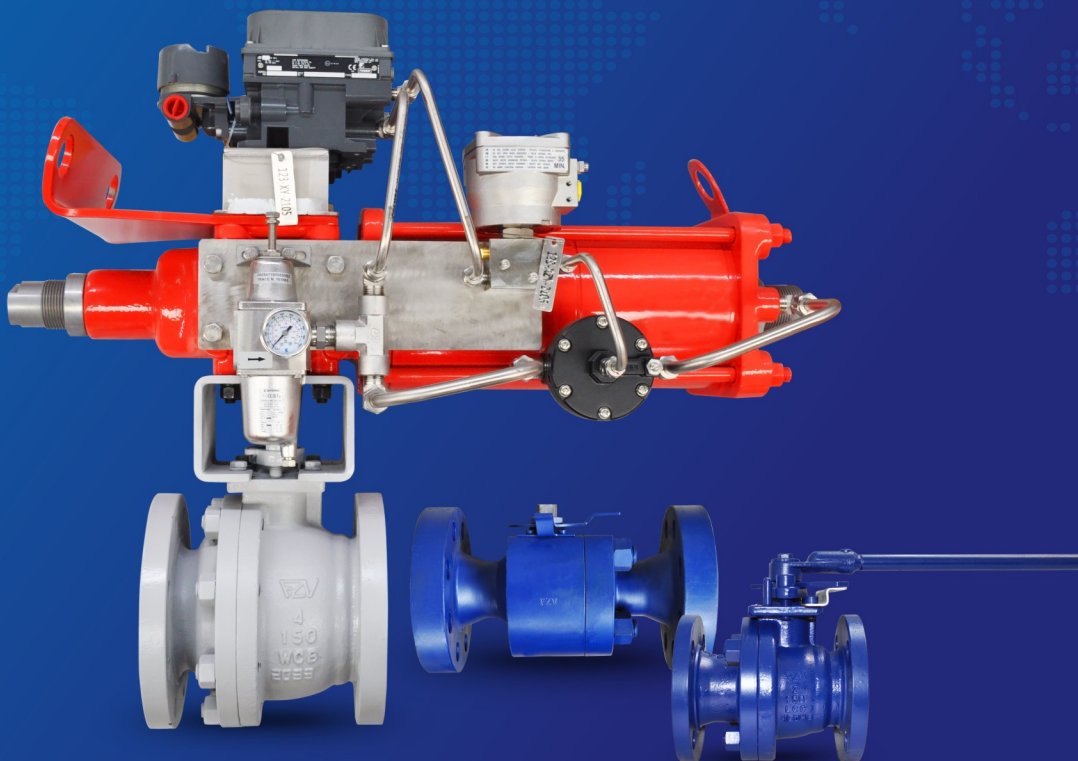


PROVIDING COMPLETE CONTROL
SOLUTIONS FOR
INDUSTRIAL PIPELINES



2 PC FLOATING BALL VALVE

API 6D, ASME CLASS 150 - 600#



FZV-Ref-2017. 3





FZV is a specialized supplier of API 6D, API 600, API 6A and API 16C valves and flow control components, including industrial valves and wellhead equipment.

FZV is approved by major oil and gas companies including: Shell, Vopak, CNPC, Sinopec, CNOOC, ENI, PDO, Petronas, Sasol and Santos. Our approvals also include numerous EPC's in the oil & gas, power and mining sectors, such as Worley Parsons, Technip, Fluor, Samsung, Hyundai, JGC, and Chiyoda. We continue to work with our partners to expand our customer base due to unwavering commitment to our client needs. We strive to meet or exceed expectations. "Quality, excellence, unmatched service" is always the basis of our mission.

FZV is certified by ISO 9001, ISO 14001, OHSAS 18001, API Q1, API 6D, API 600, API 6A, ATEX, CE/PED, API 6A-PR2 and API 607.

Established in 1983, with manufacturing locations in Shanghai and Wenzhou, China, we continue to grow and have become a global leader in manufacturing high quality valves and wellhead equipment. We offer excellent customer service and excel at meeting our customers' expectations.

Growth is important to FZV, we have therefore established our own laboratory for research and development aimed at product design, innovation and validation. We have complete in house inspection facilities and test equipment to ensure that all products are of the highest quality. FZV in-house test capability includes mechanical: tensile, impact and hardness testing; NDE: PT, MT, UT; chemical: PMI; fugitive emissions; and shell type acceptance test (TAT). We simulate various tests in critical and crucial working conditions to verify product performance.



FLOATING VALVE CATALOG INDEX

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The FZV series of 2 piece floating ball valves have been engineered to meet both general service and heavy duty applications including petroleum, petro-chemical, and industrial. Valves are designed in accordance with API 6D and CSA Z245.15, they are available in a variety of configurations and materials to meet your specific operational needs. Combined with our 24/36 month extended warranty, FZV valves not only meet but exceed industry standards.

FEATURES

- Unique Seat Design

Wide flexible seat provides positive seal in both low and high pressure conditions.

Self-relieving seat is standard and is designed and tested to provide automatic internal cavity relief.

Standard seat is RPTFE in Class 150 and 300. Devlon V API in Class 600. (Other materials are available on request).

