

#### APPLICATIONS:

For discharge of liquid or gas from vessels, separators, treaters, knockouts and other similar liquid accumulators.

For back pressure or pressure reducing applications with pressure pilots.

#### FEATURES:

- Compact design
- O-Ring sealed seat
- Valve travel indicator
- Field-reversible topworks
- Teflon-packed stuffing box

#### CERTIFICATIONS:

Canadian Registration Number (CRN):  
0C15021.24567890NTY





Kimray is an ISO 9001- certified manufacturer.

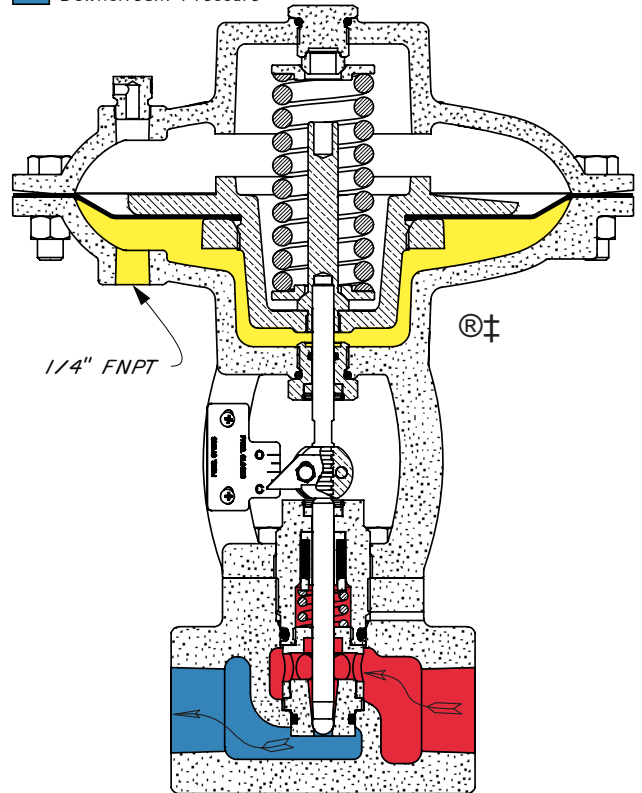
#### INNER VALVE SPECIFICATIONS:

The 1" HPCV standard valve plugs consist of a carbide ball rigidly connected to a 303 stainless steel stem. Standard seats are made of heat-treated tool steel.

The 2" HPCV standard valve plugs for 1/2" and smaller consist of a carbide ball rigidly connected to a 303 stainless steel stem. Standard valve plugs for 3/4" and 1" consist of a hardened high chrome alloy ball rigidly connected to a 303 stainless steel stem. Standard seats are made of heat-treated tool steel.

Inner valves can be made from a wide selection of materials. Specify when ordering.

-  Control Valve Diaphragm Assembly
-  Control Valve Diaphragm Pressure
-  Upstream Pressure
-  Downstream Pressure



| Order Code †      | Line Size    | Stem Travel | Inner Valve | Linear |      | Quick Open |      | Equal Percent |      |
|-------------------|--------------|-------------|-------------|--------|------|------------|------|---------------|------|
|                   |              |             |             | Cv     | Cf   | Cv         | Cf   | Cv            | Cf   |
| See page 01:300.1 | 1"           | 1/2"        | 1/8"        | 1.10   | 0.58 | 0.40       | 0.73 | 0.34          | 0.73 |
|                   |              |             | 3/16"       | 1.50   | 0.59 | 0.92       | 0.74 | ----          | ---- |
|                   |              |             | 1/4"        | 2.17   | 0.78 | 1.74       | 0.68 | 1.99          | 0.66 |
|                   |              |             | 3/8"        | 3.20   | 0.91 | 3.86       | 0.74 | ----          | ---- |
|                   |              |             | 1/2"        | 5.70   | 0.94 | 5.93       | 0.90 | 6.49          | 0.78 |
|                   | 2"           | 3/4"        | 1/4"        | 3.00   | 0.55 | 1.87       | 0.65 | 1.72          | 0.65 |
|                   |              |             | 3/8"        | 4.00   | 0.77 | 3.84       | 0.76 | ----          | ---- |
|                   |              |             | 7/16"       | ----   | ---- | ----       | ---- | 5.40          | 0.60 |
|                   |              |             | 1/2"        | 7.20   | 0.78 | 6.63       | 0.80 | ----          | ---- |
|                   |              |             | 5/8"        | ----   | ---- | ----       | ---- | 10.8          | 0.58 |
|                   |              |             | 3/4"        | 12.0   | 0.80 | 10.9       | 0.78 | ----          | ---- |
|                   | 1" Soft Seat | 1 1/2"      | 1"          | 21.0   | 0.77 | 15.8       | 0.70 | ----          | ---- |
|                   |              |             | 2"          | 29.8   | 0.75 | ----       | ---- | ----          | ---- |

#### NOTES:

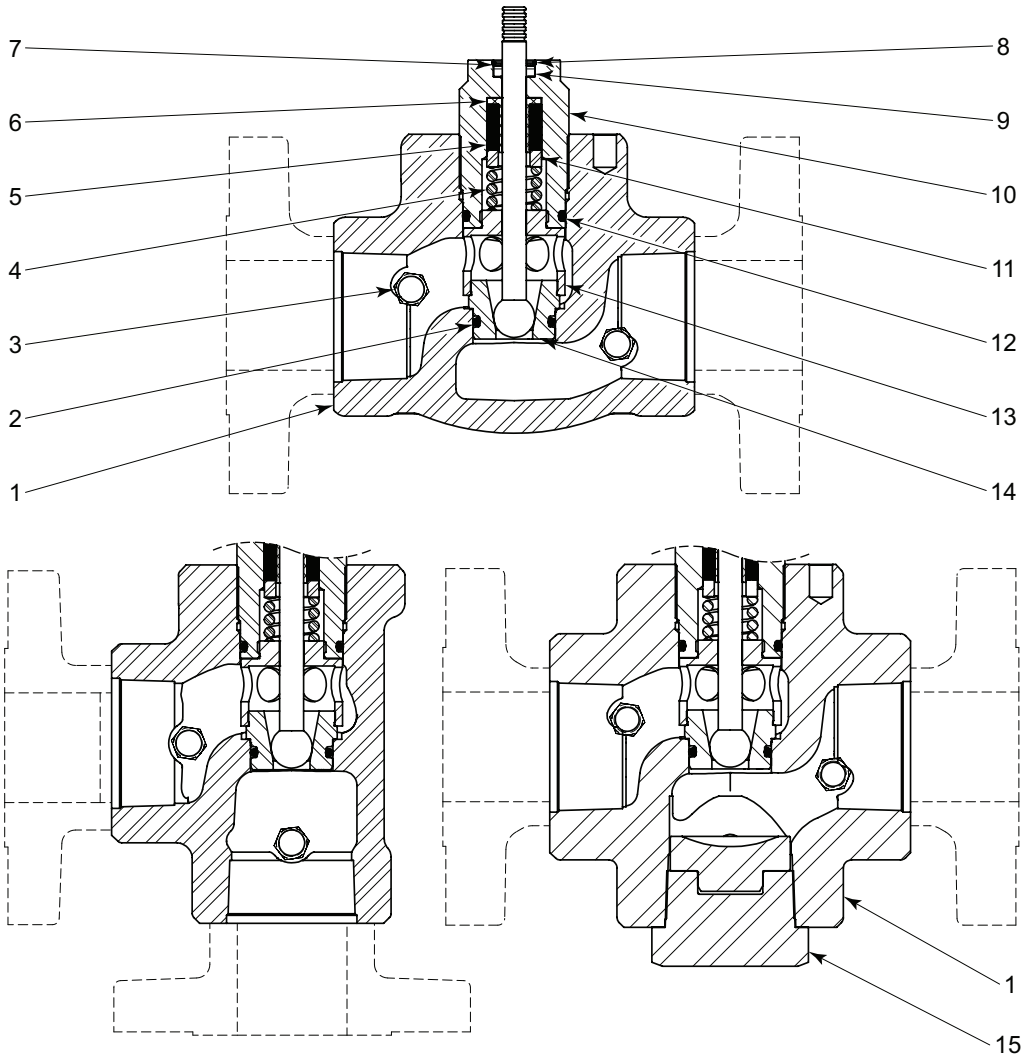
For standard & optional seals, metals, Cf Cv values, material specifications & dimensions see technical data on pages 01:1 - 01:X1

† For complete valve codes see page 01:300.1, For code builder see page 01:00.2  
Max W.P. values based on -20°F to 100°F.

# HIGH PRESSURE CONTROL VALVES



## STEM GUIDED BOTTOM WORKS MODEL CVS PARTS DRAWING



| ITEM   | QTY.  | DESCRIPTION                        | PART NO.                  |         |           |         |         |         |            |         |
|--|-------|------------------------------------|---------------------------|---------|-----------|---------|---------|---------|------------|---------|
|  |       |                                    | STANDARD                  |         | CORROSIVE |         | EROSIVE |         | MIXED DUTY |         |
|  |       |                                    | 1 INCH                    | 2 INCH  | 1 INCH    | 2 INCH  | 1 INCH  | 2 INCH  | 1 INCH     | 2 INCH  |
| 1  | 1     | Body                               | See Table On Page 01:10.3 |         |           |         |         |         |            |         |
| 2  | 1     | O-Ring *                           | 155                       | 157     | 155       | 157     | 155     | 157     | 155        | 157     |
| 3  | 2     | Plug                               | ----                      | 699     | ----      | 699SS6  | ----    | 699     | ----       | 699SS6  |
| 4  | 1     | Spring                             | 465                       | 509     | 465HAC    | 509HAC  | 465     | 509     | 465HAC     | 509HAC  |
| 5  | (QTY) | Packing Ring *                     | 484 (4)                   | 533 (6) | 484 (4)   | 533 (6) | 484 (4) | 533 (6) | 484 (4)    | 533 (6) |
| 6  | 1     | Packing Sleeve *                   | 485                       | 534     | 485       | 534     | 485     | 534     | 485        | 534     |
| 5&6  | 1     | Optional VEE Packing 450°F max     | 5117                      | 5118    | 5117      | 5118    | 5117    | 5118    | 5117       | 5118    |
|  |       | Optional Grafoil Packing 450°F max | ----                      | 5118GF  | ----      | 5118GF  | ----    | 5118GF  | ----       | 5118GF  |
| 7  | 1     | Retainer                           | 486                       | 528     | 486       | 528     | 486     | 528     | 486        | 528     |
| 8  | 1     | Snap Ring *                        | 938                       | 940     | 938       | 940     | 938     | 940     | 938        | 940     |
| 9  | 1     | Felt Wiper *                       | 480                       | 527     | 480       | 527     | 480     | 527     | 480        | 527     |
| 10   | 1     | Stuffing Box                       | 479                       | 526     | 479SS6    | 526SS6  | 479     | 526     | 479SS6     | 526SS6  |
| 11   | 1     | Packing Follower                   | 482SS6                    | 531SS6  | 482SS6    | 531SS6  | 482SS6  | 531SS6  | 482SS6     | 531SS6  |
| 12   | 1     | O-Ring *                           | 156                       | 520     | 156       | 520     | 156     | 520     | 156        | 520     |
| 13   | 1     | Cage                               | 2837                      | 2889    | 2837SS6   | 2889SS6 | 2837    | 2889    | 2837       | 2889PH  |
| 14   | 1     | Trim Set                           | See Table On Page 01:10.3 |         |           |         |         |         |            |         |
| 15   | 1     | 2" NPT Hex Plug w/Wear Plug        | ----                      | 7886ASB | ----      | 7886ASB | ----    | 7886ASB | ----       | 7886ASB |
| 2" NPT Hex Plug for Angle T-Body (not shown) |       |                                    | ----                      | 7665R   | ----      | 7665R   | ----    | 7665R   | ----       | 7665R   |
| Repair Kits                                  |       |                                    | RFA                       | RFE     | RFA       | RFE     | RFA     | RFE     | RFA        | RFE     |
| Stuffing Box Assemblies                      |       | Order Code                         | EAW                       | EBY     | EAWSS6    | EBYSS6  | EAW     | EBY     | EAWSS6     | EBYSS6  |
|  |       | Max W.P. psig                      | 6000                      | 6170    | 6000      | 6170    | 6000    | 6170    | 6000       | 6170    |

\* These parts are recommended spare parts and are stocked as repair kits.

All Pictures shown are for illustration purpose only. Actual product may vary due to product enhancement.

| THRU BODIES AVAILABLE |      |               |          |         |        |       |                    |
|-----------------------|------|---------------|----------|---------|--------|-------|--------------------|
| ITEM                  | QTY. | DESCRIPTION   | PART NO. |         |        |       |                    |
|                       |      |               | 1 INCH   |         | 2 INCH |       |                    |
|                       |      |               | THRU     | ANGLE   | THRU   | ANGLE | DUAL PORT (T-BODY) |
| 1                     | 1    | 2000 psig NPT | ----     | ----    | 493    | 496   | ----               |
|                       |      | 4000 psig NPT | 452      | 453     | 494    | 497   | 7622               |
|                       |      | 6000 psig NPT | 5029     | 7509    | 4083   | 4355  | 7702               |
|                       |      | 150RF         | 2374RF   | 2772RF  | 4510   | 2791  | 7765               |
|                       |      | 300RF         | 5335RF   | 2773RF  | 4512   | 2793  | 7766               |
|                       |      | 600RF         | 1945RF   | 2133RF  | 4513   | 2795  | 7767               |
|                       |      | 1500RF        | 2768RF   | ----    | 4516   | 2442  | 7768               |
|                       |      | 600RTJ        | 2054RTJ  | 2778RTJ | 4514   | 2816  | ----               |
|                       |      | 1500RTJ       | 2771RTJ  | 2780RTJ | 4515   | 1742  | 7769               |
|                       |      | 2500RTJ       | ----     | ----    | 4230   | ----  | ----               |
|                       |      | API 5000      | ----     | ----    | 6604   | 6612  | 7764               |

Coated Bodies available with "K" & "E" service types

| TRIM SETS AVAILABLE (Other materials available see page 01:200.2) |      |       |            |              |            |          |              |            |          |
|---|------|-------|------------|--------------|------------|----------|--------------|------------|----------|
| ITEM  | QTY. | SIZE  | SERVICE    | 1" LINE SIZE |            |          | 2" LINE SIZE |            |          |
|   |      |       |            | Linear       | Quick Open | E.P.     | Linear       | Quick Open | E.P.     |
| 14  | 1    | 1/8"  | Standard   | T2842        | T2856      | T6400    |              |            |          |
|   |      |       | Corrosive  | T2842SS6     |            | T6400SS6 |              |            |          |
|   |      |       | Erosive    |              |            |          |              |            |          |
|   |      |       | Mixed Duty | T2842PH      |            |          |              |            |          |
|   |      | 3/16" | Standard   | T2841        | T2855      |          |              |            |          |
|   |      |       | Corrosive  | T2841SS6     |            |          |              |            |          |
|   |      |       | Erosive    |              |            |          |              |            |          |
|   |      |       | Mixed Duty | T2841PH      |            |          |              |            |          |
|   |      | 1/4"  | Standard   | T2840        | T2854      | T4730    | T2895        | T2890      | T6404    |
|   |      |       | Corrosive  | T2840SS6     |            | T4730SS6 |              |            | T6404SS6 |
|   |      |       | Erosive    |              |            | T4730ZR  |              |            |          |
|   |      |       | Mixed Duty | T2840PH      |            |          | T2895PH      |            | T6404PH  |
|   |      | 3/8"  | Standard   | T2838        | T2853      |          | T2896        | T2891      |          |
|   |      |       | Corrosive  | T2838SS6     |            |          | T2896SS6     |            |          |
|   |      |       | Erosive    |              |            |          |              | T2891ZR    |          |
|   |      |       | Mixed Duty | T2838PH      |            |          | T2896PH      |            |          |
|   |      | 7/16" | Standard   |              |            |          |              |            | T2993    |
|   |      |       | Corrosive  |              |            |          |              |            | T2993SS6 |
|   |      |       | Erosive    |              |            |          |              |            | T2993ZR  |
|   |      |       | Mixed Duty |              |            |          |              |            | T2993PH  |
|   |      | 1/2"  | Standard   | T2839        | T5307      | T4732    | T2897        | T2892      |          |
|   |      |       | Corrosive  | T2839SS6     |            | T4732SS6 | T2897SS6     |            |          |
|   |      |       | Erosive    |              |            | T4732ZR  |              |            |          |
|   |      |       | Mixed Duty | T2839PH      |            |          | T2897PH      |            |          |
|   |      | 5/8"  | Standard   |              |            |          |              |            | T2992    |
|   |      |       | Corrosive  |              |            |          |              |            | T2992SS6 |
|   |      |       | Erosive    |              |            |          |              |            | T2992ZR  |
|   |      |       | Mixed Duty |              |            |          |              |            | T2992PH  |
|   |      | 3/4"  | Standard   |              |            |          | T2898        | T4690      |          |
|   |      |       | Corrosive  |              |            |          | T2898SS6     |            |          |
|   |      |       | Erosive    |              |            |          |              | T4690ZR    |          |
|   |      |       | Mixed Duty |              |            |          | T2898PH      |            |          |
|   |      | 7/8"  | Standard   |              |            |          |              |            | T2947    |
|   |      |       | Corrosive  |              |            |          |              |            | T2947SS6 |
|   |      |       | Erosive    |              |            |          |              |            | T2947ZR  |
|   |      |       | Mixed Duty |              |            |          |              |            | T2947PH  |
|   |      | 1"    | Standard   |              |            |          | T2899        | T4691      |          |
|   |      |       | Corrosive  |              |            |          | T2899SS6     |            |          |
|   |      |       | Erosive    |              |            |          | T2899ZR      |            |          |
|   |      |       | Mixed Duty |              |            |          | T2899PH      |            |          |

**APPLICATIONS:**



Used for actuating HPCV Control Valves.

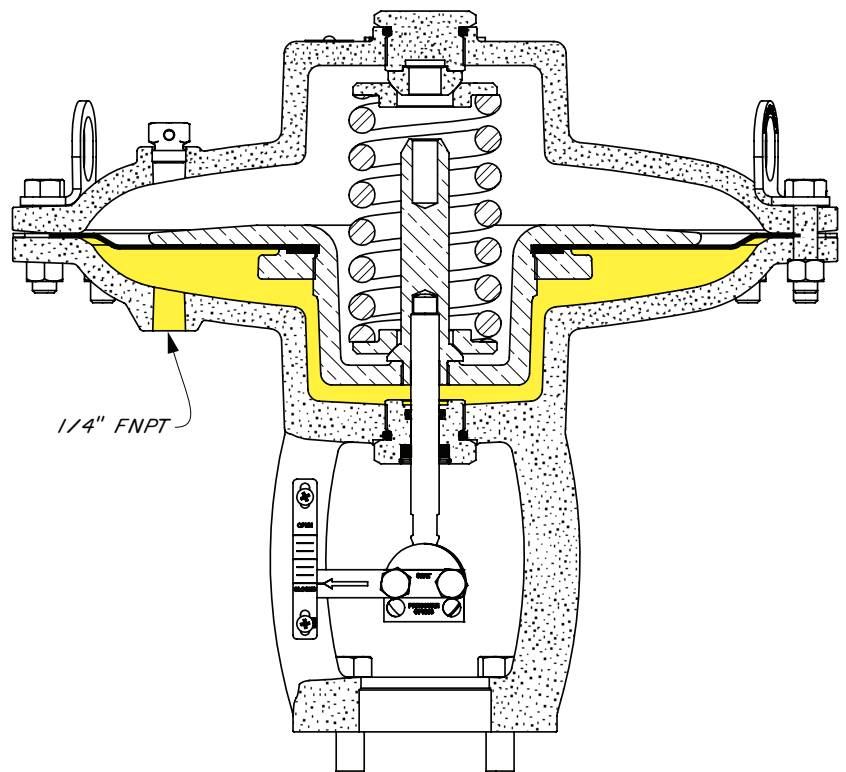
**FEATURES:**

- Compact design
- Valve travel indicator
- Field-reversible topworks
- Top Adjusting Screw may be adjusted to vary the spring tension slightly; this affects pressure required to actuate valve.

