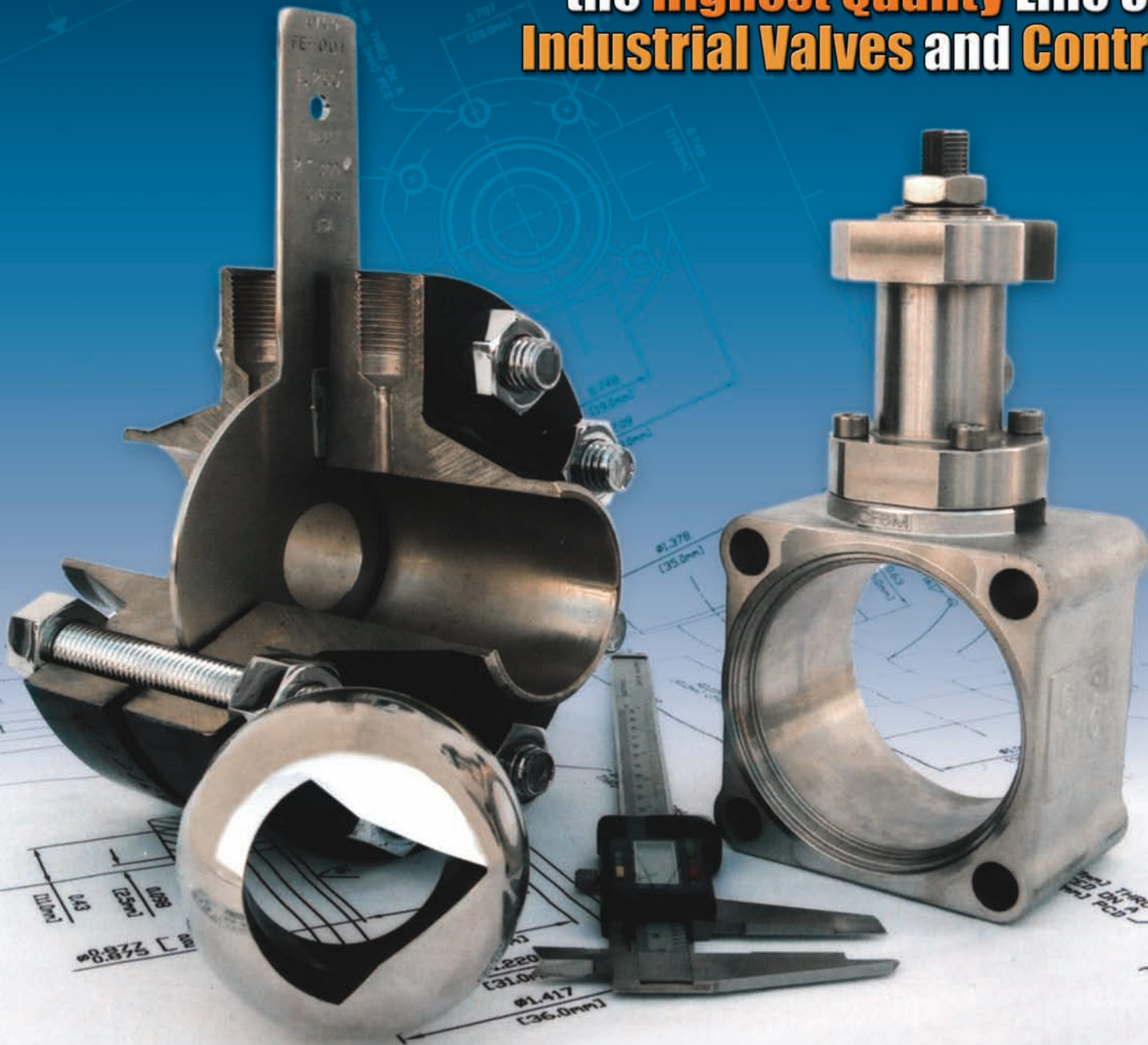




Alloy Valves and Control

Manufacturing & Delivering the **Highest Quality** Line of **Industrial Valves and Controls**



AvcoValve.com



Alloy Valves and Control

3210 S. Susan St. • Santa Ana, CA 92704
Tel: +1 714 427-0877 • fx. +1 714 427-6392

AVCO

Alloy Valves and Control

BALL VALVES 1100 SERIES



Size

1/4" - 4" (Full Port)
2000 WOG
3000 WOG Option

End Connections

NPT
Butt Weld
Socket Weld
Flanged (150#, 300#, 600#)

Valve Materials

316 Stainless Steel
Carbon Steel
Hastelloy C
Monel

Ball and Stem Materials

316 Stainless Steel
Hastelloy B & C
Monel 400
Alloy 20

Seat Materials

Teflon (PTFE)
25% Carbon Filled Teflon
15% Glass Filled Teflon
Kel-F (PCTFE)
PEEK
UHMWPE
Metals

Service Applications

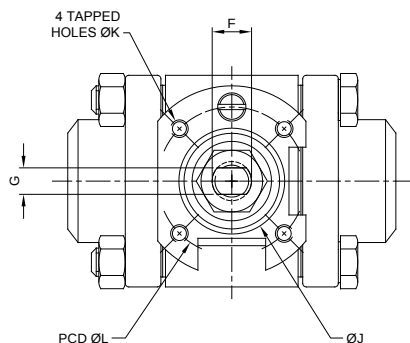
Chemical
Dry/Liquid Chlorine
Food Processing
Hydraulic
Oxygen
Steam
Thermal Fluids
Vacuum
Water/Oil/Gas

Applicable Standards

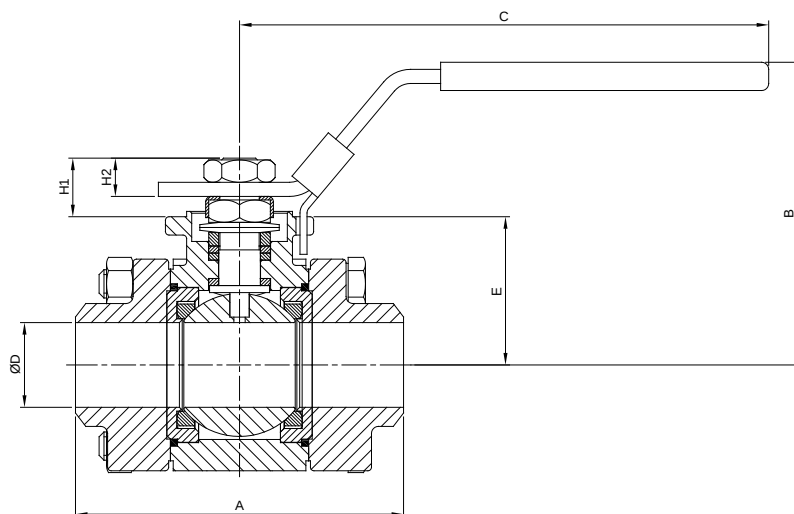
ASME B16.34
API 598
API 607 4th Edition

Alloy Valves and Control

1/4" THRU 2"

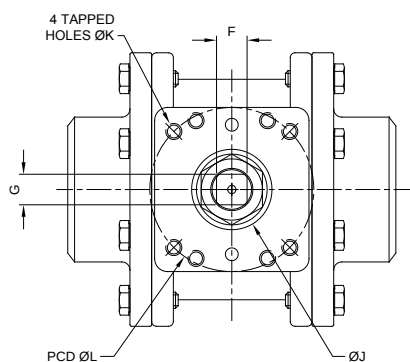


Plan View with Handle Removed

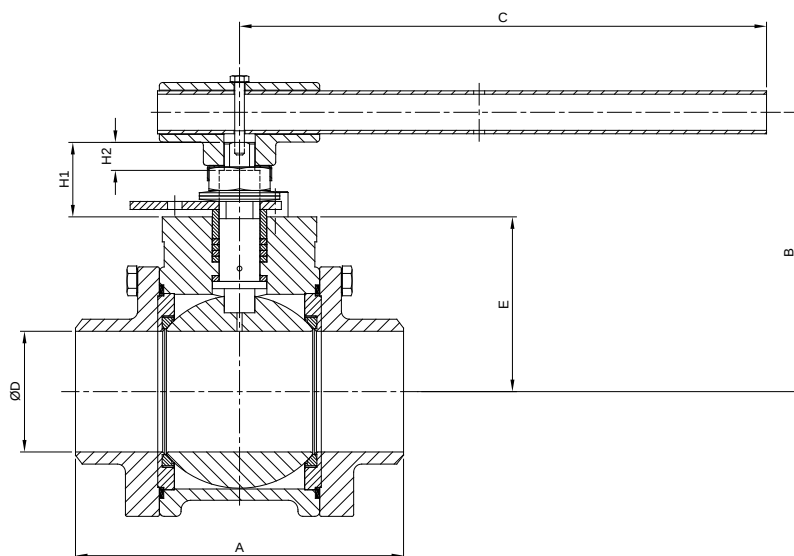


SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)
1/4"	2.61	2.48	4.53	0.36	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
3/8"	2.61	2.48	4.53	0.49	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
1/2"	2.97	2.48	4.53	0.59	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
3/4"	3.17	2.56	4.53	0.75	1.32	0.38	0.22	0.52	0.29	0.98	M5	1.42	F04	2.5	80
1"	3.67	3.38	5.91	0.95	1.65	0.44	0.30	0.65	0.43	1.18	M5	1.65	F04	4	120
1 1/4"	4.37	3.50	5.91	1.18	1.82	0.44	0.30	0.67	0.47	1.18	M5	1.65	F04	6	235
1 1/2"	4.72	3.92	6.85	1.50	1.90	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	8	290
2"	5.53	4.25	6.85	1.97	2.22	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	14	450

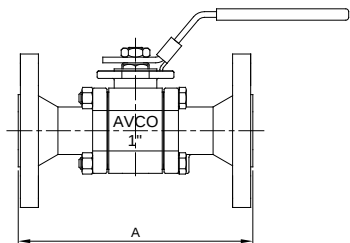
2 1/2" THRU 4"



Plan View with Handle Removed



SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)
2 1/2"	7.27	5.28	8.84	2.52	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22	685
3"	8.02	6.84	13.74	2.95	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35	1200
4"	9.46	7.37	13.74	3.78	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55	2000



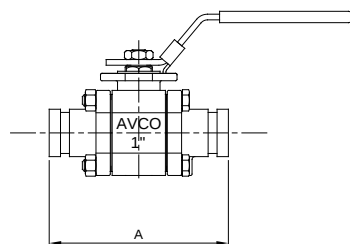
Standard Flanged Ends (150#, 300#, 600#)

SIZE	A (in.)		
	150#	300#	600#
1/2"	5.50	5.50	6.50
3/4"	6.00	6.00	7.50
1"	6.50	6.50	8.50
1 1/4"	7.00	7.00	9.00
1 1/2"	7.50	7.50	9.50
2"	8.50	8.50	11.50
2 1/2"	9.50	9.50	13.00
3"	11.12	11.12	14.00
4"	12.00	12.00	17.00

See tables on page 2 for all other dimensions

Note

Please contact AVCO if you require flanged ends to be other than standard raised face.



Standard Cut Grooved Ends

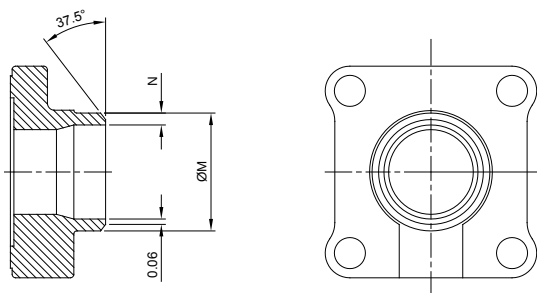
SIZE	A (in.)
3/4"	4.63
1"	5.17
1 1/4"	6.00
1 1/2"	6.50
2"	6.99
2 1/2"	7.88
3"	8.50
4"	10.00

See tables on page 2 for all other dimensions

Note

Please contact AVCO if you require any other end style than those shown in this literature.

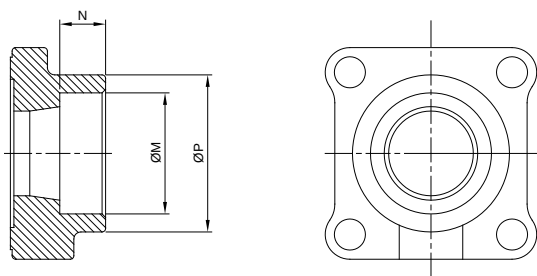
BUTT WELD END STYLE (SCH 10, SCH 40, SCH 80)



Butt weld ends are square cut where N is less than or equal to 0.12"

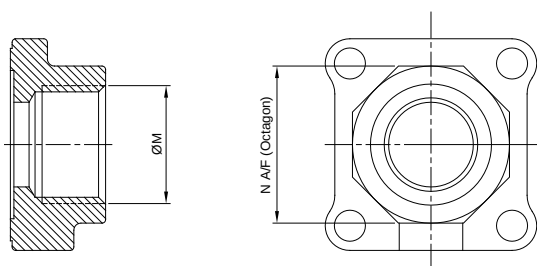
SIZE	M (in.)	N (in.)		
		Sch 10	Sch 40	Sch 80
1/4"	0.540	0.065	0.088	0.119
3/8"	0.675	0.065	0.091	0.126
1/2"	0.840	0.083	0.109	0.147
3/4"	1.050	0.083	0.113	0.154
1"	1.315	0.109	0.133	0.179
1 1/4"	1.660	0.109	0.140	0.191
1 1/2"	1.900	0.109	0.145	0.200
2"	2.375	0.109	0.154	0.218
2 1/2"	2.875	0.120	0.203	0.276
3"	3.500	0.120	0.216	0.300
4"	4.500	0.120	0.237	0.337

SOCKET WELD END STYLE



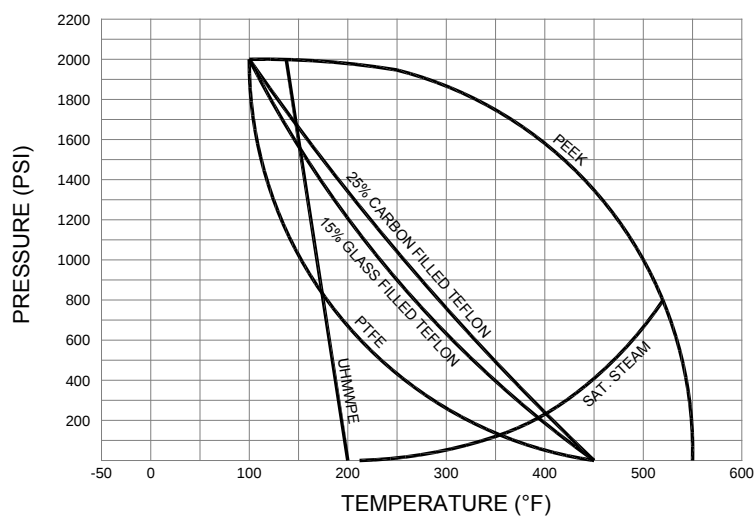
SIZE	M (in.)	N (in.)	P (in.)
1/4"	0.57	0.39	1.00
3/8"	0.71	0.39	1.00
1/2"	0.87	0.39	1.20
3/4"	1.07	0.51	1.42
1"	1.35	0.51	1.75
1 1/4"	1.70	0.51	2.13
1 1/2"	1.94	0.51	2.44
2"	2.43	0.65	2.99
2 1/2"	2.93	0.65	3.62
3"	3.56	0.65	4.33
4"	4.56	0.79	5.59

THREADED NPT END STYLE



SIZE	M (NPT)	N (in.)
1/4"	1/4	1.00
3/8"	3/8	1.00
1/2"	1/2	1.20
3/4"	3/4	1.42
1"	1	1.75
1 1/4"	1 1/4	2.13
1 1/2"	1 1/2	2.44
2"	2	2.99
2 1/2"	2 1/2	3.62
3"	3	4.33
4"	4	5.59

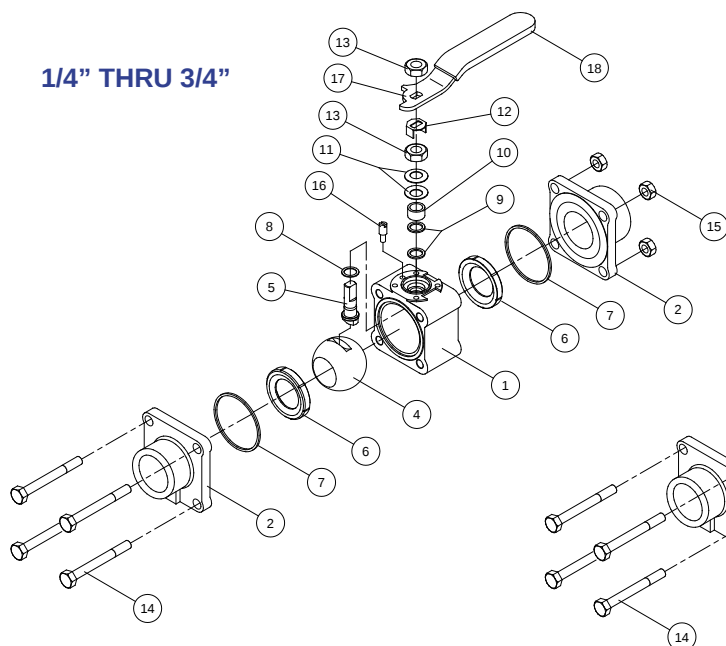
Pressure/Temperature Rating



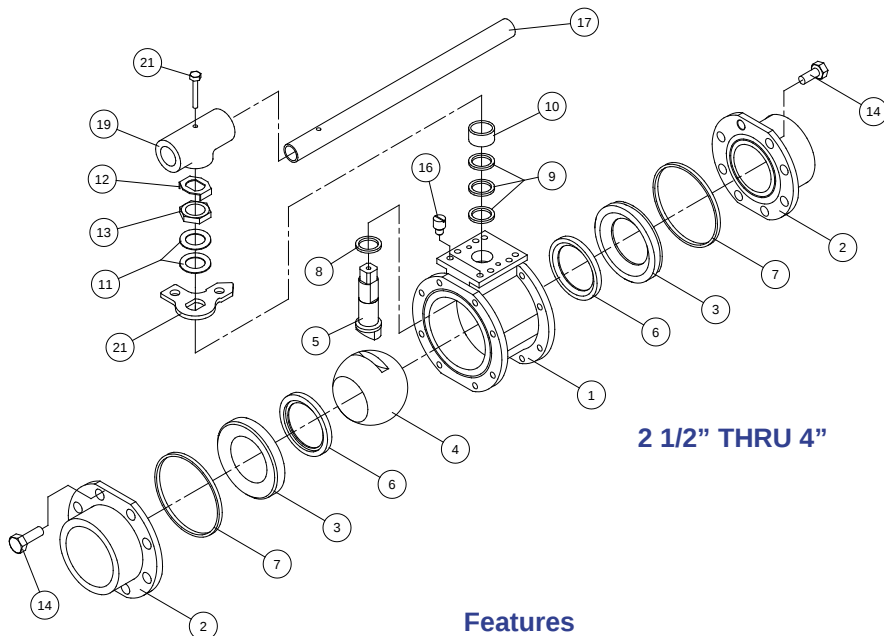
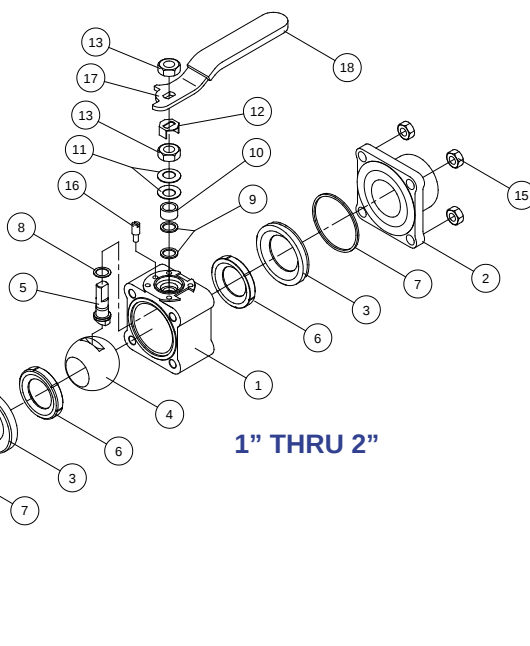
Notes

Please contact AVCO if you require customized versions of our valves. CAD drawings are available for most variations, including actuators etc.

1/4" THRU 3/4"



1" THRU 2"



2 1/2" THRU 4"

Features

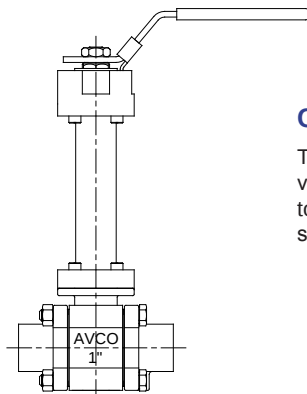
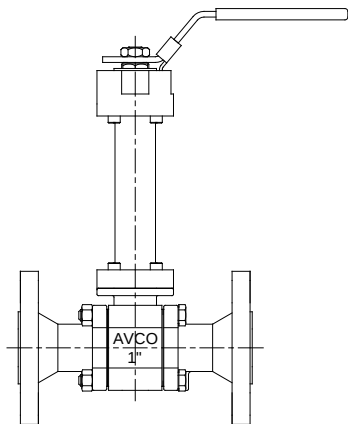
ANSI Class 150, 300 & 600
2000/3000 WOG
Encapsulated Seats, Seals & Body Bolts
Spring Loaded Stem Packing
Bottom Entry Stem to Prevent Blow-Out
ISO 5211 Mounting Pad
Locking Handle as Standard
Inter-Changeable End Connections

Item	Parts
1	Body
2	End Cap
3	Retainer
4	Ball
5	Stem
6	Ball Seat
7	Body Seal
8	Thrust Washer
9	Packing
10	Gland Ring
11	Disc Spring
12	Lock Tab
13	Stem Nut
14	Body Bolt
15	Body Nut
16	Stop Pin
17	Handle
18	Handle Sleeve
19	Wrench Block
20	Handle Bolt
21	Lock Pad

AVCO

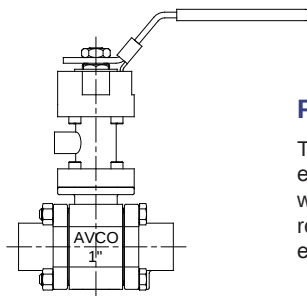
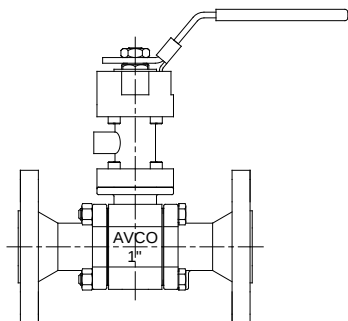
Alloy Valves and Control

BALL VALVES 1100 SERIES



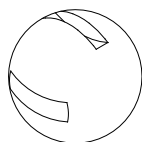
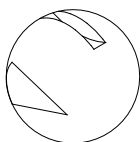
Cryogenic Option

The AVCO 1100 series ball valves are available as cryogenic valves. The extended bonnet can be shortened or lengthened to suit many applications and is also available 'off the shelf' in standard lengths (see 1500 series literature).



Fugitive Emissions Option

The AVCO 1100 series ball valves can be supplied with fugitive emissions (sniffer) bonnets. This gives an early warning system when the valve stem packing is becoming worn and ready for renewal, thus preventing dangerous chemicals/gases from entering the surrounding environment.



Vee Port and Slotted Ball Option

The AVCO 1100 series ball valves can be supplied with vee port or slotted balls for greater control and accuracy. Many configurations are available to suit the needs of the customer (see 1900 series literature).



Electric Actuator

120 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20 mA
Reversing
Telemetry
Battery Back-up
Spring Return



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 psi
Positioners 4-20 mA
Intelligent Positioner
Dec clutchable Manual Override



Manual Valves

Oval Handle
Spring Return
Fusible Link
Lock Device
Gear Operators

HOW TO ORDER

1"	11	3	3	T	T	SE	BAVT
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/4"	1100 Series 3 Piece Ball Valve	1 - Carbon Steel	2 - Alloy 20	T - Teflon (PTFE)	T - Teflon (PTFE)	SE - NPT	BAVT - Vented Balls
3/8"		1L - Low Grade Carbon	3 - 316 SS	R - 15% Glass PTFE	C - 25% Carbon PTFE	SW - Socket Weld	BAHL - Hardened Ball
1/2"		2 - Alloy 20	4 - Monel 400	C - 25% Carbon PTFE	G - Graphoil	BW - Butt Weld	BNIE - Emissions Bonnet
3/4"		3 - 316 SS	5 - Hastelloy B	P - PEEK	B - BUNA N	GR - Grooved	FS - Fire Safe
1"		4 - Monel 400	6 - Hastelloy C	U - UHMWPE	E - EPDM	FBT - Flush Bottom Tank	O2CB - O2 Clean/Bagged
1 1/4"		5 - Hastelloy B	7 - Inconel 625	K - Kel-F (PCTFE)	V - Viton	BSP - British Standard Pipe	CF - Cavity Filled
1 1/2"		6 - Hastelloy C	8 - Titanium	B - Bronze	N - Neoprene	AN - Army Navy	
2"		7 - Inconel 625	9 - Aluminum	S - Stellite		150 - 150# Flange	
2 1/2"		8 - Titanium		I - Inconel		300 - 300# Flange	
3"		9 - Aluminum				600 - 600# Flange	
4"							
						Variations of the above or special ends can be supplied upon request	

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This brochure is general in nature and we reserve the right to alter dimensions, materials or make design improvements.

AVCO

Alloy Valves and Control

BALL VALVES 1500 SERIES



Size

1/4" - 4" (Full Port)

End Connections

NPT
Butt Weld
Socket Weld
Flanged (150#, 300#, 600#)

Valve Materials

316 Stainless Steel
Hastelloy C
Monel 400

Ball and Stem Materials

316 Stainless Steel
Hastelloy C
Monel 400

Seat Materials

Teflon (PTFE)
Carbon Filled Teflon
Kel-F (PCTFE)

Service Applications

Aerospace
Cryogenic Service
Food Processing
Liquid H₂
Liquid N₂
Petro-Chemical

Applicable Standards

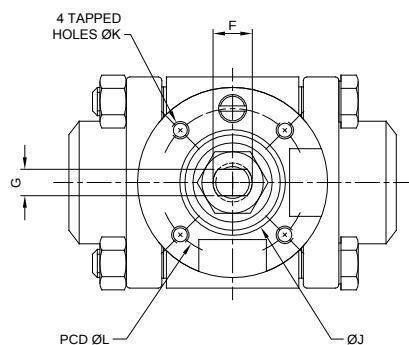
ASME B16.34
API 598
API 607 4th Edition

AVCO

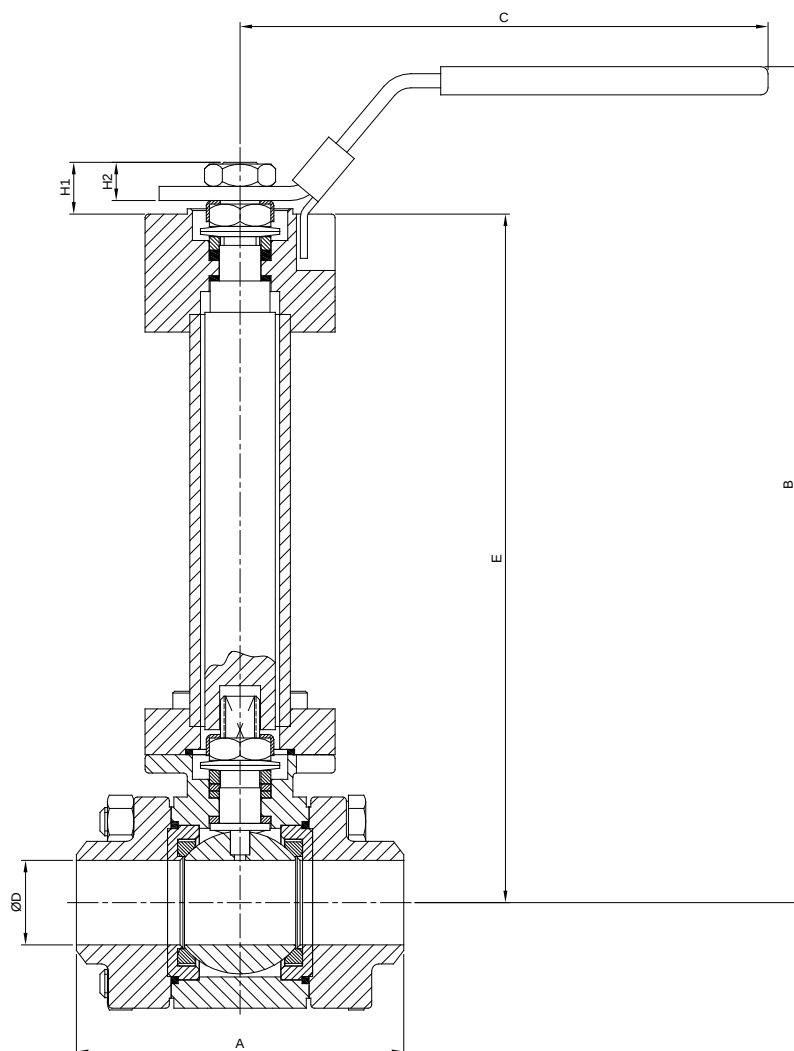
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BALL VALVES 1500 SERIES

1/4" THRU 2"

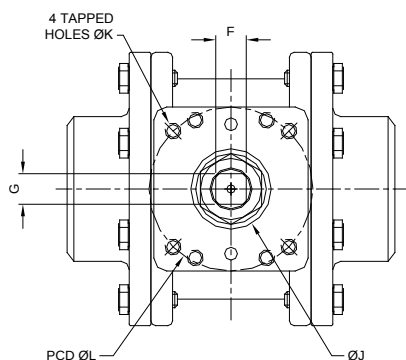


Plan View with Handle Removed

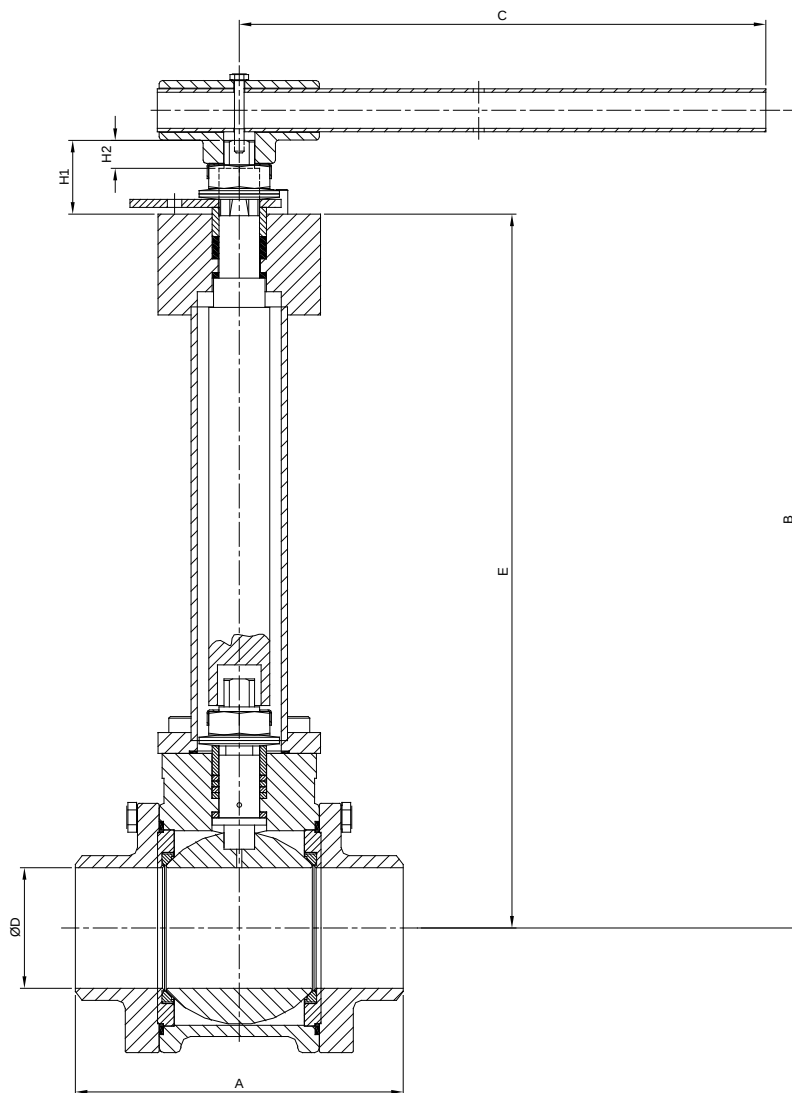


SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)	CV
1/4"	2.61	9.11	4.53	0.36	7.85	0.38	0.22	0.52	0.29	0.98	M5	1.42	F03	3	65	5
3/8"	2.61	9.11	4.53	0.49	7.85	0.38	0.22	0.52	0.29	0.98	M5	1.42	F03	3	65	10
1/2"	2.97	9.11	4.53	0.59	7.85	0.38	0.22	0.52	0.29	0.98	M5	1.42	F03	3	65	23
3/4"	3.17	9.19	4.53	0.75	7.93	0.38	0.22	0.52	0.29	0.98	M5	1.42	F04	3	80	33
1"	3.67	9.41	5.91	0.95	7.70	0.44	0.30	0.65	0.43	1.18	M5	1.65	F04	7	120	46
1 1/4"	4.37	9.57	5.91	1.18	7.86	0.44	0.30	0.67	0.47	1.18	M5	1.65	F04	9	235	64
1 1/2"	4.72	11.38	6.85	1.50	9.35	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	12	290	132
2"	5.53	11.73	6.85	1.97	9.70	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	17	450	262

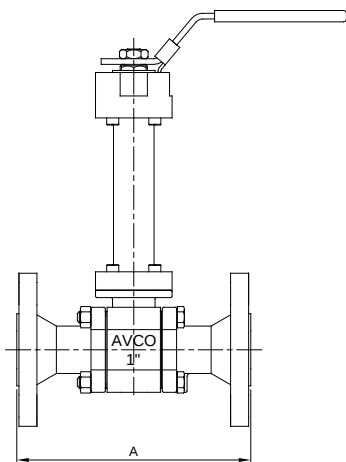
2 1/2" THRU 4"



Plan View with Handle Removed



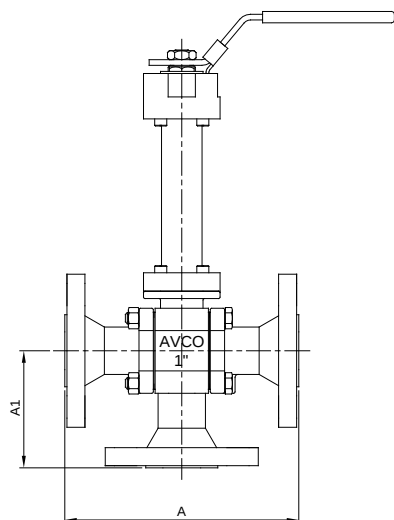
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)	CV
2 1/2"	8.02	20.12	13.74	2.52	17.54	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	58	1200	427
3"	8.02	20.12	13.74	2.95	17.54	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	58	1200	579
4"	9.46	20.65	13.74	3.78	18.07	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	74	2000	896



Standard Flanged Ends (150#, 300#, 600#)

SIZE	A (in.)		
	150#	300#	600#
1/2"	5.50	5.50	6.50
3/4"	6.00	6.00	7.50
1"	6.50	6.50	8.50
1 1/4"	7.00	7.00	9.00
1 1/2"	7.50	7.50	9.50
2"	8.50	8.50	11.50
2 1/2"	9.50	9.50	13.00
3"	11.12	11.12	14.00
4"	12.00	12.00	17.00

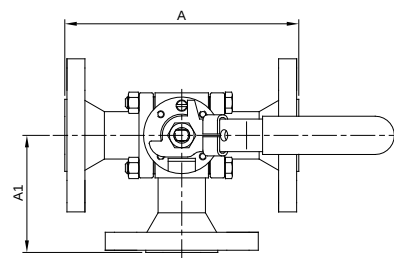
See tables on pages 2 & 3 for all other dimensions



3 Way Bottom Entry with Flanged Ends (150#, 300#, 600#)

SIZE	A (in.)			A1 (in.)		
	150#	300#	600#	150#	300#	600#
1/2"	5.50	5.50	6.50	2.75	2.75	3.25
3/4"	6.00	6.00	7.50	3.00	3.00	3.75
1"	6.50	6.50	8.50	3.25	3.25	4.25
1 1/4"	7.00	7.00	9.00	3.50	3.50	4.50
1 1/2"	7.50	7.50	9.50	3.75	3.75	4.75
2"	8.50	8.50	11.50	4.25	4.25	5.75
2 1/2"	9.50	9.50	13.00	4.75	4.75	6.50
3"	11.12	11.12	14.00	5.56	5.56	7.00
4"	12.00	12.00	17.00	6.00	6.00	8.50

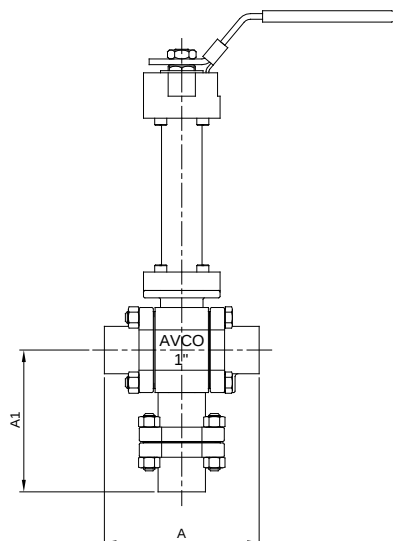
See tables on pages 2 & 3 for all other dimensions



3 Way Side Entry with Flanged Ends (150#, 300#, 600#)

SIZE	A (in.)			A1 (in.)		
	150#	300#	600#	150#	300#	600#
1/2"	5.50	5.50	6.50	2.75	2.75	3.25
3/4"	6.00	6.00	7.50	3.00	3.00	3.75
1"	6.50	6.50	8.50	3.25	3.25	4.25
1 1/4"	7.00	7.00	9.00	3.50	3.50	4.50
1 1/2"	7.50	7.50	9.50	3.75	3.75	4.75
2"	8.50	8.50	11.50	4.25	4.25	5.75
2 1/2"	9.50	9.50	13.00	4.75	4.75	6.50
3"	11.12	11.12	14.00	5.56	5.56	7.00
4"	12.00	12.00	17.00	6.00	6.00	8.50

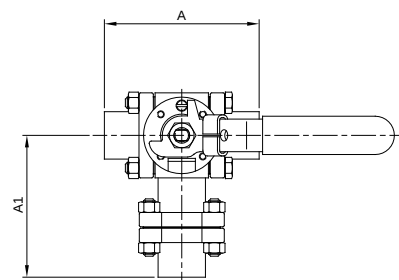
See tables on pages 2 & 3 for all other dimensions



3 Way Bottom Entry with BW, NPT or SW Ends

SIZE	A (in.)	A1 (in.)
1/4"	2.59	2.71
3/8"	2.59	2.71
1/2"	2.95	2.88
3/4"	3.16	3.04
1"	3.66	3.30
1 1/4"	4.35	3.91
1 1/2"	4.72	4.23
2"	5.51	4.83

See tables on pages 2 & 3 for all other dimensions



3 Way Side Entry with BW, NPT or SW Ends

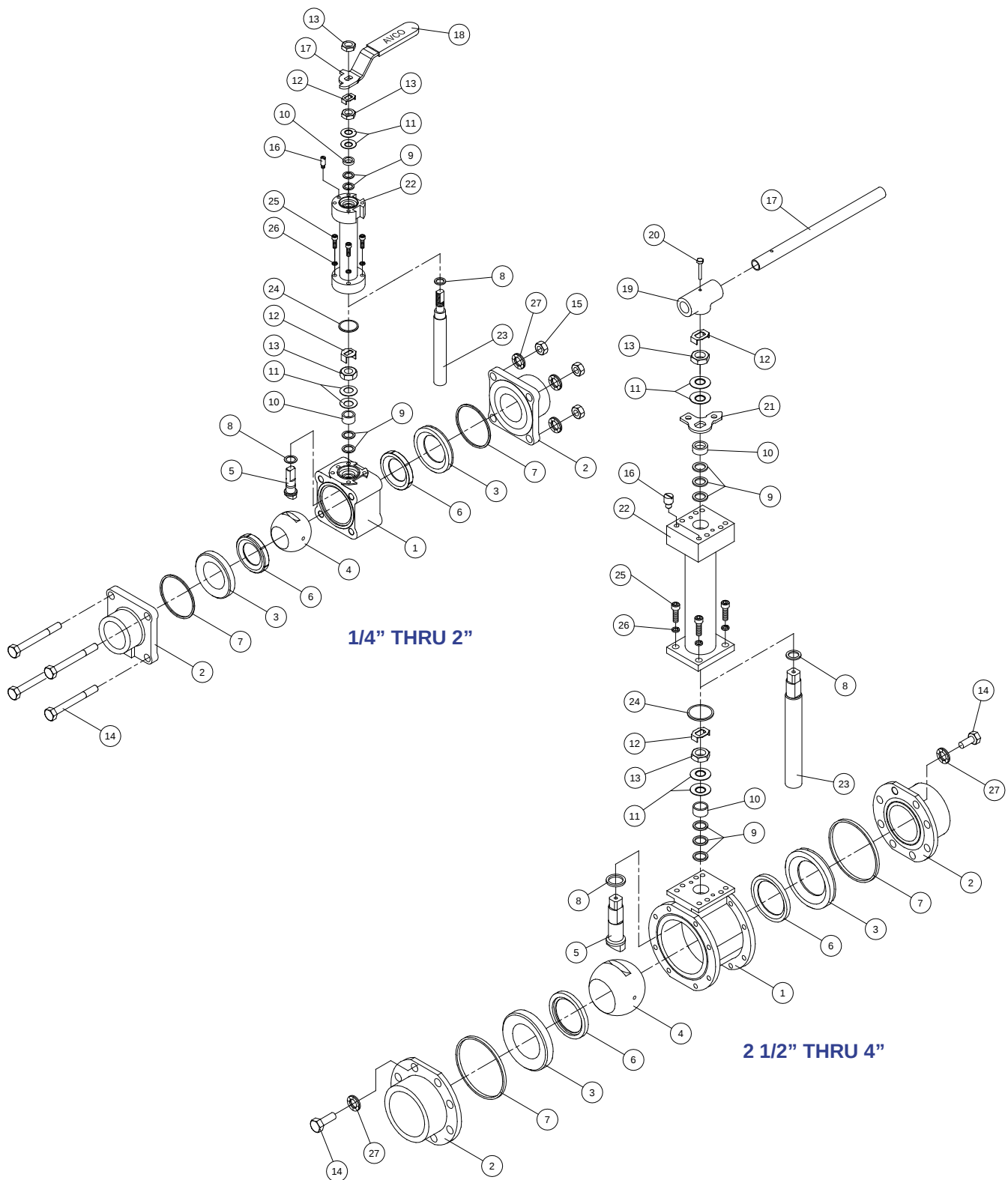
SIZE	A (in.)	A1 (in.)
1/4"	2.59	2.57
3/8"	2.59	2.57
1/2"	2.95	2.74
3/4"	3.16	2.93
1"	3.66	3.19
1 1/4"	4.35	3.70
1 1/2"	4.72	4.09
2"	5.51	4.71

See tables on pages 2 & 3 for all other dimensions

AVCO

Alloy Valves and Control

BALL VALVES 1500 SERIES



Item	Parts	Material
1	Body	316 Stainless Steel/Hastelloy C/Monel 400
2	End Cap	316 Stainless Steel/Hastelloy C/Monel 400
3	Retainer*	316 Stainless Steel/Hastelloy C/Monel 400
4	Ball	316 Stainless Steel/Hastelloy C/Monel 400
5	Stem	316 Stainless Steel/Hastelloy C/Monel 400
6	Ball Seat	25% Carbon PTFE/PCTFE/PTFE
7	Body Seal	25% Carbon PTFE/PTFE/Graphoil
8	Thrust Washer	25% Carbon PTFE/Graphoil
9	Packing	25% Carbon PTFE/Graphoil
10	Gland Ring	304 Stainless Steel
11	Disc Spring	304 Stainless Steel
12	Lock Tab	304 Stainless Steel
13	Stem Nut	304 Stainless Steel
14	Body Bolt	304 Stainless Steel
15	Body Nut	304 Stainless Steel
16	Stop Pin	304 Stainless Steel
17	Handle	304 Stainless Steel
18	Handle Sleeve	Vinyl
19	Wrench Block	304 Stainless Steel
20	Handle Bolt	304 Stainless Steel
21	Lock Pad	304 Stainless Steel
22	Bonnet Extension	316 Stainless Steel/Hastelloy C/Monel 400
23	Stem Extension	316 Stainless Steel/Hastelloy C/Monel 400
24	Bonnet Gasket	Flexitallic Spiral Wound Gasket (316 SS w/ Flexicarb)
25	Bonnet Bolt	304 Stainless Steel
26	Bonnet Washer	304 Stainless Steel
27	Disc-Lock Washer	316 Stainless Steel

* This item is integral with the end cap (item 2) on sizes 1/4" thru 3/4"

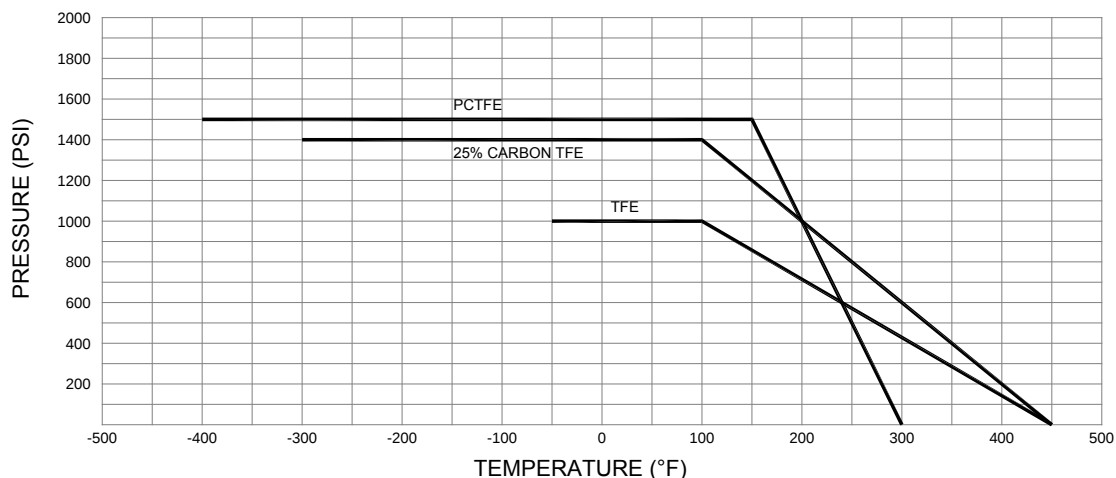
Features

Extended Bonnet
Optional Extended Bonnet Lengths
Optional Shortened Bonnet Lengths
Encapsulated Seats, Seals & Body Bolts
Spring Loaded Stem Packing
Bottom Entry Stem to Prevent Blow-Out
Vent Hole on Pressure Side of Ball
ISO 5211 Mounting Pad
Locking Handle
Inter-Changeable End Connections

Notes

Please contact AVCO if you require customized versions of our valves. CAD drawings are available for most variations, including actuators etc.

Pressure/Temperature Rating





Electric Actuator

120 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20 MA
Reversing
Telemetry
Battery Back-up
Spring Return



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 PSI
Positioners 4-20 MA
Intelligent Positioner
Declutchable Manual Override



Manual Valves

Oval Handle
Spring Return
Fusible Link
Lock Device
Gear Operators

HOW TO ORDER

1"	15	3	3	T	T	SE	BAB90
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/4"	1500 Series 3 Piece Cryogenic Full Port Ball Valve	3 - 316 SS	3 - 316 SS	T - Teflon (PTFE)	T - Teflon (PTFE)	SE - NPT	BAHL - Hardened Ball
3/8"		4 - Monel 400	4 - Monel 400	C - 25% Carbon PTFE	C - 25% Carbon PTFE	SW - Socket Weld	BAB90 - 90° Bottom Diverter
1/2"		6 - Hastelloy C	6 - Hastelloy C	K - Kel-F (PCTFE)	G - Graphoil	BW - Butt Weld	BAB180 - 180° Bottom Diverter
3/4"						150 - 150# Flange	BAS90 - 90° Side Entry Diverter
1"						300 - 300# Flange	BAV15 - 15° Vee Port
1 1/4"						600 - 600# Flange	BAV30 - 30° Vee Port
1 1/2"							BAV45 - 45° Vee Port
2"							BAV60 - 60° Vee Port
2 1/2"							EBxx - Custom Bonnet Length
3"							FS - Fire Safe
4"							O2CB - O ₂ Cleaned & Bagged
						Variations of the above or special ends can be supplied upon request	

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This brochure is general in nature and we reserve the right to alter dimensions, materials or make design improvements.

