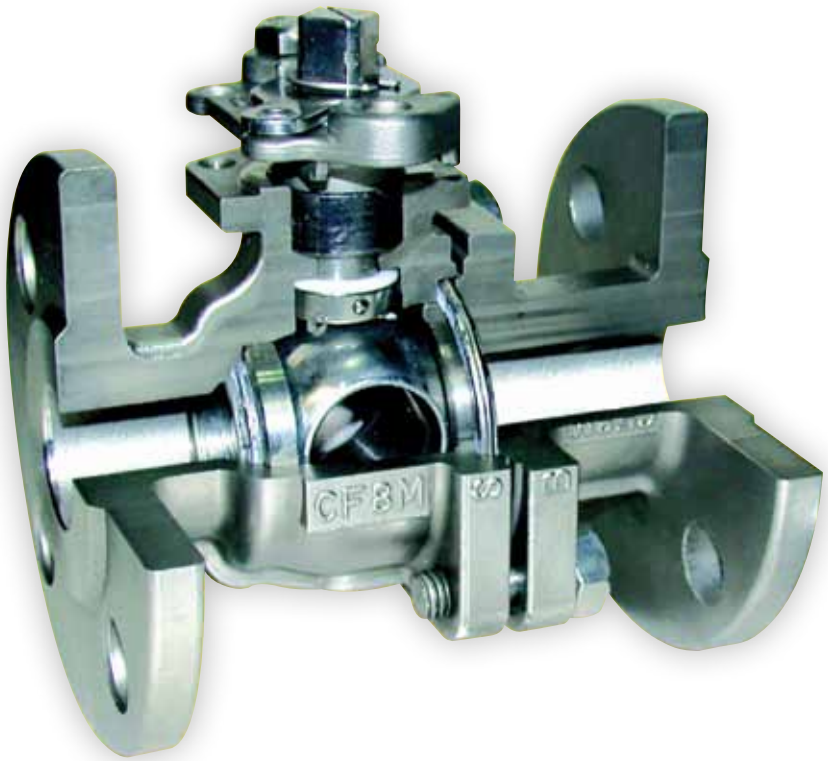
A-T Controls, Inc.

M Series

Floating Metal Seat Ball Valve

M Series
Floating Metal Seat Ball Valve

Full Bore Two-piece Flanged Ends
ANSI 150/300/600LB



The A-T Controls M Series metal seat ball valve is designed for use in severe services such as high temperature and abrasive fluids. It is used in the areas of oil and gas, petroleum, chemicals and petrochemicals, power generation, pulp and paper, and mining.

Product Features

- Precise CNC machining enables the ball and seats to seal tightly, offering superior shutoff.
- Spring live-loaded seats ensure tight seal, even at low temperature and pressure.
- Fire safe design conforms to API 607 4th edition.
- Select material for different service applications.
- Hard face treatment on ball and seats for longer life cycle in severe environments.
- Uni-directional shutoff is standard with bi-directional shutoff available as an option.

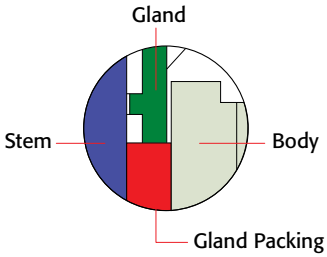
Applications

- Abrasive Fluids
- High Temperature Process
- Steam

HVOF Thermal Spray

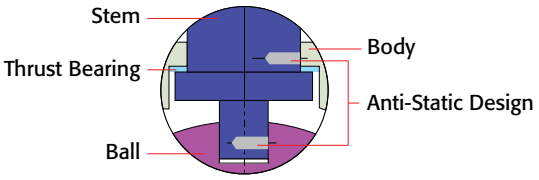
Design and Structures

Gland Packing: Flexible Graphite



Gland Packing Area
Fire safe graphite gland packing to ensure safety under fire conditions

Stem
17-4PH/XM-19/Duplex 2205/Inconel 718



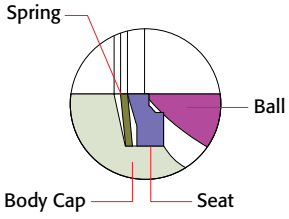
Stem Area
Blow-out proof design

Ball
Stainless Steel
HCr Coated
TC Coated
CC Coated

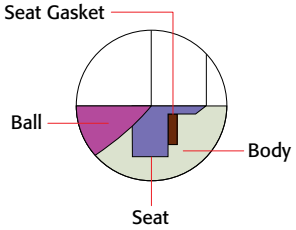
Seat Spring
Inconel X750

Seat
Stainless Steel
Stellite Welded
TC Coated
CC Coated

Uni-directional (Std.)

