

Female NPT Thread, 600 CWP (psig), Cold Non-Shock.  
150 psig Saturated Steam.  
Vacuum Service to 29 inches Hg.  
MSS SP-110 Compliant.

#### FEATURES

- Two piece body
- Reinforced seats

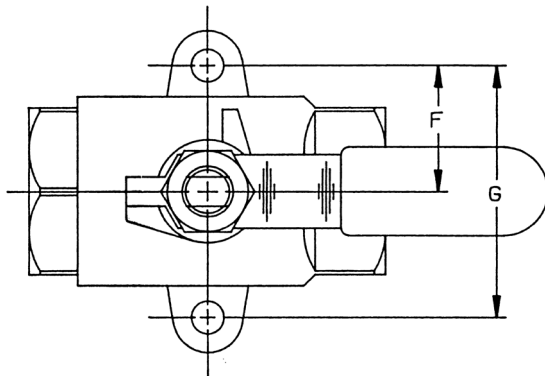
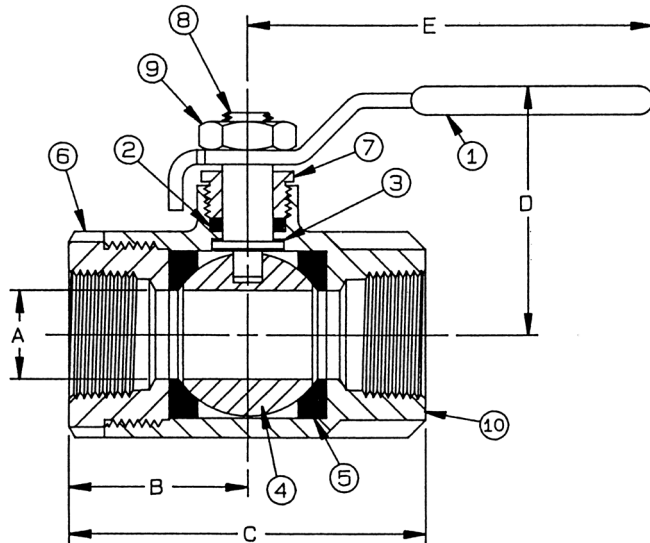
- Blowout-proof stem design
- Adjustable packing gland

#### 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          |
| -T -01-  | BSPT (Tapered) Thread Connection                      | 1/4" to 3/4" |
| -04-     | 2.25" Stem Extension (Carbon Steel, Zinc Plated)      | 1/4" to 3/4" |
| -07-     | Steel Tee Handle                                      | 1/4" to 3/4" |
| -10-     | SS Lever & Nut                                        | 1/4" to 3/4" |
| -14-     | Side Vented Ball (Uni-Directional)                    | 1/4" to 3/4" |
| -15-     | Wheel Handle, Steel                                   | 1/4" to 3/4" |
| -17-     | Rough Chrome Plated - Bronze Valves                   | 1/4" to 3/4" |
| -27-     | SS Latch-Lock Lever & Nut                             | 1/4" to 3/4" |
| -30-     | Cam-Lock and Grounded                                 | 1/4" to 3/4" |
| -32-     | SS Tee Handle & Nut                                   | 1/4" to 3/4" |
| -35-     | PTFE Trim                                             | 1/4" to 3/4" |
| -41-     | Automatic Drain (+50°F to 200°F limit. 125 psig max.) | 1/4" to 3/4" |
| -56-     | Multifill Seats & Packing                             | 1/4" to 3/4" |
| -57-     | Oxygen Cleaned                                        | 1/4" to 3/4" |



**Pressure/Temperature Ratings - Page M-10, Graph No. 4**

#### STANDARD MATERIAL LIST

|    | PART           | MATERIAL                   |
|----|----------------|----------------------------|
| 1  | Lever and grip | Steel, zinc plated w/vinyl |
| 2  | Stem packing   | MPTFE                      |
| 3  | Stem bearing   | RPTFE                      |
| 4  | Ball           | B16 Brass, chrome plated   |
| 5  | Seat (2)       | RPTFE                      |
| 6  | Retainer       | B16 Brass                  |
| 7  | Gland nut      | B16 Brass                  |
| 8  | Stem           | B16 Brass                  |
| 9  | Lever nut      | Steel, zinc plated         |
| 10 | Body           | B584-C84400                |

