Pressure Regulators
K Series

- Pressure-reducing models
- Back-pressure models
- Gas cylinder changeover model
- Vaporizing models
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Pressure Regulator Operation
Regulators reduce the pressure of a gas or liquid from a source, such as a cylinder or compressor, to a lower value needed by a device, such as an analyzer. A pressure regulator provides better resolution and control when its inlet and control range pressures closely match the pressure requirements of the fluid handling system. Resolution is the number of handle turns needed to adjust a regulator from its lowest to highest outlet pressure set point.

Pressure-Reducing Regulators
Pressure-reducing regulators control outlet pressure by balancing an adjustable spring force against the forces caused by inlet and outlet pressures. The spring force is adjusted by turning the stem/handle, which sets the desired outlet pressure.

As inlet pressure decreases, the force balance changes. To compensate, outlet pressure will increase. This supply-pressure effect (SPE) is a function of the design and type of regulator. If a regulator is subjected to fluctuating inlet pressure, and outlet pressure variations are not desirable, a two-stage regulator is available.

Specialty Pressure-Reducing Regulators
Gas Cylinder Changeover
A two-stage gas cylinder changeover model automatically switches between two sources.

Vaporizing
Vaporization regulators are available with electric and steam heat to vaporize liquid samples or to preheat gas samples.

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

### K Series Pressure Regulator Selection

<table>
<thead>
<tr>
<th>Series</th>
<th>Diaphragm Sensing</th>
<th>Piston Sensing</th>
<th>2 Stage</th>
<th>Gas Cylinder Changeover</th>
<th>Electrical Vaporizing</th>
<th>Steam Vaporizing</th>
<th>Compact, MVP Platform</th>
<th>Maximum Inlet Pressure (psig)</th>
<th>Pressure Control Ranges, psig (bar)</th>
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<td>0 to 750 (0.13 to 51.6)</td>
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<td>10 (0.68)</td>
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<td>50 (3.4)</td>
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<td>100 (6.8)</td>
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<td>250 (17.2)</td>
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<td>375 (25.8)</td>
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<td>500 (34.4)</td>
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<td></td>
<td>750 (51.6)</td>
</tr>
</tbody>
</table>

#### Pressure-Reducing Models

- **KPR** ✓
- **KCY** ✓
- **KLF** ✓
- **KHF** ✓
- **KCP** ✓
- **KPP** ✓
- **KPF** ✓
- **KHP** ✓
- **KHR** ✓

#### Specialty Regulators

- **KCM** ✓ ✓ ✓
- **KSV** ✓
- **KEV** ✓ ✓

#### Back-Pressure Models

- **KBP** ✓
- **KFB** ✓
- **KCB** ✓
- **KPB** ✓
- **KHB** ✓

Outlet pressures up to 500 psig (34.4 bar) require diaphragm sensing mechanism; outlet pressures above 500 psig (34.4 bar) require piston sensing mechanism.
model, it is important to make sure that SPE will not cause excessive overpressurization on opening and closing of the supply pressure.

**Back-Pressure Regulators**

Back-pressure regulators control inlet pressure by balancing an adjustable spring force against the force of the inlet pressure. The spring force is adjusted by turning the stem/handle, which sets the desired inlet pressure.

When the force caused by the inlet pressure rises above the force of the spring, the regulator opens until the spring force and inlet pressure are balanced again.

⚠ **Swagelok pressure regulators are not “Safety Accessories” as defined in the Pressure Equipment Directive 2014/68/EU.**

⚠ **Do not use the regulator as a shutoff device.**

⚠ **Self-venting and captured-venting regulators can release system fluid to atmosphere. Position the self-vent hole or the captured vent connection away from operating personnel. See Venting Options, page 5, for more information.**

**Testing**

Every Swagelok K series pressure regulator is pressure tested with nitrogen.

**Cleaning and Packaging**

Every Swagelok K series pressure regulator is cleaned and packaged in accordance with Swagelok Standard Cleaning and Packaging (SC-10) (MS-06-62).

Cleaning and packaging to ensure compliance with product cleanliness requirements stated in ASTM G93 Level E is available for brass and stainless steel Swagelok regulators.

Cleaning and packaging in accordance with Swagelok Special Cleaning and Packaging (SC-11) (MS-06-63), to ensure compliance with product cleanliness requirements stated in ASTM G93 Level C is available for select KPR, KCY, KCP, KBP, and KCB series regulators.

**Oxygen Service Hazards**

For more information about hazards and risks of oxygen-enriched systems, see the Swagelok Oxygen System Safety technical report (MS-06-13).
Swagelok® K Series Pressure Regulator Features

**Stop Plate**
This disc provides positive backup to the diaphragm in case of diaphragm overpressure.

**Range Spring**
Turning the handle compresses the spring, pushing the poppet away from the seat and increasing outlet pressure.

**Convoluted Diaphragm**
The all-metal diaphragm acts as the sensing mechanism between the inlet pressure and the range spring. The convoluted, nonperforated design ensures greater sensitivity and longer life. A piston sensing mechanism (shown below) can accommodate higher pressures.

**Two-Piece Cap**
The two-piece design provides linear load on the diaphragm seal when the cap ring is tightened, eliminating torque damage to the diaphragm during assembly.

**Poppet Damper**
The poppet damper keeps the poppet aligned and reduces vibration and resonance.

**Gauze Inlet Filter**
Regulators are susceptible to damage from system particles. Swagelok pressure-reducing regulators include a 25 µm press fit filter. It can be removed to use the regulator in liquid service.

**Inlet**

**Outlet**

**Stem**
Fine-pitch threads enable precise spring adjustment with low torque.

**Venting Options**
The self-vent option allows excess outlet pressure to vent through the body cap. This can occur when downstream flow is suddenly reduced or when the handle is adjusted to a lower pressure with little or no flow downstream.

The captured-vent option includes a 1/8 in. female NPT connection and stem seal in the body cap to allow monitoring of the diaphragm or piston sensing mechanism. It also allows containment of hazardous gas or liquid media should a diaphragm or piston rupture.

**Self-vent and captured-vent** options can be ordered together so that hazardous gas or liquid media can be contained if vented.

*① The captured-vent port is in the bottom of the KHR series body.

**Piston Sensing Mechanism**
Piston sensing mechanisms typically are used to regulate higher pressures than a diaphragm can withstand. They are also more resistant to damage caused by pressure spikes and have a short stroke to maximize cycle life.

**Fully-Contained Piston**
The piston is contained by a shoulder in the regulator body cap to prevent piston blowout if the regulator outlet is overpressurized.
General-Purpose Diaphragm-Sensing, Pressure-Reducing Regulators (KPR Series)

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

Features
- Convoluted, nonperforated diaphragm
- Metal-to-metal diaphragm seal
- Low internal volume
- Two-piece cap design provides linear load on the diaphragm seal
- High-flow, dual-gauze type filter in inlet ports

Technical Data

Maximum Inlet Pressure
- 3600 psig (248 bar)
- 6000 psig (413 bar) with PEEK seat

Pressure Control Ranges
- 0 to 10 psig (0.68 bar) through 0 to 500 psig (34.4 bar)

Flow Coefficient \( (C_v) \)
- 0.06 and 0.20

See page 41 for flow graphs.
- 0.02 and 0.50 also available

Supply-Pressure Effect

<table>
<thead>
<tr>
<th>Flow Coefficient ( (C_v) )</th>
<th>Pressure Control Range</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 100 psig (6.8 bar)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>250 psig (17.2 bar) and Higher</td>
<td></td>
</tr>
<tr>
<td>0.02</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>0.06</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>0.20</td>
<td>1.7</td>
<td>2.5</td>
</tr>
<tr>
<td>0.50</td>
<td>2.3</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Maximum Operating Temperature
- 176°F (80°C) with PCTFE seat
- 392°F (200°C) with PEEK seat
- 212°F (100°C) with PEEK seat and maximum inlet pressure greater than 3600 psig (248 bar)

Weight
- 2.4 lb (1.1 kg)

Ports
- 1/4 in. female NPT inlet, outlet, and gauge ports (all body materials)
- 1/4 in. tube butt weld inlet, outlet, and gauge ports (316 SS body material only)
- 1/4 in. VCR® inlet, outlet, and gauge ports (316 SS body material only)

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>316 SS</th>
<th>Brass CW721R</th>
<th>Alloy 400</th>
<th>Alloy C-276</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Spring button</td>
<td>Zinc-plated steel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring stabilizer (^1)</td>
<td>301 SS</td>
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<tr>
<td>Range spring</td>
<td>316 SS and zinc-plated steel, depending on configuration</td>
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<tr>
<td>Stem, stem nut, cap ring, stop plate, body cap, panel nuts (^2)</td>
<td>316 SS</td>
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<td>VCR nuts (^2)</td>
<td>316 SS</td>
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<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
<td></td>
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<td></td>
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<tr>
<td>Seat retainer</td>
<td>316 SS</td>
<td>Alloy 400</td>
<td></td>
<td>Alloy C-276</td>
</tr>
<tr>
<td>Seat</td>
<td>PCTFE or PEEK</td>
<td></td>
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</tr>
<tr>
<td>Filter</td>
<td>316 SS</td>
<td>Alloy C-22</td>
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<tr>
<td>Diaphragm (^3)</td>
<td>Alloy X-750 or alloy C-276</td>
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<tr>
<td>Poppet</td>
<td>S17400 SS</td>
<td>Alloy 400</td>
<td></td>
<td>Alloy C-276</td>
</tr>
<tr>
<td>Poppet spring</td>
<td>Alloy X-750</td>
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<td></td>
</tr>
<tr>
<td>Poppet damper, filter carrier</td>
<td>PTFE</td>
<td></td>
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<tr>
<td>Self-vent seal (^2)</td>
<td>Fluorocarbon FKM</td>
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<td>Body</td>
<td>316 SS</td>
<td>Brass CW721R</td>
<td>Alloy 400</td>
<td>Alloy C-276</td>
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<tr>
<td>Tube butt weld ports (^3)</td>
<td>316L SS</td>
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<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
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</tbody>
</table>

Wetted components listed in italics.

\(^1\) Not required in all configurations.
\(^2\) Not shown.
\(^3\) Regulators with control ranges higher than 0 to 100 psig (0 to 6.8 bar) are assembled with two diaphragms.
Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Ordering Information

Build a KPR series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>Body Material</td>
<td>Port Configuration</td>
<td>Ports</td>
<td>Pressure Control Range</td>
<td>Maximum Inlet Pressure</td>
<td>Seat Material</td>
<td>Flow Coefficient (C_v)</td>
<td>Sensing Mechanism, Vent</td>
<td>Handle, Mounting</td>
<td>Isolation and Relief Valves</td>
<td>Cylinder Connections</td>
<td>Gauges</td>
<td>Options</td>
</tr>
<tr>
<td>1</td>
<td>KPR</td>
<td>F</td>
<td>F</td>
<td>4</td>
<td>1</td>
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</tbody>
</table>

**Dimensions**

**Ordering Information**

Select KPR series regulators are available that meet the testing requirements of ASTM G175, “Standard Test Method for Evaluating the Ignition Sensitivity and Fault Tolerance of Oxygen Regulators Used for Medical and Emergency Applications.” Contact your authorized Swagelok sales and service representative.
Two-Stage Diaphragm-Sensing, Pressure-Reducing Regulators (KCY Series)

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.

This two-stage arrangement minimizes the supply-pressure effect caused by fluctuating inlet pressure, such as with a depleting gas cylinder. As inlet pressure drops below the setting of the first stage, the regulator then functions as a single-stage regulator. The first-stage pressure setting can be reduced while monitoring the pressure at the interstage port, but lower flow may result.

Features
- Convoluted, nonperforated diaphragm
- Metal-to-metal diaphragm seal
- Excellent set-point stability
- High-flow, dual-gauze type filter in inlet ports

Technical Data

Maximum Inlet Pressure
- 3600 psig (248 bar)
- 6000 psig (413 bar) with PEEK seat

Pressure Control Ranges
- 0 to 10 psig (0.68 bar) through 0 to 500 psig (34.4 bar)

Flow Coefficient ($C_v$)
- 0.06 and 0.20
- See page 42 for flow graphs.
- 0.50 also available

Supply-Pressure Effect

<table>
<thead>
<tr>
<th>Flow Coefficient ($C_v$)</th>
<th>Pressure Control Range</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 100 psig (6.8 bar)</td>
<td>250 psig (17.2 bar) and Higher</td>
</tr>
<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>
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</tbody>
</table>

Maximum Operating Temperature
- 176°F (80°C) with PCTFE seat
- 392°F (200°C) with PEEK seat
- 212°F (100°C) with PEEK seat and maximum inlet pressure greater than 3600 psig (248 bar)

Weight
- 4.2 lb (1.9 kg)

Ports
- 1/4 in. female NPT inlet, outlet, and gauge ports
Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Ordering Information

Build a KCY series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>Body Material</th>
<th>Pressure Control Range</th>
<th>Maximum Inlet Pressure</th>
<th>Port Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 5 6 7 8 9 10 11 12 13 14 15 16</td>
<td>4 5 6 7 8 9 10 11 12 13 14 15 16</td>
<td>4 5 6 7 8 9 10 11 12 13 14 15 16</td>
<td>4 5 6 7 8 9 10 11 12 13 14 15 16</td>
</tr>
<tr>
<td>1 = 316 SS</td>
<td>C = 0 to 10 psig (0 to 0.68 bar)</td>
<td>P = 3000 psig (206 bar)</td>
<td>A, B, C, E, F, H, K, L, M, N</td>
</tr>
<tr>
<td>2 = Brass CW721R</td>
<td>D = 0 to 25 psig (0 to 1.7 bar)</td>
<td>R = 3600 psig (248 bar)</td>
<td>See Port Configurations, page 52.</td>
</tr>
<tr>
<td>A = 316 SS, ASTM G93 Level E-cleaned</td>
<td>E = 0 to 50 psig (0 to 3.4 bar)</td>
<td>T = 4351 psig (300 bar)②</td>
<td></td>
</tr>
<tr>
<td>B = Brass, ASTM G93 Level E-cleaned</td>
<td>F = 0 to 100 psig (0 to 6.8 bar)</td>
<td>W = 6000 psig (413 bar)③</td>
<td></td>
</tr>
<tr>
<td>C = 316 SS, SC-11–cleaned</td>
<td>G = 0 to 250 psig (0 to 17.2 bar)</td>
<td>① Cylinder Connections and Hose accessories may limit inlet pressure ratings, see pages 53 and 56.</td>
<td></td>
</tr>
<tr>
<td>D = Brass, SC-11–cleaned</td>
<td>J = 0 to 500 psig (0 to 34.4 bar)</td>
<td>② Available only with 316 SS body material and PEEK seat material. Not available with SC-11 cleaning.</td>
<td></td>
</tr>
</tbody>
</table>

Select KCY series regulators are available that meet the testing requirements of ASTM G175, “Standard Test Method for Evaluating the Ignition Sensitivity and Fault Tolerance of Oxygen Regulators Used for Medical and Emergency Applications.” Contact your authorized Swagelok representative.
High-Sensitivity Diaphragm-Sensing, Pressure-Reducing Regulators (KLF Series)

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

**Features**
- Large-diameter convoluted, nonperforated diaphragm for increased pressure sensitivity
- Metal-to-metal diaphragm seal
- High-flow, dual-gauze type filter in inlet ports

