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CATALOGUE

Flow+ Ball Valves

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B Series Ball Valves

B SERIES 1, 2 AND 3 PIECE BALL VALVE PART NUMBERING SYSTEM

1

1 = Size

02 = 1/4"
03 = 3/8"
05 = 1/2"
07 = 3/4"
10 = 1"
12 = 1 1/4"
15 = 1 1/2"
20 = 2"
25 = 2 1/2"
30 = 3"
40 = 4"

2

2 = Valve Series

B01 = 2 PC, 1000 WOG, 316SS
B02 = 2 PC, 2000/1500 WOG, 316SS
B03 = 2 PC, 1000 WOG, 316SS, Direct Mount
B04 = 3 PC, 1000 WOG, 316SS, Screwed Ends
B04S = 3 PC, 1000 WOG, 316SS, Socket Weld Ends
B05 = 3 PC, 1000 WOG, 316SS, Direct Mount, Screwed Ends
B05S = 3 PC, 1000 WOG, 316SS, Direct Mount, Socket Weld Ends
B05TC = 3 PC, 1000 WOG, 316SS, Direct Mount, Tri-Clamps Ends
B05TO = 3 PC, 1000 WOG, 316SS, Direct Mount, Tube Ends
B06 = 1 PC, 2000 PSI, Carbon Steel/Bar Stock
B07L = 3 PC, 1000 WOG, 316SS, 3-way, L-Port
B07T = 3 PC, 1000 WOG, 316SS, 3-way, T-Port
B11 = 2 PC, 2000/1500 WOG, Carbon Steel
BT3 = 3 PC, 3000 PSI, Carbon Steel
BT6 = 3 PC, 6000 PSI, Carbon Steel
TFP600 = 2 PC, 600 WOG, Brass, Threaded Ends
SFP600 = 2 PC, 600 WOG, Brass, Solder Ends

2-PC Full Port Brass Ball Valve

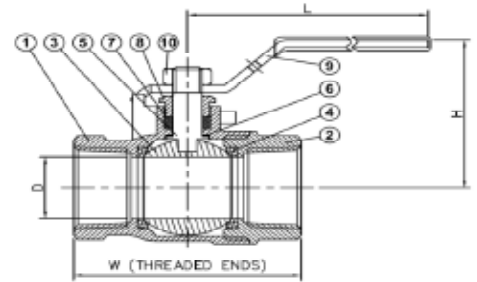
PRESSURE RATING: 600 WOG

600FPT



Construction

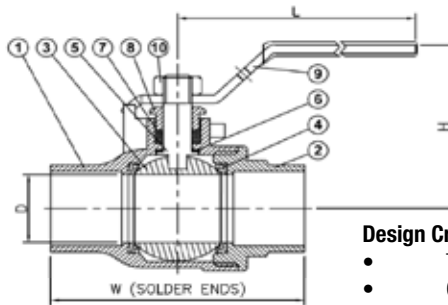
- Forged brass body
- Full port
- Durable chrome plated brass ball
- Viton O Ring and PTFE Packing
- Stem threaded packing nut
- Blow out proof stem
- MSS SP – 110 standards



2-PC Full Port Brass Ball Valve

Pressure Rating: 600 WOG for 1/4" to 4"

600FPS



SIZE (IN)	L	D	H	W
1/2	3.23	0.50	1.45	1.94
3/4	3.94	0.75	1.78	2.73
1	4.72	0.98	2.29	3.29
1-1/4	4.72	1.22	2.44	3.74
1-1/2	7.09	1.50	3.00	4.30
2	7.09	1.97	3.30	5.31
2-1/2	8.66	2.50	4.59	6.29
3	8.66	3.00	4.92	7.19
4	9.84	3.98	5.73	9.26

Design Criteria,

- Trim and drain 300PSI
- Compressed Gas Shut-off valves 600PSI
- Flammable Liquid Shut off Valves 600PSI
- Gas Shut off valves
- LP gas shut off valves
- Manual valves

MATERIALS LIST	
PART	SPECIFICATION
1 BODY	FORGED BRASS ASTM B124 C37700
2 END CAP	FORGED BRASS ASTM B124 C37700
3 SEAT	PTFE
4 BALL	BRASS ASTM B16 C36000/B124 C37700
5 STEM	BRASS ASTM B16 C36000
6 THRUST WASHER	PTFE
7 STEM PACKING	PTFE
8 GLAND	PTFE
9 HANDLE	BRASS ASTM B16 C36000
10 NUT	STEEL

MATERIALS LIST	
PART	SPECIFICATION
1 BODY	FORGED BRASS ASTM B124 C37700
2 END CAP**	FORGED BRASS ASTM B124 C37700
3 SEAT	PTFE
4 BALL	BRASS ASTM B16 C36000/B124 C37700
5 STEM	BRASS ASTM B16 C36000
6 THRUST WASHER	PTFE
7 STEM PACKING	PTFE
8 GLAND	PTFE
9 HANDLE	BRASS ASTM B16 C36000
10 NUT	STEEL

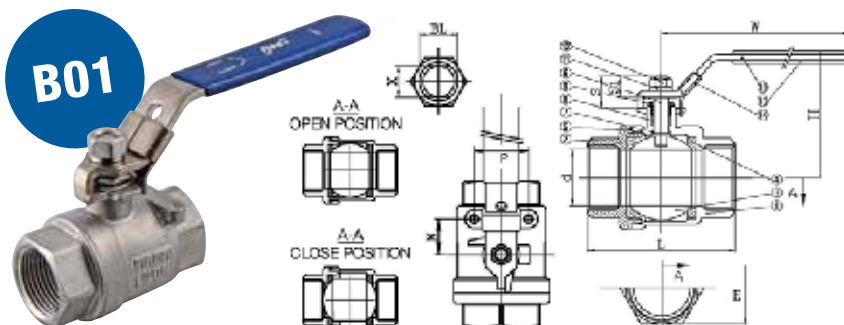
Patented "Raised V" design negates body joint leakage.

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B Series Ball Valves

2-PC Full Port SS 1000 PSI Ball Valve

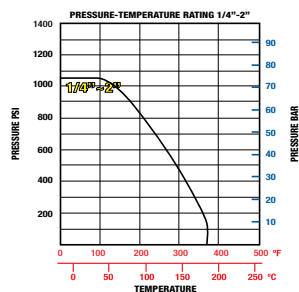
Pressure Rating: 1000 psi (69 bar) WOG for 1/4" to 2 1/2"



- Investment cast body and ends
- Blow-out proof stem
- Full port
- FNPT threaded on both ends
- Material: ASTM A351-CF8M
- NACE MR0175
- Locking handle

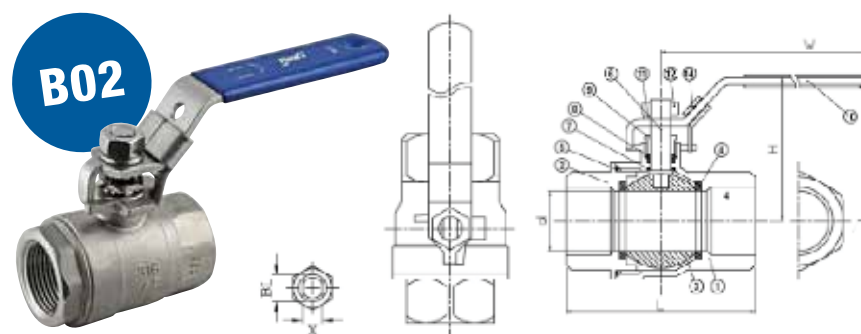
Size	dia (mm)	L	H	W	S	S1	X	N	P	BL	Torque (in-lbs)	CV Factor	Kg
1/4"	11.6	50	48	91	16.5	10.2	5	12.5	28.5	5/16"	35	7	0.21
3/8"	12.5	50	48	91	16.5	10.2	5	12.5	28.5	5/16"	35	7	0.22
1/2"	15	60	52	91	16.5	10.2	5	12.5	28.5	5/16"	47	15	0.29
3/4"	20	65	61	111	20	13.5	6.5	21	34.8	3/8"	64	45	0.42
1"	25	80	65	111	23.5	16	8	22.5	34.8	7/16"	90	65	0.71
1 1/4"	32	92	79	154	23.5	16	8	23.5	38.1	7/16"	117	125	1.06
1 1/2"	38	105	83	154	25.5	17	9	23.5	38.1	1/2"	156	175	1.68
2"	50	125	97	192	25.5	17	9	23.5	38.1	1/2"	217	380	2.71
2 1/2"	65	156	129	246	41.5	29.5	12	35	56	3/4"	407	265	5.66

No.	Part (Qty)	Material
1.	Body (1)	ASTM-CF8M-A351
2.	End (1)	ASTM-CF8M-A351
3.	Ball (1)	ASTM-CF8M-A351
4.	Ball Seat (2)	15% R-PTFE
5.	Joint Gasket (1)	PTFE
6.	Stem (1)	AISI 316
7.	Thrust Washer (1)	PTFE
8.	Stem Packing (2)	PTFE
9.	Gland Nut (1)	AISI 304
10.	Handle (1)	AISI 304
11.	Spring Washer (1)	AISI 304
12.	Stem Nut (1)	AISI 304
13.	Handle Sleeve (1)	Vinyl Grip
14.	Lock Device (1)	AISI 430



2-PC Full Port SS 2000 PSI Ball Valve

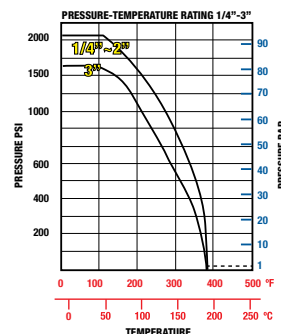
Pressure Rating: 2000 psi (138 bar) WOG for 1/4" to 2" / 1500 (103.4 bar) WOG for 3"



- Investment cast body and ends
- Blow-out proof stem
- Full port
- FNPT threaded on both ends
- Locking handle
- Material: ASTM A351-CF8M

Size	(mm)	L	H	W	X	BL	CV Factor	Torque (in-lbs)	Kg
1/4"	11.6	44.5	51	95	5	5/16"	6.6	35	0.194
3/8"	12.7	44.5	51	95	5	5/16"	7.9	35	0.205
1/2"	15	57	53	95	5	5/16"	11.2	47	0.285
3/4"	20	65	59.5	110	6.5	3/8"	21	64	0.456
1"	25	76	73	135	8	7/16"	35	90	0.764
1 1/4"	32	87.5	79	135	8	7/16"	57	117	1.163
1 1/2"	38	102	90.5	165	9	1/2"	80	156	1.870
2"	50	123	98.8	165	9	1/2"	148	217	3.126
3"	80	184	142.5	215	12	3/4"	415	651	9.79

No.	Part (Qty)	Material
1.	Body (1)	ASTM-CF8M-A351
2.	End (1)	ASTM-CF8M-A351
3.	Ball (1)	ASTM-CF8M-A351
4.	Ball Seat (2)	15% R-PTFE
5.	Joint Gasket (1)	PTFE
6.	Stem (1)	AISI 316
7.	Thrust Washer (1)	PTFE
8.	Stem Packing (2)	PTFE
9.	Gland Nut (1)	AISI 304
10.	Handle (1)	AISI 304
11.	Spring Washer (1)	AISI 304
12.	Stem Nut (1)	AISI 304
13.	Handle Sleeve (1)	Vinyl Grip
14.	Lock Device (1)	AISI 304

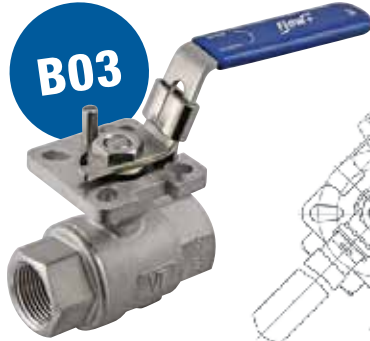


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B Series Ball Valves

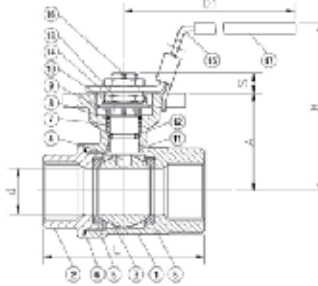
2-PC Full Port SS Ball Valve - Direct Mount

Pressure Rating: 1000 psi (69 bar) WOG for 1/4" to 2" / See Page 21 for Actuation

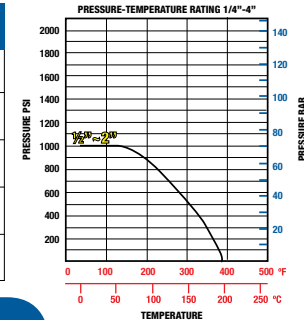


- Investment cast body and ends
- Blow-out proof stem
- Full port
- Direct mounting pad for ISO Std 5211
- FNPT threaded on both ends
- Material: ASTM A351-CF8M (316SS)
- NACE MR0175

Size	dia (mm)	L	F	M	ISO 5211	Torque (in-lbs)	D	H	D1	S	A	CV Factor	Kg
1/2"	15	65.3	6	7.5	42 50 F04 F05	85	9	72.85	112	8.5	36.95	15	0.46
3/4"	20	77.3	7.5	9.5	50 70 F05 F07	110	9	81.8	112	8.5	45	45	0.81
1"	25	88.7	7.5	9.5	50 70 F05 F07	180	11	90.45	136	11.4	53.45	65	0.96
1½"	38	109	7.5	9.5	50 70 F05 F07	315	14	114.7	197.9	14	74.75	175	2.3
2"	50	125.3	9.5	11	70 102 F07 F10	450	14	124.0	197.9	13.7	83.5	380	2.3

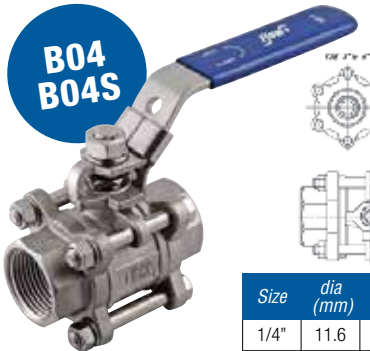


No.	Part	Material
1.	Body	ASTM-A351 Gr. CF8M
2.	Ends	ASTM-A351 Gr. CF8M
3.	Ball	ASTM-A351 Gr. CF8M
4.	Stem	316SS
5.	Ball Seat	15% RTFE
6.	Gasket	15% RTFE
7.	Stem Packing	15% RTFE
8.	Thrust Washer	15% RTFE
9.	Stem Packing	304SS
10.	Belleville Washer	SUS 304-SSP
11.	Thrust Washer	PTFE +25% Carbon
12.	O-Ring	Viton
13.	Locking Washer	304SS
14.	Stem Nut	304SS
15.	Handle	304SS
16.	Handle Nut	304SS
17.	Handle Cover	Vinyl Grip



