	✓	✓		-
	PN40			✓			✓	✓	✓	✓	✓		-
	PN63												-
	PN100						✓	✓	✓	✓			-
	PN160			✓			✓	✓	✓	✓		-	-

Forged Steel Metal To Metal Sealed Trunnion Ball Valve

SUNGO company's metal to metal sealed trunnion ball valve is in general employing casted steel valve body. As per customers' requirement, forged steel valve body is also available, of which the flange dimensions and face to face dimensions are the same as that of cast steel trunnion ball valve

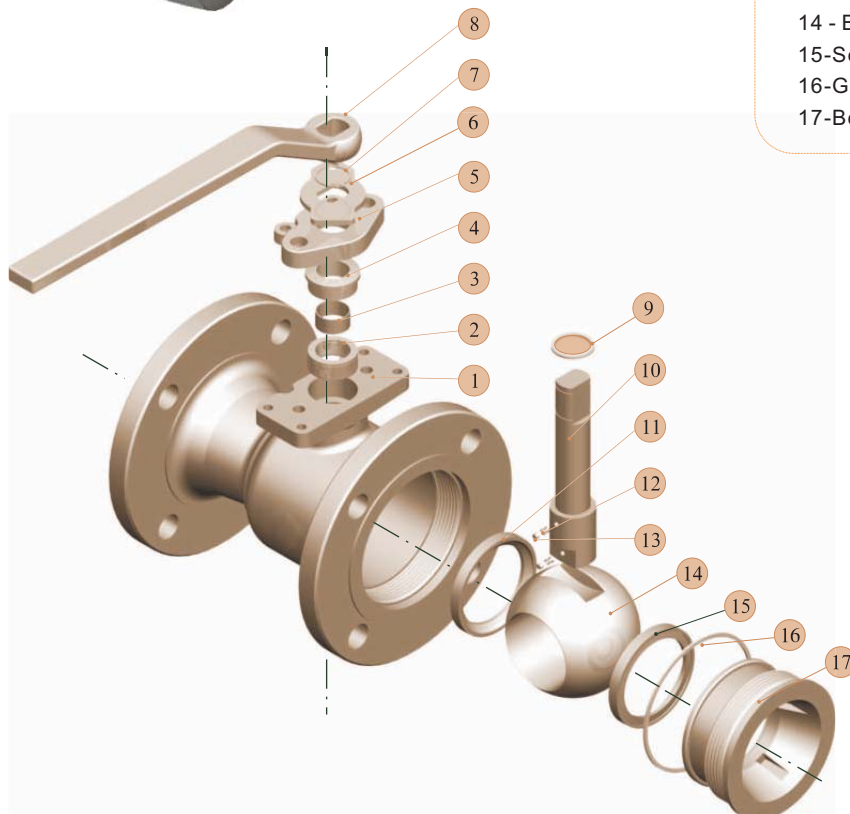


One Piece Body Ball Valve

Application

One piece body ball valve is suitable for use on various kinds of pipelines of Class150 to Class300, PN16 to PN40, JIS 10K to JIS 20K to turn off or on the pipeline medium, of which operation manners are of manual, worm gear, pneumatic or electric actuators, being of flange connection with reduced bore.

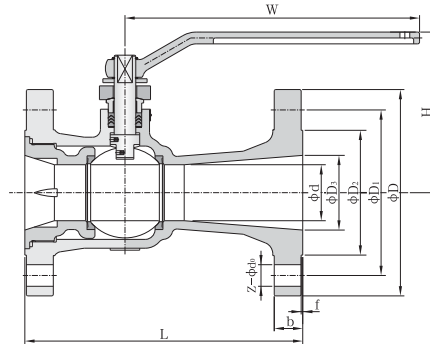
Typical Drawing Of One Piece Body Ball Valve And Parts Composition



- 1 - Body
- 2 - Packing
- 3 - Bush
- 4 - Gland
- 5 - Gland flange
- 6 - Stop collar
- 7 - Circlip
- 8 - Lever
- 9 - Thrust washer
- 10 - Stem
- 11 - Seat
- 12 - Spring
- 13 - Steel ball
- 14 - Ball
- 15 - Seat
- 16 - Gasket
- 17 - Body insert

One Piece Body Ball Valve

Main Size And Weight



Pressure rating	Size		Dimensions(mm)											Weight (kg)
	DN	NPS	L	d	D	D ₁	D ₂	D ₃	b	F	Z-d ₀	W	H	
Class150 PN20	40	1 1/2	165	28	127	98.5	73	38	14.5	1.6	4-15	150	100	6
	50	2	178	38	152	120.5	92	51	16	1.6	4-19	200	132	8
	65	2 1/2	190	50	178	139.5	105	64	17.5	1.6	4-19	250	142	12
	80	3	203	57	190	152.5	127	76	19.5	1.6	4-19	300	163	15
	100	4	229	76	229	190.5	157	102	24	1.6	8-19	350	178	29
Class300 PN50	40	1 1/2	190	28	156	114.5	73	38	21	1.6	4-22	150	100	9
	50	2	216	38	165	127	92	51	22.5	1.6	8-19	200	132	11
	65	2 1/2	241	50	190	149	105	64	25.5	1.6	8-22	250	142	15
	80	3	283	57	210	168.5	127	76	29	1.6	8-22	300	164	22
	100	4	305	76	254	200	157	102	32	1.6	8-22	350	183	40
	150	6	403	102	318	270	216	152	37	1.6	12-22	500	230	81

Pressure rating	DN	40	50	65	80	100	150	
PN16	Dimensions (mm)	L	165	178	190	203	229	394
		H	100	132	142	163	178	230
		W	150	200	250	300	350	500
	Weight(kg)		7	9	12	16	28	53
PN25	Dimensions (mm)	L	165	178	190	203	229	394
		H	100	132	142	163	178	230
		W	150	200	250	300	350	500
	Weight(kg)		7	10	13	17	30	56
PN40	Dimensions (mm)	L	190	216	241	283	305	403
		H	100	132	142	164	283	230
		W	150	200	250	300	350	500
	Weight(kg)		7	10	13	17	30	56
JIS 10K	Dimensions (mm)	L	165	178	190	203	229	394
		H	100	132	142	163	178	230
		W	150	200	250	300	350	500
	Weight(kg)		7	9	12	15	27	52
JIS 20K	Dimensions (mm)	L	190	216	241	283	305	403
		H	100	132	142	164	183	230
		W	150	200	250	300	350	500
	Weight(kg)		8	11	14	20	36	77

Three Way Ball Valve



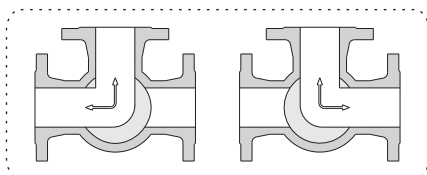
Application

Three way ball valves are suitable for use on various kinds of pipelines of Class150~Class300, PN16~PN40 for switching, dividing, and combining medium flow, of which the operation manners include manual, worm gear, pneumatic or electric actuators, connection manners are in general of flanges. As required by customers, the other type of connection is available too.

