

Metal Seated Ball Valve Series



Metal Seated Ball Valve Series

Pressure Class :Class 150~900
Size Range : 1/2"~36"
API Standards:6D
ASME B 16.34

Summary

With such features as small fluid resistance, smooth flow channel, rapid opening and closing, and easy automatic control, the ball valve has been widely used. But the seat or regular ball valves is generally made of PTFE and other nonmetal material. Limited by seat seal materials, The regular valves cannot be used under the service condition of high temperature. Therefore, the use of regular ball valves is limited to a certain degree, The series of new style practical metal seated ball valve problem, and have been widely applied in petroleum, chemical industry, electric power, metallurgy, light industry and etc.

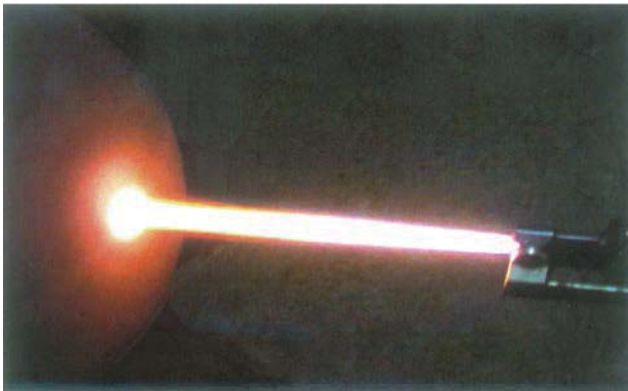
Usage

The metal seated ball valve is used to cut off or connect the media in various pipelines. It is suitable for severe service conditions containing solid granules, slurry, coal powder, cinder and etc.

Structural Features

1. Advanced Ball and Seat Hardening Technology

The ball and seat of the metal seated ball valve absolutely adopts the sealing mode of metal to metal. According to different service conditions and requirements of users, various advanced ball and seat hardening technologies can be adopted, including HVOF coating, nickel-base alloy spray welding, high nickel alloy spray welding, cobalt-base hard alloy spray welding, etc. Generally, the ball and seat surface hardness can reach HRC55~60 with the maximum value of HRC70. Generally, the heat resistance of the sealing face material can reach 540°C with the maximum value of 980°C. The sealing face material has also good wear resistant and impact resistant performances.



2. Flexible Valve Opening and Closing

Under the service condition of high temperature, the ball and seat will expand too much because of thermal expansion, and thus causing that the valve cannot be opened, The ball valve adopts the disc spring or spring loaded sealing structure so that thermal expansion of parts under high temperature can be absorbed by the disc spring or spring. And it is ensured that the valve will be flexibly opened and closed under high temperature without expanding too much under high temperature.

3. Fireproof Structure Design

In the metal to metal structure for the valve. The gasket is the stainless steel+flexible graphite and the packing is the flexible graphite. Therefore, reliable sealing of the valve can be ensured even in case of fire.

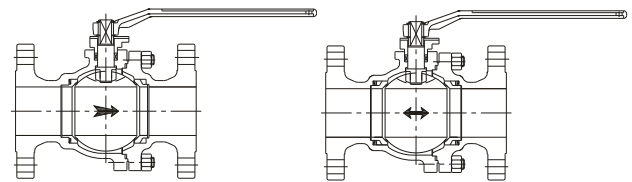
4. Double Block and Bleed (Metal Seated Trunnion Ball Valve)

The metal seated trunnion ball valve usually adopts the sealing structure before the ball. When the valve is closed and the middle cavity is emptied through the discharge valve, the upstream and downstream seats will independently block the fluid at the inlet and outlet to realize double block function. The metal seated floating ball valve usually adopts the sealing structure after the ball. Unidirectional sealing is generally adopted with flow direction marked on the body. If users have special requirements, bidirectional sealing structure can be adopted.

5. Reliable Sealing Performance

The unique ball grinding technology is adopted, Through rotation of the ball and the grinder at different positions, the ball surface will achieve high roundness and fineness. The low pressure sealing of valve seat is realized by spring pre-tightening. In addition, the piston effect of valve seat is designed reasonably, which realizes high pressure sealing by the pressure of the medium itself, The sealing level of the valve meet the requirements of level IV in ANSI B16.104.