AVCO

Alloy Valves and Control

BALL VALVES 1700 SERIES



Size

1/4" - 4" (Full Port)
2000 WOG

End Connections

NPT
Butt Weld
Socket Weld
Flanged (150#, 300#, 600#)

Valve Materials

316 Stainless Steel
Carbon Steel
Hastelloy C
Monel

Ball and Stem Materials

316 Stainless Steel
Hastelloy B & C
Monel 400
Alloy 20

Seat Materials

Teflon (PTFE)
25% Carbon Filled Teflon
15% Glass Filled Teflon
Kel-F (PCTFE)
PEEK
UHMWPE
Metals

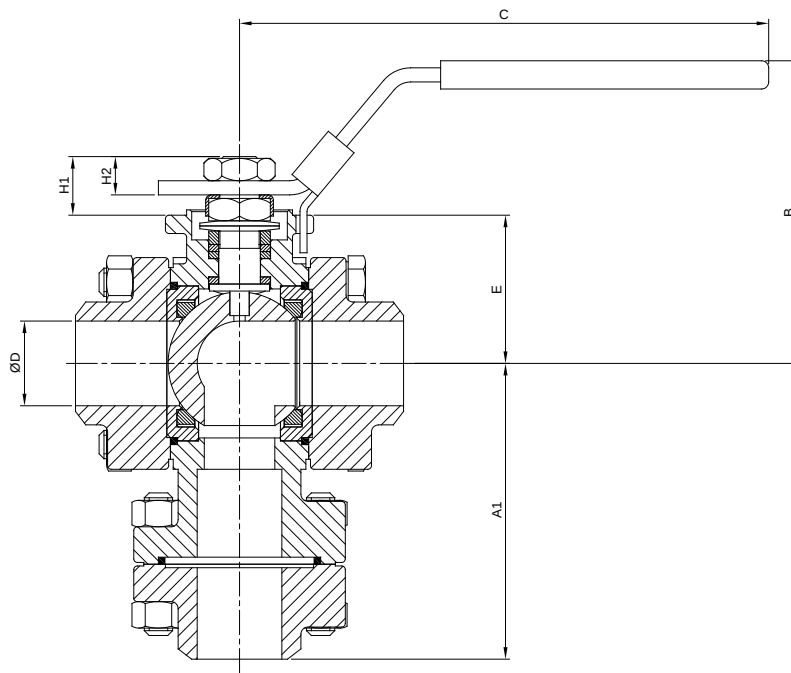
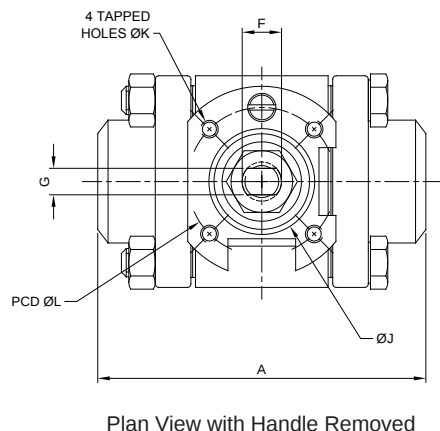
Service Applications

Chemical
Dry/Liquid Chlorine
Food Processing
Hydraulic
Oxygen
Steam
Thermal Fluids
Vacuum
Water/Oil/Gas

Applicable Standards

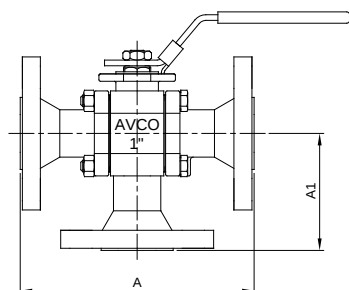
ASME B16.34
API 598

1/4" THRU 2" (NPT, BW, SW)



SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)
1/4"	2.61	2.72	2.48	4.53	0.36	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
3/8"	2.61	2.72	2.48	4.53	0.49	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
1/2"	2.97	2.90	2.48	4.53	0.59	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
3/4"	3.17	3.05	2.56	4.53	0.75	1.32	0.38	0.22	0.52	0.29	0.98	M5	1.42	F04	2.5	80
1"	3.67	3.31	3.38	5.91	0.95	1.65	0.44	0.30	0.65	0.43	1.18	M5	1.65	F04	4	120
1 1/4"	4.37	3.93	3.50	5.91	1.18	1.82	0.44	0.30	0.67	0.47	1.18	M5	1.65	F04	6	235
1 1/2"	4.72	4.23	3.92	6.85	1.50	1.90	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	8	290
2"	5.53	4.85	4.25	6.85	1.97	2.22	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	14	450

1/2" THRU 2" (Standard Flanged Ends 150#, 300#, 600#)



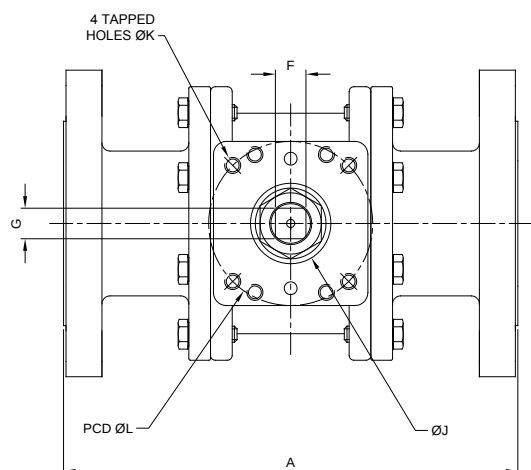
SIZE	A (in.)			A1 (in.)		
	150#	300#	600#	150#	300#	600#
1/2"	5.50	5.50	6.50	2.75	2.75	3.25
3/4"	6.00	6.00	7.50	3.00	3.00	3.75
1"	6.50	6.50	8.50	3.25	3.25	4.25
1 1/4"	7.00	7.00	9.00	3.50	3.50	4.50
1 1/2"	7.50	7.50	9.50	3.75	3.75	4.75
2"	8.50	8.50	11.50	4.25	4.25	5.75

Note

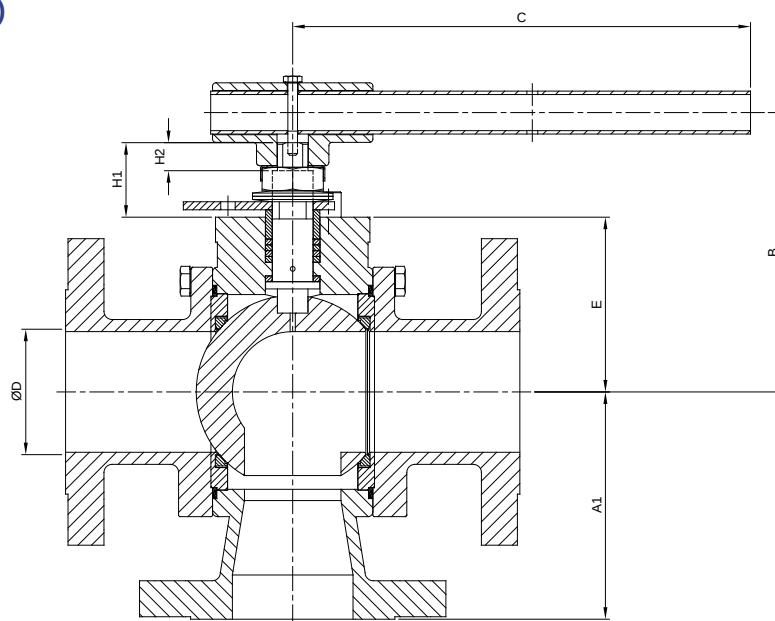
Please contact AVCO if you require flanged ends to be other than standard raised face.

See main table on this page for all other dimensions

2 1/2" THRU 4" (FLANGED 150#, 300#, 600#)

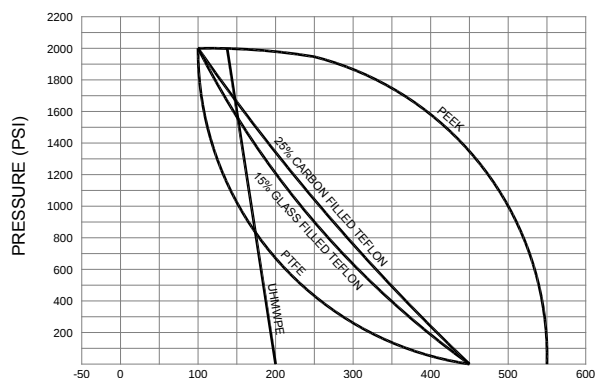


Plan View with Handle Removed



SIZE	A (in.)			A1 (in.)			B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)
	150#	300#	600#	150#	300#	600#														
2 1/2"	9.50	9.50	13.00	4.75	4.75	6.50	5.28	8.84	2.52	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22	685
3"	11.12	11.12	14.00	5.56	5.56	7.00	6.84	13.74	2.95	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35	1200
4"	12.00	12.00	17.00	6.00	6.00	8.50	7.37	13.74	3.78	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55	2000

Pressure/Temperature Rating

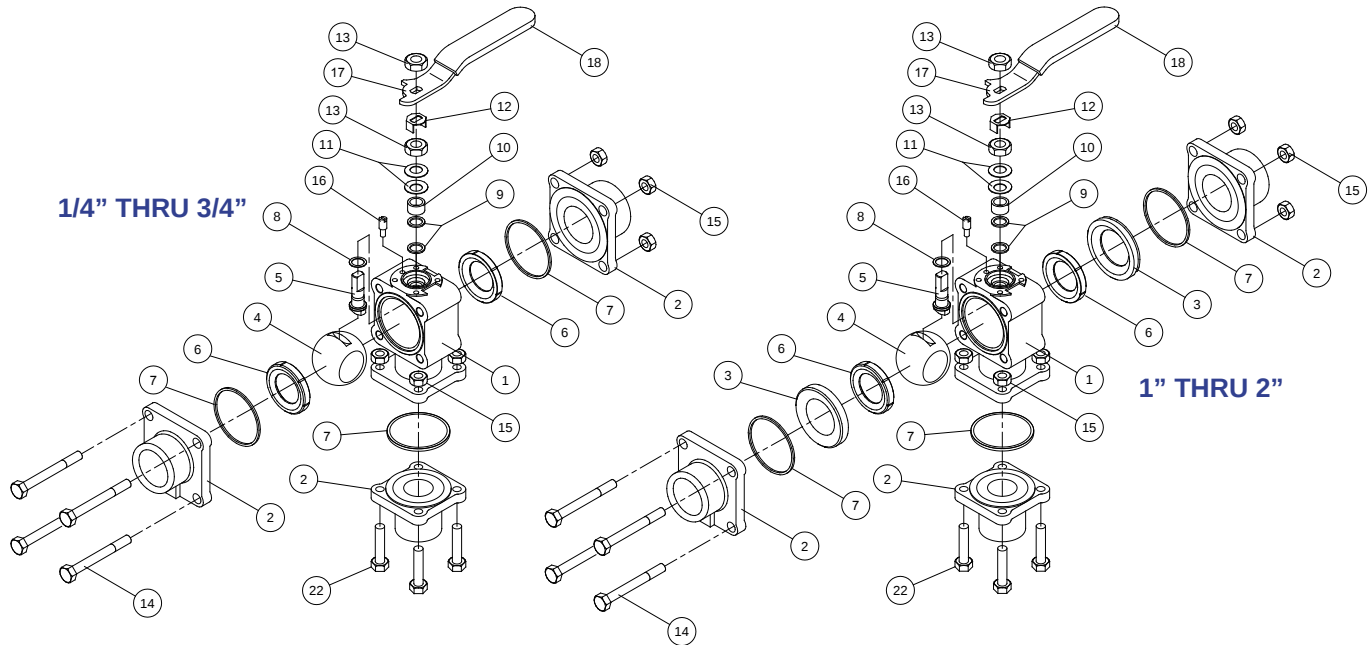


Notes

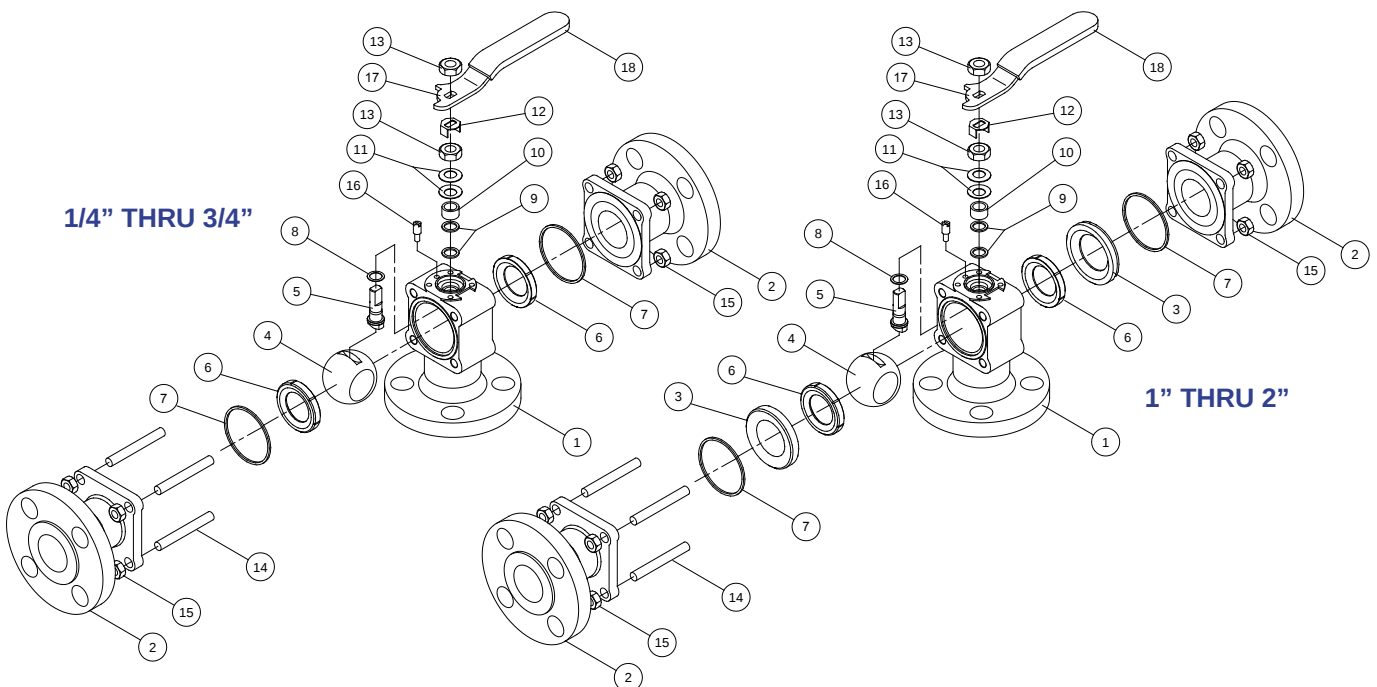
Please contact AVCO if you require customized versions of our valves. CAD drawings are available for most variations, including actuators etc.

Alloy Valves and Control

1/4" THRU 2" (NPT, BW, SW)

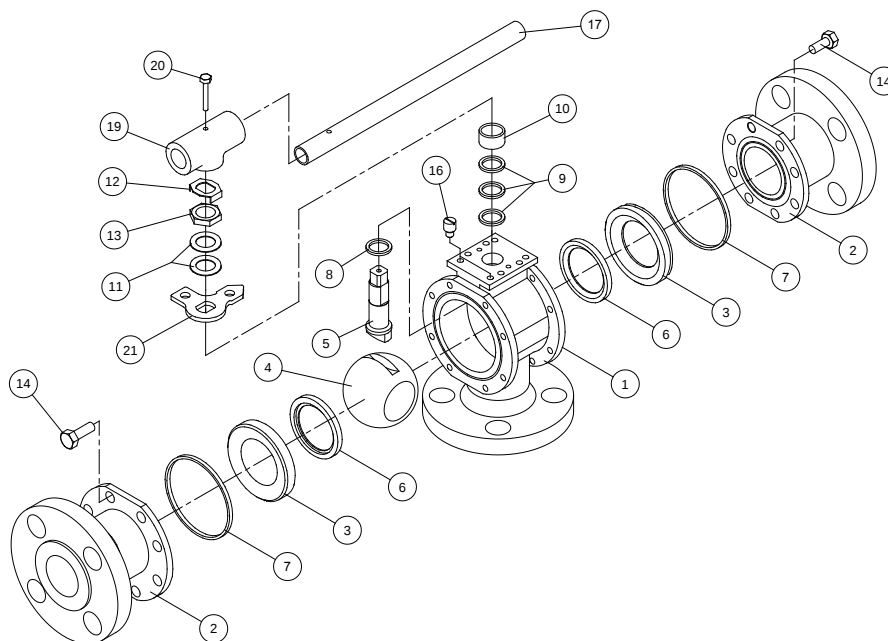


1/4" THRU 2" (FLANGED)



Alloy Valves and Control

2 1/2" THRU 4" (FLANGED)

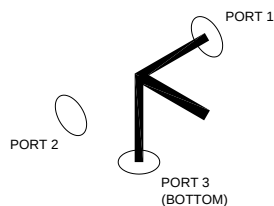
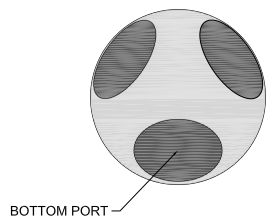


Features

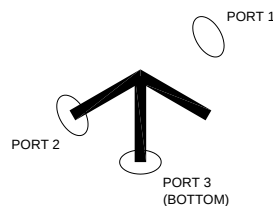
ANSI Class 150#, 300# & 600#
2000 WOG
Encapsulated Seats, Seals & Body Bolts
Spring Loaded Stem Packing
Bottom Entry Stem to Prevent Blow-Out
ISO 5211 Mounting Pad
Locking Handle
Inter-Changeable End Connections

Item	Parts
1	Body
2	End Cap
3	Retainer
4	Ball
5	Stem
6	Ball Seat
7	Body Seal
8	Thrust Washer
9	Packing
10	Gland Ring
11	Disc Spring
12	Lock Tab
13	Stem Nut
14	Body Bolt
15	Body Nut
16	Stop Pin
17	Handle
18	Handle Sleeve
19	Wrench Block
20	Handle Bolt
21	Lock Pad
22	End Cap Bolt

Ball Options



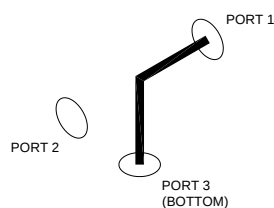
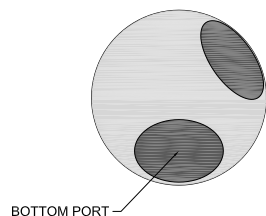
Start Position



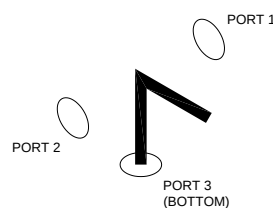
90 Degree Rotation

90 Degree Diverter Ball

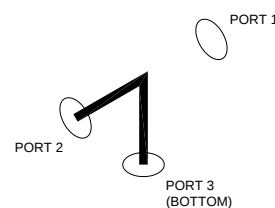
Media flows between port 1 and port 3 when the valve handle is in-line with pipeline. Upon 90 degree rotation the media is diverted to flow between port 2 and port 3. The valve handle can be locked off in either position thus preventing unwanted tampering.



Start Position



90 Degree Rotation



180 Degree Rotation

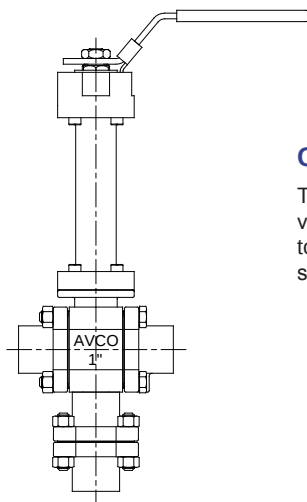
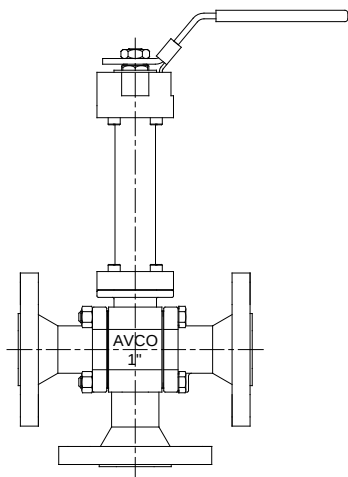
180 Degree Diverter Ball

Media flows between port 1 and port 3 and can be locked off in this position. Upon 90 degree rotation the valve will be isolated resulting in no flow and can be locked off. Upon 180 degree rotation the flow path diverts to port 2 and port 3, but cannot be locked off.

AVCO

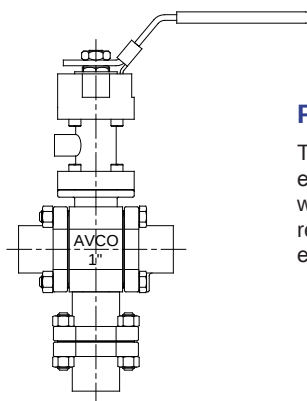
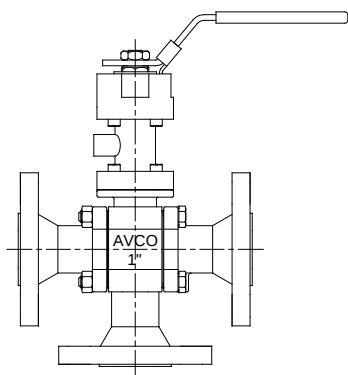
Alloy Valves and Control

BALL VALVES 1700 SERIES



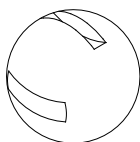
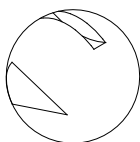
Cryogenic Option

The AVCO 1700 series ball valves are available as cryogenic valves. The extended bonnet can be shortened or lengthened to suit many applications and is also available 'off the shelf' in standard lengths (see 1500 series literature).



Fugitive Emissions Option

The AVCO 1700 series ball valves can be supplied with fugitive emissions (sniffer) bonnets. This gives an early warning system when the valve stem packing is becoming worn and ready for renewal, thus preventing dangerous chemicals/gases from entering the surrounding environment.



Vee Port and Slotted Ball Option

The AVCO 1700 series ball valves can be supplied with vee port or slotted balls for greater control and accuracy. Many configurations are available to suit the needs of the customer.



Electric Actuator

120 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20 mA
Reversing
Telemetry
Battery Back-up
Spring Return



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 psi
Positioners 4-20 mA
Intelligent Positioner
Dec clutchable Manual Override



Manual Valves

Oval Handle
Spring Return
Fusible Link
Lock Device
Gear Operators

HOW TO ORDER

1"	17	3	3	T	T	SE	BAB90
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/4"	1700 Series 3 Piece Bottom Entry Diverter Ball Valve	1 - Carbon Steel	2 - Alloy 20	T - Teflon (PTFE)	T - Teflon (PTFE)	SE - NPT	BAB90 - 90° Rotation Ball
3/8"		1L - Low Grade Carbon	3 - 316 SS	R - 15% Glass PTFE	C - 25% Carbon PTFE	SW - Socket Weld	BAB180 - 180° Rotation Ball
1/2"		2 - Alloy 20	4 - Monel 400	C - 25% Carbon PTFE	G - Graphoil	BW - Butt Weld	BAHL - Hardened Ball
3/4"		3 - 316 SS	5 - Hastelloy B	P - PEEK	B - BUNA N	GR - Grooved	BNIE - Emissions Bonnet
1"		4 - Monel 400	6 - Hastelloy C	U - UHMWPE	E - EPDM	FBT - Flush Bottom Tank	CF - Cavity Filled
1 1/4"		5 - Hastelloy B	7 - Inconel 625	K - Kel-F (PCTFE)	V - Viton	BSP - British Standard Pipe	O2CB - O2 Clean/Bagged
1 1/2"		6 - Hastelloy C	8 - Titanium	B - Bronze	N - Neoprene	AN - Army Navy	
2"		7 - Inconel 625	9 - Aluminum	S - Stellite		150 - 150# Flange	
2 1/2"		8 - Titanium		I - Inconel		300 - 300# Flange	
3"		9 - Aluminum				600 - 600# Flange	
4"							
						Variations of the above or special ends can be supplied upon request	Customized Ports are available upon request

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AVCO

Alloy Valves and Control

BALL VALVES 1800 SERIES



Size

1/4" - 4" (Full Port)
2000 WOG

End Connections

NPT
Butt Weld
Socket Weld
Flanged (150#, 300#, 600#)

Valve Materials

316 Stainless Steel
Carbon Steel
Hastelloy C
Monel

Ball and Stem Materials

316 Stainless Steel
Hastelloy B & C
Monel 400
Alloy 20

Seat Materials

Teflon (PTFE)
25% Carbon Filled Teflon
15% Glass Filled Teflon
Kel-F (PCTFE)
PEEK
UHMWPE
Metals

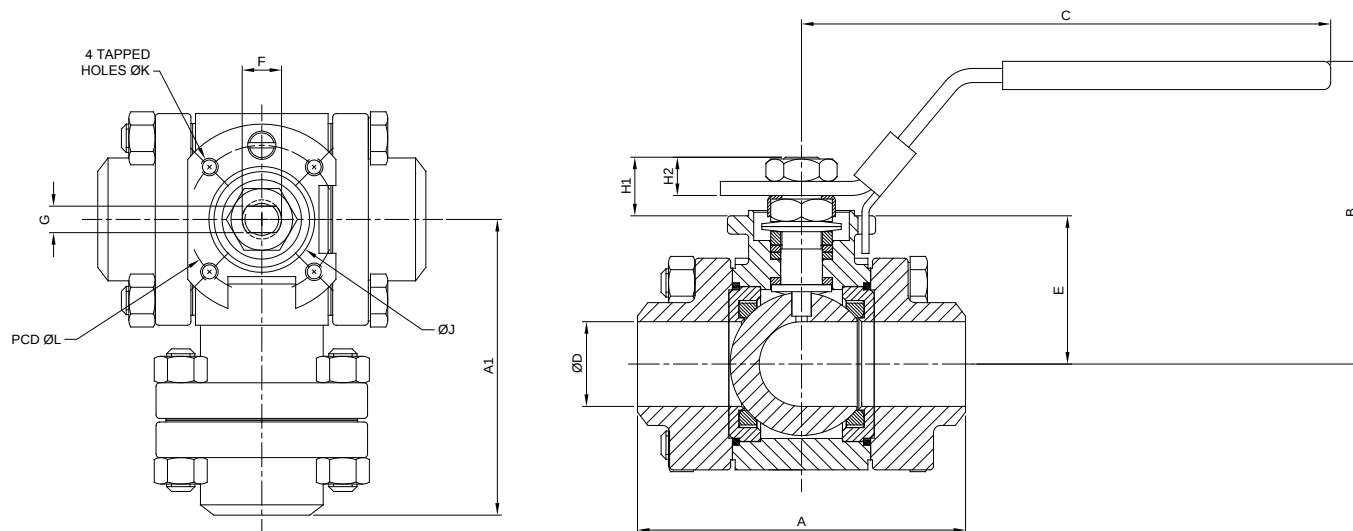
Service Applications

Chemical
Dry/Liquid Chlorine
Food Processing
Hydraulic
Oxygen
Steam
Thermal Fluids
Vacuum
Water/Oil/Gas

Applicable Standards

ASME B16.34
API 598

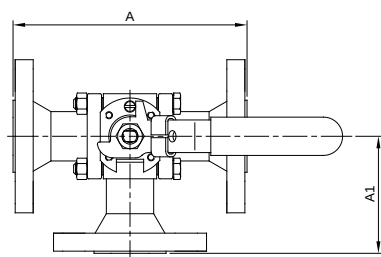
1/4" THRU 2" (NPT, BW, SW)



Plan View with Handle Removed

SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)
1/4"	2.61	2.58	2.48	4.53	0.36	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
3/8"	2.61	2.58	2.48	4.53	0.49	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
1/2"	2.97	2.75	2.48	4.53	0.59	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
3/4"	3.17	2.94	2.56	4.53	0.75	1.32	0.38	0.22	0.52	0.29	0.98	M5	1.42	F04	2.5	80
1"	3.67	3.20	3.38	5.91	0.95	1.65	0.44	0.30	0.65	0.43	1.18	M5	1.65	F04	4	120
1 1/4"	4.37	3.71	3.50	5.91	1.18	1.82	0.44	0.30	0.67	0.47	1.18	M5	1.65	F04	6	235
1 1/2"	4.72	4.09	3.92	6.85	1.50	1.90	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	8	290
2"	5.53	4.72	4.25	6.85	1.97	2.22	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	14	450

1/2" THRU 2" (Standard Flanged Ends 150#, 300#, 600#)



SIZE	A (in.)			A1 (in.)		
	150#	300#	600#	150#	300#	600#
1/2"	5.50	5.50	6.50	2.66	2.75	3.25
3/4"	6.00	6.00	7.50	2.90	3.00	3.75
1"	6.50	6.50	8.50	3.25	3.25	4.25
1 1/4"	7.00	7.00	9.00	3.50	3.50	4.50
1 1/2"	7.50	7.50	9.50	3.75	3.75	4.75
2"	8.50	8.50	11.50	4.25	4.25	5.75

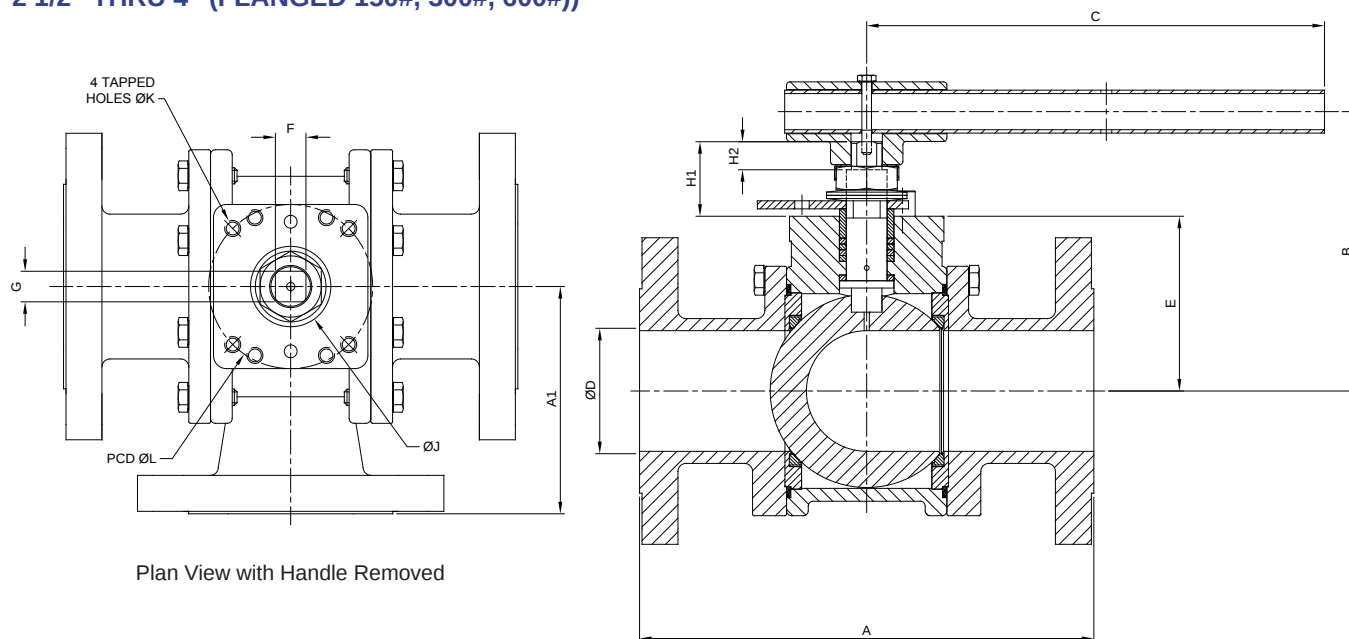
See main table on this page for all other dimensions

Note

Please contact AVCO if you require flanged ends to be other than standard raised face.

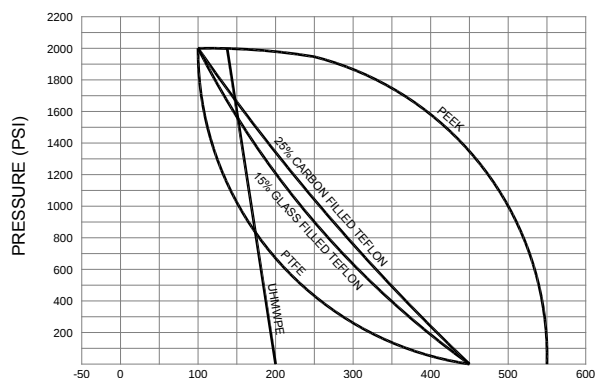
Alloy Valves and Control

2 1/2" THRU 4" (FLANGED 150#, 300#, 600#)



SIZE	A (in.)			A1 (in.)			B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)
	150#	300#	600#	150#	300#	600#														
2 1/2"	9.50	9.50	13.00	4.75	4.75	6.50	5.28	8.84	2.52	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22	685
3"	11.12	11.12	14.00	5.56	5.56	7.00	6.84	13.74	2.95	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35	1200
4"	12.00	12.00	17.00	6.00	6.00	8.50	7.37	13.74	3.78	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55	2000

Pressure/Temperature Rating

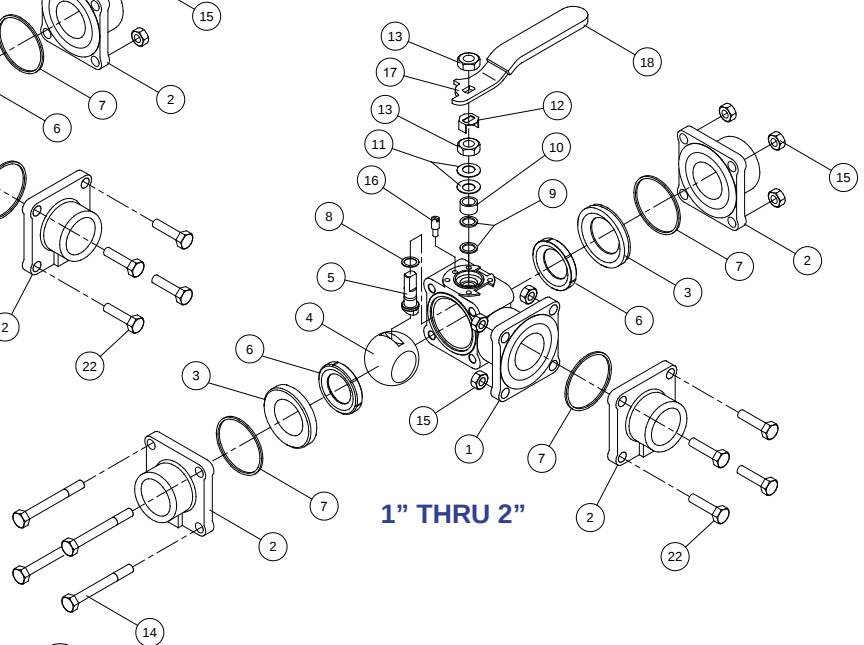
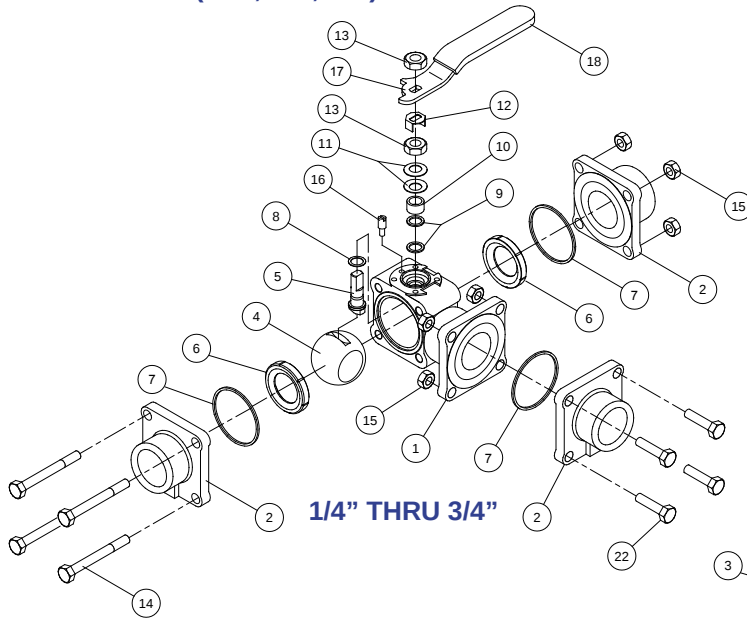


Notes

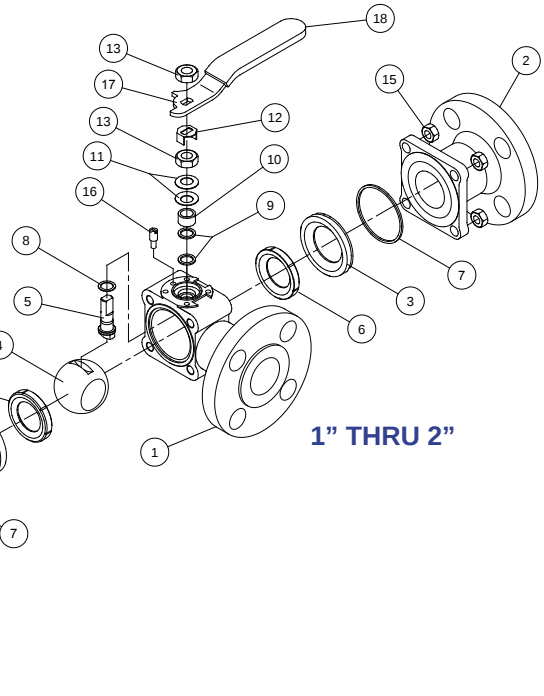
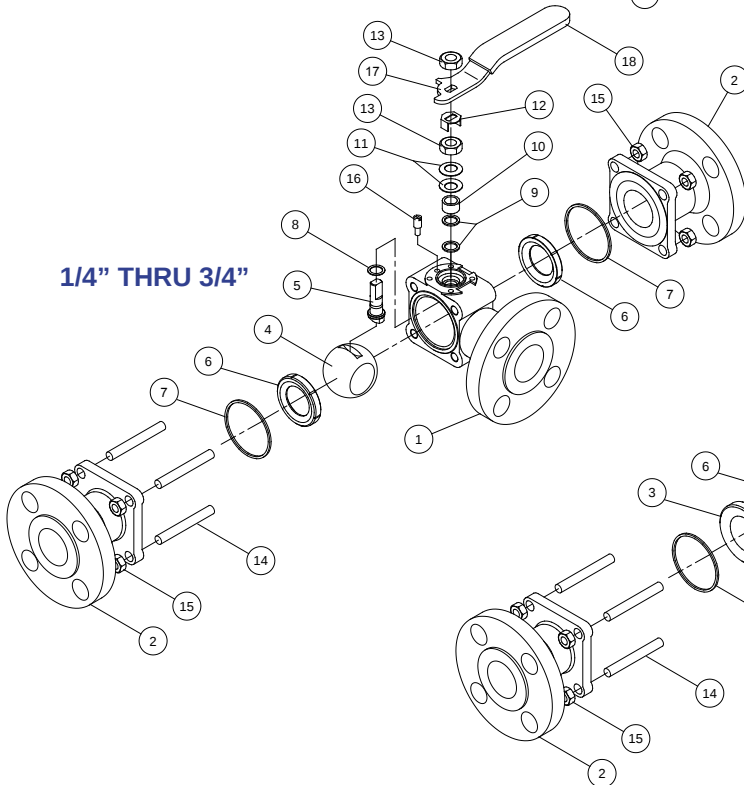
Please contact AVCO if you require customized versions of our valves. CAD drawings are available for most variations, including actuators etc.

Alloy Valves and Control

1/4" THRU 2" (NPT, BW, SW)

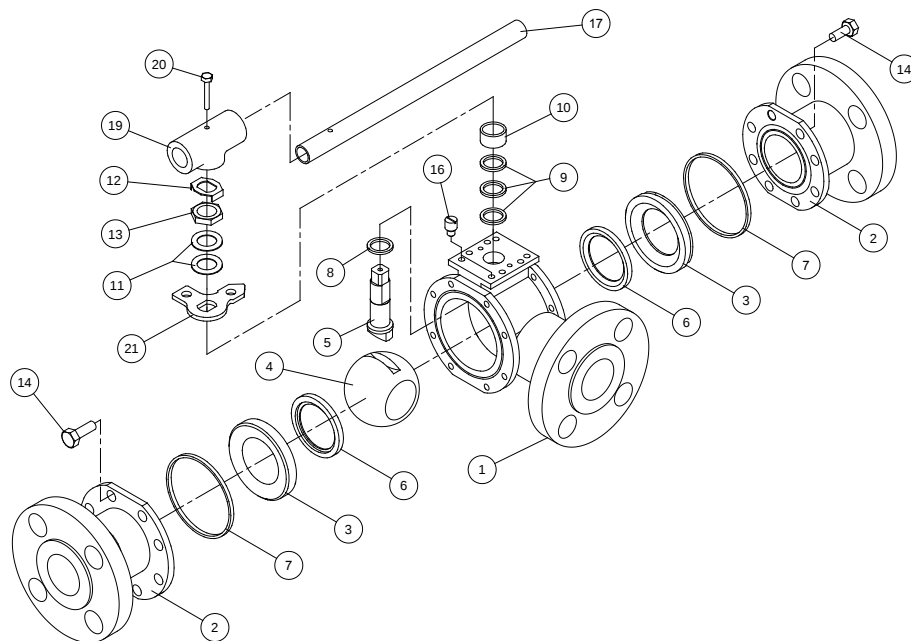


1/4" THRU 2" (FLANGED)



Alloy Valves and Control

2 1/2" THRU 4" (FLANGED)

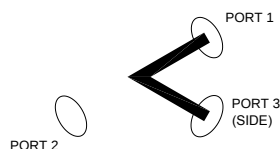
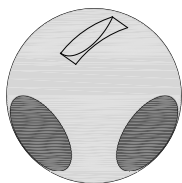


Features

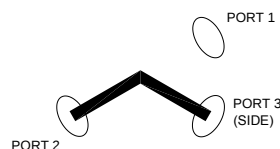
ANSI Class 150#, 300# & 600#
2000 WOG
Encapsulated Seats, Seals & Body Bolts
Spring Loaded Stem Packing
Bottom Entry Stem to Prevent Blow-Out
ISO 5211 Mounting Pad
Locking Handle
Inter-Changeable End Connections

Item	Parts
1	Body
2	End Cap
3	Retainer
4	Ball
5	Stem
6	Ball Seat
7	Body Seal
8	Thrust Washer
9	Packing
10	Gland Ring
11	Disc Spring
12	Lock Tab
13	Stem Nut
14	Body Bolt
15	Body Nut
16	Stop Pin
17	Handle
18	Handle Sleeve
19	Wrench Block
20	Handle Bolt
21	Lock Pad
22	End Cap Bolt

Ball Options



Start Position



90 Degree Rotation

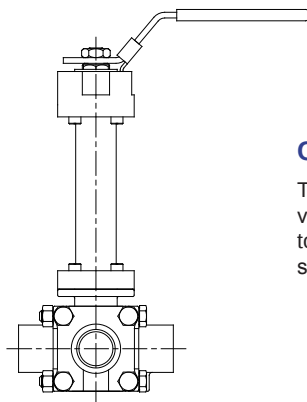
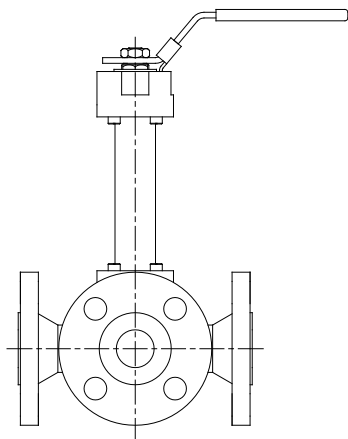
90 Degree Diverter Ball

Media flows between port 1 and port 3 when the valve handle is in-line with pipeline. Upon 90 degree rotation the media is diverted to flow between port 2 and port 3. The valve handle can be locked off in either position thus preventing unwanted tampering.

AVCO

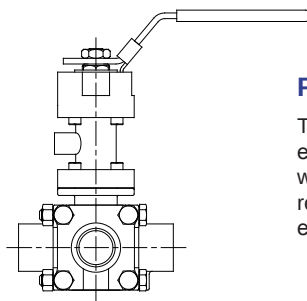
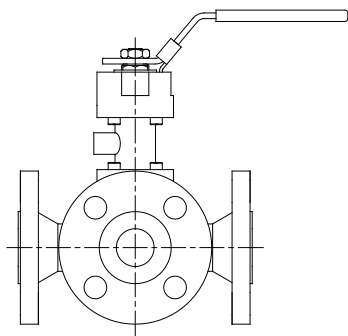
Alloy Valves and Control

BALL VALVES 1800 SERIES



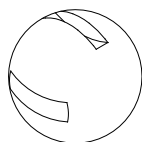
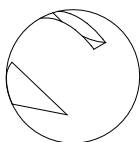
Cryogenic Option

The AVCO 1800 series ball valves are available as cryogenic valves. The extended bonnet can be shortened or lengthened to suit many applications and is also available 'off the shelf' in standard lengths (see 1500 series literature).



Fugitive Emissions Option

The AVCO 1800 series ball valves can be supplied with fugitive emissions (sniffer) bonnets. This gives an early warning system when the valve stem packing is becoming worn and ready for renewal, thus preventing dangerous chemicals/gases from entering the surrounding environment.



Vee Port and Slotted Ball Option

The AVCO 1800 series ball valves can be supplied with vee port or slotted balls for greater control and accuracy. Many configurations are available to suit the needs of the customer.



Electric Actuator

120 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20 mA
Reversing
Telemetry
Battery Back-up
Spring Return



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 psi
Positioners 4-20 mA
Intelligent Positioner
Dec clutchable Manual Override



Manual Valves

Oval Handle
Spring Return
Fusible Link
Lock Device
Gear Operators

HOW TO ORDER

1"	18	3	3	T	T	SE	BAS90
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/4"	1800 Series 3 Piece Side Entry Diverter Ball Valve	1 - Carbon Steel	2 - Alloy 20	T - Teflon (PTFE)	T - Teflon (PTFE)	SE - NPT	BAS90 - 90° Rotation Ball
3/8"		1L - Low Grade Carbon	3 - 316 SS	R - 15% Glass PTFE	C - 25% Carbon PTFE	SW - Socket Weld	BAHL - Hardened Ball
1/2"		2 - Alloy 20	4 - Monel 400	C - 25% Carbon PTFE	G - Graphoil	BW - Butt Weld	BNIE - Emissions Bonnet
3/4"		3 - 316 SS	5 - Hastelloy B	P - PEEK	B - BUNA N	GR - Grooved	CF - Cavity Filled
1"		4 - Monel 400	6 - Hastelloy C	U - UHMWPE	E - EPDM	FBT - Flush Bottom Tank	O2CB - O2 Clean/Bagged
1 1/4"		5 - Hastelloy B	7 - Inconel 625	K - Kel-F (PCTFE)	V - Viton	BSP - British Standard Pipe	
1 1/2"		6 - Hastelloy C	8 - Titanium	B - Bronze	N - Neoprene	AN - Army Navy	
2"		7 - Inconel 625	9 - Aluminum	S - Stellite		150 - 150# Flange	
2 1/2"		8 - Titanium		I - Inconel		300 - 300# Flange	
3"		9 - Aluminum				600 - 600# Flange	
4"							
						Variations of the above or special ends can be supplied upon request	Customized Ports are available upon request

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This brochure is general in nature and we reserve the right to alter dimensions, materials or make design improvements.

AVCO

Alloy Valves and Control

BALL VALVES 1900 SERIES



Size

1/4" - 4" (Full Port)
2000 WOG

End Connections

NPT
Butt Weld
Socket Weld
Flanged (150#, 300#, 600#)

Valve Materials

316 Stainless Steel
Carbon Steel
Hastelloy C
Monel

Ball and Stem Materials

316 Stainless Steel
Hastelloy B & C
Monel 400
Alloy 20

Seat Materials

Teflon (PTFE)
25% Carbon Filled Teflon
15% Glass Filled Teflon
Kel-F (PCTFE)
PEEK
UHMWPE
Metals

Service Applications

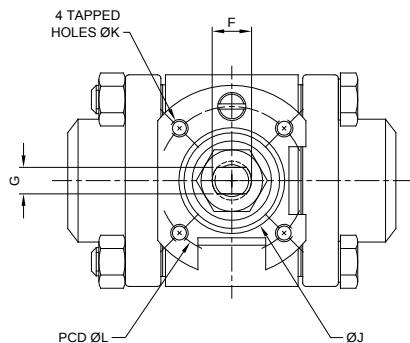
Chemical
Dry/Liquid Chlorine
Food Processing
Hydraulic
Oxygen
Steam
Thermal Fluids
Vacuum
Water/Oil/Gas

Applicable Standards

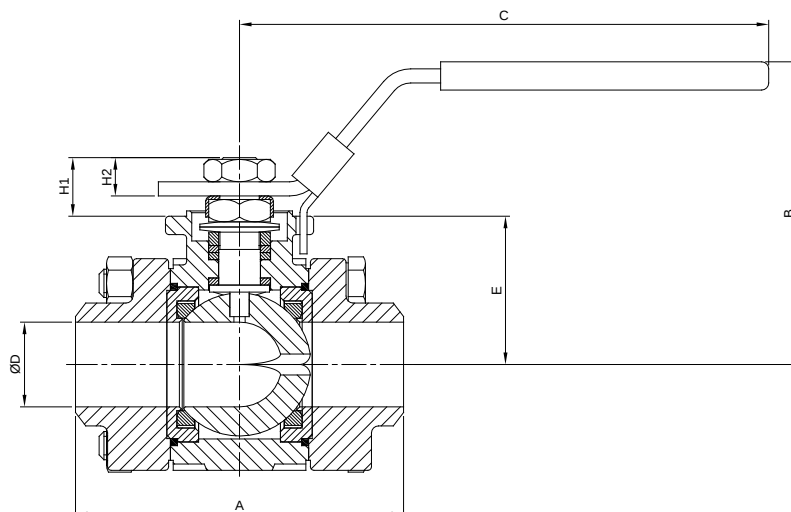
ASME B16.34
API 598
API 607 4th Edition

Alloy Valves and Control

1/4" THRU 2"

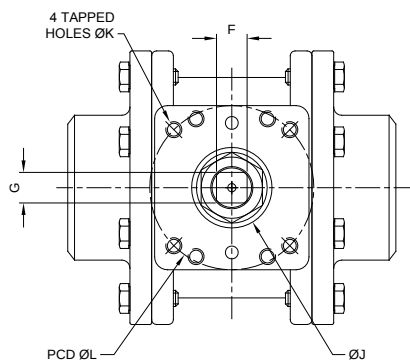


Plan View with Handle Removed

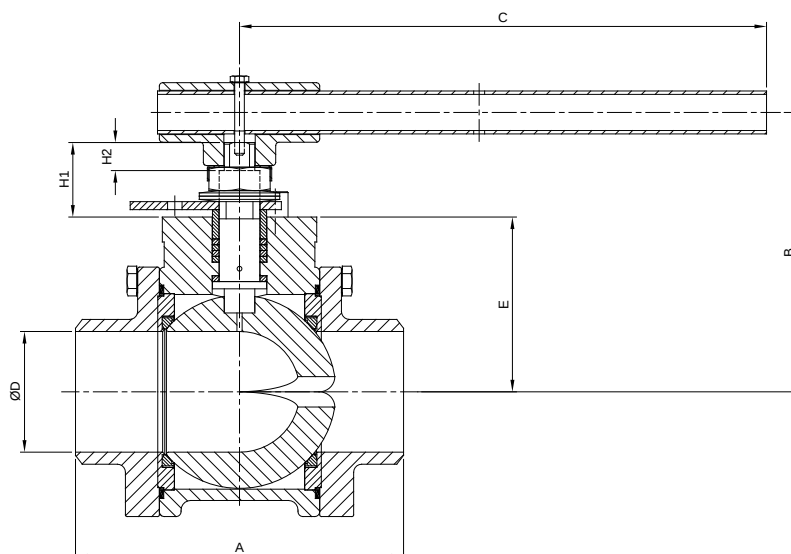


SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)
1/4"	2.61	2.48	4.53	0.36	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
3/8"	2.61	2.48	4.53	0.49	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
1/2"	2.97	2.48	4.53	0.59	1.24	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2	65
3/4"	3.17	2.56	4.53	0.75	1.32	0.38	0.22	0.52	0.29	0.98	M5	1.42	F04	2.5	80
1"	3.67	3.38	5.91	0.95	1.65	0.44	0.30	0.65	0.43	1.18	M5	1.65	F04	4	120
1 1/4"	4.37	3.50	5.91	1.18	1.82	0.44	0.30	0.67	0.47	1.18	M5	1.65	F04	6	235
1 1/2"	4.72	3.92	6.85	1.50	1.90	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	8	290
2"	5.53	4.25	6.85	1.97	2.22	0.57	0.34	1.14	0.60	1.38	M6	1.97	F05	14	450

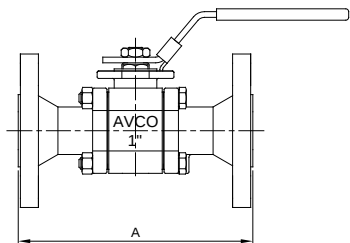
2 1/2" THRU 4"



Plan View with Handle Removed



SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)
2 1/2"	7.27	5.28	8.84	2.52	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22	685
3"	8.02	6.84	13.74	2.95	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35	1200
4"	9.46	7.37	13.74	3.78	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55	2000



Standard Flanged Ends (150#, 300#, 600#)

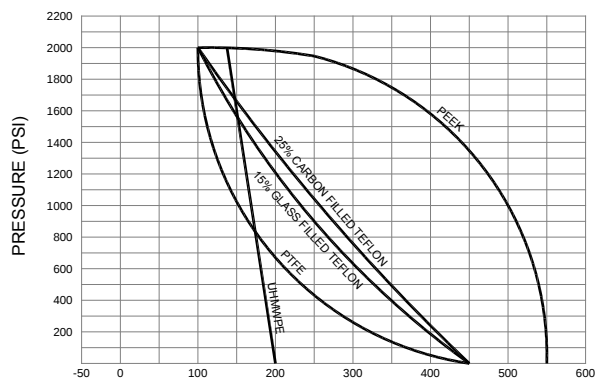
SIZE	A (in.)		
	150#	300#	600#
1/2"	5.50	5.50	6.50
3/4"	6.00	6.00	7.50
1"	6.50	6.50	8.50
1 1/4"	7.00	7.00	9.00
1 1/2"	7.50	7.50	9.50
2"	8.50	8.50	11.50
2 1/2"	9.50	9.50	13.00
3"	11.12	11.12	14.00
4"	12.00	12.00	17.00

Note

Please contact AVCO if you require flanged ends to be other than standard raised face.