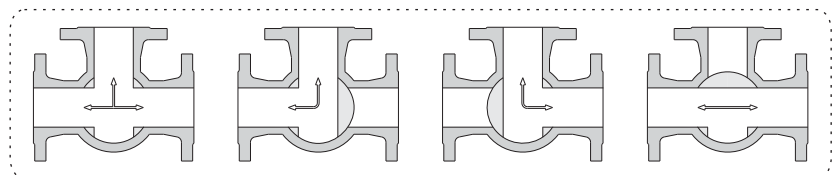
Structure And Features

L type three way ball valve (type of Q44) is used for pipelines to switch the flow direction, being able to switch on two flow lines perpendicular with each other. T type three way ball valve(type Q45).

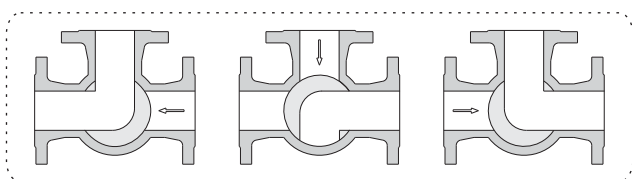
May be used to divide, combine or switch the flow direction. T type ball passage is able to switch on three flow lines or switch on two of the three flow lines. T type ball valve may realize two, three or four seats of the functions, however, the specific valve design must draw a distinction between them to realize different function. In this respect, as selecting and ordering by customers, it is necessary to describe in detail the application requirement so as for SUNGO company to make correct design and fitting. Regarding the general Floating three way ball valve, it is unsuited to be used for certain working conditions, which must be made clear to the customers for making right selection. There are many kinds of three way ball valves with unique designs made by SUNGO company to meet customers' special working conditions and requirement. For the common three way ball valves, SUNGO company adopts in general the design of two seats. As required by customers, SUNGO company can also design and manufacture the three way ball valves with four seats.



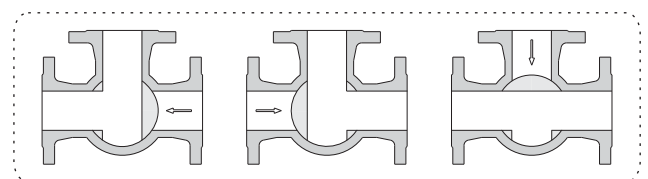
Two usages of L type three way ball valve



Four usages of T type three way ball valve



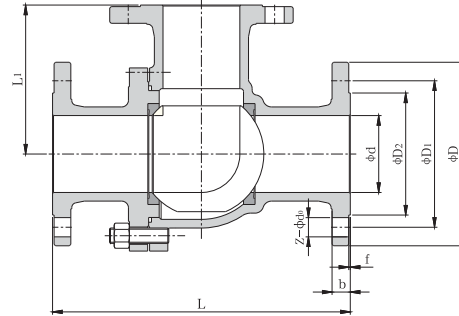
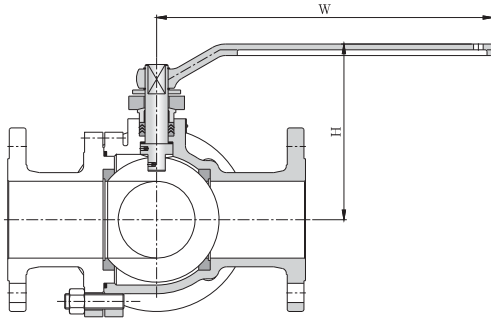
Several unsuited conditions of common L type three way floating ball valve



Several unsuited conditions of common T type three way floating ball valve

Three Way Ball Valve

L Type And T Type Three Way Ball Valve With Two Seats Main Sizes And Weights



Pressure rating	Size		Dimensions(mm)											Weight (kg)
	DN	NPS	L	L ₁	d	D	D ₁	D ₂	b	f	Z-d ₀	W	H	
Class150 PN20	15	1/2	130	65	14	89	60.5	35	11.5	1.6	4-15	140	85	4
	20	3/4	140	70	19	98	70	43	11.5	1.6	4-15	140	90	5
	25	1	150	75	25	108	79.5	51	11.5	1.6	4-15	150	99	7
	32	1 1/4	170	85	32	117	89	64	13	1.6	4-15	180	105	9
	40	1 1/2	180	90	38	127	98.5	73	14.5	1.6	4-15	200	126	10
	50	2	200	100	51	152	120.5	92	16	1.6	4-19	250	140	15
	65	2 1/2	220	110	64	178	139.5	105	17.5	1.6	4-19	300	165	22
	80	3	250	125	76	190	152.5	127	19.5	1.6	4-19	350	178	29
	100	4	280	140	102	229	190.5	157	24	1.6	8-19	500	230	46
Class300 PN50	15	1/2	130	65	14	95	66.5	35	14.5	1.6	4-15	140	85	4
	20	3/4	140	70	19	117	82.5	43	16	1.6	4-19	140	90	5
	25	1	150	75	25	124	89	51	17.5	1.6	4-19	150	99	7
	32	1 1/4	180	90	32	133	98.5	64	19.5	1.6	4-19	180	105	10
	40	1 1/2	200	100	38	156	114.5	73	21	1.6	4-22	200	126	13
	50	2	220	110	51	165	127	92	22.5	1.6	8-19	250	140	19
	65	2 1/2	250	125	64	190	149	105	25.5	1.6	8-22	300	165	29
	80	3	280	140	76	210	168.5	127	29	1.6	8-22	350	178	41
	100	4	320	160	102	254	200	157	32	1.6	8-22	500	230	67
125	5	360	180	127	279	235	186	35	1.6	8-22	800	280	103	
150	6	450	225	152	318	270	216	37	1.6	12-22	800	310	150	

Pressure rating	DN		15	20	25	32	40	50	65	80	100	125	150
			PN16	Dimensions (mm)	L	130	140	150	170	180	200	220	250
L ₁	65	70			75	85	90	100	110	125	140	160	180
W	140	140			150	180	200	250	300	350	500	800	800
H	85	90			99	105	126	140	165	178	230	280	310
PN25	Dimensions (mm)	L	130	140	150	180	200	220	250	280	320	360	450
		L ₁	65	70	75	90	100	110	125	140	160	180	225
		W	140	140	150	180	200	250	300	350	500	800	800
		H	85	90	99	105	126	140	165	178	230	280	310
PN40	Dimensions (mm)	L	130	140	150	180	200	220	250	280	320	360	450
		L ₁	65	70	75	90	100	110	125	140	160	180	225
		W	140	140	150	180	200	250	300	350	500	800	800
		H	85	90	99	105	126	140	165	178	230	280	310
Weight(kg)			4	5	6	10	13	18	24	35	58	82	118

