

# FluoroSeal



## 3 PIECE TRUNNION BALL VALVES

**API 6D**  
**FORGED BOLTED BODY**  
**FULLY WELDED BODY**

Class 150, 300, 600, 900, 1500 & 2500

## PRODUCT OVERVIEW



For over 30 years, FluoroSeal has been manufacturing and customizing a wide range of valves, and accessories for many industries including Oil & Gas, Petrochemical, Chemical, Mining, Pharmaceutical, and Marine.

Our BDB (Bolted Body) and BW3 (Fully Welded Body) trunnion-mounted ball valves are designed and manufactured

according to API, ANSI, and ASME standards to meet the most stringent industry requirements. Moreover, FluoroSeal BDB and BW3 trunnion mounted ball valves are available in a broad range of exotic alloys for use in upstream, midstream and downstream applications.



FluoroSeal BDB (Bolted Body)  
Trunnion-Mounted Ball Valve



FluoroSeal BW3 (Fully-welded)  
Trunnion-Mounted Ball Valve



FluoroSeal Twin Trunnion-Mounted  
Ball Valve (double block & bleed)

**FluoroSeal® three-piece trunnion-mounted ball valves offer increased value by incorporating advanced design features:**

- **TRUNNION-MOUNTED BALL**

The ball is fixed and the seat rings are floating, free to move along the valve axis. Side load generated by the pressure acting on the ball is absorbed by bearings. At low pressure, the seat sealing action is achieved by the thrust of the springs acting on the seat rings. As the pressure increases, the line pressure pushes the seat rings against the ball.

- **FLOATING SEAT RINGS**

Two independent floating seat rings assure bi-directional sealing. The seats are carefully designed to minimize operating torque without compromising sealing. Bubble-tight sealing is assured from zero differential pressure to the maximum rated pressure.

- **FIRE SAFE DESIGN**

FluoroSeal® three-piece trunnion-mounted ball valves are designed to meet fire safety standards API 6FA, API 607, and ISO 10497. Fire tests have been conducted by an independent laboratory for the complete product range.

- **DOUBLE BLOCK AND BLEED**

Valves with single piston or double piston seat design allow to bleed the body cavity through the drain plug/valve with the ball in either the fully closed or fully open position. This unique feature allows for seat integrity confirmation without the need to close the valve in a normally open application.

FluoroSeal also offer the Twin Ball in a single body for a true Double Block and Bleed service, where requirements prohibit the use of a single ball.

- **BODY SEALING**

Sealing and fire-safe features are ensured by the use of the double sealing action of o-rings and graphite gaskets in all the body static joints.

- **SINGLE PISTON EFFECT**

In the standard design FluoroSeal® trunnion-mounted ball valves, each seat ring performs the “Single Piston” action. The pressure acting on the external and internal side of the seat ring results in a force compressing the seat against the ball.

When the body cavity pressure exceeds the spring pressure, self-relieving seats vent the pressure to the process piping.

- **DOUBLE PISTON EFFECT (OPTIONAL)**

Upon request, the seat rings design may be modified to the “Double Piston” design. In this case, the pressure acting on both the external and internal side of the seat rings results in a force which pushes the seat against the ball. Each seat ring provides positive sealing when pressure is applied in the body cavity.

- **INDEPENDENT BALL AND STEM**

The ball and stem are independent to minimize the effect of the side load generated by the pressure differential on the ball.

- **LOW EMISSION VALVES**

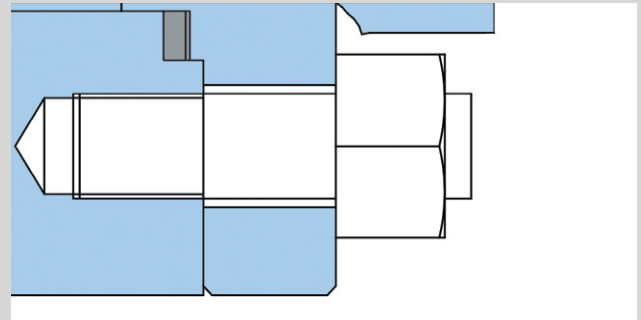
Precise machining of stem and bonnet sealing surfaces in combination with unique stem seals ensures minimal Fugitive Emissions. Special live-loaded seals are available on request.

- **ANTI-BLOWOUT STEM**

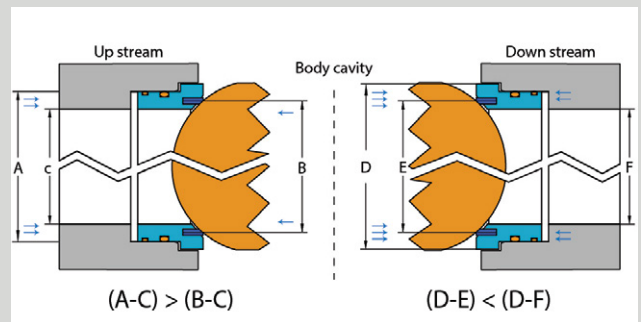
The stem and body are designed to prevent stem blow-out.

- **ANTI-STATIC DESIGN**

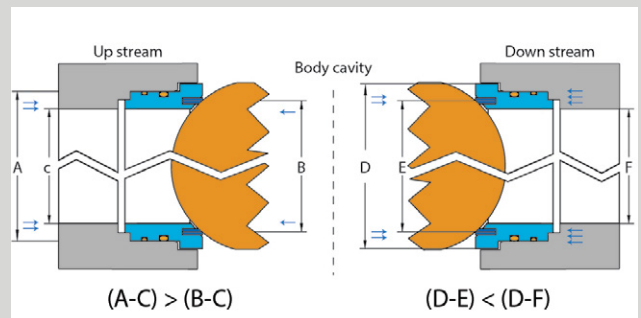
Electrical continuity is assured through the use of a spring loaded contact.



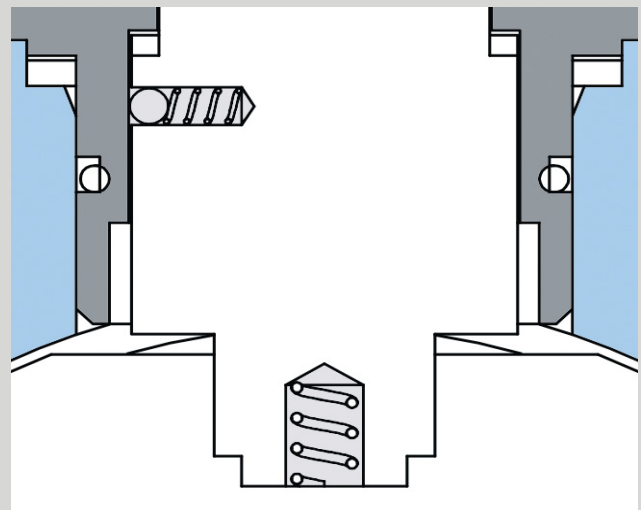
Body Sealing



Single Piston Effect



Double Piston Effect



Anti-Blowout Stem and Anti-static device

## DESIGN FEATURES

### • STEM SEALING

The stem is separated from the ball, so that it is not affected by the side loading created by line pressure acting on the ball. This ensures a bubble tight seal at the stem. Sealing is achieved through a combination of o-rings and a graphite gasket retained by the gland plate.

The graphite gasket can be replaced with the valve in line and the ball in any position by removing the gland plate, after releasing any trapped pressure through the grease injection fitting hole. The stem seals can be replaced with the valve in-line, providing that the ball is in the fully closed or fully open position and the pressure in the body cavity has been completely released.

### • EMERGENCY SEALANT INJECTION

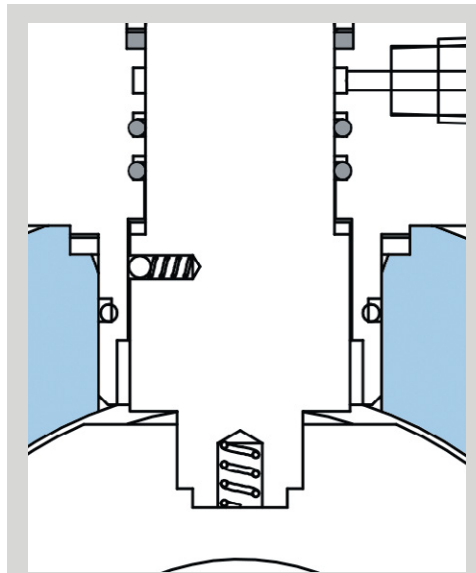
Optional emergency grease injection port at the seat sealing area is available upon request.

## OPTIONAL EXTENDED STEM

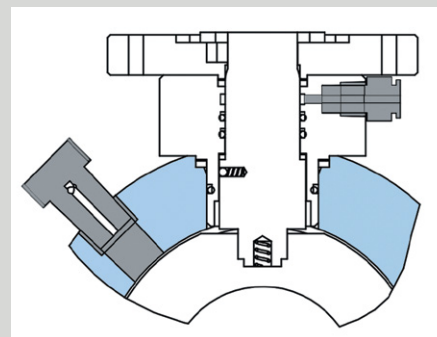
For valves to be installed in buried service lines, FluoroSeal® Trunnion Mounted Ball Valves can be supplied complete with suitable stem extensions. All drain, vent and emergency sealant lines are firmly attached to the stem extension.

## BDB AND BW3 VALVE COMPARISON

Bolted body ball valves (BDB) and fully-welded ball valves (BW3) are very similar in many design features; however it is important to consider some key factors to determine the best valve for the application. These factors are mainly internal parts



Stem Sealing



Emergency Sealant Injection

### APPLICABLE STANDARDS BDB & BW3 VALVES

API 6D, ISO 14313, API SPEC Q1  
Specification for Pipeline Valves

API 6A, ISO 10423

Valves design

ANSI B16.10, API 6D

Face-to-Face and End-to-End Dimensions of Valves

ANSI B16.34

Valves, Flanged and Butt Weld End

API 6FA, API 607

Specification for Fire Test for Valves

NACE MR0175

Sulphide Stress Cracking Resistant Metallic Material for Oilfield Equipment

ANSI B16.5

1/2" – 24" Pipe Flanged and Flanged Fittings

ANSI B16.47

Series A, 26" – 60" Large Diameter Steel Flanges

ANSI B16.25

Butt Weld Ends

API 6A, API 6D, API 598

Testing

ASTM / ANSI

Materials

exposure to corrosive media, location (accessibility and available space), installation site (under or above ground), pipeline pressures and stresses, shipping costs (weight and size), and maintenance requirements.

Below is an overview of the main differences between designs:

### BDB Valves

- Lower acquisition costs\*
- Simplified on-site maintenance
- ASME Class 150 to ASME Class 2500
- Size Range: 2" up to 56" (Full Bore)

\*Applicable for standard configuration only

### BW3 Valves:

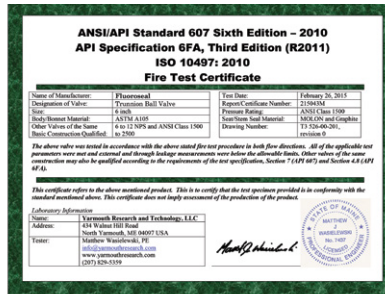
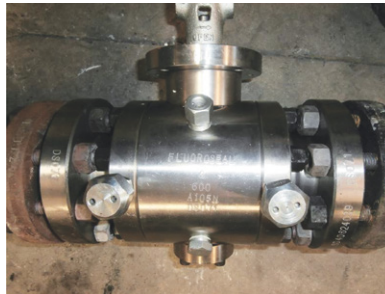
- Welded joints reduce potential leakage paths
- Compact body design reduces overall size and weight
- Ideal for underground and buried service
- Maintenance-free
- ASME Class 150 to ASME Class 600
- Size Range: 6" up to 60" (Full Bore)



### QUALITY ASSURANCE

FluoroSeal Valves are designed with the best features presently available on the market. They are inspected throughout the manufacturing process to assure high quality and consistency in every unit.

### Fire Safe Testing



### API-6D



License No. 6D-1564  
Plug Valves and Ball Valves

### API Spec Q1



Registration No. Q1-2682  
Design and Manufacture of Pipeline Industrial Valves

### ISO 9001: 2008



APIQR Registration No. 2798  
Design and Manufacture of Pipeline Industrial Valves

## MANUFACTURING FACILITY

Headquartered in Montreal, Canada; Fluoroseal has two production plants with over 10,000 square meters dedicated to the manufacturing of a broad range of quality standard and customized valves. Our modern plants are equipped with specialized machinery and state of the art inspection and testing instruments.

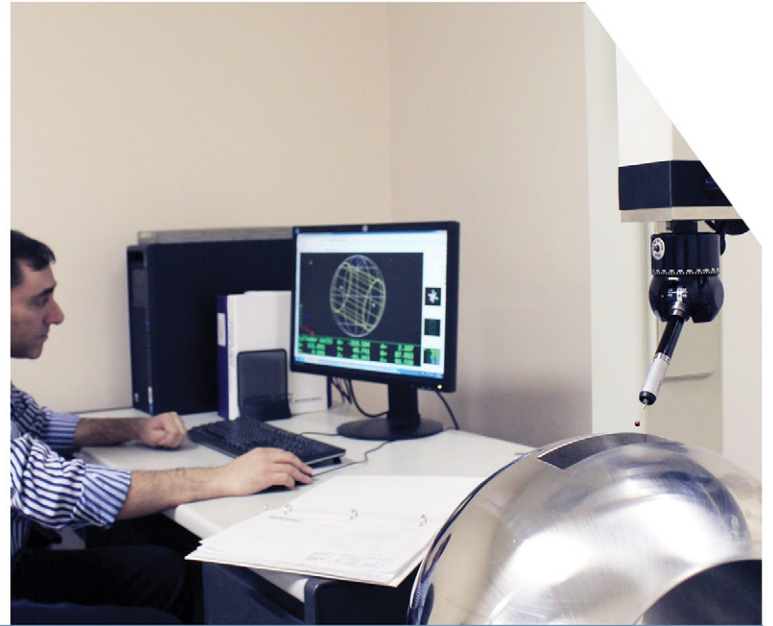
With its large network of warehouses, distributors, and representatives, FluoroSeal can deliver valve products, technical support, and complementary services worldwide and is able to support its customers with quick deliveries in case of emergencies and unscheduled shutdowns.



Besides offering a broad range of industrial valves, FluoroSeal is also specialized in valve automation. Whether electric, pneumatic, hydraulic, or gas-over-oil, FluoroSeal's highly skilled and experienced engineers will always find a reliable and economical solution to suit your special application. With a large inventory of assembled valves and pneumatic actuators, FluoroSeal is able to offer quick lead times for automated assemblies to meet end user requirements.

Our product offering is continuously evolving thanks to our team of highly skilled designers, engineers, and metallurgists who ensure the application of the latest technologies in CAD software, production methods, machinery, quality control procedures, and product testing to all of our products.