See tables on pages 2 & 3 for all other dimensions

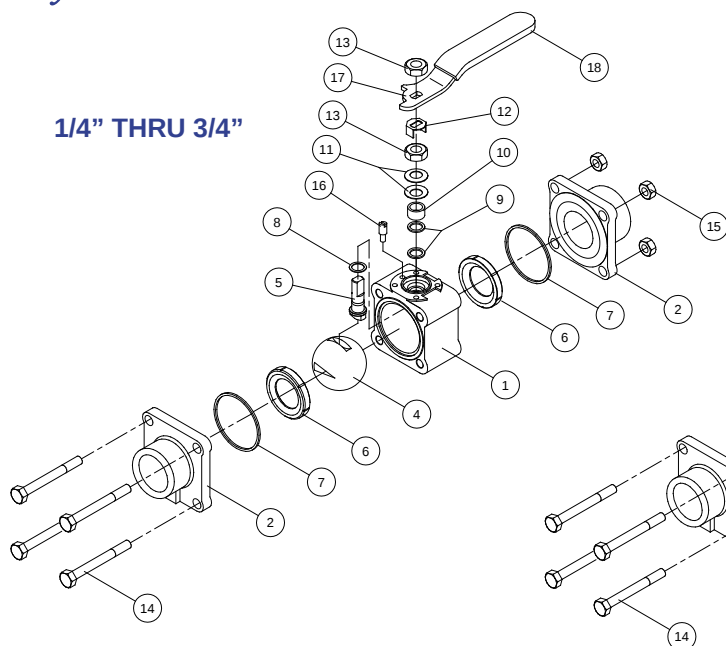
Pressure/Temperature Rating



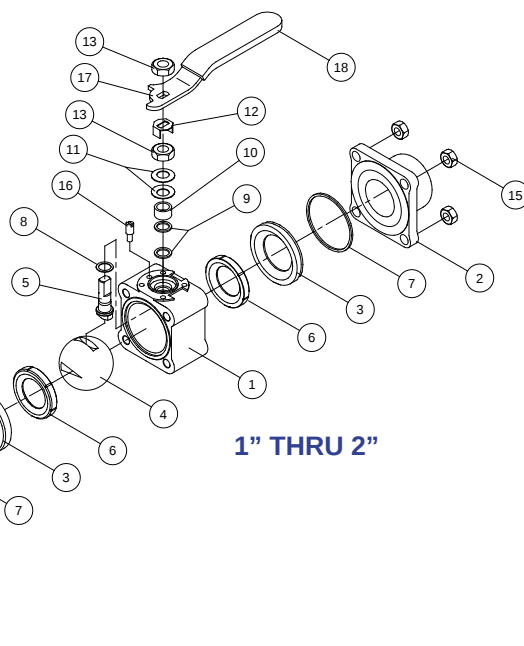
Notes

Please contact AVCO if you require customized versions of our valves. CAD drawings are available for most variations, including actuators etc.

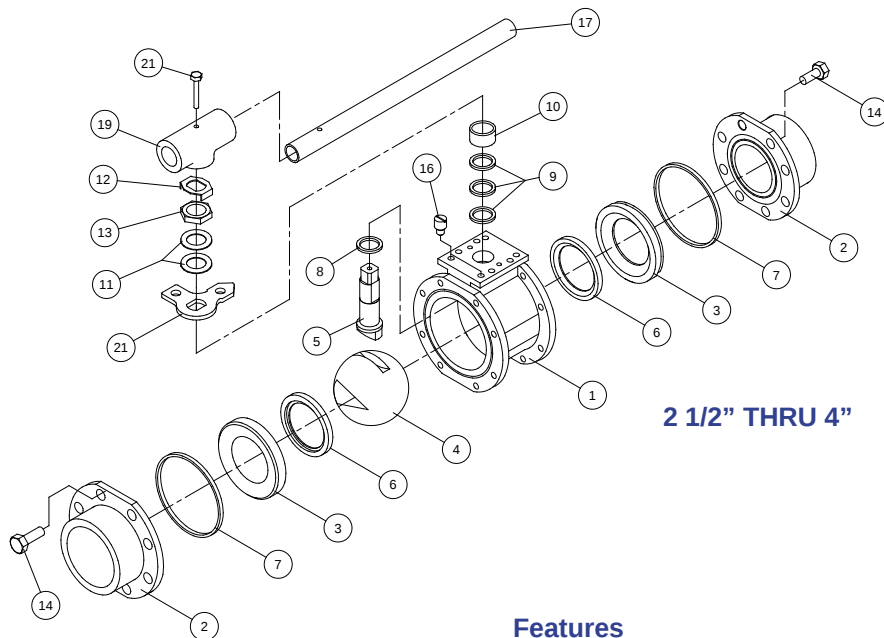
1/4" THRU 3/4"



1" THRU 2"



2 1/2" THRU 4"



Features

ANSI Class 150#, 300# & 600#
2000 WOG
Encapsulated Seats, Seals & Body Bolts
Spring Loaded Stem Packing
Bottom Entry Stem to Prevent Blow-Out
ISO 5211 Mounting Pad
Locking Handle
Inter-Changeable End Connections

Item	Parts
1	Body
2	End Cap
3	Retainer
4	Ball
5	Stem
6	Ball Seat
7	Body Seal
8	Thrust Washer
9	Packing
10	Gland Ring
11	Disc Spring
12	Lock Tab
13	Stem Nut
14	Body Bolt
15	Body Nut
16	Stop Pin
17	Handle
18	Handle Sleeve
19	Wrench Block
20	Handle Bolt
21	Lock Pad

15° Vee Port - Cv Table

SIZE	PERCENTAGE OPEN								
	20	30	40	50	60	70	80	90	100
1/4"	N/A	0.01	0.03	0.10	0.22	0.40	0.62	0.90	1.23
3/8"	N/A	0.01	0.03	0.10	0.22	0.40	0.62	0.90	1.23
1/2"	N/A	0.01	0.03	0.10	0.22	0.40	0.62	0.90	1.23
3/4"	N/A	0.02	0.10	0.24	0.44	0.72	1.06	1.46	1.91
1"	N/A	0.03	0.16	0.38	0.70	1.13	1.68	2.31	3.02
1 1/4"	N/A	0.04	0.27	0.62	1.12	1.79	2.62	3.57	4.63
1 1/2"	N/A	0.16	0.50	1.07	1.90	2.99	4.32	5.87	7.57
2"	N/A	0.43	1.12	2.18	3.65	5.53	7.79	10.36	13.14
2 1/2"	N/A	0.84	2.02	3.80	6.23	9.29	12.92	17.02	21.39
3"	N/A	0.76	2.18	4.49	7.75	11.97	17.12	23.05	29.53
4"	N/A	1.89	4.53	8.53	13.97	20.82	28.96	38.10	47.88

Cv values below 20% open and marked N/A are negligible and not recommended.

30° Vee Port - Cv Table

SIZE	PERCENTAGE OPEN								
	20	30	40	50	60	70	80	90	100
1/4"	N/A	0.01	0.06	0.21	0.46	0.83	1.35	2.04	2.93
3/8"	N/A	0.01	0.06	0.21	0.46	0.83	1.35	2.04	2.93
1/2"	N/A	0.01	0.06	0.21	0.46	0.83	1.35	2.04	2.93
3/4"	N/A	0.05	0.21	0.49	0.92	1.51	2.29	3.26	4.42
1"	N/A	0.08	0.33	0.77	1.45	2.38	3.60	5.12	6.92
1 1/4"	N/A	0.15	0.55	1.26	2.31	3.74	5.56	7.77	10.34
1 1/2"	N/A	0.32	1.02	2.20	3.94	6.30	9.33	13.03	17.40
2"	0.17	0.88	2.28	4.49	7.61	11.73	16.93	23.18	30.43
2 1/2"	0.41	1.71	4.11	7.81	12.96	19.67	27.99	37.90	49.24
3"	N/A	1.54	4.44	9.21	16.10	25.35	37.12	51.52	68.46
4"	0.92	3.83	9.23	17.53	29.04	44.02	62.56	84.54	109.57

Cv values below 20% open and marked N/A are negligible and not recommended.

45° Vee Port - Cv Table

SIZE	PERCENTAGE OPEN								
	20	30	40	50	60	70	80	90	100
1/4"	N/A	0.02	0.10	0.32	0.71	1.32	2.21	3.52	5.52
3/8"	N/A	0.02	0.10	0.32	0.71	1.32	2.21	3.52	5.52
1/2"	N/A	0.02	0.10	0.32	0.71	1.32	2.21	3.52	5.52
3/4"	N/A	0.08	0.32	0.75	1.43	2.39	3.70	5.47	7.83
1"	N/A	0.12	0.50	1.19	2.25	3.76	5.81	8.53	12.10
1 1/4"	N/A	0.23	0.84	1.93	3.57	5.85	8.85	12.68	17.45
1 1/2"	N/A	0.49	1.56	3.40	6.14	9.97	15.10	21.85	30.62
2"	0.26	1.36	3.50	6.94	11.89	18.66	27.63	39.30	54.28
2 1/2"	0.63	2.62	6.32	12.07	20.24	31.25	45.59	63.88	86.84
3"	N/A	2.36	6.83	14.22	25.13	40.24	60.53	87.31	122.34
4"	1.41	5.89	14.19	27.07	45.29	69.77	101.53	141.78	191.75

Cv values below 20% open and marked N/A are negligible and not recommended.

60° Vee Port - Cv Table

SIZE	PERCENTAGE OPEN								
	20	30	40	50	60	70	80	90	100
1/4"	N/A	0.03	0.13	0.44	0.99	1.86	3.24	5.53	9.93
3/8"	N/A	0.03	0.13	0.44	0.99	1.86	3.24	5.53	9.93
1/2"	N/A	0.03	0.13	0.44	0.99	1.86	3.24	5.53	9.93
3/4"	N/A	0.11	0.44	1.03	1.98	3.36	5.36	8.27	12.74
1"	N/A	0.17	0.69	1.63	3.11	5.27	8.34	12.74	19.27
1 1/4"	N/A	0.32	1.16	2.65	4.91	8.12	12.50	18.40	26.37
1 1/2"	N/A	0.67	2.14	4.67	8.50	14.01	21.80	32.92	49.32
2"	0.36	1.86	4.81	9.55	16.54	26.42	40.29	60.08	89.17
2 1/2"	0.87	3.60	8.67	16.63	28.13	44.16	66.23	96.92	140.28
3"	0.41	3.25	9.37	19.58	34.88	56.88	88.14	133.45	201.90
4"	1.95	8.09	19.47	37.22	62.86	98.40	146.92	213.52	306.23

Cv values below 20% open and marked N/A are negligible and not recommended.

90° Vee Port - Cv Table

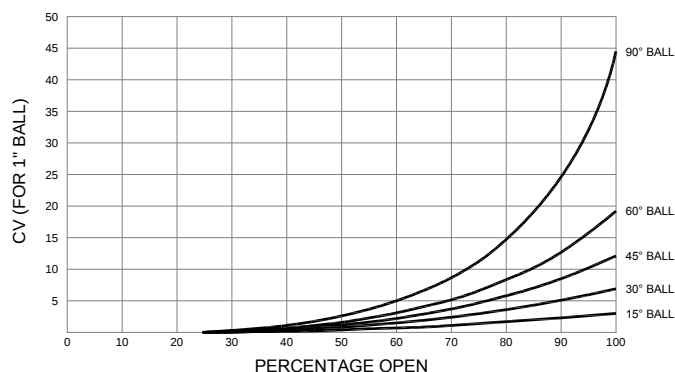
SIZE	PERCENTAGE OPEN								
	20	30	40	50	60	70	80	90	100
1/4"	N/A	0.04	0.22	0.71	1.57	2.95	5.23	9.43	19.04
3/8"	N/A	0.04	0.22	0.71	1.57	2.95	5.23	9.43	19.04
1/2"	N/A	0.04	0.22	0.71	1.57	2.95	5.23	9.43	19.04
3/4"	N/A	0.19	0.71	1.67	3.21	5.61	9.51	16.55	32.07
1"	N/A	0.30	1.12	2.63	5.03	8.72	14.55	24.57	44.53
1 1/4"	N/A	0.52	1.87	4.24	7.86	13.15	20.90	32.60	51.14
1 1/2"	N/A	1.10	3.47	7.52	13.81	23.41	38.66	65.10	118.69
2"	0.61	3.05	7.78	15.44	27.11	44.90	73.54	124.50	233.32
2 1/2"	1.45	5.89	14.06	27.04	46.66	76.59	124.94	211.29	398.80
3"	0.70	5.34	15.19	31.63	57.08	96.35	160.37	276.68	537.12
4"	3.25	13.20	31.39	59.96	102.46	165.40	262.05	421.05	711.22

Cv values below 20% open and marked N/A are negligible and not recommended.

How to use tables

- Calculate required maximum and minimum Cv using appropriate formulas for gas or liquid (AVCO can provide assistance if required).
- Select a valve size based upon the maximum Cv whilst ensuring the percentage open is less than 90 percent.
- Check that the minimum Cv is greater than the figure for 30 percent open.
- If the values fall between these criteria then the valve should be suitable for the application.
- Please check with AVCO if further help or confirmation is required.

Typical Ball Characteristics





Electric Actuator

120 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20 mA
Reversing
Telemetry
Battery Back-up
Spring Return



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 psi
Positioners 4-20 mA
Intelligent Positioner
Dec clutchable Manual Override



Manual Valves

Oval Handle
Spring Return
Fusible Link
Lock Device
Gear Operators

HOW TO ORDER

1"	19	3	3	T	T	SE	BAV60
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/4"	1900 Series 3 Piece Vee Port Ball Valve	1 - Carbon Steel	2 - Alloy 20	T - Teflon (PTFE)	T - Teflon (PTFE)	SE - NPT	BAV15 - 15° Vee Port
3/8"		1L - Low Grade Carbon	3 - 316 SS	R - 15% Glass PTFE	C - 25% Carbon PTFE	SW - Socket Weld	BAV30 - 30° Vee Port
1/2"		2 - Alloy 20	4 - Monel 400	C - 25% Carbon PTFE	G - Graphoil	BW - Butt Weld	BAV45 - 45° Vee Port
3/4"		3 - 316 SS	5 - Hastelloy B	P - PEEK	B - BUNA N	GR - Grooved	BAV60 - 60° Vee Port
1"		4 - Monel 400	6 - Hastelloy C	U - UHMWPE	E - EPDM	FBT - Flush Bottom Tank	BAV90 - 90° Vee Port
1 1/4"		5 - Hastelloy B	7 - Inconel 625	K - Kel-F (PCTFE)	V - Viton	BSP - British Standard Pipe	BAVT - Vented Balls
1 1/2"		6 - Hastelloy C	8 - Titanium	B - Bronze	N - Neoprene	AN - Army Navy	BAHL - Hardened Ball
2"		7 - Inconel 625	9 - Aluminum	S - Stellite		150 - 150# Flange	BNIE - Emissions Bonnet
2 1/2"		8 - Titanium		I - Inconel		300 - 300# Flange	FS - Fire Safe
3"		9 - Aluminum				600 - 600# Flange	O2CB - O2 Clean/Bagged
4"						Variations of the above or special ends can be supplied upon request	Customized Ports are available upon request

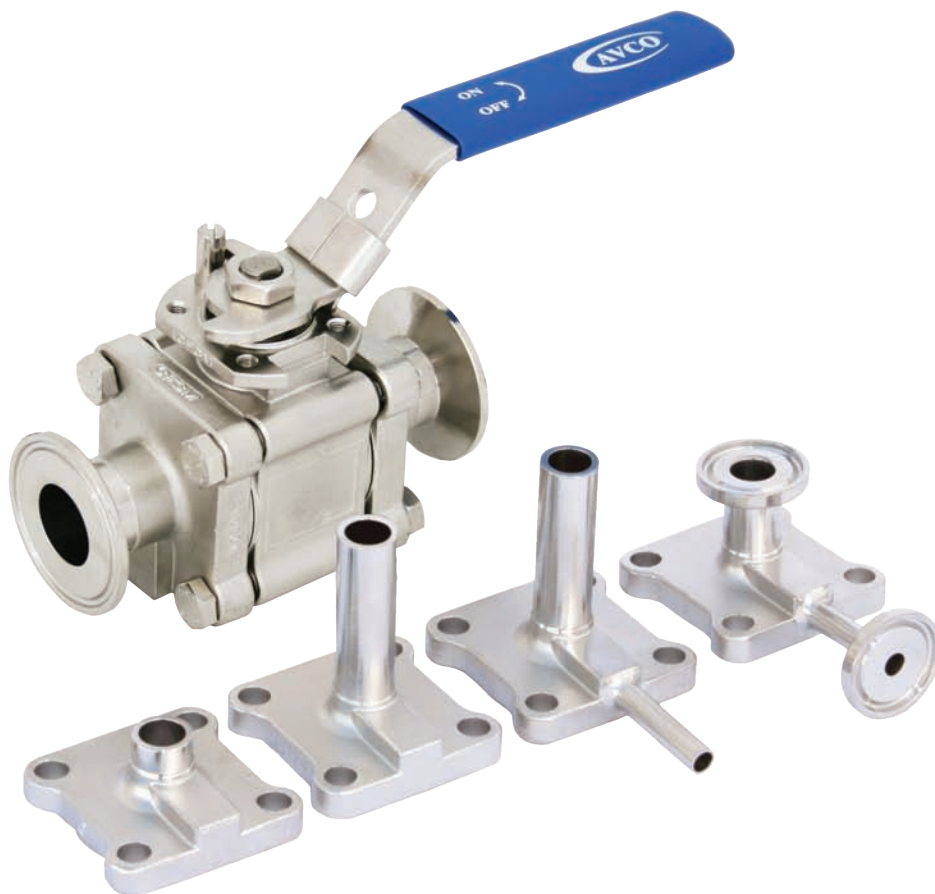
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AVCO

Alloy Valves and Control

BALL VALVES 2100 SERIES



Size

1/4" - 4" (Full Port Tube OD)
1500 WOG

End Connections

Extended Tube OD
Short Tube OD
Socket Weld Tube OD
Clamp Ends
Flush Bottom Tank Pad
Compression Fitting (AVCO-LOK)
Vacuum Fitting

Valve Materials

316L Stainless Steel
Various Alloys

Ball and Stem Materials

316L Stainless Steel
Various Alloys

Seat Materials

TFM
PEEK
UHMWPE

Options

Cavity Filled Seats
Purge Ports
Electro-Polish
Mechanical Polish to 10 Ra

Service Applications

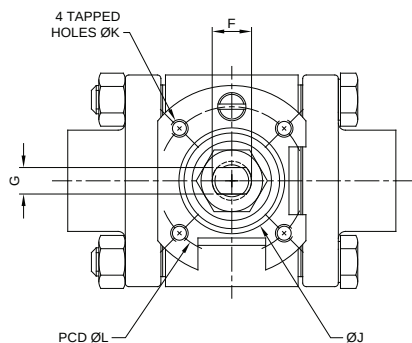
Biotech
Clean Steam
Cleaning Solutions
Detergents
Gas and Air Delivery
High Purity Gases
High Purity Water/Oils
Pharmaceutical
Vacuum
Waxes

Applicable Standards

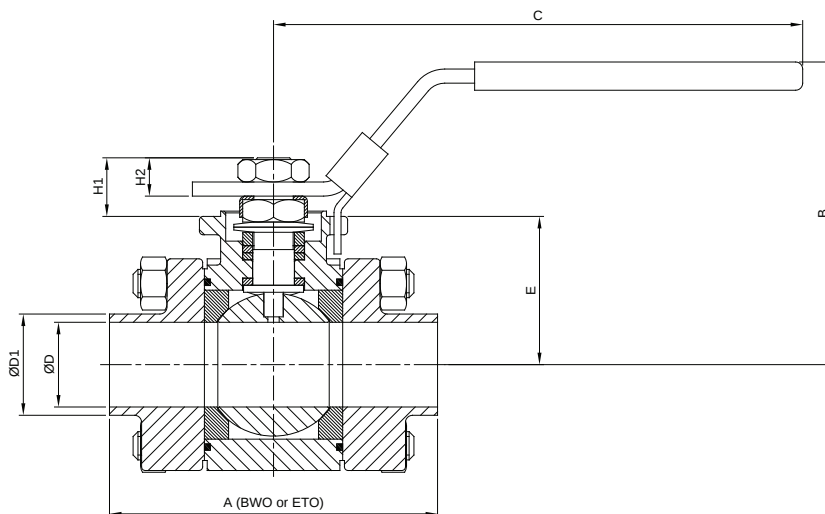
ASME B16.34
ASME-BPE
ISO 5211

Alloy Valves and Control

1/2" THRU 2" Butt Weld OD & Extended Tube OD

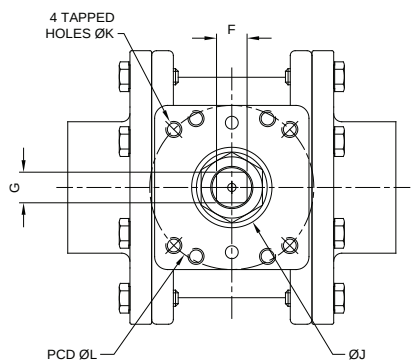


Plan View with Handle Removed

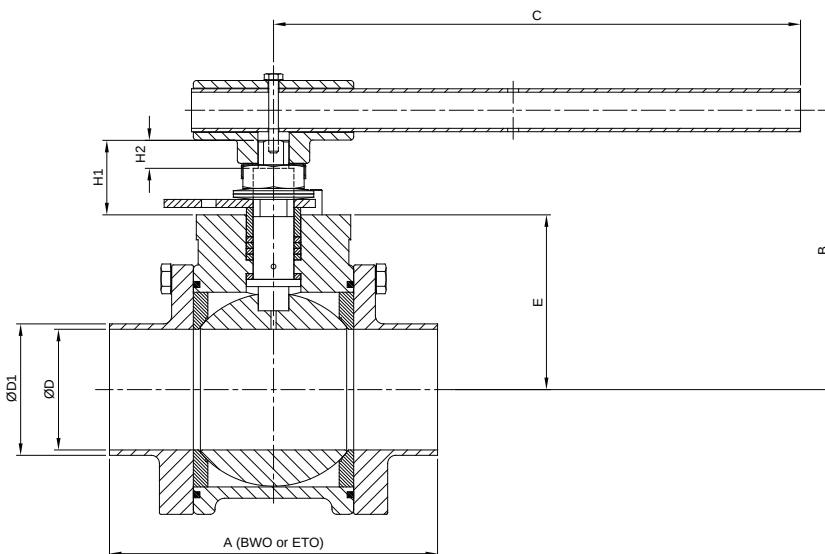


SIZE	A (in.)		B (in.)	C (in.)	D (in.)	D1 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
	BWO	ETO														
1/2"	2.61	5.50	2.35	4.53	0.37	0.50	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	3.03	6.00	2.41	4.53	0.62	0.75	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	4.06	6.50	3.33	5.91	0.87	1.00	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4
1 1/2"	5.50	7.50	3.92	6.85	1.37	1.50	1.90	0.57	0.34	1.12	0.61	1.38	M6	1.97	F05	8
2"	6.25	8.50	4.26	6.85	1.87	2.00	2.24	0.57	0.34	1.12	0.60	1.38	M6	1.97	F05	14

2 1/2" THRU 4" Butt Weld OD & Extended Tube OD



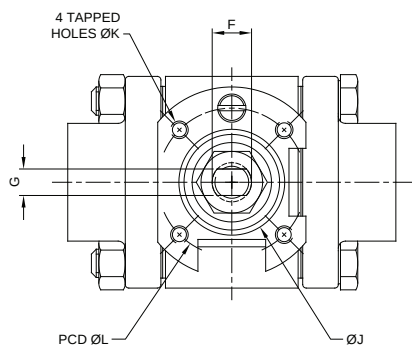
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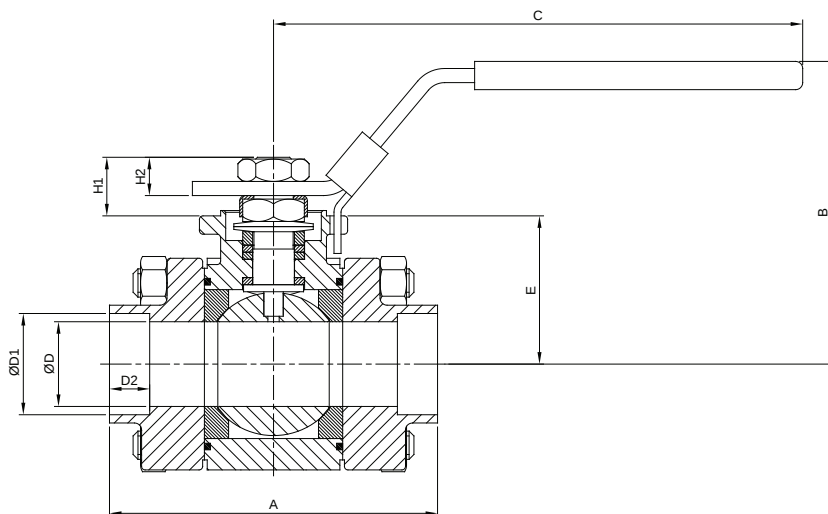
SIZE	A (in.)		B (in.)	C (in.)	D (in.)	D1 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
	BWO	ETO														
2 1/2"	6.26	10.00	5.28	8.84	2.37	2.50	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22
3"	7.00	10.00	6.84	13.74	2.87	3.00	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35
4"	8.50	11.00	7.37	13.74	3.83	4.00	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55

Alloy Valves and Control

1/2" THRU 2" Socket Weld Tube OD

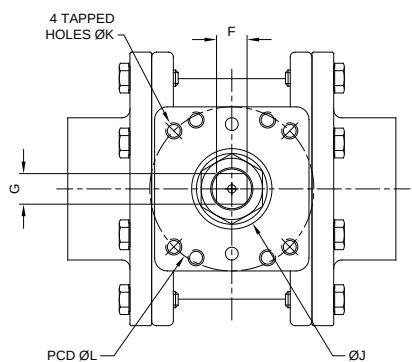


Plan View with Handle Removed

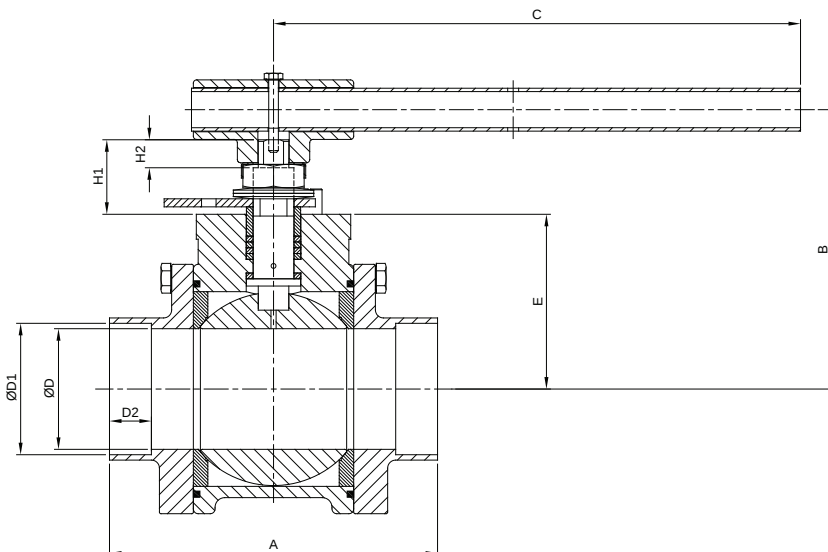


SIZE	A (in.)	B (in.)	C (in.)	D (in.)	D1 (in.)	D2 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
1/2"	2.61	2.35	4.53	0.37	0.51	0.43	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	3.03	2.41	4.53	0.62	0.76	0.51	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	4.06	3.33	5.91	0.87	1.01	0.51	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4
1 1/2"	5.50	3.92	6.85	1.37	1.52	0.51	1.90	0.57	0.34	1.12	0.61	1.38	M6	1.97	F05	8
2"	6.25	4.26	6.85	1.87	2.02	0.63	2.24	0.57	0.34	1.12	0.60	1.38	M6	1.97	F05	14

2 1/2" THRU 4" Socket Weld Tube OD



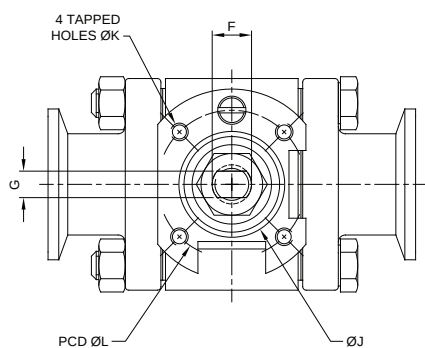
Plan View with Handle Removed



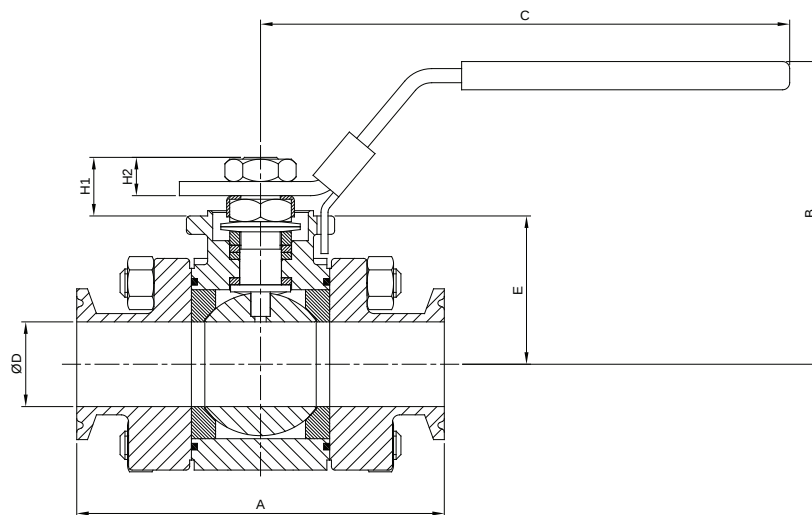
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	D1 (in.)	D2 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
2 1/2"	6.26	5.28	8.84	2.37	2.52	0.63	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22
3"	7.00	6.84	13.74	2.87	3.02	0.63	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35
4"	8.50	7.37	13.74	3.83	4.02	0.79	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55

Alloy Valves and Control

1/2" THRU 2" Clamp Ends

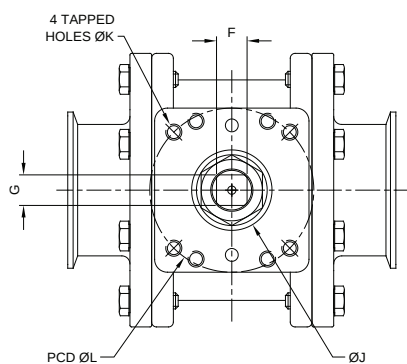


Plan View with Handle Removed

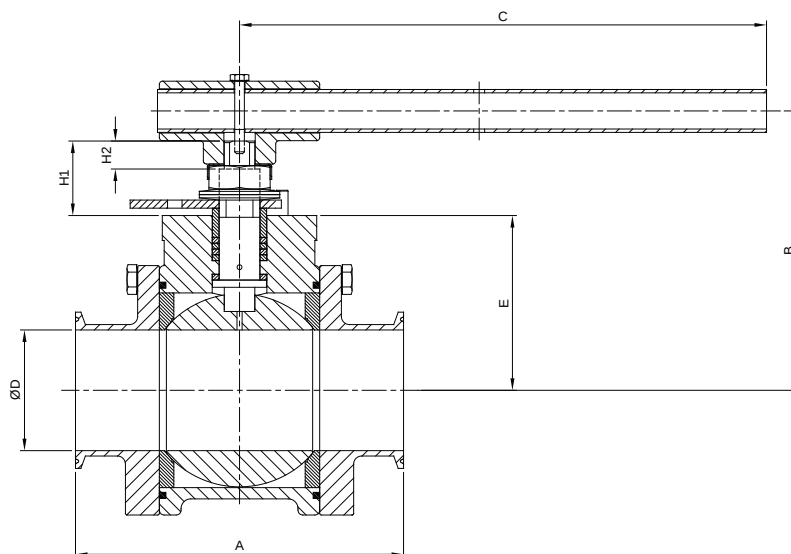


SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
1/2"	3.50	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	4.00	2.41	4.53	0.62	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	4.80	3.33	5.91	0.87	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4
1 1/2"	5.50	3.92	6.85	1.37	1.90	0.57	0.34	1.12	0.61	1.38	M6	1.97	F05	8
2"	6.25	4.26	6.85	1.87	2.24	0.57	0.34	1.12	0.60	1.38	M6	1.97	F05	14

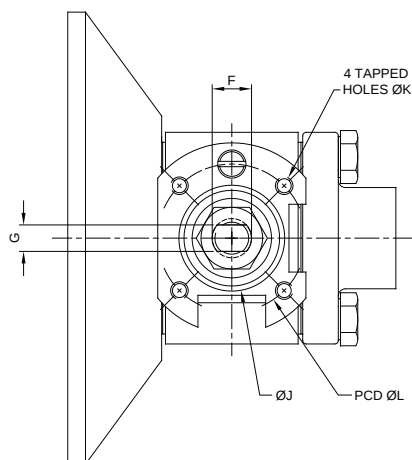
2 1/2" THRU 4" Clamp Ends



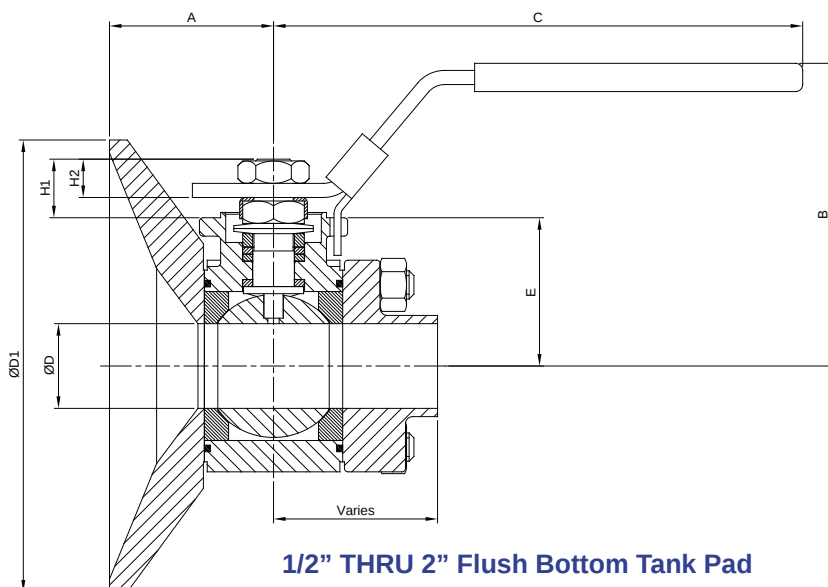
Plan View with Handle Removed



SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
2 1/2"	6.26	5.28	8.84	2.37	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22
3"	7.00	6.84	13.74	2.87	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35
4"	8.50	7.37	13.74	3.83	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55

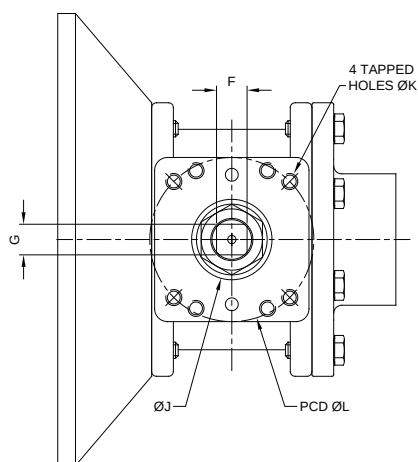


Plan View with Handle Removed

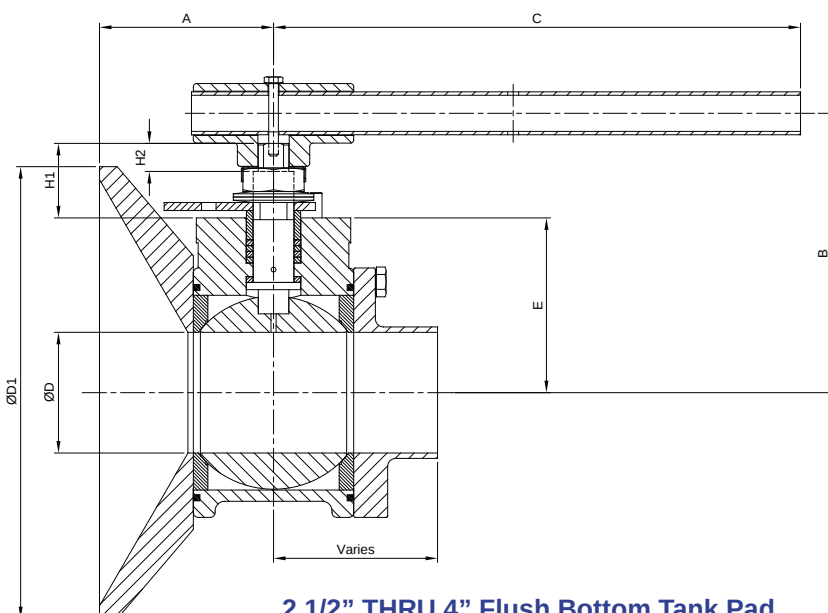


1/2" THRU 2" Flush Bottom Tank Pad

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	D1 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
1/2"	1.27	2.35	4.53	0.37	2.75	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	1.35	2.41	4.53	0.62	3.00	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2
1"	1.71	3.33	5.91	0.87	3.75	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	5
1 1/2"	2.39	3.92	6.85	1.37	5.50	1.90	0.57	0.34	1.12	0.61	1.38	M6	1.97	F05	9
2"	2.66	4.26	6.85	1.87	6.50	2.24	0.57	0.34	1.12	0.60	1.38	M6	1.97	F05	16



Plan View with Handle Removed

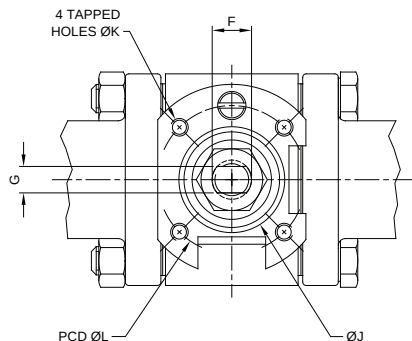


2 1/2" THRU 4" Flush Bottom Tank Pad

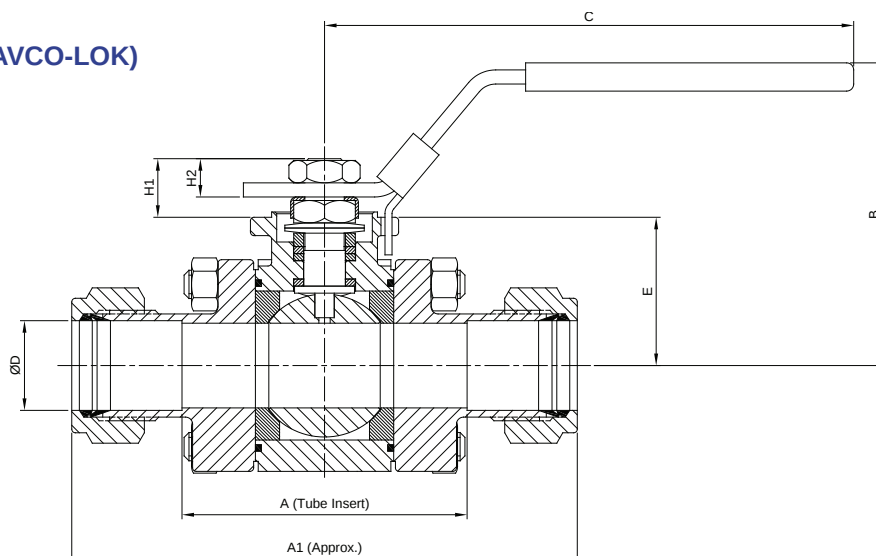
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	D1 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
2 1/2"	3.25	5.28	8.84	2.37	8.00	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	25
3"	3.88	6.84	13.74	2.87	9.00	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	39
4"	4.50	7.37	13.74	3.83	11.50	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	61

Alloy Valves and Control

1/4" THRU 1" Compression Fitting (AVCO-LOK)



Plan View with Handle Removed



SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
1/4"	2.44	3.64	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/8"	2.46	3.78	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
1/2"	2.20	4.00	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	2.33	4.25	2.41	4.53	0.62	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	2.79	5.25	3.33	5.91	0.87	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4

Common to all Valves

Size	Torque (in.lbs)	Cv
1/4"	65	12
3/8"	65	12
1/2"	65	12
3/4"	80	36
1"	120	71
1 1/2"	290	178
2"	450	437
2 1/2"	685	729
3"	1200	1118
4"	2000	2237

General Notes

All Valves

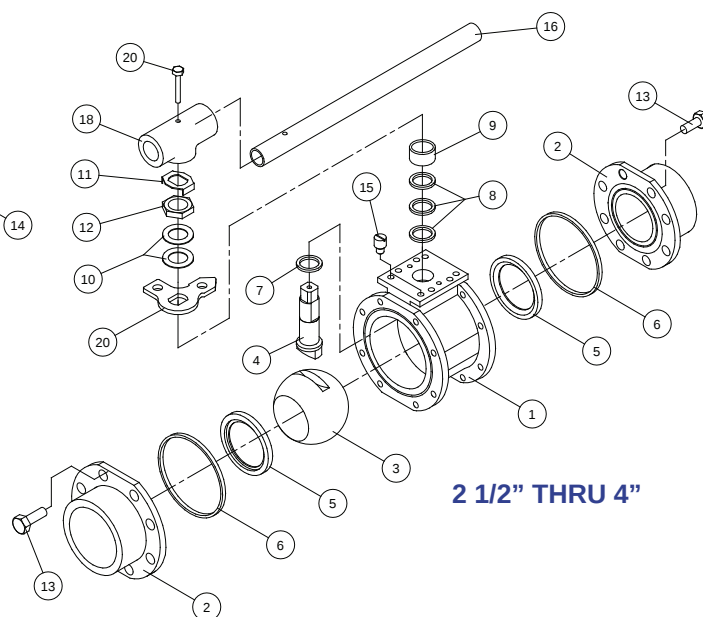
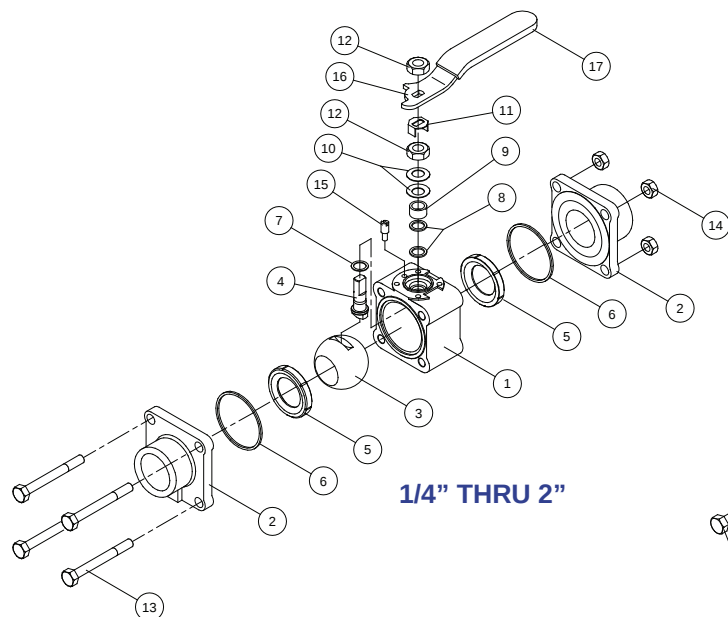
1. Special customized end connections can be supplied to all valves upon request.
2. All valves can be adapted for cryogenic use.
3. All valves can have bonnet extensions added, which is particularly useful for flush tank pad applications.

Flush Bottom Tank Pads

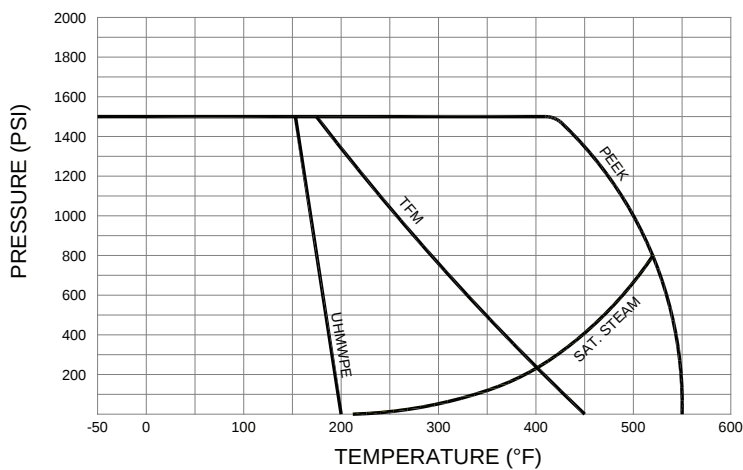
1. The tank pad can be supplied with a radius to suit the actual tank diameter in most cases, thus reducing welding stresses.
2. The opposite end to the tank pad can be any other fitting type shown within this brochure or a customized one.

