DelVal® SERIES 7 & 8

Two-Piece / Three-Piece Trunnion Mounted Ball Valves

ASME Class150, 300, 600, 900, 1500

DelVal®
Flow Controls

Leading the Industry with Innovation by Design

Series 7 & 8 Trunnion Ball Valves

Quality and performance you can count on!

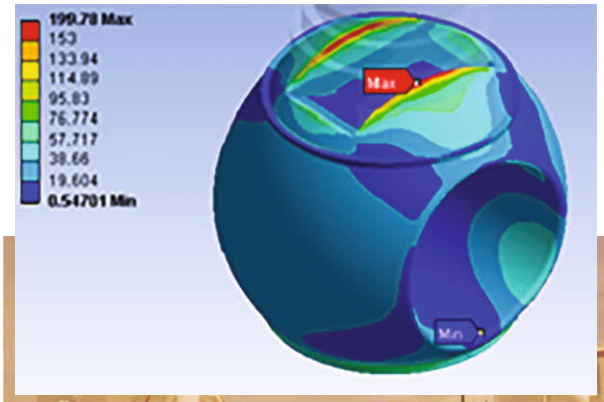
Delval Flow Controls offers a wide range of DelVal® Trunnion Ball Valves. Our designs are proven performers in the harshest of environments. The DelVal® brand means Performance, Quality and Reliability you can count on.

All DelVal® Ball Valves are manufactured and tested in conformance with API 6D specifications and are designed to meet our customers' demanding service conditions.

Most DelVal® Ball Valves are designed to mount directly with DelTorq® Pneumatic and Electric Actuators. On some large sizes where direct mounting is not possible, pre-engineered mounting kits are available for close mounting. The valves are manufactured in a modern plant equipped with state-of-the-art facilities under a robust quality assurance program complying with ISO 9001-2008.

DelVal® Valves and DelTorq® Pneumatic and Electric Actuators and accessories are marketed and sold worldwide by an experienced team of domestic and international representatives. Our sales offices work closely with the representatives to ensure that our customers' expectations are met and exceeded. A network of authorized distributors stock DelVal® and DelTorq® products for immediate delivery to the oil, gas and industrial markets.

Our complete API 6D product offering includes flanged, butt weld, ring joint and threaded ends in floating ball and trunnion mounted ball designs. Sizes range from 2” to 24” in 150 to 1500 ASME classes. Contact DelVal Flow Controls to learn how one of the cost effective products can help provide solutions for your upstream wellheads and downstream production needs.




Certificate of Authority to use the Official API Monogram
License Number: 6D-0912
ORIGINAL

The American Petroleum Institute hereby grants to

DELVAL FLOW CONTROLS PRIVATE LIMITED
Gat No. 25+37+43/1A, At. Kavathe Post-Jawale
Shirval, Satara, Maharashtra 412801
India

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and API-6D and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram shall be used in conjunction with this certificate number: 6D-0912

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following: Ball Valves

QMS Exclusions: Customer Property

Effective Date: NOVEMBER 9, 2015
Expiration Date: NOVEMBER 9, 2018

To verify the authenticity of this license, go to www.api.org/compositelist.

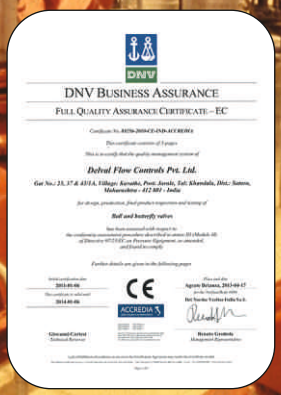
American Petroleum Institute


DNV BUSINESS ASSURANCE
MANAGEMENT SYSTEM CERTIFICATE

DELVAL FLOW CONTROLS PVT. LTD.

ISO 9001:2008

DESIGN, MANUFACTURE AND AFTER SALES SERVICE OF BUTTERFLY VALVES, BALL VALVES, ACTUATORS, LIMIT SWITCH BOX AND VALVE AUTOMATION SYSTEMS


DNV BUSINESS ASSURANCE
FULL QUALITY ASSURANCE CERTIFICATE - EC

Delval Flow Controls Pvt. Ltd.

Ball and butterfly valves

Design Features

Ball valves are straight-through flow valves which provide shutoff with minimal pressure drop and flow turbulence. The barrier to flow is a ball which is rotated 90 degrees to the direction of the flow.

In trunnion mounted valves, the ball is held in a fixed axial position by upper and lower trunnions and can move only in a rotational mode. The seats are contained in metal carriers which are spring loaded against the ball. Line pressure applied to a closed valve increases the spring load on the upstream seat to effect a tight seal. The primary seating is therefore on the upstream seat permitting trunnion mounted ball valves to be used for "block and bleed" services.

As the stem motion from full open to full close is 90 degree rotation, ball valves are ideally suited for automatic operation.

All DelVal® Trunnion Ball Valves have a self-relieving seat design. When the body cavity pressure exceeds the downstream seat springs preloaded force, the differential force in the cavity area pushes the downstream seat away from the ball, the body cavity pressure will be relieved automatically. The seat then returns to the ball under spring loaded action.

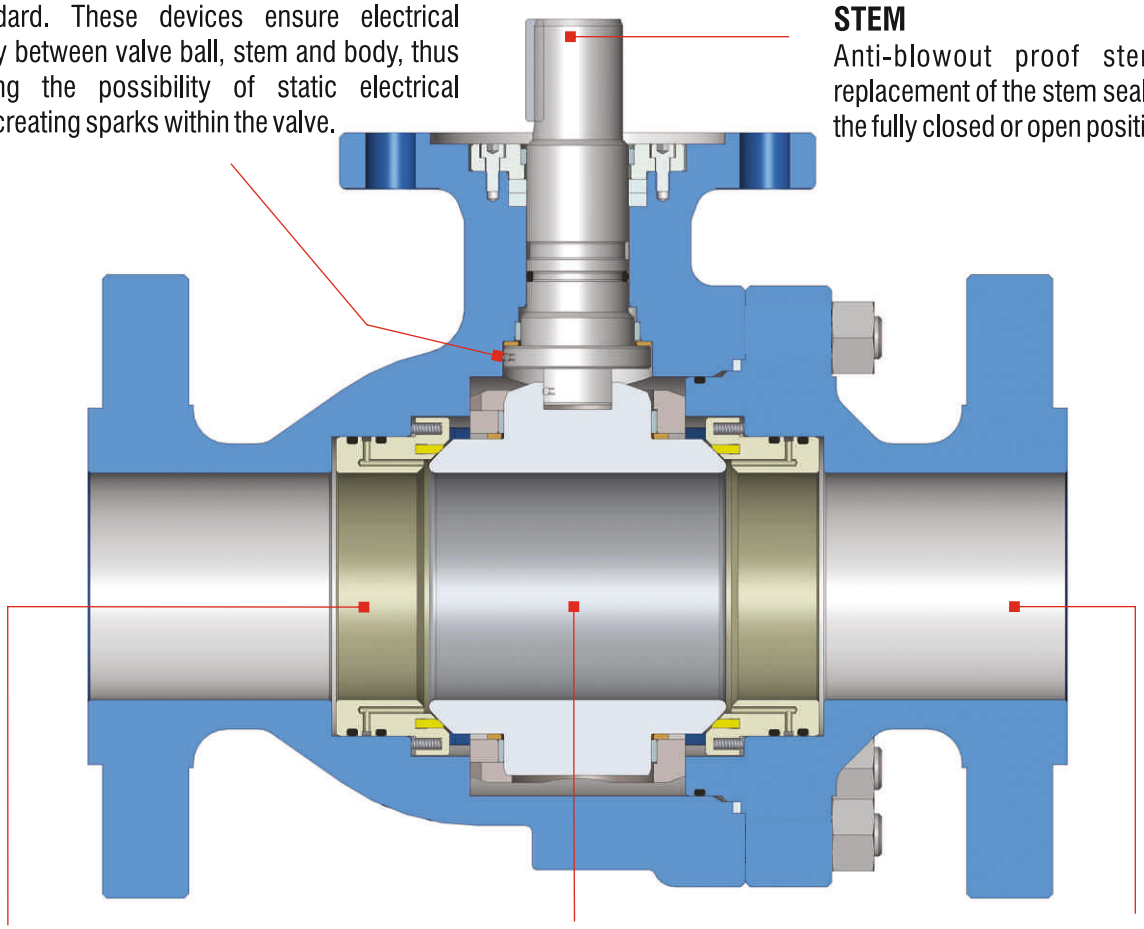
DelVal® Trunnion Ball Valves comply with the design and testing requirements of ANSI B16.34 and API 6D. Installation dimensions comply with ANSI B16.10 / API 6D.

ANTI-STATIC DESIGN

All DelVal stems feature anti-static grounding device as standard. These devices ensure electrical continuity between valve ball, stem and body, thus eliminating the possibility of static electrical charges creating sparks within the valve.

STEM

Anti-blowout proof stem permits the replacement of the stem seals with the valve in the fully closed or open position.



FLOATING SEAT RING

Two independent floating seat rings assure the bi-directional tightness of the valve from zero differential pressure to the maximum rated pressure.

TRUNNION-MOUNTED BALL

The ball is supported and the seat rings are floating, free to move along the flow axis. As the pressure increases the fluid pressure pushes the seat rings against the ball.

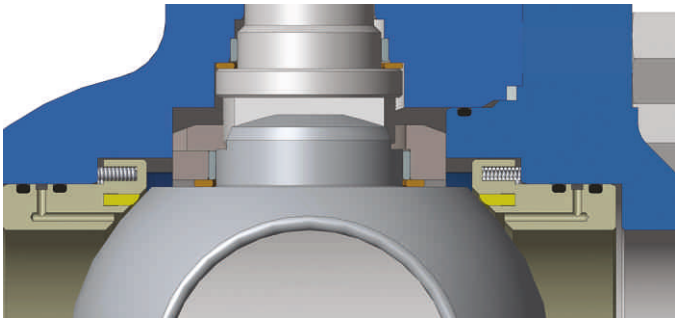
MACHINED VALVE BORE

The valve body bore is completely machined from the edge of flange to the edge of the ball. This machined bore provides less resistance to flow, thereby increasing flow through the valve.

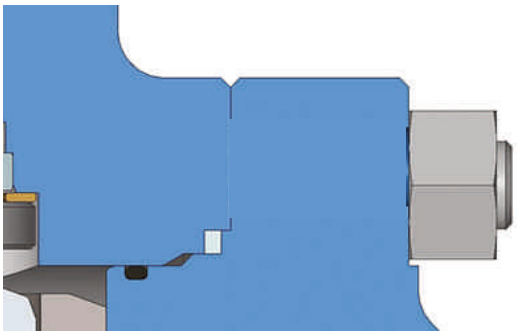
SELF-RELIEVING SEAT DESIGN

When the valve is in the closed position, media will be trapped in the body cavity. Unless this media is drained, it will be subjected to thermal expansion and contraction. As the temperature rises, the trapped media desires to expand and the pressure increases in the body cavity. In order to avoid excessive pressure build-up, the DelVal® seats are designed to self-relieve, allowing the media in the body to escape into the pipeline.

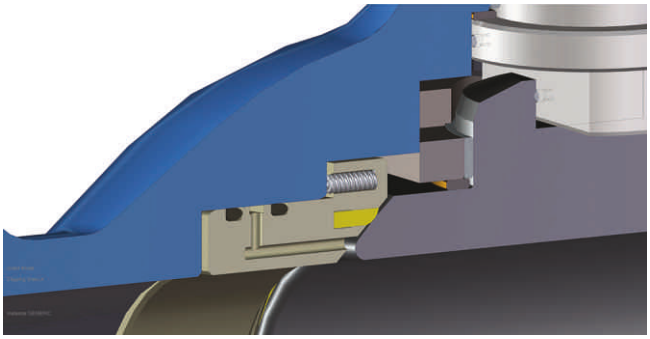
Design Features



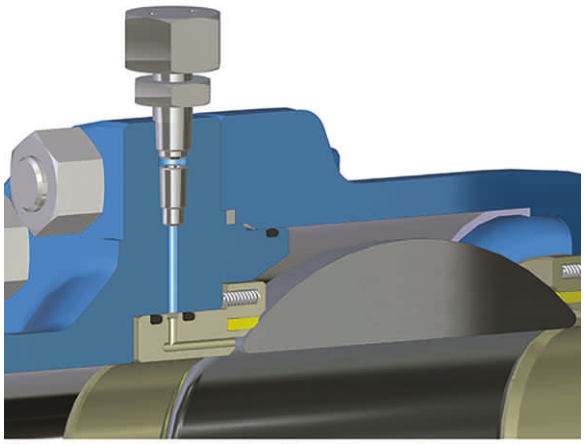
DOUBLE BLOCK AND BLEED
Spring loaded floating seats maintain contact with the ball and provide a tight shut off even at low pressure differential. Independent sealing of upstream and downstream sides facilitate draining of fluid from body cavity, and thus double block and bleed operation.



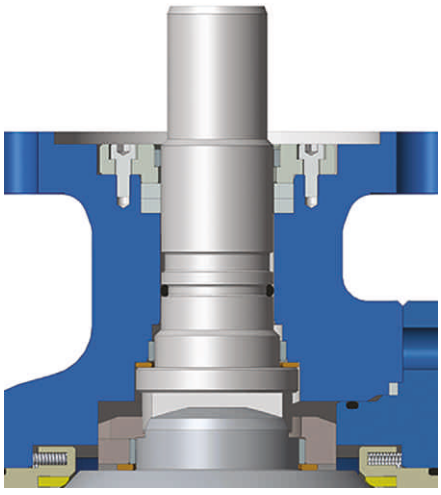
BODY JOINTS
Double seal combination of o-ring and fire safe spiral wound gasket ensures perfect body joint sealing. DelVal® Trunnion Ball Valves meet or exceed the fugitive emission requirements across a wide range of pressure and temperature applications. Valves are suitable for both above and underground installations.