**Technical Data**

**Maximum Inlet Pressure**
- 3600 psig (248 bar)

**Pressure Control Ranges**
- 0 to 2.0 psig (0.13 bar) through 0 to 250 psig (17.2 bar)

**Flow Coefficient \( (C_v) \)**
- 0.02 and 0.06
  - See page 43 for flow graphs.
- 0.20 and 0.50 also available

**Supply-Pressure Effect**

<table>
<thead>
<tr>
<th>Flow Coefficient ( (C_v) )</th>
<th>Pressure Control Range</th>
<th>Up to 10 psig (0.68 bar)</th>
<th>25 psig (1.7 bar)</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02</td>
<td></td>
<td>0.1</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>0.06</td>
<td></td>
<td>0.4</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>0.20</td>
<td></td>
<td>0.7</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>0.50</td>
<td></td>
<td>1.0</td>
<td>1.4</td>
<td></td>
</tr>
</tbody>
</table>

**Maximum Operating Temperature**
- 176°F (80°C) with PCTFE seat
- 392°F (200°C) with PEEK seat

**Weight**
- 4.0 lb (1.8 kg)

**Ports**
- 1/4 in. female NPT inlet, outlet, and gauge ports

**Materials of Construction**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
</tr>
<tr>
<td>Spring button</td>
<td>Zinc-plated steel</td>
</tr>
<tr>
<td>Spring stabilizer(^1)</td>
<td>301 SS</td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS or zinc-plated steel, depending on configuration</td>
</tr>
<tr>
<td>Stem, stem nut, cap ring, stop plate, body cap, panel nuts(^2)</td>
<td>316 SS</td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, seat retainer, filter</td>
<td>316 SS</td>
</tr>
<tr>
<td>Seat</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>Diaphragm,(^3) poppet spring</td>
<td>Alloy X-750</td>
</tr>
<tr>
<td>Poppet</td>
<td>S17400 SS</td>
</tr>
<tr>
<td>Poppet damper, filter carrier</td>
<td>PTFE</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
</tr>
</tbody>
</table>

Wetted components listed in italics.
\(^1\) Not required in all configurations.
\(^2\) Not shown.
\(^3\) Regulators with control range 0 to 250 psig (0 to 17.2 bar) are assembled with two diaphragms.
Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Ordering Information

Build a KLF series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
</table>
| 4 | Body Material | 1 = 316 SS  
A = 316 SS, ASTM G93 Level E-cleaned |
| 5 | Pressure Control Range | B = 0 to 2.0 psig (0 to 0.13 bar)  
C = 0 to 10 psig (0 to 0.68 bar)  
D = 0 to 25 psig (0 to 1.7 bar)  
E = 0 to 50 psig (0 to 3.4 bar)  
F = 0 to 100 psig (0 to 6.8 bar)  
G = 0 to 250 psig (0 to 17.2 bar)  
① Available with 15 psig (1.0 bar) maximum inlet pressure only. |
| 6 | Maximum Inlet Pressure ②③ | C = 15 psig (1.0 bar)  
F = 100 psig (6.8 bar)  
J = 500 psig (34.4 bar)  
L = 1000 psig (68.9 bar)  
P = 3000 psig (206 bar)  
R = 3600 psig (248 bar)  
① For better resolution and control, select a pressure that closely matches system pressure.  
② Available with 0 to 2.0 psig (0 to 0.13 bar) pressure control range only.  
③ Cylinder Connections and Hose accessories may limit inlet pressure ratings, see pages 53 and 56. |
| 7 | Port Configuration | A, B, C, E, F, H, K, L, M, N  
See Port Configurations, page 52. |
| 8 | Ports | 4 = 1/4 in. female NPT |
| 9 | Seat Material | 1 = PCTFE  
2 = PEEK |
| 10 | Flow Coefficient ($C_v$) | 1 = 0.02  
2 = 0.06  
5 = 0.20  
7 = 0.50 |
| 11 | Sensing Mechanism, Vent | A = Alloy X-750 diaphragm, no vent  
E = Alloy X-750 diaphragm, captured vent, no self vent |
| 12 | Handle, Mounting | 2 = Knob  
3 = 316 SS antitamper nut  
6 = Knob, panel mount  
7 = 316 SS antitamper nut, panel mount  
For knob handle color options, see page 56. |
| 13 | Isolation and Relief Valves | 0 = No valves  
For isolation and relief valve options, see page 54. |
| 14 | Cylinder Connections | 0 = No connection  
For cylinder connection options and pressure ratings, see page 53. |
| 15 | Gauges | 0 = No gauges  
For inlet and outlet gauge options, see page 54. |
| 16 | Options | 0 = No options  
3 = 3 ft, 1/4 in. FX series metal flexible hose, 1/4 in. female NPT inlet ①  
4 = 3 ft, 1/4 in. TH series PTFE-lined, stainless steel braided hose, 1/4 in. female NPT inlet ①  
For hose options and pressure ratings, see page 56.  
① Not available for ASTM G93 Level E-cleaned regulators. |
High-Flow, High-Sensitivity Diaphragm-Sensing, Pressure-Reducing Regulators (KHF Series)

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

**Features**
- Large-diameter convoluted, nonperforated diaphragm for increased pressure sensitivity
- Metal-to-metal diaphragm seal
- High-flow dual-gauze type filter in inlet ports

**Technical Data**

**Maximum Inlet Pressure**
- 3600 psig (248 bar)

**Pressure Control Ranges**
- 0 to 10 psig (0.68 bar) through 0 to 250 psig (17.2 bar)

**Flow Coefficient (Cᵥ)**
- 1.0

See page 44 for flow graphs.

<table>
<thead>
<tr>
<th>Flow Coefficient (Cᵥ)</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>

**Supply-Pressure Effect**

**Maximum Operating Temperature**
- 176°F (80°C) with PCTFE seat
- 392°F (200°C) with PEEK seat

**Weight**
- 4.4 lb (2.0 kg)

**Ports**
- 1/2 in. female NPT inlet and outlet; 1/4 in. female NPT gauge port

**Materials of Construction**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
</tr>
<tr>
<td>Spring button</td>
<td>316 SS (0 to 250 psig range)</td>
</tr>
<tr>
<td>Spring stabilizer&lt;sup&gt;1&lt;/sup&gt;</td>
<td>316 SS</td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS (0 to 10 and 0 to 25 psig control ranges)</td>
</tr>
<tr>
<td>Stem, stem nut, cap ring, stop plate, body cap, panel nuts&lt;sup&gt;2&lt;/sup&gt;</td>
<td>316 SS</td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, spring retainer, seat retainer, filter, poppet seal retainer</td>
<td>316 SS</td>
</tr>
<tr>
<td>Seat</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>Diaphragm&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Alloy X-750</td>
</tr>
<tr>
<td>Poppet</td>
<td>S17400 SS</td>
</tr>
<tr>
<td>Poppet spring</td>
<td>302 SS</td>
</tr>
<tr>
<td>Poppet seal, filter carrier</td>
<td>PTFE</td>
</tr>
<tr>
<td>Poppet seal spring</td>
<td>Elgiloy ®</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
</tr>
</tbody>
</table>

Wetted components listed in italics.

<sup>1</sup> Not included in regulators with 0 to 250 psig (0 to 17.2 bar) control range.
<sup>2</sup> Not shown.
<sup>3</sup> Regulators with control range 0 to 250 psig (0 to 17.2 bar) are assembled with two diaphragms.
Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

<table>
<thead>
<tr>
<th>2.13 (54.0)</th>
<th>3.15 (80.0)</th>
<th>0.75 (19.0)</th>
<th>0.96 (24.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>dia</td>
<td>dia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.00 (127)</td>
<td>5.39 (137)</td>
<td>0.39 (10.0)</td>
<td>0.63 (16.0)</td>
</tr>
<tr>
<td>10-32, 0.33 deep</td>
<td>(M5 x 0.8, 8.5 deep)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel 0.39 (10.0) thick maximum with 2 lock nuts
Panel 0.63 (16.0) thick maximum with 1 lock nut
Panel cutout 1.38 (35.0) dia

Ordering Information

Build a KHF series regulator ordering number by combining the designators in the sequence shown below.

KHF 1 F R F 8 1 8 A 2 0 0 0 0

1. Body Material  
   1 = 316 SS
   A = 316 SS, ASTM G93 Level E-cleaned

2. Pressure Control Range  
   C = 0 to 10 psig (0 to 0.68 bar)
   D = 0 to 25 psig (0 to 1.7 bar)
   E = 0 to 50 psig (0 to 3.4 bar)
   F = 0 to 100 psig (0 to 6.8 bar)
   G = 0 to 250 psig (0 to 17.2 bar)

3. Maximum Inlet Pressure  
   F = 100 psig (6.8 bar)
   J = 500 psig (34.4 bar)
   L = 1000 psig (68.9 bar)
   R = 3600 psig (248 bar)
   \( \text{For better resolution and control, select a pressure that closely matches system pressure.} \)

4. Port Configuration  
   A, B, C, E, F, H, K, L, M, N
   \( \text{See Port Configurations, page 52.} \)

5. Ports  
   8 = 1/2 in. female NPT inlet and outlet;
   1/4 in. female NPT gauge port

6. Seat Material  
   1 = PCTFE
   2 = PEEK

7. Flow Coefficient \((C_v)\)  
   8 = 1.0

8. Sensing Mechanism, Vent  
   A = Alloy X-750 diaphragm, no vent
   E = Alloy X-750 diaphragm, captured vent, no self vent

9. Handle, Mounting  
   2 = Knob
   3 = 316 SS antitamper nut
   6 = Knob, panel mount
   7 = 316 SS antitamper nut, panel mount
   \( \text{For knob handle color options, see page 56.} \)

10. Isolation and Relief Valves  
    0 = No valves
    \( \text{For isolation and relief valve options, see page 54.} \)

11. Cylinder Connections  
    0 = No connections

12. Gauges  
    0 = No gauges
    \( \text{For inlet and outlet gauge options, see page 54.} \)

13. Options  
    0 = No options
Compact, Piston-Sensing, Pressure-Reducing Regulators (KCP Series)

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

**Features**
- Low internal volume
- Fully contained piston
- High-flow, dual-gauze type filter in inlet ports
- ANSI/ISA 76.00.02-compliant modular platform component (MPC) configuration available; MPC platform regulator does not contain a filter

**Technical Data**

**Maximum Inlet Pressure**
- 3600 psig (248 bar)

**Pressure Control Ranges**
- 0 to 10 psig (0.68 bar) through 0 to 1500 psig (103 bar)

**Flow Coefficient ($C_v$)**
- 0.06 and 0.20
  
  See page 45 for flow graphs.
- 0.02 and 0.50 also available

**Supply Pressure Effect**

<table>
<thead>
<tr>
<th>Flow Coefficient ($C_v$)</th>
<th>Pressure Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 250 psig (17.2 bar)</td>
</tr>
<tr>
<td>Supply Pressure Effect, %</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
</tr>
</tbody>
</table>

**Maximum Operating Temperature**
- 176°F (80°C) with PCTFE seat
- 392°F (200°C) with PEEK seat

**Weight**
- 1.0 lb (0.45 kg)

**Ports**
- 1/8 in. female NPT inlet, outlet, and gauge ports
- MPC platform

**Materials of Construction**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thumbwheel handle</td>
<td>Anodized aluminum</td>
</tr>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
</tr>
<tr>
<td>Spring button</td>
<td>Zinc-plated steel</td>
</tr>
<tr>
<td>Spring stabilizer</td>
<td>301 SS</td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS or zinc-plated steel,</td>
</tr>
<tr>
<td></td>
<td>depending on configuration</td>
</tr>
<tr>
<td>Stem, stem nut, body cap, panel</td>
<td>316 SS</td>
</tr>
<tr>
<td>nuts</td>
<td></td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, seat retainer, piston,</td>
<td>316 SS</td>
</tr>
<tr>
<td>filter</td>
<td></td>
</tr>
<tr>
<td>Piston seal</td>
<td>Fluorocarbon FKM or Kalrez®</td>
</tr>
<tr>
<td>Seat</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>Poppet</td>
<td>S17400 SS</td>
</tr>
<tr>
<td>Poppet spring</td>
<td>302 SS</td>
</tr>
<tr>
<td>Filter carrier</td>
<td>PTFE</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
</tr>
</tbody>
</table>

Wetted components listed in italics.

① Not shown.
② MPC platform regulator does not contain a filter.
**Dimensions**

Dimensions, in inches (millimeters), are for reference only and are subject to change.

---

**Ordering Information**

Build a KCP series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>KCP</td>
<td>1</td>
<td>F</td>
<td>R</td>
<td>A</td>
<td>2</td>
<td>A</td>
<td>2</td>
<td>P</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Body Material**
  - 1 = 316 SS
  - A = 316 SS, ASTM G93 Level E-cleaned
  - C = 316 SS, SC-11-cleaned

- **Pressure Control Range**
  - C = 0 to 10 psig (0 to 0.68 bar)
  - D = 0 to 25 psig (0 to 1.7 bar)
  - E = 0 to 50 psig (0 to 3.4 bar)
  - F = 0 to 100 psig (0 to 6.8 bar)
  - G = 0 to 250 psig (0 to 17.2 bar)
  - J = 0 to 500 psig (0 to 34.4 bar)
  - L = 0 to 1000 psig (0 to 68.9 bar)
  - M = 0 to 1500 psig (0 to 103 bar)

- **Maximum Inlet Pressure**
  - F = 100 psig (6.8 bar)
  - J = 500 psig (34.4 bar)
  - L = 1000 psig (68.9 bar)
  - R = 3600 psig (248 bar)

- **Port Configuration**
  - A, B, C, E, F, H, K, L, M, N, 5, 6
  - See Port Configurations, page 52.

- **Ports**
  - 2 = 1/8 in. female NPT
  - M = MPC platform

- **Seat, Seal Material**
  - A = PCTFE, fluorocarbon FKM
  - B = PCTFE, Kalrez
  - C = PEEK, fluorocarbon FKM
  - D = PEEK, Kalrez

- **Flow Coefficient ($C_v$)**
  - 1 = 0.02
  - 2 = 0.06
  - 5 = 0.20
  - 7 = 0.50

- **Sensing Mechanism**
  - P = 316 SS piston

- **Handle, Mounting**
  - 1 = Thumbwheel
  - 2 = Knob
  - 3 = 316 SS antitamper nut
  - 5 = Thumbwheel, panel mount
  - 6 = Knob, panel mount
  - 7 = 316 SS antitamper nut, panel mount

  For knob handle color options, see page 56.

- **Isolation Valves**
  - 0 = No valves

  For isolation valve options, see page 54.

- **Cylinder Connections**
  - 0 = No connections

- **Gauges**
  - 0 = No gauges

  For inlet and outlet gauge options, see page 54.

- **Options**
  - 0 = No options
Medium- to High-Pressure Piston-Sensing, Pressure-Reducing Regulators (KPP Series)

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.

Features
- Lightweight, compact design
- Live-loaded body seals
- Low internal volume
- High-flow, dual-gauze type filter in inlet ports

Technical Data

Maximum Inlet Pressure
- 6000 psig (413 bar)

Pressure Control Ranges
- 0 to 1000 psig (68.9 bar) through 0 to 3600 psig (248 bar)

Flow Coefficient ($C_v$)
- 0.02 and 0.06

See page 48 for flow graphs.

