

Type BV2002

Trunnion Mounted Ball Valve



Application

Tight-closing ball valve for process engineering and industrial applications

Nominal size NPS 6 to NPS 20

Nominal pressure Class 600 to Class 2500

Temperatures -10 to 200 °C

Body material

- Carbon Steel
- Stainless Steel

Ball material

- Stainless steel

Further features

- Design Standard: API 6D, ASME B 16.34
- Test and inspection: API 598, API 6D
- Face-to-face dimensions according to API 6D, ASME B16.10
- Flanged Ends: ASME B 16.5
- Exchangeable PTFE seat rings
- Blow-out proof ball shaft with spring-loaded PTFE V-ring packing
- TA-Luft (German clean air act) equivalent certification

Ball valve made of corrosion-resistant materials equipped with

- Pneumatic actuator or
- Manual actuator

The ball valves with pneumatic actuators can be equipped with positioners, limit switches and solenoid valves.

Leakage rate acc. to IEC 60534-4 or ANSI/FCI 70-2: IV,V

Other Versions

– Body, ball and ball stem made from TITANIUM (TA1, TA2), Nickel (N6t N201), HASTELLOY (B,C), INCOLOY (800,825,903), MONEL (400,500), INCONEL (625,690), ZIRCONIUM 702, 904L, 20# Alloy, S32750 (SAF2507, F53), S31803 (SAF2205, F51), F55 (S32760), F60 (S32205), A4,C4 or other materials

- Ball valves for higher temperatures
- Ball valves for low temperatures
- Fire-safe versions according to API 607/6FA
- Others on request



Fig. 1: Type BV2002 Ball Valve with Manual Actuator

Anti blow out stem

Our ball valves are always provided with anti-blow out stem design, which ensures total safety and integrity.

Full bore

Ball valves are generally designed so that internal flow passage is large enough to pass flow without a significant restriction. The diameter of the bore is the same as the diameter of the pipe to which it connects.

Reduced bore

Often, a system does not expected to operate at the full capacity of the pipe. This offers an opportunity for reducing equipment costs.

A reduced bore ball valve uses a ball/seat combination which has a smaller diameter than the pipe. The nominal valve size is referred to by the outlet size x the ball diameter — for example 3" x 2".

Soft seated ball valves

The seat design features a deep pocket with a protective lip which makes the design a long lasting design. The seat assembly consists in an outer metallic seat carrier with a soft seat insert. The soft insert is located into a groove in the metallic seat carrier.

The complete seat assembly is floating inside valve body and it is energized by a set of springs which load the seat assembly against the ball preventing leakage from behind the seat.

Seat assembly is provided with outer o-ring to avoid leakage through the seat carrier and a graphite back up ring which ensure the tightness in case the o-ring is damaged.

Metal seated ball valves

Metal to metal sealed design has been employed perfectly for the ball and seat, which has also adopted the advanced hardening technologies, such as ultrasonic 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.

Principle of operation

The process medium can flow through the ball valve in both directions. The ball with its cylindrical bore (ball channel) rotates around the center axis. The rotary angle of the ball determines the flow rate across the free area between the body and the ball channel. The ball shaft, can be optionally connected to a pneumatic actuator or equipped with a manually operated lever actuator. The ball is sealed by means of exchangeable seat rings. The ball shaft is sealed with PTFE/Flexible graphite ring packing.

Additional equipment and accessories:

The ball valve, following accessories can be used individually or in combination

- Pneumatic actuator
- Limit switch
- Various solenoid valves
- Supply pressure regulator
- According to user specifications can provide other attachments



Fail-safe position

Depending on the different initial install position of in the pneumatic actuators, the ball valve has two fail-safe positions, which become automatically close or open when the supply air fails:

Control valve CLOSED without supply air

The ball valve closes when the air supply fails.

The ball valve opens when the air supply increases to against the force of the springs.

Control valve OPEN without supply air

The ball valve opens when the air supply fails.

The ball valve closes when the air supply increases to against the force of the springs.