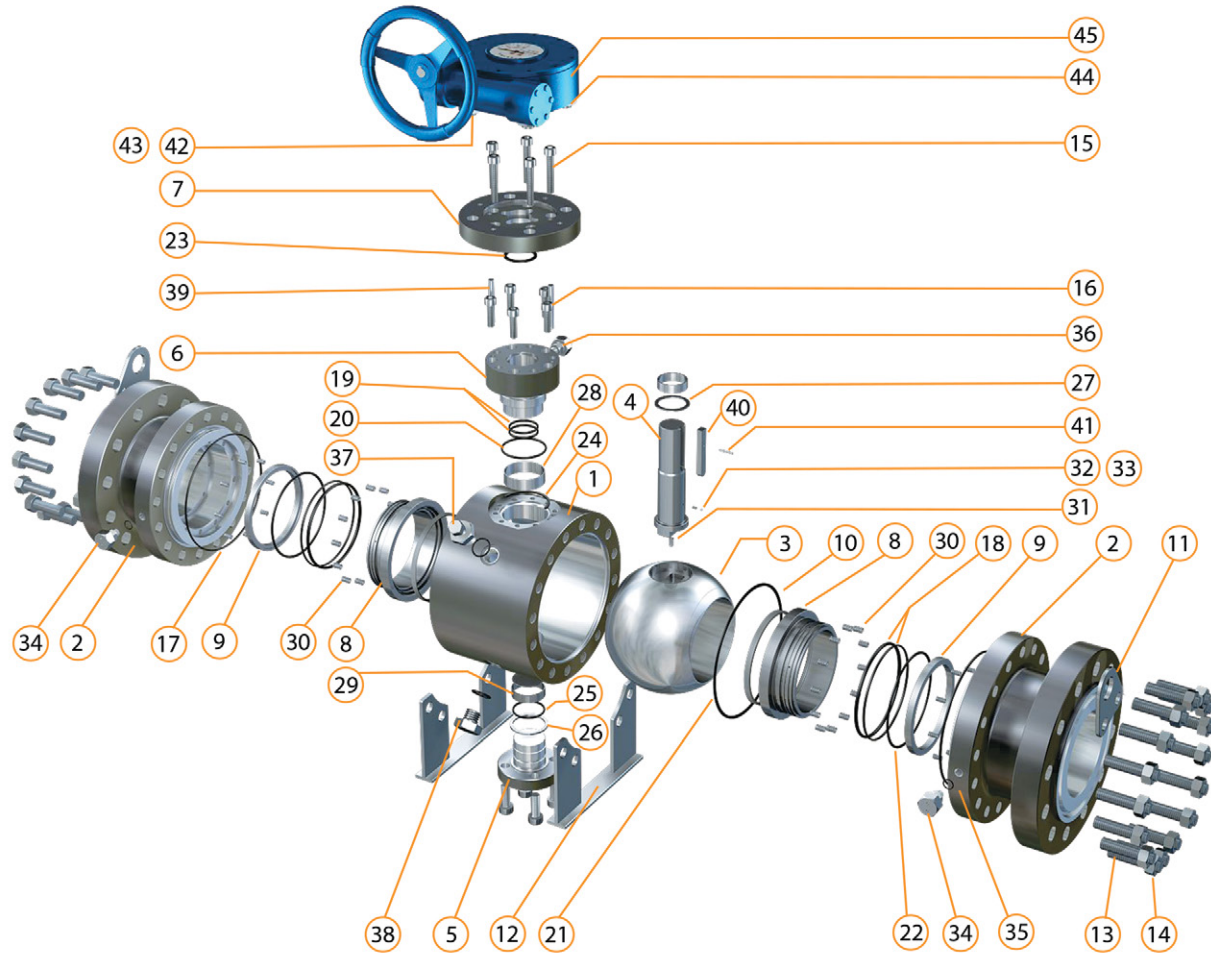
At FluoroSeal, we are inspired and committed to developing innovative flow control solutions for every industry we serve.



**3 PIECE BOLTED BODY OUTER TRUNNION-MOUNTED BALL VALVE**

Class 150, 300, 600: 2" up to 12" / Class 900: 2" up to 10" / Class 1500: 2" up to 4" / Class 2500: 2" up to 4"

BDB  
VALVES



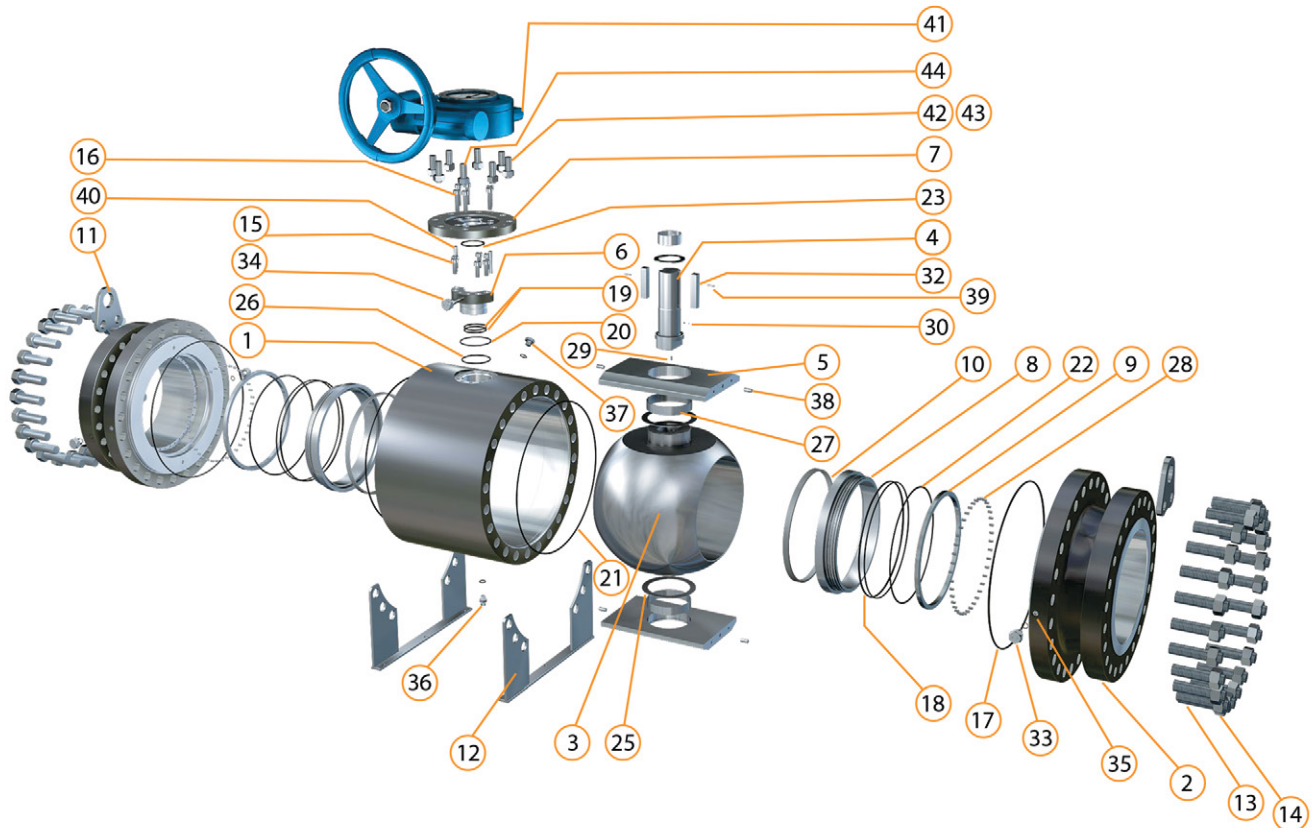
No.	Description/Part	No.	Description/Part	No.	Description/Part
1	Body	18	Seat Ring o-ring	35	Check Valve
2	End Cap	19	Stem o-ring	36	Stem Grease Injection Valve
3	Ball	20	Body & Bonnet o-ring	37	Vent Valve
4	Stem	21	Body & End Cap o-ring	38	Drain Valve
5	Trunnion	22	Seat Ring Gasket	39	Pin
6	Bonnet	23	Adapter Flange & Bonnet Gasket	40	Key
7	Adapter Flange	24	Body & Bonnet Gasket	41	Pin
8	Seat Ring	25	Trunnion o-ring	42	Bolt
9	Spring Retainer	26	Washer	43	Nut
10	Seat	27	Trunnion o-ring	44	Pin
11	Lifting Lugs *	28	Bearing	45	Gearbox
12	Support Legs *	29	Bearing		
13	Stud Bolt	30	Seat Spring		
14	Nut	31	Anti-static Spring		
15	Screw	32	Anti-static Spring		
16	Screw	33	Anti-static Ball		
17	End Cap o-ring	34	Seat Grease Injection Valve		

\* Lifting lugs and Support Legs for 8" and above

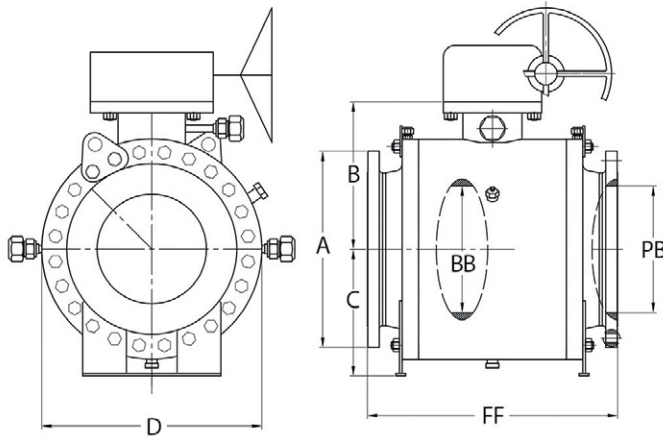


### 3 PIECE BOLTED BODY INNER TRUNNION-MOUNTED BALL VALVE

Class 150, 300, 600: 14" and above / Class 900: 12" and above / Class 1500: 6" and above / Class 2500: 6" and above



No.	Description/Part	No.	Description/Part	No.	Description/Part
1	Body	18	Seat Ring o-ring	35	Check Valve
2	End Cap	19	Stem o-ring	36	Drain Valve
3	Ball	20	Body & Bonnet o-ring	37	Vent Valve
4	Stem	21	Body & End Cap o-ring	38	Pin
5	Trunnion	22	Seat Ring Gasket	39	Pin
6	Bonnet	23	Adapter Flange & Bonnet Gasket	40	Pin
7	Adapter Flange	24	Body & Bonnet Gasket	41	Gearbox
8	Seat Ring	25	Washer	42	Bolt
9	Spring Retainer	26	Thrust Washer	43	Nut
10	Seat	27	Bearing	44	Pin
11	Lifting Lugs*	28	Seat Spring		
12	Support Legs*	29	Anti-static Spring		
13	Stud Bolt	30	Anti-static Spring		
14	Nut	31	Anti-static Ball		
15	Screw	32	Key		
16	Screw	33	Seat		
17	End Cap o-ring	34	Stem		



**3 PIECE BOLTED BODY  
TRUNNION-MOUNTED BALL VALVE  
ANSI CLASS 150**

SIZE 2" to 56"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

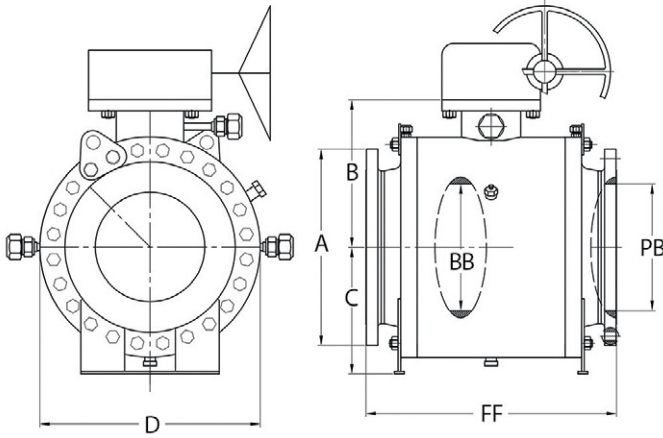
Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

**ANSI CLASS 150**

Size		FF						BB		PB		A		B		C		D		Weight	
		RF		RTJ		WE															
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
2"	50	7.01	178	7.48	190	8.50	216	1.97	50	1.97	50	5.91	150	5.08	129	3.90	99	6.02	153	61.7	28
3"	80	7.99	203	8.50	216	11.14	283	2.99	76	2.99	76	7.48	190	5.43	138	4.72	120	7.36	187	121.3	55
4"	100	9.02	229	9.49	241	12.01	305	3.94	100	3.94	100	9.06	230	6.69	170	5.67	144	9.06	230	154.3	70
6"	150	15.51	394	15.98	406	17.99	457	5.91	150	5.91	150	11.02	280	8.50	216	7.87	200	12.01	305	352.7	160
8"	200	17.99	457	18.50	470	20.51	521	7.91	201	7.91	201	13.58	345	10.12	257	9.84	250	15.35	390	540.1	245
10"	250	20.98	533	21.50	546	22.01	559	9.92	252	9.92	252	15.94	405	11.69	297	11.81	300	18.39	467	914.9	600
12"	300	24.02	610	24.49	622	25.00	635	11.93	303	11.93	303	19.09	485	13.11	333	13.90	353	21.26	540	1,322.8	850
14"	350	27.01	686	27.48	698	30.00	762	13.15	334	13.15	334	21.06	535	14.13	359	15.55	395	23.90	607	1,873.9	1,168
16"	400	30.00	762	30.51	775	32.99	838	15.16	385	15.16	385	23.43	595	15.91	404	18.90	480	26.57	675	2,575.0	1,420
18"	450	34.02	864	34.49	876	35.98	914	17.17	436	17.17	436	25.00	635	17.60	447	20.47	520	29.65	753	3,130.6	2,050
20"	500	35.98	914	36.50	927	39.02	991	19.17	487	19.17	487	27.56	700	19.13	486	16.93	430	33.27	845	4,519.5	2,620
22"	550	39.02	991	-	-	42.99	1,092	21.26	540	21.26	540	29.53	750	20.67	525	18.70	475	36.61	930	5,776.1	3,420
24"	600	42.01	1,067	42.48	1,079	45.00	1,143	23.19	589	23.19	589	32.09	815	22.56	573	23.62	600	39.76	1,010	7,539.8	3,687
26"	650	45.00	1,143	-	-	49.02	1,245	24.92	633	24.92	633	34.25	870	24.80	630	22.05	560	42.13	1,070	8,128.4	4,495
28"	700	48.98	1,244	-	-	53.03	1,347	26.93	684	26.93	684	36.42	925	25.39	645	25.59	650	44.88	1,140	9,909.8	4,495
30"	750	50.98	1,295	-	-	55.00	1,397	28.94	735	28.94	735	38.78	985	27.13	689	27.56	700	48.08	1,220	11,530.2	5,230
32"	800	53.98	1,371	-	-	60.00	1,524	30.67	779	30.67	779	41.73	1,060	29.13	740	29.33	745	51.57	1,310	15,035.5	6,820
34"	850	57.99	1,473	-	-	64.02	1,626	32.68	830	32.68	830	43.70	1,110	29.92	760	30.51	775	54.33	1,380	17,218.1	7,810
36"	900	60.00	1,524	-	-	68.03	1,728	34.41	874	34.41	874	46.06	1,170	31.89	810	31.69	805	56.69	1,440	19,422.7	8,810
40"	1,000	69.00	1,753	-	-	77.01	1,956	38.43	976	38.43	976	50.79	1,290	35.24	895	35.43	900	63.39	1,610	27,756.2	12,590
42"	1,050	73.03	1,855	-	-	82.01	2,083	40.16	1,020	40.16	1,020	52.95	1,345	37.40	950	36.81	935	66.26	1,683	31,548.1	14,310
48"	1,200	84.02	2,134	-	-	94.02	2,388	45.91	1,166	45.91	1,166	59.45	1,510	43.11	1,095	42.13	1,070	75.98	1,930	48,347.4	21,930
56"	1,400	98.00	2,489	-	-	97.99	2,489	54.33	1,380	54.33	1,380	68.70	1,745	51.18	1,300	49.21	1,250	89.49	2,273	75,221.7	34,120



**3 PIECE BOLTED BODY  
TRUNNION-MOUNTED BALL VALVE  
ANSI CLASS 300**

SIZE 2" to 56"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

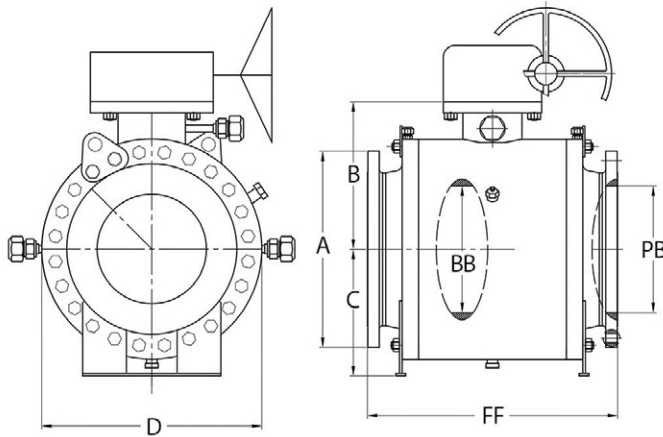
Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