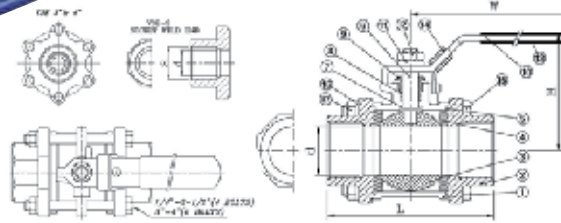
3-PC Full Port SS 1000 PSI Ball Valve

Pressure Rating: 1000 psi (69 bar) WOG for 1/4" to 4"

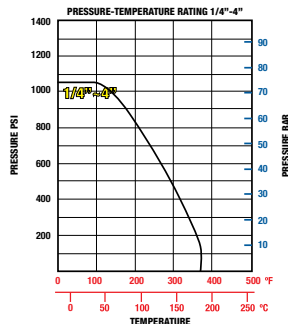


- Investment cast body and ends
- Blow-out proof stem
- Full port
- FNPT threaded on both ends for B04
- Socket weld on both ends for B04S
- Locking handle
- Material: ASTM A351-CF8M (316SS)

Size	dia (mm)	L	H	W	B	D	S	CV Factor	Kg
1/4"	11.6	54	51	84	12	18	14.1	10	0.34
3/8"	12.7	54	51	84	12.5	18	17.6	10	0.34
1/2"	15	61.5	55	84	15.8	22	21.7	26	0.46
3/4"	20	71	58.5	110	20.9	28	27.2	50	0.62
1"	25	83.5	73	135	26.6	34	33.9	68	1.96
1¼"	32	97	78.5	135	35.05	44	42.6	120	1.49
1½"	38	110.5	90.5	165	40.9	50	48.7	170	2
2"	50	129	99	165	52.5	61.5	61.1	360	3.12
2½"	65	171.5	127	215	69	76	76.9	510	6.5
3"	80	200	136	215	82	90	89.8	900	10.4
4"	100	252	172	325	106	115	115.4	1250	20.2



No.	Part (Qty)	Material
1.	Body (1)	ASTM-CF8M-A351
2.	End (1)	ASTM-CF8M-A351
3.	Ball (1)	ASTM-CF8M-A351
4.	Ball Seat (2)	15% RTFE
5.	Joint Gasket (1)	15% RTFE
6.	Stem (1)	AISI 316
7.	Thrust Washer (1)	PTFE
8.	Stem Packing (2)	PTFE
9.	Gland Nut (1)	AISI 304
10.	Handle (1)	AISI 304
11.	Stem Washer (1)	AISI 304
12.	Stem Nut (1)	AISI 304
13.	Handle Sleeve (1)	Vinyl Grip
14.	Lock Device (1)	AISI 304
15.	Bolt (4-6)	AISI 304
16.	Spring Washer (4-12)	AISI 304
17.	Hex Nut (4-12)	AISI 304



Sizes and specifications shown are subject to change without notice.

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B Series Ball Valves

3-PC Full Port SS Ball Valve - Direct Mount

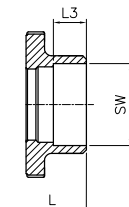
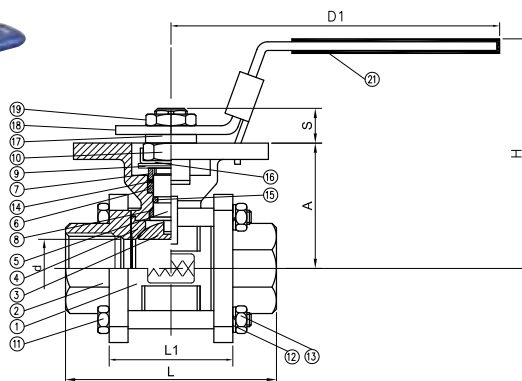
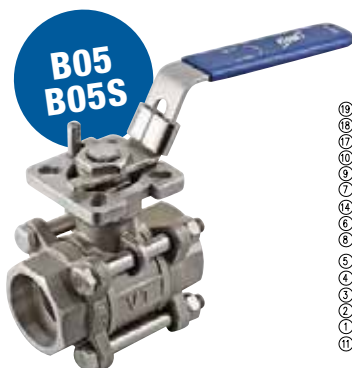
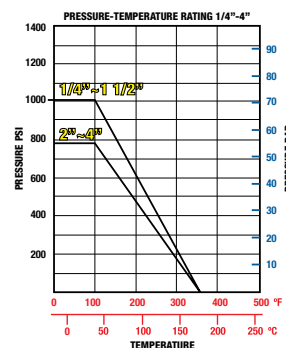
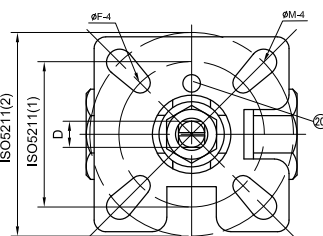
Pressure Rating: 1000 psi (69 bar) WOG for 1/4" to 4" / See Page 21 for Actuation

No. Part (Qty)	Material
1. Body (1)	ASTM-A351Gr. CF8M
2. Ends (2)	ASTM-A351Gr. CF8M *CF3M for SW
3. Ball (1)	ASTM-A351Gr. CF8M
4. Stem (1)	316SS
5. Seat (2)	15% RTFE
6. Stem Packing (1)	25% CTFE
7. Washer (1)	304SS
8. Thrust Washer (1)	PTFE +25% Carbon
9. Belleville Washer(1)	SUS 304-CSP
10. Stem Nut (1)	304SS
11. Bolts (4-6)	304SS
12. Spring Washer (4-6)	304SS
13. Bolt Nuts (4-6)	304SS
14. Stem Ring (1)	PTFE +25% Carbon
15. O-Ring (1)	Viton
16. Stopper Washer (1)	304SS
17. Sqaure (1)	304SS
18. Handle (1)	304SS
19. Handle Nut (1)	304SS
20. Stopper Pin (1)	304SS
21. Handle Sleeve (1)	Vinyl

Threaded (B05) and Socket Weld (B05S) Ends

- High Cycle, Live Loaded, Triple Stem Seal comprised of:
 - » Carbon filled PTFE wedge ring thrust washer and Viton O-Ring
 - » 15% RTFE Chevron packing
 - » Live loaded Belleville washers
 - » Packing nut mechanically locked to stem
- Investment cast body and ends

- Blow-out proof stem
- Full port
- Locking Handle
- Direct mounting pad for ISO Std 5211
- FNPT threaded on both ends on B05
- Socket weld ends on B05S
- Material: ASTM A351-CF8M (316SS) and 316LSS ends on socket weld



SOCKET WELD END

Size	1/2"		3/4"		1"		1 1/4"		1 1/2"		2"		2 1/2"		3"		4"	
d	15		20		25		32		38		50		65		80		100	
L	63.5		72.5		81.0		94.5		108.0		121.5		157.5		190.0		225.0	
L1	22.5		27.5		34.0		42.5		52.0		63.5		85.5		102.0		128.5	
L3	10.0		13.0		7.5		7.5		7.5		9.5		9.5		11.0		11.0	
ØF	6.0		7.5		7.5		7.5		7.5		9.5		9.5		11.0		11.0	
ØM	7.5		9.5		9.5		9.5		9.5		11.0		11.0		14.3		14.3	
ISO 5211	42	50	50	70	50	70	50	70	50	70	70	102	70	102	102	125	102	125
	F04	F05	F05	F07	F05	F07	F05	F07	F05	F07	F07	F10	F07	F10	F10	F12	F10	F12
SW	21.8		27.4		34.1		42.7		49.0		61.2		77.0		90.2		115.3	
D	9.0		9.0		11.0		11.0		14.0		14.0		17.00		17.0		22.0	
H	72.95		80.8		90.45		98.65		115.25		124.0		155.0		208.5		216.7	
D1	112.0		112.0		136.0		185.0		197.9		197.9		264.0		264.0		325.0	
S	8.5		8.5		11.4		11.4		14.0		13.7		18.0		18.0		23.0	
A	36.95		45.0		53.45		58.95		74.75		83.5		108.75		118.25		153.75	
CV	26		51		68		120		170		376		510		996		1893	
T(NM)	7		12		20		21		33		45		70		120		200	

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B Series Ball Valves

3-PC Full Port SS Ball Valve - Direct Mount

Pressure Rating: 1000 psi (69 bar) WOG for 1/2" to 4" / See Page 21 for Actuation

Tri-Clamp (B05TC) and Tube (B05TO) Ends

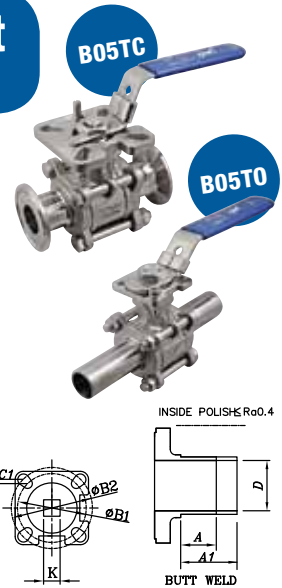
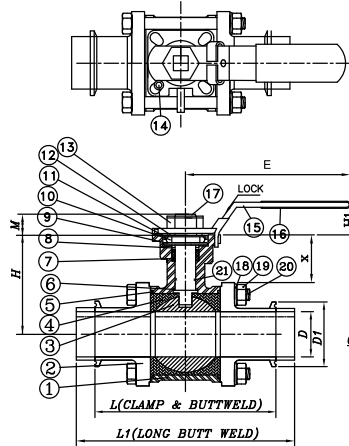
- High Cycle, Live Loaded, Triple Stem Seal comprised of:

- » Carbon filled PTFE wedge ring thrust washer and Viton O-Ring
- » 15% RTFE Chevron packing
- » Live loaded Belleville washers
- » Packing nut mechanically locked to stem

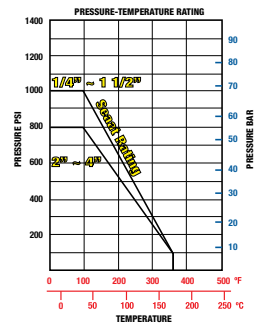
- Investment cast body and ends
- Blow-out proof stem
- Full port
- Direct mounting pad for ISO Std 5211
- Tube ends

- Material: ASTM, A351-CF8M (316SS)

No.	Part	Material
1.	Body.....	CF8/CF8M/CF3M
2.	Ends.....	CF8/CF8M/CF3M
3.	Ball.....	CF8/CF8M/CF3M
4.	Seat.....	RPTFE
5.	Gasket.....	RPTFE
6.	Thrust Packing.....	RPTFE
7.	Stem Packing.....	RPTFE
8.	Ring.....	AISI 304
9.	Belleville Washer.....	AISI 304
10.	Stem Nut.....	AISI 304
11.	Lock Washer.....	AISI 304
12.	Ring.....	AISI 304
13.	Handle Nut.....	AISI 304
14.	Stop Pin.....	AISI 304
15.	Handle.....	AISI 304
16.	Handle Sleeve.....	Plastic
17.	Stem.....	AISI 316
18.	Spring Washer.....	AISI 304
19.	Bolt Nut.....	AISI 304
20.	Bolt.....	AISI 304
21.	O-Ring.....	Viton



Size		ISO 5211	D ±0.5	L ±1.0	H	M ±1.5	ØB1	ØB2	K	D1	E	D2	H1	A	C1	C2	TORQUE IN/LBS	X	A1	L1 ±1.0	BWL	CV
DN	NPS																					
15	1/2"	F03-F04	9.5	89	37.0	9	36	42	9	25.4	143	12.7	26	18	6	6	120	15.5	42	137	88	6
20	3/4"	F03-F04	15.9	101	47.0	9	36	42	9	25.4	143	19.1	26	21	6	6	130	20.6	44	147	99	12.3
25	1"	F04-F05	22.2	114	57.2	11	42	50	11	50.4	160	25.4	34	25	6	8	185	29.0	52	168		30
32	1 1/4"	F04-F05	28.5	124	62.5	11	42	50	11	50.4	160	31.8	41	27	6	8	250	29.0				50
40	1 1/2"	F05-F07	35.0	140	78.2	14	50	70	14	50.4	187	38.1	43	28	8	10	330	39.0	51	186		73.7
50	2"	F05-F07	47.6	156	86.2	14	50	70	14	63.8	187	50.8	43	25	8	10	650	42.0	58.5	223		140
65	2 1/2"	F07-F10	60.3	197	109.2	17	70	102	17	77.6	310	63.5	53	35	10	12	850	48.0	61	250.4		245
80	3"	F07-F10	73.0	229	116.2	17	70	102	17	91.0	310	76.2	53	43	10	12	1560	48.7	79	302		378
100	4"	F10-F12	97.4	241	133.5	22	102	125	22	119.0	400	100.6	56	37	12	14	1900	34.0	75	317.5		760

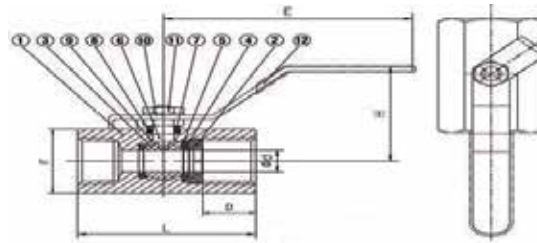


1-PC Reg. Port Carbon Steel 2000 PSI Ball Valve

Pressure Rating: 2000 psi (138 bar)

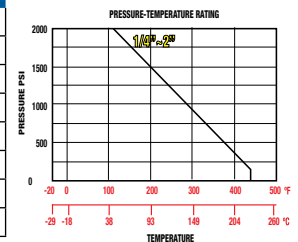


- NACE MR0175
- Blow-out proof stem
- FNPT threaded on both ends
- Material: ASTM A105N Carbon Steel



Size	D	H	L	OD	F	E	CV Factor	Kg
1/4"	12	31.8	41.3	5	21	66.7	1.5	0.21
3/8"	12.2	33.9	47.2	7	25.4	66.7	3.5	0.22
1/2"	17.4	55.5	62.5	9.2	30	118	5.7	0.29
3/4"	22.3	59	69.9	12.5	36	118	10	0.42
1"	25.5	65.4	85.9	16	46	120	16	0.71
1 1/4"	27.8	74	93.7	20	55	146	25	1.06
1 1/2"	29.6	78.7	101.6	24.5	61	146	40	1.68
2"	29.4	120	114.3	32	75	152	62	2.71

No.	Part	Material
1.	Body.....	A105
2.	Insert.....	A105
3.	Ball.....	AISI 316
4.	Seat.....	PTFE+15% G/F
5.	Stem.....	AISI316
6.	Thrust Washer.....	PTFE
7.	Stem Seal.....	PTFE
8.	Handle.....	AISI 304
9.	Handle Sleeve.....	Vinyl
10.	Nut.....	304SS
11.	Washer.....	WCB
12.	Spring Washer.....	304SS



Sizes and specifications shown are subject to change without notice.

