

89-AR SERIES

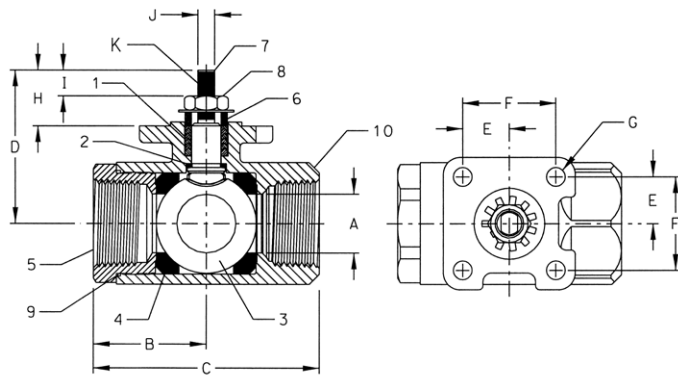
Carbon Steel Std. Port Ball Valve with Actuator Ready ISO Mounting Pad

Female NPT Thread, 1/4"-1" 2000 CWP (psig), 1.25"-2" 1500 CWP (psig), 2.5"-3" 1000 CWP (psig). Cold Non-Shock.
250 psig Saturated Steam. (See referenced P/T chart)
Vacuum Service to 29 inches Hg.
MSS SP-110 compliant.



FEATURES

- Multi-piece packing set
- Blow-out-proof stem design
- ISO 5211 mounting pad
- Adjustable packing gland
- Stainless ball & stem
- Live loaded packing



OPTIONS AVAILABLE: (More information in Section J)

(SUFFIX)	OPTION	SIZES
-01	Standard Configuration	All
-14-	Side Vented Ball (Uni-Directional)	1/4" to 3"
-24-	Graphite Packing	1/4" to 3"
-27-	Latch Lock Handle	1/4" to 2"
-35-	PTFE Seats	1/4" to 3"
-65-	Multifill Seats/Graphite Packing	1/4" to 3"
-67-	Cleaned for Industrial Gases - CS Valves	1/4" to 3"

STANDARD MATERIAL LIST

PART	MATERIAL
1 Stem packing	MPTFE
2 Stem bearing	PEEK/PTFE
3 Ball	316 SS
4 Seat (2)	MPTFE
5 Retainer	A108-CS (1/4" to 3")
6 Gland	A276-316
7 Stem	A276-316
8 Jam nut	SS
9 Body seal	PTFE (1.25" to 3")
10 Body	A216-WCB
11 Bellville washer(s)	Stainless Steel

PRODUCT NUMBER	SIZE	A	B	C	D	E	F	G	H	I	J (FLATS)	K (THRDS) UNF	WT.
89-AR1-64	1/4"	0.37	1.02	2.04	1.40	0.59	1.17	0.28	0.61	0.25	.247/.249	3/8-24	0.52
89-AR2-64	3/8"	0.37	1.02	2.04	1.40	0.59	1.17	0.28	0.61	0.25	.247/.249	3/8-24	0.49
89-AR3-64	1/2"	0.50	1.12	2.23	1.54	0.59	1.17	0.28	0.61	0.22	.247/.249	3/8-24	0.58
89-AR4-64	3/4"	0.68	1.47	2.96	2.16	0.70	1.39	0.28	0.84	0.33	.247/.249	3/8-24	1.26
89-AR5-64	1"	0.87	1.66	3.34	2.28	0.70	1.39	0.28	0.84	0.32	.247/.249	3/8-24	1.62
89-AR6-64	1.25"	1.00	2.00	4.00	2.98	0.98	1.95	0.34	1.16	0.43	.370/.372	5/8-18	3.22
89-AR7-64	1.5"	1.25	2.18	4.34	3.16	0.98	1.95	0.34	1.16	0.38	.370/.372	5/8-18	4.06
89-AR8-64	2"	1.50	2.75	5.43	3.37	0.98	1.95	0.34	1.16	0.47	.370/.372	5/8-18	6.18
89-AR9-64	2.5"	2.00	3.12	6.25	3.85	0.98	1.95	0.34	1.16	0.41	.370/.372	5/8-18	13.06
89-AR0-64	3"	2.50	3.37	6.75	4.18	0.98	1.95	0.34	1.16	0.55	.370/.372	5/8-18	17.06

FOR PRESSURE/TEMPERATURE RATINGS, REFER TO PAGE M-14 GRAPH NO. 13
(1/4" TO 1") REFER TO PAGE M-13, GRAPH NO. 11 (1.25" TO 2")
REFER TO PAGE M-12, GRAPH NO. 7 (2.5" TO 3")



