

# Masoneilan® 39003 Series High Performance Butterfly Valves (HPBV)

Specification Data

CM9003

4/00



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## Foreword

The Masoneilan 39003 Series High Performance Butterfly Valve (HPBV) is a heavy duty automatic throttling control valve that incorporates the two basic features of the HPBV types. These features differentiate the HPBV from the conventional swing-through butterfly valve in regards to sealing method and operational characteristics. Specifically, the two basic features are: (1) A PTFE, RTFE, or metal seal ring instead of a liner, and (2) The employment of double offset (eccentric operation). Each of these features contributes to the improved performance of HPBV's compared to conventional butterfly valves.

The use of a seal ring (PTFE, RTFE, or metal) eliminates the inherent problems of high sealing forces, due to interference fit, and the resultant high wear rates due to scraping and scuffing of liners. Also, due to the design of the seal itself, which is a dynamic pressure-assisted member, ANSI Class VI shutoff rates are available throughout the full range of ANSI Class 150, 300 and 600 ratings (soft-sealed constructions only).

The double offset (eccentric) operating principles of both seal offset (the seal ring centerline is offset from the shaft centerline - see Figure 1) and shaft offset (the shaft centerline is offset from the valve

centerline – see Figure 1) allows the disc to get off the seal quickly due to the camming rotation with respect to the valve/seal centerlines. This results in minimal sliding (friction producing) contact between the disc and the seal ring with complete separation after only a few degrees of rotation.

The overall characteristics of the 39003 Series are listed below:

- Long seal life – Offset (eccentric) operation gets the disc off the seal quickly, minimizing sliding contact and friction, resulting in reduced seal wear and lower breakaway and seating torque requirements.
- Fast/dynamic operation – Offset (eccentric) operation eliminates disc-to-seal friction throughout the operating range resulting in fast response to input signals. Also, the disc tends to move in the direction of flow, assisting the valve and actuator to maximize the allowable operating pressures.

Trade names noted are for reference only. Masoneilan reserves the right to supply trade-named material or equivalent.

- Excellent flow characteristics - the offset (eccentric) disc design provides an approximate equal percentage flow characteristic through its full travel of 90° rotation yielding a Cv ratio of 100:1.
- Extra heavy shafts with keyed ends for actuator mounting - precise and accurate positioning without lost motion or backlash.

PTFE-lined low-friction bearing – Reduces operating torque and promotes fast response to valve and actuator action. The triple bearing support of the shaft prevents deflection of the shaft due to side-loading and incorporates a grounding circuit.

Field replaceable components – Unlike most competitive valves, shaft and disc need not be purchased as a set. The 39003 Series uses tapered pins to attach the shaft and disc positively, yet provide component interchangeability.

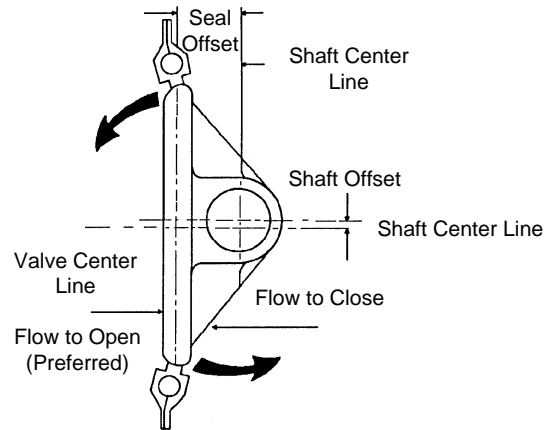
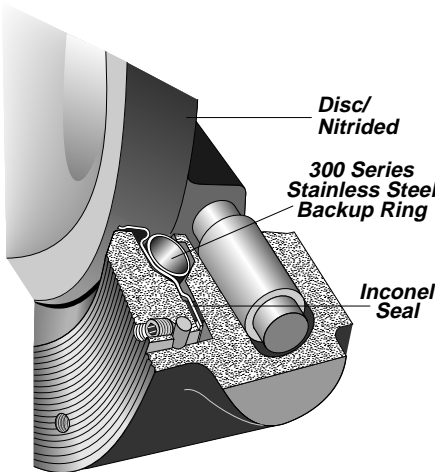


Figure 1

## Features

The Masoneilan 39003 HPBV includes unique valve seal designs for metal, soft seal, and fire-safe configurations.

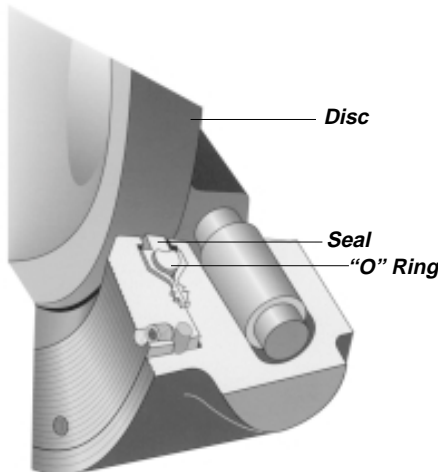


**Metal Seal Design**

The metal seal design incorporates an Inconel seal for higher tensile strength, a 300 series stainless steel back-up ring in the seal cavity for axial seal support, and a disc that is case hardened by nitriding.

The Inconel seal, by its dynamic and flexible design, applies enough force per linear inch against the disc edge (Rockwell Hardness of C66 to C70) to obtain an optimum sealing characteristic while controlling the loads between the metal surfaces.

The metal seal design can be utilized for temperatures up to 900°F, in compliance with ANSI B16.34 pressure/temperature specifications. Leakage is rated at Class IV per ANSI FCI 70-2.

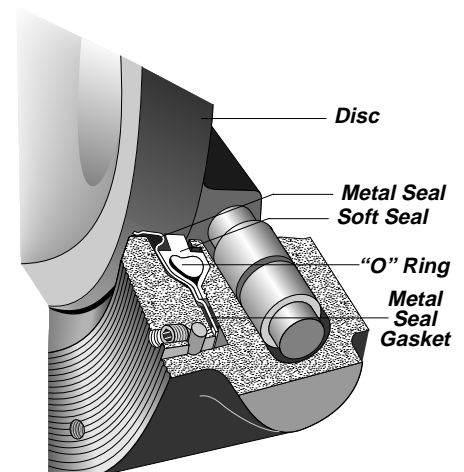


**Soft Seal Design**

The soft seal design provides a bi-directional bubble tight shutoff (zero leakage) through the use of a patented seal. This unique seal design creates a self-energized seal in vacuum-to-low pressure applications.

Under higher pressure conditions, the seal is also designed to confine and direct movement of the soft seal against the disc edge, up to the full ANSI Class 150, 300 and 600 Cold Working Pressures.

The soft seal is designed for high services with minimal wear and low torque. Seal replacement is a simple procedure requiring no special tools.



**Fire-Safe Seal Design**

The fire-safe seal design incorporates two patented seals which function together to seal off pipeline flow. In normal operation, the soft seal provides a bi-directional "bubble tight" shutoff (zero leakage); the metal seal provides bi-directional shutoff in the event of a fire, in conformance to industry fire-safe requirements.

With little or no pressure, the fire-safe seal creates a self-energized seal against the disc. Higher line pressures act on the geometry of both seals to dynamically load them against the disc, creating higher sealing forces in either direction.

The metal seal is made of Inconel material which is shaped by a proprietary hydroforming process into its unique, patented design. Stainless steel outer bearings are included for post-fire disc and shaft alignment. Fireproof packing is used to prevent external shaft leakage.

