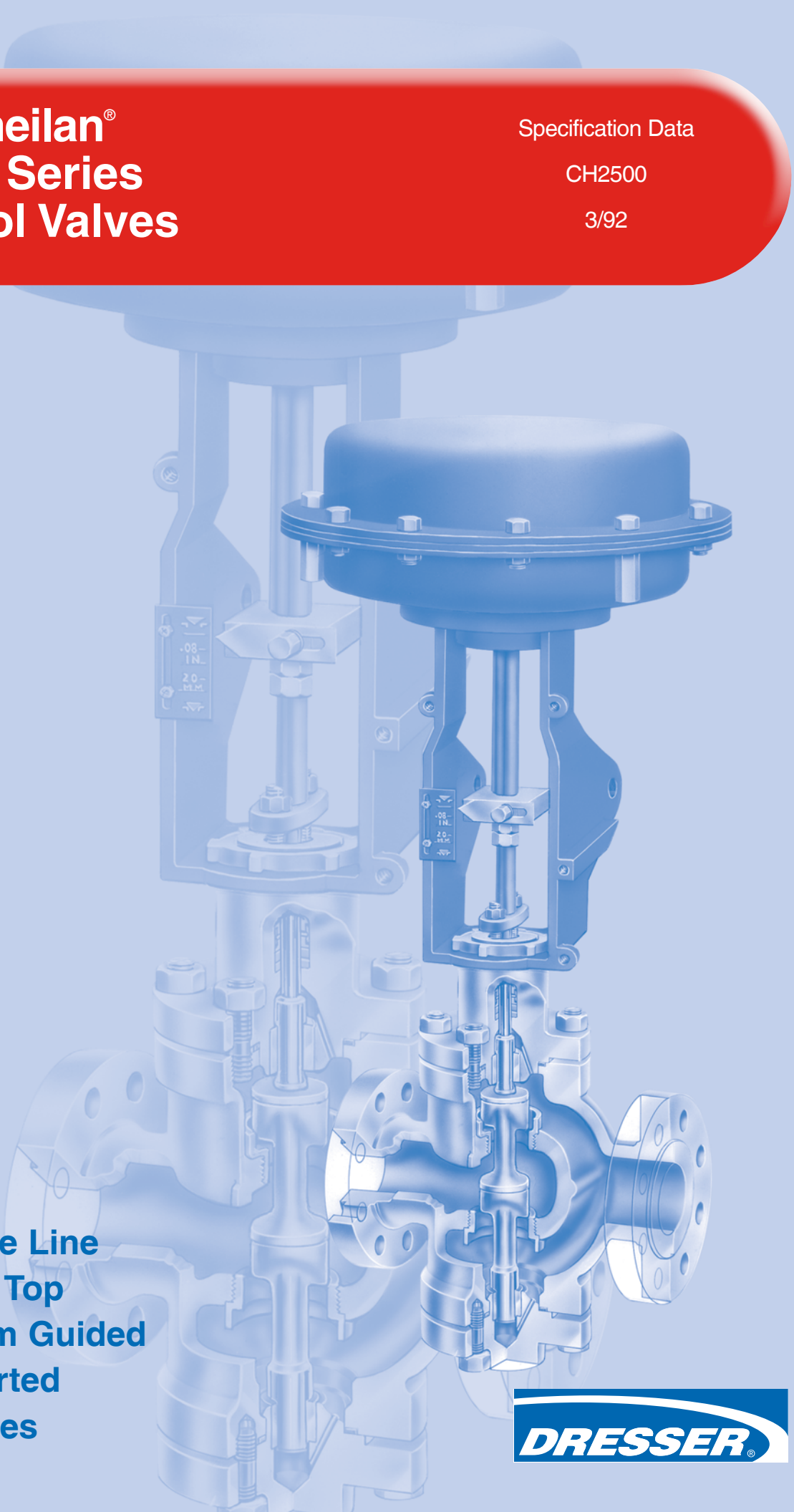
# Masoneilan® 10000 Series Control Valves

Specification Data

CH2500

3/92



## A Complete Line of Rugged Top and Bottom Guided Double Ported Globe Valves

DRESSER®

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## Foreword

The 10000 Series double ported control valves are designed to handle a wide variety of process applications. Construction features have been carefully selected to provide optimum performance. Standard features include:

**Top and Bottom Guiding**
A well accepted industry standard particularly suited for double ported plugs to provide adequate support against side loads.

**High Allowable Pressure Drops**
Incorporates the simplest form of balanced construction and provides high pressure drop capability with standard actuators.

Allowable pressure drop shown on all tables reflect actuator capability for the leakage class.

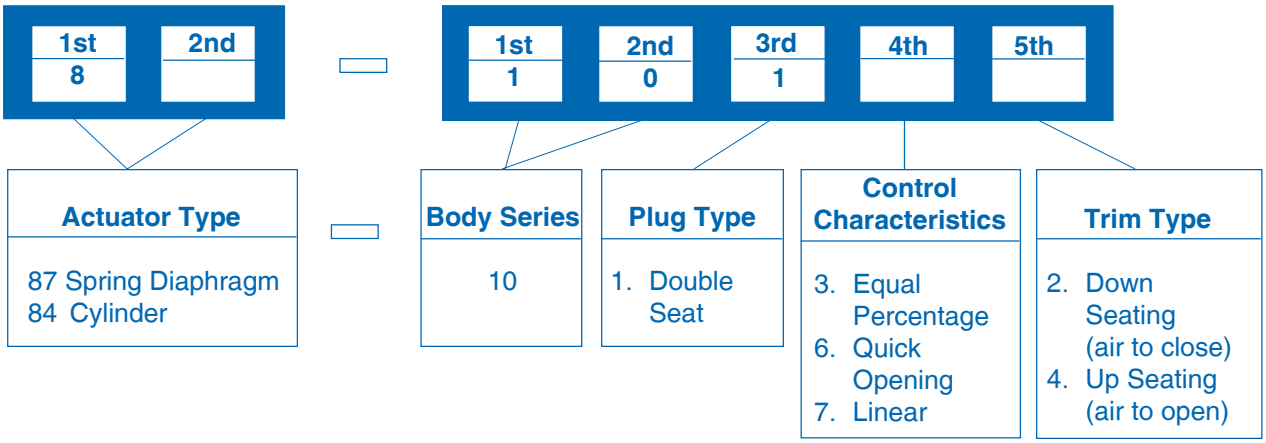
Proper application requires consideration with regards to cavitation, noise, velocity, etc. Refer to Masoneilan sizing and noise manuals.

**High Capacity with Low Recovery**
Flow capacity is at top levels for contemporary double ported control valves and is attained with little pressure recovery as indicated by its high critical flow factors.

**Invertible Bodies and Plugs**
All 10000 Series bodies and plugs are invertible, so either air to open or air to close action can be obtained with the same actuator.

The following pages provide the necessary technical information required to specify a 10000 Series control valve with Masoneilan 87 spring diaphragm actuators and 84 cylinder actuators. For additional information, contact your local Masoneilan Representative.