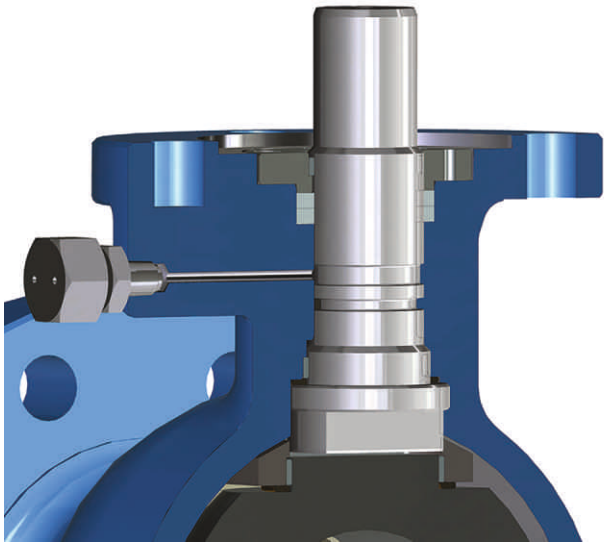
FIRE SAFE DESIGN
DelVal® fire safe design consists of a primary soft sealing and a secondary metal seat. A resilient material is inserted into the metal seat holder to provide a soft action in addition to the metal sealing between the ball and the seat rings. In case of fire the soft seat insert burns and allows the spring loaded seat to ensure metal to metal sealing against the ball.



EMERGENCY SEAT SEALANT INJECTION
An emergency sealant injection system is available on request. Each DelVal® Trunnion Ball Valve has a port for sealant injection feature.

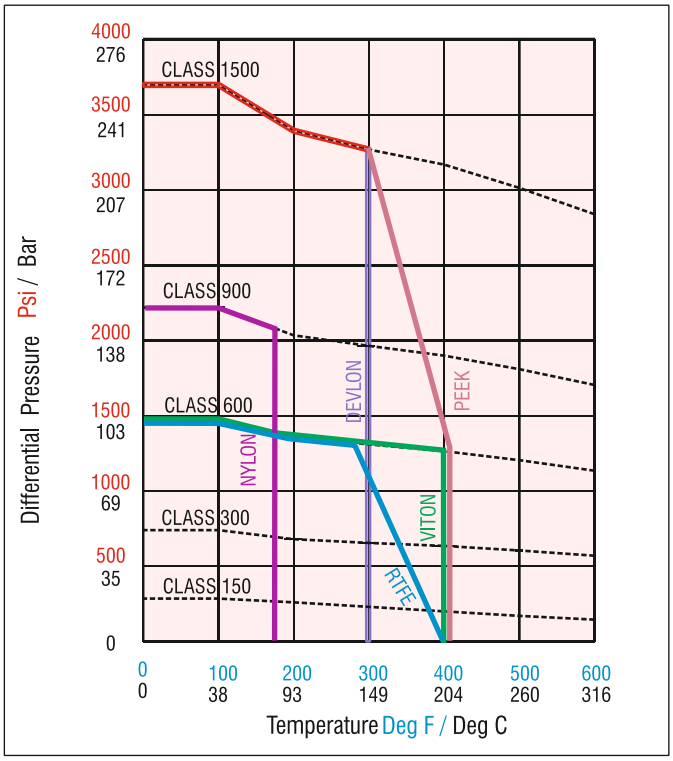


STEM SEALING
A multiple stem sealing arrangement prevents leakage to the atmosphere. The unique arrangement consists of a double sealing arrangement with o-rings around the stem, and two pre-energized graphite seal rings are also provided.



EMERGENCY STEM SEALANT INJECTION
An emergency sealant injection system is available on request. Each DelVal® Trunnion Ball Valve has a port for sealant injection feature.

Pressure Temperature Ratings:



Pressure - temperature seat ratings of valves are as given in the graph for body material ASTM A 216 - Gr. WCB. With the exception of body seat rings and primary soft seals, all valve components are capable of withstanding the pressure - temperature ratings as specified in ASME B 16.34.

Temperature Limits :

		Lower limit		Upper limit	
		Deg.F	Deg.C	Deg.F	Deg.C
Body Matl.	WCB	-20	-29	797	425
	LCB	-50	-46	653	345
	CF8	-320	-196	1000	538
	CF8M	-320	-196	1000	538
Seat	RTFE	-58	-50	400	204
	DEVLON	-58	-50	302	150
	PEEK	-58	-50	400	204
	VITON	-10	-23	400	204
	NYLON 12	-58	-50	176	80

Note : These ratings are a guide for general service.
Please consult DelVal® for specific recommendations.

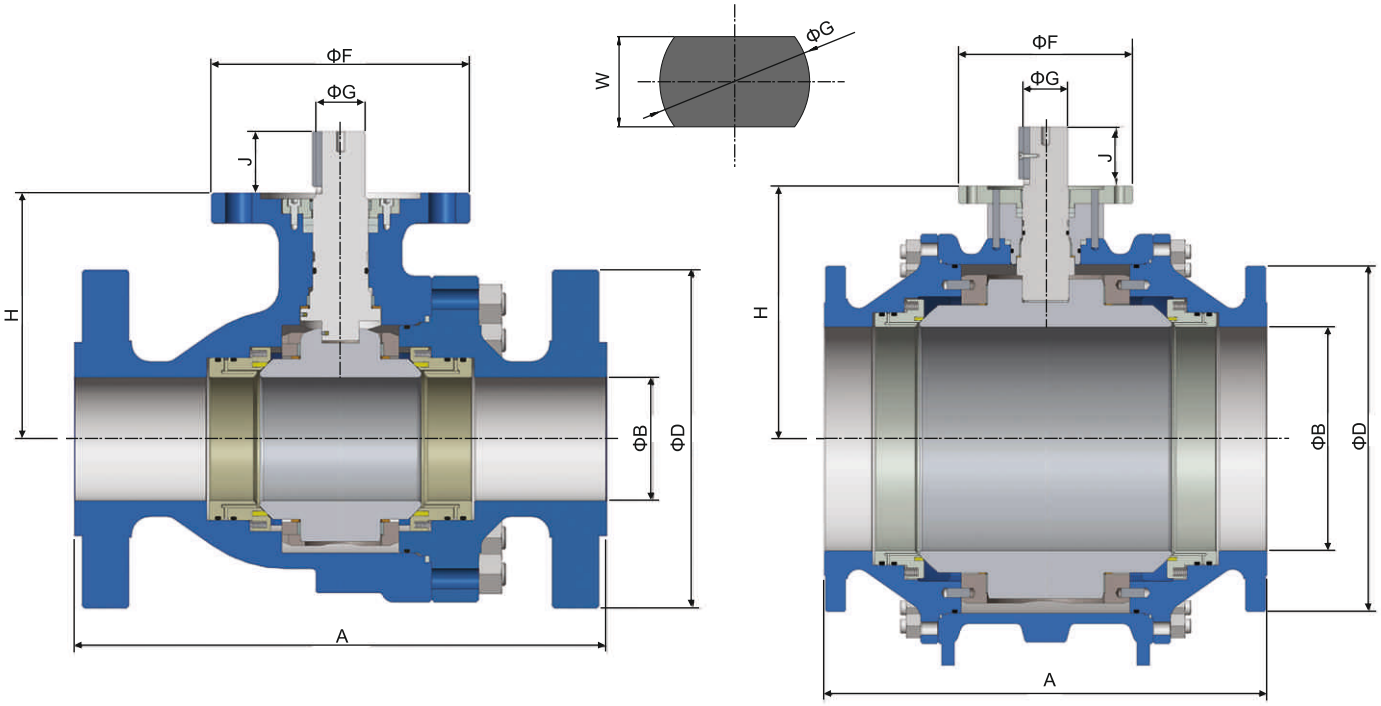
Range:

VALVE TYPE	ASME CLASS	2		3		4		6		8		10		12		14		16		18		20		24	
		FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP
2 PIECE	150	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•		•						
	300	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•						
	600	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•						
	900	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•		•						
	1500	•	•	•	•	•	•	•	•	•	•		•												
3 PIECE	150																	•		•	•	•	•	•	•
	300																	•		•	•	•	•	•	•
	600																	•		•	•	•	•	•	•
	900															•		•			•				
	1500											•		•	•		•								

Specification and Codes:

Design		API 6D / ASME B16.34 / BS EN ISO 17292
Pressure & Temperature Rating		ASME B16.34
Testing		API 6D / API 598 / BS EN 1226 -1
Ends	Face to Face/End to End Dimensions	API 6D / ASME B16.10
	End Flange Dimensions	ASME B16.5 / ASME B16.47
	Butt Weld End Dimensions	ASME B16.25
Fire Safe Test		API 607
Compliance		PED 2014 / 68 / EU
NACE		ANSI / NACE MRO 175 / ISO 15156 - 2

Engineering (Full Port)



ASME CLASS 150 (mm)

SIZE	2-Piece												3-Piece											
	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#
NPS		RF	RTJ	BWE								FL		RF	RTJ	BWE								FL
2	49	178	191	216	130	F10	30	22	35	-	150	11	-	-	-	-	-	-	-	-	-	-	-	-
3	74	203	216	283	160	F12	35	24	40	-	190	25	-	-	-	-	-	-	-	-	-	-	-	-
4	100	229	241	305	185	F12	35	24	40	-	230	43	-	-	-	-	-	-	-	-	-	-	-	-
6	150	394	406	457	250	F12	40	29	40	-	280	122	-	-	-	-	-	-	-	-	-	-	-	-
8	201	457	470	521	302	F16	55	-	80	16 x 10	345	200	-	-	-	-	-	-	-	-	-	-	-	-
10	252	533	546	559	340	F16	55	-	80	16 x 10	405	315	-	-	-	-	-	-	-	-	-	-	-	-
12	303	610	622	635	375	F25	63.5	-	102	15.88 x 15.88	485	470	-	-	-	-	-	-	-	-	-	-	-	-
14	334	686	699	762	390	F25	70	-	102	20 x 12	535	600	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-		-	-	-	-	385	762	775	838	460	F25	76.2	-	102	19.05 x 19.05	595	995
18	-	-	-	-	-	-	-		-	-	-	-	436	864	876	914	500	F30	88.9	-	134	22.23 x 15.86	635	1315
20	-	-	-	-	-	-	-		-	-	-	-	487	914	927	991	525	F30	88.9	-	134	22.23 x 15.86	700	1700
24	-	-	-	-	-	-	-		-	-	-	-	589	1067	1080	1143	650	F35	120	-	150	32 x 18	815	2750

ASME CLASS 150 (INCH)

SIZE	2-Piece												3-Piece											
	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#
NPS		RF	RTJ	BWE								FL		RF	RTJ	BWE								FL
2	1.94	7.00	7.50	8.50	5.12	F10	1.18	0.87	1.38	--	6.00	24	-	-	-	-	-	-	-	-	-	-	-	-
3	2.94	8.00	8.50	11.13	6.30	F12	1.38	0.94	1.57	--	7.50	55	-	-	-	-	-	-	-	-	-	-	-	-
4	3.94	9.00	9.50	12.00	7.28	F12	1.38	0.94	1.57	--	9.00	95	-	-	-	-	-	-	-	-	-	-	-	-
6	5.94	15.50	16.00	18.00	9.84	F12	1.57	1.18	1.57	--	11.00	268	-	-	-	-	-	-	-	-	-	-	-	-
8	7.94	18.00	18.50	20.50	11.89	F16	2.16	-	3.15	0.63 x 0.39	13.50	440	-	-	-	-	-	-	-	-	-	-	-	-
10	9.94	21.00	21.50	22.00	13.39	F16	2.16	-	3.15	0.63 x 0.39	16.00	693	-	-	-	-	-	-	-	-	-	-	-	-
12	11.94	24.00	24.50	25.00	14.76	F25	2.50	-	4.01	0.63 x 0.63	19.00	1034	-	-	-	-	-	-	-	-	-	-	-	-
14	13.19	27.00	27.50	30.00	15.35	F25	2.76	-	4.01	0.79 x 0.47	21.00	1320	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-		-	-	-	-	15.19	30	30.5	33	18.11	F25	3	-	4.01	0.75 x 0.75	23.5	2189
18	-	-	-	-	-	-	-		-	-	-	-	17.19	34	34.5	36	19.7	F30	3.5	-	5.27	0.88 x 0.63	25	2893
20	-	-	-	-	-	-	-		-	-	-	-	19.19	36	36.5	39	20.67	F30	3.5	-	5.27	0.88 x 0.63	27.5	3740
24	-	-	-	-	-	-	-		-	-	-	-	23.19	42.00	42.50	45.00	25.60	F35	4.72	-	5.91	1.26 x 0.71	32.00	6050

Approximate Value

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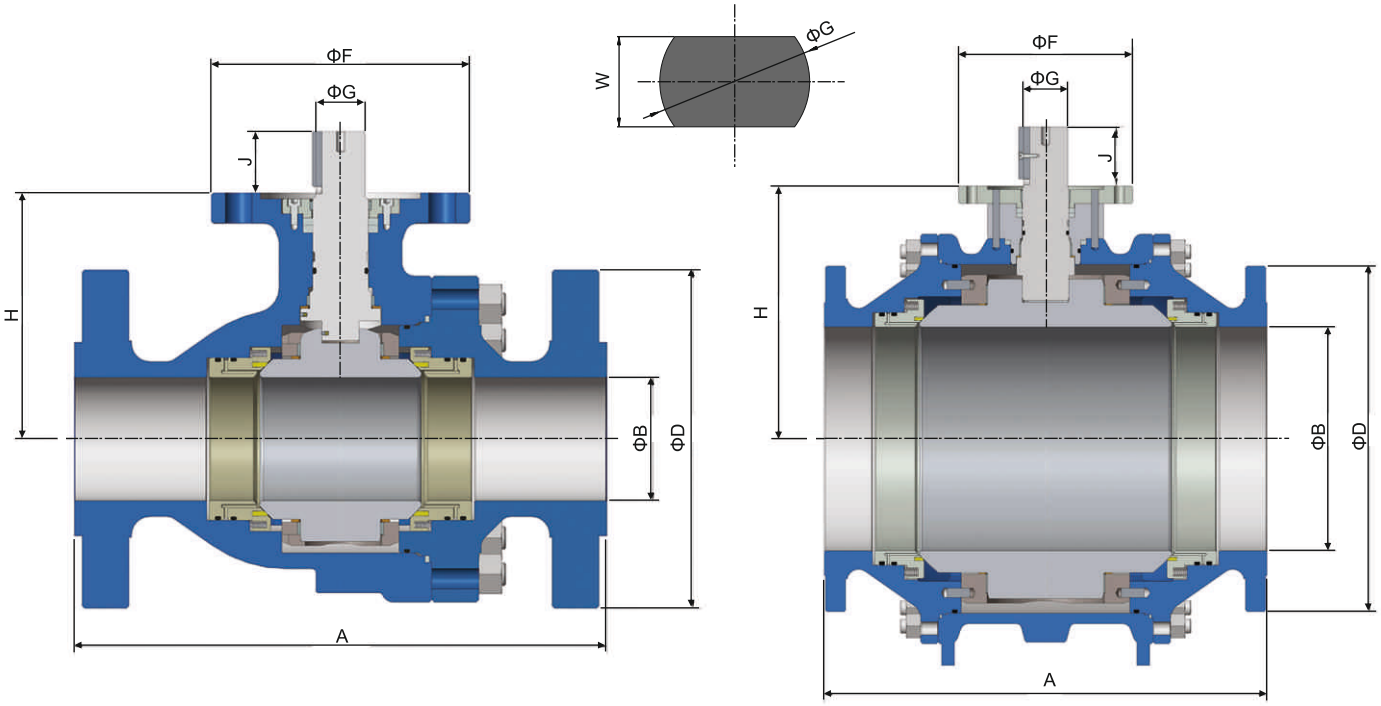
Engineering (Full Port)