- Firesafe Designed and Tested

In the event of a fire, the ball will be forced to the downstream machined metal lip and create a metal-to-metal seat seal. The graphite body seal and graphite stem seal provide a positive seal even after a fire.

- Blowout Proof Stem

The stem is inserted during assembly from the inside of the bore and a shoulder on the stem ensures positive stem retention.

The shoulder of the stem slides against a RPTFE thrust washer to provide low operating torque.

- Adjustable Stem Packing

Graphite stem packing is adjustable in the field. Packing is self-lubricating and is replaceable.

- Locking Devices

Both lever operated and gear operated valves are provided with locking devices and travel stops that are independent of the stem packing adjustment bolts.

- O-Ring Free Design

The seal design allows the valve to be O-Ring free which can extend the valve upper and lower temperature range.

O-Ring free design reduces media compatibility concerns by one component.

- Double Anti-static Stem

Valve design includes anti-static devices from both the ball-to-stem and the stem-to-body to ensure electrical continuity through the valve.

- NACE Compatible

Valves stocked meet NACE MR 0175 and ISO 15156 as a standard.

PRODUCT RANGE API 6D FP AND RP

(Available in full and regular port.)

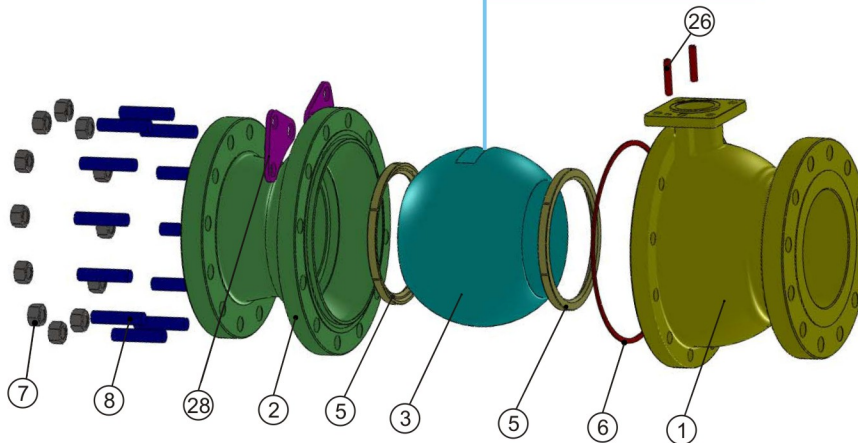
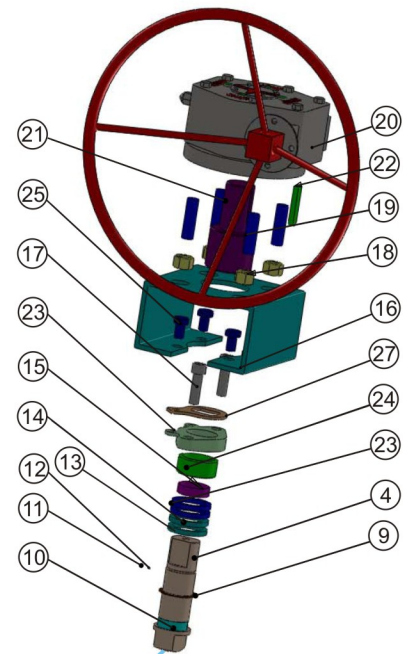
Size	ANSI 150	ANSI 300	ANSI 600
1/2"	●	●	●
3/4"	●	●	●
1"	●	●	●
1 1/2"	●	●	●
2"	●	●	●
4"	●	●	●
6"	●	●	
8"	●	●	
10"	●		

DESIGN AND TEST STANDARDS

DESIGN	API 6D, CSA Z245.15, API 608, ISO 17292, CSA B51
PRESSURE/TEMPERATURE	ASME B16.34
FACE TO FACE	ASME B16.10
END FLANGES	ASME B16.5
FIRESAFE	API 607
SOUR SERVICE	NACE MR0175/ISO 15156
TOP FLANGE	ISO 5211
INSPECTION	API 598
TESTING	API 6D, CSA Z245.15 (Includes High and Low Pressure Air Seat Test)
MARKING	MSS SP-25, API 6D, CSA Z245.15
QUALITY	MSS SP-55
DOCUMENTATION	BS EN 10204-3.1
REGISTRATION	CRN IN PLACE FOR CANADA

