Pressure Regulator Flow Curves

Technical Bulletin

Scope
Selecting a regulator for an application first requires review of its performance capabilities and their alignment with the application’s requirements. The best starting point is the regulator’s flow curve provided by the manufacturer, because it illustrates the regulator’s range of capabilities at one glance. The curve represents the range of pressures that a regulator will maintain given certain flow rates in a system.

This technical bulletin provides an overview of how to read regulator flow curves for pressure-reducing regulators. It describes some of the complexities, including droop, seat-load drop or lockup, choked flow, hysteresis, and supply pressure effect (SPE), also known as dependency.

In addition, SPE values and flow curves for many Swagelok® series pressure-reducing regulators are provided for the full line of maximum inlet pressure ranges and flow coefficients available.

The Basics
A regulator’s main purpose is to maintain a constant pressure on one side of the regulator even though there is a different pressure or fluctuating pressure on the other side. In the case of a pressure-reducing regulator, pressure is controlled downstream of the regulator.

A flow curve illustrates a regulator’s performance in terms of outlet pressure (Y axis) and flow rate (X axis). Flow is not controlled by the regulator. It is controlled downstream by a valve or flow meter. The curve shows how a regulator will respond as flow in the system changes.

Let us examine how to read a flow curve. Examine the top curve in Fig. 1. The curve starts at 400 psig (27.5 bar), but drops slightly as flow increases across most of the graph.

When reading a flow curve, identify the range of flows that are seen in the system. Then, mark them on the graph to see what the corresponding changes in outlet pressure will be. Is that range of pressures acceptable? If not, a different regulator is needed.

![Flow Curves](image)

Fig. 1. Manufacturers often provide multiple flow curves for the same regulator at different inlet pressures to provide a range of the regulator’s operating capabilities.

Ideally, a regulator operates best on the flattest part of the curve, and will maintain relatively constant pressures, even with significant changes in flow. At the extreme ends of the curve, however, there are steep drops where pressures change dramatically with even the slightest change in flow. The regulator will not operate at the highest level of efficiency at these locations.

For every set pressure, there is a different curve. In Fig. 1, there are two main sets of curves: one based on a set pressure of 400 psig (27.5 bar) with a control range of 0 to 500 psig (34.4 bar) and one on a set pressure of 200 psig (13.7 bar) with a control range of 0 to 250 psig (17.2 bar). The control ranges represent two separate regulators and the curves must be used separately. If the desired set pressure or inlet pressure is not shown on the graph, one can interpolate within a control range, but not between different control ranges.

There is one additional variable that affects the shape of a curve—the inlet pressure (i.e., pressure going into a pressure-reducing regulator on the upstream side). Note that for each of the two sets of curves in Fig. 1, there are three curves representing a range of inlet pressures.
As mentioned, it is best to operate a regulator along the flattest—or most horizontal—part of a flow curve. Indeed, an ideal flow curve would be a flat line. However, no regulator can produce a perfectly flat line over its full range of pressures because its internal components have limitations. Typically, a flow curve consists of three parts (Fig. 2):

- The ideal operating range, a relatively flat part in the middle
- A steep drop on the far left, which shows seat-load drop or lockup
- A steep drop on the far right, which shows the choked-flow area.

**Droop**

The flat part in the middle is not perfectly flat. It slopes downward, which is called droop. As flow increases, outlet pressure will drop some—or a lot, depending on the regulator design. While droop is relatively modest along the flat part of the curve, it is quite steep at the far ends of the curve. Supplying a regulator with pressures substantially lower than the inlet pressure rating results in a flow curve with more droop than flow curves for regulators whose inlet pressure rating closely matches actual system pressure (Fig. 3). In addition, selecting a regulator that closely matches inlet pressure requirements provides the best handle resolution (smaller amount of pressure change per turn of the handle) and control, enabling a broader ideal operating range.

**Seat-Load Drop or Lockup**

Seat-load drop occurs on the far left of the regulator curve (Fig. 2), where there is initially a steep drop in pressure. If reading the curve from left to right, imagine that the system is in a no-flow state. The regulator is set to a certain pressure, but there is no flow. Then, imagine that an operator slowly opens a downstream valve to initiate flow. Immediately, there is a sharp drop in pressure because it is difficult for a regulator to maintain pressure at this location. A regulator operating along this steep drop in the curve may emit chattering or pulsating sounds as it fluctuates between flow and no-flow conditions.

Now read the curve from right to left. Imagine that the system is operating along the flat part of the curve. Then, imagine that an operator slowly closes a downstream valve, reducing flow to near zero. We are moving up the curve. As the no-flow
The phenomenon of hysteresis reveals that at the same flow volume, outlet pressure is higher with decreasing flow than with increasing flow. Hysteresis is shown larger than normal for illustration purposes.

Hysteresis results from dynamic friction forces within the regulator, but is usually not an issue when evaluating the performance of a regulator. However, it can be a point of confusion during system operation. Suppose an operator sets up a system to deliver an outlet pressure of 50 psig (3.4 bar) at 110 std ft³/min (3115 std L/min). The next day, the pressure is now 50.5 psig (3.48 bar), but the flow is still 110 std ft³/min (3115 std L/min). It is likely that something in the system temporarily created more flow demand downstream. Moving from left to right on the curve, the temporary flow increase slightly reduced the outlet pressure. Then, as the flow demand returned to 110 std ft³/min (3115 std L/min), hysteresis caused the outlet pressure to return to a point slightly higher than the initial set point.

It is recommended to approach set pressure from a lower pressure. Another best practice is to employ pressure gauges in the system to help fine tune regulator settings to achieve desired operating pressures.

**Supply-Pressure Effect**
Supply-pressure effect (SPE) or dependency is a ratio describing the change in outlet pressure per 100 psi (6.8 bar) change in inlet pressure. In other words, for every 100 psi (6.8 bar) drop in inlet pressure, the outlet pressure will increase by X psi. X is the SPE. For standard pressure-reducing regulators, the outlet pressure increases as supply pressure decreases. The opposite is true as supply pressure increases. This effect can also be realized on system startup or shutdown.

The regulator should be set to the “off” position before turning the supply pressure on or off to prevent overpressurization of regulator diaphragms, outlet pressure gauges, or other equipment downstream. When selecting an antitamper model, it is important to make sure that SPE will not cause excessive overpressurization on opening and closing of the supply pressure.
Flow Considerations

Flow curves are dependent on the media flowing through the system. Depending on the fluid’s specific gravity (density), viscosity, and physical phase (gas or liquid), the amount of droop and where choked flow occurs will change. Higher specific gravities will cause greater droop (steeper flow curves) than lower specific gravities because the regulator is forced to open wider to maintain an equivalent flow rate. Further, a regulator’s maximum flow rate will be lower for a fluid with higher specific gravity, resulting in a lower flow rate for the choked-flow range.

For spring-loaded models, handles are factory set to avoid overcompressing the spring, thereby limiting maximum outlet pressure. This setting is made at the no-flow condition. Use the flow curve to interpolate what the no-flow outlet pressure will be to ensure the pressure control range selected can achieve the pressure/flow setting required. Relief valve settings downstream of the regulator must also be considered with regard to pressure rise as the flow is terminated.

Gas Flow

Manufacturers usually create gas flow curves using air or nitrogen. If the system media is a different fluid, it may be necessary to adjust the flow scale to account for the difference between the specific gravity of the actual system fluid ($G_{\text{actual}}$) and that of the fluid used to create the curve ($G_{\text{ref}}$). The effect of specific gravity changes the flow rate by a factor ($F_G$):

$$F_G = \sqrt{\frac{G_{\text{ref}}}{G_{\text{actual}}}}$$

Nitrogen has a specific gravity of 0.97, so the correction factor can be calculated by:

$$F_G = \sqrt{\frac{0.97}{G_{\text{actual}}}}$$

where $G_{\text{actual}}$ is the specific gravity of your system fluid.

For convenience, below is a list of specific gravity correction factors calculated with this equation to adjust a flow scale from nitrogen to several other gases.

<table>
<thead>
<tr>
<th>Gas</th>
<th>Specific Gravity Correction Factor ($F_G$ from Nitrogen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>0.98</td>
</tr>
<tr>
<td>Ammonia</td>
<td>1.28</td>
</tr>
<tr>
<td>Argon</td>
<td>0.84</td>
</tr>
<tr>
<td>Arsine</td>
<td>0.60</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>0.80</td>
</tr>
<tr>
<td>Helium</td>
<td>2.65</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>3.72</td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>0.87</td>
</tr>
<tr>
<td>Oxygen</td>
<td>0.94</td>
</tr>
<tr>
<td>Silane</td>
<td>0.93</td>
</tr>
</tbody>
</table>

For example, the correction factor for carbon dioxide is 0.80. Therefore, the point on a flow curve showing a nitrogen flow volume of 100 std ft$^3$/min (2831 std L/min) indicates a comparable carbon dioxide flow of 80 std ft$^3$/min (2265 std L/min). The curve is the same, but the flow scale changes.

In a similar way, adjustments may be needed to account for an actual temperature different from the temperature used for the test. Below is a list of correction factors that can be used to account for differences from a test temperature of 70°F (20°C).

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Temperature</th>
<th>Temperature Correction Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>°F</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>–40</td>
<td>–40</td>
<td>1.12</td>
</tr>
<tr>
<td>–20</td>
<td>–28</td>
<td>1.10</td>
</tr>
<tr>
<td>0</td>
<td>–17</td>
<td>1.07</td>
</tr>
<tr>
<td>20</td>
<td>–6</td>
<td>1.05</td>
</tr>
<tr>
<td>70</td>
<td>20</td>
<td>1.00</td>
</tr>
<tr>
<td>100</td>
<td>37</td>
<td>0.97</td>
</tr>
<tr>
<td>150</td>
<td>65</td>
<td>0.93</td>
</tr>
<tr>
<td>212</td>
<td>100</td>
<td>0.89</td>
</tr>
<tr>
<td>250</td>
<td>121</td>
<td>0.86</td>
</tr>
<tr>
<td>300</td>
<td>148</td>
<td>0.84</td>
</tr>
<tr>
<td>350</td>
<td>176</td>
<td>0.81</td>
</tr>
<tr>
<td>400</td>
<td>204</td>
<td>0.78</td>
</tr>
</tbody>
</table>

For example, if the actual system temperature is 100°F (37°C), the point on a flow curve showing a flow volume of 100 std ft$^3$/min (2831 std L/min) would adjust to 97 std ft$^3$/min (2747 std L/min).
**Liquid Flow**

The same regulator will produce flow curves with substantial differences between gas and liquid fluids—flow curves for liquid media will show steeper droop rates and lower maximum flow. Avoid using flow curves generated with gas flow when selecting a regulator for a liquid flow application, as the differences between the curve and the regulator’s performance in a liquid system will be significant. Also keep in mind that not all regulators are suitable for liquid service. The higher forces on the poppet from liquid flows can cause extreme chatter, resulting in damage within the regulator. Be sure the regulator model and pressure range have been tested for liquid applications to ensure a positive performance.

Another consideration is to understand fully the effects of pressure drop on the liquid, given the application parameters. In applications where the liquid is close to its bubble point, it is likely that the pressure drop within the regulator will create bubbles or even start to vaporize the liquid. A two-phase mixture can cause component failure, fluid sample distortion, or clogging of lines. Be sure that the pressure drop will consistently maintain a liquid phase throughout a wide temperature range, or install the regulator in a location that minimizes the risk of bubble creation.

Finally, as is the case with gases, you may need to adjust the flow scale based on the difference in specific gravity between the liquid used to generate the flow curve (typically hydraulic oil or water) and the liquid to be used in your system. The liquid flow curves in this document were generated from flow tests using hydraulic oil with a specific gravity of 0.86.

For convenience, below is a list of specific gravity correction factors calculated to adjust a flow scale from hydraulic oil to several other liquids.

<table>
<thead>
<tr>
<th>Liquid</th>
<th>Specific Gravity Correction Factor (Fr from Hydraulic Oil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl alcohol</td>
<td>1.04</td>
</tr>
<tr>
<td>Gasoline</td>
<td>1.07</td>
</tr>
<tr>
<td>Kerosene</td>
<td>1.02</td>
</tr>
<tr>
<td>Pentane</td>
<td>1.18</td>
</tr>
<tr>
<td>Water</td>
<td>0.93</td>
</tr>
</tbody>
</table>

For example, the correction factor for water is 0.93. Therefore, the point on a flow curve showing a hydraulic oil flow volume of 10 U.S. gal/min (37.8 L/min) indicates a comparable water flow of 9.3 U.S. gal/min 35.2 L/min).

A safety concern can arise when using a positive displacement pump in a liquid system. The pump can cause impulses through the regulator that can fatigue and eventually cause failure in a metal diaphragm. Also, without proper relief mechanisms, the pump may cause excessive pressure rises that rupture components within the fluid system, even with a properly operating regulator. Always ensure proper relief devices are installed to protect components from burst failure.

**Flow Curve Checklist**

When selecting a regulator, consult the flow curve in addition to the Cv value.