**CERTIFICATIONS:**

Kimray is an ISO 9001- certified manufacturer.

 Control Valve Diaphragm Assembly  
 Control Valve Diaphragm Pressure



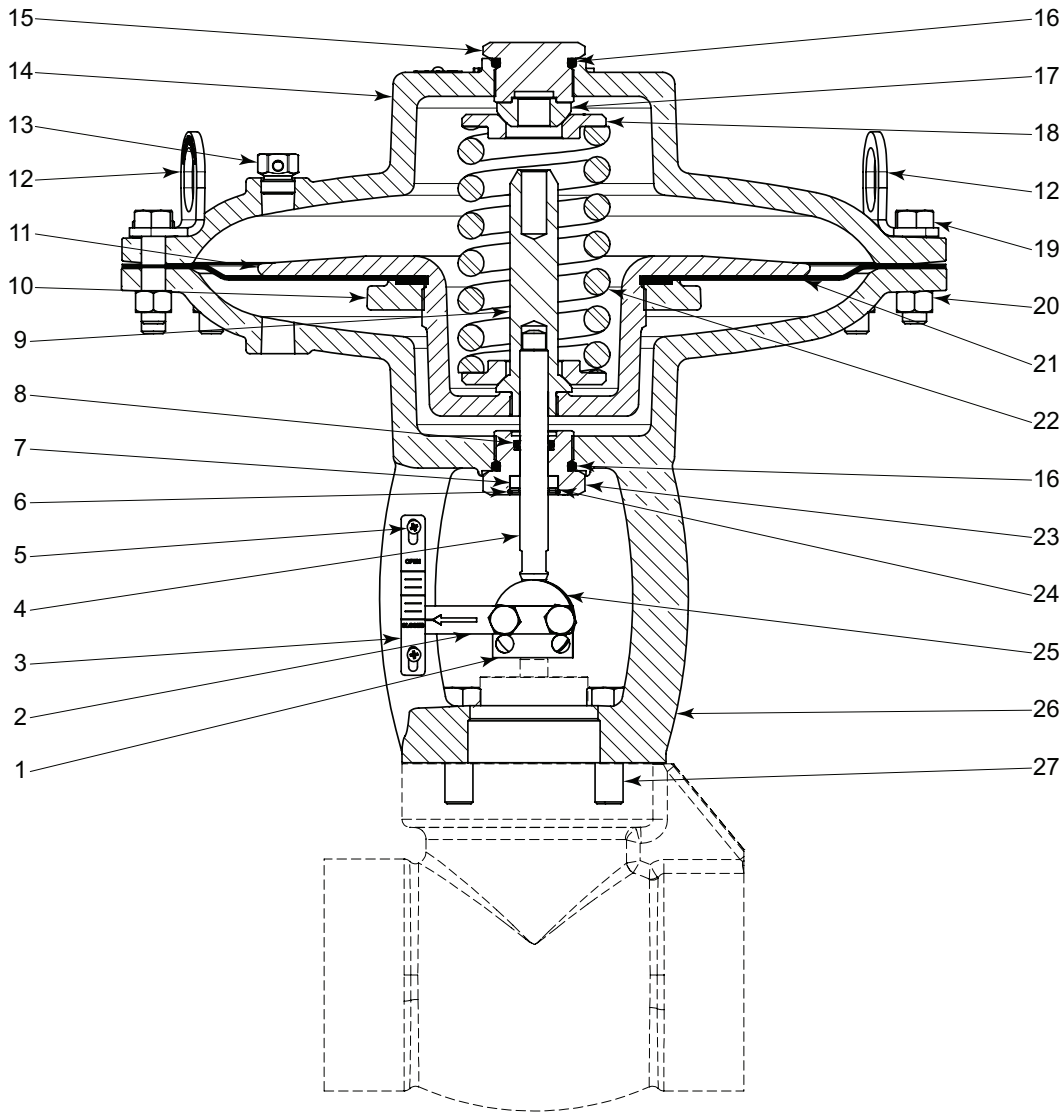
| Order Code † | Body Size | Effective Diaphragm Area | Normal Actuator. W.P. psig ††  | MAX. Actuator. W.P. psig †† | Stem Travel |  |        |
|--------------|-----------|--------------------------|--------------------------------|-----------------------------|-------------|--|--------|
| EAT          | 1"        | 30 square inches         | 10 - 30<br>(see spring ranges) | 45                          | 1/2"        |  |        |
| EBT          | 2"        | 65 square inches         |                                |                             | 3/4"        |  |        |
| EFX          | 3"        | 100 square inches        |                                |                             | 1 3/8"      |  |        |
| EEY          | 4"        |                          |                                |                             | 1 3/4"      |  |        |
| EEZ          | 6"        | 120 square inches        |                                |                             |             |  | 2 1/2" |
|              | 8"        |                          |                                |                             |             |  |        |
|              | 10"       |                          |                                |                             |             |  |        |

**NOTES:**

For standard & optional seals, metals, Cf Cv values, material specifications & dimensions see technical data on pages 01:1 - 01:XI  
 † Top Works only. For complete valve codes see pages 01:300.1 - 01:300.4  
 †† Max W.P. values based on -20°F to 100°F.

# HIGH PRESSURE CONTROL VALVES

## STANDARD PISTON BALANCED / CAGE GUIDED ACTUATORS PARTS DRAWING





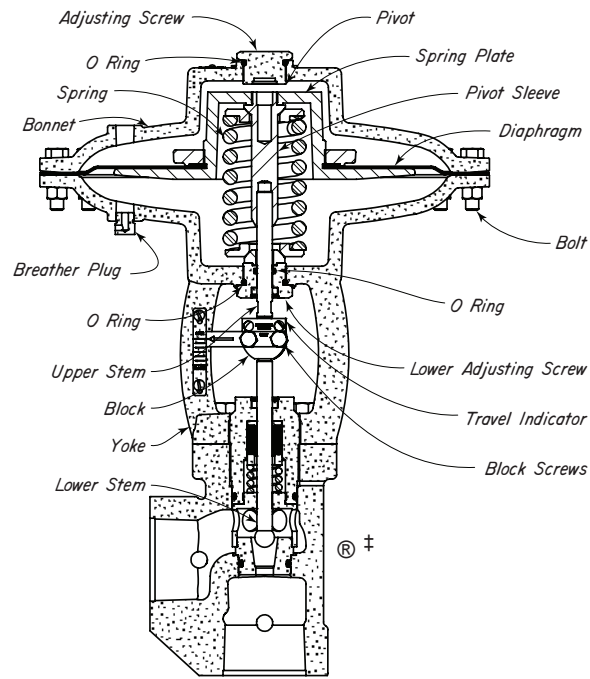
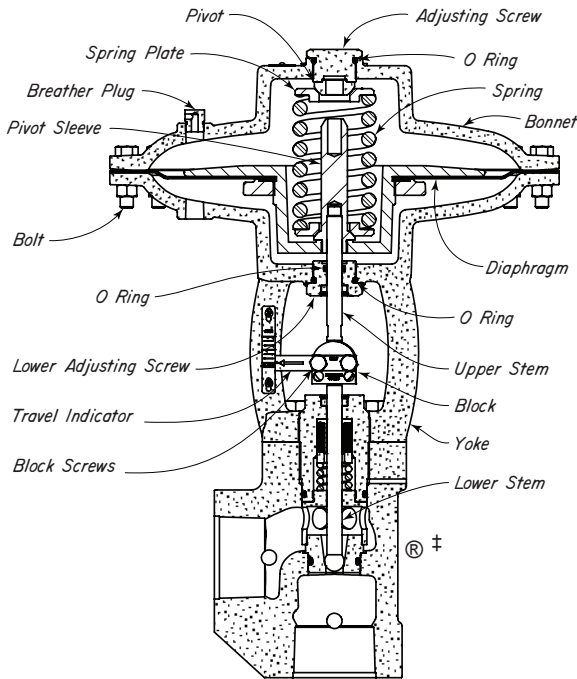
# HIGH PRESSURE CONTROL VALVES

## STANDARD PISTON BALANCED / CAGE GUIDED ACTUATORS PARTS LIST

| ITEM              | QTY.       | DESCRIPTION           | STANDARD PART NO.   |               |          |            |               |             |
|-------------------|------------|-----------------------|---|---------------|----------|------------|---------------|-------------|
|                   |            |                       | 1 INCH  | 2 INCH        | 3 INCH   | 4 INCH     | 6 INCH        | 8 & 10 INCH |
| 1                 | 1          | Tag                   | ----  | 677           | 4975     |            | 5352          |             |
| 2                 | 1          | Travel Indicator      | 1659A   | 535           | 4974     |            | 5317          |             |
| 3                 | 1          | Indicator Scale       | 488   | 536           | 4973     | 5131       | 5316          |             |
| 4                 | 1          | Upper Stem            | 1643  | 522           | 4971     | 5171       | 5310          |             |
| 5                 | 2          | Screw                 | 7534  |               |          |            |               |             |
| 6                 | 1          | Snap Ring *           | 938   | 940           | 4968     |            | 5311          |             |
| 7                 | (QTY)      | Felt Wiper *          | 480   | 527 (1)       | 4969 (2) |            | 5337 (2)      |             |
| 8                 | 1          | O-Ring *              | 153   | 530           | 155      |            | 5355          |             |
| 9                 | 1          | Pivot Sleeve          | 466   | 510           | 4963     | 5179       | 5309          |             |
| 10                | 1          | Retainer Ring         | 476   | 4356          | 4965     |            | 5344          |             |
| 11                | 1          | Diaphragm Plate       | 469   | 4357          | 4964     |            | 5343          |             |
| 12                | 2          | Lifting Ring          | ----  | 7559          | ----     |            |               |             |
| 13                | 1          | Breather Plug         | 147   |               |          |            | 5559SS6       |             |
| 14                | 1          | Bonnet                | 461   | 506           | 4956     |            | 5299          |             |
| 15                | 1          | Upper Adjusting Screw | 457   | 502           | 4959     | 6560       | 5348          |             |
| 16                | 2          | O-Ring *              | 491   | 537           | 808      |            | 2632          |             |
| 17                | 1          | Pivot                 | 459   | 504           | 4960     |            | 5349          |             |
| 18                | 2          | Spring Plate          | 462   | 507           | 4961     |            | 5350          |             |
| 19                | (Qty)      | Bolt                  | 247 (10)  | 430 (16)      | 236 (24) |            | 191 (24)      |             |
| 20                | (Qty)      | Nut                   | 241 (10)  | 241 (16)      | 241 (24) |            |               |             |
| 21                | 1          | Diaphragm             | 475   | 519           | 5169     |            | 5315          |             |
| 22                | 1          | Spring 2-10 lb        | 621 (silver)  | ----          | ----     | ----       | ----          |             |
|                   |            | Spring 3-15 lb        | 7659 (blue)   | 1245 (silver) | ----     | ----       | ----          |             |
|                   |            | Spring 4-20 lb        | 463 (red)   | 538 (red)     | ----     | ----       | ----          |             |
|                   |            | Spring 6-30 lb        | 464 (green)   | 508 (yellow)  | 4962     | 5130 (red) | 5353 / 5314 ‡ |             |
|                   |            | Spring 9-45 lb        | ----  | 6848 (blue)   | ----     | ----       | ----          | ----        |
| 23                | 1          | Lower Adjusting Screw | 458   | 503           | 4967     |            | 5351          |             |
| 24                | 1          | Retainer              | 486   | 528           | 4970     |            | 5338          |             |
| 25                | 1          | Coupling Block        | 1659  | 511           | 4972     |            | 5345          |             |
| 26                | 1          | Yoke                  | 460   | 505           | 4957     |            | 5300          |             |
| 27                | 4          | Bolt                  | 694   | 524           | 4991     |            | 5406          |             |
| Repair Kits       |            |                       | RHV   | RHW           | RYB      |            | RWDTW         |             |
| Actuator Assembly | Fail Close | 2-10 lb Spring        | EASPO10   | ----          | ----     | ----       | ----          |             |
|                   |            | 3-15 lb Spring        | EASPO15   | EBTPO15       | ----     | ----       | ----          |             |
|                   |            | 4-20 lb Spring        | EASPO20   | EBTPO20       | ----     | ----       | ----          |             |
|                   |            | 6-30 lb Spring        | EASPO30   | EBTPO30       | EFXPO30  | EEYPO30    | EEZPO30       |             |
|                   |            | 9-45 lb Spring        | ----  | EBTPO45       | ----     | ----       | ----          |             |
|                   | Fail Open  | 2-10 lb Spring        | EASPC10   | ----          | ----     | ----       | ----          |             |
|                   |            | 3-15 lb Spring        | EASPC15   | EBTPC15       | ----     | ----       | ----          |             |
|                   |            | 4-20 lb Spring        | EASPC20   | EBTPC20       | ----     | ----       | ----          |             |
|                   |            | 6-30 lb Spring        | EASPC30   | EBTPC30       | EFXPC30  | EEYPC30    | EEZPC30       |             |
|                   |            | 9-45 lb Spring        | ----  | EBTPC45       | ----     | ----       |               |             |
|                   |            |                       | * These parts are recommended spare parts and are stocked as repair kits. |               |          |            |               |             |
|                   |            |                       | ‡ 5314 on Pressure Open only  |               |          |            |               |             |



## STANDARD STEM GUIDED / CAGE GUIDED ACTUATOR CONVERSION INSTRUCTIONS



### PRESSURE CLOSING to PRESSURE OPENING:

Remove BLOCK SCREWS, TRAVEL INDICATOR and COUPLING BLOCK. Remove UPPER ADJUSTING SCREW, BOLTS, and BONNET. Lift out Diaphragm Assembly (Crosshatched). Remove SPRING, SPRING PLATES and PIVOT. Unscrew UPPER STEM and insert in opposite end of PIVOT SLEEVE.

Replace LOWER ADJUSTING SCREW and tighten against YOKE. O RING 491 - 1", 537 - 2", provides the necessary pressure seal. Invert Diaphragm Assembly and replace. Care should

be taken when threading the UPPER STEM through the LOWER ADJUSTING SCREW so as not to damage O RING, 153Q - 1", 530Q - 2". Replace SPRING with a SPRING PLATE in each end. UPPER ADJUSTING SCREW opening Thread UPPER ADJUSTING SCREW into BONNET until contact is made with the PIVOT, then tighten two turns. The UPPER ADJUSTING SCREW now becomes the SPRING adjustment. With BLOCK SCREWS through INDICATOR, replace COUPLING BLOCK matching match marks. Move BREATHER PLUG to BONNET (upper Diaphragm Housing). Connect Diaphragm Pressure from PILOT to YOKE (Lower Diaphragm Housing).

### PRESSURE OPENING to PRESSURE CLOSING:

Remove BLOCK SCREWS, TRAVEL INDICATOR and COUPLING BLOCK. Remove UPPER ADJUSTING SCREW, BOLTS, and BONNET. Lift out Diaphragm Assembly (Crosshatched). Remove SPRING, SPRING PLATES and PIVOT. Rotate Diaphragm Assembly when pulling UPPER STEM through LOWER ADJUSTING SCREW so as not to damage O-Ring, 153Q - 1", and 530Q - 2".

Unscrew UPPER STEM and replace in opposite end of PIVOT SLEEVE.

Using COUPLING BLOCK, pull LOWER STEM up to open position. Thread LOWER ADJUSTING SCREW in YOKE until end is flush with inside surface of YOKE. Set PIVOT on top of LOWER ADJUSTING SCREW with the beveled surface up. Replace SPRING with a SPRING PLATE in each end.

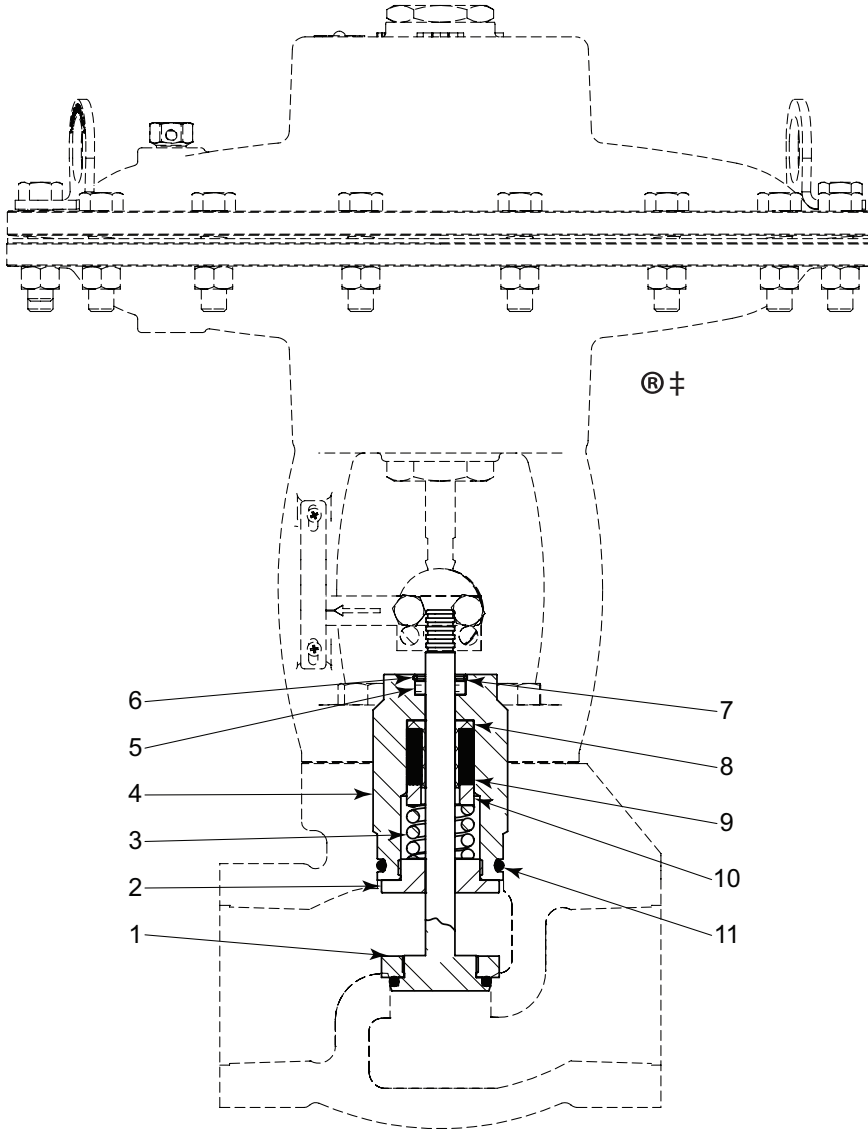
Invert Diaphragm Assembly from its original position and replace. Be sure UPPER STEM and LOWER STEM meet. With BLOCK SCREWS through INDICATOR, replace COUPLING BLOCK matching match marks. Replace BONNET and BOLTS and INDICATOR is in "Open" position, then tighten one turn. Move BREATHER PLUG to YOKE (Lower Diaphragm Housing). Connect Diaphragm Pressure from PILOT to BONNET (Upper Diaphragm Housing).