## Numbering System




## General Data

- **Flow Direction**

  all trims: inlet between the ports

- **Body**

  type: double seat globe

- **Bonnet & Blind Flange**

  type: bolted

- **Body, Bonnet & Blind Flange**

  materials: carbon steel
  316 stainless steel
  chrome-molybdenum steel

- **Trim**

  plug type: double seat, V-Port or contoured

  leakage: ANSI/FCI 70.2, Class II

  seat ring: threaded

  guide: top and bottom

  capacity: full area and 0.4 factor all sizes

  $C_v$ ratio: 50:1

  flow characteristics: equal percentage, linear and quick opening

- **Actuators**

  type: spring diaphragm
  handwheel: optional

  type: spring return cylinder
  handjack: optional

# Flow Coefficients - Rated $C_v$

## Equal Percentage (V-Port) and Linear (Contoured)

| Nominal Trim Size | Full Area / Reduced Area | | | 2 | | 3 | 4 | | 6 | | 8 | 10 | 12 | 14 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | | 4 | | 6 | 8 | 10 | 12 | | | | | |
| Orifice Dia. (inches) | Upper | 1.438 | 1.876 | 2.000 | 2.376 | 2.625 | 3.500 | 4.626 | 4.250 | 6.375 | 7.000 | 8.750 | 10.500 | 12.251 | 14.000 |
| | Lower | 1.355 | 1.782 | 1.906 | 2.282 | 2.531 | 3.406 | 4.531 | 5.156 | 6.250 | 6.875 | 8.625 | 10.375 | 12.126 | 13.860 |
| Valve Size (inches) | Travel (inches) | Rated $C_v$ | | | | | | | | | | | | | |
| 2 | 0.8 | 19 | | 48 | | | | | | | | | | | |
| 3 | 1.5 | | 44 | | | 110 | | | | | | | | | |
| 4 | 1.5 | | | | 78 | | 195 | | | | | | | | |
| 6 | 2.0 | | | | | | 180 | | 450 | | | | | | |
| 8 | 2.5 | | | | | | | 300 | | | 750 | | | | |
| 10 | 2.5 | | | | | | | | 460 | | | 1160 | | | |
| 12 | 3.5 | | | | | | | | | 650 | | | 1620 | | |
| 14 | 4.0 | | | | | | | | | | | | | 2000① | |
| 16 | 4.0 | | | | | | | | | | | | | | 2560① |

① Available with equal percentage plug only.
Note: Rated $C_v$ for quick opening valves multiply times 1.3.

# Ratings/Connections

• Socket Weld ■ Butt Weld Δ RT Joint ○ Threaded □ RF Flanged

| Valve Size♣ (inches) | ANSI Class | | | | |
|---|---|---|---|---|---|
| | 150 | 300 | 600 | 900 | 1500 |
| 2 | □ Δ | □ Δ | ○ □ Δ • | □ Δ • | □ Δ • |
| 3 - 12 | □ Δ ■ | □ Δ ■ | □ Δ ■ | □ Δ ■ | □ Δ ■ |
| 14 & 16 | □ Δ ■ | □ Δ ■ | □ Δ ■ | | |
| 20 & 24 | □ ■ | □ ■ | □ ■① | | |

① ANSI Class 400

Denotes no product offering

# $C_v$ and $F_L$ Versus Travel

## V-Port Trim

ANSI Class: 150 through 1500
Sizes: 2" through 16"

Flow Characteristics: **EQUAL PERCENTAGE**

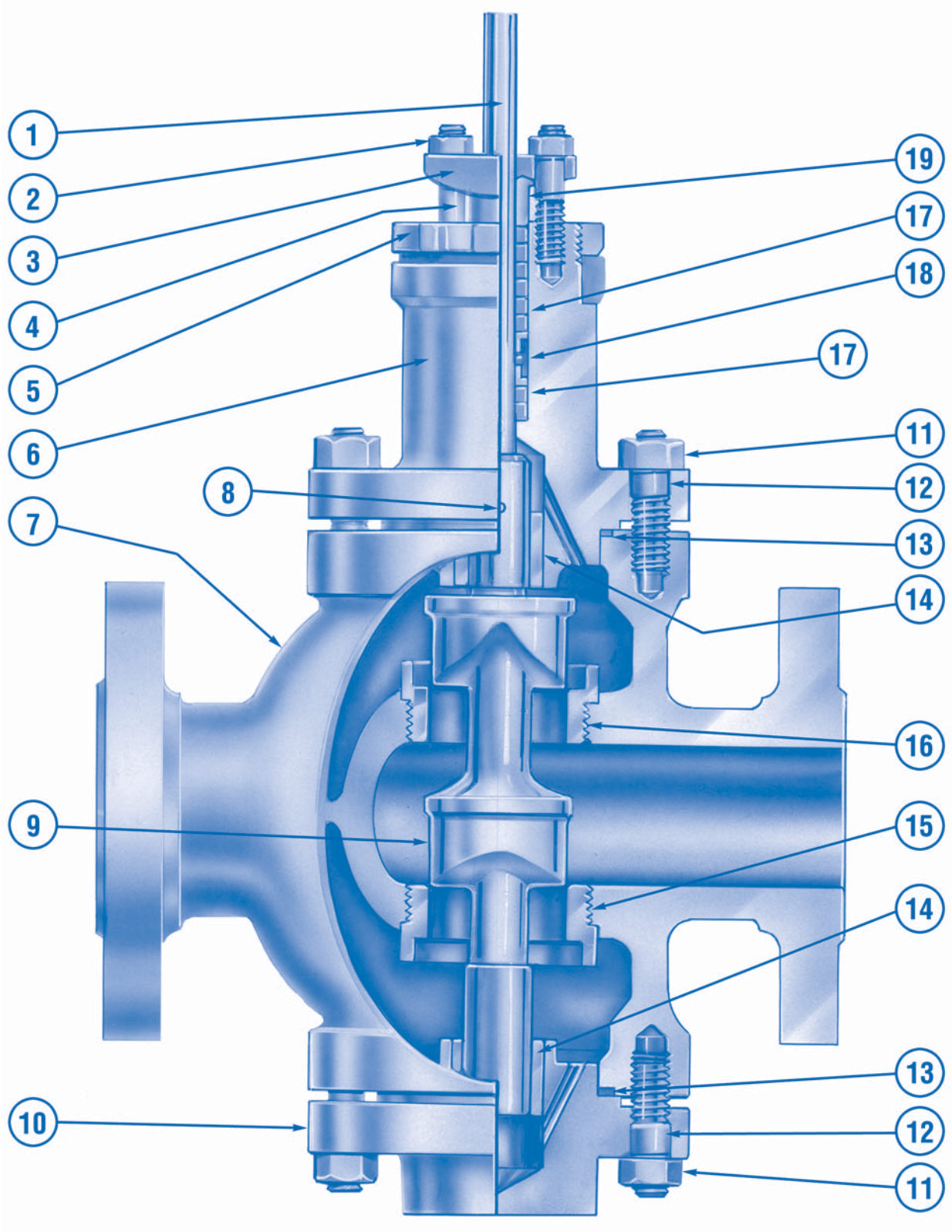
| Percent of Plug Travel | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $F_L$ | Full Area<br>Reduced Area | | .96<br>.96 | .96<br>.96 | .96<br>.95 | .96<br>.94 | .95<br>.93 | .94<br>.92 | .94<br>.91 | .93<br>.90 | .91<br>.89 | .90<br>.88 |
| Valve Size (inches) | Orifice Diameter (inches) Upper/Lower | Travel (inches) | Rated $C_v$ | | | | | | | | | |
| 2 | 1.438/1.355 | 0.8 | 0.6 | 1.1 | 1.5 | 2.0 | 2.8 | 4.2 | 5.5 | 8.5 | 12.3 | 19 |
| | 2.000/1.906 | 0.8 | 1.4 | 2.8 | 3.8 | 5.3 | 7.2 | 10.5 | 13.9 | 21.6 | 31.2 | **48** |
| 3 | 1.876/1.782 | 1.5 | 1.3 | 2.6 | 3.5 | 4.8 | 6.6 | 9.7 | 12.8 | 19.8 | 28.6 | 44 |
| | 2.625/2.531 | 1.5 | 3.3 | 6.6 | 8.8 | 12.1 | 16.5 | 24.2 | 31.9 | 49.5 | 71.5 | **110** |
| 4 | 2.376/2.282 | 1.5 | 2.3 | 4.7 | 6.2 | 8.6 | 11.7 | 17.2 | 22.6 | 35.1 | 50.7 | 78 |
| | 3.500/3.406 | 1.5 | 5.8 | 11.7 | 15.6 | 21.4 | 29.2 | 42.9 | 56.5 | 87.7 | 126 | **195** |
| 6 | 3.500/3.406 | 2.0 | 5 | 11 | 14 | 20 | 27 | 40 | 52 | 81 | 117 | 180 |
| | 5.250/5.156 | 2.0 | 14 | 27 | 36 | 50 | 68 | 99 | 130 | 202 | 292 | **450** |
| 8 | 4.626/4.531 | 2.5 | 9 | 18 | 24 | 33 | 45 | 66 | 87 | 135 | 195 | 300 |
| | 7.000/6.875 | 2.5 | 23 | 45 | 60 | 83 | 112 | 165 | 217 | 337 | 487 | **750** |
| 10 | 5.250/5.156 | 2.5 | 14 | 28 | 37 | 51 | 69 | 101 | 133 | 207 | 299 | 460 |
| | 8.750/8.625 | 2.5 | 35 | 70 | 93 | 127 | 174 | 255 | 336 | 522 | 754 | **1160** |
| 12 | 6.375/6.250 | 3.5 | 20 | 39 | 52 | 72 | 98 | 143 | 189 | 293 | 423 | 650 |
| | 10.500/10.375 | 3.5 | 49 | 97 | 130 | 178 | 243 | 356 | 469 | 729 | 1053 | **1620** |
| 14 | 12.251/12.126 | 4 | 60 | 120 | 160 | 220 | 300 | 440 | 580 | 900 | 1300 | **2000** |
| 16 | 14.000/13.860 | 4 | 77 | 153 | 207 | 281 | 384 | 563 | 742 | 1152 | 1664 | **2560** |