# Numbering System

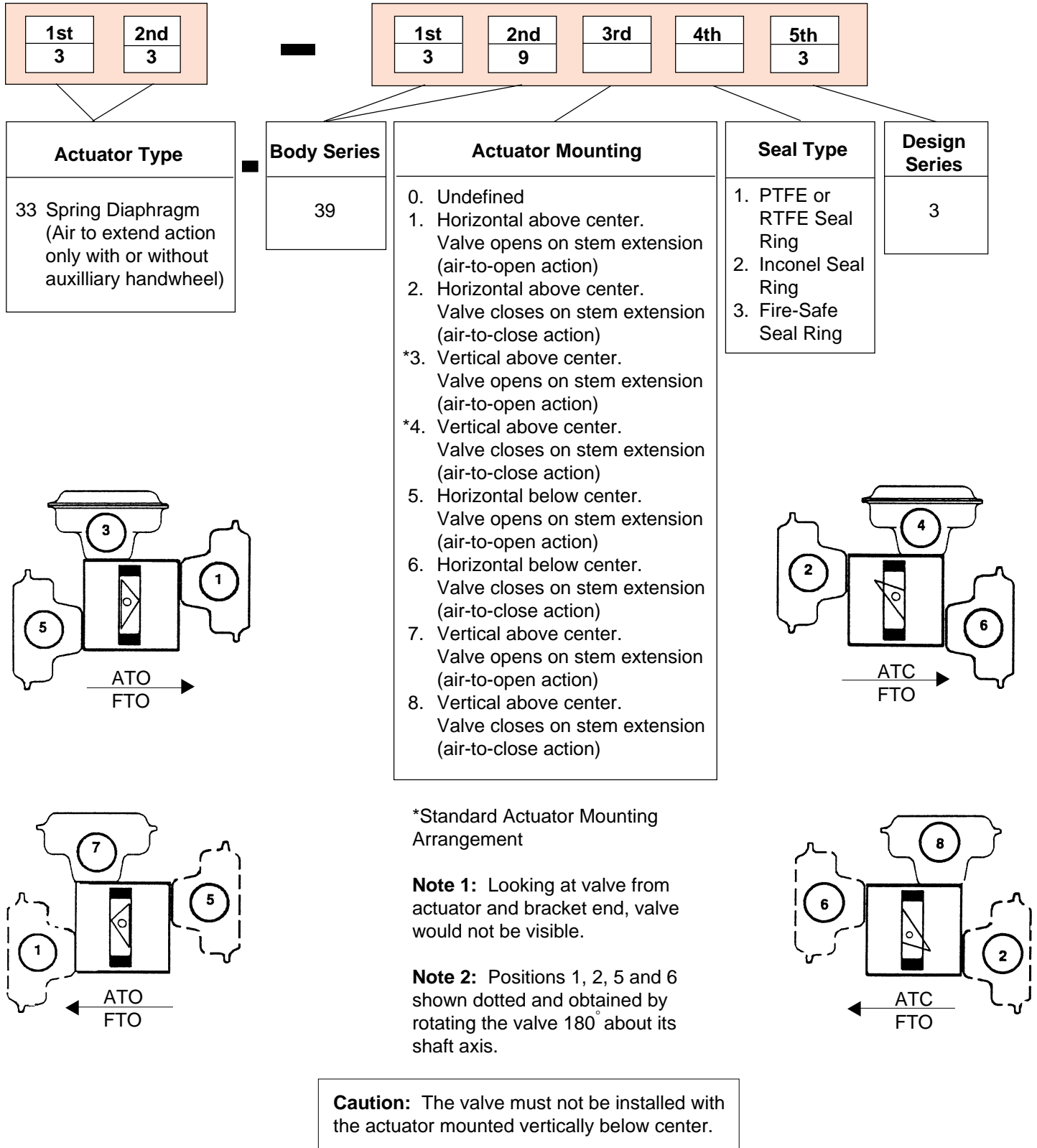
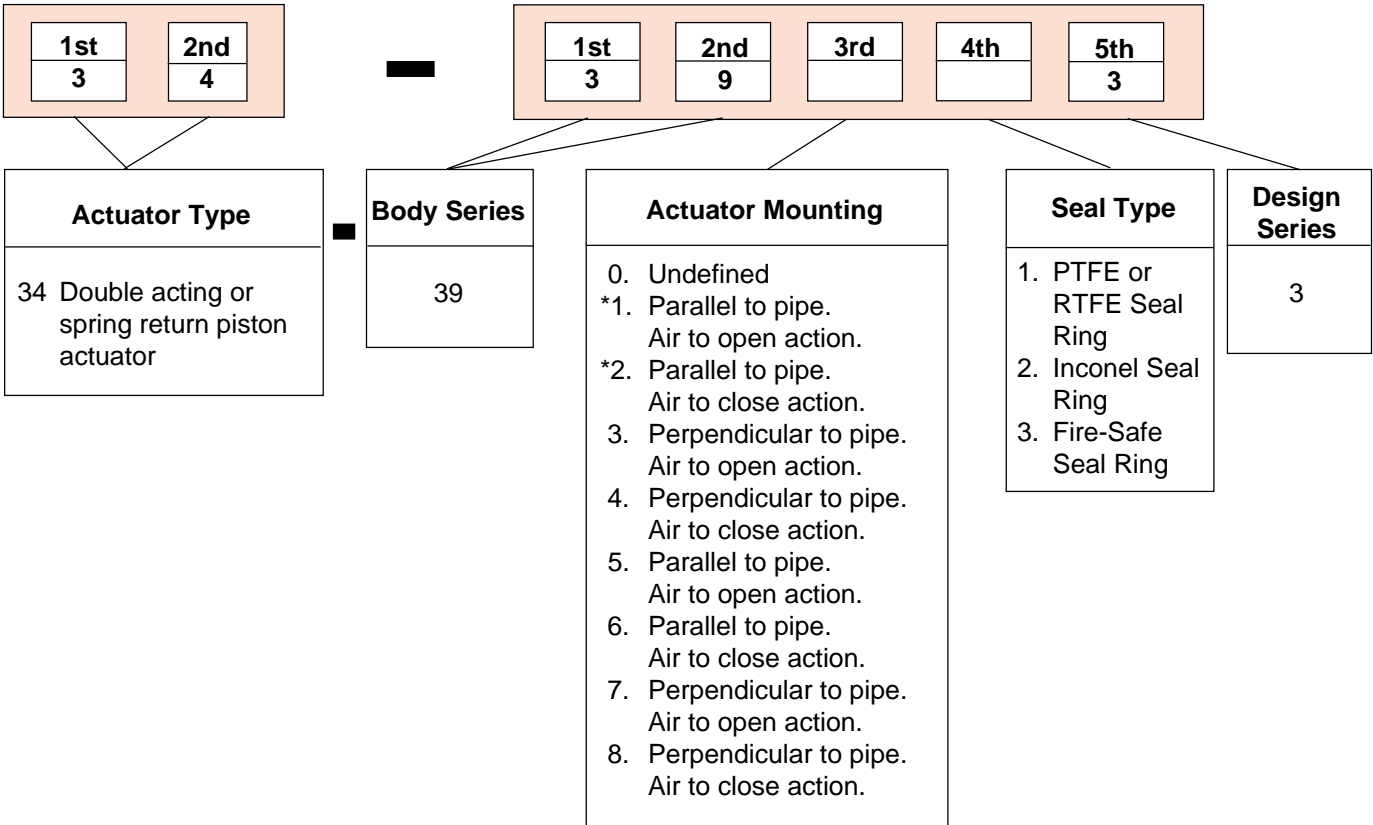
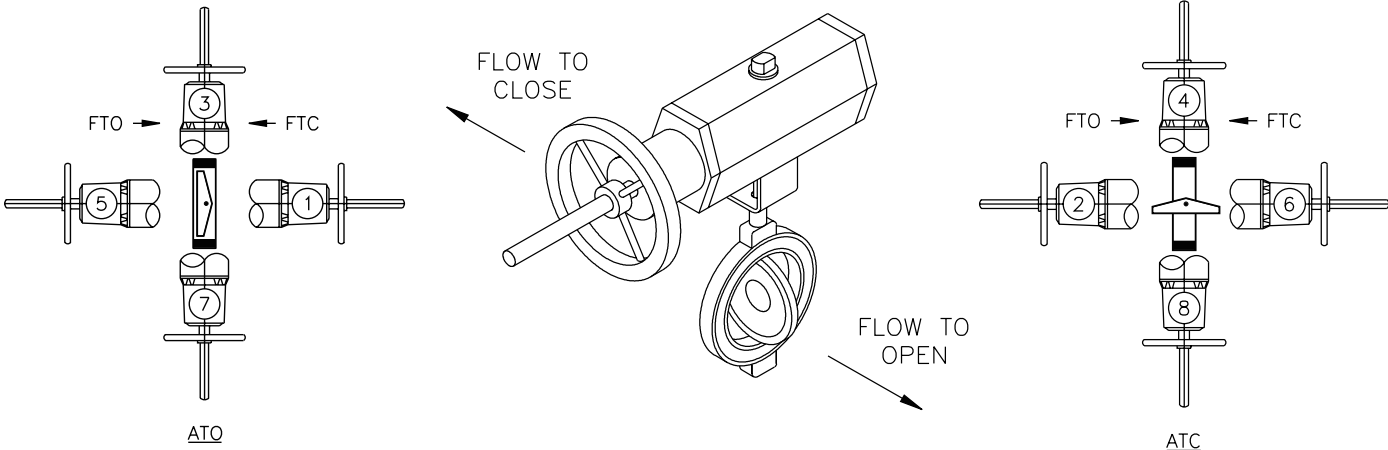


Figure 2

# Numbering System



\*Standard Actuator Mounting Arrangement



**Figure 3**

## General Data

flow characteristic: equal percentage

flow direction: bi-directional

seal leakage: per ANSI FCI 70-2  
Class VI, PTFE, RTFE  
Class IV, metal seals

Cv ratio: 100:1

| Valve Sizes |      | ANSI Class                 |                            |                            |
|-------------|------|----------------------------|----------------------------|----------------------------|
| inches      | mm   | 150<br>Carbon<br>& St. St. | 300<br>Carbon<br>& St. St. | 600<br>Carbon<br>& St. St. |
| 2           | 50   | •                          | •                          | •                          |
| 3           | 80   | •                          | •                          | •                          |
| 4           | 100  | •                          | •                          | •                          |
| 6           | 150  | •                          | •                          | •                          |
| 8           | 200  | •                          | •                          | •                          |
| 10          | 250  | •                          | •                          | •                          |
| 12          | 300  | •                          | •                          | •                          |
| 14          | 350  | •                          | •                          | •                          |
| 16          | 400  | •                          | •                          | •                          |
| 18          | 450  | •                          | •                          |                            |
| 20          | 500  | •                          | •                          |                            |
| 24          | 600  | •                          | •                          |                            |
| 30          | 750  | •                          | •                          |                            |
| 36          | 900  | •                          |                            |                            |
| 42          | 1050 | •                          |                            |                            |
| 48          | 1200 | •                          |                            |                            |

### Soft and Fire-Safe Seal

As temperature increases, the pressure retaining capability of materials decreases. The graph below illustrates the pressure/temperature ratings for ANSI Class 150, Class 300 and Class 600.

The heavy lines define the ratings of the carbon steel and stainless steel valve body (or "shell") in conformance to ANSI B16.34. The shaded areas define the ratings of the PTFE and RTFE Seal materials (Soft Seal).

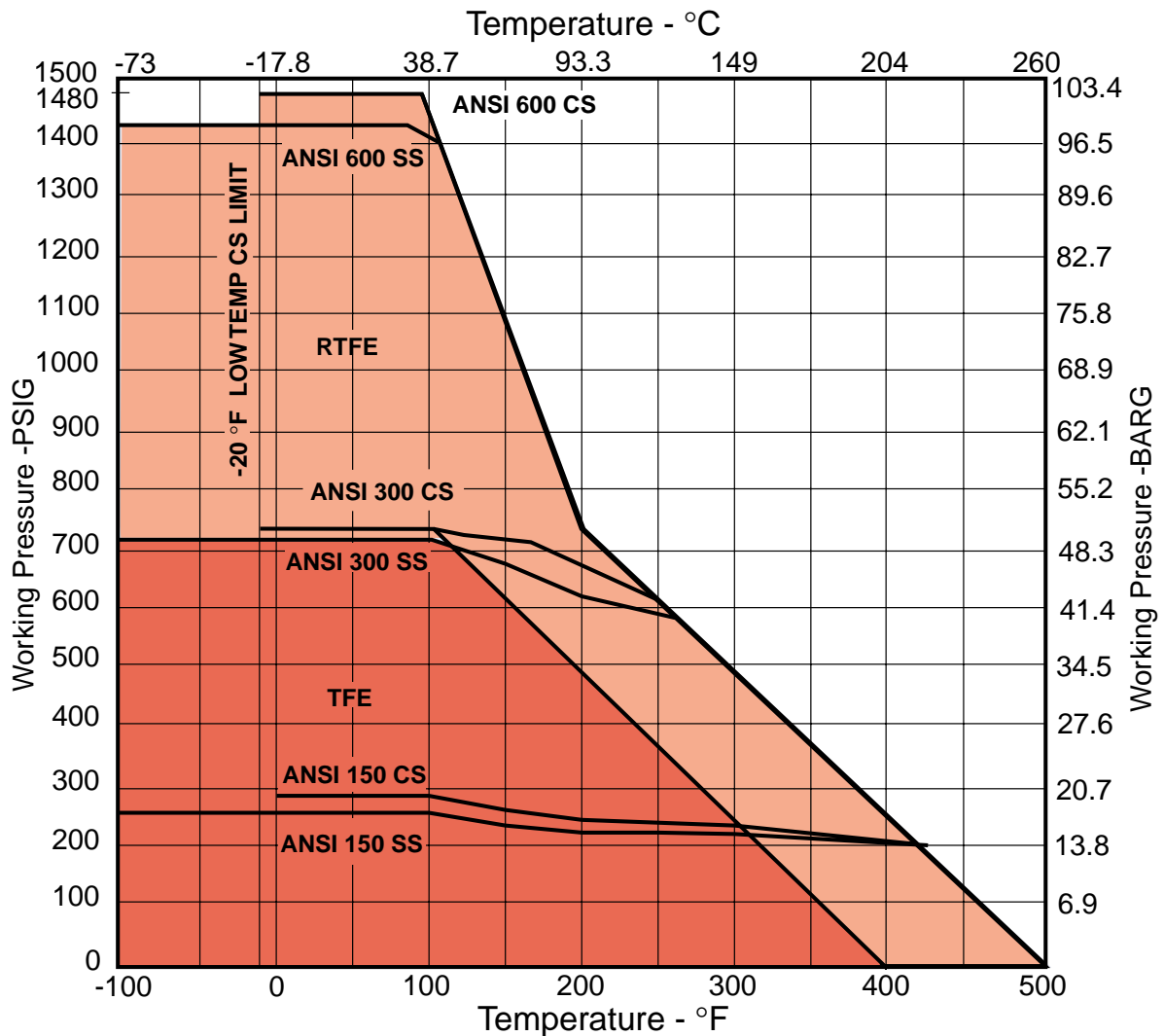
Seal ratings are based on differential pressure with the disc in the fully closed position.\*

### Steam Service (Soft Seal only)

PTFE sealed valves are rated for 50 psi saturated steam.