#### DIMENSIONS

| PRODUCT NO. | SIZE | A    | B    | C    | D    | E    | F    | G    | WT.  |
|-------------|------|------|------|------|------|------|------|------|------|
| 78-248-01   | 1/4" | 0.43 | 1.12 | 2.25 | 1.78 | 3.87 | 0.93 | 1.87 | 0.68 |
| 78-250-01   | 3/8" | 0.50 | 1.12 | 2.25 | 1.78 | 3.87 | 0.93 | 1.87 | 0.68 |
| 78-256-01   | 1/2" | 0.50 | 1.12 | 2.25 | 1.78 | 3.87 | 0.93 | 1.87 | 0.65 |
| 78-438-01   | 3/4" | 0.68 | 1.50 | 3.00 | 2.12 | 4.87 | 1.06 | 2.12 | 1.40 |

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 1 psig 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 media for valve sizing.

### FLOW OF LIQUID

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

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

#### WHERE:

- Q = Flow in US gpm
- $\Delta P$  = Pressure drop (psig)
- SpGr = Specific gravity at flowing temperature
- $C_v$  = Valve constant

### FLOW OF GAS

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

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

#### WHERE:

- Q = Flow in SCFH
- $\Delta P$  = Pressure drop (psig)
- SpGr = Specific gravity (based on air = 1.0)
- $P_2$  = 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-4)

| 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 |
| 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  | --  | --  | --  | --  | -- | -- | -- | -- |
| 71-AR 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 | --  | --  | --  | -- | -- | -- | -- |
| 72-1xx-A/72-9xx-A Series | --         | --  | 26  | 48  | 65 | 125  | 170 | 245 | --  | --  | --  | -- | -- | -- | -- |
| 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 | -- | -- | -- | -- |
| 76-AR 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 | --  | --  | --  | -- | -- | -- | -- |
| 76FJ-100 Series          | 8.1        | 15  | 15  | 51  | 68 | 125  | 177 | 389 | --  | --  | --  | -- | -- | -- | -- |
| 76FK-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  | --  | --  | --  | -- | -- | -- | -- |
| 76J-100 Series           | 8.4        | 7.2 | 15  | 30  | 43 | 48   | 84  | 108 | 190 | 370 | --  | -- | -- | -- | -- |
| 76J-AR Series            | 8.4        | 7.2 | 15  | 30  | 43 | 48   | 84  | 108 | 190 | 370 | 670 | -- | -- | -- | -- |
| 76K-100 Series           | 8.4        | 7.2 | 15  | 30  | 43 | 48   | 84  | 108 | 190 | 370 | --  | -- | -- | -- | -- |
| 76K-AR Series            | 8.4        | 7.2 | 15  | 30  | 43 | 48   | 84  | 108 | 190 | 370 | 670 | -- | -- | -- | -- |
| 7K-100 Series            | --         | --  | 15  | 51  | 68 | 125  | 177 | 389 | 503 | --  | --  | -- | -- | -- | -- |
| 77-AR Series             | 8.1        | 15  | 15  | 51  | 68 | --   | 177 | 389 | --  | --  | --  | -- | -- | -- | -- |