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

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

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

Where:

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

FLOW OF GAS

$$Q = 1360 C_v \sqrt{\frac{(\Delta P) (P_2)}{(SpGr) (T)}}$$

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

Where:

Q = flow in SCFH
 ΔP = pressure drop (psig)
 SpGr = specific gravity (based on air = 1.0)
 P₂ = outlet pressure-psia (psig + 14.7)
 T = (temp. °F + 460)
 Cv = valve constant

Cv FACTORS FOR APOLLO VALVES

SIZE (IN.)	1/4	3/8	1/2	3/4	1	1.25	1.5	2	2.5	3	4	6	8	10	12
VALVE															
32-100/200 Series	5.1	6.6	8	24	30	45	55	95	--	--	--	--	--	--	--
64-100/200 Series	6	7	19	34	50	104	268	309	629	1018	1622	--	--	--	--
64W Series	--	--	--	--	--	--	--	--	629	1018	1622	--	--	--	--
70B-140 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
70-100/200 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
70-300/400 Series	--	--	15	30	43	48	84	108	--	--	--	--	--	--	--
70-600 Series	2.3	4.5	5.4	12	14	21	34	47	--	--	--	--	--	--	--
70-800 Series	8.4	7.2	15	30	43	48	84	--	--	--	--	--	--	--	--
71AR Series	--	--	--	30	43	48	84	108	190	370	--	--	--	--	--
71-100/200 Series	--	--	--	30	43	48	84	108	190	370	--	--	--	--	--
72-100/900 Series	--	--	26	48	65	125	170	216	--	--	--	--	--	--	--
73A-100 Series	8.4	7.2	15	30	43	48	84	108	--	--	--	--	--	--	--
73-300/400 Series	--	--	26	48	65	125	170	216	--	--	--	--	--	--	--
74-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
75-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
76AR Series	8.4	7.2	15	30	43	48	84	108	190	370	670	--	--	--	--
76F-100 Series	8.1	15	15	51	68	125	177	389	--	--	--	--	--	--	--
76-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
76-300/400 Series	--	--	26	48	65	125	170	216	--	--	--	--	--	--	--
76-600 Series	2.3	4.5	5.4	12	14	21	34	47	--	--	--	--	--	--	--
7K-100 Series	--	--	15	51	68	125	177	389	503	--	--	--	--	--	--
77AR Series	8.1	15	15	51	68	125	177	389	--	--	--	--	--	--	--
77C-100/200 Series	4.5	7.2	16	36	68	125	177	389	503	--	--	--	--	--	--
77D-140 Series	4.5	7.2	16	36	68	125	177	389	--	--	--	--	--	--	--
77D-640 Series	--	--	--	11	24	35	--	--	--	--	--	--	--	--	--
77G-UL Series	4.5	7.2	16	36	68	125	177	389	503	--	--	--	--	--	--
77W Series	--	--	16	36	68	125	177	389	--	--	--	--	--	--	--
77X Series	--	--	16	36	68	--	--	--	--	--	--	--	--	--	--
77-100/200 Series	8.1	15	15	51	68	125	177	389	503	--	--	--	--	--	--
79 Series	8.5	8.5	9.8	32	44	66	148	218	440	390	--	--	--	--	--