ASME CLASS 300 (mm)

SIZE	2-Piece												3-Piece											
	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg) #	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg) #
NPS		RF	RTJ	BWE								FL		RF	RTJ	BWE								FL
2	49	216	232	216	130	F10	30	22	35	-	165	14	-	-	-	-	-	-	-	-	-	-	-	-
3	74	283	298	283	160	F12	35	24	40	-	210	40	-	-	-	-	-	-	-	-	-	-	-	-
4	100	305	321	305	185	F12	35	24	40	-	255	50	-	-	-	-	-	-	-	-	-	-	-	-
6	150	403	419	457	250	F16	45	-	60	14 x 9	320	138	-	-	-	-	-	-	-	-	-	-	-	-
8	201	502	518	521	302	F16	55	-	80	16 x 10	380	245	-	-	-	-	-	-	-	-	-	-	-	-
10	252	568	584	559	340	F16	55	-	80	16 x 10	445	366	-	-	-	-	-	-	-	-	-	-	-	-
12	303	648	664	635	375	F25	63.5	-	102	15.88 x 15.88	520	550	-	-	-	-	-	-	-	-	-	-	-	-
14	334	762	778	762	390	F25	70	-	102	20 x 12	585	820	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	385	838	854	838	460	F25	76.2	-	102	19.05 x 19.05	650	1187
18	-	-	-	-	-	-	-	-	-	-	-	-	436	914	930	914	500	F30	88.9	-	134	22.23 x 15.88	710	1560
20	-	-	-	-	-	-	-	-	-	-	-	-	487	991	1010	991	565	F35	88.9	-	134	22.23 x 15.88	775	2200
24	-	-	-	-	-	-	-	-	-	-	-	-	589	1143	1165	1143	670	F35	120	-	150	32 x 18	915	3500

ASME CLASS 300 (INCH)

SIZE	2-Piece												3-Piece											
	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS) #	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS) #
NPS		RF	RTJ	BWE								FL		RF	RTJ	BWE								FL
2	1.94	8.5	9.13	8.5	5.12	F10	1.18	0.87	1.38	-	6.5	31	-	-	-	-	-	-	-	-	-	-	-	-
3	2.94	11.13	11.75	11.13	6.3	F12	1.38	0.94	1.57	-	8.25	88	-	-	-	-	-	-	-	-	-	-	-	-
4	3.94	12	12.63	12	7.28	F12	1.38	0.94	1.57	-	10	110	-	-	-	-	-	-	-	-	-	-	-	-
6	5.94	15.88	16.5	18	9.84	F16	1.77	-	2.36	0.55 x 0.36	12.5	304	-	-	-	-	-	-	-	-	-	-	-	-
8	7.94	19.75	20.38	20.5	11.89	F16	2.16	-	3.15	0.63 x 0.39	15	539	-	-	-	-	-	-	-	-	-	-	-	-
10	9.94	22.38	23	22	13.39	F16	2.16	-	3.15	0.63 x 0.39	17.5	805	-	-	-	-	-	-	-	-	-	-	-	-
12	11.94	25.5	26.13	25	14.76	F25	2.5	-	4.01	0.63 x 0.63	20.5	1210	-	-	-	-	-	-	-	-	-	-	-	-
14	13.19	30	30.63	30	15.35	F25	2.76	-	4.01	0.79 x 0.47	23	1804	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	15.19	33	33.63	33	18.11	F25	3	-	4.01	0.75 x 0.75	25.5	2611
18	-	-	-	-	-	-	-	-	-	-	-	-	17.19	36	36.63	36	19.69	F30	3.5	-	5.27	0.88 x 0.63	28	3432
20	-	-	-	-	-	-	-	-	-	-	-	-	19.19	39	39.75	39	22.24	F35	3.5	-	5.27	0.88 x 0.63	30.5	4840
24	-	-	-	-	-	-	-	-	-	-	-	-	23.19	45	45.88	45	26.38	F35	4.72	-	5.91	1.26 x 0.71	36	7700

Approximate Value

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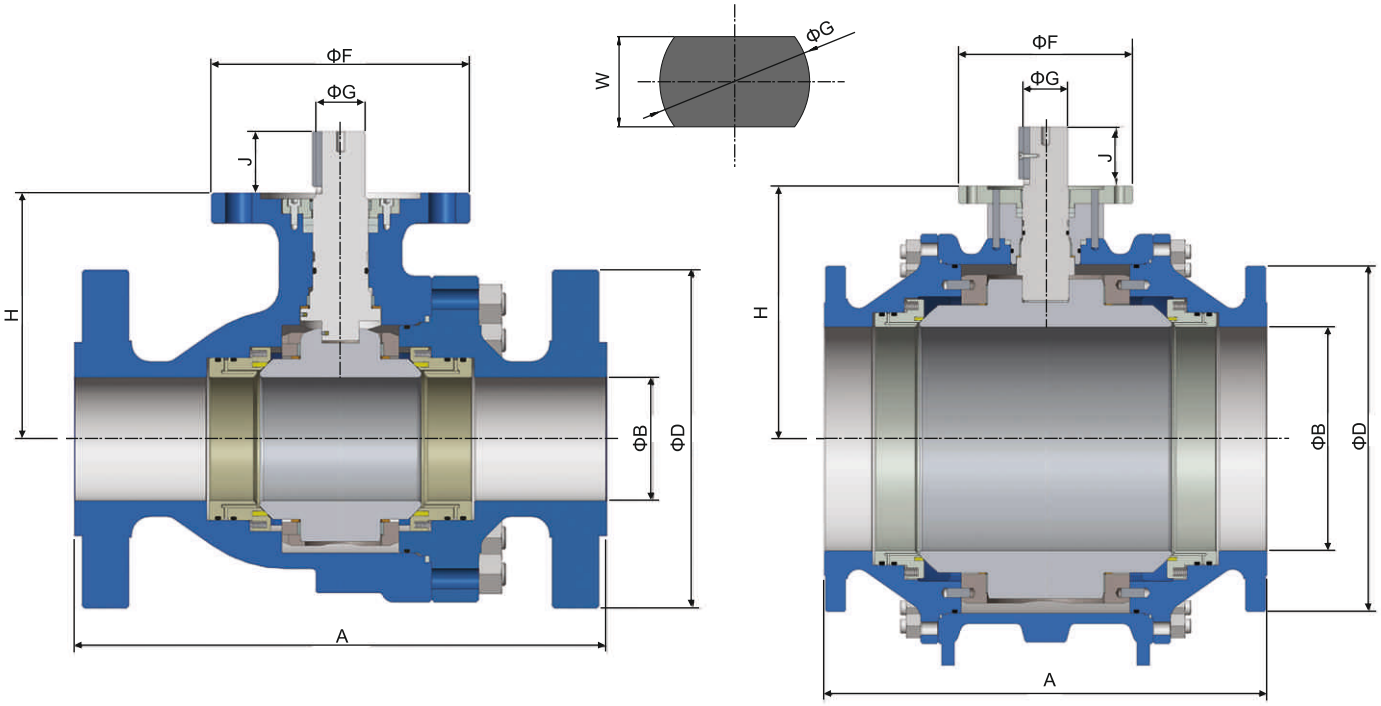
Engineering (Full Port)



ASME CLASS 600 (mm)

SIZE	2-Piece												3-Piece											
	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#
NPS		RF	RTJ	BWE								FL		RF	RTJ	BWE								FL
2	49	292	295	292	140	F10	30	22	35	-	165	32	-	-	-	-	-	-	-	-	-	-	-	-
3	74	356	359	356	165	F12	35	24	40	-	210	56	-	-	-	-	-	-	-	-	-	-	-	-
4	100	432	435	432	200	F16	40	-	50	12 x 8	275	108	-	-	-	-	-	-	-	-	-	-	-	-
6	150	559	562	559	250	F16	45	-	60	14 x 9	355	172	-	-	-	-	-	-	-	-	-	-	-	-
8	201	660	664	660	302	F16	55	-	80	16 x 10	420	349	-	-	-	-	-	-	-	-	-	-	-	-
10	252	787	791	787	343	F25	63.5	-	102	15.88 x 15.88	510	621	-	-	-	-	-	-	-	-	-	-	-	-
12	303	838	841	838	390	F25	70	-	102	20 x 12	560	835	-	-	-	-	-	-	-	-	-	-	-	-
14	334	889	892	889	415	F25	76.2	-	102	19.05 x 19.05	605	1200	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	385	991	994	991	460	F30	88.9	-	134	22.23 x 15.88	685	1997
18	-	-	-	-	-	-	-	-	-	-	-	-	436	1092	1095	1092	525	F35	120	-	150	32 x 18	745	2730
20	-	-	-	-	-	-	-	-	-	-	-	-	487	1194	1200	1194	595	F35	120	-	150	32 x 18	815	3350
24	-	-	-	-	-	-	-	-	-	-	-	-	589	1397	1407	1397	680	F40	140	-	210	36 x 20	940	5975

ASME CLASS 600 (INCH)

SIZE	2-Piece												3-Piece											
	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#
NPS		RF	RTJ	BWE								FL		RF	RTJ	BWE								FL
2	1.94	11.50	11.63	11.50	5.51	F10	1.18	0.87	1.38	-	6.50	70	-	-	-	-	-	-	-	-	-	-	-	-
3	2.94	14.00	14.13	14.00	6.50	F12	1.38	0.94	1.57	-	8.25	123	-	-	-	-	-	-	-	-	-	-	-	-
4	3.94	17.00	17.13	17.00	7.87	F16	1.57	-	1.97	0.47 x 0.31	10.75	238	-	-	-	-	-	-	-	-	-	-	-	-
6	5.94	22.00	22.13	22.00	9.84	F16	1.77	-	2.36	0.55 x 0.35	14.00	378	-	-	-	-	-	-	-	-	-	-	-	-
8	7.94	26.00	26.13	26.00	11.89	F16	2.16	-	3.15	0.63 x 0.39	16.50	767	-	-	-	-	-	-	-	-	-	-	-	-
10	9.94	31.00	31.13	31.00	13.50	F25	2.50	-	4.01	0.63 x 0.63	20.00	1366	-	-	-	-	-	-	-	-	-	-	-	-
12	11.94	33.00	33.13	33.00	15.35	F25	2.76	-	4.01	0.79 x 0.47	22.00	1837	-	-	-	-	-	-	-	-	-	-	-	-
14	13.19	35.00	35.13	35.00	16.34	F25	3.00	-	4.01	0.75 x 0.75	23.75	2640	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-	15.19	39	39.13	39	18.11	F30	3.5	-	5.27	0.88 x 0.63	27	4393
18	-	-	-	-	-	-	-	-	-	-	-	-	17.19	43	43.13	43	20.67	F35	4.72	-	5.9	1.26 x 0.71	29.25	6006
20	-	-	-	-	-	-	-	-	-	-	-	-	19.19	47	47.25	47	23.43	F35	4.72	-	5.9	1.26 x 0.71	32	7370
24	-	-	-	-	-	-	-	-	-	-	-	-	23.19	55	55.38	55	26.77	F40	5.51	-	8.27	1.42 x 0.79	37	13145

Approximate Value

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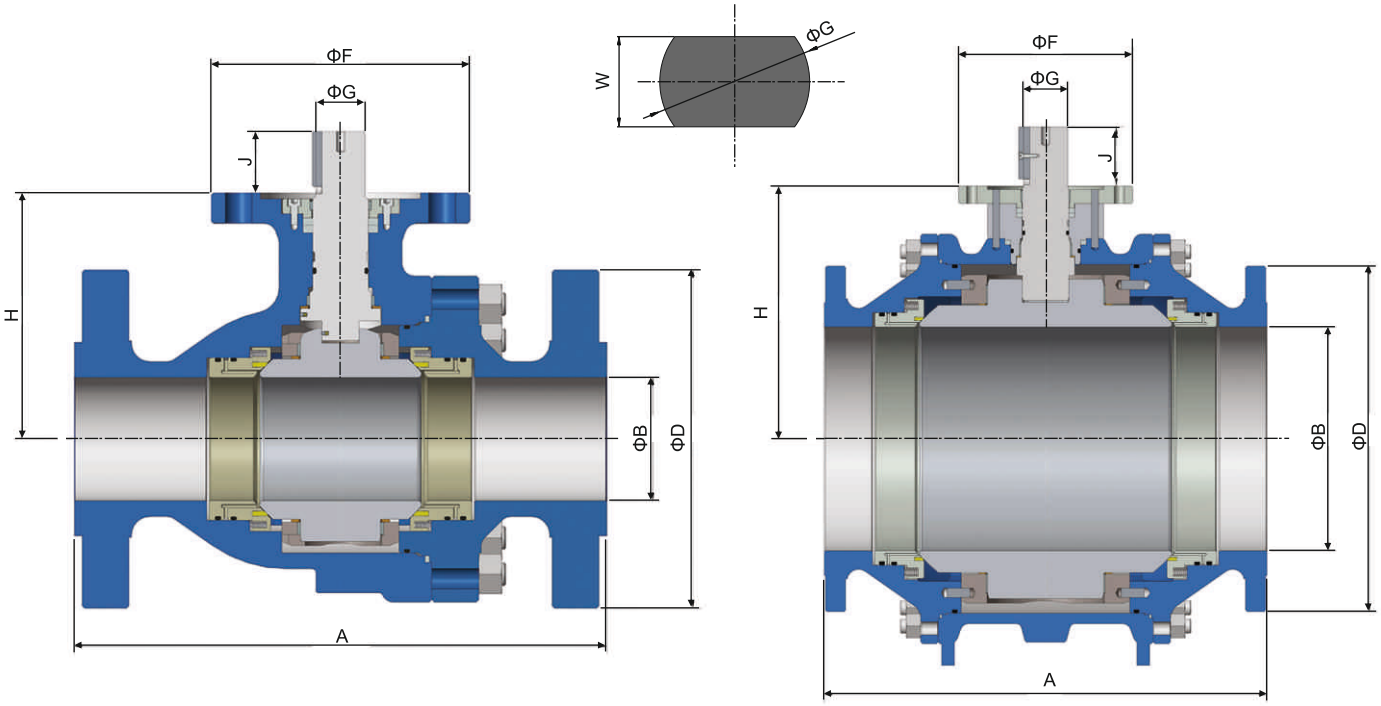
Engineering (Full Port)