## Contoured Trim

ANSI Class: 150 through 1500
Sizes: 2" through 12"

Flow Characteristics: **LINEAR**

| Percent of Plug Travel | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $F_L$ | Full Area<br>Reduced Area | | .63<br>.63 | .64<br>.64 | .65<br>.65 | .70<br>.70 | .77<br>.75 | .85<br>.80 | .90<br>.82 | .90<br>.82 | .89<br>.81 | .88<br>.80 |
| Valve Size (inches) | Orifice Diameter (inches) Upper/Lower | Travel (inches) | Rated $C_v$ | | | | | | | | | |
| 2 | 1.438/1.355 | 0.8 | 1.9 | 3.8 | 5.7 | 7.6 | 9.5 | 11.4 | 13.3 | 15.2 | 17.1 | 19 |
| | 2.000/1.906 | 0.8 | 4.8 | 9.6 | 14.4 | 19.2 | 24 | 28.8 | 33.6 | 38.4 | 43.2 | **48** |
| 3 | 1.876/1.782 | 1.5 | 4.4 | 8.8 | 13.2 | 17.6 | 22 | 26.4 | 30.8 | 35.2 | 39.6 | 44 |
| | 2.625/2.531 | 1.5 | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 99 | **110** |
| 4 | 2.376/2.282 | 1.5 | 7.8 | 15.6 | 23.4 | 31.2 | 39 | 46.8 | 54.6 | 62.4 | 70.2 | 78 |
| | 3.500/3.406 | 1.5 | 19.5 | 39 | 58.5 | 78 | 97.5 | 117 | 136 | 156 | 175 | **195** |
| 6 | 3.500/3.406 | 2.0 | 18 | 36 | 54 | 72 | 90 | 108 | 126 | 144 | 162 | 180 |
| | 5.250/5.156 | 2.0 | 45 | 90 | 135 | 180 | 225 | 270 | 315 | 360 | 405 | **450** |
| 8 | 4.626/4.531 | 2.5 | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 | 300 |
| | 7.000/6.875 | 2.5 | 75 | 150 | 225 | 300 | 375 | 450 | 525 | 600 | 675 | **750** |
| 10 | 5.250/5.156 | 2.5 | 46 | 92 | 138 | 184 | 230 | 276 | 322 | 368 | 414 | 460 |
| | 8.750/8.625 | 2.5 | 116 | 232 | 348 | 464 | 580 | 696 | 812 | 928 | 1044 | **1160** |
| 12 | 6.375/6.250 | 3.5 | 65 | 130 | 195 | 260 | 325 | 390 | 455 | 520 | 585 | 650 |
| | 10.500/10.375 | 3.5 | 162 | 324 | 486 | 648 | 810 | 972 | 1134 | 1296 | 1458 | **1620** |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# Materials of Construction