Valves with "O" seal configuration (RTFE seal/AFLAS O-ring) are rated to 100 psi steam service.

**ANSI B16.34 Body and Flowseal Soft Seat Pressure - Temperature Ratings**



\* Valves with 316SS shafts are rated for maximum pressure differentials of 150 psi for Class 150, 300 psi for Class 300, and 600 psi for Class 600.

# Pressure/Temperature Ratings

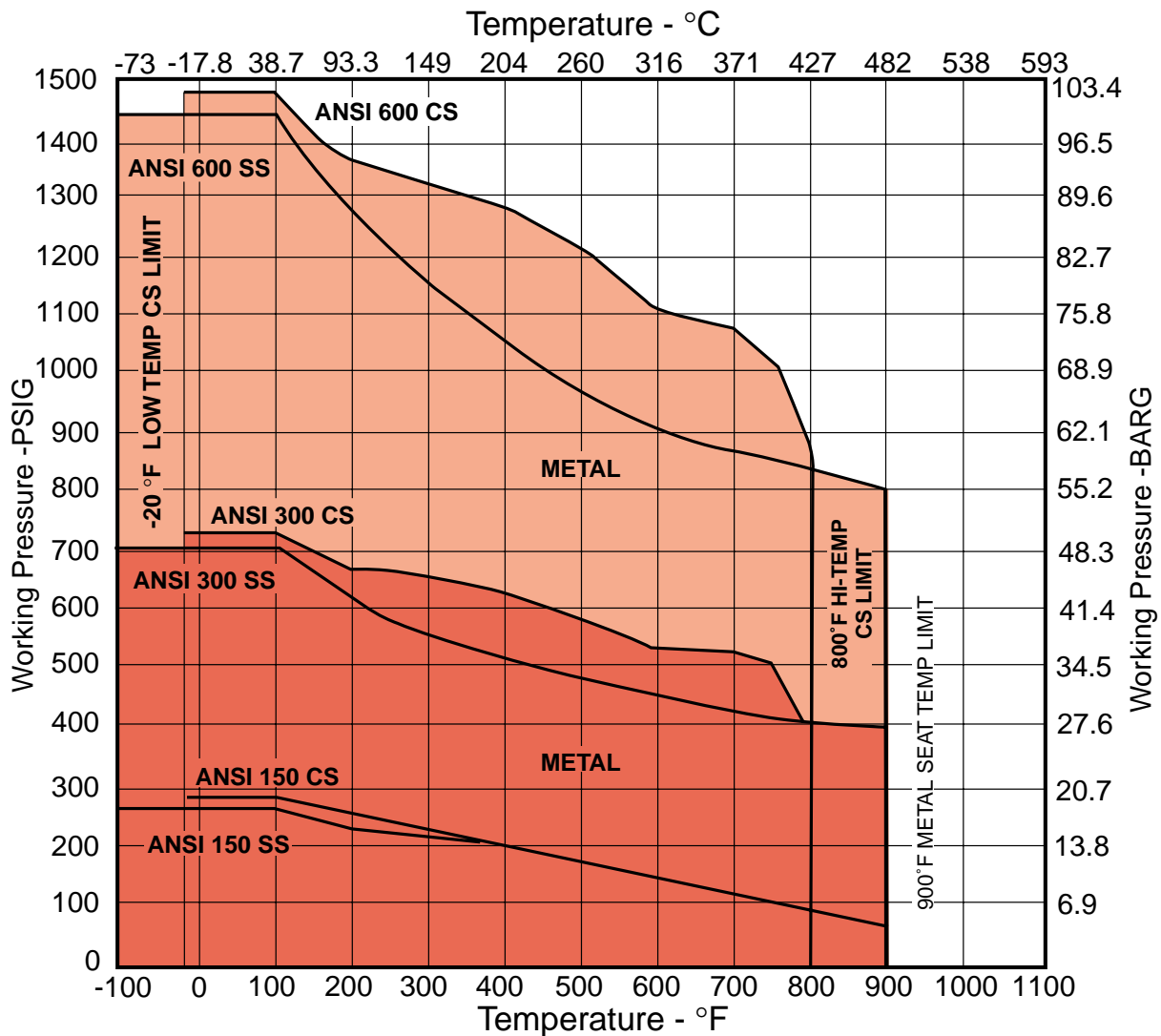
## Metal Seal

As temperature increases, the pressure retaining capability of materials decreases. The graph below illustrates the pressure/temperature ratings for ANSI Class 150, Class 300 and Class 600.

The heavy lines define the ratings of the carbon steel and stainless steel valve body (or “shell”) in conformance to ANSI B16.34. The shaded areas define the ratings of the metal seal.

Seal ratings are based on differential pressure with the disc in the fully closed position.\*

### ANSI B16.34 Body and Flowseal Metal Seal Pressure - Temperature Ratings



\* Valves with 316SS shafts are rated for maximum pressure differentials of 150 psi for Class 150, 300 psi for Class 300, and 600 psi for Class 600.



## Body Assembly Data

- Body Type:** wafer or lug with integral bonnet  
**Sizes:** 2", 3", 4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36", 42", 48" (50 mm-1200 mm)  
**Materials:** carbon steel ASTM A216 Gr WCB or ASTM A105  
 stainless steel ASTM A351 Gr CF8M or ASTM A182-F316  
**Connections:** flangeless - clamped between ANSI Class 150, 300 or 600 line flanges  
 single flanged - bolts between ANSI Class 150, 300 or 600 line flanges  
**Rating:** ANSI Class 150 - carbon steel and stainless steel 2" - 48" sizes (50 mm-1200 mm)  
 ANSI Class 300 - carbon steel and stainless steel 2" - 30" sizes (50 mm-750 mm)  
 ANSI Class 600 - carbon steel and stainless steel 2" - 16" sizes (50 mm-400 mm)  
**Seal:** PTFE, RTFE or Inconel with 304 stainless steel O-Ring  
**Disc Type:** offset eccentric disc  
 Materials: stainless steel ASTM A351 Gr CF8M or ASTM A182-F316 Nitrided  
**Shaft Type:** Keyed on outboard end  
 Materials: 17-4 PH stainless steel A564 Gr 630 (others optional)  
**Valve Bearings:** PTFE-lined fiberglass  
 bronze (up to 750° F) stainless steel (above 750° F)  
**Packing Box:** bolted  
 Packing: PTFE V-ring  
 graphite (optional)

## Actuator Data

### (Model 33) – Sizes 3" – 8" (80mm-200mm)

- Type: spring-diaphragm, floating stem  
 pneumatic actuator  
 Action: increasing air extends stem  
 Bench Range: B size 7-16 psig (48-110 kPa)  
 C size 9-16 psig (62-110 kPa)  
 Connection: 1/4" NPT  
 Fail Safe Action: field reversible  
 Yoke: carbon steel  
 Bracket: cast iron  
 Handwheel:  
 (optional) push type tilting, rising stem, permanently  
 lubricated materials: 17-4 PH and AISI  
 416 stainless steel adjustable limit stops  
 Bracket Bearing: a sealed, permanently lubricated ball bearing

| Actuator Size | Valve Size<br>in. (mm) | Effective Area<br>sq.in. (sq. cm) | Travel<br>in. (mm) |
|---------------|------------------------|-----------------------------------|--------------------|
| B             | 3 (80)                 | 70 (452)                          | 2.625 (66.5)       |
|               | 4 (100)                |                                   |                    |
| C             | 6 (150)                | 140 (903)                         | 2.625 (66.5)       |
|               | 8 (200)                |                                   |                    |
|               | optional               |                                   |                    |
|               | 3 (80)                 |                                   |                    |
|               | 4 (100)                |                                   |                    |

### (Model 34) – Sizes 3" – 48" (80mm – 1200mm)

- Type: Spring-return, or double-acting scotch yoke piston  
 Body: Extruded aluminum, anodized finish – sizes 210 to 280 & 88  
 Ductile Iron – sizes 90 and 100  
 Seals: Buna-N  
 Pressure Rating: 150 psi (1034 kPa) maximum working pressure  
 Manual Override: Declutchable direct mount – sizes 210 to 280  
 Hydraulic – size 88  
 Bevel Gear – sizes 90 and 100  
 Optional  
 Construction: Low temperature or high temperature seals, low pressure hydraulic.

# Rated Flow Coefficients ( $C_V$ ) and Pressure Recovery Coefficients ( $F_L$ )

## Rated Flow Coefficients ( $C_V$ )

The values shown are for the valve installed in the seal upstream ("SUS") position.