Supply-Pressure Effect

<table>
<thead>
<tr>
<th>Flow Coefficient ($C_v$)</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>

Maximum Operating Temperature
- 392°F (200°C) with 2000 psig (137 bar) maximum inlet pressure
- 212°F (100°C) with maximum inlet pressure greater than 2000 psig (137 bar)

Weight
- 2.5 lb (1.2 kg)

Ports
- 1/4 in. female NPT inlet, outlet, and gauge ports

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
</tr>
<tr>
<td>Spring button</td>
<td>316 SS (0 to 3000 and 0 to 3600 psig range)</td>
</tr>
<tr>
<td>Spring stabilizer</td>
<td>301 SS</td>
</tr>
<tr>
<td>Range spring</td>
<td>Zinc-plated steel</td>
</tr>
<tr>
<td>Stem, stem nut, cap ring, body cap, panel nuts</td>
<td>316 SS</td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, seat retainer, filter, piston, piston guide</td>
<td>316 SS</td>
</tr>
<tr>
<td>Seat, piston seal retainer</td>
<td>PEEK</td>
</tr>
<tr>
<td>Poppet</td>
<td>S17400 SS</td>
</tr>
<tr>
<td>Poppet spring</td>
<td>Alloy X-750</td>
</tr>
<tr>
<td>Piston seal spring, body seal spring</td>
<td>Eligiloy</td>
</tr>
<tr>
<td>Poppet damper, filter carrier, piston seal, body seal</td>
<td>PTFE</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
</tr>
</tbody>
</table>

Wetted components listed in italics.

1. 316 SS in regulators with 0 to 2000 psig (0 to 137 bar) control range with 6000 psig (413 bar) inlet pressure and regulators with 0 to 2000 psig (0 to 137 bar) control range, 4000 psig (275 bar) inlet pressure, and 0.06 $C_v$.
2. Not included in regulators with 316 SS spring button.
3. Not shown.
Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Ordering Information

Build a KPP series regulator ordering number by combining the designators in the sequence shown below.

```plaintext
KPP 1 L W A 4 2 2 P 2 0 0 0 0
```

4. **Body Material**
   - 1 = 316 SS
   - A = 316 SS, ASTM G93 Level E-cleaned

5. **Pressure Control Range**
   - L = 0 to 1000 psig (0 to 68.9 bar)
   - M = 0 to 1500 psig (0 to 103 bar)
   - N = 0 to 2000 psig (0 to 137 bar)
   - P = 0 to 3000 psig (0 to 206 bar)
   - R = 0 to 3600 psig (0 to 248 bar)

6. **Maximum Inlet Pressure**
   - N = 2000 psig (137 bar)
   - S = 4000 psig (275 bar)
   - W = 6000 psig (413 bar)

7. **Port Configuration**
   - A, B, C, E, F, H, K, L, M, N
   - See Port Configurations, page 52.

8. **Ports**
   - 4 = 1/4 in. female NPT

9. **Seat, Seal Material**
   - 2 = PEEK, PTFE

10. **Flow Coefficient \((C_v)\)**
    - 1 = 0.02
    - 2 = 0.06

11. **Sensing Mechanism, Vent**
    - P = 316 SS piston, no vent
    - V = 316 SS piston, captured vent, no self vent

12. **Handle, Mounting**
    - 2 = Knob
    - 3 = 316 SS antitamper nut
    - 6 = Knob, panel mount
    - 7 = 316 SS antitamper nut, panel mount

13. **Isolation Valves**
    - 0 = No valves
    - For isolation valve options, see page 54.

14. **Cylinder Connections**
    - 0 = No connections

15. **Gauges**
    - 0 = No gauges
    - For inlet and outlet gauge options, see page 54.

16. **Options**
    - 0 = No options
High-Flow Piston-Sensing, Pressure-Reducing Regulators (KPF Series)

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

### Features
- High flow coefficient ($C_v = 1.0$)
- Balanced poppet for minimal supply-pressure effect
- High-flow, dual-gauze type filter in inlet ports

### Technical Data

#### Maximum Inlet Pressure
- 6000 psig (413 bar)

#### Pressure Control Ranges
- 0 to 1000 psig (68.9 bar) through 0 to 4000 psig (275 bar)

#### Flow Coefficient ($C_v$)
- 1.0

See page 44 for flow graphs.

### Supply-Pressure Effect

<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>

### Maximum Operating Temperature
- 176°F (80°C) with PCTFE seat
- 392°F (200°C) with PEEK seat

### Weight
- 4.5 lb (2.1 kg)

### Ports
- 1/2 in. female NPT inlet and outlet; 1/4 in. female NPT gauge ports

### Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
</tr>
<tr>
<td>Spring button</td>
<td>316 SS (0 to 3000 and 0 to 4000 psig range) Zinc-plated steel (all other ranges)</td>
</tr>
<tr>
<td>Spring stabilizer(^\d)</td>
<td>301 SS</td>
</tr>
<tr>
<td>Range spring</td>
<td>Zinc-plated steel</td>
</tr>
<tr>
<td>Stem, stem nut, cap ring, body cap, panel nuts(^2)</td>
<td>316 SS</td>
</tr>
<tr>
<td>Body, spring retainer, seat retainer, filter, piston, piston guide, poppet seal retainer</td>
<td>316 SS</td>
</tr>
<tr>
<td>Seat, piston seal retainer</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>Poppet</td>
<td>S17400 SS</td>
</tr>
<tr>
<td>Poppet spring</td>
<td>302 SS</td>
</tr>
<tr>
<td>Filter carrier, piston seal, poppet seal</td>
<td>PTFE</td>
</tr>
<tr>
<td>Piston seal spring, poppet seal spring</td>
<td>Eligiloy</td>
</tr>
<tr>
<td>Body seal</td>
<td>Fluorocarbon FKM</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
</tr>
</tbody>
</table>

\(^\d\) Not included in regulators with 316 SS spring button.
\(^2\) Not shown.
**Dimensions**

Dimensions, in inches (millimeters), are for reference only and are subject to change.

![Dimensions Diagram]

**Ordering Information**

Build a KPF series regulator ordering number by combining the designators in the sequence shown below.

```
KPF 4 5 6 7 8 9 10 11 12 13 14 15 16
```

- **4** Body Material
  - 1 = 316 SS
  - A = 316 SS, ASTM G93 Level E-cleaned

- **5** Pressure Control Range
  - L = 0 to 1000 psig (0 to 68.9 bar)
  - N = 0 to 2000 psig (0 to 137 bar)
  - P = 0 to 3000 psig (0 to 206 bar)
  - S = 0 to 4000 psig (0 to 275 bar)

- **6** Maximum Inlet Pressure
  - W = 6000 psig (413 bar)

- **7** Port Configuration
  - A, B, C, E, F, H, K, L, M, N
  - See Port Configurations, page 52.

- **8** Ports
  - 8 = 1/2 in. female NPT inlet and outlet; 1/4 in. female NPT gauge ports

- **9** Seat, Body Seal Material
  - A = PCTFE, fluorocarbon FKM
  - C = PEEK, fluorocarbon FKM

- **10** Flow Coefficient ($C_v$)
  - 8 = 1.0

- **11** Sensing Mechanism, Vent
  - P = 316 SS piston, no vent
  - V = 316 SS piston, captured vent, no self vent

- **12** Handle, Mounting
  - 2 = Knob
  - 3 = 316 SS antitamper nut
  - 6 = Knob, panel mount
  - 7 = 316 SS antitamper nut, panel mount
  - For knob handle color options, see page 56.

- **13** Isolation Valves
  - 0 = No valves
  - For isolation valve options, see page 54.

- **14** Cylinder Connections
  - 0 = No connections

- **15** Gauges
  - 0 = No gauges
  - For inlet and outlet gauge options, see page 54.

- **16** Options
  - 0 = No options
High-Pressure Piston-Sensing, Pressure-Reducing Regulators (KHP Series)

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.

**Features**
- Thrust roller bearing eases operation
- Panel-mounting configuration available
- High-flow, dual-gauze type filter in inlet ports

**Technical Data**

**Maximum Inlet Pressure**
- 10,000 psig (689 bar)

**Pressure Control Ranges**
- 0 to 500 psig (34.4 bar) through 100 to 10,000 psig (6.8 to 689 bar)

**Flow Coefficient \( (C_v) \)**
- 0.06 and 0.25
  
  See page 46 and 47 for flow graphs.

**Supply Pressure Effect**

<table>
<thead>
<tr>
<th>Flow Coefficient ( (C_v) )</th>
<th>Pressure Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 2500 psig (172 bar)</td>
</tr>
<tr>
<td>0.06</td>
<td>1.0</td>
</tr>
<tr>
<td>0.25</td>
<td>3.3</td>
</tr>
</tbody>
</table>

**Maximum Operating Temperature**
- 212°F (100°C)

**Weight**
- 5.7 lb (2.6 kg)

**Ports**
- 1/4 in. female NPT inlet, outlet, and gauge ports

---

**Materials of Construction**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
</tr>
<tr>
<td>Spring buttons, upper spring</td>
<td>316 SS</td>
</tr>
<tr>
<td>button set screw</td>
<td></td>
</tr>
<tr>
<td>Knob handle retainer</td>
<td></td>
</tr>
<tr>
<td>Vent screw</td>
<td>302 SS</td>
</tr>
<tr>
<td>Thrust roller bearing</td>
<td></td>
</tr>
<tr>
<td>Upper spring button</td>
<td>431 SS</td>
</tr>
<tr>
<td>Stem</td>
<td></td>
</tr>
<tr>
<td>Stem nuts</td>
<td>CZ114 bronze</td>
</tr>
<tr>
<td>Vent</td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>Piston</td>
<td></td>
</tr>
<tr>
<td>Piston seal backup ring</td>
<td>PTFE</td>
</tr>
<tr>
<td>Self-vent poppet</td>
<td></td>
</tr>
<tr>
<td>Self-vent poppet spring</td>
<td></td>
</tr>
<tr>
<td>Body seal</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Lower spring button</td>
<td></td>
</tr>
<tr>
<td>Piston guide</td>
<td></td>
</tr>
<tr>
<td>Self-vent seat</td>
<td>316 SS</td>
</tr>
<tr>
<td>Body seal</td>
<td></td>
</tr>
<tr>
<td>Poppet</td>
<td>PEEK</td>
</tr>
<tr>
<td>Poppet spring</td>
<td>S17400 SS</td>
</tr>
<tr>
<td>Self-vent seat retainer</td>
<td></td>
</tr>
<tr>
<td>Seat</td>
<td></td>
</tr>
<tr>
<td>Self-vent seat</td>
<td></td>
</tr>
<tr>
<td>Poppet damper, filter carrier</td>
<td>PTFE</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td></td>
</tr>
<tr>
<td>Body seal, piston seal</td>
<td>Fluorocarbon FKM</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td></td>
</tr>
</tbody>
</table>

Wetted components listed in italics.
Dimensions
Dimensions, in inches (millimeters), are for reference only and are subject to change.

![Diagram showing panel-mount assembly and dimensions](image)

Ordering Information
Build a KHP series regulator ordering number by combining the designators in the sequence shown below.

```
4 5 6 7 8 9 10 11 12 13 14 15 16
KHP 1 T X A 4 C 2 S 2 0 0 0 0
```

- **4 Body Material**
  - 1 = 316 SS
  - A = 316 SS, ASTM G93 Level E-cleaned

- **5 Pressure Control Range**
  - J = 0 to 500 psig (0 to 34.4 bar)
  - K = 0 to 750 psig (0 to 51.6 bar)
  - T = 10 to 1500 psig (0.68 to 103 bar)
  - U = 15 to 2500 psig (1.0 to 172 bar)
  - V = 25 to 3600 psig (1.7 to 248 bar)
  - W = 50 to 6000 psig (3.4 to 413 bar)
  - X = 100 to 10 000 psig (6.8 to 689 bar)

- **6 Maximum Inlet Pressure**
  - X = 10 000 psig (689 bar)

- **7 Port Configuration**
  - A, B, C, E, F, H, K, L, M, N
  - See Port Configurations, page 52.

- **8 Ports**
  - 4 = 1/4 in. female NPT

- **9 Seat, Seal Material**
  - C = PEEK, fluorocarbon FKM

- **10 Flow Coefficient ($C_v$)**
  - 2 = 0.06
  - 6 = 0.25

- **11 Sensing Mechanism, Vent**
  - P = 316 SS piston, no vent
  - S = 316 SS piston, self vent

- **12 Handle, Mounting**
  - 2 = Knob
  - 6 = Knob, panel mount
  - For knob handle color options, see page 56.

- **13 Isolation Valves**
  - 0 = No valves
  - For isolation valve options, see page 54.

- **14 Cylinder Connections**
  - 0 = No connections

- **15 Gauges**
  - 0 = No gauges
  - For inlet and outlet gauge options, see page 54.

- **16 Options**
  - 0 = No options
High-Pressure Piston-Sensing, Hydraulic Pressure-Reducing Regulators (KHR Series)

The KHR series provides control of pressures up to 10,000 psig (689 bar) for both liquid and gas applications. Metal or polymer seats are available.

**Features**
- Self-venting
- Captured vent port in bottom of body
- Panel-mounting configuration available
- Thrust roller bearing eases operation
- High-flow, dual-gauze type filter in inlet ports

**Technical Data**

**Maximum Inlet Pressure**
- 10,000 psig (689 bar)

**Pressure Control Ranges**
- 0 to 500 psig (34.4 bar) through 100 to 10,000 psig (6.8 to 689 bar)

**Materials of Construction**
- Knob handle retainer, cover: Nylon with 316 SS insert
- Nonwetted lubricant: Hydrocarbon-based
- Wetted lubricant: PTFE-based

**Flow Coefficient ($C_v$)**
- 0.06
- 0.25 also available

**Supply-Pressure Effect**

<table>
<thead>
<tr>
<th>Flow Coefficient ($C_v$)</th>
<th>Pressure Control Range</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 2,500 psig</td>
<td>3,600 and 6,000 psig (246 and 413 bar)</td>
</tr>
<tr>
<td>0.06</td>
<td>1.0</td>
<td>2.6</td>
</tr>
<tr>
<td>0.25</td>
<td>3.3</td>
<td>8.5</td>
</tr>
</tbody>
</table>

**Maximum Operating Temperature**
- 212°F (100°C)

**Weight**
- 6.1 lb (2.75 kg)

**Ports**
- 1/4 in. female NPT inlet, outlet, vent, and gauge ports
Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Ordering Information

Build a KHR series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>Body Material</th>
<th>Pressure Control Range</th>
<th>Port Configuration</th>
<th>Ports</th>
<th>Seat, Seal Material</th>
<th>Flow Coefficient ($C_v$)</th>
<th>Sensing Mechanism, Vent</th>
<th>Handle, Mounting</th>
<th>Isolation Valves</th>
<th>Cylinder Connections</th>
<th>Gauges</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 1 = 316 SS</td>
<td>J = 0 to 500 psig (0 to 34.4 bar)</td>
<td>A, B, C, F, M</td>
<td>4</td>
<td>C = PEEK, fluorocarbon FKM</td>
<td>2 = 0.06</td>
<td>U = 316 SS piston, self and captured vent</td>
<td>2 = Knob</td>
<td>0 = No valves</td>
<td>0 = No connections</td>
<td>0 = No gauges</td>
<td>0 = No options</td>
</tr>
<tr>
<td>5 A = 316 SS, ASTM G93 Level E-cleaned</td>
<td>K = 0 to 750 psig (0 to 51.6 bar)</td>
<td>4 = 1/4 in. female NPT</td>
<td>5</td>
<td>J = 316 SS, fluorocarbon FKM</td>
<td>6 = 0.25</td>
<td></td>
<td>6 = Knob, panel mount</td>
<td>For knob handle color options, see page 56.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 T = 10 to 1500 psig (0.68 to 103 bar)</td>
<td>U = 15 to 2500 psig (1.0 to 172 bar)</td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>For isolation valve options, see page 54.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 V = 25 to 3600 psig (1.7 to 248 bar)</td>
<td>W = 50 to 6000 psig (3.4 to 413 bar)</td>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>For inlet and outlet gauge options, see page 54.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 X = 100 to 10 000 psig (6.8 to 689 bar)</td>
<td>X = 100 to 10 000 psig (6.8 to 689 bar)</td>
<td></td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not available for regulators assembled with isolation valves.

