

# Type S402Y Direct-Operated Pressure Reducing Regulator

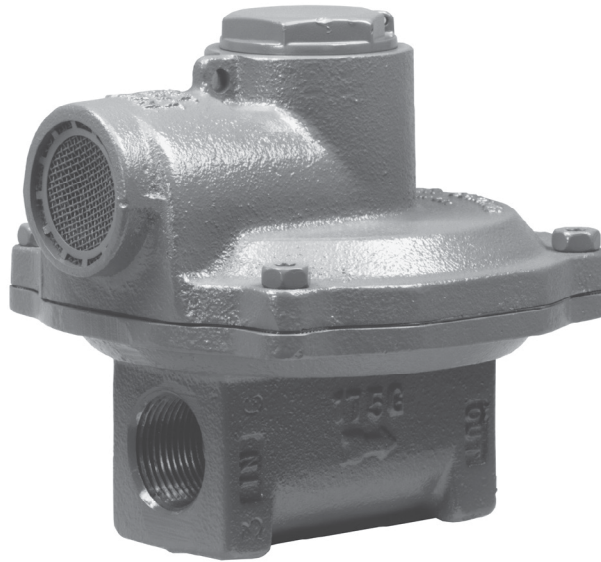


Figure 1. Type S402Y Pressure Reducing Regulator

## Features

- **Built for Corrosive Environments**—The cast iron body and spring case are built to withstand moisture, salt air and other corrosive environments.
- **Materials**—Field proven construction materials provide maximum corrosion protection and long service life.
- **Internal Relief**—The Type S402Y regulator has high capacity, factory set internal relief to help minimize over-pressurization of the downstream system.
- **Fixed Factor Measurement**—The control accuracy of the Type S402Y regulator provides fixed-factor billing capabilities throughout the available spring ranges, and it is specifically applicable for use in 2 psig / 0.14 bar piping systems within the natural gas industry.
- **Equipment Flexibility**—Different orifice tubes and relief valve assemblies are available to meet unique service conditions and they are easily field-interchanged.
- **High Flow Rates**—Suitable for many commercial installations.
- **Control Accuracy**—Unique patented flow-through trim design provides boost control for high accuracy in regulation. The molded diaphragm improves setpoint repeatability and minimizes diaphragm effect.

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## Specifications

### Body Sizes and End Connection Styles<sup>(1)</sup>

NPS 3/4 x 3/4 and 1 x 1, NPT

### Maximum Operating Inlet Pressure<sup>(2)</sup>

125 psig / 8.6 bar

### Maximum Allowable Emergency Inlet Pressure<sup>(2)</sup>

175 psig / 12.1 bar

### Allowable Outlet Pressure (Casing)<sup>(2)</sup>

**Emergency:** 10 psig / 0.69 bar

**Maximum Operating to Avoid Internal Part**

**Damage:** 5 psig / 0.35 bar

### Outlet Pressure Ranges<sup>(2)</sup>

See Table 2

### Orifice Sizes

See Table 1

### Flow Coefficients

**Wide-Open C<sub>g</sub> for External Relief Sizing**

See Table 1

C<sub>i</sub>: 35

**IEC Sizing Coefficient**

X<sub>t</sub>: 0.775

F<sub>d</sub>: 0.50

F<sub>L</sub>: 0.89

### Typical Regulating Capacities

See Tables 3 and 4 and Capacity Information section

### Factory Adjustable Internal Relief Performance (Type S402Y only)

See Table 5 and Figure 3

### Construction Materials

**Body and Lower Casing:** Cast iron

**O-ring:** Nitrile (NBR)

**Closing Cap:** ASA thermoplastic (provides UV-ray protection)

**Adjusting Screw:** Delrin® and Zinc-plated steel

**Spring Case:** Cast iron

**Relief Valve Spring:** Stainless steel

**Vent Flapper Assembly:** Delrin and 302 Stainless steel

**Cam Stem:** Delrin

**Diaphragm:** Nitrile (NBR)

**Diaphragm Head:** Delrin

**Orifice Tube Assembly:** Delrin / Nylon (PA) / Nitrile (NBR)

**Control Spring, Relief Valve Spring, Relief Valve Spring Seat and Vent Screen:**

Stainless steel

**Gasket:** Neoprene (CR)

### Material Temperature Capabilities<sup>(2)</sup>

-20 to 160°F / -29 to 71°C

### Pressure Registration

Internal

### Spring Case Vent Connection

1 NPT with removable screen (**standard**)

3 NPT with removable screen (optional)

### Spring Case Vent and Body Mounting Positions

See Figure 5

### External Dimensions

See Figure 6

### Approximate Weight

3.75 pounds / 2 kg

1. End connections threaded to other than ASME standards can usually be supplied.

2. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.

## Introduction

The Type S402Y is the same as the Type S402 regulator except the Type S402Y has cast iron diaphragm casings and the lower casing is integral with the body.

The Type S402Y direct-operated, spring-loaded regulators provide economical pressure-reducing control in corrosive environments for residential and small commercial applications. Typically, the Type S402Y is used to reduce gas distribution pressures down to a range from 4.5-inches w.c. to 2.5 psig / 11 mbar to 0.17 bar.

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The Type S402Y regulator has high capacity factory adjustable internal relief to help minimize overpressurization of the downstream system. Any excess outlet pressure above the start-to-discharge point of the relief valve spring, moves the diaphragm off the relief valve seat, allowing excess pressure to bleed out through the screened, spring case vent.

## Principle of Operation

Inlet pressure flows through the open orifice around the valve disk and disk holder, around the cam stem down the remaining length of the orifice tube and