Table 1: Main Parameter Specification

Nominal size	NPS	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"
Nominal pressure	Class	600 to 2500										
Design and Manufacture		API6D,ASME,B16.34,API608,MSS-SP-72(BS5351)										
Face to Face Dimension		ASME B16.10,API6D										
Connection Dimension		ASME B16.5										
Test and Inspection		API 598.API 6D										
Fire-Safe Design		API 607/6FA										
Temperature range	°C	-10 C to 200 C										
Leakage		according to ANSI/FCI 70-2										
Valve plug	Soft seal	VI										
	Metal seal	IV										

Table 2: Bill of Material**Table 2.1: 2" to 4"**

No.	Designation	Material
1	Left Body	"Carbon Steel,Stainless Steel, TITANIUM(TA1, TA2),Nickel(N6,N201). HASTELLOY(B,C),INCOLOY(800,825,903),MONEL(400,500). INCONEL(625,690),ZIRCONIUM 702,904L,20#Alloy,S32750(SAF2507,F53). S3 1803(SAF2205,F51),F55(S32760),F60(S32205),A4,C4"
2	Ball	A105+ENP,A182 F6,F304,F304L,F316,F316L,F321,F51,F53,ALLOY-20
3	Sealing ring	FLEXIBLE GRAPHITE
4	Seat ring	A105+ENP,A182 F6,F304,F304L,F316,F316L,F321,F51,F53,ALLOY-20
5	Spring	SS304,INCONEL
6	Bearing	1045+RPTFE,SS304+RPTFE
7	Stuffing box	A105+ENP,A182 F6,F304,F304L,F316,F316L,F321,F51,F53,ALLOY-20
8	Sealing ring	SS304,SS316+FLEXIBLE GRAPHITE SPIRAL WOUND
9	Stem	A105+ENP,A182 F6,F304,F304L,F316,F316L,F321,F51,F53,ALLOY-20
10	Screw	1035,STAINLESS STEEL
11	Pin	AISI 1566
12	Lever	A216WCB+1020
13	Limited Plate	1035,Stainless Steel
14	Connecting plate	1025,A216 WCB,A351 CF8
15	Packing	FLEXIBLE GRAPHITE
16	Oil cup	1025,SS304
17	O-Ring	VITON
18	O-Ring	NBR,VITON
19	Thrust Washer	PTFE
20	Sealing ring	PTFE,RPTFE,NYLON,PEEK,PPL,POM,KARBATE,MOLON,DEVLON
21	O-Ring	VITON
22	Right body	"Carbon Steel,Stainless Steel, TITANIUM(TA1, TA2),Nickel(N6,N201). HASTELLOY(B,C),INCOLOY(800,825,903),MONEL(400,500). INCONEL(625,690),ZIRCONIUM 702,904L,20#Alloy,S32750(SAF2507,F53). S3 1803(SAF2205,F51),F55(S32760),F60(S32205),A4,C4"
23	Nut	A194-2H,2HM,8,8M
24	Bolt	A193-B7,B7M,B8,B8M
25	Gasket	SS304,SS316+FLEXIBLE GRAPHITE SPIRAL WOUND
26	O-Ring	NBR,VITON
27	Adujsting ring	PTFE
28	Screw	1035,STAINLESS STEEL
29	Trunnion	1045+ENP,A182-F6,F304,F316,F304L,F316L,F321,F51,F53,ALLOY-20,4140+ENP,17-4PH
30	Drain valve and plug	1025,SS304,SS316,SS304L,SS316L,SS321,ALLOY-20,F51,F53