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FLOW DATA

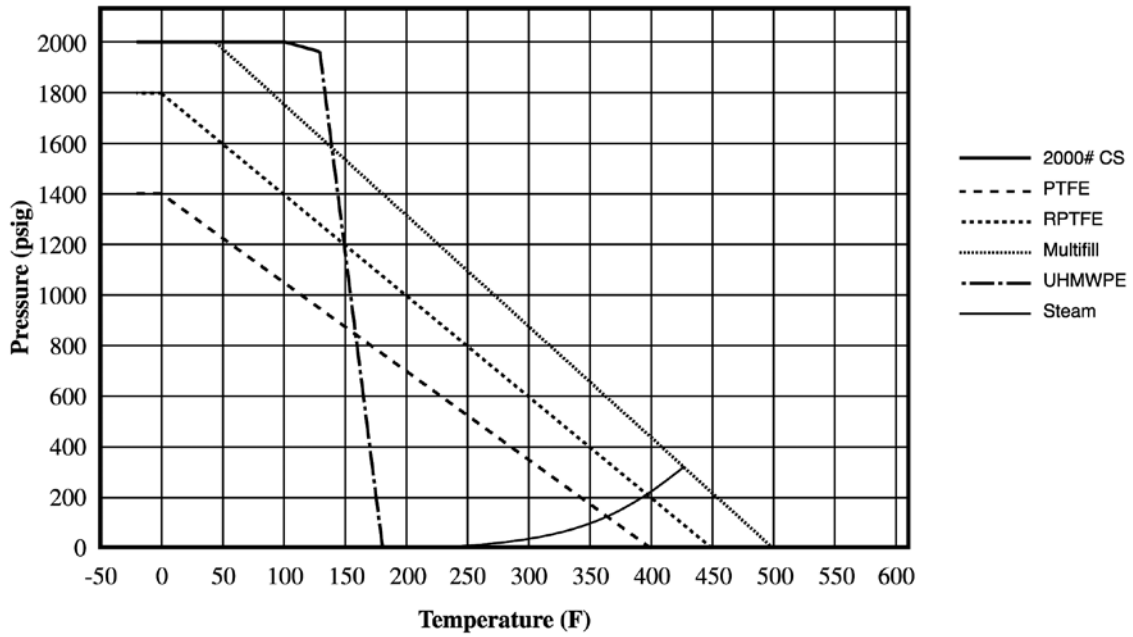
For Apollo® Ball Valves

Cv FACTORS FOR APOLLO VALVES (continued from page M-3)

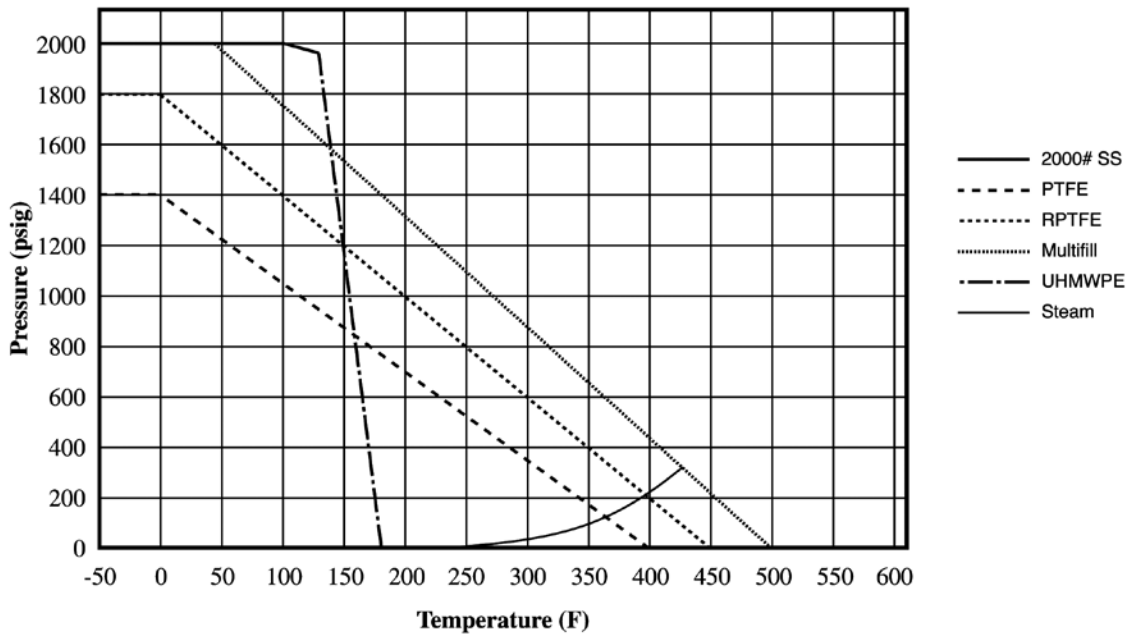
SIZE (IN.)	1/4	3/8	1/2	3/4	1	1.25	1.5	2	2.5	3	4	6	8	10	12
VALVE															
80/81 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
82-100/200 Series	8.1	14	26	51	68	120	170	376	510	996	1893	--	--	--	--
83A/83B Series	8.1	14	26	51	68	120	170	376	--	--	--	--	--	--	--
83R-100/200 Series	--	--	--	--	--	--	170	376	--	996	1893	--	--	--	--
86A/86B Series	8.1	14	26	51	68	120	170	376	--	--	--	--	--	--	--
86R-100/200 Series	--	--	--	--	--	--	170	376	--	996	1893	--	--	--	--
87A-100 Series	--	--	--	--	--	--	86	104	234	375	673	1099	1902	3890	--
87A-200 Series	--	--	15	19	75	--	195	410	545	1021	2016	4837	9250	15170	22390
87A-700 Series	--	--	--	--	--	--	86	104	234	375	673	1099	1902	3890	--
87A-900 Series	--	--	15	19	75	--	195	410	545	1021	2016	4837	9250	15170	22390
87B-100 Series	--	--	--	--	--	--	--	--	--	375	673	1099	1902	3890	--
