"Apollo" Valves

PROUDLY MADE IN USA — 5 YEAR WARRANTY

3-Piece Full Port Carbon Steel Class 600 Socket-Weld Ball Valve

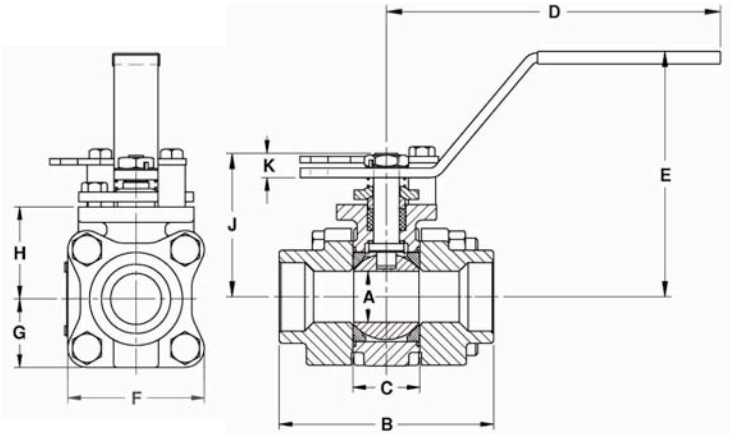
Standard Compliance - Valve design: ASME B16.34, Class 600, End Connections: Socket-weld per ASME B16.11, Valve Marking: ASME B16.34, Production Testing: ASME B16.34, NACE MR0175, 2000 edition.

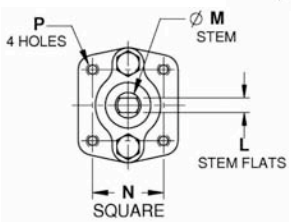
FEATURES

- 3-Piece construction w/ enclosed fasteners
- Full port
- Stainless steel trim & hardware
- Swing-out center section
- Pressure balanced solid ball
- Compression controlled spiral wound gaskets
- Anti-blowout one piece bottom entry stem
- Statically grounded ball, stem, & body
- Two-position locking
- Adjustable multi-piece PTFE "V" style packing
- Fully machined ISO 5211 mounting
- Cast bosses on the center-section and end caps for bleed & drain ports
- Vacuum service to 29 in of Hg.
- CE mark, 1-1/4" and larger
- 250 psig saturated steam

STANDARD MATERIAL LIST

1. Body	ASTM A216-WCB
2. End Caps	ASTM A216-WCB
3. Ball	ASTM A276-316SS
4. Stem	ASTM A276-316SS
5. Seat	Multi-Seal
6. Packing	PTFE
7. Stem Bearing	PEEK/PTFE
8. Body Gasket	PTFE Spiral Wound
9. Body Bolts	ASTM A193-Gr.B8M3
10. Body Nuts	ASTM A194-Gr.8
11. Stop Bolts	18-8 Stainless Steel
12. Gland Bolts	ASTM A193-Gr.B8
13. Handle Nut/Screw	300 Series Stainless Steel
14. Packing Gland	ASTM A276-316SS
15. Gland Plate	300 Series Stainless Steel
16. Lever Handle	300 Series Stainless Steel
17. Lock Plate	300 Series Stainless Steel
18. Stops	300 Series Stainless Steel
19. Int. Grnd. Spring	300 Series Stainless Steel
20. Ext. Grnd. Spring	300 Series Stainless Steel





OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-04-	2-1/4" Stem Extension	1/4" to 2"
-14-	Vented Ball (see page J-2)	1/4" to 2"
-15-	Round Handle	1/4" to 2"
-21-	UHMWPE Seats w/Graphite Seals	1/4" to 2"
-24-	Fire Safe - Graphite Packing & Gaskets (API 607, 5th ed., ISO 10497-5)	1/4" to 2"
-38-	Peek Seats, Graphite Stem Packing & Gaskets	1/4" to 2"
-49-	Assembled Dry	1/4" to 2"
-62-	Center Section Only	1/4" to 2"
-67-	Cleaned for Industrial Gases	1/4" to 2"
-69-	Drilled & Tapped Purge & Drains	1/4" to 2"
-70-	Extended Bonnet	1/4" to 2"
-76-	Live Loaded (Lever Operated)	1/4" to 2"
-77-	Live Loaded (Actuated)	1/4" to 2"
-90-	Extended Bonnet w/Double Packing	1/4" to 2"
-SR-	Spring Return Handle	1/4" to 1"

For Pressure/Temperature Ratings, Refer to Page M-18, Graph No. 25

CARBON STEEL 3-PIECE FULL PORT BALL VALVE

NUMBER	SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT.
	1/4"	.37	2.80	0.89	5.12	3.02	2.02	1.01	1.39	1.97	0.23	0.245	0.375	1.00	10-24	2.3
	3/8"	.50	2.80	0.89	5.12	3.02	2.02	1.01	1.39	1.97	0.23	0.245	0.375	1.00	10-24	2.3
	1/2"	.50	2.80	0.89	5.12	3.02	2.02	1.01	1.39	1.97	0.23	0.245	0.375	1.00	10-24	2.3
	3/4"	0.75	3.68	1.10	5.53	3.40	2.40	1.20	1.65	2.35	0.24	0.312	0.500	1.392	1/4-20	4.0
	1"	1.00	4.19	1.31	6.53	4.80	2.67	1.34	1.80	2.80	0.48	0.287	0.500	1.392	1/4-20	5.7
	1-1/4"	1.50	4.50	1.97	6.65	4.70	3.84	1.92	2.49	3.89	0.72	0.412	0.625	1.949	5/16-18	14.2
	1-1/2"	1.50	4.98	1.97	6.65	4.70	3.84	1.92	2.49	3.89	0.72	0.412	0.625	1.949	5/16-18	14.4
	2"	2.00	5.86	2.56	8.40	5.47	4.92	2.46	3.17	4.74	0.80	0.477	0.750	1.949	5/16-18	27.6

FLOW DATA

For Apollo® Ball Valves

The listed Cv "factors" are derived from actual flow testing, in the Apollo® Ball Valve Division, Conbraco Industries, Inc., Pageland, South Carolina. These tests were completed using standard "off the shelf" valves with no special preparation and utilizing standard schedule 40 pipe. It should be understood that these factors are for the valve only and also include the connection configuration. The flow testing is done utilizing water as a fluid media and is a direct statement of the gallons of water flowed per minute with a 1 psig pressure differential across the valve/connection unit. Line pressure is not a factor. Because the Cv is a factor, the formula can be used to estimate flow of most media for valve sizing.