Compression Fitting Ends

1. Valve sizes 1/4" and 3/8" can be supplied with a bracket to prevent tube twist upon valve operation.



Pressure/Temperature Rating



Features

- 3 Piece Design
- Tube OD Bore
- 316L Stainless Body, Ball, Stem & Ends
- Inter-changeable Ends
- Standard Seats
- Cavity Filled Seats
- Electro-Polished Internal Bore to 10 Ra
- ISO 5211 Mounting Pad
- ASME-BPE Compliant

Item	Parts
1	Body
2	End Cap
3	Ball
4	Stem
5	Ball Seat
6	Body Seal
7	Thrust Washer
8	Packing
9	Gland Ring
10	Disc Spring
11	Lock Tab
12	Stem Nut
13	Body Bolt
14	Body Nut
15	Stop Pin
16	Handle
17	Handle Sleeve
18	Wrench Block
19	Handle Bolt
20	Lock Pad



Electric Actuator

120 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20 mA
Reversing
Telemetry
Battery Back-up
Spring Return



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 psi
Positioners 4-20 mA
Intelligent Positioner
Declutchable Manual Override



Manual Valves

Oval Handle
Spring Return
Fusible Link
Locking Device
Gear Operators
Stem Extensions
Wing Handle

HOW TO ORDER

1"	21	3	3	T	T	ETO	10
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/4"	2100 Series 3 Piece High Performance Full Port Tube OD Ball Valve	3 - 316L SS	3 - 316L SS	T - TFM	T - TFM	ETO - Extended Tube OD	10 - 10 Ra
3/8"				P - PEEK	P - PEEK	BWO - Butt Weld Tube OD	EP - Electro-Polish
1/2"				U - UHMWPE	U - UHMWPE	SWO - Socket Weld Tube OD	CF - Cavity Filled
3/4"						TR - Clamp Ends	O2CB - O ₂ Clean/Bagged
1"						TP - Tank Pad	
1 1/2"						AL - AVCO-LOK	
2"						KF - Vacuum Ends	
2 1/2"							
3"							
4"							
						Variations of the above or special ends can be supplied upon request	

AVCO

Alloy Valves and Control

BALL VALVES 2700 SERIES



Size

1/4" - 4" (Full Port Tube OD)
1500 WOG

End Connections

Extended Tube OD
Short Tube OD
Socket Weld Tube OD
Clamp Ends
Compression Fitting (AVCO-LOK)
Vacuum Fitting

Valve Materials

316L Stainless Steel
Various Alloys

Ball and Stem Materials

316L Stainless Steel
Various Alloys

Seat Materials

TFM
PEEK
UHMWPE

Options

Cavity Filled Seats
Purge Ports
Electro-Polish
Mechanical Polish to 10 Ra

Service Applications

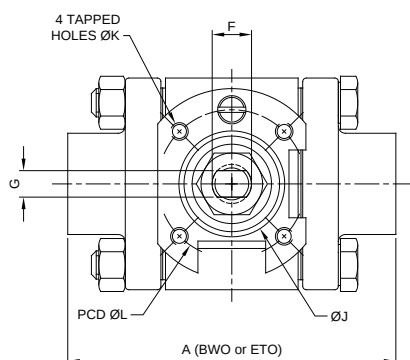
Biotech
Clean Steam
Cleaning Solutions
Detergents
Gas and Air Delivery
High Purity Gases
High Purity Water/Oils
Pharmaceutical
Vacuum
Waxes

Applicable Standards

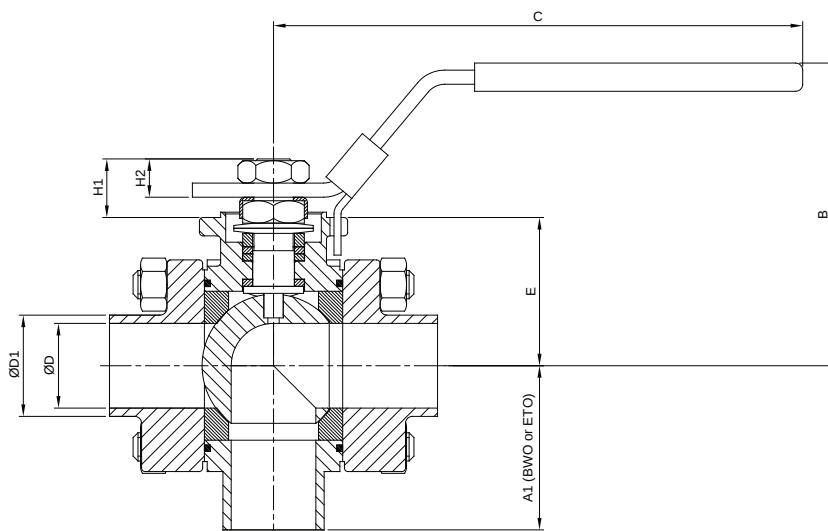
ASME B16.34
ASME-BPE
ISO 5211

Alloy Valves and Control

1/2" THRU 2" Butt Weld OD & Extended Tube OD

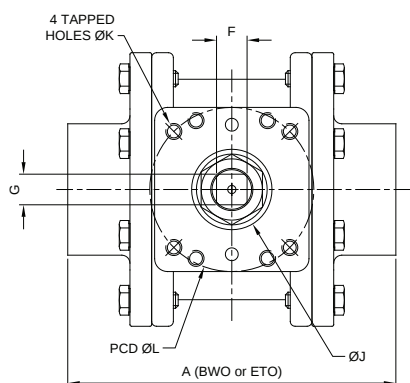


Plan View with Handle Removed

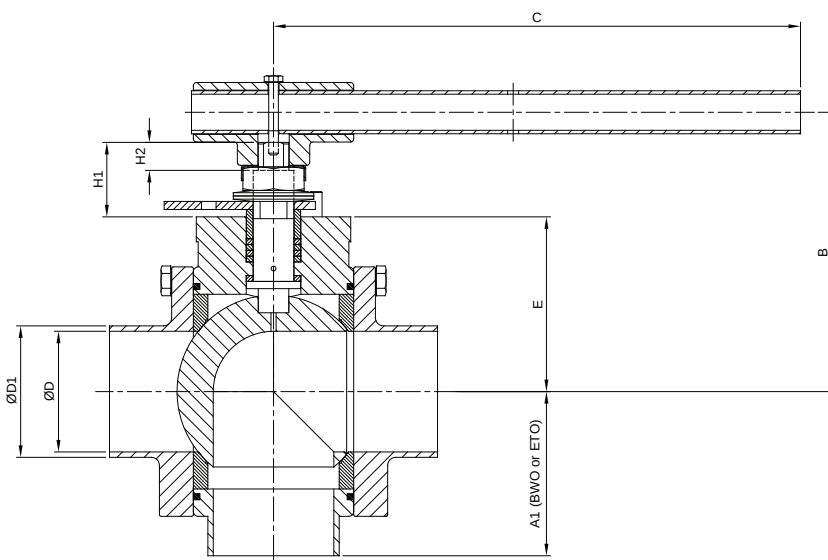


SIZE	A (in.)		A1 (in.)		B (in.)	C (in.)	D (in.)	D1 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
	BWO	ETO	BWO	ETO														
1/2"	2.61	5.50	2.75	2.75	2.35	4.53	0.37	0.50	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	3.03	6.00	3.00	3.00	2.41	4.53	0.62	0.75	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	4.06	6.50	3.25	3.25	3.33	5.91	0.87	1.00	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4
1 1/2"	5.50	7.50	3.75	3.75	3.92	6.85	1.37	1.50	1.90	0.57	0.34	1.12	0.61	1.38	M6	1.97	F05	8
2"	6.25	8.50	4.25	4.25	4.26	6.85	1.87	2.00	2.24	0.57	0.34	1.12	0.60	1.38	M6	1.97	F05	14

2 1/2" THRU 4" Butt Weld OD & Extended Tube OD



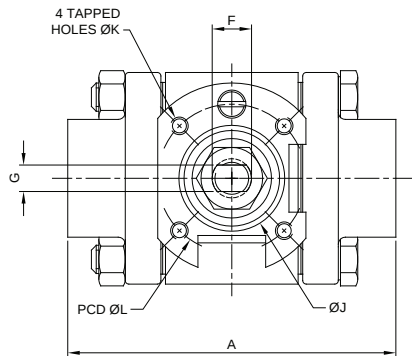
Plan View with Handle Removed



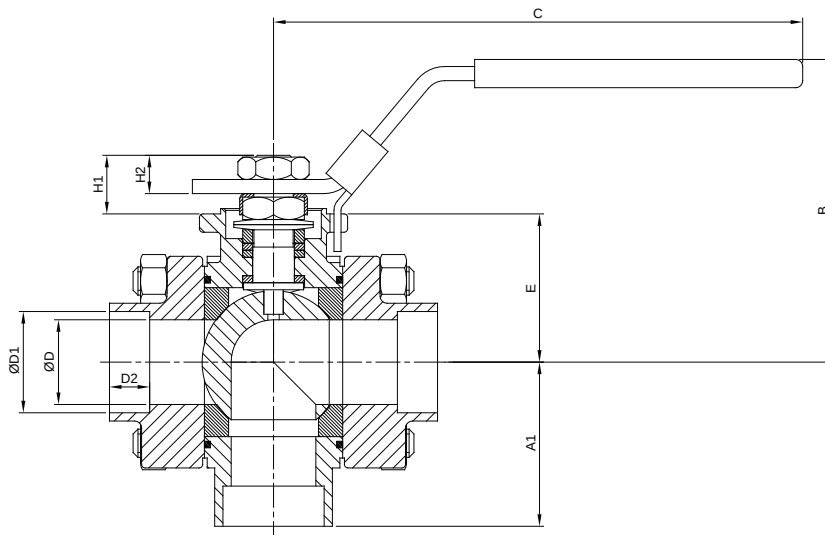
SIZE	A (in.)		A1 (in.)		B (in.)	C (in.)	D (in.)	D1 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
	BWO	ETO	BWO	ETO														
2 1/2"	6.26	10.00	5.00	5.00	5.28	8.84	2.37	2.50	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22
3"	7.00	10.00	5.00	5.00	6.84	13.74	2.87	3.00	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35
4"	8.50	11.00	5.50	5.50	7.37	13.74	3.83	4.00	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55

Alloy Valves and Control

1/2" THRU 2" Socket Weld Tube OD

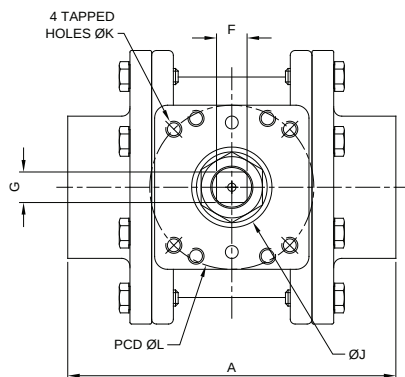


Plan View with Handle Removed

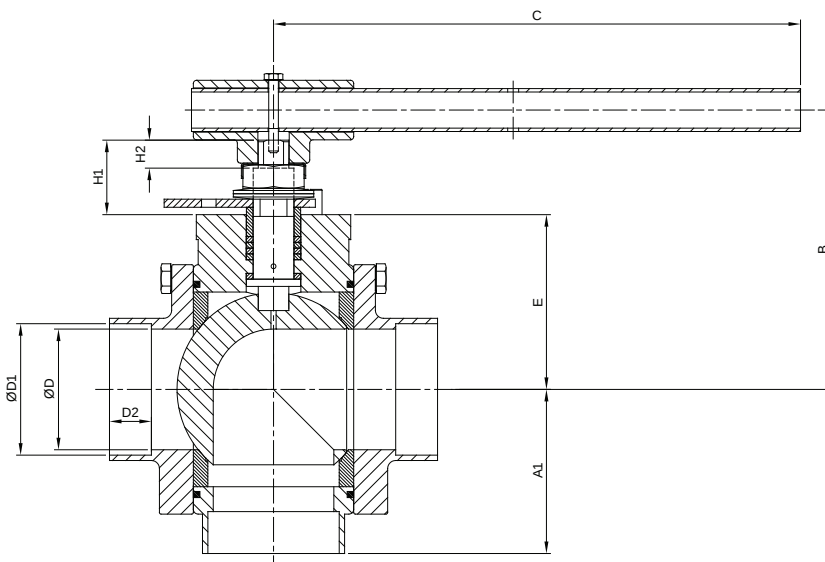


SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	D1 (in.)	D2 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
1/2"	2.61	1.31	2.35	4.53	0.37	0.51	0.43	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	3.03	1.52	2.41	4.53	0.62	0.76	0.51	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	4.06	2.03	3.33	5.91	0.87	1.01	0.51	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4
1 1/2"	5.50	2.75	3.92	6.85	1.37	1.52	0.51	1.90	0.57	0.34	1.12	0.61	1.38	M6	1.97	F05	8
2"	6.25	3.13	4.26	6.85	1.87	2.02	0.63	2.24	0.57	0.34	1.12	0.60	1.38	M6	1.97	F05	14

2 1/2" THRU 4" Socket Weld Tube OD



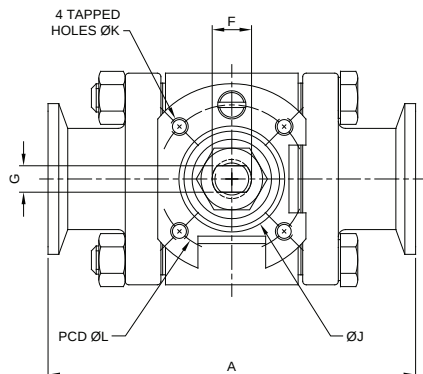
Plan View with Handle Removed



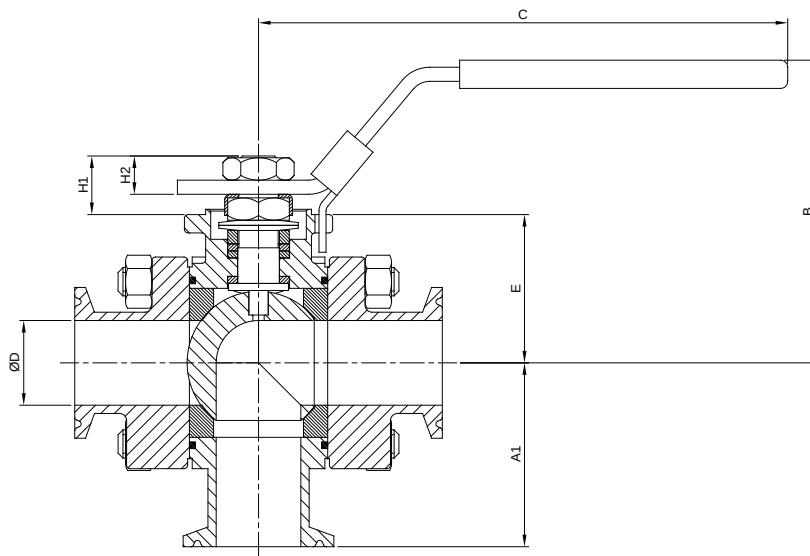
SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	D1 (in.)	D2 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
2 1/2"	6.26	3.13	5.28	8.84	2.37	2.52	0.63	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22
3"	7.00	3.50	6.84	13.74	2.87	3.02	0.63	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35
4"	8.50	4.25	7.37	13.74	3.83	4.02	0.79	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55

Alloy Valves and Control

1/2" THRU 2" Clamp Ends

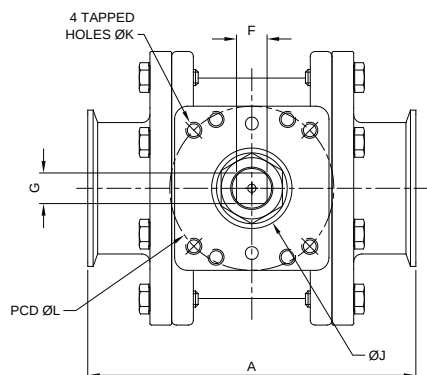


Plan View with Handle Removed

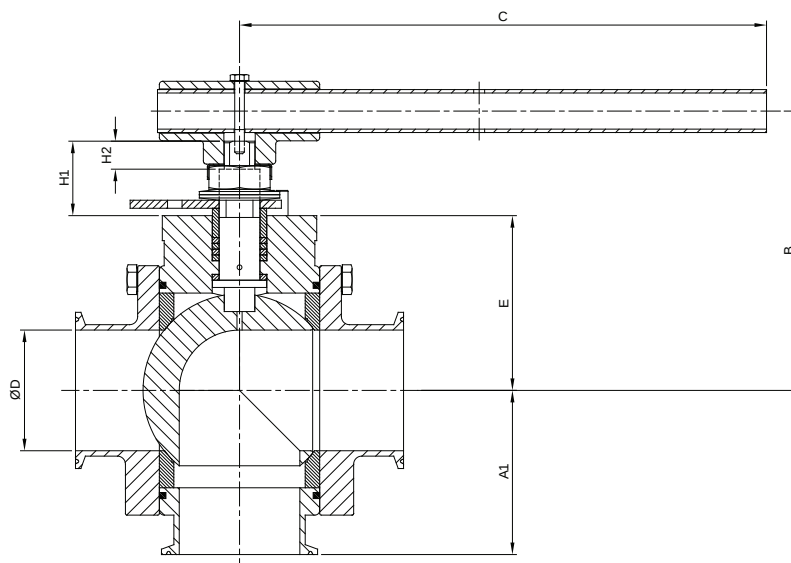


SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
1/2"	3.50	1.75	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	4.00	2.00	2.41	4.53	0.62	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	4.80	2.40	3.33	5.91	0.87	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4
1 1/2"	5.50	2.75	3.92	6.85	1.37	1.90	0.57	0.34	1.12	0.61	1.38	M6	1.97	F05	8
2"	6.25	3.13	4.26	6.85	1.87	2.24	0.57	0.34	1.12	0.60	1.38	M6	1.97	F05	14

2 1/2" THRU 4" Clamp Ends

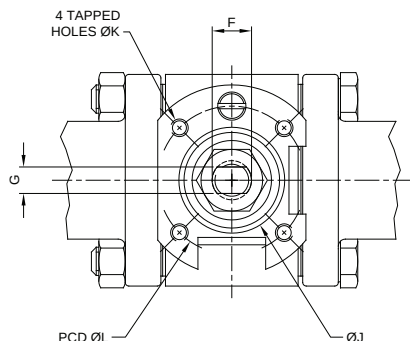


Plan View with Handle Removed

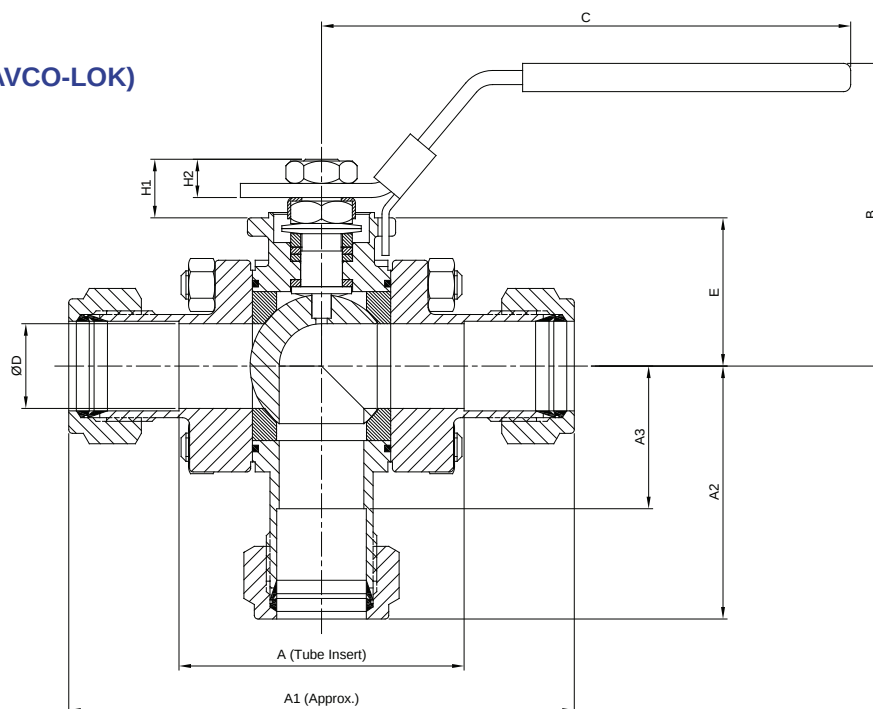


SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
2 1/2"	6.26	3.13	5.28	8.84	2.37	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22
3"	7.00	3.50	6.84	13.74	2.87	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35
4"	8.50	4.25	7.37	13.74	3.83	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55

1/4" THRU 1" Compression Fitting (AVCO-LOK)



Plan View with Handle Removed



SIZE	A (in.)	A1 (in.)	A2 (in.)	A3 (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
1/4"	2.44	3.64	1.82	1.22	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/8"	2.46	3.78	1.89	1.23	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
1/2"	2.20	4.00	2.00	1.10	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	2.33	4.25	2.13	1.17	2.41	4.53	0.62	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	2.79	5.25	2.63	1.40	3.33	5.91	0.87	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4

Common to all Valves

Size	Torque (in.lbs)	Cv
1/4"	65	12
3/8"	65	12
1/2"	65	12
3/4"	80	36
1"	120	71
1 1/2"	290	178
2"	450	437
2 1/2"	685	729
3"	1200	1118
4"	2000	2237

General Notes

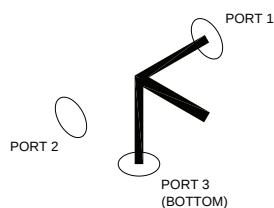
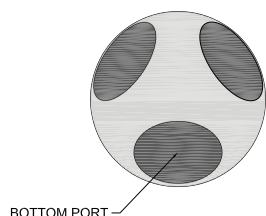
All Valves

1. Special customized end connections can be supplied to all valves upon request.
2. All valves can be adapted for cryogenic use.
3. All valves can have bonnet extensions added, which is particularly useful for flush tank pad applications.

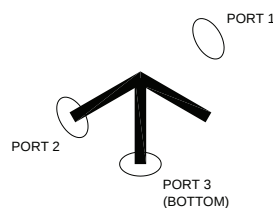
Compression Fitting Ends

1. Valve sizes 1/4" and 3/8" can be supplied with a bracket to prevent tube twist upon valve operation.

Ball Options



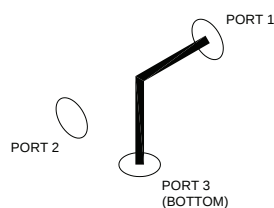
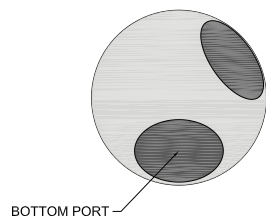
Start Position



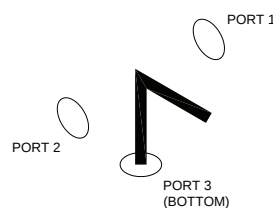
90 Degree Rotation

90 Degree Diverter Ball

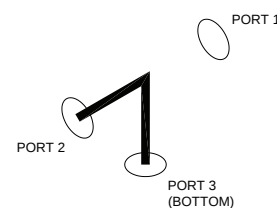
Media flows between port 1 and port 3 when the valve handle is in-line with pipeline. Upon 90 degree rotation the media is diverted to flow between port 2 and port 3. The valve handle can be locked off in either position thus preventing unwanted tampering.



Start Position



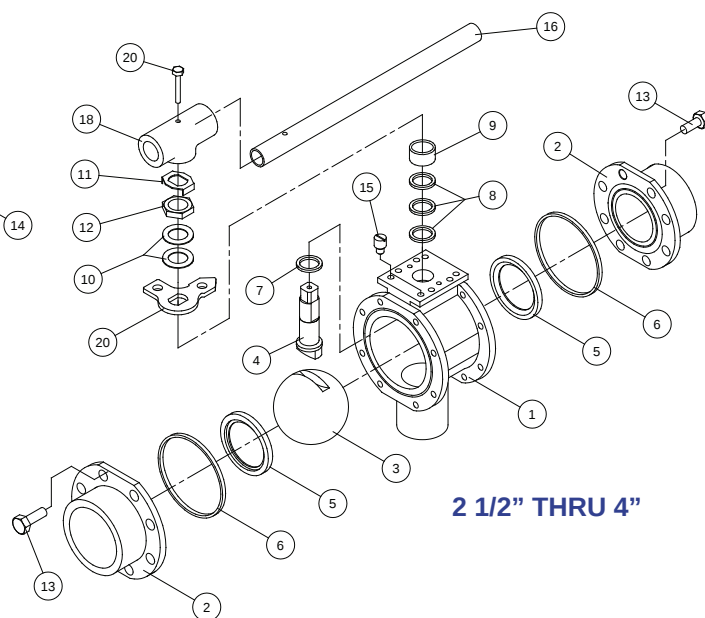
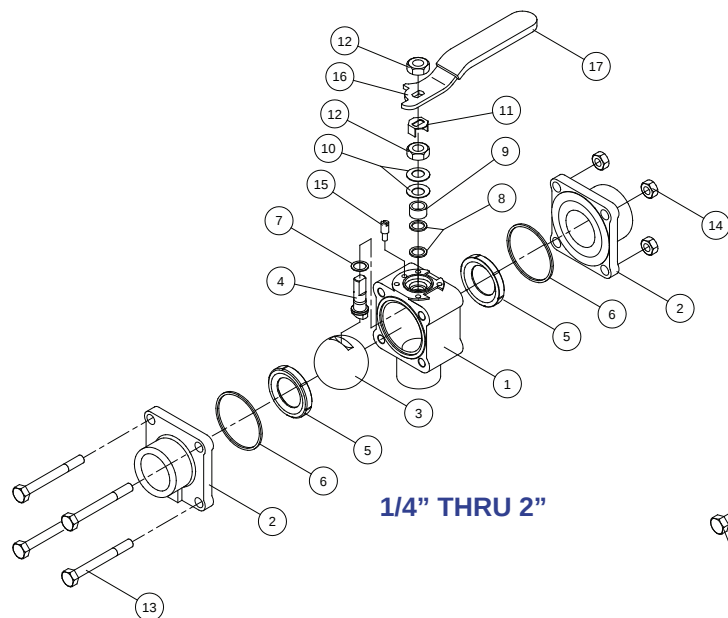
90 Degree Rotation



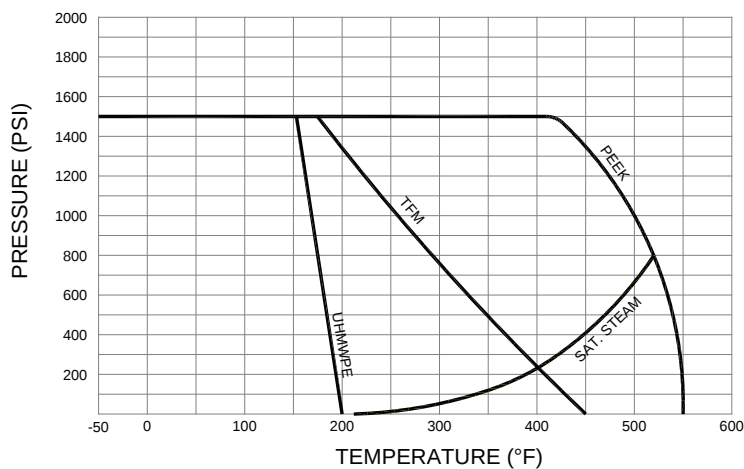
180 Degree Rotation

180 Degree Diverter Ball

Media flows between port 1 and port 3 and can be locked off in this position. Upon 90 degree rotation the valve will be isolated resulting in no flow and can be locked off. Upon 180 degree rotation the flow path diverts to port 2 and port 3, but cannot be locked off.



Pressure/Temperature Rating



Item	Parts
1	Body
2	End Cap
3	Ball
4	Stem
5	Ball Seat
6	Body Seal
7	Thrust Washer
8	Packing
9	Gland Ring
10	Disc Spring
11	Lock Tab
12	Stem Nut
13	Body Bolt
14	Body Nut
15	Stop Pin
16	Handle
17	Handle Sleeve
18	Wrench Block
19	Handle Bolt
20	Lock Pad

Features

- 3 Piece Design
- Tube OD Bore
- 316L Stainless Body, Ball, Stem & Ends
- Inter-changeable Ends
- Standard Seats
- Cavity Filled Seats
- Electro-Polished Internal Bore to 10 Ra
- ISO 5211 Mounting Pad
- ASME-BPE Compliant



Electric Actuator

120 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20 mA
Reversing
Telemetry
Battery Back-up
Spring Return



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 psi
Positioners 4-20 mA
Intelligent Positioner
Declutchable Manual Override



Manual Valves

Oval Handle
Spring Return
Fusible Link
Locking Device
Gear Operators
Stem Extensions
Wing Handle

HOW TO ORDER

1"	27	3	3	T	T	ETO	BAB90
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/4"	2700 Series 3 Piece Bottom Entry, High Performance, Full Port Tube OD Diverter Ball Valve	3 - 316L SS	3 - 316L SS	T - TFM	T - TFM	ETO - Extended Tube OD	BAB90 - 90° Rotation Ball
3/8"				P - PEEK	P - PEEK	BWO - Butt Weld Tube OD	BAB180 - 180° Rotation Ball
1/2"				U - UHMWPE	U - UHMWPE	SWO - Socket Weld Tube OD	10 - 10 Ra
3/4"						TR - Clamp Ends	EP - Electro-Polish
1"						TP - Tank Pad	CF - Cavity Filled
1 1/2"						AL - AVCO-LOK	O2CB - O ₂ Clean/Bagged
2"						KF - Vacuum Ends	
2 1/2"							
3"							
4"							
					Variations of the above or special ends can be supplied upon request		

AVCO

Alloy Valves and Control

BALL VALVES 2800 SERIES



Size

1/4" - 4" (Full Port Tube OD)
1500 WOG

End Connections

Extended Tube OD
Short Tube OD
Socket Weld Tube OD
Clamp Ends
Compression Fitting (AVCO-LOK)
Vacuum Fitting

Valve Materials

316L Stainless Steel
Various Alloys

Ball and Stem Materials

316L Stainless Steel
Various Alloys

Seat Materials

TFM
PEEK
UHMWPE

Options

Cavity Filled Seats
Purge Ports
Electro-Polish
Mechanical Polish to 10 Ra

Service Applications

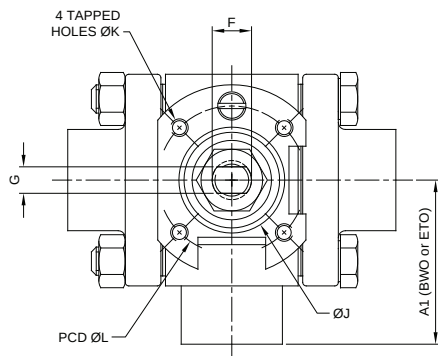
Biotech
Clean Steam
Cleaning Solutions
Detergents
Gas and Air Delivery
High Purity Gases
High Purity Water/Oils
Pharmaceutical
Vacuum
Waxes

Applicable Standards

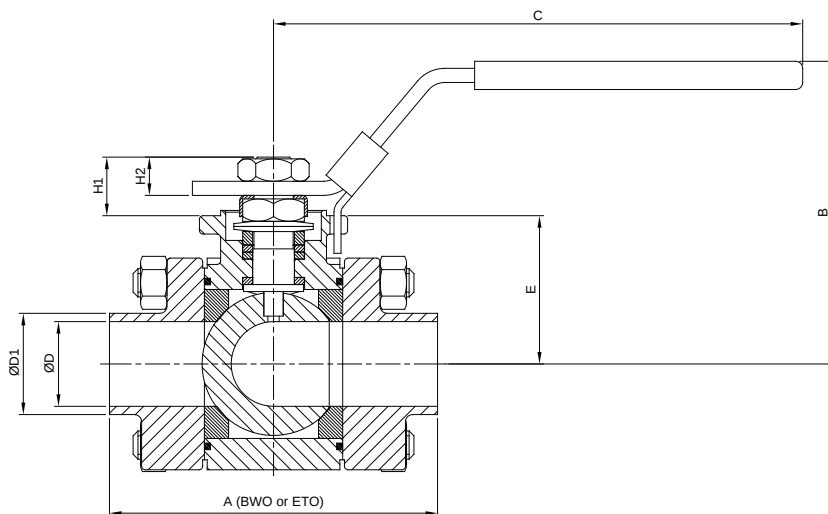
ASME B16.34
ASME-BPE
ISO 5211

Alloy Valves and Control

1/2" THRU 2" Butt Weld OD & Extended Tube OD

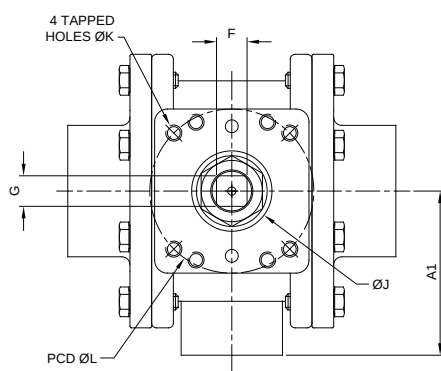


Plan View with Handle Removed

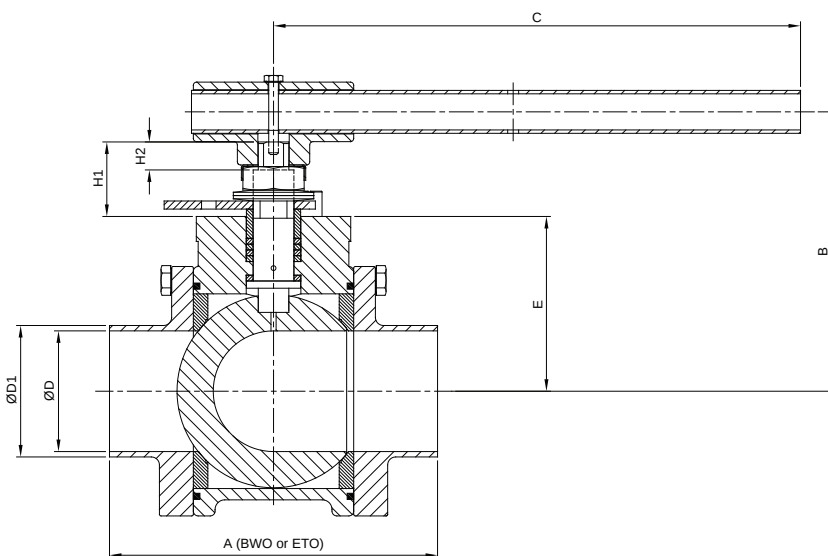


SIZE	A (in.)		A1 (in.)		B (in.)	C (in.)	D (in.)	D1 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
	BWO	ETO	BWO	ETO														
1/2"	2.61	5.50	2.75	2.75	2.35	4.53	0.37	0.50	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	3.03	6.00	3.00	3.00	2.41	4.53	0.62	0.75	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	4.06	6.50	3.25	3.25	3.33	5.91	0.87	1.00	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4
1 1/2"	5.50	7.50	3.75	3.75	3.92	6.85	1.37	1.50	1.90	0.57	0.34	1.12	0.61	1.38	M6	1.97	F05	8
2"	6.25	8.50	4.25	4.25	4.26	6.85	1.87	2.00	2.24	0.57	0.34	1.12	0.60	1.38	M6	1.97	F05	14

2 1/2" THRU 4" Butt Weld OD & Extended Tube OD



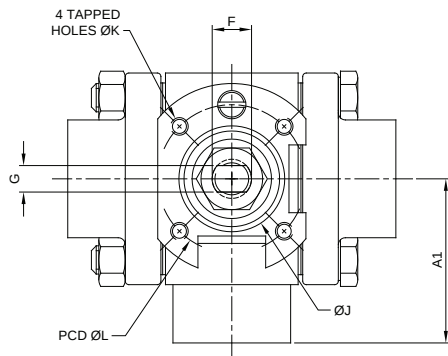
Plan View with Handle Removed



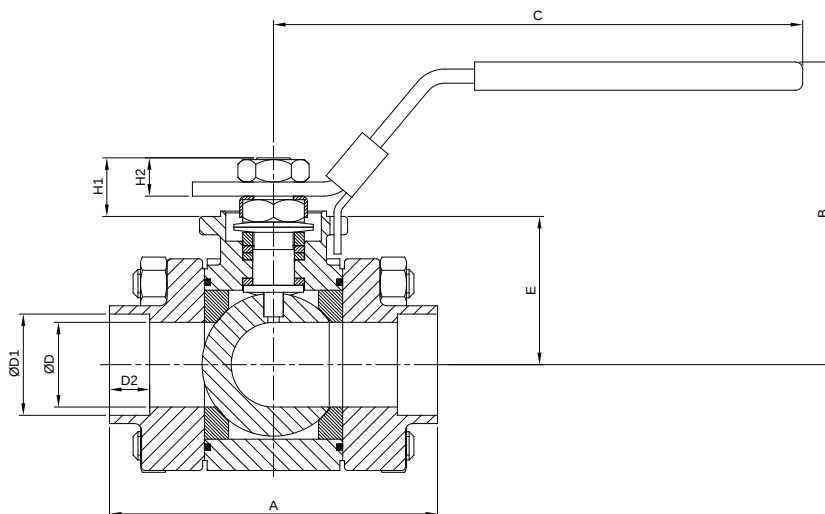
SIZE	A (in.)		A1 (in.)		B (in.)	C (in.)	D (in.)	D1 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
	BWO	ETO	BWO	ETO														
2 1/2"	6.26	10.00	5.00	5.00	5.28	8.84	2.37	2.50	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22
3"	7.00	10.00	5.00	5.00	6.84	13.74	2.87	3.00	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35
4"	8.50	11.00	5.50	5.50	7.37	13.74	3.83	4.00	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55

Alloy Valves and Control

1/2" THRU 2" Socket Weld Tube OD

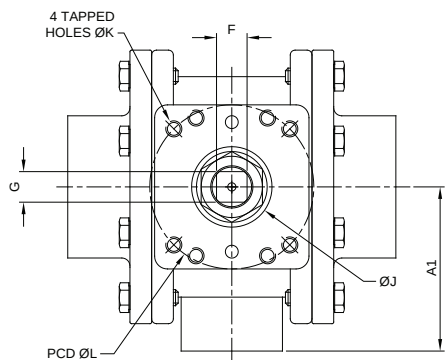


Plan View with Handle Removed

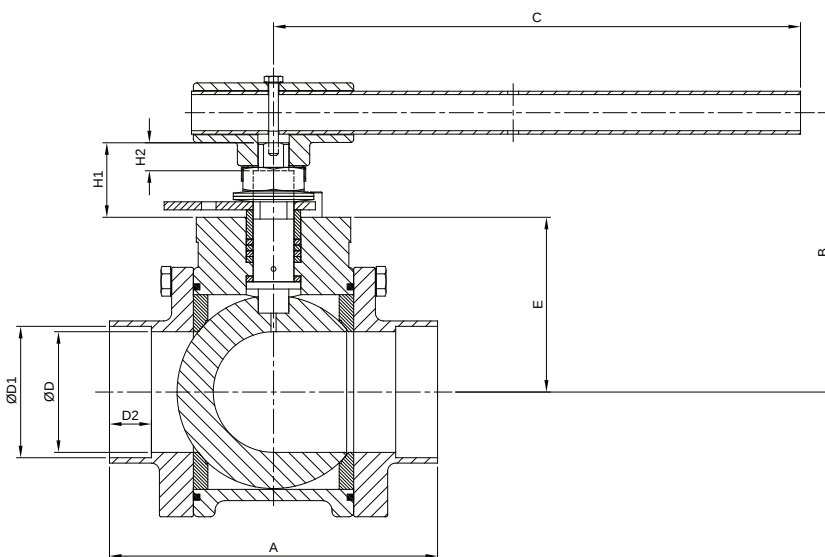


SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	D1 (in.)	D2 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
1/2"	2.61	1.31	2.35	4.53	0.37	0.51	0.43	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	3.03	1.52	2.41	4.53	0.62	0.76	0.51	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	4.06	2.03	3.33	5.91	0.87	1.01	0.51	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4
1 1/2"	5.50	2.75	3.92	6.85	1.37	1.52	0.51	1.90	0.57	0.34	1.12	0.61	1.38	M6	1.97	F05	8
2"	6.25	3.13	4.26	6.85	1.87	2.02	0.63	2.24	0.57	0.34	1.12	0.60	1.38	M6	1.97	F05	14

2 1/2" THRU 4" Socket Weld Tube OD



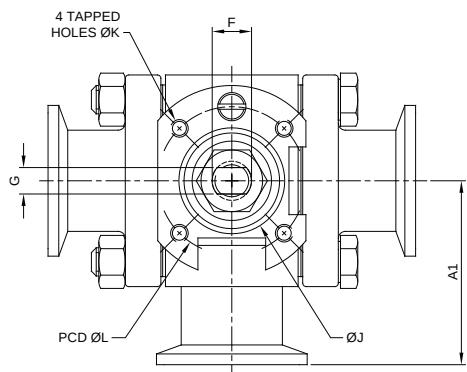
Plan View with Handle Removed



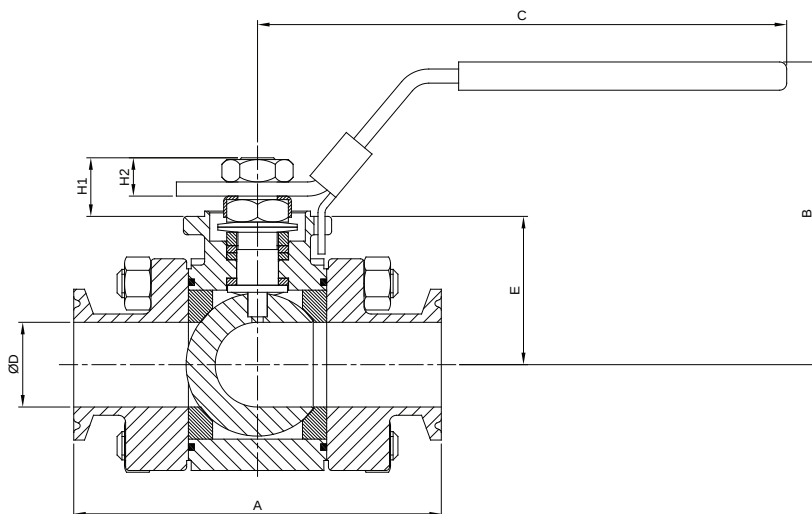
SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	D1 (in.)	D2 (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
2 1/2"	6.26	3.13	5.28	8.84	2.37	2.52	0.63	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22
3"	7.00	3.50	6.84	13.74	2.87	3.02	0.63	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35
4"	8.50	4.25	7.37	13.74	3.83	4.02	0.79	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55

Alloy Valves and Control

1/2" THRU 2" Clamp Ends

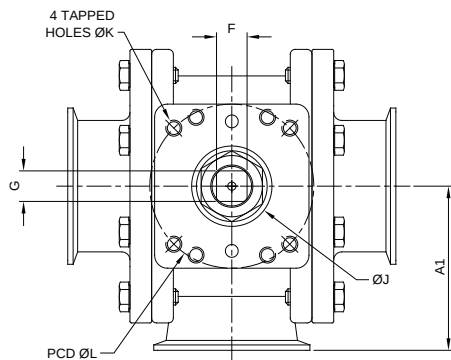


Plan View with Handle Removed

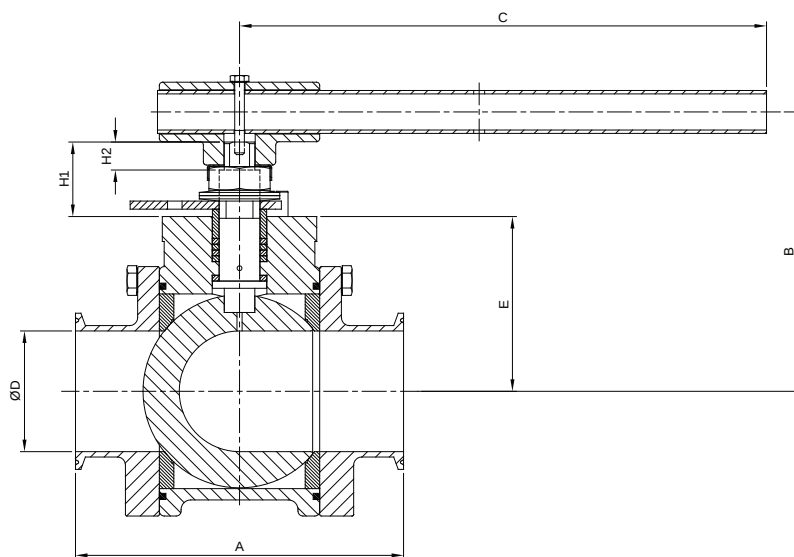


SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
1/2"	3.50	1.75	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	4.00	2.00	2.41	4.53	0.62	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	4.80	2.40	3.33	5.91	0.87	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4
1 1/2"	5.50	2.75	3.92	6.85	1.37	1.90	0.57	0.34	1.12	0.61	1.38	M6	1.97	F05	8
2"	6.25	3.13	4.26	6.85	1.87	2.24	0.57	0.34	1.12	0.60	1.38	M6	1.97	F05	14

2 1/2" THRU 4" Clamp Ends

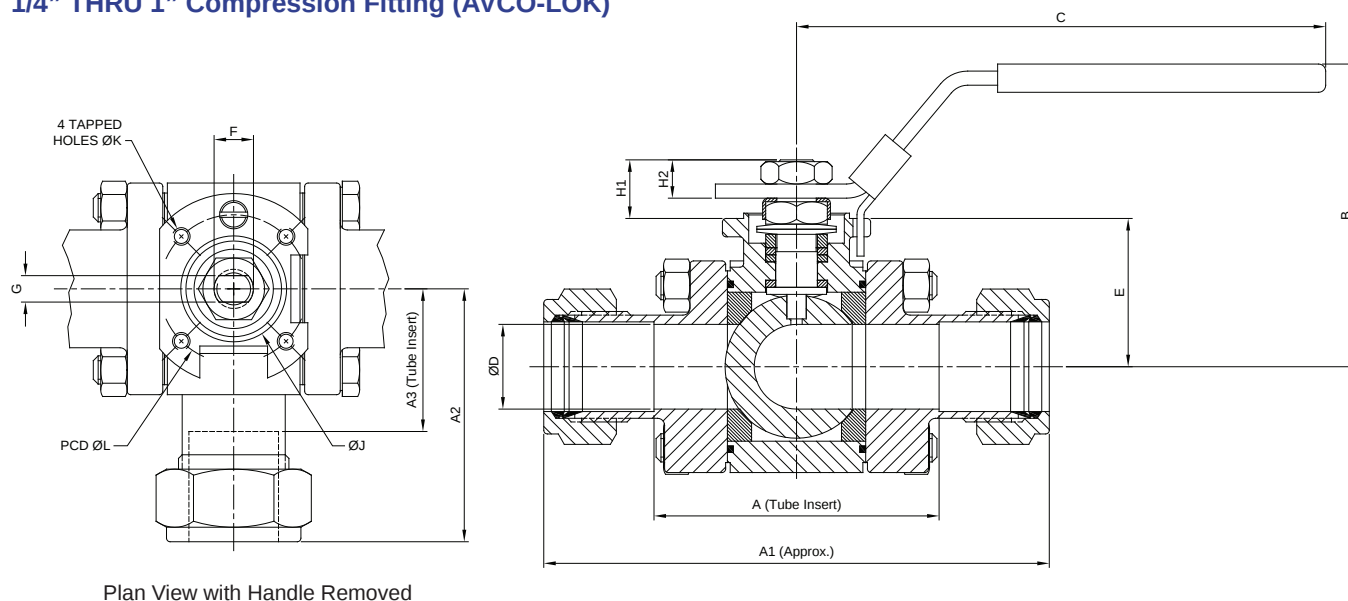


Plan View with Handle Removed



SIZE	A (in.)	A1 (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
2 1/2"	6.26	3.13	5.28	8.84	2.37	3.25	0.79	0.55	1.65	0.72	1.58	M8	2.76	F07	22
3"	7.00	3.50	6.84	13.74	2.87	4.28	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	35
4"	8.50	4.25	7.37	13.74	3.83	4.81	0.75	0.75	1.82	0.69	1.97	M10	4.02	F10	55

1/4" THRU 1" Compression Fitting (AVCO-LOK)



SIZE	A (in.)	A1 (in.)	A2 (in.)	A3 (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H1 (in.)	H2 (in.)	J (in.)	K	L (in.)	ISO 5211	Weight (lbs)
1/4"	2.44	3.64	1.82	1.22	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/8"	2.46	3.78	1.89	1.23	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
1/2"	2.20	4.00	2.00	1.10	2.35	4.53	0.37	1.09	0.38	0.22	0.52	0.28	0.98	M5	1.42	F03	2
3/4"	2.33	4.25	2.13	1.17	2.41	4.53	0.62	1.15	0.38	0.22	0.52	0.28	0.98	M5	1.42	F04	2.5
1"	2.79	5.25	2.63	1.40	3.33	5.91	0.87	1.64	0.44	0.30	0.65	0.46	1.18	M5	1.65	F04	4

Common to all Valves

Size	Torque (in.lbs)	Cv
1/4"	65	12
3/8"	65	12
1/2"	65	12
3/4"	80	36
1"	120	71
1 1/2"	290	178
2"	450	437
2 1/2"	685	729
3"	1200	1118
4"	2000	2237

General Notes

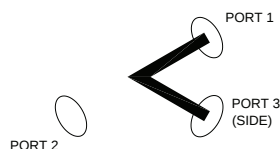
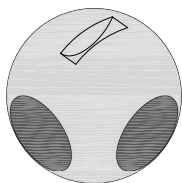
All Valves

1. Special customized end connections can be supplied to all valves upon request.
2. All valves can be adapted for cryogenic use.
3. All valves can have bonnet extensions added, which is particularly useful for flush tank pad applications.

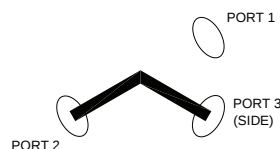
Compression Fitting Ends

1. Valve sizes 1/4" and 3/8" can be supplied with a bracket to prevent tube twist upon valve operation.

Ball Options



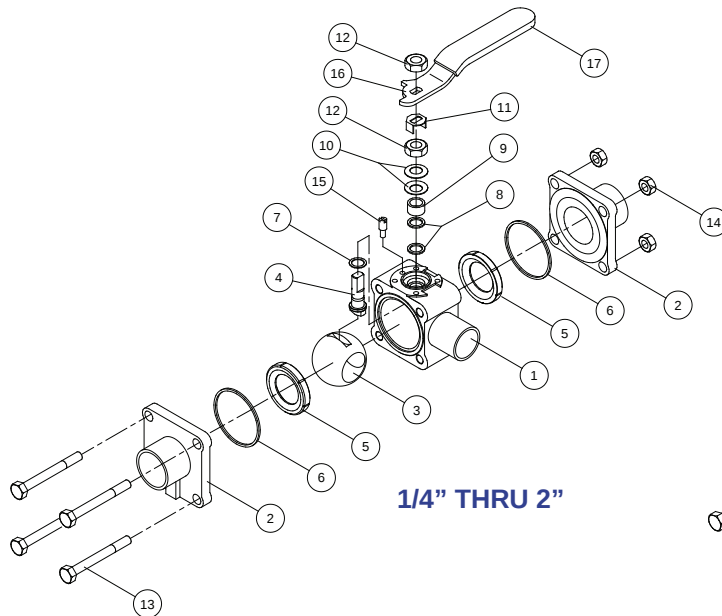
Start Position



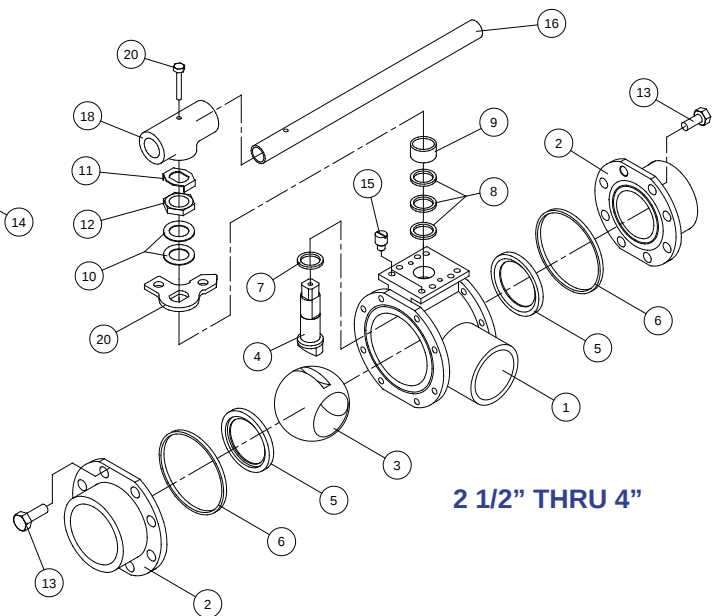
90 Degree Rotation

90 Degree Diverter Ball

Media flows between port 1 and port 3 when the valve handle is in-line with pipeline. Upon 90 degree rotation the media is diverted to flow between port 2 and port 3. The valve handle can be locked off in either position thus preventing unwanted tampering.