Swagelok
General-Purpose Diaphragm-Sensing Back-Pressure Regulators (KBP Series)

The KBP series is a high-sensitivity, general-purpose regulator designed to control back-pressure levels in analytical or process systems upstream of the regulator. The convoluted diaphragm provides excellent sensitivity and set-point repeatability. The metal-to-metal diaphragm seal minimizes the potential for leakage.

Features

- Convoluted, nonperforated diaphragm
- Metal-to-metal diaphragm seal
- Low internal volume
- Two-piece cap design provides linear load on the seal

Technical Data

**Maximum Inlet Pressure**

- Equal to pressure control range

**Pressure Control Ranges**

- 0 to 10 psig (0.68 bar) through 0 to 500 psig (34.4 bar)

Flow Coefficient ($C_v$)

- 0.20

See page 49 for flow graphs.

**Maximum Operating Temperature**

- 176°F (80°C) with PCTFE retainer seal
- 392°F (200°C) with PEEK retainer seal

**Weight**

- 2.4 lb (1.1 kg)

**Ports**

- 1/4 in. female NPT inlet, outlet, and gauge ports (all body materials)
- 1/4 in. tube butt weld inlet, outlet, and gauge ports (316 SS body material only)
- 1/4 in. VCR inlet, outlet, and gauge ports (316 SS body material only)

### Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>316 SS</th>
<th>Brass CW721R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
<td></td>
</tr>
<tr>
<td>Spring button</td>
<td>316 SS (0 to 500 psig range)</td>
<td>301 SS</td>
</tr>
<tr>
<td>Spring stabilizer&lt;sup&gt;1&lt;/sup&gt;</td>
<td>316 SS (0 to 10 through 0 to 50 psig control ranges)</td>
<td>Zinc-plated steel (all other ranges)</td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS (0 to 100 through 0 to 500 psig control ranges)</td>
<td>Zendal steel (0 to 100 through 0 to 500 psig control ranges)</td>
</tr>
<tr>
<td>Stem, stem nut, cap ring, stop plate, body cap, panel nuts&lt;sup&gt;2&lt;/sup&gt;</td>
<td>316 SS</td>
<td></td>
</tr>
<tr>
<td>VCR nuts&lt;sup&gt;2&lt;/sup&gt;</td>
<td>316 SS</td>
<td>—</td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
<td>PTFE-based</td>
</tr>
<tr>
<td>Seat retainer</td>
<td>316 SS</td>
<td></td>
</tr>
<tr>
<td>Retainer seal</td>
<td>PCTFE or PEEK</td>
<td></td>
</tr>
<tr>
<td>Seat</td>
<td>Fluorocarbon FKM or Kalrez</td>
<td></td>
</tr>
<tr>
<td>Diaphragm&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Alloy X-750</td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td>316 SS</td>
<td>Brass CW721R</td>
</tr>
<tr>
<td>Tube butt weld ports&lt;sup&gt;2&lt;/sup&gt;</td>
<td>316L SS</td>
<td>—</td>
</tr>
<tr>
<td>VCR gland ports&lt;sup&gt;2&lt;/sup&gt;</td>
<td>316L SS</td>
<td>—</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
<td></td>
</tr>
</tbody>
</table>

Wetted components listed in italics.

<sup>1</sup> Not included in regulators with 0 to 500 psig (0 to 34.4 bar) control range.

<sup>2</sup> Not shown.

<sup>3</sup> Regulators with control ranges higher than 0 to 100 psig (0 to 6.8 bar) are assembled with two diaphragms.
**Dimensions**

Dimensions, in inches (millimeters), are for reference only and are subject to change.

![Diagram](image)

**Ordering Information**

Build a KBP series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>Body Material</th>
<th>Ports</th>
<th>Seat, Seal Material</th>
<th>Flow Coefficient ($C_v$)</th>
<th>Sensing Mechanism, Vent</th>
<th>Handle, Mounting</th>
<th>Valves</th>
<th>Cylinder Connections</th>
<th>Gauges</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = 316 SS</td>
<td>4</td>
<td>A = Fluorocarbon FKM, PCTFE</td>
<td>5 = 0.20</td>
<td>A = Alloy X-750 diaphragm, no vent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 = Brass CW721R</td>
<td>5</td>
<td>B = Kalrez, PCTFE</td>
<td></td>
<td>E = Alloy X-750 diaphragm, captured vent, no self vent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A = 316 SS, ASTM G93 Level E-cleaned</td>
<td>6</td>
<td>C = Fluorocarbon FKM, PEEK</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B = Brass, ASTM G93 Level E-cleaned</td>
<td>7</td>
<td>D = Kalrez, PEEK</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C = 316 SS, SC-11–cleaned</td>
<td>8</td>
<td>0 = No valves</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D = Brass, SC-11–cleaned</td>
<td>9</td>
<td>1 = 316 SS antitamper nut</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E = 0 to 10 psig (0 to 0.68 bar)</td>
<td>10</td>
<td>2 = Knob</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F = 0 to 25 psig (0 to 1.7 bar)</td>
<td>11</td>
<td>3 = 316 SS antitamper nut</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G = 0 to 50 psig (0 to 3.4 bar)</td>
<td>12</td>
<td>6 = Knob, panel mount</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H = 0 to 100 psig (0 to 6.8 bar)</td>
<td>13</td>
<td>7 = 316 SS antitamper nut, panel mount</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I = 0 to 250 psig (0 to 17.2 bar)</td>
<td>14</td>
<td>For knob handle color options, see page 56.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J = 0 to 500 psig (0 to 34.4 bar)</td>
<td>15</td>
<td>0 = No gauges</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 = Not applicable (equal to pressure control range)</td>
<td>16</td>
<td>0 = No options</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Port Configurations, page 52.*
High-Flow, High-Sensitivity Diaphragm-Sensing Back-Pressure Regulators (KFB Series)

The KFB series regulator is designed to maintain back-pressure control in high-flow applications with a $C_v$ of 1.0.

**Features**
- Large-diameter convoluted, nonperforated diaphragm for increased pressure sensitivity
- Metal-to-metal diaphragm seal

**Technical Data**

**Maximum Inlet Pressure**
- Equal to pressure control range

**Pressure Control Ranges**
- 0 to 10 psig (0.68 bar) through 0 to 250 psig (17.2 bar)

**Flow Coefficient ($C_v$)**
- 1.0

*See page 49 for flow graphs.*

**Maximum Operating Temperature**
- 176°F (80°C) with PCTFE retainer seal
- 392°F (200°C) with PEEK retainer seal

**Weight**
- 4.4 lb (2.0 kg)

**Ports**
- 1/2 in. female NPT inlet and outlet; 1/4 in. female NPT gauge port

**Materials of Construction**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
</tr>
<tr>
<td>Spring button</td>
<td>316 SS (0 to 250 psig range)</td>
</tr>
<tr>
<td></td>
<td>Zinc-plated steel (all other ranges)</td>
</tr>
<tr>
<td>Spring stabilizer$^\text{1}$</td>
<td>301 SS</td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS (0 to 10 and 0 to 25 psig control ranges)</td>
</tr>
<tr>
<td></td>
<td>Zinc-plated steel (0 to 50 through 0 to 250 psig control ranges)</td>
</tr>
<tr>
<td>Stem, stem nut, cap ring,</td>
<td>316 SS</td>
</tr>
<tr>
<td>stop plate, body cap, panel</td>
<td></td>
</tr>
<tr>
<td>nuts$^\text{2}$</td>
<td></td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, seat retainer</td>
<td>316 SS</td>
</tr>
<tr>
<td>Retainer seat</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>Seat</td>
<td>Fluorocarbon FKM</td>
</tr>
<tr>
<td>Diaphragm$^\text{3}$</td>
<td>Alloy X-750</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
</tr>
</tbody>
</table>

Wetted components listed in *italics.*

$^1$ Not included in regulators with 0 to 250 psig (0 to 17.2 bar) control range.

$^2$ Not shown.

$^3$ Regulators with control range 0 to 250 psig (0 to 17.2 bar) are assembled with two diaphragms.
Dimensions
Dimensions, in inches (millimeters), are for reference only and are subject to change.

Ordering Information
Build a KFB series regulator ordering number by combining the designators in the sequence shown below.

```
KFB 1 F 0 D 8 A 8 A 1 0 0 0 0
```

4 Body Material
- 1 = 316 SS
- A = 316 SS, ASTM G93 Level E-cleaned

5 Pressure Control Range
- C = 0 to 10 psig (0 to 0.68 bar)
- D = 0 to 25 psig (0 to 1.7 bar)
- E = 0 to 50 psig (0 to 3.4 bar)
- F = 0 to 100 psig (0 to 6.8 bar)
- G = 0 to 250 psig (0 to 17.2 bar)

6 Maximum Inlet Pressure
- 0 = Not applicable (equal to pressure control range)

7 Port Configuration
- A, D, G, V
See Port Configurations, page 52.

8 Ports
- 8 = 1/2 in. female NPT inlet and outlet; 1/4 in. female NPT gauge port

9 Seat, Seal Material
- A = Fluorocarbon FKM, PCTFE
- C = Fluorocarbon FKM, PEEK

10 Flow Coefficient ($C_v$)
- 8 = 1.0

11 Sensing Mechanism, Vent
- A = Alloy X-750 diaphragm, no vent
- E = Alloy X-750 diaphragm, captured vent, no self vent

12 Handle, Mounting
- 2 = Knob
- 3 = 316 SS antitamper nut
- 6 = Knob, panel mount
- 7 = 316 SS antitamper nut, panel mount
For knob handle color options, see page 56.

13 Valves
- 0 = No valves

14 Cylinder Connections
- 0 = No connections

15 Gauges
- 0 = No gauges
For inlet gauge options, see page 54.

16 Options
- 0 = No options
Compact Piston-Sensing
Back-Pressure Regulators (KCB Series)

The KCB series provides high sensitivity back-pressure control of sampling conditioning systems. It is ideally suited for use in portable or laboratory analytical systems as well as being embedded in the instrument bays of OEM equipment or sampling cabinets.

Features
- Low internal volume
- Fully contained piston
- Excellent flow characteristics with a $C_v$ of 0.20
- ANSI/ISA 76.00.02-compliant modular platform component (MPC) configuration available

Technical Data

Maximum Inlet Pressure
- Equal to pressure control range

Pressure Control Ranges
- 0 to 10 psig (0.68 bar) through 0 to 375 psig (25.8 bar)

Flow Coefficient ($C_v$)
- 0.20
  
  See page 49 for flow graphs.
- 0.10 also available with MPC platform

Maximum Operating Temperature
- 176°F (80°C) with PCTFE retainer seal
- 392°F (200°C) with PEEK retainer seal

Weight
- 1.0 lb (0.5 kg)

Ports
- 1/8 in. female NPT inlet and outlet(s)
- MPC platform

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thumbwheel handle</td>
<td>Anodized aluminum</td>
</tr>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
</tr>
<tr>
<td>Spring button</td>
<td>Zinc-plated steel</td>
</tr>
<tr>
<td>Spring stabilizer</td>
<td>301 SS</td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS (0 to 10 through 0 to 50 and 0 to 375 psig control ranges)</td>
</tr>
<tr>
<td>(all other control ranges)</td>
<td>Zinc-plated steel</td>
</tr>
<tr>
<td>Stem, stem nut, body cap, panel nuts</td>
<td>316 SS</td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, seat retainer, piston</td>
<td>316 SS</td>
</tr>
<tr>
<td>Seat, piston seal</td>
<td>Fluorocarbon FKM or Kalrez</td>
</tr>
<tr>
<td>Retainer seal</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
</tr>
</tbody>
</table>

Wetted components listed in italics.
① Not shown.
Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Ordering Information

Build a KCB series regulator ordering number by combining the designators in the sequence shown below.

KCB 4 5 6 7 8 9 10 11 12 13 14 15 16

<table>
<thead>
<tr>
<th>4 Body Material</th>
<th>8 Ports</th>
<th>13 Valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = 316 SS</td>
<td>2 = 1/8 in. female NPT</td>
<td>0 = No valves</td>
</tr>
<tr>
<td>A = 316 SS, ASTM G93 Level E-cleaned</td>
<td>M = MPC platform</td>
<td></td>
</tr>
<tr>
<td>C = 316 SS, SC-11–cleaned</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5 Pressure Control Range</th>
<th>9 Seat, Retainer Seal Material</th>
<th>14 Cylinder Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>C = 0 to 10 psig (0 to 0.68 bar)</td>
<td>A = Fluorocarbon FKM, PCTFE</td>
<td>0 = No connections</td>
</tr>
<tr>
<td>D = 0 to 25 psig (0 to 1.7 bar)</td>
<td>B = Kalrez, PCTFE</td>
<td></td>
</tr>
<tr>
<td>E = 0 to 50 psig (0 to 3.4 bar)</td>
<td>C = Fluorocarbon FKM, PEEK</td>
<td></td>
</tr>
<tr>
<td>F = 0 to 100 psig (0 to 6.8 bar)</td>
<td>D = Kalrez, PEEK</td>
<td></td>
</tr>
<tr>
<td>G = 0 to 250 psig (0 to 17.2 bar)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H = 0 to 375 psig (0 to 25.8 bar)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6 Maximum Inlet Pressure</th>
<th>10 Flow Coefficient ($C_v$)</th>
<th>15 Gauges</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = Not applicable (equal to pressure control range)</td>
<td>4 = 0.10 (MPC platform only)</td>
<td>0 = No gauges</td>
</tr>
<tr>
<td></td>
<td>5 = 0.20 (1/8 in. female NPT ports only)</td>
<td>For inlet gauge options, see page 54.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7 Port Configuration</th>
<th>11 Sensing Mechanism</th>
<th>16 Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, D, G, V, 7, 8</td>
<td>P = 316 SS piston</td>
<td>0 = No options</td>
</tr>
</tbody>
</table>

See Port Configurations, page 52.

For knob handle color options, see page 56.

1 Not available with 0 to 375 psig (0 to 25.8 bar) pressure control range.
Medium- to High-Pressure Piston-Sensing Back-Pressure Regulators (KPB Series)

The KPB series provides back-pressure control in gas or liquid applications. This compact and lightweight regulator provides an ideal pressure-control solution within high-density compact OEM equipment, as well as other applications.

Features
- Integral high-pressure overrange protection
- Lightweight, compact design

Technical Data

Maximum Inlet Pressure
- Equal to pressure control range

Pressure Control Ranges
- 0 to 1000 psig (68.9 bar) through 0 to 4000 psig (275 bar)

Flow Coefficient ($C_v$)
- 0.06 and 0.2
  See page 50 for flow graphs.

Maximum Operating Temperature
- 176°F (80°C) with PCTFE seat
- 392°F (200°C) with PEEK seat

Weight
- 2.5 lb (1.2 kg)

Ports
- 1/4 in. female NPT inlet, outlet, and gauge ports

Materials of Construction
Dimensions
Dimensions, in inches (millimeters), are for reference only and are subject to change.

Ordering Information
Build a KPB series regulator ordering number by combining the designators in the sequence shown below.