| Degree Open  |     | 10°  | 20°  | 30°   | 40°   | 50°   | 60°   | 70°   | 80°   | 90°   |
|--------------|-----|------|------|-------|-------|-------|-------|-------|-------|-------|
| % Full $C_V$ |     | 1.5% | 6%   | 14%   | 25.2% | 38%   | 55%   | 75%   | 97%   | 100%  |
| 2"           | 150 | 1.5  | 6    | 14    | 25    | 39    | 56    | 76    | 99    | 102   |
|              | 300 | 1.4  | 6    | 13    | 24    | 36    | 52    | 71    | 95    | 100   |
|              | 600 | 1.4  | 5    | 13    | 23    | 35    | 51    | 70    | 90    | 93    |
| 3"           | 150 | 3.4  | 14   | 32    | 57    | 87    | 125   | 171   | 221   | 228   |
|              | 300 | 3.2  | 13   | 30    | 53    | 81    | 117   | 159   | 212   | 223   |
|              | 600 | 3.1  | 12   | 29    | 52    | 79    | 114   | 156   | 202   | 208   |
| 4"           | 150 | 6.8  | 27   | 63    | 114   | 171   | 248   | 338   | 437   | 451   |
|              | 300 | 6.2  | 25   | 58    | 104   | 157   | 228   | 310   | 414   | 435   |
|              | 600 | 5.8  | 23   | 54    | 98    | 147   | 213   | 290   | 375   | 387   |
| 6"           | 150 | 16.5 | 66   | 154   | 278   | 419   | 607   | 827   | 1070  | 1103  |
|              | 300 | 14.9 | 60   | 139   | 250   | 377   | 546   | 744   | 992   | 1041  |
|              | 600 | 14.7 | 59   | 137   | 247   | 372   | 538   | 734   | 950   | 979   |
| 8"           | 150 | 30.9 | 124  | 289   | 520   | 784   | 1135  | 1584  | 2002  | 2064  |
|              | 300 | 27.3 | 109  | 255   | 459   | 692   | 1001  | 1365  | 1820  | 1911  |
|              | 600 | 26.8 | 107  | 250   | 451   | 679   | 983   | 1341  | 1734  | 1788  |
| 10"          | 150 | 52.8 | 211  | 492   | 886   | 1336  | 1934  | 2638  | 3411  | 3517  |
|              | 300 | 45.6 | 183  | 426   | 767   | 1156  | 1673  | 2282  | 3042  | 3194  |
|              | 600 | 41.2 | 165  | 384   | 692   | 1044  | 1511  | 2060  | 2665  | 2747  |
| 12"          | 150 | 72.6 | 290  | 677   | 1219  | 1838  | 2660  | 3628  | 4690  | 4837  |
|              | 300 | 63.3 | 253  | 590   | 1063  | 1602  | 2319  | 3163  | 4217  | 4428  |
|              | 600 | 58.4 | 233  | 545   | 981   | 1479  | 2140  | 2918  | 3774  | 3891  |
| 14"          | 150 | 90   | 392  | 914   | 1646  | 2481  | 3592  | 4898  | 6530  | 6857  |
|              | 300 | 81   | 326  | 760   | 1368  | 2063  | 2986  | 4072  | 5430  | 5702  |
|              | 600 | 73   | 292  | 682   | 1228  | 1838  | 2680  | 3655  | 4727  | 4873  |
| 16"          | 150 | 132  | 531  | 1230  | 2229  | 3361  | 4865  | 6634  | 8845  | 9287  |
|              | 300 | 109  | 435  | 1015  | 1827  | 2755  | 3988  | 5438  | 7850  | 8243  |
|              | 600 | 96   | 385  | 899   | 1619  | 2423  | 3533  | 4818  | 6231  | 6424  |
| 18"          | 150 | 171  | 684  | 1596  | 3873  | 4332  | 6270  | 8550  | 11270 | 11400 |
|              | 300 | 139  | 555  | 1295  | 2331  | 3515  | 5088  | 6938  | 9250  | 9712  |
|              | 600 | 127  | 500  | 1173  | 2112  | 3185  | 4611  | 6288  | 8132  | 8384  |
| 20"          | 150 | 207  | 828  | 1932  | 3478  | 5244  | 7590  | 10350 | 13800 | 14420 |
|              | 300 | 158  | 630  | 1470  | 2646  | 3990  | 5775  | 7875  | 10150 | 10658 |
|              | 600 | 142  | 560  | 1320  | 2352  | 3540  | 5145  | 7050  | 9100  | 9480  |
| 24"          | 150 | 315  | 1260 | 2940  | 5292  | 7890  | 11550 | 15750 | 21000 | 22050 |
|              | 300 | 242  | 966  | 2254  | 4057  | 6118  | 8855  | 12075 | 16100 | 16205 |
|              | 600 | 215  | 840  | 1980  | 3642  | 5397  | 7965  | 10800 | 14400 | 14850 |
| 30"          | 150 | 491  | 1965 | 4585  | 8253  | 12445 | 18012 | 24563 | 32750 | 34388 |
|              | 300 | 404  | 1614 | 3766  | 6779  | 10222 | 14795 | 20175 | 26900 | 28245 |
|              | 600 | 360  | 1440 | 3360  | 6060  | 8910  | 12870 | 17400 | 22800 | 23850 |
| 36"          | 150 | 707  | 2830 | 6602  | 11884 | 17920 | 25938 | 35370 | 45745 | 47160 |
|              | 300 | 566  | 2264 | 5442  | 9507  | 14256 | 19950 | 26715 | 34675 | 35920 |
|              | 600 | 506  | 1960 | 4760  | 8400  | 12480 | 17340 | 23100 | 29800 | 30840 |
| 42"          | 150 | 963  | 3851 | 8987  | 16176 | 24392 | 35304 | 48143 | 62264 | 64190 |
|              | 300 | 770  | 3081 | 7490  | 13020 | 19514 | 28504 | 37817 | 48830 | 50552 |
|              | 600 | 684  | 2700 | 6540  | 11880 | 17760 | 26160 | 34800 | 45000 | 46650 |
| 48"          | 150 | 1258 | 5030 | 11738 | 21128 | 31859 | 46111 | 62881 | 81324 | 83840 |
|              | 300 | 1006 | 3944 | 9470  | 17302 | 25924 | 37339 | 50166 | 64656 | 67040 |
|              | 600 | 905  | 3540 | 8580  | 15660 | 23490 | 34500 | 45600 | 58800 | 60800 |

## Pressure Recovery Coefficients ( $F_L$ )

| DISC DEGREE OPENING | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| SEAL UPSTREAM       | .95 | .91 | .84 | .81 | .78 | .80 | .77 | .74 | .74 | .73 | .70 | .66 | .63 | .60 | .57 | .53 |
| SEAL DOWNSTREAM     | .94 | .89 | .84 | .82 | .80 | .77 | .75 | .72 | .69 | .66 | .63 | .60 | .58 | .55 | .54 | .53 |

# Standard Valve Components

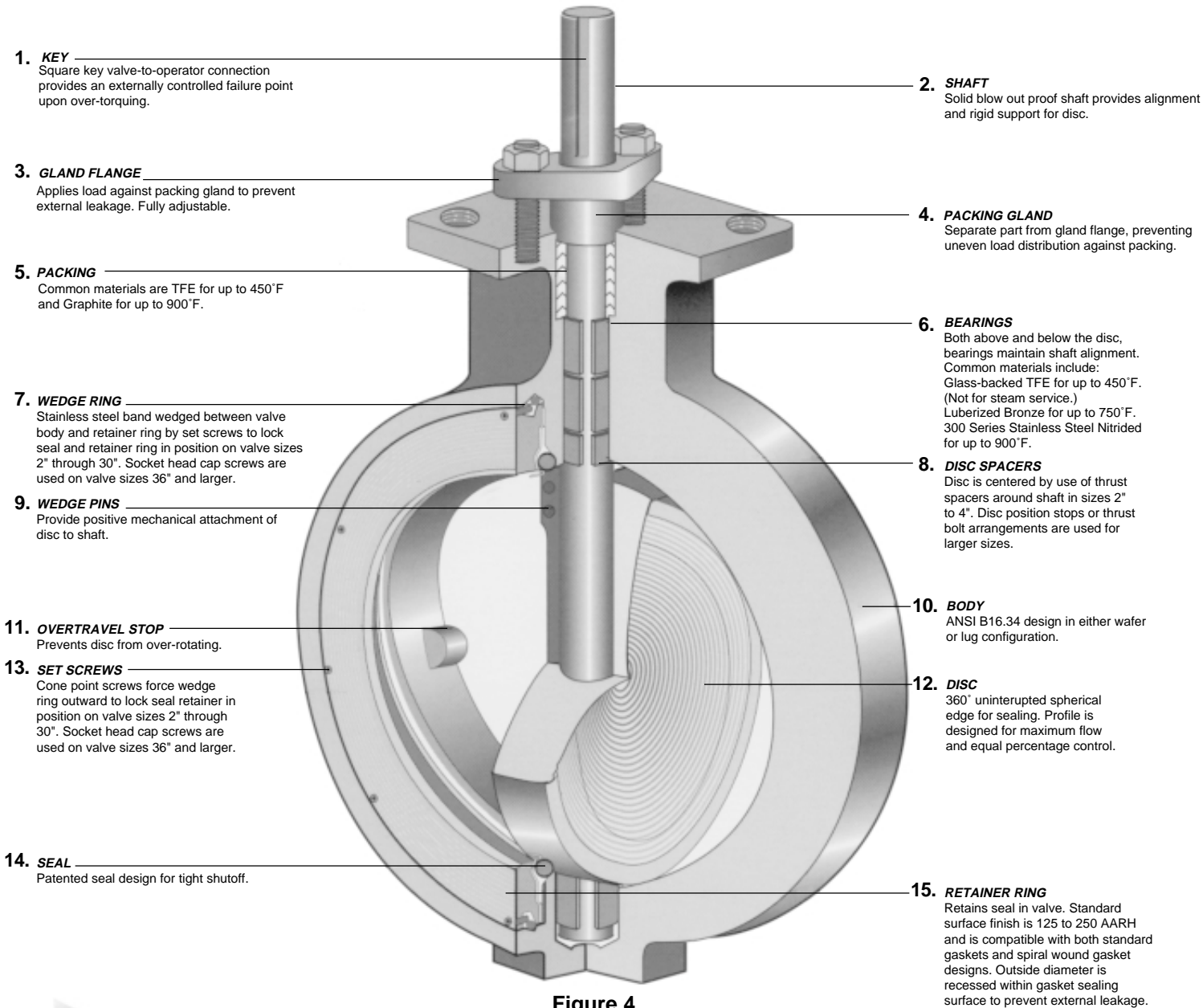
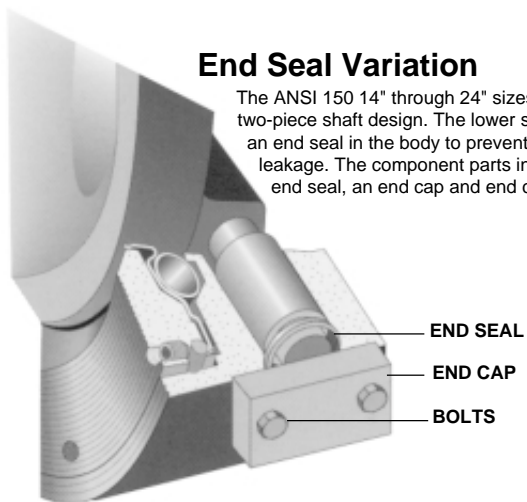


Figure 4

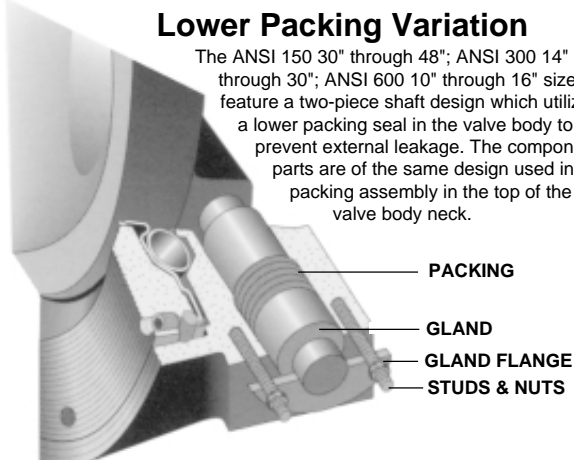
## End Seal Variation

The ANSI 150 14" through 24" sizes feature a two-piece shaft design. The lower shaft utilizes an end seal in the body to prevent external leakage. The component parts include an end seal, an end cap and end cap bolts.



## Lower Packing Variation

The ANSI 150 30" through 48"; ANSI 300 14" through 30"; ANSI 600 10" through 16" sizes feature a two-piece shaft design which utilizes a lower packing seal in the valve body to prevent external leakage. The component parts are of the same design used in the packing assembly in the top of the valve body neck.