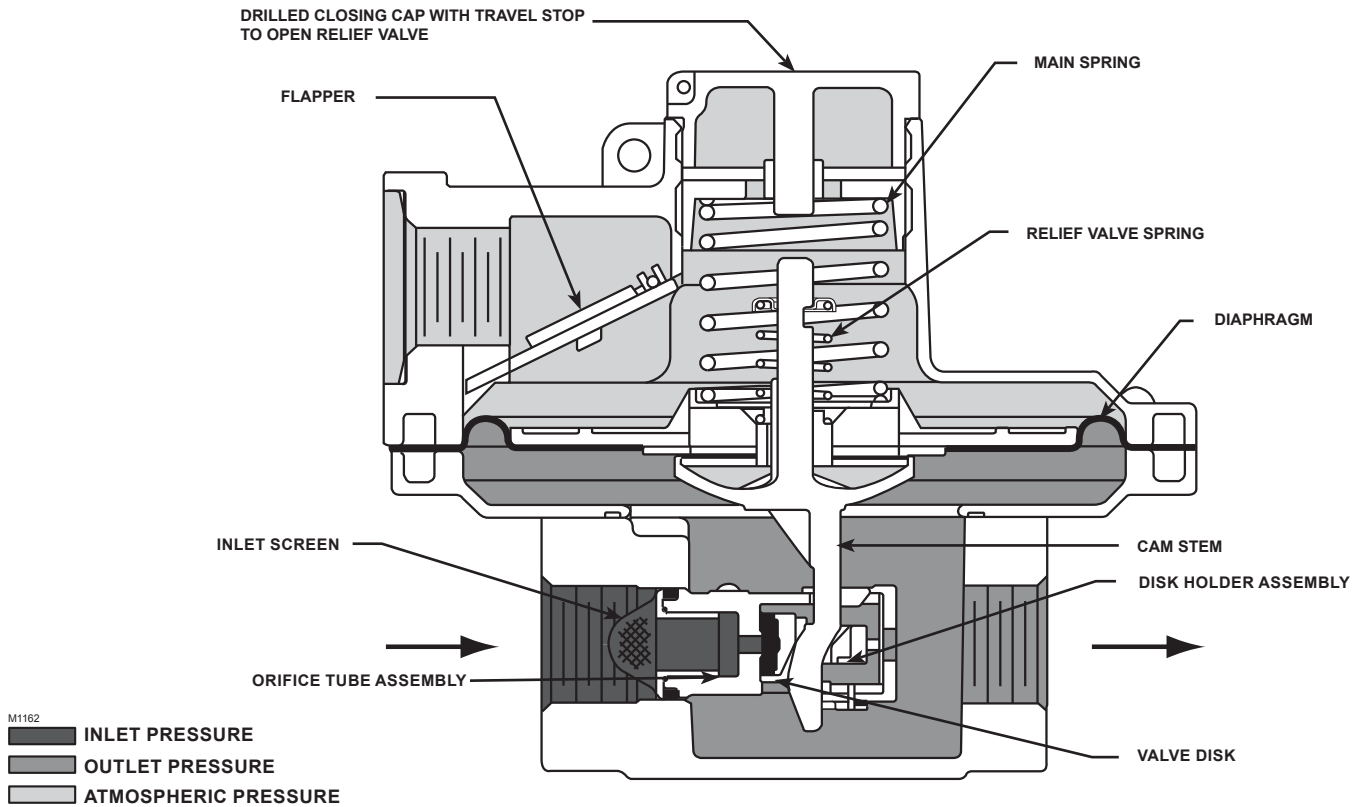


Figure 2. Type S402Y Operational Schematic

into the outlet of the regulator body. However, not all of the pressure passes directly from the inlet to the outlet of the regulator. Pressure is channelled through openings in the orifice tube and pressurizes the cavity formed by the body and diaphragm/diaphragm head/cam stem assembly. When downstream demand is reduced, the pressure under the diaphragm increases. This pressure overcomes the regulator setting (which is set by a spring) and moves the diaphragm assembly upwards. This upward motion is transferred to the cam stem which in turn bears against the sliding contact point on the back side of the disk holder.

The inclined surface of the cam then forces the disk holder toward the orifice and reduces gas flow. If a higher volume flow rate is demanded downstream, the pressure under the diaphragm decreases. The control spring force pushes the diaphragm/diaphragm head/cam stem assembly downward and the valve disk moves away from the orifice.

At the lockup (complete shutoff) position the ratio of diaphragm travel to disk travel is 4 to 1 giving the regulator an effective 4 to 1 lever ratio for positive lockup.

The cam is characterized for higher downstream demand to produce a mechanical boost effect.

Type S402Y regulator includes an internal relief valve for overpressure protection. If the downstream pressure exceeds the regulator setting and the regulator is not able to achieve complete shutoff (lockup) due to foreign matter lodged between the orifice and the valve disk or a failure in the valve disk, the regulator diaphragm assembly moves upwards trying to push the valve disk against the orifice. The valve disk and disk holder being pressed against the orifice will prevent the cam stem from being able to travel any further upward in conjunction with the diaphragm assembly. The continued leakage of the inlet pressure into the regulator cavity will then force the diaphragm and diaphragm head up off of the seating area of the relief valve overcoming the relief valve spring which was pressing them together. The resulting gap will allow pressure to exit the regulator cavity and exhaust through the openings in the diaphragm head and out the spring case vent to atmosphere.

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**Table 1. Orifice Sizes and  $C_g$  Coefficients**

| ORIFICE SIZE |     | ORIFICE COLOR CODE | WIDE-OPEN $C_g$ FOR RELIEF SIZING | MAXIMUM OPERATING PRESSURE FOR OPTIMUM PERFORMANCE <sup>(1)</sup> |     |
|--------------|-----|--------------------|-----------------------------------|---|-----|
| Inch         | mm  |                    |                                   | psig  | bar |
| 1/8          | 3.2 | Blue               | 12.5                              | 125   | 8.6 |
| 3/16         | 4.8 | Green              | 28.2                              | 80  | 5.5 |
| 1/4          | 6.4 | Brown              | 50.0                              | 60  | 4.1 |

1. Maximum operating inlet pressure is 125 psig / 8.6 bar for all orifice sizes. The optimum performance is based on 2-inch w.c. / 5 mbar boost or 1-inch w.c. / 2 mbar droop.

**Table 2. Outlet Pressure Ranges and Control Spring Data**

| OUTLET PRESSURE RANGES                         | CONTROL SPRING DATA |            |               |      |             |      |
|--|---------------------|------------|---------------|------|-------------|------|
|  | Part Number         | Color      | Wire Diameter |      | Free length |      |
|  |                     |            | Inch          | mm   | Inch        | mm   |
| 4.5 to 6-inch w.c. / 11 to 15 mbar             | T13539T0012         | Red        | 0.070         | 1.78 | 2.50        | 63.5 |
| 5.5 to 8-inch w.c. / 14 to 20 mbar             | T13527T0012         | Yellow     | 0.067         | 1.70 | 2.59        | 65.8 |
| 7.5 to 9.5-inch w.c. / 19 to 24 mbar           | T13563T0012         | Olive drab | 0.067         | 1.70 | 3.24        | 82.3 |
| 9.5 to 13-inch w.c. / 24 to 32 mbar            | T13529T0012         | Green      | 0.075         | 1.91 | 3.00        | 76.2 |
| 13-inch w.c. to 1.5 psig / 32 mbar to 0.10 bar | T13564T0012         | Unpainted  | 0.120         | 3.05 | 1.93        | 49.0 |
| 1.5 to 2.5 psig / 0.10 to 0.17 bar             | T13536T0012         | Blue       | 0.120         | 3.05 | 2.60        | 66.0 |

## Installation

The regulator may be installed in any position as shown in Figure 5. However, the spring case vent should be pointed down. If gas escaping through the Type S402Y internal relief valve could constitute a hazard, the spring case vent must be piped to a location where escaping gas will not be hazardous. In this case, obstruction-free tubing or piping at least equal to the vent size in diameter with a minimum number of bends should be used and a screened vent should be installed on the end of the vent pipe. On all installations, the vent or the end of the vent pipe must be protected from anything that might clog it. Dimensions are shown in Figure 6.

## Overpressure Protection

The wide-open  $C_g$  for relief sizing along with the capacity information should be used in choosing appropriate overpressure protection devices to ensure that none of the limits in the Specifications section, Table 1 or 2 are exceeded.