- Identify the range of flows expected. Given that range, the curve will indicate what pressures the regulator can be expected to maintain.
- A regulator operates best along the relatively flat part of its curve. Make sure the control range selected can accommodate the droop to meet the pressure requirement at the desired flow rate.
- Avoid operating a regulator at the far ends of the curve where undesirable conditions like lockup and choked flow occur.
- Does it reflect the required pressure, set pressure, and inlet pressure range?
- For gas regulators, will supply-pressure effect be an issue when the system is shut down or restarted?
- Do you need to calculate any specific gravity or temperature adjustments?
- Finally, make sure all measurement units agree. Pressure readings are provided most commonly in psig or bar. Flow rate units of measure depend on the system media, so be sure to note whether the regulator is rated for liquid or gas service. Liquid flow is typically expressed as gallons per minute (U.S. gal/min) or liters per minute (L/min), while gas flow is conveyed as standard cubic feet per minute (std ft³/min) or standard liters per minute (std L/min).

Note: Flow curves for regulators greater than 1 1/2 inch may have been generated using either test flow data or mathematical modeling.

If a flow curve is not available or if you need additional help in selecting a regulator, contact your authorized Swagelok sales and service representative for guidance on properly sizing a regulator for an application.
## Flow Curves

### KPR Series
- Flow coefficients of 0.02, 0.06, 0.20, and 0.50
- Pressure control ranges from 0 to 10 psig (0 to 0.68 bar) through 0 to 500 psig (0 to 34.4 bar)
- Maximum inlet pressures from 100 to 6000 psig (6.8 to 413 bar)
- Gas Flow: 9
- Liquid Flow: 84

### KCP Series
- Flow coefficients of 0.02, 0.06, 0.20, and 0.50
- Pressure control ranges from 0 to 10 psig (0.68 bar) through 0 to 1500 psig (103 bar)
- Maximum inlet pressures from 100 to 3600 psig (6.8 to 248 bar)
- Gas Flow: 50
- Liquid Flow: 108

### KCY Series
- Flow coefficients of 0.06, 0.20, and 0.50
- Pressure control ranges from 0 to 10 psig (0.68 bar) through 0 to 500 psig (0 to 34.4 bar)
- Maximum inlet pressures from 3000 to 6000 psig (206 to 413 bar)
- Gas Flow: 21
- Liquid Flow: 93

### KPP Series
- Flow coefficients of 0.02 and 0.06
- Pressure control ranges from 0 to 1000 psig (68.9 bar) through 0 to 3600 psig (248 bar)
- Maximum inlet pressures from 2000 to 6000 psig (137 to 413 bar)
- Gas Flow: 66
- Liquid Flow: 119

### KLF Series
- Flow coefficients of 0.02, 0.06, 0.20, and 0.50
- Pressure control ranges from 0 to 2.0 psig (0 to 0.13 bar) through 0 to 250 psig (0 to 17.2 bar)
- Maximum inlet pressures from 15 to 3600 psig (1.0 to 248 bar)
- Gas Flow: 30
- Liquid Flow: 101

### KPF Series
- Flow coefficient of 1.0
- Pressure control ranges from 0 to 1000 psig (68.9 bar) through 0 to 4000 psig (275 bar)
- Maximum inlet pressure of 6000 psig (413 bar)
- Gas Flow: 73
- Liquid Flow: 122

### KHF Series
- Flow coefficient of 1.0
- Pressure control ranges from 0 to 10 psig (0.68 bar) through 0 to 250 psig (17.2 bar)
- Maximum inlet pressures from 100 to 3600 psig (6.8 to 248 bar)
- Gas Flow: 46

### KHP Series and KHR Series
- Flow coefficients of 0.06 and 0.25
- Pressure control ranges from 0 to 500 psig (34.4 bar) through 100 to 10000 psig (6.8 to 689 bar)
- Maximum inlet pressure of 10000 psig (689 bar)
- KHP Gas Flow: 76
- KHR Liquid Flow: 125
Flow Curves

RS(H)2 Series
- Flow coefficient of 0.05
- Pressure control ranges from 0 to 145 psig (0 to 10.0 bar) through
  RS2: 0 to 5075 psig (0 to 350 bar)
  RSH2: 0 to 10 150 psig (0 to 700 bar)
- Maximum inlet pressure: 5800 psig (400 bar)

Gas Flow ........................................ 133

RS(H)4, RS(H)6, and RS(H)8 Series
- Flow coefficients of 1.84 and 1.95
- Pressure control ranges from 0 to 2175 psig (0 to 150 bar) through 0 to 58000 psig (0 to 400 bar)
- Maximum inlet pressure: 5800 psig (400 bar)

Gas Flow ........................................ 136

RS(H)10, RS(H)15, and RS(H)20 Series
- Flow coefficients of 3.79, 7.30 and 13
- Pressure control ranges from 0 to 43 psig (0 to 3.0 bar) through
  RSH10 and RS(H)15: 0 to 3625 psig (0 to 350 bar)
  RS20: 0 to 290 psig (0 to 20.0 bar)
- Maximum inlet pressures:
  RS10: 1015 psig (70.0 bar)
  RSH10 and RS(H)15: 5800 psig (400 bar)
  RS20: 3630 psig (250 bar)

Gas Flow ........................................ 142

LRS(H)4 Series
- Flow coefficients of 0.73 and 0.10
- Pressure control ranges from 0 to 43 psig (0 to 3.0 bar) through 0 to 290 psig (0 to 20.0 bar)
- Maximum inlet pressures:
  LRS4: 507 psig (35.0 bar)
  LRSH4: 5800 psig (400 bar)

Gas Flow ........................................ 147

LPRS4, LPRS6, and LPRS8 Series
- Flow coefficients of 1.84, 1.95 and 2.07
- Pressure control ranges from 1.4 to 14.5 psig (0.10 to 1.0 bar) through 4.3 to 43 psig (0.30 to 3.0 bar)
- Maximum inlet pressure: 218 psig (15.0 bar)

Gas Flow ........................................ 150

LPRS10, and LPRS15 Series
- Flow coefficients of 3.79 and 7.3
- Pressure control ranges from 1.4 to 14.5 psig (0.10 to 1.0 bar) through 4.3 to 43 psig (0.30 to 3.0 bar)
- Maximum inlet pressure: 232 psig (16.0 bar)

Gas Flow ........................................ 152

RD2 Series
- Flow coefficient of 0.05
- Pressure control ranges: 0 to 5800 psig (0 to 400 bar)
- Maximum inlet pressures: 5800 psig (400 bar)

Gas Flow ........................................ 154

RD(H)6 and RD(H)8 Series
- Flow coefficients of 1.95 and 2.07
- Pressure control ranges from 0 to 145 psig (0 to 10.0 bar) through
  RDH6: 0 to 2539 psig (0 to 175 bar)
  RDH8: 0 to 2537 psig (0 to 175 bar)
- Maximum inlet pressures:
  RDH6: 5800 psig (400 bar)
  RDH8: 3990 psig (275 bar)

Gas Flow ........................................ 156

RD6DP and RDH6DP Series
- Flow coefficient of 1.95
- Pressure control ranges from 0 to 1015 psig (0 to 70.0 bar) through
  RD6DP: 0 to 3335 psig (0 to 230 bar)
- Maximum inlet pressures:
  RD6DP: 1015 psig (70.0 bar)
  RDH6DP: 3990 psig (275 bar)

Gas Flow ........................................ 160

RD(H)10 and RD(H)15 Series
- Flow coefficients of 3.79 and 7.30
- Pressure control ranges from 0 to 43 psig (0 to 3.0 bar) through
  RD: 0 to 1015 psig (0 to 70.0 bar)
  RDH: 0 to 3625 psig (0 to 250 bar)
- Maximum inlet pressures:
  RD: 1015 psig (70.0 bar)
  RDH: 5800 psig (400 bar)

Gas Flow ........................................ 162

Swagelok
Pressure-Reducing Regulator Flow Curves

**RD(H)20 and RD(H)25 Series**
- Flow coefficients of 13 and 21
- Pressure control ranges from 0 to 43 psig (0 to 3.0 bar) through
  - RD20 and RD25: 0 to 1015 psig (0 to 70.0 bar)
  - RD20 and RD25: 0 to 2900 psig (0 to 200 bar)
- Maximum inlet pressures:
  - RD20 and RD25: 1015 psig (70.0 bar)
  - RDH20 and RDH25: 5800 psig (400 bar)
  - RDH25: 4060 psig (280 bar)

**Gas Flow** ........................................... 175

**RD(H)30 and RD(H)40 Series**
- Flow coefficients of 36 and 73
- Pressure control ranges from 0 to 43 psig (0 to 3.0 bar) through
  - RD30 and RD40: 0 to 1015 psig (70.0 bar)
  - RDH30 and RDH40: 0 to 2900 psig (0 to 200 bar)
- Maximum inlet pressures:
  - RD30 and RD30: 1015 psig (70.0 bar)
  - RD30 and RD30: 4060 psig (280 bar)

**Gas Flow** ........................................... 188

**RA4, RA6 and RA8 Series**
- Flow coefficient of 1.84
- Pressure ratios from 1:15 through 1:70
- Maximum inlet pressure: 5800 psig (400 bar)

**Gas Flow** ........................................... 201

**BS(H)2 Series**
- Flow coefficient of 0.10
- Pressure control ranges from 0 to 145 psig (0 to 10.0 bar) through
  - BS2: 0 to 5075 psig (0 to 350 bar)
  - BSH2: 0 to 10 150 psig (700 bar)
- Maximum inlet pressures:
  - BS2: 5800 psig (400 bar)
  - BSH2: 10 150 psig (700 bar)

**Gas Flow** ........................................... 204

**BS(H)4, BS(H)6, and BS(H)8 Series**
- Flow coefficient from 0.49 to 2.07
- Pressure control ranges from 0 to 5220 psig (0 to 360 bar) through
  - BS4: 0 to 5220 psig (0 to 360 bar)
- Maximum inlet pressure: 5800 psig (400 bar)

**Gas Flow** ........................................... 207

**BS(H)10 and BS(H)15 Series**
- Flow coefficient from 3.84 to 7.3
- Pressure control ranges from 0 to 203 psig (0 to 14.0 bar) through
  - BS10: 0 to 5220 psig (0 to 360 bar)
- Maximum inlet pressure: 5800 psig (400 bar)

**Gas Flow** ........................................... 210

**LBS4 Series**
- Flow coefficient of 1.3
- Pressure control ranges from 0 to 43 psig (0 to 3.0 bar) through
  - LBS4: 0 to 290 psig (0 to 20.0 bar)
- Maximum inlet pressure: 507 psig (35.0 bar)

**Gas Flow** ........................................... 214
KPR Series Pressure-Reducing Regulators Gas Flow

The KPR series is a compact regulator with excellent accuracy, sensitivity, and set-point pressure stability.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.02, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)**

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Pressure Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 100 psig (6.8 bar)</td>
<td>250 psig (17.2 bar) and Higher</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow Coefficient (Cᵥ)</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02</td>
<td>0.3</td>
</tr>
<tr>
<td>0.06</td>
<td>1.0</td>
</tr>
<tr>
<td>0.20</td>
<td>1.7</td>
</tr>
<tr>
<td>0.50</td>
<td>2.3</td>
</tr>
</tbody>
</table>

**Outlet Pressure, psig**

- 50 (3.4), 100 (6.8)
- 500 (34.4), 1000 (68.9)
- 3600 (248), 6000 (413)

**Outlet Pressure, bar**

- 0.34, 0.68
- 3.44, 6.89, 24.8, 41.3
KPR Series Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.02, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)
KPR Series Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.02, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)

Outlet Pressure, psig
Outlet Pressure, bar
Nitrogen Flow, std L/min
Nitrogen Flow, std ft³/min
Pressure Control Range
- 0 to 500 psig (0 to 34.4 bar)
- 0 to 250 psig (0 to 17.2 bar)

USA
EURO
JPN

Nitrogen Flow, std ft³/min
Outlet Pressure, psig
Outlet Pressure, bar
Nitrogen Flow, std L/min
Nitrogen Flow, std ft³/min

500 (34.4) 1000 (68.9) 3600 (248), 6000 (413)
500 (34.4) 1000 (68.9) 3600 (248), 6000 (413)
500 (34.4) 1000 (68.9) 3600 (248), 6000 (413)

100 (6.8) 500 (34.4) 1000 (68.9) 3600 (248), 6000 (413)

34.4 (500) 68.9 (1000) 248 (3600), 413 (6000)
34.4 (500) 68.9 (1000) 248 (3600), 413 (6000)
34.4 (500) 68.9 (1000) 248 (3600), 413 (6000)

6.8 (100) 34.4 (500) 68.9 (1000) 248 (3600), 413 (6000)
KPR Series Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)
KPR Series Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)

Pressure Control Range
- 0 to 100 psig (0 to 6.8 bar)
- 0 to 50 psig (0 to 3.4 bar)

Nitrogen Flow, std L/min
Outlet Pressure, psig
Outlet Pressure, bar

Detail A
Nitrogen Flow, std ft³/min
KPR Series Pressure-Reducing Regulators Gas Flow

Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.06, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)**

![Flow Curve Diagram]

- Pressure Control Range
  - 0 to 500 psig (0 to 34.4 bar)
  - 0 to 250 psig (0 to 17.2 bar)

---

Nitrogen Flow, std ft$^3$/min

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std L/min

---

**Detail A**

Nitrogen Flow, std ft$^3$/min

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std L/min
Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.20, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)**

![Diagram of flow curves showing nitrogen flow and outlet pressure for different flow rates and pressure control ranges.]
KPR Series Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)

Pressure Control Range
- 0 to 100 psig (0 to 6.8 bar)
- 0 to 50 psig (0 to 3.4 bar)
KPR Series Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)

![Flow Curves Diagram]

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USA
EURO
JPN

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Nitrogen Flow, std ft³/min
Outlet Pressure, psig
Outlet Pressure, bar
Nitrogen Flow, std L/min