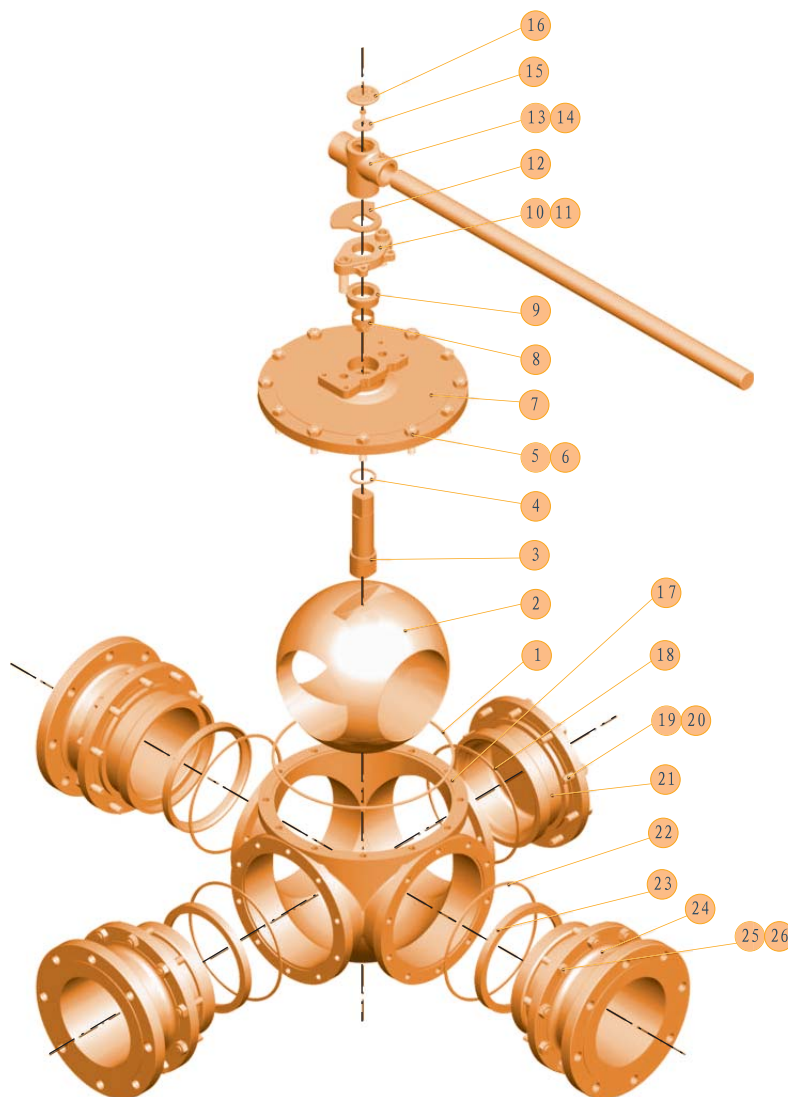
Three Way Ball Valve

Other Structure Of Three Way Ball Valve And Features

Except for manufacture of general L type and T type three way ball valves, SUNGO company has developed a couple of designs of three way ball valve, which is able to satisfy customers' different requirement.

L Type And T Type Three Way Ball Valve With Four Seats

Three way ball valve with four seats features the top entry ball design with four seats, which possesses more reliable tightness functions. However, Valve size gets bigger, including the ball, and the design sounds a bit complicated.



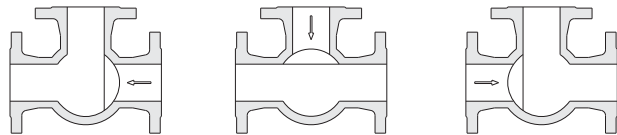
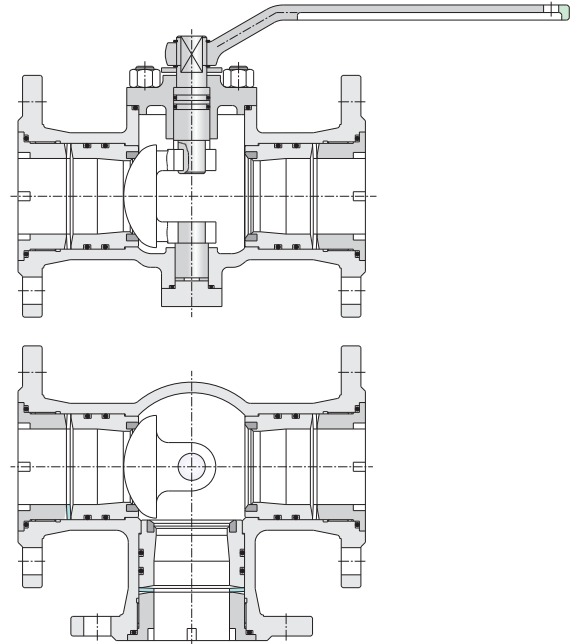
- 1-Gasket
- 2-Ball
- 3-Stem
- 4-Thrust washer
- 5-Stud
- 6-Nut
- 7-Cover
- 8-Packing
- 9-Gland
- 10-Gland flange
- 11-Bolt
- 12-Stop collar
- 13-Lever connector
- 14-Lever
- 15-Washer
- 16-Top cap
- 17-Body
- 18-Gasket
- 19-Stud
- 20-Nut
- 21-Blank plate
- 22-Gasket
- 23-Seat
- 24-End bonnet
- 25-Stud
- 26-Nut

Typical drawing of three way ball valve with four seats

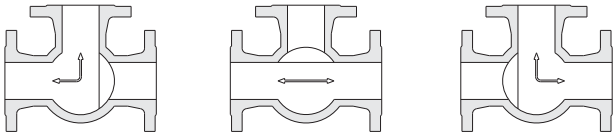
Three Way Ball Valve

Three Way Ball Valve With Half-ball

Half - ball seat three way ball valve is of the design of trunnion ball valve, being impact in structure, and unable to have medium deposition or dirty in the body cavity, As per customers' different requirement, the ball valve may be designed as the front ball tightness or behind ball tightness, Half - ball three way ball valve may adopt soft seats sealing structure (sealing material of PTFE, PPL, nylon and carbon fibre etc.),and metal to metal sealed structure as well.



Half - ball three way ball valve with front ball tightness structure

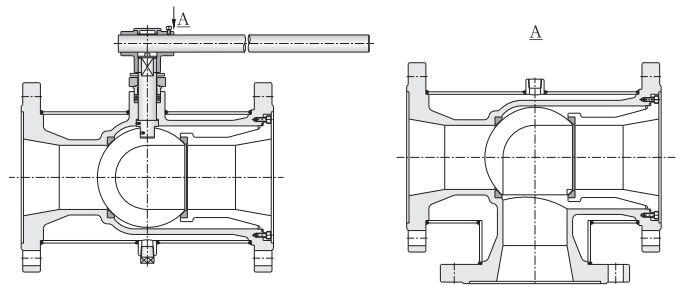


Half - ball three way ball valve with behind ball tightness structure

Typical structure of half - ball three way ball valve

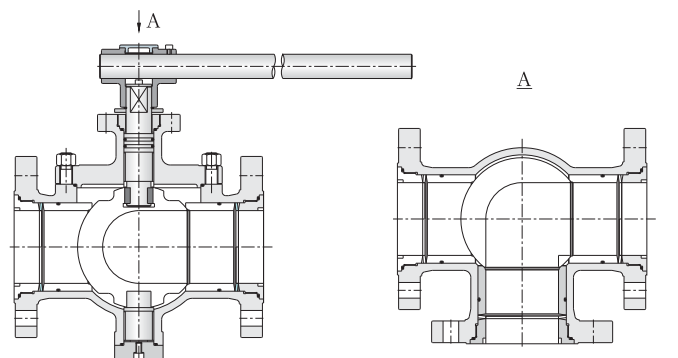
Temperature Protection Jacket Three Way Ball Valve

Temperature protection jacket three way ball valve employs the design of one piece body, being impact in structure and excellent in temperature protection effect. As per customers' requirement, the structure may be of L type three way and T type three way design.