Overpressuring any portion of a regulator or associated equipment may cause leakage, parts damage or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas. Regulator operation within ratings

does not prevent the possibility of damage from external sources or from debris in the pipeline. A regulator should be inspected for damage after any overpressure condition.

## Capacity Information

The high efficiency flow-through design provides maximum capacity for a given orifice size. Tables 3 and 4 give S402Y Series regulator flow capacities at selected inlet pressures and outlet pressure settings. Flows are in SCFH (60°F and 14.7 psia) of 0.6 specific gravity natural gas at 60°F. To determine equivalent capacities for air, propane, butane or nitrogen, multiply the listed capacity by the following appropriate conversion factors: 0.775 for air, 0.625 for propane, 0.547 for butane or 0.789 for nitrogen. For gases of other specific gravities, multiply the given capacities by 0.775 and divide by the square root of the appropriate specific gravity. If capacity is desired in normal cubic meters per hour (Nm<sup>3</sup>/h) at 0°C and 1.01325 bar, multiply SCFH by 0.0268.

To determine wide-open flow capacities for relief sizing of 0.6 specific gravity natural gas at 60°F at critical pressure drops (absolute outlet pressure equal to up to approximately one-half of the absolute inlet pressure),

**Table 3. Typical Regulating Capacities for NPS 3/4 x 3/4 and 1 x 1 body sizes at 5 to 11-inch w.c. / 12 to 27 mbar Outlet Pressure Settings**

| OUTLET PRESSURE SETTING,<br>CONTROL SPRING RANGE,<br>SPRING PART NUMBER<br>AND DROOP   | INLET PRESSURE  |      | CAPACITIES IN SCFH / Nm <sup>3</sup> /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |      |                  |      |                 |      |
|--|---|------|---|------|------------------|------|-----------------|------|
|  |   |      | Orifice Size  |      |                  |      |                 |      |
|  | psig  | bar  | 1/8 / 3.2 Blue  |      | 3/16 / 4.8 Green |      | 1/4 / 6.4 Brown |      |
|  |   |      | Inch  | mm   | Inch             | mm   | Inch            | mm   |
| 5-inch w.c. / 12 mbar setting<br><br>4.5 to 6-inch w.c. /<br>11 to 15 mbar<br>T13539T0012, Red<br><br>1-inch w.c. / 2 mbar droop<br>2-inch w.c. / 5 mbar boost     | 1   | 0.07 | 100   | 2.7  | 180              | 4.8  | 330             | 8.8  |
|  | 2   | 0.14 | 160   | 4.3  | 290              | 7.8  | 500             | 13.4 |
|  | 3   | 0.21 | 190   | 5.1  | 360              | 9.7  | 650             | 17.4 |
|  | 5   | 0.34 | 255   | 6.8  | 475              | 12.7 | 860             | 23.1 |
|  | 10  | 0.69 | 360   | 9.7  | 670              | 18.0 | 1280            | 34.3 |
|  | 15  | 1.0  | 440   | 11.8 | 820              | 22.0 | 1420            | 38.1 |
|  | 20  | 1.4  | 510   | 13.7 | 960              | 25.7 | 1650            | 44.2 |
|  | 40  | 2.8  | 790   | 21.2 | 1520             | 40.7 | 2440            | 65.4 |
|  | 60  | 4.1  | 1120  | 30.0 | 2120             | 56.8 | 2650            | 71.0 |
|  | 80  | 5.5  | 1420  | 38.1 | 2600             | 69.7 | ----            | ---- |
|  | 100   | 6.9  | 1720  | 46.1 | ----             | ---- | ----            | ---- |
|  | 125   | 8.6  | 1680  | 45.0 | ----             | ---- | ----            | ---- |
|  | 7-inch w.c. / 17 mbar setting<br><br>5.5 to 8-inch w.c. /<br>14 to 20 mbar<br>T13527T0012, Yellow<br><br>1-inch w.c. / 2 mbar droop<br>2-inch w.c. / 5 mbar boost | 1    | 0.07  | 90   | 2.4              | 170  | 4.6             | 265  |
| 2  |   | 0.14 | 150   | 4.0  | 265              | 7.1  | 470             | 12.6 |
| 3  |   | 0.21 | 190   | 5.1  | 340              | 9.1  | 610             | 16.4 |
| 5  |   | 0.34 | 255   | 6.8  | 450              | 12.1 | 840             | 22.5 |
| 10   |   | 0.69 | 370   | 9.9  | 680              | 18.2 | 1300            | 34.8 |
| 15   |   | 1.0  | 450   | 12.1 | 900              | 24.1 | 1440            | 38.6 |
| 20   |   | 1.4  | 520   | 13.9 | 1060             | 28.4 | 1660            | 44.5 |
| 40   |   | 2.8  | 820   | 22.0 | 1720             | 46.1 | 2480            | 66.5 |
| 60   |   | 4.1  | 1120  | 30.0 | 2325             | 62.3 | 2840            | 76.1 |
| 80   |   | 5.5  | 1420  | 38.1 | 2730             | 73.2 | ----            | ---- |
| 100  |   | 6.9  | 1780  | 47.7 | ----             | ---- | ----            | ---- |
| 125  |   | 8.6  | 1880  | 50.4 | ----             | ---- | ----            | ---- |
| 11-inch w.c. / 27 mbar setting<br><br>9.5 to 13-inch w.c. /<br>24 to 32 mbar<br>T13529T0012, Green<br><br>1-inch w.c. / 2 mbar droop<br>2-inch w.c. / 5 mbar boost |   | 1    | 0.07  | 85   | 2.3              | 140  | 3.8             | 215  |
|  | 2   | 0.14 | 145   | 3.9  | 250              | 6.7  | 395             | 10.6 |
|  | 3   | 0.21 | 185   | 5.0  | 340              | 9.1  | 565             | 15.1 |
|  | 5   | 0.34 | 250   | 6.7  | 445              | 11.9 | 775             | 20.8 |
|  | 10  | 0.69 | 370   | 9.9  | 740              | 19.8 | 1120            | 30.0 |
|  | 15  | 1.0  | 440   | 11.8 | 920              | 24.7 | 1360            | 36.5 |
|  | 20  | 1.4  | 520   | 13.9 | 1080             | 28.9 | 1680            | 45.0 |
|  | 40  | 2.8  | 800   | 21.4 | 1710             | 45.8 | 2500            | 67.0 |
|  | 60  | 4.1  | 1040  | 27.9 | 2325             | 62.3 | 2720            | 72.9 |
|  | 80  | 5.5  | 1440  | 38.6 | 2800             | 75.0 | ----            | ---- |
|  | 100   | 6.9  | 1760  | 47.2 | ----             | ---- | ----            | ---- |
|  | 125   | 8.6  | 1660  | 44.5 | ----             | ---- | ----            | ---- |

use the following formula (convert according to the factors in the preceding paragraph if necessary).

$$Q = (P_{1\text{ abs}})(C_g)(1.29)$$

where,

- Q = Flow capacity in SCFH
- P<sub>1 abs</sub> = Absolute inlet pressure in psia (P<sub>1</sub> gauge plus 14.7)
- C<sub>g</sub> = Relief gas sizing coefficient from Table 1

If pressure drops will be lower than critical (absolute outlet pressure greater than approximately one-half the absolute inlet pressure), use the Fisher® valve sizing slide rule or the sizing nomographs in Catalog 10.