Table 2.2: 6" and Above

No.	Designation	Material
1	Left Body	"Carbon Steel, Stainless Steel, TITANIUM(TA1, TA2), Nickel(N6, N201). HASTELLOY(B, C), INCOLOY(800, 825, 903), MONEL(400, 500). INCONEL(625, 690), ZIRCONIUM 702, 904L, 20#Alloy, S32750(SAF2507, F53). S3 1803(SAF2205, F51), F55(S32760), F60(S32205), A4, C4"
2	Ball	A105+ENP, A182 F6, F304, F304L, F316, F316L, F321, F51, F53, ALLOY-20
3	Sealing ring	FLEXIBLE GRAPHITE
4	Seat ring	A105+ENP, A182 F6, F304, F304L, F316, F316L, F321, F51, F53, ALLOY-20
5	Spring	SS304, INCONEL
6	Bearing	1045+RPTFE, SS304+RPTFE
7	Stuffing box	A105+ENP, A182 F6, F304, F304L, F316, F316L, F321, F51, F53, ALLOY-20
8	Sealing ring	SS304, SS316+FLEXIBLE GRAPHITE SPIRAL WOUND
9	Stem	A105+ENP, A182 F6, F304, F304L, F316, F316L, F321, F51, F53, ALLOY-20, 4140+EMP/17-4PH
10	Screw	1035, STAINLESS STEEL
11	Pin	AISI 1566
12	Key	1045
13	Connecting plate	1025, A216 WCB, A351 CF8
14	Packing	FLEXIBLE GRAPHITE
15	Oil cup	1025, SS304
16	O-Ring	VITON
17	O-Ring	NBR, VITON
18	Grease fitting	1025, SS394, SS316, SS394L, SS316L, SS321, ALLOY-20, F51, F53
19	Thrust Washer	PTFE
20	Sealing ring	PTFE, RPTFE, NYLON, PEEK, PPL, POM, KARBATE, MOLON, DEVLON
21	O-Ring	VITON
22	Right body	"Carbon Steel, Stainless Steel, TITANIUM(TA1, TA2), Nickel(N6, N201). HASTELLOY(B, C), INCOLOY(800, 825, 903), MONEL(400, 500). INCONEL(625, 690), ZIRCONIUM 702, 904L, 20#Alloy, S32750(SAF2507, F53). S3 1803(SAF2205, F51), F55(S32760), F60(S32205), A4, C4"
23	Nut	A194-2H, 2HM, 8, 8M
24	Bolt	A193-B7, B7M, B8, B8M
25	Gasket	SS304, SS316+FLEXIBLE GRAPHITE SPIRAL WOUND
26	O-Ring	NBR
27	Adjusting ring	PTFE
28	Screw	1035, STAINLESS STEEL
29	Trunnion	1045+ENP, A182-F6, F304, F316, F304L, F316L, F321, F51, F53, ALLOY-20, 4140+ENP, 17-4PH
30	Drain valve and plug	1025, SS304, SS316, SS304L, SS316L, SS321, ALLOY-20, F51, F53

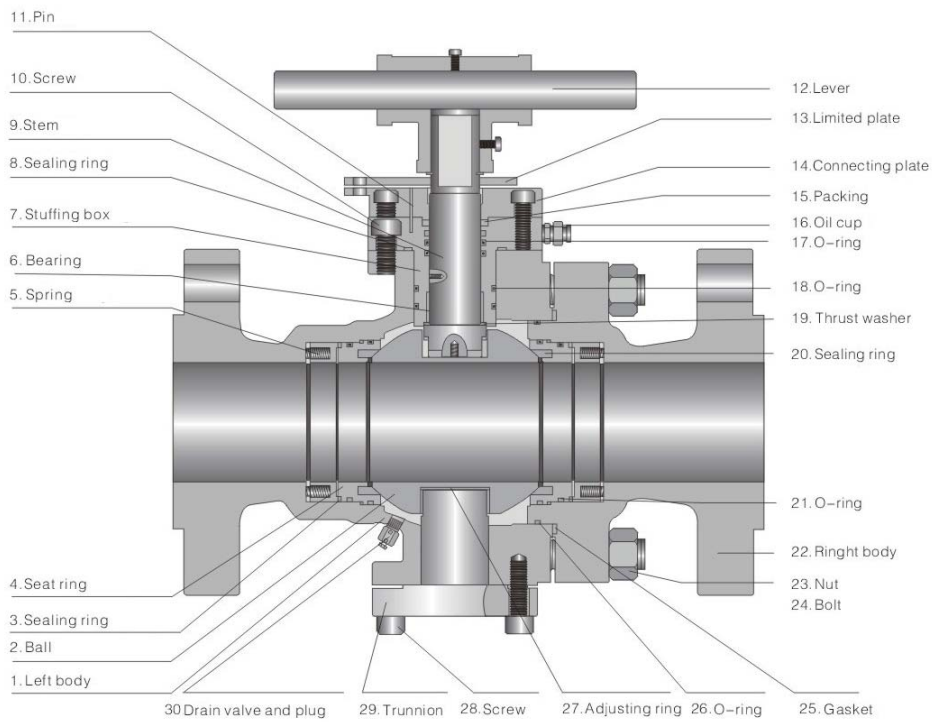


Fig.2 2PC Full Bore Floating Ball Valve Major Features of Type BV2002 (2" to 4")