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B Series Ball Valves

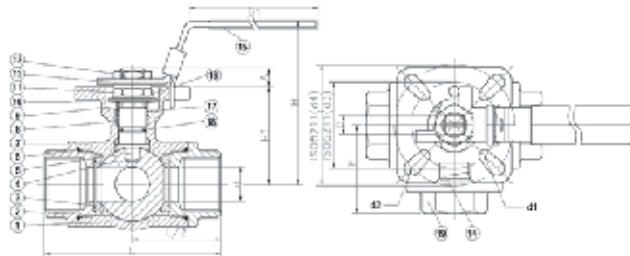
3-way Reg. Port SS Ball Valve - Direct Mount

Pressure Rating: 1000 psi (69 bar) WOG for 1/4" to 2" / See Page 21 for Actuation



- High Cycle, Live Loaded, Triple Stem Seal comprised of:
 - » Carbon filled PTFE wedge ring thrust washer and Viton O-Ring
 - » 15% RTFE Chevron packing
 - » Live loaded Belleville washers
 - » Packing nut mechanically locked to stem

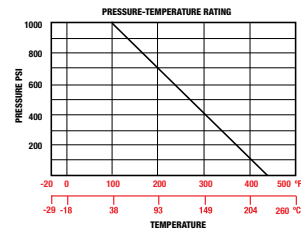
- Anti-static device
- L-Port and T-Port
- Blow-out proof stem
- FNPT end connections
- Material: ASTM A351-CF8M (316SS)
- Locking handle



No. Part	Material
1. Body	ASTM-A351 Gr. CF8M
2. Ends	ASTM-A351 Gr. CF8M
3. Seat	15% RTFE
4. Ball	ASTM-A351 Gr. CF8M
5. Stem	316SS
6. Gasket	15% RTFE
7. Thrust Washer	PTFE +25% Carbon
8. Stem Packing	15% RTFE
9. Gland	304SS
10. Belleville Washer	SUS 304-CSP
11. Stem Nut	304SS
12. Handle	304SS
13. Handle Nut	304SS
14. Gasket	15% RTFE
15. Handle Sleeve	Vinyl
16. Locking Washer	SUS 304-CSP
17. Thrust Washer	PTFE +25% Carbon
18. End Cap	ASTM-A351 Gr. CF8M
19. O-Ring	Viton

Size	dia (mm)	L	F	ISO 5211	D	H	D1	A	C	d1	d2	H1	Torque (in-lbs)	Kg	CV Factor
1/2"	12.7	75.7	37.25	42 F04 50 F05	9	77.45	112	8.5	12	6	7.5	40.65	85	0.67	6
3/4"	16.0	86.6	44.7	50 F05 70 F07	9	82	112	8.5	12	7.5	9.5	45.2	110	1.07	8
1"	20.0	102.4	51.4	50 F05 70 F07	11	93.7	136.5	11.4	15.8	7.5	9.5	56.5	180	1.68	11
1 1/2"	32.0	125.8	62.7	50 F05 70 F07	14	120.25	197.5	14	20.8	7.5	9.5	73.5	315	3.6	65
2"	38.1	149	74.6	70 F07 102 F10	14	129.85	197.5	13.7	20.8	9.5	11	87.35	450	5.8	112

Position	Type
1	L T
2	L T
3	L T
4	L T

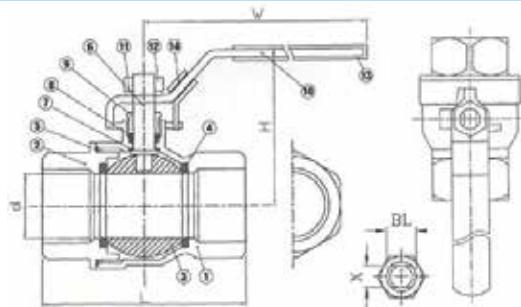


2-PC Full Port Carbon Steel Ball Valve

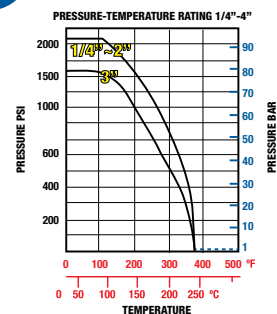
Pressure Rating: 2000 psi (138 bar) WOG for 1/4" to 2" / 1500 (103.4 bar) WOG for 3"



- Blow-out proof stem
- Full port
- FNPT threaded on both ends
- Locking handle
- Carbon steel body and ends
- Material: ASTM A216-WCB
- NACE MR0175



Size	dia (mm)	L	H	W	X	BL	CV Factor	Torque (in-lbs)	Kg
1/4"	11.6	44.5	51	95	5	5/16"	6.6	35	0.194
3/8"	12.7	44.5	51	95	5	5/16"	7.9	35	0.205
1/2"	15	57	53	95	5	5/16"	11.2	47	0.285
3/4"	20	65	59.5	100	6.5	3/8"	21	64	0.456
1"	25	76	73	135	8	7/16"	35	90	0.764
1 1/4"	32	87.5	79	135	8	7/16"	57	117	1.163
1 1/2"	38	102	90.5	165	9	1/2"	80	156	1.870
2"	50	123	98.8	165	9	1/2"	148	217	3.126
3"	80	184	142.5	215	12	3/4"	415	651	9.79



No. Part (Qty)	Material
1. Body (1)	ASTM-A216-WCB
2. Ends (1)	ASTM-A216-WCB
3. Ball (1)	ASTM-CF8M-A351
4. Ball Seat (2)	15% R-PTFE
5. Joint Gasket (1)	PTFE
6. Stem (1)	AISI 316
7. Thrust Washer (1)	PTFE
8. Stem Packing (2)	PTFE
9. Gland Nut (1)	AISI 304
10. Handle (1)	AISI 304
11. Spring Washer (1)	AISI 304
12. Stem Nut (1)	AISI 304
13. Handle Sleeve (1)	Vinyl
14. Lock Device (1)	AISI 304

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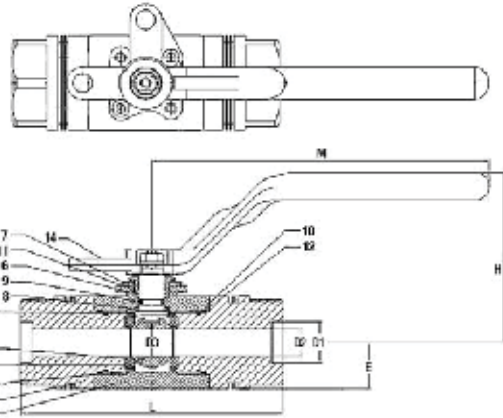
3-PC Threaded Body 3000/6000 PSI Ball Valve

Pressure Rating: 3000 psi for the BT3 and 6000 psi for the BT6



**BT3
BT6**

Available in threaded, socket weld and threaded-socket weld.



SPECIFICATIONS AND FEATURES

- Designed to ASME B16.34
- NPT and SW to ASME B16.11
- Tested to API 598
- API 607 Fire-safe
- NACE MR0175
- Available in full port and regular port
- Forged steel body
- Locking lever
- Blow-out proof stem
- Anti-static device
- Mounting device

STANDARD SOUR

No. Part	Material
1. Body	A105N
2. Cap	A105N
3. Ball	CF8M / 316SS / 17/4 PH
4. Stem	316SS / A564 Gr. 630 17/4 PH
5. Seat	PEEK
6. Packing Ring	304SS
7. Gland	Carbon Steel
8. Thrust Washer	Delrin/PEEK
9. Packing	Graphite
10. O-Ring	Viton-B
11. O-Ring	Viton-B
12. Gasket	Graphite
13. Belleville Washer	302SS
14. Handle	A216 WCB

*NPT valves

LOW TEMP / SOUR

No. Part	Material
1. Body	A350 LF2
2. Cap	A350 LF2
3. Ball	CF8M / 316SS / 17/4 PH
4. Stem	316SS / A564 Gr. 630 17/4 PH
5. Seat	PEEK
6. Packing Ring	304SS
7. Gland	Carbon Steel
8. Thrust Washer	PEEK
9. Packing	Graphite
10. O-Ring	Viton-B
11. O-Ring	Viton-B
12. Gasket	Graphite
13. Belleville Washer	302SS
14. Handle	A216 WCB

STAINLESS STEEL / SOUR

No. Part	Material
1. Body	316SS
2. Cap	316SS
3. Ball	CF8M / 316SS / 17/4 PH
4. Stem	316SS / A564 Gr. 630 17/4 PH
5. Seat	PEEK
6. Packing Ring	304SS
7. Gland	Carbon Steel
8. Thrust Washer	PEEK
9. Packing	Graphite
10. O-Ring	Viton-B
11. O-Ring	Viton-B
12. Gasket	Graphite
13. Belleville Washer	302SS
14. Handle	A351 CF8M

Size	Size (mm)	L NPT	L SW	L NPT x SW	E	H	D1	D2	D3	M	Torque (in-lbs)
1/2" FP-BT3	12.7	98	127	113	19	83	21.8	12.7	12.7	160	156
1/2" FP-BT6	12.7	98	127	119	19	83	21.8	12.7	12.7	160	214
3/4" FP	19	108	172	140	24	90	27.8	19	19	160	358
3/4" RP	19	111	172	140	19	83	27.8	19	12.7	160	156
1" FP	25	108	172	152	27	94	48.8	25	25	200	441
1" RP-BT3	25	108	172	140	24	90	48.8	25	19	160	358
1" RP-BT6	25	108	172	152	24	90	48.8	25	19	160	560
1½" FP	38.1	159	217	188	37	122	33.9	38.1	38.1	250	885
1½" RP-BT3	38.1	159	217	188	27	94	33.9	38.1	25	200	441
1½" RP-BT6	38.1	159	217	201	27	94	33.9	38.1	25	200	841
2" FP	50	159	324	241	43	150	61.2	50	50	325	2847
2" RP-BT3	50	159	217	188	37	122	61.2	50	38.1	250	885
2" RP-BT6	50	159	217	201	37	122	61.2	50	38.1	250	1290

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Z Series Ball Valves

Z SERIES FLOATING FLANGED BALL VALVES

PART NUMBERING SYSTEM

1

1 = Code and Class

ZR1 = Reduced port class 150

ZR3 = Reduced port class 300

ZR6 = Reduced port class 600

ZF1 = Full port class 150

ZF3 = Full port class 300

ZF6 = Full port class 600

2

2 = Size

050 = 1/2" 250 = 2 1/2"

075 = 3/4" 003 = 3"

001 = 1" 004 = 4"

150 = 1 1/2" 006 = 6"

002 = 2" 008 = 8"

3

3 = Type

A = Floating ball split body

B = Floating ball uni-body

L = 3-Way L port

T = 3-Way T port

4

4 = Type

1 = ASTM A216 WCB, Non Direct Mount

2 = ASTM A325 LCC

3 = ASTM A351 CF8M, ISO Direct Mount

4 = A105N

5 = A350 LF2

6 = ASTM A351 CF8M, ISO Non Direct Mount

5

5 = End Connection

F = Raised face flanged*

R = Ring joint flanged ends

B = Butt-welded ends

6

6 = Trim Material

1 = Body + 3ENC

2 = 304SS

3 = 316SS*

7

7 = Seat Material

P = PTFE

R = RTFE*

N = Nylon

K = PEEK

D = Devlon

8

8 = Operator

H = Handle/Lever

G = Gear Operator

B = Bare Stem

9

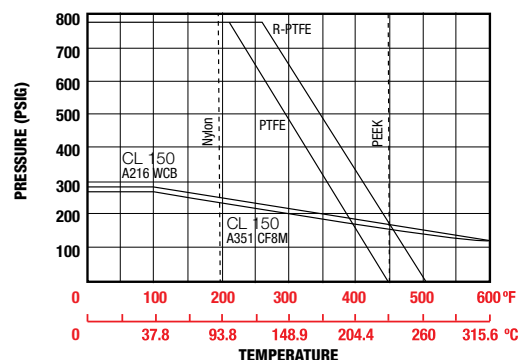
9 = Special Requirements

00 = Standard Requirement

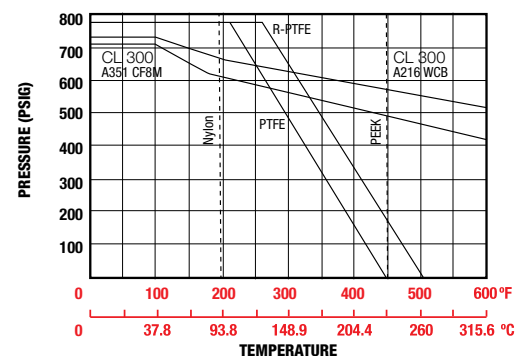
*Denotes standard stock trim.

Z Series Pressure and Temperature Charts

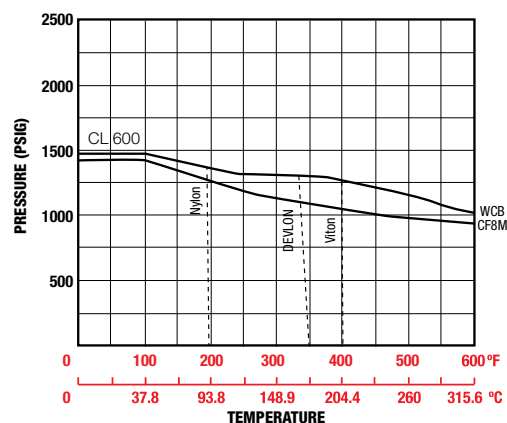
CLASS #150



CLASS #300



CLASS #600



ZF1– 150# Full Port 3-Way Flanged SS L/T PORT

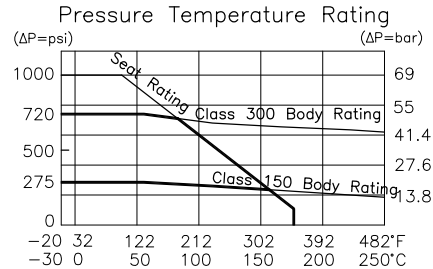
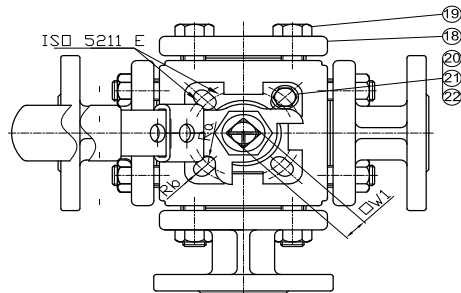
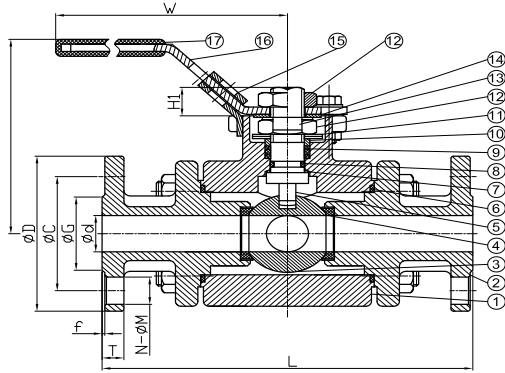


FEATURES:

- END FLANGE DIMENSION: ASME B16.5
- TEST: ASME B16.34
- INVESTMENT CASTING BODY
- WITH ISO 5211 MOUNTING PAD
- LOCKING DEVICE
- THERE ARE FOUR SEATS
- L-PORT OR T-PORT AVAILABLE / 360°PAD