## Type S402Y Internal Relief Performance

The Type S402Y internal relief regulator has been designed to provide superior relief performance. A variety of springs are available to allow various levels of overpressure protection. The relief setting is fixed at the factory, thus further adjustment in the field is not achievable.

Backup means of opening the internal relief valve are provided by the closing cap extension (Figure 3) in the Type S402Y regulator. Should emergency conditions exist that would prevent normal relief operation, the closing cap extension will act as a travel stop for the relief valve stem. Since the diaphragm continues to rise as pressure builds, it lifts off the relief valve and thereby opens this valve to provide relief operation.

Regulating capacity and relief performance information are given in Tables 3, 4 and 5 and Figure 3.

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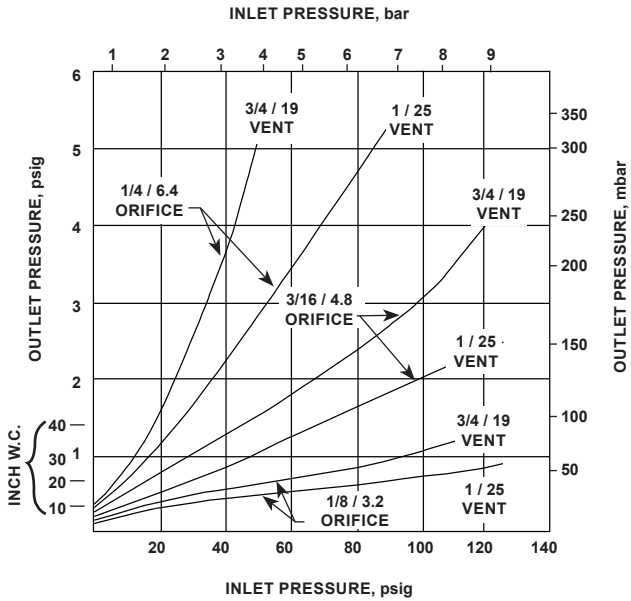
**Table 4. Typical Regulating Capacities for NPS 3/4 x 3/4 and 1 x 1 body sizes at 2 psig / 0.14 bar Outlet Pressure Setting**

| OUTLET PRESSURE SETTING,<br>CONTROL SPRING RANGE,<br>SPRING PART NUMBER<br>AND DROOP                            | INLET<br>PRESSURE   |      | CAPACITIES IN SCFH / Nm <sup>3</sup> /h OF 0.6 SPECIFIC GRAVITY NATURAL GAS |      |                      |      |                    |      |                      |      |                    |      |      |      |
|---|---|------|---|------|----------------------|------|--------------------|------|----------------------|------|--------------------|------|------|------|
|   |   |      | Orifice size  |      |                      |      |                    |      |                      |      |                    |      |      |      |
|   | 1/8 / 3.2 Blue  |      |   |      | 3/16 / 4.8 Green     |      |                    |      | 1/4 / 6.4 Brown      |      |                    |      |      |      |
|   | NPS 3/4<br>Body Size  |      | NPS 1<br>Body Size  |      | NPS 3/4<br>Body Size |      | NPS 1<br>Body Size |      | NPS 3/4<br>Body Size |      | NPS 1<br>Body Size |      |      |      |
|   | psig  | bar  | Inch  | mm   | Inch                 | mm   | Inch               | mm   | Inch                 | mm   | Inch               | mm   | Inch | mm   |
| 2 psig / 0.14 bar setting<br><br>1.5 to 2.5 psig / 0.10 to 0.17 bar<br>T13536T0012, Blue<br><br>1% droop (psia) | 3   | 0.21 | 115   | 3.1  | 130                  | 3.5  | 225                | 6.0  | 190                  | 5.1  | 410                | 11.0 | 370  | 9.9  |
|   | 5   | 0.34 | 190   | 5.1  | 200                  | 5.4  | 365                | 9.8  | 320                  | 8.6  | 710                | 19.0 | 640  | 17.2 |
|   | 10  | 0.69 | 330   | 8.8  | 330                  | 8.8  | 700                | 18.8 | 610                  | 16.4 | 1040               | 27.9 | 1120 | 30.0 |
|   | 15  | 1.03 | 430   | 11.5 | 420                  | 11.3 | 900                | 24.1 | 870                  | 23.3 | 1240               | 33.2 | 1620 | 43.4 |
|   | 20  | 1.38 | 510   | 13.7 | 490                  | 13.1 | 1060               | 28.4 | 1020                 | 27.3 | 1560               | 41.8 | 2020 | 54.1 |
|   | 40  | 2.76 | 820   | 22.0 | 800                  | 21.4 | 1720               | 46.1 | 1670                 | 44.8 | 2540               | 68.1 | 3550 | 95.1 |
|   | 60  | 4.14 | 1100  | 29.5 | 1080                 | 28.9 | 2100               | 56.3 | 2300                 | 61.6 | 3120               | 83.6 | 4660 | 125  |
|   | 80  | 5.52 | 1440  | 38.6 | 1360                 | 36.5 | 2650               | 71.0 | 2930                 | 78.5 | ----               | ---- | ---- | ---- |
|   | 100   | 6.90 | 1700  | 45.6 | 1620                 | 43.4 | ----               | ---- | ----                 | ---- | ----               | ---- | ---- | ---- |
|   | 125   | 8.62 | 1840  | 49.3 | 2020                 | 54.1 | ----               | ---- | ----                 | ---- | ----               | ---- | ---- | ---- |
|   | 2 psig / 0.14 bar setting<br><br>1.5 to 2.5 psig / 0.10 to 0.17 bar<br>T13536T0012, Blue<br><br>2% droop (psia) | 3    | 0.21  | 115  | 3.1                  | 137  | 3.7                | 240  | 6.4                  | 195  | 5.2                | 440  | 11.8 | 415  |
| 5   |   | 0.34 | 190   | 5.1  | 210                  | 5.6  | 375                | 10.1 | 325                  | 8.7  | 760                | 20.4 | 690  | 18.5 |
| 10  |   | 0.69 | 330   | 8.8  | 337                  | 9.0  | 700                | 18.8 | 615                  | 16.5 | 1160               | 31.1 | 1190 | 31.9 |
| 15  |   | 1.03 | 430   | 11.5 | 425                  | 11.4 | 900                | 24.1 | 900                  | 24.1 | 1560               | 41.8 | 1650 | 44.2 |
| 20  |   | 1.38 | 510   | 13.7 | 490                  | 13.1 | 1060               | 28.4 | 1075                 | 28.8 | 1940               | 52.0 | 2050 | 54.9 |
| 40  |   | 2.76 | 820   | 22.0 | 800                  | 21.4 | 1720               | 46.1 | 1675                 | 44.9 | 2900               | 77.7 | 3550 | 95.1 |
| 60  |   | 4.14 | 1100  | 29.5 | 1040                 | 27.9 | 2300               | 61.6 | 2300                 | 61.6 | 3750               | 101  | 4660 | 125  |
| 80  |   | 5.52 | 1440  | 38.6 | 1370                 | 36.7 | 2870               | 76.9 | 2930                 | 78.5 | ----               | ---- | ---- | ---- |
| 100   |   | 6.90 | 1700  | 45.6 | 1630                 | 43.7 | ----               | ---- | ----                 | ---- | ----               | ---- | ---- | ---- |
| 125   |   | 8.62 | 2060  | 55.2 | 2030                 | 54.4 | ----               | ---- | ----                 | ---- | ----               | ---- | ---- | ---- |