**NOTES:**



**1" & 2" HPCV OVERSIZED SOFT SEATS STUFFING BOX ASSEMBLY  
PARTS DRAWING**

For increased flow at low operating pressure. Maximum pressure drop is 300 psig For on - off service only.  
Uses standard valve body  
Teflon seal



| ITEM                    | QTY.  | DESCRIPTION      | PART NO. |         |           |         |
|-------------------------|-------|------------------|----------|---------|-----------|---------|
|                         |       |                  | STANDARD |         | CORROSIVE |         |
|                         |       |                  | 1 INCH   | 2 INCH  | 1 INCH    | 2 INCH  |
| 1                       | 1     | Soft Seat        | 2137     | 2136    | 2137SS6   | 2136SS6 |
| 2                       | 1     | Nut              | 1828     | 1829    | 1828SS6   | 1829SS6 |
| 3                       | 1     | Spring           | 465      | 509     | 465HAC    | 509HAC  |
| 4                       | 1     | Stuffing Box     | 479      | 526     | 479SS6    | 526SS6  |
| 5                       | 1     | Felt Wiper *     | 480      | 527     | 480       | 527     |
| 6                       | 1     | Snap Ring *      | 938      | 940     | 938       | 940     |
| 7                       | 1     | Retainer         | 486      | 528     | 486       | 528     |
| 8                       | 1     | Packing Sleeve * | 485      | 534     | 485       | 534     |
| 9                       | (QTY) | Packing Ring *   | 484 (4)  | 533 (6) | 484 (4)   | 533 (6) |
| 10                      | 1     | Packing Follower | 482SS6   | 531SS6  | 482SS6    | 531SS6  |
| 11                      | 1     | O-Ring *         | 156      | 520     | 156       | 520     |
| Repair Kits             |       |                  | RFA      | RFE     | RFA       | RFE     |
| Stuffing Box Assemblies |       |                  | EAX      | EBZ     | EAXSS6    | EBZSS6  |

\* These parts are recommended spare parts and are stocked as repair kits.



#### Equal Percentage Trim:

A given amount of change in stem position will make the same percent of change in flow whether the flow is low and the valve is nearly closed, or the flow volume is high and the valve is nearly open. In other words: if a 10 psi change in diaphragm pressure is required to fully travel the plug in the valve then with the valve in a specific open position, adding 1 psi to the diaphragm pressure will increase the flow by 154% of the previous value, no matter where you start. This allows for precise control at high pressure drops throughout the valve's range of position.

Application: Throttling service.

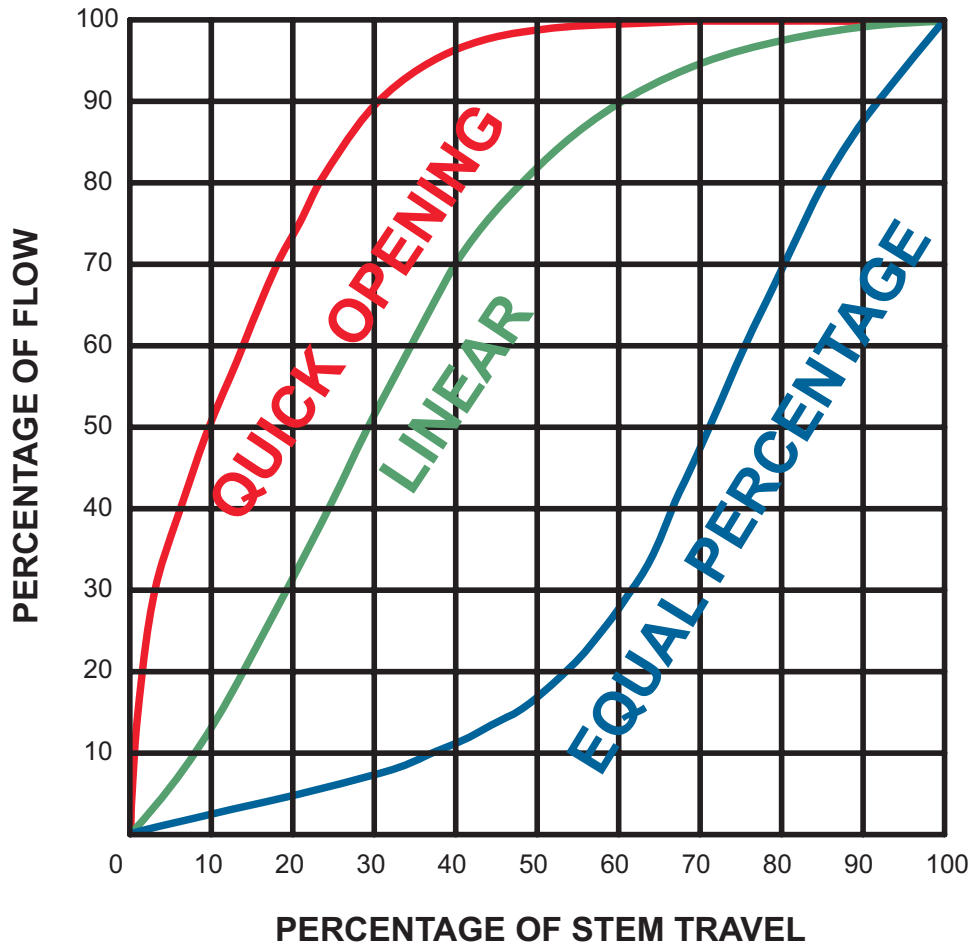
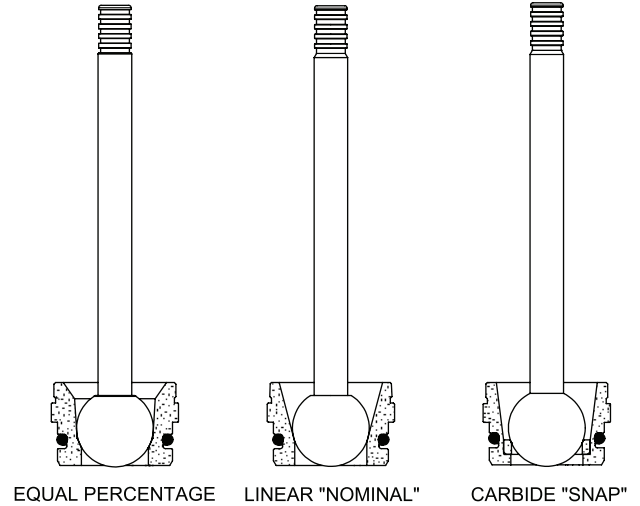
#### Linear "Nominal" Trim:

The characteristic could be described as "quick opening, semi-linear". Application: On / off service where abrasive material is not present in the media stream. May be used for throttling liquid service, though Equal Percentage trim would provide smoother control at higher pressure drops.

#### Carbide "Quick Opening" Trim:

The seat is designed so that the maximum Cv is reached with a minimal amount of closure member travel. Quick opening will have a carbide ring brazed in the bottom of the seat and the stem ball will have one lapping ring around it.

Applications: On / off service. Highly abrasive service.



| VALVE           | FLOW CHARACTERISTIC     | MATERIAL                  | INNER VALVE SIZE   |                    |                    |                    |                    |                    |
|-----------------|-------------------------|---------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|                 |                         |                           | 1/8"               | 3/16"              | 1/4"               | 3/8"               | 1/2"               |                    |
| 1" SMA & 1" SMT | LINEAR "NOMINAL" FLOW   | TOOL STEEL* <sup>a</sup>  | T2842              | T2841              | T2840              | T2838              | T2839              |                    |
|                 |                         | 17-4PH <sup>d</sup>       | T2842PH            | T2841PH            | T2840PH            | T2838PH            | T2839PH            |                    |
|                 |                         | 316SS <sup>c</sup>        | T2842SS6           | T2841SS6           | T2840SS6           | T2838SS6           | T2839SS6           |                    |
|                 | EQUAL PERCENTAGE        | CARBIDE "QUICK OPENING"   | CARB. INSERT       | T2856              | T2855              | T2854              | T2853              | T5307              |
|                 |                         |                           | TOOL STEEL*        | T6400              |                    | T4730 <sup>a</sup> |                    | T4732 <sup>a</sup> |
|                 |                         |                           | 316SS <sup>c</sup> | T6400SS6           |                    | T4730SS6           |                    | T4732SS6           |
|                 |                         | ZIRCONIA                  |                    |                    | T4730ZR            |                    | T4732ZR            |                    |
| 1" SMS          | LINEAR "NOMINAL" FLOW   | TOOL STEEL* <sup>a</sup>  |                    |                    | T1202              | T1234              | T1977              |                    |
|                 |                         | 316SS <sup>c</sup>        |                    |                    | T1202SS6           | T1234SS6           | T1977SS6           |                    |
|                 | CARBIDE "QUICK OPENING" | CARB. INSERT <sup>a</sup> |                    |                    | T1463              | T1462              | T5325              |                    |
| 1" MV           | EQUAL PERCENTAGE        | TOOL STEEL* <sup>a</sup>  |                    |                    | T4730MV            |                    | T4732MV            |                    |
|                 |                         | 316SS <sup>c</sup>        |                    |                    | T4730SS6MV         |                    | T4732SS6MV         |                    |
|                 |                         | ZIRCONIA                  |                    |                    | T4730ZRMV          |                    | T4732ZRMV          |                    |
| VALVE           | FLOW CHARACTERISTIC     | MATERIAL                  | INNER VALVE SIZE   |                    |                    |                    |                    |                    |
|                 |                         |                           | 1/4"               | 3/8"               | 1/2"               | 3/4"               | 1"                 |                    |
| 2" SMA & 2" SMT | LINEAR "NOMINAL" FLOW   | TOOL STEEL*               | T2895 <sup>a</sup> | T2896 <sup>a</sup> | T2897 <sup>a</sup> | T2898 <sup>b</sup> | T2899 <sup>b</sup> |                    |
|                 |                         | 17-4PH <sup>d</sup>       | T2895PH            | T2896PH            | T2897PH            | T2898PH            | T2899PH            |                    |
|                 |                         | 316SS <sup>c</sup>        |                    | T2896SS6           | T2897SS6           | T2898SS6           | T2899SS6           |                    |
|                 |                         | ZIRCONIA                  |                    |                    |                    |                    | T2899ZR            |                    |
|                 | CARBIDE "QUICK OPENING" | CARB INSERT               | T2890              | T2891              | T2892              | T4690              | T4691              |                    |
|                 |                         | ZIRCONIA                  |                    | T2891ZR            |                    | T4690ZR            |                    |                    |
| VALVE           | FLOW CHARACTERISTIC     | MATERIAL                  | INNER VALVE SIZES  |                    |                    |                    |                    |                    |
|                 |                         |                           | 1/4"               | 7/16"              | 5/8"               | 7/8"               | 1"                 |                    |
| 2" SMA & 2" SMT | EQUAL PERCENTAGE        | TOOL STEEL*               | T6404              | T2993 <sup>a</sup> | T2992 <sup>b</sup> | T2947 <sup>b</sup> |                    |                    |
|                 |                         | 17-4PH <sup>d</sup>       | T6404PH            | T2993PH            | T2992PH            | T2947PH            |                    |                    |
|                 |                         | 316SS <sup>c</sup>        | T6404SS6           | T2993SS6           | T2992SS6           | T2947SS6           |                    |                    |
|                 |                         | ZIRCONIA                  |                    | T2993ZR            | T2992ZR            | T2947ZR            |                    |                    |
| 2" MV           | EQUAL PERCENTAGE        | TOOL STEEL* <sup>a</sup>  | T6404MV            | T2993MV            | T2992MV            | T2947MV            |                    |                    |
|                 |                         | 17-4PH <sup>d</sup>       |                    |                    |                    | T2947PHMV          |                    |                    |
|                 |                         | 316SS <sup>c</sup>        | T6404S6MV          | T2993S6MV          | T2992S6MV          | T2947S6MV          |                    |                    |
|                 |                         | ZIRCONIA                  |                    | T2993ZRMV          | T2992ZRMV          | T2947ZRMV          |                    |                    |

<sup>a</sup>Carbide ball rigidly connected to a 303SS stem  
<sup>b</sup>Hardened high chrome alloy ball connected to a 303SS stem  
<sup>c</sup>One piece 316SS steel stem  
<sup>d</sup>One piece 17-4 PH SS steel stem  
\*Seat and Plug furnished with Standard HPCV

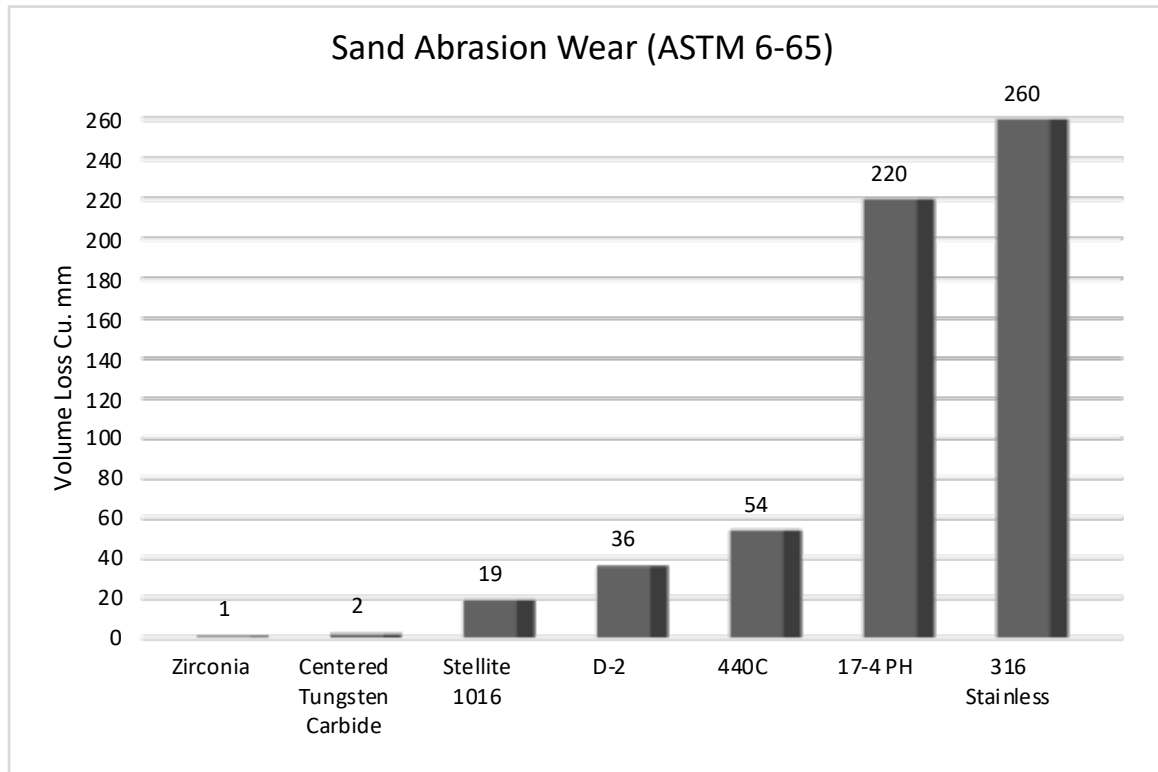


Figure 1

### Valve Trim & Inner Valve Material Abrasion Resistance

The abrasion resistance of common inner valve materials varies (seat, ball, trim sets, ratio plug, piston). A standard ASTM G-65 test can be used to compare the abrasion resistance of valve plug materials using silica sand as abrasive.

In the ASTM G-65 procedure A, fine silica sand is introduced at a specified rate between the wear sample and a rubber wheel that is spinning in contact with the wear sample. The rubber wheel carries the sand across the surface of the wear sample for a specified period of time, abrading the surface. Volume loss is then calculated for the wear sample.

#### References

Budinski, Kenneth G., and Michael K. Budinski. *Engineering Materials: Properties and Selection*. 8th ed. Upper Saddle River, NJ: Prentice Hall, 2005. Print.

\*(ASTM G-65, table x1.2 Volume Loss Range) .

#### APPLICATIONS:

Allows a wider spring adjustment range for discharge of liquid or gas from vessels, separators, treaters, knockouts and similar liquid accumulators.

Allows a finer control when used with back pressure and pressure reducing controllers.

Used as an operator on 1" HPCV, 2" HPCV or 1" SMS.

#### FEATURES:

Compact design

Valve travel indicator

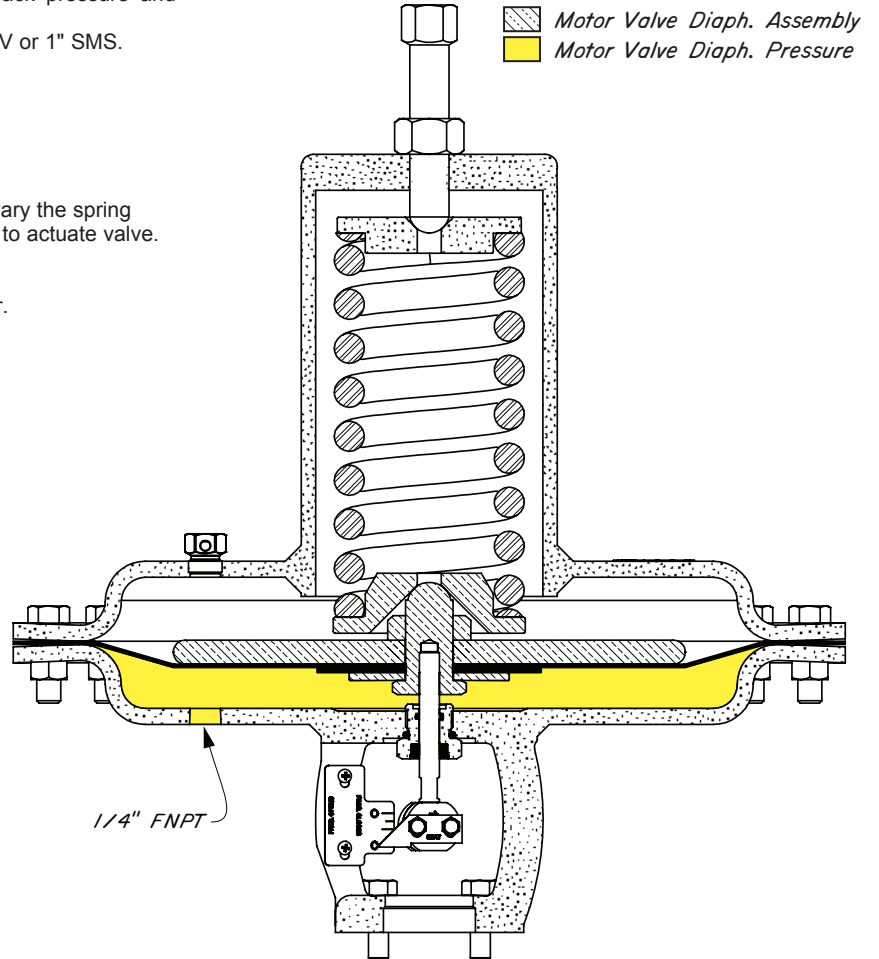
All steel

Adjustable topworks

Top Adjusting Screw may be adjusted to vary the spring tension slightly; this affects pressure required to actuate valve.

