

# Series 2000 Control Valves Globe-Single Seated, Top Guide

*promotes more tightness and heavy duty control*



*Series 2000 Single Seated Globe Valve with Model 880 Actuator and Masonellan Smart*

**J Flow Controls**

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## Ordering Schematic

|                     |                         |               |                              |               |                           |
|---------------------|-------------------------|---------------|------------------------------|---------------|---------------------------|
| 880                 | 2                       | 0             | 0                            | 0             |                           |
| Actuator Type       | Body Type               | Trim Type     | Characteristic               | Plug Type     |                           |
| Spring Diaphragm    |                         | 0   Undefined |                              | 0   Undefined |                           |
| 870                 | 2   Globe Single Seated | 1             | 1   Quick Change             | 1             | 1   Contoured             |
|                     |                         | 2             | 2   Threaded                 | 2             | 2   Tendril               |
|                     |                         | 3             | 3   Soft Seat (Threaded)     | 3             | 3   Multi-groove Cascade) |
| 880                 |                         | 4             | 4   Soft Seat (Quick Change) | 4             | 4   Micro                 |
|                     |                         |               |                              |               |                           |
| Air to Close        |                         |               |                              |               |                           |
| Multi-Spring Type   |                         |               |                              |               |                           |
| Air to Open         |                         |               |                              |               |                           |
| Cylinder            |                         |               |                              |               |                           |
| 670                 |                         |               |                              |               |                           |
| Spring Cylinder     |                         |               |                              |               |                           |
| 680                 |                         |               |                              |               |                           |
| Springless Cylinder |                         |               |                              |               |                           |

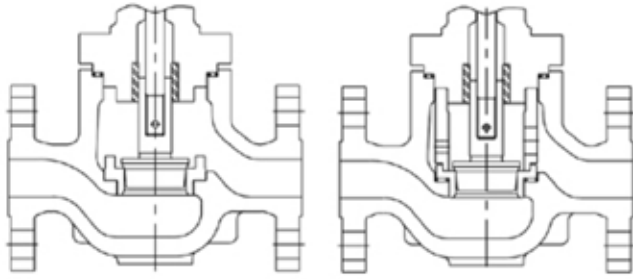
## Manufacturing Range

| Description   | Manufacturing Range   | Remark |
|---------------|---|--------|
| Body Size     | 3/4" – 10"  |        |
| Ratings       | ANSI Class 150 – 2500   |        |
| Connections   | Flanged, Butt-Weld, Socket-Weld                                   |        |
| Body Material | A216 Gr-WCB, A351 Gr-CF8, CF8M, Alloy Steel Available             |        |
| Trim Material | 304, 316, 420, 630SST, 17-4PH, Hard Facing, Alloy Steel Available |        |

## General Specifications

- Flow Direction: Flow to Open or Flow to Close
- Max. Fluid Temperature: 1049°F
- Minimum Fluid Temperature: -320°F
- Seat Leakages: ANSI B16.104 Class IV
  - Option 1: ANSI B16.104 Class V for Metal Seat Tight Shutoff
  - Option 2: ANSI B16.104 Class VI for Teflon Soft Seat & Seal (-22°F ~ 446°F)
- Body: Globe Single Seated Top Guide
- Bonnet Type: Stud Bolted
  - Standard Type: -0.4°F ~ 536°F
  - Extension Type: 538°F ~ 1049°F & under -0.4°F
- Flow Characteristics: Linear, Equal Percentage, Modified % & Semi-Throttle
- Cv Ratio: 50:1
- Diaphragm actuators enclosed, heavy duty cylinders (spring-cylinder and double-cylinder) available
- Applicable for various instruments (positioner, SOV, Limit switch)

## Trim Design Applications – 1



**Threaded Trim**

**Quick Change Trim**

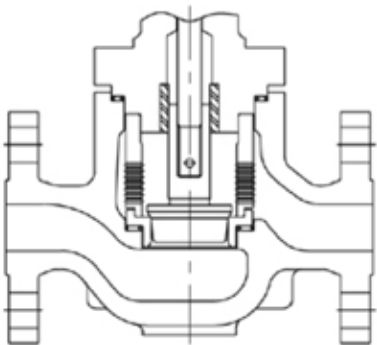
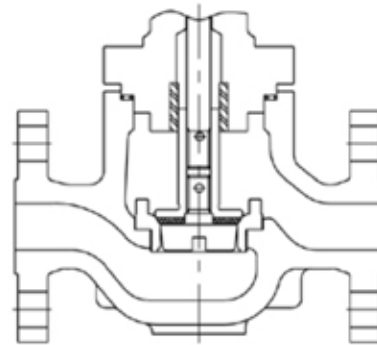
### **Contoured Trim (Thread & Quick Change Trim)**

