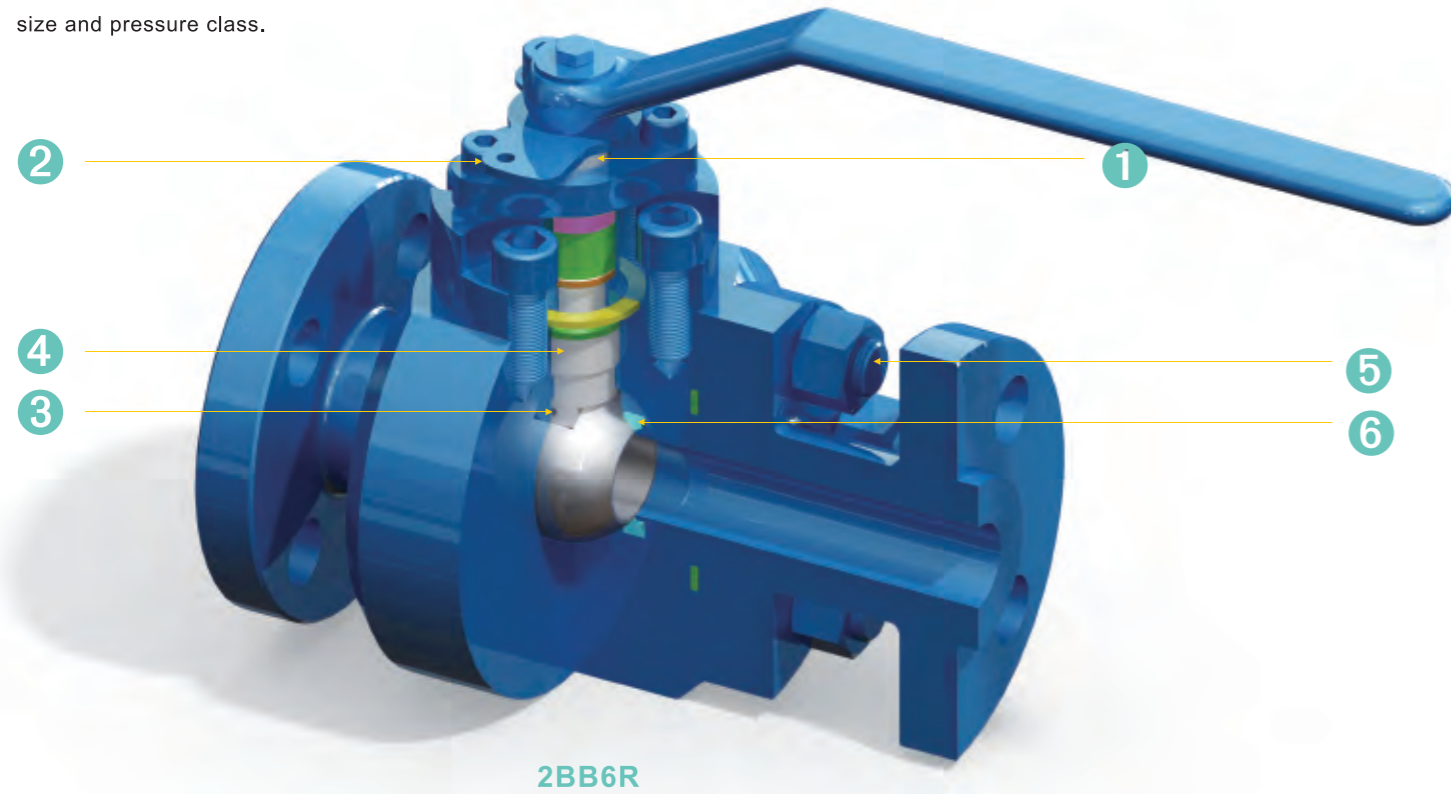


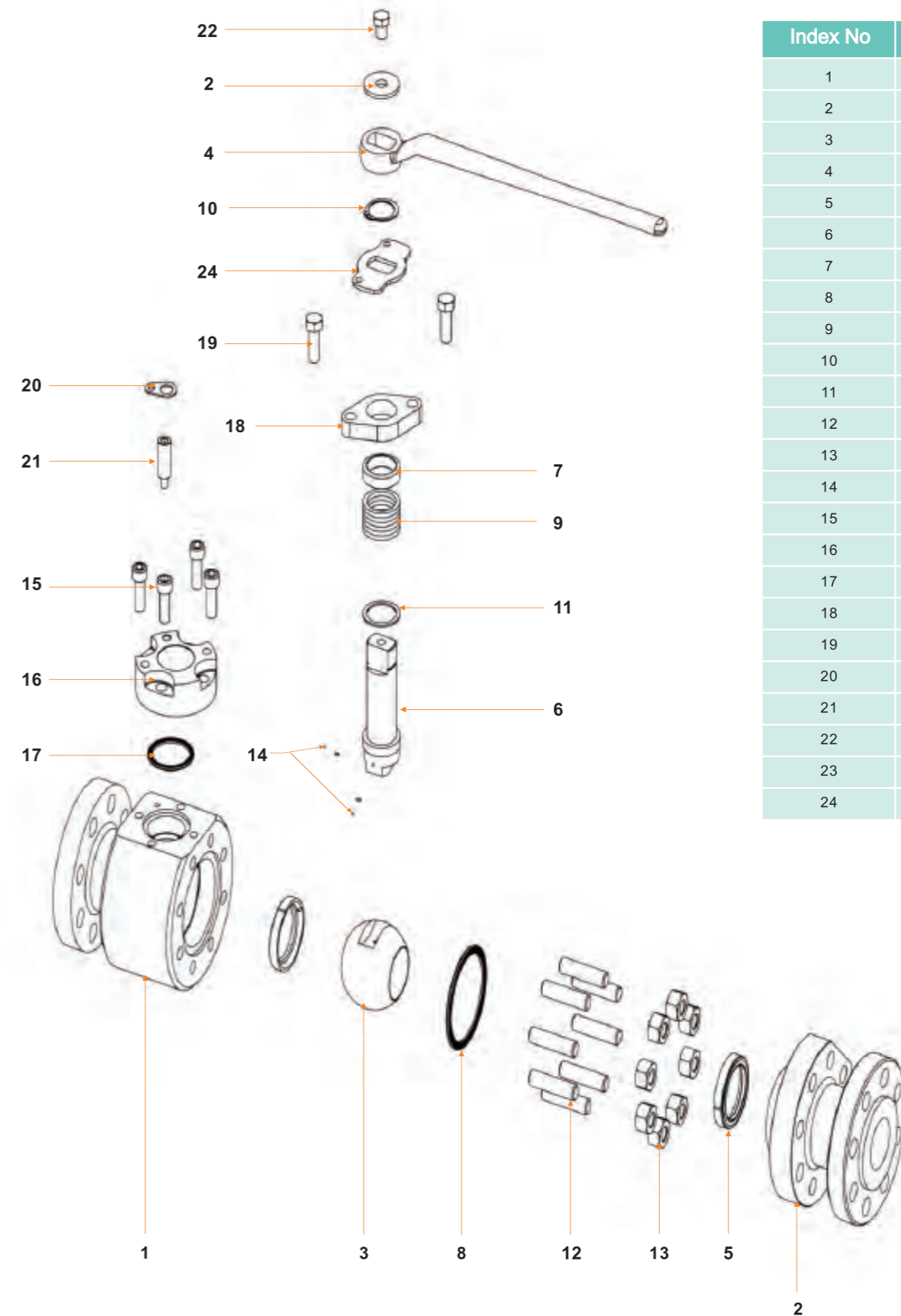
This is an illustration of typical full port, split body, floating type ball valve to exhibit the basic design concept. The actual design of a valve may be slightly different from this illustration depending on its size and pressure class.