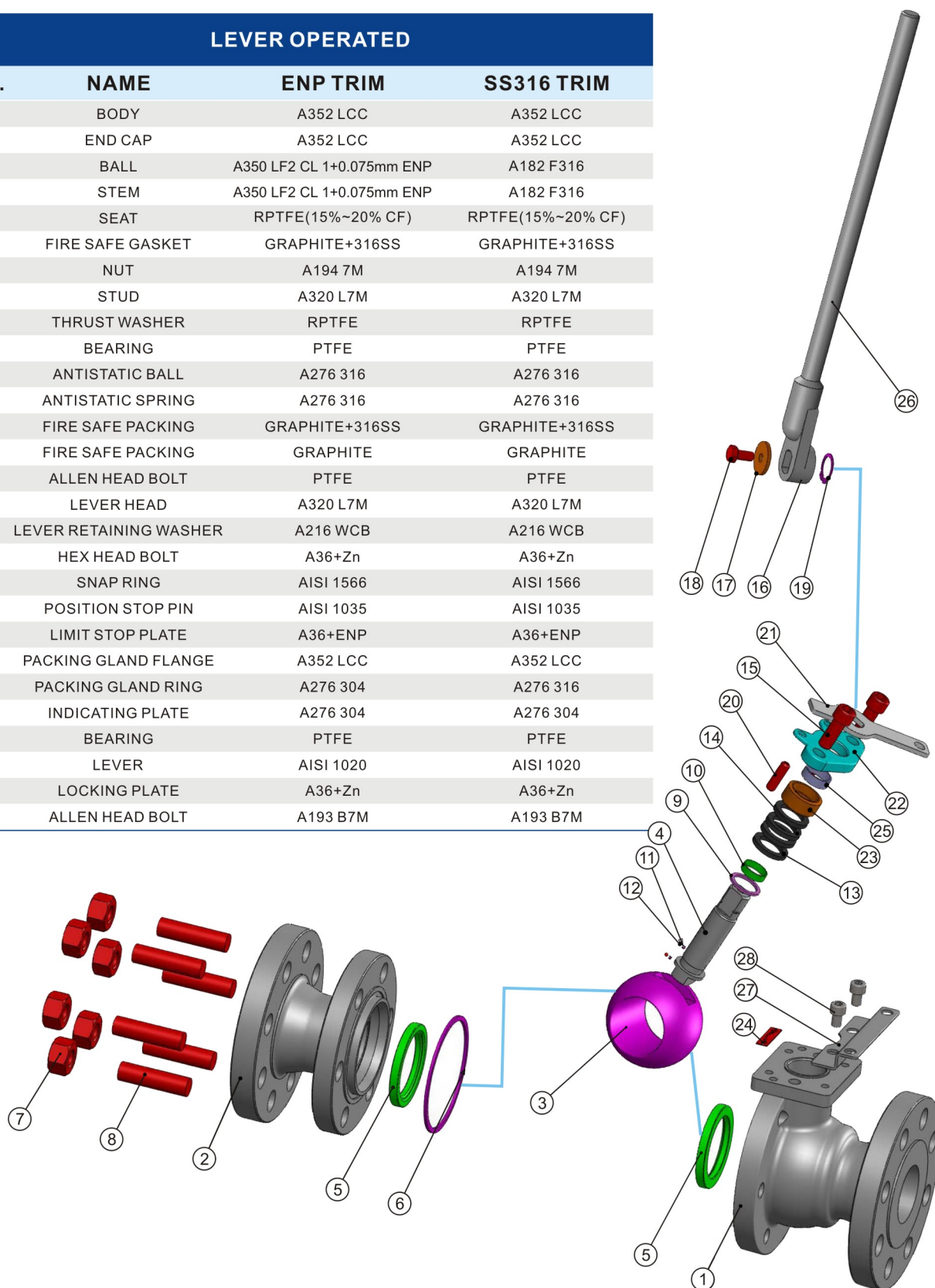
CROSS SECTIONAL DRAWING & BOM

GEAR OPERATED			
NO.	NAME	ENP TRIM	SS316 TRIM
1	BODY	A352 LCC	A352 LCC
2	END CAP	A352 LCC	A352 LCC
3	BALL	A350 LF2 CL 1+0.075mm ENP	A182 F316
4	STEM	A350 LF2 CL 1+0.075mm ENP	A182 F316
5	SEAT	RPTFE(15%~20% CF)	RPTFE(15%~20% CF)
6	FIRE SAFE GASKET	GRAPHITE+316SS	GRAPHITE+316SS
7	NUT	A194 7M	A194 7M
8	STUD	A320 L7M	A320 L7M
9	THRUST WASHER	RPTFE	RPTFE
10	BEARING	PTFE	PTFE
11	ANTISTATIC BALL	A276 316	A276 316
12	ANTISTATIC SPRING	A276 316	A276 316
13	FIRE SAFE PACKING	GRAPHITE+316SS	GRAPHITE+316SS
14	FIRE SAFE PACKING	GRAPHITE	GRAPHITE
15	BEARING	PTFE	PTFE
16	MOUNTING BRACKET	A36	A36
17	ALLEN HEAD BOLT	A320 L7M	A320 L7M
18	NUT	A194 7M	A194 7M
19	STUD	A320 L7M	A320 L7M
20	GEAR OPERATOR	ASSEMBLY	ASSEMBLY
21	GEAR OPERATOR DRIVE COUPLING	A29 4135+ENP	A29 4135+ENP
22	KEY	AISI 1045	AISI 1045
23	PACKING GLAND FLANGE	A320 LCC	A320 LCC
24	PACKING GLAND RING	A276 304	A276 304
25	HEX HEAD BOLT	A320 L7M	A320 L7M
26	POSITION STOP PIN	AISI 1035	AISI 1035
27	LIMIT STOP PLATE	A36+ENP	A36+ENP
28	LIFTING LUGS	A36	A36