| Ref. No. | Temperature Range | -20°F ▽ | +450°F ▽ | +800°F ▽ | +850°F ▽ |
|---|---|---|---|---|---|
| | **Description** | **Standard Materials *(Optional Materials)*** | | | |
| 1 | Valve Plug Stem | 316 St. St. ASTM A479 TY 316 | | | |
| 2 | Packing Flange Nut | 304 St. St. ASTM A194 Gr 8 | | | |
| 3 | Packing Flange | Carbon Steel ASTM A668 CL B Zinc Plated | | | |
| 4 | Packing Flange Stud | 304 St. St. ASTM A193 Gr B8 | | | |
| 5 | Drive Nut | SAE 1117 | | | |
| 6 | Bonnet | Carbon Steel ASTM A216 | | | |
| 7 | Body | 316 St. St. ASTM A351 Gr CF8M | | | |
| 10 | Blind Flange | Chrome-Moly Steel ASTM A217 | | | |
| 8 | Plug Pin | 316 St. St. ASTM A479 TY 316 | | | |
| 9 | Valve Plug | 316 St. St. ASTM A479 TY 316 or ASTM A351 Gr CF8M or ASTM A182 Gr F316 | | | |
| | | *316 St. St. ASTM A479 TY 316 w/Hardfacing Seat and Post or Solid Stellite* | | | |
| 11 | Valve Body Stud Nuts | Alloy Steel ASTM A194 Gr 2H | | | |
| 12 | Valve Body Studs | Alloy Steel ASTM A193 Gr B7 | | | |
| 13 | Valve Body Gasket | 304 St. St. w/Grafoil Filler (Spiral Wound) | | | |
| 14 | Guide Bushing | 440C St. St. ASTM A276 TY 440C | | | |
| | | *Stellite No. 6 (standard with St. St. body materials)* | | | |
| 15 | Lower Seat Ring | 316 St. St. ASTM A351 Gr CF8M or ASTM A182 Gr F316 or ASTM A479 TY316 | | | |
| 16 | Upper Seat Ring | *316 St. St. w/Hardfacing* | | | |
| 17 | Packing | Crane 285K | | | |
| | | *Braided TFE Chesterton 324* | | | |
| | | *Grafoil* | | | |
| 18 | Packing Spacer | 303 St. St. ASTM A582 TY 303 | | | |
| 19 | Packing Follower | 303 St. St. ASTM A582 TY 303 | | | |
| **Temperature Range** | | **-20°F** Δ | **+450°F** Δ | **+800°F** Δ | **+850°F** Δ |

# Allowable Pressure Drops (psig)

# Air To Close

## Model 10132
## Equal Percentage - V-Port

Flow Direction: Flow Passing into the Seats
Leakage: Per ANSI/FCI 70.2, Class II

Temperature: -20°F to +850°F

| Valve Size (inches) | Travel (inches) | Rated $C_v$ | Actuator Size | Bench Range (psig) | Supply Pressure (psig) | Compressible Flow | | Incompressible Flow | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Closed | Open | Closed | Open |
| 2 | 0.8 | 48 | 6 | 3-15 | 20 | 640 | 640 | 640 | 640 |
| | | | | 11-23 | 35 | 2200 | 2200 | 2200 | 2200 |
| | | | 10 | 3-15 | 20 | 1050 | 1050 | 1050 | 1050 |
| | | | | 11-23 | 35 | 3650 | 3650 | 3650 | 3650 |
| | | 19 | 6 | 3-15 | 20 | 1020 | 1020 | 1030 | 1030 |
| | | | | 11-23 | 35 | 3510 | 3510 | 3550 | 3550 |
| | | | 10 | 3-15 | 20 | 1690 | 1690 | 1700 | 1700 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 3 | 1.5 | 110 | 10 | 3-15 | 20 | 810 | 810 | 810 | 680 |
| | | | | 11-23 | 35 | 2780 | 2780 | 2780 | 2440 |
| | | | 16 | 3-15 | 20 | 1280 | 1280 | 1280 | 1100 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| | | 44 | 10 | 3-15 | 20 | 1490 | 1490 | 1170 | 1170 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| | | | 16 | 3-15 | 20 | 2360 | 2360 | 1850 | 1850 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 4 | 1.5 | 195 | 10 | 3-15 | 20 | 610 | 610 | 610 | 340 |
| | | | | 11-23 | 35 | 2080 | 2080 | 2080 | 1240 |
| | | | 16 | 3-15 | 20 | 970 | 970 | 970 | 550 |
| | | | | 11-23 | 35 | 3320 | 3320 | 3320 | 2000 |
| | | 78 | 10 | 3-15 | 20 | 920 | 920 | 930 | 930 |
| | | | | 11-23 | 35 | 3130 | 3130 | 3160 | 3160 |
| | | | 16 | 3-15 | 20 | 1450 | 1450 | 1460 | 1460 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 6 | 2.0 | 450 | 16 | 3-15 | 20 | 660 | 570 | 660 | 220 |
| | | | | 11-23 | 35 | 2220 | 2100 | 2220 | 840 |
| | | | 23 | 3-15 | 20 | 930 | 840 | 930 | 330 |
| | | | | 11-23 | 35 | 3170 | 3040 | 2930 | 2680 |
| | | 180 | 16 | 3-15 | 20 | 980 | 980 | 1030 | 1030 |
| | | | | 11-23 | 35 | 3290 | 3290 | 3460 | 3460 |
| | | | 23 | 3-15 | 20 | 1380 | 1380 | 1460 | 1460 |

**NOTE: INLET PRESSURE MUST NOT EXCEED THE ANSI RATING FOR THE SELECTED PRESSURE CLASS**

# Allowable Pressure Drops (psig)

# Air To Close

**Model 10132**
**Equal Percentage - V-Port**

Flow Direction: Flow Passing into the Seats
Leakage: Per ANSI/FCI 70.2, Class II

Temperature: -20°F to +850°F

| Valve Size (inches) | Travel (inches) | Rated $C_v$ | Actuator Size | Bench Range (psig) | Supply Pressure (psig) | Compressible Flow | | Incompressible Flow | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Closed | Open | Closed | Open |
| 8 | 2.5 | 750 | 16 | 3-15 | 20 | 420 | 280 | 450 | 120 |
| | | | | 11-23 | 35 | 1350 | 1110 | 1440 | 470 |
| | | | 23 | 3-15 | 20 | 580 | 430 | 620 | 180 |
| | | | | 11-23 | 35 | 1920 | 1620 | 2040 | 680 |
| | | 300 | 16 | 3-15 | 20 | 820 | 820 | 840 | 630 |
| | | | | 11-23 | 35 | 2630 | 2630 | 2690 | 2470 |
| | | | 23 | 3-15 | 20 | 1140 | 1140 | 1160 | 950 |
| 10 | 2.5 | 1160 | 16 | 3-15 | 20 | 390 | 130 | 420 | 60 |
| | | | | 11-23 | 35 | 1150 | 640 | 1240 | 280 |
| | | | 23 | 3-15 | 20 | 520 | 220 | 570 | 90 |
| | | | | 11-23 | 35 | 1610 | 950 | 1740 | 410 |
| | | 460 | 16 | 3-15 | 20 | 830 | 830 | 850 | 380 |
| | | | | 11-23 | 35 | 2430 | 2430 | 2480 | 1800 |
| | | | 23 | 3-15 | 20 | 1110 | 1110 | 1140 | 630 |
| 12 | 3.5 | 1620 | 154 | 10-47 | 55 | 510 | 370 | 570 | 130 |
| | | | | 25-40 | 55 | 440 | 440 | 490 | 360 |
| | | | 314 | 10-47 | 55 | 920 | 840 | 1040 | 290 |
| | | 650 | 154 | 10-47 | 55 | 1060 | 1060 | 1060 | 990 |
| | | | | 25-40 | 55 | 920 | 920 | 920 | 920 |
| 14 | 4.0 | 2000 | 154 | 10-36 | 45 | 460 | 240 | 530 | 70 |
| | | | | 25-42 | 55 | 730 | 730 | 840 | 220 |
| | | | 314 | 10-36 | 45 | 820 | 590 | 930 | 180 |
| 16 | 4.0 | 2560 | 154 | 10-36 | 45 | 380 | 160 | 440 | 40 |
| | | | | 25-42 | 55 | 590 | 520 | 680 | 150 |
| | | | 314 | 10-36 | 45 | 660 | 410 | 760 | 120 |