The contoured plug is design with a specially represented valve plug head. The plug head represent defines the flow characteristic through the valve, and offers a smooth profile to the flow leading to a high pressure recovery. The trim is most suited to low pressure drop application and is used in the majority of control applications.

### **Contoured Soft Seat Trim**

An alternative of the standard contoured plug is the soft seated option.

The plug head is manufactured with a clamped on shroud which locks the soft seated ring in position. When the soft face contacts the seating point it deforms the softer ring ensuring a high degree of closure. The soft faced plug is used on applications where bubble tight shut off is required.



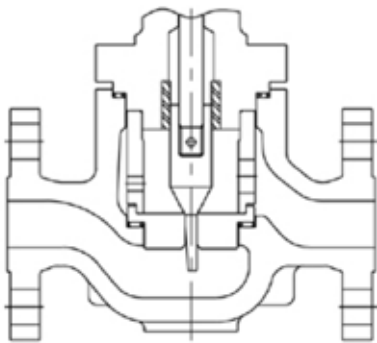
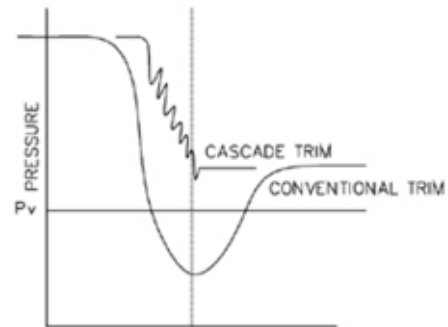
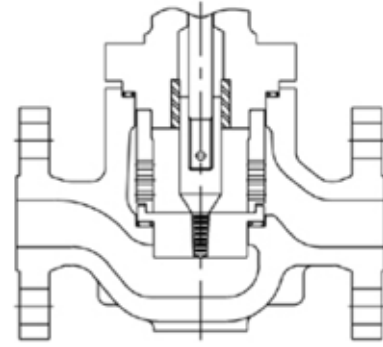
### **Tendril (Multi-hole, Multi-stage) Trim**

The trim design presented is a multi-stage, multi-hole trim. There are 1 ~ 5 Stage designs available depending on pressure drop and potential for cavitation. The fluid passes through the flow path generated by incorporating angled flats onto the surface of the plug, together with a cut out on the internal diameter of the seat. The pressure drop is apportioned across the stages of letdown so that the pressure drop progressively reduces as it passes through the stages of the trim. This gives excellent resistance to cavitation on high pressure drop applications. For very high pressure drop applications the plug and seat insert would be manufactured from tungsten carbide or glass metallic optionally.

## Trim Design Applications – 2

### Multi-Grooved (Cascade) Trim

Cascade trim for non-compressible fluid applications is designed for any number of grooves of required pressure drop to meet the specifications for preventing cavitation from occurring and eventual erosion. There are 8~9 groove designs available depending on pressure drop and potential for cavitation. The fluid passes through the flow path generated by incorporating angled flats onto the surface of the plug, together with a cut out on the internal surface of the seat. The pressure drop is apportioned across the stages of letdown so that the pressure drop progressively reduces as it passes through the grooves of the trim. This gives excellent resistance to cavitation on high pressure drop applications. For very high pressure drop applications the plug and seat insert would be manufactured from tungsten carbide or advanced glass metallic optionally.



### Micro Trim

The micro trim designs a seat guided construction, capable of handling high pressure drops, without instability problems. This trim design has an inherent flow characteristic of Linear or Modified Equal Percentage, and has excellent rangeability. It is an ideal selection for the control of very low flow rates.

For very high pressure drop applications, or flows which would have potential cavitation, there are multi-stage options of this design (5 stages maximum), and there are also applicable tungsten carbide and advanced glass metallic options for pressure drops greater than 1450 psi.