- 1 Double "D" Stem Head: ensures handle lever will always be mounted correctly, parallel to the media flow, indicating valve open and closed positions.
- 2 Reliable Flow Locking Device: Valve is equipped with an integral locking device to secure flow.
- 3 Anti-static Device: Spring-loaded plunger assures the electrical continuity between the ball, stem and body, to avoid static buildup.
- 4 Blow-out proof stem: The lower end of the stem is T-shaped structured, protected by boss of body, which assures stem retention against any pressure.
- 5 Bolted body-cap configuration: Properly torqued nut is used to maintain seal performance.
- 6 Fire Safe Design: Metal to metal sealing shuts off valve flow when soft sealing materials are destroyed by fire.

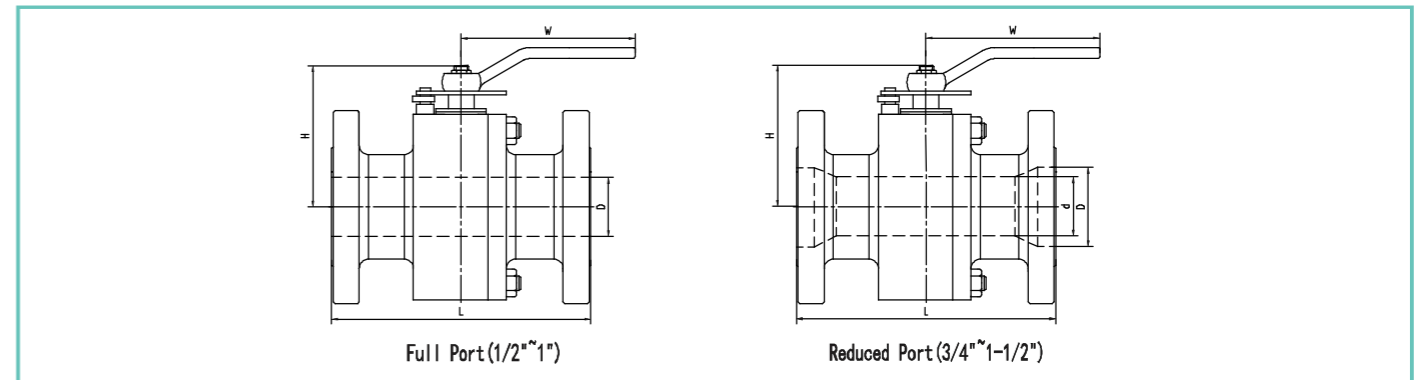
APPLICATIONS

- Refinery
- Petrochemical
- Power
- Chemical
- Pharmaceutical
- Paper



Index No	Part
1	Body
2	Bonnet
3	Ball
4	Handle
5	Seat
6	Stem
7	Gland
8	Gasket Gland
9	Packing
10	Retainer
11	Thrust Washer
12	Stud
13	Nut
14	Anti-Static Device
15	Screw
16	Gland Cap
17	Gasket
18	Gland Flange
19	Bolt
20	Locking Plate
21	Stop Pin
22	Bolt
23	Washer
24	Stop Plate

No	Part	Carbon Steel (Non-Sour)	Stainless Steel	Carbon Steel (Sour Service)	Low Temperature Carbon Steel
1	Body	ASTMA105N	ASTMA182-F316	ASTMA105N	ASTMA350-LF2
2	Bonnet	ASTMA105N	ASTMA182-F316	ASTMA105N	ASTMA350-LF2
3	Ball	ASTMA182 F6a	ASTMA182-F316	ASTMA182 F6a	ASTMA182-F316
4	Handle	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
5	Seat	PTFE	PTFE	PTFE	PTFE
6	Stem	ASTMA182-F6a	ASTMA182-F316	ASTMA182-F6a	ASTMA182-F316
7	Gland	ASTM A276-304L	ASTM A276-304L	ASTM A276-304L	ASTM A276-304L
8	Gasket Gland	316 L+Graphite	316 L+Graphite	316 L+Graphite	316 L+Graphite
9	Packing	Graphite	Graphite	Graphite	Graphite
10	Retainer	Carbon Steel	S.S.	Carbon Steel	S.S.
11	Thrust Washer	PTFE	PTFE	PTFE	PTFE
12	Stud	ASTMA193-B7	ASTM A193-B8 CI2	ASTMA193-B7M	ASTMA320-L7M
13	Nut	ASTMA194-2H	ASTMA194-8	ASTMA194-2HM	ASTMA194-7M
14	Anti-Static Device	S.S.	S.S.	S.S.	S.S.
15	Screw	Carbon Steel	S.S.	Carbon Steel	Carbon Steel
16	Gland Cap	ASTMA105N	ASTMA182-F316	ASTMA105N	ASTMA350-LF2
17	Gasket	316 L+Graphite	316 L+Graphite	316 L+Graphite	316 L+Graphite
18	Gland Flange	ASTMA216-WCB	ASTMA351-CF8	ASTMA216-WCB	ASTMA352-LCB
19	Bolt	ASTMA193-B7	ASTM A193-B8 CI2	ASTMA193-B7M	ASTMA320-L7M
20	Locking Plate	S.S.	S.S.	S.S.	S.S.
21	Stop Pin	Carbon Steel	S.S.	Carbon Steel	Carbon Steel
22	Bolt	Carbon Steel	S.S.	Carbon Steel	Carbon Steel
23	Washer	Carbon Steel	S.S.	Carbon Steel	Carbon Steel
24	Stop Plate	Carbon Steel	S.S.	Carbon Steel	Carbon Steel