---

Nitrogen Flow, std ft³/min
Outlet Pressure, psig
Outlet Pressure, bar
Nitrogen Flow, std L/min

---

Nitrogen Flow, std ft³/min
Outlet Pressure, psig
Outlet Pressure, bar
Nitrogen Flow, std L/min
KPR Series Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)
KPR Series Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft\(^3\)/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.50, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)**

![Flow curves diagram](image-url)
KPR Series Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)
KCY Series Two-Stage Pressure-Reducing Regulators Gas Flow

The KCY series is designed for use in applications requiring constant outlet pressure even with wide variations in inlet pressure. This two-stage regulator is comparable to two single-stage regulators connected in series. The first stage is factory set to reduce the inlet pressure to 500 psig (34.4 bar). The second stage can be adjusted with the handle to achieve the required outlet pressure.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.06, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)**

<table>
<thead>
<tr>
<th>Flow Coefficient (Cv)</th>
<th>Pressure Control Range</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.06</td>
<td>Up to 100 psig (6.8 bar)</td>
<td>0.01</td>
</tr>
<tr>
<td>0.20</td>
<td>Up to 100 psig (6.8 bar)</td>
<td>0.02</td>
</tr>
<tr>
<td>0.50</td>
<td>250 psig (17.2 bar) and Higher</td>
<td>0.06</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply Pressure Effect, %</th>
<th>Up to 100 psig (6.8 bar)</th>
<th>250 psig (17.2 bar) and Higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.06</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>0.20</td>
<td>0.02</td>
<td>0.06</td>
</tr>
<tr>
<td>0.50</td>
<td>0.05</td>
<td>0.13</td>
</tr>
</tbody>
</table>

For Nitrogen Flow, std ft³/min and Outlet Pressure, psig (bar): 500 (34.4), 1000 (68.9), 3600 (248)
KCY Series Two-Stage Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)
KCY Series Two-Stage Pressure-Reducing Regulators Gas Flow

Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.06, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)*

[Diagram showing flow curves for nitrogen flow (std ft³/min) and outlet pressure (psig/bar).]
KCY Series Two-Stage Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.20, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)**

![Flow Curves Diagram](image_url)
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.20, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)**
KCY Series Two-Stage Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)
KCY Series Two-Stage Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)
KCY Series Two-Stage Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)

Pressure Control Range
- 0 to 100 psig (0 to 6.8 bar)
- 0 to 50 psig (0 to 3.4 bar)
KCY Series Two-Stage Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

The KLF series provides high-sensitivity pressure control of gases or liquids with minimum droop in both low-flow and low-pressure applications.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

Pressure Control Range

0 to 10 psig (0 to 0.68 bar) and Higher

Supply Pressure Effect

<table>
<thead>
<tr>
<th>Flow Coefficient (Cv)</th>
<th>Pressure Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 10 psig (0.68 bar)</td>
</tr>
<tr>
<td>0.02</td>
<td>0.1</td>
</tr>
<tr>
<td>0.06</td>
<td>0.4</td>
</tr>
<tr>
<td>0.20</td>
<td>0.7</td>
</tr>
<tr>
<td>0.50</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.02, Pressure Control Range 0 to 10 psig (0 to 0.68 bar)

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**Swagelok**
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.02, Pressure Control Range 0 to 50 psig (0 to 3.4 bar) and 0 to 25 psig (0 to 1.7 bar)
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.02, Pressure Control Range 0 to 100 psig (0 to 6.8 bar)
Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.02, Pressure Control Range 0 to 250 psig (0 to 17.2 bar)**

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**KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow**

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**Flow Coefficient 0.02, Pressure Control Range 0 to 250 psig (0 to 17.2 bar)**
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 0 to 10 psig (0 to 0.68 bar)

Pressure Control Range

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std L/min

Nitrogen Flow, std ft³/min

Detail A
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 50 psig (0 to 3.4 bar) and 0 to 25 psig (0 to 1.7 bar)
Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.06, Pressure Control Range 0 to 100 psig (0 to 6.8 bar)**

[Diagram showing pressure-flow curves for nitrogen flow]
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft\(^3\)/min (1 std L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.06, Pressure Control Range 0 to 250 psig (0 to 17.2 bar)*

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, std L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 250 psig (0 to 17.2 bar)</td>
<td>Outlet Pressure, psig</td>
</tr>
<tr>
<td>0</td>
<td>400</td>
</tr>
<tr>
<td>10</td>
<td>800</td>
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<tr>
<td>20</td>
<td>1200</td>
</tr>
<tr>
<td>30</td>
<td>1600</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nitrogen Flow, std ft(^3)/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td>60</td>
</tr>
</tbody>
</table>

Outlet Pressure, bar
USA
JPN
EURO

Nitrogen Flow, std ft\(^3\)/min
Nitrogen Flow, std L/min
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft\(^3\)/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.20, Pressure Control Range 0 to 10 psig (0 to 0.68 bar)**

[Diagram showing flow curves and pressure control range]
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.20, Pressure Control Ranges 0 to 50 psig (0 to 3.4 bar) and 0 to 25 psig (0 to 1.7 bar)*
Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Range 0 to 100 psig (0 to 6.8 bar)
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.20, Pressure Control Range Pressure Control Range 0 to 250 psig (0 to 17.2 bar)**

[Diagram of flow curves showing nitrogen flow in std ft³/min and outlet pressure in psig and bar, with specific values marked on the graph.]
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.50, Pressure Control Range 0 to 10 psig (0 to 0.68 bar)**

Pressure Control Range

0 to 10 psig (0 to 0.68 bar)
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 50 psig (0 to 3.4 bar) and 0 to 25 psig (0 to 1.7 bar)

The diagram shows the relationship between nitrogen flow rate and outlet pressure for two different pressure control ranges. The curves are color-coded:
- Black: 0 to 50 psig (0 to 3.4 bar)
- Blue: 0 to 25 psig (0 to 1.7 bar)

The curves illustrate how the nitrogen flow rate changes with outlet pressure for different flow rates and pressure control ranges.
KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.50, Pressure Control Range 0 to 100 psig (0 to 6.8 bar)**

![Graph showing flow curves for different pressures and nitrogen flow rates](image-url)

- Outlet Pressure, psig
- Nitrogen Flow, std ft$^3$/min
- Nitrogen Flow, std L/min

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KLF Series High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Range Pressure Control Range 0 to 250 psig (0 to 17.2 bar)

Pressure Control Range

Outlet Pressure, psig
Nitrogen Flow, std L/min
Outlet Pressure, bar
Nitrogen Flow, std ft³/min

0 to 250 psig (0 to 17.2 bar)
KHF Series High-Flow, High-Sensitivity Pressure-Reducing Regulators

The KHF series combines the high-flow capabilities—1.0 $C_v$—of a bulk distribution regulator with the high sensitivity and accuracy of a point-of-use regulator.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

**Flow Curves**

The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 1.0, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)**

<table>
<thead>
<tr>
<th>Flow Coefficient ($C_v$)</th>
<th>Pressure Control Range</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Up to 50 psig (3.4 bar)</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>100 psig (6.8 bar) and Higher</td>
<td>0.4</td>
</tr>
</tbody>
</table>
KHF Series High-Flow, High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 1.0, Pressure Control Range 0 to 50 psig (0 to 3.4 bar)
KHF Series High-Flow, High-Sensitivity Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 1.0, Pressure Control Range 0 to 100 psig (0 to 6.8 bar)**

Pressure Control Range

Outlet Pressure, psig

Nitrogen Flow, std L/min

Outlet Pressure, bar

Nitrogen Flow, std ft³/min

Detail A
**KHF Series High-Flow, High-Sensitivity Pressure-Reducing Regulators Gas Flow**

**Flow Curves**

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 1.0, Pressure Control Range 0 to 250 psig (0 to 17.2 bar)**

---

**Outlet Pressure, psig**

- 0 to 250 psig (0 to 17.2 bar)

**Nitrogen Flow, std L/min**

- 500 (34.4), 1000 (68.9), 3600 (248)

---

**Outlet Pressure, bar**

- 0 to 250 psig (0 to 17.2 bar)

**Nitrogen Flow, std ft³/min**

- 50 (3.4), 100 (6.8), 500 (34.4), 1000 (68.9), 3600 (248)

---

**Outlet Pressure, bar**

- 0 to 250 psig (0 to 17.2 bar)

**Nitrogen Flow, std ft³/min**

- 50 (3.4), 100 (6.8), 500 (34.4), 1000 (68.9), 3600 (248)
KCP Series Compact Pressure-Reducing Regulators Gas Flow

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

The KCP series is a compact, piston-sensing pressure regulator with a short stroke to minimize wear in high-cycling applications.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.02, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)

<table>
<thead>
<tr>
<th>Flow Coefficient ($C_v$)</th>
<th>0.02</th>
<th>0.06</th>
<th>0.20</th>
<th>0.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Coefficient ($C_p$)</td>
<td>0.4</td>
<td>1.3</td>
<td>2.1</td>
<td>3.0</td>
</tr>
<tr>
<td>Supply Pressure Effect, %</td>
<td>2.6</td>
<td>8.6</td>
<td>14.5</td>
<td>22.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 250 psig (17.2 bar)</td>
<td>2.6</td>
</tr>
<tr>
<td>500 psig (34.4 bar) and Higher</td>
<td>22.6</td>
</tr>
</tbody>
</table>

**Supply Pressure Effect**

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Flow Coefficient ($C_v$)</th>
<th>0.02</th>
<th>0.06</th>
<th>0.20</th>
<th>0.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen Flow, std L/min</td>
<td>Supply Pressure Effect, %</td>
<td>2.6</td>
<td>8.6</td>
<td>14.5</td>
<td>22.6</td>
</tr>
</tbody>
</table>

**Flow Coefficient 0.02, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)**

**Detail A**
KCP Series Compact Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.02, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)**

```
Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std ft$^3$/min

Nitrogen Flow, std L/min

Detail A

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std ft$^3$/min

Nitrogen Flow, std L/min

A

0 to 100 psig (0 to 6.8 bar)

0 to 50 psig (0 to 3.4 bar)
```
KCP Series Compact Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.02, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)**

[Diagram showing flow curves with nitrogen flow and outlet pressure for different pressure control ranges.]
KCP Series Compact Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.02, Pressure Control Ranges 0 to 1500 psig (0 to 103 bar) and 0 to 1000 psig (0 to 68.9 bar)*

Pressure Control Range
- 0 to 1500 psig (0 to 103 bar)
- 0 to 1000 psig (0 to 68.9 bar)
KCP Series Compact Pressure-Reducing Regulators Gas Flow

Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)

Nitrogen Flow, std ft³/min
Outlet Pressure, psig
Outlet Pressure, bar

Nitrogen Flow, std L/min

Detail A
KCP Series Compact Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)
Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.06, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)**
KCP Series Compact Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 1500 psig (0 to 103 bar) and 0 to 1000 psig (0 to 68.9 bar)

Pressure Control Range
- 0 to 1500 psig (0 to 103 bar)
- 0 to 1000 psig (0 to 68.9 bar)
KCP Series Compact Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)
**KCP Series Compact Pressure-Reducing Regulators Gas Flow**

**Flow Curves**
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.20, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)**

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, std L/min</th>
<th>Outlet Pressure, psig</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 100 psig (0 to 6.8 bar)</td>
<td>0 100 200 300 400 500</td>
<td>0 10 20 50 (3.4) 100 (6.8)</td>
</tr>
<tr>
<td>0 to 50 psig (0 to 3.4 bar)</td>
<td>0 10 20 50 (3.4) 100 (6.8)</td>
<td>0 20 40 60</td>
</tr>
</tbody>
</table>

**Detail A**

<table>
<thead>
<tr>
<th>Nitrogen Flow, std ft³/min</th>
<th>Outlet Pressure, psig</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 20 40 60 80 100 120 140 160</td>
<td>0 20 40 60 80 100</td>
</tr>
</tbody>
</table>

**Outlet Pressure, bar**

- 0.34 0.68 1.0 1.36 2.0 4.0 8.0
- 3.44 6.89 10.0 13.6 20.0 40.0 80.0

**Outlet Pressure, bar**

- 0.34 0.68 1.0 1.36 2.0 4.0 8.0
- 3.44 6.89 10.0 13.6 20.0 40.0 80.0
KCP Series Compact Pressure-Reducing Regulator Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)
KCP Series Compact Pressure-Reducing Regulators Gas Flow

**Flow Curves**
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.20, Pressure Control Ranges 0 to 1500 psig (0 to 103 bar) and 0 to 1000 psig (0 to 68.9 bar)*

---

**Pressure Control Range**
- 0 to 1500 psig (0 to 103 bar)
- 0 to 1000 psig (0 to 68.9 bar)

---

**Detail A**

Nitrogen Flow, std L/min

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std ft³/min
**KCP Series Compact Pressure-Reducing Regulators Gas Flow**

**Flow Curves**

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.50, Pressure Control Ranges 0 to 25 psig (0 to 1.7 bar) and 0 to 10 psig (0 to 0.68 bar)*

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, std L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 25 psig (0 to 1.7 bar)</td>
<td>0, 50 (3.4), 100 (6.8), 3600 (248)</td>
</tr>
<tr>
<td>0 to 10 psig (0 to 0.68 bar)</td>
<td>0, 100 (6.8), 1000 (68.9), 3600 (248)</td>
</tr>
</tbody>
</table>

---

**Pressure Control Range**

- 0 to 25 psig (0 to 1.7 bar)
- 0 to 10 psig (0 to 0.68 bar)
KCP Series Compact Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)