ASME CLASS 900 (mm)

SIZE	2-Piece												3-Piece											
	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#
NPS		RF	RTJ	BWE								FL		RF	RTJ	BWE								FL
2	49	368	371	368	138	F12	30	22	35	-	215	60	-	-	-	-	-	-	-	-	-	-	-	-
3	74	381	384	381	180	F16	40	-	50	12 x 8	240	88	-	-	-	-	-	-	-	-	-	-	-	-
4	100	457	460	457	240	F16	45	-	60	14 x 9	290	140	-	-	-	-	-	-	-	-	-	-	-	-
6	150	610	613	610	275	F16	55	-	80	16 x 10	380	190	-	-	-	-	-	-	-	-	-	-	-	-
8	201	737	740	737	350	F25	63.5	-	102	15.88 x 15.88	470	593	-	-	-	-	-	-	-	-	-	-	-	-
10	252	838	841	838	360	F30	70	-	102	20 x 12	545	845	-	-	-	-	-	-	-	-	-	-	-	-
12	303	965	968	965	400	F30	70	-	102	20 x 12	610	1115	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-	322	1029	1038	1029	465	F35	88.9	-	134	22.23 x 15.88	640	2074
16	-	-	-	-	-	-	-	-	-	-	-	-	373	1130	1140	1130	485	F35	88.9	-	134	22.23 x 15.88	705	2385

ASME CLASS 900 (INCH)

SIZE	2-Piece												3-Piece											
	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#
NPS		RF	RTJ	BWE								FL		RF	RTJ	BWE								FL
2	1.94	14.5	14.63	14.5	5.43	F12	1.18	0.87	1.38	-	8.5	132	-	-	-	-	-	-	-	-	-	-	-	-
3	2.94	15	15.13	15	7.09	F16	1.57	-	1.97	0.47 x 0.31	9.5	194	-	-	-	-	-	-	-	-	-	-	-	-
4	3.94	18	18.13	18	9.45	F16	1.77	-	2.36	0.55 x 0.35	11.5	308	-	-	-	-	-	-	-	-	-	-	-	-
6	5.94	24	24.13	24	10.82	F16	2.16	-	3.15	0.63 x 0.39	15	418	-	-	-	-	-	-	-	-	-	-	-	-
8	7.94	29	29.13	29	13.78	F25	2.5	-	4.01	0.63 x 0.63	18.5	1305	-	-	-	-	-	-	-	-	-	-	-	-
10	9.94	33	33.13	33	14.17	F30	2.76	-	4.01	0.79 x 0.47	21.5	1859	-	-	-	-	-	-	-	-	-	-	-	-
12	11.94	38	38.13	38	15.75	F30	2.76	-	4.01	0.79 x 0.47	24	2453	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-	12.69	40.5	40.88	40.5	18.31	F35	3.5	-	5.27	0.88 x 0.63	25.25	4563
16	-	-	-	-	-	-	-	-	-	-	-	-	14.69	44.5	44.88	44.5	19.1	F35	3.5	-	5.27	0.88 x 0.63	27.75	5247

Approximate Value

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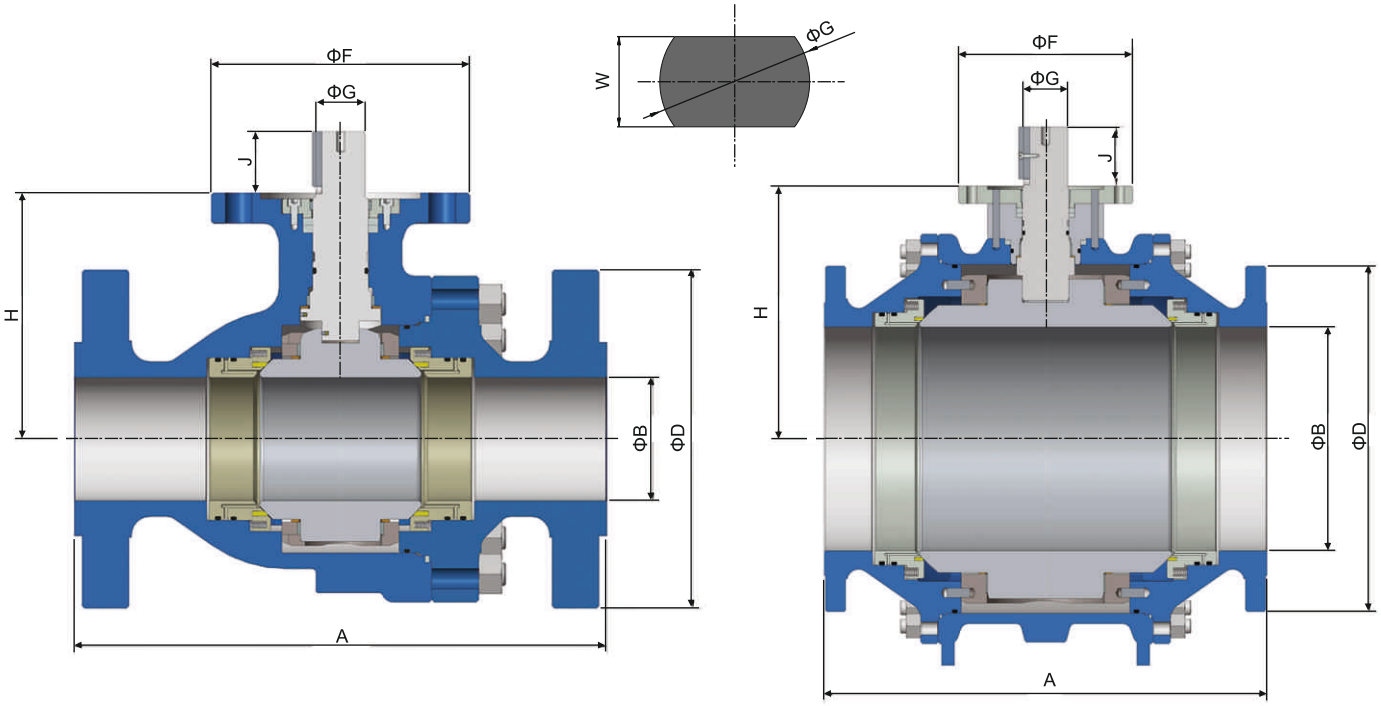
Engineering (Full Port)



ASME CLASS 1500 (mm)

SIZE	2-Piece												3-Piece											
	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg) #	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg) #
NPS		RF	RTJ	BWE								FL		RF	RTJ	BWE								FL
2	49	368	371	368	150	F12	30	22	35	-	215	62	-	-	-	-	-	-	-	-	-	-	-	-
3	74	470	473	470	180	F16	40	-	50	12 x 8	265	112	-	-	-	-	-	-	-	-	-	-	-	-
4	100	546	549	546	240	F16	45	-	60	14 x 9	310	200	-	-	-	-	-	-	-	-	-	-	-	-
6	144	705	711	705	325	F16	55	-	80	16 x 10	395	500	-	-	-	-	-	-	-	-	-	-	-	-
8	192	832	841	832	370	F30	63.5	-	102	15.88 x 15.88	485	1000	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	239	991	1000	991	470	F30	70	-	102	20 x 12	585	1580
12	-	-	-	-	-	-	-	-	-	-	-	-	287	1130	1146	1130	480	F35	88.9	-	134	22.23 x 15.88	675	2485

ASME CLASS 1500 (INCH)

SIZE	2-Piece												3-Piece											
	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS) #	ΦB	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS) #
NPS		RF	RTJ	BWE								FL		RF	RTJ	BWE								FL
2	1.94	14.5	14.63	14.5	5.91	F12	1.18	0.87	1.38	-	8.5	136	-	-	-	-	-	-	-	-	-	-	-	-
3	2.94	18.5	18.63	18.5	7.09	F16	1.57	-	1.97	0.47 x 0.32	10.5	246	-	-	-	-	-	-	-	-	-	-	-	-
4	3.94	21.5	21.63	21.5	9.45	F16	1.77	-	2.36	0.55 x 0.36	12.25	440	-	-	-	-	-	-	-	-	-	-	-	-
6	5.69	27.75	28	27.75	12.79	F16	2.16	-	3.15	0.63 x 0.39	15.5	1100	-	-	-	-	-	-	-	-	-	-	-	-
8	7.56	32.75	33.13	32.75	14.57	F30	2.5	-	4.01	0.63 x 0.63	19	2200	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	9.44	39	39.38	39	18.5	F30	2.76	-	4.01	0.79 x 0.47	23	3476
12	-	-	-	-	-	-	-	-	-	-	-	-	11.31	44.5	45.13	44.5	18.9	F35	3.5	-	5.27	0.88 x 0.63	26.5	5467

Approximate Value

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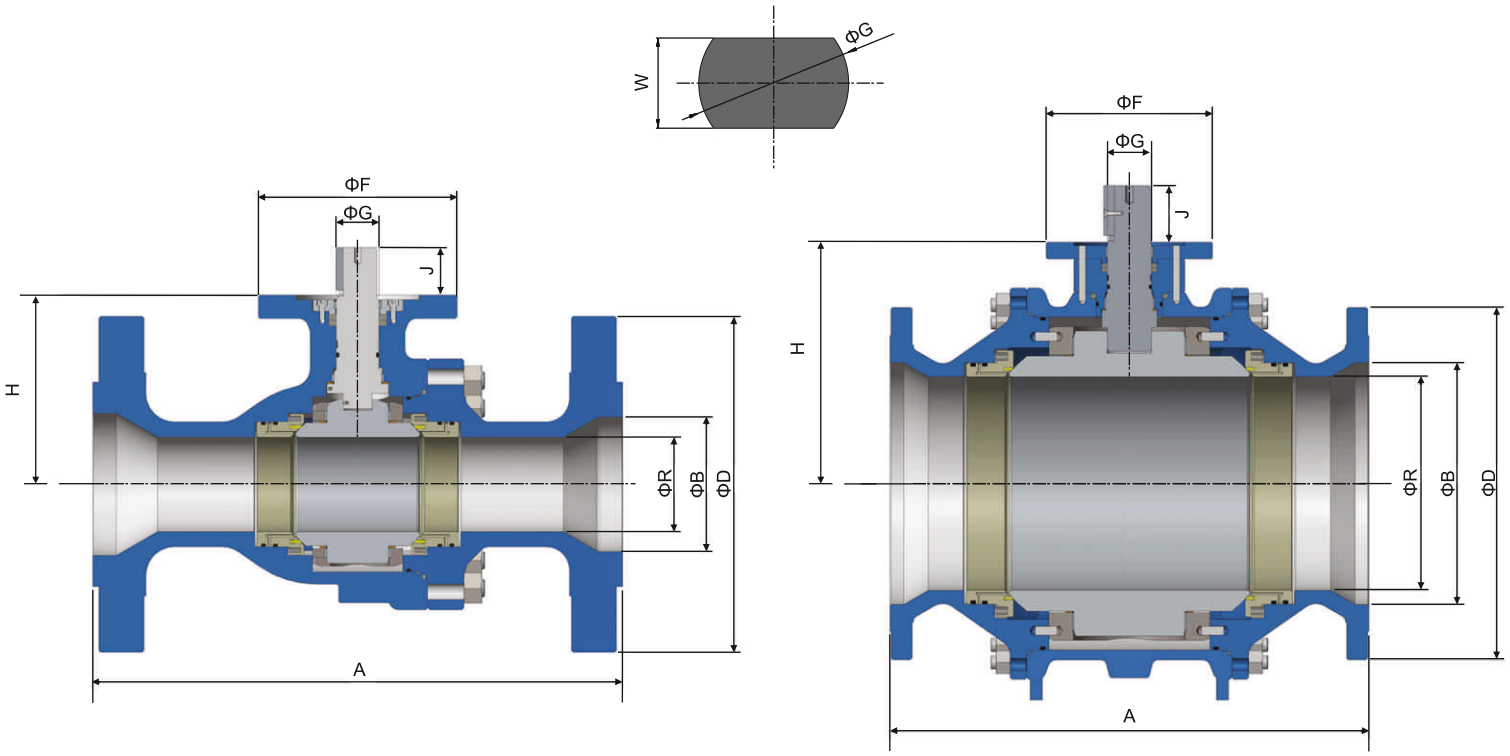
Engineering (Reduced Port)



ASME CLASS 150 (mm)

SIZE	2-Piece													3-Piece											
	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#
NPS			RF	RTJ	BWE								FL			RF	RTJ	BWE								FL
3 x 2	74	49	203	216	283	130	F10	30	22	35	-	190	15	-	-	-	-	-	-	-	-	-	-	-	-	-
4 x 3	100	74	229	241	305	160	F12	35	24	40	-	230	40	-	-	-	-	-	-	-	-	-	-	-	-	-
6 x 4	150	100	394	406	457	185	F12	35	24	40	-	280	64	-	-	-	-	-	-	-	-	-	-	-	-	-
8 x 6	201	150	457	470	521	250	F12	40	29	40	-	345	131	-	-	-	-	-	-	-	-	-	-	-	-	-
10 x 8	252	201	533	546	559	302	F16	55	-	80	16 x 10	405	250	-	-	-	-	-	-	-	-	-	-	-	-	-
12 x 10	303	252	610	622	635	340	F16	55	-	80	16 x 10	485	351	-	-	-	-	-	-	-	-	-	-	-	-	-
14 x 10	334	252	686	699	762	340	F16	55	-	80	16 x 10	535	400	-	-	-	-	-	-	-	-	-	-	-	-	-
16 x 12	385	303	762	775	838	375	F25	63.5	-	102	15.88 x 15.88	595	538	-	-	-	-	-	-	-	-	-	-	-	-	-
18 x 16	-	-	-	-	-	-	-	-	-	-	-	-	-	436	385	864	876	914	460	F25	76.2	-	102	19.05 x 19.05	635	1032
20 x 16	-	-	-	-	-	-	-	-	-	-	-	-	-	487	385	914	927	991	460	F25	76.2	-	102	19.05 x 19.05	700	1200
24 x 20	-	-	-	-	-	-	-	-	-	-	-	-	-	589	487	1067	1080	1143	525	F30	88.9	-	134	22.23 x 15.88	815	2030