Class 150 Dimension and Weight

Full Port											
Size		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lb	Kg
1/2	15	0.50	13	4.25	108	3.35	85	6.50	165	5.50	2.50
3/4	20	0.75	19	4.62	117	3.54	90	6.50	165	7.70	3.50
1	25	1.00	25	5.00	127	4.27	108.5	8.46	215	11.00	5.00

Reduced Port													
Size		d		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
3/4*1/2	20*15	0.50	13	0.75	19	4.62	117	3.35	85	6.50	165	6.60	3.00
1*3/4	25*20	0.75	19	1.00	25	5.00	127	3.54	90	6.50	165	8.80	4.00
1-1/2*1	40*25	1.00	25	1.50	38	6.50	165	4.27	108.5	8.46	215	15.40	7.00

Class 300 Dimension and Weight

Full Port											
Size		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lb	Kg
1/2	15	0.50	13	5.50	140	3.35	85	6.50	165	6.60	3.00
3/4	20	0.75	19	6.00	152	3.54	90	6.50	165	8.80	4.00
1	25	1.00	25	6.50	165	4.27	108.5	8.46	215	15.40	7.00

Reduced Port													
Size		d		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
3/4*1/2	20*15	0.50	13	0.75	19	6.00	152	3.35	85	6.50	165	8.80	4.00
1*3/4	25*20	0.75	19	1.00	25	6.50	165	3.54	90	6.50	165	11.00	5.00
1-1/2*1	40*25	1.00	25	1.50	38	7.50	190	4.27	108.5	8.46	215	19.80	9.00

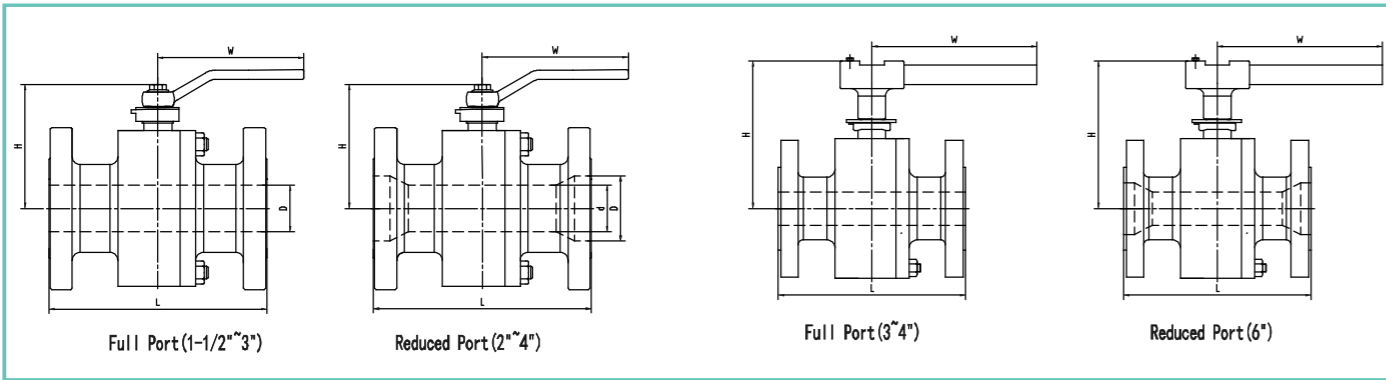
Class 600 Dimension and Weight

Full Port											
Size		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lb	Kg
3	80	3.00	76	14.00	356	7.09	180	15.75	400	136.70	62.00

Reduced Port													
Size		d		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
4*3	100*80	3.00	76	4.00	102	17.00	432	7.09	180	15.75	400	180.80	82.00

BB Series Ball Valve

Two-piece, Split Body, Forged Steel, Side Entry Design



Class 150 Dimension and Weight

Size		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lb	Kg
1-1/2	40	1.50	38	6.50	165	5.24	133	10.43	265	24.30	11.00
2	50	2.00	51	7.00	178	5.87	149	10.43	265	35.30	16.00
2-1/2	65	2.50	64	7.50	190	6.48	164.5	11.22	285	57.30	26.00
3	80	3.00	76	8.00	203	7.22	183.5	11.81	300	70.50	32.00
4	100	4.00	102	9.00	229	8.46	215	17.72	450	116.80	53.00

Size		d		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
2*1-1/2	50*40	1.50	38	2.00	51	7.00	178	5.24	133	10.43	265	29.80	13.50
3*2	80*50	2.00	51	2.50	64	8.00	203	5.87	149	10.43	265	44.10	20.00
4*3	100*80	3.00	76	4.00	102	9.00	229	7.22	183.5	11.81	300	83.80	38.00
6*4	150*100	4.00	102	6.00	152	15.50	394	8.46	215	17.72	450	158.70	72.00

Class 300 Dimension and Weight

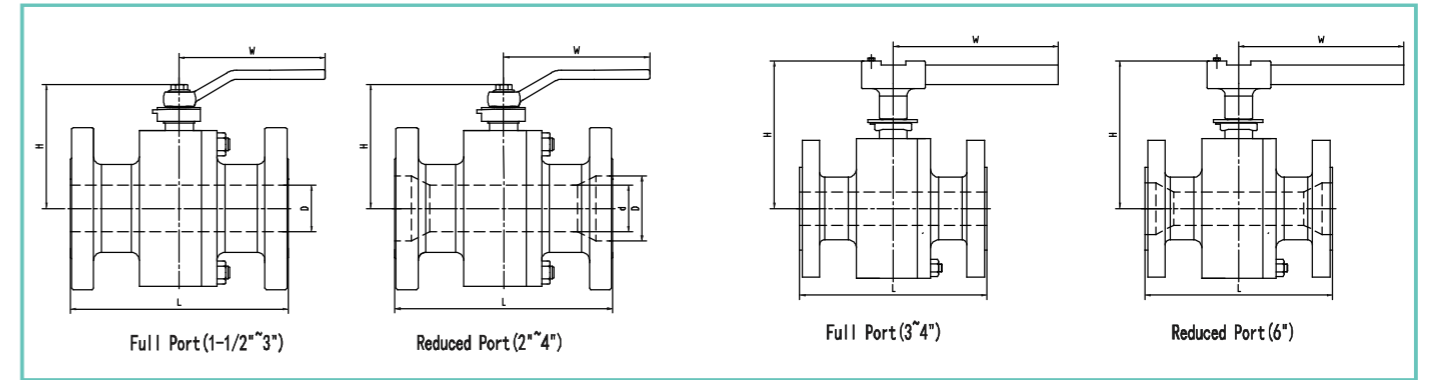
Size		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lb	Kg
1-1/2	40	1.50	38	7.50	190	5.24	133	10.43	265	30.90	14.00
2	50	2.00	51	8.50	216	5.87	149	10.43	265	39.70	18.00
2-1/2	65	2.50	64	9.50	241	6.48	164.5	11.22	285	63.90	29.00
3	80	3.00	76	11.12	283	7.22	183.5	11.81	300	88.20	40.00
4	100	4.00	102	12.00	305	10.75	273	32.09	**815	163.10	74.00