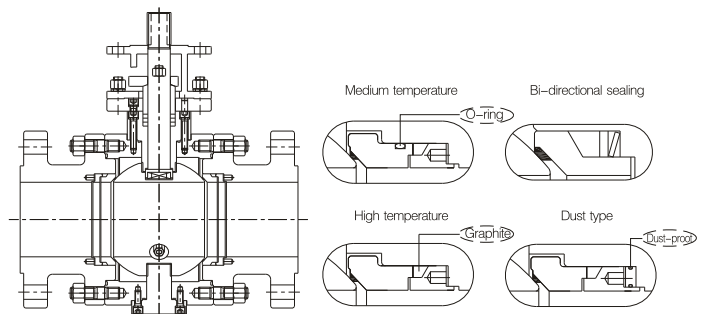
Metal seated floating ball valve



Unidirectional seal

Bi-directional sealing

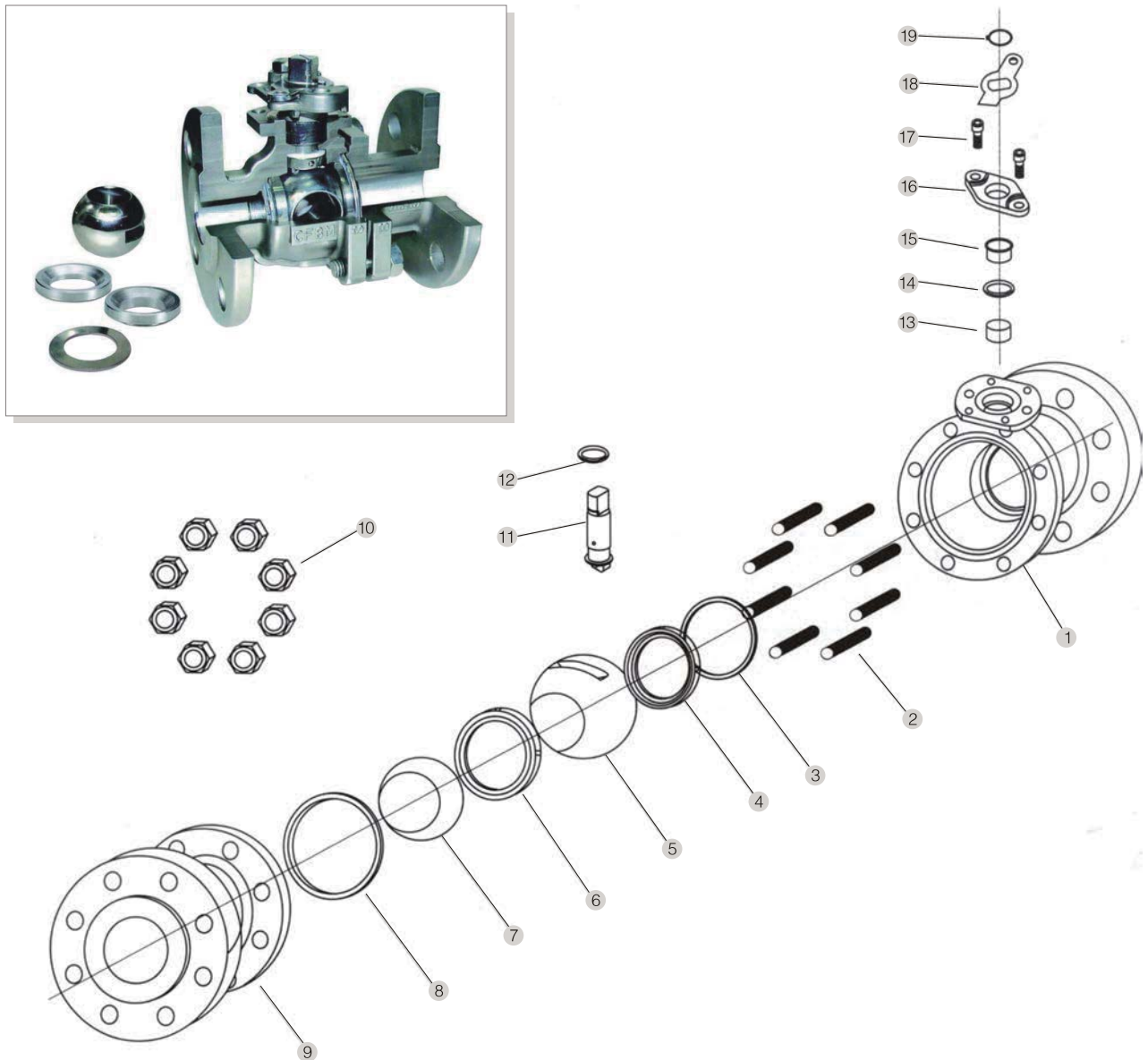
Metal seated trunnion ball valve Seat structure