ASME CLASS 150 (INCH)

SIZE	2-Piece													3-Piece											
	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#
NPS			RF	RTJ	BWE								FL			RF	RTJ	BWE								FL
3 x 2	2.94	1.94	8	8.5	11.13	5.12	F10	1.18	0.87	1.38	-	7.5	33	-	-	-	-	-	-	-	-	-	-	-	-	-
4 x 3	3.94	2.94	9	9.5	12	6.3	F12	1.38	0.94	1.57	-	9	88	-	-	-	-	-	-	-	-	-	-	-	-	-
6 x 4	5.94	3.94	15.5	16	18	7.28	F12	1.38	0.94	1.57	-	11	141	-	-	-	-	-	-	-	-	-	-	-	-	-
8 x 6	7.94	5.94	18	18.5	20.5	9.84	F12	1.57	1.18	1.57	-	13.5	288	-	-	-	-	-	-	-	-	-	-	-	-	-
10 x 8	9.94	7.94	21	21.5	22	11.89	F16	2.16	-	3.15	0.63 x 0.39	16	550	-	-	-	-	-	-	-	-	-	-	-	-	-
12 x 10	11.94	9.94	24	24.5	25	13.39	F16	2.16	-	3.15	0.63 x 0.39	19	772	-	-	-	-	-	-	-	-	-	-	-	-	-
14 x 10	13.19	9.94	27	27.5	30	13.39	F16	2.16	-	3.15	0.63 x 0.39	21	880	-	-	-	-	-	-	-	-	-	-	-	-	-
16 x 12	15.19	11.94	30	30.5	33	14.75	F25	2.5	-	4.01	0.63 x 0.63	23.5	1184	-	-	-	-	-	-	-	-	-	-	-	-	-
18 x 16	-	-	-	-	-	-	-	-	-	-	-	-	-	17.19	15.19	34	34.5	36	18.11	F25	3	-	4.01	0.75 x 0.75	25	2270
20 x 16	-	-	-	-	-	-	-	-	-	-	-	-	-	19.19	15.19	36	36.5	39	18.11	F25	3	-	4.01	0.75 x 0.75	27.5	2640
24 x 20	-	-	-	-	-	-	-	-	-	-	-	-	-	23.19	19.19	42	42.5	45	20.67	F30	3.5	-	5.27	0.88 x 0.63	32	4466

Approximate Value

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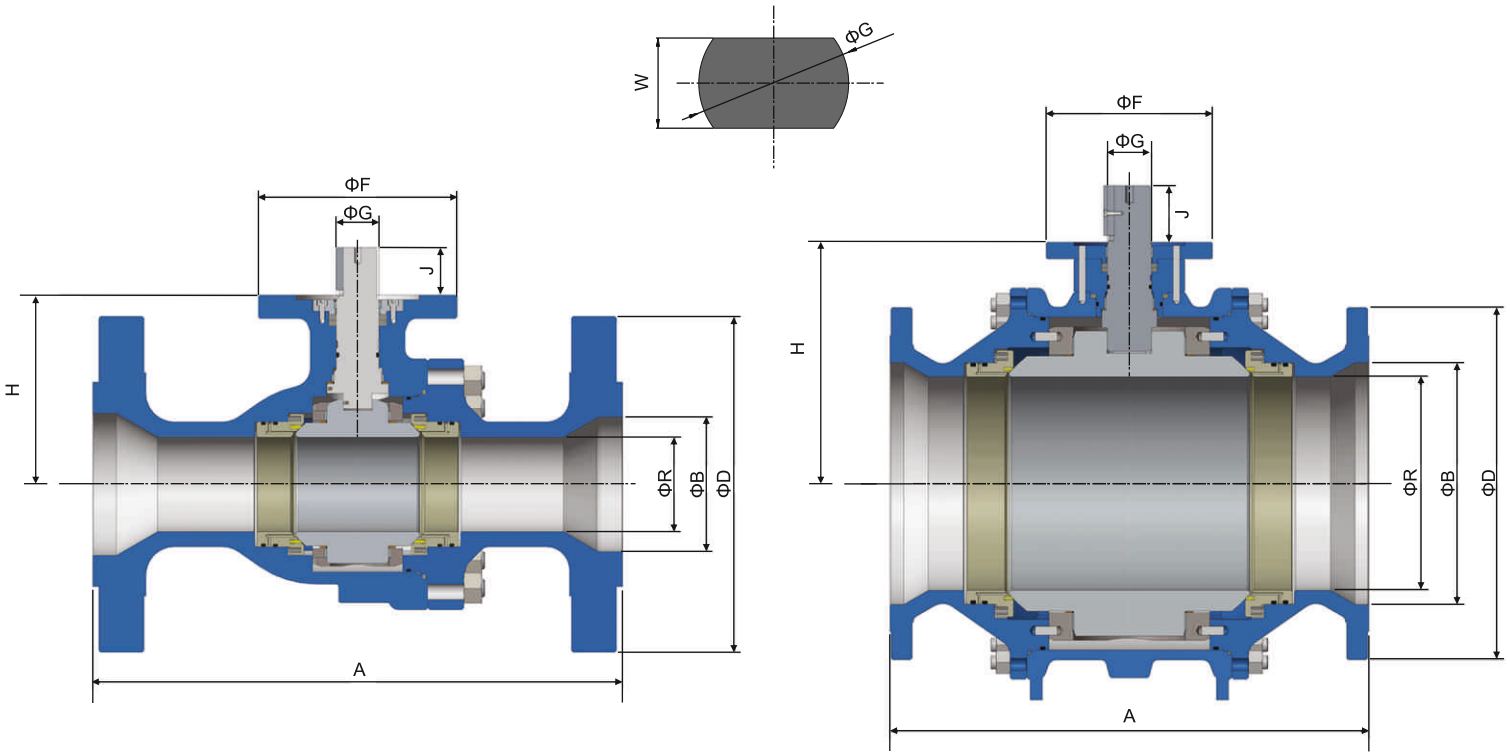
Engineering (Reduced Port)



ASME CLASS 300 (mm)

SIZE	2-Piece													3-Piece											
	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#
NPS			RF	RTJ	BWE								FL			RF	RTJ	BWE								FL
2 x 1.5	49	39	216	232	216	110	F10	30	22	35	-	165	18	-	-	-	-	-	-	-	-	-	-	-	-	-
3 x 2	74	49	283	298	283	130	F10	30	22	35	-	210	30	-	-	-	-	-	-	-	-	-	-	-	-	-
4 x 3	100	74	305	321	305	160	F12	35	24	40	-	255	51	-	-	-	-	-	-	-	-	-	-	-	-	-
6 x 4	150	100	403	419	457	185	F12	35	24	40	-	320	91	-	-	-	-	-	-	-	-	-	-	-	-	-
8 x 6	201	150	502	518	521	250	F16	45	-	60	14 x 9	380	181	-	-	-	-	-	-	-	-	-	-	-	-	-
10 x 8	252	201	568	584	559	302	F16	55	-	80	16 x 10	445	290	-	-	-	-	-	-	-	-	-	-	-	-	-
12 x 10	303	252	648	664	635	340	F16	55	-	80	16 x 10	520	431	-	-	-	-	-	-	-	-	-	-	-	-	-
14 x 10	334	303	762	778	762	340	F16	55	-	102	16 x 10	585	500	-	-	-	-	-	-	-	-	-	-	-	-	-
16 x 12	385	303	838	854	838	375	F25	63.5	-	102	15.88 x 15.88	650	800	-	-	-	-	-	-	-	-	-	-	-	-	-
18 x 16	-	-	-	-	-	-	-	-	-	-	-	-	-	436	385	914	930	914	460	F25	76.2	-	102	19.05 x 19.05	710	1400
20 x 16	-	-	-	-	-	-	-	-	-	-	-	-	-	487	385	991	1010	991	460	F25	76.2	-	102	19.05 x 19.05	775	1465
24 x 20	-	-	-	-	-	-	-	-	-	-	-	-	-	589	487	1143	1165	1143	565	F35	88.9	-	134	22.23 x 15.88	915	2400

ASME CLASS 300 (INCH)

SIZE	2-Piece													3-Piece											
	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#
NPS			RF	RTJ	BWE								FL			RF	RTJ	BWE								FL
2 x 1.5	1.94	1.5	8.5	9.13	8.5	4.33	F10	1.18	0.87	1.38	-	6	40	-	-	-	-	-	-	-	-	-	-	-	-	-
3 x 2	2.94	1.94	11.13	11.75	11.13	5.12	F10	1.18	0.87	1.38	-	8.25	66	-	-	-	-	-	-	-	-	-	-	-	-	-
4 x 3	3.94	2.94	12	12.63	12	6.3	F12	1.38	0.94	1.57	-	10	112	-	-	-	-	-	-	-	-	-	-	-	-	-
6 x 4	5.94	3.94	15.88	16.5	18	7.28	F12	1.38	0.94	1.57	-	12.5	200	-	-	-	-	-	-	-	-	-	-	-	-	-
8 x 6	7.94	5.94	19.75	20.38	20.5	9.84	F16	1.77	-	2.36	0.55 x 0.36	15	398	-	-	-	-	-	-	-	-	-	-	-	-	-
10 x 8	9.94	7.94	22.38	23	22	11.89	F16	2.16	-	3.15	0.63 x 0.39	17.5	638	-	-	-	-	-	-	-	-	-	-	-	-	-
12 x 10	11.94	9.94	25.5	26.13	25	13.39	F16	2.16	-	3.15	0.63 x 0.39	20.5	948	-	-	-	-	-	-	-	-	-	-	-	-	-
14 x 10	13.19	9.94	30	30.63	30	13.39	F16	2.16	-	3.2	0.63 x 0.39	23	1100	-	-	-	-	-	-	-	-	-	-	-	-	-
16 x 12	15.19	11.94	33	33.63	33	14.76	F25	2.5	-	4.01	0.63 x 0.63	25.5	1760	-	-	-	-	-	-	-	-	-	-	-	-	-
18 x 16	-	-	-	-	-	-	-	-	-	-	-	-	-	17.19	15.19	36	36.63	36	18.11	F25	3	-	4.01	0.75 x 0.75	28	3080
20 x 16	-	-	-	-	-	-	-	-	-	-	-	-	-	19.19	15.19	39	39.75	39	18.11	F25	3	-	4.01	0.75 x 0.75	30.5	3223
24 x 20	-	-	-	-	-	-	-	-	-	-	-	-	-	23.19	19.19	45	45.88	45	22.24	F35	3.5	-	5.27	0.88 x 0.63	36	5280

Approximate Value

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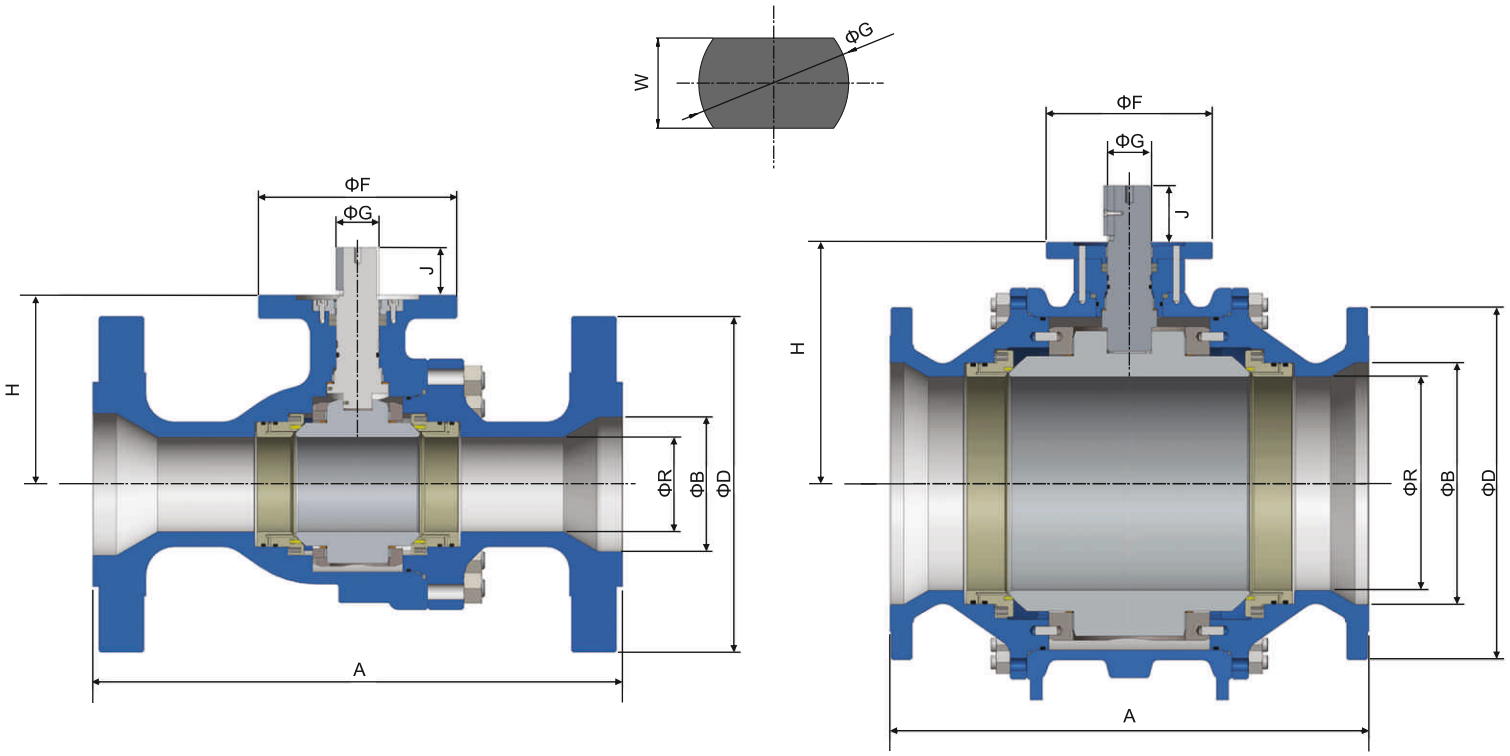
Engineering (Reduced Port)



ASME CLASS 600 (mm)