Size		d		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
2*1-1/2	50*40	1.50	38	2.00	51	8.50	216	5.24	133	10.43	265	32.00	14.50
3*2	80*50	2.00	51	2.50	64	11.12	283	5.87	149	10.43	265	55.10	25.00
4*3	100*80	3.00	76	4.00	102	12.00	305	7.22	183.5	11.81	300	110.20	50.00
6*4	150*100	4.00	102	6.00	152	15.88	403	10.75	273	32.09	**815	211.60	96.00

** T-Bar Operator

BB Series Ball Valve

Two-piece, Split Body, Forged Steel, Side Entry Design



Class 600 Dimension and Weight

Size		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lb	Kg
4	100	4.00	102	17.00	432	11.93	303	41.73	**1060	297.60	135.00

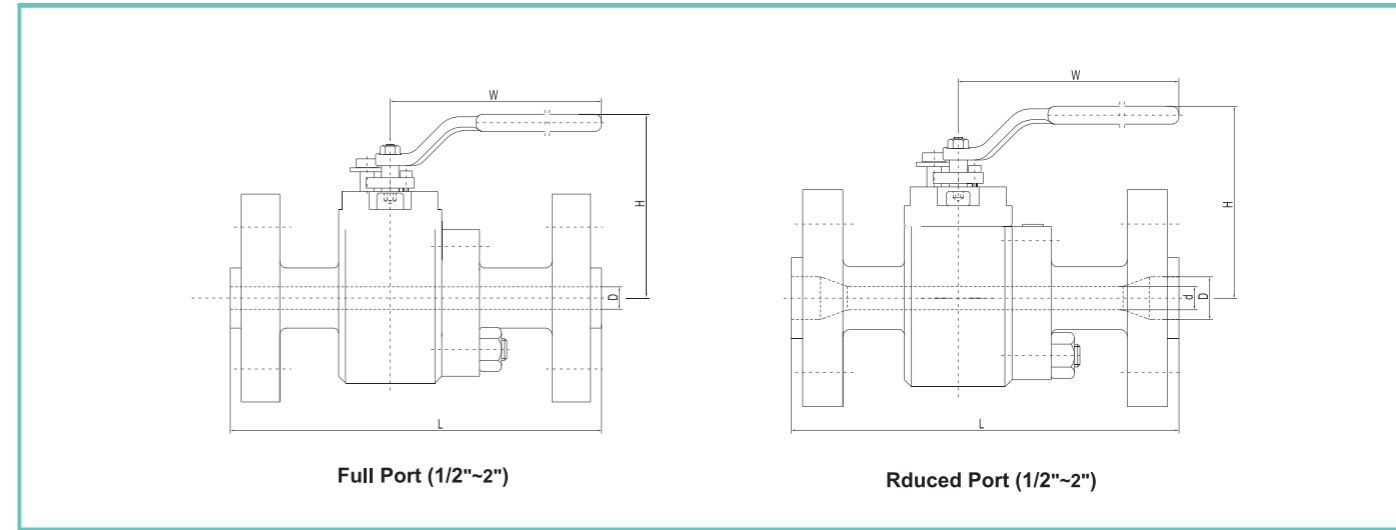
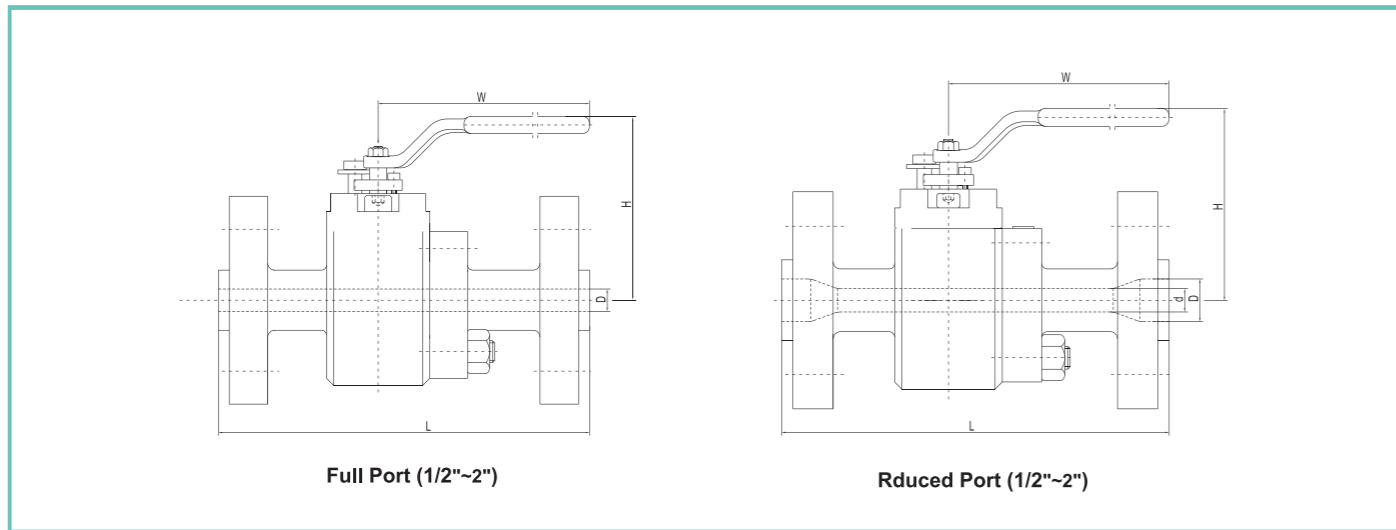
** T-Bar Operator