## Metal Seal Design

### Carbon Steel Construction

| Item Number | Description | -20°F to +450°F<br>(- 29°C to +232°C)               | +451°F to +750°F<br>(+233°C to +399°C) | +751°F to +800°F<br>(+400°C to +427°C) |
|-------------|-------------|---|--|--|
| 2           | Shaft       | 17-4 PH Stainless Steel ASTM A564 Gr 630            |  |  |
| 5           | Packing     | PTFE  | Graphite                               |  |
| 6           | Bearings    | Glass-Backed PTFE                                   | Bronze                                 | 316 Stainless Steel<br>Nitrided        |
| 10          | Body        | Carbon Steel A216 Gr WCB or A105                    |  |  |
| 12          | Disc        | 316 Stainless Steel A351 CF8M or A182 F316 Nitrided |  |  |
| 14          | Seal        | Inconel   |  |  |

### Stainless Steel Construction

| Item Number | Description | -20°F to +450°F<br>(-29°C to +232°C)                | +451°F to +750°F<br>(+233°C to +399°C) | +751°F to +900°F<br>(+400°C to +482°C)      |
|-------------|-------------|---|--|---|
| 2           | Shaft       | 17-4 PH Stainless Steel<br>ASTM A564 Gr 630         |  | 316 Stainless*<br>Steel ASTM<br>A479 Gr 316 |
| 5           | Packing     | PTFE  | Graphite                               |   |
| 6           | Bearings    | Glass-Backed PTFE                                   | Bronze                                 | 316 Stainless Steel<br>Nitrided             |
| 10          | Body        | 316 Stainless Steel A351 CF8M or A182 F316          |  |   |
| 12          | Disc        | 316 Stainless Steel A351 CF8M or A182 F316 Nitrided |  |   |
| 14          | Seal        | Inconel   |  |   |

\* Metal seal valves with 316 SS shafts are rated for maximum pressure differentials of 150 psi for Class 150, 300 psi for Class 300, and 600 psi for Class 600. Monel, Nitronic 50, and Inconel (718 or X750) shafts may be substituted for higher differential pressures at elevated temperatures. Please consult factory for additional information.

## Soft Seal Design

| Item Number | Description | -100°F to +400°F<br>(- 88°C to +204°C)   | +400°F to +500°F<br>(+204°C to +260°C) |
|-------------|-------------|--|--|
| 2           | Shaft       | 17-4 PH Stainless Steel ASTM A564 Gr 630   |  |
|             |             | Optional: 316 SS, Inconel 718/750, Monel, Alloy 20, Nitronic 50, Hastelloy C, and Others       |  |
| 5           | Packing     | TFE  |  |
|             |             | Optional: Graphite   |  |
| 6           | Bearings    | Glass Backed PTFE  |  |
|             |             | Optional: 316 SS Backed TFE, Hastelloy C Backed TFE  |  |
| 10          | Body        | Carbon Steel A216 Gr WCB or A105   |  |
|             |             | Optional: 316 SS ASTM A351 CF8M or A182 F316, Monel, Alloy 20, Aluminum Bronze, or Hastelloy C |  |
| 12          | Disc        | 316 Stainless Steel A351 CF8M or A182 F316   |  |
|             |             | Optional: Monel, Alloy 20, Aluminum Bronze, or Hastelloy C                                     |  |
| 14          | Seal        | PTFE   |  |
|             |             | Optional: RTFE, Polyethylene (UHMWPE)  |  |

## Fire-Safe Design

| Item Number | Description | -100°F to +400°F<br>(- 88°C to +204°C)   | +400°F to +500°F<br>(+204°C to +260°C) |
|-------------|-------------|--|--|
| 2           | Shaft       | 17-4 PH Stainless Steel ASTM A564 Gr 630   |  |
|             |             | Optional: 316 Stainless Steel  |  |
| 5           | Packing     | Fire-Safe  |  |
| 6           | Bearings    | Fire-Safe (Garfil & 316 SS)  |  |
| 10          | Body        | Carbon Steel A216 Gr WCB or A105   |  |
|             |             | Optional: 316 SS ASTM A351 CF8M or A182 F316, Monel, Alloy 20, Hastelloy C, and Others |  |
| 12          | Disc        | 316 Stainless Steel A351 CF8M or A182 F316 - ENP                                       |  |
|             |             | Consult Factory for Optional Materials   |  |
| 14          | Seal        | Fire-Safe (TFE & Inconel)  | RTFE & Inconel                         |
|             |             | Optional: TFE & Monel, TFE & Hastelloy C   | RTFE & Monel, RTFE & Hastelloy C       |

## Allowable Pressure Drops

Dresser Valve Division has created a simple actuator sizing and selection program, which allows for quick and accurate actuator sizing based on the specific service conditions. This program is designed to run in Microsoft® Excel®, and is available from your local Masoneilan sales representative.

The opening screen of the sizing program is shown below. Operating variables can be selected from a number of pull-down menus. The program will then

provide an actuator recommendation, along with calculations for the required torque (with safety margins) for valve seating, unseating, and throttling conditions.

This program covers standard product construction only. Please consult with your local Masoneilan sales representative, or with the factory, for applications and conditions not covered by this program.

| 39003 HPBV Actuator Quick Selector |  |
|------------------------------------|--|
| <b>I. Specification Inputs</b>     | <b>II. Actuator Selection Output</b>                                   |
| ANSI Pressure Class                | 300 Class  |
| Size (Inches)                      | 4"   |
| Flow Direction                     | Flow-to-Open   |
| Air Action                         | Air-to-Close   |
| Seat Construction                  | Soft Seat  |
| Air Supply (Psig)                  | 25 Psig  |
| Shaft Material                     | 17-4 PH  |
| Service Sizing Factor              | Normal   |
| Shutoff Delta P (Psig)             | 600 Psig   |
| Throttling Delta P (Psig)          | 150 Psig   |
| Throttling Position (Deg)          | 50 Deg   |
|                                    | <b>Actuator Model</b>  |
|                                    | 33-C   |
|                                    | <b>Seating/Unseating Torque (in-lbs)</b>                               |
|                                    | 790  |
|                                    | <b>Throttling Torque (in-lbs)</b>                                      |
|                                    | 1,250  |
|                                    | <u>Notes</u>   |
|                                    | Shaft Material Acceptable  |
|                                    | Select SEVERE Service Sizing Factor for Soft Seat applications < 40 °F |

## 150 CLASS ASSEMBLIES

| ACTUATOR TYPE |       | VALVE<br>WT | BRACKET<br>WT | RC210 |    | RC220 |       | RC230 |      | RC240 |      | RC250 |       | RC260 |     | RC270 |     | RC280 |     | RC88 |      | RC190 |      | RCG100 |      | 33 ACTUATOR |           |           |  |  |
|---------------|-------|-------------|---------------|-------|----|-------|-------|-------|------|-------|------|-------|-------|-------|-----|-------|-----|-------|-----|------|------|-------|------|--------|------|-------------|-----------|-----------|--|--|
| VALVE<br>SIZE | TYPE  |             |               | DA    | SR | DA    | SR    | DA    | SR   | DA    | SR   | DA    | SR    | DA    | SR  | DA    | SR  | DA    | SR  | DA   | SR   | DA    | SR   | DA     | SR   | YOKE<br>WT  | "B"<br>32 | "C"<br>85 |  |  |
|               |       |             |               | 3.1   | 4  | 4     | 5.85  | 8     | 10.4 | 10.6  | 15.5 | 20.4  | 26.8  | 27    | 40  | 69    | 69  | 89    | 142 | 162  | 330  | 618   | 772  | 684    | 1102 |             |           |           |  |  |
| 2"            | WAFER | 8           | 12            | 23.1  | 24 | 24    | 25.85 | 28    | 30.4 | 30.6  | 35.5 |       |       |       |     |       |     |       |     |      |      |       |      |        | 24   | 64          | 117       |           |  |  |
|               | LUG   | 11          | 12            | 26.1  | 27 | 27    | 28.85 | 31    | 33.4 | 33.6  | 38.5 |       |       |       |     |       |     |       |     |      |      |       |      |        | 24   | 67          | 120       |           |  |  |
| 3"            | WAFER | 11          | 12            | 26.1  | 27 | 27    | 28.85 | 31    | 33.4 | 33.6  | 38.5 |       |       |       |     |       |     |       |     |      |      |       |      |        | 24   | 67          | 120       |           |  |  |
|               | LUG   | 13          | 12            | 28.1  | 29 | 29    | 30.85 | 33    | 35.4 | 35.6  | 40.5 |       |       |       |     |       |     |       |     |      |      |       |      |        | 24   | 69          | 122       |           |  |  |
| 4"            | WAFER | 17          | 12            | 32.1  | 33 | 33    | 34.85 | 37    | 39.4 | 39.6  | 44.5 |       |       |       |     |       |     |       |     |      |      |       |      |        | 24   | 73          | 126       |           |  |  |
|               | LUG   | 25          | 12            | 40.1  | 41 | 41    | 42.85 | 45    | 47.4 | 47.6  | 52.5 |       |       |       |     |       |     |       |     |      |      |       |      |        | 24   | 81          | 134       |           |  |  |
| 6"            | WAFER | 30          | 12            |       |    |       |       | 50    | 52.4 | 52.6  | 57.5 | 62.4  | 68.8  | 69    | 82  |       |     |       |     |      |      |       |      |        | 24   |             | 139       |           |  |  |
|               | LUG   | 35          | 12            |       |    |       |       | 55    | 57.4 | 57.6  | 62.5 | 67.4  | 73.8  | 74    | 87  |       |     |       |     |      |      |       |      |        | 24   |             | 144       |           |  |  |
| 8"            | WAFER | 44          | 12            |       |    |       |       |       |      | 71.5  | 76.4 | 82.8  | 83    | 96    | 125 | 125   |     |       |     |      |      |       |      |        | 24   |             | 153       |           |  |  |
|               | LUG   | 48          | 12            |       |    |       |       |       |      | 75.5  | 80.4 | 86.8  | 87    | 100   | 129 | 129   |     |       |     |      |      |       |      |        | 24   |             | 157       |           |  |  |
| 10"           | WAFER | 71          | 14            |       |    |       |       |       |      |       |      | 105.4 | 111.8 | 112   | 125 | 154   | 154 | 174   | 227 |      |      |       |      |        |      |             |           |           |  |  |
|               | LUG   | 191         | 14            |       |    |       |       |       |      |       |      | 125.4 | 131.8 | 132   | 145 | 174   | 174 | 194   | 247 |      |      |       |      |        |      |             |           |           |  |  |
| 12"           | WAFER | 110         | 14            |       |    |       |       |       |      |       |      |       |       | 157   | 170 | 199   | 199 | 219   | 272 |      |      |       |      |        |      |             |           |           |  |  |
|               | LUG   | 127         | 14            |       |    |       |       |       |      |       |      |       |       | 174   | 187 | 216   | 216 | 236   | 289 |      |      |       |      |        |      |             |           |           |  |  |
| 14"           | WAFER | 135         | 16            |       |    |       |       |       |      |       |      |       |       | 182   | 195 | 224   | 224 | 244   | 297 |      |      |       |      |        |      |             |           |           |  |  |
|               | LUG   | 183         | 16            |       |    |       |       |       |      |       |      |       |       | 230   | 243 | 272   | 272 | 292   | 345 |      |      |       |      |        |      |             |           |           |  |  |
| 16"           | WAFER | 182         | 20            |       |    |       |       |       |      |       |      |       |       |       |     | 271   | 271 | 291   | 344 | 364  | 532  |       |      |        |      |             |           |           |  |  |
|               | LUG   | 250         | 20            |       |    |       |       |       |      |       |      |       |       |       |     | 339   | 339 | 359   | 412 | 432  | 600  |       |      |        |      |             |           |           |  |  |
| 18"           | WAFER | 234         | 20            |       |    |       |       |       |      |       |      |       |       |       |     | 323   | 323 | 343   | 396 | 416  | 584  | 872   | 1026 | 938    |      |             |           |           |  |  |
|               | LUG   | 305         | 20            |       |    |       |       |       |      |       |      |       |       |       |     | 394   | 394 | 414   | 467 | 487  | 655  | 943   | 1097 | 1009   |      |             |           |           |  |  |
| 20"           | WAFER | 320         | 20            |       |    |       |       |       |      |       |      |       |       |       |     |       |     | 429   | 482 | 502  | 670  | 958   | 1112 | 1024   |      |             |           |           |  |  |
|               | LUG   | 414         | 20            |       |    |       |       |       |      |       |      |       |       |       |     |       |     | 523   | 576 | 596  | 764  | 1052  | 1206 | 1118   |      |             |           |           |  |  |
| 24"           | WAFER | 505         | 25            |       |    |       |       |       |      |       |      |       |       |       |     |       |     |       |     | 692  | 860  | 1148  | 1302 | 1214   | 1632 |             |           |           |  |  |
|               | LUG   | 702         | 25            |       |    |       |       |       |      |       |      |       |       |       |     |       |     |       |     | 889  | 1057 | 1345  | 1499 | 1411   | 1829 |             |           |           |  |  |
| 30"           | WAFER | 925         | 25            |       |    |       |       |       |      |       |      |       |       |       |     |       |     |       |     |      | 1112 | 1280  | 1568 | 1722   | 1634 | 2052        |           |           |  |  |
|               | LUG   | 1130        | 25            |       |    |       |       |       |      |       |      |       |       |       |     |       |     |       |     |      | 1317 | 1485  | 1773 | 1927   | 1839 | 2257        |           |           |  |  |
| 36"           | WAFER | 1630        | 25            |       |    |       |       |       |      |       |      |       |       |       |     |       |     |       |     |      |      | 1985  | 2273 | 2427   | 2339 | 2757        |           |           |  |  |
|               | LUG   | 1890        | 25            |       |    |       |       |       |      |       |      |       |       |       |     |       |     |       |     |      |      | 2245  | 2533 | 2687   | 2599 | 3017        |           |           |  |  |
| 42"           | WAFER | 2475        | 25            |       |    |       |       |       |      |       |      |       |       |       |     |       |     |       |     |      |      |       | 2830 | 3118   | 3272 | 3184        | 3602      |           |  |  |
|               | LUG   | 2700        | 25            |       |    |       |       |       |      |       |      |       |       |       |     |       |     |       |     |      |      |       | 3055 | 3343   | 3497 | 3409        | 3827      |           |  |  |
| 48"           | WAFER | 2815        | 25            |       |    |       |       |       |      |       |      |       |       |       |     |       |     |       |     |      |      |       |      | 3170   | 3458 | 3612        | 3524      | 3942      |  |  |
|               | LUG   | 3085        | 25            |       |    |       |       |       |      |       |      |       |       |       |     |       |     |       |     |      |      |       |      | 3440   | 3728 | 3882        | 3794      | 4212      |  |  |