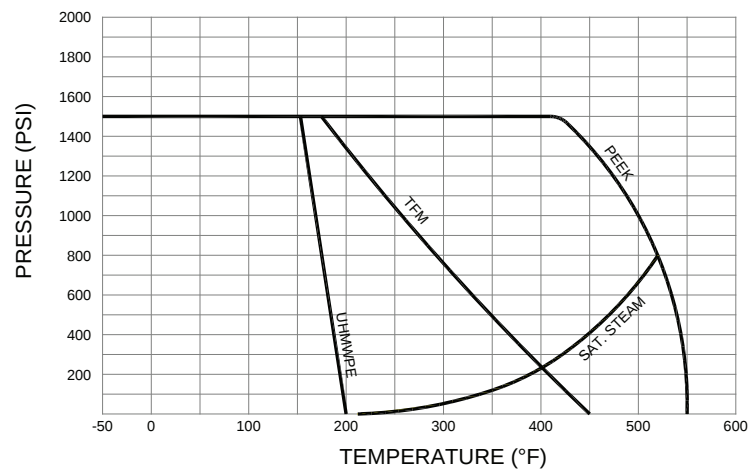


1/4" THRU 2"



2 1/2" THRU 4"

Pressure/Temperature Rating



Item	Parts
1	Body
2	End Cap
3	Ball
4	Stem
5	Ball Seat
6	Body Seal
7	Thrust Washer
8	Packing
9	Gland Ring
10	Disc Spring
11	Lock Tab
12	Stem Nut
13	Body Bolt
14	Body Nut
15	Stop Pin
16	Handle
17	Handle Sleeve
18	Wrench Block
19	Handle Bolt
20	Lock Pad

Features

- 3 Piece Design
- Tube OD Bore
- 316L Stainless Body, Ball, Stem & Ends
- Inter-changeable Ends
- Standard Seats
- Cavity Filled Seats
- Electro-Polished Internal Bore to 10 Ra
- ISO 5211 Mounting Pad
- ASME-BPE Compliant



Electric Actuator

120 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20 mA
Reversing
Telemetry
Battery Back-up
Spring Return



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 psi
Positioners 4-20 mA
Intelligent Positioner
Dec clutchable Manual Override



Manual Valves

Oval Handle
Spring Return
Fusible Link
Locking Device
Gear Operators
Stem Extensions
Wing Handle

HOW TO ORDER

1"	28	3	3	T	T	ETO	BAS90
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/4"	2800 Series 3 Piece Side Entry, High Performance, Full Port Tube OD Diverter Ball Valve	3 - 316L SS	3 - 316L SS	T - TFM	T - TFM	ETO - Extended Tube OD	BAS90 - 90° Rotation Ball
3/8"				P - PEEK	P - PEEK	BWO - Butt Weld Tube OD	10 - 10 Ra
1/2"				U - UHMWPE	U - UHMWPE	SWO - Socket Weld Tube OD	EP - Electro-Polish
3/4"						TR - Clamp Ends	CF - Cavity Filled
1"						TP - Tank Pad	O2CB - O ₂ Clean/Bagged
1 1/2"						AL - AVCO-LOK	
2"						KF - Vacuum Ends	
2 1/2"							
3"							
4"							
						Variations of the above or special ends can be supplied upon request	

AVCO

Alloy Valves and Control

BALL VALVES 7000 SERIES



Size

1/2" - 4" (Full Port Tube OD)
1000 WOG

End Connections

Extended Tube OD
Short Tube OD
Clamp Ends
Butt Weld Pipe Ends

Valve Materials

316L Stainless Steel

Ball & Stem Materials

316L Stainless Steel

Seat Materials

TFM
TFE

Service Applications

Biotech
Clean Steam
Cleaning Solutions
Detergents
Gas and Air Delivery
High Purity Gases
High Purity Water/Oils
Pharmaceutical
Vacuum
Waxes

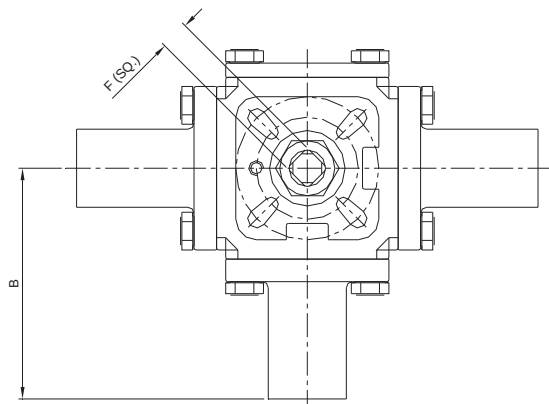
Applicable Standards

ASME B16.34
ASME-BPE
ISO 5211

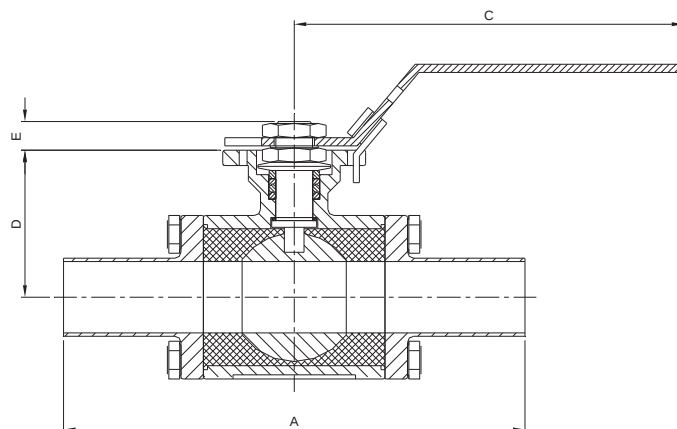
AVCO

Alloy Valves and Control

Extended Tube OD

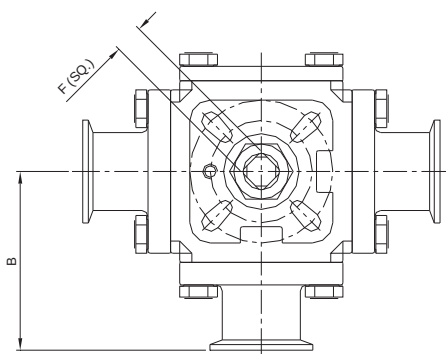


Plan View with Handle Removed

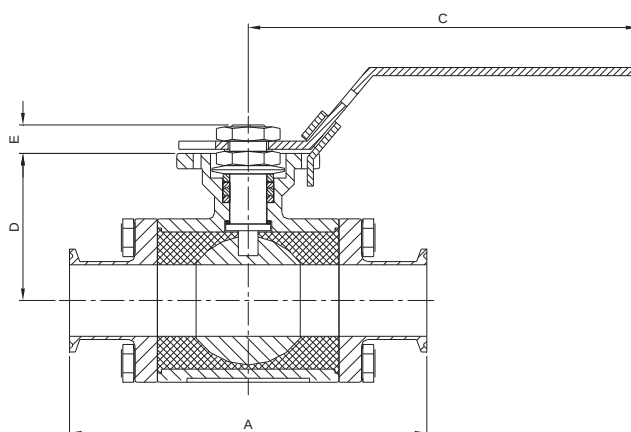


SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	ISO 5211
1/2"	6.70	3.35	4.76	1.75	0.35	0.35	F03/F04
3/4"	7.20	3.60	4.76	1.89	0.35	0.35	F03/F04
1"	7.56	3.78	5.40	2.32	0.43	0.43	F04/F05
1 1/2"	8.90	4.45	7.17	2.83	0.55	0.55	F05/F07
2"	9.75	4.88	7.17	3.32	0.55	0.55	F05/F07
2 1/2"	11.13	5.56	14.60	3.94	0.67	0.67	F07/F10
3"	13.55	6.78	22.00	4.94	0.87	0.87	F07/F10
4"	Contact AVCO for details						

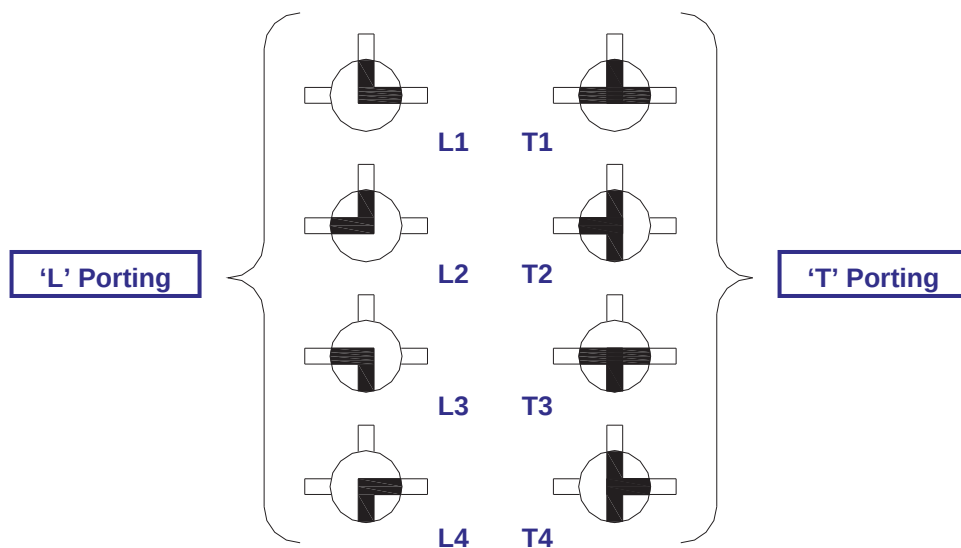
Tri Clamp Ends



Plan View with Handle Removed



SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	ISO 5211
1/2"	6.70	3.35	4.76	1.75	0.35	0.35	F03/F04
3/4"	7.20	3.60	4.76	1.89	0.35	0.35	F03/F04
1"	7.56	3.78	5.40	2.32	0.43	0.43	F04/F05
1 1/2"	8.90	4.45	7.17	2.83	0.55	0.55	F05/F07
2"	9.75	4.88	7.17	3.32	0.55	0.55	F05/F07
2 1/2"	11.13	5.56	14.60	3.94	0.67	0.67	F07/F10
3"	13.55	6.78	22.00	4.94	0.87	0.87	F07/F10
4"	Contact AVCO for details						



Basic Flow Patterns

General Notes

1. Each port has its own seat for greater flexibility of flow patterns
2. Flow patterns are available as 'L' or 'T' ported balls.
3. 4 ported 'cross' flow balls are available upon request.
4. These valves can be operated with 90° or 180° rotation.
5. These valves can be installed in any orientation.

Features

Tube OD Bore
316L Stainless Body, Ball, Stem & Ends
Inter-changeable Ends
Standard Seats
Cavity Filled Seats
Electro-Polished Internal Bore to 10 Ra
ISO 5211 Mounting Pad
ASME-BPE Compliant
Live-Loaded Stem Seals
Full Port Design
Direct Mount Actuation



Electric Actuator

120 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20mA
Reversing
Telemetry
Battery Back-up



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 psi
Positioners 4-20mA
Intelligent Positioner
Declutchable Manual Override



Manual Valves

Spring Handles
Stem Extensions
Fusible Link
Gear Operators
Oval Handles
Locking Device
Wing Handle

HOW TO ORDER

1"	71	3	3	T	T	TR	CF	L1
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options	Flow Pattern
1/2"	7100 Series Multi-Ported Full Port Tube OD Ball Valve	3 - 316L SS	3 - 316L SS	T - TFM	T - TFM	ETO - Extended Tube OD	CF - Cavity Filled	L1
3/4"						TR - Clamp Ends		L2
1"								L3
1 1/2"								L4
2"								T1
2 1/2"								T2
3"								T3
4"						Variations of the above or special ends can be supplied upon request		T4



Alloy Valves and Control

BALL VALVES 9100 SERIES



Size

1/2" - 12" (Full Port)
Fire Safe as Standard

End Connections

150# Flanged
300# Flanged

Valve Materials

316 Stainless Steel
Carbon Steel
Alloy 20

Ball and Stem Materials

316 Stainless Steel
Alloy 20

Seat Materials

15% Glass Filled Teflon
25% Carbon Filled Teflon
Teflon

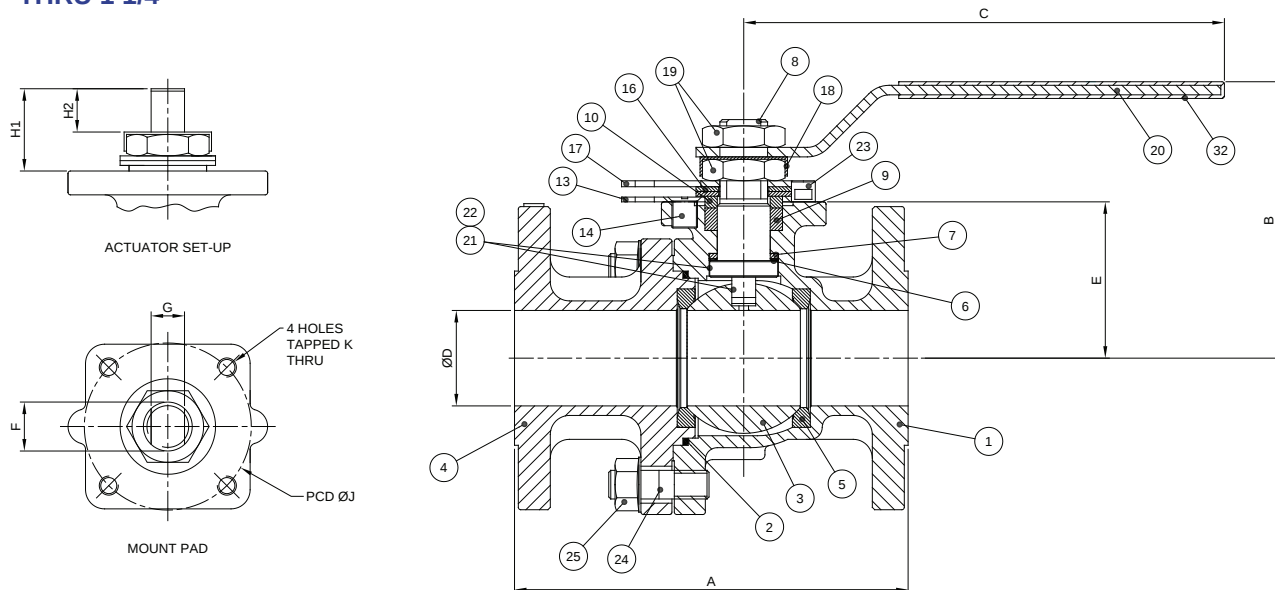
Service Applications

Chemical
Food Processing
Oxygen
Steam
Thermal Fluids
Vacuum
Water/Oil/Gas

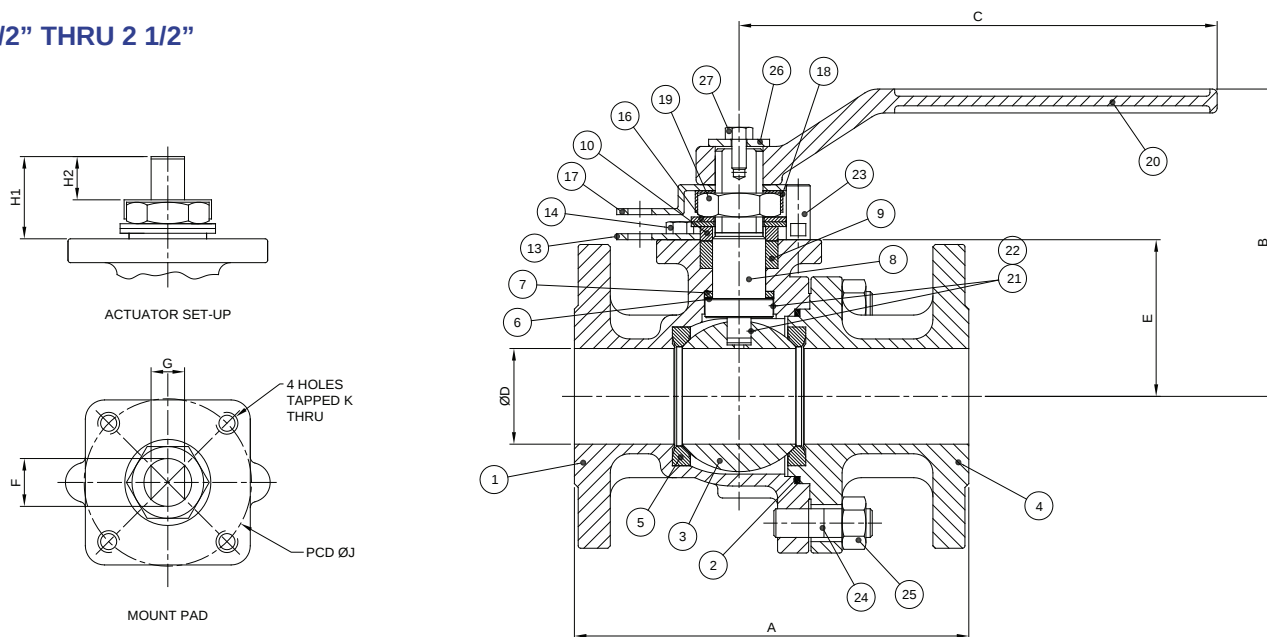
Applicable Standards

ASME B16.34
ASME B16.10
ASME B16.5
API 598
API 607

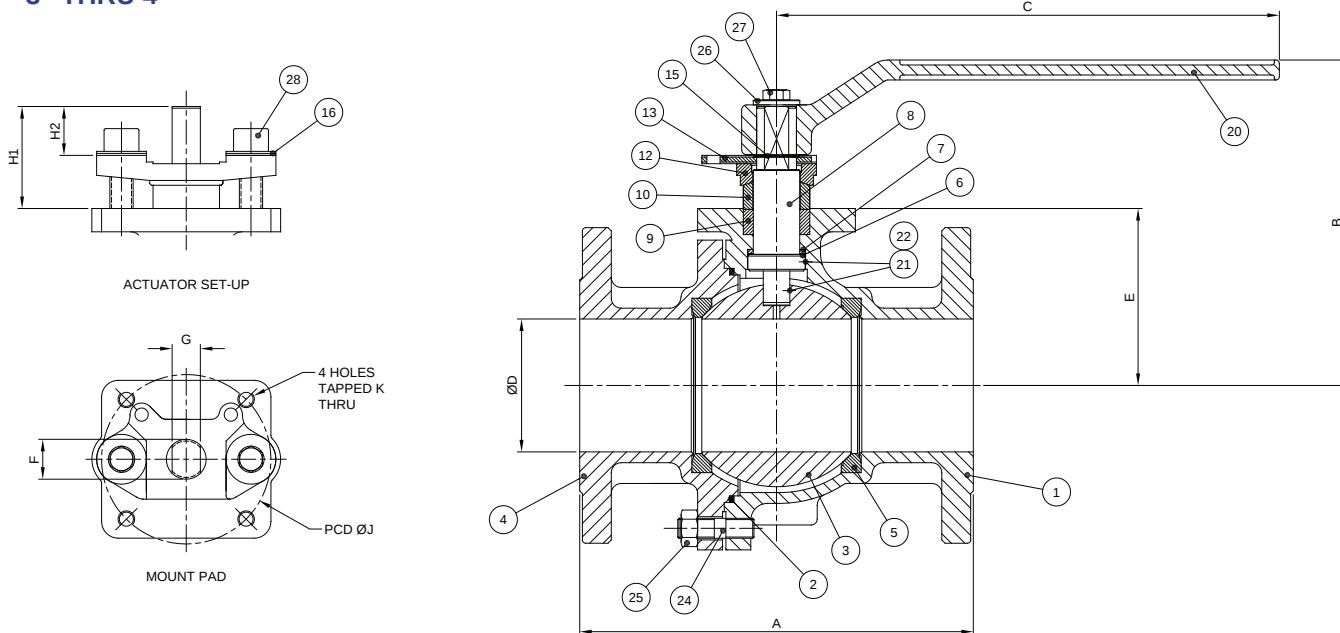
1/2" THRU 1 1/4"



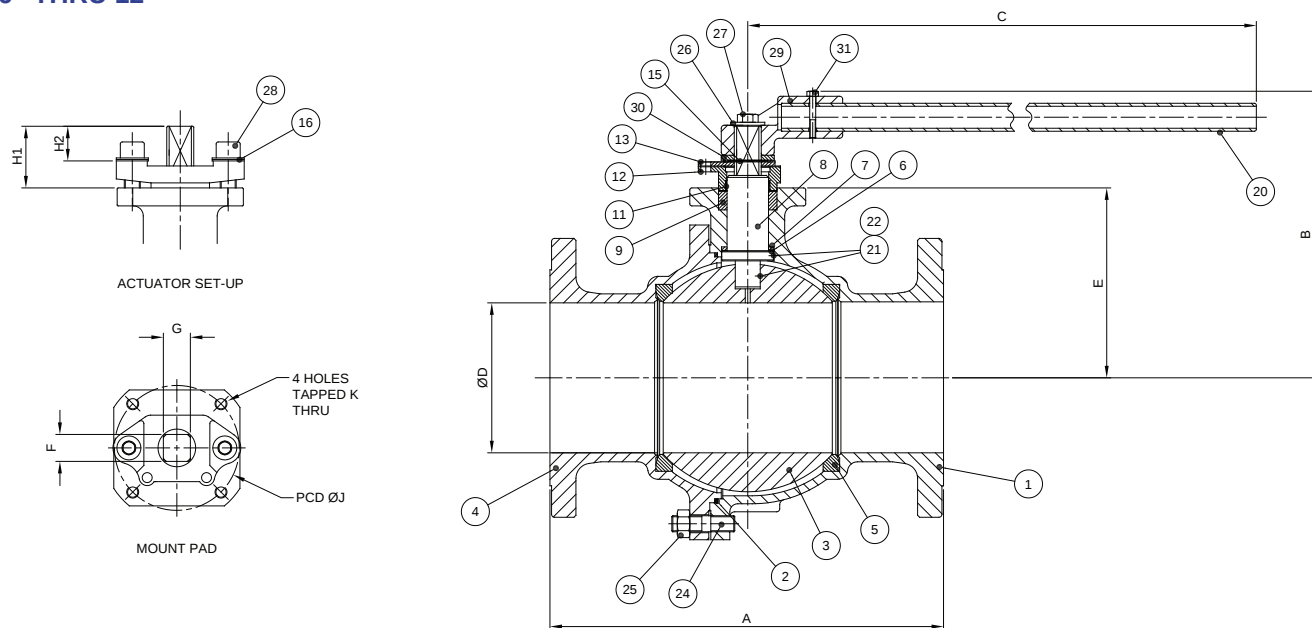
1 1/2" THRU 2 1/2"



3" THRU 4"

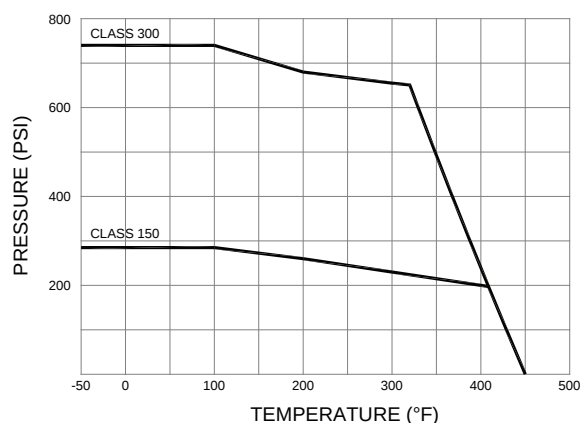


6" THRU 12"



SIZE	ANS Class	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G	H1 (in.)	H2 (in.)	J (in.)	K (in.)	ISO 5211	Weight (lbs)	TORQUE (in-lbs)	CV
1/2"	150#	4.25	3.57	5.65	0.59	1.67	M10	0.297	0.69	0.39	1.654	M5	F04	4.6	84	23
	300#	5.50	3.67	5.65	0.59	1.75	M10	0.297	0.69	0.37	1.654	M5	F04	7.1	84	23
3/4"	150#	4.61	3.70	5.65	0.79	1.79	M10	0.297	0.73	0.39	1.654	M5	F04	5.3	96	53
	300#	5.98	3.76	5.65	0.79	1.85	M10	0.297	0.69	0.37	1.654	M5	F04	9.5	96	53
1"	150#	5.00	4.07	5.65	0.98	2.05	M14	0.342	1.16	0.72	1.969	M6	F05	5.7	120	94
	300#	6.50	4.23	5.65	0.98	2.15	M14	0.342	1.06	0.63	1.969	M6	F05	10.6	120	94
1 1/4"	150#	5.51	4.41	5.65	1.26	2.34	M14	0.342	1.06	0.63	1.969	M6	F05	11.5	178	118
	300#	7.00	4.41	5.65	1.26	2.34	M14	0.342	1.06	0.63	1.969	M6	F05	13.9	178	118
1 1/2"	150#	6.50	5.04	7.87	1.57	2.58	M20	0.551	1.46	0.69	2.756	M8	F07	15.0	216	213
	300#	7.48	5.04	7.87	1.57	2.58	M20	0.551	1.46	0.69	2.756	M8	F07	15.9	216	213
2"	150#	7.01	5.35	7.87	1.97	2.87	M20	0.551	1.50	0.69	2.756	M8	F07	19.8	300	378
	300#	8.50	5.35	7.87	1.97	2.87	M20	0.551	1.50	0.69	2.756	M8	F07	27.6	300	378
2 1/2"	150#	7.48	6.22	11.81	2.56	3.74	M20	0.551	1.50	0.69	2.756	M8	F07	32.0	531	660
	300#	9.49	6.22	11.81	2.56	3.74	M20	0.551	1.50	0.69	2.756	M8	F07	40.4	531	660
3"	150#	7.99	7.72	13.78	3.15	4.19	0.984	0.669	2.42	1.14	4.016	M10	F10	43.0	781	951
	300#	11.14	7.95	13.78	3.15	4.45	0.984	0.669	2.42	1.14	4.016	M10	F10	70.6	781	951
4"	150#	9.02	8.35	15.75	3.94	4.80	0.984	0.669	2.42	1.14	4.016	M10	F10	72.8	1444	1691
	300#	12.01	8.58	15.75	3.94	5.06	0.984	0.669	2.42	1.14	4.016	M10	F10	101	1444	1691
6"	150#	15.51	11.30	32.87	5.91	7.48	1.063	1.063	2.43	1.34	4.921	M12	F12	137	3356	3806
	300#	15.87	11.30	32.87	5.91	7.48	1.063	1.063	2.44	1.34	4.921	M12	F12	194	3356	3806
8"	150#	17.99	14.88	41.14	7.87	9.90	1.260	1.260	3.11	1.59	4.921	M12	F12	243	12744	7812
	300#	19.76	14.88	41.14	7.87	9.90	1.260	1.260	3.11	1.59	4.921	M12	F12	359	12744	7812
10"	150#	20.98	16.26	41.34	9.84	10.87	1.417	1.417	3.37	1.83	5.512	M16	F14	366	15930	13371
	300#	22.36	16.26	41.34	9.84	10.87	1.417	1.417	3.37	1.83	5.512	M16	F14	525	15930	13371
12"	150#	24.02	20.53	59.06	11.81	13.33	1.811	1.811	4.98	2.66	6.496	M20	F16	523	21240	19255
	300#	25.51	20.53	59.06	11.81	13.33	1.811	1.811	4.98	2.66	6.496	M20	F16	783	21240	19255

Pressure/Temperature Rating for 15% Glass Filled Teflon



Features

- ANSI Class 150 & 300
- Spring Loaded Stem Packing
- Bottom Entry Stem to Prevent Blow-Out
- ISO 5211 Mounting Pad
- Locking Handle as Standard
- Fire Safe as Standard

Item	Description	Part of Valve Assembly				Material		
		1/2" thru 1 1/4"	1 1/2" thru 2 1/2"	3" thru 4"	6" thru 12"	Stainless Steel	Alloy 20	Carbon Steel
1	Body	Yes	Yes	Yes	Yes	A351-CF8M	Alloy 20	A216-WCB
2	Body Seal	Yes	Yes	Yes	Yes	SS 316/Graphite	SS 316/Graphite	SS 316/Graphite
3	Ball	Yes	Yes	Yes	Yes	A351-CF8M	Alloy 20	A351-CF8M
4	End Cap	Yes	Yes	Yes	Yes	A351-CF8M	Alloy 20	A216-WCB
5	Seat	Yes	Yes	Yes	Yes	RPTFE	RPTFE	RPTFE
6	Thrust Ring	Yes	Yes	Yes	Yes	TFM 4215	TFM 4215	TFM 4215
7	Thrust Seal	Yes	Yes	Yes	Yes	Grafoil	Grafoil	Grafoil
8	Stem	Yes	Yes	Yes	Yes	A276-316	Alloy 20	A276-316
9	Packing	Yes	Yes	Yes	Yes	Grafoil	Grafoil	Grafoil
10	Gland Ring	Yes	Yes	Yes	No	A276-316	Alloy 20	A276-316
11	Bushing	No	No	No	Yes	PTFE	PTFE	PTFE
12	Packing Gland	No	No	Yes	Yes	A351-CF8M	Alloy 20	A216-WCB
13	Locking Plate	Yes	Yes	Yes	Yes	Stainless Steel	Stainless Steel	Stainless Steel or Steel
14	Locking Plate Screw	Yes	Yes	No	No	A193-B8	A193-B8	A193-B7
15	Locking Plate Retainer	No	No	Yes	Yes	Stainless Steel	Stainless Steel	Steel
16	Belleville Washer	Yes	Yes	Yes	Yes	A276-301	A276-301	A276-301
17	Travel Stop	Yes	Yes	No	No	Stainless Steel	Stainless Steel	Stainless Steel
18	Lock Washer	Yes	Yes	No	No	Stainless Steel	Stainless Steel	Stainless Steel
19	Stem Nut	Yes	Yes	No	No	A276-304	A276-304	A276-304
20	Handle	Yes	Yes	Yes	Yes	Steel	Steel	Steel
21	Anti-Static Ball	Yes	Yes	Yes	Yes	A276-316	A276-316	A276-316
22	Spring	Yes	Yes	Yes	Yes	A276-316	A276-316	A276-316
23	Stop Pin	Yes	Yes	No	No	Stainless Steel	Stainless Steel	Stainless Steel
24	Threaded Rod	Yes	Yes	Yes	Yes	A193-B8	A193-B8	A193-B7
25	Body Nut	Yes	Yes	Yes	Yes	A194-8	A194-8	A194-2H
26	Handle Washer	No	Yes	Yes	Yes	Stainless Steel	Stainless Steel	Stainless Steel
27	Handle Screw	No	Yes	Yes	Yes	A193-B8	A193-B8	A193-B7
28	Packing Gland Screw	No	No	Yes	Yes	A193-B8	A193-B8	A193-B7
29	Handle Block	No	No	No	Yes	A216-WCB	A216-WCB	A216-WCB
30	Stem Washer	No	No	No	Yes	Stainless Steel	Stainless Steel	Stainless Steel
31	Handle Block Screw	No	No	No	Yes	A193-B8	A193-B8	A193-B7
32	Handle Sleeve	Yes	No	No	No	Plastic	Plastic	Plastic



Electric Actuator

120/230 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20 mA
Reversing
Telemetry
Battery Back-up
Spring Return



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 PSI
Positioners 4-20 mA
Intelligent Positioner
Dec clutchable Manual Override



Manual Valves

Oval Handle
Spring Return
Stem Extensions
Fusible Link
Lock Device
Gear Operators

HOW TO ORDER

1"	91	3	3	R	T	150	BAVT
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/2"	9100 Series 2 Piece Economy Full Port Flanged Ball Valve	1 - Carbon Steel	2 - Alloy 20	C - 25% Carbon PTFE	G - Graphoil	150 - 150# Flange	BAVT - Vented Ball
3/4"		2 - Alloy 20	3 - 316 SS	R - 15% Glass PTFE	T - Teflon (PTFE)	300 - 300# Flange	FS - Fire Safe
1"		3 - 316 SS		T - Teflon (PTFE)		600 - 600# Flange	O2CB - O2 Clean/Bagged
1 1/4"							
1 1/2"							
2"							
2 1/2"							
3"							
4"							
6"							
8"							
10"							
12"							

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Alloy Valves and Control

BALL VALVES 100 SERIES



Size

1/4" - 2" (Reduced Port)
1000 WOG

End Connections

NPT to ASME B1.20.1

Valve Materials

316 Stainless Steel

Ball and Stem Materials

316 Stainless Steel

Seat Materials

Teflon (PTFE)

Features

Locking Handle
Bottom Entry Stem to Prevent Blow-Out

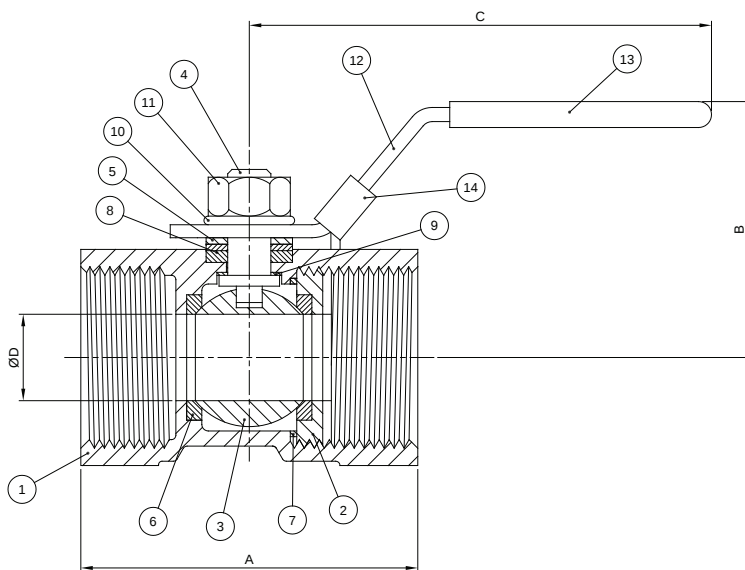
Temperature Range

-4°F to 392°F

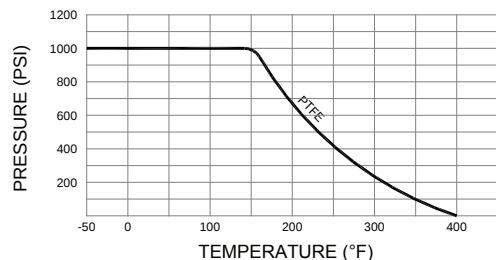
Service Applications

Chemical
Food Processing
Hydraulic
Steam
Vacuum
Water/Oil/Gas

Item	Parts	Material
1	Body	316 Stainless Steel
2	Retainer	316 Stainless Steel
3	Ball	316 Stainless Steel
4	Stem	316 Stainless Steel
5	Gland Ring	Stainless Steel
6	Ball Seat	Teflon (PTFE)
7	Body Seal	Teflon (PTFE)
8	Packing	Teflon (PTFE)
9	Thrust Washer	Teflon (PTFE)
10	Spring Washer	Stainless Steel
11	Stem Nut	Stainless Steel
12	Handle	Stainless Steel
13	Handle Sleeve	Vinyl
14	Lock Tab	Stainless Steel



Pressure/Temperature Rating



SIZE	A (in.)	B (in.)	C (in.)	D (in.)	Cv	Weight (lbs)	TORQUE (in-lbs)
1/4"	1.54	1.38	3.17	0.20	2.5	0.15	3.5
3/8"	1.73	1.46	2.95	0.28	4.5	0.37	7.0
1/2"	2.22	1.71	3.50	0.35	7	0.44	11.3
3/4"	2.28	1.85	3.50	0.49	9	0.66	19
1"	2.80	1.97	4.17	0.63	16	1.04	30
1 1/4"	3.07	2.24	4.17	0.79	24	1.76	44
1 1/2"	3.27	2.72	5.04	0.97	37	2.12	57
2"	3.94	2.93	5.04	1.26	68	3.20	91

HOW TO ORDER

1"	1	3	3	T	T	SE
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style
1/4"	100 Series 1 Piece Ball Valve	3 - 316 SS	3 - 316 SS	T - Teflon (PTFE)	T - Teflon (PTFE)	SE - NPT
3/8"						
1/2"						
3/4"						
1"						
1 1/4"						
1 1/2"						
2"						

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Alloy Valves and Control

BALL VALVES 200 SERIES



Size

1/4" - 3" (Full Port)
1000 WOG

End Connections

NPT to ASME B1.20.1

Valve Materials

316 Stainless Steel

Ball and Stem Materials

316 Stainless Steel

Seat Materials

15% Glass Filled Teflon

Features

Locking Handle
Bottom Entry Stem to Prevent Blow-Out
Tapped Hole Mount Pad

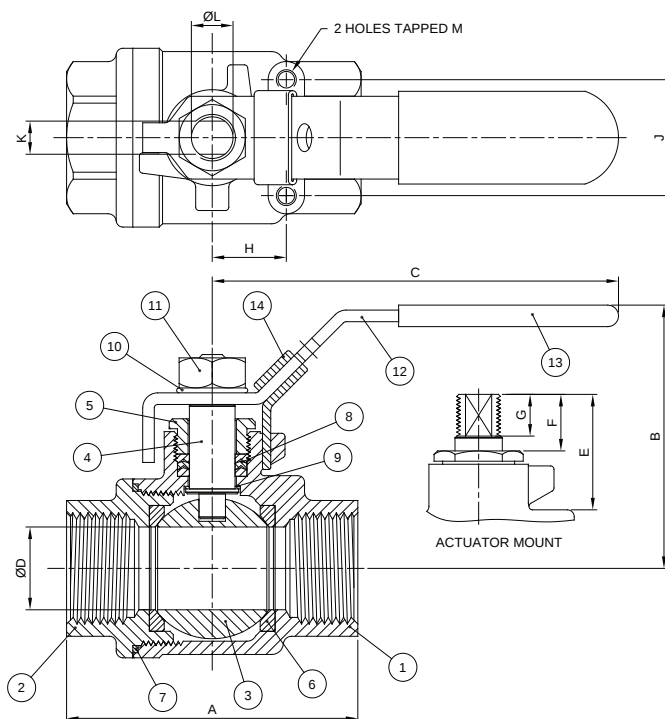
Temperature Range

-4°F to 392°F

Service Applications

Chemical
Food Processing
Hydraulic
Steam
Thermal Fluids
Vacuum
Water/Oil/Gas

Item	Parts	Material
1	Body	316 Stainless Steel
2	End Cap	316 Stainless Steel
3	Ball	316 Stainless Steel
4	Stem	316 Stainless Steel
5	Gland Nut	Stainless Steel
6	Ball Seat	15% Glass Filled Teflon
7	Body Seal	Teflon (PTFE)
8	Packing	Teflon (PTFE)
9	Thrust Washer	Teflon (PTFE)
10	Spring Washer	Stainless Steel
11	Stem Nut	Stainless Steel
12	Handle	Stainless Steel
13	Handle Sleeve	Vinyl
14	Lock Tab	Stainless Steel



SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H (in.)	J (in.)	K (in.)	L (in.)	M	Cv	Weight (lbs)	TORQUE (in-lbs)
1/4"	2.00	2.36	3.86	0.46	0.94	0.54	0.52	0.50	1.12	0.19	0.38	M5	10	0.57	36
3/8"	2.00	2.36	3.86	0.49	0.99	0.58	0.52	0.50	1.12	0.19	0.38	M5	10	0.62	36
1/2"	2.28	2.44	3.86	0.59	0.99	0.57	0.52	0.50	1.12	0.19	0.38	M5	12	0.66	39
3/4"	2.58	2.44	4.92	0.79	1.25	0.64	0.63	0.50	1.12	0.25	0.44	M5	35	1.21	52
1"	3.10	3.15	5.79	0.98	1.55	0.70	0.64	0.88	1.38	0.31	0.44	M5	60	1.85	65
1 1/4"	3.54	3.35	5.79	1.26	1.49	0.65	0.64	1.00	1.50	0.31	0.44	M6	100	2.78	78
1 1/2"	4.13	3.94	7.48	1.50	1.71	0.84	0.79	1.00	1.50	0.39	0.50	M6	150	4.41	117
2"	4.88	4.25	7.48	1.97	1.65	0.83	0.79	1.00	1.50	0.39	0.50	M6	250	6.90	143
2 1/2"	5.76	5.35	9.84	2.48	2.16	1.23	1.08	1.14	1.97	0.47	0.75	M6	400	13.20	390
3"	6.44	5.75	9.84	2.99	2.20	1.24	1.08	1.38	2.20	0.47	0.75	M6	600	22.30	412

HOW TO ORDER

1"	2	3	3	R	T	SE
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style
1/4" 3/8" 1/2" 3/4" 1" 1 1/4" 1 1/2" 2" 3"	200 Series 2 Piece Ball Valve	3 - 316 SS	3 - 316 SS	R - 15% Glass Filled Teflon	T - Teflon (PTFE)	SE - NPT

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Alloy Valves and Control

BALL VALVES 500 SERIES



Size

1/4" - 4" (No Mount)
1/2" - 4" (Direct Mount & Clamp Ends)

End Connections

NPT(F)
Socket Weld
Clamp Ends

Valve Materials

316 Stainless Steel

Ball & Stem Materials

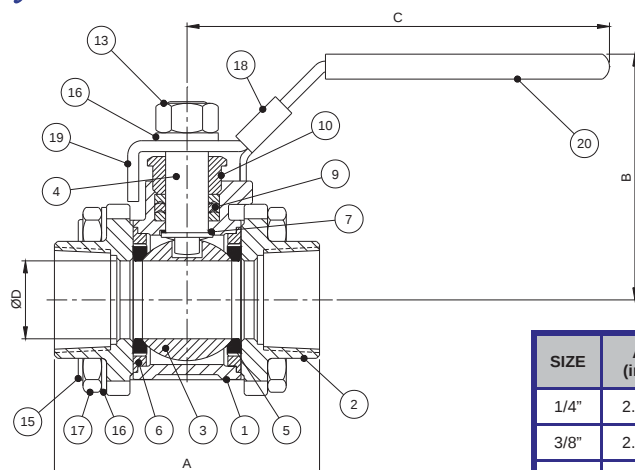
316 Stainless Steel

Seat Materials

RTFE (No Mount & Direct Mount)
TFM Cavity Filled (Clamp Ends)

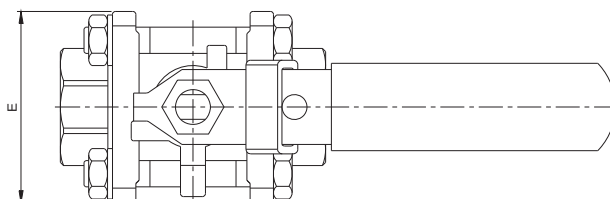
Service Applications

Chemical
Dry/Liquid Chlorine
Food Processing
Hydraulic
Oxygen
Steam
Thermal Fluids
Vacuum
Water/Oil/Gas

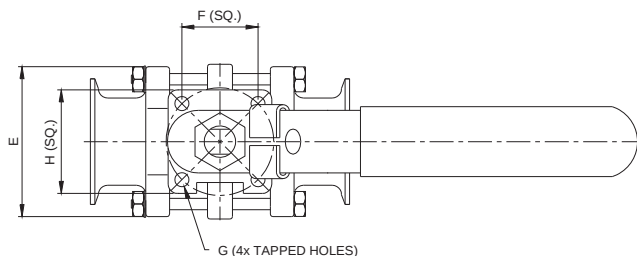
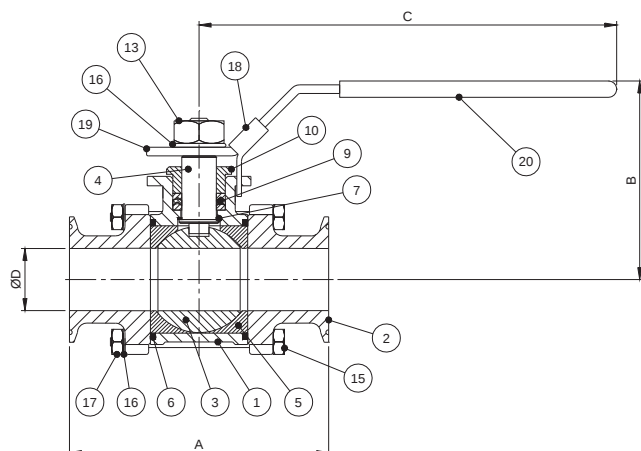


STANDARD BALL VALVE

1000 WOG
Full Port
Blow-Out Proof Stem
RTFE Seats
NPT & SW Ends
Latch Lock Handle



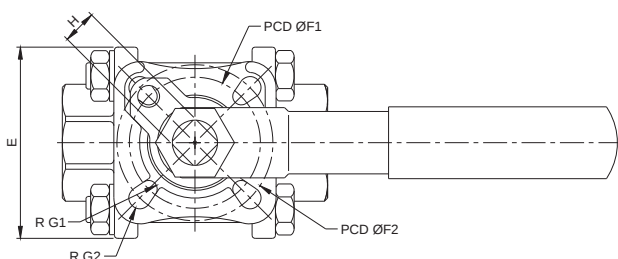
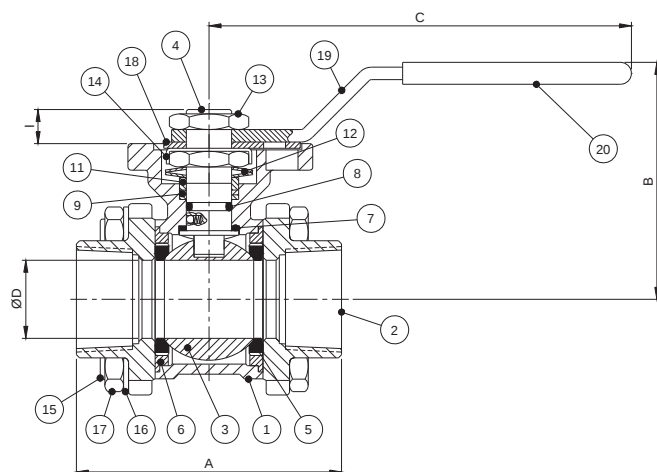
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	WEIGHT (lbs)	TORQUE (in-lbs)	CV
1/4"	2.56	2.36	3.94	0.46	1.56	1	35	6.6
3/8"	2.56	2.36	3.94	0.49	1.56	1	35	7.9
1/2"	2.56	2.44	3.94	0.59	1.82	2	47	11.2
3/4"	2.95	2.44	4.92	0.79	2.05	2	65	21
1"	3.35	3.15	5.87	0.98	2.28	3	90	34
1 1/4"	3.98	3.35	5.87	1.25	2.74	4	118	57
1 1/2"	4.41	3.94	7.48	1.50	3.05	6	157	80
2"	5.12	4.25	7.48	1.97	3.57	9	217	148
2 1/2"	6.38	5.35	9.84	2.48	4.48	18	416	265
3"	7.40	5.75	9.84	2.99	6.67	30	651	415
4"	8.82	7.17	12.72	3.78	8.65	55	955	780



CLAMP BALL VALVE

1000 WOG
Full Port
Blow-Out Proof Stem
TFM Cavity Filled Seats
Clamp Ends
Latch Lock Handle
ISO Mounting Pad

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H (in.)	ISO 5211	WEIGHT (lbs)	TORQUE (in-lbs)	CV
1/2"	3.57	2.50	5.56	0.38	1.91	1.00	M5	1.46	F03	2	51	9
3/4"	4.06	2.62	5.56	0.62	2.20	1.00	M5	1.46	F03	3	79	26
1"	4.53	2.73	5.56	0.87	2.34	1.17	M5	1.65	F04	3	113	61
1 1/2"	5.51	3.96	7.41	1.37	3.16	1.39	M6	1.97	F05	6	203	193
2"	6.22	4.35	7.41	1.88	3.70	1.39	M6	1.97	F05	10	248	432
2 1/2"	7.76	5.48	10.24	2.37	4.80	1.95	M8	2.83	F07	19	528	728
3"	8.98	5.83	10.24	2.87	6.16	1.95	M8	2.83	F07	32	821	1125
4"	9.52	6.89	11.61	3.84	8.70	2.84	M10	3.70	F10	46	1379	1986

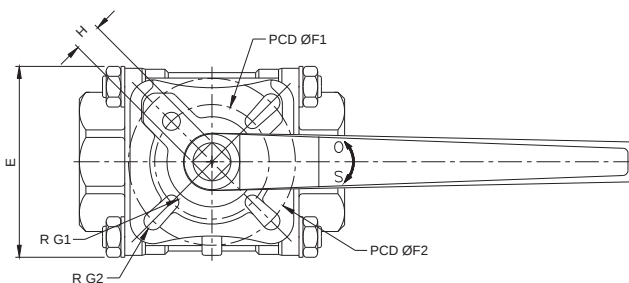
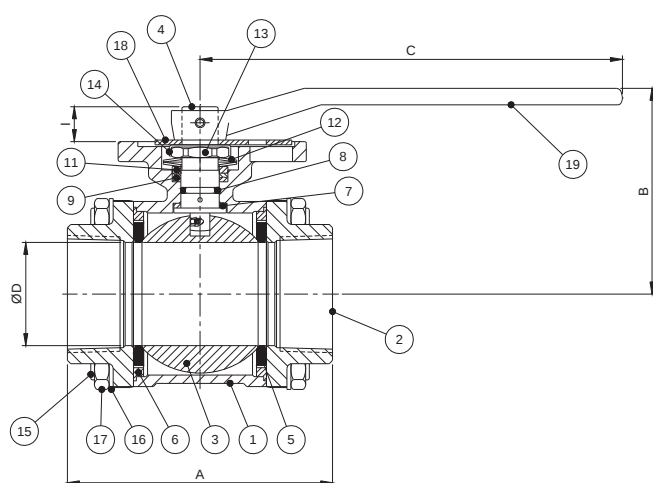


DIRECT MOUNT BALL VALVE (1/2" - 2")

1000 WOG
Full Port
Blow-Out Proof Stem
RTFE Seats
NPT & SW Ends
Latch Lock Handle

ISO Direct Mounting Pad
Built In Coupler
Spring System on Stem
Fixed Spring Load
Anti-Static Device

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F1 (in.)	F2 (in.)	G1 (in.)	G2 (in.)	H (in.)	I (in.)	ISO 5211	WEIGHT (lbs)	TORQUE (in-lbs)	CV
1/2"	2.56	2.36	4.72	0.59	1.82	1.42	1.65	0.11	0.11	0.35	0.33	F03/F04	2	49	5
3/4"	2.95	2.52	4.72	0.79	2.05	1.42	1.65	0.11	0.11	0.35	0.33	F03/F04	2	67	21
1"	3.35	2.91	5.83	0.98	2.28	1.65	1.97	0.11	0.14	0.43	0.43	F04/F05	3	98	46
1 1/4"	3.98	3.11	5.83	1.26	2.74	1.65	1.97	0.11	0.14	0.43	0.43	F04/F05	4	133	67
1 1/2"	4.41	3.74	7.01	1.50	3.05	1.97	2.76	0.14	0.18	0.55	0.55	F05/F07	6	177	87
2"	5.12	4.06	7.01	1.97	3.57	1.97	2.76	0.14	0.18	0.55	0.55	F05/F07	9	354	210



DIRECT MOUNT BALL VALVE (2 1/2" - 4")

1000 WOG
Full Port
Blow-Out Proof Stem
RTFE Seats
NPT & SW Ends
Latch Lock Handle

ISO Direct Mounting Pad
Built In Coupler
Spring System on Stem
Fixed Spring Load
Anti-Static Device

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F1 (in.)	F2 (in.)	G1 (in.)	G2 (in.)	H (in.)	I (in.)	ISO 5211	WEIGHT (lbs)	TORQUE (in-lbs)	CV
2 1/2"	6.38	4.84	12.80	2.48	4.48	2.76	4.02	0.18	0.22	0.67	0.81	F07/F10	16	531	275
3"	7.40	5.18	12.80	2.99	6.67	2.76	4.02	0.18	0.22	0.67	0.81	F07/F10	23	753	485
4"	8.82	6.52	12.80	3.78	8.65	4.02	4.92	0.22	0.26	0.87	0.89	F10/F12	43	1328	617

500 Series Ball Valve - Materials

Item	Part	Standard	Direct Mount	Clamp
1	Body	316 SS	316 SS	316L SS
2	End Cap	316 SS	316 SS	316L SS
3	Ball	316 SS	316 SS	316L SS
4	Stem	316 SS	316 SS	316L SS
5	Seat	RTFE	RTFE	TFM
6	Seal	TFE	TFE	TFM
7	Thrust Washer	TFE	TFE	TFE
8	O-Ring	-	Viton	-
9	Packing	TFE	TFE	TFE
10	Gland Nut	304 SS	-	304 SS
11	Gland Ring	-	304 SS	-
12	Disk Spring	-	304 SS	-
13	Stem Nut	304 SS	304 SS	304 SS
14	Lock Tab	-	304 SS	-
15	Bolt	304 SS	304 SS	304 SS
16	Lock Washer	304 SS	304 SS	304 SS
17	Nut	304 SS	304 SS	304 SS
18	Locking Device	304 SS	304 SS	304 SS
19	Handle	304 SS	304 SS	304 SS
20	Handle Sleeve	Vinyl	Vinyl	Vinyl

AUTOMATION

Pneumatic Actuators:
Spring Return
Double Acting

Electric Actuators:
120 VAC
12 & 24 VDC

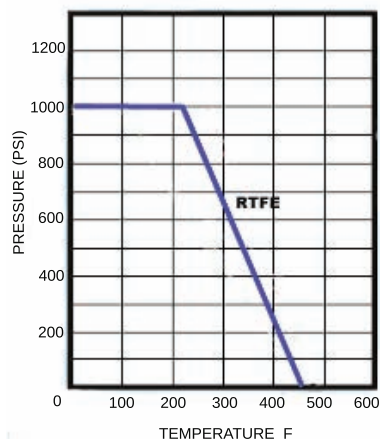
Solenoid Valves

Limit Switches

Positioners



PRESSURE-TEMPERATURE RATING



HOW TO ORDER

1"	5	3	3	R	T	SE	
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Features
1/4"	500 Series	3 - 316 S.S	3 - 316 S.S	R - RTFE	T - TFE	SE - NPT(F)	Blank - Standard/Clamp
3/8"	3 Piece Economy			T - TFM		SW - Socket Weld	DM - Direct Mount
1/2"	Full Port Ball Valve					TR - Clamp	CF - Cavity Filled
3/4"							
1"							
1 1/4"							
1 1/2"							
2"							
2 1/2"							
3"	Available as: Standard Direct Mount Clamp with ISO Pad			Options: Standard - RTFE only Direct Mount - RTFE only Clamp - TFM only		Options: Standard - SE, SW Direct Mount - SE, SW Clamp - TR only	Options: Standard - Blank only Direct Mount - DM only Clamp - Blank, CF
4"							

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Alloy Valves and Control

BALL VALVES 900 SERIES



Size

1/4" - 12" (Full Port)

End Connections

150# Flanged
300# Flanged

Valve Materials

316 Stainless Steel
Carbon Steel

Ball and Stem Materials

316 Stainless Steel

Seat Materials

15% Glass Filled Teflon

Service Applications

Chemical
Food Processing
Oxygen
Steam
Thermal Fluids
Vacuum
Water/Oil/Gas

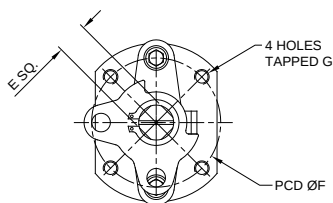
Applicable Standards

ASME B16.34
API 598
API 607 4th Edition

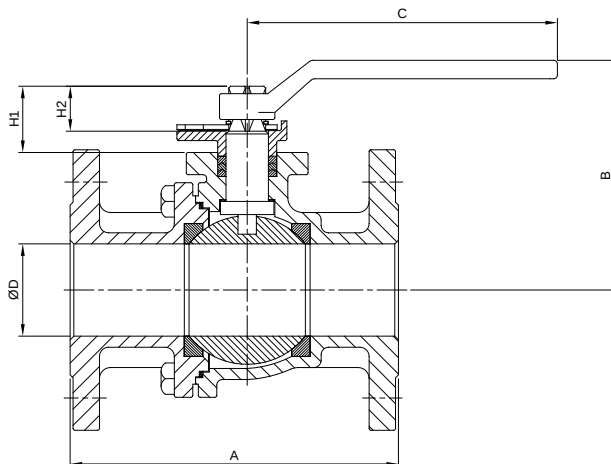
Alloy Valves and Control

1/2" THRU 4"