Class 900 Dimension and Weight

Size		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lb	Kg
3	80	3.00	76	15.00	381	9.80	249	32.09	**815	198.40	90.00

Size		d		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
4*3	100*80	3.00	76	4.00	102	18.00	457	9.80	249	32.09	**815	249.10	113.00

** T-Bar Operator



Class 400/600 Dimension and Weight

Full Port											
Size		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lb	Kg
1/2"	15	0.50	12.7	6.50	165	4.59	116.50	5.91	150	7.70	3.50
3/4"	20	0.75	19	7.52	191	5.14	130.50	7.09	180	12.80	5.80
1"	25	1.00	25.4	8.50	216	5.83	148	10.43	265	28.66	13.00
1-1/2"	40	1.50	38	9.49	241	6.32	160.50	11.81	300	50.71	23.00
2"	50	2.00	51	11.50	292	7.56	192	15.75	400	63.90	29.00

Reduced Port													
Size		d		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
1/2*3/8	15*10	0.37	9.5	0.50	12.7	6.50	165	4.59	116.50	5.91	150	11.02	5.00
3/4*1/2	20*15	0.50	12.7	0.75	19	7.52	191	4.59	116.50	5.91	150	17.64	8.00
1*3/4	25*20	0.75	19	1.00	25.4	8.50	216	5.14	130.50	7.09	180	26.46	12.00
1-1/2*1	40*25	1.00	25.4	1.50	38	9.49	241	5.83	148	10.43	265	37.48	17.00
2*1-1/2	50*40	1.50	38	2.00	51	11.50	292	6.32	160.50	11.81	300	59.52	27.00

Class 900 Dimension and Weight

Full Port											
Size		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lb	Kg
1/2"	15	0.50	12.7	8.50	216	4.59	116.50	5.91	150	22.04	10
3/4"	20	0.75	19	9.02	229	5.35	136	7.09	180	28.66	13
1"	25	1.00	25.4	10.00	254	6.20	157.50	10.43	265	44.09	20
1-1/2"	40	1.50	38	12.01	305	6.99	177.50	11.81	300	90.39	41
2"	50	2.00	51	14.49	368	8.35	212	15.75	400	132.28	60

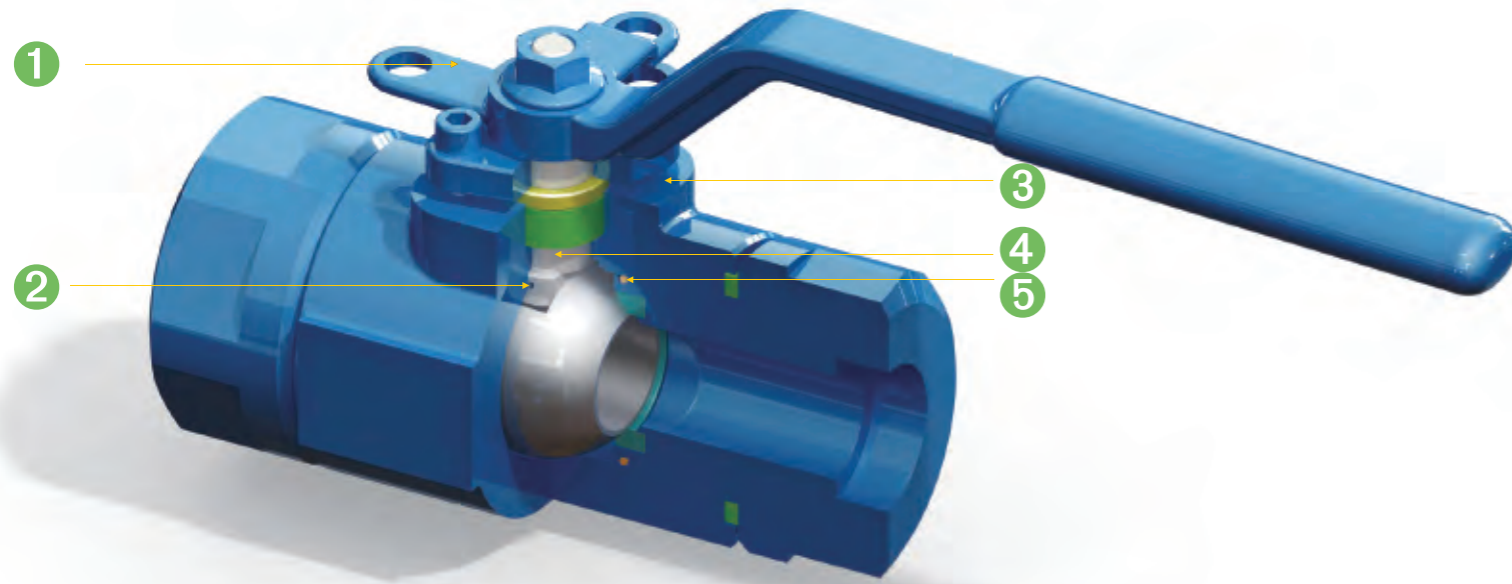
Class 900 Dimension and Weight

Reduced port													
Size		d		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
1/2*3/8	15*10	0.37	9.5	0.50	12.7	8.50	216	4.59	116.50	5.91	150	19.84	9
3/4*1/2	20*15	0.50	12.7	0.75	19	9.02	229	4.59	116.50	5.91	150	24.25	11
1*3/4	25*20	0.75	19	1.00	25.4	10.00	254	5.35	136	7.09	180	35.27	16
1-1/2*1	40*25	1.00	25.4	1.50	38	12.01	305	6.20	157.50	10.43	265	55.12	25
2*1-1/2	50*40	1.50	38	2.00	51	14.49	368	6.99	177.50	11.81	300	123.46	56

Class 1500 Dimension and Weight

Full Port											
Size		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lb	Kg
1/2"	15	0.50	12.7	8.50	216	4.59	116.50	5.91	150	22.04	10
3/4"	20	0.75	19	9.02	229	5.35	136	7.09	180	28.66	13
1"	25	1.00	25.4	10.00	254	6.20	157.50	10.43	265	44.09	20
1-1/2"	40	1.50	38	12.01	305	6.99	177.50	11.81	300	90.39	41
2"	50	2.00	51	14.49	368	8.35	212	15.75	400	132.28	60