## Body Materials: Carbon Steel or Alloy Steel

| Part No. | Description        | Material   |
|----------|--------------------|--|
| 1        | Body               | ASTM A216 Gr-WCB / Alloy Steel Available                 |
| 2        | Bonnet             | ASTM A216 Gr-WCB / Alloy Steel Available                 |
| 3        | Plug Stem          | 316 Stainless Steel                                      |
| 4        | Packing Stud       | 316 / 304 Stainless Steel                                |
| 5        | Packing Nut        | 316 / 304 Stainless Steel                                |
| 6        | Packing Flange     | 316 / 304 Stainless Steel                                |
| 7        | Gland              | 316 / 304 Stainless Steel                                |
| 8        | Packing            | PTFE Carbon Fiber / Graphite / Grafoil + Graphite        |
| 9        | Packing Spacer     | 316 / 304 Stainless Steel                                |
| 9A       | Lantern Ring       | 316 / 304 Stainless Steel                                |
| 10       | Body Stud          | A193 B7  |
| 11       | Body Nut           | A194 2H  |
| 12       | Body Gasket        | 316 SST with Grafoil Filler                              |
| 13       | Guide Bushing      | Solid Stellite / 440B Stainless Steel                    |
| 14       | Seat Ring Retainer | 316 / 304 Stainless Steel                                |
| 15       | Seat Ring          | 304 & 316SST, 316L and Alloy Steel / Soft Seat Available |
| 16       | Seat Ring Gasket   | 316 SST with Grafoil Filler                              |
| 17       | Plug               | 304 & 316SST, 316L and Alloy Steel / Soft Seat Available |
| 18       | Plug Stem Pin      | 316 Stainless Steel                                      |
| 19       | Drive Nut          | 316 / 304 Stainless Steel                                |

## Body Materials: Stainless Steel

| Part No. | Description        | Material   |
|----------|--------------------|--|
| 1        | Body               | ASTM A351 Gr-CF8 / A351 Gr-CF8M                          |
| 2        | Bonnet             | ASTM A351 Gr-CF8 / A351 Gr-CF8M                          |
| 3        | Plug Stem          | 316 Stainless Steel                                      |
| 4        | Packing Stud       | 316 / 304 Stainless Steel                                |
| 5        | Packing Nut        | 316 / 304 Stainless Steel                                |
| 6        | Packing Flange     | 316 / 304 Stainless Steel                                |
| 7        | Gland              | 316 / 304 Stainless Steel                                |
| 8        | Packing            | PTFE Carbon Fiber / Graphite / Grafoil + Graphite        |
| 9        | Packing Spacer     | 316 / 304 Stainless Steel                                |
| 9A       | Lantern Ring       | 316 / 304 Stainless Steel                                |
| 10       | Body Stud          | A193 B7  |
| 11       | Body Nut           | A194 2H  |
| 12       | Body Gasket        | 316 SST with Grafoil Filler                              |
| 13       | Guide Bushing      | Solid Stellite / 440B Stainless Steel                    |
| 14       | Seat Ring Retainer | 316 / 304 Stainless Steel                                |
| 15       | Seat Ring          | 304 & 316SST, 316L and Alloy Steel / Soft Seat Available |
| 16       | Seat Ring Gasket   | 316 SST with Grafoil Filler                              |
| 17       | Plug               | 304 & 316SST, 316L and Alloy Steel / Soft Seat Available |
| 18       | Plug Stem Pin      | 316 Stainless Steel                                      |
| 19       | Drive Nut          | 316 / 304 Stainless Steel                                |