Flow of Liquid

$$Q = Cv\sqrt{\frac{\Delta P}{SpGr}}$$

or $$\Delta P = \frac{(Q)^2\ (SpGr)}{(Cv)^2}$$

Where:
Q = flow in US gpm
ΔP = pressure drop (psig)
SpGr = specific gravity at flowing temperature
Cv = valve constant

Flow of Gas

$$Q = 1360\ Cv\sqrt{\frac{(\Delta P)\ (P_1)}{(SpGr)\ (T)}}$$

or $$\Delta P = \frac{5.4 \times 10^{-7}\ (SpGr)\ (T)}{(Q)^2} \over (Cv)^2\ (P_2)$$

Where:
Q = flow in SCFH
ΔP = pressure drop (psig)
SpGr = specific gravity (based on air = 1.0)
P_1 = outlet pressure–psia (psig + 14.7)
T = (temp. °F + 460)
Cv = valve constant

Cv FACTORS
SERIES:
70-100, 71-100, 71AR, 73A-100,
74-100, 76-100, 76AR, 80-100
81-100, 89-100

SIZE		1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
OPEN	90°	8.4	7.2	15	30	43	48	84	108	503	370	670

Cv FACTORS
76F, 77, 77AR, 77C, 77D SERIES

SIZE		1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"
OPEN	90°	8.1	15	15	51	68	125	177	389	503

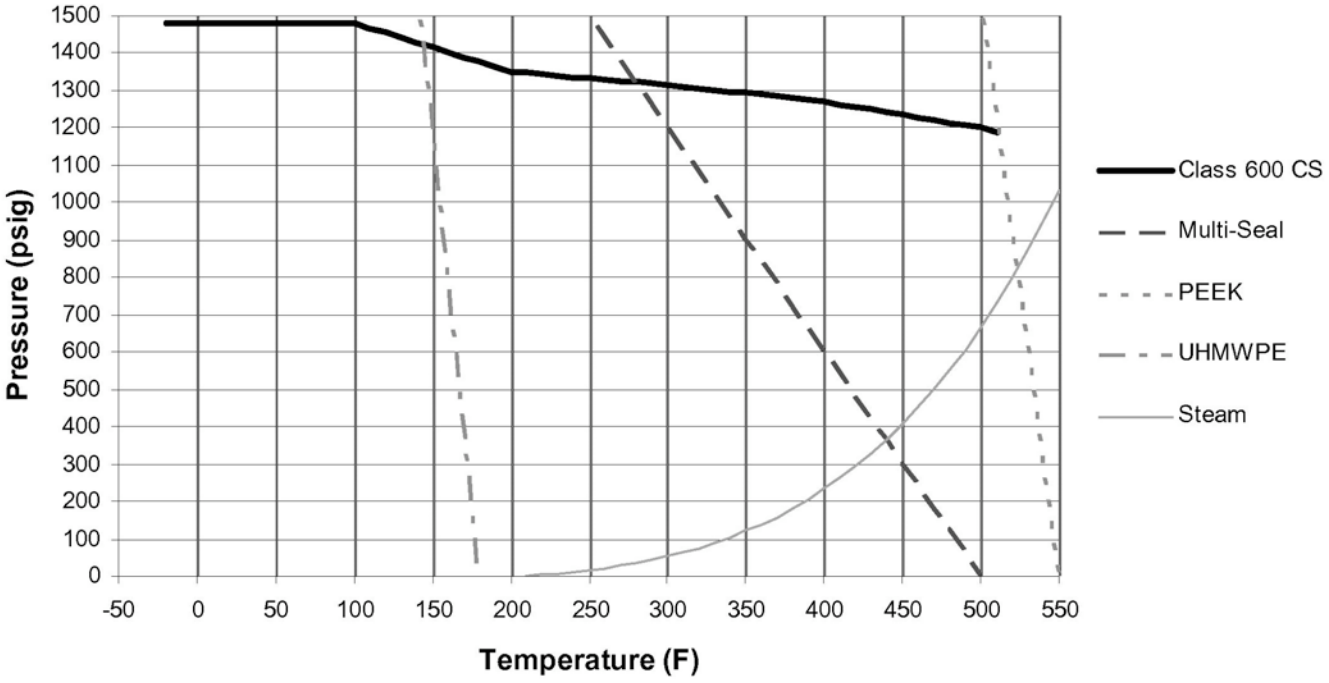
Cv FACTORS
82-100/200, 83R-100/200/700,85R-100/200,86R-100/200/700,83-500/600,86-500/600/900 SERIES

SIZE		1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
OPEN	90°	8.1	14	26	51	68	120	170	376	510	996	1893

Cv FACTORS
83A/83B, 86A/86B, 86C SERIES

SIZE		1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
OPEN	90°	8.1	14	26	51	68	120	170	376

ASME Class 600 CS P-T Rating
(Graph 25)



ASME Class 600 SS P-T Rating
(Graph 26)