Reduced port													
Size		d		D		L		H		W		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
1/2*3/8	15*10	0.37	9.5	0.50	12.7	8.50	216	4.59	116.50	5.91	150	19.84	9
3/4*1/2	20*15	0.50	12.7	0.75	19	9.02	229	4.59	116.50	5.91	150	24.25	11
1*3/4	25*20	0.75	19	1.00	25.4	10.00	254	5.35	136	7.09	180	35.27	16
1-1/2*1	40*25	1.00	25.4	1.50	38	12.01	305	6.20	157.50	10.43	265	55.12	25
2*1-1/2	50*40	1.50	38	2.00	51	14.49	368	6.99	177.50	11.81	300	123.46	56

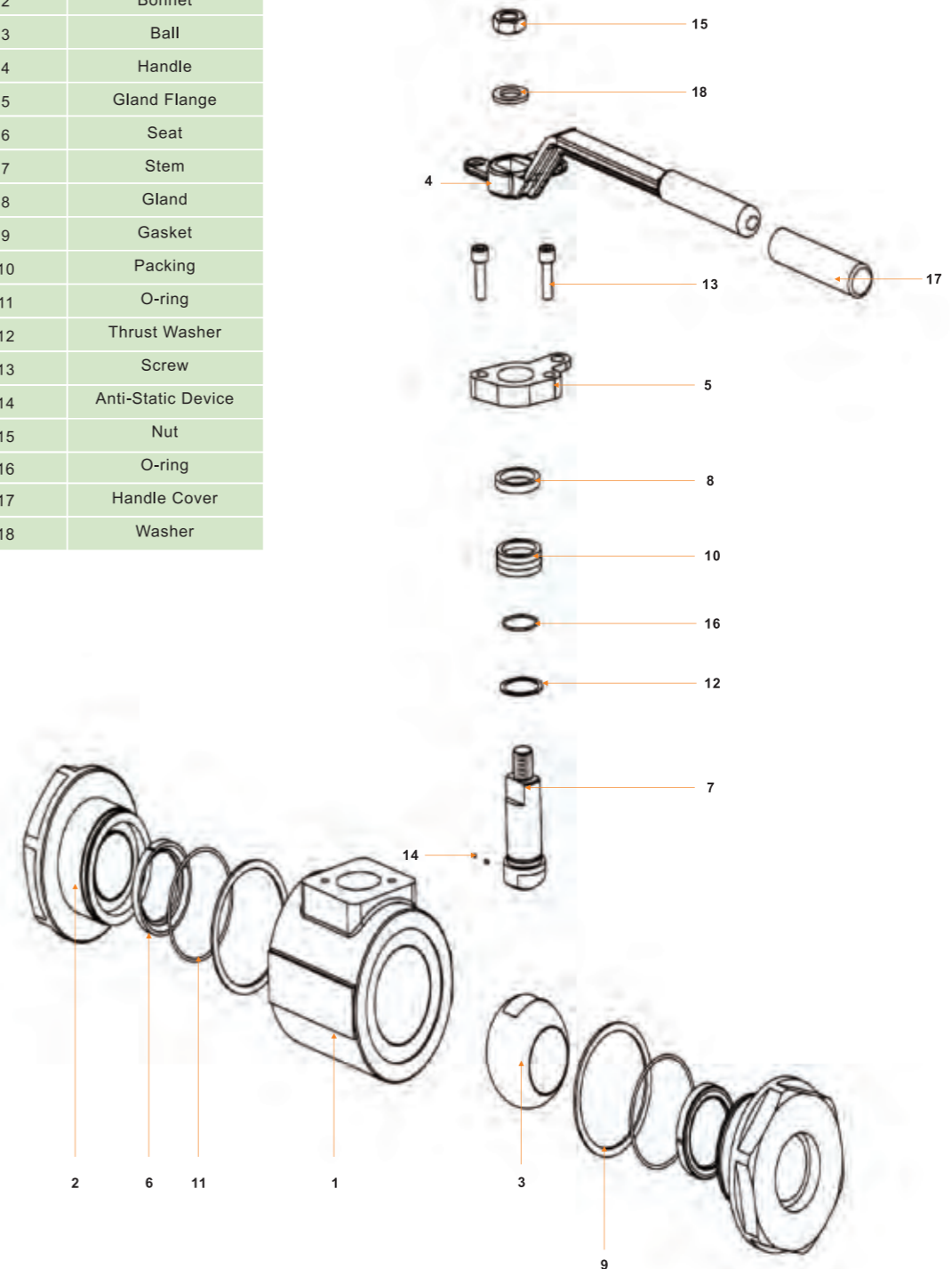


- 1 Reliable Flow Locking Device: Valve is equipped with an integral locking device to secure flow.
- 2 Anti-static Device: Spring-loaded plunger assures the electrical continuity between the ball, stem and body, to avoid static buildup.
- 3 ISO5211 connection dimension: actuator installation is simplified by using connection dimension recognized in international standards.
- 4 Blow-out proof stem: The lower end of the stem is T-shaped structured, protected by boss of body, which assures stem retention against any pressure.
- 5 O-ring Seal Design: Protects threads from crevice corrosion.