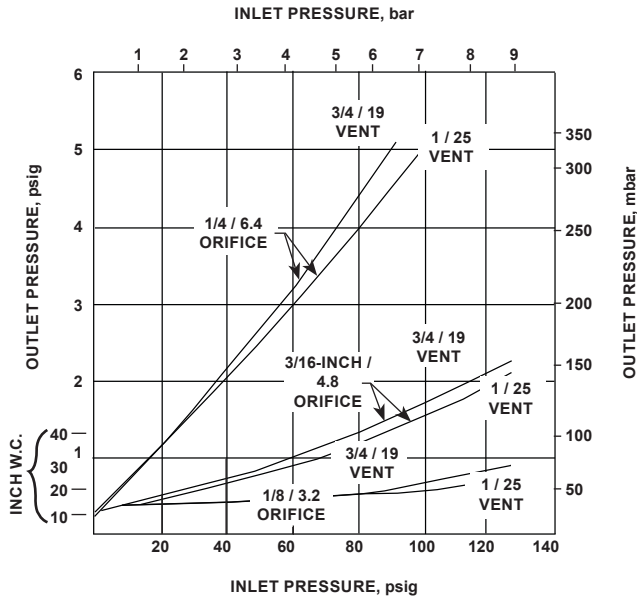
**Table 5. Standard Performance for Type S402Y Regulator (Downstream Pressure with 60 psig / 4.1 bar Inlet and 7-inch w.c. / 17 mbar Pressure Setting)**

| ORIFICE SIZE |     | RELIEF PERFORMANCE                         |                                 |                               |
|--------------|-----|--|---------------------------------|-------------------------------|
|              |     | Inch w.c. / mbar                           |                                 |                               |
| Inch         | mm  | Low <sup>(1)</sup><br>(Blue Relief Spring) | Medium<br>(Green Relief Spring) | High<br>(Brown Relief Spring) |
| 1/8          | 3.2 | 14 / 35                                    | 24 / 60                         | 30 / 75                       |
| 3/16         | 4.8 | 28 / 70                                    | 35 / 87                         | 42 / 104                      |
| 1/4          | 6.4 | 3 psig / 0.21 bar                          | 3.25 psig / 0.22 bar            | 3.70 psig / 0.26 bar          |

1. Not available with 1.5 to 2.5 psig / 0.10 to 0.17 bar spring range.

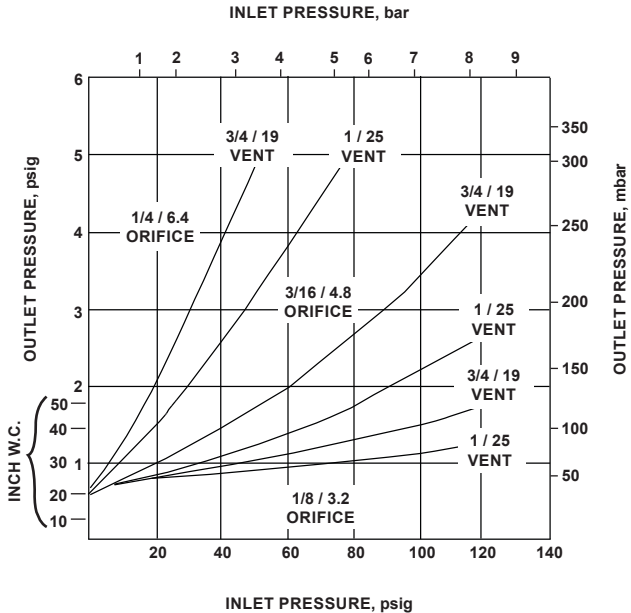


7-INCH W.C. / 17 mbar OUTLET PRESSURE SETTING, WITH 10 FT / 3.1 m OF VENT PIPING

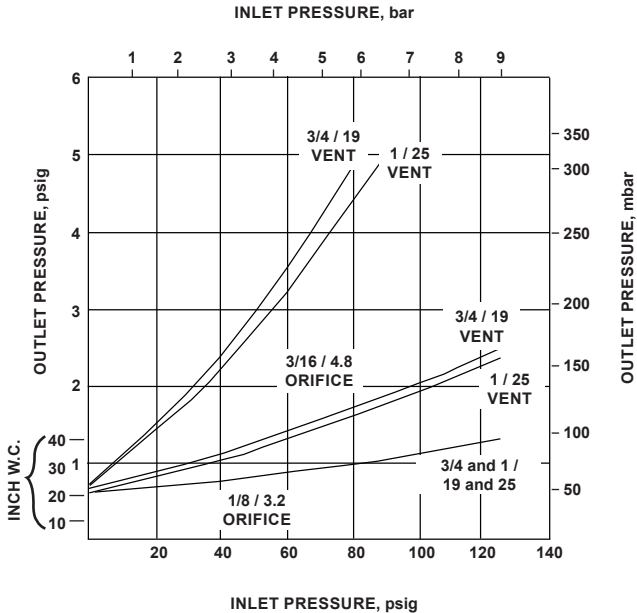


7-INCH W.C. / 17 mbar OUTLET PRESSURE SETTING, NO VENT PIPING

LOW RELIEF VALVE SPRING (BLUE)



7-INCH W.C. / 17 mbar OUTLET PRESSURE SETTING, WITH 10 FT / 3.1 m OF VENT PIPING



7-INCH W.C. / 17 mbar OUTLET PRESSURE SETTING, NO VENT PIPING

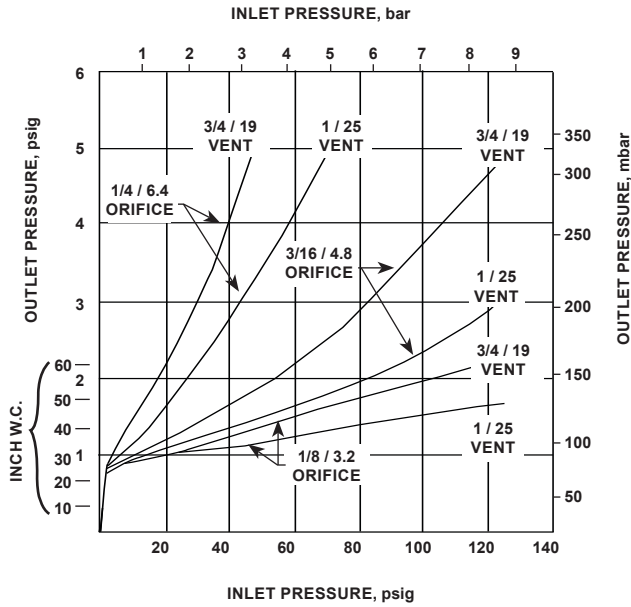
MEDIUM RELIEF VALVE SPRING (GREEN)