## Flow Coefficients – Rated Cv

| Valve Size | Travel | Nominal Trim Size (Inch) |     |     |    |       |       |    |       |     |     |     |     |   |          |
|------------|--------|--------------------------|-----|-----|----|-------|-------|----|-------|-----|-----|-----|-----|---|----------|
|            |        | 1/4                      | 3/8 | 1/2 | 1  | 1-1/4 | 1-1/2 | 2  | 2-1/2 | 3   | 4   | 5   | 6   | 8 | 10       |
| 1/2"       | 0.79   | 1.9                      | 4.0 | 7.0 |    |       |       |    |       |     |     |     |     |   |          |
| 3/4"       | 0.79   | 1.9                      | 4.0 | 7.0 | 14 |       |       |    |       |     |     |     |     |   |          |
| 1"         | 0.79   | 1.9                      | 4.0 | 7.0 | 14 |       |       |    |       |     |     |     |     |   |          |
| 1-1/2"     | 0.79   | 1.9                      | 4.0 | 7.0 | 15 | 20    | 28    |    |       |     |     |     |     |   |          |
| 2"         | 1.18   | 1.9                      | 4.0 | 7.0 | 17 | 21    | 28    | 52 |       |     |     |     |     |   |          |
| 3"         | 1.57   |                          |     |     |    | 22    | 34    | 53 | 76    | 118 |     |     |     |   |          |
| 4"         | 1.57   |                          |     |     |    |       | 35    | 55 | 78    | 122 | 205 |     |     |   |          |
| 6"         | 1.97   |                          |     |     |    |       |       | 58 | 85    | 134 | 216 | 315 | 420 |   |          |
| 8"         | 1.97   |                          |     |     |    |       |       |    |       | 140 | 230 | 330 | 435 |   |          |
|            | 2.76   |                          |     |     |    |       |       |    |       |     |     |     |     |   | 695      |
| 10"        | 1.97   |                          |     |     |    |       |       |    |       |     | 233 | 345 | 454 |   |          |
|            | 2.76   |                          |     |     |    |       |       |    |       |     |     |     |     |   | 715 1220 |

## Tendril Trim (Multi-Hole, 1-Stage)

| Valve Size | Travel | Nominal Trim Size (Inch) |       |    |       |    |     |     |     |   |    |  |     |  |     |
|------------|--------|--------------------------|-------|----|-------|----|-----|-----|-----|---|----|--|-----|--|-----|
|            |        | 1/4                      | 1-1/2 | 2  | 2-1/2 | 3  | 4   | 5   | 6   | 8 | 10 |  |     |  |     |
| 3/4", 1"   | 0.79   | 9                        |       |    |       |    |     |     |     |   |    |  |     |  |     |
| 1-1/2"     | 0.79   | 9                        | 16    |    |       |    |     |     |     |   |    |  |     |  |     |
| 2"         | 1.18   |                          | 19    | 22 |       |    |     |     |     |   |    |  |     |  |     |
| 3"         | 1.57   |                          |       | 28 | 32    | 76 |     |     |     |   |    |  |     |  |     |
| 4"         | 1.57   |                          |       |    |       | 76 | 105 |     |     |   |    |  |     |  |     |
| 6"         | 1.97   |                          |       |    |       |    |     | 160 | 210 |   |    |  |     |  |     |
| 8"         | 2.76   |                          |       |    |       |    |     |     |     |   |    |  | 340 |  |     |
| 10"        | 2.76   |                          |       |    |       |    |     |     |     |   |    |  |     |  | 540 |

This trim is applicable to Quick Change, Linear Flow Characteristics

## Multi-Groove Trim (Cascade)

| Valve Size | Travel | Nominal Trim No. |     |      |     |     |      |      |
|------------|--------|------------------|-----|------|-----|-----|------|------|
|            |        | A                | B   | C    | D   | E   | F    | G    |
| 3/4", 1"   |        |                  |     |      |     |     |      |      |
| 1-1/2"     | 1.18   | 0.4              | 0.8 | 1.25 | 3.0 | 6.0 | 10.0 | 16.0 |
| 2", 3"     |        |                  |     |      |     |     |      |      |

This trim is applicable only Quick Change, Linear Flow Characteristics

## Micro Trim (Mini Flow Trim)

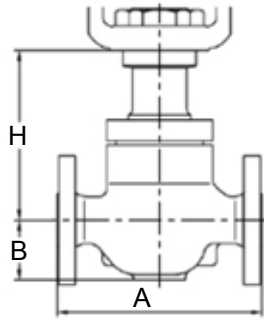
| Valve Size | Travel | Nominal Trim No. |       |       |       |      |     |     |     |
|------------|--------|------------------|-------|-------|-------|------|-----|-----|-----|
|            |        | 1                | 2     | 3     | 4     | 5    | 6   | 7   | 8   |
| 3/4", 1"   |        |                  |       |       |       |      |     |     |     |
| 1-1/2"     | 1.18   | 0.001            | 0.004 | 0.008 | 0.025 | 0.11 | 0.3 | 0.6 | 1.0 |
| 2"         |        |                  |       |       |       |      |     |     |     |

This trim is applicable only Quick Change, Linear and/or Modified % Flow Characteristics