Pressure Control Range
- 0 to 100 psig (0 to 6.8 bar)
- 0 to 50 psig (0 to 3.4 bar)

![Graph showing flow curves for different pressure control ranges](image-url)
KCP Series Compact Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)
KCP Series Compact Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 1500 psig (0 to 103 bar) and 0 to 1000 psig (0 to 68.9 bar)
KPP Series Medium- to High-Pressure Pressure-Reducing Regulators Gas Flow Curves

The KPP series meets the demands of a wide range of gas or liquid applications in a lightweight, compact installation footprint. These features make the KPP pressure regulator an ideal pressure control solution within high-density OEM equipment.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

**Flow Curves**

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.02, Pressure Control Range 0 to 1000 psig (0 to 68.9 bar)**

```
<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, std L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1000 psig (0 to 68.9 bar)</td>
<td>0 100 200 300 400 500 600 700 800</td>
</tr>
</tbody>
</table>
```

**Supply-Pressure Effect**

<table>
<thead>
<tr>
<th>Flow Coefficient (Cv)</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02</td>
<td>2.2</td>
</tr>
<tr>
<td>0.06</td>
<td>7.2</td>
</tr>
</tbody>
</table>

---

**Swagelok**
KPP Series Medium- to High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.02, Pressure Control Range 0 to 1500 psig (0 to 103 bar)
KPP Series Medium- to High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.02, Pressure Control Range 0 to 2000 psig (0 to 137 bar)

Pressure Control Range
0 to 2000 psig (0 to 137 bar)

Detail A
KPP Series Medium- to High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.02, Pressure Control Ranges 0 to 3600 psig (0 to 248 bar) and 0 to 3000 psig (0 to 206 bar)
KPP Series Medium- to High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 0 to 1000 psig (0 to 68.9 bar)
KPP Series Medium- to High-Pressure Pressure-Reducing Regulators

Gas Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 0 to 1500 psig (0 to 103 bar)

Pressure Control Range

0 to 1500 psig (0 to 103 bar)

Nitrogen Flow, std ft³/min

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std L/min

Detail A

Nitrogen Flow, std ft³/min

Nitrogen Flow, std L/min

Outlet Pressure, psig

Outlet Pressure, bar
Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.06, Pressure Control Ranges 0 to 3600 psig (0 to 248 bar), 0 to 3000 psig (0 to 206 bar), and 0 to 2000 psig (0 to 137 bar)**
KPF Series High-Flow Pressure-Reducing Regulators Gas Flow

The KPF series provides minimum droop across the flow range with high accuracy of outlet pressure.)

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 1.0, Pressure Control Range 0 to 1000 psig (0 to 68.9 bar)**

<table>
<thead>
<tr>
<th>Flow Coefficient ($C_v$)</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>5.3</td>
</tr>
</tbody>
</table>

**Supply-Pressure Effect**

- **Pressure Control Range**
  - 0 to 1000 psig (0 to 68.9 bar)

**Outlet Pressure, psig**

- 0 to 1200 psig
- 0 to 1200 bar

**Nitrogen Flow, std L/min**

- 0 to 14000 L/min
- 0 to 200 ft³/min

**Nitrogen Flow, std ft³/min**

- 0 to 1200 ft³/min
- 0 to 80 ft³/min

**Outlet Pressure, bar**

- 0 to 80 bar
- 0 to 20 bar

**Detail A**

- 0 to 50 ft³/min
- 0 to 500 L/min

- 0 to 50 ft³/min
- 0 to 500 L/min
KPF Series High-Flow Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft$^3$/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 1.0, Pressure Control Range 0 to 2000 psig (0 to 137 bar)
KPF Series High-Flow Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 1.0, Pressure Control Ranges 0 to 4000 psig (0 to 275 bar), and 0 to 3000 psig (0 to 206 bar)
The KHP series provides control of supply pressures up to 10 000 psig (689 bar). The self-venting capability enables downstream pressure reduction in closed-loop systems.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

### Flow Curves

The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.06, Pressure Control Ranges 0 to 750 psig (0 to 51.6 bar) and 0 to 500 psig (0 to 34.4 bar)**

<table>
<thead>
<tr>
<th>Flow Coefficient (Cᵥ)</th>
<th>Pressure Control Range</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.06</td>
<td>Up to 2500 psig (172 bar)</td>
<td>1.0 2.6 4.2</td>
</tr>
<tr>
<td>0.25</td>
<td>3600 and 6000 psig (248 and 413 bar)</td>
<td>3.3 8.5 14.6</td>
</tr>
<tr>
<td></td>
<td>10 000 psig (689 bar)</td>
<td></td>
</tr>
</tbody>
</table>

**Supply-Pressure Effect**

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Pressure Control Range</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 750 psig (0 to 51.6 bar)</td>
<td>1000 (68.9)</td>
<td></td>
</tr>
<tr>
<td>0 to 500 psig (0 to 34.4 bar)</td>
<td>3600 (248), 6000 (413), 10 000 (689)</td>
<td></td>
</tr>
</tbody>
</table>

**Pressure Control Range**

- 0 to 750 psig (0 to 51.6 bar)
- 0 to 500 psig (0 to 34.4 bar)
KHP Series High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 15 to 2500 psig (1.0 to 172 bar) and 10 to 1500 psig (0.68 to 103 bar)
KHP Series High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.06, Pressure Control Ranges 50 to 6000 psig (3.4 to 413 bar) and 25 to 3600 psig (1.7 to 248 bar)*
KHP Series High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 100 to 10 000 psig (6.8 to 689 bar)

Pressure Control Range
100 to 10 000 psig (6.8 to 689 bar)
KHP Series High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.25, Pressure Control Ranges 0 to 750 psig (0 to 51.6 bar) and 0 to 500 psig (0 to 34.4 bar)
KHP Series High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.25, Pressure Control Ranges 15 to 2500 psig (1.0 to 172 bar) and 10 to 1500 psig (0.68 to 103 bar)
KHP Series High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft\(^3\)/min (1 std L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.25, Pressure Control Ranges 50 to 6000 psig (3.4 to 413 bar) and 25 to 3600 psig (1.7 to 248 bar)*
KHP Series High-Pressure Pressure-Reducing Regulators Gas Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.035 std ft³/min (1 std L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.25, Pressure Control Range 10 to 10,000 psig (0.68 to 689 bar)

[Graph showing flow curves for nitrogen flow vs. outlet pressure, with details on the graph indicated by Detail A.]
KPR Series Pressure-Reducing Regulators Liquid Flow

The KPR series is a compact regulator with excellent accuracy, sensitivity, and set-point pressure stability.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

Flow Curves

The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 0 to 25 psig (0 to 1.7 bar)
KPR Series Pressure-Reducing Regulators Liquid Flow Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)
KPR Series Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)
**KPR Series Pressure-Reducing Regulators Liquid Flow**

**Flow Curves**

The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.20, Pressure Control Range 0 to 25 psig (0 to 1.7 bar)*
Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.20, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)**

**KPR Series Pressure-Reducing Regulators Liquid Flow**

---

**Detail A**

- **Flow Curves**
- **Pressure Control Range**
- **Outlet Pressure, psig**
- **Outlet Pressure, bar**
- **Hydraulic Oil Flow, U.S. gal/min**
- **Hydraulic Oil Flow, L/min**
Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)
KPR Series Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Range 0 to 25 psig (0 to 1.7 bar)

Pressure Control Range

[Diagram showing flow curves with Hydraulic Oil Flow (U.S. gal/min) on the x-axis and Outlet Pressure (psig) on the y-axis. Key points include 0.10, 0.20, 0.30, 0.40, 0.50 L/min and Outlet Pressure values for 0, 50, 100, 500, 1000 psi.]

Outlet Pressure, psig
Outlet Pressure, bar
Hydraulic Oil Flow, U.S. gal/min
Hydraulic Oil Flow, L/min

Pressure Control Range: 0 to 25 psig (0 to 1.7 bar)
**KPR Series Pressure-Reducing Regulators Liquid Flow**

**Flow Curves**
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.50, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)**

---

**Pressure Control Range**
- 0 to 100 psig (0 to 6.8 bar)
- 0 to 50 psig (0 to 3.4 bar)

---

**Detail A**

---

---
KPR Series Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)
**KCY Series Two-Stage Pressure-Reducing Regulators Liquid Flow**

The KCY series is designed for use in applications requiring constant outlet pressure even with wide variations in inlet pressure. This two-stage regulator is comparable to two single-stage regulators connected in series. The first stage is factory set to reduce the inlet pressure to 500 psig (34.4 bar). The second stage can be adjusted with the handle to achieve the required outlet pressure.

**Flow Curves**

The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.06, Pressure Control Range 0 to 25 psig (0 to 1.7 bar)**

![Graph showing flow curves for 0 to 25 psig range]

**Flow Coefficient 0.06, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)**

![Graph showing flow curves for 0 to 100 and 0 to 50 psig ranges]
KCY Series Two-Stage Pressure-Reducing Regulators Liquid Flow

Flow Curves

The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.06, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)*

Pressure Control Range

- 0 to 500 psig (0 to 34.4 bar)
- 0 to 250 psig (0 to 17.2 bar)
**KCY Series Two-Stage Pressure-Reducing Regulators**

**Liquid Flow**

**Flow Curves**

The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.20, Pressure Control Range 0 to 25 psig (0 to 1.7 bar)*

![Flow Curve Diagram](image-url)
KCY Series Two-Stage Pressure-Reducing Regulators
Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)

Pressure Control Range
- 0 to 100 psig (0 to 6.8 bar)
- 0 to 50 psig (0 to 3.4 bar)
Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.20, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)*

![Graph showing flow curves for KCY Series Two-Stage Pressure-Reducing Regulators Liquid Flow](image-url)
KCY Series Two-Stage Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.50, Pressure Control Range 0 to 25 psig (0 to 1.7 bar)**

<table>
<thead>
<tr>
<th>Hydraulic Oil Flow, U.S. gal/min</th>
<th>Outlet Pressure, psig</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>0.3</td>
<td>1.0</td>
</tr>
<tr>
<td>0.4</td>
<td>1.5</td>
</tr>
<tr>
<td>0.5</td>
<td>2.0</td>
</tr>
<tr>
<td>0.6</td>
<td>2.5</td>
</tr>
<tr>
<td>0.7</td>
<td>3.0</td>
</tr>
<tr>
<td>0.8</td>
<td>3.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydraulic Oil Flow, L/min</th>
<th>Outlet Pressure, psig</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>1.5</td>
<td>1.0</td>
</tr>
<tr>
<td>2.0</td>
<td>1.5</td>
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<tr>
<td>2.5</td>
<td>2.0</td>
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<tr>
<td>3.0</td>
<td>2.5</td>
</tr>
<tr>
<td>3.5</td>
<td>3.0</td>
</tr>
</tbody>
</table>

750 (51.6)
**KCY Series Two-Stage Pressure-Reducing Regulators Liquid Flow**

**Flow Curves**
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.50, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)**

Pressures and flows are shown graphically.

**Pressure Control Range**
- 0 to 100 psig (0 to 6.8 bar)
- 0 to 50 psig (0 to 3.4 bar)

**Detailed Diagram**
- Hydraulic Oil Flow, U.S. gal/min vs. Outlet Pressure, psig
- Hydraulic Oil Flow, L/min vs. Outlet Pressure, bar

**Legend**
- Black line: 0 to 100 psig (0 to 6.8 bar)
- Blue line: 0 to 50 psig (0 to 3.4 bar)
KCY Series Two-Stage Pressure-Reducing Regulators Liquid Flow

Flow Curves

The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 500 psig (0 to 34.4 bar) and 0 to 250 psig (0 to 17.2 bar)
KLF Series High-Sensitivity Pressure-Reducing Regulators Liquid Flow

The KLF series provides high-sensitivity pressure control of gases or liquids with minimum droop in both low-flow and low-pressure applications.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

Flow Curves

The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 0 to 10 psig (0 to 0.68 bar)

Flow Coefficient 0.06, Pressure Control Ranges 0 to 50 psig (0 to 3.4 bar) and 0 to 25 psig (0 to 1.7 bar)
KLF Series High-Sensitivity Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 0 to 100 psig (0 to 6.8 bar)

Flow Coefficient 0.06, Pressure Control Range 0 to 250 psig (0 to 17.2 bar)
KLF Series High-Sensitivity Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Ranges 0 to 50 psig (0 to 3.4 bar) and 0 to 25 psig (0 to 1.7 bar)

Flow Coefficient 0.20, Pressure Control Range 0 to 100 psig (0 to 6.8 bar)
KLF Series High-Sensitivity Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Range 0 to 250 psig (0 to 17.2 bar)
**KLF Series High-Sensitivity Pressure-Reducing Regulators Liquid Flow**

**Flow Curves**
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.50, Pressure Control Ranges 0 to 50 psig (0 to 3.4 bar) and 0 to 25 psig (0 to 1.7 bar)**

**Pressure Control Range**
- 0 to 50 psig (0 to 3.4 bar)
- 0 to 25 psig (0 to 1.7 bar)

**Outlet Pressure, psig**
- 0 to 50
- 0 to 25

**Outlet Pressure, bar**
- 0 to 3.4
- 0 to 1.7

**Hydraulic Oil Flow, U.S. gal/min**
- 0 to 4.0

**Hydraulic Oil Flow, L/min**
- 0 to 60

**Detail A**

**Outlet Pressure, psig**
- 0 to 50
- 0 to 25

**Outlet Pressure, bar**
- 0 to 3.4
- 0 to 1.7

**Hydraulic Oil Flow, U.S. gal/min**
- 0 to 4.0
KLF Series High-Sensitivity Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Range 0 to 100 psig (0 to 6.8 bar)