Metal Seated Floating Ball Valve

1	Body
2	Stud
3	Sealing gasket
4	Back seat
5	Ball
6	Front seat
7	Disc spring
8	Sealing gasket
9	Bonnet
10	Hexagon nut
11	Stem
12	Thrust bearing

13	Sliding bearing
14	Packing
15	Packing bushing
16	Packing gland
17	Socket head cap screw
18	Stopper
19	Retainer ring

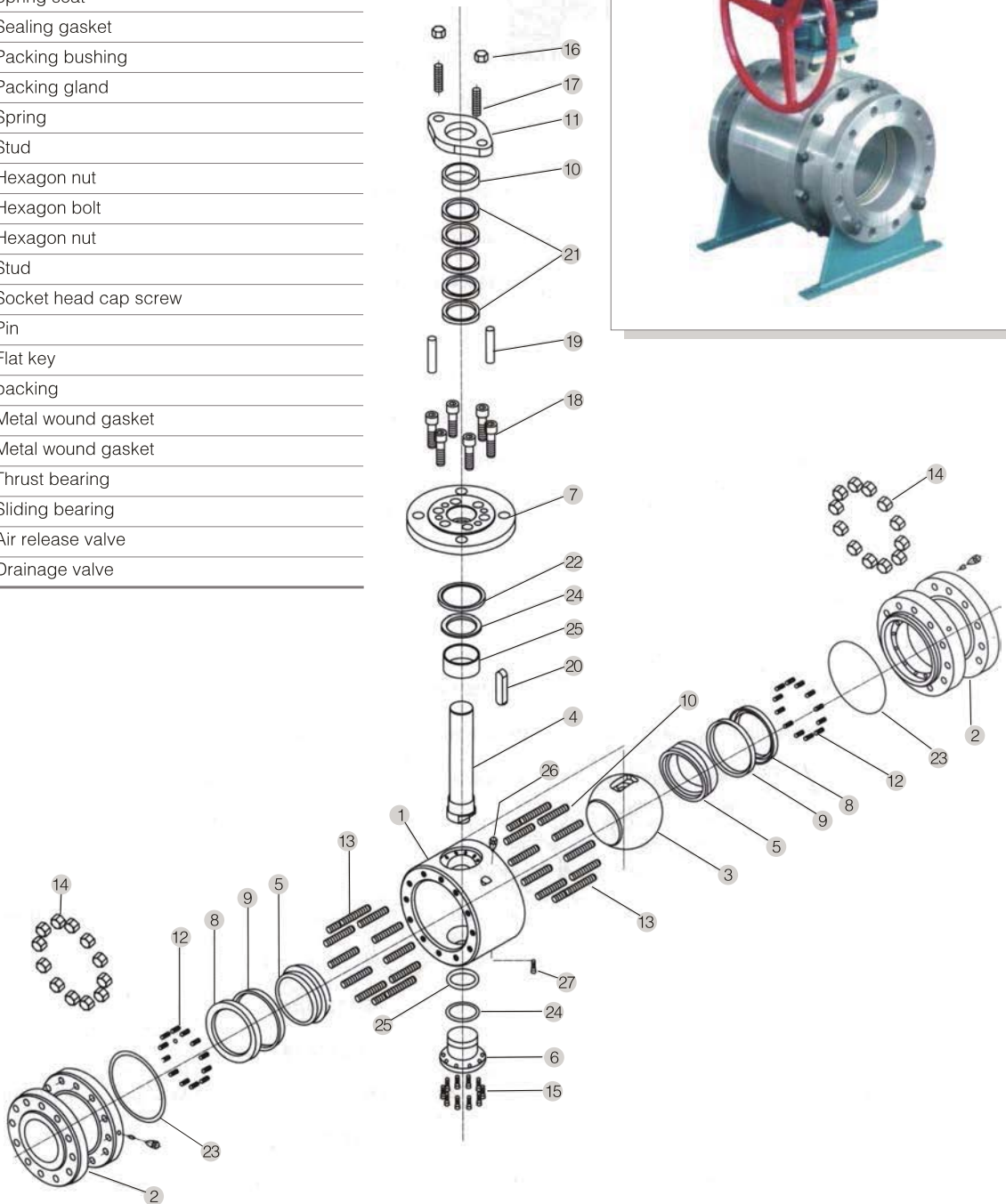


Part Materials and Main Parameters

Nominal diameter (in)		NPS1/2-8					
Nominal Pressure (MPa)		Class150~Class600					
Materials of parts	No.	Part Name	Material				
			Carbon steel	Stainless steel			
	1	Body	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A351 CF3	ASTM A351 CF3M
	2	Stud	A193 B7M	A320 B8	A320 B8M	A320 B8	A320 B8M
	3	Sealing gasket	Graphite				
	4	Back seat	ASTM A105+HF	ASTM A182 304+HF	ASTM A182 316+HF	ASTM A182 304L+HF	ASTM A182 316L+HF
	5	Ball	ASTM A105+HF	ASTM A182 304+HF	ASTM A182 316+HF	ASTM A182 304L+HF	ASTM A182 316L+HF
	6	Front seat	ASTM A105+HF	ASTM A182 304+HF	ASTM A182 316+HF	ASTM A182 304L+HF	ASTM A182 316L+HF
	7	Disc spring	17-7PH				
	8	Sealing gasket	Graphite				
	9	Bonnet	ASTM A216 WCB	ASTM A351 CF8	ASTM A351 CF8M	ASTM A351 CF3	ASTM A351 CF3M
	10	Hexagon nut	A194-2HM	A194-8	A194-8M	A194-8	A194-8M
	11	Stem	ASTM A182 F6a	ASTM A182 304	ASTM A182 316	ASTM A182 304L	ASTM A182 316L
	12	Thrust bearing	SST + Graphite				