**NOTE: INLET PRESSURE MUST NOT EXCEED THE ANSI RATING FOR THE SELECTED PRESSURE CLASS**

# Allowable Pressure Drops (psig)

# Air To Close

## Models 10162 and 10172
## Linear and Quick Opening

Flow Direction: Flow Passing into the Seats
Leakage: Per ANSI/FCI 70.2, Class II

Temperature: -20°F to +850°F

| Valve Size (inches) | Travel (inches) | Rated $C_v$ | Actuator Size | Bench Range (psig) | Supply Pressure (psig) | Compressible Flow | | Incompressible Flow | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Closed | Open | Closed | Open |
| 2 | 0.8 | 48 | 6 | 3-15 | 20 | 640 | 640 | 640 | 360 |
| | | | | 11-23 | 35 | 2200 | 2200 | 2190 | 1310 |
| | | | 10 | 3-15 | 20 | 1050 | 1050 | 1050 | 610 |
| | | | | 11-23 | 35 | 3650 | 3650 | 3640 | 2190 |
| | | 19 | 6 | 3-15 | 20 | 1030 | 1030 | 1020 | 1020 |
| | | | | 11-23 | 35 | 3550 | 3550 | 3490 | 3490 |
| | | | 10 | 3-15 | 20 | 1700 | 1700 | 1610 | 1610 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 3 | 1.5 | 110 | 10 | 3-15 | 20 | 810 | 680 | 810 | 310 |
| | | | | 11-23 | 35 | 2780 | 2440 | 2780 | 1110 |
| | | | 16 | 3-15 | 20 | 1280 | 1100 | 1280 | 500 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 1790 |
| | | 44 | 10 | 3-15 | 20 | 1170 | 1170 | 1150 | 1150 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| | | | 16 | 3-15 | 20 | 1850 | 1850 | 1820 | 1820 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 4 | 1.5 | 195 | 10 | 3-15 | 20 | 610 | 340 | 610 | 160 |
| | | | | 11-23 | 35 | 2080 | 1240 | 2080 | 580 |
| | | | 16 | 3-15 | 20 | 970 | 550 | 970 | 260 |
| | | | | 11-23 | 35 | 3320 | 2000 | 3320 | 940 |
| | | 78 | 10 | 3-15 | 20 | 930 | 930 | 910 | 910 |
| | | | | 11-23 | 35 | 3160 | 3160 | 3090 | 3090 |
| | | | 16 | 3-15 | 20 | 1460 | 1460 | 1430 | 1430 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 6 | 2.0 | 450 | 16 | 3-15 | 20 | 660 | 220 | 660 | 100 |
| | | | | 11-23 | 35 | 2220 | 840 | 2220 | 390 |
| | | | 23 | 3-15 | 20 | 930 | 330 | 930 | 150 |
| | | | | 11-23 | 35 | 2930 | 2680 | 3170 | 570 |
| | | 180 | 16 | 3-15 | 20 | 1030 | 1030 | 1000 | 730 |
| | | | | 11-23 | 35 | 3460 | 3460 | 3350 | 2710 |
| | | | 23 | 3-15 | 20 | 1460 | 1460 | 1410 | 1080 |

**NOTE: INLET PRESSURE MUST NOT EXCEED THE ANSI RATING FOR THE SELECTED PRESSURE CLASS**

# Allowable Pressure Drops (psig)

# Air To Close

## Models 10162 and 10172
## Linear and Quick Opening

Flow Direction: Flow Passing into the Seats
Leakage: Per ANSI/FCI 70.2, Class II

Temperature: -20°F to +850°F

| Valve Size (inches) | Travel (inches) | Rated $C_v$ | Actuator Size | Bench Range (psig) | Supply Pressure (psig) | Compressible Flow | | Incompressible Flow | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Closed | Open | Closed | Open |
| 8 | 2.5 | 750 | 16 | 3-15 | 20 | 450 | 120 | 400 | 50 |
| | | | | 11-23 | 35 | 1440 | 470 | 1280 | 220 |
| | | | 23 | 3-15 | 20 | 620 | 180 | 550 | 80 |
| | | | | 11-23 | 35 | 2040 | 680 | 1820 | 330 |
| | | 300 | 16 | 3-15 | 20 | 840 | 630 | 810 | 390 |
| | | | | 11-23 | 35 | 2690 | 2470 | 2580 | 1540 |
| | | | 23 | 3-15 | 20 | 1160 | 950 | 1120 | 590 |
| 10 | 2.5 | 1160 | 16 | 3-15 | 20 | 420 | 60 | 370 | 20 |
| | | | | 11-23 | 35 | 1240 | 280 | 1070 | 130 |
| | | | 23 | 3-15 | 20 | 570 | 90 | 490 | 40 |
| | | | | 11-23 | 35 | 1740 | 410 | 1500 | 200 |
| | | 460 | 16 | 3-15 | 20 | 850 | 380 | 820 | 230 |
| | | | | 11-23 | 35 | 2480 | 1800 | 2380 | 1100 |
| | | | 23 | 3-15 | 20 | 1140 | 630 | 1090 | 390 |
| 12 | 3.5 | 1620 | 154 | 10-47 | 55 | 570 | 130 | 430 | 70 |
| | | | | 25-40 | 55 | 490 | 360 | 370 | 210 |
| | | | 314 | 10-47 | 55 | 1040 | 290 | 770 | 170 |
| | | 650 | 154 | 10-47 | 55 | 1060 | 990 | 1000 | 610 |
| | | | | 25-40 | 55 | 920 | 920 | 860 | 860 |
| 14 | 4.0 | 2000 | 154 | 10-36 | 45 | 530 | 70 | 340 | 40 |
| | | | | 25-42 | 55 | 840 | 220 | 540 | 140 |
| | | | 314 | 10-36 | 45 | 930 | 180 | 600 | 110 |
| 16 | 4.0 | 2560 | 154 | 10-36 | 45 | 440 | 40 | 250 | 30 |
| | | | | 25-42 | 55 | 680 | 150 | 390 | 100 |
| | | | 314 | 10-36 | 45 | 760 | 120 | 435 | 80 |