Full Port
150# & 300# Flanged
ISO Mounting Pad
Adjustable Packing



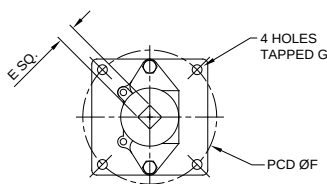
ISO Mounting Pad Detail



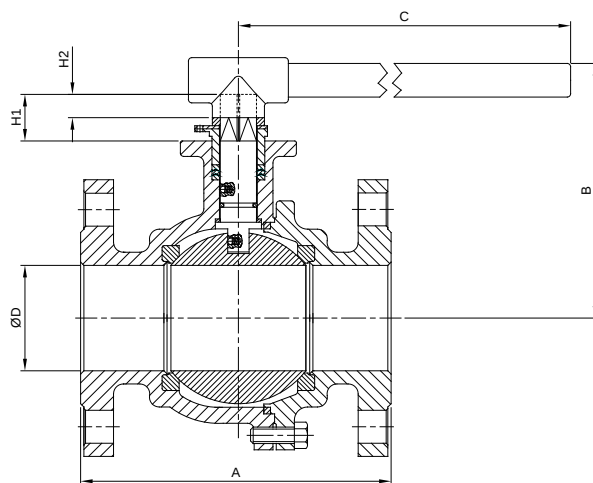
SIZE	A (in.)		B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G	H1 (in.)		H2 (in.)		ISO 5211	Weight (lbs)		TORQUE (in-lbs)	CV
	150#	300#							150#	300#	150#	300#		150#	300#		
1/2"	4.25	5.51	2.87	5.12	0.59	0.43	1.65	M5	1.02	1.32	0.68	0.83	F04	4	7	36	35
3/4"	4.61	5.98	2.99	5.12	0.79	0.43	1.65	M5	1.02	1.32	0.68	0.83	F04	5	8	36	69
1"	5.00	6.50	3.39	6.30	0.98	0.55	1.97	M5	1.21	1.32	0.80	0.83	F05	7	15	89	93
1 1/4"	5.51	-	3.58	6.30	1.26	0.55	1.97	M6	1.15	-	0.76	-	F05	9	-	177	160
1 1/2"	6.50	7.48	4.69	8.07	1.57	0.67	2.76	M8	1.63	1.89	1.05	0.98	F07	14	20	177	287
2"	7.01	8.50	5.00	8.07	1.97	0.67	2.76	M8	1.60	1.75	1.04	0.79	F07	19	26	354	450
2 1/2"	7.48	9.49	5.35	12.80	2.56	0.67	2.76	M8	1.68	2.17	1.12	1.32	F07	30	40	487	580
3"	7.99	11.14	6.46	12.80	3.15	0.87	4.02	M10	2.13	2.17	1.42	1.32	F10	41	56	708	819
4"	9.02	12.01	7.01	12.80	3.86	0.87	4.02	M10	2.24	2.17	1.47	1.32	F10	62	86	1062	1683

6" THRU 12"

Full Port
150# & 300# Flanged
ISO Mounting Pad
Adjustable Packing

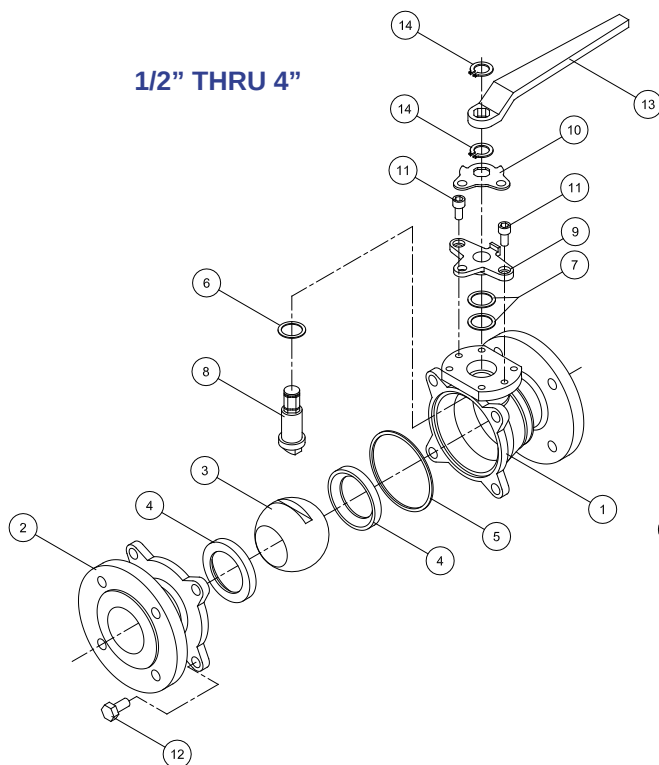


ISO Mounting Pad Detail

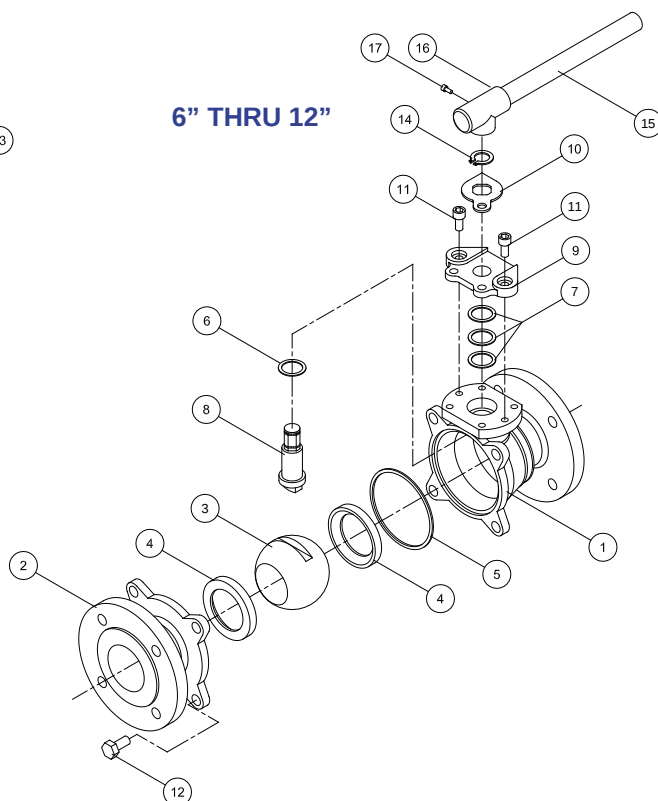


SIZE	A (in.)		B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G	H1 (in.)		H2 (in.)		ISO 5211	Weight (lbs)		TORQUE (in-lbs)	CV
	150#	300#							150#	300#	150#	300#		150#	300#		
6"	15.51	15.87	11.02	25.59	5.91	0.94	4.92	M12	2.50	2.36	1.28	1.32	F12	144	192	4700	6302
8"	17.99	19.76	13.39	33.46	7.80	1.26	5.51	M12	2.87	2.76	1.54	1.57	F12	269	344	10000	11670
10"	20.98	22.36	15.75	39.37	9.84	1.26	5.51	M16	3.86	3.74	2.44	1.97	F14	514	552	17800	23340
12"	24.02	25.51	Gear	39.37	11.81	1.26	5.51	M16	3.58	3.74	2.44	1.97	F14	673	1037	20000	29175

1/2" THRU 4"



6" THRU 12"



Item	Parts		Material	
	1/2" - 4"	6" - 12"	Stainless Steel	Carbon Steel
1	Body	Body	316 SS	Carbon Steel
2	End Cap	End Cap	316 SS	Carbon Steel
3	Ball	Ball	316 SS	Carbon Steel
4	Seat (2)	Seat (2)	15% Glass Filled Teflon	15% Glass Filled Teflon
5	Body Gasket	Body Gasket	Teflon/Graphoil	Teflon/Graphoil
6	Thrust Washer	Thrust Washer	Teflon	Teflon
7	Stem Packing (2)	Stem Packing (3)	Teflon/Graphoil	Teflon/Graphoil
8	Stem	Stem	316 SS	316 SS
9	Packing Gland	Packing Gland	304 SS	304 SS
10	Stop Plate	Stop Plate	304 SS	Carbon Steel
11	Gland Bolt (2)	Gland Bolt (2)	304 SS	Carbon Steel
12	Body Bolt	Body Bolt	304 SS	Carbon Steel
13	Handle	-	304 SS	Carbon Steel
14	Snap Ring	Snap Ring	304 SS	304 SS
15	-	Handle Tube	304 SS	Carbon Steel
16	-	Handle Head	304 SS	Carbon Steel
17	-	Handle Bolt	304 SS	Carbon Steel



Electric Actuator

120/230 VAC
12/24 VDC
NEMA 4/7
Positioners 4-20 mA
Reversing
Telemetry
Battery Back-up
Spring Return



Pneumatic Actuator

Double Acting
Spring Return
Solenoid Valves
Limit Switches
Positioners 3-15 PSI
Positioners 4-20 mA
Intelligent Positioner
Dec clutchable Manual Override



Manual Valves

Oval Handle
Spring Return
Stem Extensions
Fusible Link
Lock Device
Gear Operators

HOW TO ORDER

1"	9	3	3	R	T	150	BAVT
Size	Series	Body & End Material	Ball & Stem Material	Seat Material	Seal Material	End Style	Options
1/2"	900 Series 2 Piece Economy Full Port Flanged Ball Valve	1 - Carbon Steel	3 - 316 SS	R - 15% Glass PTFE	T - Teflon (PTFE)	150 - 150# Flange	BAVT - Vented Ball
3/4"		3 - 316 SS			G - Graphoil	300 - 300# Flange (Not available in 1 1/4")	FS - Fire Safe
1"							O2CB - O2 Clean/Bagged
1 1/4"							
1 1/2"							
2"							
2 1/2"							
3"							
4"							
6"							
8"							
10"							
12"							

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AVCO

Alloy Valves and Control

KNIFEGATE VALVES 6000 SERIES



Size

2" - 24"

End Connections

150# Lug

Port Type

Standard
V-Port
Deflector Cone

Body & Trim Materials

304 Stainless Steel
316 Stainless Steel
Cast Iron
Hastelloy

Seat Materials

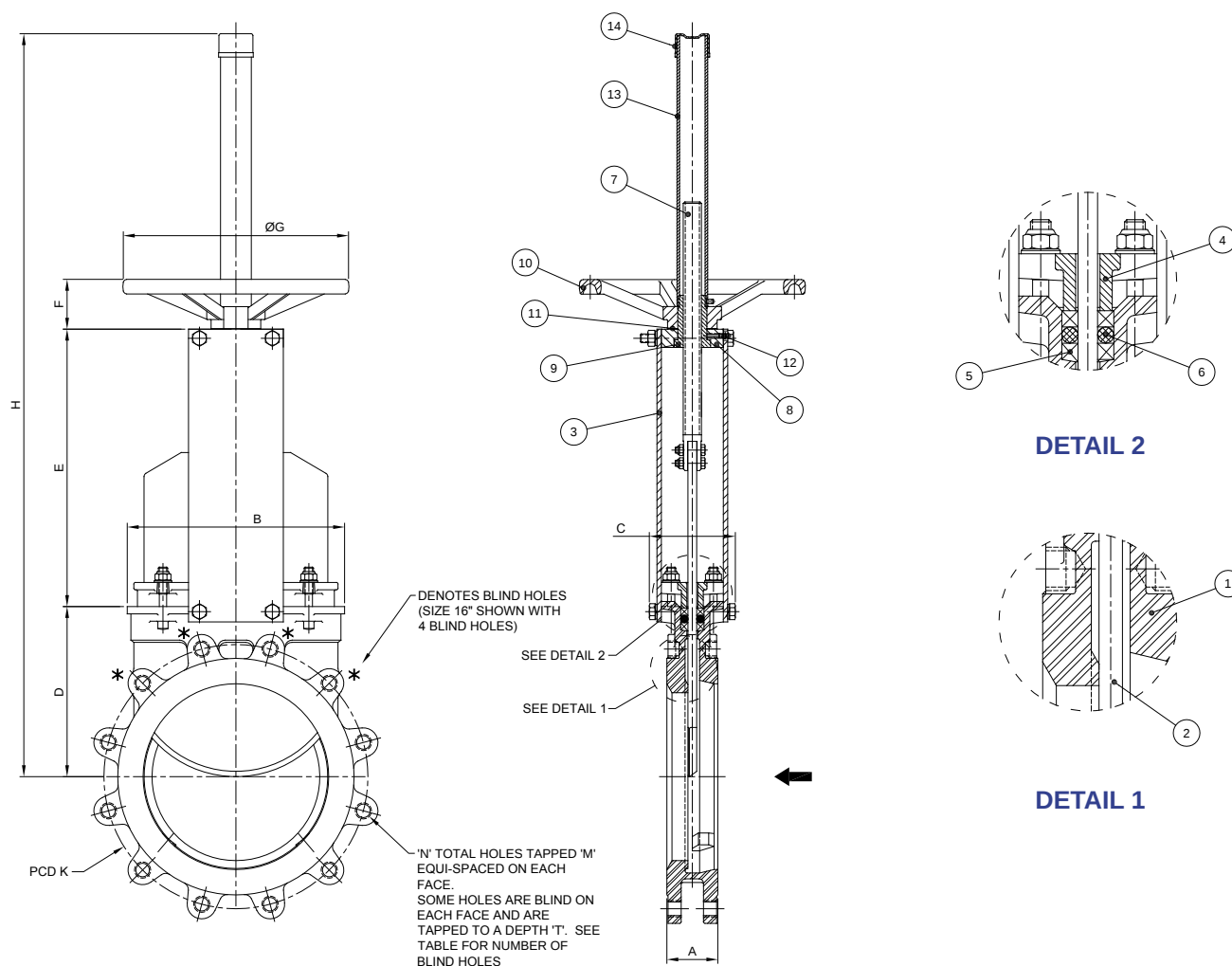
Metal
Buna
EPDM
Neoprene
Viton

Service Applications

Chemical
Food & Beverage
Mining
Power Plants
Pulp & Paper
Waste Water

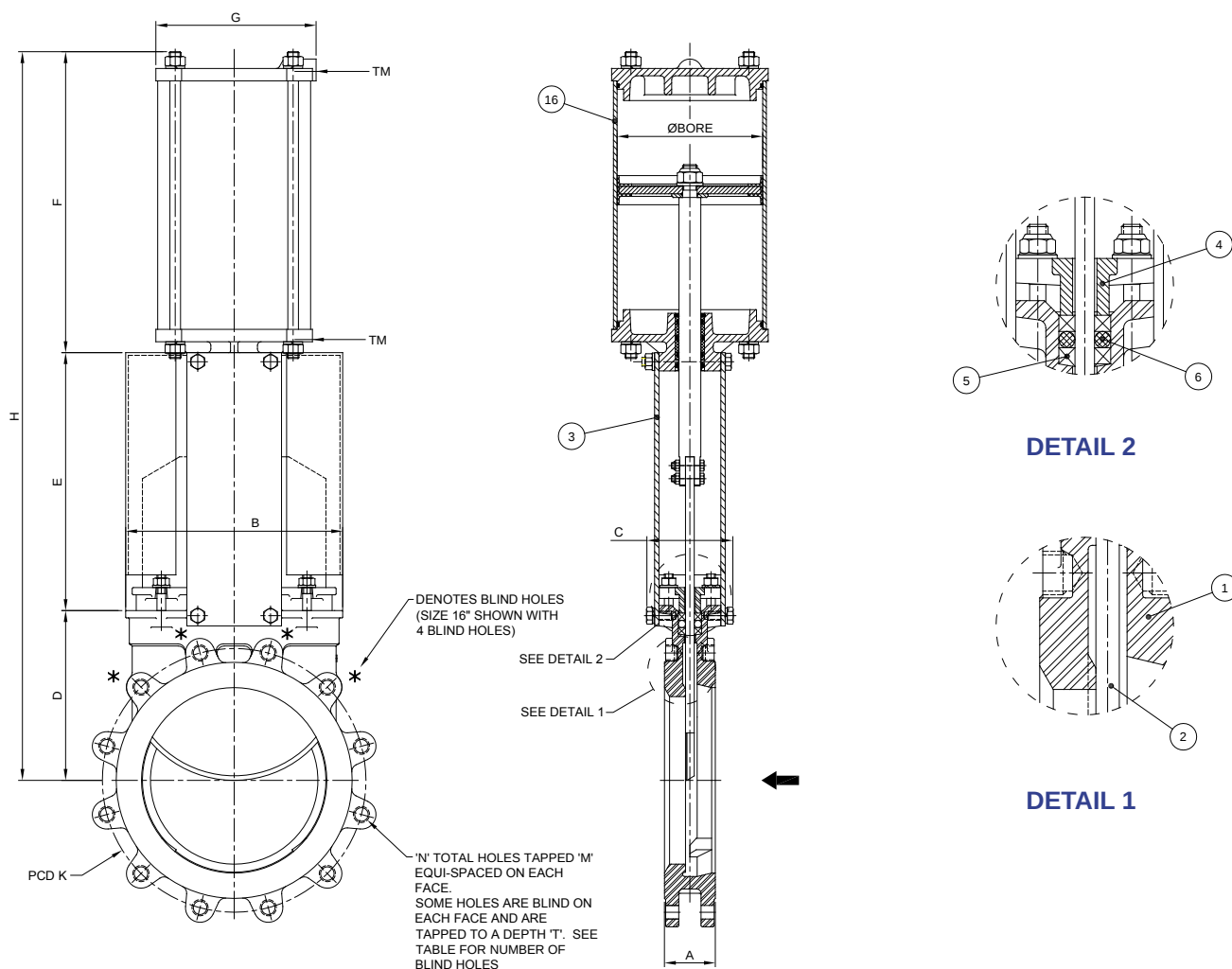
Applicable Standards

MSS-SP-81
TAPPI TIS 405-8



MANUALLY OPERATED

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H (in.)	K (in.)	M	N	T (in.)	No. OF BLIND HOLES	WEIGHT (lbs)
2"	1.9	4.9	3.5	3.9	5.6	1.9	7.9	17.2	4.75	5/8 UNC	4	0.31	2	17
3"	2.0	5.9	3.5	4.7	6.6	1.9	7.9	18.7	6.00	5/8 UNC	4	0.34	2	22
4"	2.0	6.7	3.5	5.5	7.6	1.9	7.9	20.5	7.50	5/8 UNC	8	0.34	2	27
5"	2.3	6.7	4.1	5.9	8.5	2.0	9.8	23.9	8.50	3/4 UNC	8	0.34	2	35
6"	2.3	7.7	4.1	6.5	9.6	2.0	9.8	25.5	9.50	3/4 UNC	8	0.47	2	44
8"	2.7	9.7	4.6	8.0	12.5	2.5	11.8	32.6	11.75	3/4 UNC	8	0.47	2	70
10"	2.7	11.7	4.6	9.2	13.9	2.5	11.8	39.1	14.25	7/8 UNC	12	0.47	4	103
12"	3.0	13.7	4.6	10.7	15.6	2.5	16.1	42.4	17.00	7/8 UNC	12	0.47	4	143
14"	3.0	15.5	7.6	12.3	18.3	2.7	16.1	50.3	18.75	1 UNC	12	0.59	4	209
16"	3.5	17.4	7.6	13.7	20.2	2.7	16.1	53.5	21.25	1 UNC	16	0.59	4	268
18"	3.5	19.0	7.8	15.0	21.7	2.7	21.7	59.4	22.75	1 1/8 UNC	16	0.59	6	352
20"	4.5	21.3	7.8	17.0	24.1	2.7	21.7	63.7	25.00	1 1/8 UNC	20	0.88	6	444
24"	4.5	25.1	7.8	19.7	27.4	2.7	21.7	74.1	29.50	1 1/4 UNC	20	0.88	6	638



PNEUMATICALLY OPERATED

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H (in.)	K (in.)	M	N	T (in.)	No. OF BLIND HOLES	TM (NPT)	BORE (in.)	WEIGHT (lbs)
2"	1.9	4.9	3.5	3.9	5.6	6.7	3.7	16.1	4.75	5/8 UNC	4	0.31	2	1/4	4	22
3"	2.0	5.9	3.5	4.7	6.6	8.0	3.7	19.5	6.00	5/8 UNC	4	0.34	2	1/4	4	26
4"	2.0	6.7	3.5	5.5	7.6	8.8	4.5	21.9	7.50	5/8 UNC	8	0.34	2	1/4	4	33
5"	2.3	6.7	4.1	5.9	8.5	10.5	5.5	25.0	8.50	3/4 UNC	8	0.34	2	1/4	5	46
6"	2.3	7.7	4.1	6.5	9.6	11.5	5.5	27.6	9.50	3/4 UNC	8	0.47	2	1/4	5	59
8"	2.7	9.7	4.6	8.0	12.5	14.0	6.9	34.5	11.75	3/4 UNC	8	0.47	2	1/4	6	101
10"	2.7	11.7	4.6	9.2	13.9	16.3	8.7	39.4	14.25	7/8 UNC	12	0.47	4	3/8	7	154
12"	3.0	13.7	4.6	10.7	15.6	18.2	8.7	44.6	17.00	7/8 UNC	12	0.47	4	3/8	8	195
14"	3.0	15.5	7.6	12.3	18.3	21.3	10.9	51.9	18.75	1 UNC	12	0.59	4	3/8	10	297
16"	3.5	17.4	7.6	13.7	20.2	23.2	10.9	57.1	21.25	1 UNC	16	0.59	4	3/8	10	356
18"	3.5	19.0	7.8	15.0	21.7	26.0	15.0	62.8	22.75	1 1/8 UNC	16	0.59	6	1/2	10	466
20"	4.5	21.3	7.8	17.0	24.1	28.0	15.0	69.0	25.00	1 1/8 UNC	20	0.88	6	1/2	12	638
24"	4.5	25.1	7.8	19.7	27.4	31.9	15.0	79.1	29.50	1 1/4 UNC	20	0.88	6	1/2	12	825

Features**Body**

- One piece integrally cast stainless steel body with reinforced ribs in larger diameters for extra body strength.
- Internal cast gate wedges and guides allow tighter shut-off.
- Full port design complying with MSS-SP-81 and TAPPI TIS 405-8
- Internal design reduces build up of solids which could affect valve operation.

Gate

- AISI 316 stainless steel gate as standard.
- Gates are polished and lapped both sides for improved sealing.
- Bottom edge of gates have a machined bevel to cut through solids and provide a tighter seal when closed.

Seat

- Unique design which mechanically locks the seat in the valve body using a stainless steel retainer ring.
- Resilient EPDM seat as standard with different materials available as options.

Packing

- Braided PTFE impregnated fibre and EPDM o-ring as standard for improved stem sealing.
- Long-life braided packing is available in a wide range of materials.

Stem

- Long life corrosion resistant stainless steel stem as standard.
- The hand wheel assembly includes a grease nipple for stem lubrication to give easier operation and enhance life expectancy.
- Hand wheel assemblies include a protective cover for the stem to prevent against the ingress of dust.

Actuators

- AVCO supplies actuators which are interchangeable and have standard mounting kits for easy site installation.

Yoke and Support Plates

- Made from Epoxy coated carbon steel with stainless steel available upon request.
- Compact design makes it extremely robust even in severe conditions.

Item	Parts	Material
1	Body	CF8M
2	Gate	AISI 316
3	Support	Carbon Steel
4	Packing Gland	CF8M
5	Packing	Braided PTFE
6	O-Ring	EPDM
7	Spindle	AISI 303
8	Yoke	Carbon Steel (2" thru 6") Cast Iron (8" thru 24")
9	Yoke Sleeve	Brass
10	Hand Wheel	Cast Iron
11	Friction Washer	Brass
12	Grease Nipple	Steel
13	Hood	Carbon Steel
14	Cap	Plastic
15	Nuts & Bolts	Steel 8.8/AISI 316
16	Pneumatic Cylinder	Aluminum/Steel



Electric Actuator

120 VAC
NEMA 4/7
Positioners 4-20 mA



Other Actuators

Pneumatic
Hydraulic
Double Acting
Solenoid Valves
Limit Switches
Positioners 4-20 mA
Intelligent Positioner



Manual Valves

Bevel Gear
Lever
Custom Extensions
Lock Out

HOW TO ORDER

1"	6	1	1	1	M	HT
Size	Series	Style	Port Type	Body Material	Seat Material	Options
2"	6000 Series Knifegate Valve	1 - Tappi	1 - Standard	1 - Cast Iron	M - Metal	HT - High Temperature Packing
3"		2 - Slurry	2 - V-Port 60o	3 - 254 SMO	RB - Resilient Buna	
4"		3 - Wafer	3 - V-Port 90o	4 - 304 SS	RE - Resilient EPDM	
5"		4 - Bi-Directional	8 - Deflector Cone	6 - 316 SS	RN - Resilient Neoprene	
6"		5 - Scavenger		7 - 317 SS	RV - Resilient Viton	
8"		6 - Knife Control		8 - 317L SS		
10"		8 - Double Gate		9 - Hastelloy		
12"				0 - Other		
14"						
16"						
18"						
20"						
24"						

AVCO

Alloy Valves and Control

KNIFEGATE VALVES 6500 SERIES



Size

4" - 16"

End Connections

Inlet - ANSI B16.5 Class 150
Outlet - Square Pattern or
transition to Class 150

Body and Trim Materials

316 Stainless Steel
Hastelloy

Seat Materials

Polyurethane

Options

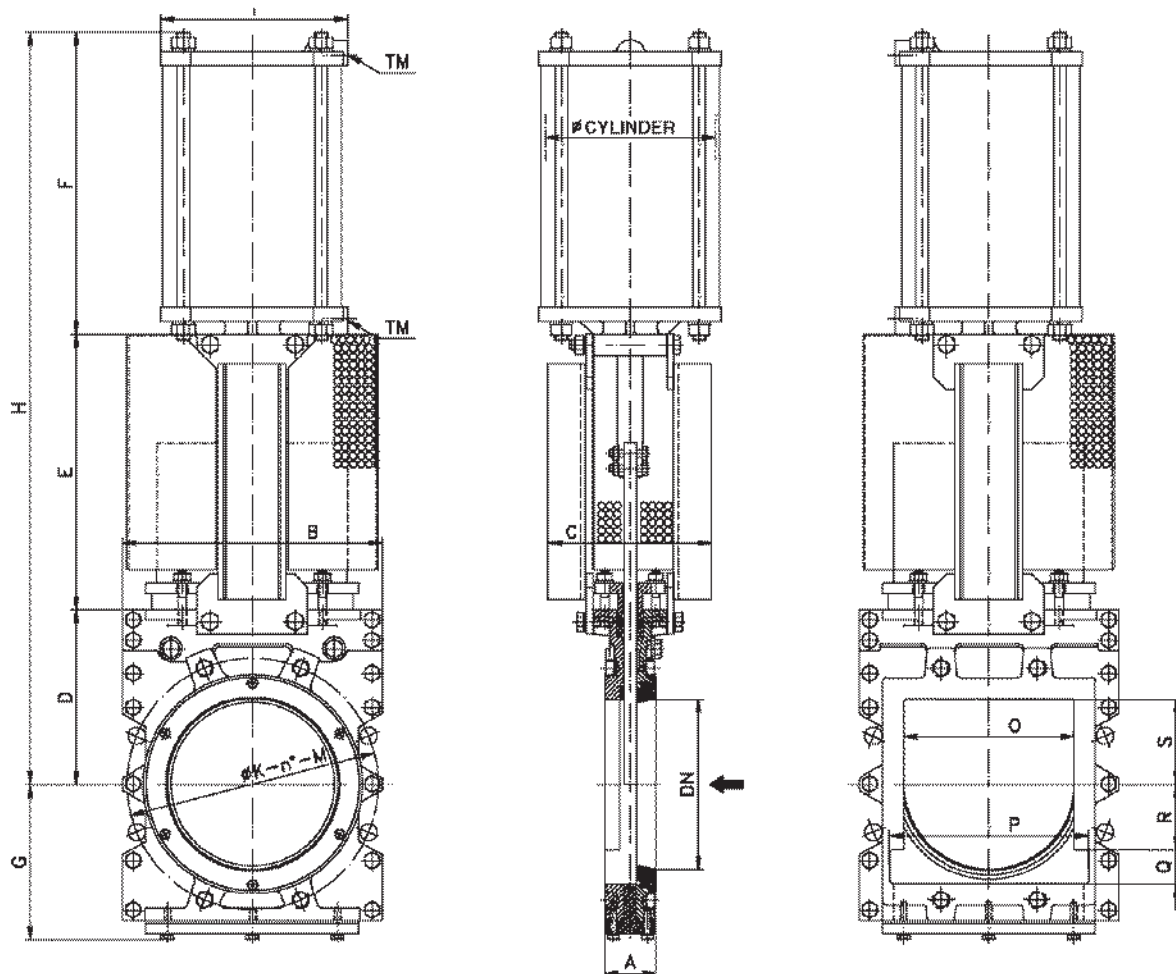
Travel Stops
Positioners
Solenoid Valves
Flow Regulators

Service Applications

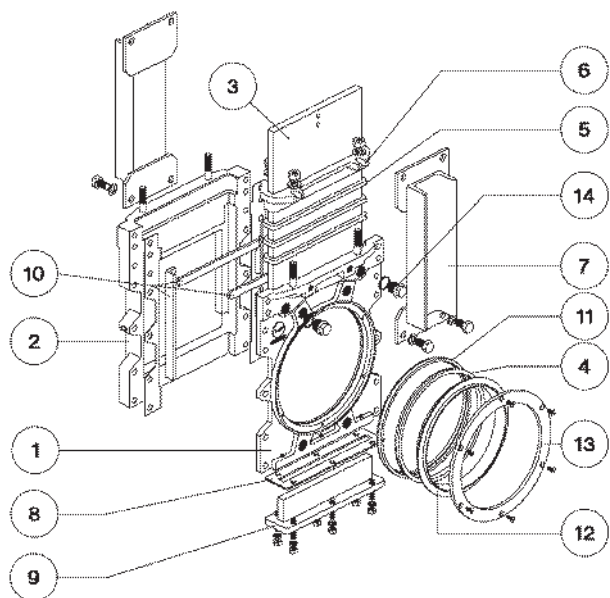
Chemical
Food & Beverage
Mining
Power Plants
Pulp & Paper
Waster Water
High Solid Content

Applicable Standards

DIR 98/37/CE
DIR 97/23/CE
DIR 94/9/CE



SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H (in.)	I (in.)	O (in.)	P (in.)	Q (in.)	R (in.)	S (in.)	Weight (lbs)	Standard Cylinder	Connection
4"	2.0	8.3	3.5	5.5	7.6	8.9	5.2	22.0	4.5	3.9	4.8	0.9	1.6	2.0	77	C100/115	1/4" G
5"	2.0	9.3	4.1	6.9	9.2	10.5	5.7	26.6	5.5	4.9	6.1	1.1	2.0	2.5	112	C125/143	1/4" G
6"	2.4	10.2	4.6	7.3	10.8	11.7	6.0	29.8	6.9	5.9	7.1	1.4	2.2	3.0	172	C160/162	1/4" G
8"	2.4	12.3	4.8	8.1	12.8	14.0	7.2	34.8	8.7	7.9	9.2	1.6	3.0	3.9	196	C200/212	3/8" G
10"	2.8	14.6	10.1	9.8	15.7	17.0	8.9	42.6	10.9	9.8	11.2	1.6	4.0	4.9	220	C250/265	3/8" G
12"	2.8	16.7	11.4	13.4	17.7	20.0	10.2	51.1	15.0	11.8	13.1	1.6	5.0	5.9	319	C300/315	1/2" G
14"	3.8	19.7	11.4	14.6	20.7	22.0	11.3	57.2	15.0	13.8	15.2	1.8	5.9	6.9	449	C300/362	1/2" G
16"	3.9	22.2	11.4	15.7	23.0	25.9	12.6	64.6	17.5	15.7	17.3	1.8	6.9	7.9	590	C350/418	3/4" G



Item	Parts	Material
1	Inlet Body (Round)	CF8M
2	Outlet Body (Square)	CF8M
3	Gate	AISI 316
4	Seat	EPDM
5	Packing	NT
6	Gland Follower	CF8M
7	Support Plates	Epoxy Coated Carbon Steel
8	Gasket	Rubber
9	Bottom Cover	CF8M
10	Sliders	Brass
11	Seat Ring	Bronze
12	Conic Ring	Bronze
13	Retainer Ring	AISI 316
14	Cap	AISI 316

Description

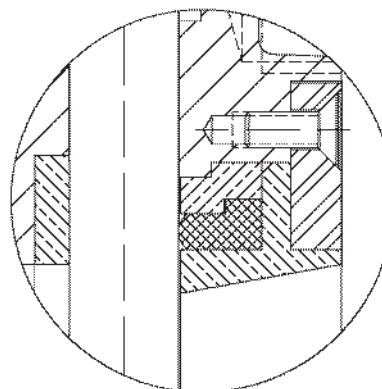
The AVCO 6500 series gate valve is designed for water/liquid applications with high solid content. It is particularly suitable for recycle applications such as junk or pulper sand traps, high consistency cleaners, silo outlets with solid material and other similar applications.

The two piece body with round inlet and square outlet assures jamming does not occur.

The seat is mounted between two bronze rings by a stainless steel retainer ring, thus giving a longer life.

The valve has a removable bottom cover to allow quick inspection of the gate and removal of any solid particle build-up.

The inlet connection has blind tapped holes to match ANSI class 150 flange patterns, whereas the outlet has a bespoke square bolt pattern (available upon request) or an engineered transition section to ANSI class 150.



Features**Body**

- Two part bolted body with reinforced ribs
- Replaceable gate guides
- Square outlet to avoid build up of contamination
- Bottom clean out port

Gate

- Standard stainless steel gate
- Polished both sides for greater seal and long life
- Increased thickness for longer life

Seat

- Sandwiched between metal rings for greater protection

Bottom Cover

- Easily removable
- Allows quick internal inspection
- Enables any solid build-up to be removed

HOW TO ORDER

4"	65	1	6	RE
Size	Series	Port Type	Body Material	Seat Material
4"	6500 Series 2 Piece Scavenger knifegate valve	1 - Standard	6 - 316 SS	RE - Resilient EPDM
5"				
6"				
8"				
10"				
12"				
14"				
16"				



These breather vents have many applications, including vacuum relief or pressure equalization on gear boxes, oil tanks or reservoirs. Common uses can be found on single acting cylinders or valves to prevent dirt and foreign particles from entering ports open to the atmosphere.

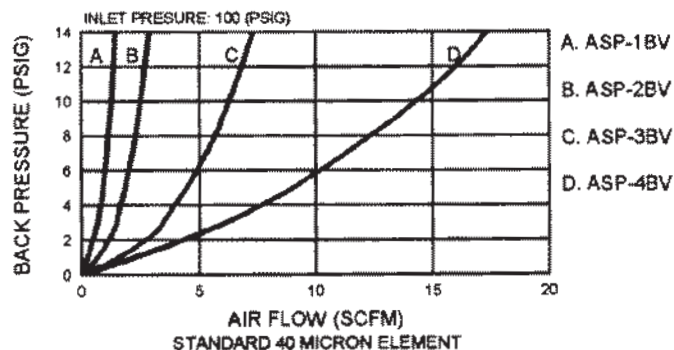
Units have a nickel plated steel insert. All have standard pipe thread fittings for quick assembly and removal for cleaning. The filter element within the standard breather vent is rated for 40 micron filtration and can also be obtained for 20 or 90 micron filtration on special order.

See performance charts for flow characteristics.

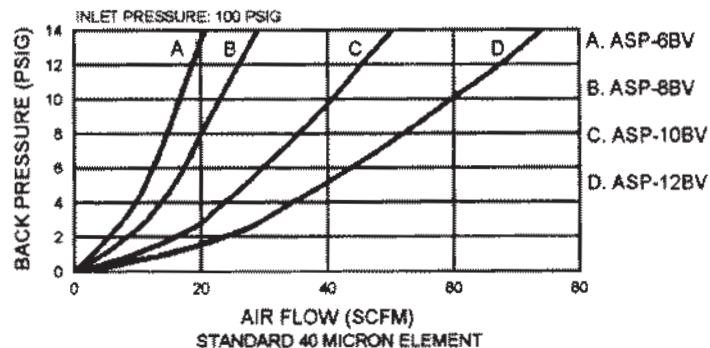
Maximum operating pressure: 150 PSI
Operating temperatures: 35°F to 300°F

part no. NPT	part no. BSP	thread size	overall length	dia.	weight lbs.
ASP-1BV	ASP-1BVBS	1/8"	7/16"	7/16"	.01
ASP-2BV	ASP-2BVBS	1/4"	5/8"	9/16"	.02
ASP-3BV	ASP-3BVBS	3/8"	3/4"	11/16"	.04
ASP-4BV	ASP-4BVBS	1/2"	7/8"	7/8"	.06
ASP-6BV	---	3/4"	1"	1 1/16"	.10
ASP-8BV	---	1"	1 5/16"	1 5/16"	.23
ASP-10BV	---	1 1/4"	1 13/32"	1 11/16"	.41
ASP-12BV	---	1 1/2"	1 1/2"	2"	.56

**ASP-1BV, ASP-2BV, ASP-3BV & ASP-4BV
BACK PRESSURE VS. AIR FLOW**



**ASP-6BV, ASP-8BV, ASP-10BV & ASP-12BV
BACK PRESSURE VS. AIR FLOW**



AVCO

Alloy Valves and Control

ACTUATORS ELECTRIC



DS Series

Quarter Turn Reversible
Compact Spring Return
90 in.lbs thru 445 in.lbs
Manual Override
On/Off/3 Position or Proportional Control
12v thru 230v



PL Series

Linear
Non-Spring Return
550 in.lbs thru 4400 in.lbs
Manual Override
Up To 4" stem travel
On/Off/Jog or Proportional Control
12v thru 230v



P Series

Quarter Turn
Non-Spring Return
300 in.lbs thru 40500 in.lbs
Manual Override (optional)
On/Off/Jog or Proportional Control
12v thru 230v



PS Series

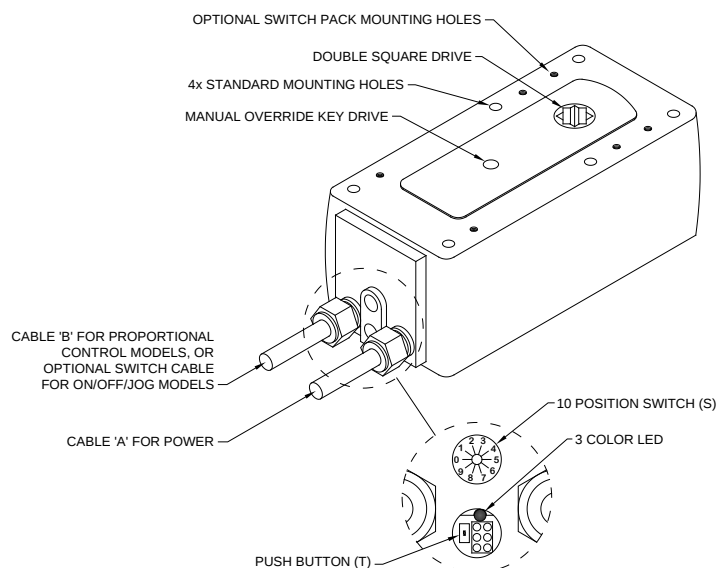
Quarter Turn Reversible
Spring Return
450 in.lbs thru 2300 in.lbs
Manual Override (optional)
On/Off/Jog or Proportional Control
12v thru 230v

DS Series

The AVCO DS Series is a compact reversible electric spring return actuator. Stainless steel and sintered metal gears are contained in a compact, robust aluminum housing adhering to NEMA 4/IP66. It has direct coupling capabilities on dampers with 12mm or 16mm square shafts or can be used with brackets on almost any quarter turn product i.e. ball or butterfly valves. The shaft has 95 degree rotation including 5 degree pre-tension. Basic manual override is standard with the addition of a handwheel being optional.

Key Features

- Universal voltage (24 thru 230v AC/DC)
- Site adjustable motor run times
- Site selectable spring return times
- Proportional, On/Off and Jog (3 position) control with or without spring return
- 100% overload protection
- Integral heater for temperatures down to -40°F
- Integral safety temperature sensor
- Integral design for field selection of run time and spring speed
- Automatic voltage switching
- Maintenance free



Model	Torque (in.lbs)	Voltage	Motor Run Time (seconds)	Spring Return (seconds)	Control	Available Options
ACT-EL-DS045	45	24 thru 230v AC/DC	3, 15, 30, 60 or 120 @ 90°	3 or 10 @ 90°	On/Off, Jog or Proportional	EMT Enclosure 1/2" Conduit Entry Terminal Strips Man. Override Handwheel External Auxiliary Switches ISO 5211 Conversion Bracket *Not all combinations possible
ACT-EL-DS090	90	24 thru 230v AC/DC	3, 15, 30, 60 or 120 @ 90°	3 or 10 @ 90°	On/Off, Jog or Proportional	
ACT-EL-DS133	133	24 thru 230v AC/DC	3, 15, 30, 60 or 120 @ 90°	3 or 10 @ 90°	On/Off, Jog or Proportional	
ACT-EL-DS265	265	24 thru 230v AC/DC	40, 60, 90, 120 or 150 @ 90°	20 @ 90°	On/Off, Jog or Proportional	
ACT-EL-DS445	445	24 thru 230v AC/DC	40, 60, 90, 120 or 150 @ 90°	20 @ 90°	On/Off, Jog or Proportional	

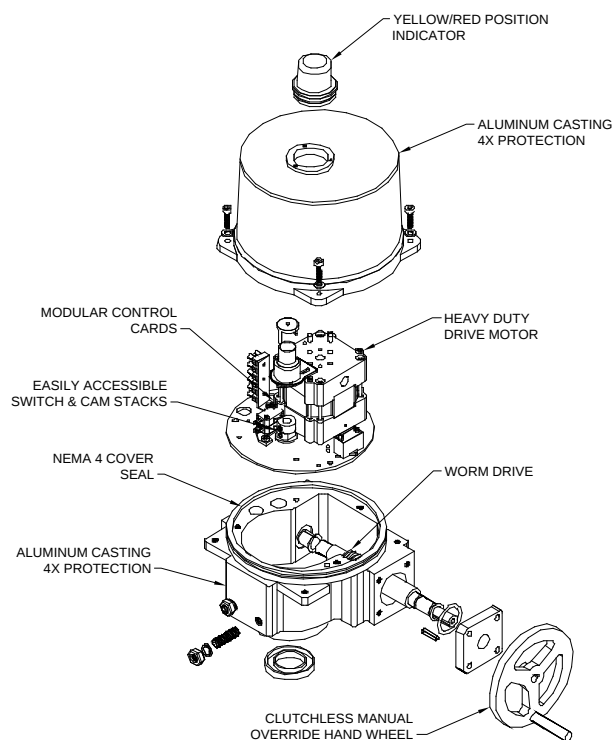
Alloy Valves and Control

P Series

The AVCO P Series is an electric actuator. The planetary epicyclic gear design is contained in a robust cast aluminum housing adhering to NEMA 4/4X to resist environmental attack. The internal modular design eliminates excess wiring and allows for simple field conversion between 2 position and proportional control. It has direct coupling capabilities with many valves via the ISO 5211 mount pad, culminating in a lower profile assembly. The shaft gives 90 degree rotation with a +/- 3 degree adjustment and its position is clearly shown on a raised indicator for quick visual verification. Manual override is optional and is achieved without the need for levers to engage the override function.

Key Features

- Patented self locking drive
- Proportional, On/Off and jog control
- Internal heater
- Dual SPDT auxiliary switches
- Internal motor thermal protection
- 3/4" NPT wiring ports (2)
- Positive mechanical stops
- Operating range (ambient) -22°F to 150°F



Model	Torque (in.lbs)	Voltage	Motor Run Time (seconds)	Spring Return (seconds)	Control	Available Options
ACT-EL-P0300	300	12/24v AC/DC, 120/230v AC/DC	12	-	On/Off, Jog or Proportional	Basic Local Control Mid-Level Local Control Full Local Control Chain Wheel Override Additional Auxiliary Switches Potentiometric Feedback No Manual Override *Not all combinations possible or available for all actuators - consult AVCO
ACT-EL-P0445	445	12/24v AC/DC, 120/230v AC/DC	12	-	On/Off, Jog or Proportional	
ACT-EL-P0800	800	12/24v AC/DC, 120/230v AC/DC	15	-	On/Off, Jog or Proportional	
ACT-EL-P1300	1335	12/24v AC/DC, 120/230v AC/DC	22	-	On/Off, Jog or Proportional	
ACT-EL-P3500	3560	12/24v AC/DC, 120/230v AC/DC	16	-	On/Off, Jog or Proportional	
ACT-EL-P4400	4450	12/24v AC/DC, 120/230v AC/DC	22	-	On/Off, Jog or Proportional	
ACT-EL-P5800	5785	12/24v AC/DC, 120/230v AC/DC	28	-	On/Off, Jog or Proportional	
ACT-EL-P8900	8900	120/230v AC/DC	46	-	On/Off, Jog or Proportional	
ACT-EL-P13500	13350	120/230v AC/DC	46	-	On/Off, Jog or Proportional	
ACT-EL-P17500	17800	120/230v AC/DC	58	-	On/Off, Jog or Proportional	
ACT-EL-P22000	22250	120/230v AC/DC	58	-	On/Off, Jog or Proportional	
ACT-EL-P26500	26700	120/230v AC/DC	58	-	On/Off, Jog or Proportional	
ACT-EL-P31000	31150	120/230v AC/DC	58	-	On/Off, Jog or Proportional	
ACT-EL-P40500	40500	120/230v AC/DC	80	-	On/Off, Jog or Proportional	

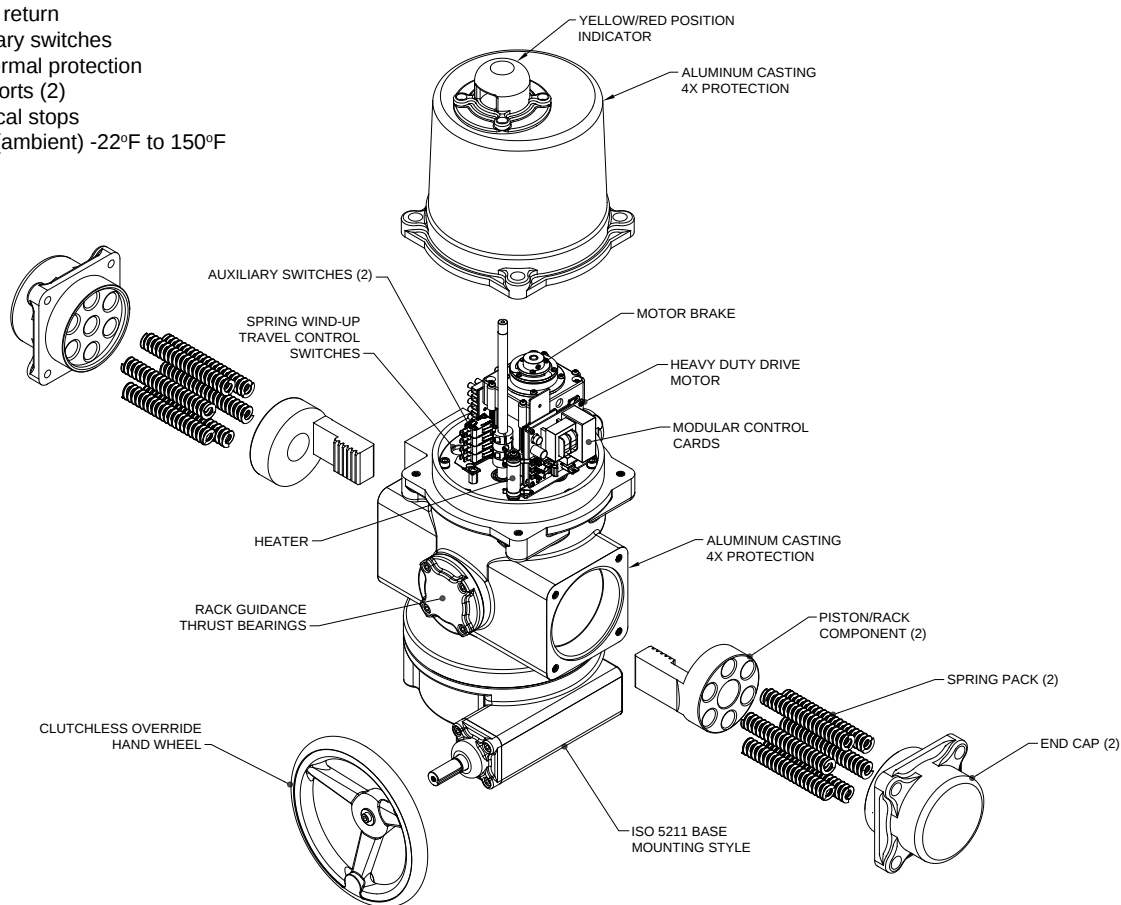
Alloy Valves and Control

PS Series

The AVCO PS Series is a reversible electric spring return actuator. The mechanical drive train is contained in a robust cast aluminum housing adhering to NEMA 4/4X to resist environmental attack. The internal modular design eliminates excess wiring and allows for simple field conversion between 2 position and proportional control. It has direct coupling capabilities with many valves via the ISO 5211 mount pad, culminating in a lower profile assembly. The shaft gives 90 degree rotation with a ± 2 degree adjustment and its position is clearly shown on a raised indicator for quick visual verification. Manual override is optional and is achieved without the need for levers to engage the override function.