#### CERTIFICATIONS:

Kimray is an ISO 9001- certified manufacturer.



| Order Code † | Body Size | Effective Diaphragm Area | Spring Diaphragm Pressure psig †† | Normal Actuator. W.P. psig †† | MAX. Actuator. W.P. psig †† | Stem Travel |
|--------------|-----------|--------------------------|-----------------------------------|-------------------------------|-----------------------------|-------------|
| EAU          | 1"        | 65 square inches         | 10 - 30                           | 25                            | 45                          | 3/4" MAX    |
| EBW          | 2"        |                          |                                   |                               |                             |             |

#### NOTES:

For standard & optional seals, metals, Cf Cv values, material specifications & dimensions see technical data on pages 01:I - 01:XI

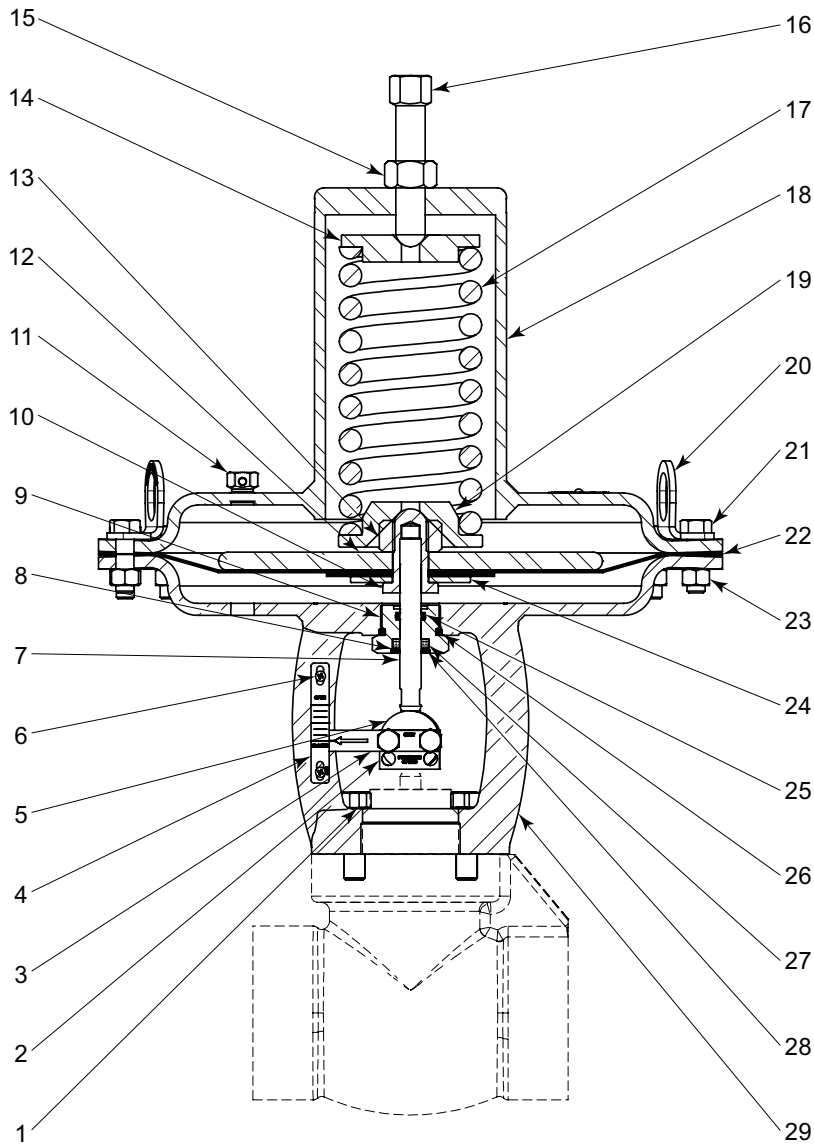
† Top Works only. For complete valve codes see page 01:300.4

†† Max W.P. values based on -20°F to 100°F.

# HIGH PRESSURE CONTROL VALVES



## -65 ACTUATORS MODEL CVS PARTS DRAWING



| ITEM | QTY. | DESCRIPTION           | STANDARD PART NO. |        |
|------|------|-----------------------|-------------------|--------|
|      |      |                       | 1 INCH            | 2 INCH |
| 1    | 4    | Bolt                  | 845               | 524    |
| 2    | 1    | Tag                   | ----              | 677    |
| 3    | 1    | Travel Indicator      | 1659A             | 535    |
| 4    | 1    | Indicator Scale       | 488               | 536    |
| 5    | 1    | Coupling Block        | 1659              | 511    |
| 6    | 2    | Screw                 | 7534              |        |
| 7    | 1    | Upper Stem            | 1643              | 522    |
| 8    | 1    | Retainer              | 486               | 528    |
| 9    | 1    | Lower Adjusting Screw | 458               | 503    |
| 10   | 1    | Pivot Screw           | 2237              | 1986   |
| 11   | 1    | Breather Plug         | 147               |        |
| 12   | 1    | Diaphragm Plate       | 1890              |        |
| 13   | 1    | Lock Nut              | 175               |        |
| 14   | 1    | Upper Spring Guide    | 1888              |        |
| 15   | 1    | Nut                   | 1897              |        |

| ITEM        | QTY.  | DESCRIPTION           | STANDARD PART NO. |               |
|-------------|-------|-----------------------|-------------------|---------------|
|             |       |                       | 1 INCH            | 2 INCH        |
| 16          | 1     | Adjusting Screw       | 1987              |               |
| 17          | 1     | Spring                | 1848              |               |
| 18          | 1     | Bonnet                | 1886              |               |
| 19          | 1     | Lower Spring Guide    | 1889              |               |
| 20          | 2     | Lifting Ring          | ----              | 7559          |
| 21          | 16    | Bolt                  | 247               |               |
| 22          | 1     | Diaphragm             | 1892              |               |
| 23          | 16    | Nut                   | 241               |               |
| 24          | 1     | Lower Diaphragm Plate | 1893              |               |
| 25          | 1     | O-Ring                | *                 | 153   530     |
| 26          | 1     | O-Ring                | *                 | 491   537     |
| 27          | (QTY) | Felt Wiper            | *                 | 480   527 (1) |
| 28          | 1     | Snap Ring             | *                 | 938   940     |
| 29          | 1     | Yoke                  | 1887   1989       |               |
| Repair Kits |       |                       | RHV               | RHW           |

\* These parts are recommended spare parts and are stocked as repair kits.

All Pictures shown are for illustration purpose only. Actual product may vary due to product enhancement.

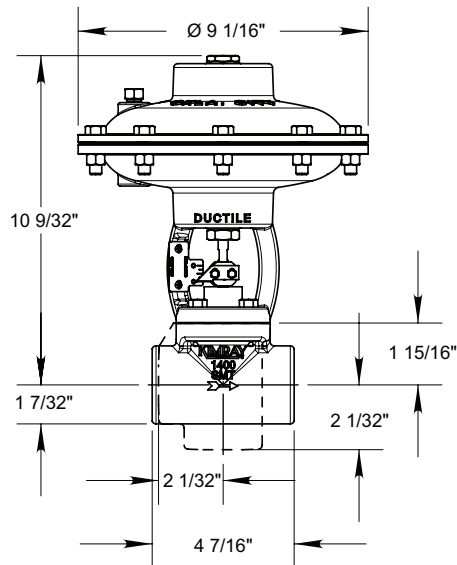
| Table 1 - Flow Coefficient(Cv) |                    |                  |                         |                          |      |       |       |       |       |       |       |       |       |      |
|--------------------------------|--------------------|------------------|-------------------------|--------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Line Size                      | Trim Size in. (mm) | Trim Type        | Cf                      | Valve Opening Percentage |      |       |       |       |       |       |       |       |       |      |
|                                |                    |                  |                         | 10                       | 20   | 30    | 40    | 50    | 60    | 70    | 80    | 90    | 100   |      |
| <b>Stem Guided</b>             |                    |                  |                         |                          |      |       |       |       |       |       |       |       |       |      |
| 1"                             | 1/8 in (3.17 mm)   | Linear (Nominal) | 0.58                    | 0.10                     | 0.40 | 0.50  | 0.70  | 0.90  | 1.00  | 1.00  | 1.00  | 1.10  | 1.10  |      |
|                                | 3/16 in (4.74 mm)  |                  | 0.59                    | 0.20                     | 0.50 | 0.77  | 1.00  | 1.30  | 1.40  | 1.50  | 1.50  | 1.50  | 1.50  |      |
|                                | 1/4 in (6.35 mm)   |                  | 0.78                    | 0.28                     | 0.72 | 1.11  | 1.50  | 1.80  | 1.95  | 2.08  | 2.13  | 2.15  | 2.17  |      |
|                                | 3/8 in (9.52 mm)   |                  | 0.91                    | 0.40                     | 1.10 | 1.60  | 2.20  | 2.70  | 2.90  | 3.10  | 3.20  | 3.20  | 3.20  |      |
|                                | 1/2 in (12.7 mm)   |                  | 0.94                    | 0.70                     | 1.90 | 2.90  | 4.00  | 4.80  | 5.20  | 5.50  | 5.60  | 5.70  | 5.70  |      |
| 2"                             | 1/4 in (6.35 mm)   |                  | 0.55                    | 0.40                     | 1.00 | 1.50  | 2.00  | 2.50  | 2.70  | 2.80  | 2.90  | 2.90  | 3.00  |      |
|                                | 3/8 in (9.52 mm)   |                  | 0.77                    | 0.53                     | 1.33 | 2.06  | 2.80  | 3.40  | 3.60  | 3.90  | 4.00  | 4.00  | 4.00  |      |
|                                | 1/2 in (12.7 mm)   |                  | 0.78                    | 0.94                     | 2.38 | 3.67  | 4.97  | 5.98  | 6.48  | 6.91  | 7.06  | 7.13  | 7.20  |      |
|                                | 3/4 in (19.0 mm)   |                  | 0.80                    | 1.60                     | 4.00 | 6.20  | 8.40  | 10.10 | 11.00 | 12.00 | 12.00 | 12.00 | 12.00 |      |
|                                | 1 in (25.4 mm)     |                  | 0.77                    | 2.80                     | 7.00 | 11.00 | 15.00 | 18.00 | 19.00 | 20.00 | 21.00 | 21.00 | 21.00 |      |
| 1"                             | 1/8 in (3.17 mm)   |                  | Quick Opening (Carbide) | 0.73                     | 0.39 | 0.40  | 0.40  | 0.40  | 0.40  | 0.40  | 0.40  | 0.40  | 0.40  | 0.40 |
|                                | 3/16 in (4.74 mm)  |                  |                         | 0.74                     | 0.77 | 0.90  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92 |
|                                | 1/4 in (6.35 mm)   |                  |                         | 0.68                     | 0.88 | 1.51  | 1.67  | 1.71  | 1.73  | 1.73  | 1.74  | 1.74  | 1.74  | 1.74 |
|                                | 3/8 in (9.52 mm)   | 0.74             |                         | 1.02                     | 2.40 | 3.36  | 3.64  | 3.73  | 3.78  | 3.82  | 3.83  | 3.83  | 3.86  |      |
|                                | 1/2 in (12.7 mm)   | 0.90             |                         | 1.09                     | 2.46 | 4.17  | 5.03  | 5.27  | 5.45  | 5.60  | 5.72  | 5.85  | 5.93  |      |
| 2"                             | 1/4 in (6.35 mm)   | 0.65             |                         | 1.23                     | 1.82 | 1.87  | 1.87  | 1.87  | 1.87  | 1.87  | 1.87  | 1.87  | 1.87  |      |
|                                | 3/8 in (9.52 mm)   | 0.76             |                         | 1.65                     | 3.41 | 3.77  | 3.83  | 3.84  | 3.84  | 3.84  | 3.84  | 3.84  | 3.84  |      |
|                                | 1/2 in (12.7 mm)   | 0.80             |                         | 2.26                     | 4.35 | 5.87  | 6.36  | 6.51  | 6.58  | 6.61  | 6.63  | 6.63  | 6.63  |      |
|                                | 3/4 in (19.0 mm)   | 0.78             |                         | 2.16                     | 4.61 | 7.23  | 9.19  | 10.2  | 10.6  | 10.9  | 10.9  | 10.9  | 10.9  |      |
|                                | 1 in (25.4 mm)     | 0.70             |                         | 2.54                     | 5.58 | 9.30  | 12.3  | 14.2  | 15.1  | 15.5  | 15.6  | 15.6  | 15.8  |      |
| 1"                             | 1/8 in (3.17 mm)   | Equal Percentage |                         | 0.73                     | 0.01 | 0.02  | 0.03  | 0.04  | 0.06  | 0.09  | 0.15  | 0.26  | 0.32  | 0.34 |
|                                | 1/4 in (6.35 mm)   |                  |                         | 0.66                     | 0.05 | 0.10  | 0.14  | 0.19  | 0.29  | 0.58  | 0.93  | 1.27  | 1.63  | 1.99 |
|                                | 1/2 in (12.7 mm)   |                  |                         | 0.78                     | 0.16 | 0.32  | 0.47  | 0.60  | 0.93  | 1.74  | 2.99  | 4.41  | 5.65  | 6.49 |
| 2"                             | 1/4 in (6.35 mm)   |                  | 0.65                    | 0.10                     | 0.14 | 0.19  | 0.23  | 0.27  | 0.55  | 0.82  | 1.12  | 1.62  | 1.72  |      |
|                                | 7/16 in (11.1 mm)  |                  | 0.60                    | 0.10                     | 0.30 | 0.50  | 0.70  | 1.00  | 1.50  | 2.60  | 3.80  | 4.80  | 5.40  |      |
|                                | 5/8 in (15.8 mm)   |                  | 0.58                    | 0.30                     | 0.50 | 0.90  | 1.10  | 1.40  | 2.30  | 3.90  | 6.40  | 8.70  | 10.80 |      |
|                                | 7/8 in (22.2 mm)   |                  | 0.66                    | 0.40                     | 0.90 | 1.57  | 2.10  | 3.00  | 4.20  | 6.30  | 9.60  | 13.00 | 17.00 |      |
| <b>Cage Guided</b>             |                    |                  |                         |                          |      |       |       |       |       |       |       |       |       |      |
| 2"                             | 1 1/2 in (38mm)    |                  | Equal Percentage        | 0.75                     | 0.60 | 1.30  | 2.20  | 3.40  | 5.00  | 8.60  | 14.0  | 21.0  | 26.0  | 28.6 |
|                                | 2 in (51 mm)       | 0.76             |                         | 2.00                     | 4.00 | 6.00  | 8.00  | 11.0  | 20.0  | 33.0  | 45.0  | 51.0  | 57.0  |      |
| 3"                             | 2 in (51 mm)       | 0.75             |                         | 2.90                     | 4.90 | 7.40  | 9.50  | 12.0  | 17.4  | 28.9  | 40.8  | 48.1  | 52.6  |      |
|                                | 3 in (76 mm)       | 0.76             |                         | 4.00                     | 6.00 | 10.0  | 13.0  | 16.0  | 26.0  | 54.0  | 83.0  | 97.0  | 107   |      |
| 4"                             | 3 in (76 mm)       | 0.75             |                         | 4.00                     | 6.00 | 9.00  | 12.0  | 16.0  | 25.0  | 52.0  | 81.0  | 95.0  | 115   |      |
|                                | 4 in (102 mm)      | 0.75             |                         | 9.00                     | 13.0 | 18.0  | 26.0  | 36.0  | 64.0  | 104   | 148   | 197   | 222   |      |
| 6"                             | 4 in (102 mm)      | 0.75             |                         | 9.00                     | 13.0 | 18.0  | 26.0  | 36.0  | 64.0  | 104   | 148   | 197   | 222   |      |
|                                | 6 in (152 mm)      | 0.75             |                         | 7.00                     | 20.0 | 45.0  | 78.0  | 108   | 140   | 222   | 318   | 399   | 431   |      |
| 8"                             | 6 in (152 mm)      | 0.75             |                         | 47.0                     | 60.0 | 90.0  | 106   | 119   | 139   | 173   | 243   | 294   | 453   |      |
|                                | 8 in (203 mm)      | 0.75             |                         | 51.0                     | 53.0 | 235   | 362   | 485   | 584   | 665   | 699   | 745   | 810   |      |
| 10"                            | 6 in (152 mm)      | 0.75             |                         | 26.0                     | 37.0 | 46.0  | 53.0  | 56.0  | 58.0  | 104   | 146   | 655   | 655   |      |
|                                | 8.5 in (216 mm)    | 0.75             |                         | 28.0                     | 72.0 | 420   | 509   | 632   | 678   | 769   | 814   | 832   | 1091  |      |
| 8"                             | 8 in (203 mm)      | Modified E.P.    |                         | 0.75                     | 51.0 | 55.0  | 64.0  | 134   | 162   | 330   | 452   | 527   | 571   | 630  |
| 10"                            | 8.5 in (216 mm)    |                  | 0.75                    | 21.0                     | 22.0 | 27.0  | 103   | 209   | 429   | 596   | 663   | 695   | 884   |      |
| 2"                             | 2 in (51 mm)       | Quick Open       | 0.76                    | 0.80                     | 1.50 | 6.10  | 13.0  | 20.2  | 27.6  | 35.6  | 42.4  | 48.8  | 53.0  |      |
| 3"                             | 3 in (76 mm)       |                  | 0.76                    | 5.10                     | 21.3 | 42.4  | 63.8  | 83.0  | 97.7  | 105   | 111   | 113   | 115   |      |
| 4"                             | 4 in (102 mm)      |                  | 0.75                    | 8.20                     | 43.8 | 80.0  | 119   | 170   | 211   | 237   | 247   | 252   | 253   |      |