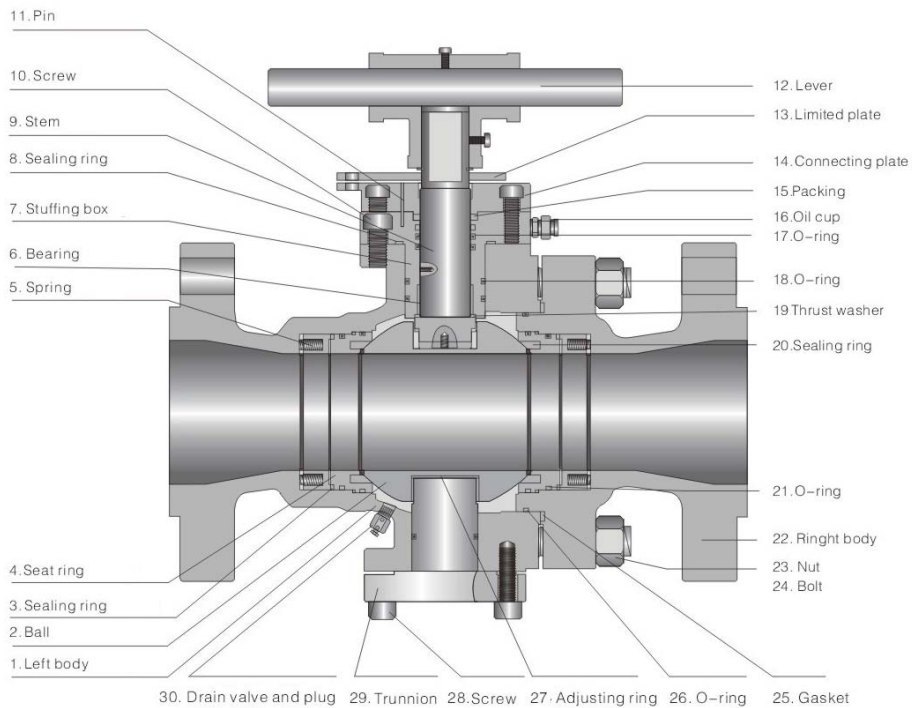


Fig.3 2PC Reduced Bore Floating Ball Valve Major Features of Type BV2002 (2" to 4")

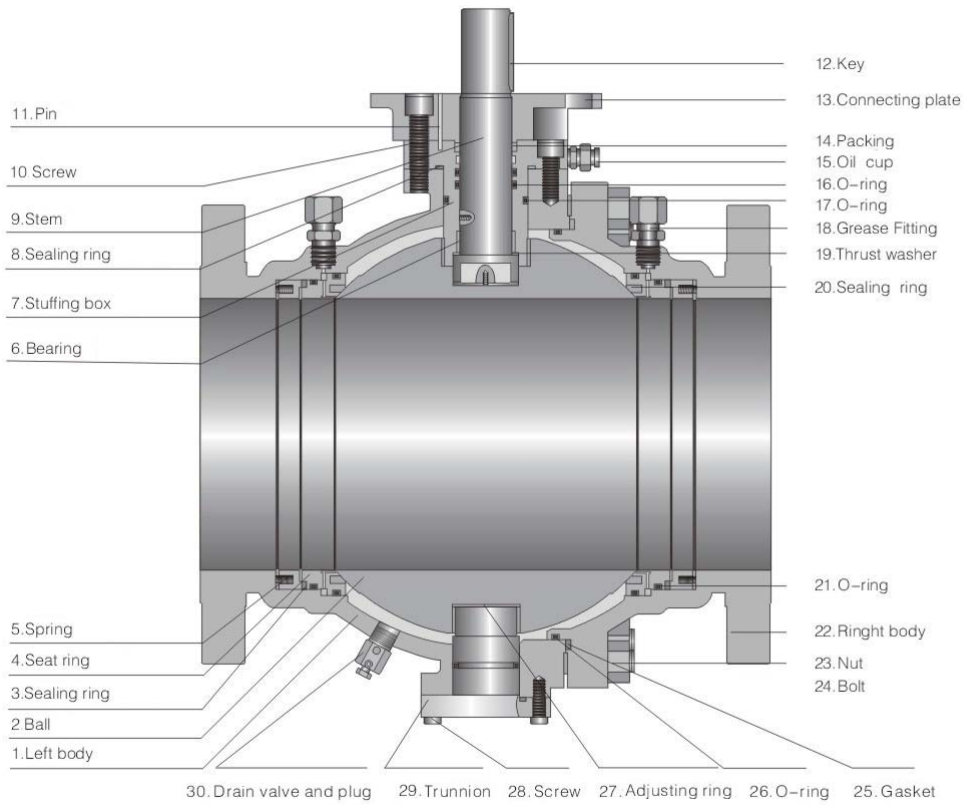


Fig.4 2PC Full Bore Floating Ball Valve Major Features of Type BV2002(6" and Above)

