

# 83L-540 SERIES

CARBON STEEL 3-PIECE FULL PORT LOW TEMP.  
CLASS 600 SCH. 40 BUTT WELD BALL VALVE



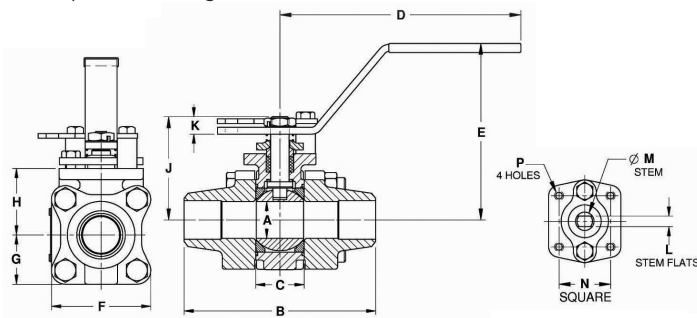
## STANDARD COMPLIANCE

- Valve Design: ASME B16.34 Class 600, NACE MR0175 (2000) & MR0103 (2012), API 608
- End Connections: Butt-Weld per ASME B16.25

- Valve Marking: ASME B16.34
- 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
- Rated to -50°F (-46°C)
- Two-position locking



## STANDARD MATERIAL LIST

|    | PART                      | MATERIAL                                                 |
|----|---------------------------|----------------------------------------------------------|
| 1  | Body                      | ASTM A352-LCC                                            |
| 2  | End Caps                  | ASTM A352-LCC                                            |
| 3  | Ball                      | ASTM A276-316SS                                          |
| 4  | Stem                      | ASTM A276-316SS<br>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-24, Graph No. 33**

## DIMENSIONS

| PART NO.   | SIZE   | A    | B    | C    | D    | E    | F    | G    | H    | J    | K    | L     | M     | N     | P       | WT.  |
|------------|--------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|---------|------|
| 83L-543-01 | 1/2"   | 0.50 | 3.80 | 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  |
| 83L-544-01 | 3/4"   | 0.75 | 4.66 | 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  |
| 83L-545-01 | 1"     | 1.00 | 5.19 | 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  |
| 83L-547-01 | 1-1/2" | 1.50 | 5.96 | 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 |
| 83L-548-01 | 2"     | 2.00 | 6.84 | 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 |

- 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
- Fire safe to API 607 (requires -24 suffix)
- Vacuum service to 29 in of Hg.
- CE Marking, 1-1/2" and larger (add "-CE" suffix)
- 250 psig saturated steam

## VARIATIONS AVAILABLE

- 83L-340 Schedule 5 Butt-Weld
- 83L-440 Schedule 10 Butt-Weld
- 83L-640 Schedule 80 Butt-Weld

## 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          |
| -04-     | 2-1/4" Stem Extension (Carbon Steel, Zinc Plated)                                                                       | All          |
| -14-     | Vented Ball                                                                                                             | All          |
| -15-     | Stainless Steel Locking Round Handle                                                                                    | All          |
| -21-     | UHMWPE Seats w/ Graphite Seals                                                                                          | All          |
| -24-     | Graphite Packing, Spiral Wound Graphite Body Seal, PTFE/PEEK Bearing (Fire Safe API 607, 5th Edition, ISO 10497-5:2004) | All          |
| -26-     | Chlorine Service. Vented. Special Cleaning. Assembled Dry. (for CS, HC, & Monel only)                                   | All          |
| -38-     | PEEK Seats, Graphite Stem Packing & Gaskets                                                                             | All          |
| -49-     | No Lubrication. Assembled Dry                                                                                           | All          |
| -62-     | Center Section Only                                                                                                     | All          |
| -66-     | FNPT x Buttweld                                                                                                         | All          |
| -67-     | Cleaned for Industrial Gases                                                                                            | All          |
| -69-     | Drilled & Tapped Purge & Drains                                                                                         | All          |
| -70-     | 4" Extended Bonnet                                                                                                      | All          |
| -76-     | Live Loaded (Lever Operated)                                                                                            | All          |
| -77-     | Live Loaded (Actuated)                                                                                                  | All          |
| -90-     | Double Packed 4" Extended Bonnet                                                                                        | All          |
| -9P-     | Double Packed 4" Extended Bonnet w/ Monitoring Port                                                                     | All          |
| -CE-     | CE Marking                                                                                                              | 1-1/2" to 2" |
| -EF-     | Graphite Packing (API 641 Compliant)                                                                                    | 3/4" to 2"   |
| -EP-     | Garlock EVSP Stem Packing w/ Spiral Wound Graphite Gasket (Fire Safe by Design)                                         | All          |
| -KF-     | PCTFE Stem Bearing                                                                                                      | All          |
| -SR-     | Spring Return Handle                                                                                                    | 1/2" to 1"   |
| -UL-     | UL Listed                                                                                                               | All          |
| -ZP1-    | Fugitive Emissions Packing (Viton)                                                                                      | All          |
| -ZP2-    | Fugitive Emissions Packing (Buna-N)                                                                                     | All          |
| -ZP3-    | Fugitive Emissions Packing (Kalrez)                                                                                     | All          |

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)
- 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 (P1) exceeds 0.02.

**NOTE:** Only use the gas equation shown if  $(P1-P2)/P1$  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  | --   | --   | --   | --    | --    |

**CLASS 600**

**ASTM A352-LCC**

**GRAPH 33**