ANSI CLASS 300																					
Size		FF						BB		PB		A		B		C		D		Weight	
		RF		RTJ		WE															
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
2"	50	8.50	216	9.13	232	8.50	216	1.97	50	1.97	50	6.50	165	4.53	115	3.31	84	6.02	153	66.0	30
3"	80	11.14	283	11.73	298	11.14	283	2.99	76	2.99	76	8.27	210	5.43	138	4.41	112	7.36	187	127.9	58
4"	100	12.01	305	12.64	321	12.01	305	3.94	100	3.94	100	10.04	255	6.69	170	5.28	134	9.06	230	187.4	85
6"	150	15.87	403	16.50	419	17.99	457	5.91	150	5.91	150	12.52	318	8.50	216	8.43	214	12.01	305	401.2	182
8"	200	19.76	502	20.35	517	20.51	521	7.91	201	7.91	201	14.96	380	10.12	257	9.84	250	15.35	390	650.4	295
10"	250	22.36	568	22.99	584	22.01	559	9.92	252	9.92	252	17.52	445	11.69	297	11.81	300	18.78	477	1,150.8	522
12"	300	25.51	648	26.14	664	25.00	635	11.93	303	11.93	303	20.47	520	13.11	333	14.17	360	21.26	540	1,653.5	750
14"	350	30.00	762	30.63	778	30.00	762	13.15	334	13.15	334	23.03	585	14.57	370	15.94	405	24.80	630	2,535.3	1,150
16"	400	32.99	838	33.62	854	32.99	838	15.16	385	15.16	385	25.59	650	16.14	410	17.44	443	27.48	698	3,082.1	1,398
18"	450	35.98	914	36.61	930	35.98	914	17.17	436	17.17	436	27.95	710	18.03	458	19.29	490	30.31	770	4,739.9	2,150
20"	500	39.02	991	39.76	1,010	39.02	991	19.17	487	19.17	487	30.51	775	20.08	510	21.26	540	33.66	855	6,062.7	2,750
22"	550	35.98	1,092	43.86	1,114	42.99	1,092	21.26	540	21.26	540	33.07	840	20.87	530	19.09	485	37.01	940	6,172.9	2,800
24"	600	39.02	1,143	45.87	1,165	45.00	1,143	23.19	589	23.19	589	36.02	915	23.31	592	24.21	615	40.35	1,025	8,983.8	4,075
26"	650	42.99	1,245	50.00	1,270	49.02	1,245	24.92	633	24.92	633	38.19	970	25.00	635	23.03	585	42.72	1,085	10,295.6	4,670
28"	700	52.99	1,346	54.02	1,372	52.99	1,346	26.93	684	26.93	684	40.75	1,035	25.36	645	26.38	670	45.28	1,150	12,742.7	5,780
30"	750	55.00	1,397	55.98	1,422	55.00	1,397	28.94	735	28.94	735	42.91	1,090	28.11	714	28.74	730	48.85	1,240	14,550.5	6,600
32"	800	60.00	1,524	61.14	1,553	60.00	1,524	30.67	779	30.67	779	45.28	1,150	29.53	750	30.31	770	51.97	1,320	17,504.7	7,940
34"	850	64.02	1,626	65.12	1,654	64.02	1,626	32.68	830	32.68	830	47.44	1,205	30.12	765	31.50	800	54.84	1,393	19,951.8	9,050
36"	900	67.99	1,727	69.13	1,756	67.99	1,727	34.41	874	34.41	874	50.00	1,270	31.89	810	32.48	825	57.09	1,450	21,715.5	9,850
40"	1,000	77.01	1,956	-	-	77.01	1,956	38.43	976	38.43	976	48.82	1,240	35.63	905	36.22	920	63.78	1,620	30,401.7	13,790
42"	1,050	82.01	2,083	-	-	82.01	2,083	40.16	1,020	40.16	1,020	50.79	1,290	37.80	960	37.60	955	66.54	1,690	35,538.5	16,120
48"	1,200	85.43	2,170	-	-	85.43	2,170	45.91	1,166	45.91	1,166	57.68	1,465	43.31	1,100	43.50	1,105	76.50	1,943	51,808.6	23,500
56"	1,400	107.99	2,743	-	-	107.99	2,743	54.33	1,380	54.33	1,380	67.32	1,710	51.18	1,300	50.20	1,275	89.76	2,280	84,150.4	38,170





**3 PIECE BOLTED BODY  
TRUNNION-MOUNTED BALL VALVE  
ANSI CLASS 600**

SIZE 2" to 56"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

**ANSI CLASS 600**

Size		FF						BB		PB		A		B		C		D		Weight	
		RF		RTJ		WE															
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
2"	50	11.50	292	11.61	295	11.50	292	1.97	50	1.97	50	6.50	165	4.76	121	3.54	90	6.30	160	77.2	35
3"	80	14.02	356	14.13	359	14.02	356	2.99	76	2.99	76	8.27	210	5.91	150	4.76	121	7.48	190	143.3	65
4"	100	17.01	432	17.13	435	17.01	432	3.94	100	3.94	100	10.83	275	7.20	183	5.31	135	9.21	234	264.6	120
6"	150	22.01	559	22.13	562	22.01	559	5.91	150	5.91	150	13.98	355	8.86	225	9.06	230	12.01	305	577.6	262
8"	200	25.98	660	26.14	664	25.98	660	7.95	202	7.95	202	16.54	420	10.04	299	10.55	268	15.94	405	925.9	420
10"	250	30.98	787	31.14	791	30.98	787	10.00	254	10.00	254	20.08	510	11.77	388	13.39	340	19.29	490	1,715.2	778
12"	300	32.99	838	33.11	841	32.99	838	11.93	303	11.93	303	22.05	560	13.90	479	13.90	353	22.83	580	2,385.4	1,082
14"	350	35.00	889	35.12	892	35.00	889	13.15	334	13.15	334	23.82	605	15.28	523	16.54	420	24.80	630	2,821.9	1,280
16"	400	39.02	991	39.13	994	39.02	991	15.16	385	15.16	385	26.97	685	17.05	433	18.39	467	27.64	702	3,703.8	1,680
18"	450	42.99	1,092	43.11	1,095	42.99	1,092	17.17	436	17.17	436	29.33	745	18.86	479	20.08	510	30.51	775	5,346.2	2,425
20"	500	47.01	1,194	47.24	1,200	47.01	1,194	19.17	487	19.17	487	32.09	815	20.59	523	21.65	550	33.98	863	6,728.5	3,052
22"	550	51.02	1,296	51.38	1,305	51.02	1,296	21.26	540	21.26	540	34.25	870	21.46	545	20.08	510	37.40	950	8,355.5	3,790
24"	600	55.00	1,397	55.35	1,406	55.00	1,397	23.19	589	23.19	589	37.01	940	24.80	630	25.20	640	40.55	1,030	11,464.0	5,200
26"	650	57.01	1,448	57.48	1,460	57.01	1,448	24.92	633	24.92	633	39.96	1,015	26.50	673	26.77	680	43.03	1,093	12,456.1	5,650
28"	700	60.98	1,549	61.50	1,562	60.98	1,549	26.93	684	26.93	684	42.32	1,075	26.18	665	27.17	690	46.06	1,170	14,903.2	6,750
30"	750	65.00	1,651	65.51	1,664	65.00	1,651	28.94	735	28.94	735	44.49	1,130	29.72	755	32.17	817	49.41	1,255	18,408.6	8,350
32"	800	70.00	1,778	70.63	1,794	70.00	1,778	30.67	779	30.67	779	47.05	1,195	29.72	755	30.71	780	52.24	1,327	21,473.0	9,740
34"	850	75.98	1,930	76.61	1,946	75.98	1,930	32.68	830	32.68	830	49.02	1,245	30.71	780	32.09	815	55.31	1,405	25,000.4	11,340
36"	900	82.01	2,083	82.60	2,098	82.01	2,083	34.41	874	34.41	874	51.77	1,315	32.09	815	33.07	840	57.68	1,465	29,762.4	13,500
40"	1,000	92.01	2,337	92.01	2,337	92.01	2,337	38.43	976	38.43	976	51.97	1,320	36.02	915	37.01	940	64.57	1,640	40,432.8	18,340
42"	1,050	95.94	2,437	95.94	2,437	95.94	2,437	40.16	1,020	40.16	1,020	55.31	1,405	38.19	970	38.58	980	67.72	1,720	47,090.7	21,360
48"	1,200	100.00	2,540	100.00	2,540	100.00	2,540	45.91	1,166	45.91	1,166	62.80	1,595	43.50	1,105	44.09	1,120	77.56	1,970	68,784.2	31,200
56"	1,400	116.10	2,949	116.10	2,949	116.10	2,949	54.33	1,380	54.33	1,380	73.03	1,855	51.18	1,300	50.79	1,290	90.75	2,305	104,697.5	47,490

### 3 PIECE BOLTED BODY TRUNNION-MOUNTED BALL VALVE ANSI CLASS 900

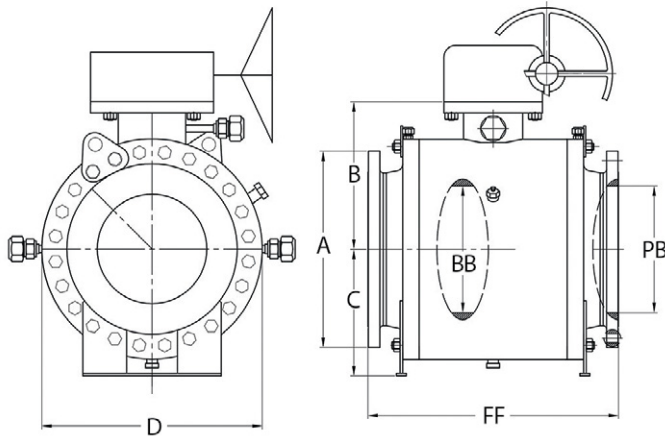
SIZE 2" to 36"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

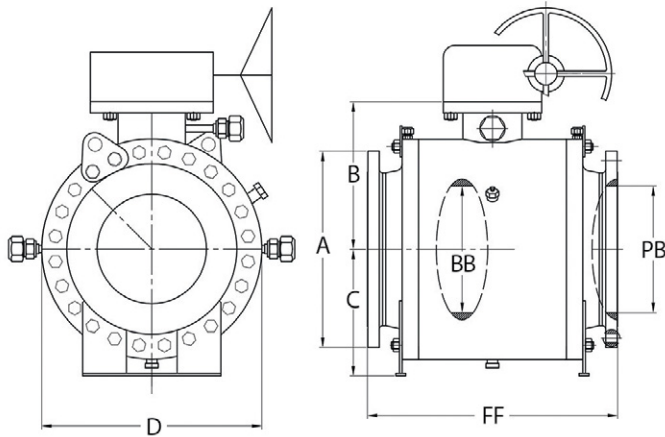
Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25



ANSI CLASS 900																					
Size		FF						BB		PB		A		B		C		D		Weight	
		RF		RTJ		WE															
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
2"	50	14.49	368	14.61	371	14.49	368	1.97	50	1.97	50	8.46	215	5.00	127	3.74	95	6.30	160	110.2	50
3"	80	15.00	381	15.12	384	15.00	381	2.99	76	2.99	76	9.45	240	6.22	158	4.69	119	7.48	190	176.4	80
4"	100	17.99	457	18.11	460	17.99	457	4.02	102	4.02	102	11.42	290	7.83	199	5.47	139	9.33	237	319.7	145
6"	150	24.02	610	24.13	613	24.02	610	5.91	150	5.91	150	14.96	380	9.17	233	10.35	263	12.60	320	815.7	370
8"	200	29.02	737	29.13	740	29.02	737	7.95	202	7.95	202	18.50	470	10.87	276	11.54	293	16.54	420	1,311.8	595
10"	250	32.99	838	33.11	841	32.99	838	10.00	254	10.00	254	21.46	545	12.87	327	13.39	340	20.28	515	2,270.8	1,030
12"	300	37.99	965	38.11	968	37.99	965	12.01	305	12.01	305	24.02	610	15.12	384	16.14	410	23.82	605	3,434.8	1,558
14"	350	40.51	1,029	40.87	1,038	40.51	1,029	12.76	324	12.76	324	25.20	640	16.50	419	17.72	450	25.20	640	3,256.2	1,477
16"	400	44.49	1,130	44.88	1,140	44.49	1,130	14.69	373	14.69	373	27.76	705	18.11	460	19.21	488	28.15	715	4,755.4	2,157
18"	450	47.99	1,219	48.50	1,232	47.99	1,219	16.65	423	16.65	423	30.91	785	20.51	521	21.65	550	31.50	800	7,068.0	3,206
20"	500	52.01	1,321	52.48	1,333	52.01	1,321	18.54	471	18.54	471	33.66	855	21.77	553	22.95	583	35.43	900	9,303.5	4,220
24"	600	60.98	1,549	61.73	1,568	60.98	1,549	22.44	570	22.44	570	40.94	1,040	26.30	668	26.77	680	41.73	1,060	15,101.7	6,850
26"	650	65.00	1,651	65.91	1,674	65.00	1,651	24.29	617	24.29	617	42.72	1,085	25.59	650	25.59	650	44.09	1,120	17,725.2	8,040
28"	700	69.02	1,753	69.88	1,775	69.02	1,753	26.18	665	26.18	665	46.06	1,170	26.38	670	27.95	710	48.43	1,230	21,980.1	9,970
30"	750	74.02	1,880	74.88	1,902	74.02	1,880	28.03	712	28.03	712	48.43	1,230	33.23	844	33.46	850	51.18	1,300	26,918.4	12,340
32"	800	80.00	2,032	80.87	2,054	80.00	2,032	29.92	760	29.92	760	51.77	1,315	30.91	785	31.89	810	53.54	1,360	26,168.9	11,870
34"	850	85.00	2,159	86.14	2,188	85.00	2,159	31.81	808	31.81	808	54.92	1,395	31.69	805	33.46	850	57.87	1,470	37,985.6	17,230
36"	900	90.00	2,286	91.14	2,315	90.00	2,286	33.66	855	33.66	855	57.48	1,460	33.27	845	35.43	900	60.24	1,530	43,916.1	19,920



**3 PIECE BOLTED BODY  
TRUNNION-MOUNTED BALL VALVE  
ANSI CLASS 1500**

SIZE 2" to 24"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and  
ANSI B16.10

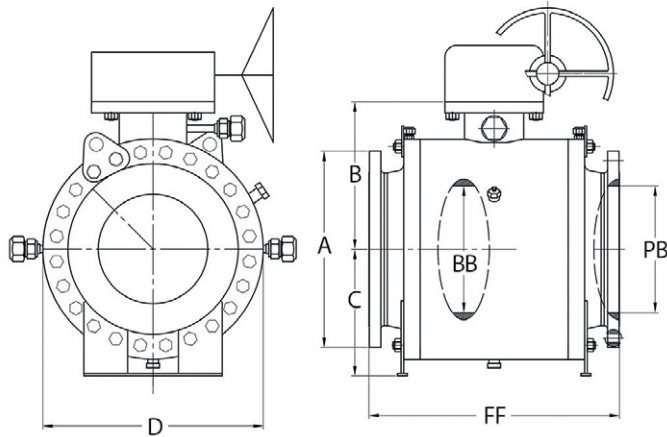
Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

**ANSI CLASS 1500**

Size		FF						BB		PB		A		B		C		D		Weight	
		RF		RTJ		WE															
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
2"	50	14.49	368	14.61	371	14.49	368	1.97	50	1.97	50	8.46	215	4.92	125	3.74	95	6.30	160	121.5	55
3"	80	18.50	470	18.62	473	18.50	470	2.99	76	2.99	76	10.43	265	6.34	161	4.84	123	7.48	190	242.5	110
4"	100	21.50	546	21.61	549	21.50	546	4.02	102	4.02	102	12.20	310	7.83	199	7.87	200	9.65	245	485.0	220
6"	150	21.76	705	27.99	711	27.76	705	5.67	144	5.67	144	15.55	395	10.55	268	11.02	280	13.58	345	1,146.4	520
8"	200	32.76	832	33.11	841	32.76	832	7.56	192	7.56	192	19.09	485	13.19	335	13.19	335	17.72	450	2,098.8	952
10"	250	39.02	991	39.37	1,000	39.02	991	9.41	239	9.41	239	23.03	585	15.08	383	15.75	400	21.85	555	3,580.3	1,624
12"	300	44.49	1,130	45.12	1,146	44.49	1,130	11.30	287	11.30	287	26.57	675	17.36	441	18.11	460	27.95	710	5,787.1	2,625
14"	350	49.49	1,257	50.24	1,276	49.49	1,257	12.40	315	12.40	315	29.53	750	18.62	473	19.69	500	30.31	770	6,349.3	2,880
16"	400	54.49	1,384	55.35	1,406	54.49	1,384	14.25	362	14.25	362	32.48	825	19.02	483	22.56	573	33.46	850	8,928.7	4,050
18"	450	60.51	1,537	61.38	1,559	60.51	1,537	15.98	406	15.98	406	36.02	915	23.43	595	23.62	600	38.58	980	13,800.9	6,260
20"	500	65.51	1,664	66.38	1,686	65.51	1,664	17.87	454	17.87	454	38.78	985	25.08	637	27.56	700	40.16	1,020	20,106.2	9,120
24"	600	80.43	2,043	81.54	2,071	80.43	2,043	21.50	546	21.50	546	46.06	1,170	29.45	748	30.71	780	50.79	1,290	31,570.2	14,320





