

# Regulators

## Pressure Regulating Valve

# 403 Series

## Pilot-Operated

|                                  |                                             |
|----------------------------------|---------------------------------------------|
| Model                            | <b>403 Series</b>                           |
| Service                          | <b>Steam &amp; Air</b>                      |
| Sizes                            | <b>1/2" – 4"</b>                            |
| Connections                      | <b>NPT, 150# FLG, 300# FLG</b>              |
| Body Material                    | <b>Ductile Iron</b>                         |
| Seat & Disc                      | <b>Hardened 420 Stainless Steel (55 Rc)</b> |
| <b>Max Inlet Pressure</b>        | <b>450 PSIG</b>                             |
| <b>Min Inlet Pressure</b>        | <b>20 PSIG</b>                              |
| <b>Max Differential Pressure</b> | <b>250 PSI</b>                              |
| <b>Min Differential Pressure</b> | <b>15% of Inlet Pressure (10 PSI min)</b>   |

### Design Pressure/Temperature Rating – PMA/TMA

|          |                  |
|----------|------------------|
| NPT      | 450 PSIG @ 650°F |
| 150# FLG | 150 PSIG @ 566°F |
| 300# FLG | 450 PSIG @ 650°F |



PRESSURE  
Regulators

### Typical Applications

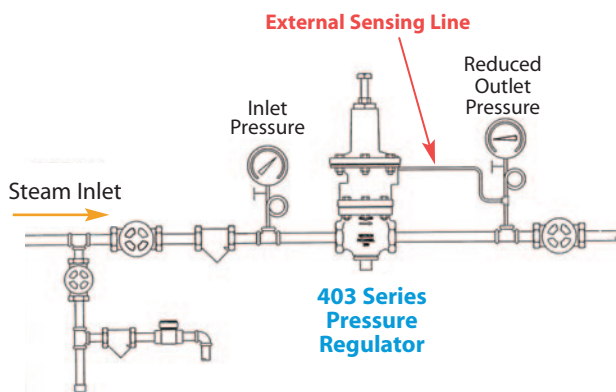
The **403 Series** pilot-operated (piston-actuated) pressure regulating valves are used for pressure reduction on steam mains and other process equipment. Pilot-operated regulators will maintain a constant and accurate downstream pressure regardless of fluctuations in supply pressure or usage. These regulators can be supplied with an optional internal sensing line which simplifies installation. Piston-actuated regulators are more compact than Diaphragm-actuated regulators. The 403 Series contains all stainless steel internals for high-pressure applications up to 450 PSIG. The Double-Spring option is available for a wider range of reduced pressures.

### Features & Options

- Pilot-operated regulators minimize outlet pressure fluctuations even when load varies
- Internal Sensing option (If requested, the regulator can be modified to internally sense pressure, eliminating the need for an external sensing line)
- Ductile Iron body to handle increased pressure and temperature
- Hardened stainless steel seat and disc (55 Rc)

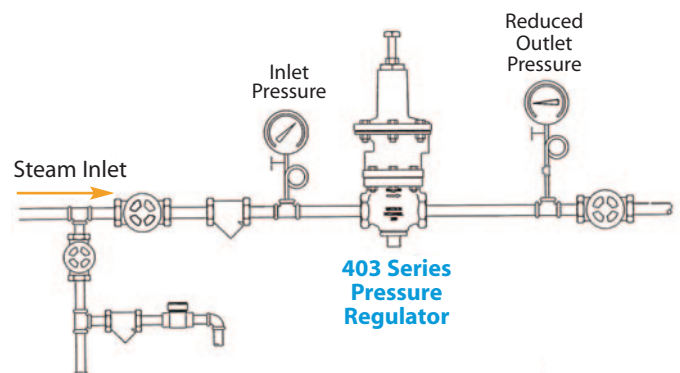
### Pressure Reducing Station with External Sensing Line