88A-100 Series	--	--	--	--	--	--	86	104	234	375	673	1099	1902	3890	--
88A-200 Series	--	--	15	19	75	--	195	410	545	1021	2016	4837	9250	15170	22390
88A-700 Series	--	--	--	--	--	--	86	104	234	375	673	1099	1902	3890	--
88A-900 Series	--	--	15	19	75	--	195	410	545	1021	2016	4837	9250	15170	22390
88B-100 Series	--	--	--	--	--	--	--	--	--	375	673	1099	1902	3890	--
89-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
9A-100 Series	8.3	6.7	5.7	10	16	25	40	62	--	--	--	--	--	--	--
91-100 Series	8.3	6.7	5.7	10	16	25	40	62	--	--	--	--	--	--	--
92-100 Series	8.3	6.7	5.7	10	16	25	40	62	--	--	--	--	--	--	--
93-100 Series	8.3	6.7	5.7	10	16	25	40	62	--	--	--	--	--	--	--
94A-100/200 Series	6	7	19	34	50	104	268	309	629	1018	1622	--	--	--	--
95-100/200 Series	--	--	15	51	68	--	--	--	--	--	--	--	--	--	--
95A-300/400 Series	--	--	19	34	50	--	--	--	--	--	--	--	--	--	--
96-100 Series	8.3	6.7	5.7	10	16	25	40	62	--	--	--	--	--	--	--
399-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--
489-100 Series	8.4	7.2	15	30	43	48	84	108	190	370	--	--	--	--	--