### 3 PIECE BOLTED BODY TRUNNION-MOUNTED BALL VALVE ANSI CLASS 2500

SIZE 2" TO 12"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and

ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

ANSI CLASS 2500																					
Size		FF						BB		PB		A		B		C		D		Weight	
		RF		RTJ		WE															
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
2"	50	17.76	451	17.87	454	17.76	451	1.73	44	1.73	44	9.25	235	5.67	144	4.69	119	6.69	170	202.8	92
3"	80	22.76	578	22.99	584	22.76	578	2.52	64	2.52	64	12.01	305	7.17	182	5.71	145	9.45	240	440.9	200
4"	100	26.50	673	26.89	683	26.50	673	3.50	89	3.50	89	13.98	355	8.62	219	6.89	175	12.99	330	848.8	385
6"	150	35.98	914	36.50	927	35.98	914	5.24	133	5.24	133	19.09	485	12.01	305	11.02	280	17.72	450	1,730.6	785
8"	200	40.24	1,022	40.87	1,038	40.24	1,022	7.09	180	7.09	180	21.65	550	16.93	430	17.13	435	24.61	625	2,980.6	1,352
10"	250	50.00	1,270	50.87	1,292	50.00	1,270	8.78	223	8.78	223	26.57	675	17.72	450	16.73	425	29.53	750	5,952.5	2,700
12"	300	55.98	1,422	56.89	1,445	55.98	1,422	10.43	265	10.43	265	29.92	760	20.28	515	18.90	480	34.65	880	7,760.3	3,520

#### NOTES:

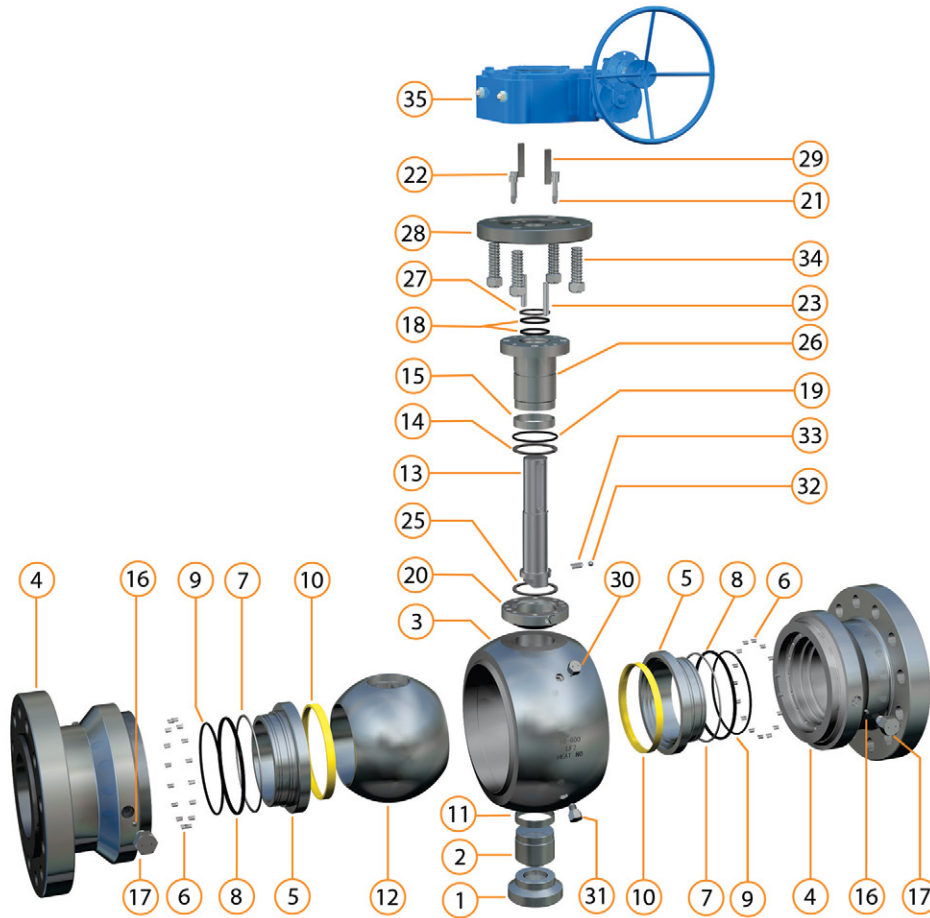
1. Standard Valve Operator: Wrench for all valves below 4 in.
2. The information on this catalog is provided for general informational purposes only.

3. For all technical parameters of the product please contact your local FluoroSeal sales office or authorized representative.
4. Customization for specific applications is available upon request.
5. We reserve the right to make changes without prior notice.

3 PIECE FULLY WELDED OUTER TRUNNION-MOUNTED BALL VALVE

Class 150, 300, 600: 12" and below

BW3  
VALVES



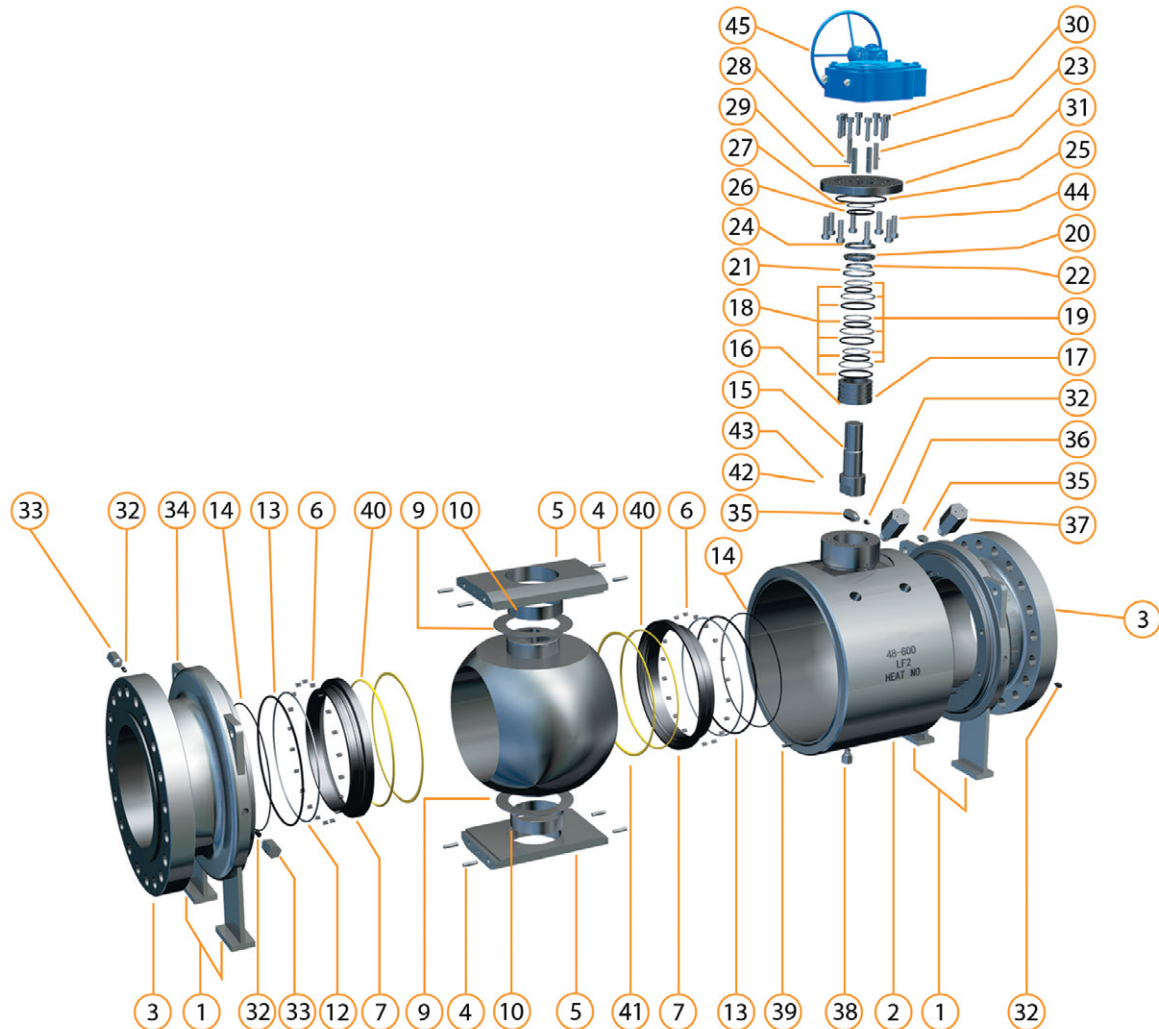
No.	Description/Part
1	Cover Plate
2	Trunnion
3	Body
4	End Cap
5	Seat Ring
6	Springs
7	Fire Safe Gasket
8	O-ring
9	O-ring
10	Seat
11	Trunnion Bearing
12	Ball
13	Stem
14	Thrust Washer
15	Bearing
16	Seat Check Valve

No.	Description/Part
17	Seat Grease Injection Valve
18	O-ring
19	O-ring
20	Connection Plate
21	Screw
22	Screw
23	Pin
24	Stem Injection Valve
25	Gasket
26	Bonnet
27	Gasket
28	Adapter Flange
29	Key
30	Vent Valve
31	Drain Valve
32	Anti-static Ball

No.	Description/Part
33	Anti-static Spring
34	Bolts
35	Gearbox

### 3 PIECE FULLY WELDED INNER TRUNNION-MOUNTED BALL VALVE

Class 150, 300, 600: 14" and above



No.	Description/Part	No.	Description/Part	No.	Description/Part
1	Support Legs *	17	Gland Bonnet	33	Seat Check Fitting
2	Body	18	O-ring	34	Lifting Lugs*
3	End Cap	19	Back-up Ring	35	Stem Grease Fitting
4	Pin	20	Compression Ring	36	Vent Valve
5	Trunnion Plate	21	Packing	37	Safety Relief Valve
6	Springs	22	Packing	38	Drain Valve
7	Seat Ring	23	Pin	39	Pin
8	Ball	24	Snap Ring	40	Seat
9	Thrust Washer	25	O-ring	41	Scraper Ring
10	Bearing	26	O-ring	42	Anti-static Ball
11	Upper Thrust Washer	27	Back-up Ring	43	Anti-static Spring
12	O-ring	28	Capscrew	44	Bolts
13	Gasket	29	Key	45	Gearbox
14	O-ring	30	Capscrew		
15	Stem	31	Adapter Flange		
16	Thrust Bearing	32	Seat Grease Injection Valve		

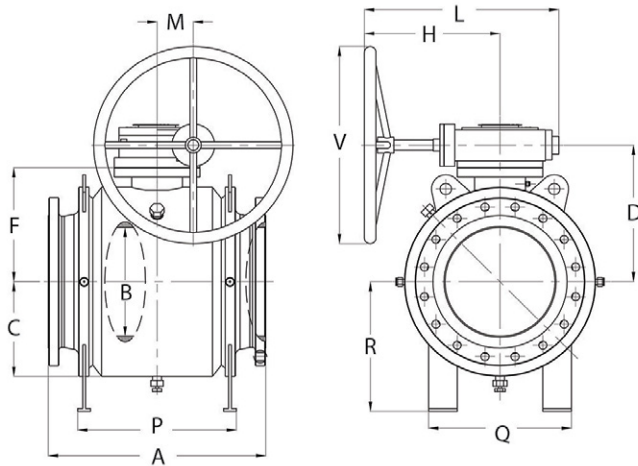
\* Lifting Lugs and Support Legs\* for 8" and above



# DIMENSIONS & WEIGHTS



BM3 VALVES



## 3 PIECE FULLY WELDED BODY TRUNNION-MOUNTED BALL VALVE FULL BORE - ANSI CLASS 150

SIZE 6" to 60"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

### ANSI CLASS 150

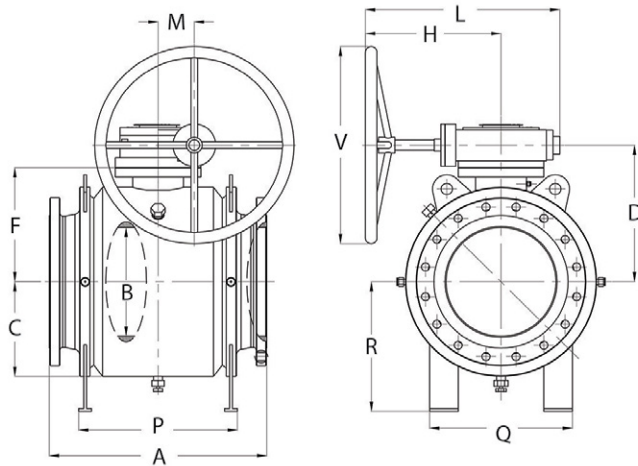
Size		B		A						C		D		F		H		L		M		V	
				RF		BW		RTJ															
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
6"	150	5.90	150	15.51	394	17.99	457	15.98	406	6.53	166	11.41	290	9.25	235	14.17	360	19.17	487	3.54	90	15.74	400
8"	200	7.91	201	17.99	457	20.51	521	18.50	470	7.87	200	12.91	328	10.74	273	15.82	402	21.41	544	4.96	126	18.30	465
10"	250	9.92	252	20.98	533	22.00	559	21.49	546	9.56	243	14.64	372	12.48	317	15.82	402	21.41	544	4.96	126	18.30	465
12"	300	11.92	303	24.01	610	25.00	635	24.48	622	11.02	280	12.12	308	13.89	353	15.82	402	21.41	544	4.96	126	23.62	600
14"	350	13.14	334	27.00	686	30.00	762	27.51	699	12.00	305	17.04	433	14.88	378	15.82	402	21.41	544	4.96	126	23.62	600
16"	400	15.15	385	30.00	762	32.99	838	30.51	775	13.70	348	18.85	479	16.33	415	20.19	513	26.18	665	4.96	126	23.62	600
18"	450	17.16	436	34.01	864	35.98	914	32.51	876	15.35	390	20.94	532	17.91	455	21.41	544	28.26	718	5.43	138	29.52	750
20"	500	19.17	487	35.98	914	39.01	991	36.49	927	16.65	423	22.32	567	19.29	490	21.41	544	28.26	718	5.43	138	29.52	750
22"	550	21.18	538	39.01	991	42.99	1,092	39.48	1,003	18.11	460	24.17	614	21.14	537	21.41	544	28.26	718	5.43	138	29.52	750
24"	600	23.18	589	42.00	1,067	45.00	1,143	42.51	1,080	19.68	500	25.74	654	22.71	577	21.41	544	28.26	718	5.43	138	29.52	750
26"	650	24.92	633	45.00	1,143	49.01	1,245	50.00	1,270	21.41	544	27.83	707	24.33	618	23.07	586	30.59	777	7.00	178	29.52	750
28"	700	26.92	684	49.01	1,245	52.99	1,346	54.01	1,372	23.18	589	29.96	761	26.29	668	25.27	642	34.64	880	9.05	230	29.52	750
30"	750	28.93	735	50.98	1,295	55.00	1,397	55.98	1,422	23.93	608	30.47	774	26.81	681	25.27	642	34.64	880	9.05	230	29.52	750
32"	800	30.66	779	54.01	1,372	60.00	1,524	61.14	1,553	25.90	658	31.18	843	29.52	750	25.27	642	34.64	880	9.05	230	29.52	750
34"	850	32.67	830	57.99	1,473	64.01	1,626	65.11	1,654	28.26	695	34.76	883	31.10	790	25.27	642	34.64	880	9.05	230	29.52	750
36"	900	34.44	875	60.00	1,524	67.99	1,727	69.13	1,756	28.26	718	35.98	914	32.32	821	25.27	642	34.64	880	9.05	230	29.52	750
38"	950	36.41	925	63.97	1,625	72.00	1,829	-	-	31.49	800	38.54	979	33.77	858	27.67	703	38.77	985	10.62	270	29.52	750
40"	1,000	38.42	976	68.30	1,753	77.00	1,956	-	-	33.07	840	39.72	1,009	34.96	888	27.67	703	38.77	985	10.62	270	29.52	750
42"	1,050	40.15	1,020	73.03	1,855	82.00	2,083	-	-	37.00	940	42.55	1,081	37.79	960	27.67	703	38.77	985	10.62	270	29.52	750
48"	1,200	45.90	1,166	84.01	2,134	94.01	2,388	-	-	41.85	1,063	52.55	1,335	47.24	1,200	30.35	771	43.97	1,117	12.79	325	31.49	800
54"	1,350	51.65	1,312	97.99	2,489	97.99	2,489	-	-	45.47	1,155	56.10	1,425	50.78	1,290	-	-	-	-	-	-	-	-
60"	1,500	57.40	1,458	105.00	2,667	105.00	2,667	-	-	51.57	1,310	63.38	1,610	58.07	1,475	-	-	-	-	-	-	-	-