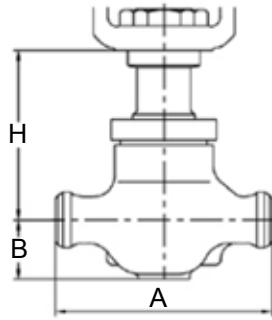
\*\* The Cv value shown in our catalog are for reference only

J Flow Controls, LLC can design and modify the seat design to meet different customer requirements

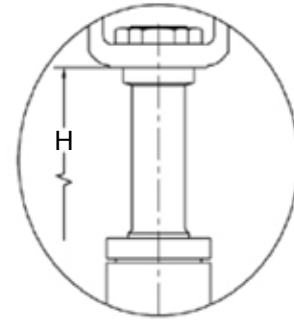
## Dimensions



Flanged



Threaded Socket Weld / Butt Weld



Extension Bonnet

### ANSI Class 150 ~ 600

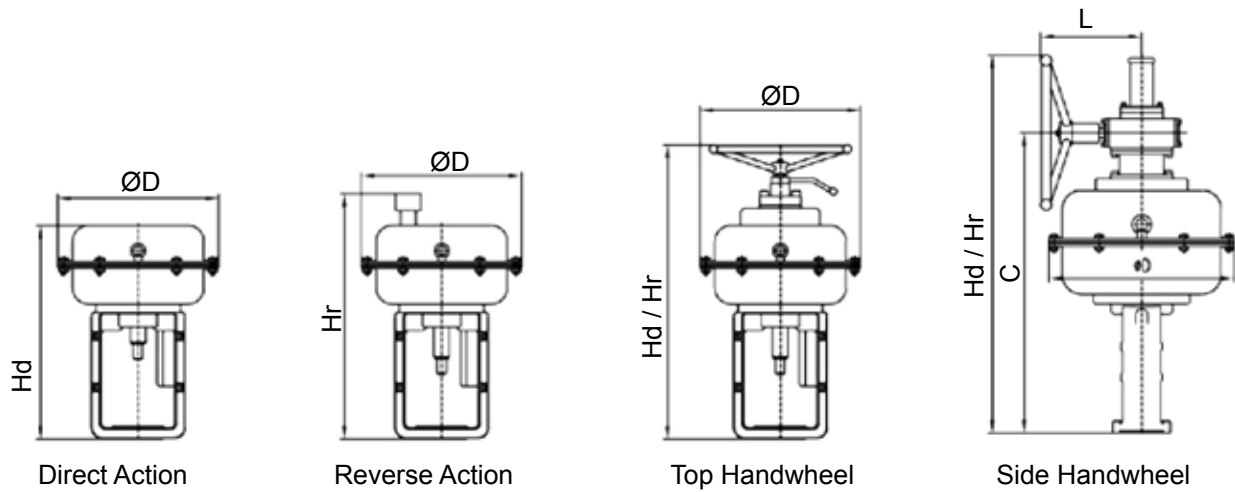
| Valve Size | A                  |                |      |                |      |                |      | B                  |                | H                  |             |                |             |
|------------|--------------------|----------------|------|----------------|------|----------------|------|--------------------|----------------|--------------------|-------------|----------------|-------------|
|            | ANSI Class 150~600 | ANSI Class 150 |      | ANSI Class 300 |      | ANSI Class 600 |      | ANSI Class 150~300 | ANSI Class 600 | ANSI Class 150~300 |             | ANSI Class 600 |             |
|            | Thd, SW, BW        | RF             | RTJ  | RF             | RTJ  | RF             | RTJ  |                    |                | Std. Bonnet        | Ext. Bonnet | Std. Bonnet    | Ext. Bonnet |
| 1/2"       | 8.3                | 7.2            | -    | 7.5            | 8.0  | 8.0            | 8.0  | 2.6                | 2.6            | 6.3                | 11.6        | 6.3            | 11.6        |
| 3/4"       | 8.3                | 7.2            | -    | 7.6            | 8.1  | 8.1            | 8.1  | 2.6                | 2.6            | 6.3                | 11.6        | 6.3            | 11.6        |
| 1"         | 8.3                | 7.2            | 7.8  | 7.8            | 8.3  | 8.3            | 8.3  | 2.6                | 2.6            | 6.3                | 11.6        | 6.3            | 11.6        |
| 1-1/2"     | 9.9                | 8.7            | 9.3  | 9.3            | 9.8  | 9.9            | 9.9  | 3.1                | 3.1            | 6.3                | 11.6        | 6.3            | 11.6        |
| 2"         | 11.3               | 10.0           | 10.5 | 10.5           | 11.1 | 11.3           | 11.4 | 3.5                | 3.5            | 6.3                | 11.6        | 6.3            | 11.6        |
| 3"         | 13.3               | 11.7           | 12.2 | 12.5           | 13.1 | 13.3           | 13.4 | 4.6                | 4.6            | 8.3                | 13.0        | 9.4            | 13.4        |
| 4"         | 15.5               | 13.9           | 14.4 | 14.5           | 15.1 | 15.5           | 15.6 | 5.5                | 5.5            | 8.3                | 13.0        | 10.8           | 14.8        |
| 6"         | 20.0               | 17.8           | 18.3 | 18.6           | 19.3 | 20.0           | 20.1 | 7.4                | 7.4            | 11.4               | 16.9        | 12.8           | 17.7        |
| 8"         | 24.0               | 21.4           | 21.9 | 22.4           | 23.0 | 24.0           | 24.1 | 8.7                | 8.7            | 16.9               | 23.0        | 16.9           | 23.0        |
| 10"        | 29.6               | 26.5           | 27.0 | 27.9           | 28.5 | 29.6           | 29.7 | 10.7               | 10.7           | 18.5               | 25.0        | 18.9           | 25.4        |