Metal To Metal Sealed Three Way Ball Valve

The ball and seat of metal to metal sealed three way ball valve are employing advanced techniques of nickel base alloy spray welding (of which hardness being HRC 60), ultra - sonic stellite spray coating (max. Hardness of HRC 75), and specially hardening treatment etc., featuring reliable tightness and longer service life, being particularly used for the medium with ash dregs and solid particles. Application temperature of general products is 200 .As specially ordering, application temperature may reach 425 (carbon Steel) or 540 (S.S., CrMo steel,

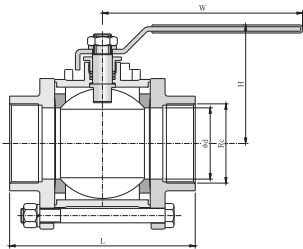


Female Threaded Ball Valve

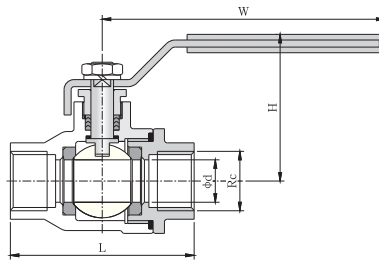
Application

Female threaded ball valves are suitable for use on pipelines of medium or low pressure to turn off or switch on pipeline medium. Operation manners are in general of manual, and pneumatic or electric actuators are available. Based on design structures, the valves get divided into three pieces, two pieces, and one piece types.

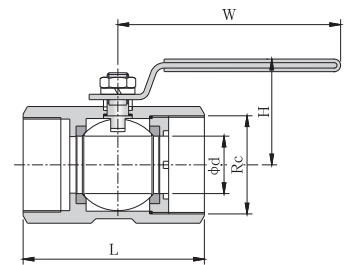
Main Sizes And Weights



QS11F female threaded three pieces ball valve



QL11F female threaded two pieces ball valve



QZ11F female threaded one piece ball valve

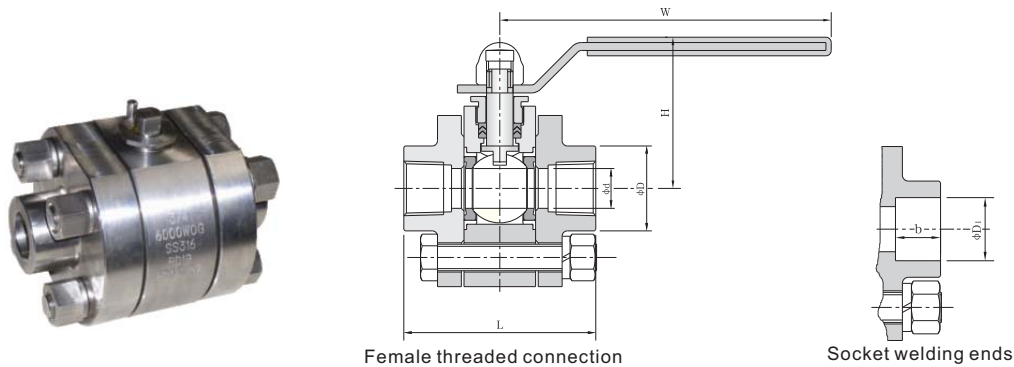
Type	Size		Rc	Dimensions(mm)				Weight (kg)
	DN	NPS		L	d	W	H	
Three pieces	10	3/8	3/8	60	10	95	57	0.4
	15	1/2	1/2	75	14	110	68	0.5
	20	3/4	3/4	80	19	110	70	0.7
	25	1	1	90	25	140	80	1.2
	32	1 1/4	1 1/4	110	32	140	85	1.9
	40	1 1/2	1 1/2	120	38	180	100	2.7
	50	2	2	144	50	180	110	3.9
	65	2 1/2	2 1/2	186	64	200	130	7.1
	80	3	3	206	76	250	150	11.5
Two pieces	10	3/8	3/8	55	10	95	57	0.3
	15	1/2	1/2	65	14	110	68	0.4
	20	3/4	3/4	78	19	110	70	0.6
	25	1	1	88	25	140	80	1.0
	32	1 1/4	1 1/4	105	32	140	85	1.6
	40	1 1/2	1 1/2	112	38	180	100	2.3
	50	2	2	125	50	180	110	3.3
	65	2 1/2	2 1/2	165	64	200	130	6.0
	80	3	3	184	76	250	150	9.8
One piece	10	3/8	3/8	39	6	70	35	0.2
	15	1/2	1/2	57	9	95	44	0.3
	20	3/4	3/4	59	12	95	47	0.4
	25	1	1	71	16	110	55	0.6
	32	1 1/4	1 1/4	80	20	110	60	1.1
	40	1 1/2	1 1/2	83	25	140	75	1.5
	50	2	2	100	32	140	80	2.8

Female Threaded Ball Valve

Application

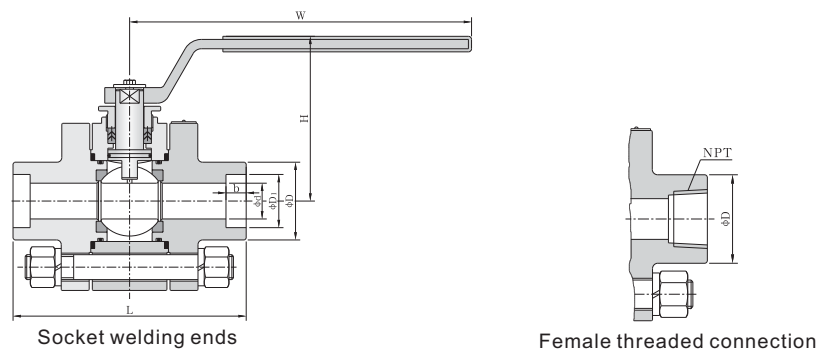
High pressure forged ball valves are suitable for use on pipelines of Class 600 ~ Class 1500, PN 160 ~ PN 320, being used for cutting off or switching on pipelines medium, of which operation manners are of manual in general, and worm gear and pneumatic or electric actuators are available, connections are of socket welding and female threaded ends.