4 5 6 7 8 9 10 11 12 13 14 15 16
KPB 1 L 0 A 4 2 2 P 2 0 0 0 0

4 Body Material
1 = 316 SS
A = 316 SS, ASTM G93 Level E-cleaned

5 Pressure Control Range
L = 0 to 1000 psig (0 to 68.9 bar)
N = 0 to 2000 psig (0 to 137 bar)
P = 0 to 3000 psig (0 to 206 bar)
S = 0 to 4000 psig (0 to 275 bar)

6 Maximum Inlet Pressure
0 = Not applicable (equal to pressure control range)

7 Port Configuration
A, D, G, V
See Port Configurations, page 52.

8 Ports
4 = 1/4 in. female NPT

9 Seat, Seal Material
1 = PCTFE
2 = PEEK

10 Flow Coefficient ($C_v$)
2 = 0.06
5 = 0.20

11 Sensing Mechanism
P = 316 SS piston

12 Handle, Mounting
2 = Knob
3 = 316 SS antitamper nut
6 = Knob, panel mount
7 = 316 SS antitamper nut, panel mount
For knob handle color options, see page 56.

13 Valves
0 = No valves

14 Cylinder Connections
0 = No connections

15 Gauges
0 = No gauges
For inlet gauge options, see page 54.

16 Options
0 = No options
High-Pressure Piston-Sensing
Back-Pressure Regulators (KHB Series)

The KHB series provides control of back pressures up to 10 000 psig (689 bar) with high sensitivity across the control range.

**Features**
- Thrust roller bearing eases operation
- Panel-mounting configuration available

**Technical Data**

**Maximum Inlet Pressure**
- Equal to pressure control range

**Pressure Control Ranges**
- 0 to 500 psig (34.4 bar) through
- 100 to 10 000 psig (6.8 to 689 bar)

**Flow Coefficient ($C_v$)**
- 0.06 and 0.25

*See page 51 for flow graphs.*

**Maximum Operating Temperature**
- 212°F (100°C)

**Weight**
- 5.7 lb (2.6 kg)

**Ports**
- 1/4 in. female NPT inlet, outlet, and gauge ports

**Materials of Construction**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knob handle, cover</td>
<td>Nylon with 316 SS insert</td>
</tr>
<tr>
<td>Spring buttons, upper spring</td>
<td>316 SS</td>
</tr>
<tr>
<td>button set screw, knob handle</td>
<td></td>
</tr>
<tr>
<td>handle retainer, stem nuts,</td>
<td></td>
</tr>
<tr>
<td>body cap</td>
<td></td>
</tr>
<tr>
<td>Stem</td>
<td>CZ114 bronze</td>
</tr>
<tr>
<td>Upper spring button,</td>
<td></td>
</tr>
<tr>
<td>upper spring button</td>
<td></td>
</tr>
<tr>
<td>Thrust roller bearing</td>
<td></td>
</tr>
<tr>
<td>Range spring</td>
<td>Hardened carbon steel</td>
</tr>
<tr>
<td>Body cap</td>
<td></td>
</tr>
<tr>
<td>Piston, piston guide,</td>
<td>Chrome vanadium steel</td>
</tr>
<tr>
<td>piston, piston guide</td>
<td></td>
</tr>
<tr>
<td>Body, poppet retainer, seat</td>
<td>316 SS</td>
</tr>
<tr>
<td>retainer, seat retainer, seat</td>
<td></td>
</tr>
<tr>
<td>support, piston, piston guide,</td>
<td></td>
</tr>
<tr>
<td>PEEK</td>
<td></td>
</tr>
<tr>
<td>Nonwetted lubricant, Hydrocarbon-</td>
<td></td>
</tr>
<tr>
<td>based</td>
<td></td>
</tr>
<tr>
<td>Seat</td>
<td>PEEK or 316 SS</td>
</tr>
<tr>
<td>Piston seal backup ring</td>
<td></td>
</tr>
<tr>
<td>Poppet retainer seal</td>
<td>PEEK</td>
</tr>
<tr>
<td>Poppet</td>
<td>S17400 SS</td>
</tr>
<tr>
<td>Poppet spring</td>
<td>302 SS</td>
</tr>
<tr>
<td>Body seal, body seal, seat</td>
<td>Fluorocarbon FKM</td>
</tr>
<tr>
<td>support seal</td>
<td>Wetted lubricant</td>
</tr>
<tr>
<td>Wetted lubricant, PTFE-based</td>
<td></td>
</tr>
</tbody>
</table>

Wetted components listed in italics.
Dimensions
Dimensions, in inches (millimeters), are for reference only and are subject to change.

Ordering Information
Build a KHB series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>KHB</th>
<th>1</th>
<th>T</th>
<th>0</th>
<th>D</th>
<th>4</th>
<th>C</th>
<th>2</th>
<th>P</th>
<th>2</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
</tr>
</thead>
</table>

4 Body Material
1 = 316 SS
A = 316 SS, ASTM G93 Level E-cleaned

5 Pressure Control Range
J = 0 to 500 psig (0 to 34.4 bar)
K = 0 to 750 psig (0 to 51.6 bar)
T = 10 to 1500 psig (0.68 to 103 bar)
U = 15 to 2500 psig (1.0 to 172 bar)
V = 25 to 3600 psig (1.7 to 248 bar)
W = 50 to 6000 psig (3.4 to 413 bar)
X = 100 to 10 000 psig (6.8 to 689 bar)

6 Maximum Inlet Pressure
0 = Not applicable (equal to pressure control range)

7 Port Configuration
A, D, G, V
See Port Configurations, page 52.

8 Ports
4 = 1/4 in. female NPT

9 Seat, Piston/Body/Seat Support Seal Material
C = PEEK, fluorocarbon FKM
J = 316 SS, fluorocarbon FKM
1 Not suitable for gas service.

10 Flow Coefficient ($C_v$)
2 = 0.06
6 = 0.25

11 Sensing Mechanism
P = 316 SS piston

12 Handle, Mounting
2 = Knob
6 = Knob, panel mount
For knob handle color options, see page 56.

13 Valves
0 = No valves

14 Cylinder Connections
0 = No connections

15 Gauges
0 = No gauges
For inlet gauge options, see page 54.

16 Options
0 = No options
Gas Cylinder Changeover Regulator (KCM Series)

The KCM series is a two-stage gas delivery system that ensures continuous flow of gases in critical applications. When one supply drops below the changeover pressure, the selector regulator automatically switches the gas feed from the depleted supply to an alternate supply. The automatic operation of the KCM series eliminates costly system downtime and maintenance expense of continuously monitoring the gas supply.

Features
- Convoluted, nonperforated diaphragm for strength and improved pressure response
- Metal-to-metal diaphragm seals on all stages
- Supply-pressure effect of approximately 0.01 %
- Bracket mount

Technical Data

Maximum Inlet Pressure
- 4351 psig (300 bar) with PEEK seat
- 3600 psig (248 bar)

Cylinder Connections and Hose accessories may limit inlet pressure ratings, see pages 53 and 56.

Pressure Control Ranges
- 0 to 10 psig (0.68 bar) through 0 to 500 psig (34.4 bar)

Nominal Changeover Pressures
- 100, 250, and 500 psig (6.8, 17.2, and 34.4 bar)

Flow Coefficient ($C_v$)
- 0.06

Supply-Pressure Effect

<table>
<thead>
<tr>
<th>Flow Coefficient ($C_v$)</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></td>
<td>250 psig (17.2 bar) and Higher</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Maximum Operating Temperature
- 176°F (80°C) with PCTFE seat
- 392°F (200°C) with PEEK seat
- 212°F (100°C) with PEEK seat and maximum inlet pressure greater than 3600 psig (248 bar)

Operation

The KCM series can be ordered to switch from one supply to another at one of three different inlet pressures—100, 250, and 500 psig (6.8, 17.2, and 34.4 bar)—called changeover pressures.

The selector regulator (first stage) is factory-set to reduce the supply pressure to the nominal changeover pressure ordered. The line regulator (second stage) can be adjusted with the handle to achieve the required system pressure. This two-stage arrangement minimizes the supply-pressure effect caused by depleting gas supplies (cylinders, tank farm, etc.).

When one supply drops below the changeover pressure, the selector regulator automatically switches the gas feed from the depleted supply to an alternate supply. If both supplies drop below the changeover pressure, the assembly functions as a single-stage regulator, depleting both supplies at the same time. See the Approximate Supply Depletion Pressures table at right for pressures at which this occurs.

Approximate Supply Depletion Pressures

<table>
<thead>
<tr>
<th>Nominal Changeover Pressure psig (bar)</th>
<th>Supply 1 Depletion Pressure psig (bar)</th>
<th>Supply 1 (300 bar) Depletion Pressure psig (bar)</th>
<th>Supply 2 Depletion Pressure psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 (6.8)</td>
<td>150 (10.3)</td>
<td>180 (12.4)</td>
<td>90 (6.2)</td>
</tr>
<tr>
<td>250 (17.2)</td>
<td>300 (20.6)</td>
<td>320 (22.1)</td>
<td>230 (15.8)</td>
</tr>
<tr>
<td>500 (34.4)</td>
<td>500 (34.4)</td>
<td>530 (36.6)</td>
<td>450 (31.0)</td>
</tr>
</tbody>
</table>

The Swagelok KCA series continuous gas delivery system is a panel-mounted gas changeover assembly that can be configured for many applications. For more information, see the Swagelok KCA Series Continuous Gas Delivery System catalog, MS-18-01.
Dimensions
Dimensions, in inches (millimeters), are for reference only and are subject to change.

Port Configurations

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Designator</th>
<th>Configuration</th>
<th>Designator</th>
<th>Configuration</th>
<th>Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td></td>
<td>I</td>
<td></td>
<td>L</td>
</tr>
</tbody>
</table>

Ordering Information
Build a KCM series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>KCM</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>B</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>A</td>
<td>D</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

4. Body Material
1 = 316 SS
A = 316 SS, ASTM G93 Level E-cleaned

5. Pressure Control Range
C = 0 to 10 psig (0 to 0.68 bar)
D = 0 to 25 psig (0 to 1.7 bar)
E = 0 to 50 psig (0 to 3.4 bar)
F = 0 to 100 psig (0 to 6.8 bar)
G = 0 to 250 psig (0 to 17.2 bar)
J = 0 to 500 psig (0 to 34.4 bar)

5. Pressure Control Range
C = 0 to 10 psig (0 to 0.68 bar)
D = 0 to 25 psig (0 to 1.7 bar)
E = 0 to 50 psig (0 to 3.4 bar)
F = 0 to 100 psig (0 to 6.8 bar)
G = 0 to 250 psig (0 to 17.2 bar)
J = 0 to 500 psig (0 to 34.4 bar)

6. Nominal Changeover Pressure
F = 100 psig (6.8 bar)
G = 250 psig (17.2 bar)
J = 500 psig (34.4 bar)

For 4351 psig (300 bar) inlet
5 = 100 psig (6.8 bar)
6 = 250 psig (17.2 bar)
7 = 500 psig (34.4 bar)

7. Port Configuration
B, C, L
See Port Configurations, below.

8. Ports
4 = 1/4 in. female NPT

9. Seat Material
1 = PCTFE
2 = PEEK

10. Flow Coefficient ($C_v$)
2 = 0.06

11. Sensing Mechanism, Vent
A = Alloy X-750 diaphragm, no vent
C = Alloy X-750 diaphragm, self vent
E = Alloy X-750 diaphragm, captured vent
F = Alloy X-750 diaphragm, self and captured vent

12. Line Regulator Handle
D = Knob
E = 316 SS antitamper nut
Selector regulator has knob handle. For knob handle color options, see page 56.

13. Isolation and Relief Valves
0 = No valves
For isolation and relief valve options, see page 54.

14. Cylinder Connections
0 = No connections
Cylinder connections available only with hose option. For cylinder connection options and pressure ratings, see page 53.

15. Gauge Scale
1 = psig (bar) (North America only)
2 = bar (psig)
3 = psig (bar)
4 = MPa
5 = psig (kPa)
For more information, see page 54.

16. Options
0 = No options
3 = 3 ft, 1/4 in. FX series metal flexible hose, 1/4 in. female NPT inlet
4 = 3 ft, 1/4 in. TH series PTFE-lined, stainless steel braided hose, 1/4 in. female NPT inlet

For hose options and pressure ratings, see page 56.

Port Configurations

- **G_/R = Outlet gauge.**
- **G_/R = Outlet gauge or relief valve.**
- **R = Relief valve.**
- **I = Isolation valve.**
Steam-Heated Vaporizing, Diaphragm-Sensing Pressure-Reducing Regulator (KSV Series)

The KSV series is a steam-heated vaporizing regulator with a low internal volume. It can be used to vaporize liquid samples or to preheat gas samples to prevent them from condensing.

Features
- Convoluted, nonperforated diaphragm
- Metal-to-metal diaphragm seal
- Low internal volume

Technical Data

Maximum Inlet Pressure
- 3600 psig (248 bar)

Outlet Pressure Ranges
- 0 to 10 psig (0.68 bar) through 0 to 500 psig (34.4 bar)

Flow Coefficient ($C_v$)
- 0.06 or 0.20

Supply-Pressure Effect

<table>
<thead>
<tr>
<th>Flow Coefficient ($C_v$)</th>
<th>Pressure Control Range</th>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 100 psig (6.8 bar)</td>
<td>250 psig (17.2 bar) and Higher</td>
</tr>
<tr>
<td></td>
<td>supplied</td>
<td>250 psig (17.2 bar) and Higher</td>
</tr>
<tr>
<td>0.06</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>0.20</td>
<td>1.5</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Maximum Steam Pressure and Temperature
- 650 psig (44.7 bar) and 500°F (260°C)

Maximum Regulator Operating Temperature
- 392°F (200°C)

Weight
- 3.3 lb (1.5 kg)

Ports
- 1/8 in. female NPT inlet; 1/4 in. female NPT outlet(s)
- Steam tube 1/2 in. outside diameter, 0.049 in. wall

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antitamper nut, stem, cap ring, stop plate, body cap, panel nuts ①</td>
<td>316 SS</td>
</tr>
<tr>
<td>Spring button</td>
<td>Zinc-plated steel</td>
</tr>
<tr>
<td>Spring stabilizer ②</td>
<td>301 SS</td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS or zinc-plated steel, depending on configuration</td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, seat retainer, steam tube</td>
<td>316 SS</td>
</tr>
<tr>
<td>Seat</td>
<td>PEEK</td>
</tr>
<tr>
<td>Diaphragm,③ poppet spring</td>
<td>Alloy X-750</td>
</tr>
<tr>
<td>Poppet</td>
<td>S17400 SS</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
</tr>
</tbody>
</table>

Wetted components listed in italics.
① Not shown.
② Not required in all configurations.
③ Regulators with control ranges higher than 0 to 100 psig (0 to 6.8 bar) are assembled with two diaphragms.
Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

![Diagram of pressure regulator]

Ordering Information

Build a KSV series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>S</td>
<td>V</td>
<td>F</td>
<td>R</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>A</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

4 Body Material
1 = 316 SS
A = 316 SS, ASTM G93 Level E-cleaned

5 Pressure Control Range
C = 0 to 10 psig (0 to 0.68 bar)
D = 0 to 25 psig (0 to 1.7 bar)
E = 0 to 50 psig (0 to 3.4 bar)
F = 0 to 100 psig (0 to 6.8 bar)
G = 0 to 250 psig (0 to 17.2 bar)
J = 0 to 500 psig (0 to 34.4 bar)

6 Maximum Inlet Pressure
F = 100 psig (6.8 bar)
J = 500 psig (34.4 bar)
L = 1000 psig (68.9 bar)
R = 3600 psig (248 bar)

5 For better resolution and control, select a pressure that closely matches system pressure.

7 Port Configuration
1, 4

See Port Configurations, right.