### ANSI Class 900 ~ 2500

| Valve Size | A                   |                 |                |      |                 |      | B               |     |                 | H                   |             |                 |             |
|------------|---------------------|-----------------|----------------|------|-----------------|------|-----------------|-----|-----------------|---------------------|-------------|-----------------|-------------|
|            | ANSI Class 900~1500 | ANSI Class 2500 | ANSI Class 900 |      | ANSI Class 1500 |      | ANSI Class 2500 |     | ANSI Class 2500 | ANSI Class 900~1500 |             | ANSI Class 2500 |             |
|            | SW, BW              | SW, BW          | RF             | RTJ  | RF              | RTJ  | RF              | RTJ |                 | Std. Bonnet         | Ext. Bonnet | Std. Bonnet     | Ext. Bonnet |
| 3/4"       | 9.8                 | 11.5            | 9.5            | 9.5  | 9.5             | 9.5  | 11.3            | 2.6 | 2.9             | 7.9                 | 12.0        | 9.4             | 13.4        |
| 1"         | 11.5                | 12.5            | 11.5           | 11.5 | 11.5            | 11.5 | 12.5            | 2.9 | 2.9             | 7.3                 | 11.8        | 7.3             | 11.8        |
| 1-1/2"     | 13.1                | 14.1            | 13.1           | 13.1 | 13.1            | 13.1 | 14.3            | 2.9 | 2.9             | 7.3                 | 11.8        | 7.3             | 11.8        |
| 2"         | 12.2                | 15.5            | 12.2           | 12.4 | 12.2            | 12.4 | 15.6            | 3.8 | 4.4             | 9.3                 | 13.2        | 11.6            | 15.7        |
| 3"         | 16.0                | 20.7            | 15.2           | 15.4 | 16.0            | 16.1 | 21.0            | 4.9 | 5.5             | 11.6                | 15.7        | 14.4            | 18.5        |
| 4"         | 19.0                | 25.0            | 18.3           | 18.4 | 19.0            | 19.1 | 25.4            | 6.1 | 6.5             | 14.0                | 18.3        | 17.5            | 22.0        |
| 6"         | 24.0                | 30.0            | 21.9           | 22.0 | 24.0            | 24.3 | 30.5            | 8.1 | 8.6             | 17.1                | 22.8        | 20.7            | 26.6        |