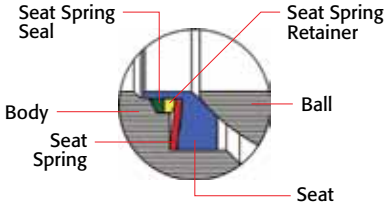


Seat Area (Upstream Side)
Seat spring provides flexibility under piping stress and thermal expansion, thereby stabilizing operation

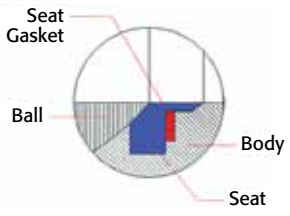


Seat Area (Downstream Side)
Seat gasket is press-fit into the body, providing stability within wide temperature ranges

Bi-directional



Seat Area A
Seat spring seal design prevents leakage. Seat spring provides flexibility to piping stress and thermal expansion for stabilizing operation

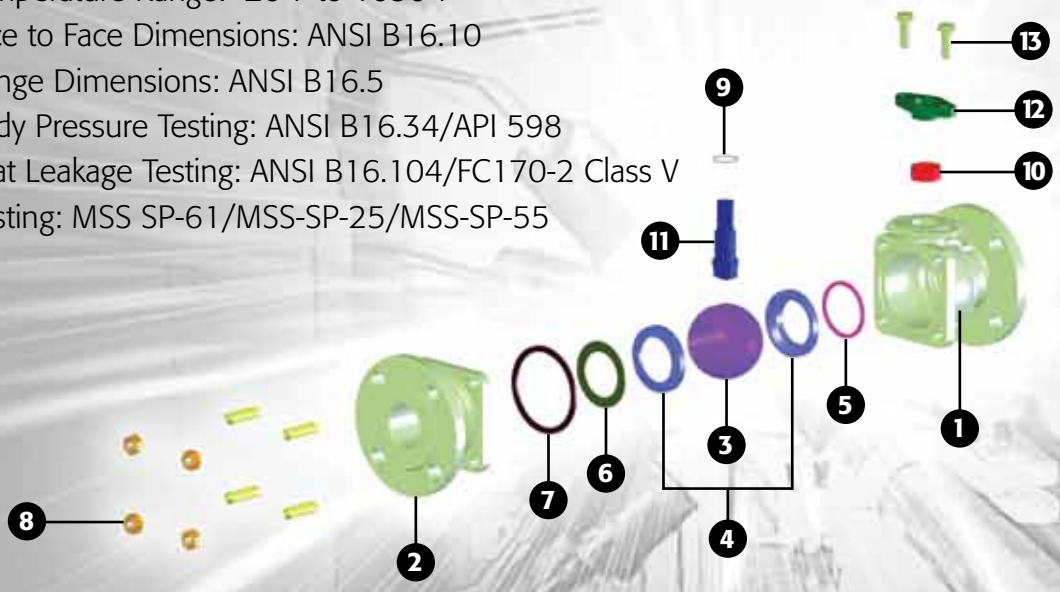


Seat Area B
Seat gasket is press-fit into the body and provides stability for a wide range of temperatures

M Series
Floating Metal Seat Ball Valve

Applicable Standards

- Body Material: Standard in WCB, CF8, CF8M
  Special material is available based on application
- Nominal Size: 1/2" to 8"
- Available in ANSI 150/300/600LB
- End Connections: Raised face flange
- Temperature Range: -20°F to 1050°F
- Face to Face Dimensions: ANSI B16.10
- Flange Dimensions: ANSI B16.5
- Body Pressure Testing: ANSI B16.34/API 598
- Seat Leakage Testing: ANSI B16.104/FC170-2 Class V
- Casting: MSS SP-61/MSS-SP-25/MSS-SP-55