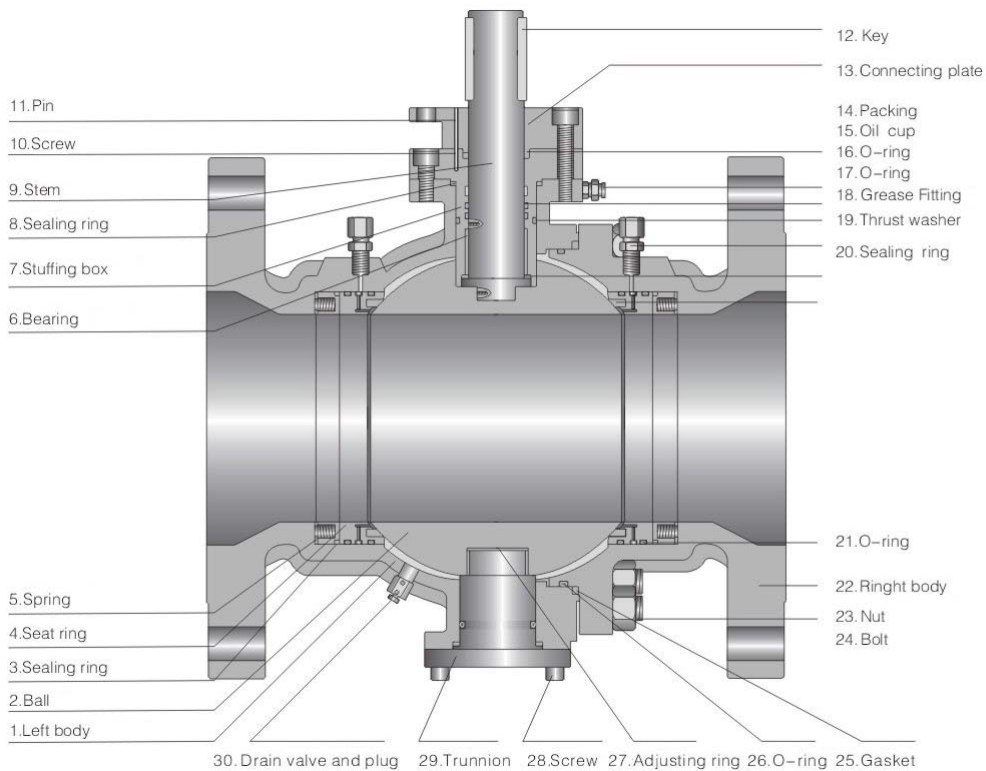


Fig.5 2PC Reduced Bore Floating Ball Valve Major Features of Type BV2002(6" and Above)