PRESSURE TEMPERATURE RATINGS

2000# CS (GRAPH 13)

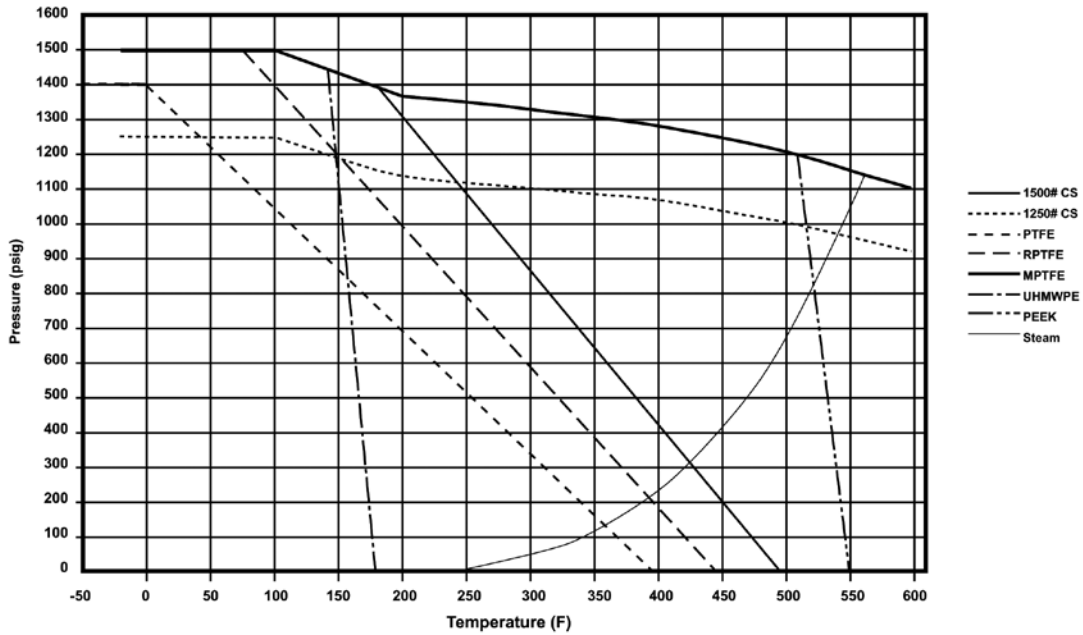


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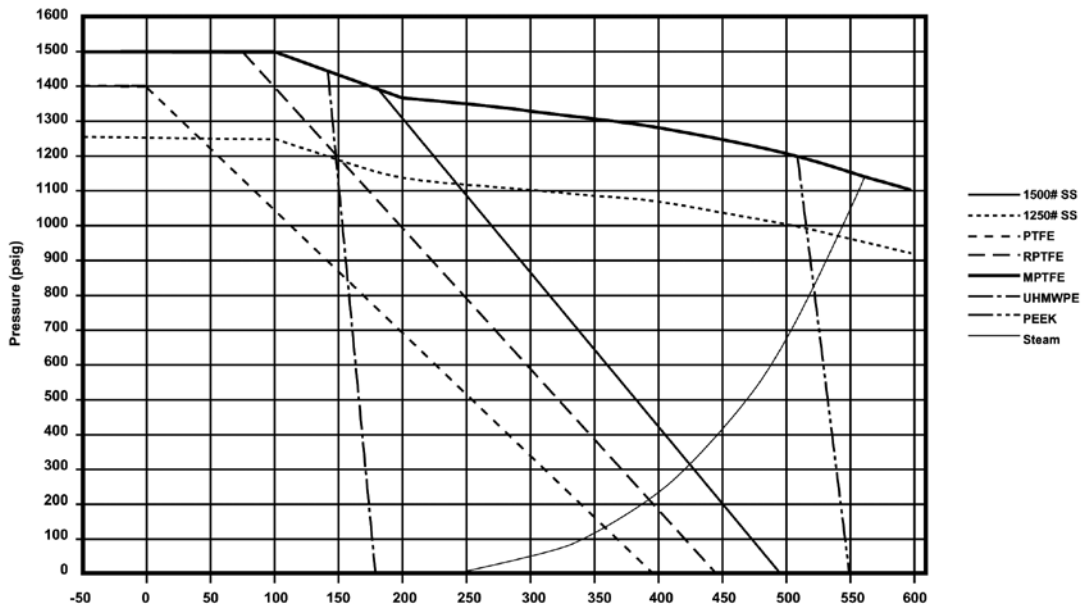


PRESSURE TEMPERATURE RATINGS

1500# CS (GRAPH 11)

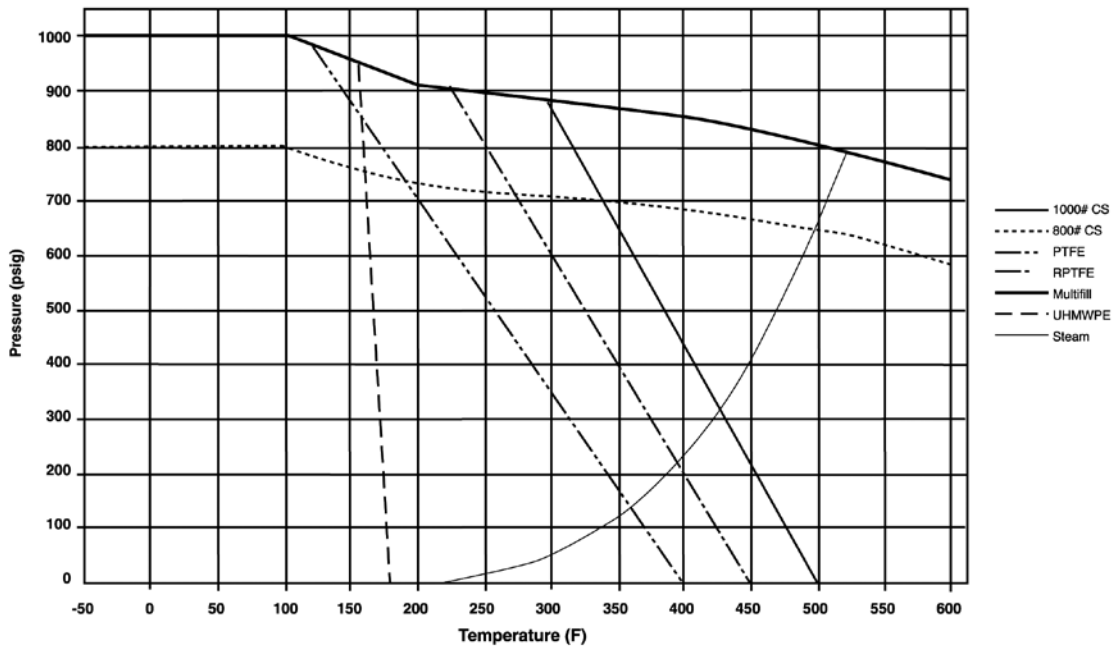


1500# SS (GRAPH 12)



PRESSURE TEMPERATURE RATINGS

1000# CS (GRAPH 7)



1000# SS (GRAPH 8)