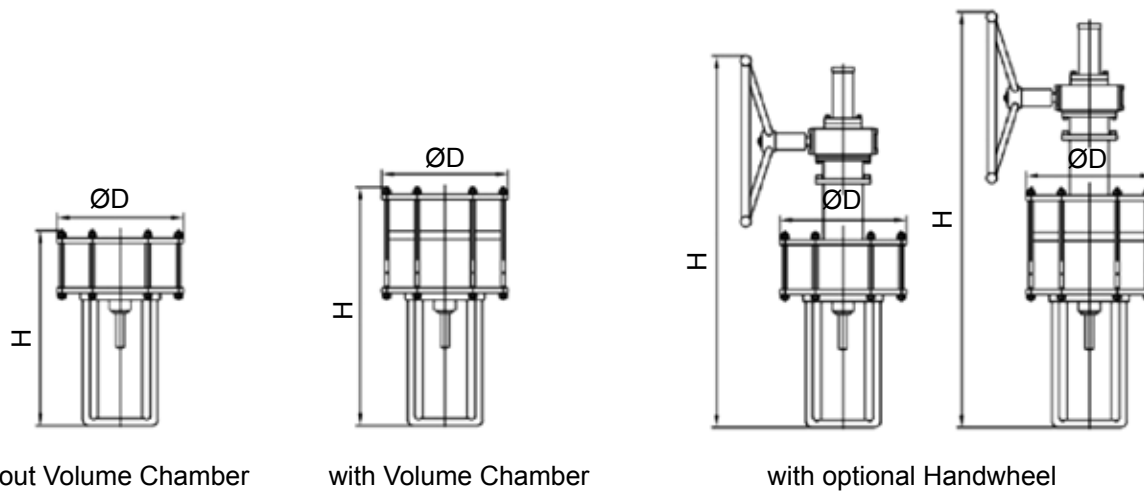
# Actuator and Handwheels

## Model 870 / 880 Diaphragm Actuators



| Actuator Size | D    | Without Handwheel |       | With Handwheel |       |       |      |      |
|---------------|------|-------------------|-------|----------------|-------|-------|------|------|
|               |      | DA Hd             | RA Hr | Handwheel Type | DA Hd | RA Hr | C    | L    |
| #25           | 9.8  | 13.1              | 13.9  | Top            | 17.7  | 18.6  | -    | -    |
| #29           | 11.4 | 14.5              | 16.5  | Top            | 21.0  | 22.4  | -    | -    |
| #37           | 14.6 | 16.1              | 18.1  | Top            | 22.6  | 24.4  | -    | -    |
| #48           | 18.9 | 24.8              | 26.7  | Side           | 38.5  | 38.5  | 30.7 | 10.2 |
| #55           | 21.7 | 26.7              | 28.7  | Side           | 43.2  | 43.2  | 33.4 | 11.8 |
| #55H          | 21.7 | 28.7              | 30.6  | Side           | 45.2  | 45.2  | 33.4 | 11.8 |

## Model 670 / 680 Cylinder Actuators



## Weight

### Body Sub-Assembly

| Valve Size | ANSI Class |      |     |      |      |                 |                  |              |
|------------|------------|------|-----|------|------|-----------------|------------------|--------------|
|            | 150~300    | 600  | 900 | 1500 | 2500 | 150~600 Welding | 900~1500 Welding | 2500 Welding |
| 3/4"~1"    | 44         | 44   | 97  | 97   | 97   | 40              | 88               | 88           |
| 1-1/2"     | 60         | 60   | 60  | 128  | 128  | 55              | 117              | 117          |
| 2"         | 71         | 71   | 154 | 154  | 265  | 66              | 139              | 254          |
| 3"         | 137        | 137  | 287 | 287  | 551  | 128             | 242              | 529          |
| 4"         | 196        | 196  | 456 | 456  | 928  | 207             | 461              | 906          |
| 6"         | 362        | 463  | 875 | 1047 | 1873 | 445             | 853              | 1025         |
| 8"         | 712        | 915  | -   | -    | -    | 893             | -                | -            |
| 10"        | 1084       | 1367 | -   | -    | -    | 1058            | -                | -            |

### Actuator

| Actuator Size | Standard | With Handwheel |      |
|---------------|----------|----------------|------|
|               |          | Top            | Side |
| #25           | 22       | 29             | 33   |
| #29           | 42       | 55             | 60   |
| #37           | 82       | 101            | 108  |
| #48           | 203      | 238            | 247  |
| #55           | 256      | 309            | 320  |
| #55H          | 265      | 318            | 331  |

### Accessories

- Positioners
  - Smart, E/P, P/P Positioners for Single / Double Acting
- Instrument Valves
  - Transfer (Trip) Valves, Volume Booster Relay
  - Air Regulators (Air Set), Speed Control Valves
- Limit Switches
- Solenoid Valves