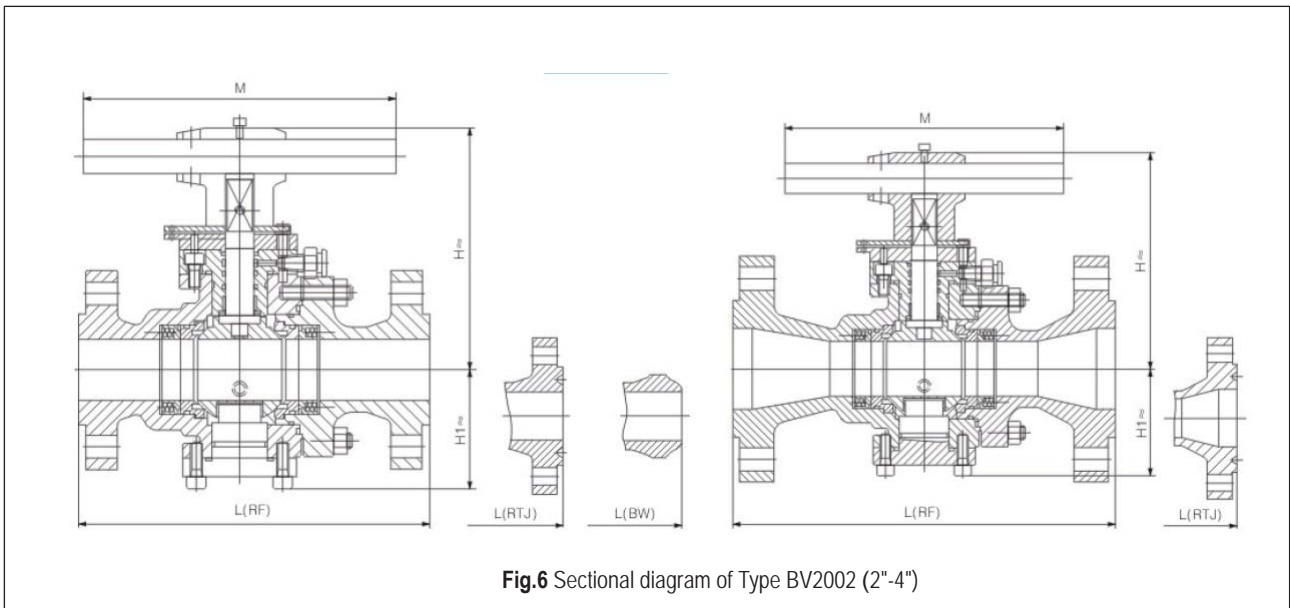


Fig.6 Sectional diagram of Type BV2002 (2"-4")

Table 3: Dimensions in mm for standard version of Type BV2002

Table 3.1: 2"-4", Class 600 LB

SIZE(in)	L(RF) (mm)	L(RTJ) (mm)	L(BW) (mm)	H≈ (mm)	H1≈ (mm)	M≈ (mm)	W≈ (kg)
2	292	295	292	195	100	500	33
3×2 ®	356	359	356	195	100	500	37
2 1/2	330	333	330	220	115	600	47
3×2 1/2 G	356	359	356	220	115	600	48.8
4×2 1/2 ®	432	435	432	220	115	600	57.5
3	356	359	356	247	126	700	58
4×3 G	432	435	432	247	126	700	72
6×3 ®	559	562	559	247	126	700	97.8
4	432	435	432	275	154	900	83
6×4 G	559	562	559	275	154	900	102.8
8×4 ®	660	664	660	275	154	900	109.6

G:Regular bore; ®:Reduce bore; W:The W in the table means weight of RF End Ball Valve

Table 3.2: 2"-4", Class 900 LB

SIZE(in)	L(RF) (mm)	L(RTJ) (mm)	L(BW) (mm)	H≈ (mm)	H1≈ (mm)	M≈ (mm)	W≈ (kg)
2	368	371	368	217	118.5	500	39
3×2 ®	381	384	381	217	118.5	500	44
2 1/2	419	422	419	241	133	600	55
3×2 1/2 G	381	384	381	241	133	600	58
4×2 1/2 ®	457	460	457	241	133	600	62.1
3	381	384	381	259	141	900	68
4×3 G	457	460	457	259	141	900	82
6×3 ®	610	613	610	259	141	900	106.1
4	457	460	457	297	167	1000	98
6×4 G	610	613	610	297	167	1000	127
8×4 ®	737	740	737	297	167	1000	171.1

G:Regular bore; ®:Reduce bore; W:The W in the table means weight of RF End Ball Valve

Table 3.3: 2"-4", Class1500Lb

SIZE(in)	L(RF) (mm)	L(RTJ) (mm)	L(BW) (mm)	H≈ (mm)	H1≈ (mm)	M≈ (mm)	W≈ (kg)
2	368	371	368	237	122	800	40
3×2®	470	473	470	237	122	800	50
2 1/2	419	422	419	261	148	900	64
3×2 1/2®	470	473	470	261	148	900	70
4×2 1/2 G	546	549	546	261	148	900	86
3	470	473	470	269	163	1000	95
4×3 G	546	549	546	269	163	1000	108
6×3®	705	711	705	269	163	1000	160
4	546	549	546	297	173	-	180
6×4 G	705	711	705	297	173	-	225
8×4®	832	841	832	297	173	-	297

G:Regular bore; ®:Reduce bore; W:The W in the table means weight of RF End Ball Valve

Table 3.4: 2"-4", Class2500Lb

SIZE(in)	L(RF) (mm)	L(RTJ) (mm)	L(BW) (mm)	H≈ (mm)	H1≈ (mm)	M≈ (mm)	W≈ (kg)
2	451	454	451	240	129	1000	75
3×2®	578	584	578	240	129	1000	102
2 1/2	508	514	508	270	135	1000	110
3×2 1/2 G	578	584	578	270	135	1000	173
4×2 1/2®	673	683	673	270	135	1000	180
3	578	584	578	300	159	1000	201
4×3 G	673	683	673	300	159	1000	230
6×3®	914	927	914	300	159	1000	340
4	673	683	673	350	204	-	303
6×4 G	914	927	914	350	204	-	413
8×4®	1022	1038	1022	350	204	-	524