Class600,Class800 Female Threaded And Socket Welding Forged Ball Valve



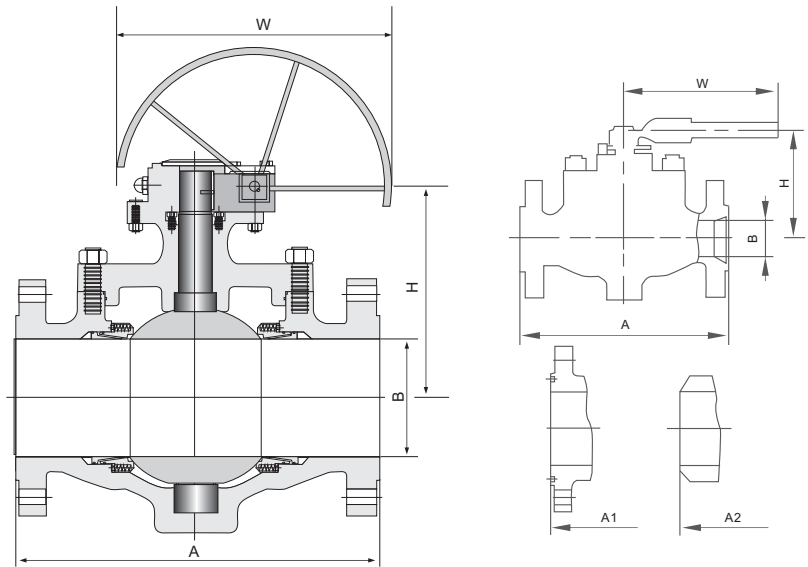
Pressure rating	NPS	DN	Dimensions(mm)							
			L	d	D	H	W	NPT	D ₁	b
Class600 Class800	1/2	15	72	14	32	60	125	1/2	22	10
	3/4	20	86	19	37	73	140	3/4	27.3	13
	1	25	100	25	46	75	150	1	34	13
	1 1/4	32	120	32	56	80	180	1 1/4	42.8	13
	1 1/2	40	130	38	64	125	250	1 1/2	48.9	13
	2	50	140	51	86	162	350	2	61.4	16

Class900,Class1500 Female Threaded And Socket Welding Forged Ball Valve



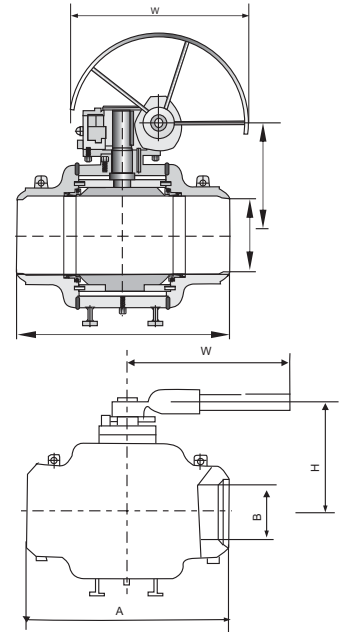
Pressure rating	NPS	DN	Dimensions(mm)							
			L	d	D	H	W	NPT	D ₁	b
Class900 Class1500	1/2	15	130	14	36	90	180	1/2	22	10
	3/4	20	140	19	42	95	200	3/4	27.3	13
	1	25	150	25	50	106	220	1	34	13
	1 1/4	32	180	32	58	115	250	1 1/4	42.8	13
	1 1/2	40	200	38	70	125	250	1 1/2	48.9	13
	2	50	250	51	86	150	350	2	61.4	16

Top Entry Ball Valve



Pressure rating	NPS	A	A1	A2	B	H	W	WT	T
	inch	mm	mm	mm	mm	mm	mm	Kg	N.m
Class 600 (PN6.4~10.0Mpa)	2	292	295	292	49	200	500	25	148
	3	356	359	356	74	210	600	44	200
	4	432	435	432	100	230	650	90	460
	*6	559	562	559	150	290	600	220	908
	*8	660	664	660	201	365	600	392	2560
	*10	787	791	787	252	400	600	640	3048
	*12	838	841	838	303	460	700	895	4300
Class 900 (PN15.0Mpa)	2	368	368	368	36	190	650	48	208
	3	381	384	381	62	215	700	83	280
	4	457	460	457	100	240	800	155	650
	*6	610	613	610	252	300	600	297	1298
	*8	737	740	737	201	375	600	505	3596
	*10	838	841	838	252	415	600	882	4306
Class 1500 (PN25.0Mpa)	*12	965	968	965	303	512	700	1248	6000
	2	368	371	368	49	175	600	45	330
	3	470	473	470	74	232	930	108	440
	4	546	549	546	100	295	1000	150	1034
	*6	705	711	705	144	300	600	378	2084
	*8	832	841	832	192	360	600	550	5496
	*10	991	1000	991	239	410	700	1078	6720
*12	1130	1146	1130	287	500	700	1450	14520	

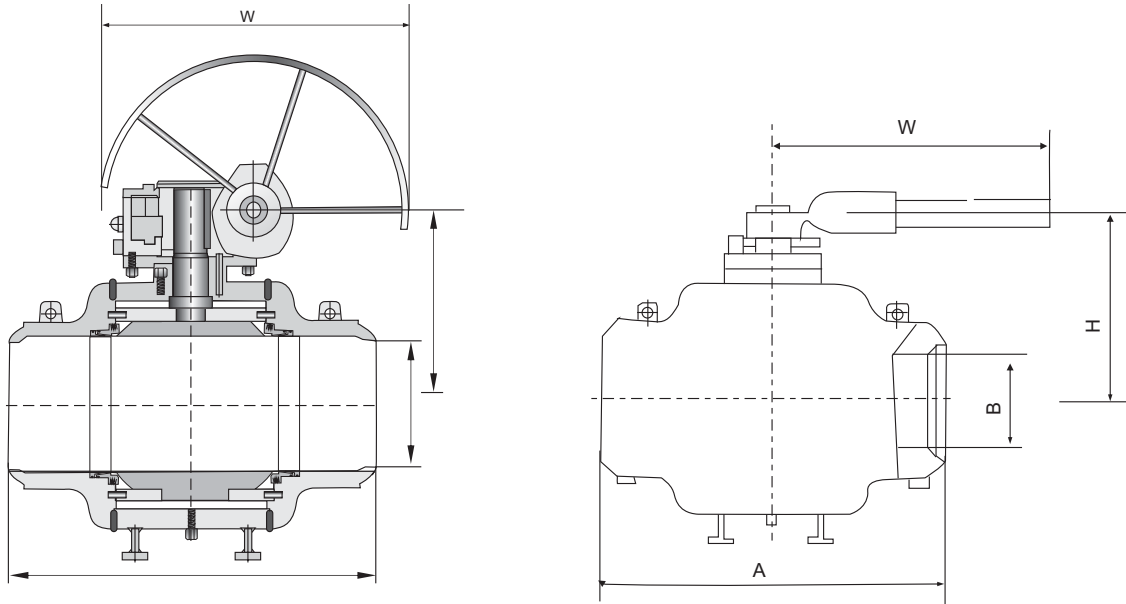
Full Welded Ball Valve



Class 600(PN6.4~10.0Mpa)