- NOTES: 1. The weights of actuators are without handwheel  
 2. The weights are in lbs.  
 3. DA = Double Acting / SR = Spring Return

## HANDWHEEL WEIGHTS

| ACTUATOR TYPE | RC210 DA/SR | RC220 DA/SR | RC230 DA/SR | RC240 DA/SR | RC250 DA/SR | RC260 DA/SR | RC270 DA/SR | RC280 DA/SR | RC88 DA/SR | RC90&100 DA | RC90&100 SR | 33 ACT. |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|---------|
| WEIGHT        | 1.5         | 1.5         | 2.5         | 2.5         | 6.5         | 6.5         | 26          | 26          | 250        | 185         | 66          | 22      |

- NOTES: 1. The weights are in lbs.

# Weights

## 300 CLASS ASSEMBLIES

| ACTUATOR TYPE |       | VALVE WT | BRACKET WT | RC210 |    | RC220 |       | RC230 |      | RC240 |       | RC250 |       | RC260 |     | RC270 |     | RC280 |     | RC88 |      | RCI90 |      | RCG100 |      | 33 ACTUATOR |      |         |      |     |  |  |
|---------------|-------|----------|------------|-------|----|-------|-------|-------|------|-------|-------|-------|-------|-------|-----|-------|-----|-------|-----|------|------|-------|------|--------|------|-------------|------|---------|------|-----|--|--|
| VALVE SIZE    | TYPE  |          |            | DA    | SR | DA    | SR    | DA    | SR   | DA    | SR    | DA    | SR    | DA    | SR  | DA    | SR  | DA    | SR  | DA   | SR   | DA    | SR   | DA     | SR   | DA          | SR   | YOKE WT | "B"  | "C" |  |  |
|               |       |          |            | 3.1   | 4  | 4     | 5.85  | 8     | 10.4 | 10.6  | 15.5  | 20.4  | 26.8  | 27    | 40  | 69    | 69  | 89    | 142 | 162  | 330  | 618   | 772  | 684    | 1102 | 684         | 1102 | WT      | 32   | 85  |  |  |
| 2"            | WAFER | 8        | 12         | 23.1  | 24 | 24    | 25.85 | 28    | 30.4 | 30.6  | 35.5  |       |       |       |     |       |     |       |     |      |      |       |      |        |      |             | 24   | 64      | 117  |     |  |  |
|               | LUG   | 11       | 12         | 26.1  | 27 | 27    | 28.85 | 31    | 33.4 | 33.6  | 38.5  |       |       |       |     |       |     |       |     |      |      |       |      |        |      |             | 24   | 67      | 120  |     |  |  |
| 3"            | WAFER | 12       | 12         | 27.1  | 28 | 28    | 29.85 | 32    | 34.4 | 34.6  | 39.5  |       |       |       |     |       |     |       |     |      |      |       |      |        |      |             | 24   | 68      | 121  |     |  |  |
|               | LUG   | 17       | 12         | 32.1  | 33 | 33    | 34.85 | 37    | 39.4 | 39.6  | 44.5  |       |       |       |     |       |     |       |     |      |      |       |      |        |      |             | 24   | 73      | 126  |     |  |  |
| 4"            | WAFER | 17       | 12         |       |    | 33    | 34.85 | 37    | 39.4 | 39.6  | 44.5  |       |       |       |     |       |     |       |     |      |      |       |      |        |      |             | 24   | 73      | 126  |     |  |  |
|               | LUG   | 24       | 12         |       |    | 40    | 41.85 | 44    | 46.4 | 46.6  | 51.5  |       |       |       |     |       |     |       |     |      |      |       |      |        |      |             | 24   | 80      | 133  |     |  |  |
| 6"            | WAFER | 30       | 12         |       |    |       |       | 50    | 52.4 | 52.6  | 57.5  | 62.4  | 68.8  | 69    | 82  |       |     |       |     |      |      |       |      |        |      | 24          |      | 139     |      |     |  |  |
|               | LUG   | 49       | 12         |       |    |       |       | 69    | 71.4 | 71.6  | 76.5  | 81.4  | 87.8  | 88    | 101 |       |     |       |     |      |      |       |      |        |      | 24          |      | 158     |      |     |  |  |
| 8"            | WAFER | 52       | 12         |       |    |       |       |       |      | 79.5  | 84.4  | 90.8  | 91    | 104   | 133 | 133   |     |       |     |      |      |       |      |        | 24   |             | 161  |         |      |     |  |  |
|               | LUG   | 80       | 12         |       |    |       |       |       |      | 107.5 | 112.4 | 118.8 | 119   | 132   | 161 | 161   |     |       |     |      |      |       |      |        | 24   |             | 189  |         |      |     |  |  |
| 10"           | WAFER | 88       | 14         |       |    |       |       |       |      |       |       | 122.4 | 128.8 | 129   | 142 | 171   | 171 | 191   | 244 |      |      |       |      |        |      |             |      |         |      |     |  |  |
|               | LUG   | 115      | 14         |       |    |       |       |       |      |       |       | 149.4 | 155.8 | 156   | 169 | 198   | 198 | 218   | 271 |      |      |       |      |        |      |             |      |         |      |     |  |  |
| 12"           | WAFER | 153      | 14         |       |    |       |       |       |      |       |       |       |       | 194   | 207 | 236   | 236 | 256   | 309 |      |      |       |      |        |      |             |      |         |      |     |  |  |
|               | LUG   | 199      | 14         |       |    |       |       |       |      |       |       |       |       | 240   | 253 | 282   | 282 | 302   | 355 |      |      |       |      |        |      |             |      |         |      |     |  |  |
| 14"           | WAFER | 285      | 16         |       |    |       |       |       |      |       |       |       |       |       |     | 328   | 341 | 370   | 370 | 390  | 443  | 463   | 631  |        |      |             |      |         |      |     |  |  |
|               | LUG   | 324      | 16         |       |    |       |       |       |      |       |       |       |       |       |     | 367   | 380 | 409   | 409 | 429  | 482  | 502   | 670  |        |      |             |      |         |      |     |  |  |
| 16"           | WAFER | 336      | 20         |       |    |       |       |       |      |       |       |       |       |       |     |       |     | 425   | 425 | 445  | 498  | 518   | 686  | 974    | 1128 | 1040        | 1458 |         |      |     |  |  |
|               | LUG   | 401      | 20         |       |    |       |       |       |      |       |       |       |       |       |     |       |     | 490   | 490 | 510  | 563  | 583   | 751  | 1039   | 1193 | 1105        | 1523 |         |      |     |  |  |
| 18"           | WAFER | 393      | 20         |       |    |       |       |       |      |       |       |       |       |       |     |       |     | 482   | 482 | 502  | 555  | 575   | 743  | 1031   | 1185 | 1097        | 1515 |         |      |     |  |  |
|               | LUG   | 517      | 20         |       |    |       |       |       |      |       |       |       |       |       |     |       |     | 606   | 606 | 626  | 679  | 699   | 867  | 1155   | 1309 | 1221        | 1639 |         |      |     |  |  |
| 20"           | WAFER | 510      | 20         |       |    |       |       |       |      |       |       |       |       |       |     |       |     |       |     | 619  | 672  | 692   | 860  | 1148   | 1302 | 1214        | 1632 |         |      |     |  |  |
|               | LUG   | 735      | 20         |       |    |       |       |       |      |       |       |       |       |       |     |       |     |       |     | 844  | 897  | 917   | 1085 | 1373   | 1527 | 1439        | 1857 |         |      |     |  |  |
| 24"           | WAFER | 733      | 25         |       |    |       |       |       |      |       |       |       |       |       |     |       |     |       |     | 847  | 900  | 920   | 1088 | 1376   | 1530 | 1442        | 1860 |         |      |     |  |  |
|               | LUG   | 1020     | 25         |       |    |       |       |       |      |       |       |       |       |       |     |       |     |       |     | 1134 | 1187 | 1207  | 1375 | 1663   | 1817 | 1729        | 2147 |         |      |     |  |  |
| 30"           | WAFER | 1745     | 25         |       |    |       |       |       |      |       |       |       |       |       |     |       |     |       |     |      |      |       |      | 1932   | 2100 | 2388        | 2542 | 2454    | 2872 |     |  |  |
|               | LUG   | 2145     | 25         |       |    |       |       |       |      |       |       |       |       |       |     |       |     |       |     |      |      |       |      | 2332   | 2500 | 2788        | 2942 | 2854    | 3272 |     |  |  |