MATERIALS LIST:

NO.	PART NAME	MATERIAL
1	BODY	CF8M
2	CAP	CF8M
3	BALL	CF8M
4	SEAT	RPTFE
5	STEM	SUS316
6	GASKET	RPTFE
7	THRUST WASHER	TFM4215
8	O-RING	VITON
9	PACKING	RPTFE
10	GLAND	SUS304
11	SPRING WASHER	SUS301
12	STEM NUT	SUS304
13	STOP WASHER	SUS304
14	HANDLE WASHER	SUS304
15	LOCKING DEVICE	SUS304
16	HANDLE	SUS304
17	PLASTIC COVER	PLASTIC
18	CAP-A	CF8M
19	BOLT	SUS304
20	STOP PIN	SUS304
21	BOLT	SUS304
22	NUT	SUS304



TEST PRESSURE:

SHELL(BY WATER)	450PSI 32kg/cm ²
SEAT BY AIR	85PSI 6kg/cm ²

FLOW PATTERN:

PORT TYPE	1	2	3	4
L	1/3 2	1/3 2	1/3 2	1/3 2
T	1/3 2	1/3 2	1/3 2	1/3 2

SIZE	ISO 5211																	
DN/NPS	d	D	C	G	T	f	N	M	L	H	W	E	H1	W1	Ra	Rb		
15 1/2"	15	89	60.5	35	11.1	1.6	4	16	148	80	123	F03-F04	36-42	9	9	R3	R3	
20 3/4"	20	98	70.0	43	11.1	1.6	4	16	153	84	123	F03-F04	36-42	9	9	R3	R3	
25 1"	25	108	79.5	51	11.1	1.6	4	16	168	96	153	F04-F05	42-50	11	11	R3	R3.5	

SIZE		d	D	C	G	T	f	N	M	L	H	W	ISO 5211	E	H1	W1	Ma
DN	NPS																
40	1 1/2"	40	127	98.5	73	14.3	1.6	4	16	221	171	403	F07	70	19	17	10
50	2"	50	152	120.5	92	15.9	1.6	4	19	254	176	403	F07	70	19	17	10
65	2 1/2"	65	178	139.5	105	17.5	1.6	4	19	300	208	504	F10	102	24	22	12
80	3"	76	190	152.5	127	19.1	1.6	4	19	305	216	504	F10	102	24	22	12
100	4"	96	229	190.5	157	23.9	1.6	8	19	369	236	654	F10	102	24	22	12
150	6"	148	279	241.5	216	25.4	1.6	8	22	480	329	800	F14	140	38	36	18
200	8"	200	343	298.5	270	28.6	1.6	8	22	630	354	1000	F14	140	40	36	18

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Z Series Ball Valves

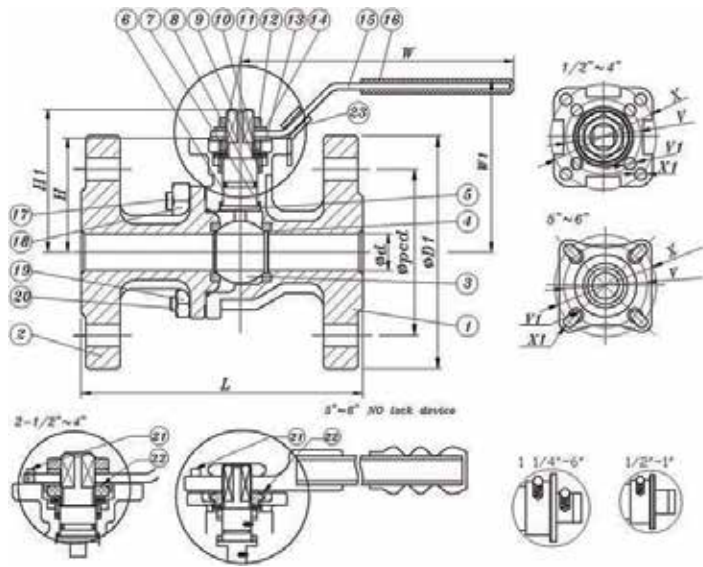
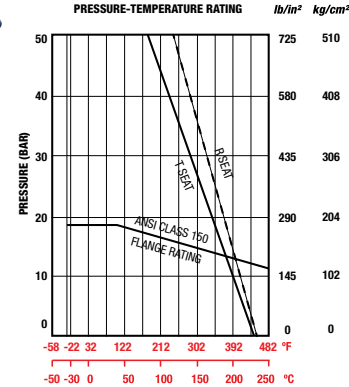
ZF1 – 150# Full Port Direct Mount SS

SPECIFICATIONS

- Designed according to ASME/ANSI Class 150 B16.34
- Face to Face per ASME/ANSI B16.10 Long Pattern
- Flanged designed per ASME/ANSI B16.5
- NACE MR0175
- Design Standard per API 608
- Markings per MSS-SP25
- Pressure Test per API 598

FEATURES

- Full bore, 2 piece body floating ball
- ISO mounting pad, direct mounting
- Blow-out proof stem
- Cavity Relieved seats, anti-static device
- Lever operated



No. Part (Qty)	Material
1. Body (1)	ASTM-A351 CF8M
2. Cap (1)	ASTM-A351 CF8M
3. Ball (1)	ASTM-A351 CF8M
4. Ball Seat (2)	15% R-PTFE
5. Joint Gasket (1)	PTFE +25% Carbon
6. Stem (1)	AISI 316
7. Thrust Washer (1)	PTFE +25% Carbon
8. O-Ring (1)	Viton
9. Stem Packing (1)	PTFE +25% Carbon
10. Stem Ring (1)	AISI 304
11. Belleville Washer (1)	AISI 304
12. Stem Nut (2)	AISI 304
13. Stopper (2)	AISI 304
14. Spring Washer (1)	AISI 304
15. Handle (1)	AISI 304
16. Plastic Cover (1)	Plastic
17. Nut*1 (1)	AISI 304
18. Stud Bolt*1 (1)	AISI 304
19. Nut*2 (3,5,7)	AISI 304
20. Stud Bolt*2 (3,5,7)	AISI 304
21. Stopper Pin (1)	AISI 304
22. Lock Washer (1)	AISI 304
23. Lock Device (1)	AISI 304

Size	d	D1	pcd	L	H	H1	W	W1	V	V1	X	X1	Stem Diameter	Torque	WT	CV
1/4"	0.59"	3.5"	2.38"	4.25"	1.83"	2.20"	4.3"	3.50"	1.65"	0.24"	1.97"	0.28"	0.35"	85 in lb	3.6 lb	27
12	15	89	60.5	108	46.5	56	110	89	42	6	50	7	9	9.6 Nm	1.6 kg	
3/4"	0.79"	3.875"	2.75"	4.6"	2.03"	2.40"	4.3"	3.70"	1.97"	0.3"	2.76"	0.38"	0.35"	110 in lb	4.5 lb	50
20	20	98	70	117	51.5	61	110	94	50	7.6	70	9.6	9	12.4 Nm	2 kg	
1"	0.98"	4.25"	3.125"	5"	2.26"	2.64"	5.35"	3.74"	1.97"	0.3"	2.76"	0.38"	0.43"	180 in lb	7 lb	95
25	25	108	79.5	127	57.5	67	136	95	50	76	70	9.6	11	20.3 Nm	3.2 kg	
1 1/2"	1.57"	5"	3.875"	6.5"	3.01"	3.62"	8"	4.36"	2.76"	0.38"	4.02"	0.44"	0.55"	315 in lb	14 lb	280
38	40	127	98.5	165	76.5	92	203	110.7	70	9.6	102	11.2	14	35.6 Nm	6.4 kg	
2"	1.97"	6"	4.75"	7"	3.29"	3.90"	8"	4.63"	2.76"	0.38"	4.02"	0.44"	0.55"	450 in lb	21 lb	490
50.8	50	152.4	120.5	178	83.5	99	203	117.7	70	9.6	102	11.2	14	50.8 Nm	9.5 kg	
2 1/2"	2.56"	7.01"	5.49"	7.48"	4.57"	5.39"	10.93"	6.12"	4.02"	0.44"	4.92"	0.56"	0.67"	565 in lb	36 lb	750
63.5	65	178	139.5	190	118.5	137	277.5	155.5	102	11.2	125	14.3	17	63.8 Nm	16.3 kg	
3"	3.14"	7.5"	6"	8"	5.10"	5.83"	10.93"	6.56"	4.02"	0.44"	4.92"	0.56"	0.67"	680 in lb	48 lb	1160
75	80	190.5	152.5	203	129.5	148	277.5	166.5	102	11.2	125	14.3	17	76.8 Nm	22 kg	
4"	3.94"	9"	7.5"	9.06"	5.71"	6.44"	14.86"	7.17"	4.02"	0.44"	4.92"	0.56"	0.87"	1190 in lb	79 lb	2200
100	100	229	190.5	230	145	163.5	377.5	182	102	11.2	125	14.3	22	134.5 Nm	36 kg	
6"	5.9"	11"	9.5"	15.51"	6.89"	8.61"	21.65"	7.17"	4.92"	0.56"	5.51"	0.73"	1.06"	2850 in lb	207 lb	5100
150	150	280	241.5	994	175	218.6	550	182	125	14.3	140	18.6	27	322 Nm	94 kg	

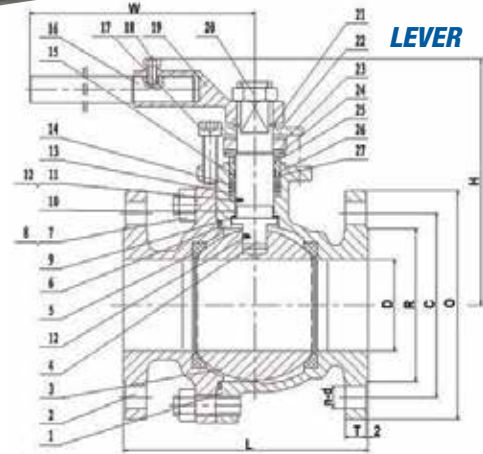
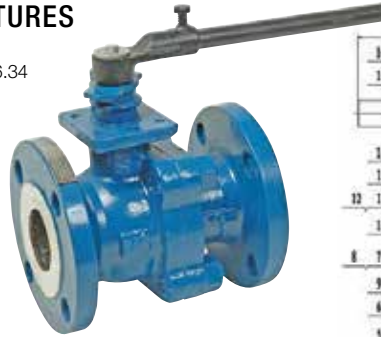
Sizes and specifications shown are subject to change without notice.

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ZF1 – 150# Full Port Carbon Steel and Low Temp

SPECIFICATIONS AND FEATURES

- Fire-safe to API-607, latest Ed.
- Designed to ASME/ANSI Class 150-B16.34
- Face to Face to ASME/ANSI B16.10 Long Pattern
- Flanges to ASME/ANSI B16.5
- NACE MR0175
- Design Standard per API 608
- Pressure Test per API 598
- Full bore, 2 piece body floating ball
- ISO mounting pad, direct mounting
- Blow-out proof stem
- Cavity relieving seats, anti-static device
- Lever operated 2"-6", gear operated 8"

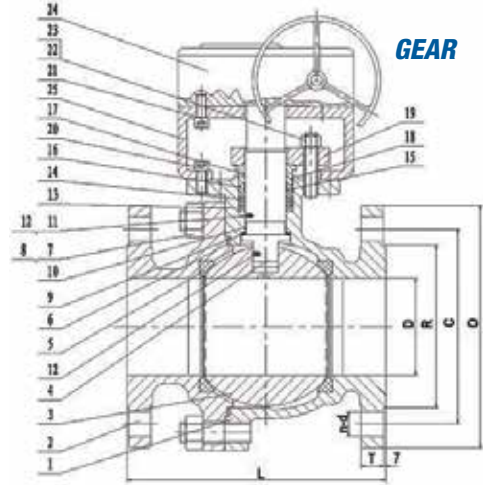


LEVER and GEAR PARTS LIST

No. Part	WCB BODY	LCC BODY
1. Body	A216 WCB	A352 LCC
2. End	A216 WCB	A352 LCC
3. Ball	A182 F316	A182 F316
4. Stem	A182 F316	A182 F316
5. Seat	R-PTFE	R-PTFE
6. Body Gasket	304 Graphite Spiral Wound	304 Graphite Spiral Wound
7. Nut	A194-2HM	A194-2HM
8. Full-threaded Bolt	A193-B7M	A320 L7M
9. Stem Gasket	PTFE	PTFE
10. Stem Bearing	PTFE	PTFE
11. Steel Ball	A276 304	A276 304
12. Anti-static Spring	A276 304	A276 304
13. Stem Firesafe Gasket I	Flexible Graphite + 316	Flexible Graphite + 316
14. Stem Firesafe Gasket II	Flexible Graphite	Flexible Graphite
15. Packing Gland Bearing	PTFE	PTFE

LEVER PARTS ONLY

16. Lever	AISI 1020	AISI 1020
17. Screw	A193-B7M	A320 L7M
18. Hex Bolt	A193-B7M	SS
19. Joint	A216 WCB	A352 LCC
20. Nut	AISI 1020	AISI 1020
21. Axial Retaining Ring	AISI 1566	AISI 1566
22. Limit Block	A36	A36
23. Nut	AISI 1020	AISI 1020
24. Belleville Washer	A276 304	A276 304
25. O-Ring	Viton	Viton
26. O-Ring	Viton	Viton
27. Packing Bushing	A276 316	A276 316



GEAR PARTS ONLY

	WCB BODY
16. O-Ring	Viton
17. O-Ring	Viton
18. Packing Bushing	A276 316
19. Packing Plate	A216 WCB
20. Inner Hex Screw	A193-B7M
21. Inner Hex Screw	A194-B7M
22. Nut	A194-2HM
23. Bolt	A193-B7M
24. Actuator	Component
25. Yoke	A36

	LCC BODY
16. O-Ring	Viton
17. O-Ring	Viton
18. Packing Bushing	A276 316
19. Packing Plate	A352 LCC
20. Inner Hex Screw	A320 L7M
21. Inner Hex Screw	A320 L7M
22. Nut	A194 7M
23. Bolt	A320 L7M
24. Actuator	Component
25. Yoke	A36