SIZE	2-Piece													3-Piece												
	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#
NPS			RF	RTJ	BWE								FL			RF	RTJ	BWE								FL
2 x 1.5	49	38	292	295	292	110	F10	30	22	35	-	165	25	-	-	-	-	-	-	-	-	-	-	-	-	-
3 x 2	74	49	356	359	356	140	F10	30	22	35	-	210	43	-	-	-	-	-	-	-	-	-	-	-	-	-
4 x 3	100	74	432	435	432	165	F12	35	24	40	-	275	88	-	-	-	-	-	-	-	-	-	-	-	-	-
6 x 4	150	100	559	562	559	200	F16	40	-	50	12 x 8	355	133	-	-	-	-	-	-	-	-	-	-	-	-	-
8 x 6	201	150	660	664	660	250	F16	45	-	60	14 x 9	420	304	-	-	-	-	-	-	-	-	-	-	-	-	-
10 x 8	252	201	787	791	787	302	F16	55	-	80	16 x 10	510	600	-	-	-	-	-	-	-	-	-	-	-	-	-
12 x 10	303	252	838	841	838	343	F25	63.5	-	102	15.88 x 15.88	560	980	-	-	-	-	-	-	-	-	-	-	-	-	-
14 x 10	334	252	889	892	889	343	F25	63.5	-	102	15.88 x 15.88	605	1000	-	-	-	-	-	-	-	-	-	-	-	-	-
16 x 12	385	334	991	994	991	415	F25	70	-	102	20 x 12	685	1200	-	-	-	-	-	-	-	-	-	-	-	-	-
18 x 16	-	-	-	-	-	-	-	-	-	-	-	-	-	436	385	1092	1095	1092	460	F30	88.9	-	134	22.23 x 15.88	745	2150
20 x 16	-	-	-	-	-	-	-	-	-	-	-	-	-	487	385	1194	1200	1194	460	F30	88.9	-	134	22.23 x 15.88	815	2600
24 x 20	-	-	-	-	-	-	-	-	-	-	-	-	-	589	487	1397	1407	1397	595	F35	120	-	150	32 x 18	940	3430

ASME CLASS 600 (INCH)

SIZE	2-Piece													3-Piece												
	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#
NPS			RF	RTJ	BWE								FL			RF	RTJ	BWE								FL
2 x 1.5	1.94	1.5	11.5	11.63	11.5	4.33	F10	1.18	0.87	1.38	-	6	55	-	-	-	-	-	-	-	-	-	-	-	-	-
3 x 2	2.94	1.94	14	14.13	14	5.51	F10	1.18	0.87	1.38	-	8.25	95	-	-	-	-	-	-	-	-	-	-	-	-	-
4 x 3	3.94	2.94	17	17.13	17	6.5	F12	1.38	0.94	1.57	-	10.75	194	-	-	-	-	-	-	-	-	-	-	-	-	-
6 x 4	5.94	3.94	22	22.13	22	7.87	F16	1.57	-	1.97	0.47 x 0.31	14	293	-	-	-	-	-	-	-	-	-	-	-	-	-
8 x 6	7.94	5.94	26	26.13	26	9.84	F16	1.77	-	2.36	0.55 x 0.35	16.5	669	-	-	-	-	-	-	-	-	-	-	-	-	-
10 x 8	9.94	7.94	31	31.13	31	11.89	F16	2.16	-	3.15	0.63 x 0.39	20	1320	-	-	-	-	-	-	-	-	-	-	-	-	-
12 x 10	11.94	9.94	33	33.13	33	13.5	F25	2.5	-	4.01	0.63 x 0.63	22	2156	-	-	-	-	-	-	-	-	-	-	-	-	-
14 x 10	13.19	9.94	35	35.13	35	13.5	F25	2.5	-	4.01	0.63 x 0.63	23.75	2200	-	-	-	-	-	-	-	-	-	-	-	-	-
16 x 12	15.19	11.94	39	39.13	39	15.35	F25	2.76	-	4.01	0.79 x 0.47	27	2640	-	-	-	-	-	-	-	-	-	-	-	-	-
18 x 16	-	-	-	-	-	-	-	-	-	-	-		-	17.19	15.19	43	43.13	43	18.11	F30	3.5	-	5.27	0.88 x 0.63	29.25	4730
20 x 16	-	-	-	-	-	-	-	-	-	-	-		-	19.19	15.19	47	47.25	47	18.11	F30	3.5	-	5.27	0.88 x 0.63	32	5720
24 x 20	-	-	-	-	-	-	-	-	-	-	-		-	23.19	19.19	55	55.38	55	23.43	F35	4.72	-	5.9	1.26 x 0.71	37	7546

Approximate Value

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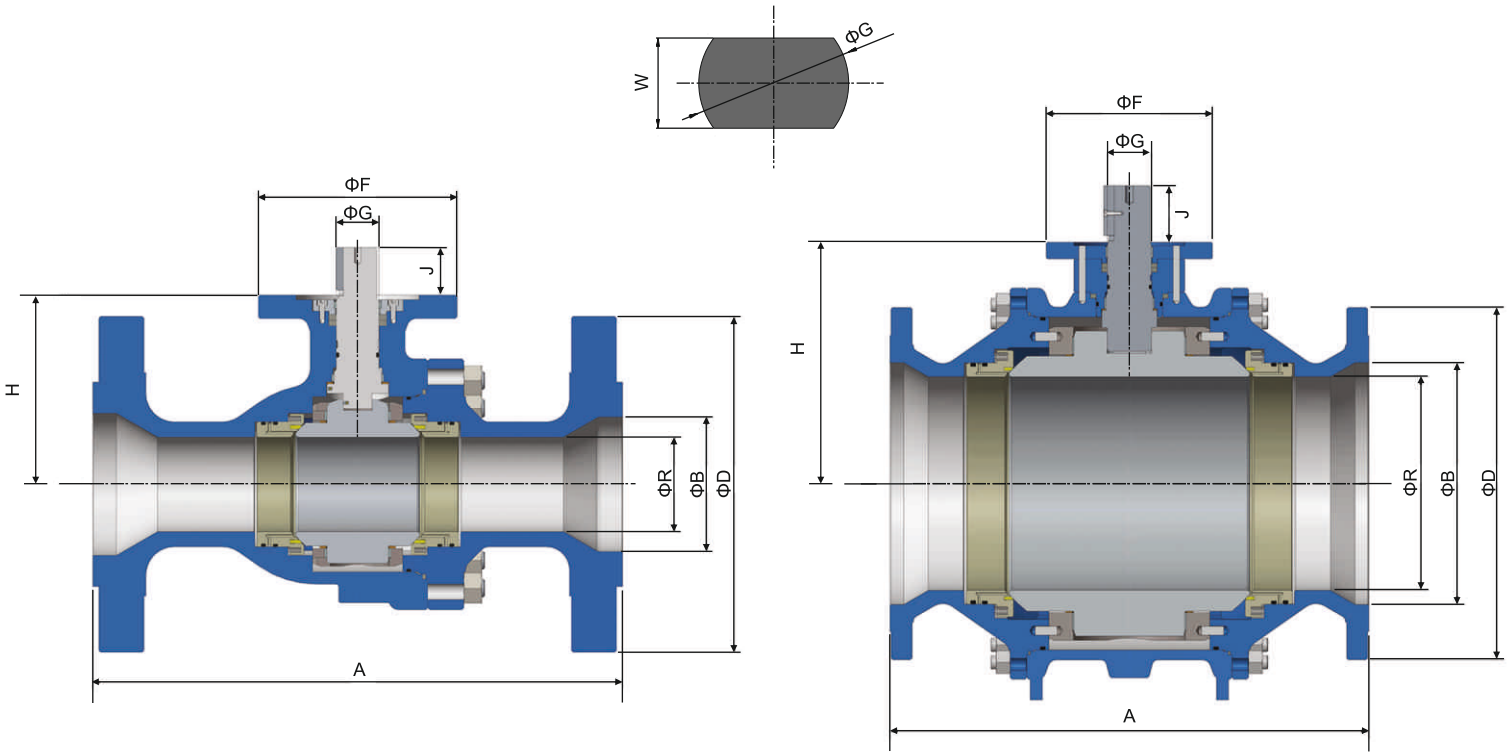
Engineering (Reduced Port)



ASME CLASS 900 (mm)

SIZE	2-Piece													3-Piece												
	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)#
NPS			RF	RTJ	BWE								FL			RF	RTJ	BWE								FL
2x1.5	49	38	368	371	368	110	F12	30	22	35	-	215	34	-	-	-	-	-	-	-	-	-	-	-	-	-
3x2	74	49	381	384	381	138	F12	30	22	35	-	240	59	-	-	-	-	-	-	-	-	-	-	-	-	-
4x3	100	74	457	460	457	180	F16	40	-	50	12x8	290	115	-	-	-	-	-	-	-	-	-	-	-	-	-
6x4	150	100	610	613	610	240	F16	45	-	60	14x9	380	170	-	-	-	-	-	-	-	-	-	-	-	-	-
8x6	201	150	737	740	737	275	F16	55	-	80	16x10	470	348	-	-	-	-	-	-	-	-	-	-	-	-	-
10x8	252	201	838	841	838	350	F25	63.5	-	102	15.88x15.88	545	783	-	-	-	-	-	-	-	-	-	-	-	-	-
12x10	303	252	965	968	965	360	F30	70	-	102	20x12	610	984	-	-	-	-	-	-	-	-	-	-	-	-	-
14x10	322	252	1029	1038	1029	360	F30	70	-	102	20x12	640	1115	-	-	-	-	-	-	-	-	-	-	-	-	-
16x12	-	-	-	-	-	-	-	-	-	-	-	-	-	373	303	1130	1140	1130	400	F30	70	-	102	20x12	705	1440
18x16	-	-	-	-	-	-	-	-	-	-	-	-	-	423	373	1219	1232	1219	465	F35	88.9	-	134	22.23x15.88	785	2650

ASME CLASS900 (INCH)

SIZE	2-Piece													3-Piece												
	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#	ΦB	ΦR	A			H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)#
NPS			RF	RTJ	BWE								FL			RF	RTJ	BWE								FL
2x1.5	1.94	1.5	14.5	14.63	14.5	4.33	F12	1.18	0.87	1.38	-	8.5	75	-	-	-	-	-	-	-	-	-	-	-	-	-
3x2	2.94	1.94	15	15.13	15	5.43	F12	1.18	0.87	1.38	-	9.5	130	-	-	-	-	-	-	-	-	-	-	-	-	-
4x3	3.94	2.94	18	18.13	18	7.09	F16	1.57	-	1.97	0.47x0.32	11.5	253	-	-	-	-	-	-	-	-	-	-	-	-	-
6x4	5.94	3.94	24	24.13	24	9.45	F16	1.77	-	2.36	0.55x0.36	15	374	-	-	-	-	-	-	-	-	-	-	-	-	-
8x6	7.94	5.94	29	29.13	29	10.82	F16	2.16	-	3.15	0.63x0.39	18.5	766	-	-	-	-	-	-	-	-	-	-	-	-	-
10x8	9.94	7.94	33	33.13	33	13.78	F25	2.5	-	4.01	0.63 x 0.63	21.5	1723	-	-	-	-	-	-	-	-	-	-	-	-	-
12x10	11.94	9.94	38	38.13	38	14.17	F30	2.76	-	4.01	0.79 x 0.47	24	2165	-	-	-	-	-	-	-	-	-	-	-	-	-
14x10	12.69	9.94	40.5	40.88	40.5	14.17	F30	2.76	-	4.01	0.79 x 0.47	25.25	2453	-	-	-	-	-	-	-	-	-	-	-	-	-
16x12	-	-	-	-	-	-	-	-	-	-	-	-	-	14.69	11.94	44.5	44.88	44.5	15.75	F30	2.76	-	4.01	0.79 x 0.47	27.75	3168
18x16	-	-	-	-	-	-	-	-	-	-	-	-	-	16.69	14.69	48	48.5	48	19.1	F35	3.5	-	5.27	0.88 x 0.63	31	5830

Approximate Value

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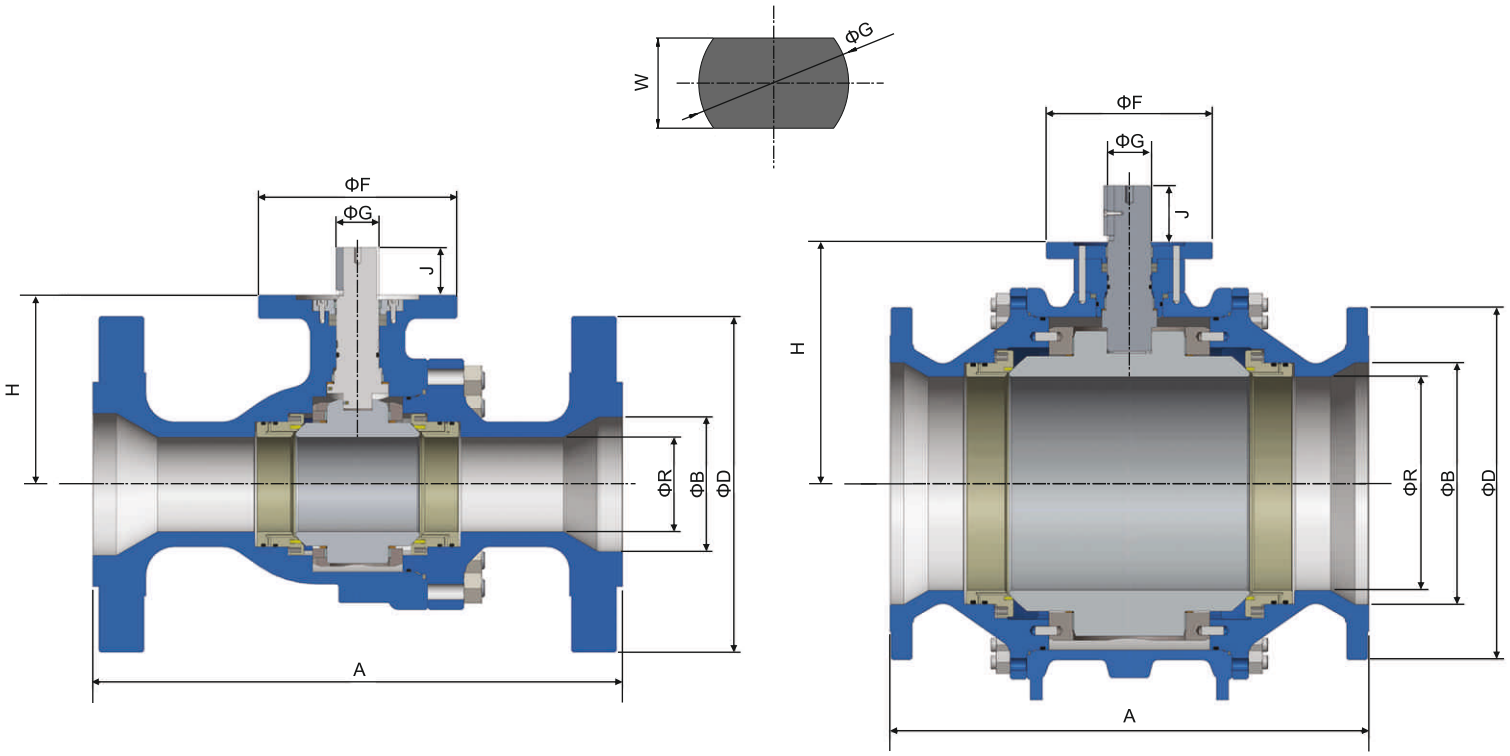
Engineering (Reduced Port)