NPS	A	B	H	W	WT	T
inch	mm	mm	mm	mm	Kg	N.m
2	292	49	185	500	27	148
3 2	356	49	185	500	40	148
3	356	74	190	600	48	200
4 3	432	74	210	600	74	200
4	432	100	220	650	95	460
6 4	559	100	220	650	180	460
*6	559	150	270	600	210	908
*8 6	660	150	270	600	325	908
*8	660	201	320	600	405	2560
*10 8	787	201	320	600	510	2560
*10	787	252	350	600	655	3048
*12 10	838	252	350	600	805	3048
*12	838	303	400	700	915	4300
*14 12	889	303	400	700	1035	4300
*14	889	334	450	700	1228	7255
*16 12	991	303	400	700	1345	4300
*16 14	991	334	450	700	1450	7255
*16	991	385	500	700	1705	9174
*18 16	1092	385	500	700	2190	9174
*18	1092	436	560	762	2380	13520
*20 18	1194	436	560	762	2625	13520
*20	1194	487	620	762	2875	18034
*24 20	1397	487	620	762	3600	18034
*24 28	1397	589	700	762	4830	29512
*24	1549	598	700	762	5310	29512
*28	1549	684	840	762	5900	42264
*30 28	1651	684	840	762	6530	42264
*32 28	1778	684	840	762	6950	42264

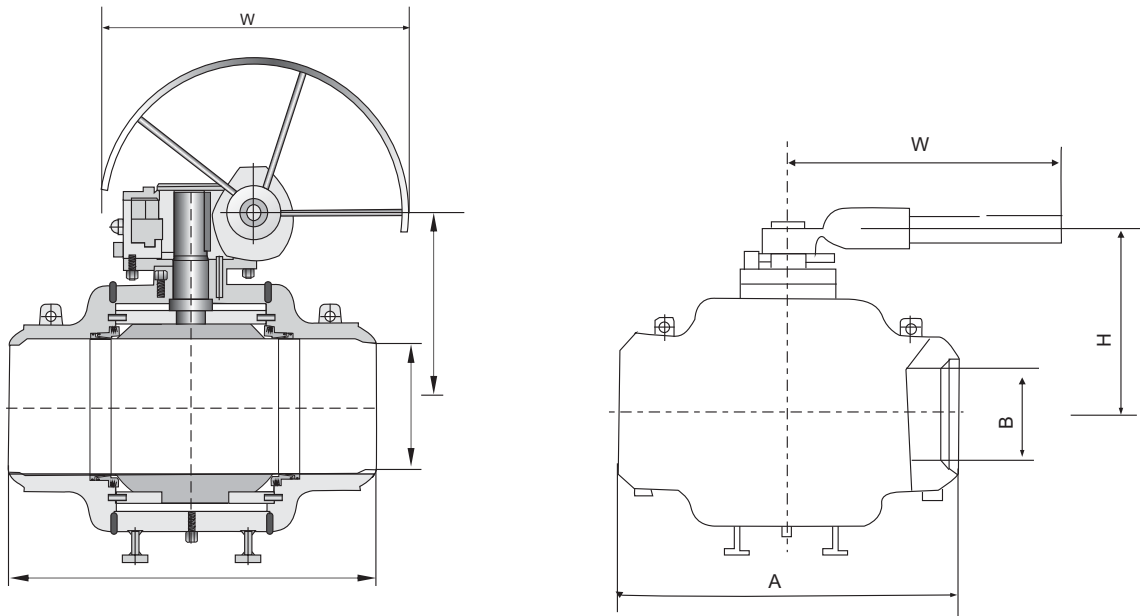
Full Welded Ball Valve



Class 900(PN15.0Mpa)

NPS	A	B	W	H	WT	T
inch	mm	mm	mm	mm	Kg	N.m
2	368	49	180	650	40	208
3	381	49	180	650	45	208
3	381	74	208	700	70	280
4	457	74	208	700	85	280
4	457	100	222	800	110	650
6	610	100	222	800	215	650
*6	610	150	600	270	255	1298
*8	737	150	600	270	450	1298
*8	737	201	600	325	525	3596
*10	838	201	600	325	720	3596
*10	838	252	600	360	810	4306
*12	965	252	600	360	1000	4306
*12	965	303	700	450	1270	6000
*14	1029	303	700	450	1435	6000
*14	1029	322	700	550	1515	10220
*16	1130	322	700	550	1750	10220
*16	1130	373	762	650	2420	12968
*18	1219	373	762	650	2565	12968
*18	1219	423	762	750	2740	19054
*20	1321	423	762	750	2900	19054
*20	1321	471	762	830	3325	25452
*24	1549	471	762	830	3410	25452

Full Welded Ball Valve



Class 1500(PN25.0Mpa)

NPS	A	B	W	H	WT	T
inch	mm	mm	mm	mm	Kg	N.m
2	368	49	175	600	50	330
3 2	470	49	175	600	93	330
3	470	74	232	930	115	440
4 3	546	74	232	930	130	440
4	546	100	295	1000	170	1034
6 4	705	100	295	1000	305	1034
*6	705	144	600	300	402	2084
*8 6	832	144	600	300	498	2084
*8	832	192	600	360	580	5496
*10 8	991	192	600	360	845	5496
*10	991	239	700	410	1120	6720
*12 10	1130	239	700	410	1245	6720
*12	1130	287	700	500	1492	14520
*14 12	1257	287	700	500	1715	14520
*14	1257	315	762	560	2140	32600
*16 12	1384	237	700	500	1842	14520
*16 14	1381	315	762	560	3100	32600
*16	1384	360	762	640	3636	64000

Operation Torque Of Ball Valve

Operation Torque Of Floating Ball Valve

The operation torque data of soft sealed floating ball valve in the following table are calculated based on normal temperature and clean medium. As selecting actuator, it is suggested that drive torque of actuator be more than 1.3 times the operation torque of ball valve at least. In case of high temperature and low temperature working conditions or unclean medium, it is possible that valve operation torque gets increased, which should be taken into full consideration as selecting actuators. Operation torque for metal to metal sealed floating ball valve is about 4 times that of soft sealed floating ball valve.