Size	L	D	R	C	O	n-d	T	W	H	WT	Torque 150 PSI	285 PSI	CV
1/2"	4.25"	0.51"	1.375"	2.375"	3.5"	0.625"	0.438"	5.91"	3.19"	4.85 lb	71 in lb	107 in lb	24
12.7	108	13	34.93	60.33	88.9	4-62	11.11	150	81	2.2 kg	8 Nm	12 Nm	
3/4"	4.61"	0.75"	1.6875"	2.75"	3.875"	0.625"	0.5"	5.91"	3.35"	5.95 lb	80 in lb	124 in lb	53
19.05	117	19	42.86	69.85	98.43	4-62	12.7	150	85	2.7 kg	9 Nm	14 Nm	
1"	5.0"	0.98"	2"	3.125"	4.25"	0.625"	0.56"	7.09"	3.86"	9.92 lb	142 in lb	239 in lb	92
25.4	127	25	50.8	79.38	107.98	4-62	14.29	180	98	4.5 kg	16 Nm	27 Nm	
1 1/2"	6.5"	1.50"	2.875"	3.875"	5"	0.625"	0.69"	11.02"	5.24"	15.43 lb	292 in lb	487 in lb	211
38.1	165	38	73.03	98.43	127	4-62	17.46	280	133	7 kg	33 Nm	55 Nm	
2"	7"	1.97"	3.625"	4.75"	5.9"	0.625"	0.562"	9.53"	6.14"	22 lb	372 in lb	620 in lb	450
50.8	178	50	92.1	120.7	150	4-19	14.3	242	156	9.8 kg	42 Nm	70 Nm	
3"	8"	2.95"	5"	6"	7.48"	0.625"	0.69"	13.78"	8.07"	44 lb	797 in lb	1328 in lb	1100
76.2	203	75	127	152.4	190	4-19	17.5	350	205	20 kg	90 Nm	150 Nm	
4"	9.02"	3.98"	6.19"	7.5"	9.05"	0.875"	0.88"	18.11"	8.858"	77 lb	1328 in lb	2168 in lb	2200
101.6	229	101	157.2	190.5	230	8-19	22.3	460	225	35 kg	150 Nm	245 Nm	
6"	15.51"	5.94"	8.5"	9.5"	11.02"	0.885"	0.94"	29.53"	12.48"	211 lb	3009 in lb	4956 in lb	5200
152.4	394	151	215.9	241.3	280	8-22.5	23.9	750	317	96 kg	340 Nm	560 Nm	
8"	18"	7.95"	10.625"	11.75"	13.58"	0.885"	1.06"	//	//	364 lb	7213 in lb	12001 in lb	10,000
203.2	457	202	269.9	298.5	345	8-22.5	27	//	//	165 kg	815 Nm	1356 Nm	

Z Series Ball Valves

ZR1 – 150# Reg. Port Carbon Steel and Low Temp

SPECIFICATIONS

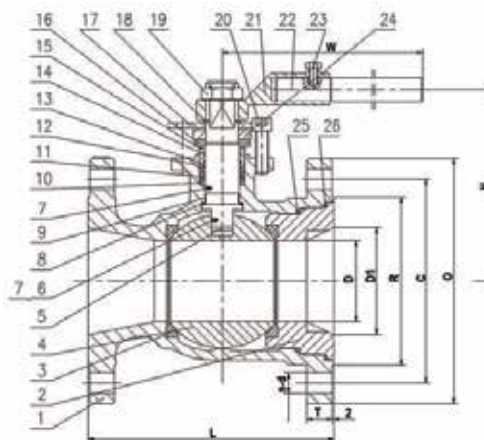
- Fire-safe to API-607, latest Ed.
- Designed to ASME/ANSI Class 150-B16.34
- Face to Face to ASME/ANSI B16.10 Short Pattern
- Markings per MSS-SP25
- NACE MR0175
- Design Standard per API 608
- Pressure Test per API 598

FEATURES

- Reduced bore, 1 piece uni-body floating ball
- ISO mounting pad
- Blow-out proof stem
- Cavity relieving seats, anti-static device
- Lever operated



No. Part	WCB BODY	LCC BODY
1. Body	A216 WCB	A352 LCC
2. End	A216 WCB	A352 LCC
3. Seat	R-PTFE	R-PTFE
4. Ball	A182 F316	A182 F316
5. Stem	A182 F316	A182 F316
6. Stem Steel Ball	A276 304	A276 304
7. Spring	A276 304	A276 304
8. Stem Gasket	PTFE	PTFE
9. Stem Bearing	PTFE	PTFE
10. Stem Firesafe Gasket I	Flexible Graphite + 316	Flexible Graphite + 316
11. Stem Firesafe Gasket II	Flexible Graphite	Flexible Graphite
12. Packing Bushing Bearing	PTFE	PTFE
13. O-Ring	Viton	Viton
14. O-Ring	Viton	Viton
15. Packing Bushing	A276 316	A276 316
16. Belleville Washer	A276 304	A276 304
17. Limit Block	A36	A36
18. Axial Retaining Ring	AISI 1566	AISI 1566
19. Nut	SS	SS
20. Screw	A193 B7M	A2320 L7M
21. Joint	A216 WCB	A216 LCC
22. Lever	AISI 1020	AISI 1020
23. Hex Bolt	CS	CS
24. Nut	SS	SS
25. Gasket	PTFE	PTFE
26. Gasket	Flexible Graphite + 316SS	Flexible Graphite + 316SS



Size	L	D	D1	R	C	O	n-d	T	W	H	WT	Torque		CV
												150 PSI	285 PSI	
2" x 1½"	7"	1.46"	1.97"	3.625"	4.75"	5.9"	4-0.75"	0.562"	9.53"	5.4"	22 lb	221 in lb	487 in lb	230
50 x 38	178	37	50	92.1	120.7	150	4-19	14.3	14.3	137	9.7 kg	25 Nm	55 Nm	
3" x 2"	8"	1.97"	2.95"	5"	6"	7.48"	4-0.75"	0.69"	9.35"	6.575"	40 lb	372 in lb	620 in lb	450
76 x 50	203	50	75	127	152.4	190	4-19	17.5	242	167	18 kg	42 Nm	70 Nm	
4" x 3"	9.02"	2.95"	3.98"	6.19"	7.5"	9.05"	4-0.75"	0.88"	13.78"	8.07"	77 lb	797 in lb	1328 in lb	1100
102 x 76	229	75	101	157.2	190.5	230	8-19	22.3	350	205	35 kg	90 Nm	150 Nm	
6" x 4"	10.5"	3.98"	5.94"	8.5"	9.5"	11.02"	4-0.885"	0.94"	18.11"	8.66"	132 lb	1328 in lb	2168 in lb	2200
152 x 102	267	101	151	215.9	241.3	280	8-22.5	23.9	460	220	60 kg	150 Nm	245 Nm	
8" x 6"	11.5"	5.94"	7.95"	10.625"	11.75"	13.58"	4-0.885"	1.06"	29.52"	12.32"	265 lb	3009 in lb	4956 in lb	5200
203 x 152	292	151	202	269.9	298.5	345	8-22.5	27	750	313	120 kg	340 Nm	560 Nm	

Sizes and specifications shown are subject to change without notice.

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Z Series Ball Valves

ZF3 – 300# Full Port Carbon Steel, Low Temp and SS



LEVER PARTS LIST

No. Part	WCB BODY	LCC BODY	316SS BODY
1. Body	A216 WCB	A352 LCC	A351 CF8M
2. End	A216 WCB	A352 LCC	A351 CF8M
3. Ball	A182 F316	A182 F316	A182 F316
4. Stem	A182 F316	A182 F316	A182 F316
5. Seat	R-PTFE	R-PTFE	R-PTFE
6. Body Gasket	304 Graphite Spiral Wound	304 Graphite Spiral Wound	304 Graphite Spiral Wound
7. Nut	A194-2HM	A194-2HM	A194-8M
8. Full-threaded Bolt	A193-B7M	A320 L7M	A320 B8M
9. Stem Gasket	PTFE	PTFE	PTFE
10. Stem Bearing	PTFE	PTFE	PTFE
11. Steel Ball	A276 304	A276 304	A276 304
12. Anti-static Spring	A276 304	A276 304	A276 304
13. Stem Firesafe Gasket I	Flexible Graphite + 316	Flexible Graphite + 316	Flexible Graphite + 316
14. Stem Firesafe Gasket II	Flexible Graphite	Flexible Graphite	Flexible Graphite
15. Packing Gland Bearing	PTFE	PTFE	PTFE
16. Lever	AISI 1020	AISI 1020	AISI 1020 + Zn
17. Screw	A193-B7M	A320 L7M	A193B8M
18. Hex Bolt	A193-B7M	SS	SS
19. Joint	A216 WCB	A352 LCC	A216 WCB + Zn
20. Nut	AISI 1020	AISI 1020	SS
21. Axial Retaining Ring	AISI 1566	AISI 1566	AISI 1566
22. Limit Block	A36	A36	A36
23. Nut	AISI 1020	AISI 1020	SS
24. Belleville Washer	A276 304	A276 304	A276 304
25. O-Ring	Viton	Viton	Viton
26. O-Ring	Viton	Viton	Viton
27. Packing Bushing	A276 316	A276 316	A276 316

SPECIFICATIONS

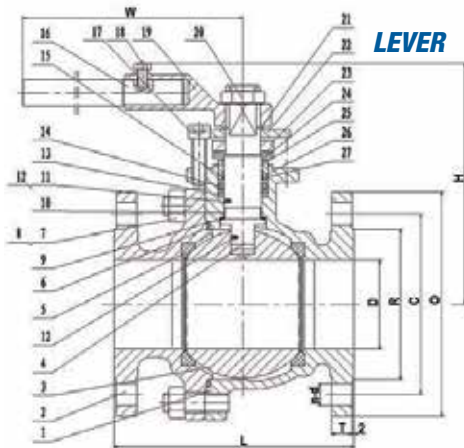
- Fire-safe to API-607, latest Ed.
- Designed to ASME/ANSI Class 300-B16.34
- Face to Face to ASME/ANSI B16.10 Long Pattern
- Flanges to ASME/ANSI B16.5
- NACE MR0175
- Design Standard per API 608
- Markings per MSS-SP25
- Pressure Test per API 598

FEATURES

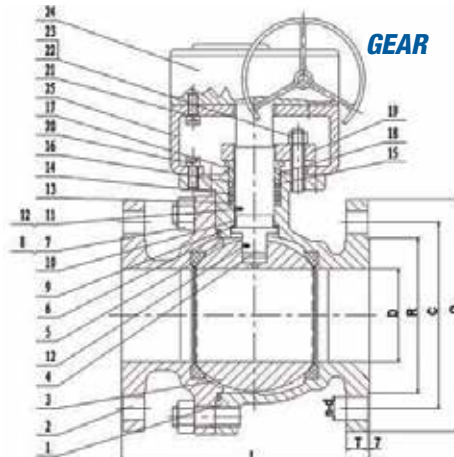
- Full bore, 2 piece body floating ball
- ISO mounting pad
- Blow-out proof stem
- Cavity relieving seats, anti-static device
- Lever operated 2"-6", gear operated 8"

GEAR PARTS LIST

No. Part	WCB BODY	LCC BODY	316SS BODY
1. Body	A216 WCB	A352 LCC	A351 CF8M
2. End	A216 WCB	A352 LCC	A351 CF8M
3. Ball	A182 F316	A182 F316	A182 F316
4. Stem	A182 F316	A182 F316	A182 F316
5. Seat	R-PTFE	R-PTFE	R-PTFE
6. Body Gasket	304 Graphite Spiral Wound	304 Graphite Spiral Wound	304 Graphite Spiral Wound
7. Nut	A194-2HM	A194-2HM	A194-8M
8. Full-threaded Bolt	A193-B7M	A320 L7M	A320 B8M
9. Stem Gasket	PTFE	PTFE	PTFE
10. Stem Bearing	PTFE	PTFE	PTFE
11. Steel Ball	A276 304	A276 304	A276 304
12. Anti-static Spring	A276 304	A276 304	A276 304
13. Stem Firesafe Gasket I	Flexible Graphite + 316	Flexible Graphite + 316	Flexible Graphite + 316
14. Stem Firesafe Gasket II	Flexible Graphite	Flexible Graphite	Flexible Graphite
15. Packing Gland Bearing	PTFE	PTFE	PTFE
16. O-Ring	Viton	Viton	Viton
17. O-Ring	Viton	Viton	Viton
18. Packing Bushing	A276 316	A276 316	A276 316
19. Packing Plate	A216 WCB	A352 LCC	A216 WCB + Zn
20. Inner Hex Screw	A193-B7M	A320 L7M	A320 L8M
21. Inner Hex Screw	A193-B7M	A320 L7M	A320 L8M
22. Nut	A194-2HM	A194-7M	A194-8M
23. Bolt	A193-B7M	A320 L7M	A320 B8M
24. Actuator	Component	Component	Component
25. Yokes	A36	A36	A36



LEVER



GEAR

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Z Series Ball Valves

ZF3 – 300# Full Port Carbon Steel sizing chart

Cont'd from Page 19

Size	L	D	R	C	O	n-d	T	W	H	WT	Torque		CV
											150 PSI	285 PSI	
2"	8.5"	1.97"	3.625"	5"	6.5"	8-0.75"	0.814"	9.53"	6.34"	35 lb	664 in lb	974 in lb	450
50	216	50	92.1	127	165	8-19	20.7	242	161	16 kg	75 Nm	100 Nm	
3"	11.1"	2.95"	5"	6.62"	8.26"	8-0.885"	1.06"	13.78"	8.07"	79 lb	1416 in lb	2478 in lb	1100
76	283	75	127	168.3	210	8-22.5	27	350	205	36 kg	160 Nm	280 Nm	
4"	12"	3.98"	6.19"	7.87"	10.04"	8-0.885"	1.19"	18.11"	8.86"	132 lb	2301 in lb	3540 in lb	2200
102	305	101	157.2	200	255	8-22.5	30.2	460	225	60 kg	260 Nm	400 Nm	
6"	15.87"	5.94"	8.5"	10.625"	12.6"	12-0.885"	1.38"	29.53"	12.48"	260 lb	4426 in lb	8496 in lb	5200
152	403	151	215.9	269.9	320	12-22.5	35	750	317	118 kg	500 Nm	960 Nm	
8"	19.76"	7.95"	10.625"	13"	14.96"	12-1"	1.56"	//	//	520 lb	12611 in lb	13718 in lb	10,000
203	502	202	269.9	330.2	380	12-25.5	39.7	//	//	236 kg	1425 Nm	1550 Nm	

ZR3 – 300# Reg. Port Carbon Steel and Low Temp

SPECIFICATIONS

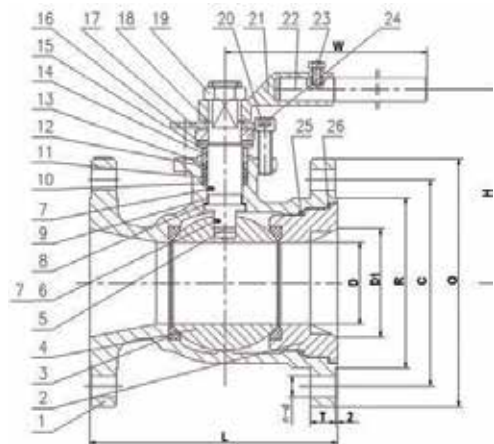
- Fire-safe to API-607, latest Ed.
- Designed to ASME/ANSI Class 300-B16.34
- Face to Face to ASME/ANSI B16.10 Short Pattern
- NACE MR0175
- Design Standard per API 608
- Markings per MSS-SP25
- Pressure Test per API 598

FEATURES

- Reduce bore, 1 piece uni-body floating ball
- ISO mounting pad
- Blow-out proof stem
- Cavity relieving seats, anti-static device
- Lever operated