**External Sensing (standard)**  
(requires sensing line)



### Pressure Reducing Station with Internal Sensing Line

**Internal Sensing Option**  
(Specially drilled internal sensing path eliminates the need for an external sensing line)

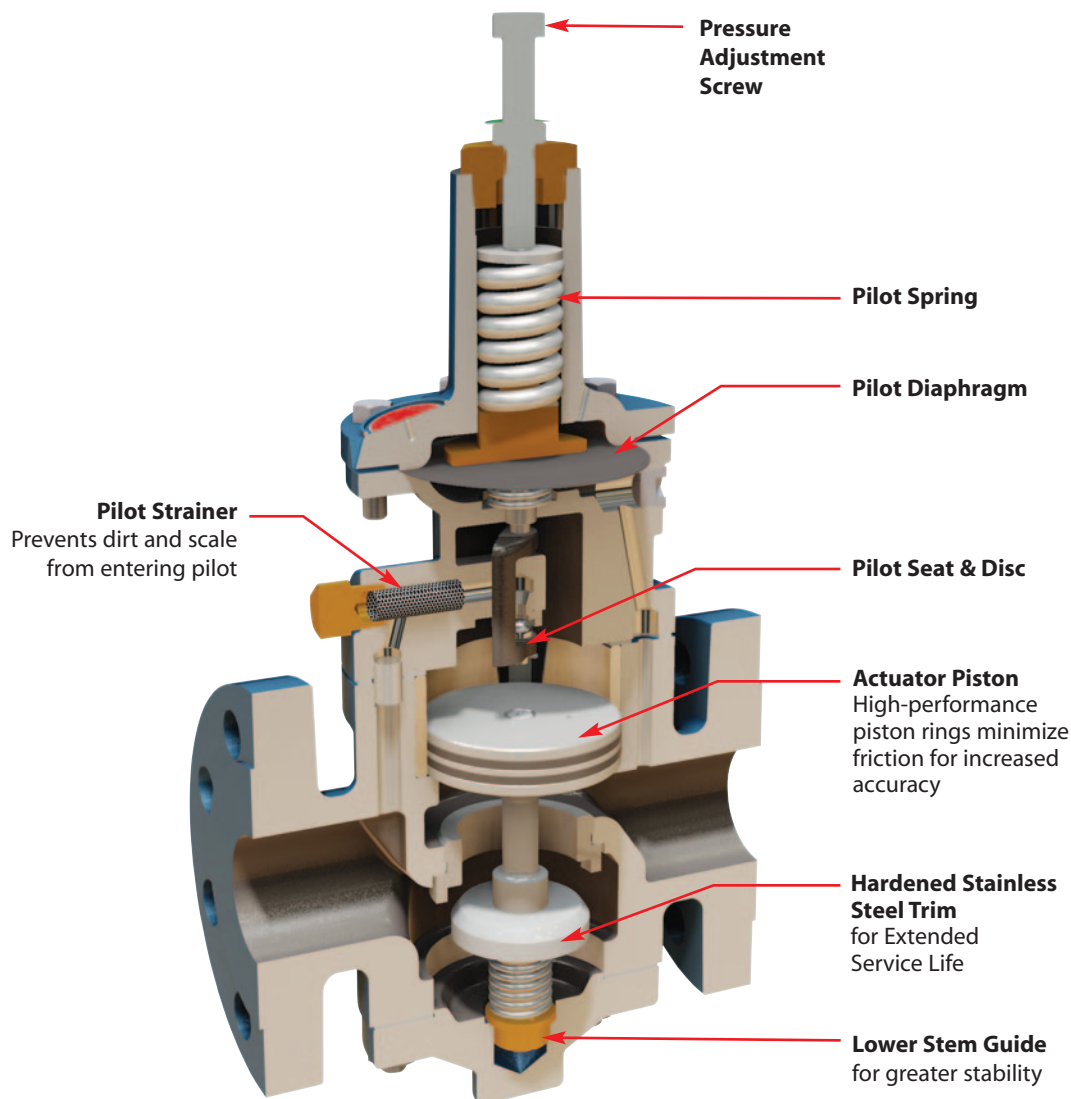


# Regulators

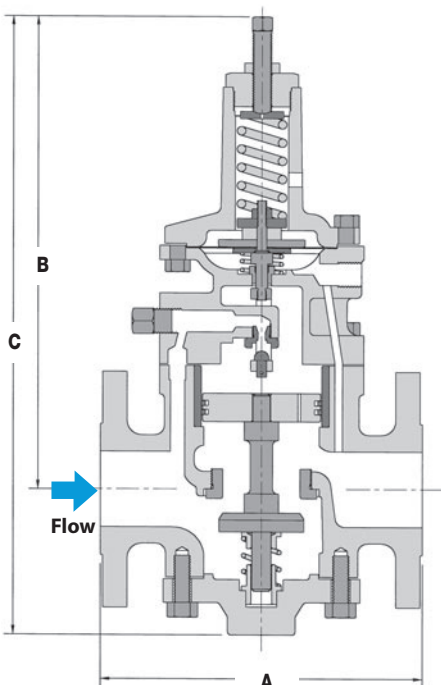
## Pressure Regulating Valve

# 403 Series

Pilot-Operated



**PRESSURE**  
Regulators



### DIMENSIONS — inches

| Size   | Face-to-Face<br>A |                 |                 | Centerline to Top<br>B |                  | Overall Height<br>C |                  |
|--------|-------------------|-----------------|-----------------|------------------------|------------------|---------------------|------------------|
|        | NPT<br>Threaded   | 150#<br>Flanged | 300#<br>Flanged | Single<br>Spring       | Double<br>Spring | Single<br>Spring    | Double<br>Spring |
| 1/2"   | 4 1/2             |                 |                 | 12                     | 14 3/8           | 14 3/8              | 16 3/4           |
| 3/4"   | 4 1/2             |                 |                 | 12                     | 14 3/8           | 14 3/8              | 16 3/4           |
| 1"     | 4 1/2             |                 |                 | 12                     | 14 3/8           | 14 3/8              | 16 3/4           |
| 1 1/4" | 8 3/16            |                 |                 | 12 3/4                 | 15 1/8           | 16 1/8              | 18 1/2           |
| 1 1/2" | 8 3/16            |                 |                 | 12 3/4                 | 15 1/8           | 16 1/8              | 18 1/2           |
| 2"     | 8 3/4             | 8 1/4           | 8 3/4           | 13                     | 15 3/8           | 17 1/8              | 19 1/2           |
| 2 1/2" |                   | 9 1/8           | 9 3/4           | 13 3/4                 | 16 1/8           | 18 1/4              | 20 5/8           |
| 3"     |                   | 9 3/4           | 10 1/2          | 14 3/4                 | 16 1/8           | 19 3/4              | 22 1/8           |
| 4"     |                   | 13 1/2          | 14              | 16                     | 18 3/8           | 24                  | 26 3/8           |

# Regulators

## Pressure Regulating Valve

**403 Series**  
Pilot-Operated

### How to Size/Order

From the Capacity chart, find the inlet pressure and required regulator outlet pressure. Follow across chart to nearest capacity (steam, air) that meets or slightly exceeds demand requirements. Follow vertically up to determine appropriate size. When exact application values are not shown, interpolate between values. From the spring range chart, select the spring range that accommodates the required outlet set pressure. Specify Internal or External (remote) Pressure sensing.

#### Example:

Application: 12,500 lbs/hr of 300 PSIG Steam reduced to 125 PSIG  
Model Code: **403-17-N-0010-R** (2" 403 Series Valve, 100-200 PSIG spring range, with external sensing)

**Note:** Flange selection may reduce pressure/temperature ratings.

| Size/Connection                                                 | Model Code *           | Weight lbs |