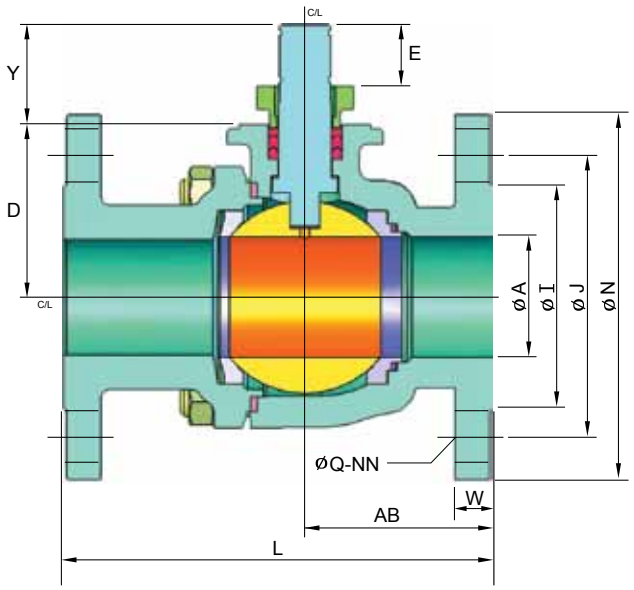


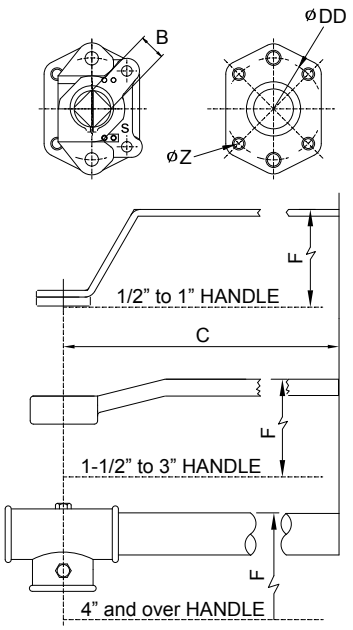
Technical Specifications
MATERIAL

NO.	TEMPERATURE	STELLITE SEAT			TUNGSTEN CARBIDE SEAT		
		-20°F - 660°F			-20°F - 800°F	-20°F - 930°F	
1	Body	WCB	CF8	CF8M	WCB	CF8	CF8M
2	Cap	WCB	CF8	CF8M	WCB	CF8	CF8M
3	Ball	CF8/CF8M + HCr			CF8/CF8M + TC		
4	Seat	SUS304/SUS316 + Stellite			SUS304/SUS316 + TC		
5	Seat Gasket	Graphite					
6	Seat Spring	Inconel X750					
7	Body Gasket	SUS316 + Graphite					
8	Joint Bolt & Nut	B7 & 2H	B8 & 8		B7 & 2H	B8 & 8	
9	Thrust Washer	Stainless Steel					
10	Gland Packing	SUS316 + Graphite					
11	Stem	17-4PH/XM-19/Duplex 2205/Inconel 718			XM-19/Duplex 2205/Inconel 718		
12	Gland	SUS304					
13	Gland Bolt	SUS304					

NOTE
HCr - Hard Chrome Plated
TC - Tungsten Carbide Coated
CC - Chrome Carbide Coated Available for Higher Temperature (1050°F)

Above materials may vary with different usage conditions
Stem: 17-4PH SS use below 750°F
Duplex 2205 use below 570°F
Inconel 718 and XM-19 use up to 1100°F





Dimensions (IN) MU-F1 150#

SIZE	A	B	C	D	E	F	I	J	L	N	Q	W	Y	Z	AB	DD	NN	ISO 5211	LBS
1/2"	0.59	0.39	5.12	1.48	0.55	2.48	1.38	2.38	4.25	3.74	0.63	0.44	0.98	M5	1.69	1.654	4	F04	4
3/4"	0.79	0.39	5.12	1.59	0.55	2.68	1.69	2.76	4.61	3.86	0.63	0.44	0.98	M5	1.81	1.654	4	F04	5
1"	0.98	0.47	6.30	1.87	0.55	2.99	2.01	3.13	5.00	4.25	0.63	0.44	1.20	M6	2.09	1.969	4	F05	7
1 1/2"	1.50	0.67	8.82	2.56	0.75	3.46	2.87	3.88	6.50	5.00	0.63	0.56	1.65	M8	2.83	2.756	4	F07	14
2"	1.97	0.67	8.82	2.83	0.75	3.70	3.62	4.74	7.01	5.98	0.75	0.63	1.65	M8	3.11	2.756	4	F07	20
2 1/2"	2.56	0.79	12.76	3.58	0.75	4.53	4.13	5.49	7.48	7.01	0.75	0.69	1.83	M8	3.35	2.756	4	F07	29
3"	2.99	0.79	12.76	3.92	0.75	4.72	5.00	6.00	7.99	7.48	0.75	0.75	1.83	M8	3.82	2.756	4	F07	39
4"	3.94	1.06	15.75	4.80	1.02	7.68	6.18	7.50	9.02	8.27	0.75	0.94	2.11	M10	4.45	4.016	8	F10	62
6"	5.91	1.06	21.65	6.61	1.18	9.45	8.50	9.51	15.51	10.98	0.87	1.00	2.44	M12	5.91	4.016	8	F10	140
8"	7.87	1.38	39.37	8.68	1.38	11.81	10.63	11.75	17.99	13.50	0.87	1.13	2.80	M16	8.31	5.512	8	F14	285