No. Part	WCB BODY	LCC BODY
1. Body	A216 WCB	A352 LCC
2. End	A216 WCB	A352 LCC
3. Seat	R-PTFE	R-PTFE
4. Ball	A182 F316	A182 F316
5. Stem	A182 F316	A182 F316
6. Stem Steel Ball	A276 304	A276 304
7. Spring	A276 304	A276 304
8. Stem Gasket	PTFE	PTFE
9. Stem Bearing	PTFE	PTFE
10. Stem Firesafe Gasket I	Flexible Graphite + 316	Flexible Graphite + 316
11. Stem Firesafe Gasket II	Flexible Graphite	Flexible Graphite
12. Packing Bushing Bearing	PTFE	PTFE
13. O-Ring	Viton	Viton
14. O-Ring	Viton	Viton
15. Packing Bushing	A276 316	A276 316
16. Belleville Washer	A276 304	A276 304
17. Limit Block	A36	A36
18. Axial Retaining Ring	AISI 1566	AISI 1566
19. Nut	SS	SS
20. Screw	A193 B7M	AZ320 L7M
21. Joint	A216 WCB	A216 LCC
22. Lever	AISI 1020	AISI 1020
23. Hex Bolt	CS	CS
24. Nut	SS	SS
25. Gasket	PTFE	PTFE
26. Gasket	Flexible Graphite + 316SS	Flexible Graphite + 316SS



Size	L	D	D1	R	C	O	n-d	T	W	H	WT	Torque		CV
												300 PSI	740 PSI	
2" x 1 1/2"	8.5"	1.46"	1.97"	3.625"	5"	6.5"	8-0.75"	0.814"	9.53"	5.4"	33 lb	575 in lb	841 in lb	230
50 x 38	216	37	50	92.1	127	165	8-19	20.7	242	137	15 kg	65 Nm	95 Nm	
3" x 2"	11.1"	1.97"	2.95"	5"	6.62"	8.26"	8-0.885"	1.06"	9.53"	6.575"	69 lb	664 in lb	974 in lb	450
76 x 50	283	50	75	127	168.3	210	8-22.5	27	350	167	31.2 kg	75 Nm	110 Nm	
4" x 3"	12"	2.95"	3.98"	6.19"	7.87"	10.04"	8-0.885"	1.19"	13.78"	8.07"	126 lb	1415 in lb	2478 in lb	1100
102 x 76	305	75	101	157.2	200	255	8-22.5	30.2	460	205	57 kg	160 Nm	280 Nm	
6" x 4"	15.87"	3.98"	5.94"	8.5"	10.625"	12.6"	12-0.885"	1.38"	18.11"	8.66"	183 lb	2301 in lb	3540 in lb	2200
152 x 102	403	101	151	215.9	269.9	320	12-22.5	35	750	220	83 kg	260 Nm	400 Nm	

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ZF6 – 600# Full Port Carbon Steel and Low Temp

SPECIFICATIONS

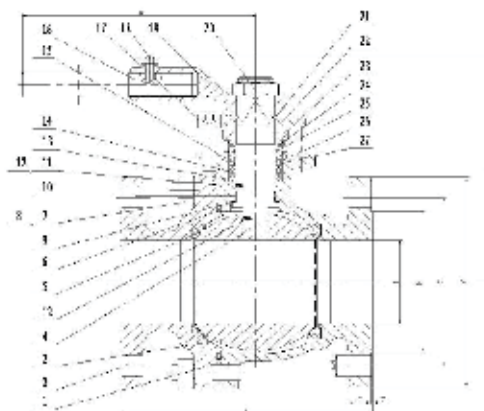
- Fire-safe to API-607, latest Ed.
- Designed to ASME/ANSI Class 600-B16.34
- Face to Face to ASME/ANSI B16.10 Long Pattern
- Flanges to ASME/ANSI B16.5
- NACE MR0175
- Design Standard per API 608
- Markings per MSS-SP25
- Pressure Test per API 598

FEATURES

- Full bore, 2 piece split body floating ball
- ISO mounting pad
- Blow-out proof stem
- Anti-static device
- Lever operated



LEVER PARTS LIST	No. Part	WCB BODY	LCC BODY
	1. Body	A216 WCB	A352 LCC
	2. End	A216 WCB	A352 LCC
	3. Ball	A182 F316	A182 F316
	4. Stem	A182 F316	A182 F316
	5. Seat	Nylon	Nylon
	6. Body Gasket	304 Graphite Spiral Wound	304 Graphite Spiral Wound
	7. Nut	A194-2HM	A194-2HM
	8. Full-threaded Bolt	A193-B7M	A320 L7M
	9. Stem Gasket	PTFE	PTFE
	10. Stem Bearing	PTFE	PTFE
	11. Steel Ball	A276 304	A276 304
	12. Anti-static Spring	A276 304	A276 304
	13. Stem Firesafe Gasket I	Flexible Graphite + 316	Flexible Graphite + 316
	14. Stem Firesafe Gasket II	Flexible Graphite	Flexible Graphite
	15. Packing Gland Bearing	PTFE	PTFE
	16. Lever	AISI 1020	AISI 1020
	17. Screw	A193-B7M	A320 L7M
	18. Hex Bolt	A193-B7M	SS
	19. Joint	A216 WCB	A352 LCC
	20. Nut	AISI 1020	AISI 1020
	21. Axial Retaining Ring	AISI 1566	AISI 1566
	22. Limit Block	A36	A36
	23. Nut	AISI 1020	AISI 1020
	24. Belleville Washer	A276 304	A276 304
	25. O-Ring	Viton	Viton
	26. O-Ring	Viton	Viton
	27. Packing Bushing	A276 316	A276 316



Size	L	D	R	C	O	n-d	T	W	H	WT	Torque		CV
											600 PSI	1440 PSI	
2"	11.5"	1.97"	3.625"	5"	6.5"	8-0.75"	1"	17"	6.14"	42 lb	841 in lb	1682 in lb	450
50	292	50	92.1	127	165	8-19	25.4	432	156	19 kg	95 Nm	190 Nm	
3"	14"	2.95"	5"	6.62"	8.26"	8-0.885"	1.25"	21.65"	8.22"	99 lb	2080 in lb	4071 in lb	1100
76	356	75	127	168.3	210	8-22.5	31.8	550	309	45 kg	235 Nm	460 Nm	
4"	17"	3.98"	6.19"	8.5"	10.82"	8-1"	1.5"	33.46"	11.02"	167 lb	2567 in lb	5089 in lb	2200
102	432	101	157.2	215.9	275	8-22.5	38.1	850	280	76 kg	290 Nm	575 Nm	

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Z Series Ball Valves

ZR6 – 600# Reg. Port Carbon Steel and Low Temp

SPECIFICATIONS

- Fire-safe to API-607, latest Ed.
- Designed to ASME/ANSI Class 600-B16.34
- Face to Face to ASME/ANSI B16.10 Long Pattern
- NACE MR0175
- Design Standard per API 608
- Markings per MSS-SP25
- Pressure Test per API 598

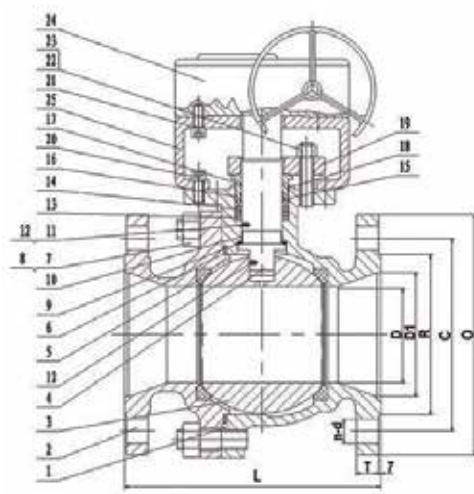
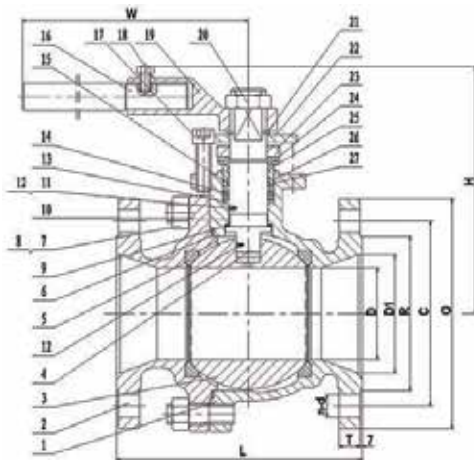
FEATURES

- Reduce bore, 2 piece split body floating ball
- ISO mounting pad
- Blow-out proof stem
- Anti-static device
- Lever operated 2"-4", gear operated 6"



LEVER PARTS LIST	No. Part	WCB BODY	LCC BODY
	1. Body	A216 WCB	A352 LCC
	2. End	A216 WCB	A352 LCC
	3. Ball	A182 F316	A182 F316
	4. Stem	A182 F316	A182 F316
	5. Seat	Nylon	Nylon
	6. Body Gasket	304 Graphite Spiral Wound	304 Graphite Spiral Wound
	7. Nut	A194-2HM	A194-2HM
	8. Full-threaded Bolt	A193-B7M	A320 L7M
	9. Stem Gasket	PTFE	PTFE
	10. Stem Bearing	PTFE	PTFE
	11. Steel Ball	A276 304	A276 304
	12. Anti-static Spring	A276 304	A276 304
	13. Stem Firesafe Gasket I	Flexible Graphite + 316	Flexible Graphite + 316
	14. Stem Firesafe Gasket II	Flexible Graphite	Flexible Graphite
	15. Packing Gland Bearing	PTFE	PTFE
	16. Lever	ANSI 1020	ANSI 1020
	17. Screw	A193-B7M	A320 L7M
	18. Hex Bolt	A193-B7M	SS
	19. Joint	A216 WCB	A352 LCC
	20. Nut	ANSI 1020	ANSI 1020
	21. Axial Retaining Ring	ANSI 1566	ANSI 1566
	22. Limit Block	A36	A36
	23. Nut	ANSI 1020	ANSI 1020
	24. Belleville Washer	A276 304	A276 304
	25. O-Ring	Viton	Viton
	26. O-Ring	Viton	Viton
	27. Packing Bushing	A276 316	A276 316

GEAR PARTS LIST	No. Part	WCB BODY	LCC BODY
	1. Body	A216 WCB	A352 LCC
	2. End	A216 WCB	A352 LCC
	3. Ball	A182 F316	A182 F316
	4. Stem	A182 F316	A182 F316
	5. Seat	Nylon	Nylon
	6. Body Gasket	304 Graphite Spiral Wound	304 Graphite Spiral Wound
	7. Nut	A194-2HM	A194-2HM
	8. Full-threaded Bolt	A193-B7M	A320 L7M
	9. Stem Gasket	PTFE	PTFE
	10. Stem Bearing	PTFE	PTFE
	11. Steel Ball	A276 304	A276 304
	12. Anti-static Spring	A276 304	A276 304
	13. Stem Firesafe Gasket I	Flexible Graphite + 316	Flexible Graphite + 316
	14. Stem Firesafe Gasket II	Flexible Graphite	Flexible Graphite
	15. Packing Gland Bearing	PTFE	PTFE
	16. O-Ring	Viton	Viton
	17. O-Ring	Viton	Viton
	18. Packing Bushing	A276 316	A276 316
	19. Packing Plate	A216 WCB	A352 LCC
	20. Inner Hex Screw	A193-B7M	A320-L7M
	21. Inner Hex Screw	A193-B7M	A320-L7M
	22. Nut	A194-B7M	A194-B7
	23. Bolt	A193-B7M	A320-L7M
	24. Actuator	Component	Component
	25. Yokes	A36	A36



Size	L	D	D1	R	C	O	n-d	T	W	H	WT	300 PSI Torque	740 PSI	CV
2" x 1 1/2"	11.5"	1.46"	1.97"	3.625"	5"	6.5"	8-0.75"	1"	9.53"	5.4"	40 lb	664 in lb	1328 in lb	230
50 x 38	292	37	50	92.1	127	165	8-19	25.4	242	137	18.2 kg	75 Nm	150 Nm	
3" x 2"	14"	1.97"	2.95"	5"	6.62"	8.26"	8-0.885"	1.25"	13.78"	7.56"	77 lb	841 in lb	1682 in lb	450
76 x 50	356	50	75	127	168.3	210	8-22.5	31.8	350	192	35 kg	95 Nm	190 Nm	
4" x 3"	17"	2.95"	3.98"	6.19"	8.5"	10.82"	8-1"	1.5"	21.65"	8.2"	165 lb	2080 in lb	4071 in lb	1100
102 x 76	432	75	101	157.2	215.9	275	8-25.5	38.1	550	205	75 kg	235 Nm	460 Nm	
6" x 4"	22"	3.98"	5.94"	8.5"	11.5"	13.98"	12-1.12"	1.88"	/	/	342 lb	2567 in lb	5089 in lb	2200
152 x 102	559	101	151	215.9	292.1	355	12-28.5	47.7	/	/	155 kg	290 Nm	575 Nm	

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Z Series Ball Valves

T SERIES FLANGED TRUNNION BALL VALVES PART NUMBERING SYSTEM

1

1 = Port and Class

TR1 = Reduced port class 150
TR3 = Reduced port class 300
TR6 = Reduced port class 600
TR9 = Reduced port class 900
TR15 = Reduced port class 1500
TR25 = Reduced port class 2500
TF1 = Full port class 150
TF3 = Full port class 300
TF6 = Full port class 600
TF9 = Full port class 900
TF15 = Full port class 1500
TF25 = Full port class 2500

2

2 = Size

002 = 2" 020 = 20"
003 = 3" 024 = 24"
004 = 4" 026 = 26"
006 = 6" 028 = 28"
008 = 8" 030 = 30"
010 = 10" 032 = 32"
012 = 12" 034 = 34"
014 = 14" 036 = 36"
016 = 16" 040 = 40"
018 = 18" 042 = 42"

3

3 = Type

T = 3 Piece Split Body
S = 2 Piece Split Body
W = Welded Body

4

4 = Body Material

1 = ASTM A216 WCB (-29C)
2 = ASTM A325 LCC (-46C)
3 = ASTM A351 CF8M (-196C)
4 = ASTM A105N (-29C)
5 = ASTM A350 LF2 (-46C)
6 = ASTM 182 F316 (-196C)
7 = DUPLEX 22CR

5

5 = End Connections

F = Flanged Raised Face
J = Flanged RTJ
B = Butt Weld End
G = Weld X RF
H = Weld X RTJ
P = Weld W/PUPS
X = GRAYLOC

