

# 86S-100 SERIES

STAINLESS STEEL 3-PIECE FULL PORT CLASS 600 NPT BALL VALVE



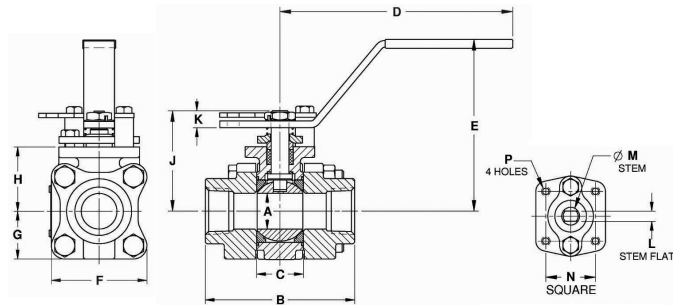
## STANDARD COMPLIANCE

- Valve Design: ASME B16.34, Class 600, NACE MR0175 (2000) & MR0103 (2012), API 608

- End Connections: NPT per ASME B1.20.1
- Valve Marking: ASME B16.3
- Production Testing: ASME B16.34

## 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 Marking, 1.25" and larger (add "-CE" suffix)
- 250 psig saturated steam

## OPTIONS AVAILABLE

(MORE INFORMATION IN SECTION J)

- Minimum quantities apply
- To specify an option, replace the "01" standard suffix with the suffix of the option.
- To specify multiple options, replace the "01" suffix with the desired suffixes in the numerical order shown below. NOTE: Not all suffixes can be combined together.

(SUFFIX)	OPTION	SIZES
-01	Standard Configuration	All
-P -01-	BSPP (Parallel) Thread Connection	1/4" to 2"
-T -01-	BSPT (Tapered) Thread Connection	1/4" to 2"
-04-	2.25" Stem Extension (Carbon Steel, Zinc Plated)	1/4" to 2"
-14-	Vented Ball	1/4" to 2"
-15-	Stainless Steel Locking Round Handle	1/4" to 2"
-21-	UHMWPE Seats w/ Graphite Seals	1/4" to 2"
-24-	Graphite Packing, Spiral Wound Graphite Body Seal, PTFE/PEEK Bearing (Fire Safe API 607, 6th Edition, ISO 10497:2010) (Fire Safe by Design)	1/4" to 2"
-38-	Peek Seats, Graphite Stem Packing & Gaskets	1/4" to 2"
-49-	No Lubrication. Assembled Dry	1/4" to 2"
-57-	Cleaned for Oxygen Service	1/4" to 2"
-62-	Center Section Only	1/4" to 2"
-63-	NPT x Socketweld	1/4" to 2"
-69-	Drilled & Tapped Purge & Drains	1/4" to 2"
-70-	4" Extended Bonnet	1/4" to 2"
-76-	Live Loaded (Lever Operated)	1/4" to 2"
-77-	Live Loaded (Actuated)	1/4" to 2"
-90-	Double Packed 4" Extended Bonnet	1/4" to 2"
-9P-	Double Packed 4" Extended Bonnet w/ Monitoring Port	1/4" to 2"
-CE-	CE Marking	1-1/4" to 2"
-KF-	PCTFE Stem Bearing	1/4" to 2"
-SR-	Spring Return Handle	1/4" to 1"

## STANDARD MATERIAL LIST

	PART	MATERIAL
1	Body	ASTM A351-CF3
2	End Caps	ASTM A351-CF3
3	Ball	ASTM A276-304/304L
4	Stem	ASTM A276-304/304L ASTM A564 17-4PH (2" with -38 suffix)
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	Internal Grounding Spring	300 Series Stainless Steel
20	External Grounding Spring	300 Series Stainless Steel

**Pressure/Temperature Ratings - Page M-31, Graph No. 46**

## DIMENSIONS

PRODUCT NO.	SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	WT.
86B-101-01	1/4"	0.37	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
86B-102-01	3/8	0.50	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
86B-103-01	1/2"	0.50	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
86B-104-01	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
86B-105-01	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
86B-106-01	1.25"	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
86B-107-01	1.5"	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
86B-108-01	2"	2.00	5.86	2.56	8.40	5.47	4.56	2.46	3.17	4.74	0.80	0.477	0.750	1.949	5/16-18	24.4