ASME CLASS 1500 (mm)

SIZE	2-Piece													2-Piece												
NPS	ΦB	ΦR	A RF	A RTJ	A BWE	H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)# FL	ΦB	ΦR	A RF	A RTJ	A BWE	H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(Kg)# FL
2x1.5	49	38	368	371	368	110	F12	30	22	35	-	215	40	-	-	-	-	-	-	-	-	-	-	-	-	-
3x2	74	49	470	473	470	150	F12	30	22	35	-	265	75	-	-	-	-	-	-	-	-	-	-	-	-	-
4x3	100	74	546	549	546	180	F16	40	-	50	12 x 8	310	130	-	-	-	-	-	-	-	-	-	-	-	-	-
6x4	144	100	705	711	705	240	F16	45	-	60	14 x 9	395	270	-	-	-	-	-	-	-	-	-	-	-	-	-
8x6	192	144	832	841	832	325	F16	55	-	80	16 x 10	485	600	-	-	-	-	-	-	-	-	-	-	-	-	-
10x8	239	192	991	1000	991	370	F30	63.5	-	102	15.88 x 15.88	585	1200	-	-	-	-	-	-	-	-	-	-	-	-	-
12x10	-	-	-	-	-	-	-	-	-	-	-	-	-	287	239	1130	1146	1130	470	F30	70	-	102	20 x 12	675	1800
14x10	-	-	-	-	-	-	-	-	-	-	-	-	-	315	239	1257	1276	1257	480	F30	70	-	102	20 x 12	750	2050

ASME CLASS 1500 (INCH)

SIZE	2-Piece													2-Piece												
NPS	ΦB	ΦR	A RF	A RTJ	A BWE	H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)# FL	ΦB	ΦR	A RF	A RTJ	A BWE	H	ISO TOP	ΦG	W	J	KEY SIZE	ΦD	WT(LBS)# FL
2x1.5	1.94	1.5	14.5	14.63	14.5	4.33	F12	1.18	0.87	1.38	-	8.5	88	-	-	-	-	-	-	-	-	-	-	-	-	-
3x2	2.94	1.94	18.5	18.63	18.5	5.91	F12	1.18	0.87	1.38	-	10.5	165	-	-	-	-	-	-	-	-	-	-	-	-	-
4x3	3.94	2.94	21.5	21.63	21.5	7.09	F16	1.57	-	1.97	0.47 x 0.32	12.3	286	-	-	-	-	-	-	-	-	-	-	-	-	-
6x4	5.69	3.94	27.75	28	27.75	9.45	F16	1.77	-	2.36	0.55 x 0.36	15.5	594	-	-	-	-	-	-	-	-	-	-	-	-	-
8x6	7.56	5.69	32.75	33.13	32.75	12.79	F16	2.16	-	3.15	0.63 x 0.39	19	1320	-	-	-	-	-	-	-	-	-	-	-	-	-
10x8	9.44	7.56	39	39.38	39	14.57	F30	2.5	-	4.01	0.63 x 0.63	23	2640	-	-	-	-	-	-	-	-	-	-	-	-	-
12x10	-	-	-	-	-	-	-	-	-	-	-	-	-	11.31	9.44	44.5	45.13	44.5	18.5	F30	3	-	4.01	0.79 x 0.47	26.5	3960
14x10	-	-	-	-	-	-	-	-	-	-	-	-	-	12.44	9.44	49.5	50.25	49.5	18.5	F30	3	-	4.01	0.79 x 0.47	29.5	4510

Approximate Value

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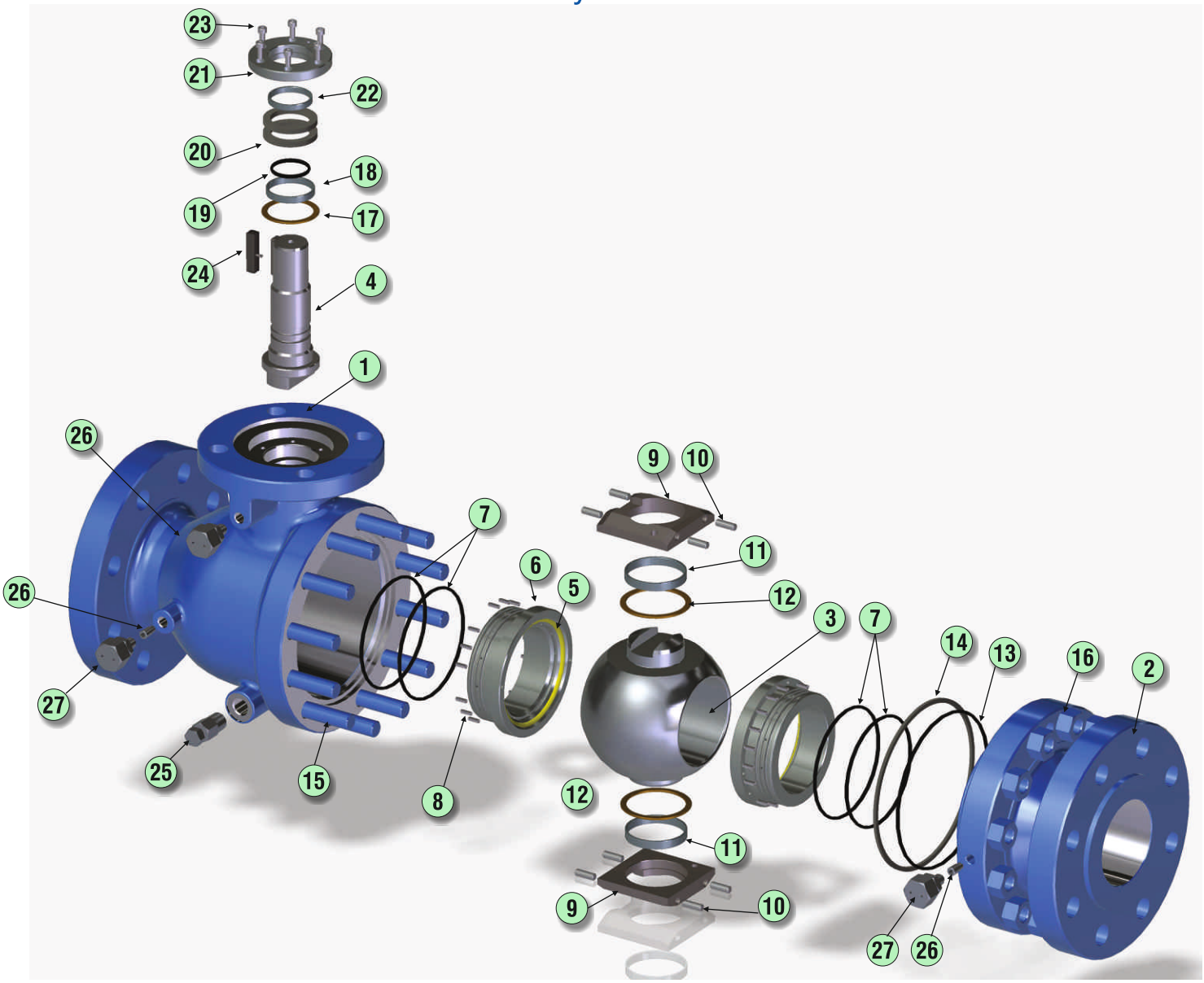
Materials of Construction: Two-Piece Body

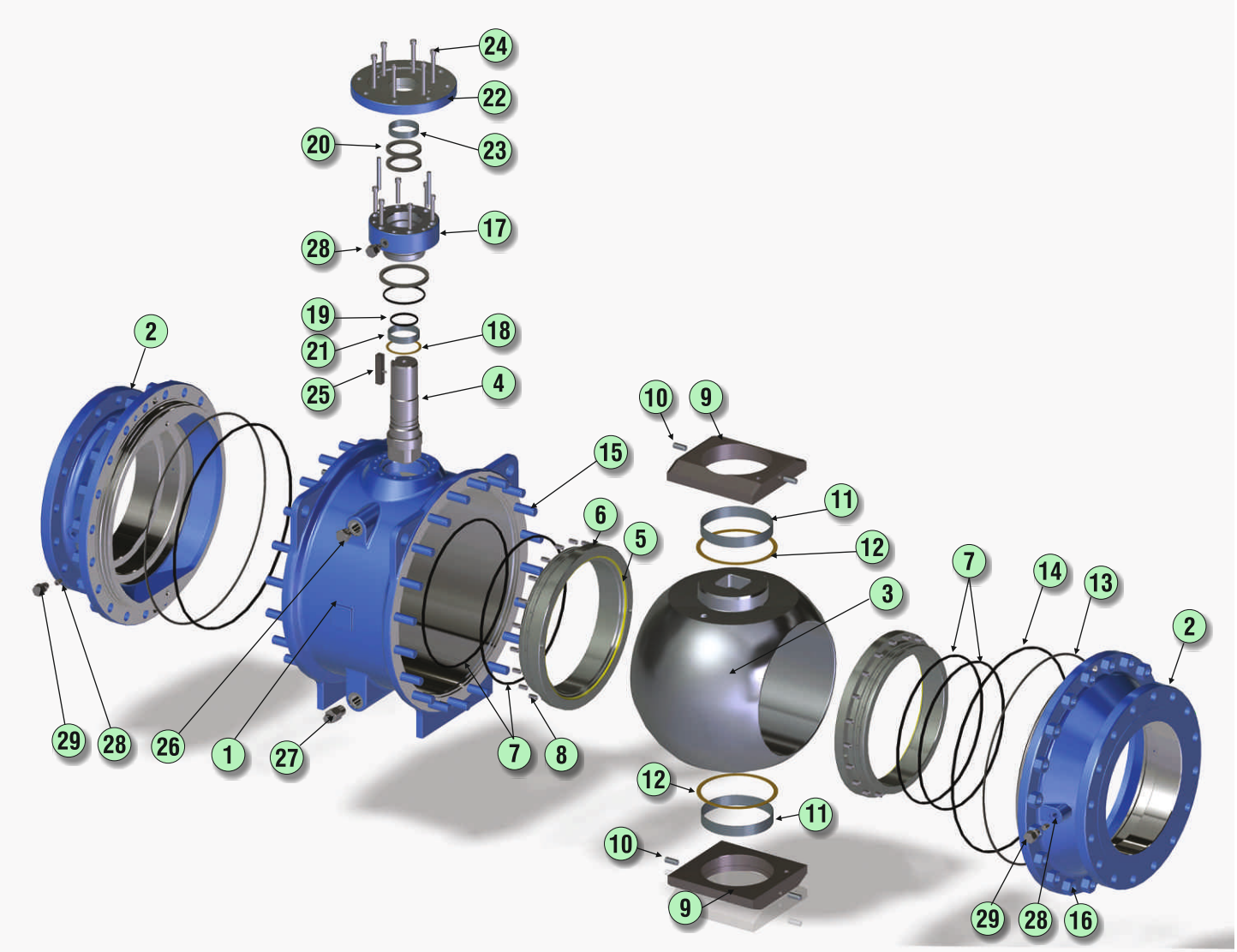


MATERIALS OF CONSTRUCTION

NO.	COMPONENTS	MATERIALS	NO.	COMPONENTS	MATERIALS
1	**Body**	A 216 WCB,WCC / A 352 LCB,LCC /A 351 CF8M ,CF8,CF3M /DUPLEX SS /SUPER DUPLEX	17	Stem Thrust Bearing	SS-backed PTFE
2	**Connector**		18	Stem Bearing	SS-backed PTFE
3	**Ball**	A105+ENP/A216 WCC+ENP/A 352 LCB+ENP/A 351 CF8M/ A 351 CF3M/A 217 CA 15/DUPLEX SS / SUPER DUPLEX	19	Stem Seal	FKM (Viton®)/ HNBR
4	**Stem**	AISI 4140 + ENP/ A 479 SS 410,SS 316,SS304,XM19 / A564 TYPE 630	20	Stem Packing	Graphite
5	**Seat Insert**	RPTFE/Devlon®/ PEEK / Viton	21	Gland	SS 316
6	**Seat Ring**	A 105+ENP/A182 LF2+ENP/A182 F316/F316L/F6A/F51/F55	22	Gland Bearing	SS-backed PTFE
7	**Seat Seal**	FKM (Viton®)/ HNBR	23	Soc Hd Cap Screw	A2-70(SS304)
8	**Seat Spring**	Inconel B 637 X-750,A 313 SS 302	24	Key	EN8
9	**Trunnion**	A320 CS/A 240 SS316 /DUPLEX SS /SUPER DUPLEX	25	Bleed Fitting/Vent Fitting	SS316
10	**Pin**	SS 316	26	Check Valve	SS316
11	**Trunnion Bearing**	SS-backed PTFE	27	Sealent fitting	SS316
12	**Thrust Bearing**	SS-backed PTFE			
13	**Connector Seal**	FKM (Viton®)/ HNBR			
14	**Body Gaket**	Spirally-wound SS316 with Graphite Filler			
15	**Stud**	ASTM A193 B7, B7M,B8M,B8MA/A320 L7,L7M			
16	**Hex Nut**	ASTM A194 Gr. 2H, 2HM, 8M, 8MA, 7, 7M			

Note :- High Grade 3mil (75 Micron) ENP Carbon steel stems and balls are standard.