G:Regular bore; ®:Reduce bore; W:The W in the table means weight of RF End Ball Valve

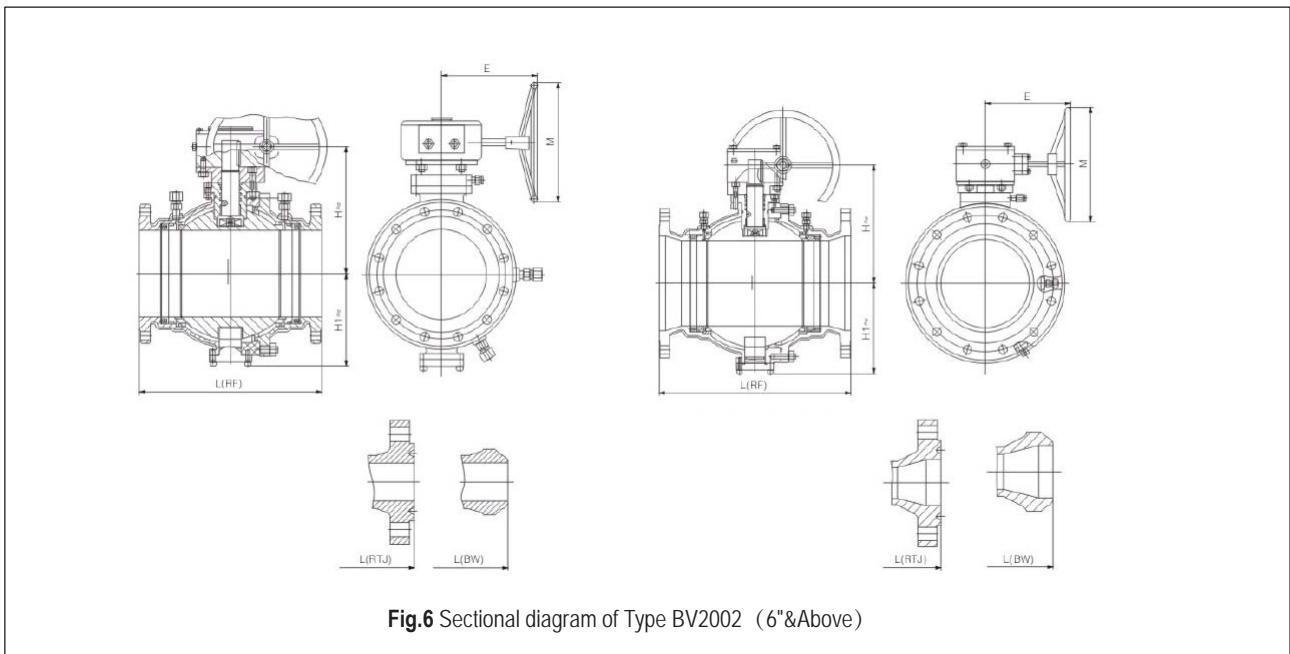


Table 3.5: 6" & Above, Class 600 LB

SIZE(in)	L(RF)(mm)	L(RTJ)(mm)	L(BW)(mm)	H≈(mm)	H1≈(mm)	M≈(mm)	E≈(mm)	W≈(kg)
8x6 G	660	664	660	305	198	300	270	198
10x6®	787	791	787	305	198	300	270	244
8	660	664	660	365	252	400	380	339
10x8 G	787	791	787	365	252	400	380	386
12x8®	838	841	838	365	252	400	380	420
10	787	791	787	484	299	450	430	515
12x10 G	838	841	838	484	299	450	430	545
14x10®	889	892	889	484	299	450	430	576
16x10®	991	994	991	484	299	450	430	648
12	838	841	838	580	343	500	430	960
14x12 G	889	892	889	580	343	500	430	992
16x12 G	991	994	991	580	343	500	430	1072
18x12®	1092	1095	1092	580	343	500	430	1142
14	889	892	889	608	377	500	510	1250
16x14 G	991	994	991	608	377	500	510	1328
18x14 G	1092	1095	1092	608	377	500	510	1405
20x14®	1194	1200	1194	608	377	500	510	1513
16	991	994	991	663	416	500	510	1415
18x16	1092	1095	1092	663	416	500	510	1615
20x16	1194	1200	1194	663	416	500	510	1692

G:Regular bore; ®:Reduce bore; W:The W in the table means weight of RF End Ball Valve