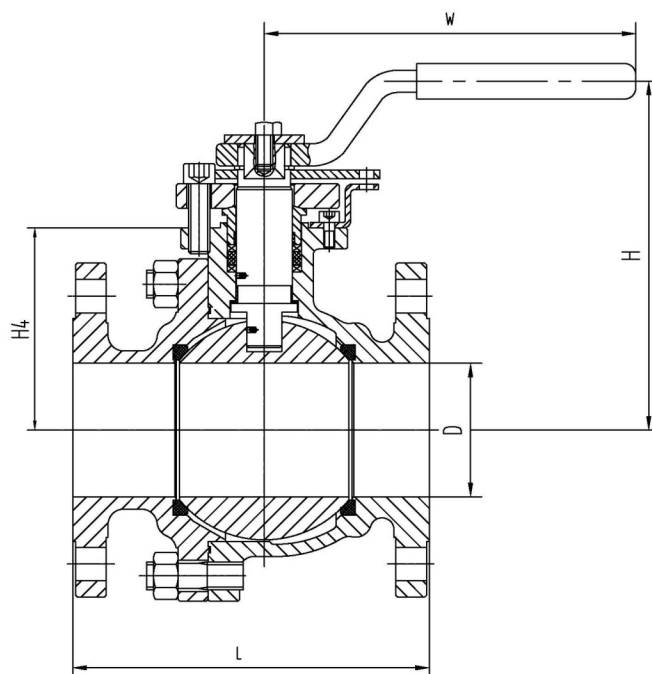
LEVER OPERATED

NO.	NAME	ENP TRIM	SS316 TRIM
1	BODY	A352 LCC	A352 LCC
2	END CAP	A352 LCC	A352 LCC
3	BALL	A350 LF2 CL 1+0.075mm ENP	A182 F316
4	STEM	A350 LF2 CL 1+0.075mm ENP	A182 F316
5	SEAT	RPTFE(15%~20% CF)	RPTFE(15%~20% CF)
6	FIRE SAFE GASKET	GRAPHITE+316SS	GRAPHITE+316SS
7	NUT	A194 7M	A194 7M
8	STUD	A320 L7M	A320 L7M
9	THRUST WASHER	RPTFE	RPTFE
10	BEARING	PTFE	PTFE
11	ANTISTATIC BALL	A276 316	A276 316
12	ANTISTATIC SPRING	A276 316	A276 316
13	FIRE SAFE PACKING	GRAPHITE+316SS	GRAPHITE+316SS
14	FIRE SAFE PACKING	GRAPHITE	GRAPHITE
15	ALLEN HEAD BOLT	PTFE	PTFE
16	LEVER HEAD	A320 L7M	A320 L7M
17	LEVER RETAINING WASHER	A216 WCB	A216 WCB
18	HEX HEAD BOLT	A36+Zn	A36+Zn
19	SNAP RING	AISI 1566	AISI 1566
20	POSITION STOP PIN	AISI 1035	AISI 1035
21	LIMIT STOP PLATE	A36+ENP	A36+ENP
22	PACKING GLAND FLANGE	A352 LCC	A352 LCC
23	PACKING GLAND RING	A276 304	A276 316
24	INDICATING PLATE	A276 304	A276 304
25	BEARING	PTFE	PTFE
26	LEVER	AISI 1020	AISI 1020
27	LOCKING PLATE	A36+Zn	A36+Zn
28	ALLEN HEAD BOLT	A193 B7M	A193 B7M



SIZES, DIMENSIONS & WEIGHTS

1/2" TO 1 1/2" FULL PORT, LEVER OPERATED						
ASME CLASS 150				SIZE IN INCHES, DIMENSIONS IN INCHES		
SIZE	D-FULL PORT	L	H	H4	W	WEIGHT (POUNDS)
1/2	0.59	4.25	3.23	1.57	5.91	6
3/4	0.75	4.61	3.54	1.54	5.91	7
1	0.98	5.00	3.94	1.81	5.91	13
1 1/2	1.50	6.50	4.33	2.56	11.81	16
ASME CLASS 300				SIZE IN INCHES, DIMENSIONS IN INCHES		
SIZE	D-FULL PORT	L	H	H4	W	WEIGHT (POUNDS)
1/2	0.59	5.51	3.27	1.54	5.91	6
3/4	0.75	5.98	3.54	1.54	5.91	8
1	0.98	6.50	3.94	1.81	5.91	13
1 1/2	1.50	7.48	4.33	2.56	11.81	23
ASME CLASS 600				SIZE IN INCHES, DIMENSIONS IN INCHES		
SIZE	D-FULL PORT	L	H	H4	W	WEIGHT (POUNDS)
1/2	0.59	6.5	3.31	1.50	5.91	6
3/4	0.75	7.48	3.54	1.54	5.91	12
1	0.98	8.50	3.66	1.81	5.91	16
1 1/2	1.50	9.49	5.28	2.60	15.75	30