### ANSI CLASS 150

Size		P		Q		R		Weight	
in	mm	in	mm	in	mm	in	mm	lb	Kg
6"	150	9.44	240	11.81	300	10.23	260	299.8	136
8"	200	11.02	280	14.56	370	11.81	300	540.1	245
10"	250	16.88	429	16.92	430	13.50	343	914.9	415
12"	300	19.09	485	18.11	460	14.96	380	1,388.9	630
14"	350	21.25	540	21.10	536	15.94	405	1,887.2	856
16"	400	22.63	575	22.04	560	17.71	450	2,722.7	1,235
18"	450	24.40	620	26.37	670	19.68	500	3,545.0	1,608
20"	500	26.77	680	27.16	690	22.44	570	4,420.3	2,005
22"	550	28.74	730	27.55	700	23.81	605	5,467.5	2,480
24"	600	31.41	798	35.43	900	25.59	650	6,926.9	3,142
26"	650	34.88	886	35.43	900	28.11	714	8,157.1	3,700
28"	700	39.37	1,000	36.22	920	28.34	720	10,262.5	4,655
30"	750	42.51	1,080	36.22	960	29.72	755	11,838.8	5,370
32"	800	44.48	1,130	39.60	1,006	31.22	793	15,432.4	7,000

### ANSI CLASS 150

Size		P		Q		R		Weight	
in	mm	in	mm	in	mm	in	mm	lb	Kg
34"	850	46.45	1,180	42.51	1,080	32.36	822	17,592.9	7,980
36"	900	47.63	1,210	45.27	1,150	35.58	853	20,062.1	9,100
38"	950	42.21	1,250	46.85	1,190	35.66	906	24,250.8	11,000
40"	1,000	51.96	1,320	49.21	1,250	37.40	950	28,395.5	12,880
42"	1,050	58.26	1,480	59.05	1,500	41.53	1,055	32,187.5	14,600
48"	1,200	68.89	1,750	66.06	1,678	44.88	1,140	48,501.7	22,000
54"	1,350	77.16	1,960	74.40	1,890	49.21	1,250	66,535.5	30,180
60"	1,500	85.43	2,170	85.23	2,165	53.54	1,360	103,617.3	47,000



**3 PIECE FULLY WELDED BODY  
TRUNNION-MOUNTED BALL VALVE  
FULL BORE - ANSI CLASS 300**

SIZE 4" to 60"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

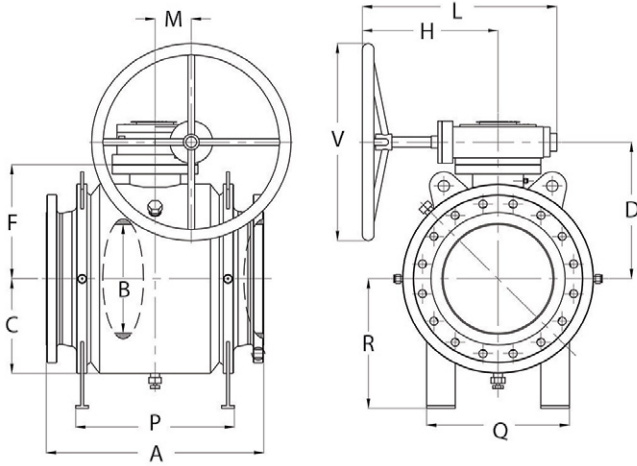
BW3  
VALVES

ANSI CLASS 300																									
Size		B				A						C		D		F		H		L		M		V	
in	mm	in	mm	RF		BW		RTJ		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
4"	100	3.94	100	12.01	305	12.01	305	12.64	321	5.71	145	10.04	255	-	-	23.62*	600*	-	-	-	-	-	-	-	-
6"	150	5.90	150	15.86	403	17.99	457	16.50	419	6.54	166	11.42	290	9.25	235	14.17	360	19.17	487	3.54	90	15.75	400	-	-
8"	200	7.91	201	19.76	502	20.51	521	20.39	518	7.87	200	12.91	328	10.75	273	15.83	402	21.42	544	4.96	126	18.31	465	-	-
10"	250	9.92	252	22.36	568	22.01	559	22.99	584	9.65	245	14.69	373	12.52	318	15.83	402	21.42	544	4.96	126	18.31	465	-	-
12"	300	11.92	303	25.51	648	25.00	635	26.14	664	11.34	288	16.10	409	13.94	354	15.83	402	21.42	544	4.96	126	23.62	600	-	-
14"	350	13.14	334	30.00	762	30.00	762	30.63	778	12.40	315	17.68	449	15.16	385	20.20	513	26.18	665	4.96	126	23.62	600	-	-
16"	400	15.15	385	32.99	838	32.99	838	33.62	854	13.90	353	19.49	495	16.46	418	21.42	544	28.27	718	5.43	138	29.53	750	-	-
18"	450	17.16	436	35.98	914	35.98	914	36.61	930	15.55	395	21.62	550	18.62	473	21.42	544	28.27	718	5.43	138	29.53	750	-	-
20"	500	19.17	487	39.01	991	39.02	991	39.76	1,010	16.93	430	23.43	595	20.04	509	23.07	586	30.59	777	7.01	178	29.53	750	-	-
22"	550	21.18	538	42.99	1,092	42.99	1,092	43.86	1,114	18.50	470	25.20	640	21.54	547	25.28	642	34.65	880	9.06	230	29.53	750	-	-
24"	600	23.18	589	45.00	1,143	45.00	1,143	45.87	1,165	20.00	508	27.99	711	23.23	590	25.28	642	34.65	880	9.06	230	29.53	750	-	-
26"	650	25.00	635	49.01	1,245	49.02	1,245	50.00	1,270	21.42	544	29.09	739	24.33	618	25.28	642	34.65	880	9.06	230	29.53	750	-	-
28"	700	24.92	633	52.99	1,346	52.99	1,346	54.02	1,372	23.03	585	30.87	784	26.10	663	25.28	642	34.65	880	9.06	230	29.53	750	-	-
30"	750	28.93	735	55.00	1,397	55.00	1,397	55.98	1,422	24.80	630	32.52	826	27.76	705	25.28	642	34.65	880	9.06	230	29.53	750	-	-
32"	800	30.66	779	60.00	1,524	60.00	1,524	61.14	1,553	25.98	660	34.69	881	29.92	760	27.68	703	38.78	985	10.63	270	29.53	750	-	-
34"	850	32.67	830	64.01	1,626	64.02	1,626	65.12	1,654	27.56	700	36.26	921	31.50	800	27.68	703	38.78	985	10.63	270	29.53	750	-	-
36"	900	34.44	875	67.99	1,727	67.99	1,727	69.13	1,756	28.54	725	37.24	946	32.48	825	27.68	703	38.78	985	10.63	270	29.53	750	-	-
38"	950	36.41	925	72.04	1,830	72.02	1,830	-	-	32.28	820	38.54	979	33.78	858	27.68	703	38.78	985	10.63	270	29.53	750	-	-
40"	1,000	38.42	976	77.00	1,956	77.01	1,956	-	-	33.46	850	39.53	1,004	34.96	888	27.68	703	38.78	985	10.63	270	29.53	750	-	-
42"	1,050	40.15	1,020	82.00	2,083	82.01	2,083	-	-	37.60	955	43.11	1,095	37.80	960	30.35	771	43.98	1,117	12.80	325	31.50	800	-	-
48"	1,200	45.90	1,166	85.43	2,170	94.02	2,388	-	-	42.13	1,070	52.56	1,335	47.24	1,200	30.35	771	43.98	1,117	12.80	325	31.50	800	-	-
54"	1,350	51.65	1,312	100.98	2,565	100.98	2,565	-	-	46.06	1,170	-	-	50.98	1,295	-	-	-	-	-	-	-	-	-	-
60"	1,500	57.40	1,458	117.99	2,997	117.99	2,997	-	-	51.97	1,320	-	-	58.27	1,480	-	-	-	-	-	-	-	-	-	-

ANSI CLASS 300									
Size		P		Q		R		Weight	
in	mm	in	mm	in	mm	in	mm	lb	Kg
4"	100	-	-	-	-	-	-	154.3	70
6"	150	9.45	240	11.81	300	10.43	265	418.9	190
8"	200	11.02	280	13.78	350	12.20	310	617.3	280
10"	250	15.16	385	14.96	380	13.58	345	1,058.2	480
12"	300	19.29	490	18.11	460	15.35	390	1,578.3	720
14"	350	21.46	545	21.26	540	16.22	412	2,385.4	1,082
16"	400	23.03	585	22.80	579	18.11	460	3,174.7	1,440
18"	450	25.35	644	27.56	700	20.87	530	3,955.1	1,794
20"	500	30.20	767	28.94	735	22.24	565	5,070.6	2,300
22"	550	32.52	826	27.40	696	23.82	605	6,613.9	3,000
24"	600	34.09	866	35.63	905	25.31	643	7,866.1	3,568
26"	650	34.09	886	35.43	900	28.11	714	10,229.5	4,640
28"	700	39.76	1,010	36.22	920	28.35	720	13,227.7	6,000
30"	750	43.86	1,114	37.80	960	30.12	765	14,947.3	6,780

ANSI CLASS 300									
Size		P		Q		R		Weight	
in	mm	in	mm	in	mm	in	mm	lb	Kg
32"	800	44.69	1,135	37.76	1,010	31.50	800	17,857.4	8,100
34"	850	46.85	1,190	43.31	1,100	32.68	830	20,282.5	9,200
36"	900	47.83	1,215	46.54	1,182	34.45	875	22,773.8	10,330
38"	950	49.61	1,260	47.44	1,205	35.83	910	27,072.8	12,280
40"	1,000	52.36	1,330	49.61	1,260	37.44	951	30,864.7	14,000
42"	1,050	58.66	1,490	59.53	1,512	41.73	1,060	36,376.3	16,500
48"	1,200	69.29	1,760	66.54	1,690	44.88	1,140	53,903.0	24,450
54"	1,350	77.17	1,960	74.80	1,900	49.41	1,255	71,650.2	32,500
60"	1,500	85.63	2,175	85.43	2,170	53.94	1,370	110,010.7	49,900

\* Standard Valve Operator: Wrench for all 4 in. valves



**3 PIECE FULLY WELDED BODY  
TRUNNION-MOUNTED BALL VALVE  
FULL BORE - ANSI CLASS 600**

SIZE 4" to 60"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

**ANSI CLASS 600**

Size	B		A						C		D		F		H		L		M		V		
			RF		BW		RTJ																
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm		
4"	100	3.94	100	17.01	432	17.01	432	17.13	435	5.63	143	9.29	236	-	-	25.98*	660*	-	-	-	-	-	
6"	150	5.91	150	22.01	559	22.01	559	22.13	562	6.54	166	11.57	294	9.41	239	14.17	360	19.17	487	3.54	90	23.62	600
8"	200	7.91	201	25.98	660	25.98	660	26.14	664	8.07	205	13.07	332	10.91	277	15.83	402	21.42	544	4.96	126	23.62	600
10"	250	9.92	252	30.98	787	30.98	787	31.14	791	9.84	250	15.04	382	12.52	318	20.20	513	26.18	665	4.96	126	23.62	600
12"	300	11.93	303	32.99	838	32.99	838	33.11	841	11.42	290	16.65	423	14.13	359	20.20	513	26.18	665	4.96	126	23.62	600
14"	350	13.15	334	35.00	889	35.00	889	35.12	892	12.72	323	18.07	459	15.04	382	21.42	544	28.27	718	5.43	138	29.53	750
16"	400	15.16	385	39.02	991	39.02	991	39.13	994	14.09	358	20.20	513	17.17	436	21.42	544	28.27	718	5.43	138	29.53	750
18"	450	17.17	436	42.99	1,092	42.99	1,092	43.11	1,095	15.75	400	22.01	559	18.62	473	23.07	586	30.59	777	7.01	178	29.53	750
20"	500	19.17	487	47.01	1,194	47.01	1,194	47.24	1,200	17.13	435	23.70	602	20.04	509	25.28	642	34.65	880	9.06	230	29.53	750
22"	550	21.18	538	50.98	1,295	50.98	1,295	51.38	1,305	19.09	485	25.31	643	21.65	550	25.28	642	34.65	880	9.06	230	29.53	750
24"	600	23.19	589	55.00	1,397	55.00	1,397	55.39	1,407	20.28	515	28.19	716	23.43	595	27.68	703	38.78	985	10.63	270	29.53	750
26"	650	24.92	633	57.01	1,448	57.01	1,448	57.52	1,461	22.24	565	30.20	767	25.43	646	27.68	703	38.78	985	10.63	270	29.53	750
28"	700	26.93	684	60.98	1,549	60.98	1,549	61.50	1,562	23.23	590	31.54	801	26.77	680	27.68	703	38.78	985	10.63	270	29.53	750
30"	750	28.94	735	65.00	1,651	65.00	1,651	65.51	1,664	25.16	639	32.95	837	28.19	716	27.68	703	38.78	985	10.63	270	29.53	750
32"	800	30.67	779	70.00	1,778	70.00	1,778	70.63	1,794	26.38	670	35.00	889	30.24	768	27.68	703	38.78	985	10.63	270	29.53	750
34"	850	32.68	830	75.98	1,930	75.98	1,930	76.63	1,946	27.76	705	36.38	924	31.61	803	27.68	703	38.78	985	10.63	270	29.53	750
36"	900	34.45	875	82.01	2,083	82.01	2,083	82.64	2,099	29.69	754	37.64	956	32.87	835	27.68	703	38.78	985	10.63	270	29.53	750
38"	950	36.42	925	87.99	2,235	87.99	2,235	-	-	32.69	830	39.76	1,010	34.45	875	27.68	703	43.98	1,117	12.80	325	31.50	800
40"	1,000	38.43	976	92.01	2,337	92.01	2,337	-	-	33.86	860	40.94	1,040	35.63	905	30.35	771	43.98	1,117	12.80	325	31.50	800
42"	1,050	40.16	1,020	95.94	2,437	95.94	2,437	-	-	37.80	960	43.50	1,105	38.19	970	30.35	771	43.98	1,117	12.80	325	31.50	800
48"	1,200	45.91	1,166	112.01	2,845	112.01	2,845	-	-	42.52	1,080	-	-	47.64	1,210	-	-	-	-	-	-	-	-
54"	1,350	51.65	1,312	123.50	3,137	123.50	3,137	-	-	46.46	1,180	-	-	51.54	1,309	-	-	-	-	-	-	-	-
60"	1,500	57.40	1,458	135.04	3,430	135.04	3,430	-	-	54.72	1,390	-	-	58.66	1,490	-	-	-	-	-	-	-	-