|-----------------------------------------------------------------|------------------------|------------|
| <b>REMOTE Pressure Sensing - Requires External Sensing Line</b> |                        |            |
| 1/2" NPT                                                        | <b>403-12-N-X-R</b>    | 20         |
| 3/4" NPT                                                        | <b>403-13-N-X-R</b>    | 20         |
| 1" NPT                                                          | <b>403-14-N-X-R</b>    | 20         |
| 1 1/4" NPT                                                      | <b>403-15-N-X-R</b>    | 37         |
| 1 1/2" NPT                                                      | <b>403-16-N-X-R</b>    | 38         |
| NPT                                                             | <b>403-17-N-X-R</b>    | 54         |
| 2" 150# FLG                                                     | <b>403-17-F150-X-R</b> | 54         |
| 300# FLG                                                        | <b>403-17-F300-X-R</b> | 56         |
| 2 1/2" 150# FLG                                                 | <b>403-18-F150-X-R</b> | 66         |
| 300# FLG                                                        | <b>403-18-F300-X-R</b> | 69         |
| 3" 150# FLG                                                     | <b>403-19-F150-X-R</b> | 88         |
| 300# FLG                                                        | <b>403-19-F300-X-R</b> | 96         |
| 4" 150# FLG                                                     | <b>403-20-F150-X-R</b> | 174        |
| 300# FLG                                                        | <b>403-20-F300-X-R</b> | 182        |
| <b>INTERNAL Pressure Sensing - No Sensing Line Required</b>     |                        |            |
| 1/2" NPT                                                        | <b>403-12-N-X-I</b>    | 20         |
| 3/4" NPT                                                        | <b>403-13-N-X-I</b>    | 20         |
| 1" NPT                                                          | <b>403-14-N-X-I</b>    | 20         |
| 1 1/4" NPT                                                      | <b>403-15-N-X-I</b>    | 37         |
| 1 1/2" NPT                                                      | <b>403-16-N-X-I</b>    | 38         |
| NPT                                                             | <b>403-17-N-X-I</b>    | 54         |
| 2" 150# FLG                                                     | <b>403-17-F150-X-I</b> | 54         |
| 300# FLG                                                        | <b>403-17-F300-X-I</b> | 56         |
| 2 1/2" 150# FLG                                                 | <b>403-18-F150-X-I</b> | 66         |
| 300# FLG                                                        | <b>403-18-F300-X-I</b> | 69         |
| 3" 150# FLG                                                     | <b>403-19-F150-X-I</b> | 88         |
| 300# FLG                                                        | <b>403-19-F300-X-I</b> | 96         |
| 4" 150# FLG                                                     | <b>403-20-F150-X-I</b> | 174        |
| 300# FLG                                                        | <b>403-20-F300-X-I</b> | 182        |