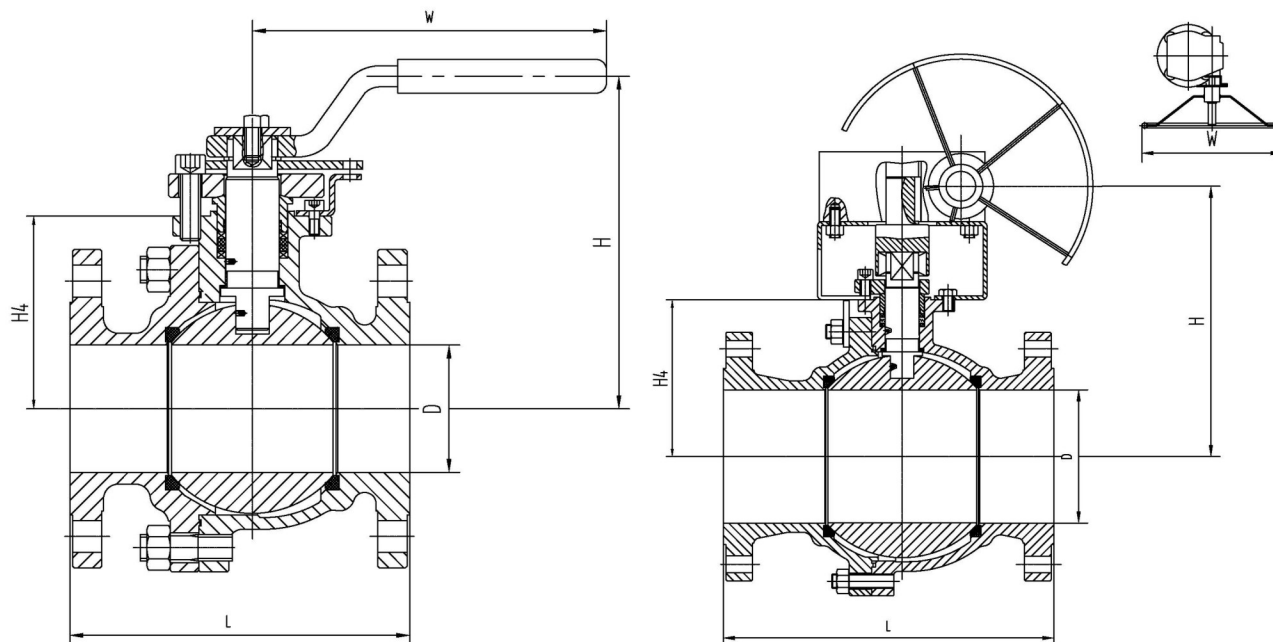


2" TO 10" FULL PORT, LEVER OR GEAR OPERATED

ASME CLASS 150				SIZE IN INCHES, DIMENSIONS IN INCHES		
SIZE	D-FULL PORT	L	H	H4	W	WEIGHT (POUNDS)
2	1.97	7.01	5.31	3.31	11.81	22
3	2.95	7.99	6.93	4.53	15.75	44
4	3.94	9.02	7.72	5.31	18.11	78
6	5.94	15.51	13.90	7.56	18.11	212
8	7.95	17.99	16.18	9.45	23.62	364
10	9.92	20.98	18.31	11.42	23.62	551

ASME CLASS 300				SIZE IN INCHES, DIMENSIONS IN INCHES		
SIZE	D-FULL PORT	L	H	H4	W	WEIGHT (POUNDS)
2	1.97	8.50	5.31	3.50	15.75	35
3	2.95	11.10	6.93	4.53	21.65	80
4	3.94	12.01	7.72	5.31	23.62	132
6	5.94	15.87	13.90	7.52	18.31	260
8	7.95	19.76	16.18	9.45	23.62	520

ASME CLASS 600				SIZE IN INCHES, DIMENSIONS IN INCHES		
SIZE	D-FULL PORT	L	H	H4	W	WEIGHT (POUNDS)
2	1.97	11.50	5.31	3.39	21.65	49
3	2.95	14.02	7.20	4.80	27.56	88
4	3.94	17.01	11.02	6.06	33.46	177