**NOTE: INLET PRESSURE MUST NOT EXCEED THE ANSI RATING FOR THE SELECTED PRESSURE CLASS**

## Allowable Pressure Drops (psig)

## Air To Close

**Model 10134**
**Equal Percentage - V-Port**

Flow Direction: Flow Passing into the Seats
Leakage: Per ANSI/FCI 70.2, Class II

Temperature: -20°F to +850°F

| Valve Size (inches) | Travel (inches) | Rated $C_v$ | Actuator Size | Bench Range (psig) | Supply Pressure (psig) | Compressible Flow | | Incompressible Flow | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Closed | Open | Closed | Open |
| 2 | 0.8 | 48 | 6 | 6-30 | 35 | 800 | 800 | 800 | 790 |
| | | | | 11-23 | 35 | 1740 | 1740 | 1740 | 1740 |
| | | | 10 | 6-30 | 35 | 1360 | 2200 | 1360 | 1310 |
| | | | | 11-23 | 35 | 2920 | 2920 | 2920 | 2920 |
| | | 19 | 6 | 6-30 | 35 | 1300 | 1300 | 1300 | 1300 |
| | | | | 11-23 | 35 | 2800 | 2800 | 2810 | 2810 |
| | | | 10 | 6-30 | 35 | 2180 | 2180 | 2200 | 2200 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 3 | 1.5 | 110 | 10 | 6-30 | 35 | 1020 | 1020 | 1020 | 820 |
| | | | | 11-23 | 35 | 2210 | 2210 | 2210 | 2030 |
| | | | 16 | 6-30 | 35 | 1650 | 1650 | 1650 | 1300 |
| | | | | 11-23 | 35 | 3550 | 3550 | 3550 | 3240 |
| | | 44 | 10 | 6-30 | 35 | 1460 | 1460 | 1470 | 1470 |
| | | | | 11-23 | 35 | 3140 | 3140 | 3160 | 3160 |
| | | | 16 | 6-30 | 35 | 2350 | 2350 | 2370 | 2370 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 4 | 1.5 | 195 | 10 | 6-30 | 35 | 750 | 750 | 750 | 500 |
| | | | | 11-23 | 35 | 1630 | 1630 | 1630 | 1240 |
| | | | 16 | 6-30 | 35 | 1220 | 1540 | 1220 | 790 |
| | | | | 11-23 | 35 | 2630 | 2630 | 2630 | 1970 |
| | | 78 | 10 | 6-30 | 35 | 1120 | 1120 | 1130 | 1130 |
| | | | | 11-23 | 35 | 2440 | 2440 | 2460 | 2460 |
| | | | 16 | 6-30 | 35 | 1820 | 1820 | 1840 | 1840 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 6 | 2.0 | 450 | 16 | 6-30 | 35 | 780 | 680 | 780 | 340 |
| | | | | 11-23 | 35 | 1720 | 1660 | 1720 | 840 |
| | | | 23 | 6-30 | 35 | 1150 | 960 | 1150 | 490 |
| | | | | 11-23 | 35 | 2490 | 2380 | 2490 | 1210 |
| | | 180 | 16 | 6-30 | 35 | 1210 | 1210 | 1230 | 1230 |
| | | | | 11-23 | 35 | 2640 | 2640 | 2680 | 2680 |
| | | | 23 | 6-30 | 35 | 1760 | 1760 | 1790 | 1790 |

**NOTE: INLET PRESSURE MUST NOT EXCEED THE ANSI RATING FOR THE SELECTED PRESSURE CLASS**

# Allowable Pressure Drops (psig)

# Air To Close

**Model 10134**
**Equal Percentage - V-Port**

Flow Direction: Flow Passing into the Seats
Leakage: Per ANSI/FCI 70.2, Class II

Temperature: -20°F to +850°F

| Valve Size (inches) | Travel (inches) | Rated $C_v$ | Actuator Size | Bench Range (psig) | Supply Pressure (psig) | Compressible Flow | | Incompressible Flow | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Closed | Open | Closed | Open |
| 8 | 2.5 | 750 | 16 | 6-30 | 35 | 440 | 460 | 470 | 220 |
| | | | | 11-23 | 35 | 1000 | 1000 | 1060 | 530 |
| | | | 23 | 6-30 | 35 | 650 | 640 | 700 | 310 |
| | | | | 11-23 | 35 | 1460 | 1460 | 1550 | 760 |
| | | 300 | 16 | 6-30 | 35 | 870 | 870 | 870 | 870 |
| | | | | 11-23 | 35 | 1960 | 1960 | 1980 | 1980 |
| | | | 23 | 6-30 | 35 | 1290 | 1290 | 1300 | 1300 |
| 10 | 2.5 | 1160 | 16 | 6-30 | 35 | 300 | 330 | 330 | 160 |
| | | | | 11-23 | 35 | 760 | 760 | 820 | 360 |
| | | | 23 | 6-30 | 35 | 480 | 460 | 520 | 220 |
| | | | | 11-23 | 35 | 1130 | 1070 | 1220 | 510 |
| | | 460 | 16 | 6-30 | 35 | 650 | 650 | 660 | 660 |
| | | | | 11-23 | 35 | 1600 | 1600 | 1640 | 1640 |
| | | | 23 | 6-30 | 35 | 1020 | 1020 | 1040 | 1040 |
| 12 | 3.5 | 1620 | 154 | 10-47 | 55 | 440 | 350 | 500 | 120 |
| | | | | 25-40 | 55 | 1490 | 310 | 1680 | 110 |
| | | | 314 | 10-47 | 55 | 1020 | 660 | 1160 | 230 |
| | | 650 | 154 | 10-47 | 55 | 930 | 930 | 930 | 930 |
| | | | | 25-40 | 55 | 3130 | 1340 | 3130 | 850 |