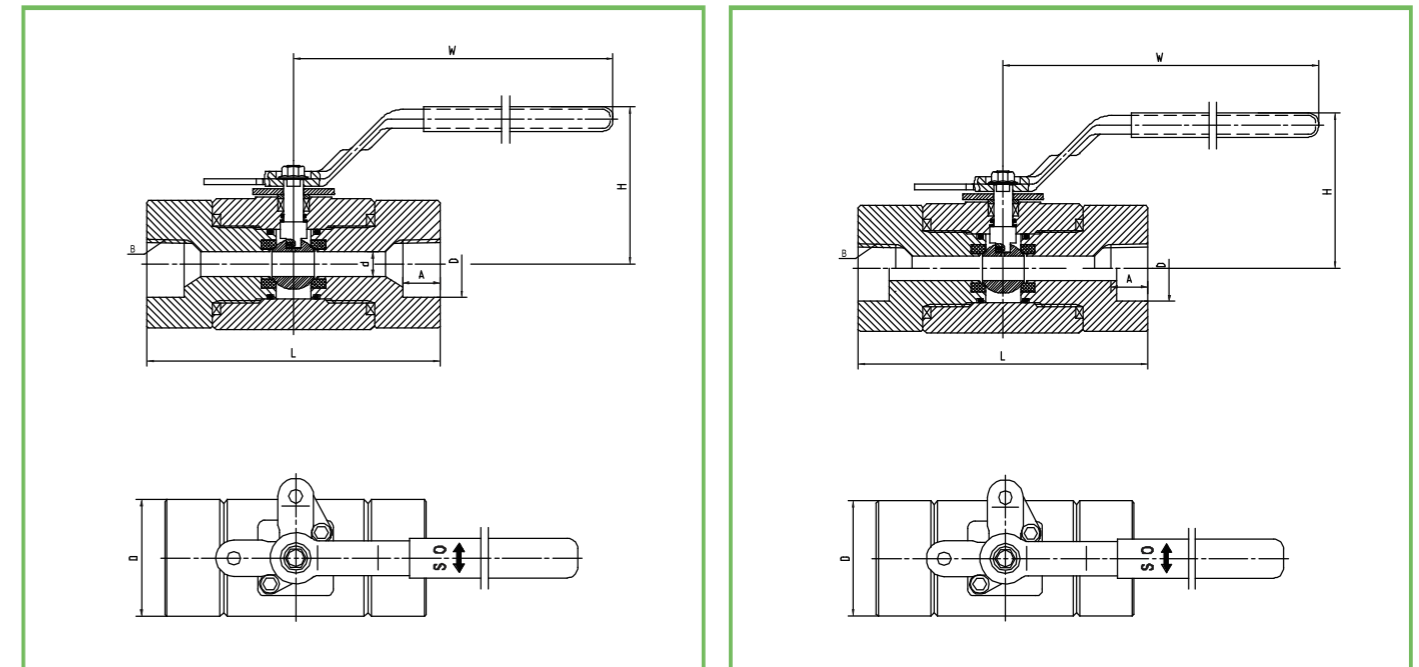
APPLICATIONS

- Refinery
- Chemical
- Power
- Petrochemical

Index No	Part
1	Body
2	Bonnet
3	Ball
4	Handle
5	Gland Flange
6	Seat
7	Stem
8	Gland
9	Gasket
10	Packing
11	O-ring
12	Thrust Washer
13	Screw
14	Anti-Static Device
15	Nut
16	O-ring
17	Handle Cover
18	Washer



No	Part	Carbon Steel (Non-Sour)	Stainless Steel	Carbon Steel (Sour Service)	Low Temperature Carbon Steel
1	Body	ASTM A105N	ASTM A182-F316	ASTM A105N	ASTM A350-LF2
2	Bonnet	ASTM A105N	ASTM A182-F316	ASTM A105N	ASTM A350-LF2
3	Ball	ASTM A182 F6a	ASTM A182-F316	ASTM A182 F6a	ASTM A182-F316
4	Handle	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel
5	Gland Flange	ASTM A216-WCB	ASTM A351-CF8	ASTM A216-WCB	ASTM A352-LCB
6	Seat	PTFE	PTFE	PTFE	PTFE
7	Stem	ASTM A182-F6a	ASTM A182-F316	ASTM A182-F6a	ASTM A182-F316
8	Gland	ASTM A276-304L	ASTM A276-304L	ASTM A276-304L	ASTM A276-304L
9	Gasket	316 L+Graphite	316 L+Graphite	316 L+Graphite	316 L+Graphite
10	Packing	Graphite	Graphite	Graphite	Graphite
11	O-ring	Viton AED	Viton AED	Viton AED	HNBR
12	Thrust Washer	PTFE	PTFE	PTFE	PTFE
13	Screw	ASTM A193-B7	ASTM A182-B8 Cl2	ASTM A193-B7M	ASTM A320-L7M
14	Anti-Static Device	S.S.	S.S.	S.S.	S.S.
15	Nut	Carbon Steel	S.S.	Carbon Steel	Carbon Steel
16	O-ring	Viton AED	Viton AED	Viton AED	HNBR
17	Handle Cover	Plastic	Plastic	Plastic	Plastic
18	Washer	Carbon Steel	S.S.	Carbon Steel	Carbon Steel



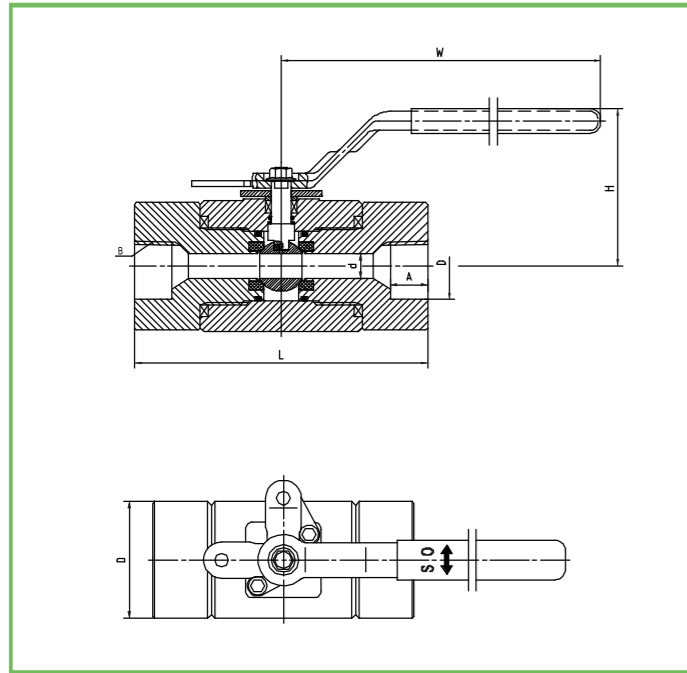
Full Bore (1/2"~2")

Reduced Bore (1/2"~2")

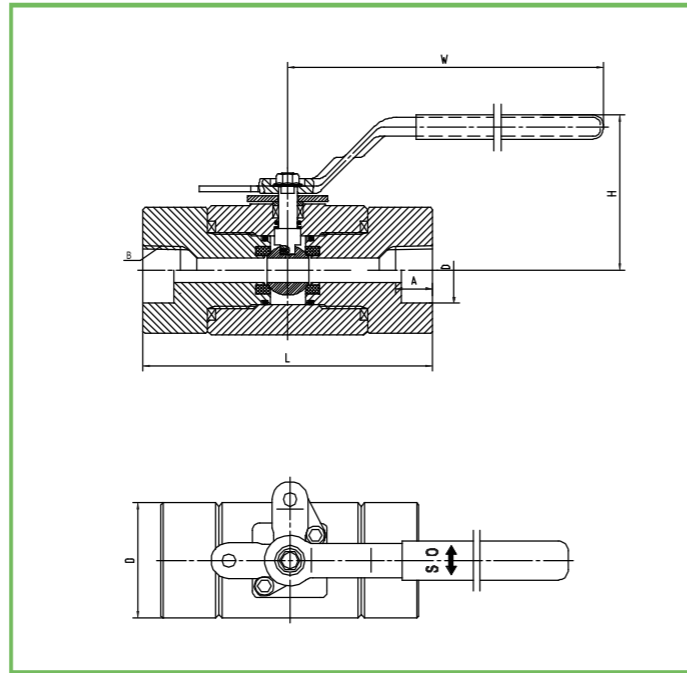
Class 150/300/600/800/900 Dimension and weight