# HIGH PRESSURE CONTROL VALVES

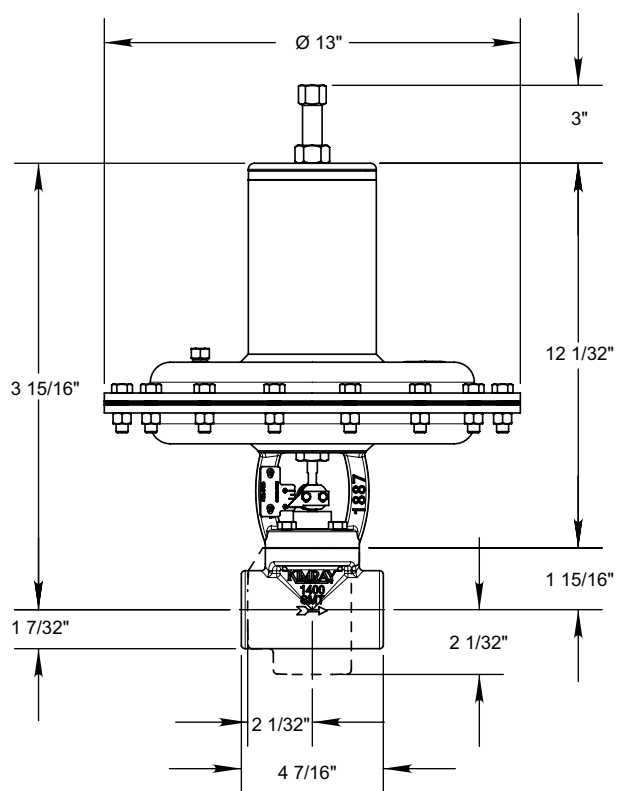


## DIMENSIONS 1" MODEL CVS

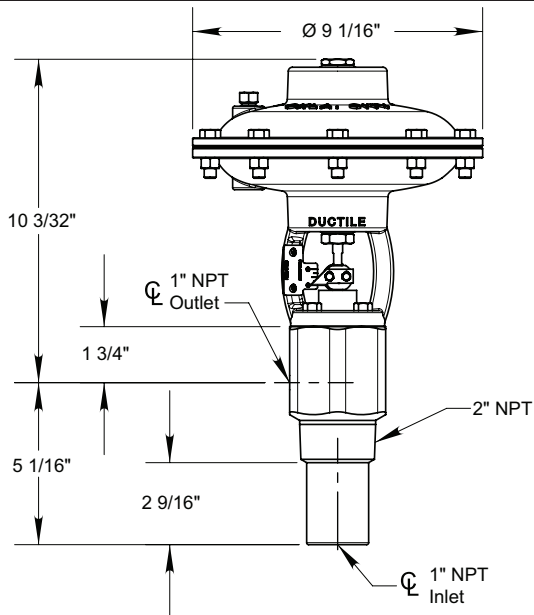
1" HPCV



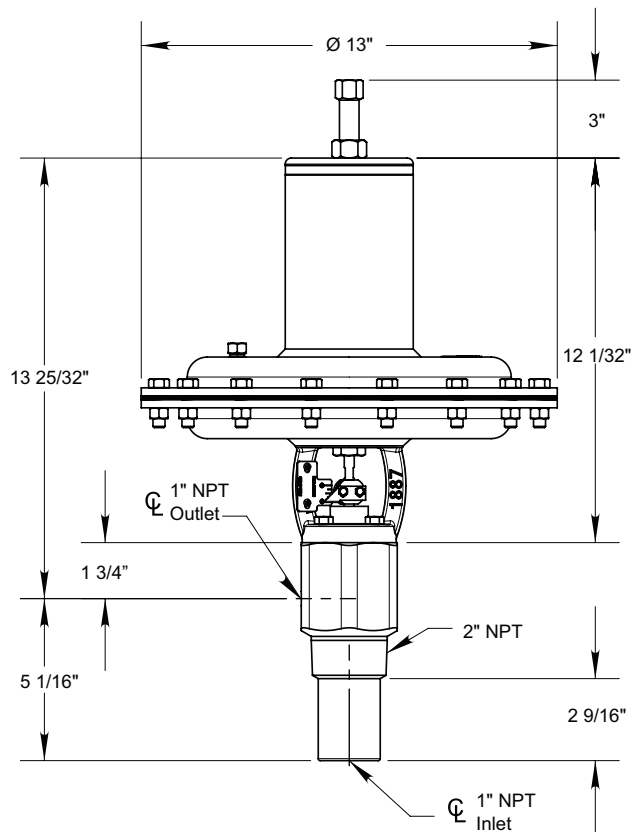
1" HPCV -65 TOPWORKS



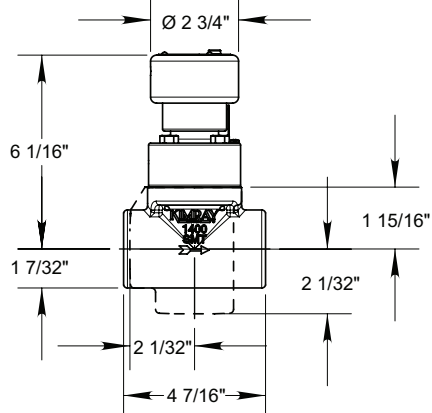
1" SMS



1" SMS -65 TOPWORKS

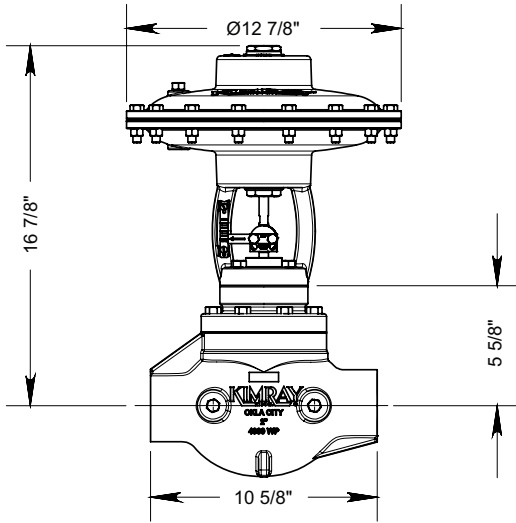


1" SMVA/T

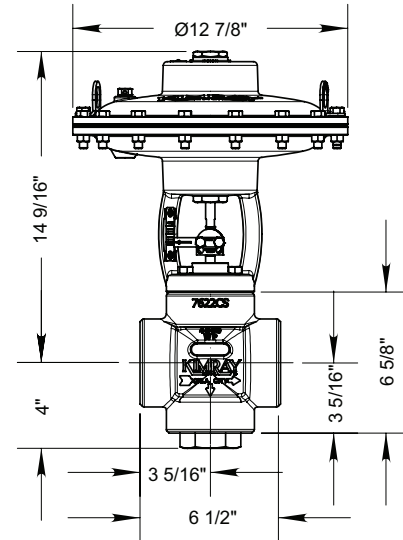




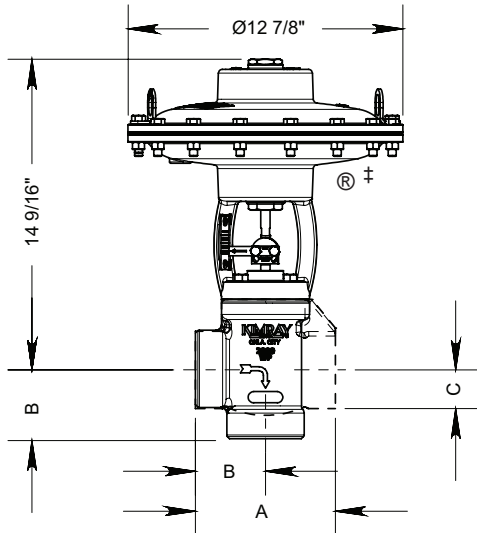
**2" HPCV PB**



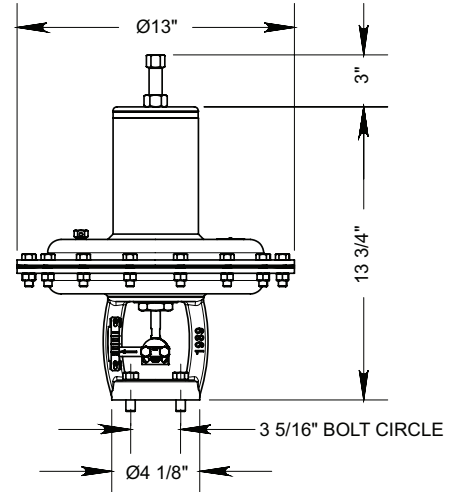
**2" SMD**



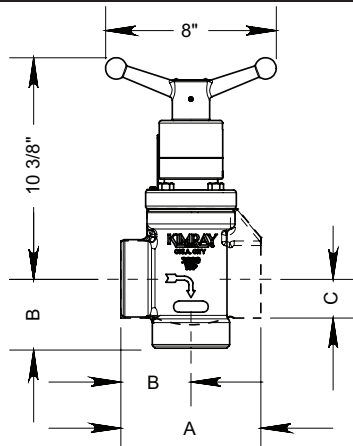
**2" HPCV**



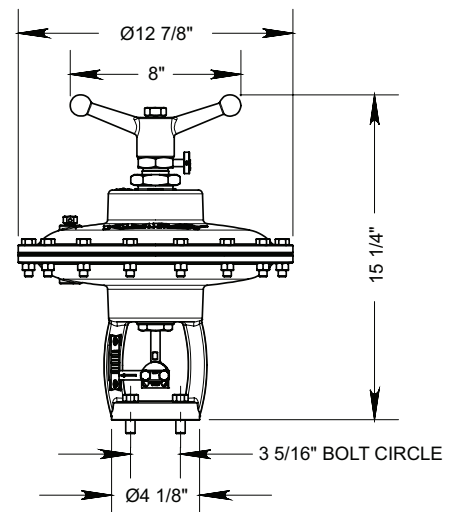
**2" -65 TOPWORKS**



**2" SMVA/T TOPWORKS**



**2" MVP TOPWORKS**



| MODEL NO. | A       | B       | C        |
|-----------|---------|---------|----------|
| 2200      | 6 9/16" | 3 9/32" | 1 13/16" |
| 2400      | 6 9/16" | 3 9/32" | 2 1/16"  |

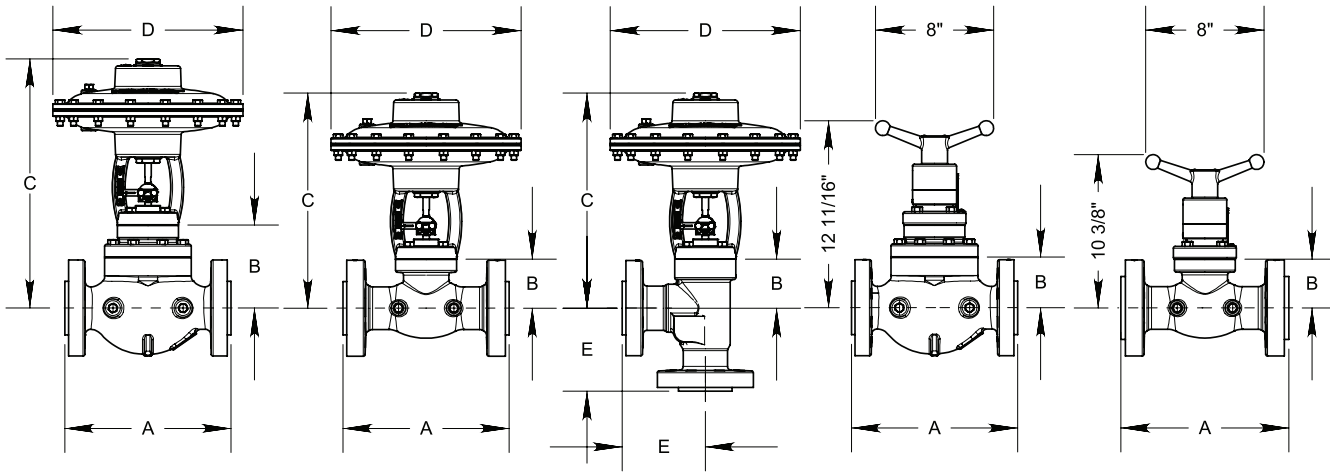
All dimensions are in inches  
Flanged body dimensions available on request.

# HIGH PRESSURE CONTROL VALVES



## DIMENSIONS

### FLANGED BODY MODEL CVS & CVC



|                 | SIZE    | BODY STYLE | A        | B        | C       | D        | E        |
|-----------------|---------|------------|----------|----------|---------|----------|----------|
| STEM GUIDED     | 1"      | 150RF      | 7 1/4"   | 1 15/16" | 10 1/2" | 9 1/8"   |          |
|                 |         | 150RTJ     | 7 5/8"   | 1 15/16" | 10 1/2" | 9 1/8"   |          |
|                 |         | 300RF      | 7 3/4"   | 1 15/16" | 10 1/2" | 9 1/8"   |          |
|                 |         | 300RTJ     | 8 1/8"   | 1 15/16" | 10 1/2" | 9 1/8"   |          |
|                 |         | 600RF      | 8 1/4"   | 1 15/16" | 10 1/2" | 9 1/8"   |          |
|                 |         | 600RTJ     | 8 1/4"   | 1 15/16" | 10 1/2" | 9 1/8"   |          |
|                 |         | 1500RF     | 10 3/4"  | 1 15/16" | 10 1/2" | 9 1/8"   |          |
|                 | 1500RTJ | 10 3/4"    | 1 15/16" | 10 1/2"  | 9 1/8"  |          |          |
|                 | 2"      | 150RF      | 10"      | 3 3/16"  | 14 1/2" | 12 7/8"  | 5"       |
|                 |         | 150RTJ     | 10 3/8"  | 3 3/16"  | 14 1/2" | 12 7/8"  | 5"       |
|                 |         | 300RF      | 10 1/2"  | 3 3/16"  | 14 1/2" | 12 7/8"  | 5 1/2"   |
|                 |         | 300RTJ     | 11"      | 3 3/16"  | 14 1/2" | 12 7/8"  | 5 1/4"   |
|                 |         | 600RF      | 11 1/4"  | 3 3/16"  | 14 1/2" | 12 7/8"  | 5 5/8"   |
|                 |         | 600RTJ     | 11 3/8"  | 3 3/16"  | 14 1/2" | 12 7/8"  | 5 5/8"   |
|                 |         | 1500RF     | 13 3/8"  | 3 3/16"  | 14 1/2" | 12 7/8"  | 7 13/32" |
|                 | 1500RTJ | 13 1/2"    | 3 3/16"  | 14 1/2"  | 12 7/8" | 7 13/32" |          |
|                 | 2500RTJ | 16 3/8"    | 3 3/16"  | 14 1/2"  | 12 7/8" |          |          |
| 2-1/16 API 5000 | 14 3/4" | 4 1/4"     | 14 1/2"  | 12 7/8"  | 7 3/8"  |          |          |
| CAGE GUIDED     | 2"      | 150RF      | 10"      | 5 5/8"   | 17"     | 12 7/8"  |          |
|                 |         | 300RF      | 10 1/2"  | 5 5/8"   | 17"     | 12 7/8"  |          |
|                 |         | 600RF      | 11 1/4"  | 5 5/8"   | 17"     | 12 7/8"  |          |
|                 |         | 1500RF     | 13 3/8"  | 5 5/8"   | 17"     | 12 7/8"  |          |
|                 |         | 1500RTJ    | 13 1/2"  | 5 5/8"   | 17"     | 12 7/8"  |          |
|                 | 3"      | 150RF      | 11 3/4"  | 7 1/4"   | 27"     | 15 3/4"  |          |
|                 |         | 300RF      | 12 1/2"  | 7 1/4"   | 27"     | 15 3/4"  |          |
|                 |         | 600RF      | 13 1/4"  | 7 1/4"   | 27"     | 15 3/4"  |          |
|                 |         | 600RTJ     | 13 3/8"  | 7 1/4"   | 27"     | 15 3/4"  |          |
|                 | 4"      | 150RF      | 13 7/8"  | 11"      | 30"     | 15 3/4"  |          |
|                 |         | 300RF      | 14 1/2"  | 11"      | 30"     | 15 3/4"  |          |
|                 |         | 600RF      | 15 1/2"  | 11"      | 30"     | 15 3/4"  |          |
|                 | 6"      | 150RF      | 17 3/4"  | 11 3/16" | 34 1/2" | 20 7/16" |          |
|                 |         | 300RF      | 18 5/8"  | 11 3/16" | 34 1/2" | 20 7/16" |          |
|                 |         | 600RF      | 20 1/16" | 11 3/16" | 34 1/2" | 20 7/16" |          |
|                 | 8"      | 150RF      | 21 3/8"  | 11 5/16" | 34 1/2" | 20 1/2"  |          |
|                 |         | 300RF      | 22 3/8"  | 11 5/16" | 34 1/2" | 20 1/2"  |          |
| 600RF           |         | 24"        | 11 5/16" | 34 1/2"  | 20 1/2" |          |          |
| 10"             | 150RF   | 26 1/2"    | 11 5/16" | 34 1/2"  | 20 1/2" |          |          |
|                 | 300RF   | 27 7/8"    | 11 5/16" | 34 1/2"  | 20 1/2" |          |          |
|                 | 600RF   | 29 9/16"   | 11 5/16" | 34 1/2"  | 20 1/2" |          |          |

All Pictures shown are for illustration purpose only. Actual product may vary due to product enhancement.

| Table 2 - Seal Options |                   |                           |
|------------------------|-------------------|---------------------------|
| Part                   | Standard Material | Optional Material         |
| Diaphragm              | Nitrile           | FKM                       |
| Packing Rings          | Nitrile           | FKM, Aflas, HSN, Graphite |
| Packing Sleeve         | Teflon            |                           |
| O-rings                | Nitrile           | FKM, Aflas, HSN           |
| Seal Ring              | Polyurethane      | Aflas                     |

| Table 3 - Seal Specifications                |                  |                |                          |                |                |                 |                  |
|--|------------------|----------------|--------------------------|----------------|----------------|-----------------|------------------|
|  |                  | NITRILE        | HIGHLY SATURATED NITRILE | FKM            | AFLAS®         | TEFLON          | GRAPHITE PACKING |
|  | Kimray Suffix    | -              | HSN                      | V              | AF             | T               | G                |
| Resistance                                   | Abrasion         | G              | G-E                      | G              | G              | E               | PF               |
|  | Acid             | F              | G-E                      | G-E            | E              | E               | G                |
|  | Chemical         | F              | F                        | E              | E              | E               | E                |
|  | Cold             | G              | G                        | P              | P              | E               | E                |
|  | Flame            | P              | P                        | E              | E              | P               | E                |
|  | Heat             | G              | E                        | E              | E              | E               | E                |
|  | Oil              | G-E            | E                        | E              | E              | E               | E                |
|  | Ozone            | P              | G                        | G-E            | E              | E               | F                |
|  | Set              | G              | G                        | G-E            | P              | P               | G                |
|  | Tear             | F              | F                        | F              | P              | E               | P                |
|  | Water/Steam      | F              | E                        | P              | G              | E               | E                |
|  | Weather          | F              | G                        | E              | E              | E               | E                |
|  | CO2              | F-G            | G                        | G              | G              | E               | E                |
|  | H2S              | P              | F                        | P              | E              | E               | E                |
| Methanol                                     | F                | E              | P                        | P              | E              | E               |                  |
| Properties                                   | Dynamic          | G              | G                        | G              | G              | P               | E                |
|  | Electrical       | F              | F                        | F              | G-E            | E               | Conductive       |
|  | Impermeability   | G              | G                        | G              | G              | E               | G                |
|  | Tensile Strength | G              | G-E                      | G              | F              | E               | P                |
| Temp. Range                                  |                  | -20° to +250°F | -20° to +300°F           | -15° to +400°F | +15° to +450°F | -450° to +500°F | -328° to +850°F  |
|  |                  | -29° to +121°C | -29° to +149°C           | -26° to +204°C | -9° to +232°C  | -268° to +260°C | -200° to +455°C  |
| RATINGS: P-POOR, F-FAIR, G-GOOD, E-EXCELLENT |                  |                |                          |                |                |                 |                  |

| <b>Table 5 - Material Options Stem Guided</b> |                          |                         |                           |
|---|--------------------------|-------------------------|---------------------------|
| <b>Part Description</b>                       | <b>Standard Material</b> | <b>Erosive Material</b> | <b>Corrosive Material</b> |
| Body  | WCB (ASTM A216)          |                         | WCB (ASTM A216) ‡         |
| Actuator                                      | Ductile (ASTM A395)      |                         |                           |
| Stuffing Box                                  | Carbon Steel (ASTM A105) |                         | 316SS (ASTM A479)         |
| Cage  | Alloy Steel (ASTM A108)  |                         | 316SS (ASTM A479)         |
| Stem  | 303SS (ASTM A582)        |                         | 316SS (ASTM A479)         |
| Plug*   | Chrome Alloy             | Tungsten Carbide        | 316SS (ASTM A479)         |
| Seat  | D-2 (ASTM A681)          | Zirconia                | 316SS (ASTM A479)         |
| Cover Bonnet (Metering Valve)                 | WCB (ASTM A216)          |                         |                           |