	13	Sliding bearing	TF-2				
	14	Packing	Graphite				
	15	Packing bushing	ASTM A182 F6a	ASTM A182 F6a	ASTM A182 F6a	ASTM A182 F6a	ASTM A182 F6a
	16	Packing gland	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB
	17	Socket head cap screw	A193 B7M	A193 B7M	A193 B7M	A193 B7M	A193 B7M
18	Stopper	A3 · HZn	A3 · HZn	A3 · HZn	A3 · HZn	A3 · HZn	
19	Retainer ring	65Mn	65Mn	65Mn	65Mn	65Mn	
Applicable service conditions	Applicable media	Water, steam, oil, coal gas, liquefied gas, natural gas,	Nitric acid	Acetic acid	Strong Oxidizer	Urea	
	Applicable temperature	-29 ~ +425°C	≤ 200°C				
Design and manufacturing		ASME B16.34					
Face-to-face dimensions		ASME B16.10					
Type of connection	Flange	ASME B16.5		Butt welding	ASME B16.25		
Pressure test		API 598					
Transmission mode		Manual, worm and worm gear transmission, pneumatic, electric					

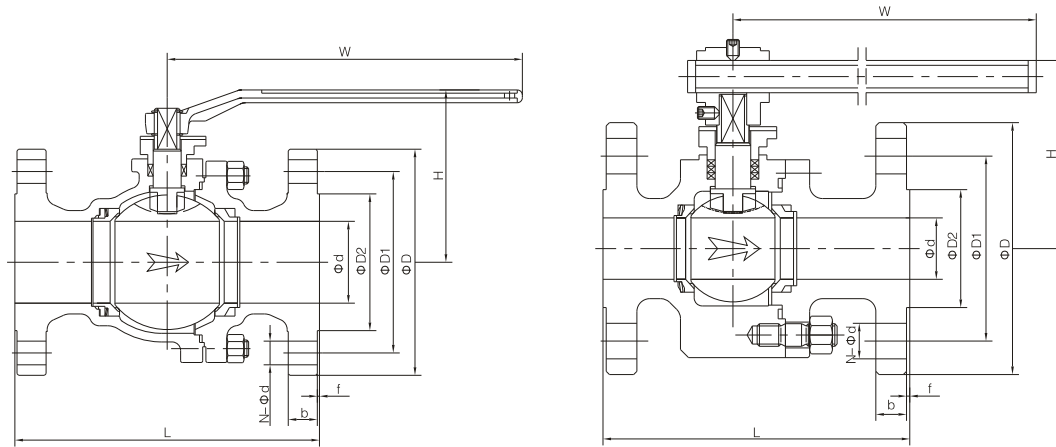
Metal Seated Trunnion Ball Valve

1	Body
2	Bonnet
3	Ball
4	Stem
5	Seat
6	Lower cover
7	Connection plate
8	Spring seat
9	Sealing gasket
10	Packing bushing
11	Packing gland
12	Spring
13	Stud
14	Hexagon nut
15	Hexagon bolt
16	Hexagon nut
17	Stud
18	Socket head cap screw
19	Pin
20	Flat key
21	packing
22	Metal wound gasket
23	Metal wound gasket
24	Thrust bearing
25	Sliding bearing
26	Air release valve
27	Drainage valve