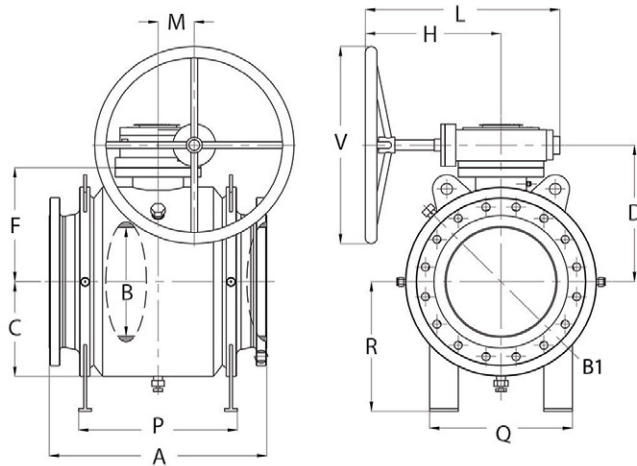
**ANSI CLASS 600**

Size	P		Q		R		Weight		
	in	mm	in	mm	in	mm	lb	Kg	
4"	100	-	-	-	-	-	297.6	135	
6"	150	12.99	330	12.20	310	10.47	266	573.2	260
8"	200	13.39	340	13.78	350	11.02	280	987.7	448
10"	250	13.98	355	15.16	385	15.16	385	1,554.3	705
12"	300	18.90	480	16.93	430	16.73	425	1,966.5	892
14"	350	24.17	614	20.67	525	16.06	408	2,711.7	1,230
16"	400	26.38	670	23.23	590	17.72	450	3,747.9	1,700
18"	450	29.76	756	26.46	672	18.94	481	5,070.6	2,300
20"	500	31.77	807	22.24	565	22.44	570	6,250.1	2,835
22"	550	34.88	886	23.62	600	24.41	620	7,716.2	3,500
24"	600	37.28	947	26.97	685	25.59	650	9,347.6	4,240
26"	650	40.39	1,026	33.07	840	27.56	700	12,786.8	5,800
28"	700	42.05	1,068	38.98	990	28.54	725	14,109.6	6,400
30"	750	45.83	1,164	40.79	1,036	30.47	774	14,771.0	6,700

**ANSI CLASS 600**

Size	P		Q		R		Weight		
	in	mm	in	mm	in	mm	lb	Kg	
32"	800	46.81	1,189	47.09	1,196	32.56	821	19,841.6	9,000
34"	850	50.39	1,280	44.49	1,130	33.46	850	22,332.8	10,130
36"	900	53.15	1,350	47.44	1,205	34.84	885	27,557.9	12,500
38"	950	54.33	1,380	48.43	1,230	36.22	920	31,085.2	14,100
40"	1,000	57.09	1,450	50.59	1,285	37.80	960	37,037.7	16,800
42"	1,050	63.39	1,610	60.24	1,530	42.32	1,075	52,690.5	23,900
48"	1,200	73.90	1,877	67.60	1,717	45.67	1,160	72,752.6	33,000
54"	1,350	74.80	1,900	74.80	1,900	50.00	1,270	107,585.6	48,800
60"	1,500	85.83	2,180	85.83	2,180	54.72	1,390	116,845.0	53,000

\* Standard Valve Operator: Wrench for all 4 in. valves



**3 PIECE FULLY WELDED BODY  
TRUNNION-MOUNTED BALL VALVE  
REDUCED BORE - ANSI CLASS 150**

SIZE 6x4" to 36x30"

Wrench or Enclosed Gear Operated

Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

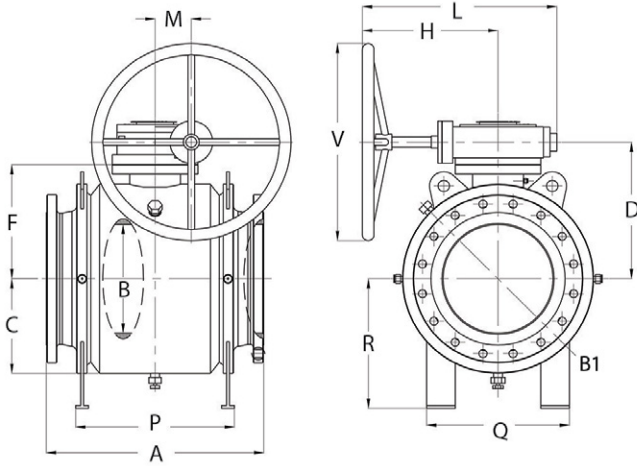
BW3  
VALVES

ANSI CLASS 150																							
Size		B		B1		A						C		D		F		H		L		M	
						RF		BW		RTJ		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
6x4	150x100	4.02	102	5.98	152	15.51	394	17.99	457	15.98	406	4.92	125	8.50	216	-	-	29.13*	740*	-	-	-	-
8x6	200x150	5.98	152	7.99	203	17.99	457	20.51	521	18.50	470	6.54	166	10.87	276	9.25	235	13.58	345	15.71	399	2.05	52.0
10x8	250x200	7.99	203	10.00	254	20.98	533	22.01	559	21.50	546	7.87	200	12.52	318	10.75	273	11.69	297	14.33	364	2.58	65.5
12x10	300x250	10.00	254	12.01	305	24.02	610	25.00	635	24.49	622	9.57	243	14.25	362	12.48	317	11.69	297	14.33	364	2.58	65.5
14x12	350x300	12.01	305	13.27	337	27.01	686	30.00	762	27.52	699	11.02	280	15.67	398	13.90	353	11.69	297	14.33	364	2.58	65.5
16x12	400x300	12.01	305	15.24	387	30.00	762	32.99	838	30.51	775	11.02	280	15.67	398	13.90	353	11.69	297	14.33	364	2.58	65.5
16x14	400x350	13.27	337	15.24	387	30.00	762	32.99	838	30.51	775	12.01	305	17.95	456	14.88	378	17.32	440	21.26	540	4.13	105.0
18x16	450x400	15.24	387	17.24	438	34.02	864	35.98	914	34.49	876	13.70	348	19.41	493	16.34	415	16.38	416	20.31	516	4.13	105.0
20x16	500x400	15.24	387	19.25	489	35.98	914	39.02	991	36.50	927	13.70	348	19.41	493	16.34	415	16.38	416	20.31	516	4.13	105.0
20x18	500x450	17.24	438	19.25	489	35.98	914	39.02	991	36.50	927	15.35	390	20.98	533	17.91	455	16.38	416	20.31	516	5.08	129.0
24x20	600x450	19.25	489	23.27	591	42.01	1,067	45.00	1,143	42.52	1,080	16.65	423	22.36	568	19.29	490	21.57	548	26.46	672	5.08	129.0
30x24	750x600	23.27	591	29.02	737	50.98	1,295	55.00	1,397	55.98	1,422	19.69	500	25.87	657	22.72	577	22.36	568	29.45	748	6.85	174.0
36x30	900x750	29.02	737	34.49	876	60.00	1,524	67.99	1,727	69.13	1,756	23.94	608	31.54	801	26.81	681	26.38	670	35.75	908	9.17	233.0

ANSI CLASS 150											
Size		V		P		Q		R		Weight	
in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
6x4	150x100	-	-	-	-	-	-	-	-	165.3	75
8x6	200x150	11.81	300	10.47	266	11.81	300	10.24	260	440.9	200
10x8	250x200	15.75	400	11.02	280	14.57	370	11.81	300	672.4	305
12x10	300x250	15.75	400	16.89	429	16.93	430	13.50	343	1,234.6	560
14x12	350x300	15.75	400	19.09	485	18.11	460	14.96	380	1,455.1	660
16x12	400x300	15.75	400	19.09	485	21.10	536	14.96	380	1,719.6	780
16x14	400x350	31.40	800	21.26	540	21.10	536	15.94	405	2,006.2	910
18x16	450x400	19.69	500	22.64	575	22.05	560	17.72	450	2,861.6	1,298
20x16	500x400	19.69	500	22.64	575	22.05	560	17.72	450	2,921.1	1,325
20x18	500x450	19.69	500	24.41	620	26.38	670	19.69	500	4,254.9	1,930
24x20	600x450	31.50	800	26.77	680	27.17	690	22.44	570	4,995.0	2,243
30x24	750x600	31.50	800	31.42	798	35.43	900	25.59	650	9,832.6	4,460
36x30	900x750	31.50	800	42.52	1,080	37.80	960	29.72	755	14,627.7	6,635

\* Standard Valve Operator: Wrench for all 6x4 in. valves





**3 PIECE FULLY WELDED BODY  
TRUNNION-MOUNTED BALL VALVE  
REDUCED BORE - ANSI CLASS 300**

SIZE 6x4" to 36x30"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

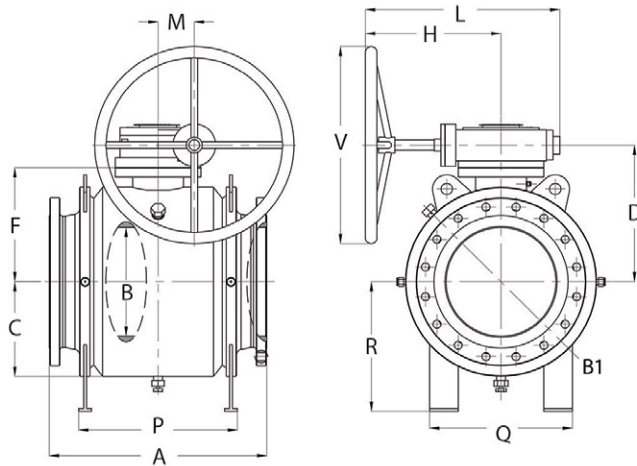
**ANSI CLASS 300**

Size		B		B1		A						C		D		F		H		L		M	
in	mm	in	mm	in	mm	RF		BW		RTJ		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
6x4	150x100	4.02	102	5.98	152	15.87	403	17.99	457	16.50	419	5.51	140	8.50	216	-	-	29.13*	740*	-	-	-	-
8x6	200x150	5.98	152	7.99	203	19.76	502	20.51	521	20.39	518	6.54	166	11.14	283	9.25	235	12.13	308	15.35	390	3.31	84
10x8	250x200	7.99	203	10.00	254	22.36	568	22.01	559	22.99	584	7.87	200	12.64	321	10.75	273	12.13	308	15.35	390	3.31	84
12x10	300x250	10.00	254	12.01	305	25.51	648	25.00	635	26.14	664	9.65	245	14.80	376	12.52	318	12.28	312	16.22	412	3.62	92
14x12	350x300	12.01	305	13.27	337	30.00	762	30.00	762	30.63	778	11.34	288	17.01	432	13.94	354	17.32	440	21.26	540	4.13	105
16x12	400x300	12.01	305	15.24	387	32.99	838	32.99	838	33.62	854	11.34	288	17.01	432	13.94	354	17.32	440	21.26	540	4.13	105
16x14	400x350	13.27	337	15.24	387	32.99	838	32.99	838	33.62	854	12.40	315	18.23	463	15.16	385	16.38	416	20.31	516	4.13	105
18x16	450x400	15.24	387	17.24	438	35.98	914	35.98	914	36.61	930	13.90	353	19.53	496	16.46	418	16.38	416	20.31	516	5.08	129
20x16	500x400	15.24	387	19.25	489	39.02	991	39.02	991	39.76	1,010	13.90	353	19.53	496	16.46	418	16.38	416	20.31	516	5.08	129
20x18	500x450	17.24	438	19.25	489	39.02	991	39.02	991	39.76	1,010	15.55	395	21.69	551	18.62	473	21.57	548	26.46	672	5.08	129
24x20	600x450	19.25	489	23.27	591	45.00	1,143	45.00	1,143	45.87	1,165	16.93	430	23.19	589	20.04	509	22.36	568	29.45	748	6.85	174
30x24	750x600	23.27	591	29.02	737	55.00	1,397	55.00	1,397	55.98	1,422	20.00	508	27.95	710	23.23	590	26.38	670	35.75	908	9.17	233
36x30	900x750	29.02	737	34.49	876	67.99	1,727	67.99	1,727	69.13	1,756	24.80	630	32.68	830	27.76	705	27.76	705	37.99	965	10.28	261

**ANSI CLASS 300**

Size		V		P		Q		R		Weight	
in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
6x4	150x100	-	-	-	-	-	-	-	-	209.4	95
8x6	200x150	15.75	400	10.47	266	11.81	300	10.43	265	440.9	200
10x8	250x200	19.69	500	11.02	280	13.78	350	12.20	310	727.5	330
12x10	300x250	27.56	700	15.16	385	14.96	380	13.58	345	1,327.2	602
14x12	300x250	31.50	800	19.29	490	18.11	460	15.35	390	1,788.0	811
16x12	350x300	31.50	800	19.29	490	18.11	460	15.35	390	1,984.2	900
16x14	400x300	19.69	500	21.46	545	21.26	540	16.22	412	2,645.6	1,200
18x16	450x400	19.69	500	23.03	585	22.80	579	18.11	460	3,340.0	1,515
20x16	500x400	19.69	500	23.03	585	22.80	579	18.11	460	3,527.4	1,600
20x18	500x450	31.50	800	25.35	644	27.56	700	20.87	530	4,210.8	1,910
24x20	600x450	31.50	800	30.20	767	28.94	735	22.24	565	3,637.6	1,650
30x24	750x600	31.50	800	34.09	866	35.63	905	25.31	643	9,303.5	4,220
36x30	900x750	31.50	800	43.86	1,114	37.80	960	30.12	765	17,372.4	7,880

\* Standard Valve Operator: Wrench for all 6x4 in. valves



**3 PIECE FULLY WELDED BODY  
TRUNNION-MOUNTED BALL VALVE  
REDUCED BORE - ANSI CLASS 600**

SIZE 6x4" to 36x30"

Wrench or Enclosed Gear Operated  
Actuators Optional on All Sizes

Face-to-Face Dimensions to API 6D and  
ANSI B16.10

Flanged End Dimensions to ANSI B16.5 and  
ANSI B16.47 Series A

Butt Weld End Dimensions to ANSI B16.25

BW3  
VALVES

ANSI CLASS 600																								
Size		B		B1		A						C		D		F		H		L		M		
in	mm	in	mm	in	mm	RF		BW		RTJ		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
6x4	150x100	3.94	100	5.91	150	22.01	559	22.01	559	22.13	562	5.63	143	9.29	236	-	-	31.50*	800*	-	-	-	-	-
8x6	200x150	5.91	150	7.91	201	25.98	660	23.62	600	26.14	664	6.54	166	11.57	294	9.41	239	14.17	360	19.17	487	3.54	90	-
10x8	250x200	7.91	201	9.92	252	30.98	787	30.98	787	31.14	791	8.07	205	13.07	332	10.91	277	15.83	402	21.42	544	4.96	126	-
12x10	300x250	9.92	252	11.93	303	32.99	838	32.99	838	33.11	841	9.84	250	15.04	382	12.52	318	20.20	513	26.18	665	4.96	126	-
14x12	350x300	11.93	303	13.15	334	35.00	889	35.00	889	35.12	892	11.42	290	16.65	423	14.13	359	20.20	513	26.18	665	4.96	126	-
16x12	400x300	11.93	303	15.16	385	39.02	991	39.02	991	39.13	994	11.42	290	16.65	423	14.13	359	20.20	513	26.18	665	4.96	126	-
16x14	400x350	13.45	334	15.16	385	39.02	991	39.02	991	39.13	994	12.72	323	18.07	459	15.04	382	21.42	544	28.27	718	5.43	138	-
18x16	450x400	15.16	385	17.17	436	42.99	1,092	42.99	1,092	43.11	1,095	14.09	358	17.17	436	21.42	544	28.27	718	29.06	738	5.91	150	-
20x16	500x400	15.16	385	19.17	487	47.01	1,194	47.01	1,194	47.24	1,200	14.09	358	17.17	436	21.42	544	28.27	718	29.06	738	5.91	150	-
20x18	500x450	17.17	436	19.17	487	47.01	1,194	47.01	1,194	47.24	1,200	15.75	400	22.01	559	18.62	473	23.07	586	30.59	777	7.01	178	-
24x20	600x450	19.19	487	23.19	589	55.00	1,397	55.00	1,397	55.39	1,407	17.13	435	23.70	602	20.04	509	25.28	642	34.65	880	9.06	230	-
30x24	750x600	23.19	589	28.94	735	65.00	1,651	65.00	1,651	65.51	1,664	20.28	515	28.19	716	23.43	595	27.68	703	38.78	985	10.63	270	-
36x30	900x750	28.94	735	34.45	875	82.01	2,083	81.97	2,082	82.64	2,099	25.16	639	32.95	837	28.19	716	27.68	703	38.78	985	10.63	270	-

ANSI CLASS 600											
Size		V		P		Q		R		Weight	
in	mm	in	mm	in	mm	in	mm	in	mm	lb	Kg
6x4	150x100	-	-	-	-	-	-	-	-	368.2	167
8x6	200x150	23.62	600	12.99	330	12.20	310	10.47	266	672.4	305
10x8	200x150	23.62	600	13.39	340	13.78	350	11.02	280	1,278.9	580
12x10	300x250	23.62	600	13.98	355	15.16	385	15.16	385	1,724.0	782
14x12	350x300	23.62	600	18.90	480	16.93	430	16.73	425	2,211.2	1,003
16x12	400x300	23.62	600	18.90	480	16.93	430	16.73	425	2,578.4	1,170
16x14	400x350	29.53	750	24.17	614	20.67	525	16.06	408	3,130.6	1,420
18x16	450x400	26.38	670	23.23	590	23.23	590	17.72	450	4,091.8	1,856
20x16	500x400	26.38	670	23.23	590	23.23	590	17.72	450	4,457.7	2,022
20x18	500x450	29.53	750	29.76	756	26.46	672	18.94	481	5,577.7	2,530
24x20	600x450	29.53	750	31.77	807	22.24	565	22.44	570	7,407.5	3,360
30x24	750x600	29.53	750	37.28	947	26.97	685	25.59	650	11,640.4	5,280
36x30	900x750	29.53	750	45.83	1,164	40.79	1,036	30.47	774	17,945.6	8,140

**NOTES:**

\* Standard Valve Operator: Wrench for all 6x4 in. valves

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2. The information on this catalog is provided for general informational purposes only.