6

6 = Trim Material

1 = Body + 3ENC
2 = 304SS
3 = 316SS
4 = 410SS
5 = DUPLEX 22CR

7

7 = Seat Material

P = PTFE
R = RTFE
N = Nylon
K = PEEK
D = Devlon
M = Metal x Metal

8

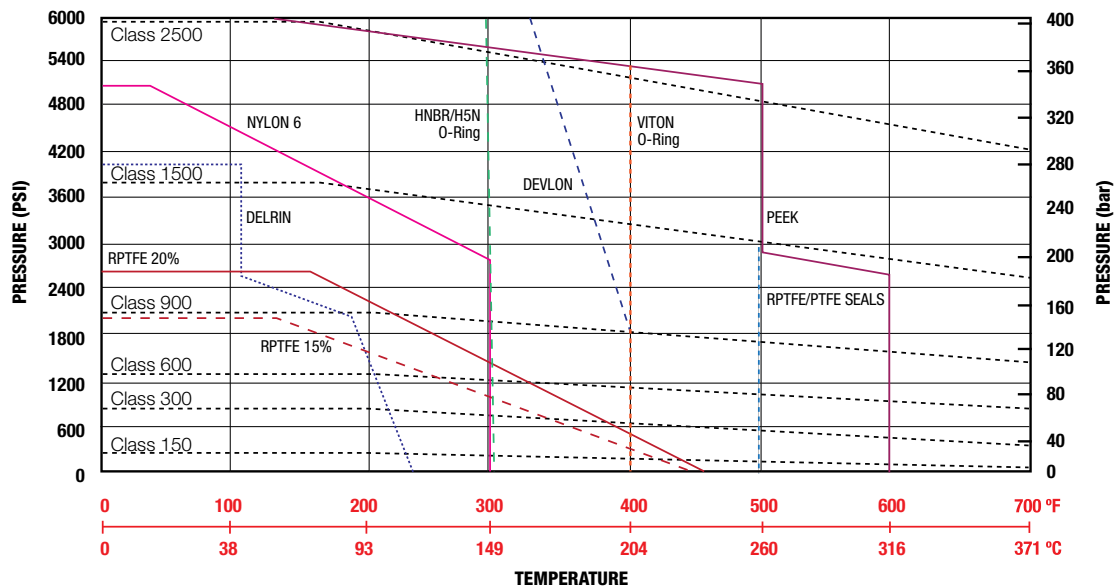
8 = Operator

L = Handle/Lever
G = Gear Operator
B = Bare Stem
C = Chain Wheel

9

9 = Special Requirements

00 = Standard Requirement



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T Series Ball Valves

T Series Trunnion Ball Valves

COMPLIANCE / SPECIFICATIONS

- ISO 14313:2007 / API 6D
- ISO 9001-2008 Registered Quality System
- API 608 / API 598 Fire-safe to API 607
- ASME B16.34, B16.5, B16.10
- CSA Z245.15 Steel Valves
- NACE MR0175 / ISO 15156 Compliance

Designs Available

Two piece cast or three piece forged designs available.

Double Block and Bleed

Independent spring loaded upstream and downstream seats and body bleed ensure suitability for use in double and bleed services.

Anti-Static Design

Anti-static design to ensure electrical continuity between stem, ball and body.

Emergency Seat and Stem Seal Injection Fittings

In the event of leakage, sealant injection fittings are provided for the stem and seat areas to temporarily allow sealing the valve before a more permanent repair can be made.

Automatic Body Cavity Relief

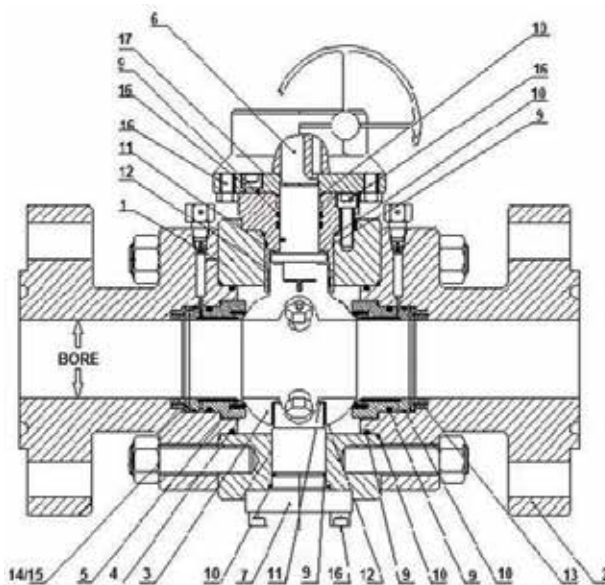
Trunnion mounted ball valves are protected from thermal expansion and over pressurizations due to spring loaded seats which automatically relieve pressure to the down stream side of the body cavity. In addition, all valves come with a manual safe relieving bleed valve.

Seat Design

Independent free floating spring loaded seats provide a tight seal even in a low differential pressure situation.

Additional Notes

- Other materials available upon request.
- Materials shown are general materials of construction for 2 piece or 3 piece Trunnion Ball Valves.
- We reserve the right to substitute materials listed above with alternate approved material for specific service conditions.



No.	Part Name	Standard NACE	Low Temperature NACE*	Stainless Steel NACE	Duplex
1.	Body	A105N A216 WCB	A350 LF2* A352 LCC	A182 F316 A351 CF8M	DUPLEX 22CR
2.	Cap/Adapter	A105N A216 WCB	A350 LF2* A352 LCC	A182 F316 A351 CF8M	DUPLEX 22CR
3.	Ball	A105N / ENP A182 CF8M / 316SS	A350 LF2 / ENP* A182 CF8M / 316SS	A182 F316 A351 CF8M	DUPLEX 22CR
4.	Seat Holder	A105N / ENP A182 F316SS	A350 LF2 / ENP* A182 F316SS	A182 F316SS	A182 F51
5.	Seat Insert	RTFE Nylon Devlon PEEK	RTFE Nylon Devlon PEEK	RTFE Nylon Devlon PEEK	RTFE Nylon Devlon PEEK
6.	Stem	A105N / ENP 4130 / 4140 / ENP A182 F316SS / 17-4PH	A350 LF2 / ENP* 4130 / 4140 / ENP A182 F316SS / 17-4PH	A182 F316SS A479 Type 316SS 17-4PH	A182 F316SS A479 Type 316SS 17-4PH
7.	Trunnion	A105N / ENP 4130 / 4140 ENP A182 F316SS	A350 LF2 / ENP* 4130 / 4140 / ENP A182 F316SS	A182 F316SS A479 Type 316SS -	A182 F316SS A479 Type 316SS -
8.	Bonnet	A105N A216 WCB	A350 LF2* A352 LCC	A182 CF8M A182 F316	A182 CF8M A182 F316
9.	O-Ring	Viton-B Viton-AED Viton-GLT HSN EPDM	Viton-B Viton-AED Viton-GLT HSN (HNBR)* EPDM	Viton-B Viton-AED Viton-GLT HSN EPDM	Viton-B Viton-AED Viton-GLT HSN EPDM
10.	Gasket	Graphite	Graphite*	Graphite	Graphite
11.	Thrust Washer	RTFE PEEK	RTFE PEEK	Graphite PEEK	Graphite PEEK
12.	Bearings	Carbon Steel-DU	Carbon Steel-DU	Carbon Steel-DU	Carbon Steel-DU
13.	Springs	Inconel X750	Inconel X750	Inconel X750	Inconel X750
14.	Studs	A193 B7M	A320 L2M	A193 B8M	A193 B8M
15.	Nuts	A194 2HM	A194 7M	A194 Gr. 8	A194 Gr. 8
16.	Bolting	A193 B7M	A320 L7M	193 B8M	193 B8M
17.	Mounting Plate	Carbon Steel	Carbon Steel	Stainless Steel	Stainless Steel

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T Series Ball Valves

ANSI 150

Size	Full Port Bore		Regular Bore		Raised Face Length		Weld End Length		RTJ Length	
Inch	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2	2	49	2	49	7	178	8.5	216	7.5	191
3	3	74	3	74	8	203	11.12	283	8.5	219
4	4	100	4	100	9	229	12	305	9.5	241
6	6	150	6	150	15.5	394	18	457	16	406
8	8	201	8	201	18	467	20.5	521	18.5	470
10	10	252	10	252	21	533	22	559	21.5	546
12	12	303	12	303	24	610	25	635	24.5	622
14	14	334	12	303	27	686	30	762	27.5	699
16	16	385	16	385	30	762	33	838	30.5	775
18	18	436	16	385	34	864	36.37	914	34.5	876
20	20	487	20	487	36	914	39	991	35.6	927
24	24	589	20	487	42	1067	45	1143	42.5	1080
26	26	633	24	589	45	1143	49	1245	-	-
28	28	684	26	633	49	1245	53	1346	-	-
30	30	735	-	-	51	1295	55	1397	-	-

ANSI 300

Size	Full Port Bore		Regular Bore		Raised Face Length		Weld End Length		RTJ Length	
Inch	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2	2	49	-	-	8.5	216	8.5	216	9.12	232
3	3	74	2	49	11.12	283	11.12	283	11.75	298
4	4	100	3	74	12	305	12	305	12.62	321
6	6	150	4	100	15.87	403	18	457	16.5	419
8	8	201	6	150	19.75	502	20.5	521	20.37	518
10	10	252	8	201	22.37	568	22	559	23	584
12	12	303	10	252	25.5	648	25	635	26.12	664
14	14	334	12	303	30	762	30	762	30.62	778
16	16	385	12	303	33	838	33	838	33.62	854
18	18	436	16	385	36	914	36.37	914	36.62	930
20	20	487	16	385	39	991	39	991	39.75	1010
24	24	589	20	487	45	1143	45	1143	45.87	1165
26	26	633	20	487	49	1245	49	1245	50	1270
28	28	684	24	589	53	1346	53	1346	54	1372
30	30	735	26	633	55	1397	55	1397	56	1422

ANSI 600

Size	Full Port Bore		Regular Bore		Raised Face Length		Weld End Length		RTJ Length	
Inch	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2	2	49	-	-	11.5	292	11.5	292	11.62	295
3	3	74	2	49	14	356	14	356	14.12	359
4	4	100	3	74	17	432	17	432	17.12	435
6	6	150	4	100	22	559	22	559	22.12	562
8	8	201	6	150	26	660	26	660	26.12	664
10	10	252	8	201	31	787	31	787	31.12	791
12	12	303	10	252	33	838	33	838	33.12	841
14	14	334	12	303	35	889	35	889	35.12	892
16	16	385	12	303	39	991	39	991	39.12	994
18	18	436	16	385	43	1092	43	1092	43.12	1095
20	20	487	16	385	47	1194	47	1194	47.25	1200
24	24	589	20	487	51	1295	51	1295	51.37	1305
26	26	633	20	487	55	1397	55	1397	55.37	1407
28	28	684	24	589	57	1448	57	1448	57.5	1461
30	30	735	26	633	61	1549	61	1549	61.5	1562

ANSI 900

Size	Full Port Bore		Regular Bore		Raised Face Length		Weld End Length		RTJ Length	
Inch	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2	2	49	-	-	14.5	368	14.5	368	14.62	371
3	3	74	2	49	15	381	15	381	15.12	384
4	4	100	3	74	18	457	18	457	18.12	460
6	6	150	4	100	24	610	24	610	24.12	613
8	8	201	6	150	29	737	29	737	29.12	740
10	10	252	8	201	33	838	33	838	33.12	841
12	12	303	10	252	38	965	38	965	38.12	968
16	14.67	373	12	303	44.5	1130	44.5	1130	44.87	1140
18	16.67	423	-	-	48	1219	48	1219	48.5	1232
20	18.5	471	-	-	52	1321	52	1321	52.5	1334
24	22.5	570	-	-	61	1549	61	1549	61.75	1568

For information on ANSI 2500, please contact your Flow+ supplier.

ANSI 1500

Size	Full Port Bore		Regular Bore		Raised Face Length		Weld End Length		RTJ Length	
Inch	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2	2	49	-	-	14.5	368	14.5	368	14.61	371
3	3	74	2	49	18.5	470	18.5	470	18.62	473
4	4	100	3	74	21.5	546	21.5	546	21.62	549
6	5.67	144	4	100	27.75	705	27.75	705	28	711
8	7.56	192	6	150	32.75	832	32.75	832	33.12	841
10	9.41	239	8	201	39	991	39	991	39.37	1000
12	11.3	287	10	252	44.5	1130	44.5	1130	45.12	1146
16	14.17	360	12	303	54.5	1384	54.5	1384	55.39	1407

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T Series Trunnion Ball Valve Cv Flow Coefficients

Size	150#	300#	600#	900#	1500#	2500#
Inch	Cv	Cv	Cv	Cv	Cv	Cv
1/2	46	46	46	42	41	-
3/4	97	97	97	90	88	-
1	168	168	168	156	152	-
1.5	389	389	389	360	350	-
2	647	647	647	599	582	412
3	2086	2086	2086	1932	1879	1268
4	2694	2694	2694	2494	2426	1766
6	6062	6062	6062	5612	5030	4004
8	10885	10885	10885	10077	8943	7476
10	17109	17109	17109	15840	13857	11603
12	24734	24734	24734	22990	19982	16385
14	30055	30055	30055	25862	24071	19894
16	39934	39934	39934	34703	31440	25872
18	51214	51214	51214	44630	39988	32636
20	63896	63896	63896	53333	50002	40982
24	96465	96465	96465	81039	7231	58329
26	109956	109956	109956	98501	-	-
28	121833	121833	121833	113248	-	-
30	145588	145588	145588	129948	-	-
32	170872	170872	170872	151468	-	-
36	211092	211092	211092	198273	-	-
40	267398	267398	267398	-	-	-
42	280946	280946	280946	-	-	-
48	383846	383846	383846	-	-	-
46	520791	520791	520791	-	-	-

METHOD OF CALCULATING FLOW

The Flow Coefficient "Cv" of a valve is the flow rate of water (gallons/minute) through a fully opened valve, with a pressure drop of 1 PSI across the valve. To find the flow of liquid through the valve from the Cv, use the following formulae.

Liquid Flow

$$QL = Cv (\Delta P/G)^{1/2}$$

WHERE

QL = flow rate of liquid (gal./min.)

ΔP = differential pressure across the valve (psi)

G = specific gravity of liquid (for water, G=1)

Gas Flow

$$Qg = 61Cv (P2\Delta P/g)^{1/2}$$

WHERE $\{(\Delta P/P < 1.0)\}$

Qg = flow rate of gas (CFH at STP)

P2 = outlet pressure (psi)

g = specific gravity of gas (for air, G=1.0)

Valve Position Monitor - FL31000: Weatherproof, Compact and Durable

FL31000 POSITION MONITOR



FEATURES OF THE FL31000

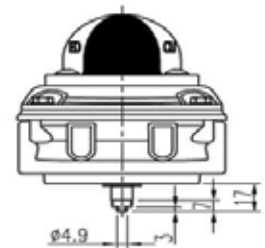
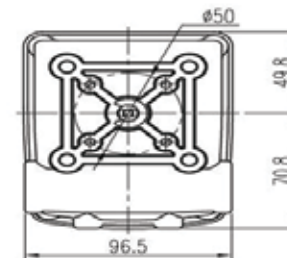
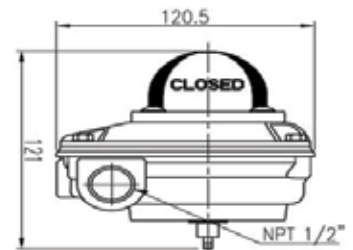
- Solid and compact design.
- Weatherproof and corrosion resistant, NEMA 4, 4X, IP67 enclosure.
- Captive stainless steel cover bolts.
- Bolt on green/red position indicator.
- Quick-sets, spring loaded, splined cams.
- Requires no tools for adjustments.
- Dual 1/2" conduit entries and 8 point terminal strip to allow for mounting and wiring of solenoid valve.
- Qty 2 OMRON SPDT mechanical switches rated at 5 amps at 120 VAC / 4 amps at 30 VDC. Other switches are available on request.
- Approvals: UL, CSA, SEMKO and SEV EN61058-1.