Dimensions (IN) MU-F3 300#

SIZE	A	B	C	D	E	F	I	J	L	N	Q	W	Y	Z	AB	DD	NN	ISO 5211	LBS
1/2"	0.59	0.39	5.12	1.48	0.55	2.48	1.38	2.62	5.51	3.74	0.63	0.56	0.98	M5	2.32	1.654	4	F04	6
3/4"	0.79	0.39	5.12	1.59	0.55	2.68	1.69	3.25	5.98	4.61	0.75	0.63	0.98	M5	2.64	1.654	4	F04	8
1"	0.98	0.47	6.30	1.87	0.55	2.99	2.01	3.50	6.50	4.88	0.75	0.69	1.20	M6	2.83	1.969	4	F05	11
1 1/2"	1.50	0.67	8.82	2.56	0.75	3.46	2.87	4.51	7.48	6.14	0.87	0.81	1.65	M8	3.23	2.756	4	F07	22
2"	1.97	0.67	8.82	2.83	0.75	3.70	3.62	5.00	8.50	6.50	0.75	0.88	1.65	M8	3.78	2.756	8	F07	27
2 1/2"	2.56	0.79	12.76	3.58	0.75	4.53	4.13	5.87	9.49	7.48	0.87	1.00	1.83	M8	3.90	2.756	8	F07	50
3"	2.99	0.79	12.76	3.92	0.75	4.72	5.00	6.61	11.14	8.27	0.87	1.13	1.83	M8	5.08	2.756	8	F07	70
4"	3.94	1.06	15.75	4.80	1.02	7.68	6.18	7.87	12.01	10.00	0.87	1.25	2.11	M10	5.43	4.016	8	F10	105
6"	5.91	1.06	21.65	6.61	1.18	9.45	8.50	10.63	15.87	12.52	0.87	1.44	2.44	M12	6.69	4.921	12	F12	220
8"	7.87	1.38	39.37	8.68	1.38	11.81	10.63	13.00	19.76	15.00	0.98	1.63	2.80	M16	8.90	5.512	12	F14	380

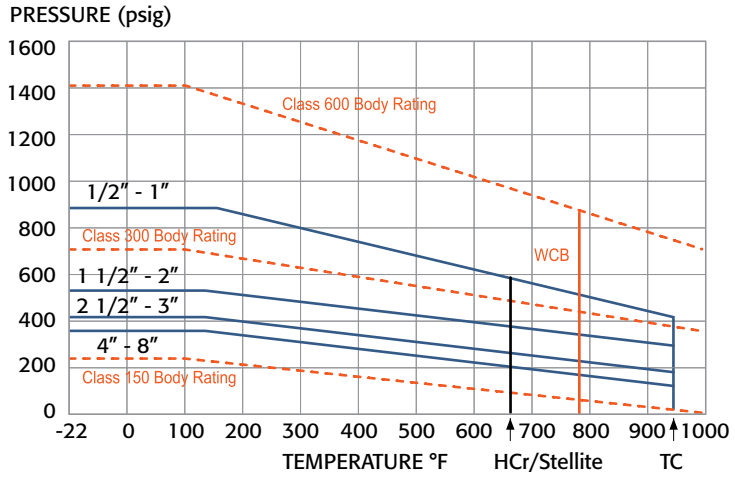
Dimensions (IN) MU-F6 600#

SIZE	A	B	C	D	E	F	I	J	L	N	Q	W	Y	Z	AB	DD	NN	ISO 5211	LBS
1/2"	0.59	0.39	5.12	1.48	0.55	2.48	1.38	2.62	6.50	3.74	0.63	0.82	0.98	M5	2.28	1.654	4	F04	6
3/4"	0.79	0.39	5.12	1.59	0.55	2.68	1.69	3.25	7.48	4.61	0.75	0.88	0.98	M5	2.76	1.654	4	F04	9
1"	0.98	0.47	6.30	1.87	0.55	2.99	2.01	3.50	8.50	4.88	0.75	0.94	1.20	M6	3.03	1.969	4	F05	13
1 1/2"	1.50	0.67	8.82	2.56	0.75	4.72	2.87	4.51	9.49	6.14	0.87	1.13	1.65	M8	4.25	2.756	4	F07	26
2"	1.97	0.67	8.82	3.23	0.75	5.51	3.62	5.00	11.50	6.50	0.75	1.25	1.65	M8	5.28	2.756	8	F07	40
3"	2.99	0.87	12.76	4.51	1.10	7.09	5.00	6.61	14.02	8.27	0.87	1.50	1.83	M8	6.50	2.756	8	F07	80
4"	3.94	1.06	21.65	5.28	1.30	9.45	6.18	8.50	17.01	10.75	0.98	1.75	2.09	M10	8.15	4.016	8	F10	150