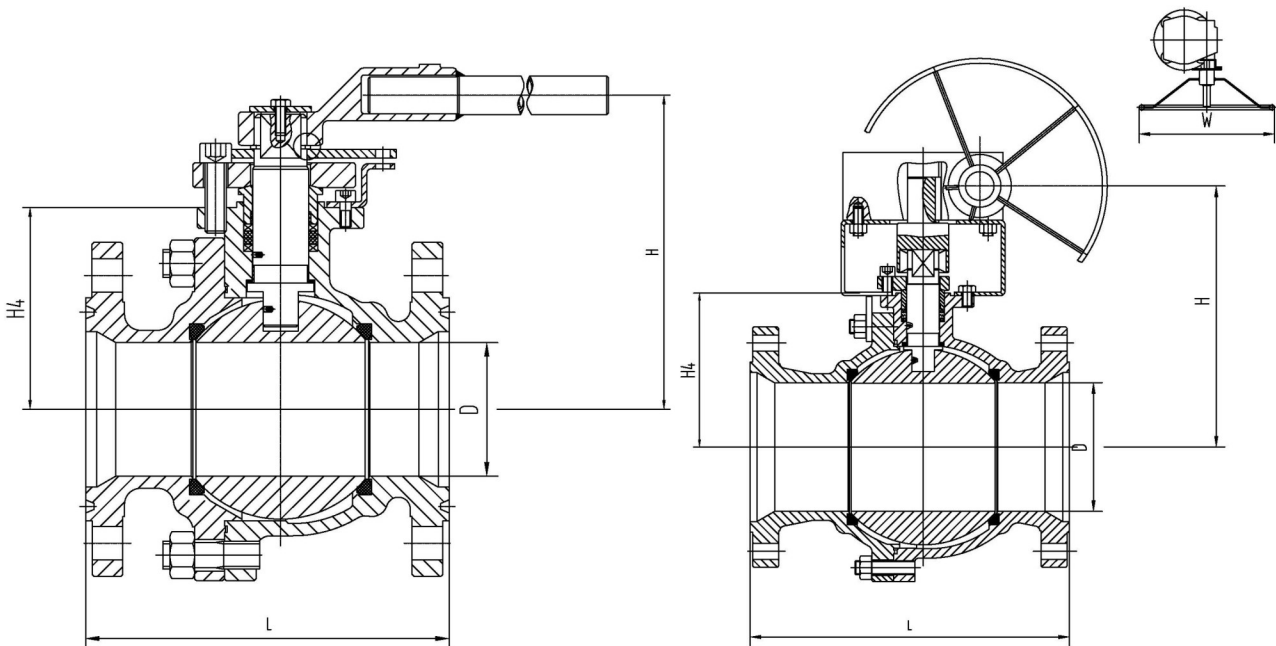


2" TO 10" REDUCED PORT, LEVER OR GEAR OPERATED

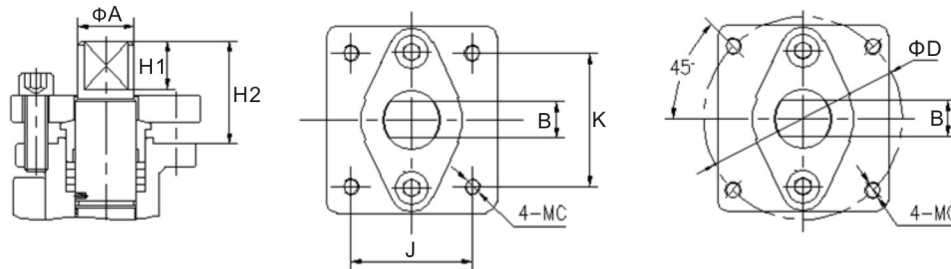
ASME CLASS 150				SIZE IN INCHES, DIMENSIONS IN INCHES		
SIZE	D-REDUCED PORT	L	H	H4	W	WEIGHT (POUNDS)
2X1 1/2"	1.50	7.01	4.57	2.56	11.81	21
3X2"	1.97	7.99	5.31	3.31	11.81	10
4X3"	2.95	9.02	6.93	4.53	15.75	77
6X4"	3.94	15.51	7.72	5.31	18.11	132
8X6"	5.94	17.99	10.08	7.56	18.11	265
10X8"	7.95	20.98	16.18	9.45	23.62	320

ASME CLASS 300				SIZE IN INCHES, DIMENSIONS IN INCHES		
SIZE	D-REDUCED PORT	L	H	H4	W	WEIGHT (POUNDS)
2X1 1/2"	1.50	8.50	4.57	2.56	11.81	33
3X2"	1.97	11.10	5.31	3.50	15.75	69
4X3"	2.95	12.01	6.93	4.53	21.65	126
6X4"	3.94	15.87	7.72	5.31	23.62	183
8X6"	5.94	19.76	13.90	7.52	18.31	421

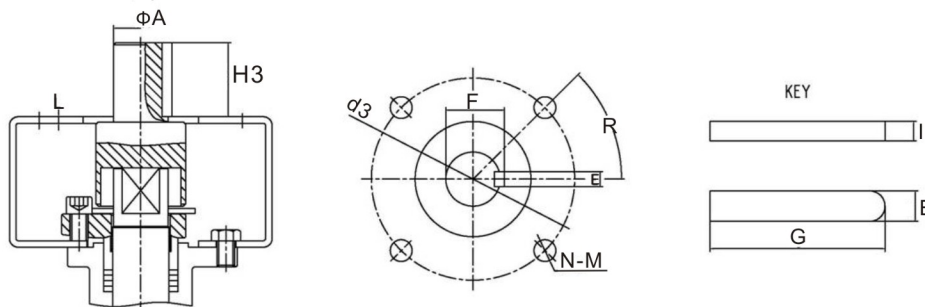
ASME CLASS 600				SIZE IN INCHES, DIMENSIONS IN INCHES		
SIZE	D-REDUCED PORT	L	H	H4	W	WEIGHT (POUNDS)
2X1 1/2"	1.50	11.50	4.61	2.60	15.75	40
3X2"	1.97	14.02	5.31	3.39	21.65	77
4X3"	2.95	17.01	7.20	4.80	27.56	121
6X4"	3.94	22.01	11.02	6.06	33.46	234