X = Spring Code (reference Spring Selection Table).



### 403 Spring Selection Table

| Reduced Outlet Pressure PSI | Spring # | Code = X    | Color                          |
|-----------------------------|----------|-------------|--------------------------------|
| <b>SINGLE Spring Ranges</b> |          |             |                                |
| 0 to 10                     | #13      | <b>0013</b> | Blue & yellow                  |
| 10 to 50                    | #14      | <b>0014</b> | Black & yellow                 |
| 40 to 100                   | #9       | <b>0009</b> | Red & yellow                   |
| 100 to 200                  | #10      | <b>0010</b> | Green & blue                   |
| <b>DOUBLE Spring Ranges</b> |          |             |                                |
| 30 to 125                   | #14 & #9 | <b>1409</b> | Red & yellow<br>Black & yellow |
| 50 to 200                   | #9 & #10 | <b>0910</b> | Red & yellow<br>Green & blue   |

Note: For 200 - 280 PSI use Bellville washers (Code = **0015**)

#### Notes:

#### Must Specify Spring Code when Ordering:

Use the 403 Spring Selection Table to specify the proper spring(s) based on reduced pressure range by replacing the "X" with Spring Code from chart.

Internal Sensing (not available with 0-10 PSI range)

#### Pressure Sensing Codes:

Code R - Remote Pressure Sensing  
Code I - Internal Pressure Sensing

#### Example Model Code:

1) **403-15-N-0014-R**  
(403 Series, 1 1/4" NPT, 10-50 PSI, Remote Pressure Sensing)