**NOTE: INLET PRESSURE MUST NOT EXCEED THE ANSI RATING FOR THE SELECTED PRESSURE CLASS**

# Allowable Pressure Drops (psig)

# Air To Close

## Models 10164 and 10174
## Linear and Quick Opening

Flow Direction: Flow Passing into the Seats
Leakage: Per ANSI/FCI 70.2, Class II

Temperature: -20°F to +850°F

| Valve Size (inches) | Travel (inches) | Rated $C_v$ | Actuator Size | Bench Range (psig) | Supply Pressure (psig) | Compressible Flow | | Incompressible Flow | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Closed | Open | Closed | Open |
| 2 | 0.8 | 48 | 6 | 6-30 | 35 | 800 | 790 | 800 | 450 |
| | | | | 11-23 | 35 | 1740 | 1740 | 1740 | 1120 |
| | | | 10 | 6-30 | 35 | 1360 | 1310 | 1360 | 750 |
| | | | | 11-23 | 35 | 2920 | 2920 | 2920 | 1870 |
| | | 19 | 6 | 6-30 | 35 | 1300 | 1300 | 1280 | 1280 |
| | | | | 11-23 | 35 | 2810 | 2810 | 2760 | 2760 |
| | | | 10 | 6-30 | 35 | 2200 | 2200 | 2160 | 2160 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 3 | 1.5 | 110 | 10 | 6-30 | 35 | 1020 | 820 | 1020 | 450 |
| | | | | 11-23 | 35 | 2210 | 2030 | 2210 | 1120 |
| | | | 16 | 6-30 | 35 | 1650 | 1300 | 1650 | 720 |
| | | | | 11-23 | 35 | 3550 | 3240 | 3550 | 1790 |
| | | 44 | 10 | 6-30 | 35 | 1470 | 1470 | 1440 | 1440 |
| | | | | 11-23 | 35 | 3160 | 3160 | 3110 | 3110 |
| | | | 16 | 6-30 | 35 | 2370 | 2370 | 2330 | 2330 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 4 | 1.5 | 195 | 10 | 6-30 | 35 | 750 | 500 | 750 | 260 |
| | | | | 11-23 | 35 | 1630 | 1240 | 1630 | 640 |
| | | | 16 | 6-30 | 35 | 1220 | 790 | 1220 | 410 |
| | | | | 11-23 | 35 | 2630 | 1970 | 2630 | 1020 |
| | | 78 | 10 | 6-30 | 35 | 1130 | 1130 | 1110 | 1110 |
| | | | | 11-23 | 35 | 2460 | 2460 | 2410 | 2410 |
| | | | 16 | 6-30 | 35 | 1840 | 1840 | 1800 | 1800 |
| | | | | 11-23 | 35 | 3750 | 3750 | 3750 | 3750 |
| 6 | 2.0 | 450 | 16 | 6-30 | 35 | 780 | 340 | 780 | 180 |
| | | | | 11-23 | 35 | 1720 | 840 | 1720 | 440 |
| | | | 23 | 6-30 | 35 | 1150 | 490 | 1150 | 250 |
| | | | | 11-23 | 35 | 2490 | 1210 | 2490 | 630 |
| | | 180 | 16 | 6-30 | 35 | 1230 | 1230 | 1190 | 910 |
| | | | | 11-23 | 35 | 2680 | 2680 | 2600 | 2220 |
| | | | 23 | 6-30 | 35 | 1790 | 1790 | 1740 | 1290 |

**NOTE: INLET PRESSURE MUST NOT EXCEED THE ANSI RATING FOR THE SELECTED PRESSURE CLASS**

# Allowable Pressure Drops (psig)

# Air To Close

## Models 10164 and 10174
## Linear and Quick Opening

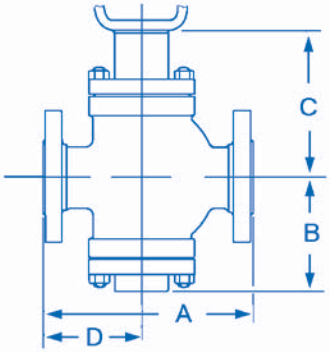
Flow Direction: Flow Passing into the Seats
Leakage: Per ANSI/FCI 70.2, Class II

Temperature: -20°F to +850°F

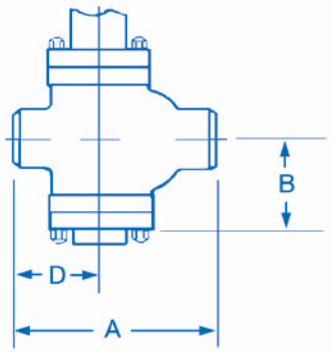
| Valve Size (inches) | Travel (inches) | Rated $C_v$ | Actuator Size | Bench Range (psig) | Supply Pressure (psig) | Compressible Flow | | Incompressible Flow | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Closed | Open | Closed | Open |
| 8 | 2.5 | 750 | 16 | 6-30 | 35 | 470 | 220 | 410 | 110 |
| | | | | 11-23 | 35 | 1060 | 530 | 940 | 270 |
| | | | 23 | 6-30 | 35 | 700 | 310 | 620 | 160 |
| | | | | 11-23 | 35 | 1550 | 760 | 1380 | 390 |
| | | 300 | 16 | 6-30 | 35 | 870 | 870 | 840 | 580 |
| | | | | 11-23 | 35 | 1980 | 1980 | 1900 | 1390 |
| | | | 23 | 6-30 | 35 | 1300 | 1300 | 1250 | 820 |
| 10 | 2.5 | 1160 | 16 | 6-30 | 35 | 330 | 160 | 280 | 80 |
| | | | | 11-23 | 35 | 820 | 360 | 710 | 180 |
| | | | 23 | 6-30 | 35 | 520 | 220 | 450 | 110 |
| | | | | 11-23 | 35 | 1220 | 510 | 1060 | 260 |
| | | 460 | 16 | 6-30 | 35 | 660 | 660 | 640 | 520 |
| | | | | 11-23 | 35 | 1640 | 1640 | 1590 | 1180 |
| | | | 23 | 6-30 | 35 | 1040 | 1040 | 1010 | 710 |
| 12 | 3.5 | 1620 | 154 | 10-47 | 55 | 500 | 120 | 370 | 80 |
| | | | | 25-40 | 55 | 1680 | 110 | 1260 | 70 |
| | | | 314 | 10-47 | 55 | 1160 | 230 | 860 | 150 |
| | | 650 | 154 | 10-47 | 55 | 930 | 930 | 930 | 550 |
| | | | | 25-40 | 55 | 3130 | 850 | 3130 | 490 |

**NOTE: INLET PRESSURE MUST NOT EXCEED THE ANSI RATING FOR THE SELECTED PRESSURE CLASS**

# Dimensions (inches)




Flanged Ends




Socket Weld
or Threaded Ends

## Body S/A

| Valve Size (in.) | ANSI Class | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 150-600 Butt Weld or Socket Weld | | 150 | | | | 300 | | | | 600 | | | |
| | | | RF | | RTJ | | RF | | RTJ | | R F | | RTJ | |
| | A | D | A | D | A | D | A | D | A | D | A | D | A | D |
| 2 | 9.25 | 4.12 | 10.00 | 4.62 | 10.50 | 4.88 | 10.50 | 4.88 | 11.12 | 5.19 | 11.25 | 5.25 | 11.38 | 5.31 |
| 3 | 13.25 | 6.25 | 11.75 | 5.50 | 12.25 | 5.75 | 12.50 | 5.88 | 13.12 | 6.19 | 13.25 | 6.25 | 13.38 | 6.31 |
| 4 | 15.50 | 7.38 | 13.88 | 6.56 | 14.38 | 6.81 | 14.50 | 6.88 | 15.12 | 7.19 | 15.50 | 7.38 | 15.62 | 7.44 |
| 6 | 20.00 | 8.75 | 17.75 | 7.62 | 18.25 | 7.88 | 18.62 | 8.06 | 19.25 | 8.38 | 20.00 | 8.75 | 20.12 | 8.81 |
| 8 | 24.00 | 9.88 | 21.38 | 8.56 | 21.88 | 8.81 | 22.38 | 9.06 | 23.00 | 9.38 | 24.00 | 9.88 | 24.12 | 9.94 |
| 10 | 27.75 | 11.50 | 24.62 | 9.94 | 25.12 | 10.19 | 26.00 | 10.62 | 26.62 | 10.94 | 27.75 | 11.50 | 27.88 | 11.56 |
| 12 | 32.00 | 12.88 | 28.75 | 11.25 | 29.25 | 11.50 | 30.25 | 12.00 | 30.88 | 12.31 | 32.00 | 12.88 | 32.12 | 12.94 |
| 14 | 36.75 | 14.62 | 33.50 | 13.00 | 34.00 | 13.25 | 35.00 | 13.75 | 35.62 | 14.06 | 36.75 | 14.62 | 36.88 | 14.68 |
| 16 | 38.63 | 17.25 | 35.38 | 15.69 | 35.88 | 15.94 | 36.88 | 16.50 | 37.50 | 16.81 | 38.63 | 17.25 | 38.75 | 17.31 |