Size		d		L(NPT)		L(SW)		H		L1		A		D		D1		B		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
3/8	10	0.375	9.50	4.09	104	7.72	196	2.44	62	6.5	165	0.37	9.50	0.69	17.60	1.65	42	3/8-18NPT	3.30	1.50	
1/2	15	0.50	13	4.09	104	7.72	196	2.44	62	6.5	165	0.37	9.50	0.86	21.80	1.65	42	1/2-14NPT	3.30	1.50	
3/4	20	0.75	19	5.00	127	8.43	214	3.23	82	6.5	165	0.49	12.50	1.07	27.20	2.28	58	3/4-14NPT	6.40	2.90	
1	25	1.00	25	4.53	115	9.53	242	3.94	100	8.46	215	0.49	12.50	1.33	33.90	2.68	68	1-11.5NPT	7.70	3.50	
1-1/2	40	1.50	38	5.63	143	10.24	260	5.31	135	10.43	265	0.49	12.50	1.92	48.80	3.66	93	1-1/2-11.5NPT	16.50	7.50	
2	50	2.00	51	6.30	160	8.82	224	6.50	165	10.43	265	0.63	16.00	2.41	61.20	4.49	114	2-11.5NPT	28.70	13.00	

Size		d		L(NPT)		L(SW)		H		L1		A		D		D1		B		Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
1/2*3/8	15*10	0.375	9.50	4.09	104	7.72	196	2.44	62	6.5	165	0.37	9.50	0.69	17.60	1.65	42	1/2-14NPT	3.30	1.50	
3/4*1/2	20*15	0.50	13	4.09	104	7.72	196	2.44	62	6.5	165	0.37	9.50	0.86	21.80	1.65	42	3/4-14NPT	3.30	1.50	
1*3/4	25*20	0.75	19	5.00	127	8.43	214	3.23	82	6.5	165	0.49	12.50	1.07	27.20	2.28	58	1-11.5NPT	6.40	2.90	
1-1/2*1	40*25	1.00	25	4.53	115	9.53	242	3.94	100	8.46	215	0.49	12.50	1.33	33.90	2.68	68	1-1/2-11.5NPT	7.70	3.50	
2*1-1/2	50*40	1.50	38	5.63	143	10.24	260	5.31	135	10.43	265	0.49	12.50	1.92	48.80	3.66	93	2-11.5NPT	16.50	7.50	



Full Bore (1/2"~2")



Reduced Bore (1/2"~2")

Cv - Full Bore Ball Valves

BORE Size (inches)	ANSI Class					
	150	300	600	900	1500	2500
0.5	17	15	14	12	12	11
0.75	43	38	34	31	31	28
1	86	76	66	64	61	56
1.25	156	139	122	111	111	99
1.5	227	211	187	167	167	148
2	423	384	330	294	294	181
3	1139	965	860	832	749	434
4	2416	2093	1759	1710	1564	995
6	5241	5183	4400	4212	3918	3107
8	10471	9991	8713	8245	6921	5240
10	17709	17154	14573	14123	11376	8451
12	26241	25460	22389	20864	16835	12295

Class 1500/2500 Dimension and weight

Size		d		L(NPT)		L(SW)		H		L1		A		D		D1		B	Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm		lb	kg
3/8	10	0.375	9.50	4.09	104	7.72	196	2.44	62	6.5	165	0.37	9.50	0.69	17.60	1.65	42	3/8-18NPT	3.30	1.50
1/2	15	0.50	13	4.09	104	7.72	196	2.44	62	6.5	165	0.37	9.50	0.86	21.80	1.65	42	1/2-14NPT	3.30	1.50
3/4	20	0.75	19	5.00	127	8.43	214	3.23	82	6.5	165	0.49	12.50	1.07	27.20	2.28	58	3/4-14NPT	6.40	2.90
1	25	1.00	25	6.18	157	9.53	242	3.94	100	8.46	215	0.49	12.50	1.33	33.90	2.68	68	1-11.5NPT	11.9	5.4
1-1/2	40	1.50	38	7.76	197	10.24	260	5.31	135	10.43	265	0.49	12.50	1.92	48.80	3.66	93	1-1/2-11.5NPT	28.7	13.0
2	50	2.00	51	8.27	210	8.82	224	6.50	165	10.43	265	0.63	16.00	2.41	61.20	4.49	114	2-11.5NPT	48.5	22.0

Size		d		L(NPT)		L(SW)		H		L1		A		D		D1		B	Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm		lb	kg
1/2*3/8	15*10	0.375	9.50	4.09	104	7.72	196	2.44	62	6.5	165	0.37	9.50	0.69	17.60	1.65	42	1/2-14NPT	3.30	1.50
3/4*1/2	20*15	0.50	13	4.09	104	7.72	196	2.44	62	6.5	165	0.37	9.50	0.86	21.80	1.65	42	3/4-14NPT	3.30	1.50
1*3/4	25*20	0.75	19	5.00	127	8.43	214	3.23	82	6.5	165	0.49	12.50	1.07	27.20	2.28	58	1-11.5NPT	6.40	2.90
1-1/2*1	40*25	1.00	25	6.18	157	9.53	242	3.94	100	8.46	215	0.49	12.50	1.33	33.90	2.68	68	1-1/2-11.5NPT	11.9	5.40
2*1-1/2	50*40	1.50	38	7.76	197	10.24	260	5.31	135	10.43	265	0.49	12.50	1.92	48.80	3.66	93	2-11.5NPT	28.7	13.0

Cv - Reduced Bore Ball Valves

BORE Size (inches)	ANSI Class					
	150	300	600	900	1500	2500
3/4*1/2	14	14	14	14	14	14
1*3/4	35	35	35	35	35	35
1-1/2*1	50	50	50	50	50	50
2*1-1/2	133	133	133	133	133	238
3*2	150	155	155	155	194	147
4*3	403	526	458	458	526	345
6*4	708	661	708	708	814	551
8*6	1715	1913	1913	1913	2433	2106
10*8	3657	3657	4608	4008	3730	3234
12*10	6645	7145	7145	7145	6455	8181

Cv = 1.156Kv

$$Kv = \frac{0.04d^2}{\sqrt{K}}$$

d: dimension of bore -mm
K: resistance coefficient