8 Ports
3 = 1/8 in. female NPT inlet; 1/4 in. female NPT outlet(s)

9 Seat Material
2 = PEEK

10 Flow Coefficient ($C_v$)
2 = 0.06
5 = 0.20

11 Sensing Mechanism, Vent
A = Alloy X-750 diaphragm, no vent
E = Alloy X-750 diaphragm, captured vent, no self vent

12 Handle, Mounting
3 = Antitamper nut
7 = Antitamper nut, panel mount

13 Valves
0 = No valves

14 Cylinder Connections
0 = No connections

15 Gauges
0 = No gauges

16 Options
0 = No options

Port Configurations

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Designator</th>
<th>Configuration</th>
<th>Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="#" alt="Port Configuration 1" /></td>
<td>1</td>
<td><img src="#" alt="Port Configuration 4" /></td>
<td>4</td>
</tr>
</tbody>
</table>
Electrically Heated Vaporizing Pressure-Reducing Regulator (KEV Series)

The KEV series is an electrically heated vaporizing regulator with a low internal volume. It can be used to vaporize liquid samples or to preheat gas samples to prevent them from condensing. It features a heating element that is in direct contact with the process fluid for maximum thermal efficiency and is removable for easy cleaning. The KEV regulator has an integral temperature controller and is rated for use in hazardous areas, as identified below.

Features
- Convoluted, nonperforated diaphragm for control ranges up to 500 psig (34.4 bar)
- Stainless steel piston for control ranges from 1000 to 3600 psig (68.9 to 248 bar)
- ATEX, IECEx, and CSA certified for critical/hazardous environments
- T3 temperature classification for all heater ranges
- CE conformity: 89/336/EEC (EMC)
- Horizontally or vertically mounted
- One-piece body eliminates potential leak paths
- Low-volume vapor chamber for fast response
- Heater in direct contact with process media for maximum thermal efficiency
- Removable heater simplifies cleaning
- Side and base inlet options

Technical Data

Maximum Inlet Pressure
- 3600 psig (248 bar)

Pressure Control Ranges
- 0 to 10 psig (0.68 bar) through 0 to 3600 psig (248 bar)

Flow Coefficient ($C_v$)
- 0.02 or 0.06

Supply-Pressure Effect

<table>
<thead>
<tr>
<th>Supply Pressure Effect, %</th>
<th>Flow Coefficient ($C_v$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 100 psig (6.8 bar)</td>
<td>0.02</td>
</tr>
<tr>
<td>250 and 500 psig (17.2 and 34.4 bar)</td>
<td>0.3</td>
</tr>
<tr>
<td>1000 psig (68.9 bar) and Higher</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Weight
- Side mounted—8.8 lb (4.0 kg)
- Base mounted—7.7 lb (3.5 kg)

Ports
- 1/8 in. female NPT inlet; 1/4 in. female NPT outlet

Electrical
- Supply—120 and 240 V (ac) (± 10 %), 50/60 Hz
- Heater ratings—50, 100, 150, and 200 W
- Control temperature range—75 to 380°F (23 to 193°C)
- Explosive atmosphere/hazardous location certification:
  - ATEX (Europe) and IECEx (international)—Group II, Category 2G, Ex db IIB + H T3 Gb
  - CSA (Canada and U.S.A.—Class I, Div 1, Groups B, C, and D; T3; CSA Encl Type 4
  - Ambient temperatures: –4 to 140°F (~–20 to 60°C)

WARNING
- Do not alter or disassemble any of the flameproof joints within the KEV series regulator. Damage to the regulator resulting in affected performance and product safety is possible.

WARNING
- Certification and hazardous type protection may be impaired if the KEV regulator is used in a manner not specified by Swagelok. Refer to KEV Series Electrically Heated Vaporizing Pressure Reducing Regulators Instructions for Use, MS-CRD-KEV1, for correct method of installation, operation, and use.

Contact your authorized sales and service representative for any maintenance or repair beyond the maintenance of the heater sheath.
### Materials of Construction

- **Antitamper nut, stem, cap ring, stop plate,** \[1\]
- **body cap, retainer nut, flange, flange bolts, lock nut, connector tube, panel nuts,** \[2\]
- **Spring button**
- **Spring stabilizer**
- **Range spring**
- **Seat retainer**
- **Poppet**
- **Poppet spring**
- **Body**
- **Heater sheath**
- **Cap ring**
- **Stop plate**
- **Cap ring**
- **Diaphragm**
- **Seat**
- **Piston seal, body seal**
- **PTFE**
- **Piston, piston guide**
- **316 SS**
- **Piston seal retainer**
- **PEEK**
- **Piston seal spring, body seal spring**
- **Elgiloy**

**Component** | **Material**
---|---
Antitamper nut, stem, cap ring, stop plate | 316 SS
Body cap, retainer nut, flange, flange bolts, lock nut, connector tube, panel nuts | 316 SS
Spring button | Zinc-plated steel
Spring stabilizer | 301 SS
Range spring | 316 SS or zinc-plated steel, depending on configuration
Seat retainer | 316 SS
Poppet | 316 SS
Poppet spring | 302 SS
Heater sheath seal | Alloy 718
Heater sheath | PEEK
Body, seat retainer, heater sheath | 316 SS
Diaphragm | Alloy X-750
Piston seal, body seal | PTFE
Piston, piston guide | 316 SS
Piston seal retainer | PEEK
Piston seal spring, body seal spring | Elgiloy

**Wetted components listed in italics.**

- **Not included in regulators with piston sensing mechanism.**
- **Not shown.**
- **Not required in all configurations.**
- **Regulators with control ranges 0 to 250 psig (0 to 17.2 bar) and 0 to 500 psig (0 to 34.7 bar) are assembled with two diaphragms.**

---

### Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

---

**Side-Mounted**

<table>
<thead>
<tr>
<th></th>
<th>Dimensions (inches)</th>
<th>Dimensions (millimeters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body cap</td>
<td>5.71</td>
<td>(145)</td>
</tr>
<tr>
<td>Poppet</td>
<td>5.12</td>
<td>(130)</td>
</tr>
<tr>
<td>Body</td>
<td>5.79</td>
<td>(147)</td>
</tr>
<tr>
<td>Seat</td>
<td>3.74</td>
<td>(95.0)</td>
</tr>
<tr>
<td>Poppet</td>
<td>3.07</td>
<td>(78.0)</td>
</tr>
<tr>
<td>Flange (bolts not shown)</td>
<td>5.55</td>
<td>(141)</td>
</tr>
</tbody>
</table>

---

**Base-Mounted**

<table>
<thead>
<tr>
<th></th>
<th>Dimensions (inches)</th>
<th>Dimensions (millimeters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flange</td>
<td>5.35</td>
<td>(136)</td>
</tr>
<tr>
<td>Poppet</td>
<td>6.37</td>
<td>(162)</td>
</tr>
<tr>
<td>Cap ring</td>
<td>3.60</td>
<td>(91.5)</td>
</tr>
<tr>
<td>Body cap</td>
<td>0.87</td>
<td>(22.0)</td>
</tr>
</tbody>
</table>
Ordering Information
Build a KEV series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>KEV</th>
<th>1</th>
<th>F</th>
<th>R</th>
<th>A</th>
<th>3</th>
<th>2</th>
<th>2</th>
<th>A</th>
<th>X</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>G</th>
</tr>
</thead>
</table>

4 Body Material
- 1 = 316 SS
- A = 316 SS, ASTM G93 Level E-cleaned

5 Pressure Control Range
Diaphragm Sensing
- C = 0 to 10 psig (0 to 0.68 bar)
- D = 0 to 25 psig (0 to 1.7 bar)
- E = 0 to 50 psig (0 to 3.4 bar)
- F = 0 to 100 psig (0 to 6.8 bar)
- G = 0 to 250 psig (0 to 17.2 bar)
- J = 0 to 500 psig (0 to 34.4 bar)

Piston Sensing
- L = 0 to 1000 psig (0 to 68.9 bar)
- M = 0 to 1500 psig (0 to 103 bar)
- N = 0 to 2000 psig (0 to 137 bar)
- P = 0 to 3000 psig (0 to 206 bar)
- R = 0 to 3600 psig (0 to 248 bar)

6 Maximum Inlet Pressure
- F = 100 psig (6.8 bar)
- J = 500 psig (34.4 bar)
- L = 1000 psig (68.9 bar)
- R = 3600 psig (248 bar)

5 For better resolution and control, select a pressure that closely matches system pressure.
6 Available with diaphragm sensing mechanism only.

7 Port Configuration
- Side Mount—A, X, 1, 2
- Base Mount—A, B, X, Y, Z

See Port Configurations, below.

8 Ports
- 3 = 1/8 in. female NPT inlet;
- 1/4 in. female NPT outlet(s)

9 Seat Material
- 2 = PEEK

10 Flow Coefficient \( (C_v) \)
- 1 = 0.02
- 2 = 0.06

11 Sensing Mechanism
- A = Alloy X-750 diaphragm (outlet pressures up to 500 psig [34.4 bar])
- P = 316 SS piston (outlet pressures above 500 psig [34.4 bar])

12 Handle, Mounting
- W = Antitamper nut, side mount
- X = Antitamper nut, base mount

13 Valves
- 0 = No valves

14 Cylinder Connections
- 0 = No connections

15 Gauges
- 0 = No gauges

16 Heater, Controller
- 75 to 380°F (23 to 193°C), 120 V
- 75 to 380°F (23 to 193°C), 240 V

- G = 50 W
- H = 100 W
- J = 150 W
- K = 200 W

Port Configurations

- Outlet and auxiliary ports on the same face.

<table>
<thead>
<tr>
<th>Side-Mount View</th>
<th>Side Mount</th>
<th>Designator</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base-Mount View</th>
<th>Designator</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Z</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Aux</td>
</tr>
</tbody>
</table>
K Series Pressure-Reducing Regulator Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. See the Swagelok Pressure-Reducing Regulator Flow Curves Technical Bulletin, MS-06-114, for an overview of how to read regulator flow curves and for additional inlet pressures and flow coefficients.

**KPR Series**

*Flow Coefficient 0.06; Maximum Inlet Pressure 3600 psig (248 bar)*

![Flow Coefficient 0.06 Graph](image)

*Flow Coefficient 0.20; Maximum Inlet Pressure 3600 psig (248 bar)*

![Flow Coefficient 0.20 Graph](image)
K Series Pressure-Reducing Regulator Flow Data

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

**KCY Series**

**Flow Coefficient 0.06; Maximum Inlet Pressure 3600 psig (248 bar)**

**Flow Coefficient 0.20; Maximum Inlet Pressure 3600 psig (248 bar)**
K Series Pressure-Reducing Regulator Flow Data

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

**KLF Series**

**Flow Coefficient 0.02;**

**Maximum Inlet Pressure 3600 psig (248 bar)**

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, std L/min</th>
<th>Nitrogen Flow, std ft³/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10 psig (0 to 0.68 bar)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 50 psig (0 to 3.4 bar)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 250 psig (0 to 17.2 bar)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Outlet Pressure, psig**

- 0 to 10 psig
- 0 to 50 psig
- 0 to 250 psig

**Outlet Pressure, bar**

- 0 to 0.68 bar
- 0 to 3.4 bar
- 0 to 17.2 bar

**Inlet Pressure**

- 100 psig (6.8 bar)
- 500 psig (34.4 bar)

**Nitrogen Flow, std ft³/min**

- 0 to 4.0
- 0 to 16
- 0 to 50

**Nitrogen Flow, std L/min**

- 0 to 10
- 0 to 50
- 0 to 200

### Flow Coefficient 0.06;

**Maximum Inlet Pressure 3600 psig (248 bar)**

<table>
<thead>
<tr>
<th>Pressure Control Ranges</th>
<th>Nitrogen Flow, std L/min</th>
<th>Nitrogen Flow, std ft³/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10 psig (0 to 0.68 bar)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 100 psig (0 to 6.8 bar)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 250 psig (0 to 17.2 bar)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Outlet Pressure, psig**

- 0 to 10 psig
- 0 to 100 psig
- 0 to 250 psig

**Outlet Pressure, bar**

- 0 to 0.68 bar
- 0 to 6.8 bar
- 0 to 17.2 bar

**Inlet Pressure**

- 100 psig (6.8 bar)
- 500 psig (34.4 bar)
- 2200 psig (151 bar)

**Nitrogen Flow, std ft³/min**

- 0 to 4.0
- 0 to 16
- 0 to 50

**Nitrogen Flow, std L/min**

- 0 to 10
- 0 to 50
- 0 to 200

### Pressure Control Range

- 0 to 250 psig (0 to 17.2 bar)
- 0 to 500 psig (0 to 34.4 bar)
- 2200 psig (151 bar)

**Outlet Pressure, bar**

- 0 to 1.7 bar
- 0 to 6.8 bar
- 0 to 34.4 bar

**Inlet Pressure**

- 100 psig (6.8 bar)
- 500 psig (34.4 bar)
- 2200 psig (151 bar)

**Nitrogen Flow, std ft³/min**

- 0 to 25
- 0 to 50
- 0 to 100

**Nitrogen Flow, std L/min**

- 0 to 10
- 0 to 50
- 0 to 200
K Series Pressure-Reducing Regulator Flow Data

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

**KHF Series**

*Flow Coefficient 1.0; Maximum Inlet Pressure 3600 psig (248 bar)*

**Pressure Control Ranges**

- 0 to 10 psig (0 to 0.68 bar)
- 0 to 25 psig (0 to 1.7 bar)

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std L/min

Nitrogen Flow, std ft³/min

**KPF Series**

*Flow Coefficient 1.0; Maximum Inlet Pressure 6000 psig (413 bar)*

**Pressure Control Ranges**

- 0 to 1000 psig (0 to 68.9 bar)
- 0 to 2000 psig (0 to 137 bar)

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, std L/min

Nitrogen Flow, std ft³/min
K Series Pressure-Reducing Regulator Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

KCP Series

Flow Coefficient 0.06; Maximum Inlet Pressure 3600 psig (248 bar)

Flow Coefficient 0.20; Maximum Inlet Pressure 3600 psig (248 bar)
K Series Pressure-Reducing Regulator Flow Data

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

KHP Series

**Flow Coefficient 0.06; Maximum Inlet Pressure 10 000 psig (689 bar)**

<table>
<thead>
<tr>
<th>Pressure Control Ranges</th>
<th>Nitrogen Flow, std L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 500 psig (0 to 34.4 bar)</td>
<td>0 to 750 psig (0 to 51.6 bar)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>Outlet Pressure, psig</th>
<th>Outlet Pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000 psig (551 bar)</td>
<td>5000 psig (344 bar)</td>
<td>1000 psig (68.9 bar)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, std ft³/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 to 1500 psig (0.68 to 103 bar)</td>
<td>8000 psig (551 bar)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>Outlet Pressure, psig</th>
<th>Outlet Pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000 psig (551 bar)</td>
<td>5000 psig (344 bar)</td>
<td>1500 psig (103 bar)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure Control Ranges</th>
<th>Nitrogen Flow, std L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 to 2500 psig (1.0 to 172 bar)</td>
<td>25 to 3600 psig (1.7 to 248 bar)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>Outlet Pressure, psig</th>
<th>Outlet Pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000 psig (551 bar)</td>
<td>5000 psig (344 bar)</td>
<td>3500 psig (241 bar)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure Control Ranges</th>
<th>Nitrogen Flow, std ft³/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 to 6000 psig (3.4 to 413 bar)</td>
<td>100 to 10 000 psig (6.8 to 689 bar)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>Outlet Pressure, psig</th>
<th>Outlet Pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000 psig (551 bar)</td>
<td>5500 psig (378 bar)</td>
<td>9000 psig (620 bar)</td>
</tr>
</tbody>
</table>
**K Series Pressure-Reducing Regulator Flow Data**