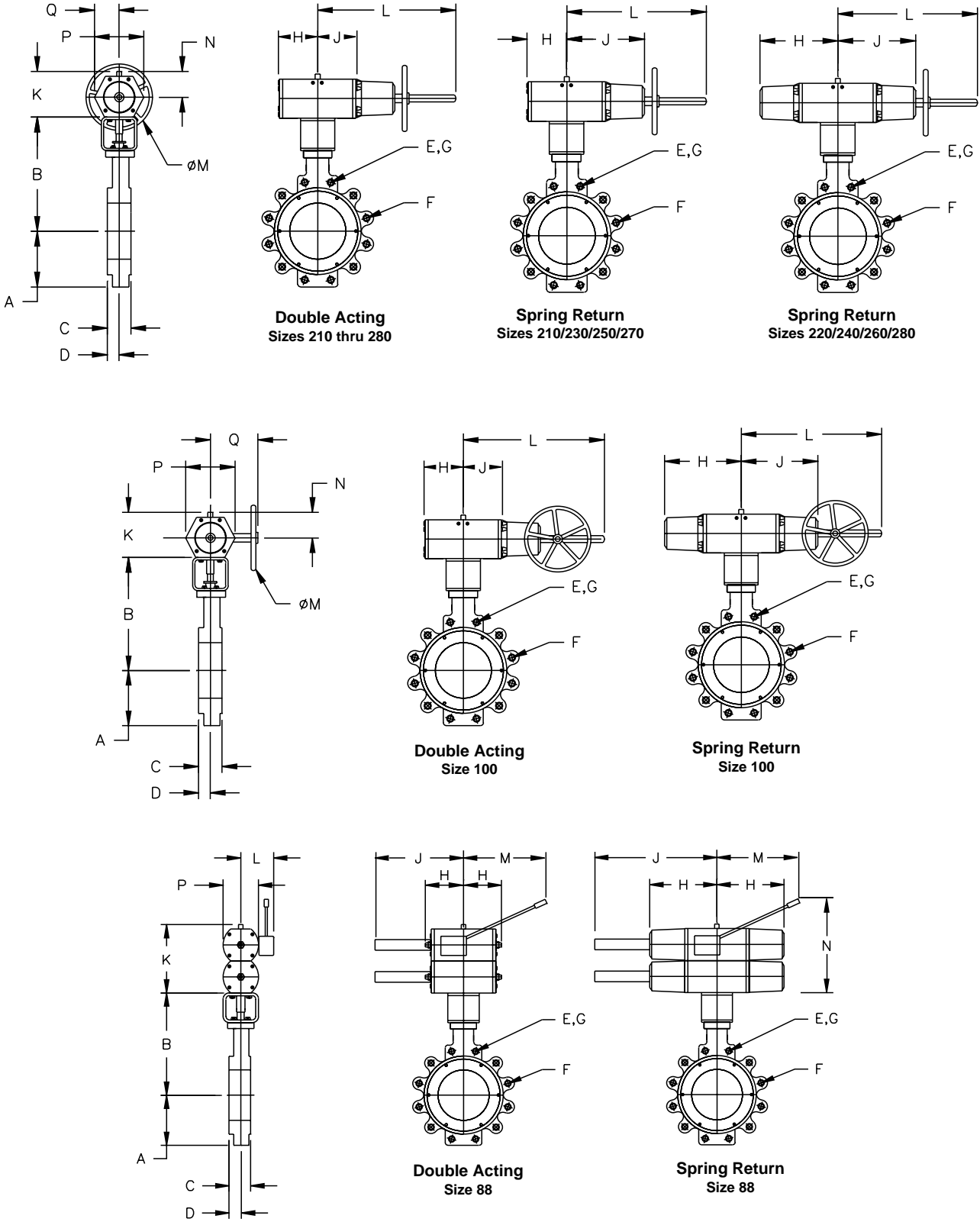
## 600 CLASS ASSEMBLIES

| ACTUATOR TYPE |       | VALVE WT | BRACKET WT | RC210 |    | RC220 |       | RC230 |       | RC240 |       | RC250 |       | RC260 |     | RC270 |      | RC280 |      | RC88 |      | RCI90 |      | RCG100 |      | 33 ACTUATOR |      |         |     |     |
|---------------|-------|----------|------------|-------|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-------|------|-------|------|------|------|-------|------|--------|------|-------------|------|---------|-----|-----|
| VALVE SIZE    | TYPE  |          |            | DA    | SR | DA    | SR    | DA    | SR    | DA    | SR    | DA    | SR    | DA    | SR  | DA    | SR   | DA    | SR   | DA   | SR   | DA    | SR   | DA     | SR   | DA          | SR   | YOKE WT | "B" | "C" |
|               |       |          |            | 3.1   | 4  | 4     | 5.85  | 8     | 10.4  | 10.6  | 15.5  | 20.4  | 26.8  | 27    | 40  | 69    | 69   | 89    | 142  | 162  | 330  | 618   | 772  | 684    | 1102 | 684         | 1102 | WT      | 32  | 85  |
| 2"            | WAFER | 11       | 12         | 26.1  | 27 | 27    | 28.85 | 31    | 33.4  | 33.6  | 38.5  |       |       |       |     |       |      |       |      |      |      |       |      |        |      |             | 24   | 67      | 120 |     |
|               | LUG   | 13       | 12         | 28.1  | 29 | 29    | 30.85 | 33    | 35.4  | 35.6  | 40.5  |       |       |       |     |       |      |       |      |      |      |       |      |        |      |             | 24   | 69      | 122 |     |
| 3"            | WAFER | 13       | 12         | 28.1  | 29 | 29    | 30.85 | 33    | 35.4  | 35.6  | 40.5  |       |       |       |     |       |      |       |      |      |      |       |      |        |      |             | 24   | 69      | 122 |     |
|               | LUG   | 18       | 12         | 33.1  | 34 | 34    | 35.85 | 38    | 40.4  | 40.6  | 45.5  |       |       |       |     |       |      |       |      |      |      |       |      |        |      |             | 24   | 74      | 127 |     |
| 4"            | WAFER | 30       | 12         |       |    | 46    | 47.85 | 50    | 52.4  | 52.6  | 57.5  |       |       |       |     |       |      |       |      |      |      |       |      |        |      |             | 24   | 86      | 139 |     |
|               | LUG   | 52       | 12         |       |    | 68    | 69.85 | 72    | 74.4  | 74.6  | 79.5  |       |       |       |     |       |      |       |      |      |      |       |      |        |      |             | 24   | 108     | 161 |     |
| 6"            | WAFER | 42       | 12         |       |    |       |       | 62    | 64.4  | 64.6  | 69.5  | 74.4  | 80.8  | 81    | 94  |       |      |       |      |      |      |       |      |        |      | 24          |      | 151     |     |     |
|               | LUG   | 85       | 12         |       |    |       |       | 105   | 107.4 | 107.6 | 112.5 | 117.4 | 123.8 | 124   | 137 |       |      |       |      |      |      |       |      |        |      | 24          |      | 194     |     |     |
| 8"            | WAFER | 72       | 12         |       |    |       |       |       |       | 99.5  | 104.4 | 110.8 | 111   | 124   | 153 | 153   |      |       |      |      |      |       |      |        | 24   |             | 181  |         |     |     |
|               | LUG   | 127      | 12         |       |    |       |       |       |       | 154.5 | 159.4 | 165.8 | 166   | 179   | 208 | 208   |      |       |      |      |      |       |      |        | 24   |             | 236  |         |     |     |
| 10"           | WAFER | 170      | 14         |       |    |       |       |       |       |       |       | 204.4 | 210.8 | 211   | 224 | 253   | 253  | 273   | 326  | 346  | 514  | 802   | 956  | 868    | 1286 |             |      |         |     |     |
|               | LUG   | 233      | 14         |       |    |       |       |       |       |       |       | 267.4 | 273.8 | 274   | 274 | 316   | 316  | 336   | 389  | 409  | 577  | 865   | 1019 | 931    | 1349 |             |      |         |     |     |
| 12"           | WAFER | 245      | 14         |       |    |       |       |       |       |       |       |       |       | 286   | 299 | 328   | 328  | 348   | 401  | 421  | 589  | 877   | 1031 | 943    | 1361 |             |      |         |     |     |
|               | LUG   | 379      | 14         |       |    |       |       |       |       |       |       |       |       | 420   | 433 | 462   | 462  | 482   | 535  | 555  | 723  | 1011  | 1165 | 1077   | 1495 |             |      |         |     |     |
| 16"           | WAFER | 1170     | 20         |       |    |       |       |       |       |       |       |       |       |       |     | 1255  | 1255 | 1275  | 1328 | 1348 | 1516 | 1804  | 1958 | 1870   | 2288 |             |      |         |     |     |
|               | LUG   | 1170     | 20         |       |    |       |       |       |       |       |       |       |       |       |     | 1255  | 1255 | 1275  | 1328 | 1348 | 1516 | 1804  | 1958 | 1870   | 2288 |             |      |         |     |     |

- NOTES: 1. The weights of actuators are without handwheel  
 2. The weights are in lbs.  
 3. DA = Double Acting / SR = Spring Return

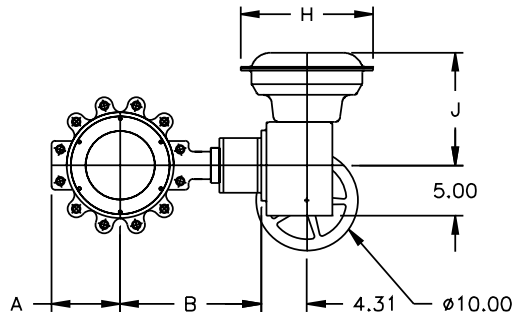
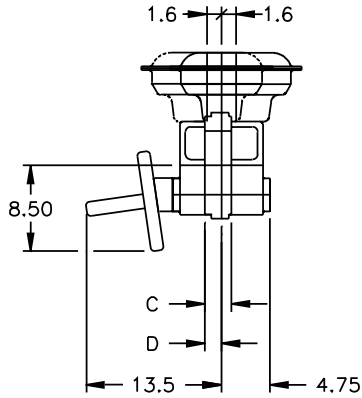


Model 34 (RC) Actuators - Dimensional Data



# Dimensions

## Model 33 Actuator - Dimensional Data



Note: ANSI Class 150/300;  
Sizes 3", 4", 6" & 8" available only.