Due to continuous product improvements, we reserve the right to modify or change design without incurring any liability to furnish or install such modifications or changes on products previously or subsequently sold.

M Series
Floating Metal Seat Ball Valve

Temperature & Pressure Curve



HCr/Stellite Trim = MAX TEMPERATURE 660°F (350°C)
TC Trim = MAX TEMPERATURE 930°F (500°C)
WCB = MAX TEMPERATURE 800°F (425°C)
CC Trim = MAX TEMPERATURE 1050°F

API 6D
ISO 9001:2008
CE
ANSI B16.34

M Series Metal Seat Torque Table

HCr/Stellite trim	Torques in In-Lbs @ PSIG								
	150	**225**	**300**	**350**	**425**	**500**	**575**	**650**	**725**
1/2"	90	105	110	110	110	115	120	130	140
3/4"	130	140	140	150	160	165	190	210	240
1"	150	170	210	220	235	255	280	310	350
1-1/2"	415	510	565	600	655	715			
2"	490	715	900	990	1100	1280			
3"	1450	1650	2010	2500	2950				
4"	2600	3250	3950	5215					
6"	3700	9250	11,900	14,500					
8"	CF	CF	CF	CF					

Bi-directional torque valve add 20% to above torques

Notes:
1) Torques include 30% safety factor tested by warm, clean water.
2) Additional safety factors should be added for high temperature, viscous fluid, powders, steam and slurries.
3) Torques are based on valve being installed in suggested direction.
4) Contact Factory for torques for bi-directional flow and Tungsten Carbide Trim Valves.

Manual Ball Valve Part Number Matrix

1 — Fire Safe Designation

F	Fire Safe Tested

2 — Valve Series

MU	Metal Seat Uni-directional Shutoff, Floating Ball
MB	Metal Seat Bi-directional Shutoff, Floating Ball
MX	Metal Seat 3-pc Bi-directional, Floating Ball

3 — Body Material

Blank	No Designation = Stainless Steel Body and Trim. CF8M-316SS (-450° F to 1100° F)
C	Carbon Steel Body, A216 Gr WCB (-20° F to 800° F)
L	Low Carbon 316 Stainless Steel, CF3M-316L (to 800° F)
7	CG8M 317
D	CD3MN Duplex SS
5	LCB, A352 (-50° F to 650° F)
8	LCC, A352 (-50° F to 650° F)
6	WC6, A217 (-20° F to 1100° F)
9	WC9, A 217 (-20° to 1100° F)

4 — End Connection

F1	150# Flanged Ends
F3	300# Flanged Ends
F6	600# Flanged Ends
FR	600# RTJ Flanged Ends

5 — Valve Size

0050	1/2″
0075	3/4″
0100	1″
0150	1-1/2″
0200	2″
0250	2-1/2″
0300	3″
0400	4″
0600	6″
0800	8″

6 — Seat, Lining & Trim Materials

2	Tungsten Carbide Coated 316SS Seats & Ball
3	HCR Coated Ball/Stellite Inlay Seat
4	Chrome Carbide Coated 316SS Seat & Ball

7 — Special Designations

X	No Specials
G	Gear Operator

8 — Additional Specials

X	No Specials
O	Oxygen Cleaned
Z	Special End Configuration
V	Vented Ball

9 — Special Stem Designation

Blank	No Designation = Standard Stem
A	17-4PH Stem
B	XM-19 (Nitronic 50) Stem
C	Duplex 2205 Stem
D	Inconel 718 Stem

How To Order

1	-	2	-	3	-	4	-	5	-	678	-	9
↓		↓		↓		↓		↓		↓↓↓		↓
F	-	MU	-	C	-	F3	-	0150	-	3XX	-	A

A-T Controls, Inc.

11363 Deerfield Rd.
Cincinnati, Ohio 45242
513-530-5175 247-5465
FAX 513-247-5462
e-mail: sales@a-tcontrols.com

See our website!
http://www.a-tcontrols.com

FMU1110

6D-0539 ISO 9001 0575