MATERIALS OF CONSTRUCTION

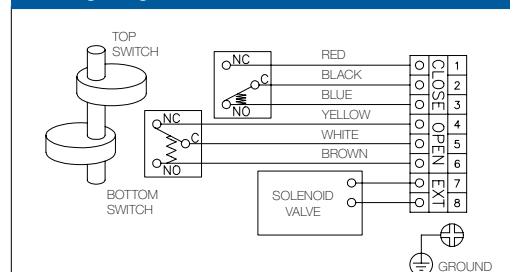
Housing Cover/Body	Polyester Painted Aluminum
Shaft	Stainless Steel
Indicator Cover	Polycarbonate
Indicator	ABS/Polycarbonate
Cam	Polycarbonate
Spring	Stainless Steel
Housing Cover Bolt	Captive Stainless Steel
O-Ring	NBR
Bushing	Bronze
E-Ring (Shaft)	Stainless Steel
Ground Lug	Stainless Steel
Bracket	Stainless Steel

DIMENSIONS FOR FL31000

DIMENSIONS



Wiring diagram for 2 SPDT Mechanical Switch



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Position Monitor FL41000

Valve Position Monitor – FL41000: Explosion Proof, Compact and Durable



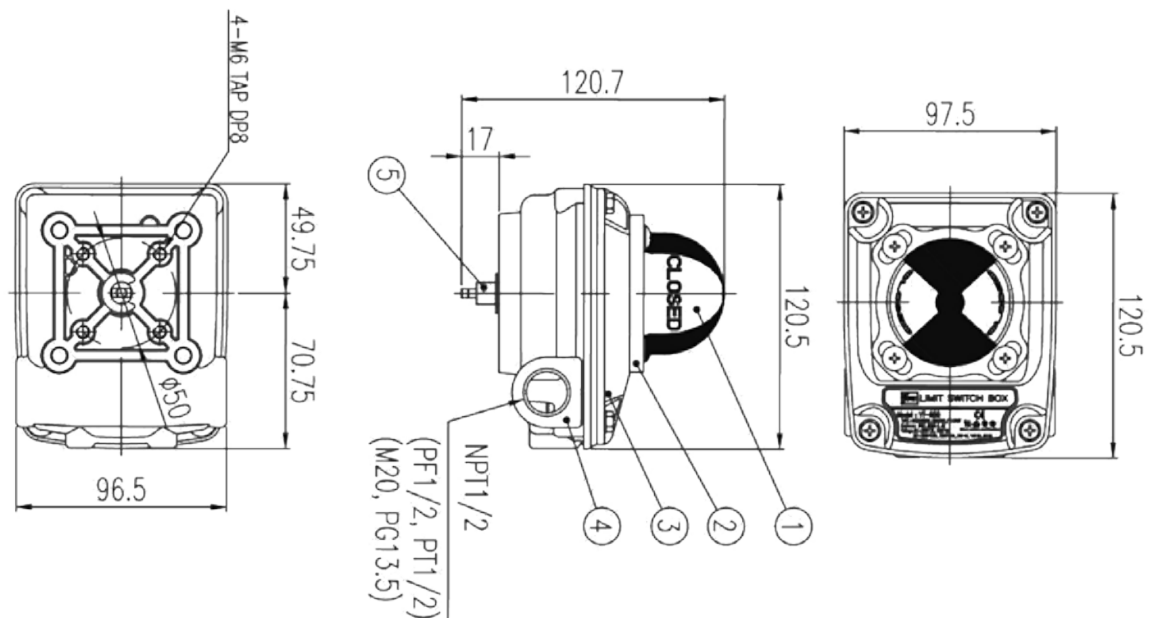
FL41000 POSITION MONITOR

Switch Type	Mechanical Switch x 2
Switch Rating	AC 250V 02A, 125V 0.4A 30V 4A
Enclosure Protection	IP67
Explosion Proof	Exd IIC T6
Ambient Temp	-20 C - 60 C
Conduit Entry	NPT3/4 (PF3/4, M20)
Terminal	8 Points
Mounting Bracket	NAMUR VDI/VDE 3845, ISO 5211
Material	Aluminum Diecasting
Weight	1.5kg (3.3lb)

- Visual Position indicator
- 8 contacts of terminal ports
- Compatibility with any rotary motion actuator <ISO5211>
- Easy adjustment of cam position
- Dual 1/2" conduit entries



DIMENSIONS FOR FL41000



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Actuation Selection Information

For ISO Direct Mount Ball Valves Only (B03, B05/5S/5TC/5T0, B07L/T and ZF1 SS)*

ISO Direct Mount Ball Valve Actuation Selection Chart

Actuator Sizing Info	Double Acting	Spring Return	Valve Torque
1/2"	SPNII50DA	SPNII63SR	85
3/4"	SPNII63DA	SPNII63SR	110
1"	SPNII63DA	SPNII75SR	180
1 1/2"	SPNII75DA	SPNII85SR	315
2"	SPNII75DA	SPNII100SR	450
3"	SPNII100DA	SPNII115SR	680
4"	SPNII115DA	SPNII125SR	1190
6"	SPNII145DA	SPNII180SR	2850



ADDITIONAL NOTES

*Actuator sized for liquid service up to 500 psig differential line pressure using 80 psig instrument air.

** Actuator sizing torques up to 500 psig DP: Water – 1.0, Oil – 0.8, Gas Wet (Steam) – 1.0, Gas Dry – 1.3.

*** Add 20% on torque valves for 3-way B07 series valve.

**** For high or low temperature applications consult supplier for special seal kits.



Example of the Flow+ ZF1 SS ball valve mounted to a Sharpe SPNII actuator.

Actuation Selection Chart for Carbon Steel, Full Port/Reduced Port Ball Valves. * Non - Direct Mounting Kit Required

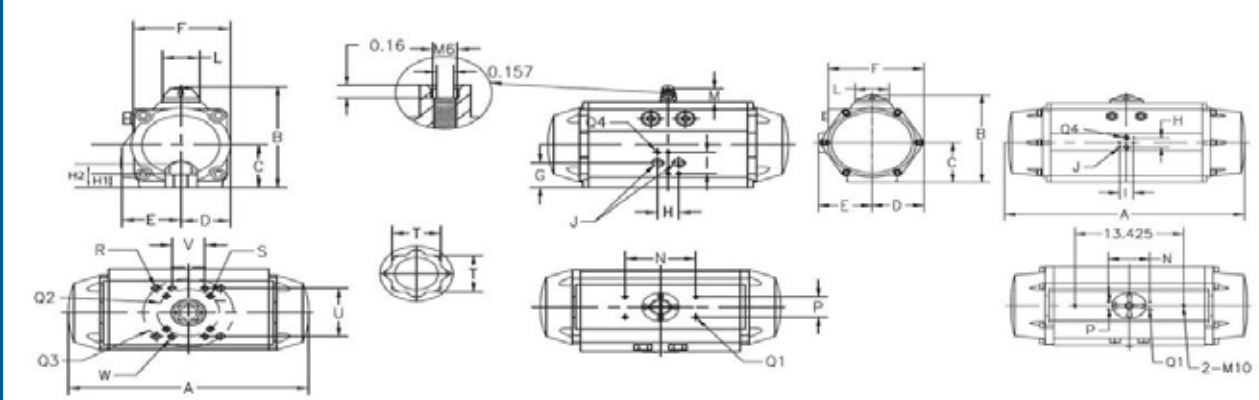
	150 FP	DA	SR11	300FP	DA	SR11	150RP	DA	SR11	300RP	DA	SR11
1/2"	106	050DA	063SR11									
3/4"	124	050DA	075SR11									
1"	239	063DA	085SR11									
1-1/2"	486	075DA	100SR11									
2"	663	085DA	115SR11	885	100DA	125SR11	486	075DA	100SR11	787	085DA	115SR11
3"	1433	115DA	145SR11	1912	115DA	160SR11	663	085DA	115SR11	885	100DA	125SR11
4"	2070	125DA	160SR11	4213	145DA	200SR11	1443	115DA	145SR11	1912	115DA	160SR11
6"	7115	180DA	240SR11	11841	240DA	265SR11	2071	125DA	160SR11	4213	145DA	200SR11
8"	12479	240DA	300SR11	27435	300DA		7115	180DA	240SR11	11841	240DA	265SR11

Actuator sizing torque based on MAWP in in/lbs, clean wet service at ambient temperature. Actuator recommendation is based on Sharpe SPNII models using 80 psi supply air. Fabricated mounting kit required. Sizing is subject to review without notice

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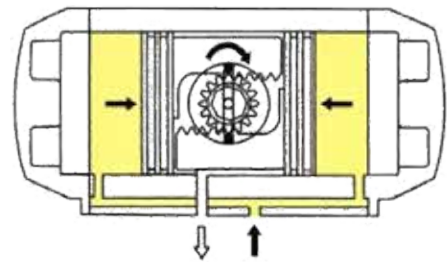
Actuation Selection Chart

SPNII Actuator Information



Model	Unit	A	B	C	D	E	F	G	H	H1	H2	I	J	L
032	in	4.61	1.77	0.88	0.88	0.88	1.77	.88	0.94	0.39	-	1.25	1/8"	1.4
	mm	117	45	22	22	22	45	22	24	10		32		36
050	in	5.8	3.62	1.35	1.12	1.61	2.28	1.02	0.94	0.47	1.26	1.26	1/4"	1.65
	mm	147	92	34	28	41	58	26	24	12	32	32		42
063	in	6.26	4.25	1.67	1.42	1.14	2.83	1.18	0.94	0.63	1.34	1.26	1/4"	1.65
	mm	159	108	42	36	29	72	30	24	16	34	32		42
075	in	8.39	4.92	2.01	1.71	2.07	3.39	1.03	0.94	0.75	1.34	1.26	1/4"	1.65
	mm	213	125	51	43	53	86	26	24	19	34	32		42
085	in	9.8	5.43	2.27	1.91	2.22	3.8	1.26	0.94	0.75	1.34	1.26	1/4"	1.65
	mm	249	138	58	49	56	97	32	24	19	34	32		42
100	in	10.67	5.94	2.5	2.2	2.6	4.17	1.46	0.94	0.91	1.89	1.26	1/4"	1.65
	mm	271	151	64	56	66	106	37	24	23	48	32		42
115	in	12.40	6.89	2.85	2.52	3.03	5.00	1.67	0.94	0.91	1.89	1.26	1/4"	2.6
	mm	315	175	72	64	77	127	42	24	23	48	32		66
125	in	13.62	7.48	3.09	2.72	3.23	5.12	1.8	0.94	1.14	2.56	1.26	1/4"	2.6
	mm	346	190	78	69	82	130	46	24	29	65	32		66
145	in	16.22	8.25	3.46	3.15	3.54	5.85	2.17	0.94	1.14	2.56	1.26	1/4"	2.6
	mm	412	210	88	80	90	149	55	24	29	65	32		66
160	in	17.44	9.06	3.88	3.46	3.87	6.28	2.04	0.94	1.14	2.56	1.26	1/4"	2.6
	mm	443	230	99	88	98	160	52	24	29	65	32		66
180	in	19.37	9.96	4.29	3.88	4.15	7.07	2.37	0.94	1.65	3.62	1.26	1/4"	3.15
	mm	492	253	109	99	105	180	60	24	42	92	32		80
200	in	21.54	10.91	4.8	4.29	4.41	7.64	2.6	0.94	1.65	3.62	1.26	1/4"	3.15
	mm	547	277	122	109	112	194	66	24	42	92	32		80
240	in	24.17	13.7	5.75	5.14	5.16	9.09	2.76	1.57	1.97	3.27	1.77	3/8"	3.15
	mm	614	348	146	131	131	231	70	40	50	92	45		80
265	in	28.7	15.31	6.57	5.79	5.78	9.99	3.54	1.57	1.97	3.27	1.77	3/8"	3.15
	mm	729	389	167	147	147	254	90	40	50	92	45		80
300	in	33.03	16.14	6.99	6.38	6.81	11.42	3.35	1.57	1.97	3.27	1.77	1/2"	3.15
	mm	839	410	178	162	173	290	85	40	50	92	45		80

Model	Unit	M	N	P	Q1	Q2	Q3	Q4	R	S	T	U	V	W
032	in	0.79	1.97	1.18	M5	F03	-	M5	-	-	0.35	-	-	-
	mm	20	50	30							9			
050	in	0.79	3.15	1.18	M5	F04	-	M5	-	M5	0.67	-	-	-
	mm	20	80	30							17			
063	in	0.79	3.15	1.18	M5	F05	-	M5	-	M6	0.67	-	-	-
	mm	20	80	30							17			
075	in	0.79	3.15	1.18	M5	F05	F07	M5	M8	M6	0.87	-	-	-
	mm	20	80	30							22			
085	in	0.79	3.15	1.18	M5	F05	F07	M5	M8	M6	0.87	-	-	-
	mm	20	80	30							22			
100	in	0.79	3.15	1.18	M5	F07	F10	M5	M10	M8	0.87	2.83	1.46	M8
	mm	20	80	30							22	72	37	
115	in	1.18	3.15	1.18	M5	F07	F10	M5	-	M10	0.87	-	-	M8
	mm	30	80	30							22			
125	in	1.18	3.15	1.18	M5	F10	-	M5	-	M10	1.42	2.83	1.46	M8
	mm	30	80	30							36	72	37	
145	in	1.18	3.15	1.18	M5	F10	F12	M5	M12	M10	1.42	2.83	1.46	M8
	mm	30	80	30							36	72	37	
160	in	1.18	3.15	1.18	M5	F10	F12	M5	M12	M10	1.42	2.83	1.46	M8
	mm	30	80	30							36	72	37	
180	in	1.18	5.12	1.18	M5	F10	F14	M5	M16	M10	1.42	3.9	2.09	M10
	mm	30	130	30							36	99	53	
200	in	1.18	5.12	1.18	M5	F10	F14	M5	M16	M10	1.42	3.9	2.09	M10
	mm	30	130	30							36	99	53	
240	in	1.97	5.12	1.18	M5	F12	F16	M6	M20	M12	1.81	-	-	-
	mm	50	130	30							46			
265	in	1.97	5.12	1.18	M5	-	F16	M6	M20	-	1.81	-	-	-
	mm	50	130	30							46			
300	in	1.97	5.12	1.18	M5	-	F16	M6	M20	-	1.81	-	-	-
	mm	50	130	30							46			



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