Flow Coefficient 0.50, Pressure Control Range 0 to 100 psig (0 to 6.8 bar)
KLF Series High-Sensitivity Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Range 0 to 250 psig (0 to 17.2 bar)

Pressure Control Range

0 to 250 psig (0 to 17.2 bar)

Outlet Pressure, psig

Outlet Pressure, bar

Hydraulic Oil Flow, U.S. gal/min

Hydraulic Oil Flow, L/min

Outlet Pressure, bar

Outlet Pressure, psig

Hydraulic Oil Flow, L/min

Hydraulic Oil Flow, U.S. gal/min

Detail A
The KCP series is a compact, piston-sensing pressure regulator with a short stroke to minimize wear in high-cycling applications.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.06, Pressure Control Range 0 to 25 psig (0 to 1.7 bar)**

![Flow Curve Diagram 0 to 25 psig](image)

**Flow Coefficient 0.06, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)**

![Flow Curve Diagram 0 to 100 and 50 psig](image)
KCP Series Compact Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 0 to 250 psig (0 to 17.2 bar)

Flow Coefficient 0.06, Pressure Control Range 0 to 500 psig (0 to 34.4 bar)
KCP Series Compact Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.06, Pressure Control Range 0 to 1000 psig (0 to 68.8 bar)*

Pressure Control Range

<table>
<thead>
<tr>
<th>Outlet Pressure, psig</th>
<th>Hydraulic Oil Flow, L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>600</td>
</tr>
<tr>
<td>100</td>
<td>500</td>
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<tr>
<td>200</td>
<td>400</td>
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<td>300</td>
<td>300</td>
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<tr>
<td>400</td>
<td>200</td>
</tr>
<tr>
<td>500</td>
<td>100</td>
</tr>
<tr>
<td>600</td>
<td>0</td>
</tr>
</tbody>
</table>

Outlet Pressure, bar

Hydraulic Oil Flow, U.S. gal/min
KCP Series Compact Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Range 0 to 25 psig (0 to 1.7 bar)

Flow Coefficient 0.20, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)
KCP Series Compact Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.20, Pressure Control Range 0 to 250 psig (0 to 17.2 bar)**

**Flow Coefficient 0.20, Pressure Control Range 0 to 500 psig (0 to 34.4 bar)**
KCP Series Compact Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.20, Pressure Control Range 0 to 1000 psig (0 to 68.8 bar)

Pressure Control Range

<table>
<thead>
<tr>
<th>Hydraulic Oil Flow, U.S. gal/min</th>
<th>Outlet Pressure, psig</th>
<th>Outlet Pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>100</td>
<td>6.89</td>
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<td>1</td>
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<td>1.5</td>
<td>500</td>
<td>34.8</td>
</tr>
<tr>
<td>2</td>
<td>600</td>
<td>40</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Hydraulic Oil Flow, L/min</th>
<th>Outlet Pressure, psig</th>
<th>Outlet Pressure, bar</th>
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<td>0</td>
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<tr>
<td>1</td>
<td>300</td>
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<td>34.8</td>
</tr>
<tr>
<td>2</td>
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<td>40</td>
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</table>

Detail A

<table>
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<th>Hydraulic Oil Flow, U.S. gal/min</th>
<th>Outlet Pressure, psig</th>
<th>Outlet Pressure, bar</th>
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<tbody>
<tr>
<td>0</td>
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<tr>
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<td>100</td>
<td>6.89</td>
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<td>1</td>
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<td>2</td>
<td>600</td>
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<table>
<thead>
<tr>
<th>Hydraulic Oil Flow, L/min</th>
<th>Outlet Pressure, psig</th>
<th>Outlet Pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.5</td>
<td>100</td>
<td>6.89</td>
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<tr>
<td>1</td>
<td>300</td>
<td>20.8</td>
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<tr>
<td>1.5</td>
<td>500</td>
<td>34.8</td>
</tr>
<tr>
<td>2</td>
<td>600</td>
<td>40</td>
</tr>
</tbody>
</table>
KCP Series Compact Pressure-Reducing Regulators Liquid Flow

Flow Curves

The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Range 0 to 25 psig (0 to 1.7 bar)

Pressure Control Range

0 to 25 psig (0 to 1.7 bar)
KCP Series Compact Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 100 psig (0 to 6.8 bar) and 0 to 50 psig (0 to 3.4 bar)
KCP Series Compact Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Range 0 to 250 psig (0 to 17.2 bar)

Pressure Control Range

0 to 250 psig (0 to 17.2 bar)

Detail A
KCP Series Compact Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.50, Pressure Control Range 0 to 500 psig (0 to 34.4 bar)**

**Pressure Control Range**
0 to 500 psig (0 to 34.4 bar)
KCP Series Compact Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.50, Pressure Control Ranges 0 to 1500 psig (0 to 103 bar) and 0 to 1000 psig (0 to 68.9 bar)
KPP Series Medium- to High-Pressure Pressure-Reducing Regulators Liquid Flow

The KPP series meets the demands of a wide range of gas or liquid applications in a lightweight, compact installation footprint. These features make the KPP pressure regulator an ideal pressure control solution within high-density OEM equipment.

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 0 to 1000 psig (0 to 68.9 bar)

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.
KPP Series Medium- to High-Pressure Pressure-Reducing Regulators Liquid Flow

Flow Curves

The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

*Flow Coefficient 0.06, Pressure Control Range 0 to 1500 psig (0 to 103 bar)*
KPP Series Medium- to High-Pressure Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 3600 psig (0 to 248 bar), 0 to 3000 psig (0 to 206 bar), and 0 to 2000 psig (0 to 137 bar)
KPF Series High-Flow Pressure-Reducing Regulators Liquid Flow

The KPF series provides minimum droop across the flow range with high accuracy of outlet pressure.

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 0 to 1000 psig (0 to 68.9 bar)

[Graph showing flow curves]

Detail A

[Graph showing flow curves]
KPF Series High-Flow Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 1.0, Pressure Control Range 0 to 2000 psig (0 to 137 bar)
Flow Curves

The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 1.0, Pressure Control Range 0 to 3000 psig (0 to 206 bar)**

**KPF Series High-Flow Pressure-Reducing Regulators Liquid Flow**

- Pressure Control Range: 0 to 3000 psig (0 to 206 bar)
- Initial set flow rate: 0.1 U.S. gal/min (3.78 L/min)
- Initial temperature: 70°F (20°C)

Diagram showing outlet pressure against hydraulic oil flow with pressure control range.
KhR Series High-Pressure Piston-Sensing, Hydraulic Pressure-Reducing Regulators Liquid Flow

The KhP series provides control of supply pressures up to 10 000 psig (689 bar). The self-venting capability enables downstream pressure reduction in closed-loop systems.

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 750 psig (0 to 51.6 bar), 0 to 500 psig (0 to 34.4 bar), and 0 to 250 psig (0 to 17.5 bar)

For features, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators catalog, MS-02-230.
Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 2500 psig (0 to 172 bar) and 0 to 1500 psig (0 to 103 bar)
KHR Series High-Pressure Piston-Sensing, Hydraulic Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Ranges 0 to 6000 psig (0 to 413 bar) and 0 to 3600 psig (0 to 248 bar)

[Diagram showing flow curves]
KHR Series High-Pressure Piston-Sensing, Hydraulic Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.06, Pressure Control Range 0 to 10 000 psig (0 to 689 bar)

Pressure Control Range

0 to 10 000 psig (0 to 689 bar)

Hydraulic Oil Flow, U.S. gal/min

Outlet Pressure, psig

Outlet Pressure, bar

Detail A

Hydraulic Oil Flow, L/min

Outlet Pressure, psig

Outlet Pressure, bar
Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

**Flow Coefficient 0.25, Pressure Control Ranges 0 to 750 psig (0 to 51.6 bar), 0 to 500 psig (0 to 34.4 bar), and 0 to 250 psig (0 to 17.5 bar)***
KHR Series High-Pressure Piston-Sensing, Hydraulic Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.25, Pressure Control Ranges 0 to 2500 psig (0 to 172 bar) and 0 to 1500 psig (0 to 103 bar)

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Hydraulic Oil Flow, L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 2500 psig (0 to 172 bar)</td>
<td>Outlet Pressure, psig</td>
</tr>
<tr>
<td>0 to 1500 psig (0 to 103 bar)</td>
<td>Outlet Pressure, bar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydraulic Oil Flow, U.S. gal/min</th>
<th>Detail A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>2.0</td>
</tr>
<tr>
<td>0</td>
<td>2500 (172)</td>
</tr>
<tr>
<td>0</td>
<td>2500 (172)</td>
</tr>
<tr>
<td>0</td>
<td>2500 (172)</td>
</tr>
</tbody>
</table>
KHR Series High-Pressure Piston-Sensing, Hydraulic Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.25, Pressure Control Ranges 0 to 6000 psig (0 to 413 bar) and 0 to 3600 psig (0 to 248 bar)
KHR Series High-Pressure Piston-Sensing, Hydraulic Pressure-Reducing Regulators Liquid Flow

Flow Curves
The flow curves assume an initial set flow rate of 0.1 U.S. gal/min (3.78 L/min) and an initial temperature of 70°F (20°C).

Flow Coefficient 0.25, Pressure Control Range 0 to 10000 psig (0 to 689 bar)
Compact, General Purpose, Spring-Loaded Pressure-Reducing Regulators
RS(H)2 Series

Features
- Bottom mounting
- Sealed spring housing
- Low-friction piston for better control
- Cartridge poppet assembly with 25 μm filter for ease of service
- Self-venting
- Threaded vent below panel for safety

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

Flow Coefficient 0.05, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar) and 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range:
- 0 to 145 psig (0 to 10.0 bar)

Pressure Control Range:
- 0 to 362 psig (0 to 25.0 bar)
**Compact, General Purpose, Spring-Loaded Pressure-Reducing Regulators**

**RS(H)2 Series**

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

**Flow Data**

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

**Flow Coefficient 0.05, Pressure Control Ranges 0 to 1450 psig (0 to 100 bar) and 0 to 2537 psig (0 to 175 bar)**

<table>
<thead>
<tr>
<th>Pressure Control Range:</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1450 psig (0 to 100 bar)</td>
<td><img src="image1" alt="Graph" /></td>
</tr>
<tr>
<td>0 to 2537 psig (0 to 175 bar)</td>
<td><img src="image2" alt="Graph" /></td>
</tr>
</tbody>
</table>

**Swagelok**
Compact, General Purpose, Spring-Loaded Pressure-Reducing Regulators
RS(H)2 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

Flow Coefficient 0.05, Pressure Control Ranges 0 to 5075 psig (0 to 350 bar) and 0 to 10 150 psig (0 to 700 bar)

Pressure Control Range:
- **0 to 5075 psig (0 to 350 bar)**

### Graph 1
- **Inlet Pressure, psig (bar)**
- **Nitrogen Flow, Nm³/h**
- **Nitrogen Flow, std ft³/min**

### Graph 2
- **Inlet Pressure, psig (bar)**
- **Nitrogen Flow, Nm³/h**
- **Nitrogen Flow, std ft³/min**

Pressure Control Range:
- **0 to 10 150 psig (0 to 700 bar)**
General-Purpose, Spring-Loaded Pressure-Reducing Regulators
RS(H)4 Series

Features
- Balanced poppet design
- Diaphragm or piston sensing

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RS4 Series
Flow Coefficient 1.84, Pressure Control Ranges 0 to 43 psig (0 to 3.0 bar), 0 to 101 psig (0 to 7.0 bar), 0 to 203 psig (0 to 14.0 bar), and 0 to 406 psig (0 to 28.0 bar)

RS(H)4 Series
Flow Coefficient 1.84, Pressure Control Ranges 0 to 406 psig (0 to 28.0 bar), 0 to 580 psig (0 to 40.0 bar), and 0 to 1160 psig (0 to 80.0 bar)
General-Purpose, Spring-Loaded Pressure-Reducing Regulators
RS(H)4 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RSH4 Series

Flow Coefficient 1.84, Pressure Control Ranges 0 to 2175 psig (0 to 150 bar), 0 to 4060 psig (0 to 280 bar), and 0 to 5800 psig (0 to 400 bar)

Pressure Control Range:
- 0 to 5800 psig (0 to 400 bar)
- 0 to 4060 psig (0 to 280 bar)
- 0 to 2175 psig (0 to 150 bar)
General-Purpose, Spring-Loaded Pressure-Reducing Regulators
RS(H)6 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RS6 Series
Flow Coefficient 1.95, Pressure Control Ranges 0 to 43 psig (0 to 3.0 bar), 0 to 101 psig (0 to 7.0 bar), 0 to 203 psig (0 to 14.0 bar), and 0 to 406 psig (0 to 28.0 bar)

```
Pressure Control Range
- 0 to 406 psig (0 to 28.0 bar)
- 0 to 203 psig (0 to 14.0 bar)
- 0 to 101 psig (0 to 7.0 bar)
- 0 to 43 psig (0 to 3.0 bar)
```

```
Nitrogen Flow, std ft³/min
Inlet Pressure, psig (bar)
Outlet Pressure, psig
Outlet Pressure, bar
Nitrogen Flow, Nm³/h
```