Key Features

- Patented self locking drive
- Proportional, On/Off and jog control
- Internal heater
- Adjustable spring return
- Dual SPDT auxiliary switches
- Internal motor thermal protection
- 3/4" NPT wiring ports (2)
- Positive mechanical stops
- Operating range (ambient) -22°F to 150°F



Model	Torque (in.lbs)	Voltage	Motor Run Time (seconds)	Spring Return (seconds)	Control	Available Options
ACT-EL-PS0450	450	12/24v AC/DC, 120/230v AC/DC	7 or 9	3	On/Off, Jog or Proportional	No Manual Override
ACT-EL-PS1150	1150	12/24v AC/DC, 120/230v AC/DC	7, 8 or 9	3 or 8	On/Off, Jog or Proportional	
ACT-EL-PS1750	1750	12/24v AC/DC, 120/230v AC/DC	11 or 13	3 or 12	On/Off, Jog or Proportional	
ACT-EL-PS2300	2300	12/24v AC/DC, 120/230v AC/DC	14 or 17	3 or 12	On/Off, Jog or Proportional	

NOTE: Motor run time and spring return is dependant upon voltage requirements and is not selectable

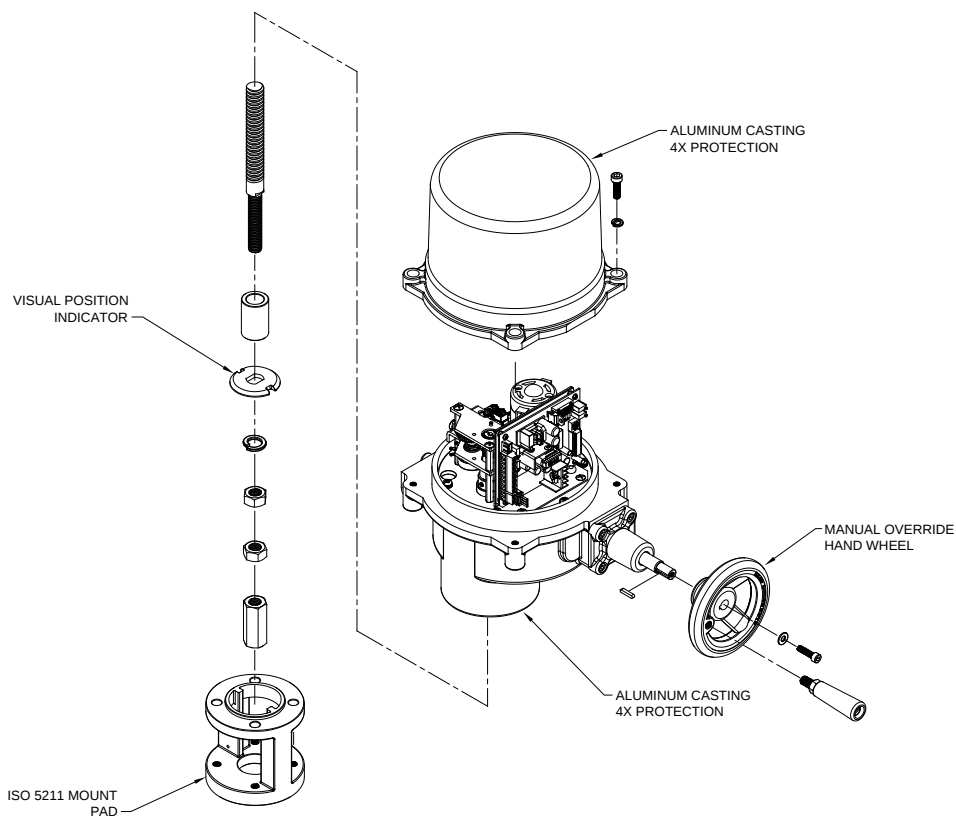
Alloy Valves and Control

PL Series

The AVCO PL Series is a linear electric actuator. The mechanical drive train is contained in a robust cast aluminum housing adhering to NEMA 4/4X to resist environmental attack. The internal modular design eliminates excess wiring and allows for simple field conversion between 2 position and proportional control. It has direct coupling capabilities with many valves via the ISO 5211 mount pad and easily adapts to most rising stem designs. The stem travel is controlled using integrated torque switches and its position is clearly shown on the stem position indicator for quick visual verification. Manual override is standard and is achieved without the need for levers to engage the override function.

Key Features

- Patented self locking drive
- Proportional, On/Off and jog control
- Internal heater
- Internal motor thermal protection
- 3/4" NPT wiring ports (2)
- Operating range (ambient) -22°F to 150°F

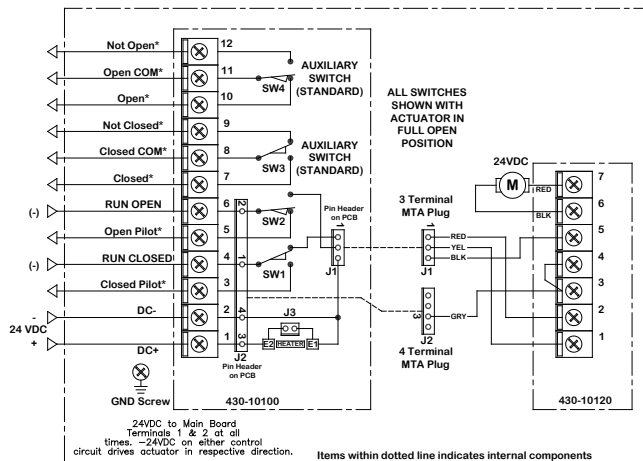


Model	Torque (in.lbs)	Voltage	Motor Run Time (seconds)	Stroke (mm)	Control	Available Options
ACT-EL-PL0550	550	12/24v AC/DC, 120/230v AC/DC	78, 148 or 201	20, 38 or 50	On/Off, Jog or Proportional	None
ACT-EL-PL1100	1100	12/24v AC/DC, 120/230v AC/DC	83, 155 or 205	20, 38 or 50	On/Off, Jog or Proportional	
ACT-EL-PL2200	2200	12/24v AC/DC, 120/230v AC/DC	166, 224, 338 or 450	38, 50, 75 or 100	On/Off, Jog or Proportional	
ACT-EL-PL4400	4400	12/24v AC/DC, 120/230v AC/DC	162, 212, 314 or 416	38, 50, 75 or 100	On/Off, Jog or Proportional	

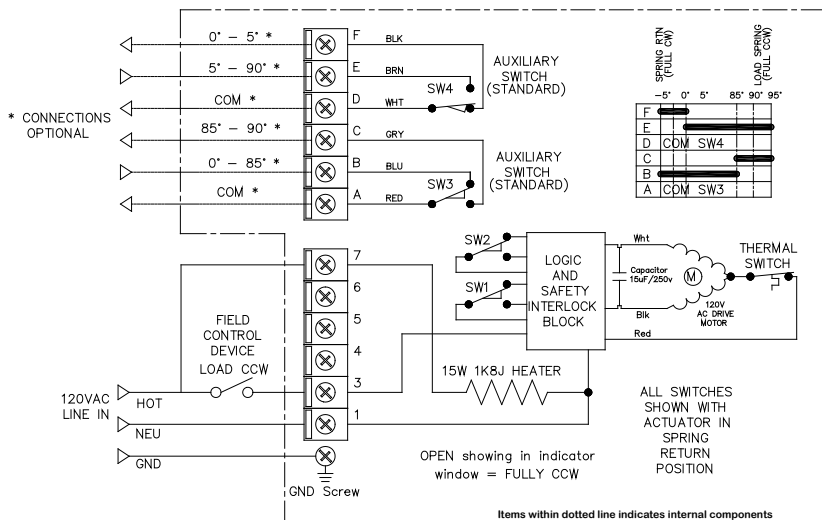
NOTE: Motor run time is dependant upon stroke length

Wiring Diagrams

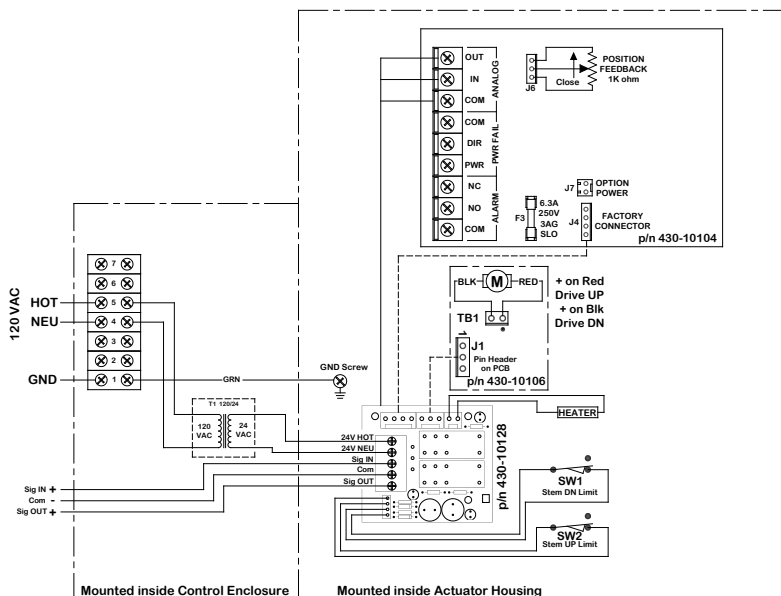
Wiring diagrams are available for all actuators in all combinations and can be freely sourced by contacting AVCO directly. Some samples are shown below:



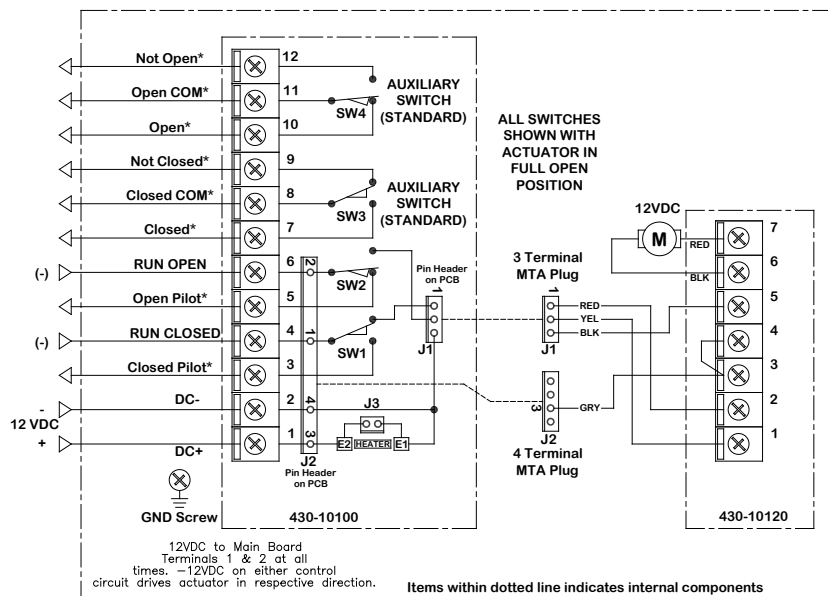
P Series 24v with Jog Control



PS Series 120v with On/Off Control



PL Series 120v with Proportional Control



P Series 12v with On/Off Control

Further Information

Product specific datasheets are available from AVCO for all actuators contained within this literature giving detailed information for all variations of each product. We also carry installation and operation manuals which we can provide prior to orders being placed to expedite project planning to better serve our customers' needs.



Alloy Valves and Control



FEATURES

- ☒ Micro seat finish to ensure no reduced pressure creep
- ☒ Diaphragm operation
- ☒ Relieving style standard
- ☒ Three position non-rising adjustment knob; push to lock, pull to adjust, detach to make tamper resistant
- ☒ Easily panel mounted
- ☒ Tamper-proof cap included
- ☒ 20 micron filter

OPTIONS

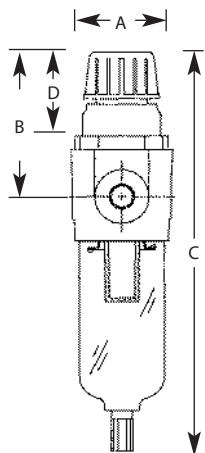
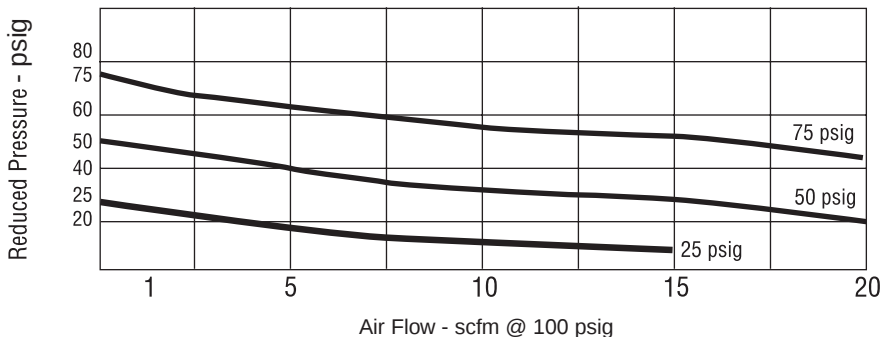
add suffix to part number in alpha and numeric order

- B 2-Position Mechanical Lockout Knob B742 B
- G Gauge (0-160 psi) B742 G
- I Instrument pressure B742 I
- 3 to 20 psi Adjustment
- J Overnight drain plastic bowl. . B742 J
- K Overnight drain metal bowl ... B742 K
- L Low pressure B742 L
- 3 to 60 psi adjustment
- M Metal bowl B742 M
- N Non-relieving B742 N
- P Panel mount B742 P
- Z Piston drain B742 Z
- 5 5 Micron element B742 5

SPECIFICATIONS

- Body
 - ☒ Zinc, black coated
- Bonnet
 - ☒ Glass filled nylon
- Polycarbonate Bowl
 - ☒ Max. pressure 150 psig
 - ☒ Operating temperature range 40°F to 125°F
- Metal Bowl aluminum
 - ☒ Max. pressure 250 psig
 - ☒ Operating temperature range 40°F to 175°F
- Piston Drain metal
- Note: limits bowl temperature and pressure rating
 - ☒ Max. pressure 150 psig
 - ☒ Operating temperature range 40°F to 175°F
- Body nickel plated zinc
- Baffle plastic
- Seals Buna N
- Elements
 - ☒ 20 micron sintered bronze
 - ☒ 5 micron sintered bronze

PERFORMANCE CHARACTERISTICS



DIMENSIONS

PIPE SIZE	MODEL NO.	MAX. FLOW SCFM	BOWL CAPACITY	DIMENSIONS (INCHES)				WEIGHT (LBS.)
				A	B	C	D	
1/8"	B741	20	1 oz.	1 5/8	2 3/16	6 1/4	1 1/4	.6
1/4"	B742	20	1 oz.	1 5/8	2 3/16	6 1/4	1 1/4	.6

Alloy Valves and Control



FEATURES

- ☒ 40 micron element
- ☒ Manual drain
- ☒ Relieving regulator
- ☒ Zero creep, machined brass valve seat
- ☒ 3-position, non-rising adjustment knob
- ☒ Tamper-proof cap included

OPTIONS

add suffix to part number in alpha and numeric order

- F Internal float drain B752 F
- G Gauge B752 G
- H High pressure B752 H
10 to 250 psi adjustment
- I Instrument pressure B752 I
3 to 20 psi adjustment
- J Overnight drain plastic bowl B752 J
- K Overnight drain metal bowl . B752 K
- L Low pressure B752 L
3 to 60 psi adjustment
- M 6 oz. metal bowl without sight B752 M
- P Panel mount B752 P
- T Tee handle adjustment B752 T
- W 6 oz. metal bowl with sight... B752 W
- 5 5 micron element B752- 5
- 3 3 micron element B752- 3

SPECIFICATIONS

WARNING! Polycarbonate plastic bowls could rupture if exposed to incompatible chemicals whether inside or outside the bowl. If such chemicals are present, use a metal bowl.

Body

- ☒ Black coated aluminum

Bonnet

- ☒ Glass filled nylon

Seals

- ☒ Buna N Elastomer standard

Polycarbonate Bowl

- ☒ Max. pressure 150 psi
- ☒ Operating temperature range 40°F to 125°F

Metal Bowl

- ☒ Zinc, black epoxy coated
- ☒ Max. pressure 200 psi
- ☒ Operating temperature range 40°F to 175°F

Metal Bowl with Sight Gauge

- ☒ Max. pressure 250 psi
- ☒ Operating temperature range 40°F to 175°F

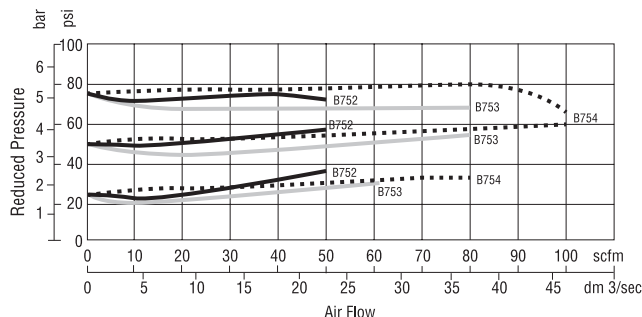
Internal Float Drain

plastic, metal, brass, Buna N seal

Note: limits bowl temperature and pressure rating

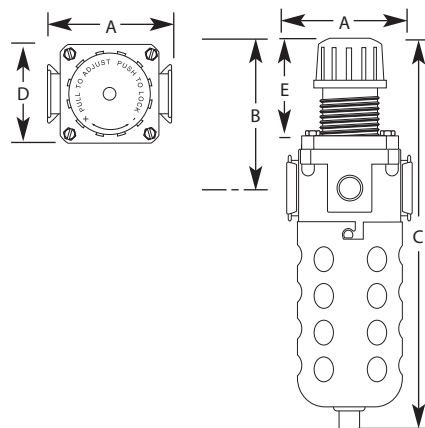
- ☒ Operating pressure range 30 to 175 psi
- ☒ Operating temperature range 40°F to 125°F

PERFORMANCE CHARACTERISTICS



DIMENSIONS

PIPE SIZE	MODEL NO.	MAX. FLOW SCFM	BOWL CAPACITY	DIMENSIONS (INCHES)					WEIGHT (LBS.)
				A	B	C	D	E	
1/4"	B752	50	5 oz.	2 1/32	4 5/32	9 3/4	2 1/4	2 3/4	1.75
3/8"	B753	80	5 oz.	2 1/32	4 5/32	9 3/4	2 1/4	2 3/4	1.75
1/2"	B754	100	5 oz.	2 1/32	4 5/32	9 3/4	2 1/4	2 3/4	1.75



Overview

The AVCO ALS210 Limit Switch is a compact mini type limit switch providing a simple cost-effective solution for valve and pneumatic actuator monitoring. The switches are housed in a weather-proof die-cast aluminum body and is compatible with ISO 5211 mount pad and NAMUR shafts.



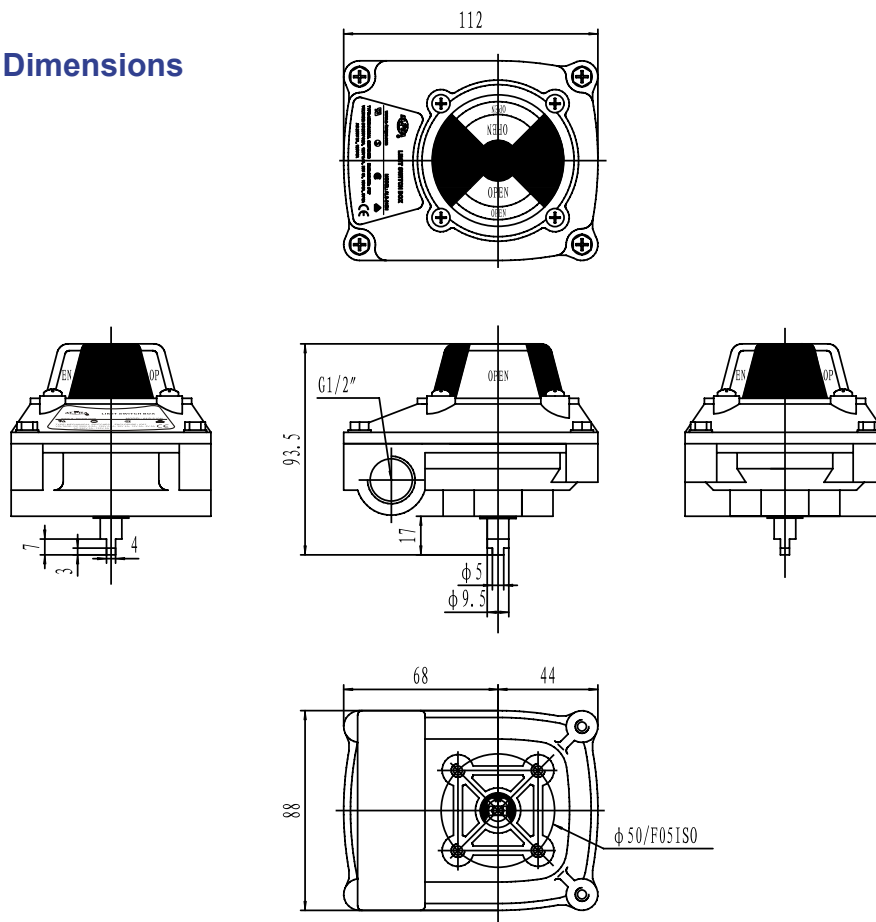
Features & Specification

- Powder Coated Die-Cast Body
- Multi-view Visual Position Indicator
- Weather Proof to IP67
- Quick Set Cam
- Multi-point Terminal Strip
- Dual Cable Entries (1/2" NPT)
- Captive Cover Bolts
- NAMUR Shaft & ISO 5211 Mount Pad
- Mechanical Switches (5A 125-250VAC)
- 4 thru 185°F Operating Temperature
- NAMUR Mount Brackets Available

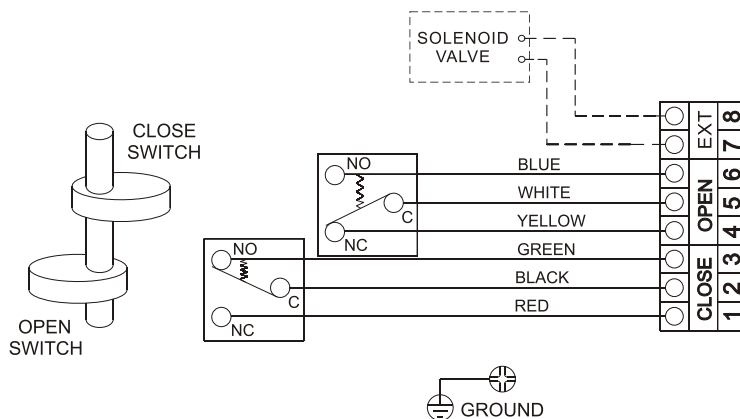
Item	Parts	Material
1	Cover	Die-Cast Aluminum
2	Body	Die-Cast Aluminum
3	Shaft	Stainless Steel
4	Indicator Cover	Polycarbonate
5	Indicator	ABS/Polycarbonate
6	Switch	Mechanical
7	Terminal Strip	Polycarbonate
8	Cam	Polycarbonate
9	Spring	Stainless Steel
10	Bolts	Stainless Steel
11	Shaft O-ring	NBR
12	Body O-ring	NBR
13	Indicator O-ring	NBR
14	Bushing	Bronze
15	Earth Lug	Stainless Steel
16	E-ring	Stainless Steel



Dimensions



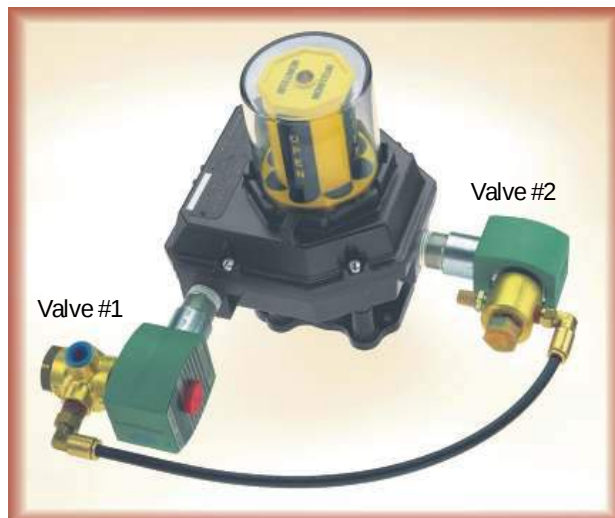
Wiring Diagram (2 SPDT)



A Full Three-Position Control Package with End-Position Signal Feedback

The AVCO D3 Three Position Control Package is a unique product incorporating specially configured solenoid valves and control switches designed for three-position operation. The package is used with rotary double-acting pneumatic actuators and allows users to transform any valve into a sophisticated three position control device.

The unit is available in General Purpose, Intrinsically Safe and Explosion-Proof configurations. In addition to the control switches, two switches are included for valve position monitoring.



Applications:

180 Degree / Three Position Valves - Set any mid position from any point in the valve cycle without a positioner.

Dribble Control - By utilizing the mid set point, one is able to reduce the flow rate during a filling operation to more accurately and efficiently fill a vessel.

Note: When fail-closed is a requirement, Moniteur recommends our Dribble Control package developed for spring-return actuators.

Hazardous Area Rating Available:

Class 1, Division 1 & 2, Group C & D

Class 2, Division 1 & 2, Group E, F, G

General Purpose Version Available

Features

Fully Adjustable Mid Point

Dual 3-way Solenoid Design Improves Valve Position Accuracy by Pressurizing Both Ports in the Mid Position

Additional Limit switches Provided as Standard to Monitor End Points (open/closed)

Factory Assembled and Tested, Saving Users and Assemblers Time and Money

Explosion-proof Version Available Rated Nema 4, 4x, 7, 9

General Purpose Version Available Rated Nema 4, 4x

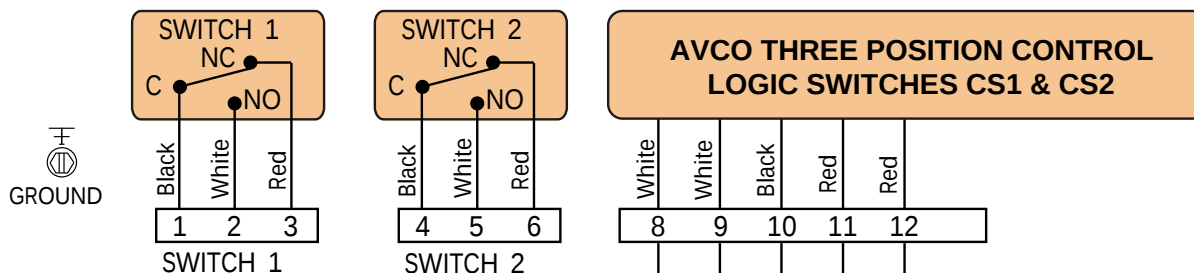
Packages for double-acting actuators, including two 3-way NO solenoid valves

Rating	Package Model No.	3-Way Solenoid (2) (ASCO [®])	Cv*	Solenoid Voltage	Solenoid Body Material
General Purpose	D3D-FMYB-51B1	8320G194	0.12	120 V AC-60Hz	Brass
Intrinsically Safe	D3D-FMYB-53B5	WBIS8314A300	0.08	24 VDC - IS	Brass
Explosion-Proof	D3D-AMYB-51B1	EF8320G194	0.12	120 V AC-60Hz	Brass

** For larger actuators, solenoid valves with higher flow rates will be required. Contact AVCO with your requirements.
ASCO is a trademark of the Automatic Switch Company

Alloy Valves and Control

Wiring Diagram



Requirements

Three independent signals are required for the closed, mid and open positions. These signals also provide power to the solenoid valves through the control logic switches. These signals must be electrically isolated and share a common ground. Two low signal lines need to be provided for the solenoids as well, as shown in the wiring diagram to the right.

Double-acting pneumatic actuator with a clean air source.

Signal Open Pos. (+)
Signal Mid Pos. (+)
Signal Closed Pos. (+)
Sol. #2 Signal Low (-)
Sol. #1 Signal Low (-)

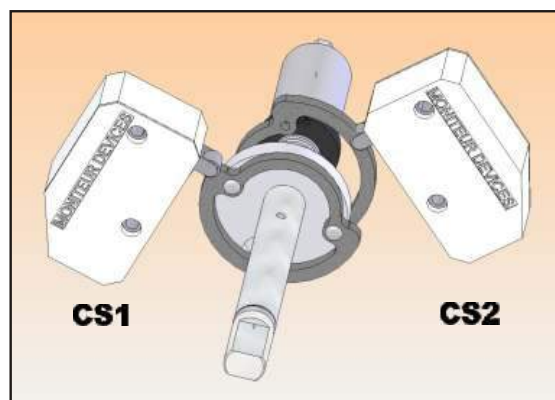
THREE POSITION CONTROL CONNECTION

Installation Instructions



NOTE: Operation Instructions depict an actuated package set for clockwise to close and counterclockwise to open operation.

- Mount limit switch package to the rotary actuator with an appropriate mounting bracket.
- Connect power lines and clean filtered air to proper positions. Ensure that all air connections are tight and all electrical connections are secured at their proper terminal points.
- The unit is designed to accept three control signals - one to open the valve, one to close it, and one to move to mid position.
- The valve should be in the fully closed position with power sent to terminal 10.
- The valve should be in the mid position with power sent to terminal 11. The logic switches marked "CS1" and "CS2" are both used to set the mid position with their custom cams - "CS1" for setting the mid position when the valve is rotating clockwise from the open position and "CS2" for setting the mid position when the valve is rotating counter-clockwise from the closed position. See the table below to understand how the logic switches need to be activated for each position.
- The valve should be in the fully open position with power sent to terminal 12.



CUSTOM CONTROL CAM CONFIGURATION

Flow Positions

Stage No.	Flow Condition Required	Switch CS1	Switch CS2
1	Closed	Tripped	Not Tripped
2	Mid	Tripped	Tripped
3	Open	Not Tripped	Tripped



NOTE: To hold the mid position, both logic switches must be tripped (CS1 and CS2)

Alloy Valves and Control

Ideal Solution for Dribble Control

The Moniteur DSS Two Stage Package is a complete unit incorporating two solenoid valves and specially configured limit switches designed for two-stage operation. The package mounts to most rotary pneumatic actuators and allows users to transform an automated valve into a two stage shutoff package. The most common applications are:

- **Filling or metering vessels.** By being able to reduce the flow rate at a given point during a filling operation, it is possible to more accurately and efficiently fill a vessel.
- **Flow dampening.** With the two stage package, valves can be partially closed and then completely closed later. This dramatically reduces shock to pipes and valves due to water hammer.

Requirements

- Two voltage sources to power both solenoid valves (#1 and #2).
- Contact logic (2), which may be provided by flow meters, scales, level sensors, or PLCs
- Spring return pneumatic actuator with a clean air source

Features

- Dual flow positions for filling vessels or flow dampening
- Fully adjustable set points allow the user flexibility to determine proper stage switching
- Open / Closed limit switches provide additional valve end point monitoring
- Factory assembled and tested, saving users and assemblers time and money

Ordering Information

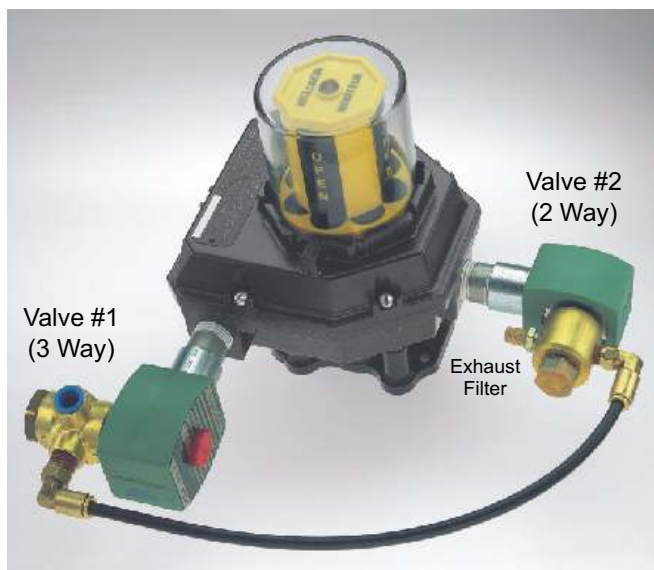
Nema Rating	Package Model No.*	3-Way Solenoid (ASCO®)	2-way solenoid (ASCO®)	Solenoid Voltage	Solenoid Body Material
7,9	DSS-AMyb-51B1	EF8320G184	EF8262G93	120 VAC-60Hz	Brass
4,4x	DSS-FMyb-51B1	8320G184	8262G93	120 VAC-60Hz	Brass
7,9	DSS-AMyb-51B3	EF8320G184	EF8262G93	24 VDC	Brass
4,4x	DSS-FMyb-51B3	8320G184	8262G93	24 VDC	Brass
IS	DSS-FMyb-53B5	WBIS8314A300	WBIS8314A300	24VDC / Intrinsically Safe	Brass

* Custom packages to your specifications available on request

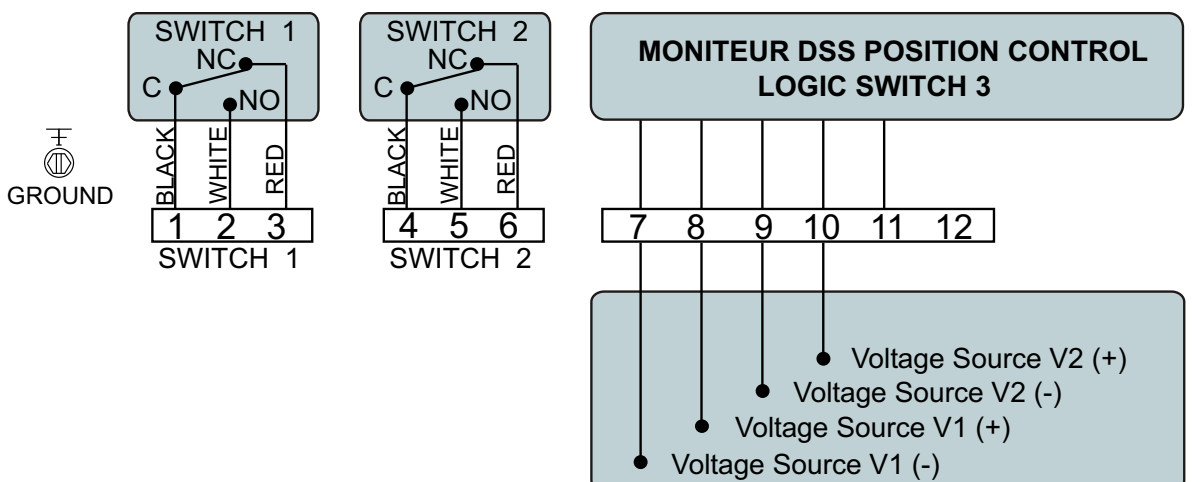
Standard Solenoid Valve Porting Configuration

3-Way Solenoid	Cv	Air Supply Port	Air to Actuator Port	To 2-way Exhaust Port	2-Way Solenoid	Cv	From 3-way Exhaust Port	Filter Exhaust Port
8320G184	0.12	2	1	3	8262G93	0.15	IN	OUT

** For larger actuators, solenoid valves with higher flow rates will be required. Contact Moniteur Devices with your requirements.
 ASCO is a trademark of the Automatic Switch Company



Wiring Diagram



TWO STAGE DRIBBLE CONTROL CONNECTIONS

Installation Procedure / Sequence of Operation



Warning:

Be sure voltage and air pressure supplied match solenoid specifications.

1. Mount limit switch package to the rotary actuator with an appropriate mounting bracket.
2. Connect power and clean filtered air to proper connections (see table on other side for standard valves). Ensure that all air connections are tight and all electrical connections are secured at their proper terminal points.
3. With no power to V-1 and V-2, the valve should be in the fully closed position (sequence #1)
4. Energize V-1 and V-2 (sequence #2), solenoid #1 (sol1) will energize allowing the air pressure to rotate the valve/actuator package to the fully open position.
5. De-energize V-1 and the package will rotate in the opposite direction until the white cam trips switch 3 (blue) and energizes solenoid #2 (sol2). This will stop the valve rotation at the set mid position. If the mid position is incorrect, estimate approximately how many degrees of rotation the cam needs to be adjusted. CAUTION - do not adjust cam until the unit is in the fully closed position, as the unit might rotate unexpectedly if the cam is adjusted under power.
6. Finally, de-energize V-2 (both V-1 and V-2 will be de-energized) and solenoid #2 (sol2) will De-energize and the valve/actuator package will rotate to the fully closed position. One full cycle has just been completed. If the mid set position requires adjustment, adjust the package now.
7. Repeat steps 4-6 to verify adjustment and/or re-adjust dribble position.



Caution:

Do not adjust cams while cycling system as the unit might shift unexpectedly

Stage No.	Flow Condition Required	Supply Volt. 1 (V-1)	Supply Volt. 2 (V-2)	Solenoid #1 (Sol 1)	Solenoid #2 (Sol 2)
1	Shut off	De-energize	De-energize	De-energize	De-energize
2	Full Flow	Energize	Energize	Energize	De-energize*
3	Reduced Flow	De-energize	Energize	De-energize	Energize
4	Shut off	De-energize	De-energize	De-energize	De-energize

* Solenoid #2 is de-energized through the limit switch



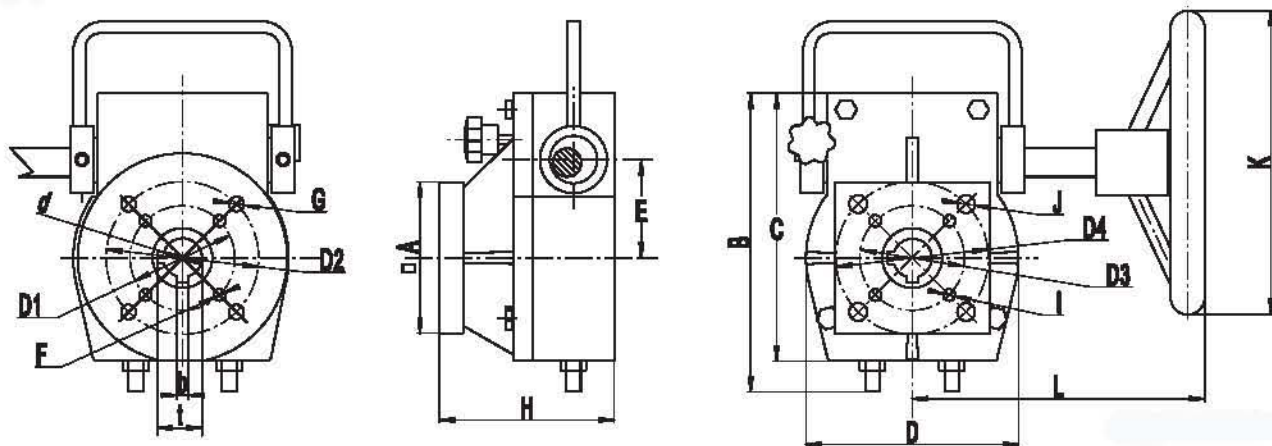
The ALXL series declutch override gear box were specially designed used for butterfly valve, ball valve and plug valve together with pneumatic actuators. This device allows for manual operation during installation, system testing and in the event of a supply air-failure. The ALXL Series mount directly to many of the most popular rack and pinion style actuators on the market, and does not require a bracket between the pneumatic actuator and declutch override. The units come complete with a coupler that

MAIN FEATURES:

- Compact and simply design, light in weight.
- Manufactured with cast iron housing.
- ISO5211 direct mount patterns.
- Easy for customer to choose relative position between gear operator and valve, with two keyway apart 90° in the inner hole of worm gear.
- Easy to realize the manual drive or the pneumatic drive with the place-pin.
- Filled with special lubricant before leaving the factory.
- Weatherproof is IP65.
- Output torque ranges from 300 to 22100Nm.

Alloy Valves and Control

Dimension



Model	d	b	t	D1	F	D2	G	A	H	E	D3	I	D4	J	K	L	B	C	D
ALXL26:1	22	6	25.4			70	M8	70	99	50.5			70	Φ9	Φ200	155	160	145	110
ALXL38:1	26	8	29.3	70	M8			100	117	65	70	Φ9	102	Φ12	Φ200	195	195	175	140
	38	10	41.3			102	M10	110											
ALXL54:1	38	10	41.3	125	M12			130	118	85	125	Φ14	140	Φ18	Φ300	205	235	215	180
	48	14	51.8			140	M16												
ALXL80:1	48	14	51.8	140	M16			156	148	124	140	Φ18	165	Φ22	Φ400	245	320	298	250
	60	18	64.4			165	M20												
ALXL78:1	60	18	64.4	165	M20			220	150	142	165	Φ22							
	80	18	84.4																
ALXL98:1	80	18	84.4	165	M20			230	195	229	165	Φ22			Φ800	410	550	530	460
ALXL100:1	100	20	105.3	254	M16			300	195	258	254	Φ18			Φ800	430	605	585	520
ALXL118:1	120	32	129.3	356	M30			Φ445	250	391	356	Φ32			Φ1000	550	900	870	800
	180	45	196	483	M36			Φ600	275	390	483	Φ39			Φ600	600	1050	900	850

Specification and Output Torque

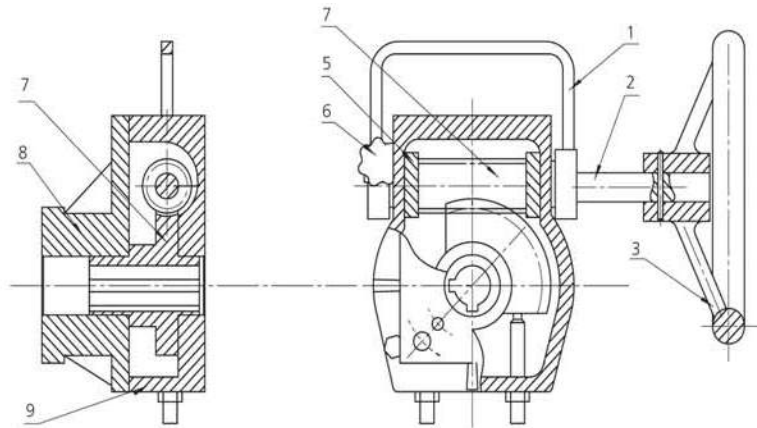
No.	Model	Gear Ratio	Input Torque(Nm)	Output Torque(Nm)	Weight(Kg)
1	ALXL26	26:1	70	300	7.3
2	ALXL38	38:1	60	550	11.8
3	ALXL54	54:1	120	1200	17.3
4	ALXL80	80:1	140	2000	35
5	ALXL78A	78:1	200	3600	48.2
6	ALXL98	98:1	300	9000	156
7	ALXL100	100:1	400	13000	190
8	ALXL118	118:1	900	22100	540

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Alloy Valves and Control

Structure & Material



No	Part	Qty.	Material	Optional material
1	Handle	1	Carbon steel	
2	Worm shaft	1	45 GB699-88	
3	Hand wheel	1	HT200 GB9439-88	WCB GB12229-88
4	Worm	1	45 GB699-88	
5	Off-center sleeve sub-assembly	1	Carbon steel	
6	Positioning screw	1	Carbon steel	
7	Worm gear	1	QT500-7 GB1348-88	
8	Bracket cap	1	HT200 GB9439-88	WCB GB12229-88
9	Body	1	HT200 GB9439-88	WCB GB12229-88

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AVCO

Alloy Valves and Control

ACTUATORS PNEUMATIC - TYPE C



Torque Rating at 80 psig

Double Acting
195 - 28,500 lbf-in

Spring Return
50 - 16,500 lbf-in

Features

Extruded Aluminum Body
Die-Cast Aluminum End Caps
Position Indicator with NAMUR slot
Blow-Out Proof Pinion
Dual Opposed Rack Pistons
Linear Torque Output (DA Actuator)
Adjustable Travel Stops
NAMUR Solenoid Mount Design

Temperature Range

Standard (NBR O-Ring)
-4 °F to 175 °F

Low Temperature (Silicone O-Ring)
-30 °F to 175 °F

High Temperature (Viton O-Ring)
5 °F to 300 °F

Supply Pressure

35 psig Minimum
150 psig Maximum

Operation Speed

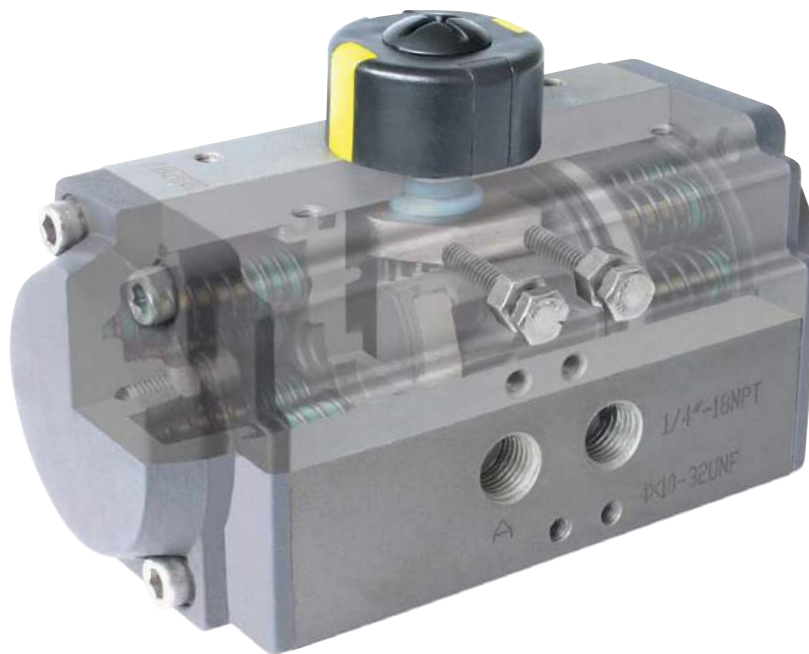
Between 0.3 & 6 seconds
Depending Upon Model Size

Industries

Chemical
Food Processing
Hydraulic
Oil/Gas
Pharmaceutical
Steam

Applicable Standards

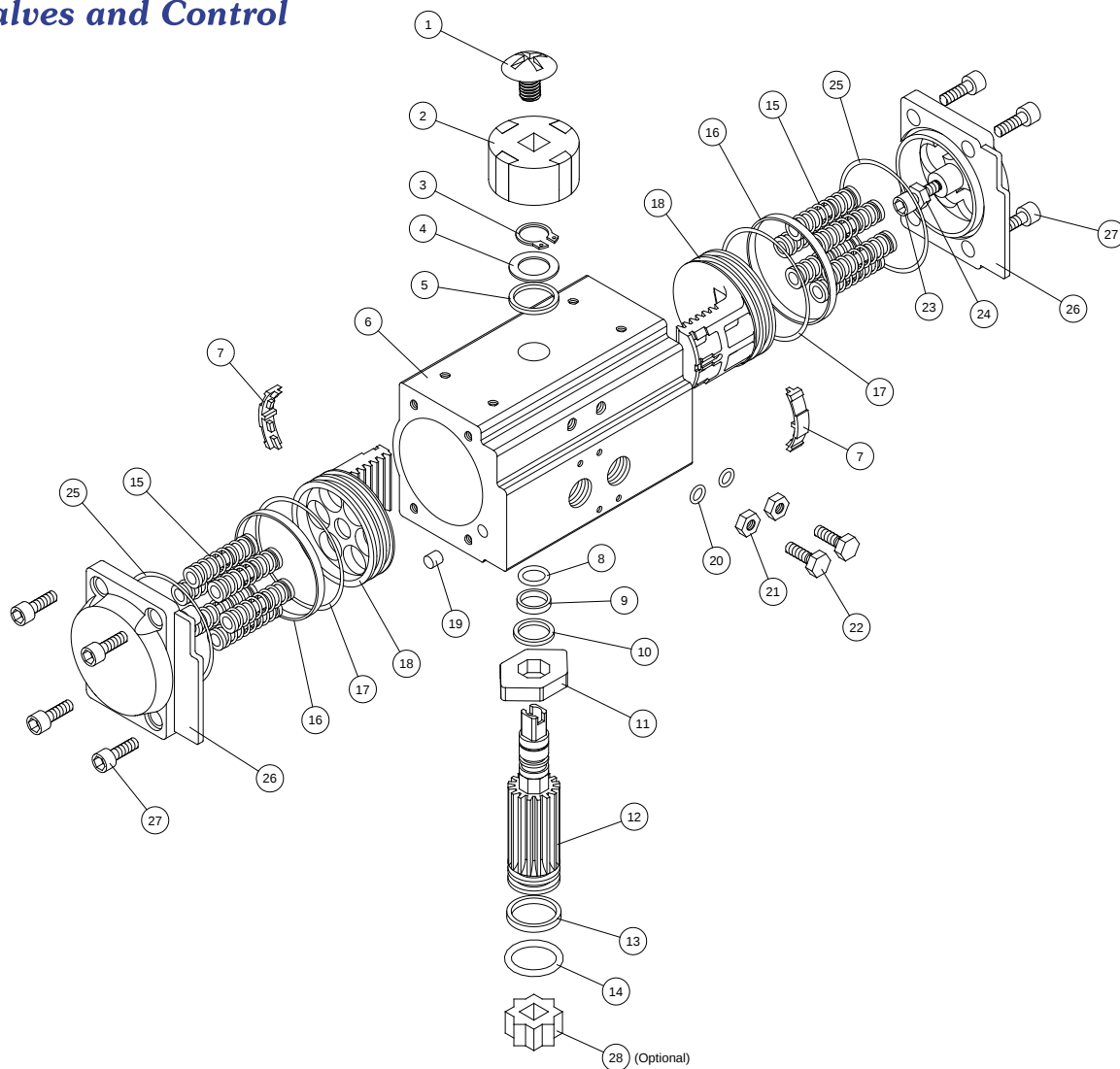
ISO 5211
NAMUR



Features and Benefits

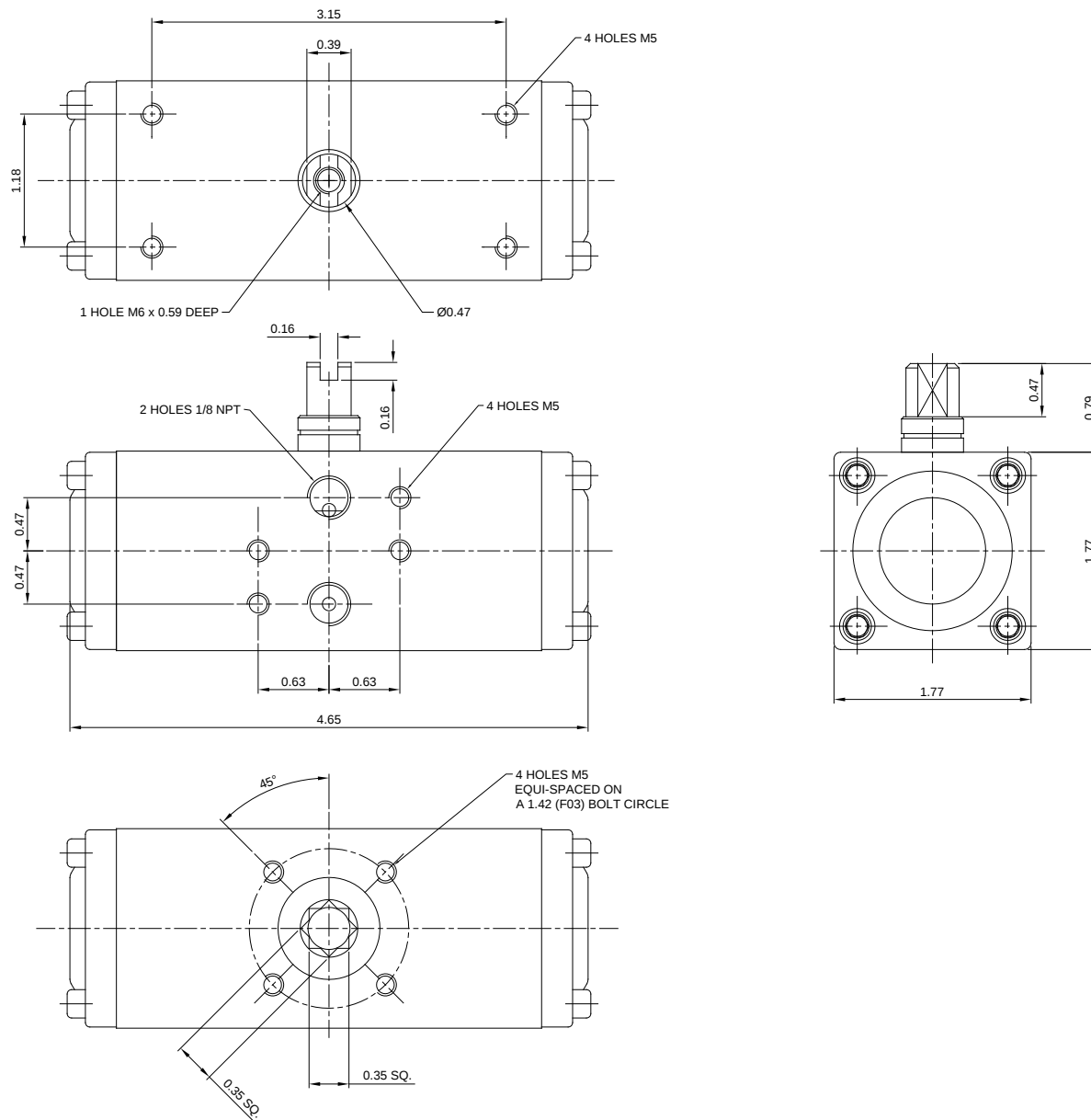
All our actuators are made to the highest standards to give long life and durability, coupled with competitive pricing. We pride ourselves in giving the customer exactly what they need and in providing first class after sales care.