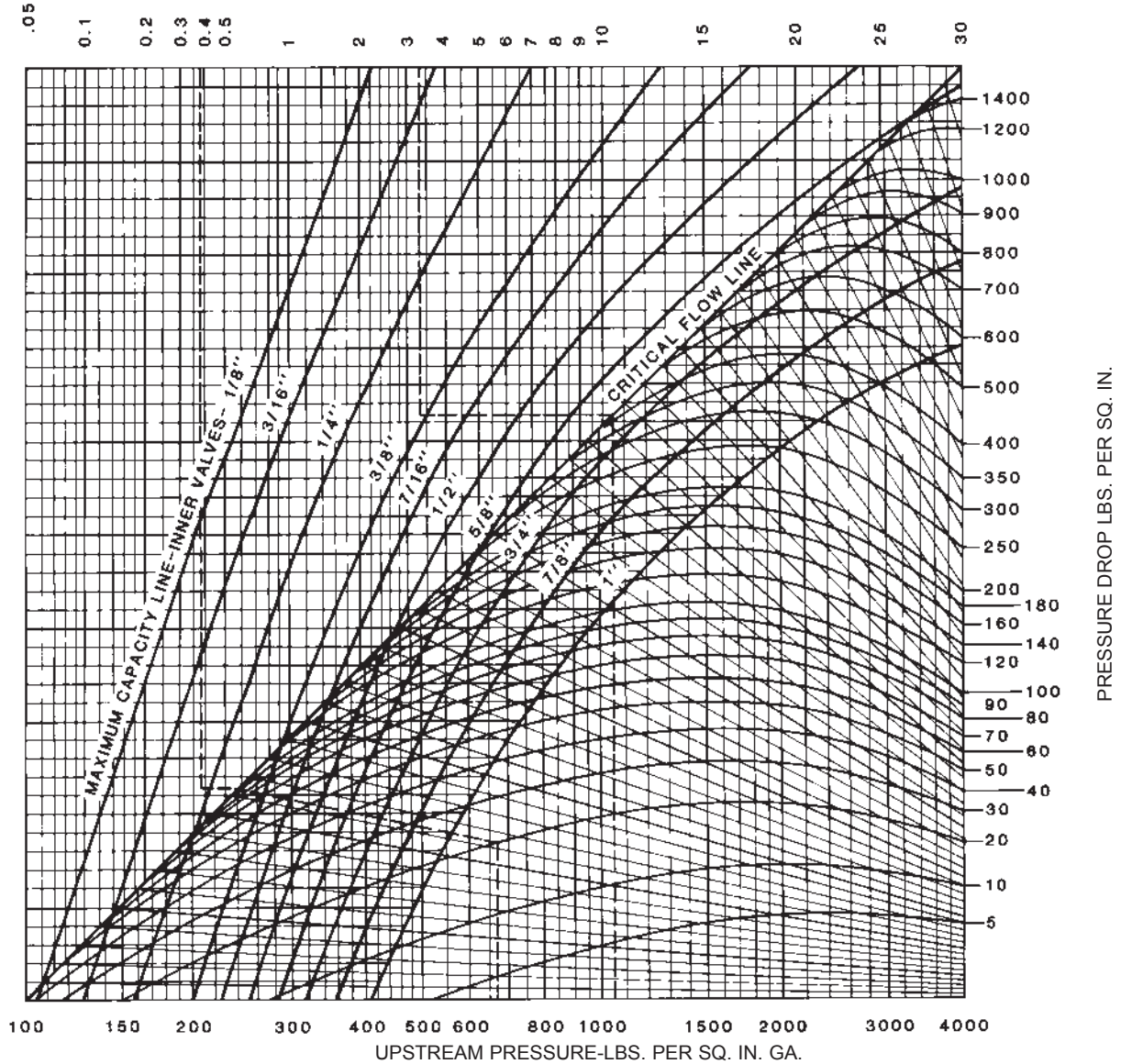
\*Material can vary by trim size. See Page 01:200.2

‡ Coated Parts available with "K" service type

| <b>Table 6 - Material Options Cage Guided</b> |                              |                                  |                           |
|---|------------------------------|----------------------------------|---------------------------|
| <b>Part Description</b>                       | <b>Standard Material</b>     | <b>Erosive Material</b>          | <b>Corrosive Material</b> |
| Body  | WCB (ASTM A216)              |                                  | WCB (ASTM A216) ‡         |
| Actuator                                      | Ductile (ASTM A395)          |                                  |                           |
| Stuffing Box                                  | 2" - 4"                      | Carbon Steel (ASTM A105)         | 316SS (ASTM A479)         |
|   | 6" - 10"                     | 316SS (ASTM A479)                |                           |
| Cover Bonnet (Upper Housing)                  | WCB (ASTM A216)              |                                  | WCB (ASTM A216) ‡         |
| Cage  | 2 & 3 inch 316SS (ASTM A479) | 4-10 inch 316SS (ASTM A351 CF8M) |                           |
| Stem  | 316SS (ASTM A479)            | 303SS (ASTM A582)                | 316SS (ASTM A479)         |
| Piston  | 316SS (ASTM A479)            | D-2 (ASTM A597)                  | 316SS (ASTM A479)         |
| Seat Disc                                     | D2 (ASTM A681)               | Zirconia                         | 316SS (ASTM A479)         |
| Ratio Plug                                    | D-2 (ASTM A597)              |                                  | 316SS (ASTM A351 CF8M)    |
| Seat  | D-2 (ASTM A681)              |                                  | 316SS (ASTM A479)         |
| Bonnet (Metering Valve)                       | WCB (ASTM A216)              |                                  |                           |

‡ Coated Parts available with "K" service type

VOLUME-MILLIONS CU. FT. PER 24 HOURS - 65 SP. GR. AT 14.4 & 60°



Gas capacities are based on pressures taken immediately upstream from the valve in a wide open position. Indicated volumes have been corrected for supercompressibility.

**HOW TO USE CHART: PRESSURE DROP LESS THAN CRITICAL FLOW with: UPSTREAM PRESSURE 670 pounds gauge; PRESSURE DROP 20 pounds; VOLUME 380,000 Cu. Ft. per 24 hours.**

Locate 670 at bottom of chart. Project a vertical line to intersect the 20 pound PRESSURE DROP line, and using sloping GUIDE LINES, project this point to the CRITICAL FLOWLINE. A horizontal line drawn through this point intersects all INNER VALVE lines at the maximum capacity is 0.43 millions of 430,000 Std. Cu. Ft. per 24 hours. A 3/8" is 0.78 and a 1/2" is 1.43. Select the inner valve size for the desired over-capacity.

**CRITICAL FLOW with: UPSTREAM PRESSURE 1050 pounds gauge. PRESSURE DROP 600 pounds. VOLUME 3.3 millions per 24 hours.**

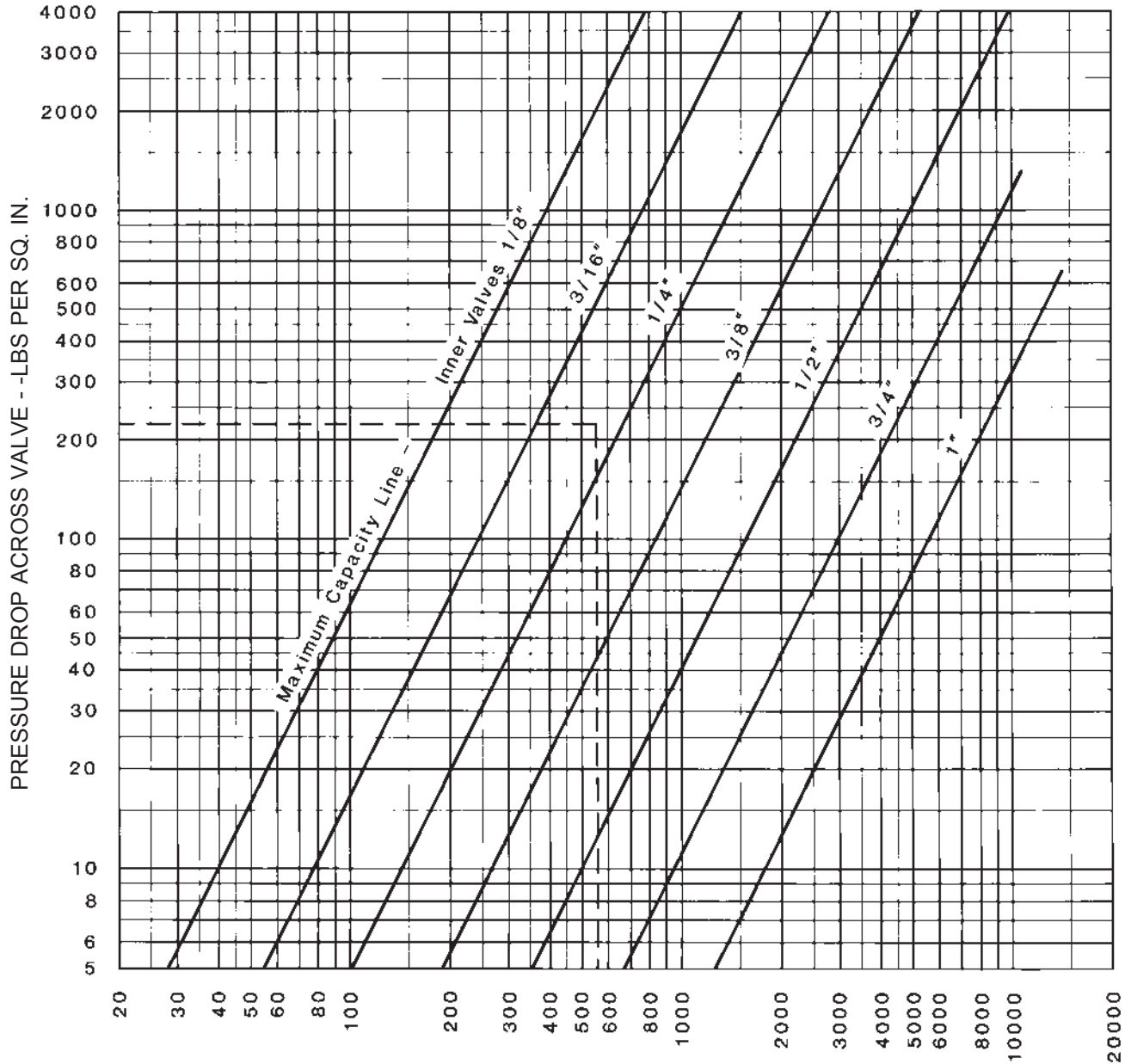
Locate 1050 at bottom of chart. Project a vertical line to intersect the CRITICAL FLOW LINE. A horizontal line drawn through this point intersects all INNER VALVE LINES at the maximum capacity of each for the above conditions. A 3/8" inner valve maximum capacity is 3.4 millions and a 1/2" is 6.4 millions. Select the inner valve size for the desired over-capacity.

\*For Gravity correction multiply above capacities by  $\sqrt{.65/G}$ ; where G equals specific gravity of gas.

See Liquid Capacity Chart for maximum pressure drops on large inner valves.

Flow rates are for steady flow conditions over a 24-hour period. Corrections should be made to deal with intermittent flow conditions.

### STEADY FLOW RATE - BARRELS WATER PER 24 HOURS



A good rule to follow when sizing liquid valves discharging from any kind of accumulator is to assume a volume at least twice than expected under steady flow conditions.

**HOW TO USE CHART:** Assume that it is desired to handle 275 barrels of water per day under steady flow conditions with a 225 psig pressure drop across the valve. Using the rule above we will use a volume of 550 barrels. The intersection of the 550 barrel line and the 225 psig pressure drop line lies between the 3/16" and 1/4" inner valve lines. Since the inner valve lines indicated maximum capacities, we must therefore select the 1/4" inner valve size to handle this volume.

\*For gravity correction multiply above capacities by  $1/\sqrt{G}$ ; where G equals specific gravity of flowing liquid.

### MAXIMUM PRESSURE DROP for LARGE INNER VALVES

| 1" CONTROL VALVES |          |        | 2" CONTROL VALVES |          |        |
|-------------------|----------|--------|-------------------|----------|--------|
| I.V.              | THROTTLE | RELIEF | I.V.              | THROTTLE | RELIEF |
| 1/2"              | 1200     | 2400   | 1"                | 650      | 1300   |
| 3/8"              | 1850     | 3700   | 3/4"              | 1350     | 2700   |

Above values are for valves furnished with standard springs for 20 psig diaphragm pressure.

NOTE: Flow rates are for steady flow conditions over a 24-hour period. Corrections should be made to deal with intermittent flow conditions.