Part Materials and Main Parameters

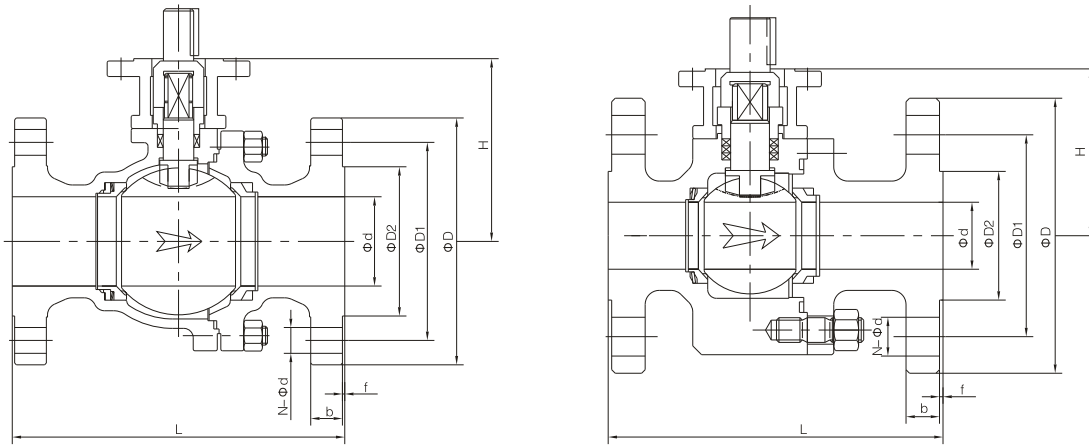
Nominal diameter (in)		NPS1/2-36					
Nominal Pressure (Mpa)		Class150~Class600					
Materials of parts	No.	Part Name	Material				
			Carbon steel	Stainless steel			
	1	Body	ASTM A105	ASTM A182 304L	ASTM A182 316	ASTM A182 304	ASTM A182 316L
	2	Bonnet	ASTM A105	ASTM A182 304L	ASTM A182 316	ASTM A182 304	ASTM A182 316L
	3	Ball	ASTM A105+HF	ASTM A182 304L+HF	ASTM A182 316+HF	ASTM A182 304+HF	ASTM A182 316L+HF
	4	Stem	ASTM A182 F6a	ASTM A182 304L	ASTM A182 316	ASTM A182 304	ASTM A182 316L
	5	Seat	ASTM A105+HF	ASTM A182 304L+HF	ASTM A182 316+HF	ASTM A182 304+HF	ASTM A182 316L+HF
	6	Lower cover	ASTM A105 · CHR	ASTM A182 304L	ASTM A182 316	ASTM A182 304	ASTM A182 316L
	7	Connection plate	ASTM A105	ASTM A182 304L	ASTM A182 316	ASTM A182 304	ASTM A182 316L
	8	Spring seat	AST MA105 · CHR	ASTM A182 304L	ASTM A182 316	ASTM A182 304	ASTM A182 316L
	9	Sealing gasket	Graphite				
	10	Packing bushing	ASTM A182 F6a	ASTM A182 F6a	ASTM A182 F6a	ASTM A182 F6a	ASTM A182 F6a
	11	Packing gland	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB
	12	Spring	17-7PH				
	13	stud	A193 B7M	A320 B8	A320 B8M	A320B8	A320 B8M
	14	Hexagon nut	A194-2HM	A194-8	A194-8M	A194-8	A194-8M
	15	Hexagon bolt	A193 B7M	A320 B8	A320 B8M	A320 B8	A320 B8M
	16	Hexagon nut	A194-2H	A194-8	A194-8	A194-8	A194-8
	17	Stud	A193 B7M	A320 B8	A320 B8M	A320B8	A320 B8M
	18	Socket head cap screw	A193 B7M	A320 B8	A320 B8M	A320B8	A320 B8M
	19	pin	ANSI 1035	ANSI 1035	ANSI 1035	ANSI 1035	ANSI 1035
	20	Flat key	ANSI 1045	ANSI 1045	ANSI 1045	ANSI 1045	ANSI 1045
	21	Packing	Graphite				
	22	Metal wound gasket	SST+Graphite				
	23	Metal wound gasket	SST+Graphite				
	24	Thrust bearing	SST+Graphite				
	25	Sliding bearing	Combined parts	TF-2			
26	Air release valve	Combined parts	Combined parts	Combined parts	Combined parts	Combined parts	
27	Drainage valve	Combined parts	Combined parts	Combined parts	Combined parts	Combined parts	
Applicable service conditions	Applicable media	Water, steam, oil, gas, liquefied petroleum gas, natural gas,	Nitric acid	Acetic acid	Strong Oxidizer	Urea	
	Applicable temperature	≤200℃					
Design and manufacturing		API 6D					
Face-to-face dimensions		ASME B16.10					
Type of connection		Flange	ASME B16.5		Butt welding	ASME B16.25	
Pressure test		API 598、API 6D					
Transmission mode		Manual, worm and worm gear transmission, pneumatic, electric					