MODEL 39003 BUTTERFLY VALVE TABLE

|                | VALVE | WAFER | LUG   | B     | C     | D    | THREAD  | # OF  | BOLT   |
|----------------|-------|-------|-------|-------|-------|------|---------|-------|--------|
|                | SIZE  | A*    | A**   |       |       |      | E       | HOLES | CIRCLE |
| ANSI CLASS 150 | 2"    | 3.00  | 3.00  | 10.25 | 1.75  | 1.06 | 5/8-11  | 4     | 4.75   |
|                | 3"    | 3.00  | 3.38  | 11.00 | 1.92  | 1.20 | 5/8-11  | 4     | 6.00   |
|                | 4"    | 3.50  | 4.13  | 11.75 | 2.13  | 1.26 | 5/8-11  | 8     | 7.50   |
|                | 6"    | 4.88  | 5.12  | 13.00 | 2.31  | 1.38 | 3/4-10  | 8     | 9.50   |
|                | 8"    | 5.88  | 6.01  | 14.13 | 2.50  | 1.49 | 3/4-10  | 8     | 11.75  |
|                | 10"   | 6.88  | 7.88  | 14.88 | 2.81  | 1.70 | 7/8-9   | 12    | 14.25  |
|                | 12"   | 9.50  | 9.50  | 16.63 | 3.23  | 1.86 | 7/8-9   | 12    | 17.00  |
|                | 14"   | 11.07 | 11.07 | 17.25 | 3.62  | 2.19 | 1-8     | 12    | 18.75  |
|                | 16"   | 12.05 | 12.05 | 22.69 | 4.00  | 2.31 | 1-8     | 16    | 21.25  |
|                | 18"   | 13.18 | 13.18 | 24.00 | 4.50  | 2.45 | 1 1/8-8 | 16    | 22.75  |
|                | 20"   | 13.94 | 13.94 | 25.13 | 5.00  | 2.94 | 1 1/8-8 | 20    | 25.00  |
|                | 24"   | 16.44 | 16.44 | 27.25 | 6.06  | 3.12 | 1 1/4-8 | 20    | 29.50  |
|                | 30"   | 22.73 | 22.73 | 34.62 | 6.75  | 3.53 | 1 1/4-8 | 28    | 36.00  |
|                | 36"   | 32.11 | 32.11 | 38.50 | 8.38  | 4.34 | 1 1/2-8 | 32    | 42.75  |
|                | 42"   | 35.62 | 35.62 | 44.00 | 9.25  | 5.03 | 1 1/2-8 | 36    | 49.50  |
|                | 48"   | 38.25 | 38.25 | 47.25 | 10.62 | 5.62 | 1 1/2-8 | 44    | 56.00  |
| ANSI CLASS 300 | 2"    | 3.00  | 3.00  | 10.25 | 1.75  | 1.06 | 5/8-11  | 8     | 5.00   |
|                | 3"    | 3.00  | 3.38  | 11.00 | 1.92  | 1.20 | 3/4-10  | 8     | 6.63   |
|                | 4"    | 3.50  | 4.12  | 11.75 | 2.13  | 1.25 | 3/4-10  | 8     | 7.88   |
|                | 6"    | 5.12  | 5.50  | 13.00 | 2.29  | 1.38 | 3/4-10  | 12    | 10.63  |
|                | 8"    | 5.88  | 7.28  | 14.14 | 2.88  | 1.54 | 7/8-9   | 12    | 13.00  |
|                | 10"   | 7.38  | 7.88  | 15.38 | 3.25  | 1.70 | 1-8     | 16    | 15.25  |
|                | 12"   | 10.50 | 10.50 | 21.00 | 3.62  | 1.86 | 1 1/8-8 | 16    | 17.75  |
|                | 14"   | 14.57 | 14.57 | 22.38 | 4.62  | 2.48 | 1 1/8-8 | 20    | 20.25  |
|                | 16"   | 16.32 | 16.32 | 24.00 | 5.25  | 2.59 | 1 1/4-8 | 20    | 22.50  |
|                | 18"   | 17.26 | 17.26 | 25.13 | 5.88  | 3.03 | 1 1/4-8 | 24    | 24.75  |
| ANSI CLASS 600 | 3"    | 3.00  | 3.00  | 11.00 | 2.12  | 1.20 | 3/4-10  | 8     | 6.63   |
|                | 4"    | 4.62  | 4.62  | 12.00 | 2.50  | 1.40 | 7/8-9   | 8     | 8.50   |
|                | 6"    | 5.56  | 6.75  | 13.62 | 3.06  | 1.68 | 1-8     | 12    | 11.50  |
|                | 8"    | 7.38  | 8.03  | 15.13 | 4.00  | 1.85 | 1 1/8-8 | 12    | 13.75  |
|                | 10"   | 13.25 | 13.25 | 19.00 | 4.62  | 2.00 | 1 1/4-8 | 16    | 17.00  |
|                | 12"   | 14.67 | 14.67 | 22.63 | 5.50  | 2.53 | 1 1/4-8 | 20    | 19.25  |
|                | 16"   | -     | 18.87 | 30.00 | 7.00  | 3.50 | 1 1/2-8 | 20    | 23.75  |

\* - Dimensions apply to wafer valves only  
\*\* - Dimensions apply to lugged valves only

MODEL 34 (RC) ACTUATOR TABLE

|               | SIZE  | H    | J    | K    | L    | M    | N    | P   | Q   |
|---------------|-------|------|------|------|------|------|------|-----|-----|
| SPRING RETURN | RC210 | 1.8  | 5.7  | 3.7  | 11.4 | 7.1  | 2.3  | 2.9 | 1.3 |
|               | RC220 | 5.7  | 5.7  | 3.7  | 11.4 | 7.1  | 2.3  | 2.9 | 1.3 |
|               | RC230 | 2.6  | 7.7  | 5.0  | 13.4 | 7.9  | 2.9  | 4.1 | 1.9 |
|               | RC240 | 7.7  | 7.7  | 5.0  | 13.4 | 7.9  | 2.9  | 4.1 | 1.9 |
|               | RC250 | 3.5  | 11.2 | 6.9  | 19.7 | 12.6 | 3.8  | 5.7 | 2.7 |
|               | RC260 | 11.2 | 11.2 | 6.9  | 19.7 | 12.6 | 3.8  | 5.7 | 2.7 |
|               | RC270 | 5.7  | 20.1 | 10.9 | 31.5 | 15.7 | 6.1  | 8.7 | 4.3 |
|               | RC280 | 20.5 | 20.5 | 10.9 | 31.5 | 23.6 | 6.1  | 8.7 | 4.3 |
|               | RC88  | 20.5 | 37.9 | 19.5 | 9.1  | 19.5 | 39.8 | 8.7 | 4.3 |
| RC100         | 33.5  | 33.5 | 19.0 | 56.0 | 31.5 | 10.7 | 13.8 | 6.9 |     |
| DOUBLE ACTING | RC210 | 1.8  | 3.9  | 3.7  | 11.4 | 7.1  | 2.3  | 2.9 | 1.3 |
|               | RC220 | 3.9  | 3.9  | 3.7  | 11.4 | 7.1  | 2.3  | 2.9 | 1.3 |
|               | RC230 | 2.6  | 5.3  | 5.0  | 13.4 | 7.9  | 2.9  | 4.1 | 1.9 |
|               | RC240 | 5.3  | 5.3  | 5.0  | 13.4 | 7.9  | 2.9  | 4.1 | 1.9 |
|               | RC250 | 3.5  | 7.5  | 6.9  | 19.7 | 12.6 | 3.8  | 5.7 | 2.7 |
|               | RC260 | 7.5  | 7.5  | 6.9  | 19.7 | 12.6 | 3.8  | 5.7 | 2.7 |
|               | RC270 | 5.7  | 11.6 | 10.9 | 31.5 | 15.7 | 6.1  | 8.7 | 4.3 |
|               | RC280 | 12.2 | 12.2 | 10.9 | 31.5 | 23.6 | 6.1  | 8.7 | 4.3 |
|               | RC88  | 12.2 | 29.6 | 19.5 | 9.1  | 19.5 | 39.8 | 8.7 | 4.3 |
| RC100         | 20.5  | 20.5 | 19.0 | 56.0 | 31.5 | 10.7 | 13.8 | 6.9 |     |

MODEL 33 ACTUATOR TABLE

|        | SIZE | H     | J     | K | L | M | N | P | Q |
|--------|------|-------|-------|---|---|---|---|---|---|
| CL 150 | 3"   | 13.00 | 11.50 | - | - | - | - | - | - |
|        | 4"   | 13.00 | 11.50 | - | - | - | - | - | - |
|        | 6"   | 17.50 | 15.20 | - | - | - | - | - | - |
|        | 8"   | 17.50 | 15.20 | - | - | - | - | - | - |
| CL 300 | 3"   | 13.00 | 11.50 | - | - | - | - | - | - |
|        | 4"   | 13.00 | 11.50 | - | - | - | - | - | - |
|        | 6"   | 17.50 | 15.20 | - | - | - | - | - | - |
|        | 8"   | 17.50 | 15.20 | - | - | - | - | - | - |

## Options and Accessories

4700P Series Pneumatic Positioner  
 Instrument signals 0.2-1 and 0.4-2 bar  
 3-15 and 6-30 psig  
 (See Specification Data CS2007)

4700E Series Electropneumatic Positioners  
 (See Specification Data CS2007)  
 Input range 4-20 mA  
 Split range

Double Acting Positioners  
 Moore 750P/760P Pneumatic Positioner  
 Instrument signals 0.2-1 and 0.4-2 bar  
 3-15 and 6-30 psig  
 Moore 750E/760E Electropneumatic Positioner  
 Input range 4-20 mA

7000 Electropneumatic (I/P) Transducer  
 Input range 4-20 mA  
 Split range  
 Output 0.2-1 bar, adjustable  
 0.4-2 bar, adjustable  
 3-15 psi, adjustable  
 6-30 psi, adjustable  
 (See TS-Model 7000)

Smart Valve Interface (SVI®)  
 Digital Positioner and Process Controller  
 Input range 4-20 mA  
 Split range  
 HART Communication  
 (See Manual EW2000)

ValVue Software  
 Calibration, Configuration, Diagnostic, and  
 Operator Interface Tool  
 (See Manual EW1000)

2700 Controllers  
 (See Specification Data CW6000)

80-4 or 80-40 Airset  
 (See Specification Data CY7800)  
 77-6 or 77-60 Lockup Valve  
 2" Gauge 0-2 bar

496 Rotary Electric Switches  
 (See Specification Data CS7000 E)  
 496-1 (1-Switch SPDT)  
 496-2 (2-Switches SPDT)  
 496-3 (Potentiometer Position Transmitter)  
 496-6 (1-Switch DPDT)  
 496-7 (2-Switches DPDT)  
 496-8 Opto-Electronic Position Transmitter  
 (See Specification Data CS7050 E)

Other Limit Switches

Solenoid Valves

### Options

|                             |
|-----------------------------|
| Limit Stops                 |
| NACE Compliance             |
| Other Materials             |
| Non-Destructive Examination |
| Oxygen Cleaning             |
| Electric Actuators          |

**Consult Dresser for additional Options and Accessories.**

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