RS(H)6 Series
Flow Coefficient 1.95, Pressure Control Ranges 0 to 406 psig (0 to 28.0 bar), 0 to 580 psig (0 to 40.0 bar), and 0 to 1160 psig (0 to 80.0 bar)

```
Pressure Control Range
- 0 to 1160 psig (0 to 80.0 bar)
- 0 to 580 psig (0 to 40.0 bar)
- 0 to 406 psig (0 to 28.0 bar)
```

```
Nitrogen Flow, std ft³/min
Nitrogen Flow, Nm³/h
Inlet Pressure, psig (bar)
Outlet Pressure, psig
Outlet Pressure, bar
```
General-Purpose, Spring-Loaded Pressure-Reducing Regulators
RS(H)6 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RSH6 Series

*Flow Coefficient 1.95, Pressure Control Ranges 0 to 2175 psig (0 to 150 bar), 0 to 4060 psig (0 to 280 bar), and 0 to 5800 psig (0 to 400 bar)*

Pressure Control Range:

- 0 to 5800 psig (0 to 400 bar)
- 0 to 4060 psig (0 to 280 bar)
- 0 to 2175 psig (0 to 150 bar)
General-Purpose, Spring-Loaded Pressure-Reducing Regulators

RS(H)8 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RS8 Series

Flow Coefficient 1.95, Pressure Control Ranges 0 to 43 psig (0 to 3.0 bar), 0 to 101 psig (0 to 7.0 bar), 0 to 203 psig (0 to 14.0 bar), and 0 to 406 psig (0 to 28.0 bar)

Pressure Control Range

- 0 to 406 psig (0 to 28.0 bar)
- 0 to 203 psig (0 to 14.0 bar)
- 0 to 101 psig (0 to 7.0 bar)
- 0 to 43 psig (0 to 3.0 bar)

RS(H)8 Series

Flow Coefficient 1.95, Pressure Control Ranges 0 to 580 psig (0 to 40.0 bar) and 0 to 1160 psig (0 to 80.0 bar)

Pressure Control Range

- 0 to 1160 psig (0 to 80.0 bar)
- 0 to 580 psig (0 to 40.0 bar)
General-Purpose, Spring-Loaded Pressure-Reducing Regulators
RS(H)8 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure
Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RSH8 Series

*Flow Coefficient 1.95, Pressure Control Ranges 0 to 2175 psig (0 to 150 bar), 0 to 4060 psig (0 to 280 bar), and 0 to 5800 psig (0 to 400 bar)*

Pressure Control Range:
- 0 to 2175 psig (0 to 150 bar)
- 0 to 4060 psig (0 to 280 bar)
- 0 to 5800 psig (0 to 400 bar)
General-Purpose, Spring-Loaded Pressure-Reducing Regulators
RS(H)10, RS(H)15, and RS(H)20 Series

Features
- Balanced poppet design
- RS(H)10 and RS(H)15—diaphragm or piston sensing
- RS(H)20—diaphragm sensing only

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RS10 Series
*Flow Coefficient 3.79, Pressure Control Ranges 0 to 43 psig (0 to 3.0 bar), 0 to 145 psig (0 to 10.0 bar), 0 to 290 psig (0 to 20.0 bar), and 0 to 580 psig (0 to 40.0 bar)*

RSH10 Series
*Flow Coefficient 3.79, Pressure Control Ranges 0 to 1450 psig (0 to 100 bar), 0 to 2610 psig (0 to 180 bar), and 0 to 3625 psig (0 to 250 bar)*
General-Purpose, Spring-Loaded Pressure-Reducing Regulators

RS(H)15 Series

Flow Coefficient 7.30, Pressure Control Ranges 0 to 43 psig (0 to 3.0 bar), 0 to 72 psig (0 to 5.0 bar), and 0 to 145 psig (0 to 10.0 bar)

RS15 Series

Flow Coefficient 7.30, Pressure Control Ranges 0 to 43 psig (0 to 3.0 bar), 0 to 72 psig (0 to 5.0 bar), and 0 to 145 psig (0 to 10.0 bar)

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RS15 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.
General-Purpose, Spring-Loaded Pressure-Reducing Regulators
RS(H)15 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RS15 Series

*Flow Coefficient 7.30, Pressure Control Ranges 0 to 290 psig (0 to 20.0 bar) and 0 to 580 psig (0 to 40.0 bar)*

![Graph showing flow data for RS15 Series regulators.](image-url)
General-Purpose, Spring-Loaded Pressure-Reducing Regulators
RS(H)15 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RSH15 Series

*Flow Coefficient 7.30, Pressure Control Ranges 0 to 580 psig (0 to 40.0 bar), 0 to 1450 psig (0 to 100 bar), 0 to 2610 (0 to 180 bar), and 0 to 3625 psig (0 to 250 bar)*

Pressure Control Range

- 0 to 580 psig (0 to 40.0 bar)
- 0 to 2900 psig (0 to 200 bar)
- 0 to 1450 psig (0 to 100 bar)
- 0 to 3625 psig (0 to 250 bar)
General-Purpose, Spring-Loaded Pressure-Reducing Regulators

RS(H)20 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RS20 Series

Flow Coefficient 13, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 72.0 psig (0 to 5.0 bar), 0 to 145 (0 to 10.0 bar), and 0 to 290 psig (0 to 20.0 bar)
High-Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LRS(H)4 Series

Features
- Diaphragm sensing
- Large diaphragm for higher accuracy
- Diaphragm materials: PTFE and 316L SS for most pressure control ranges
- Bottom mounting
- Low torque minimizes stem wear
- Nonventing
- Cartridge poppet assembly in LRSH4 for ease of service
- Panel mounting—no disassembly required

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

LRS4 Series

Flow Coefficient 0.73, Pressure Control Ranges 0 to 43 psig (0 to 3.0 bar), 0 to 145 psig (0 to 10.0 bar), and 0 to 290 psig (0 to 20.0 bar)
High-Sensitivity, Spring-Loaded Pressure-Reducing Regulators—
LRS(H)4 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure
Regulators, RHP Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

LRS4 Series with Optional External Feedback

**Flow Coefficient 0.73, Pressure Control Range 0 to 290 psig (0 to 20.0 bar)**

![Flow Coefficient Graph](image1)

LRS4 Series with Optional 316L SS Diaphragm

**Flow Coefficient 0.73, Pressure Control Range 0 to 290 psig (0 to 20.0 bar)**

![Flow Coefficient Graph](image2)
High-Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LRS(H)4 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

LRSH4 Series

Flow Coefficient 0.73, Pressure Control Ranges 0 to 130 psig (0 to 9.0 bar) and 0 to 290 psig (0 to 20.0 bar)
High Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LPRS4, LPRS6, and LPRS8 Series

Features
- Balanced poppet design
- Diaphragm sensing
- Large diaphragm for higher accuracy
- Suction tube for reduced droop
- Ideal as second-stage regulator

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

LPRS4 Series
Flow Coefficient 1.84, Pressure Control Ranges 1.4 to 14.5 psig (0.10 to 1.0 bar) and 4.3 to 43 psig (0.30 to 3.0 bar)

Pressure Control Range
- 4.3 to 43 psig (0.30 to 3.0 bar)
- 1.4 to 14.5 psig (0.10 to 1.0 bar)
High Sensitivity, Spring-Loaded Pressure-Reducing Regulators—
LPRS4, LPRS6, and LPRS8 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

LPRS6 Series

*Flow Coefficient 1.95, Pressure Control Ranges 1.4 to 14.5 psig (0.10 to 1.0 bar) and 4.3 to 43 psig (0.30 to 3.0 bar)*

LPRS8 Series

*Flow Coefficient 2.07, Pressure Control Ranges 1.4 to 14.5 psig (0.10 to 1.0 bar) and 4.3 to 43 psig (0.30 to 3.0 bar)*
High-Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LPRS10 and LPRS15 Series

Features
- Balanced poppet design
- Diaphragm sensing
- High flow and high accuracy
- Suction tube for reduced droop
- Ideal as second-stage regulator

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

LPRS10 Series

*Flow Coefficient 3.79, Pressure Control Ranges 1.4 to 14.0 psig (0.10 to 1.0 bar) and 4.3 to 43 psig (0.30 to 3.0 bar)*

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3 to 43 psig (0.30 to 3.0 bar)</td>
<td></td>
</tr>
<tr>
<td>1.4 to 14.0 psig (0.10 to 1.0 bar)</td>
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</tr>
</tbody>
</table>

[Nitrogen Flow vs. Outlet Pressure Graph]

<table>
<thead>
<tr>
<th>Nitrogen Flow, std ft³/min</th>
<th>Outlet Pressure, psig</th>
<th>Inlet Pressure, psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>43 (3.0)</td>
<td>101 (7.0)</td>
<td>218 (15.0)</td>
</tr>
<tr>
<td>43 (3.0)</td>
<td>101 (7.0)</td>
<td>218 (15.0)</td>
</tr>
<tr>
<td>43 (3.0)</td>
<td>101 (7.0)</td>
<td>218 (15.0)</td>
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<tr>
<td>43 (3.0)</td>
<td>101 (7.0)</td>
<td>218 (15.0)</td>
</tr>
<tr>
<td>43 (3.0)</td>
<td>101 (7.0)</td>
<td>218 (15.0)</td>
</tr>
</tbody>
</table>
High-Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LPRS10 and LPRS15 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

LPRS15 Series

*Flow Coefficient 7.3, Pressure Control Ranges 1.4 to 14.0 psig (0.10 to 1.0 bar) and 4.3 to 43 psig (0.30 to 3.0 bar)*

Pressure Control Range
- 4.3 to 43 psig (0.30 to 3.0 bar)
- 1.4 to 14.0 psig (0.10 to 1.0 bar)
Compact, General-Purpose Dome-Loaded Pressure-Reducing Regulators
RD2 Series

Features
- Piston sensing
- Integral 25 μm filter
- Cartridge poppet assembly for ease of service
- Bottom mounting

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

Flow Coefficient 0.05, Pressure Control Range 0 to 5800 psig (0 to 400 bar)

<table>
<thead>
<tr>
<th>Pressure Control Range:</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5800 psig (0 to 400 bar)</td>
<td><img src="image1.png" alt="Graph 1" /></td>
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</tbody>
</table>

Inlet Pressure
- Shown on graph

<table>
<thead>
<tr>
<th>Pressure Control Range:</th>
<th>Nitrogen Flow, std ft³/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5800 psig (0 to 400 bar)</td>
<td><img src="image2.png" alt="Graph 2" /></td>
</tr>
</tbody>
</table>

Inlet Pressure
- Shown on graph
Compact, General-Purpose Dome-Loaded Pressure-Reducing Regulators
RD2 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

*Flow Coefficient 0.05, Pressure Control Range 0 to 5800 psig (0 to 400 bar)*

Pressure Control Range:
- 0 to 5800 psig (0 to 400 bar)

Nitrogen Flow, std ft³/min

Outlet Pressure, psig

Inlet Pressure, psig (bar)

Nitrogen Flow, Nm³/h

Outlet Pressure, bar

Nitrogen Flow, std ft³/min

5800 (400)

2900 (200)
**General-Purpose, Dome-Loaded Pressure-Reducing Regulators—RD(H)6 and RD(H)8 Series**

**Features**
- Balanced poppet design
- Diaphragm sensing
- Dome-to-outlet pressure ratio approximately 1:1
- Outlet gauge connection: 1/4 in. female NPT

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

**Flow Data**
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

**RDH6 Series**

*Flow Coefficient 1.95, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar) and 0 to 362 (0 to 25.0 bar)*

![Flow Curve Graph](image)
**General-Purpose, Dome-Loaded Pressure-Reducing Regulators—RD(H)6 and RD(H)8 Series**

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

**Flow Data**

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

**RDH6 Series**

*Flow Coefficient 1.95, Pressure Control Ranges 0 to 362 psig (0 to 25.0 bar), 0 to 1450 (0 to 100 bar), and 0 to 2539 psig (0 to 175 bar)*

![Flow Curve Graph](image-url)

**Pressure Control Range**

- 0 to 1450 psig (0 to 100 bar)
- 0 to 362 psig (0 to 25.0 bar)
- 0 to 2539 psig (0 to 175 bar)
General-Purpose, Dome-Loaded Pressure-Reducing Regulators—RD(H)6 and RD(H)8 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RD8 Series

Flow Coefficient 2.07, Pressure Control Range 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range
0 to 1015 psig (0 to 70.0 bar)
General-Purpose, Dome-Loaded Pressure-Reducing Regulators—
RD(H)6 and RD(H)8 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH8 Series

Flow Coefficient 2.07, Pressure Control Ranges 0 to 362 psig (0 to 25.0 bar) and 0 to 2537 psig (0 to 175 bar)

Pressure Control Range
- 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range
- 0 to 2537 psig (0 to 175 bar)
Differential Pressure, Dome-Loaded Pressure Reducing Regulators—RD(H)6DP Series

Features
- Balanced poppet design
- Diaphragm sensing
- Adjustable bias
- Dome-to-outlet pressure ratio approximately 1:1

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD6DP Series

Flow Coefficient 1.95, Pressure Control Range 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range
- 0 to 1015 psig (0 to 70.0 bar)
  All curves 29 psig (2 bar) bias

Outlet Pressure, psig

Inlet Pressure, psig (bar)

Outlet Pressure, bar

Nitrogen Flow, std ft³/min

Nitrogen Flow, Nm³/h

Pressure Control Range
- 0 to 1015 psig (0 to 70.0 bar)
  All curves 116 psig (8 bar) bias

Outlet Pressure, psig

Inlet Pressure, psig (bar)