NPS	DN	Operation torque of soft sealed floating ball valve N. m											
		Class150 PN20	Class300 PN50	Class600 PN110	Class900 PN150	Class1500 PN260	PN16	PN25	PN40	PN63	PN100	JIS10K	JIS20K
1/2	15	7	10	17	25	35	6	8	10	15	17	6	10
3/4	20	10	16	24	35	50	9	12	15	20	24	9	15
1	25	16	25	40	65	100	14	18	23	35	40	14	23
1 1/4	32	24	35	60	100	150	22	28	32	50	60	22	32
1 1/2	40	35	50	90	120	180	32	40	45	70	90	32	45
2	50	50	70	110	180	270	40	55	65	85	110	40	65
2 1/2	65	80	100	165	-	-	60	85	95	130	165	60	95
3	80	120	160	300	-	-	90	130	150	200	300	90	150
4	100	180	280	600	-	-	130	190	260	340	600	130	260
5	125	280	600	-	-	-	250	320	550	-	-	250	550
6	150	540	1000	-	-	-	490	620	900	-	-	490	900
8	200	960	2100	-	-	-	860	1100	1800	-	-	860	1800
10	250	1800	-	-	-	-	-	-	-	-	-	-	-

Operation Torque Of Trunnion Ball Valve

The operation torque data of soft sealed trunnion ball valve in the following table are calculated based on normal temperature and clean medium. As selecting actuator, it is suggested that drive torque of actuator be more than 1.3 times the operation torque of ball valve at least. In case of high temperature and low temperature working conditions or unclean medium, it is possible that valve operation torque gets increased, which should be taken into full consideration as selecting actuators. Operation torque for metal to metal sealed trunnion ball valve is about 3~4 times that of soft sealed trunnion ball valve.

NPS	DN	Operation torque of soft sealed trunnion ball valve N. m													
		Class150 PN20	Class300 PN50	Class600 PN110	Class900 PN150	Class1500 PN260	Class2500 PN420	PN16	PN25	PN40	PN63	PN100	PN160	JIS10K	JIS20K
1 1/2	40	-	-	-	-	100	160	-	-	-	-	-	-	-	
2	50	-	-	70	100	155	250	-	-	-	-	70	105	-	
2 1/2	65	-	-	120	170	265	420	-	-	-	-	120	180	-	
3	80	-	-	280	320	500	800	-	-	-	-	230	340	-	
4	100	110	200	340	480	750	1200	100	140	170	240	340	500	100	170
5	125	180	290	550	780	1200	1900	160	220	260	350	550	820	160	260
6	150	340	480	800	1100	1700	2700	300	380	450	600	800	1150	280	450
8	200	500	850	1700	2400	3700	5900	450	630	750	1300	1700	2500	450	750
10	250	830	1400	2800	4000	6200	9900	750	1050	1250	2000	2800	4200	750	1250
12	300	1400	2400	4200	5900	9100	-	1250	1750	2100	2900	4200	6200	1250	2100
14	350	2200	3100	5800	8100	-	-	2000	2600	2800	3700	5800	-	2000	2800
16	400	2600	4800	7500	10500	-	-	2350	3200	4300	5800	7500	-	2350	4300
18	450	3700	6100	9500	-	-	-	3300	4600	5500	-	-	-	3300	5500
20	500	4800	7500	11500	-	-	-	4300	6000	6800	-	-	-	4300	6800
24	600	8200	12000	16500	-	-	-	7400	10000	11000	-	-	-	7400	11000
26	650	9600	15000	-	-	-	-	-	-	-	-	-	-	-	-
28	700	12000	19000	-	-	-	-	-	-	-	-	-	-	-	-
30	750	14000	22000	-	-	-	-	-	-	-	-	-	-	-	-
32	800	16000	28000	-	-	-	-	-	-	-	-	-	-	-	-
36	900	20000	35000	-	-	-	-	-	-	-	-	-	-	-	-

Flow Coefficient Cv

DN	NPS	Class150~Class600 PN20~PN110		Class900 PN150		Class1500 PN260		Class2500 PN420	
		Full bore	Reduced bore	Full bore	Reduced bore	Full bore	Reduced bore	Full bore	Reduced bore
		Flow coefficient Cv							
15	1/2	24	14	24	14	24	14	24	14
20	3/4	55	31	55	31	55	31	55	31
25	1	100	55	100	55	100	55	100	55
32	1 1/4	160	85	160	85	160	85	160	85
40	1 1/2	260	123	260	123	260	123	260	123
50	2	450	218	450	218	450	218	330	160
65	2 1/2	720	340	720	340	720	340	510	240
80	3	1100	490	1100	490	1100	490	770	350
100	4	2200	880	2200	880	2200	880	1700	680
125	5	3000	1380	3000	1380	3000	1380	2300	1060
150	6	5500	1980	5500	1980	5100	1840	4200	1500
200	8	10000	3500	10000	3500	9100	3200	7900	2800
250	10	17000	5460	17000	5460	15300	4900	13300	4300
300	12	24000	7900	24000	7900	21500	7100	18400	6100
350	14	28000	10700	26000	9940	24900	9500	-	-
400	16	36000	14000	33800	13100	31500	12300	-	-
450	18	46000	18000	43300	17000	-	-	-	-
500	20	57000	22000	53300	20600	-	-	-	-
600	24	75000	31500	70200	29500	-	-	-	-
650	26	84000	37000	-	-	-	-	-	-
700	28	93000	43000	-	-	-	-	-	-
750	30	102000	49000	-	-	-	-	-	-
800	32	110500	56000	-	-	-	-	-	-
900	36	133000	71000	-	-	-	-	-	-



Ball Valve Data Sheet

As application scope for ball valves is very extensive, various working and usage conditions would raise for ball valves different requirement of design and manufacture. SUNGO company has worked out the detailed types for ball valves, however, some more detailed requirements can still be expressed in no way. If possible, it is suggested that customers are invited to tell as much as possible the information as listed in the following table to enable SUNGO company to design and manufacture the ball valve products fully meeting customers' requirements.

Standards and specifications required:	API 6D	API 608	ASME B16.34	BS 5351	MSS SP-72
	GB/T 12237	JB/T7745			
Function of ball valve	_____				
Normal diameter (bore)	_____				
Max. Operation pressure	_____				
Max. Testing pressure in field	_____				
Normal pressure (p. rating)	_____				
Max. Usage temperature	_____				
Min. Usage temperature	_____				
Medium of liquid or gas	_____				
Composition of medium	_____				
Special circulation requirement: excrets, solid article, pipeline clean etc.	_____				
Structure type of ball Valve	_____				
Full bore required?	_____				
Min. Bore diameter	_____				

End Connection

Flange-end?	Yes	No			
Flange to standard	ASME B16.5	ASME B16.47 Series A(API 605)	ASME B16.47 Series B(MSS SP-44)		
	ISO 7005-1	JIS B2238	GB/T 9112-9124		
	HG 20592-20635	JB/T 74-90	GB/T 13402	SH3406	

Flange sealing surface: RF RJ MF TG FF

Butt welding ends?	Yes	No	Standard per	ASME B16.25	
Pipeline:	OD	ID	Pipeline no.	Material	_____
Socket welding ends?	Yes	No	Standard per	ASME B16.11	
Female threaded ends?	Yes	No	Standard per	ANSI B1.20.1	GB 7306 Other _____

Other connection type: _____

Face to Face: Any special requirement? _____

Valve Operation

Operation manner: Lever Worm gear Pneumatic actuator Electric actuator Hydraulic actuator
Pneumatic/Hydraulic actuator Electric/Hydraulic actuator

Special requirement for actuators: Manufacturer, Type, Specification, Accessories (such as positioner, 3 connectors, Solenoid valve, feedback device, position indicator, travel switch etc.) _____