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

**KHP Series**

*Flow Coefficient 0.25; Maximum Inlet Pressure 10 000 psig (689 bar)*

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>Outlet Pressure, psig</th>
<th>Outlet Pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000 psig (551 bar)</td>
<td>8000 psig (551 bar)</td>
<td></td>
</tr>
<tr>
<td>5000 psig (344 bar)</td>
<td>5000 psig (344 bar)</td>
<td></td>
</tr>
<tr>
<td>3500 psig (241 bar)</td>
<td>3500 psig (241 bar)</td>
<td></td>
</tr>
</tbody>
</table>

**KHR Series**

*Flow Coefficient 0.06; Maximum Inlet Pressure 10 000 psig (689 bar)*

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>Outlet Pressure, psig</th>
<th>Outlet Pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000 psig (551 bar)</td>
<td>8000 psig (551 bar)</td>
<td></td>
</tr>
<tr>
<td>5000 psig (344 bar)</td>
<td>5000 psig (344 bar)</td>
<td></td>
</tr>
<tr>
<td>3500 psig (241 bar)</td>
<td>3500 psig (241 bar)</td>
<td></td>
</tr>
</tbody>
</table>

---

**Pressure Control Ranges**

- **0 to 500 psig (0 to 34.4 bar)**
- **10 to 1500 psig (0.68 to 103 bar)**

**Nitrogen Flow, std ft³/min**

- **25 to 3600 psig (1.7 to 248 bar)**
- **100 to 10 000 psig (6.8 to 689 bar)**

**Water Flow, U.S. gal/min**

- **0 to 500 psig (0 to 34.4 bar)**
- **10 to 1500 psig (0.68 to 103 bar)**

**Outlet Pressure, psig**

- **8000 psig (551 bar)**
- **5000 psig (344 bar)**
- **1500 psig (103 bar)**

---

**Pressure Control Ranges**

- **0 to 750 psig (0 to 51.6 bar)**
- **10 to 2500 psig (0.68 to 172 bar)**

**Nitrogen Flow, std ft³/min**

- **25 to 3600 psig (1.7 to 248 bar)**
- **100 to 10 000 psig (6.8 to 689 bar)**

**Water Flow, U.S. gal/min**

- **0 to 750 psig (0 to 51.6 bar)**
- **10 to 2500 psig (0.68 to 172 bar)**

**Outlet Pressure, psig**

- **8000 psig (551 bar)**
- **5000 psig (344 bar)**
- **1500 psig (103 bar)**

---

**Pressure Control Ranges**

- **0 to 1500 psig (0 to 103 bar)**
- **15 to 2500 psig (1.0 to 172 bar)**

**Nitrogen Flow, std ft³/min**

- **25 to 3600 psig (1.7 to 248 bar)**
- **100 to 10 000 psig (6.8 to 689 bar)**

**Water Flow, U.S. gal/min**

- **0 to 1500 psig (0 to 103 bar)**
- **15 to 2500 psig (1.0 to 172 bar)**

**Outlet Pressure, psig**

- **8000 psig (551 bar)**
- **5000 psig (344 bar)**
- **1500 psig (103 bar)**

---

**Pressure Control Ranges**

- **0 to 500 psig (0 to 34.4 bar)**
- **10 to 750 psig (0.68 to 51.6 bar)**

**Nitrogen Flow, std ft³/min**

- **25 to 3600 psig (1.7 to 248 bar)**
- **100 to 10 000 psig (6.8 to 689 bar)**

**Water Flow, U.S. gal/min**

- **0 to 500 psig (0 to 34.4 bar)**
- **10 to 750 psig (0.68 to 51.6 bar)**

**Outlet Pressure, psig**

- **8000 psig (551 bar)**
- **5000 psig (344 bar)**
- **1500 psig (103 bar)**
K Series Pressure-Reducing Regulator Flow Data

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

**KPP Series**

**Flow Coefficient 0.02; Maximum Inlet Pressure 2000 psig (137 bar)**

- **Pressure Control Range**
  - 0 to 1000 psig (0 to 68.9 bar)
  - 0 to 1500 psig (0 to 103 bar)
  - 0 to 2000 psig (0 to 137 bar)

- **Outlet Pressure, psig**
  - Inlet Pressure 1000 psig (68.9 bar)
  - Inlet Pressure 2000 psig (137 bar)

- **Outlet Pressure, bar**
  - Inlet Pressure 1000 psig (68.9 bar)
  - Inlet Pressure 2000 psig (137 bar)

**Flow Coefficient 0.06; Maximum Inlet Pressure 2000 psig (137 bar)**

- **Pressure Control Ranges**
  - 0 to 1000 psig (0 to 68.9 bar)
  - 0 to 1500 psig (0 to 103 bar)
  - 0 to 2000 psig (0 to 137 bar)

- **Outlet Pressure, psig**
  - Inlet Pressure 1000 psig (68.9 bar)
  - Inlet Pressure 2000 psig (137 bar)

- **Outlet Pressure, bar**
  - Inlet Pressure 1000 psig (68.9 bar)
  - Inlet Pressure 2000 psig (137 bar)

**Flow Coefficient 0.02; Maximum Inlet Pressure 4000 psig (275 bar)**

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

- **Outlet Pressure, psig**
  - Inlet Pressure 2000 psig (137 bar)
  - Inlet Pressure 3000 psig (206 bar)

- **Outlet Pressure, bar**
  - Inlet Pressure 2000 psig (137 bar)
  - Inlet Pressure 3000 psig (206 bar)

**Flow Coefficient 0.06; Maximum Inlet Pressure 6000 psig (413 bar)**

- **Pressure Control Range**
  - 0 to 3000 psig (0 to 206 bar)
  - 0 to 3600 psig (0 to 248 bar)

- **Outlet Pressure, psig**
  - Inlet Pressure 3000 psig (206 bar)
  - Inlet Pressure 5000 psig (344 bar)

- **Outlet Pressure, bar**
  - Inlet Pressure 3000 psig (206 bar)
  - Inlet Pressure 5000 psig (344 bar)
K Series Back-Pressure Regulator Flow Data

The graphs illustrate the change in inlet pressure as the flow rate increases.

**KBP Series**

*Flow Coefficient 0.20*

![Graph of KBP Series](image)

**KFB Series**

*Flow Coefficient 1.0*

![Graph of KFB Series](image)

**KCB Series**

*Flow Coefficient 0.20*

![Graph of KCB Series](image)
K Series Back-Pressure Regulator Flow Data
The graphs illustrate the change in inlet pressure as the flow rate increases.

**KPB Series**

**Flow Coefficient 0.06**

- **Pressure Control Range**
  - 0 to 2000 psig (0 to 137 bar)
  - 0 to 1000 psig (0 to 68.9 bar)

- **Nitrogen Flow, std ft³/min**: 0, 5, 10, 15, 20, 25, 30
- **Inlet Pressure, psig**: 0, 500, 1000, 1500, 2000, 2500
- **Inlet Pressure, bar**: 0, 40, 80, 120, 160

**Flow Coefficient 0.20**

- **Pressure Control Range**
  - 0 to 3000 psig (0 to 206 bar)
  - 0 to 1000 psig (0 to 68.9 bar)

- **Nitrogen Flow, std ft³/min**: 0, 5, 10, 15, 20, 25, 30
- **Inlet Pressure, psig**: 0, 500, 1000, 1500, 2000, 2500
- **Inlet Pressure, bar**: 0, 40, 80, 120, 160
K Series Back-Pressure Regulator Flow Data
The graphs illustrate the change in inlet pressure as the flow rate increases.

**KHB Series**

**Flow Coefficient 0.06**

**Flow Coefficient 0.25**
Port Configurations

Port configurations are available as shown in the regulator ordering information pages. The symbols indicate the port location of factory-assembled accessories. For alternative accessory locations, contact your authorized Swagelok representative.

Port Configuration Symbols

- Filtered Accessory
- Inlet
- Filtered main inlet
- Outlet

Factory-assembled cylinder connections are placed on a filtered main inlet port; isolation valves are placed on an outlet port 180° from the cylinder connection.

Pressure Reducing Regulators

Right-to-Left Flow

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>K</td>
</tr>
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</table>

Left-to-Right Flow

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
</tbody>
</table>

Back-Pressure Regulators

Right-to-Left Flow

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>V</td>
</tr>
</tbody>
</table>

Left-to-Right Flow

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>G</td>
</tr>
</tbody>
</table>

MPC Port Configurations

Pressure Reducing

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Port</td>
<td>5</td>
</tr>
<tr>
<td>3-Port</td>
<td>6</td>
</tr>
</tbody>
</table>

Back Pressure

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Port</td>
<td>7</td>
</tr>
<tr>
<td>3-Port</td>
<td>8</td>
</tr>
</tbody>
</table>
Options and Accessories
Regulator accessories are available separately or mounted on Swagelok regulators. Some accessories limit regulator pressure or temperature ratings. Additional materials, options, and accessories are available. Contact your authorized Swagelok representative for more information.

Cylinder Connections
■ Available in a variety of 4 in (100 mm) long CGA, BS or DIN connections
■ Stainless steel construction
Insert a designator into the ordering number as shown in the appropriate regulator ordering information pages.

Cylinder Gases and Connections

<table>
<thead>
<tr>
<th>Cylinder Connection</th>
<th>Typical Gases (others may be applicable)</th>
<th>Rated Pressure psig (bar)</th>
<th>Connection Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGA 320</td>
<td>Carbon Dioxide</td>
<td>3000 (206)</td>
<td>B</td>
</tr>
<tr>
<td>CGA 347</td>
<td>High pressure Air</td>
<td>5500 (379)</td>
<td>1</td>
</tr>
<tr>
<td>CGA 350</td>
<td>Hydrogen, Natural Gas</td>
<td>3000 (206)</td>
<td>D</td>
</tr>
<tr>
<td>CGA 540</td>
<td>Oxygen</td>
<td>3000 (206)</td>
<td>F</td>
</tr>
<tr>
<td>CGA 580</td>
<td>Helium, Nitrogen</td>
<td>3000 (206)</td>
<td>G</td>
</tr>
<tr>
<td>CGA 590</td>
<td>Sulfur Hexafluoride</td>
<td>3000 (206)</td>
<td>H</td>
</tr>
<tr>
<td>CGA 660</td>
<td>Nitrogen Dioxide, Phosgene</td>
<td>3000 (206)</td>
<td>J</td>
</tr>
<tr>
<td>CGA 680</td>
<td>High pressure inert gas</td>
<td>5500 (379)</td>
<td>2</td>
</tr>
<tr>
<td>CGA 695</td>
<td>High pressure flammable gas</td>
<td>5500 (379)</td>
<td>3</td>
</tr>
<tr>
<td>BS 3</td>
<td>Argon, Helium</td>
<td>3600 (250)</td>
<td>R</td>
</tr>
<tr>
<td>BS 4</td>
<td>Hydrogen, Natural Gas</td>
<td>3600 (250)</td>
<td>S</td>
</tr>
<tr>
<td>BS 8</td>
<td>Carbon Dioxide</td>
<td>3600 (250)</td>
<td>V</td>
</tr>
<tr>
<td>BS/ISO 30</td>
<td>High pressure inert gas</td>
<td>4351 (300)</td>
<td>4</td>
</tr>
<tr>
<td>BS/ISO 31</td>
<td>High pressure Air</td>
<td>4351 (300)</td>
<td>5</td>
</tr>
<tr>
<td>BS/ISO 32</td>
<td>High pressure oxidising gas</td>
<td>4351 (300)</td>
<td>6</td>
</tr>
<tr>
<td>BS/ISO 38</td>
<td>High pressure flammable gas</td>
<td>4351 (300)</td>
<td>8</td>
</tr>
<tr>
<td>DIN 1</td>
<td>Ethane, Hydrogen</td>
<td>4351 (300)</td>
<td>K</td>
</tr>
<tr>
<td>DIN 5</td>
<td>Carbon monoxide, Hydrogen sulfide</td>
<td>4351 (300)</td>
<td>L</td>
</tr>
<tr>
<td>DIN 6</td>
<td>Ammonia, Xenon</td>
<td>4351 (300)</td>
<td>M</td>
</tr>
<tr>
<td>DIN 8</td>
<td>Chlorine, Hydrogen chloride</td>
<td>4351 (300)</td>
<td>N</td>
</tr>
<tr>
<td>DIN 10</td>
<td>Nitrogen</td>
<td>4351 (300)</td>
<td>P</td>
</tr>
<tr>
<td>DIN 13</td>
<td>Air</td>
<td>4351 (300)</td>
<td>Z</td>
</tr>
</tbody>
</table>

Regulator inlet pressures and any optional accessories must be rated to the Cylinder connectors pressure. See the ordering information for each regulator for details.

Other cylinder connections are also available. Contact your authorized Swagelok representative for more information.
Options and Accessories

Pressure Regulators and Filters
K SERIES
REGULATORS
Isolation Valves
■ Allow isolation from downstream equipment
■ Working pressures up to 5000 psig (344 bar)
■ 316 stainless steel construction
■ Swagelok integral-bonnet needle valve (1 series)
■ Used in conjunction with an adjustable regulator relief valve

See the Swagelok Integral-Bonnet Needle Valves catalog (MS-01-164) for more information.

Isolation Valve and Relief Valve Ordering Information
Isolation valves are available factory assembled on KCP, KPP, KPF, KHP, KHR, and KHB series regulators. Isolation and adjustable regulator relief valves are available factory assembled on KPR, KCY, KCM, KLF, and KHF series regulators.

To order a regulator factory assembled with an isolation valve or isolation valve and adjustable regulator relief valve, insert a designator from the table below into the ordering number as shown in the appropriate regulator ordering information pages.

<table>
<thead>
<tr>
<th>Description</th>
<th>Valve Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 in. male NPT inlet 6 mm Swagelok tube fitting outlet angle pattern isolation valve</td>
<td>A 2</td>
</tr>
<tr>
<td>1/4 in. male NPT inlet 1/4 in. female NPT outlet angle pattern isolation valve</td>
<td>B 3</td>
</tr>
<tr>
<td>1/4 in. Swagelok tube fitting inlet(^2) and outlet straight pattern isolation valve</td>
<td>C 4</td>
</tr>
<tr>
<td>6 mm Swagelok tube fitting inlet(^2) and outlet straight pattern isolation valve</td>
<td>E 6</td>
</tr>
<tr>
<td>3/8 in. Swagelok tube fitting inlet(^2) 1/4 in. female NPT outlet straight pattern isolation valve</td>
<td>G 8</td>
</tr>
</tbody>
</table>

1. Not available on KPR, KCY, KCM, KLF, and KHF series regulators, because a relief valve is needed to protect the diaphragm sensing mechanism.
2. Includes male NPT to Swagelok tube adapter fitting (required for regulators with 1/8 and 1/2 in. female NPT ports).

Ordering Information
To order a regulator assembled with gauges, insert a designator from the table below into the ordering number as shown in the appropriate regulator ordering information pages. The maximum gauge pressures are appropriate for the maximum inlet pressure and/or control pressure ordered.