3. Customization for specific applications is available upon request.

4. We reserve the right to make changes without prior notice.

**FLOW COEFFICIENT - FULL PORT**

Size		Cv					
in	mm	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
2"	50	420	420	400	330	330	250
3"	75	1,200	1,050	1,000	910	820	500
4"	100	2,200	2,100	1,850	1,800	1,700	1,100
6"	150	5,150	5,100	4,600	4,380	3,800	2,500
8"	200	9,500	9,400	9,000	8,500	7,400	5,300
10"	250	15,000	15,000	14,700	14,500	11,500	8,300
12"	300	23,000	23,000	22,500	21,100	18,000	13,000
14"	350	28,000	28,000	28,000	25,000	21,000	-
16"	400	37,200	37,200	37,200	34,500	27,500	-
18"	450	49,000	49,000	49,000	45,000	37,000	-
20"	500	59,000	59,000	59,000	55,200	47,800	-
24"	600	92,000	92,000	92,000	83,800	70,000	-
26"	650	110,000	110,000	110,000	98,500	-	-
28"	700	121,000	121,000	121,000	113,000	-	-
30"	750	145,000	144,000	144,000	130,000	-	-
32"	800	170,000	170,000	170,000	151,000	-	-
36"	900	210,000	210,000	210,000	198,200	-	-

Consult your local FluoroSeal sales office or authorized representative to obtain precise data.

**CALCULATION FORMULAS**

• For Gas

$$Q_g = 962 \times C_v \sqrt{P_1^2 - P_2^2 / T \times S_g}$$

when  $P_1 < 2 P_2$  : Sub Critical flow

$$Q_g = 816 \times C_v \times P_1 \sqrt{1 / T \times S_g}$$

when  $P_1 > 2 P_2$  : Choked flow

$P_1$  = Inlet pressure (psia)

$P_2$  = Outlet pressure (psia)

T = Absolute Temp. (°F + 460)

$S_g$  = Specific gravity of Gas (air at atmosphere 60°F = 1)

$C_v$  = Flow coefficient

$Q_g$  = Flow Rate (SCFH)

• For Liquid

$$Q_L = C_v \times \sqrt{P_1 - P_2 / S_g}$$

$Q_L$  = Flow Rate (GPM)

$P_1$  = Inlet pressure (psia)

$P_2$  = Outlet pressure (psia)

$C_v$  = Flow coefficient

$S_g$  = Specific gravity of Fluid (water at temperature 60°F=1)

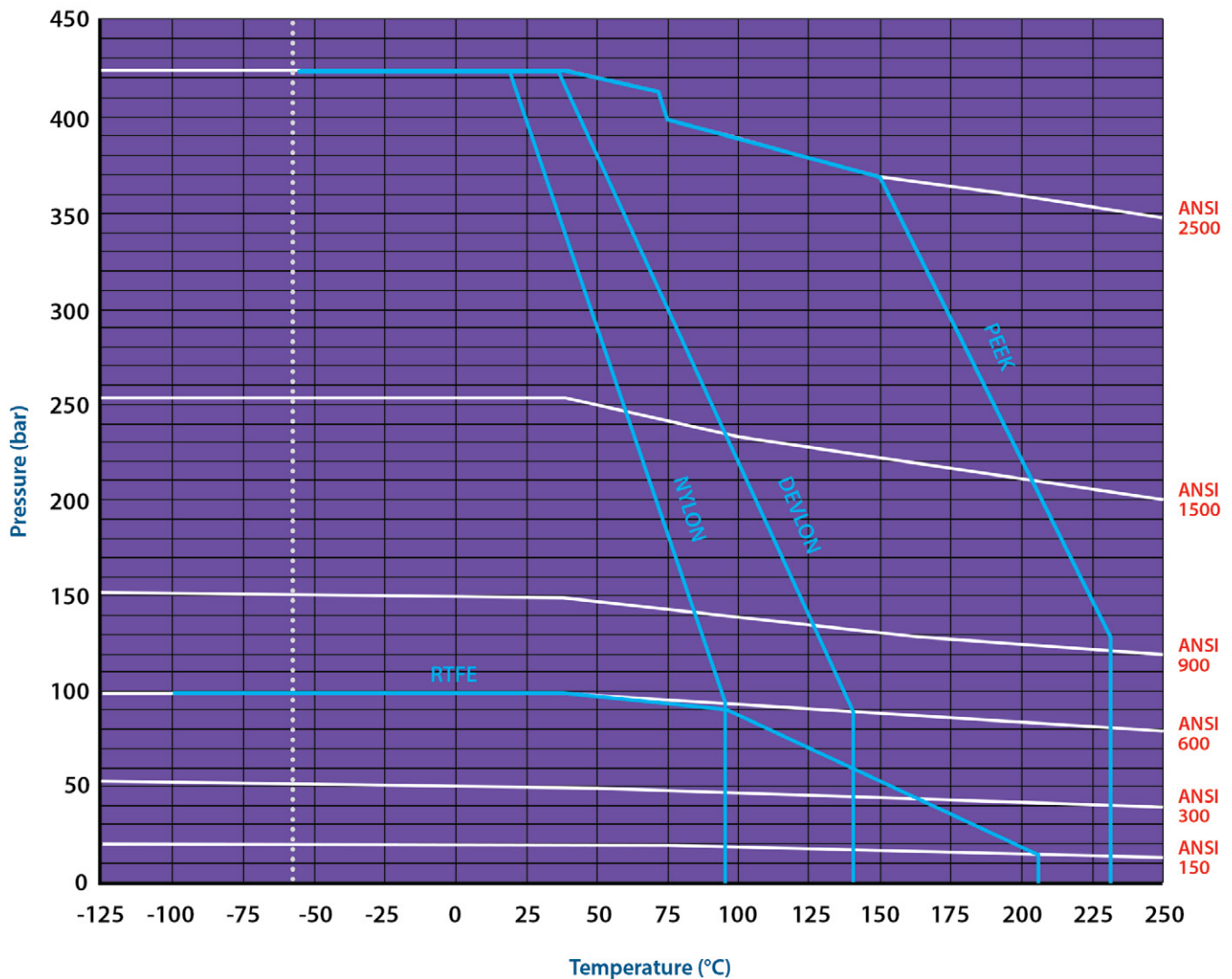
**VALVE OPERATING TORQUES - FULL PORT**

Size		Class 150		Class 300		Class 600		Class 900		Class 1500		Class 2500	
in	mm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
2"	50	823	93.0	1,000	113.0	1,301	147.0	1,593	179.9	2,177	246.0	5213	589.0
3"	75	2,036	230.0	2,814	317.9	4,080	461.0	5,345	603.7	7,930	896.0	1,3983	1,579.9
4"	100	3,248	367.0	4,283	483.9	5,947	671.9	7,620	860.9	10,956	1,237.8	3,5081	3,963.6
6"	150	5,611	633.9	8,921	1,007.9	14,284	1,613.9	19,638	2,218.8	30,364	3,430.7	4,8268	5,453.5
8"	200	8,726	985.9	13,859	1,565.8	22,160	2,503.7	30,471	3,442.8	47,082	5,319.5	104,297	11,783.9
10"	250	11,682	1,319.8	18,098	2,044.8	28,462	3,215.8	38,834	4,387.6	59,569	6,730.4	116,820	13,198.9
12"	300	14,638	1,653.9	22,019	2,487.8	42,825	4,838.6	65,313	7,379.4	102,218	11,549.1	155,318	17,548.6
14"	350	24,718	2,792.7	37,320	4,216.6	57,702	6,519.4	78,101	8,824.2	118,944	13,438.8	-	-
16"	400	33,223	3,753.7	49,905	5,638.5	76,880	8,686.3	119,696	13,523.8	157,849	17,834.5	-	-
18"	450	45,029	5,087.6	72,951	8,242.3	118,121	13,345.9	165,053	18,648.5	260,190	29,397.5	-	-
20"	500	56,684	6,404.4	105,536	11,924.0	163,690	18,494.5	230,065	25,993.5	362,027	40,903.5	-	-
24"	600	108,961	12,310.9	171,646	19,393.4	273,323	30,881.3	374,992	42,368.4	577,693	65,270.5	-	-
26"	650	133,635	15,098.7	201,417	22,757.7	311,679	35,215.0	421,172	47,586.0	-	-	-	-
28"	700	151,778	17,148.6	225,728	25,503.8	345,106	38,991.7	464,475	52,478.6	-	-	-	-
30"	750	164,522	18,588.5	243,092	27,465.7	370,284	41,836.5	499,202	56,402.2	-	-	-	-
32"	800	175,938	19,878.3	261,518	29,547.6	399,976	45,191.2	538,965	60,894.9	-	-	-	-
36"	900	203,585	23,002.0	302,564	34,185.1	464,475	52,478.6	624,226	70,528.1	-	-	-	-

### PRESSURE RATING (PSIG)

Material	Class 150		Class 300		Class 600		Class 900		Class 1500		Class 2500	
	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar
SS	275	19.0	720	49.6	1,440	99.3	2,160	148.9	3,600	248.2	6,000	413.7
LTCS	285	19.6	740	51.1	1,480	102.1	2,220	153.2	3,705	255.3	6,170	425.5
CS	285	19.6	740	51.1	1,480	102.1	2,220	153.2	3,705	255.3	6,170	425.5

### SEAT PRESSURE-TEMPERATURE CHART



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## BDB AND BW3 - OUTER TRUNNION

Item	Description	CS1	CS2
1	Body	ASTM A105	ASTM A350 LF2
2	End Cap	ASTM A105	ASTM A350 LF2
3	Ball	ASTM A105+0.075ENP	ASTM A350 LF2+0.075ENP
4	Stem	ASTM A105+ENP or AISI 4140+0.075ENP	ASTM A350 LF2+ENP or AISI 4140+0.075ENP
5	Trunnion	ASTM A105+0.075ENP	ASTM A350 LF2+0.075ENP
6	Bonnet	ASTM A105+0.075ENP	ASTM A350 LF2+0.075ENP
7	Adapter Flange	ASTM A 105	ASTM A 350 LF2
8	Seat Ring	ASTM A105+0.075ENP	ASTM A350 LF2+0.075ENP
9	Spring Retainer	ASTM A105+0.075ENP	ASTM A350 LF2+0.075ENP
10	Seat	RTFE(150/300) DEVLON(600+)	RTFE(150/300) DEVLON(600+)
11	Support Legs	ASTM A653	ASTM A653
12	Lifting Lugs	ASTM A653	ASTM A653
13	Body Stud *	ASTM A193 B7M	ASTM A320 L7M
14	Body Stud *	ASTM A193 B7M	ASTM A320 L7M
15	Body Nut *	ASTM A194 2HM	ASTM A194 7M
16	Bonnet Bolt	ASTM A193 B7M	ASTM A320 L7M
17	Adapter Bolt	ASTM A193 B7M	ASTM A320 L7M
18	Trunnion Bolt	ASTM A193 B7M	ASTM A320 L7M
19	Body & End Cap o-ring	Viton/HNBR	Viton/HNBR
20	Seat o-ring	Viton/HNBR	Viton/HNBR
21	Seat o-ring	Viton/HNBR	Viton/HNBR
22	Bonnet o-ring	Viton/HNBR	Viton/HNBR
23	Stem o-ring	Viton/HNBR	Viton/HNBR
24	Trunnion o-ring	Viton/HNBR	Viton/HNBR
25	Body FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided
26	Seat FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided
27	Bonnet FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided
28	Adapter Flange FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided
29	Trunnion FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided
30	Thrust Washer	PEEK	PEEK
31	Washer	PTFE	PTFE
32	Trunnion Bearing	SS+PTFE	SS+PTFE
33	Trunnion Bearing	SS+PTFE	SS+PTFE
34	Stem Bearing	SS+PTFE	SS+PTFE
35	Key	SAE 1045	SAE 1045
36	Stem Injection Valve	F316	F316
37	Seat Injection Valve	F316	F316
38	Check Valve	SS304	SS304
39	Vent Valve	F316	F316
40	Drain Plug	F316	F316
41	Spring Pin	SAE 1065	SAE 1065
42	Spring Pin	SAE 1065	SAE 1065
43	Spring	INCONEL X-750	INCONEL X-750
44	Spring	INCONEL X-750	INCONEL X-750
45	Stem Spring	SS 316	SS 316
46	Antistatic Spring	SS 316	SS 316
47	Antistatic Ball	SS 304	SS 304
48	Name Plate	SS 304	SS 304
49	Rivet	SS 304	SS 304
50	Tag	-	-
51	GearBox	Cast Iron	Cast Iron
52	Gear Stud	B7	B7
53	Gear Nut	2H	2H
54	Spring Pin	SAE 1065	SAE 1065

### NOTES:

\* Not applicable for fully welded ball valves

**BDB AND BW3 - OUTER TRUNNION**

Item	Description	SS1	A20	F44
1	Body	ASTM A182 F316	ASTM A20	ASTM A182 F44
2	End Cap	ASTM A182 F316	ASTM A20	ASTM A182 F44
3	Ball	ASTM A182 F316	ASTM A20	ASTM A182 F44
4	Stem	ASTM A182 F51 or A564 17-4 PH	ASTM A20 or A564 17-4 PH	ASTM A182 F44
5	Trunnion	ASTM A182 F316	ASTM A20	ASTM A182 F44
6	Bonnet	ASTM A182 F316	ASTM A20	ASTM A182 F44
7	Adapter Flange	ASTM A182 F316	ASTM A182 F304	ASTM A182 F304
8	Seat Ring	ASTM A182 F316	ASTM A20	ASTM A182 F44
9	Spring Retainer	ASTM A182 F316	ASTM A20	ASTM A182 F44
10	Seat	RTFE(150/300) DEVLON(600+)	RTFE(150/300) DEVLON(600+)	RTFE(150/300) DEVLON(600+)
11	Support Legs	ASTM A653+ENP	ASTM A653+ENP	ASTM A653+ENP
12	Lifting Lugs	ASTM A653+ENP	ASTM A653+ENP	ASTM A653+ENP
13	Body Stud *	ASTM A193 B8M	ASTM A193 B8M	ASTM A193 B8M
14	Body Stud *	ASTM A193 B8M	ASTM A193 B8M	ASTM A193 B8M
15	Body Nut *	ASTM A194 8M	ASTM A194 8M	ASTM A194 8M
16	Bonnet Bolt	ASTM A193 B8M	ASTM A193 B8M	ASTM A193 B8M
17	Adapter Bolt	ASTM A193 B8M	ASTM A193 B8M	ASTM A193 B8M
18	Trunnion Bolt	ASTM A193 B8M	ASTM A193 B8M	ASTM A193 B8M
19	Body & End Cap o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
20	Seat o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
21	Seat o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
22	Bonnet o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
23	Stem o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
24	Trunnion o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
25	Body FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided	Graphite + 304 Braided
26	Seat FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided	Graphite + 304 Braided
27	Bonnet FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided	Graphite + 304 Braided
28	Adapter Flange FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided	Graphite + 304 Braided
29	Trunnion FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided	Graphite + 304 Braided
30	Thrust Washer	PEEK	PEEK	PEEK
31	Washer	PTFE	PTFE	PTFE
32	Trunnion Bearing	SS+PTFE	SS+PTFE	SS+PTFE
33	Trunnion Bearing	SS+PTFE	SS+PTFE	SS+PTFE
34	Stem Bearing	SS+PTFE	SS+PTFE	SS+PTFE
35	Key	SAE 1045	SAE 1045	SAE 1045
36	Stem Injection Valve	F316	F316	F55
37	Seat Injection Valve	F316	F316	F55
38	Check Valve	SS304	SS304	SS304
39	Vent Valve	F316	F316	F316
40	Drain Plug	F316	F316	F316
41	Spring Pin	ASTM A29 1566	ASTM A29 1566	ASTM A29 1566
42	Spring Pin	ASTM A29 1566	ASTM A29 1566	ASTM A29 1566
43	Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750
44	Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750
45	Stem Spring	SS 316	SS 316	SS 316
46	Antistatic Spring	SS 316	SS 316	SS 316
47	Antistatic Ball	SS 304	SS 304	SS 304
48	Name Plate	SS 304	SS 304	SS 304
49	Rivet	SS 304	SS 304	SS 304
50	Tag	-	-	-
51	GearBox	Cast Iron	Cast Iron	Cast Iron
52	Gear Stud	B7	B7	B7
53	Gear Nut	2H	2H	2H