Materials of Construction: Three-Piece Body



MATERIALS OF CONSTRUCTION

NO.	COMPONENTS	MATERIALS	NO.	COMPONENTS	MATERIALS
1	Body	A 216 WCB,WCC/A 352 LCB,LCC/A 351 CF8M ,CF8,CF3M /A995 4A,6A/A 105/A 182 LF2+ENP/ A 182 F316 / F316L/ F6A /F51/F55	17	Stem Housing	A 216 WCB,WCC/A 352 LCB,LCC/A 351 CF8M, CF8,CF3M /A995 4A,6A/A105/A182 LF2+ENP/ A 182 F316 / F316L/ F6A /F51/F55
2	Connector				
3	Ball	A105 + ENP/A216 WCC + ENP/A 352 LCB+ENP/A 351 CF8M/A 351 CF3M/A 217 CA 15/DUPLEX SS /ASTM A182	18	Stem Thrust Bearing	SS-backed PTFE
4	Stem	AISI 4140 + ENP/ A 479 SS 410,SS 316,SS304,XM19 / A 564 TYPE 630	19	Stem Seal	FKM (Viton®)/ HNBR
5	Seat Insert	RPTFE/Devlon®/ PEEK / Viton	20	Stem Packing	Graphite
6	Seat Ring	A105+ENP/A 182 LF2+ENP/A 182 F316/F316L/F6A/F51/F55	21	Stem Bearing	SS-backed PTFE
7	Seat Seal	FKM (Viton®)/ HNBR	22	ISO plate	A320 CS/A 240 SS316 /DUPLEX SS /SUPER DUPLEX
8	Seat Spring	Inconel B 637 X-750,A 313 SS 302	23	Gland Bearing	SS-backed PTFE
9	Trunnion	A320 CS/A 240 SS316 /DUPLEX SS /SUPER DUPLEX	24	Soc Hd Cap Screw	A2-70(SS304)
10	Pin	SS316	25	Key	EN8
11	Trunnion Bearing	SS-backed PTFE	26	Vent Fitting	SS316
12	Thrust Bearing	SS-backed PTFE	27	Bleed Fitting	SS316
13	Connector Seal	FKM (Viton®)/ HNBR	28	Check Valve	SS316
14	Body Gaket	Spirally-wound SS316 with Graphite Filler	29	Sealent fitting	SS316
15	Stud	ASTM A193 B7, B7M,B8M,B8MA/A320 L7,L7M			
16	Hex Nut	ASTM A194 Gr. 2H, 2HM, 8M, 8MA, 7,7M			

Note :- High Grade 3mil (75 Micron) ENP Carbon steel stems and balls are standard.

TORQUE VALUES (Nm/ In-lbs)

SIZE		TORQUE TYPE	ASME PRESSURE CLASS									
			150		300		600		900		1500	
INCH	DN		Nm	In-lbs	Nm	In-lbs	Nm	In-lbs	Nm	In-lbs	Nm	In-lbs
* 1½"	40	BTO	-	-	99	717	99	876	111	982	162	1434
		ETC	-	-	65	575	79	699	89	788	130	1151
2"	50	BTO	68	602	84	743	108	956	133	1177	281	2487
		ETC	54	478	67	593	87	770	106	938	225	1991
3"	80	BTO	168	1487	234	2071	316	2797	427	3779	593	5248
		ETC	135	1195	187	1655	253	2239	342	3027	474	4195
4"	100	BTO	272	2407	359	3177	460	4071	599	5302	922	8160
		ETC	218	1929	287	2540	368	3257	479	4239	737	6523
6"	150	BTO	468	4142	745	6594	1193	10559	1639	14506	2541	22490
		ETC	374	3310	596	5275	953	8435	1311	11603	2033	17994
8"	200	BTO	871	7709	1382	12232	2392	21170	3289	29110	5293	46847
		ETC	698	6178	1105	9780	1914	16940	2632	23295	4216	37315
10"	250	BTO	1177	10417	1823	16135	3105	27482	4234	37474	6766	59884
		ETC	942	8337	1445	12789	2459	21764	3387	29977	5413	47909
12"	300	BTO	1467	12984	2208	19542	3687	32633	5442	48166	12300	108864
		ETC	1174	10391	1766	15630	2949	26101	4354	38536	9840	87091
14"	350	BTO	2614	23136	3852	34093	6923	61274	12982	114900		
		ETC	2091	18507	3083	27287	5538	49015	10446	92455		
16"	400	BTO	3545	31376	5305	46953	8850	78329	18867	166987		
		ETC	2835	25092	4245	37571	7081	62672	15122	133841		
18"	450	BTO	4905	43413	7757	68655	13599	120361				
		ETC	3944	34907	6205	54919	10879	96287				
20"	500	BTO	5968	52821	10268	90880	19696	174324				
		ETC	4774	42253	8215	72709	15756	139452				
24"	600	BTO	11571	102412	18253	161553	31622	279878				
		ETC	9256	81923	14601	129230	25297	223897				

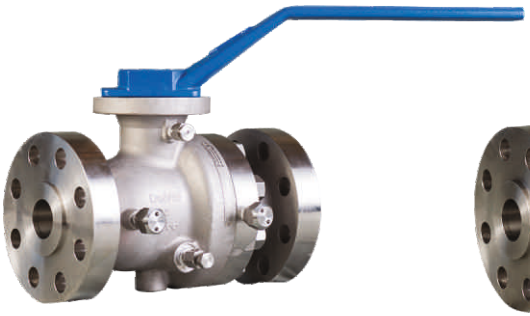
* Applies to 2" reduced port

BTO : Break To Open Torque ETC : End To Close Torque

Note:

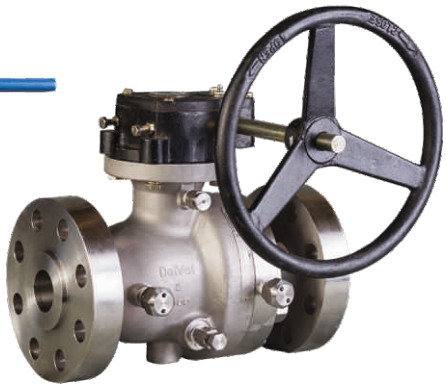
1) Torque Values are Primary Soft Seated valves with seat Insert material as Devlon / RTFE / Nylon 12 .
2) Torque Values with PEEK seat insert are 100% higher than the above corresponding values.
3) Torque Values are at ambient temperature, media being clear water without any factor of safety.
4) Above Torque Values are indicative and for reference only. Actuator sizing torque will depend on service media.
5) For reduced port valves, consider torque values corresponding to the lower size e.g. For 12" x 10" reduced port value consider torque value corresponding to 10".

Operator



Lever Operated

For sizes 2" to 4" Class 150
For sizes 2" to 4" Class 300
For sizes 2" to 3" Class 600
For size 2" Class 900/1500
Standard scope of supply



Gear Operated

For sizes 2" to 24"
Standard scope of supply with Gear

Actuator Operated

DelVal® Trunnion Ball Valves sizes 2"-24" are designed to mount directly with DelTorq® Actuators. On sizes where direct mounting is not feasible, pre-engineered brackets and coupling are available.

Special Applications

SOUR SERVICE

Trunnion Mounted Ball Valves to be used in "sour gas" service, where there is the risk of stress corrosion due to the presence of wet H_2S, comply with the requirements of ANSI / NACE MR0175 / ISO 15156-2
Hardness tests can be performed as a standard procedure on all parts in contact with the fluid, such as body, connector, ball, stem, seat ring, springs, bolts etc. ,

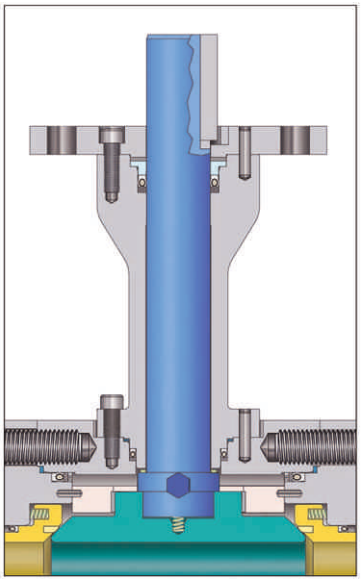
EXTENDED STEM FOR LOW AND HIGH TEMPERATURE SERVICE

For valves to be used on insulated lines or for valves required for low or high temperature service, designs can include an extended bonnet.

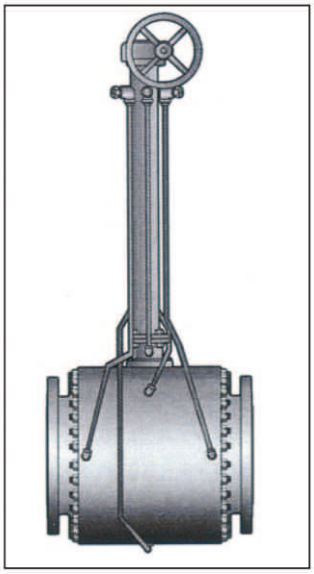
The extended bonnet increases the distance from the body and the stem sealing area, thus avoiding damage to the seals because of temperature.

Extended bonnet is recommended for use at temperatures below -50°C or above 200°C (-58°F or above 392°F).

Low-Temp Extended Bonnet



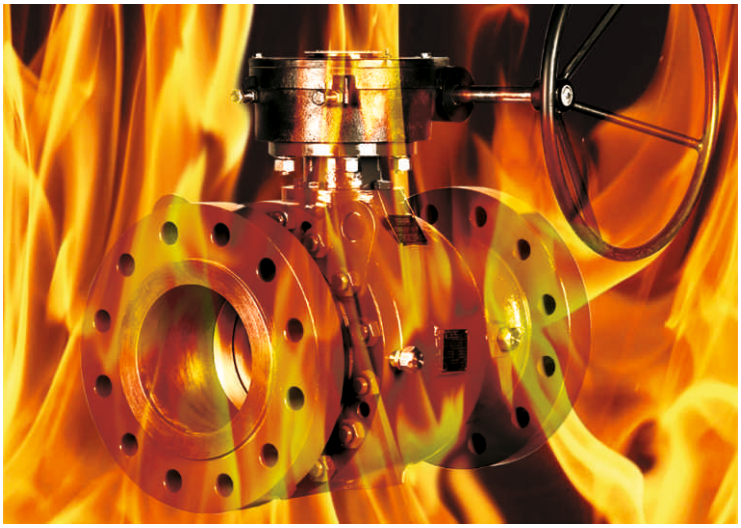
Extended Stem



STEM FOR BURIED SERVICE

For valves to be installed on underground lines, trunnion mounted ball valves are supplied complete with suitable stem extensions.

All the drain, vent and emergency sealant lines are extended and all relevant pipes are firmly attached to the stem extension.

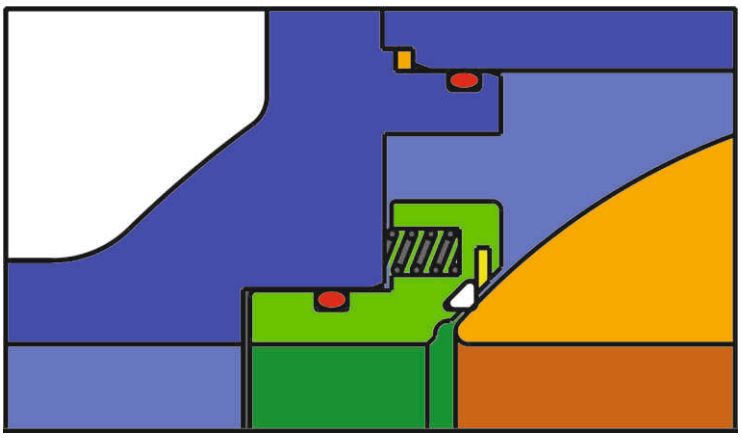


FIRE TEST

Ball valves have been designed to meet the requirements of API 607.

FIRE SAFE, PRIMARY METAL SECONDARY SOFT SEAT

Primary metal secondary soft seat has a soft Viton (secondary seal) seat which gets compressed fully due to line pressure and the metal seat does the primary sealing. The secondary soft seat give a bubble tight seat sealing, which is not possible in metal seating. These valves are mostly for gas applications.



How to Order DelVal Series 7 & 8 Ball Valves

TRIM / OTHER VARIABLES / SPECIAL

X X	X X	X X	X	X	X	X	X	X	X	X
Series	**Size**	**Body/Adaptor**	**Ball / Stem**	**Seat Ring**	**Seat**	**Seal**	**End Connections**	**Actuations**	**Options**

Series

7A=2 pc, 150#, FP
7B=2 pc, 300#, FP
7C=2 pc, 600#, FP
7E=2 pc, 900#, FP
7F=2 pc, 1500#,FP
7T=2 pc, 150#, RP
7U=2 pc, 300#, RP
7V=2 pc, 600#, RP
7W=2 pc, 900#, RP
7Y=2 pc, 1500#,RP

8A=3 pc, 150#, FP
8B=3 pc, 300#, FP
8C=3 pc, 600#, FP
8E=3 pc, 900#, FP
8F=3 pc, 1500#,FP
8T=3 pc, 150#, RP
8U=3 pc, 300#, RP
8V=3 pc, 600#, RP
8W=3 pc, 900#, RP
8Y=3 pc, 1500#,RP

Size

02 = 50/2”
03 = 80/3”
04 = 100/4”
06 = 150/6”
08= 200/8”
10 = 250/10”
12 = 300/12”
14 = 350/14”
16 = 400/16”
18= 450/18”
20 = 500/20”
24 = 600/24”

Body/Adaptor

01 = WCB
02 = CF8M
03 = LCB

Ball / Stem

1 = A105+ENP (WCB +ENP) / SS316
2 = F51(4A) / F51
3 = F316 (CF8M) / SS316

Seat Ring

1 = A105 + ENP
2 = F51
3 = F316

Seat

1 = RTFE
2 = Devlon
3 = Nylon PA12
5 = PEEK
6 = Viton

Seal

2 = Viton (FKM)
8 = Elasto-O-LION® 101
9 = HNBR

End Connections

6= Flanged RF
7= Flanged RTJ
8= Butt Weld

Actuations

A = Actuator
B = Bare Stem
E = Electric
G = Gear Opertator
H = Handle

Options

0 = None
S = Special requirement as specified by customer

For Example : To order 150 / 6" Full Port 2-PC, Class 150, Body - WCB, Ball / Stem - F316 (CF8M) / SS316, Seat Ring - F316, Seat Devlon, HNBR Seal, Flanged Race Face, Gear Operated with no special requirements.

7	A	0	6	0	1	3	3	2	9	6	G	0

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TAURUS BFV 011/16
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