REV. 21APR17

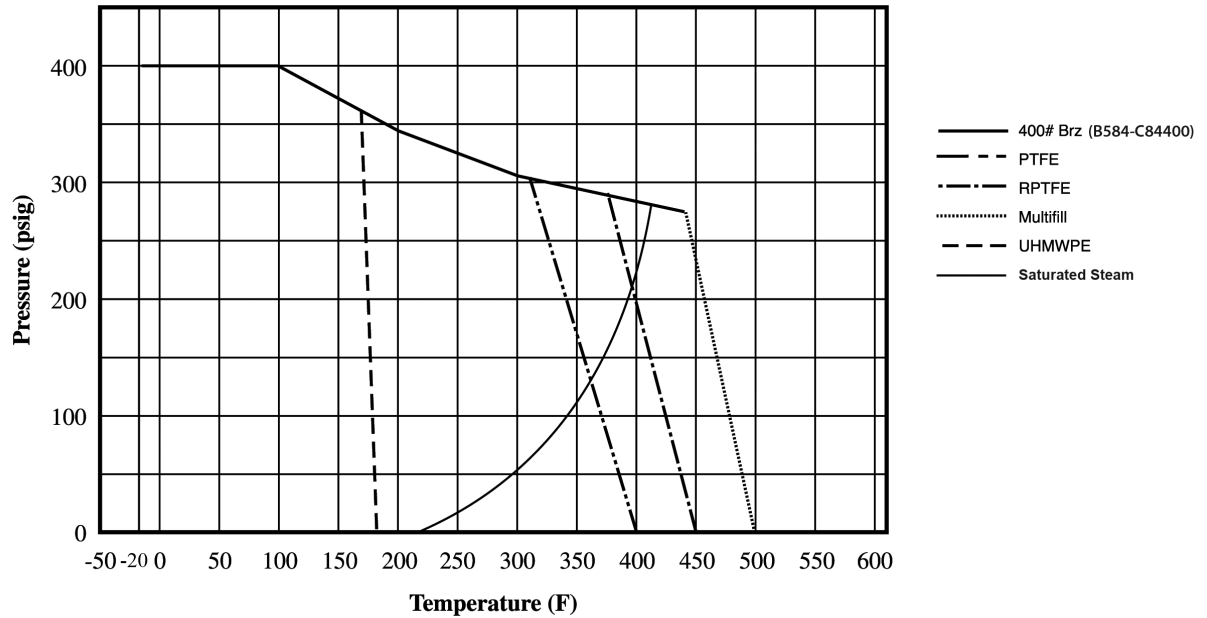
**CV FACTORS FOR APOLLO® VALVES (CONTINUED FROM M-3)**

| 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    |
| 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 | --  | --   | --   | --   | --   | --    | --    |
| 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  | --   | --   | --   | --    | --    |
| 80 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 |
| 87A-F00 Series     | --         | --  | --  | --  | 75 | --   | 195 | 410 | 545 | 1021 | 2016 | 4837 | --   | --    | --    |
| 87B-100 Series     | --         | --  | --  | --  | -- | --   | --  | --  | --  | 375  | 673  | 1099 | 1902 | 3890  | --    |
| 87J-100 Series     | --         | --  | --  | --  | -- | --   | 86  | 104 | 234 | 375  | 673  | 1099 | 1902 | 3890  | --    |
| 87J-200 Series     | --         | --  | 15  | 19  | 75 | --   | 195 | 410 | 545 | 1021 | 2016 | 4837 | 9250 | 15170 | 22390 |
| 87J-700 Series     | --         | --  | --  | --  | -- | --   | 86  | 104 | 234 | 375  | 673  | 1099 | 1902 | 3890  | --    |
| 87J-900 Series     | --         | --  | 15  | 19  | 75 | --   | 195 | 410 | 545 | 1021 | 2016 | 4837 | 9250 | 15170 | 22390 |
| 87K-100 Series     | --         | --  | --  | --  | -- | --   | 86  | 104 | 234 | 375  | 673  | 1099 | 1902 | 3890  | --    |
| 87K-200 Series     | --         | --  | 15  | 19  | 75 | --   | 195 | 410 | 545 | 1021 | 2016 | 4837 | 9250 | 15170 | 22390 |
| 87K-700 Series     | --         | --  | --  | --  | -- | --   | 86  | 104 | 234 | 375  | 673  | 1099 | 1902 | 3890  | --    |
| 87K-900 Series     | --         | --  | 15  | 19  | 75 | --   | 195 | 410 | 545 | 1021 | 2016 | 4837 | 9250 | 15170 | 22390 |
| 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 |
| 88A-F00 Series     | --         | --  | --  | --  | 75 | --   | 195 | 410 | 545 | 1021 | 2016 | 4837 | --   | --    | --    |
| 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  | --  | --   | --   | --   | --   | --    | --    |
| 90-100 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 | --   | --   | --    | --    |
| 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  | --   | --   | --   | --    | --    |

**400 CWP**

**BRONZE ASTM B584-C84400**

**GRAPH 3**



**600 CWP**

**BRONZE ASTM B584-C89836**

**GRAPH 4**