**Table 6 - 1" Stem Guided HPCV**

| Valve Description           | ΔP           | 0 psig (0 bar)          |                         | 100 psig (6.8 bar)      |                         | 500 psig (34.4 bar)     |                         | 1000 psig (68.9 bar)    |                         | 1500 psig (103.4 bar)   |                         |
|-----------------------------|--------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                             | Spring       | Crack                   | Full                    | Crack                   | Full                    | Crack                   | Full                    | Crack                   | Full                    | Crack                   | Full                    |
| 1400 SMT PO<br>1/8" IV      | 621 (10 lbs) | 3 psig<br>(0.21 bar)    | 9.5 psig<br>(0.66 bar)  | 3 psig<br>(0.21 bar)    | 9 psig<br>(0.62 bar)    | 3 psig<br>(0.21 bar)    | 8.5 psig<br>(0.59 bar)  | 2 psig<br>(0.13 bar)    | 7 psig<br>(0.48 bar)    | 2 psig<br>(0.13 bar)    | 6 psig<br>(0.41 bar)    |
|                             | 463 (20 lbs) | 6.5 psig<br>(0.44 bar)  | 20.5 psig<br>(1.41 bar) | 6 psig<br>(0.41 bar)    | 20 psig<br>(1.37 bar)   | 6 psig<br>(0.41 bar)    | 19.5 psig<br>(1.34 bar) | 5.5 psig<br>(0.37 bar)  | 18 psig<br>(1.24 bar)   | 5.5 psig<br>(0.37 bar)  | 17.5 psig<br>(1.20 bar) |
|                             | 464 (30 lbs) | 9.5 psig<br>(0.65 bar)  | 34 psig<br>(2.34 bar)   | 9.5 psig<br>(0.65 bar)  | 34 psig<br>(2.34 bar)   | 9 psig<br>(0.62 bar)    | 33 psig<br>(2.27 bar)   | 9 psig<br>(0.62 bar)    | 32 psig<br>(2.20 bar)   | 8.5 psig<br>(0.58 bar)  | 31 psig<br>(2.13 bar)   |
| 1400 SMT PO<br>1/8" IV EP   | 621 (10 lbs) | 3.5 psig<br>(0.23 bar)  | 10 psig<br>(0.68 bar)   | 3.5 psig<br>(0.23 bar)  | 10 psig<br>(0.68 bar)   | 3 psig<br>(0.21 bar)    | 8.5 psig<br>(0.58 bar)  | 2.5 psig<br>(0.17 bar)  | 7.5 psig<br>(0.51 bar)  | 2 psig<br>(0.13 bar)    | 6 psig<br>(0.41 bar)    |
|                             | 463 (20 lbs) | 7 psig<br>(0.48 bar)    | 21.5 psig<br>(1.48 bar) | 7 psig<br>(0.48 bar)    | 21 psig<br>(0.44 bar)   | 6.5 psig<br>(0.44 bar)  | 19.5 psig<br>(1.34 bar) | 6 psig<br>(0.41 bar)    | 18.5 psig<br>(1.27 bar) | 6 psig<br>(0.41 bar)    | 17.5 psig<br>(1.20 bar) |
|                             | 464 (30 lbs) | 12.5 psig<br>(0.86 bar) | 38 psig<br>(2.61 bar)   | 12.5 psig<br>(0.86 bar) | 38 psig<br>(2.61 bar)   | 11 psig<br>(0.75 bar)   | 35.5 psig<br>(2.44 bar) | 10.5 psig<br>(0.72 bar) | 34.5 psig<br>(2.37 bar) | 10 psig<br>(0.68 bar)   | 33 psig<br>(2.27 bar)   |
| 1400 SMT PO<br>3/16" IV     | 621 (10 lbs) | 3.5 psig<br>(0.23 bar)  | 10.5 psig<br>(0.72 bar) | 3.5 psig<br>(0.23 bar)  | 10 psig<br>(0.68 bar)   | 3.5 psig<br>(0.23 bar)  | 9 psig<br>(0.62 bar)    | 3.5 psig<br>(0.23 bar)  | 7.5 psig<br>(0.51 bar)  | 3 psig<br>(0.21 bar)    | 6.5 psig<br>(0.44 bar)  |
|                             | 463 (20 lbs) | 6.5 psig<br>(0.44 bar)  | 21.5 psig<br>(1.48 bar) | 6.5 psig<br>(0.44 bar)  | 21 psig<br>(1.44 bar)   | 7.5 psig<br>(0.51 bar)  | 21 psig<br>(1.44 bar)   | 7 psig<br>(0.48 bar)    | 19.5 psig<br>(1.34 bar) | 7 psig<br>(0.48 bar)    | 18.5 psig<br>(1.27 bar) |
|                             | 464 (30 lbs) | 11 psig<br>(0.75 bar)   | 36 psig<br>(2.48 bar)   | 10.5 psig<br>(0.72 bar) | 36 psig<br>(2.48 bar)   | 11 psig<br>(0.75 bar)   | 35 psig<br>(2.41 bar)   | 11 psig<br>(0.75 bar)   | 34 psig<br>(2.34 bar)   | 10.5 psig<br>(0.72 bar) | 32.5 psig<br>(2.23 bar) |
| 1400 SMT PO<br>1/4" IV      | 621 (10 lbs) | 3 psig<br>(0.21 bar)    | 9.5 psig<br>(0.65 bar)  | 3 psig<br>(0.21 bar)    | 9 psig<br>(0.62 bar)    | 3 psig<br>(0.21 bar)    | 8.5 psig<br>(0.58 bar)  | 2.5 psig<br>(0.17 bar)  | 7.5 psig<br>(0.51 bar)  | 2.5 psig<br>(0.17 bar)  | 6.5 psig<br>(0.44 bar)  |
|                             | 463 (20 lbs) | 6 psig<br>(0.41 bar)    | 20.5 psig<br>(1.41 bar) | 6 psig<br>(0.41 bar)    | 20 psig<br>(1.37 bar)   | 6 psig<br>(0.41 bar)    | 19.5 psig<br>(1.34 bar) | 5.5 psig<br>(0.37 bar)  | 18 psig<br>(1.24 bar)   | 5.5 psig<br>(0.37 bar)  | 17 psig<br>(1.20 bar)   |
|                             | 464 (30 lbs) | 10 psig<br>(0.68 bar)   | 35 psig<br>(2.41 bar)   | 10 psig<br>(0.68 bar)   | 35 psig<br>(2.42 bar)   | 10 psig<br>(0.68 bar)   | 34 psig<br>(2.34 bar)   | 9.5 psig<br>(0.65 bar)  | 33 psig<br>(2.27 bar)   | 9 psig<br>(0.62 bar)    | 32 psig<br>(2.20 bar)   |
| 1400 SMT PO<br>1/4" IV EP   | 621 (10 lbs) | 3 psig<br>(0.20 bar)    | 10 psig<br>(0.68 bar)   | 3 psig<br>(0.20 bar)    | 9.5 psig<br>(0.65 bar)  | 2.5 psig<br>(0.17 bar)  | 8 psig<br>(0.55 bar)    | 2.5 psig<br>(0.17 bar)  | 7 psig<br>(0.48 bar)    | 2 psig<br>(0.13 bar)    | 6 psig<br>(0.41 bar)    |
|                             | 463 (20 lbs) | 6.5 psig<br>(0.44 bar)  | 21.5 psig<br>(1.48 bar) | 6.5 psig<br>(0.44 bar)  | 20 psig<br>(1.37 bar)   | 6 psig<br>(0.41 bar)    | 20 psig<br>(1.37 bar)   | 6 psig<br>(0.41 bar)    | 18.5 psig<br>(1.27 bar) | 6 psig<br>(0.41 bar)    | 17.5 psig<br>(1.20 bar) |
|                             | 464 (30 lbs) | 12 psig<br>(0.83 bar)   | 40 psig<br>(2.75 bar)   | 11.5 psig<br>(0.79 bar) | 39 psig<br>(2.68 bar)   | 9.5 psig<br>(0.66 bar)  | 35 psig<br>(2.42 bar)   | 9 psig<br>(0.62 bar)    | 33 psig<br>(2.27 bar)   | 9 psig<br>(0.62 bar)    | 32 psig<br>(2.20 bar)   |
| 1400 SMT PO<br>3/8" IV SNAP | 621 (10 lbs) | 4.5 psig<br>(0.31 bar)  | 10.5 psig<br>(0.72 bar) | 4.5 psig<br>(0.31 bar)  | 10.5 psig<br>(0.72 bar) | 5.5 psig<br>(0.38 bar)  | 9.5 psig<br>(0.66 bar)  | 6.5 psig<br>(0.44 bar)  | 8 psig<br>(0.55 bar)    | 7.5 psig<br>(0.51 bar)  | 7 psig<br>(0.48 bar)    |
|                             | 463 (20 lbs) | 7 psig<br>(0.48 bar)    | 21.5 psig<br>(1.48 bar) | 7 psig<br>(0.48 bar)    | 21 psig<br>(1.44 bar)   | 9.5 psig<br>(0.65 bar)  | 21 psig<br>(0.44 bar)   | 10.5 psig<br>(0.72 bar) | 20 psig<br>(1.37 bar)   | 11 psig<br>(0.75 bar)   | 19 psig<br>(1.31 bar)   |
|                             | 464 (30 lbs) | 11 psig<br>(0.75 bar)   | 35 psig<br>(2.41 bar)   | 11 psig<br>(0.75 bar)   | 35 psig<br>(2.41 bar)   | 13 psig<br>(0.89 bar)   | 35 psig<br>(2.42 bar)   | 14 psig<br>(0.97 bar)   | 33 psig<br>(2.27 bar)   | 15.5 psig<br>(1.06 bar) | 32 psig<br>(2.20 bar)   |
| 1400 SMT PO<br>3/8" IV      | 621 (10 lbs) | 3 psig<br>(0.20 bar)    | 9 psig<br>(0.62 bar)    | 3 psig<br>(0.20 bar)    | 9 psig<br>(0.62 bar)    | 5 psig<br>(0.34 bar)    | 9 psig<br>(0.62 bar)    | 6.5 psig<br>(0.44 bar)  | 7.5 psig<br>(0.51 bar)  | 7.5 psig<br>(0.51 bar)  | 6.5 psig<br>(0.44 bar)  |
|                             | 463 (20 lbs) | 6 psig<br>(0.41 bar)    | 20.5 psig<br>(1.41 bar) | 6 psig<br>(0.41 bar)    | 20 psig<br>(1.37 bar)   | 8.5 psig<br>(0.58 bar)  | 21 psig<br>(0.44 bar)   | 9.5 psig<br>(0.65 bar)  | 20 psig<br>(1.37 bar)   | 10.5 psig<br>(0.72 bar) | 18.5 psig<br>(1.27 bar) |
|                             | 464 (30 lbs) | 9.5 psig<br>(0.66 bar)  | 34 psig<br>(2.34 bar)   | 9.5 psig<br>(0.66 bar)  | 34 psig<br>(2.34 bar)   | 11.5 psig<br>(0.79 bar) | 33 psig<br>(2.27 bar)   | 12.5 psig<br>(0.85 bar) | 32 psig<br>(2.20 bar)   | 13.5 psig<br>(0.93 bar) | 31 psig<br>(2.14 bar)   |
| 1400 SMT PO<br>1/2" IV      | 621 (10 lbs) | 3 psig<br>(0.20 bar)    | 10.5 psig<br>(0.72 bar) | 3 psig<br>(0.20 bar)    | 10 psig<br>(0.68 bar)   | 5.5 psig<br>(0.38 bar)  | 8.5 psig<br>(0.58 bar)  | 7 psig<br>(0.48 bar)    | 7.5 psig<br>(0.51 bar)  | 9 psig<br>(0.62 bar)    | 6.5 psig<br>(0.44 bar)  |
|                             | 463 (20 lbs) | 6.5 psig<br>(0.44 bar)  | 21 psig<br>(0.44 bar)   | 6 psig<br>(0.41 bar)    | 20.5 psig<br>(1.41 bar) | 8.5 psig<br>(0.58 bar)  | 19.5 psig<br>(1.34 bar) | 10 psig<br>(0.68 bar)   | 18.5 psig<br>(1.27 bar) | 12 psig<br>(0.83 bar)   | 17.5 psig<br>(1.20 bar) |
|                             | 464 (30 lbs) | 11.5 psig<br>(0.79 bar) | 37 psig<br>(2.54 bar)   | 11 psig<br>(0.75 bar)   | 36 psig<br>(2.48 bar)   | 13.5 psig<br>(0.93 bar) | 35 psig<br>(2.41 bar)   | 15 psig<br>(1.03 bar)   | 34 psig<br>(2.34 bar)   | 17 psig<br>(1.20 bar)   | 33 psig<br>(2.27 bar)   |
| 1400 SMT PO<br>1/2" IV EP   | 621 (10 lbs) | 3.5 psig<br>(0.24 bar)  | 10 psig<br>(0.68 bar)   | 3.5 psig<br>(0.24 bar)  | 9.5 psig<br>(0.66 bar)  | 7 psig<br>(0.48 bar)    | 10 psig<br>(0.68 bar)   | 7.5 psig<br>(0.52 bar)  | 7.5 psig<br>(0.51 bar)  | 9.5 psig<br>(0.65 bar)  | 6 psig<br>(0.41 bar)    |
|                             | 463 (20 lbs) | 7 psig<br>(0.48 bar)    | 21.5 psig<br>(1.48 bar) | 7.5 psig<br>(0.51 bar)  | 21.5 psig<br>(1.48 bar) | 10.5 psig<br>(0.72 bar) | 21 psig<br>(0.44 bar)   | 12.5 psig<br>(0.86 bar) | 20.5 psig<br>(1.41 bar) | 14 psig<br>(0.97 bar)   | 19 psig<br>(1.31 bar)   |
|                             | 464 (30 lbs) | 11 psig<br>(0.75 bar)   | 37 psig<br>(2.54 bar)   | 11 psig<br>(0.75 bar)   | 37 psig<br>(2.54 bar)   | 14 psig<br>(0.97 bar)   | 35 psig<br>(2.41 bar)   | 16 psig<br>(1.10 bar)   | 34 psig<br>(2.34 bar)   | 18 psig<br>(1.24 bar)   | 33 psig<br>(2.27 bar)   |



**Table 7 - 2" Stem Guided HPCV**

| Valve Description           | ΔP               | 0 psig (0 bar)         |                         | 100 psig (6.8 bar)     |                         | 500 psig (34.4 bar)    |                         | 1000 psig (68.9 bar)    |                         | 1500 psig (103.4 bar)   |                         |
|-----------------------------|------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                             | Spring           | Crack                  | Full                    | Crack                  | Full                    | Crack                  | Full                    | Crack                   | Full                    | Crack                   | Full                    |
| 2400 SMT PO<br>1/4" EP IV   | 1245<br>(15 lbs) | 3.5 psig<br>(0.24 bar) | 15.5 psig<br>(1.06 bar) | 3 psig<br>(0.20 bar)   | 15 psig<br>(1.03 bar)   | 2.5 psig<br>(0.17 bar) | 15 psig<br>(1.03 bar)   | 2 psig<br>(0.13 bar)    | 14.5 psig<br>(1.00 bar) | 1.5 psig<br>(0.10 bar)  | 13 psig<br>(0.89 bar)   |
|                             | 538<br>(20 lbs)  | 3.5 psig<br>(0.24 bar) | 18 psig<br>(1.24 bar)   | 3.5 psig<br>(0.24 bar) | 17.5 psig<br>(1.20 bar) | 3.5 psig<br>(0.24 bar) | 17.5 psig<br>(1.20 bar) | 2.5 psig<br>(0.17 bar)  | 16.5 psig<br>(1.13 bar) | 1.5 psig<br>(0.10 bar)  | 15 psig<br>(1.03 bar)   |
|                             | 508<br>(30 lbs)  | 7.5 psig<br>(0.52 bar) | 32 psig<br>(2.20 bar)   | 7 psig<br>(0.48 bar)   | 32 psig<br>(2.20 bar)   | 6.5 psig<br>(0.44 bar) | 31 psig<br>(2.14 bar)   | 6 psig<br>(0.41 bar)    | 30 psig<br>(2.07 bar)   | 5.5 psig<br>(0.38 br )  | 29 psig<br>(2.00 bar)   |
| 2400 SMT PO<br>1/4" IV      | 1245<br>(15 lbs) | 3.5 psig<br>(0.24 bar) | 16 psig<br>(1.10 bar)   | 3.5 psig<br>(0.24 bar) | 16 psig<br>(1.10 bar)   | 3 psig<br>(0.20 bar)   | 14.5 psig<br>(1.00 bar) | 3 psig<br>(0.20 bar)    | 13 psig<br>(0.89 bar)   | 3 psig<br>(0.20 bar)    | 12.5 psig<br>(0.85 bar) |
|                             | 538<br>(20 lbs)  | 4 psig<br>(0.27 bar)   | 18.5 psig<br>(1.27 bar) | 3.5 psig<br>(0.24 bar) | 18.5 psig<br>(1.27 bar) | 3.5 psig<br>(0.24 bar) | 18 psig<br>(1.24 bar)   | 3 psig<br>(0.20 bar)    | 17.5 psig<br>(1.20 bar) | 3 psig<br>(0.20 bar)    | 16.5 psig<br>(1.13 bar) |
|                             | 508<br>(30 lbs)  | 6.5 psig<br>(0.44 bar) | 32 psig<br>(2.20 bar)   | 6.5 psig<br>(0.44 bar) | 33 psig<br>(2.27 bar)   | 7 psig<br>(0.48 bar)   | 31 psig<br>(2.14 bar)   | 6.5 psig<br>(0.44 bar)  | 30 psig<br>(2.07 bar)   | 6.5 psig<br>(0.44 bar)  | 29 psig<br>(2.00 bar)   |
| 2400 SMT PO<br>1/4" IV SNAP | 1245<br>(15 lbs) | 3.5 psig<br>(0.23 bar) | 15.5 psig<br>(1.06 bar) | 4 psig<br>(0.27 bar)   | 15.5 psig<br>(1.06 bar) | 3 psig<br>(0.20 bar)   | 15 psig<br>(1.03 bar)   | 2.5 psig<br>(0.17 bar)  | 14.5 psig<br>(1.00 bar) | 2 psig<br>(0.13 bar)    | 14 psig<br>(0.97 bar)   |
|                             | 538<br>(20 lbs)  | 4 psig<br>(0.27 bar)   | 18 psig<br>(1.24 bar)   | 4 psig<br>(0.27 bar)   | 18 psig<br>(1.24 bar)   | 3 psig<br>(0.20 bar)   | 17 psig<br>(1.22 bar)   | 2.5 psig<br>(0.17 bar)  | 17 psig<br>(1.22 bar)   | 2 psig<br>(0.13 bar)    | 16.5 psig<br>(1.13 bar) |
|                             | 508<br>(30 lbs)  | 6.5 psig<br>(0.44 bar) | 32 psig<br>(2.20 bar)   | 7 psig<br>(0.48 bar)   | 32 psig<br>(2.20 bar)   | 6 psig<br>(0.41 bar)   | 31 psig<br>(2.14 bar)   | 5 psig<br>(0.34 bar)    | 30 psig<br>(2.07 bar)   | 4 psig<br>(0.27 bar)    | 29 psig<br>(2.00 bar)   |
| 2400 SMT PO<br>3/8" IV      | 1245<br>(15 lbs) | 4 psig<br>(0.27 bar)   | 16.5 psig<br>(1.13 bar) | 4 psig<br>(0.27 bar)   | 16 psig<br>(1.10 bar)   | 3.5 psig<br>(0.23 bar) | 16 psig<br>(1.10 bar)   | 3.5 psig<br>(0.23 bar)  | 15.5 psig<br>(1.06 bar) | 3.5 psig<br>(0.23 bar)  | 15 psig<br>(1.03 bar)   |
|                             | 538<br>(20 lbs)  | 4.5 psig<br>(0.31 bar) | 18 psig<br>(1.24 bar)   | 4 psig<br>(0.27 bar)   | 18 psig<br>(1.24 bar)   | 4 psig<br>(0.27 bar)   | 17 psig<br>(1.22 bar)   | 4 psig<br>(0.27 bar)    | 16.5 psig<br>(1.13 bar) | 4 psig<br>(0.27 bar)    | 16.5 psig<br>(1.13 bar) |
|                             | 508<br>(30 lbs)  | 8 psig<br>(0.55 bar)   | 32 psig<br>(2.20 bar)   | 8 psig<br>(0.55 bar)   | 32 psig<br>(2.20 bar)   | 7.5 psig<br>(0.51 bar) | 32 psig<br>(2.20 bar)   | 7.5 psig<br>(0.51 bar)  | 31 psig<br>(2.13 bar)   | 7.5 psig<br>(0.51 bar)  | 30 psig<br>(2.07 bar)   |
| 2400 SMT PO<br>3/8" IV SNAP | 1245<br>(15 lbs) | 4 psig<br>(0.27 bar)   | 14.5 psig<br>(1.00 bar) | 3.5 psig<br>(0.23 bar) | 14.5 psig<br>(1.00 bar) | 4.5 psig<br>(0.31 bar) | 14 psig<br>(0.97 bar)   | 4.5 psig<br>(0.31 bar)  | 14 psig<br>(0.97 bar)   | 4.5 psig<br>(0.31 bar)  | 13.5 psig<br>(0.93 bar) |
|                             | 538<br>(20 lbs)  | 4 psig<br>(0.27 bar)   | 17.5 psig<br>(1.20 bar) | 4 psig<br>(0.27 bar)   | 17 psig<br>(1.22 bar)   | 5 psig<br>(0.34 bar)   | 17 psig<br>(1.22 bar)   | 5 psig<br>(0.34 bar)    | 16.5 psig<br>(1.13 bar) | 5 psig<br>(0.34 bar)    | 16 psig<br>(1.10 bar)   |
|                             | 508<br>(30 lbs)  | 7.5 psig<br>(0.51 bar) | 32 psig<br>(2.20 bar)   | 7 psig<br>(0.48 bar)   | 32 psig<br>(2.20 bar)   | 8 psig<br>(0.55 bar)   | 31 psig<br>(2.13 bar)   | 8.5 psig<br>(0.58 bar)  | 30 psig<br>(2.07 bar)   | 8.5 psig<br>(0.58 bar)  | 29 psig<br>(2.00 bar)   |
| 2400 SMT PO<br>7/16" EP IV  | 1245<br>(15 lbs) | 4 psig<br>(0.27 bar)   | 15.5 psig<br>(1.06 bar) | 4 psig<br>(0.27 bar)   | 15.5 psig<br>(1.06 bar) | 3.5 psig<br>(0.23 bar) | 15 psig<br>(1.03 bar)   | 3.5 psig<br>(0.23 bar)  | 14.5 psig<br>(1.00 bar) | 3.5 psig<br>(0.23 bar)  | 14 psig<br>(0.97 bar)   |
|                             | 538<br>(20 lbs)  | 4.5 psig<br>(0.31 bar) | 18.5 psig<br>(1.31 bar) | 4.5 psig<br>(0.31 bar) | 18.5 psig<br>(1.27 bar) | 4.5 psig<br>(0.31 bar) | 17.5 psig<br>(1.20 bar) | 4 psig<br>(0.27 bar)    | 16 psig<br>(1.10 bar)   | 4 psig<br>(0.27 bar)    | 15 psig<br>(1.03 bar)   |
|                             | 508<br>(30 lbs)  | 8 psig<br>(0.55 bar)   | 32 psig<br>(2.20 bar)   | 8 psig<br>(0.55 bar)   | 31 psig<br>(2.13 bar)   | 7.5 psig<br>(0.51 bar) | 30 psig<br>(2.07 bar)   | 7.5 psig<br>(0.51 bar)  | 29 psig<br>(2.00 bar)   | 7.5 psig<br>(0.51 bar)  | 28 psig<br>(1.93 bar)   |
| 2400 SMT PO<br>1/2" IV      | 1245<br>(15 lbs) | 4 psig<br>(0.27 bar)   | 15 psig<br>(1.03 bar)   | 4 psig<br>(0.27 bar)   | 15 psig<br>(1.03 bar)   | 4.5 psig<br>(0.31 bar) | 14.5 psig<br>(1.00 bar) | 5 psig<br>(0.34 bar)    | 13.5 psig<br>(0.93 bar) | 5 psig<br>(0.34 bar)    | 12 psig<br>(0.83 bar)   |
|                             | 538<br>(20 lbs)  | 4 psig<br>(0.27 bar)   | 17 psig<br>(1.22 bar)   | 3.5 psig<br>(0.23 bar) | 16.5 psig<br>(1.13 bar) | 4.5 psig<br>(0.31 bar) | 16.5 psig<br>(1.13 bar) | 4.5 psig<br>(0.31 bar)  | 15.5 psig<br>(1.06 bar) | 5 psig<br>(0.34 bar)    | 14 psig<br>(0.97 bar)   |
|                             | 508<br>(30 lbs)  | 7 psig<br>(0.48 bar)   | 30 psig<br>(2.07 bar)   | 7 psig<br>(0.48 bar)   | 30 psig<br>(2.07 bar)   | 8 psig<br>(0.58 bar)   | 30 psig<br>(2.07 bar)   | 8 psig<br>(0.55 bar)    | 28 psig<br>(1.93 bar)   | 8.5 psig<br>(0.58 bar)  | 27 psig<br>(1.86 bar)   |
| 2400 SMT 1/2"<br>IV SNAP    | 1245<br>(15 lbs) | 3 psig<br>(0.20 bar)   | 16 psig<br>(1.10 bar)   | 3 psig<br>(0.20 bar)   | 15 psig<br>(1.03 bar)   | 4.5 psig<br>(0.31 bar) | 14.5 psig<br>(1.00 bar) | 5 psig<br>(0.34 bar)    | 14 psig<br>(0.97 bar)   | 5 psig<br>(0.34 bar)    | 13.5 psig<br>(0.93 bar) |
|                             | 538<br>(20 lbs)  | 3.5 psig<br>(0.23 bar) | 17 psig<br>(1.22 bar)   | 3 psig<br>(0.20 bar)   | 16.5 psig<br>(1.13 bar) | 4.5 psig<br>(0.31 bar) | 16 psig<br>(1.10 bar)   | 5 psig<br>(0.34 bar)    | 15 psig<br>(1.03 bar)   | 5 psig<br>(0.34 bar)    | 14.5 psig<br>(1.00 bar) |
|                             | 508<br>(30 lbs)  | 7 psig<br>(0.48 bar)   | 32 psig<br>(2.20 bar)   | 7.5 psig<br>(0.51 bar) | 32 psig<br>(2.20 bar)   | 7.5 psig<br>(0.51 bar) | 31 psig<br>(2.14 bar)   | 7.5 psig<br>(0.51 bar)  | 30 psig<br>(2.07 bar)   | 8 psig<br>(0.55 bar)    | 29 psig<br>(2.00 bar)   |
| 2400 SMT PO<br>5/8" EP IV   | 1245 (15 lbs)    | 4 psig<br>(0.27 bar)   | 16 psig<br>(1.10 bar)   | 4 psig<br>(0.27 bar)   | 16 psig<br>(1.10 bar)   | 6 psig<br>(0.41 bar)   | 16.5 psig<br>(1.13 bar) | 7.5 psig<br>(0.51 bar)  | 16 psig<br>(1.10 bar)   | 8.5 psig<br>(0.58 bar)  | 15.5 psig<br>(1.06 bar) |
|                             | 538 (20 lbs)     | 4 psig<br>(0.27 bar)   | 19 psig<br>(1.31 bar)   | 4 psig<br>(0.27 bar)   | 19 psig<br>(1.31 bar)   | 6.5 psig<br>(0.44 bar) | 18.5 psig<br>(1.27 bar) | 7.5 psig<br>(0.51 bar)  | 17.5 psig<br>(1.20 bar) | 9 psig<br>(0.62 bar)    | 17 psig<br>(1.22 bar)   |
|                             | 508 (30 lbs)     | 8 psig<br>(0.55 bar)   | 32 psig<br>(2.20 bar)   | 8.5 psig<br>(0.58 bar) | 32 psig<br>(2.20 bar)   | 10 psig<br>(0.68 bar)  | 31 psig<br>(2.14 bar)   | 11.5 psig<br>(0.79 bar) | 30 psig<br>(2.06 bar)   | 12.5 psig<br>(1.48 bar) | 29 psig<br>(2.00 bar)   |