**NOTES:**

\* Not applicable for fully welded ball valves

## BDB AND BW3 - INNER TRUNNION

Item	Description	CS1	CS2
1	Body	ASTM A105	ASTM A350 LF2
2	End Cap	ASTM A105	ASTM A350 LF2
3	Ball	ASTM A105+0.075ENP	ASTM A350 LF2+0.075ENP
4	Stem	ASTM A105+ENP or AISI 4140+0.075ENP	ASTM A350 LF2+ENP or AISI 4140+0.075ENP
5	Trunnion	ASTM A105+0.075ENP	ASTM A350 LF2+0.075ENP
6	Bonnet	ASTM A105+0.075ENP	ASTM A350 LF2+0.075ENP
7	Adapter Flange	ASTM A 105	ASTM A 350 LF2
8	Seat Ring	ASTM A105+0.075ENP	ASTM A350 LF2+0.075ENP
9	Spring Retainer	ASTM A105+0.075ENP	ASTM A350 LF2+0.075ENP
10	Seat	RTFE(150/300) DEVLON(600+)	RTFE(150/300) DEVLON(600+)
11	Lifting Lugs	ASTM A653	ASTM A653
12	Support Legs	ASTM A653	ASTM A653
13	Body Stud *	ASTM A193 B7M	ASTM A320 L7M
14	Body Stud *	ASTM A193 B7M	ASTM A320 L7M
15	Body Nut *	ASTM A194 2HM	ASTM A194 7M
16	Bonnet Bolt	ASTM A193 B7M	ASTM A320 L7M
17	Adapter Bolt	ASTM A193 B7M	ASTM A320 L7M
18	Adapter o-ring	Viton/HNBR	Viton/HNBR
19	Seat o-ring	Viton/HNBR	Viton/HNBR
20	Seat o-ring	Viton/HNBR	Viton/HNBR
21	Bonnet o-ring	Viton/HNBR	Viton/HNBR
22	Stem o-ring	Viton/HNBR	Viton/HNBR
23	Body FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided
24	Seat FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided
25	Bonnet FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided
26	Adapter Flange FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided
27	Washer	SS+PTFE	SS+PTFE
28	Thrust Washer	SS+PTFE	SS+PTFE
29	Trunnion Bearing	SS+PTFE	SS+PTFE
30	Stem Bearing	SS+PTFE	SS+PTFE
31	Stem Injection Valve	F316	F316
32	Seat Injection Valve	F316	F316
33	Check Valve	SS304	SS304
34	Drain Plug	F316	F316
35	Vent Valve	F316	F316
36	Pin	SAE 1020	SAE 1020
37	Pin	SAE 1065	SAE 1065
38	Pin	SAE 1065	SAE 1065
39	Key	SAE 1045	SAE 1045
40	Spring	INCONEL X-750	INCONEL X-750
41	Spring	INCONEL X-750	INCONEL X-750
42	Stem Spring	SS 316	SS 316
43	Antistatic Ball	SS 304	SS 304
44	Antistatic Spring	SS 316	SS 316
45	Name Plate	SS 304	SS 304
46	Rivet	SS 304	SS 304
47	Tag	-	-
48	Gear	Cast Iron	Cast Iron
49	Gear Stud	B7	B7

### NOTES:

\* Not applicable for fully welded ball valves

**BDB AND BW3 - INNER TRUNNION**

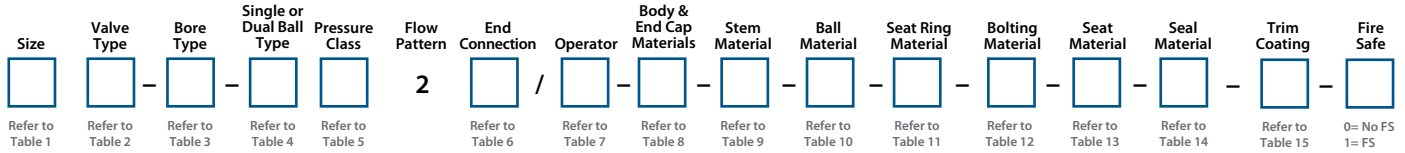
Item	Description	SS1	A20	F44
1	Body	ASTM A182 F316	ASTM A20	ASTM A182 F44
2	End Cap	ASTM A182 F316	ASTM A20	ASTM A182 F44
3	Ball	ASTM A182 F316	ASTM A20	ASTM A182 F44
4	Stem	ASTM A182 F51 or A564 17-4 PH	ASTM A20 or A564 17-4 PH	ASTM A182 F44
5	Trunnion	ASTM A182 F316	ASTM A20	ASTM A182 F44
6	Bonnet	ASTM A182 F316	ASTM A20	ASTM A182 F44
7	Adapter Flange	ASTM A182 F316	ASTM A182 F304	ASTM A182 F304
8	Seat Ring	ASTM A182 F316	ASTM A20	ASTM A182 F44
9	Spring Retainer	ASTM A182 F316	ASTM A20	ASTM A182 F44
10	Seat	RTFE(150/300) DEVLON(600+)	RTFE(150/300) DEVLON(600+)	RTFE(150/300) DEVLON(600+)
11	Lifting Lugs	ASTM A653+ENP	ASTM A653+ENP	ASTM A653+ENP
12	Support Legs	ASTM A653+ENP	ASTM A653 +ENP	ASTM A653+ENP
13	Body Stud *	ASTM A193 B8M	ASTM A193 B8M	ASTM A193 B8M
14	Body Stud *	ASTM A193 B8M	ASTM A193 B8M	ASTM A193 B8M
15	Body Nut *	ASTM A194 8M	ASTM A194 8M	ASTM A194 8M
16	Bonnet Bolt	ASTM A193 B8M	ASTM A193 B8M	ASTM A193 B8M
17	Adapter Bolt	ASTM A193 B8M	ASTM A193 B8M	ASTM A193 B8M
18	Adapter o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
19	Seat o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
20	Seat o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
21	Bonnet o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
22	Stem o-ring	Viton/HNBR	Viton/HNBR	Viton/HNBR
23	Body FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided	Graphite + 304 Braided
24	Seat FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided	Graphite + 304 Braided
25	Bonnet FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided	Graphite + 304 Braided
26	Adapter Flange FS Gasket	Graphite + 304 Braided	Graphite + 304 Braided	Graphite + 304 Braided
27	Washer	SS+PTFE	SS+PTFE	SS+PTFE
28	Thrust Washer	SS+PTFE	SS+PTFE	SS+PTFE
29	Trunnion Bearing	SS+PTFE	SS+PTFE	SS+PTFE
30	Stem Bearing	SS+PTFE	SS+PTFE	SS+PTFE
31	Stem Injection Valve	F316	F316	F316
32	Seat Injection Valve	F316	F316	F316
33	Check Valve	SS304	SS304	SS304
34	Drain Plug	F316	F316	F316
35	Vent Valve	F316	F316	F316
36	Pin	SAE 1020	SAE 1020	SAE 1020
37	Pin	SAE 1065	SAE 1065	SAE 1065
38	Pin	SAE 1065	SAE 1065	SAE 1065
39	Key	SAE 1045	SAE 1045	SAE 1045
40	Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750
41	Spring	INCONEL X-750	INCONEL X-750	INCONEL X-750
42	Stem Spring	SS 316	SS 316	SS 316
43	Antistatic Ball	SS 304	SS 304	SS 304
44	Antistatic Spring	SS 316	SS 316	SS 316
45	Name Plate	SS 304	SS 304	SS 304
46	Rivet	SS 304	SS 304	SS 304
47	Tag	-	-	-
48	Gear	Cast Iron	Cast Iron	Cast Iron
49	Gear Stud	B7	B7	B7
50	Gear Nut	2H	2H	2H

**NOTES:**

\* Not applicable for fully welded ball valves



# ORDERING INSTRUCTIONS



**Table 1 - Size**

<b>Size Range</b>
2" to 56" or DN50 to DN600
For Full Bore size ranges refer to pages 18 to 20
For Reduced Bore size ranges refer to pages 21 to 23

**Table 2 - Valve Type**

Code	Type
BDB	3 Piece Bolted Body Trunnion-Mounted Ball Valve API 6D
BW3	3 Piece Fully Welded Trunnion-Mounted Ball Valve API 6D

**Table 3 - Bore Type**

Code	Type
F	Full Bore
R	Reduced Bore

**Table 4 - Single or Dual Ball Type**

Code	Type
1	Single Ball
2	Double Ball

**Table 5 - Pressure Class**

Code	15	30	60	90	51	52
Type	150	300	600	900	1500	2500

**Table 6 - End Connection**

Code	FR	FJ	BW	FB	JB	XX
Type	Flanged Raise Face	Flanged Ring-Type Joint	Butt Weld	FRxBW	FJxBW	Special

**Table 7 - Operator**

Code	W	WX	T	EG	EX	B	A
Type	Wrench	Wrench+ Stem Extension	T-Bar	Gear Operator	Gear+ Stem Extension	Bare Stem	Actuated

**Table 8 - Body & End Cap Materials**

Code	CS1	CS2	CS3	CS4	SS1	A20	F44	F55	825	K40	K50	TF2	625	XXX
Type	A105	LF2	LF3	LF6	316	A20	F44	F55	Alloy 825	Monel K400	Monel K500	Titanium B338 Gr. F2	Inconel 625	Special

**Table 9 - Stem Material**

Code	0	1	2	3	4	5	6	7	8
Type	A105	LF2	LF3	LF6	316	A20	F44	F55	825
Code	9	A	B	C	D	E	F	X	
Type	Monel K400	Monel K500	Titanium B383 Gr. F2	Inconel 625	4140	17-4 PH	F51	Special	

**Table 10 - Ball Material**

Code	0	1	2	3	4	5	6
Type	A105	LF2	LF3	LF6	316	A20	F44
Code	7	8	9	A	B	C	X
Type	F55	825	Monel K400	Monel K500	Titanium B338 Gr. F2	Inconel 625	Special

**Table 11 - Seat Ring Material**

Code	0	1	2	3	4	5	6
Type	A105	LF2	LF3	LF6	316	A20	F44
Code	7	8	9	A	B	C	X
Type	F55	825	Monel K400	Monel K500	Titanium B338 Gr. F2	Inconel 625	Special

**Table 12 - Bolting Material**

Code	0	1	2	3	4	5	6
Type	N/A	B7/2H	B7M/2HM	B8/8	B8M/8M	L7/7	L7M/7M

**Table 13 - Seat Material**

Code	P	R	N	M	K	D	V
Type	PTFE	RTFE	NYLON	MOLON	PEEK	DEVLON	VITON

**Table 14 - Seal Material**

Code	0	1	2	3	4	X
Type	Viton B	Viton GLT	HNBR	PTFE	EPDM	Special

**Table 15 - Trim Coating (Ball, Seat Ring, and Stem)**

Code	0	1	2	3	4	5	X
Type	None	0.05 ENP	0.075 ENP	CCC	TCC	STELLITE	Special

**MODEL SELECTION EXAMPLE**

Example: 12"BW3-F-1-302FR/EG-CS1-000-0-R-221  
 Description: FluoroSeal 12" 3PC Standard Trunnion Ball Valve, Welded Body, Full Port, Single Ball, Class 300#, Flanged Raised Face, Body and End Cap Material ASTM A105+0.075ENP, Ball, Stem, and Seat Material ASTM A105+0.075ENP, Seal Material HNBR, Seat Insert in RPTFE, Fire Safe, Gear Operator.

**NOTES:**

- For all technical parameters of the product please refer to this catalog, additional information can be obtained from your local FluoroSeal sales office or authorized representative.
- Customization for specific applications is available upon request.

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**LIABILITY**

FluoroSeal Inc. will not be liable for any loss, damage, cost of repairs, incidental or consequential damages of any kind, whether based upon warranty (except for the obligation accepted by FluoroSeal Inc. under "Warranty" above), contract or negligence, arising in connection with the design, manufacture, sale, use or repair of the products or of the engineering designs supplied to Buyer. Any litigation will be interpreted in accordance with the laws of the Province of Québec, Canada and any suit, action or

proceeding relating to these terms and conditions may be instituted in any competent court sitting in the district of Montréal, Québec, Canada.

**RETURNS**

FluoroSeal Inc. cannot accept return of any product(s) unless its written permission has been first obtained, in which case same will be credited subject to the following: (a) all material returned must, on its arrival at FluoroSeal Inc.'s plant, be found to be in first-class condition; if not, cost of putting in saleable condition will be deducted from credit memoranda; (b) a handling charge deduction will be made from all credit memoranda issued for material returned; (c) transportation charges, if not prepaid, will be deducted from credit memoranda.

**SHIPMENTS**

All products sent out will be carefully examined, counted and packed. The cost of any special packing or special handling caused by Buyer's requirements or requests shall be added to the amount of the order. No claim for shortages will be allowed unless made in writing within ten (10) days of receipt of a shipment. Claims for products damaged or lost in transit should be made to the carrier, as FluoroSeal Inc.'s responsibility ceases, and title passes, on delivery to the carrier.

**SPECIAL PRODUCTS**

Orders covering special or non-standard products are not subject to cancellation except on such terms as FluoroSeal Inc. may specify on application.

**PRICES AND DESIGNS**

Prices and designs are subject to change without notice. All prices are F.O.B. Point of Shipment, unless otherwise stated.

**TAXES**

The amount of any sales, excise or other taxes, if any, applicable to the products, shall be added to the purchase price and shall be paid by Buyer unless Buyer provides FluoroSeal Inc. with an exemption certificate acceptable to the taxing authorities.

**NUCLEAR PLANTS**

Where the products, engineering design or fabrication is for nuclear plant applications, Buyer agrees (a) to take all necessary steps to add FluoroSeal Inc. as an insured supplier under the American Nuclear Insurers (ANI) pool and under the Mutual Atomic Energy Reinsurance Pool (MAERP) for property damage and liability insurance and if necessary steps could have been taken, but are not taken, Buyer shall hold FluoroSeal Inc. harmless against all such losses which could have been thus covered; (b) Buyer agrees to hold FluoroSeal Inc. harmless with respect to any personal injury or death, property damage or any other loss in a nuclear incident which is caused directly or indirectly by defective design, material, or workmanship, furnished by FluoroSeal Inc. and which is covered by insurance maintained by Buyer (or which could be so covered but with respect to which Buyer has elected to self-insure), and further agrees to waive subrogation by its carriers of such insurance against FluoroSeal Inc.; (c) as to nuclear hazards for which Buyer cannot obtain insurance coverage, the liability of FluoroSeal Inc. for any personal injury or death, property damage or any other loss directly caused by defective design, material, or workmanship furnished by FluoroSeal Inc. shall not exceed the value of the material furnished by FluoroSeal Inc. at the time of the loss occurrence.



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