Inch / mm

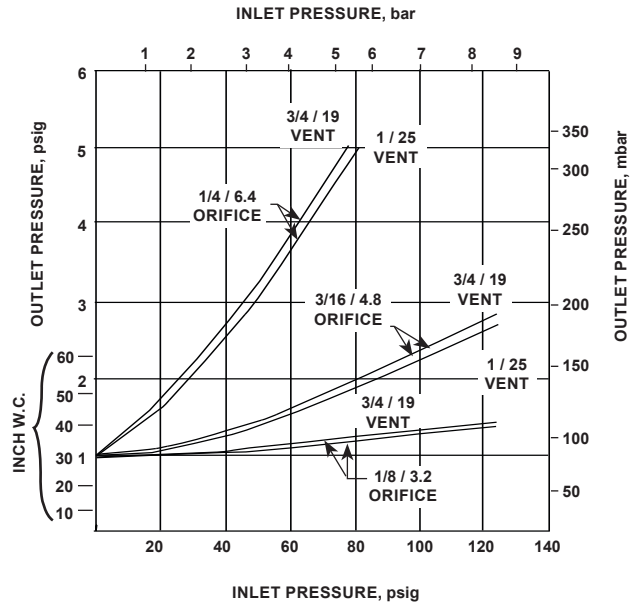
NOTE:

- 1 SET CONDITIONS FOR RELIEF PERFORMANCE SETTING:  
 1/8 AND 3/16-INCH / 3.2 and 4.8 mm-- ORIFICE: P<sub>1</sub> IS 30 psig / 2.1 bar  
 1/4-INCH / 6.4 mm ORIFICE: P<sub>1</sub> IS 15 psig / 1.0 bar  
 50 SCFH / 1.3 Nm<sup>3</sup>/h FLOW, 0.6 SPECIFIC GRAVITY NATURAL GAS.

Figure 3. Internal Relief Performance for Type S402Y Regulator (Block-Open Test Method)