|                             |                  |                        |                         |                        |                         |                         |                         |                         |                         |                         |                         |
|-----------------------------|------------------|------------------------|-------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 2400 SMT PO<br>3/4" IV      | 1245<br>(15 lbs) | 5 psig<br>(0.34 bar)   | 17 psig<br>(1.72 bar)   | 5 psig<br>(0.34 bar)   | 17 psig<br>(1.72 bar)   | 7.5 psig<br>(0.51 bar)  | 14.5 psig<br>(1.00 bar) | 8.5 psig<br>(0.58 bar)  | 13 psig<br>(0.89 bar)   | 10 psig<br>(0.68 bar)   | 12 psig<br>(0.83 bar)   |
|                             | 538<br>(20 lbs)  | 5.5 psig<br>(0.37 bar) | 19 psig<br>(1.31 bar)   | 5.5 psig<br>(0.37 bar) | 19 psig<br>(1.31 bar)   | 7 psig<br>(0.48 bar)    | 17 psig<br>(1.72 bar)   | 9 psig<br>(0.62 bar)    | 16 psig<br>(1.10 bar)   | 11 psig<br>(0.75 bar)   | 14 psig<br>(0.97 bar)   |
|                             | 508<br>(30 lbs)  | 9 psig<br>(0.62 bar)   | 34 psig<br>(2.34 bar)   | 9 psig<br>(0.62 bar)   | 34 psig<br>(2.34 bar)   | 11 psig<br>(0.75 bar)   | 33 psig<br>(2.27 bar)   | 13 psig<br>(0.89 bar)   | 32 psig<br>(2.20 bar)   | 15 psig<br>(1.03 bar)   | 30 psig<br>(2.07 bar)   |
| 2400 SMT PO<br>3/4" IV SNAP | 1245<br>(15 lbs) | 4 psig<br>(0.27 bar)   | 15 psig<br>(1.03 bar)   | 4 psig<br>(0.27 bar)   | 15 psig<br>(1.03 bar)   | 6.5 psig<br>(0.44 bar)  | 14.5 psig<br>(0.96 bar) | 8 psig<br>(0.55 bar)    | 13.5 psig<br>(0.93 bar) | 9 psig<br>(0.62 bar)    | 12 psig<br>(0.83 bar)   |
|                             | 538<br>(20 lbs)  | 5 psig<br>(0.34 bar)   | 18.5 psig<br>(1.27 bar) | 5 psig<br>(0.34 bar)   | 18.5 psig<br>(1.27 bar) | 6.5 psig<br>(0.44 bar)  | 16.5 psig<br>(1.13 bar) | 8 psig<br>(0.55 bar)    | 15.5 psig<br>(1.06 bar) | 9.5 psig<br>(0.66 bar)  | 14 psig<br>(0.97 bar)   |
|                             | 508<br>(30 lbs)  | 9 psig<br>(0.62 bar)   | 32 psig<br>(2.20 bar)   | 9 psig<br>(0.62 bar)   | 32 psig<br>(2.20 bar)   | 10 psig<br>(0.68 bar)   | 31 psig<br>(2.14 bar)   | 11 psig<br>(0.75 bar)   | 30 psig<br>(2.07 bar)   | 12.5 psig<br>(0.86 bar) | 29 psig<br>(2.00 bar)   |
| 2400 SMT PO<br>7/8" EP IV   | 1245<br>(15 lbs) | 3.5 psig<br>(0.23 bar) | 15 psig<br>(1.03 bar)   | 4 psig<br>(0.27 bar)   | 15 psig<br>(1.03 bar)   | 7 psig<br>(0.48 bar)    | 14.5 psig<br>(1.00 bar) | 11 psig<br>(0.75 bar)   | 14 psig<br>(0.97 bar)   | 13.5 psig<br>(0.93 bar) | 13.5 psig<br>(0.93 bar) |
|                             | 538<br>(20 lbs)  | 3.5 psig<br>(0.23 bar) | 17.5 psig<br>(1.20 bar) | 4 psig<br>(0.27 bar)   | 17.5 psig<br>(1.20 bar) | 7.5 psig<br>(0.51 bar)  | 17 psig<br>(1.72 bar)   | 10.5 psig<br>(0.72 bar) | 16.5 psig<br>(1.13 bar) | 13.5 psig<br>(0.93 bar) | 16 psig<br>(1.10 bar)   |
|                             | 508<br>(30 lbs)  | 7 psig<br>(0.48 bar)   | 30 psig<br>(2.07 bar)   | 7.5 psig<br>(0.51 bar) | 30 psig<br>(2.07 bar)   | 10.5 psig<br>(0.72 bar) | 29 psig<br>(2.00 bar)   | 14 psig<br>(0.97 bar)   | 28 psig<br>(1.93 bar)   | 17 psig<br>(1.72 bar)   | 27 psig<br>(1.86 bar)   |
| 2400 SMT PO<br>1" IV        | 1245<br>(15 lbs) | 4.5 psig<br>(0.31 bar) | 14.5 psig<br>(1.00 bar) | 5 psig<br>(0.34 bar)   | 14 psig<br>(0.97 bar)   | 8.5 psig<br>(0.58 bar)  | 13 psig<br>(0.89 bar)   | 12.5 psig<br>(0.86 bar) | 11.5 psig<br>(0.79 bar) | 16 psig<br>(1.10 bar)   | 11 psig<br>(0.75 bar)   |
|                             | 538<br>(20 lbs)  | 4.5 psig<br>(0.31 bar) | 17 psig<br>(1.72 bar)   | 5 psig<br>(0.34 bar)   | 17 psig<br>(1.72 bar)   | 8.5 psig<br>(0.58 bar)  | 16 psig<br>(1.10 bar)   | 12.5 psig<br>(0.86 bar) | 15 psig<br>(1.03 bar)   | 17 psig<br>(1.72 bar)   | 14 psig<br>(0.97 bar)   |
|                             | 508<br>(30 lbs)  | 7 psig<br>(0.48 bar)   | 31 psig<br>(2.14 bar)   | 7.5 psig<br>(0.51 bar) | 31 psig<br>(2.14 bar)   | 12 psig<br>(0.83 bar)   | 30 psig<br>(2.07 bar)   | 16 psig<br>(1.10 bar)   | 29 psig<br>(2.00 bar)   | 19.5 psig<br>(1.34 bar) | 28 psig<br>(1.93 bar)   |
| 2400 SMT PO<br>1" IV SNAP   | 1245<br>(15 lbs) | 4.5 psig<br>(0.31 bar) | 16.5 psig<br>(1.13 bar) | 4.5 psig<br>(0.31 bar) | 16.5 psig<br>(1.13 bar) | 8.5 psig<br>(0.58 bar)  | 15.5 psig<br>(1.06 bar) | 11.5 psig<br>(0.79 bar) | 15 psig<br>(1.03 bar)   | 15 psig<br>(1.03 bar)   | 15 psig<br>(1.03 bar)   |
|                             | 538<br>(20 lbs)  | 4.5 psig<br>(0.31 bar) | 19 psig<br>(1.31 bar)   | 4.5 psig<br>(0.31 bar) | 19 psig<br>(1.31 bar)   | 8.5 psig<br>(0.58 bar)  | 16 psig<br>(1.10 bar)   | 11.5 psig<br>(0.79 bar) | 15.5 psig<br>(1.06 bar) | 15 psig<br>(1.03 bar)   | 15 psig<br>(1.03 bar)   |
|                             | 508<br>(30 lbs)  | 8 psig<br>(0.55 bar)   | 32 psig<br>(2.20 bar)   | 8 psig<br>(0.55 bar)   | 32 psig<br>(2.20 bar)   | 12 psig<br>(0.83 bar)   | 31 psig<br>(2.14 bar)   | 16 psig<br>(1.10 bar)   | 30 psig<br>(2.07 bar)   | 19.5 psig<br>(1.34 bar) | 29 psig<br>(2.00 bar)   |

| Table 8 - 2", 3", 4", 6", 8" & 10" Cage Guided HPCV |        |                       |                        |                       |                        |                        |                        |                        |                      |                        |                        |
|---|--------|-----------------------|------------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|----------------------|------------------------|------------------------|
| Valve<br>Description                                | ΔP     | 0 psig (0 bar)        |                        | 100 psig (6.8 bar)    |                        | 500 psig (34.4 bar)    |                        | 1000 psig (68.9 bar)   |                      | 1500 psig (103.4 bar)  |                        |
|   | Spring | Crack                 | Full                   | Crack                 | Full                   | Crack                  | Full                   | Crack                  | Full                 | Crack                  | Full                   |
| 2150 SMT PB<br>2 IN IV                              | 15 lbs | 3 psig<br>(0.21bar)   | 16 psig<br>(1.1bar)    | 3.5 psig<br>(0.24bar) | 16 psig<br>(1.1bar)    | 5.5 psig<br>(0.38bar)  | 15 psig<br>(1.03bar)   | 7.5 psig<br>(0.52bar)  | 14 psig<br>(0.97bar) | 9.5 psig<br>(0.66bar)  | 12 psig<br>(0.83bar)   |
|   | 20 lbs | 3 psig<br>(0.21bar)   | 19 psig<br>(1.31bar)   | 3 psig<br>(0.21bar)   | 18 psig<br>(1.24bar)   | 5.5 psig<br>(0.38bar)  | 17 psig<br>(1.17bar)   | 8 psig<br>(0.55bar)    | 16 psig<br>(1.1bar)  | 8.5 psig<br>(0.59bar)  | 15 psig<br>(1.03bar)   |
|   | 30 lbs | 6 psig<br>(0.41bar)   | 32 psig<br>(2.21bar)   | 7 psig<br>(0.48bar)   | 31 psig<br>(2.14bar)   | 8 psig<br>(0.55bar)    | 30 psig<br>(2.07bar)   | 10.5 psig<br>(0.72bar) | 29 psig<br>(2bar)    | 12.5 psig<br>(0.86bar) | 28 psig<br>(1.93bar)   |
| 3150 FMT PB<br>3" IV                                | 30 lbs | 6 psig<br>(0.41bar)   | 30 psig<br>(2.07bar)   | 6.5 psig<br>(0.45bar) | 27.5 psig<br>(1.9bar)  | 10.5 psig<br>(0.72bar) | 27 psig<br>(1.86bar)   | 13.5 psig<br>(0.93bar) | 25 psig<br>(1.72bar) | 17 psig<br>(1.17bar)   | 22 psig<br>(1.52bar)   |
| 3150 FMT PB<br>3" IV- PC                            | 30 lbs | Shut                  | 27 psig<br>(1.86bar)   | Shut                  | 28 psig<br>(1.93bar)   | Shut                   | 30.5 psig<br>(2.1bar)  | Shut                   | 33 psig<br>(2.28bar) | Shut                   | 36.5 psig<br>(2.52bar) |
| 4150 FMT PB   | 30 lbs | 8.5 psig<br>(0.59bar) | 32 psig<br>(2.21bar)   | 8.5 psig<br>(0.59bar) | 32 psig<br>(2.21bar)   | 8 psig<br>(0.55bar)    | 29.5 psig<br>(2.03bar) | 7.5 psig<br>(0.52bar)  | 27 psig<br>(1.86bar) | 6 psig<br>(0.41bar)    | 24.5 psig<br>(1.69bar) |
| 4150 FMT PB<br>4 IN IV PC                           | 30 lbs | Shut                  | 31 psig<br>(2.14bar)   | Shut                  | 32.5 psig<br>(2.24bar) | Shut                   | 34.5 psig<br>(2.38bar) | Shut                   | 37 psig<br>(2.55bar) | Shut                   | 39.5 psig<br>(2.72bar) |
| 6150 FMT PB<br>6 IN IV                              | 30 lbs | 8 psig<br>(0.55bar)   | 29 psig<br>(2bar)      | 9.5 psig<br>(0.66bar) | 28 psig<br>(1.93bar)   | 10.5 psig<br>(0.72bar) | 27 psig<br>(1.86bar)   | 11 psig<br>(0.76bar)   | 25 psig<br>(1.72bar) | 11.5 psig<br>(0.79bar) | 22 psig<br>(1.52bar)   |
| 8150 FMT PB<br>8 IN IV                              | 30 lbs | 8 psig<br>(0.55bar)   | 29 psig<br>(2bar)      | 8.5 psig<br>(0.59bar) | 27.5 psig<br>(1.9bar)  | 10 psig<br>(0.69bar)   | 26.5 psig<br>(1.83bar) | 10.5 psig<br>(0.72bar) | 24 psig<br>(1.65bar) | 10.5 psig<br>(0.72bar) | 21.5 psig<br>(1.48bar) |
| 10150 FMT PB<br>8 IN IV                             | 30 lbs | 7.5 psig<br>(0.52bar) | 28.5 psig<br>(1.97bar) | 8.5 psig<br>(0.59bar) | 27.5 psig<br>(1.9bar)  | 9.5 psig<br>(0.66bar)  | 26 psig<br>(1.79bar)   | 10 psig<br>(0.69bar)   | 24 psig<br>(1.65bar) | 10.5 psig<br>(0.72bar) | 21.5 psig<br>(1.48bar) |

# HIGH PRESSURE CONTROL VALVES



## CODE BUILDER MODEL CVS (STEM GUIDED)

Series:

**CV = Control Valves**

Model:

**S = Stem Guided**

Line Size:

**1 = 1 NPS**

**2 = 2 NPS**

End Connection:

Body Type:

**A = Angle**

**T = Thru**

**D = Dual**

Shell Material:

**W = WCB Steel**

Inner Valve Size:

Actuator:

- 0 = No Actuator
- 1 = 3 - 15 psi Spring Fail Close
- 2 = 6 - 30 psi Spring Fail Close**
- 3 = 9 - 45 psi Spring Fail Close
- 4 = 3 - 15 psi Spring Fail Open
- 5 = 6 - 30 psi Spring Fail Open
- 6 = 9 - 45 psi Spring Fail Open

- 7 = - 65 Fail Close
- 8 = Metering Valve (EP trim only)
- J = 2 - 10 psi Spring Fail Close (1" only)
- K = 4 - 20 psi Spring Fail Close
- L = 2 - 10 psi Spring Fail Open (1" only)
- M = 4 - 20 psi Spring Fail Open

- S2 = 2000 psi FNPT
- S4 = 4000 psi FNPT
- S6 = 6000 psi FNPT
- AR = 150 RF
- BR = 300 RF
- DR = 600 RF
- FR = 900/1500 RF
- GR = 2500 RF
- DJ = 600 RTJ
- FJ = 900/1500 RTJ
- GJ = 2500 RTJ
- P5 = API 5000

|           | 1" Line Size |            |      | 2" Line Size |            |      |
|-----------|--------------|------------|------|--------------|------------|------|
|           | Linear       | Quick Open | E.P. | Linear       | Quick Open | E.P. |
| 1/8"      | 02L          | 02Q        | 02E  |              |            |      |
| 3/16"     | 03L          | 03Q        |      |              |            |      |
| 1/4"      | 04L          | 04Q        | 04E  | 04L          | 04Q        | 04E  |
| 3/8"      | 06L          | 06Q        |      | 06L          | 06Q        |      |
| 7/16"     |              |            |      |              |            | 07E  |
| 1/2"      | 08L          | 08Q        | 08E  | 08L          | 08Q        |      |
| 5/8"      |              |            |      |              |            | 10E  |
| 3/4"      |              |            |      | 12L          | 12Q        |      |
| 7/8"      |              |            |      |              |            | 14E  |
| <b>1"</b> |              | 16Q        |      | <b>16L</b>   | 16Q        |      |
| 1 1/2"    |              |            |      |              | 24Q        |      |

| Service Type:              | Trim Materials (Stem - Plug - Seat) |                 |                 |
|----------------------------|-------------------------------------|-----------------|-----------------|
|                            | Linear                              | Quick Open      | E.P.            |
| <b>S = Standard</b>        | <b>S3-CR-D2</b>                     | <b>S3-CB-CB</b> | <b>S3-CR-D2</b> |
| C = Corrosive              | S6-S6-S6                            | N/A             | S6-S6-S6        |
| K = Corrosive with Coating | S3-CB-ZR                            | S3-CB-ZR        | S3-CB-ZR        |
| E = Erosive                | S3-CB-ZR                            | S3-CB-ZR        | S3-CB-ZR        |
| M = Mixed Duty             | S7-S7-S7                            | N/A             | S7-S7-S7        |

**CV S 2 S2 T W 16L 2 S**

Options: Additional cost and lead times will apply  
If multiple options required input in sequential order  
Leave blank if no options required

- 1 = NACE Certification (Corrosive Option Only)
- 2 = Hydrostatic Test Certification
- 3 = MTR (Shell Components)
- A = AFLAS Elastomers (Green)
- E = VEE Packing
- G = Graphite Vee Packing
- H = HSN Elastomers
- V = FKM Elastomers (Yellow)
- X = Export (Hydrostatic test, MTR & 3.1)

Not all selections available on all products listed.  
See product pages 01:10.1 - 01:10.4 for available options