Pressure rating	Nominal Diameter		d	Flange		Butt welding	Raised face flange						W	Cast steel	Forged steel	Weight(kg)	
	Class	NPS		DN	L(RF)		L(RTJ)	L(BW)	D	D1	D2	f				b	N-φd
150	1/2"	15	13	108	/	140	90	60.5	35	2	9	4-φ16	140	80	63	2.3	△
	3/4"	20	19	117	/	152	100	70	43	2	10	4-φ16	140	86	82.5	3	△
	1"	25	25	127	/	165	110	79.5	51	2	11	4-φ16	140	95	93.5	4.5	△
	1 1/4"	32	32	140	/	178	115	89	64	2	11	4-φ16	180	101	96	5.5	△
	1 1/2"	40	38	165	/	190	125	98.5	73	2	13	4-φ16	180	128.5	128	7	△
	2"	50	50	178	191	216	150	120.5	92	2	14.5	4-φ19	200	136	136	9.5	△
	3"	80	75	203	216	283	190	152.5	127	2	17.5	4-φ19	300	145	145	19	△
	4"	100	100	229	241	305	230	190.5	157	2	22.5	8-φ19	650	197.5	204	33	△
300	1/2"	15	13	140	/	140	95	66.5	35	2	13	4-φ16	140	80	63	2.5	△
	3/4"	20	19	152	/	152	115	82.5	43	2	14.5	4-φ19	140	82	82.5	3.5	△
	1"	25	25	165	/	165	125	89	51	2	16	4-φ19	140	84	92.5	5.5	△
	1 1/4"	32	32	178	/	178	135	98.5	64	2	17.5	4-φ19	180	101	96	8	△
	1 1/2"	40	38	190	/	190	155	114.5	73	2	19.5	4-φ22	180	128.5	128	10.5	△
	2"	50	50	216	232	216	165	127	92	2	21	8-φ19	200	136	136	15	△
	3"	80	75	283	298	283	210	168.5	127	2	27	8-φ22	300	145	145	30	△
	4"	100	100	305	321	305	255	200	157	2	30.5	8-φ22	650	197.5	204	55	△
600	1/2"	15	13	165	/	165	95	66.5	35	7	14.5	4-φ16	140	88	78	3.5	△
	3/4"	20	19	190	/	190	115	82.5	43	7	16	4-φ19	140	98	82.5	6.5	△
	1"	25	25	216	/	216	125	89	51	7	17.5	4-φ19	180	115	102	8.5	△
	1 1/4"	32	32	229	/	229	135	98.5	64	7	21	4-φ19	200	125	110	10.5	△
	1 1/2"	40	38	241	/	241	155	114.5	73	7	22.5	4-φ22	250	142	128	13.5	△
	2"	50	50	292	295	292	165	127	92	7	26	8-φ19	300	160	142	△	△
	3"	80	75	356	359	356	210	168.5	127	7	32	8-φ22	650	178	156	△	△

△ please consult the factory:

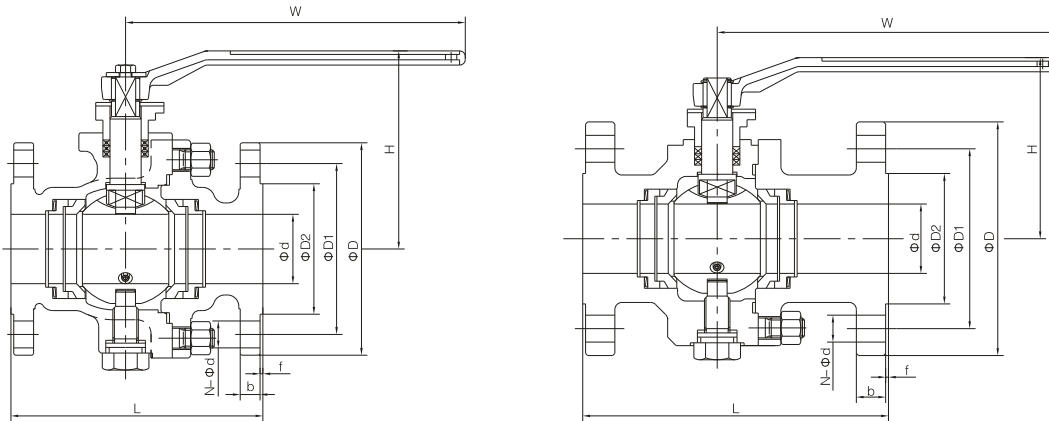
Note: The weight value is only for flanged valve. Please consult our factory for higher nominal diameter or weight. Any modification to size H, H1, and weight will not be notified otherwise.