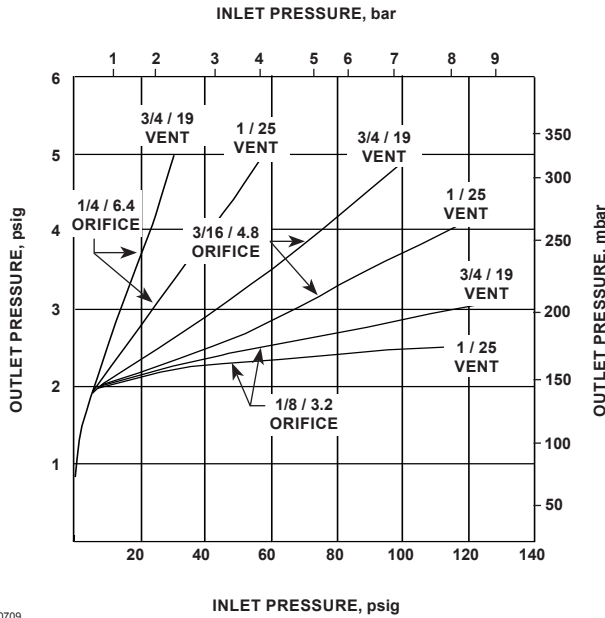


7-INCH W.C. / 17 mbar OUTLET PRESSURE SETTING, WITH 10 FT / 3.1 m OF VENT PIPING 1

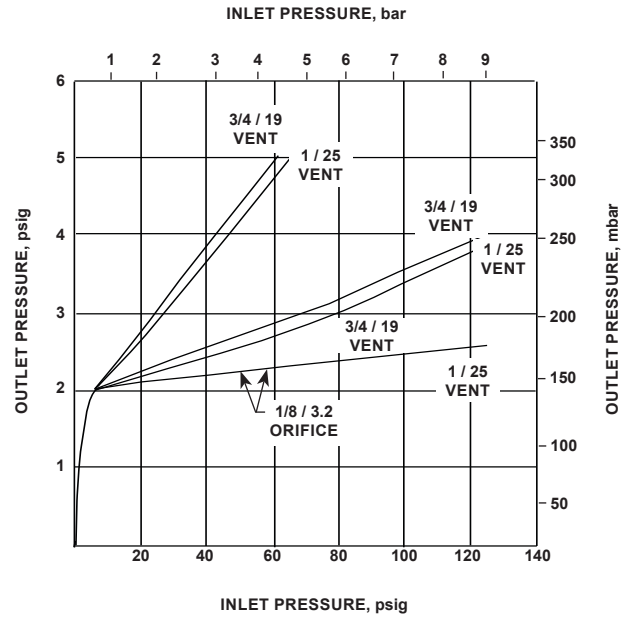


7-INCH W.C. / 17 mbar OUTLET PRESSURE SETTING, NO VENT PIPING 1

### HIGH RELIEF VALVE SPRING (BROWN)



2 psig / 0.14 bar OUTLET PRESSURE SETTING, WITH 10 FT / 3.1 m OF VENT PIPING 1



2 psig / 0.14 bar OUTLET PRESSURE SETTING, NO VENT PIPING 1

### MEDIUM RELIEF VALVE SPRING (GREEN)

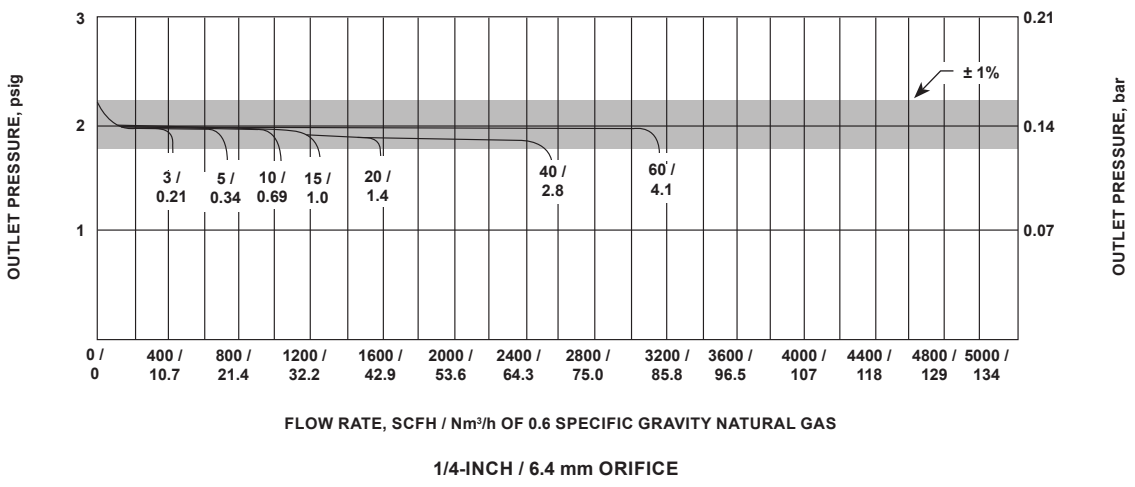
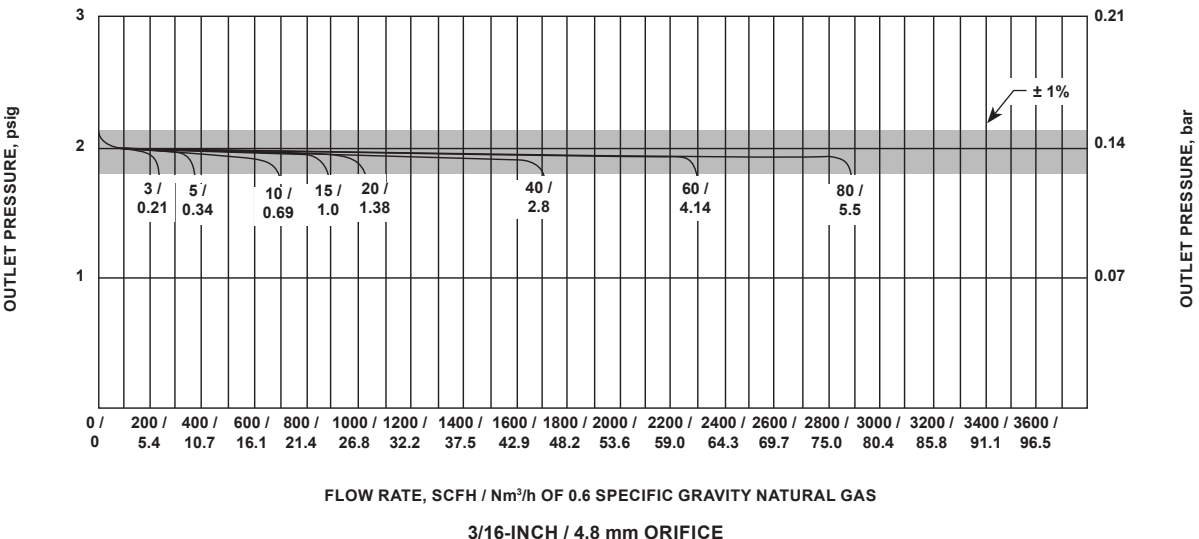
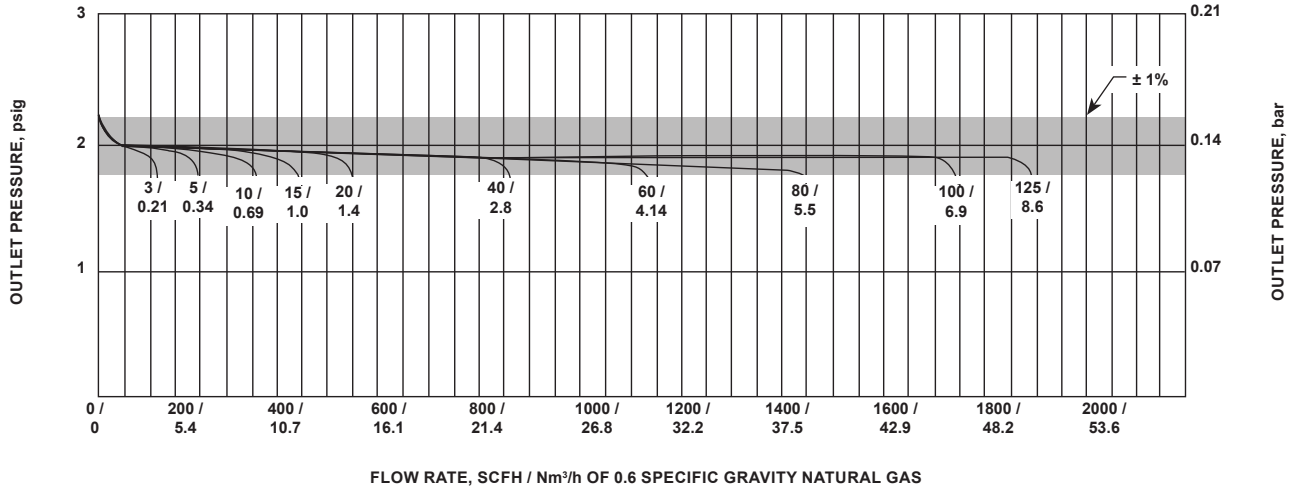
NOTE:

- 1 SET CONDITIONS FOR RELIEF PERFORMANCE SETTING:  
 1/8 AND 3/16-INCH / 3.2 and 4.8 mm-- ORIFICE: P<sub>1</sub> IS 30 psig / 2.1 bar  
 1/4-INCH / 6.4 mm ORIFICE: P<sub>1</sub> IS 15 psig / 1.0 bar  
 50 SCFH / 1.3 Nm<sup>3</sup>/h FLOW, 0.6 SPECIFIC GRAVITY NATURAL GAS.

Inch / mm

Figure 3. Internal Relief Performance for Type S402Y Regulator (Block-Open Test Method) (continued)





**NOTE:**  
 SEE CAPACITY INFORMATION FOR CONVERSION TO EQUIVALENT CAPACITIES OF OTHER GASES AND/OR Nm<sup>3</sup>/h. EACH CURVE IS FOR A DIFFERENT INLET PRESSURE AS MARKED. ALL MEASUREMENTS MADE AT INITIAL FLOW OF 50 SCFH / 1.3 Nm<sup>3</sup>/h OF 0.6 SPECIFIC GRAVITY NATURAL GAS.