Outlet Pressure, bar

Nitrogen Flow, std ft³/min

Nitrogen Flow, Nm³/h
**Differential Pressure, Dome-Loaded Pressure Reducing Regulators—RD(H)6DP Series**

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

**Flow Data**

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

**RDH6DP Series**

*Flow Coefficient 1.95, Pressure Control Range 0 to 3335 psig (0 to 230 bar)*

**Pressure Control Range**

- 0 to 3335 psig (0 to 230 bar)
- All curves 29 psig (2 bar) bias

---

**Inlet Pressure, psig (bar)**

- 580 (40.0)
- 1015 (70.0)
- 2175 (150)
- 3990 (275)

---

**Outlet Pressure, psig (bar)**

- 2175 (150)

---

**Nitrogen Flow, std ft³/min**

- 0
- 600
- 900
- 1200
- 1500
- 1800
- 2100
- 2400
- 2700
- 3000
- 3300
- 3600
- 3900
- 4200
- 4500
- 4800
- 5100
- 5400
- 5700
- 6000
- 6300
- 6600
- 6900
- 7200
- 7500

---

**Flow Coefficient:** 1.95

**Maximum Inlet Pressure:**

- RDHN6— 3990 psig (275 bar)

**Outlet Pressure Control Range:**

- 0 to 3335 psig (0 to 230 bar)
- All Curves 116 psig (8 bar) bias

---

**Inlet Pressure, psig (bar)**

- 580 (40.0)
- 1015 (70.0)
- 2175 (150)
- 3990 (275)

---

**Outlet Pressure, psig (bar)**

- 2175 (150)

---

**Nitrogen Flow, std ft³/min**

- 0
- 600
- 900
- 1200
- 1500
- 1800
- 2100
- 2400
- 2700
- 3000
- 3300
- 3600
- 3900
- 4200
- 4500
- 4800
- 5100
- 5400
- 5700
- 6000
- 6300
- 6600
- 6900
- 7200
- 7500

---

**Flow Coefficient:** 1.95

**Maximum Inlet Pressure:**

- RDHN6— 3990 psig (275 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)10 and RD(H)15 Series

Features
- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator with dynamic regulation
- Dome-to-outlet pressure ratio approximately 1:1
- Large dome for improved stability
- Pilot regulator for improved performance

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD10 Series
Flow Coefficient 3.79, Pressure Control Ranges 0 to 43 psig (0 to 3.0 bar) and 0 to 130 psig (0 to 9.0 bar)

Pressure Control Range

![Graph showing nitrogen flow vs. outlet pressure for RD10 Series with flow coefficient 3.79 and pressure control range 0 to 43 psig (0 to 3.0 bar).]

Pressure Control Range: 0 to 43 psig (0 to 3.0 bar)

Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

![Graph showing nitrogen flow vs. outlet pressure for RD10 Series with flow coefficient 3.79 and pressure control range 0 to 130 psig (0 to 9.0 bar).]
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)10 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD10 Series

Flow Coefficient 3.79, Pressure Control Ranges 0 to 290 psig (0 to 20.0 bar) and 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range:
- 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range:
- 0 to 1015 psig (0 to 70.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)10 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH10 Series

Flow Coefficient 3.79, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar), 0 to 362 psig (0 to 25.0 bar), and 0 to 1450 psig (0 to 100 bar)

Pressure Control Range:
- 0 to 145 psig (0 to 10.0 bar)
- 0 to 362 psig (0 to 25.0 bar)
- 0 to 1450 psig (0 to 100 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)10 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH10 Series

*Flow Coefficient 3.79, Pressure Control Ranges 0 to 1450 psig (0 to 100 bar) and 0 to 2537 psig (0 to 175 bar)*

**Pressure Control Range:**
- 0 to 1450 psig (0 to 100 bar)
- 0 to 2537 psig (0 to 175 bar)

**Flow Coefficient:** 3.79

**Pressure Control Ranges:**
- 0 to 1450 psig (0 to 100 bar)
- 0 to 2537 psig (0 to 175 bar)

---

**Inlet Pressure, psig (bar)**
- 1015 (70.0)
- 2900 (200)
- 3990 (275)

**Outlet Pressure, psig**
- 580 (40.0)
- 1015 (70.0)
- 2900 (200)
- 3990 (275)

**Nitrogen Flow, std ft³/min**
- 0
- 1500
- 3000
- 4500
- 6000
- 7500
- 9000

**Nitrogen Flow, Nm³/h**
- 0
- 2500
- 5000
- 7500
- 10000
- 12500
- 15000

---

**Inlet Pressure, psig (bar)**
- 1015 (70.0)
- 2900 (200)
- 3990 (275)

**Outlet Pressure, psig**
- 580 (40.0)
- 1015 (70.0)
- 2900 (200)
- 3990 (275)

**Nitrogen Flow, std ft³/min**
- 0
- 1500
- 3000
- 4500
- 6000
- 7500
- 9000

**Nitrogen Flow, Nm³/h**
- 0
- 2500
- 5000
- 7500
- 10000
- 12500
- 15000
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)10 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH10 Series
Flow Coefficient 3.79, Pressure Control Range 0 to 3625 (0 to 250 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)10 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD10-EF Series

*Flow Coefficient 3.79, Pressure Control Range 0 to 1015 psig (0 to 70.0 bar)*

Pressure Control Range

0 to 1015 psig (0 to 70.0 bar)

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std ft³/min

Inlet Pressure, psig (bar)

Inlet Pressure, bar

Nitrogen Flow, Nm³/h

Pressure Control Range

0 to 1015 psig (0 to 70.0 bar)

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std ft³/min

Inlet Pressure, psig (bar)

Inlet Pressure, bar

Nitrogen Flow, Nm³/h
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)10 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH10-EF Series
Flow Coefficient 3.79, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar), 0 to 362 psig (0 to 25.0 bar) and 0 to 1450 psig (0 to 100 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)10 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH10-EF Series

Flow Coefficient 3.79, Pressure Control Ranges 0 to 1450 psig (0 to 100 bar), 0 to 2537 psig (0 to 175 bar), and 0 to 3625 psig (0 to 250 bar)

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
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<tbody>
<tr>
<td>0 to 3625 psig (0 to 250 bar)</td>
<td>4000</td>
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<tr>
<td>0 to 2537 psig (0 to 175 bar)</td>
<td>3000</td>
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<tr>
<td>0 to 1450 psig (0 to 100 bar)</td>
<td>2000</td>
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</table>

RD10-EFP Series

Flow Coefficient 3.79, Pressure Control Range 0 to 500 psig (0 to 34.5 bar)

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 500 psig (0 to 34.5 bar)</td>
<td>350</td>
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</tbody>
</table>

Flow Coefficient 3.79, Pressure Control Range 0 to 1000 psig (0 to 69 bar)

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
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</thead>
<tbody>
<tr>
<td>0 to 1000 psig (0 to 69 bar)</td>
<td>300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inlet Pressure, psig (bar)</th>
<th>218 (15.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet Pressure, psig</td>
<td>218 (15.0)</td>
</tr>
<tr>
<td>Nitrogen Flow, std ft³/min</td>
<td>2.1</td>
</tr>
<tr>
<td>Outlet Pressure, bar</td>
<td>218 (15.0)</td>
</tr>
<tr>
<td>Nitrogen Flow, Nm³/h</td>
<td>3.3</td>
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</tbody>
</table>
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)15 Series

Features
- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator with dynamic regulation
- Dome-to-outlet pressure ratio approximately 1:1
- Large dome for improved stability
- Pilot regulator for improved performance

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD15 Series
Flow Coefficient 7.30, Pressure Control Ranges 0 to 130 psig (0 to 9.0 bar), 0 to 290 psig (0 to 20.0 bar), and 0 to 1015 psig (0 to 70.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)15 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD15 Series
*Flow Coefficient 7.30, Pressure Control Ranges 0 to 290 psig (0 to 20.0 bar), and 0 to 1015 psig (0 to 70.0 bar)*

**Pressure Control Range:**
- 0 to 290 psig (0 to 20.0 bar)

**Pressure Control Range:**
- 0 to 1015 psig (0 to 70.0 bar)

---

Flow Curves for RD15 Series

**Flow Coefficient 7.30, Pressure Control Ranges 0 to 290 psig (0 to 20.0 bar), and 0 to 1015 psig (0 to 70.0 bar)**

- Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)
- Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)15 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RDH15 Series
Flow Coefficient 7.30, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar) and 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range:
- 0 to 145 psig (0 to 10.0 bar)
- 0 to 362 psig (0 to 25.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)15 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. Dashed line represents calculated values.
For more flow curve information, contact your authorized Swagelok representative.

RDH15 Series
Flow Coefficient 7.30, Pressure Control Ranges 0 to 1450 psig (0 to 100 bar) and 0 to 2537 psig (0 to 175 bar)

Pressure Control Range:
- 0 to 1450 psig (0 to 100 bar)

Pressure Control Range:
- 0 to 2537 psig (0 to 175 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)15 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH15 Series
Flow Coefficient 7.30, Pressure Control Range 0 to 3625 psig (0 to 250 bar)

Pressure Control Range

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<tr>
<th>Nitrogen Flow, Nm³/h</th>
<th>Outlet Pressure, psig</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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</tr>
<tr>
<td>7500</td>
<td>2900 (200)</td>
</tr>
<tr>
<td>15 000</td>
<td>5800 (400)</td>
</tr>
<tr>
<td>22 500</td>
<td></td>
</tr>
<tr>
<td>30 000</td>
<td></td>
</tr>
<tr>
<td>37 500</td>
<td></td>
</tr>
</tbody>
</table>

Inlet Pressure, psig (bar)

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>Nitrogen Flow, std ft³/min</th>
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</thead>
<tbody>
<tr>
<td>25.0</td>
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<td>40.0</td>
<td>200 (2900)</td>
</tr>
<tr>
<td>5800 (400)</td>
<td>5800 (400)</td>
</tr>
<tr>
<td>200</td>
<td>5800 (400)</td>
</tr>
</tbody>
</table>

Outlet Pressure, bar

<table>
<thead>
<tr>
<th>Outlet Pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>50</td>
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<tr>
<td>100</td>
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<tr>
<td>150</td>
</tr>
<tr>
<td>200</td>
</tr>
<tr>
<td>250</td>
</tr>
<tr>
<td>250</td>
</tr>
</tbody>
</table>

Pressure Control Range 0 to 3625 psig (0 to 250 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)20 and RD(H)25 Series

Features
- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator with dynamic regulation

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD20 Series
Flow Coefficient 13, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar) and 0 to 130 psig (0 to 9.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)20 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD20 Series

Flow Coefficient 13, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar) and 0 to 290 psig (0 to 20.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)20 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD20 Series

Flow Coefficient 13, Pressure Control Ranges 0 to 130 psig (0 to 9.0 bar), 0 to 290 psig (0 to 20.0 bar), and 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)
- 0 to 130 psig (0 to 9.0 bar)

Nitrogen Flow, std ft³/min
Outlet Pressure, psig
Inlet Pressure, psig (bar)
Nitrogen Flow, Nm³/h
Outlet Pressure, psig
Inlet Pressure, psig (bar)
Nitrogen Flow, Nm³/h
Outlet Pressure, psig
Inlet Pressure, psig (bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)20 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure
Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. Dashed line represents
calculated values.
For more flow curve information, contact your authorized Swagelok representative.

RDH20 Series

Flow Coefficient 13, Pressure Control Ranges 0 to 362 psig (0 to 25.0 bar) and 0 to 1450 psig (0 to 100 bar)

Pressure Control Range:
- 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range:
- 0 to 1450 psig (0 to 100 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)20 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. Dashed line represents calculated values.
For more flow curve information, contact your authorized Swagelok representative.