The listed  $C_v$  "factors" are derived from actual flow testing, at Apollo's Pageland, South Carolina factory. 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 1psig pressure differential across the valve/connection unit. Line pressure is not a factor. Because the  $C_v$  is a factor, the formula can be used to estimate flow of most fluids 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
- $\Delta P$  = Pressure drop (psig)
- SpGr = Specific gravity of flowing temperature
- $C_v$  = 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
- $\Delta P$  = Pressure drop (psig)
- SpGr = Specific gravity (based on air = 1.0)
- P2 = Outlet pressure-psia (psig + 14.7)
- T = (temp. °F + 460)
- $C_v$  = Valve constant

**CAUTION:** The gas equation shown, is valid at very low pressure drop ratios. The gas equation is NOT valid when the ratio of pressure drop ( $\Delta P$ ) to inlet pressure ( $P_1$ ) exceeds 0.02.

**NOTE:** Only use the gas equation shown if  $(P_1 - P_2)/P_1$  is less than 0.02.

### CV FACTORS FOR APOLLO® VALVES (CONTINUED ON M-6)

VALVE	SIZE (IN.)														
	1/4	3/8	1/2	3/4	1	1.25	1.5	2	2.5	3	4	6	8	10	12
705-100Series	11.4	23	35	50	65	80	94	108	122	137	152	—	—	—	—
70-100/300Series	11.4	23	35	50	65	80	94	108	122	137	152	—	—	—	—
70-500/600 Series	—	—	35	50	65	80	94	108	—	—	—	—	—	—	—
70-600Series	2.3	4.5	6.4	12	14	18	24	27	—	—	—	—	—	—	—
70-600Series	11.4	23	35	50	65	80	94	—	—	—	—	—	—	—	—
71-AR Series	—	—	—	30	45	60	84	108	144	180	240	—	—	—	—
71-100/300Series	—	—	—	30	45	60	84	108	144	180	240	—	—	—	—
72-100/300 Series	—	—	28	48	65	85	100	124	—	—	—	—	—	—	—
72-100/300 Series	—	—	28	48	65	85	100	124	—	—	—	—	—	—	—
72-100-A/72-300-A Series	—	—	28	48	65	85	100	124	—	—	—	—	—	—	—
73A-100Series	11.4	23	35	50	65	80	94	108	—	—	—	—	—	—	—
73-500/600Series	—	—	28	48	65	85	100	124	—	—	—	—	—	—	—
74-100 Series	11.4	23	35	50	65	80	94	108	122	137	152	—	—	—	—
75-100 Series	11.4	23	35	50	65	80	94	108	122	137	152	—	—	—	—
76-ARSeries	11.4	23	35	50	65	80	94	108	122	137	152	—	—	—	—
76F-100 Series	11.1	15	15	51	68	85	107	130	—	—	—	—	—	—	—
76FJ-100Series	11.1	15	15	51	68	85	107	130	—	—	—	—	—	—	—
76FK-100 Series	11.1	15	15	51	68	85	107	130	—	—	—	—	—	—	—
76-100Series	11.4	23	35	50	65	80	94	108	122	137	—	—	—	—	—
76-500/600 Series	—	—	28	48	65	85	100	124	—	—	—	—	—	—	—
76-600 Series	2.3	4.5	6.4	12	14	18	24	27	—	—	—	—	—	—	—
76J-100Series	11.4	23	35	50	65	80	94	108	122	137	—	—	—	—	—
76J-AR Series	11.4	23	35	50	65	80	94	108	122	137	152	—	—	—	—
76N-100 Series	11.4	23	35	50	65	80	94	108	122	137	—	—	—	—	—
76K-AR Series	11.4	23	35	50	65	80	94	108	122	137	152	—	—	—	—
76-100Series	—	—	15	51	68	85	107	130	165	—	—	—	—	—	—
77-AR Series	11.1	15	15	51	68	—	107	130	—	—	—	—	—	—	—

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**ASME CLASS 600**

**(SS) ASTM A351-CF3**

**GRAPH 46**