| CAPACITIES — Steam (lbs/hr); Air (SCFM) |               |            |     |      |      |        |      |        |      | Inlet/Outlet Pressures (PSIG) |      |        |       |       |       |       |       |
|-----------------------------------------|---------------|------------|-----|------|------|--------|------|--------|------|-------------------------------|------|--------|-------|-------|-------|-------|-------|
| Inlet Press.                            | Outlet Press. | 1/2", 3/4" |     | 1"   |      | 1 1/4" |      | 1 1/2" |      | 2"                            |      | 2 1/2" |       | 3"    |       | 4"    |       |
| Cv Factors                              |               | 3.5        |     | 8.5  |      | 12     |      | 17     |      | 26                            |      | 55     |       | 77    |       | 98    |       |
| 20                                      | 0-10          | 175        | 60  | 425  | 145  | 600    | 204  | 850    | 289  | 1300                          | 442  | 2750   | 935   | 3850  | 1309  | 4900  | 1666  |
| 30                                      | 0-10          | 270        | 88  | 655  | 213  | 924    | 300  | 1309   | 425  | 2002                          | 650  | 4235   | 1375  | 5929  | 1925  | 7546  | 2450  |
|                                         | 20            | 203        | 67  | 493  | 162  | 696    | 228  | 986    | 323  | 1508                          | 494  | 3190   | 1045  | 4466  | 1463  | 5684  | 1862  |
| 50                                      | 0-20          | 385        | 130 | 935  | 315  | 1320   | 444  | 1870   | 629  | 2860                          | 962  | 6050   | 2035  | 8470  | 2849  | 10780 | 3626  |
|                                         | 30            | 343        | 116 | 833  | 281  | 1176   | 396  | 1666   | 561  | 2548                          | 858  | 5390   | 1815  | 7546  | 2541  | 9604  | 3234  |
| 100                                     | 0-50          | 690        | 231 | 1675 | 561  | 2364   | 792  | 3349   | 1122 | 5122                          | 1716 | 10835  | 3630  | 15169 | 5082  | 19306 | 6468  |
|                                         | 60            | 637        | 214 | 1547 | 519  | 2184   | 732  | 3094   | 1037 | 4732                          | 1586 | 10010  | 3355  | 14014 | 4697  | 17836 | 5978  |
|                                         | 80            | 455        | 151 | 1105 | 366  | 1560   | 516  | 2210   | 731  | 3380                          | 1118 | 7150   | 2365  | 10010 | 3311  | 12740 | 4214  |
| 125                                     | 0-60          | 865        | 287 | 2100 | 697  | 2964   | 984  | 4199   | 1394 | 6422                          | 2132 | 13585  | 4510  | 19019 | 6314  | 24206 | 8036  |
|                                         | 70            | 805        | 270 | 1955 | 655  | 2760   | 924  | 3910   | 1309 | 5980                          | 2002 | 12650  | 4235  | 17710 | 5929  | 22540 | 7546  |
|                                         | 100           | 588        | 196 | 1428 | 476  | 2016   | 672  | 2856   | 952  | 4368                          | 1456 | 9240   | 3080  | 12936 | 4312  | 16464 | 5488  |
| 150                                     | 0-70          | 1019       | 343 | 2474 | 833  | 3492   | 1176 | 4947   | 1666 | 7566                          | 2548 | 16005  | 5390  | 22407 | 7546  | 28518 | 9604  |
|                                         | 100           | 858        | 287 | 2083 | 697  | 2940   | 984  | 4165   | 1394 | 6370                          | 2132 | 13475  | 4510  | 18865 | 6314  | 24010 | 8036  |
|                                         | 125           | 609        | 214 | 1479 | 519  | 2088   | 732  | 2958   | 1037 | 4524                          | 1586 | 9570   | 3355  | 13398 | 4697  | 17052 | 5978  |
| 200                                     | 0-100         | 1337       | 445 | 3247 | 1080 | 4584   | 1524 | 6494   | 2159 | 9932                          | 3302 | 21010  | 6985  | 29414 | 9779  | 37436 | 12446 |
|                                         | 150           | 1001       | 333 | 2431 | 808  | 3432   | 1140 | 4862   | 1615 | 7436                          | 2470 | 15730  | 5225  | 22022 | 7315  | 28028 | 9310  |
|                                         | 175           | 739        | 245 | 1794 | 595  | 2532   | 840  | 3587   | 1190 | 5486                          | 1820 | 11605  | 3850  | 16247 | 5390  | 20678 | 6860  |
| 250                                     | 0-125         | 1652       | 550 | 4012 | 1335 | 5664   | 1884 | 8024   | 2669 | 12272                         | 4082 | 25960  | 8635  | 36344 | 12089 | 46256 | 15386 |
|                                         | 175           | 1358       | 452 | 3298 | 1097 | 4656   | 1548 | 6596   | 2193 | 10088                         | 3354 | 21340  | 7095  | 29876 | 9933  | 38024 | 12642 |
|                                         | 200           | 1138       | 378 | 2763 | 918  | 3900   | 1296 | 5525   | 1836 | 8450                          | 2808 | 17875  | 5940  | 25025 | 8316  | 31850 | 10584 |
| 300                                     | 0-150         | 2016       | 665 | 4896 | 1615 | 6912   | 2280 | 9792   | 3230 | 14976                         | 4940 | 31680  | 10450 | 44352 | 14630 | 56448 | 18620 |
|                                         | 200           | 2016       | 665 | 4896 | 1615 | 6912   | 2280 | 9792   | 3230 | 14976                         | 4940 | 31680  | 10450 | 44352 | 14630 | 56448 | 18620 |
|                                         | 250           | 1250       | 417 | 3035 | 1012 | 4284   | 1428 | 6069   | 2023 | 9282                          | 3094 | 19635  | 6545  | 27489 | 9163  | 34986 | 11662 |
| 400                                     | 0-200         | 2657       | 875 | 6452 | 2125 | 9108   | 3000 | 12903  | 4250 | 19734                         | 6500 | 41745  | 13750 | 58443 | 19250 | 74382 | 24500 |
|                                         | 280           | 2146       | 711 | 5211 | 1726 | 7356   | 2436 | 10421  | 3451 | 15938                         | 5278 | 33715  | 11165 | 47201 | 15631 | 60074 | 19894 |
| 450                                     | 0-225         | 2975       | 984 | 7225 | 2389 | 10200  | 3372 | 14450  | 4777 | 22100                         | 7306 | 46750  | 15455 | 65450 | 21637 | 83300 | 27538 |
|                                         | 280           | 2975       | 984 | 7225 | 2389 | 10200  | 3372 | 14450  | 4777 | 22100                         | 7306 | 46750  | 15455 | 65450 | 21637 | 83300 | 27538 |

Note: For capacities of other gases multiply the air capacities by the following factors: Argon-0.85 CO<sub>2</sub>-0.81 Helium-2.69 Nitrogen-1.02



<https://vaportec.com.ve/>