TOP WORK DIMENSIONS



NPS 1/2" - 1" CLASS 150-600 NPS 1 1/2" - 4" CLASS 150-600



NPS 6" - 10" CLASS 150, 6" - 8" CLASS 300

ASME CLASS 150												SIZE IN INCHES DIMENSIONS IN INCHES							
NPS	A	B	C	D	E	F	G	H1	H2	H3	I	J	K	ISO	d3	N-M	L	R	
1/2"	0.47	0.31	4-M6					0.30	0.71			1.22	1.22						
3/4"	0.47	0.31	4-M6					0.33	0.81			0.98	1.85						
1"	0.47	0.31	4-M6					0.35	0.89			1.14	2.09						
1 1/2"	0.79	0.55	4-M8	2.76				0.79	1.57					F07				45°	
2X1 1/2"	0.79	0.55	4-M8	2.76				0.79	1.57					F07				45°	
2"	0.79	0.55	4-M8	2.76				0.87	1.57					F07				45°	
3X2"	0.79	0.55	4-M8	2.76				0.87	1.57					F07				45°	
3"	1.18	0.79	4-M10	4.02				0.94	2.09					F10				45°	
4X3"	1.18	0.79	4-M10	4.02				0.94	2.09					F10				45°	
4"	1.18	0.79	4-M10	4.02				0.94	2.09					F10				45°	
6X4"	1.18	0.79	4-M10	4.02				0.94	2.09					F10				45°	
6"	1.57				0.47	1.69	2.17			2.28	0.31			F12	4.92	4-Φ14	0.24	45°	
8X6"	1.57				0.47	1.69	2.17			2.28	0.31			F12	4.92	4-Φ14	0.24	45°	
8"	1.97				0.55	2.11	2.76			2.81	0.35			F14	5.51	4-Φ18	0.31	45°	
10X8"	1.97				0.55	2.11	2.76			2.81	0.35			F14	5.51	4-Φ18	0.31	45°	
10"	1.97				0.55	2.11	2.76			2.60	0.35			F14	5.51	4-Φ18	0.31	45°	

ASME CLASS 300													SIZE IN INCHES DIMENSIONS IN INCHES					
NPS	A	B	C	D	E	F	G	H1	H2	H3	I	J	K	ISO	d3	N-M	L	R
1/2"	0.47	0.31	4-M6					0.33	0.81			0.98	1.85					
3/4"	0.47	0.31	4-M6					0.33	0.81			0.98	1.85					
1"	0.47	0.31	4-M6					0.35	0.89			1.14	2.09					
1 1/2"	0.79	0.55	4-M8	2.76				0.79	1.57					F07				45°
2X1 1/2"	0.79	0.55	4-M8	2.76				0.79	1.57					F07				45°
2"	0.79	0.55	4-M8	2.76				0.83	1.54					F07				45°
3X2"	0.79	0.55	4-M8	2.76				0.83	1.54					F07				45°
3"	1.18	0.79	4-M10	4.02				0.94	2.09					F10				45°
4X3"	1.18	0.79	4-M10	4.02				0.94	2.09					F10				45°
4"	1.18	0.79	4-M10	4.02				0.94	2.09					F10				45°
6X4"	1.18	0.79	4-M10	4.02				0.94	2.09					F10				45°
6"	1.57				0.47	1.69	2.17			2.28	0.31			F12	4.92	4-Φ14	0.24	45°
8X6"	1.57				0.47	1.69	2.17			2.28	0.31			F12	4.92	4-Φ14	0.24	45°
8"	1.97				0.55	2.11	2.76			2.81	0.35			F14	5.51	4-Φ18	0.31	45°

ASME CLASS 600													SIZE IN INCHES DIMENSIONS IN INCHES						
NPS	A	B	C	D	E	F	G	H1	H2	H3	I	J	K	ISO	d3	N-M	L	R	
1/2"	0.47	0.31	4-M6					0.33	0.77			0.98	1.85						
3/4"	0.47	0.31	4-M6					0.33	0.77			0.98	1.85						
1"	0.47	0.31	4-M6					0.33	0.89			1.14	2.09						
1 1/2"	0.79	0.55	4-M8	2.76				0.81	1.54					F07				45°	
2X1 1/2"	0.79	0.55	4-M8	2.76				0.81	1.54					F07				45°	
2"	0.79	0.55	4-M8	2.76				0.87	1.56					F07				45°	
3X2"	0.79	0.55	4-M8	2.76				0.87	1.56					F07				45°	
3"	1.18	0.79	4-M10	4.02				0.98	2.03					F10				45°	
4X3"	1.18	0.79	4-M10	4.02				0.98	2.03					F10				45°	
4"	1.57	1.18	4-M12	4.92				1.48	2.95					F12				45°	
6X4"	1.57	1.18	4-M12	4.92				1.48	2.95					F12				45°	

TORQUE VALUES

OPEN TORQUE AT MAX. PRESSURE			UNIT: INCH POUND
RPTFE SEAT			NYLON/DEVLOX SEAT
SIZE	CLASS 150	CLASS 300	CLASS 600
1/2"	62	98	124
3/4"	98	124	178
1"	124	160	240
1 1/2"	302	435	648
2"	400	710	959
3"	799	1137	2380
4"	1288	2078	3801
6"	4796	7593	
8"	8393	15986	
10"	15986		

Remarks: Refer to reduced bore floating ball valve, we confirm that the torques shown are based on valve bore size.