<table>
<thead>
<tr>
<th>Gauge Scale primary unit (secondary unit)</th>
<th>Description</th>
<th>Valve Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>psig (bar) (North America only)(^3)</td>
<td>1/4 in. male NPT inlet 6 mm Swagelok tube fitting outlet angle pattern isolation valve</td>
<td>A 2</td>
</tr>
<tr>
<td>psig (bar)</td>
<td>1/4 in. male NPT inlet 1/4 in. female NPT outlet angle pattern isolation valve</td>
<td>B 3</td>
</tr>
<tr>
<td>psig (kPa)</td>
<td>1/4 in. Swagelok tube fitting inlet(^2) and outlet straight pattern isolation valve</td>
<td>C 4</td>
</tr>
<tr>
<td>bar (psig)</td>
<td>6 mm Swagelok tube fitting inlet(^2) and outlet straight pattern isolation valve</td>
<td>E 6</td>
</tr>
<tr>
<td>MPa</td>
<td>3/8 in. Swagelok tube fitting inlet(^2) 1/4 in. female NPT outlet straight pattern isolation valve</td>
<td>G 8</td>
</tr>
</tbody>
</table>

1. KCP and KCB series regulators are assembled with M model gauges.
2. Not available for KCP and KCB series regulators.

Cleaning
Gauges assembled to ASTM G93 Level E or SC-11–cleaned regulators are cleaned in accordance with ASME B40.100 level IV.

Pressure Gauges
■ Provides measure of inlet pressure, outlet pressure, or both
■ 2 1/2 in. (63 mm) dial size with 1/4 in. male NPT connection
■ 1 1/2 in. (40 mm) dial size with 1/8 in. male NPT connection
■ Stainless steel cases and wetted components

See the Swagelok Pressure Gauges, Industrial and Process catalog (MS-02-170) for more information.

Options and Accessories

Pressure Gauges
■ Provides measure of inlet pressure, outlet pressure, or both
■ 2 1/2 in. (63 mm) dial size with 1/4 in. male NPT connection
■ 1 1/2 in. (40 mm) dial size with 1/8 in. male NPT connection
■ Stainless steel cases and wetted components

See the Swagelok Pressure Gauges, Industrial and Process catalog (MS-02-170) for more information.

Cleaning
Gauges assembled to ASTM G93 Level E or SC-11–cleaned regulators are cleaned in accordance with ASME B40.100 level IV.

Ordering Information
To order a regulator assembled with gauges, insert a designator from the table below into the ordering number as shown in the appropriate regulator ordering information pages. The maximum gauge pressures are appropriate for the maximum inlet pressure and/or control pressure ordered.

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<tr>
<th>Gauge Scale primary unit (secondary unit)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>psig (bar) (North America only)(^3)</td>
<td>1/4 in. male NPT inlet 6 mm Swagelok tube fitting outlet angle pattern isolation valve</td>
<td>A 2</td>
</tr>
<tr>
<td>psig (bar)</td>
<td>1/4 in. male NPT inlet 1/4 in. female NPT outlet angle pattern isolation valve</td>
<td>B 3</td>
</tr>
<tr>
<td>psig (kPa)</td>
<td>1/4 in. Swagelok tube fitting inlet(^2) and outlet straight pattern isolation valve</td>
<td>C 4</td>
</tr>
<tr>
<td>bar (psig)</td>
<td>6 mm Swagelok tube fitting inlet(^2) and outlet straight pattern isolation valve</td>
<td>E 6</td>
</tr>
<tr>
<td>MPa</td>
<td>3/8 in. Swagelok tube fitting inlet(^2) 1/4 in. female NPT outlet straight pattern isolation valve</td>
<td>G 8</td>
</tr>
</tbody>
</table>

1. KCP and KCB series regulators are assembled with M model gauges.
2. Not available for KCP and KCB series regulators.

Isolation Valves
■ Allow isolation from downstream equipment
■ Working pressures up to 5000 psig (344 bar)
■ 316 stainless steel construction
■ Swagelok integral-bonnet needle valve (1 series)
■ Used in conjunction with an adjustable regulator relief valve

See the Swagelok Integral-Bonnet Needle Valves catalog (MS-01-164) for more information.

Ordering Information
Isolation valves are available factory assembled on KCP, KPP, KPF, KHP, KHR, and KHB series regulators. Isolation and adjustable regulator relief valves are available factory assembled on KPR, KCY, KCM, KLF, and KHF series regulators.

To order a regulator factory assembled with an isolation valve or isolation valve and adjustable regulator relief valve, insert a designator from the table below into the ordering number as shown in the appropriate regulator ordering information pages.

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td>1/4 in. male NPT inlet 6 mm Swagelok tube fitting outlet angle pattern isolation valve</td>
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<tr>
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</tr>
<tr>
<td>1/4 in. Swagelok tube fitting inlet(^2) and outlet straight pattern isolation valve</td>
<td>C 4</td>
</tr>
<tr>
<td>6 mm Swagelok tube fitting inlet(^2) and outlet straight pattern isolation valve</td>
<td>E 6</td>
</tr>
<tr>
<td>3/8 in. Swagelok tube fitting inlet(^2) 1/4 in. female NPT outlet straight pattern isolation valve</td>
<td>G 8</td>
</tr>
</tbody>
</table>

1. Not available on KPR, KCY, KCM, KLF, and KHF series regulators, because a relief valve is needed to protect the diaphragm sensing mechanism.
2. Includes male NPT to Swagelok tube adapter fitting (required for regulators with 1/8 and 1/2 in. female NPT ports).
Options and Accessories

Kenmac Adjustable Regulator Relief Valves (KVV Series)

- Provide nonsafety-related pressure protection for Swagelok regulators

### Technical Data

#### Relief Pressure Ranges

- Based on the regulator control range

<table>
<thead>
<tr>
<th>Regulator Control Range psig (bar)</th>
<th>Relief Pressure Range psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10 (0 to 0.68)</td>
<td>0 to 100 (0 to 6.8)</td>
</tr>
<tr>
<td>0 to 25 (0 to 1.7)</td>
<td>50 to 200 (3.4 to 13.7)</td>
</tr>
<tr>
<td>0 to 50 (0 to 3.4)</td>
<td>150 to 500 (10.3 to 34.4)</td>
</tr>
<tr>
<td>0 to 100 (0 to 6.8)</td>
<td></td>
</tr>
<tr>
<td>0 to 250 (0 to 17.2)</td>
<td></td>
</tr>
<tr>
<td>0 to 500 (0 to 34.4)</td>
<td></td>
</tr>
</tbody>
</table>

#### Maximum Operating Temperature

- 392°F (200°C)

#### Weight

- 0.26 lb (0.12 kg)

#### Ports

- 1/4 in. NPT male inlet and female outlet

### Flow Data

The graph illustrates the discharge characteristics of the Kenmac adjustable regulator relief valve.

### Ordering Information

To order a KVV adjustable regulator relief valve separately, select an ordering number from the table below.

<table>
<thead>
<tr>
<th>Relief Pressure Range psig (bar)</th>
<th>Ordering Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 100 (0 to 6.8)</td>
<td>KVV11DE1</td>
</tr>
<tr>
<td>50 to 200 (3.4 to 13.7)</td>
<td>KVV11DG1</td>
</tr>
<tr>
<td>150 to 500 (10.3 to 34.4)</td>
<td>KVV11DI1</td>
</tr>
</tbody>
</table>

### Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body, poppet, spring button, adjusting screw</td>
<td>316 SS</td>
</tr>
<tr>
<td>Seal</td>
<td>Fluorocarbon FKM</td>
</tr>
<tr>
<td>Range spring</td>
<td>302 SS</td>
</tr>
</tbody>
</table>

Wetted components listed in *italics*.

### Testing

Every KVV series regulator relief valve is factory tested at its maximum rated pressure, then set to zero when assembled to the regulator.

⚠️ Reset relief pressure to the desired value before pressurizing the system.

⚠️ For valves not actuated for a period of time, initial relief pressure may be higher than the set pressure.

⚠️ Some system applications require relief valves to meet specific safety codes. The system designer and user must determine when such codes apply and whether these relief valves conform to them.

⚠️ Kenmac adjustable regulator relief valves should never be used as ASME Boiler and Pressure Vessel Code safety relief devices.

⚠️ Kenmac adjustable regulator relief valves are not “Safety Accessories” as defined in the Pressure Equipment Directive 2014/68/EU.
Options and Accessories

Hoses

Hoses are available assembled to the inlet of the regulator to allow connection to remote gas cylinders.

Hose options include:

- 3 ft long Swagelok 1/4 in. high-pressure, metal flexible hose (FX series), 1/4 in. female NPT inlet, 1/4 in. male NPT outlet connected to regulator: SS-FX4PM4PF4-36
  Rated to 6000 psig (413 bar) at 100°F (37°C)
- 3 ft long Swagelok 1/4 in. PTFE-lined, stainless steel braided hose (TH series), 1/4 in. female NPT inlet, 1/4 in. male NPT outlet connected to regulator: SS-TH4PM4PF4-36
  Rated to 3100 psig (213 bar) at 100°F (37°C)

See the Swagelok Hose and Flexible Tubing catalog (MS-01-180) for more information.

Cleaning

Hoses are not available assembled to ASTM G93 Level E or SC-11 specially-cleaned regulators.

Handles

Knob, thumbwheel, and antitamper handles are available.

The green plastic knob handle is standard for most Swagelok regulators. Other colors are available; add a handle color designator to a regulator ordering number.

<table>
<thead>
<tr>
<th>Color</th>
<th>Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>BK</td>
</tr>
<tr>
<td>Blue</td>
<td>BL</td>
</tr>
<tr>
<td>Orange</td>
<td>OG</td>
</tr>
<tr>
<td>Red</td>
<td>RD</td>
</tr>
<tr>
<td>Yellow</td>
<td>YW</td>
</tr>
</tbody>
</table>

Example: KPR1FRF412A20000BK

The metal thumbwheel handle is available for the compact KCB and KCP series regulators.

The metal antitamper nut is available to prevent inadvertent pressure adjustment.

Wall Mounting Brackets

Stainless steel wall mounting brackets are available for many Swagelok regulators.

Wall Mounting Bracket Kits

<table>
<thead>
<tr>
<th>Regulator Series</th>
<th>Ordering Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPR, KLF, KHF, KCP, KPP, KPF, KHP, KPB, KFB, KCB, KPB, and KHB Series Mounting Bracket</td>
<td>9R0079</td>
</tr>
<tr>
<td>KCY</td>
<td>9R0149</td>
</tr>
</tbody>
</table>

Maintenance Kits

Filter Replacement Kits

Filter replacement kits are available for KPR, KCM, KCP, KCY, KPP, KHP, KLF, KHR, KHF, and KPF series regulators.

Filter replacement kits include:

- five sets of filters and carrier assemblies
- instructions.
## Maintenance Kits

### KPR, KCP, AND KBP Series Maintenance Kits

Maintenance kits include:
- all wetted components, except for the regulator body and piston, if applicable
- wetted lubricant with MSDS
- instructions.

### Maintenance Kits for Other Regulator Series

Maintenance kits for KLF, KHF, KPP, KPF, KHP, KHR, KFB, KCB, KYC, KBP, KHB, KSV, and KEV series regulators are available.

To order, contact your authorized Swagelok representative; to ensure correct kit contents, please provide the original regulator ordering number.

### Ordering Information

Build a maintenance kit ordering number by combining the designators in the sequence shown below.

```
1 2 3  K P R 1  D 0 0 4 1 2 A 0 - K I T
```

#### Regulator Series
- **KPR** = KPR
- **KCP** = KCP
- **KBP** = KBP

#### Body Material, Cleaning
- **1** = 316 SS and brass
- **C** = 316 SS and brass, SC-11 cleaned

#### Pressure Control Range

**KPR and KBP Series**
- **D** = 0 to 10 psig (0 to 0.68 bar) and 0 to 25 psig (0 to 1.7 bar)
- **F** = 0 to 50 psig (0 to 3.4 bar) and 0 to 100 psig (0 to 6.8 bar)
- **J** = 0 to 250 psig (0 to 17.2 bar) and 0 to 500 psig (0 to 34.4 bar)

**KCP Series**
- **G** = 0 to 10 psig (0 to 0.68 bar), 0 to 25 psig (0 to 1.7 bar), 0 to 50 psig (0 to 3.4 bar), 0 to 100 psig (0 to 6.8 bar), and 0 to 250 psig (0 to 17.2 bar)
- **M** = 0 to 500 psig (0 to 34.4 bar), 0 to 1000 psig (0 to 68.9 bar), and 0 to 1500 psig (0 to 103 bar)\(^\text{①}\)

#### Maximum Inlet Pressure
- **6** = 0 to 10 psig (0 to 0.68 bar) and 0 to 25 psig (0 to 1.7 bar)
- **7** = 0 to 50 psig (0 to 3.4 bar) and 0 to 100 psig (0 to 6.8 bar)
- **J** = 0 to 250 psig (0 to 17.2 bar) and 0 to 500 psig (0 to 34.4 bar)

#### Flow Coefficient \(C_v\)
- **1** = 0.02
- **2** = 0.06
- **5** = 0.20\(^\text{①②}\)
- **7** = 0.50\(^\text{①}\)

\(^\text{①}\) Not available with MPC platform port configuration.
\(^\text{②}\) Required for KBP series.

#### Port Configuration
- **6** = Not applicable
- **7** = Not applicable

#### Ports (Filter Size)

**KPR Series**
- **4** = 1/4 in. female NPT
- **0** = All other end connections

**KBP Series**
- **0** = Not applicable

**KCP Series**
- **2** = 1/8 in. female NPT
- **M** = MPC platform

#### Seat, Seal Material

**KPR Series**
- **1** = PCTFE
- **2** = PEEK

**KBP and KCP Series**
- **A** = Fluorocarbon FKM, PCTFE
- **B** = Kalrez, PCTFE
- **C** = Fluorocarbon FKM, PEEK
- **D** = Kalrez, PEEK

#### Sensing Mechanism, Vent

**KPR Series**
- **A** = Alloy X-750 diaphragm, no-vent models and captured-vent models
- **C** = Alloy X-750 diaphragm, self-vent models and self- and captured-vent models

**KBP Series**
- **A** = Alloy X-750 diaphragm, all models

#### Handle, Mounting
- **0** = Not applicable

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\(^\text{①}\) Not available with MPC platform port configuration.
Additional Products

Filters
Swagelok offers a variety of filters, filter elements, and sizes.
- 316 SS and brass materials
- Sintered and strainer elements
- Tee type, inline, and all-welded models
For more information about Swagelok filters, see the Filters—FW, F, and TF Series catalog (MS-01-92).

Transducers
Swagelok industrial pressure transducers electronically monitor fluid system pressure in a variety of analytical and process applications.
- Accurate and repeatable readings
- Swagelok tube adapter end connections available for ease of installation and maintenance
- CE compliant
For more information about Swagelok industrial pressure transducers, see the Industrial Pressure Transducers catalog, (MS-02-225).

⚠️ Swagelok pressure regulators are not “Safety Accessories” as defined in the Pressure Equipment Directive 2014/68/EU.

⚠️ Do not use the regulator as a shutoff device.

Caution: Do not mix or interchange parts with those of other manufacturers.
About this document

Thank you for downloading this electronic catalog, which is part of General Product catalog Swagelok published in print. This type of electronic catalog is updated as new information arises or revisions, which may be more current than the printed version.

Swagelok Company is a major developer and provider of fluid system solutions, including products, integration solutions and services for industry research, instrumentation, pharmaceutical, oil and gas, power, petrochemical, alternative fuels, and semiconductor. Our manufacturing facilities, research, service and distribution facilities support a global network of more than 200 authorized sales and service centers in 57 countries.

Visit www.swagelok.com to locate your Swagelok representative and obtain any information on features, technical information and product references, or to learn about the variety of services available only through authorized sales centers and service Swagelok.

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.

Warranty Information
Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit your Swagelok Web site or contact your authorized Swagelok representative.