**Figure 4. Typical 2 psig / 0.14 bar Performance Curves for Fixed Factor Billing**

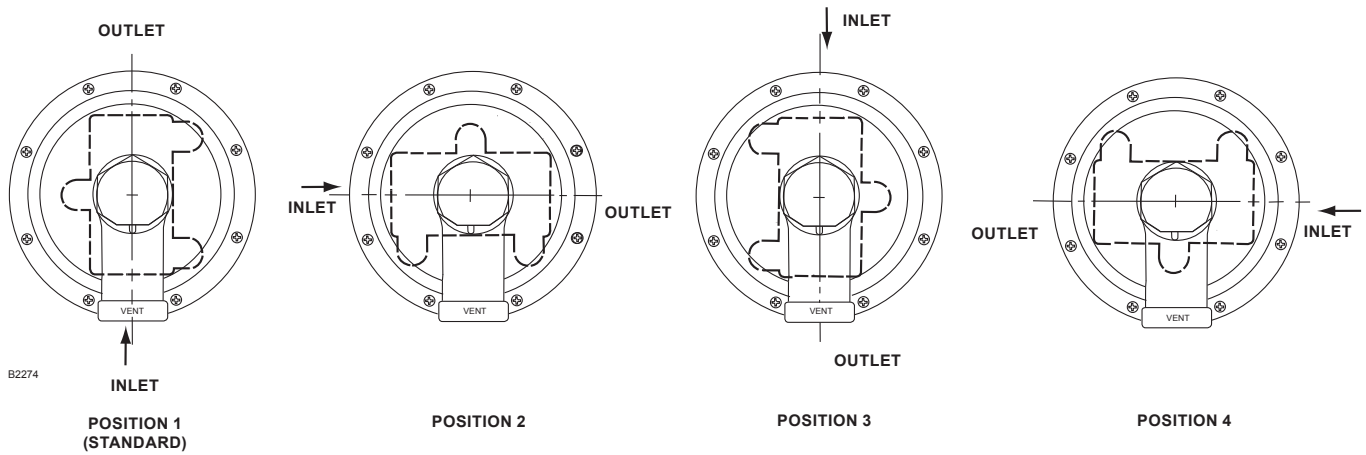


Figure 5. Spring Case Vent and Body Mounting Positions

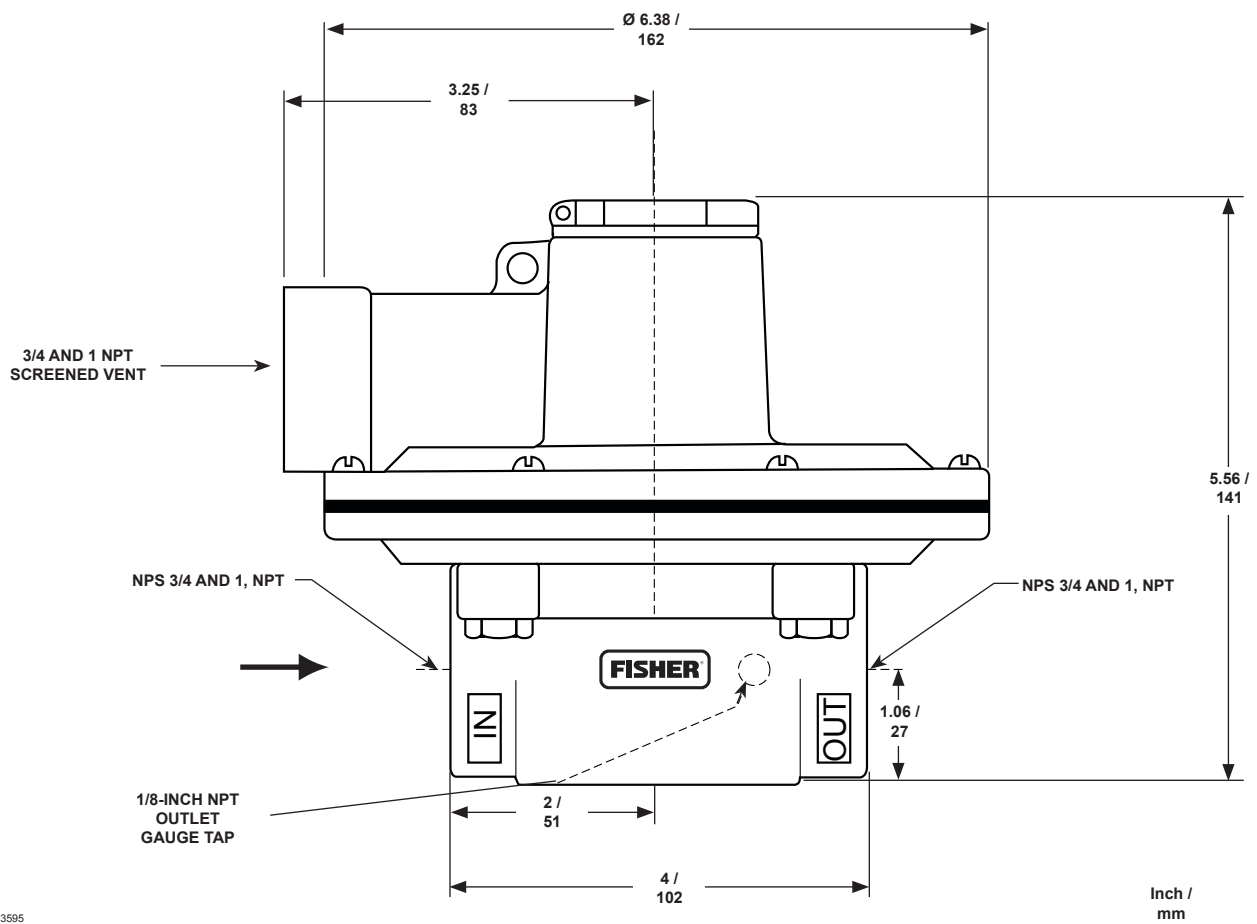


Figure 6. Dimensions

## Ordering Information

When Ordering, specify:

### Application

1. Composition and specific gravity of gas (including chemical analysis if possible)
2. Range of temperatures and flowing inlet pressure (maximum, minimum, nominal)
3. Desired outlet pressure setting
4. Range of flow rate (minimum controlled, maximum, normal)
5. Piping size(s)

6. Relief valve setting (low, medium or high) See Table 5

7. Assembly position (position 1, **standard**)

### Construction

Refer to Specifications section on page 2 and to each referenced table; indicate the desired selection whenever there is a choice to be made. Always be sure to specify the regulator type number. Assembly position 1 will be supplied automatically unless some other position is specified.

## Ordering Guide

**Body Size** (Select One)

#### No Gauge Tap

- NPS 3/4 x 3/4, NPT\*\*\*
- NPS 1 x 1, NPT\*\*\*

#### Outlet Gauge Tap

- NPS 3/4 x 3/4, NPT\*\*\*
- NPS 1 x 1, NPT\*\*\*

**Outlet Pressure Range** (Select One)

- 4.5 to 6-inch w.c. / 11 to 15 mbar, Red\*\*\*
- 5.5 to 8-inch w.c. / 14 to 20 mbar, Yellow\*\*\*
- 7.5 to 9.5-inch w.c. / 19 to 24 mbar, Olive Drab\*\*\*
- 9.5 to 13-inch w.c. / 24 to 32 mbar, Green\*\*\*
- 13-inch w.c. to 1.5 psig / 32 mbar to 0.10 bar, Unpainted\*\*\*
- 1.5 to 2.5 psig / 0.10 to 0.17 bar, Blue\*\*\*

**Spring Case Vent Connection** (Select One)

- 1 NPT with removable screen (**standard**)\*\*\*
- 3/4 NPT with removable screen (optional)\*\*\*

**Orifice Size** (Select One)

- 1/8-inch / 3.2 mm, Blue\*\*\*
- 3/16-inch / 4.8 mm, Green \*\*\*
- 1/4-inch / 6.4 mm, Brown\*\*\*

**Relief Valve Spring** (Select One)

- Blue, Low \*\*\*
- Orange, Medium-Low\*\*\*
- Green, Medium\*\*\*
- Red, Medium-Plus\*\*\*
- Brown, High\*\*\*

| Regulators Quick Order Guide  |  |
|---|--|
| ***   | Standard - Readily Available for Shipment  |
| **  | Non-Standard - Allow Additional Time for Shipment  |
| *   | Special Order, Constructed from Non-Stocked Parts. Consult your local Sales Office for Availability. |
| Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction. |  |

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