RDH20 Series
Flow Coefficient 13, Pressure Control Ranges 0 to 2537 psig (0 to 175 bar) and 0 to 2900 psig (0 to 200 bar)

Pressure Control Range:
- 0 to 2900 psig (0 to 200 bar)
- 0 to 2540 psig (0 to 175 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)20 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD20-EF Series

Flow Coefficient 13, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 130 psig (0 to 9.0 bar), 0 to 145 psig (0 to 10.0 bar), 0 to 290 psig (0 to 20.0 bar), and 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range:
- 0 to 290 psig (0 to 20.0 bar)
- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)

RD20-EF Series

Flow Coefficient 13, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 130 psig (0 to 9.0 bar), 0 to 145 psig (0 to 10.0 bar), 0 to 290 psig (0 to 20.0 bar), and 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range:
- 0 to 290 psig (0 to 20.0 bar)
- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)20 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RDH20-EF Series

*Flow Coefficient 13, Pressure Control Ranges 0 to 1015 psig (0 to 70.0 bar) and 0 to 1450 psig (0 to 100 bar)*
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)20 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH20-EF Series
Flow Coefficient 13, Pressure Control Ranges 0 to 2537 psig (0 to 175 bar) and 0 to 2900 psig (0 to 200 bar)

RD20-EFP Series
Flow Coefficient 13, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 130 psig (0 to 9.0 bar), and 0 to 290 psig (0 to 20.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)25 Series

Features
■ Balanced poppet design
■ Diaphragm sensing
■ Integral pilot regulator with dynamic regulation

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD25 Series
Flow Coefficient 21, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 290 psig (0 to 20.0 bar), 0 to 130 psig (0 to 9.0 bar), and 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range:
- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)

Pressure Control Range:
- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)25 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH25 Series

Flow Coefficient 21, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar), 0 to 362 psig (0 to 25.0 bar), 0 to 1450 psig (0 to 100 bar), 0 to 2537 psig (0 to 175 bar), and 0 to 2900 psig (0 to 200 bar)

Pressure Control Range:

- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)

Pressure Control Range:

- 0 to 2900 psig (0 to 200 bar)
- 0 to 2537 psig (0 to 175 bar)
- 0 to 1450 psig (0 to 100 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)25 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RD25-EF Series

*Flow Coefficient 21, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 130 psig (0 to 9.0 bar), 0 to 290 psig (0 to 20.0 bar), and 0 to 1015 psig (0 to 70.0 bar)*

Pressure Control Range:
- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)

![Flow Curve Graph 1](image1)

Pressure Control Range:
- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)

![Flow Curve Graph 2](image2)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)25 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH25-EF Series

Flow Coefficient 21, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar), 0 to 362 psig (0 to 25.0 bar), 0 to 1450 psig (0 to 100 bar), 0 to 2537 psig (0 to 175 bar), and 0 to 2900 psig (0 to 200 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators
RD(H)25 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD25-EFP Series

Flow Coefficient 21, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 130 psig (0 to 9.0 bar), and 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range:
- 0 to 290 psig (0 to 20.0 bar)
- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)30 and RD(H)40 Series

Features
- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator with dynamic regulation
- Dome-to-outlet pressure ratio approximately 1:1
- Large dome for stability

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD30 Series
Flow Coefficient 36, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 130 psig (0 to 9.0 bar), 0 to 290 psig (0 to 20.0 bar), and 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range
- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)

Pressure Control Range
- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)30 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH30 Series
Flow Coefficient 36, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar), 0 to 362 psig (0 to 25.0 bar), and 0 to 1450 psig (0 to 100 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)30 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RDH30 Series

Flow Coefficient 36, Pressure Control Ranges 0 to 2537 psig (0 to 175 bar) and 0 to 2900 psig (0 to 200 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)30 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD30-EF Series

Flow Coefficient 36, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 130 psig (0 to 9.0 bar), 0 to 290 psig (0 to 20.0 bar), and 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range
- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)

Pressure Control Range
- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)30 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH30-EF Series
Flow Coefficient 36, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar), 0 to 362 psig (0 to 25.0 bar, and 0 to 1450 psig (0 to 100 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)30 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RDH30-EF Series

Flow Coefficient 36, Pressure Control Ranges 0 to 2537 psig (0 to 175 bar) and 0 to 2900 psig (0 to 200 bar)
Pressure-Reducing Regulator Flow Curves

Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)30 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD30-EFP Series

Flow Coefficient 36, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 130 psig (0 to 9.0 bar), and 0 to 290 psig (0 to 20.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)40 Series

**Features**
- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator with dynamic regulation

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

**Flow Data**
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

**RD40 Series**

*Flow Coefficient 36, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar), 0 to 130 psig (0 to 9.0 bar), 0 to 290 psig (0 to 20.0 bar), and 0 to 1015 psig (0 to 70.0 bar)*

![Flow Curve Graphs](image_url)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)40 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH40 Series

Flow Coefficient 36, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar), 0 to 362 psig (0 to 25.0 bar), and 0 to 1450 psig (0 to 100 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)40 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RDH40 Series
Flow Coefficient 36, Pressure Control Ranges 0 to 2537 psig (0 to 175 bar) and 0 to 2900 psig (0 to 200 bar)

RD40-EF Series
Flow Coefficient 36, Pressure Control Ranges 0 to 43.0 psig (0 to 3.0 bar) and 0 to 130 psig (0 to 9.0 bar)
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)40 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD40-EF Series

*Flow Coefficient 36, Pressure Control Ranges 0 to 290 psig (0 to 20.0 bar) and 0 to 1015 psig (0 to 70.0 bar)*

---

**Pressure Control Range**

- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)

---

RDH40-EF Series

*Flow Coefficient 36, Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar) and 0 to 362 psig (0 to 25.0 bar)*

---

**Pressure Control Range**

- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)

---
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)40 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RDH40-EF Series
*Flow Coefficient 36, Pressure Control Range 0 to 1450 psig (0 to 100 bar)*

RDH40-EF Series
*Flow Coefficient 36, Pressure Control Ranges 0 to 2537 psig (0 to 175 bar) and 0 to 2900 psig (0 to 200 bar)*
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)40 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD40-EFP Series

Flow Coefficient 36, Pressure Control Range 0 to 290 psig (0 to 20.0 bar) and 0 to 130 psig (0 to 9.0 bar)

RD40-EFP Series

Flow Coefficient 36, Pressure Control Range 0 to 290 psig (0 to 20.0 bar)
**Air-Loaded, Pressure-Reducing Regulators—RA Series**

**Features**
- Balanced poppet design
- Diaphragm sensing
- Air-loaded pressure control with a choice of pilot-to-outlet pressure ratios.
- Remote control

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

**Flow Data**
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

**RA4 Series**

**Flow Coefficient 1.84**  
**Pressure Ratio 1:15, 1:40, 1:70**
Air-Loaded, Pressure-Reducing Regulators—RA Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RA4 Series
Flow Coefficient 1.84
Pressure Ratio 1:40, 1:70

RA6 and RA8 Series
Flow Coefficient 1.84
Pressure Ratio 1:15, 1:40, 1:70
Air-Loaded, Pressure-Reducing Regulators—RA Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

RA6 and RA8 Series

Flow Coefficient 1.84
Pressure Ratio 1:15, 1:40, 1:70

RA6 and RA8 Series

Flow Coefficient 1.84
Pressure Ratio 1:40, 1:70
Compact, General-Purpose, Spring-Loaded Back-Pressure Regulators
BS(H)2 Series

Features
- Piston sensing
- Bottom mounting
- Low-friction piston for better control

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

Flow Coefficient 0.10 Pressure Control Ranges 0 to 145 psig (0 to 10.0 bar) and 0 to 362 psig (0 to 25.0 bar)
Compact, General-Purpose, Spring-Loaded Back-Pressure Regulators
BS(H)2 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

Flow Coefficient 0.10, Pressure Control Ranges 0 to 1450 psig (0 to 100 bar) and 0 to 2537 psig (0 to 175 bar)

Pressure Control Range:
- 0 to 1450 psig (0 to 100 bar)

![Flow Curves for 0 to 1450 psig (0 to 100 bar)](image)

Pressure Control Range:
- 0 to 2537 psig (0 to 175 bar)

![Flow Curves for 0 to 2537 psig (0 to 175 bar)](image)
Compact, General-Purpose, Spring-Loaded Back-Pressure Regulators
BS(H)2 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. Dashed line represents calculated values.
For more flow curve information, contact your authorized Swagelok representative.

**Flow Coefficient 0.10, Pressure Control Range 0 to 5075 psig (0 to 350 bar)**

**Pressure Control Range:**
- **0 to 5075 psig (0 to 350 bar)**
- **Pressure Limit**

**BSH2 Series**

**Flow Coefficient 0.10, Pressure Control Range 0 to 10150 psig (0 to 700 bar)**

**Pressure Control Range**
- **0 to 10150 psig (0 to 700 bar)**
General-Purpose, Spring-Loaded Back-Pressure Regulators—BS(H)4, BS(H)6, and BS(H)8 Series

Features
■ Diaphragm sensing: 0 to 406 psig (0 to 28.0 bar)
■ Piston sensing: 0 to 5220 psig (0 to 360 bar)
■ Threaded vent to monitor seal integrity

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

BS(H)4 Series
Flow Coefficient 1.84

BSH4 Series
Flow Coefficient 1.84, Pressure Control Range 0 to 5220 psig (0 to 360 bar)
Pressure Control Range

Nitrogen Flow, Nm³/h
0 300 600 900 1200 1500 1800
2175 (150)
2175 (150)
1160 (80.0)
1160 (80.0)
1160 (80.0)
580 (40.0)
580 (40.0)
406 (28.0)
203 (14.0)
101 (7.0)

Nitrogen Flow, std ft³/min
0 200 400 600 800 1000 1200
Flow Coefficient: 0.49
Maximum Inlet Pressure:
BSH4—5800 psig (400 bar)
Inlet Pressure Control Range: 0 to 5220 psig (0 to 360 bar)
Compact, General-Purpose, Spring-Loaded Back-Pressure Regulators
BS(H)4, BS(H)6, and BS(H)8 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

BS(H)6 Series

Flow Coefficient 1.84

BSH6 Series

Flow Coefficient 1.84, Pressure Control Range 0 to 5220 psig (0 to 360 bar)

BSH6 Series

Flow Coefficient 1.84, Pressure Control Range 0 to 5220 psig (0 to 360 bar)
Compact, General-Purpose, Spring-Loaded Back-Pressure Regulators
BS(H)4, BS(H)6, and BS(H)8 Series

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

BS(H)8 Series

Flow Coefficient 1.84

Pressure Control Range 0 to 5220 psig (0 to 360 bar)

BSH8 Series

Flow Coefficient 1.84, Pressure Control Range 0 to 5220 psig (0 to 360 bar)
General-Purpose, Spring-Loaded Back-Pressure Regulators—
BS(H)10 and BS(H)15 Series

Features
- Balanced poppet design
- Diaphragm sensing: 0 to 290 psig (0 to 20.0 bar)
- Piston sensing: 0 to 3625 psig (0 to 250 bar)
- High flow capacity

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

BS10 Series

*Flow Coefficient 3.84, Pressure Control Ranges 0 to 43 psig (0 to 3.0 bar), 0 to 72 psig (0 to 5.0 bar), 0 to 145 psig (0 to 10.0 bar), and 0 to 290 psig (0 to 20.0 bar)*

Pressure Control Range

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Inlet Pressure, psig</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 290 psig (0 to 20.0 bar)</td>
<td>0 to 290</td>
<td>0 to 1500</td>
</tr>
<tr>
<td>0 to 145 psig (0 to 10.0 bar)</td>
<td>0 to 145</td>
<td>0 to 1200</td>
</tr>
<tr>
<td>0 to 72 psig (0 to 5.0 bar)</td>
<td>0 to 72</td>
<td>0 to 800</td>
</tr>
<tr>
<td>0 to 43 psig (0 to 3.0 bar)</td>
<td>0 to 43</td>
<td>0 to 500</td>
</tr>
</tbody>
</table>
General-Purpose, Spring-Loaded Back-Pressure Regulators—BS(H)10 and BS(H)15 Series

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

BSH10 Series

*Flow Coefficient 3.84, Pressure Control Ranges 0 to 580 psig (0 to 40.0 bar), 0 to 1450 psig (0 to 100 bar), 0 to 2610 psig (0 to 180 bar), and 0 to 3625 psig (0 to 250 bar)*

Pressure Control Range
- 0 to 1450 psig (0 to 100 bar)
- 0 to 580 psig (0 to 40.0 bar)

![Graph 1](image1)

Pressure Control Range
- 0 to 3625 psig (0 to 250 bar)
- 0 to 2610 psig (0 to 180 bar)

![Graph 2](image2)
General-Purpose, Spring-Loaded Back-Pressure Regulators—BS(H)10 and BS(H)15 Series

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

BS15 Series

Flow Coefficient 7.3, Pressure Control Ranges 0 to 43 psig (0 to 3.0 bar), 0 to 72 psig (0 to 5.0 bar), 0 to 145 psig (0 to 10.0 bar), and 0 to 290 psig (0 to 20.0 bar)
General-Purpose, Spring-Load Back-Pressure Regulators—BS(H)10 and BS(H)15 Series

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

BSH15 Series
Flow Coefficient: 7.3, Pressure Control Ranges 0 to 580 psig (0 to 40.0 bar), 0 to 1450 psig (0 to 100 bar), 0 to 2610 psig (0 to 180 bar), and 0 to 3625 psig (0 to 250 bar)
High-Sensitivity, Spring-Loaded Back-Pressure Regulators—
LBS4 Series

Features
- Diaphragm sensing
- Bottom mounting and panel mounting

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

LBS4 Series
Flow Coefficient: 1.3, Pressure Control Range 0 to 43 psig (0 to 3.0 bar)

LBS4 Series
Flow Coefficient: 1.3, Pressure Control Range 0 to 290 psig (0 to 20.0 bar)
**High-Sensitivity, Spring-Loaded Back-Pressure Regulators—LBS4 Series**

For options, additional technical data, materials of construction, and ordering information, see the Swagelok Pressure Regulators, RHPS Series catalog, MS-02-430.

**Flow Data**
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok representative.

**LBS4 Series**
*Flow Coefficient: 1.3, Pressure Control Range 0 to 43 psig (0 to 3.0 bar)*

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 43 psig (0 to 3.0 bar)</td>
<td><img src="image" alt="Graph of Nitrogen Flow vs Inlet Pressure for LBS4 Series (0 to 43 psig)" /></td>
</tr>
</tbody>
</table>

Optional 316L SS Diaphragm

**LBS4 Series**
*Flow Coefficient: 1.3, Pressure Control Range 0 to 130 psig (0 to 9.0 bar)*

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 130 psig (0 to 9.0 bar)</td>
<td><img src="image" alt="Graph of Nitrogen Flow vs Inlet Pressure for LBS4 Series (0 to 130 psig)" /></td>
</tr>
</tbody>
</table>

Optional 316L SS Diaphragm
Safe Product Selection
When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

Caution: Do not mix or interchange parts with those of other manufacturers.

Warranty Information
Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit swagelok.com or contact your authorized Swagelok representative.