Table 3.6: 6" & Above, Class 900 LB

SIZE(in)	L(RF)(mm)	L(RTJ)(mm)	L(BW)(mm)	H≈(mm)	H1≈(mm)	M≈(mm)	E≈(mm)	W≈(kg)
6	610	613	610	360	250	400	380	220
8x6 G	737	740	737	360	250	400	380	263
10x6®	838	841	838	360	250	400	380	316
8	737	740	737	394	280	450	430	500
10x8 G	838	841	838	394	280	450	430	551
12x8®	965	968	965	394	280	450	430	620
10	838	841	838	502	325	500	510	942
12x10 G	965	968	965	502	325	500	510	1010
14x10®	1029	1038	1029	502	325	500	510	1054
16x10®	1130	1140	1130	502	325	500	510	1143
12	965	968	965	592	380	500	510	1200
14x12 G	1029	1038	1029	592	380	500	510	1310
16x12 G	1130	1140	1130	592	380	500	510	1420
18x12®	1219	1232	1219	592	380	500	510	1550
14	1029	1038	1029	675	395	550	530	1655
16x14 G	1130	1140	1130	675	395	550	530	1855
18x14 G	1219	1232	1219	675	395	550	530	-
20x14®	1321	1334	1321	675	395	550	530	-
16	1130	1140	1130	762	426	550	530	1903
18x16	1219	1232	1219	762	426	550	530	2030
20x16	1321	1334	1321	762	426	550	530	2374

G:Regular bore; ®:Reduce bore; W:The W in the table means weight of RF End Ball Valve

Table 3.7: 6" & Above, Class 1500 LB

SIZE(in)	L(RF)(mm)	L(RTJ)(mm)	L(BW)(mm)	H≈(mm)	H1≈(mm)	M≈(mm)	E≈(mm)	W≈(kg)
6	705	711	705	365	211	400	280	380
8x6 G	832	841	832	365	211	400	280	485
10x6®	991	1000	991	365	211	400	280	635
8	832	841	832	475	274	450	430	750
10x8 G	991	1000	991	475	274	450	430	956
12x8®	1130	1146	1130	475	274	450	430	1056
10	991	1000	991	578	310	500	510	1165
12x10 G	1130	1146	1130	578	310	500	510	1267
14x10®	1257	1276	1257	578	310	500	510	1465
16x10®	1384	1407	1384	578	310	500	510	1592
12	1130	1146	1130	696	485	500	510	1625
14x12 G	1257	1276	1257	696	485	500	510	1825
16x12 G	1384	1407	1384	696	485	500	510	1900
14	1257	1276	1257	761	510	550	530	1980
16x14	1384	1407	1384	761	510	550	530	2280

G:Regular bore; ®:Reduce bore; W:The W in the table means weight of RF End Ball Valve

Table 3.8: 6" & Above, Class 2500 LB

SIZE(in)	L(RF)(mm)	L(RTJ)(mm)	L(BW)(mm)	H≈(mm)	H1≈(mm)	M≈(mm)	E≈(mm)	W≈(kg)
6	914	927	914	385	250	450	430	745
8x6 G	1022	1038	1022	385	250	450	430	935
10x6®	1270	1292	1270	385	250	450	430	1080
8	1022	1038	1022	502	340	500	510	1202
10x8 G	1270	1292	1270	502	340	500	510	1450
12x8®	1422	1445	1422	502	340	500	510	1869
10	1270	1292	1270	600	411	500	510	2080
12x10 G	1422	1445	1422	600	411	500	510	2287
12	1422	1445	1422	715	498	550	510	3080

G:Regular bore; ®:Reduce bore; W:The W in the table means weight of RF End Ball Valve

Selecting and sizing the ball valve:

Accordance with ball valve operation and design conditions:

- Calculate the required nominal size, on-off valve generally based on user pipe size to calculate diameter of the valve.
- Select the suitable materials from Table 2.
- Select accessories.

Ordering text:

Ball valve	Type BV2002
Nominal size	DN ...
Nominal pressure	PN ...
Type of end connections	Flanges
Leakage rate	
On option, special version	
Actuator Type	Pneumatic rotary actuator or Manual lever
Fail-safe position	Fail-close or Fail-open
Signal pressure	... bar
Accessories	Limit switch, Solenoid valve, Supply pressure regulator
Operating pressure	... bar
Medium temperature	... °C
Sealing type	...Soft or Metal
Others	

Specifications subject to change without notice