Other Requirement

Supplement requirement: such as Radiography test Ultrasonic test Magnetic powder test liquid penetration test
Anti-static test Special pressure test Torque test Inspection requirement _____

Fire-safe test design? Yes No Standard/certificate of the test _____

Sulphur resistance required? (NACE MR 0175)? Yes No _____

Bleed design required? Yes No Any special requirement? _____

By-pass connection required? Yes No What requirement? _____

Special requirement for documents delivered? _____

Third party witness for process of manufacture & test required? _____

Selection Of ball valve

1. Ball Valves are mainly divided into two types, i.e. floating ball valve and trunnion ball valve. The former is simple in design structure and low in price, however, its operation torque is bigger comparing to that of the trunnion ball valve with same diameter. In general, floating ball valve is adopted for valves of small and medium diameter. On the contrary, trunnion ball valve is relatively higher in price, and smaller in operation torque. So valves with bigger diameters are employing generally the design structure of trunnion ball valve. The following table of ball valve structures relating to each pressure rating is recommended by SUNGO company to customers for reference when selecting ball valves. The applicable scope of metal to metal sealed ball valve with floating ball is narrower due to its bigger operation torque.

pressure rating	Valve category							
	Soft sealed Full bore		Soft sealed Reduced bore		Metal to metal sealed Full bore		Metal to metal sealed Reduced bore	
	Ball valve design structure recommended							
	Floating ball	Trunnion ball	Floating ball	Trunnion ball	Floating ball	Trunnion ball	Floating ball	Trunnion ball
Class150 PN20	DN150 NPS6	DN200 NPS8	DN200 NPS8	DN250 NPS10	DN100 NPS4	DN125 NPS5	DN125 NPS5	DN150 NPS6
Class300 PN50	DN125 NPS5	DN150 NPS6	DN150 NPS6	DN200 NPS8	DN80 NPS3	DN100 NPS4	DN100 NPS4	DN125 NPS5
Class600 PN110	DN80 NPS3	DN100 NPS4	DN100 NPS4	DN125 NPS5	DN50 NPS2	DN65 NPS2 1/2	DN65 NPS2 1/2	DN80 NPS3
Class900 PN150	DN50 NPS2	DN65 NPS2 1/2	DN65 NPS2 1/2	DN80 NPS3	DN40 NPS1 1/2	DN50 NPS2	DN50 NPS2	DN65 NPS2 1/2
Class1500 PN260	DN40	DN50	DN50	DN65	DN40	DN50	DN50	DN65
Class2500 PN420	NPS1 1/2 Not	NPS2 DN40	NPS2 Not	NPS2 1/2 DN50	NPS1 1/2 DN32	NPS2 DN32	NPS2 DN40	NPS2 1/2 DN50
PN16	recommended	NPS1 1/2	recommended	NPS2	NPS1 1/4	NPS1 1/2	NPS1 1/2	NPS2
PN25	DN150	DN200	DN200	DN250	DN100	DN125	DN125	DN150
PN40	DN150	DN200	DN200	DN250	DN100	DN125	DN125	DN150
PN63	DN125	DN150	DN150	DN200	DN80	DN100	DN100	DN125
PN100	DN100	DN125	DN125	DN150	DN50	DN65	DN65	DN80
PN160	DN100	DN125	DN125	DN150	DN50	DN65	DN65	DN80
	DN50	DN65	DN65	DN80	DN40	DN50	DN50	DN65

2. Regarding the ball valve without any special requirement, ordering can be placed according to the type & number code System for Ball Valve made by SUNGO company. It is suggested that customers be best to render relative information as per the valve data list when ordering, because it sounds still difficult to describe the full details of the ball valve, though SUNGO company's type & number code system is done relatively in detail, so as to enable SUNGO company to design and manufacture the ball valve product fully meeting customers' requirement.

3. Regarding trunnion ball valve, if customers have no special requirement, it is suggested that SUNGO company make decision based on its own processing technique to employ the structure of either two piece or three piece body. Generally, SUNGO company adopts two piece body design for ball valve DN350(NPS14), and three piece design for ball valve DN400(NPS16).

4. Ball valves designed and manufactured by SUNGO company are very mature, however, technology is always progressing continuously. In this respect, SUNGO company reserves the right to change and improve the design and manufacture of products in the catalogue without notice.

5. There are two types of design structure of metal to metal sealed ball valves, i.e., high temperature and general temperature structure, which should be specified by customers when ordering.

Transportation, Storage And Installation Of Ball Valve

1. During transportation and storage, protection covers for both ends of ball valve should not be removed to prevent the valve connection ends from damage, and to avoid dirty and foreign articles entering valve body cavity.

2. Valves should be kept in a dry room, and it is not allowed to keep the valve in open-air in general in order to prevent valves from damage and deterioration.

3. Before delivery, valves have been tested and adjusted according to standards and requirement of ordering contract. Customers may use valves at once as received and after unpacking. As for pneumatically and electrically operated ball valves. The set-up of power and gas sources for valves should be done in detail according to the brief introduction of application and installation for pneumatic and electric actuators equipment. If customers need to re-test and re-accept valves, which should be strictly done according to standards and ordering contract, so as to avoid disadvantageous effect of valve function caused by mistake testing method. Valves stored after testing should be cleaned of water deposited in the valve body cavity.

4. The protection covers at valve ends should be removed when installation is carried on, and damage of connection ends should be avoided. As for valves with welding ends, proper protection procedures should be taken when welding to prevent valve function from transfiguration caused by high temperature during welding. Particular attention should be drawn to the disadvantage effect against the seat of soft sealed ball valve during welding due to high temperature.

5. For certain types of ball valves such as metal to metal sealed floating ball valves and V type ball valves, which need direction requirement for installation, attention should be drawn to the direction marking of arrow-head of the valve body during testing and installation to avoid mistake testing and wrong installation.

Usage and operation

1. For manual ball valve: The valve is open with the lever in parallel to piping, With the lever right angled to piping, the valve is closed. It is closed. the valve to turn the lever clockwise, and to turn the lever anticlockwise means to open the valve.

2. For worm gear operated ball valve: The indicator of valve opening degree is on the top of the actuator equipment. It is closing the valve to turn the wheel clockwise, and to turn the wheel anticlockwise means to open the valve.

3. For pneumatically, electrically, pneumatically/hydraulically, and electrically/hydraulically operated ball valves: Please refer to the detailed usage introduction of actuators equipment.

PRODUCT WARRANTY

Seller will replace without charge or refund the purchase price of products provided by seller which prove to be defective in material or workmanship, provided in each case that the product is properly installed and is used in the service for which Seller recommends it and that written claim, specifying the alleged defect, is presented to the Seller within 18 months from the date of shipment or 12 months after installation, whichever occurs first. Seller shall in no event bear any labor, equipment, engineering or other costs incurred in connection with repair or replacement. The warranty stated in this paragraph is in lieu of all other warranties, either expressed or implied. With respect to warranties, this paragraph states Buyer's exclusive remedy and seller's exclusive liability.