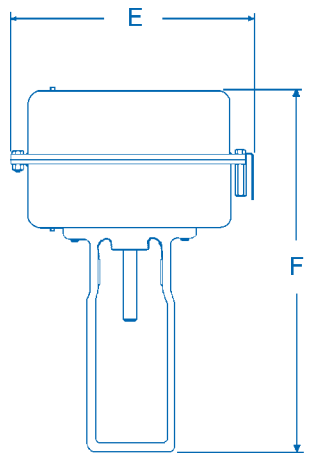
| Valve Size (in.) | ANSI Class | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 900 | | | | 1500 | | | | 900 & 1500 Butt Weld or Socket Weld | |
| | RF | | RTJ | | RF | | RTJ | | | |
| | A | D | A | D | A | D | A | D | A | D |
| 2 | 12.25 | 5.88 | 12.38 | 5.94 | 12.25 | 5.88 | 12.38 | 5.94 | 12.25 | 5.88 |
| 3 | 15.25 | 7.12 | 15.38 | 7.19 | 16.00 | 7.50 | 16.12 | 7.56 | 16.00 | 7.50 |
| 4 | 18.25 | 8.62 | 18.38 | 8.69 | 19.00 | 9.00 | 19.12 | 9.06 | 19.00 | 9.00 |
| 6 | 20.88 | 9.44 | 21.00 | 9.50 | 24.00 | 11.00 | 24.25 | 11.12 | 24.00 | 11.00 |
| 8 | 27.88 | 12.75 | 28.00 | 12.81 | 30.12 | 13.88 | 30.50 | 14.06 | 30.12 | 13.88 |
| 10 | 32.62 | 15.12 | 32.75 | 15.19 | 35.62 | 16.62 | 36.00 | 16.81 | 35.62 | 16.62 |
| 12 | 35.25 | 15.62 | 35.38 | 15.69 | 40.38 | 17.69 | 41.00 | 18.00 | 40.38 | 17.69 |

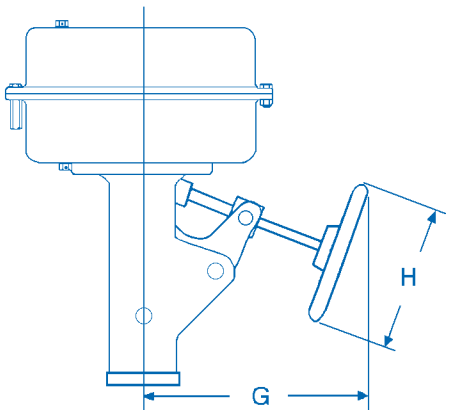
## ANSI Class 150-1500

| Valve Size (inches) | B (Max) | C (Max) |
|---|---|---|
| 2 | 6.0 | 7.2 |
| 3 | 7.8 | 9.3 |
| 4 | 8.1 | 9.5 |
| 6 | 11.2 | 12.6 |
| 8 | 13.4 | 14.7 |
| 10 | 14.8 | 16.4 |
| 12 | 17.8 | 19.8 |
| 14 ① | 21.5 | 24.1 |
| 16 ① | 22.3 | 26.1 |

① ANSI 150-600 only

# Dimensions (inches)



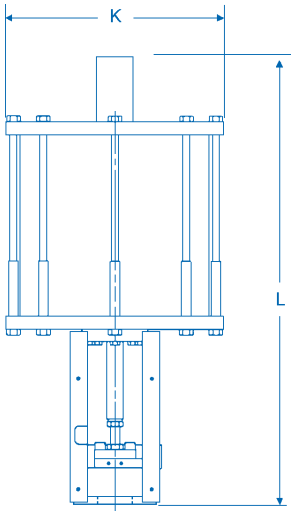



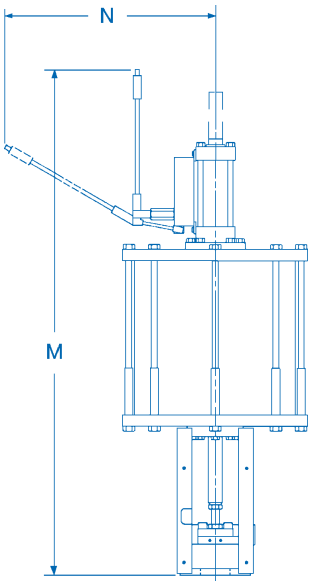

Shown with optional handwheel

## Model 87 Actuator

| Actuator Size | E | F | G | H |
|---|---|---|---|---|
| 6 | 11.50 | 15.54 | 10.00 | 9.00 |
| 10 | 14.50 | 19.58 | 10.90 | 12.00 |
| 16 | 18.75 | 28.22 | 13.00 | 18.00 |
| 23 | 21.63 | 30.71 | 15.00 | 18.00 |

Actuator removal clearance = 6 inches




Shown with optional handjack

## Model 84 Actuator

| Actuator Size | K | L | M | N |
|---|---|---|---|---|
| 154 (sq. in.) | 18.1 | 47.8 | 60.5 | 26.7 |
| 314 (sq. in.) | 23.9 | 49.8 | 62.5 | 27.0 |

# Weights (lbs)

## Body S/A

| Valve Size (inches) | Socket, Butt Weld & Threaded Ends up to 600 lbs. | Flanged | | | | |
|---|---|---|---|---|---|---|
| | | ANSI 150 | ANSI 300 | ANSI 600 | ANSI 900 | ANSI 1500 |
| 2 | 50 | 150 | 160 | 175 | 297 | 297 |
| 3 | 110 | 245 | 255 | 270 | 397 | 408 |
| 4 | 192 | 305 | 310 | 335 | 492 | 505 |
| 6 | 364 | 515 | 530 | 595 | 892 | 910 |
| 8 | 669 | 800 | 825 | 960 | 1440 | 1460 |
| 10 | 1168 | 1350 | 1380 | 1500 | 2250 | 2250 |
| 12 | 1452 | 1700 | 1740 | 1900 | 2850 | 2850 |

## Model 87 Spring Diaphragm Actuator

| Size (in.) | Standard | w/Handwheel |
|---|---|---|
| 6 | 45 | 60 |
| 10 | 85 | 105 |
| 16 | 210 | 245 |
| 23 | 265 | 340 |

## Model 84 Cylinder Actuator

| Size (sq. in.) | Base Weight | Small Spring | Medium Spring | Large Spring | Handjack |
|---|---|---|---|---|---|
| 154 | 266 | 60 | --- | 82 | 100 |
| 314 | 709 | 60 | 84 | 142 | 100 |

# Notes

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