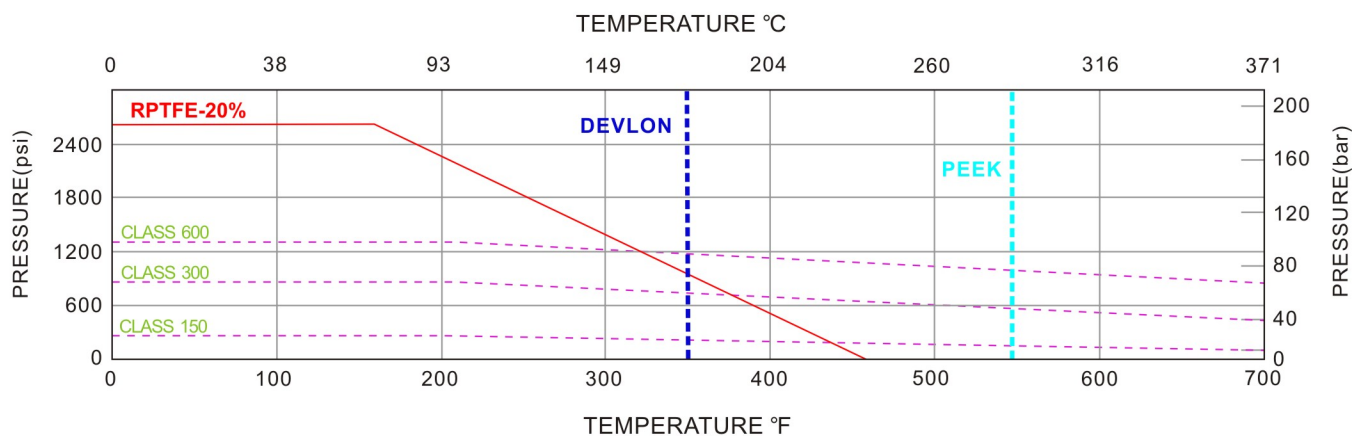
REMARK:

1. Torque values above are for new valves in clean water service.
2. Torque values are in Inch pound, and excluding safety factor.
3. Required safety factor is 1.35.
4. For unclean service, additional safety factor 30% is required.
5. For dry gas service, additional safety factor 50% is required.
6. Torques reflect valve bore, for RP select appropriate bore size.
7. Torques above are based upon standard seat insert offerings. Class 150 & 300: PTFE; class 600: DEVLOX. Consult factory for torques for differing seat materials.

CV VALUES

FULL BORE				REDUCED BORE			
Size(in)	150#	300#	600#	Size(in)	150#	300#	600#
1/2	46	46	46	2*1 1/2	306	306	306
3/4	97	97	97	3*2	377	377	377
1	168	168	168	4*3	1043	1043	1043
1 1/2	389	389	389	6*4	1587	1587	1587
2	647	647	647	8*6	4364	4364	
3	2086	2086	2086	10*8	7495		
4	2694	2694	2694				
6	6062	6062					
8	10885	10885					
10	17109						

PRESSURE & TEMPERATURE CHART FOR TYPICAL SEAT & SEAL MATERIALS



Consult ASME 16.34 for specific material pressure/temperature ratings.

PART NUMBER CONFIGURATION

F	B2	F	20	R	03	N	L	1	1	1	A	G
1	2	3	4	5	6	7	8	9	10	11	12	13

1-Valve Type	2-Body Construction	3-Port Type
T=Trunnion DBB T1=Trunnion DIB-1 T2=Trunnion DIB-2 F=Floating	B2=Bolted 2 piece B3=Bolted 3 piece TE=Top Entry WB=Welded Body	F=Full Bore R=Reduced Bore

4-Nominal Size			
050=1/2"	30=3"	140=14"	280=28"
075=3/4"	40=4"	160=16"	300=30"
10=1"	60=6"	180=18"	320=32"
15=1 1/2"	80=8"	200=20"	360=36"
20=2"	100=10"	240=24"	420=42"
25=2 1/2"	120=12"	260=26"	480=48"

5-Connection	6-Pressure	7-Service
R-RF B-BW J-RTJ	01=150 03=300 06=600 09=900 15=1500 25=2500	L=Low Temp. NACE N=Regular Temp. NACE A=Corrosive NACE R=Regular Temp. O=Oxygen C=Cryogenic H=High Temp.

8-Top Works	9-Body Material	10-Ball Material
G=Gear L=Lever B-Bare Stem A-Actuator	1=A216 WCB 2=A105N 3=LCC 4=LF2 5=CF8M 6=F316 7=Duplex 8=Super Duplex X=Special	1=A105N+ENP 2=LF2+ENP 3=4140+ENP 4=F316 5=F6A 6=F51 7=F53 8=F55 X=Special

11-Stem Material	12-Seat Material	13-Seal Material
1=A105N+ENP 2=LF2+ENP 3=4140+ENP 4=F316 5=F6A 6=F51 7=F53 8=F55 X=Special	A=RPTFE B=Devlon V C=PEEK D=Nylon E=Delrin F=Metal X=Special	A=Viton GLT V=Viton H=HNBR L=HNBR-LT E=PTFE+Elgiloy Spring G=Graphite T=Teflon X=Special



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