Pressure rating	Nominal Diameter		d	Flange			Butt welding	Raised face flange					Cast steel	Forged steel	Weight(kg)		
	Class	NPS		DN	L(RF)	L(RTJ)		L(BW)	D	D1	D2	f			b	N-φd	H
150		4"	100	100	229	241	305	230	190.5	157	2	22.5	8-φ 19	220	197	33	△
		6"	150	150	394	406	457	280	241.5	216	2	24	8-φ 22	300	250	93	△
		8"	200	201	457	470	521	345	298.5	270	2	27	8-φ 22	355	290	160	△
300		4"	100	100	305	321	305	255	200	157	2	30.5	8-φ 22	220	197	55	△
		6"	150	150	403	419	457	320	270	216	2	35	12-φ 22	300	250	118	△
		8"	200	201	502	518	521	380	330	270	2	40	12-φ 25	355	290	200	△
600		4"	100	100	432	435	432	275	216	157	7	38.5	8-φ 25	230	305	△	△
		6"	150	150	559	562	559	355	292	216	7	48	12-φ 29	310	260	△	△
		8"	200	201	660	664	660	420	349	270	7	56	12-φ 32	370	310	△	△

△ please consult the factory:

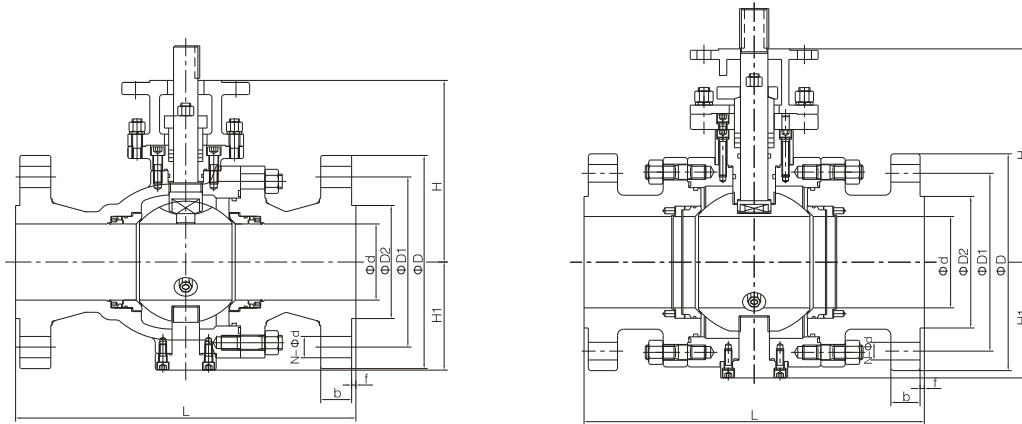
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Pressure rating	Nominal Diameter		d	Flange		Butt welding	Raised face flange							W	Cast steel	Forged steel	Weight(kg)	
				L(RF)	L(RTJ)		L(BW)	D	D1	D2	D3	f	b		N-φd	H	H	General
150	2"	50	50	178	191	216	150	120.5	92	/	2	14.5	4-φ 19	200	174	153	14	19
	3"	80	75	203	216	283	190	152.5	127	/	2	17.5	4-φ 19	300	178	162	26	28
	4"	100	100	229	271	305	230	190.5	157	/	2	22.5	8-φ 19	650	288	240	45	48
300	2"	50	50	216	232	216	165	127	92	/	2	21	8-φ 19	200	174	153	17	22
	3"	80	75	283	298	283	210	168.5	127	/	2	27	8-φ 22	300	178	162	35	38
	4"	100	100	305	321	305	255	200	157	/	2	30.5	8-φ 22	650	288	240	55	60
600	2"	50	50	292	395	292	165	127	92	/	7	26	8-φ 19	300	178	153	28	28
	3"	80	75	356	359	356	210	168.5	127	/	7	32	8-φ 22	300	283	244	55	65
900	2"	50	50	368	371	368	215	165	124	95.25	7.92	38.5	8-φ 25	650	233	222	△	57
	3"	80	75	381	384	381	240	190.5	156	12.83	7.92	38.5	8-φ 25	800	276	255	△	87

△ please consult the factory:

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Pressure rating	Nominal Diameter		d	Flange		Butt welding	Raised face flange						General		Support Board		Weight(kg)		
Class	NPS	DN		L(RF)	L(RTJ)		L(BW)	D	D1	D2	D3	f	b	N-ød	H	H1	H	H1	General
150	6"	150	150	394	406	457	280	241.5	216	/	2	24	8-ø22	310	213.5	276	178.5	120	170
	8"	200	201	457	470	521	345	298.5	270	/	2	27	8-ø22	384.5	272	319	222	300	300
	10"	250	252	533	546	559	405	362	324	/	2	29	12-ø25	434	363	370	265	315	430
	12"	300	303	610	622	635	485	432	381	/	2	30.5	12-ø25	513	412	419.5	310	500	680
	14"	350	334	686	699	762	535	476	413	/	2	33.5	12-ø29	535	436	432	334	670	930
	16"	400	385	762	775	838	595	540	470	/	2	35	16-ø29	575	462	515	375	900	1130
	18"	450	436	864	876	914	635	578	533	/	2	38.5	16-ø32	615	507	560	410	1080	1560
	20"	500	487	914	927	991	700	635	587	/	2	41.5	20-ø32	685	536	623	458	1560	2020
300	6"	150	150	403	419	457	320	270	216	/	2	35	12-ø22	310	213.5	276	178.5	160	180
	8"	200	201	502	518	521	380	330	270	/	2	40	12-ø25	384.5	272	319	222	260	258
	10"	250	252	568	584	559	445	387.5	324	/	2	46.5	16-ø29	434	363	370	265	380	413
	12"	300	303	648	664	635	520	451	381	/	2	49.5	16-ø32	513	412	419.5	310	570	629
	14"	350	334	762	778	762	585	514.5	413	/	2	52.5	20-ø32	535	436	432	334	750	887
	16"	400	385	838	854	838	650	571.5	470	/	2	56	20-ø35	575	462	515	375	1120	1340
	18"	450	436	914	930	914	710	682.5	533	/	2	59	24-ø35	615	507	560	410	1460	1610
	20"	500	487	991	1010	991	775	686	584	/	2	62	24-ø35	685	536	623	458	2030	2200
600	4"	100	100	432	435	432	275	216	157	/	7	38.5	8-ø25	234	165	261	150	102	118
	6"	150	150	559	562	559	355	292	216	/	7	48	12-ø29	335	251	283	192.5	250	250
	8"	200	201	660	664	660	420	349	270	/	7	56	12-ø32	430	290	339.5	235	430	430
	10"	250	252	787	791	787	510	432	324	/	7	64	16-ø35	466	334	380	280	680	680
	12"	300	303	838	841	838	560	489	381	/	7	67	20-ø35	528	383	432	320	985	985
	14"	350	334	889	892	889	605	527	413	/	7	70	20-ø39	600	398	473	350	1002	1002
	16"	400	385	991	994	991	685	603	470	/	7	77	20-ø41	630	434	515	395	1160	1160
	18"	450	436	1092	1095	1092	745	654	533	/	7	83	20-ø44	685	473	560	439	1611	1611
900	4"	100	100	457	460	457	290	235	181	149.23	7.92	45	8-ø32	310	186	267	267	Δ	Δ
	6"	150	150	610	613	610	380	317.5	241	211.12	7.92	56	12-ø32	372	262	288.5	200	Δ	Δ
	8"	200	201	737	740	737	470	393.5	305	269.88	7.92	64	12-ø29	428	300	300	250	Δ	Δ
	10"	250	252	838	841	838	545	470	362	323.85	7.92	70	16-ø39	477	346	410	300	Δ	Δ
	12"	300	303	965	968	965	610	533.5	419	381	7.92	79.5	20-ø39	543	388	432	320	Δ	Δ
	14"	350	322	1029	1038	1029	640	559	467	419.1	11.13	86	20-ø42	558	402	Δ	Δ	Δ	Δ
	16"	400	373	1130	1140	1130	705	616	524	469.9	11.13	89	20-ø45	605	442	Δ	Δ	Δ	Δ
	18"	450	423	1219	1232	1219	785	686	594	533.4	12.7	102	20-ø51	657	489	Δ	Δ	Δ	Δ
20"	500	471	1321	1334	1321	855	749.5	648	584.2	12.7	108	20-ø54	729	538	Δ	Δ	Δ	Δ	

Δ please consult the factory:

Note: The weight value is only for flanged valve. Please consult our factory for higher nominal diameter or weight. Any modification to size H, H1, and weight will not be notified otherwise.