- **Extruded Aluminum Body** with hard anodized finish and polished internal surfaces as standard.
- **Die Cast Aluminum End Caps** coated with powder polyester paint, PTFE or nickel plating.
- **Position Indicator** complete with NAMUR slot for simplified accessory mounting.
- **High Precision Nickel Alloy Steel Blow-Out Proof Pinion** for corrosion protection and fully conforming to ISO 5211 and NAMUR.
- **Dual Opposed Rack Pistons** with low friction bearings and guides for a high performance, long cycle life and fast operation. Simple inversion of the pistons for rotation reversal.
- **Linear Torque Output** from 0° through 90° stroke on the double acting actuators.
- **Independent Adjustable Travel Stops** giving $\pm 5^\circ$ of adjustment for the open and closed position to facilitate exact valve alignment.
- **High Performance Pre-Loaded Spring Cartridges** give greater safety and longer spring life. Double acting actuators can easily be converted to spring return by simply adding the spring cartridges. Different torque requirements can be achieved by simply changing the number of springs.
- **NAMUR Solenoid Mounting Design** enables direct mounting of the solenoid valve to the actuator without the need for adaptors.
- **Stainless Steel 304 Fasteners** are used throughout as standard.
- **Select High Quality O-rings** provide trouble free operation in a wide range of temperatures.
- **Precision Replaceable Inserts** including variable internal geometry configuration for specific customer requests.
- **Specialised Corrosion Protection** available for the body and end caps upon request.



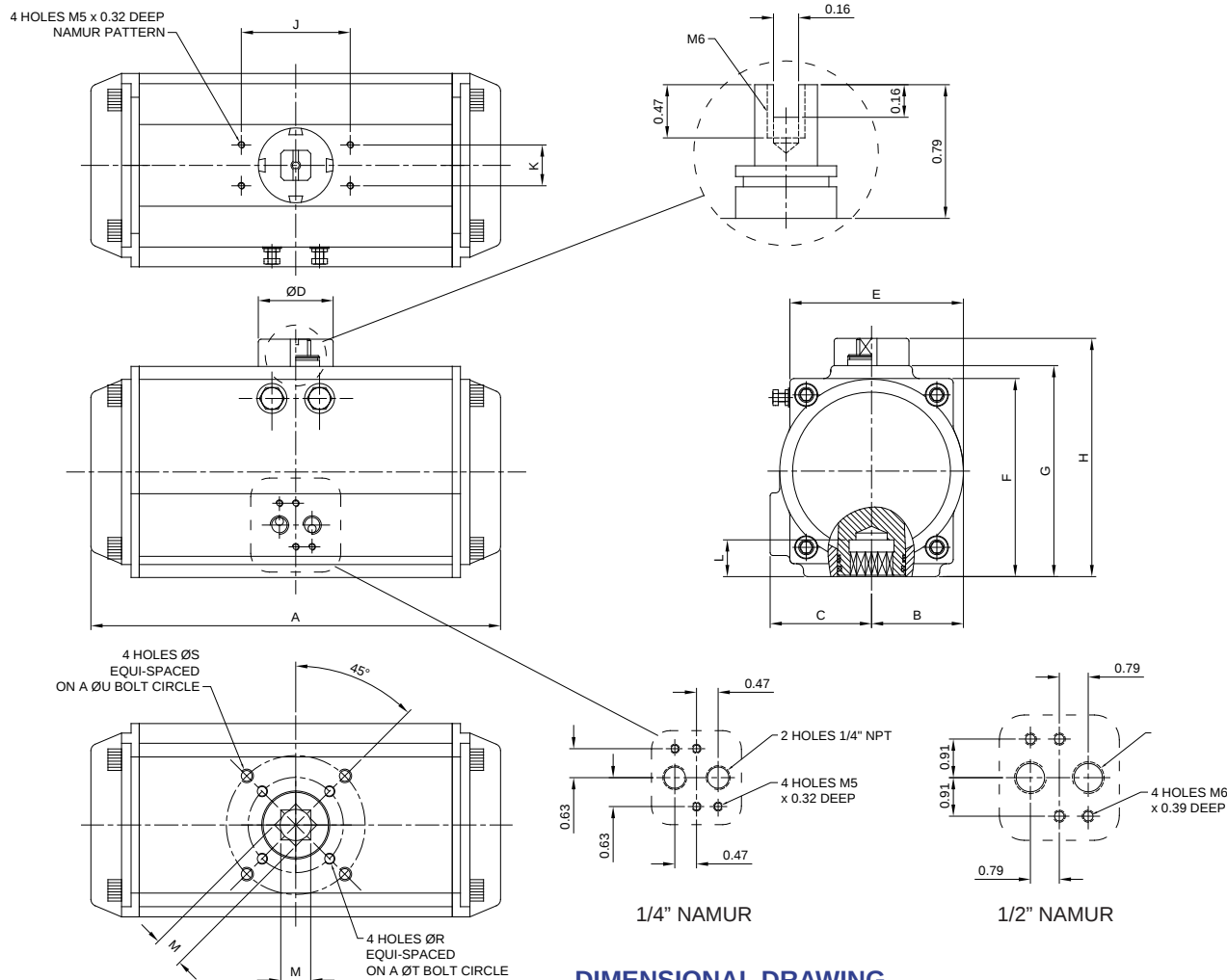
Item	Parts	Material	Qty.
1	Indicator Cap Screw	Plastic/Stainless Steel	1
2	Position Indicator	Plastic (ABS)	1
3	Pinion Snap Ring	Stainless Steel 300 Series	1
4	Thrust Washer	Stainless Steel 300 Series	1
5	Thrust Bearing	Polyoxymethylene (Delrin)	1
6	Body	Aluminum Alloy (6005-T5)	1
7	Piston Guide	Polyoxymethylene (Delrin)	2
8	O-ring (Pinion Top)	NBR	1
9	Bearing (Pinion Top)	Polyoxymethylene (Delrin)	1
10	Inside Washer	Polyoxymethylene (Delrin)	1
11	Cam	Stainless Steel 300 Series	1
12	Pinion (Drive Shaft)	Stainless Steel 300 Series	1
13	Bearing (Pinion Bottom)	Polyoxymethylene (Delrin)	1
14	O-ring (Pinion Bottom)	NBR	1

Item	Parts	Material	Qty.
15	Spring (Cartridge)	High Alloy Spring Steel	0-12
16	Bearing (Piston)	Polyoxymethylene (Delrin)	2
17	O-ring (Piston)	NBR	2
18	Piston	Die-Cast Aluminum	2
19	Plug	NBR	2
20	O-ring (Adjusting Screw)	NBR	2
21	Stop Nut (Adjusting Screw)	Stainless Steel 300 Series	2
22	Adjusting Screw	Stainless Steel 300 Series	2
23	Stop Screw	Stainless Steel 300 Series	2
24	Nut (Stop Screw)	Stainless Steel 300 Series	2
25	O-ring (End Cap)	NBR	2
26	End Cap	Die-Cast Aluminum	2
27	End Cap Screw	Stainless Steel 300 Series	8
28	Shaft Adapter	Sintered Metal	1



**DIMENSIONAL DRAWING
CDA032 ONLY**

Alloy Valves and Control

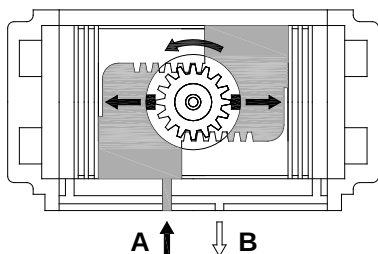


**DIMENSIONAL DRAWING
(ALL MODELS EXCEPT CDA032)**

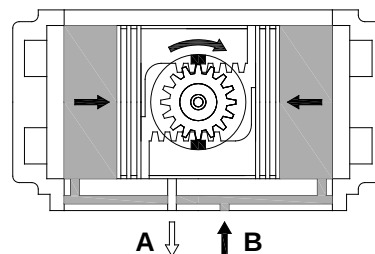
MODEL	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H (in.)	J (in.)	K (in.)	L (in.)	M (in.)	R (mm)	S (mm)	T (in.)	U (in.)	ISO 5211
CDA040	4.81	1.44	1.13	1.58	2.05	2.36		3.15	3.15	1.18	0.55	0.43	M5x8 DP	M6x10 DP	1.42	1.97	F03/F05
CDA/CSR052	5.79	1.18	1.63	1.58	2.56	2.58	2.83	3.62	3.15	1.18	0.55	0.43	M5x8 DP	M6x10 DP	1.42	1.97	F03/F05
CDA/CSR063	6.61	1.42	1.85	1.58	2.83	3.19	3.44	4.23	3.15	1.18	0.71	0.55	M6x10 DP	M8x13 DP	1.97	2.76	F05/F07
CDA/CSR075	7.24	1.65	2.09	1.58	3.19	3.70	3.92	4.70	3.15	1.18	0.71	0.55	M6x10 DP	M8x13 DP	1.97	2.76	F05/F07
CDA/CSR083	8.03	1.81	2.24	1.58	3.62	3.88	4.28	5.07	3.15	1.18	0.83	0.67	M6x10 DP	M8x13 DP	1.97	2.76	F05/F07
CDA/CSR092	10.31	1.97	2.30	1.58	3.86	4.34	4.60	5.39	3.15	1.18	0.83	0.67	M6x10 DP	M8x13 DP	1.97	2.76	F05/F07
CDA/CSR105	10.55	2.26	2.52	1.58	4.31	4.82	5.24	6.02	3.15	1.18	1.02	0.87	M8x13 DP	M10x16 DP	2.76	4.02	F07/F10
CDA/CSR125	11.65	2.66	2.93	2.17	5.02	5.73	6.10	6.89	5.12	1.18	1.02	0.87	M8x13 DP	M10x16 DP	2.76	4.02	F07/F10
CDA/CSR140	15.35	2.95	3.03	2.17	5.41	6.33	6.75	7.54	5.12	1.18	1.22	1.06	M10x16 DP	M12x20 DP	4.02	4.92	F10/F12
CDA/CSR160	18.03	3.43	3.43	2.17	6.22	7.24	7.76	8.54	5.12	1.18	1.22	1.06	M10x16 DP	M12x20 DP	4.02	4.92	F10/F12
CDA/CSR190	20.79	4.06	4.06	3.15	7.44	8.50	9.06	9.84	5.12	1.18	1.57	1.42		M16x25 DP		5.51	F14
CDA/CSR210	22.20	4.45	4.45	3.15	8.27	9.27	10.04	10.83	5.12	1.18	1.57	1.42		M16x25 DP		5.51	F14
CDA/CSR240	23.70	5.12	5.12	3.15	9.65	10.39	11.34	12.13	5.12	1.18	1.97	1.81		M20x25 DP		6.50	F16
CDA/CSR270	27.80	5.79	5.79	3.15	10.75	11.77	12.83	13.62	5.12	1.18	1.97	1.81		M20x25 DP		6.50	F16

ACTUATOR OPERATION

Double Acting

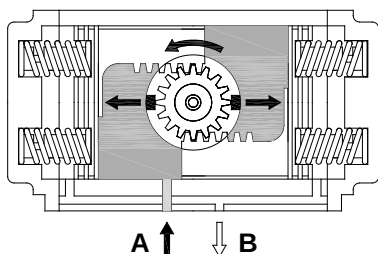


By supplying air to Port A, pressure is applied to the center chamber forcing the pistons outward. Linear piston force is transferred via gear racks to the pinion gear, causing the pinion to rotate counter-clockwise whilst air is exhausted from Port B.

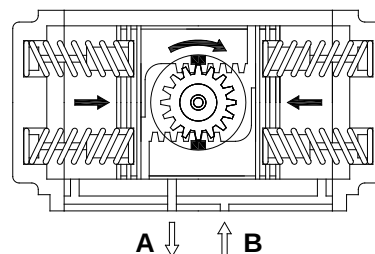


By supplying air to Port B, pressure is applied to the outside chamber and drives the dual pistons inwards, causing the pinion to turn clockwise whilst air is exhausted from Port A.

Spring Return (Fail-Safe)



By supplying air to Port A, pressure is applied to the center chamber forcing the pistons outward and compressing the springs in the outside chambers resulting in a counter-clockwise rotation. Exhaust air exits Port B.



Upon loss of air pressure, the stored energy in the compressed springs forces the pistons inwards to give a clockwise rotation with exhaust air exiting Port A. This 'fail-safe' position is held by spring force until air pressure is reapplied to Port A.

Spring Return Actuator Torque Output (lbf-in)

		OUTPUT AIR TO SPRING														SPRING RETURN	
AIR PRESSURE (psi)		40		50		60		70		80		90		100		OUTPUT	
MODEL No.	No. of SPRINGS	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
CSR052	5	55	37	77	58											55	38
	6	48	24	70	46	94	78									66	45
	7	39	13	61	34	90	67	120	89							77	52
	8			53	20	84	55	113	78	140	114					87	60
	9			44	8	76	44	105	67	133	104	160	132			98	67
	10					68	33	98	57	126	94	153	122			109	75
	11					60	21	91	46	119	84	146	113	172	140	120	82
	12							83	36	112	74	139	95	166	130	131	90
CSR063	5	111	75	153	116	204	137									92	61
	6	98	55	138	95	191	152	242	205							111	72
	7	84	35	127	73	179	133	229	187							129	85
	8			111	52	167	114	218	169	267	220	315	269			148	97
	9					154	95	206	151	255	203	304	253			166	109
	10					132	75	195	133	244	186	293	236	341	286	185	121
	11							184	115	234	169	283	220	330	270	203	133
	12							171	97	222	152	271	204	320	254	222	145
CSR075	5	141	103	197	158	270	235									128	93
	6	121	74	176	128	251	208	321	280							154	112
	7	101	47	155	99	232	182	303	256							179	131
	8			133	69	211	155	284	231	352	301	418	369			205	149
	9					192	129	266	206	335	278	402	347			231	168
	10					174	102	246	181	318	254	386	324	451	391	256	187
	11							231	157	301	231	369	301	435	369	282	205
	12							213	132	284	207	353	278	419	346	308	224
CSR083	5	227	157	317	244	428	364									204	140
	6	196	112	285	196	400	321	508	434							244	168
	7	166	67	252	151	371	279	481	395							285	196
	8			221	103	342	237	454	355	560	466	663	572			326	224
	9					313	195	426	316	534	429	638	536			367	252
	10					284	152	400	276	508	391	613	500	715	605	407	280
	11							373	237	483	353	588	464	691	570	448	308
	12							345	198	456	316	536	428	667	536	489	336
CSR092	5	322	214	450	338	612	511									304	207
	6	277	148	403	269	569	449	725	612							365	248
	7	231	80	355	197	526	385	685	553							426	289
	8			319	128	484	323	646	495	799	655	947	808			487	331
	9					441	260	606	436	761	599	911	755			548	372
	10					399	197	566	377	726	543	874	700	1022	853	608	413
	11							525	318	685	487	837	647	986	801	669	454
	12							486	260	647	432	800	593	950	749	730	496

Spring Return Actuator Torque Output (lbf-in) (Continued)

		OUTPUT AIR TO SPRING														SPRING RETURN	
AIR PRESSURE (psi)		40		50		60		70		80		90		100		OUTPUT	
MODEL No.	No. of SPRINGS	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
CSR105	5	497	325	687	508	921	760									436	280
	6	435	229	622	407	862	670	1088	908							523	336
	7	374	133	559	308	805	580	1035	824							610	392
	8			494	208	747	490	980	740	1203	974	1419	1198			697	448
	9					689	400	927	656	1152	894	1370	1122			784	504
	10					631	306	872	569	1100	811	1320	1041	1535	1264	871	560
	11							818	487	1048	733	1270	966	1486	1191	958	616
	12							764	406	997	656	1221	892	1439	1119	1045	672
CSR125	5	712	453	1000	729	1358	1115									698	462
	6	610	305	893	574	1263	976	1608	1340							832	555
	7	509	148	787	410	1167	828	1519	1202							971	647
	8			681	255	1071	689	1429	1072	1770	1429	2100	1772			1110	740
	9					976	541	1340	934	1685	1298	2018	1645			1249	832
	10					880	402	1251	804	1600	1174	1936	1526	2264	1865	1387	925
	11							1161	666	1514	1043	1854	1399	2184	1742	1530	1017
	12							1072	536	1429	919	1772	1280	2105	1626	1665	1110
CSR140	5	1246	823	1737	1296	2346	1948									1143	759
	6	1082	573	1566	1035	2192	1713	2778	2331							1370	908
	7	916	324	1392	773	2035	1478	2631	2112							1598	1059
	8			1218	512	1878	1244	2485	1892	3063	2498	6324	3080			1826	1211
	9					1713	1009	2331	1673	2916	2290	3483	2879			2054	1370
	10					1557	765	2185	1446	2777	2073	3348	2670	3906	3247	2283	1522
	11							2039	1226	2638	1864	3214	2468	3776	3051	2510	1673
	12							1892	1007	2498	1655	3080	2267	3645	2855	2741	1824
CSR160	5	1877	1212	2640	1943	3592	2966									1844	1236
	6	1609	805	2359	1518	3340	2583	4256	3549							2212	1483
	7	1332	398	2069	1093	3079	2200	4012	3192							2581	1730
	8			1789	667	2826	1818	3777	2022	4680	3782	5556	4691			2949	1977
	9					2566	1435	3533	2477	4448	3442	5332	4363			3321	2225
	10					2313	1052	3297	2120	4223	3102	5116	4034	5986	4935	3691	2472
	11							3062	1771	3999	2769	4900	3714	5776	4624	4056	2719
	12							2818	1413	3767	2429	4676	3386	5559	4305	4422	2966
CSR190	5	3228	2164	4457	3345	5957	4957									2737	1774
	6	2839	1563	4051	2717	5592	4392	7041	5921							3287	2127
	7	2451	962	3645	2088	5227	3827	6700	5393							3834	2480
	8			3239	1460	4861	3261	6359	4865	7789	6366	9180	7808			4380	2833
	9					4496	2696	6018	4337	7464	5863	8867	7323			4927	3186
	10					4131	2131	5677	3809	7139	5360	8554	6838	9936	8269	5473	3540
	11							5336	3281	6814	4858	8240	6354	9632	7798	6020	3893
	12							4995	2753	6490	4355	7927	5869	9327	7327	6566	4246

Spring Return Actuator Torque Output (lbf-in) (Continued)

		OUTPUT AIR TO SPRING														SPRING RETURN	
AIR PRESSURE (psi)		40		50		60		70		80		90		100		OUTPUT	
MODEL No.	No. of SPRINGS	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
CSR210	5	3801	2774	5327	4254	7227	6262									3363	2430
	6	3265	2035	4767	3481	6723	5566	8552	7472							4036	2917
	7	2728	1295	4206	2707	6218	4870	8081	6822							4708	3405
	8			3645	1934	5714	4174	7610	6172	9413	8044	11164	9844			5381	3893
	9					5209	3479	7139	5523	8965	7426	10731	9247			6053	4380
	10					4705	2783	6668	4873	8516	6807	10299	8651	12038	10436	6726	4868
	11							6197	4223	8068	6188	9866	8054	11617	9856	7399	5356
	12							5726	3574	7619	5569	9434	7457	11197	9276	8071	5843
CSR240	5	5373	3977	7571	6111	10332	9018									4902	3632
	6	4578	2895	6739	4979	9584	8001	12239	10761							5885	4355
	7	3773	1822	5898	3858	8827	6992	11533	9819							6861	5087
	8			5066	2727	8079	5975	10834	8869	13451	11579	15989	14184			7844	5810
	9					7323	4957	10128	7919	12778	10674	15340	13312			8828	6541
	10					6575	3948	9429	6976	12113	9777	14699	12446	17220	15031	9803	7264
	11							8731	6026	11448	8872	14057	11574	16596	14183	10787	7987
	12							8024	5076	10775	7967	13408	10701	15966	13335	11771	8719
CSR270	5	8786	6576	12163	9852	16289	14210									6961	4952
	6	7695	5050	11022	8257	15263	12775	19256	16934							8349	5944
	7	6612	3514	9891	6652	14245	11332	18306	15585							9744	6928
	8			8750	5057	13219	9897	17348	14245	21286	18332	25109	22260			11132	7920
	9					12193	8453	16389	12897	20374	17048	24229	21023			12527	8912
	10					11167	7018	15431	11557	19461	15771	23349	19792	27156	23699	13914	9904
	11							14473	10209	18548	14487	22469	18554	26300	22496	15310	10896
	12							13523	8869	17643	13211	21597	17324	25452	21300	16697	11880

Operating Conditions

Operating Media

Dry and lubricated air or non-corrosive gas.
Maximum particle size to be less than 30 µm.

Air Supply Pressure

Minimum supply pressure is 35 psig
Maximum supply pressure is 150 psig

Operating Temperature

Standard (NBR O-ring): -4 °F to 175 °F
Low temperature (Silicone O-ring): -30 °F to 175 °F
High temperature (Viton O-ring): 5 °F to 300 °F

Stroke Adjustment

±5° from 0° & 90° position

Location

Indoor and outdoor

Interface Specification

Main Drive Interface (Bottom)

Meets ISO 5211 for direct mount to suitable a valve or connection with standardized mounting hardware.

Secondary Drive Interface (Top)

Meets NAMUR specification for direct installation of accessories such as a limit switch or positioner.

Air Supply Connection (Side)

Meets NAMUR specification for direct mount of suitable solenoid valves.

Double Acting Actuator Torque (lbf-in)

MODEL	AIR PRESSURE (psig)								
	40	50	60	70	80	90	100	110	120
CDA032	38	47	57	66	76	85	95	104	113
CDA040	55	71	85	100	115	129	142	157	171
CDA052	97	122	146	171	195	219	244	268	292
CDA063	178	223	267	313	356	401	446	490	535
CDA075	245	306	368	430	490	551	613	674	735
CDA083	383	476	574	671	766	861	957	1053	1149
CDA092	551	689	827	967	1103	1240	1378	1516	1654
CDA105	808	1009	1211	1416	1615	1817	2019	2221	2423
CDA125	1225	1532	1833	2149	2450	2757	3063	3369	3676
CDA140	2088	2611	3133	3662	4177	4699	5221	5743	6265
CDA160	3249	4061	4873	5697	6497	7309	8122	8934	9746
CDA190	5198	6497	7797	9115	10396	11695	12995	14294	15594
CDA210	6497	8122	9746	11394	12995	14619	16243	17868	19492
CDA240	9398	11753	14097	16480	18796	21151	23495	25850	28194
CDA270	14282	17856	21430	25046	28565	32139	35712	39286	42859

Weight (lbs)

MODEL	032	040	052	063	075	083	092	105	125	140	160	190	210	240	270
CDA	2	2	3	4	6	7	10	13	19	25	36	70	76	106	163
CSR	N/A	N/A	3	4	6	7	12	14	22	29	44	78	85	135	216

Maximum Air Consumption Per Stroke (cubic inches)

MODEL/ ACTION	032	040	052	063	075	083	092	105	125	140	160	190	210	240	270
CCW	2.5	5.0	7.3	12.9	18.3	26.2	39.1	58.0	97.6	152.5	225.7	359.9	457.5	671.2	1037.5
CW	2.5	6.9	9.7	14.1	20.7	28.7	44.6	53.7	85.4	134.2	195.2	329.4	457.5	549.3	854.4

Actuator Cycle Speed (seconds)

ACTION	MODEL	032	040	052	063	075	083	092	105	125	140	160	190	210	240	270
CCW	DA	0.3	0.3	0.3	0.5	0.5	0.5	0.6	0.8	0.9	1.2	1.5	2.2	2.8	3.5	3.5
	SR	N/A	N/A	0.4	0.6	0.6	0.6	0.7	1.0	1.1	1.4	2.0	2.5	3.5	4.2	4.5
CW	DA	0.3	0.3	0.4	0.6	0.6	0.7	0.8	1.0	1.2	1.5	1.8	2.5	3.5	4.2	4.5
	SR	N/A	N/A	0.4	0.8	1.0	1.0	1.2	1.2	1.5	1.8	2.5	3.0	4.0	5.0	6.0

ACTUATOR SIZING GUIDE

Double Acting Actuators

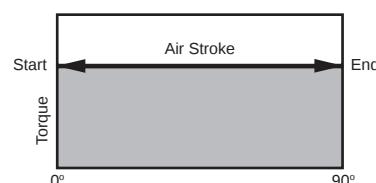
The output torque of a double acting actuator is constant in both clockwise and counter-clockwise rotation. The actuator should be sized as follows:

- Obtain the published maximum valve torque.
- Add a safety factor (margin) to the published torque to give the final torque requirement. We suggest a safety factor in normal operating conditions of at least 20%.
- Determine the required or available air pressure.
- Refer to the double acting actuator torque table in this literature and work down the appropriate air pressure column until you see a torque which just exceeds the final torque requirement.
- Work across the torque output row to find the actuator model number.

Example

- A published seating/unseating torque for an 8" high performance butterfly valve is 2600 lbf-in and the hydrodynamic torque for a 2 psi pressure drop is 500 lbf-in. Therefore the maximum valve torque is $2600 + 500 = 3100$ lbf-in.
- Applying a safety factor of 20% equals $3100 + (3100 \times 20/100) = 3720$ lbf-in. final torque requirement.
- The available air pressure is 80 psig.
- Therefore the first torque that just exceeds the final torque requirement of 3720 lbf-in is 4177 lbf-in.
- The actuator model meeting 4177 lbf-in @ 80 psig is a CDA140.

DOUBLE ACTING TORQUE CURVE

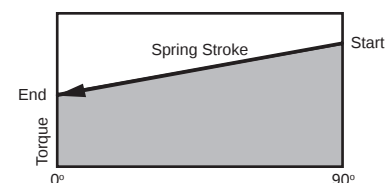
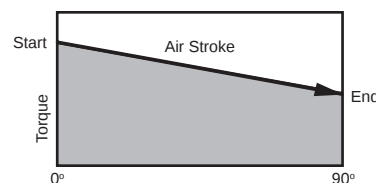


Spring Return Actuators

The output torque of a spring return actuator is determined by two factors - air stroke and spring stroke. Each clockwise or counter-clockwise stroke gives different torque values at start and end, four in total, as shown in the figures to the left. These four values are used for sizing the actuator.

- Obtain the published maximum valve torque.
- Add a safety factor (margin) to the published torque to give the final torque requirement. We suggest a safety factor in normal operating conditions of at least 10%.
- Determine the required or available air pressure.
- Refer to the spring actuator torque table in this literature and work down the appropriate air pressure column until you see a torque which just exceeds the final torque requirement in the 'END' column.
- Move across to the spring return 'END' column and check that this value also exceeds the final torque requirement. Both values must exceed the final torque requirement.
- Working left from this point determine the actuator model and number of springs.

SPRING RETURN TORQUE CURVES



Example

- A published seating/unseating torque for a 2" ball valve in full differential pressure is 400 lbf-in.
- Applying a safety factor of 10% equals $400 + (400 \times 10/100) = 440$ lbf-in. final torque requirement.
- The available air pressure is 80 psig.
- Therefore the first torque that just exceeds the final torque requirement of 440 lbf-in is 487 lbf-in. (air end) @ 80 psig and 454 lbf-in (spring end).
- The actuator model meeting this requirement is a CSR092 with 11 springs



Indirect Mount



Direct Mount



**Compatible with Most
Accessories via Direct or
Indirect Mount**

HOW TO ORDER

ACT	PN	CDA	075	0	N
Actuator	Type	Series	Size	Number of Springs	Seals
ACT	PN - Pneumatic	CDA - Double Acting CSR - Spring Return	032 - CDA Only 040 - CDA Only 052 063 075 083 092 105 125 140 160 190 210 240 270	0 - CDA Only 5 6 7 8 9 10 11 12	N - NBR S - Silicone V - Viton

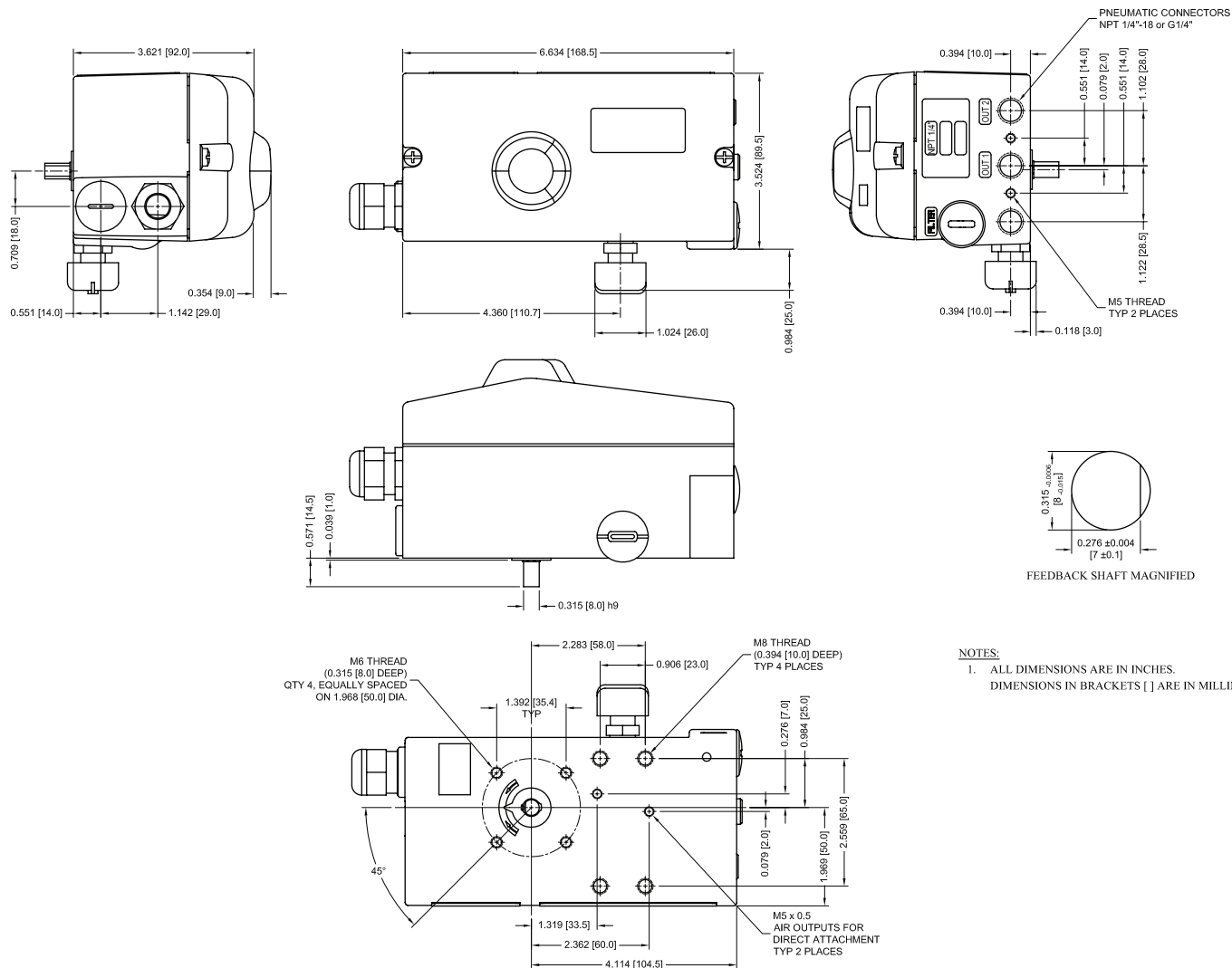


D400 Digital Positioner

The AVCO D400 is a microprocessor based, “intelligent” instrument that can be mounted to rotary or linear pneumatic actuators for accurate positioner control. This unit, while sophisticated in its accuracy and performance, is simple to mount, calibrate, and with good filtered air and proper maintenance, can provide very accurate and trouble-free service for many years. Available with Hart, Foundation Fieldbus, or Profibus communication, the D400 range of applications and communications meets the latest industry standards. The “efficiencies” of the D400 are not only in its microprocessor based technology and accuracy, but also in the pneumatic air handling where air consumption is kept to a very minimum.

Feature and Benefits

- Microprocessor based valve positioner
- User friendly, menu driven programming with LCD Display-multilingual.
- Local push button configuration—no handheld device necessary
- Low air consumption and proven dependable mechanical design
- Modular design—available with position feedback, micro switches and “Fail Freeze” options—rotary or linear mounting.
- Aluminum Housing—Nema 4X IP 65 Enclosure—Standard
- Atex-FM-CSA-IEC-Ex approvals available



Specifications

- Rotation: 25-120 degrees
- Stroke: .3 to 4" (longer strokes - POA)
- Max air supply: 90 PSI
- Connections: 1/4" NPT Air, 1/2" NPT Cable
- Air delivery: 6.0 SCFM, 90 PSI Supply
- Air consumption: .015 SCFM
- Ambient temperature: -40 to 185 °F
- Characteristic curve: linear, equal %, 1:25, 1:50 or 25:1 50:1 or user configure with 20 reference points
- Characteristic deviation: ≤ 0.5% from 0.3 to 10%
- Tolerance Band (sensitivity): adjustable
- Resolution (A/D conversion): 8000 steps
- Vibration influence: ≤ 1% up to 10 g and 20....Hz
- Sample rate: 20 msec
- Air supply: Must be free of oil, water, and dust to DIN/ISO 8573-1 pollution and oil contents according to Class 3 dew point 10 K below operating temperatures.

Explosion Protection

ATEX EEx ia IIC T4/T5/T6 or EEX n II T6

FM Intrinsically Safe CL I-II-III, Div 1, Groups A to G
Non Incendive CL I-II-III, Div 2, Groups A to G

CSA Intrinsically Safe CL I, Div 1, Groups A to D
CL II, Div 1, Groups E to G
Non Incendive CL I, Div 2, Groups A to D
CL II, Div 2, Groups E to G

HOW TO ORDER

D400	-	S	N	D1	H	GB
Series	Type	Action	Connections	Spindle	Communications	Options
D400 Series Positioner	Blank - Standard EX - Explosion Proof IS - Intrinsically Safe NI - Non Incendive	S - Single Acting D - Double Acting	N - NPT G - Metric	D1 - NAMUR DX - Linear	H - Hart FF - Foundation Fieldbus PA - Profibus	GB - Gauge Block with Gauges S - 2 Micro Switches 4/20 - 4-20 mA Transmitter FRC - Filter Regulator Coalescing FF - Fail Freeze

AVCO

Alloy Valves and Control

POSITIONERS V200 SERIES



Positioner Type

Pneumatic
Electro-Pneumatic
Explosion Proof
Intrinsically Safe
Fail Freeze

Feedback Type

2 SPDT Mechanical Switches
2 SPDT Reed Switches
4-20mA Transmitter
Mechanical Switches w/transmitter
Reed Switches w/transmitter

Indicator Type

Arrow (Flat)
Beacon (Dome)

Features

Compact Design
External Zero/Span Adjustment
Die-Cast Aluminum Housing
Standard NEMA 4X Housing
Polyester Coated

Options

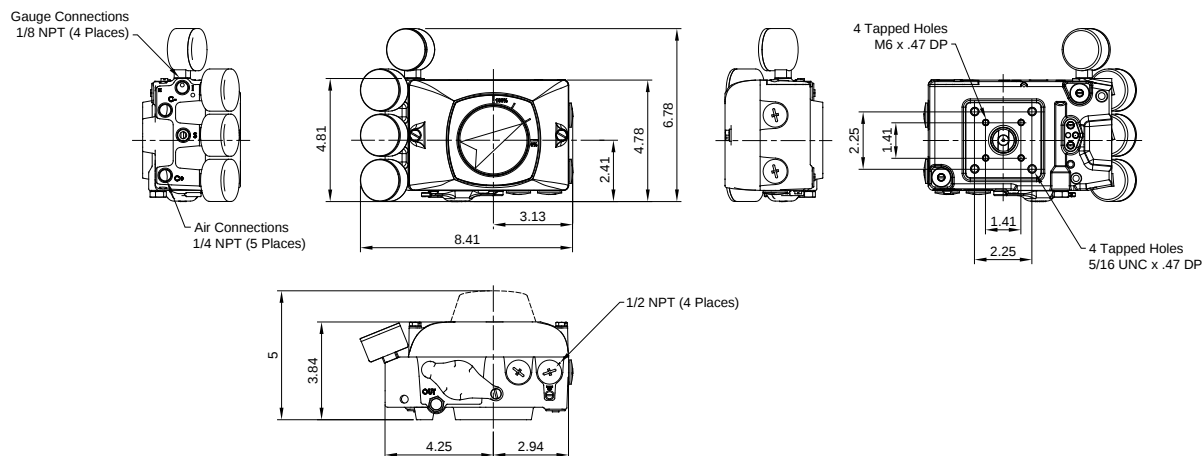
Gas Approved
Various Spindle Drives

Service Applications

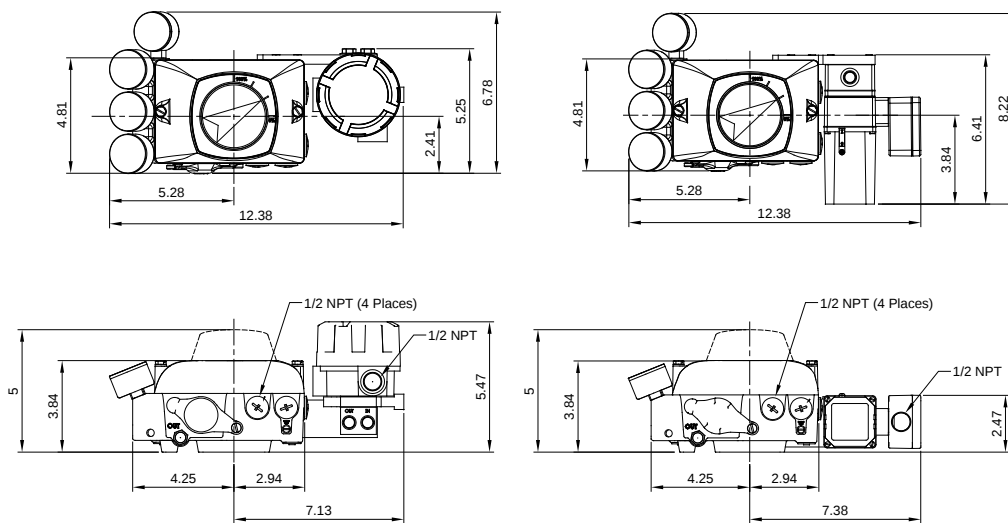
Chemical
Fluid Processing
Hydraulic
Water/Oil/Gas
Pharmaceutical
Steam

Temperature Range

-40 thru 185 °F

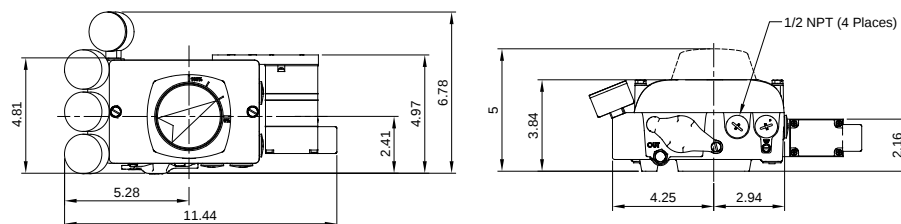


V200P, E, E-IS



V200E-EX, E-GA

V200E-FF



V200 0-10V

Alloy Valves and Control

Technical Specifications:

Positioners:	Pneumatic V200P	V200E & E-IS	Electropneumatic V200 E-EX	V200E-FF
Input Signal	3-15 PSI	4-20mA	4-20 mA	4-20 mA
Supply Pressure	145 PSI	145 PSI	100 PSI	145 PSI
Linearity error	<0.7% f.s.	<1.0% f.s.	<0.8% f.s.	<1.2% f.s.
Hysteresis	<0.4% f.s.	<0.6% f.s.	<0.5% f.s.	<0.9% f.s.
Repeatability	<0.3% f.s.	<0.5% f.s.	<0.4% f.s.	<0.8% f.s.
Temperature range	-40 to 185 F -40 to 85 C	-40 to 185 F -40 to 85 C	-40 to 158 F -40- to 70 C	-20 to 158 F -20 to 70 C

	Standard	Highflow/gain		
Air Delivery	28.3 scfm	31.8 scfm		
@87 PSI (600 kPa)				
Bleed Rate	.35 scfm	.53 scfm		
@87 PSI (600 kPa)				
Pressure Gain @87 PSI	300:1	800:1		
Air connections	1/4" NPT			
Gauges	1/8" NPT			
Cable Entry	1/2" NPT			
Ingress & corrosion protection		NEMA 4X and IP66		
Standard coating	Polyester			
Weight	P-3.2 lbs	E-3.8 lbs.	EX-5.3 lbs.	FF-5.4 lbs.

Feedback

General:

Plug-in components directly into V200 series positioner housing
Can combine switches and 4/20 feedback
Conduit connections 1/2" NPT
Enclosure Nema 4X/IP 66

Operating temp -40 to +185° F (-40 to +85° C)

Mechanical Switches:

2-Type: SPDT, V3

Max Load:

Resistive	(Inductive)	Voltage
15 A	(3) A	125/250 VAC
0.25 A	(0.1) A	220 VDC
0.5 A	(0.2) A	110 VDC
8 A	(7) A	24 VDC

Reed Switches:

2-Type: SPDT-CO, Form C

Contact rating: max 3W

Voltage:	Switching	max 100 VDC
	Breakdown	min 200 VDC
Current:	Switching	max 0.20 A
	Carry	max 1.3 A

Contact resistance: 0.2 ohms

Contact capacitance: 0.3 pF

4/20 mA Position Feedback:

Voltage supply:	7-30 VDC
Output:	4-20 mA, 2 wire
Loop Impedance:	max 850 ohms @ 24 VDC
Linearity error:	<1.2%
Hysteresis:	<0.2%
Temp. Sensitivity:	< 0.1%/10°F (5.5°C)

Others Options:

Potentiometer-Namur Sensors

Approvals

Ratings for hazardous locations:

V100E-EX (Explosion Proof)

Atex/Cenelec

Intrinsically safe: EEx ia IIB T4
Flameproof: EEx d IIB + H2 T4

British Standard (NI)

Non incandive: Ex N II T6 for Zone 2

FM

Intrinsically safe: CL I-II-III/DIV1/ Grp C D E F G
Non incandive: CL I/ DIV2/ Grp A B C D
Explosion proof: CL I/DIV1/ Grp B C D
CL I II III/ DIV1 / Grp E F G

CSA

Intrinsically safe: CL I /DIV1/ Grp C D
CL II/DIV1/ Grp E F G
CL III
CL I / DIV2/ Grp B C D
CL II DIV1/ Grp E F G
Explosion Proof: CL I/ DIV1/ Grp B C D
CL II/DIV I/ Grp E F G

V100E-IS (Intrinsically safe)

Atex

EEx ia IIC T4/T6

FM

CL1 DIV1 Grp A B C D



CSA

Ex ia, CL I Grp A B C D

Ex ia CL I DIV2 Grp A B C D





Alloy Valves and Control

POSITIONERS V200 SERIES

HOW TO ORDER

V200	P	D1	90	A	C1	HG	M
Series	Type	Spindle	Front Cover	Indicator	Cam	Gain	Feedback Options
V200 Series Positioner	P - Pneumatic	D1 - Namur (Standard)	90 - 90° Rotation	A - Arrow	C1 - 90°	HG - High Gain	M - 2 SPDT Mechanical Switches
	E - Electro-Pneumatic	D2 - 1/2" Square	60 - 60° Rotation	B - Beacon	C2 - 45/90°		R - 2 SPDT Reed Switches
	EX - Explosion Proof	D3 - 3/8" Square	45 - 45° Rotation		C3 - 30/60°		mA - 4-20mA Transmitter
	IS - Intrinsically Safe	D4 - Round (Linear)	30 - 30° Rotation		C4 - 60/120°		MmA - Mechanical Switches w/Transmitter
	FF - Fail Freeze	D5 - Double D	XX - Blank Scale				RmA - Reed Switches w/Transmitter
		D6 - 3/8" Square (Long)					
		D7 - 3/4" Slotted					
		D8 - 12mm Dual Post					
		D9 - Old Namur (Special)					
		D10 - Namur (Special)					
		D11 - Octagon					

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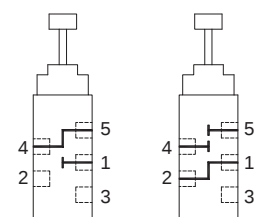
3210 S. Susan St, Santa Ana, CA 92704 Tel (714) 427-0877 Fax (714) 427-6392 Website: www.avcovalve.com

General Description

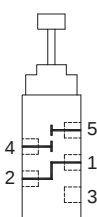
The AVCO automation solenoid valve mounts directly to the actuator eliminating the need for tubing and fittings, they are available as double acting and can be easily converted from 4 way to 3 way operation. The valves have bi-directional tapered Tee seals to eliminate sticking problems and have been tested according to SAE specifications. Solenoid options are weatherproof, intrinsically-safe and explosion proof.



Valve Operation

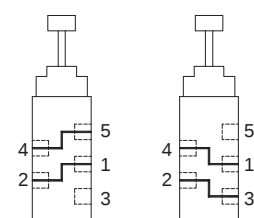


De-energized

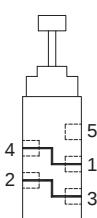


Energized

3/2 NC - 3 way 2 position normally closed valves shift and apply pressure when a maintained signal is applied to the operator then reset and block pressure when the signal is removed.

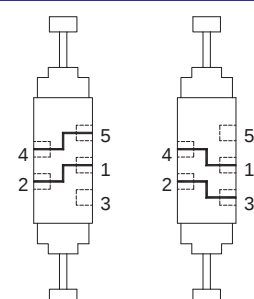


De-energized

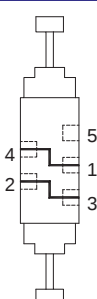


Energized

5/2 SINGLE - 4 way 2 position single operator valves shift, apply pressure from port 1 to 4 and exhaust pressure from port 2 to 3 when a maintained signal is applied to operator 1-4. Valves reset, apply pressure from port 1 to 2 and exhaust pressure from port 4 to 5 when the signal is removed.



De-energized



Energized

5/2 DOUBLE - 4 way 2 position double operator valves shift, apply pressure from port 1 to 4 and exhaust pressure from port 2 to 3 when a momentary signal is applied to operator 1-4. Valves shift, apply pressure from port 1 to 2 and exhaust pressure from port 4 to 5 when a momentary signal is applied to operator 1-2. removed.

Filtration and Lubrication

Media - Air or Inert Gas

Lubrication is not required but recommended for maximum service life. Oils should be compatible with seal material, have an ISO 32 viscosity and an aniline range of 180°F and 210°F.

Filter to 50 microns or better.

Air must be dry below 40°F.

Operating Temperatures

	Treated BUNA-N Seals	Fluoroelastomer Seals
Standard	0°F to +125°F	0°F to +125°F
High Temp. Coil	0°F to +180°F	0°F to +180°F

Operating Pressures

	Inlet Port	External Pilot Port
Standard 2 Pos.	35 to 150 PSIG	Not required
External Pilot	Vacuum to 35 PSIG	35 to 150 PSIG

AVCO can supply many combinations in addition to those listed and will be happy to discuss specific requirements.

Alloy Valves and Control

Electrical Information

	NEMA 4X with DIN 43650 Connection		NEMA 4X 1/2" Conduit with 30" Leads
	Explosion Proof 1/2" Conduit with 24" Leads CSA 202633X FM Approved CL. I; ZONE1Ex m II T4; AEx m II CL. I; Div. 1; GR. A, B, C, D CL. II; GR. E, F, G CL. III T4 Ta = -20oC to +60oC NEMA: 4, 4X, 7C, 7D		Intrinsically Safe with Strain Relief EEx ia IIC T6 CL. I; Div. 1; GR. A, B, C, D CL. II; GR. E, F, G CL. III; Div. 1 Hazardous Location

Weatherproof	110/120 VAC	220/240 VAC	12 VDC	24 VDC
Inrush Amps	.08	.04	.40	.20
Holding Amps	.06	.03	.40	.20
Resistance (Ohms)	840	3400	31	121
Power (AC=VA, DC= Watts)	4.8	6.0	4.8	4.8
Explosion Proof				
Inrush Amps	.096	.048		
Holding Amps	.054	.027	.375	.187
Resistance (Ohms)	530	2345	32	128
Power (AC=VA, DC= Watts)	6.5	6.5	7	
Intrinsically Safe				
Inrush Amps				.03
Holding Amps				.03
Resistance (Ohms)				275
Power (AC=VA, DC= Watts)				2.1

SV	4	120A	CO	DC
Solenoid	Enclosure	Voltage	Connection	Options
SV	4 - Weather Proof 7 - Explosion Proof 9 - Intrinsically Safe	120A - 120VAC 220A - 220VAC 12D - 12VDC 24D - 24VDC	CO - 1/2" Conduit DN - DIN 43650	DC - Dual Coil HT - High Temperature

Note: Intrinsically safe solenoid is 24VDC only and includes coil and connector

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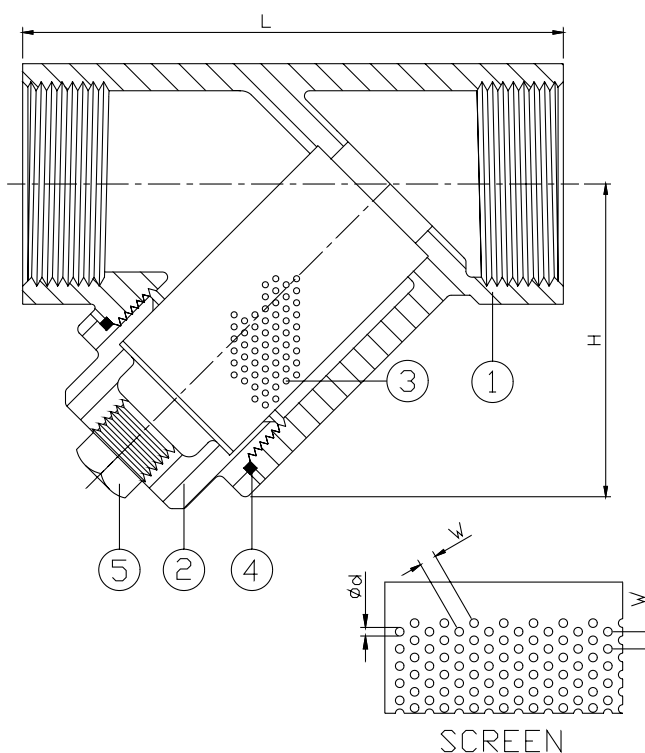
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ITEM	PARTS	MATERIAL
1	BODY	ASTM A351-CF8M
2	CAP	
3	SCREEN	AISI 316
4	GASKET	PTFE
5	PLUG	ASTM A351-CF8M

FEATURES

- 1/4" ~ 3" (DN8~DN80)
- W.P. : 800 WOG (PN50)
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Thread type : ASTM B1.20.1 (NPT)
DIN2999 & BS21
ISO228/1 & ISO7/1



DN	L	H	W	d
8	65	46.5	2	1
10	65	46.5	2	1
15	65	46.5	2	1
20	80	54	2	1
25	90	67	2	1
32	105	74	2	1
40	120	81.5	2	1
50	140	95	2	1
65	180	121.3	2	1
80	200	138.3	2	1

unit:mm

NPS	L	H	W	d
1/4"	2.56	1.83	0.08	0.04
3/8"	2.56	1.83	0.08	0.04
1/2"	2.56	1.83	0.08	0.04
3/4"	3.15	2.13	0.08	0.04
1"	3.54	2.64	0.08	0.04
1-1/4"	4.13	2.91	0.08	0.04
1-1/2"	4.72	3.21	0.08	0.04
2"	5.51	3.74	0.08	0.04
2-1/2"	7.09	4.78	0.08	0.04
3"	7.87	5.44	0.08	0.04

unit:in