Pressure Regulators
K Series

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- 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 setting. Control is the ability of the regulator to hold a given 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.

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</th>
<th>Vaporizing</th>
<th>Compact, MFC Platform</th>
<th>Maximum Inlet Pressure (psig)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPR</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6000 (413)</td>
</tr>
<tr>
<td>KCY</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KLF</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3600 (248)</td>
</tr>
<tr>
<td>KHF</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KCP</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KPP</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6000 (413)</td>
</tr>
<tr>
<td>KPF</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KHP</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10000 (689)</td>
</tr>
<tr>
<td>KHR</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pressure-Reducing Models

KCM ✓ ✓ ✓ ✓ 4351 (300) ✓ ✓ ✓ ✓ ✓ ✓ ✓
KSV ✓ ✓ ✓ ✓ 3600 (248) ✓ ✓ ✓ ✓ ✓ ✓ ✓
KEV ✓ ✓ ✓ ✓ 3600 (248) ✓ ✓ ✓ ✓ ✓ ✓ ✓

Specialty Regulators

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) catalog, 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) catalog, 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**


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### Pressure Control Ranges, psig (bar)

<table>
<thead>
<tr>
<th>Flow Coefficient (Cv)</th>
<th>0.02</th>
<th>0.06</th>
<th>0.10</th>
<th>0.20</th>
<th>0.25</th>
<th>0.50</th>
<th>1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>Page</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>32</td>
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<td>Page</td>
<td>34</td>
<td>36</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Pressure Control Ranges

<table>
<thead>
<tr>
<th>Pressure Control Ranges, psig (bar)</th>
<th>0 to ....</th>
<th>10 to 1500 (68.9 to 103)</th>
<th>15 to 2500 (1.0 to 172)</th>
<th>25 to 3600 (1.7 to 248)</th>
<th>50 to 6000 (3.5 to 413)</th>
<th>100 to 10 000 (6.8 to 689)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>....</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
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.

**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.

**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.

**Inlet**

**Outlet**

**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.

**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 (Cv)**
- 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 (Cv)</th>
<th>Pressure Control Range</th>
<th>Maximum Operating Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 100 psig (6.8 bar)</td>
<td>176°F (80°C) with PCTFE seat</td>
</tr>
<tr>
<td></td>
<td>250 psig (17.2 bar) and Higher</td>
<td>392°F (200°C) with PEEK seat</td>
</tr>
<tr>
<td>0.02</td>
<td>0.3</td>
<td>212°F (100°C) with PEEK seat and maximum inlet pressure greater than 3600 psig (248 bar)</td>
</tr>
<tr>
<td>0.06</td>
<td>1.0</td>
<td>Weight</td>
</tr>
<tr>
<td>0.20</td>
<td>1.7</td>
<td>2.4 lb (1.1 kg)</td>
</tr>
<tr>
<td>0.50</td>
<td>2.3</td>
<td>3.3</td>
</tr>
</tbody>
</table>

**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>
</tr>
<tr>
<td>Spring button</td>
<td></td>
<td>Zinc-plated steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring stabilizer</td>
<td>301 SS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS or zinc-plated steel, depending on configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stem, stem nut, cap ring, stop plate, body cap, panel nuts</td>
<td>316 SS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VCR nuts</td>
<td>316 SS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seat retainer</td>
<td>316 SS</td>
<td>Alloy 400</td>
<td>Alloy C-276</td>
<td></td>
</tr>
<tr>
<td>Filter</td>
<td>PCTFE or PEEK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diaphragm</td>
<td>316 SS</td>
<td>Alloy X-750 or alloy C-276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poppet</td>
<td>S17400 SS</td>
<td>Alloy 400</td>
<td>Alloy C-276</td>
<td></td>
</tr>
<tr>
<td>Poppet spring</td>
<td>Alloy X-750</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poppet damper, filter carrier</td>
<td>PTFE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-vent seal</td>
<td>Fluorocarbon FKM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td>316 SS</td>
<td>Brass CW721R</td>
<td>Alloy 400</td>
<td>Alloy C-276</td>
</tr>
<tr>
<td>Tube butt weld ports</td>
<td>316L SS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
<td></td>
<td></td>
<td></td>
</tr>
</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.

KPR 1 F R F 4 1 2 A 2 0 0 0 0

4 Body Material
1 = 316 SS
2 = Brass CW721R
4 = Alloy 400
6 = Alloy C-276
4 A = 316 SS, ASTM G93 Level E-cleaned
4 B = Brass, ASTM G93 Level E-cleaned
4 C = 316 SS, SC-11–cleaned
4 D = Brass, SC-11–cleaned

5 Pressure Control Range
4 C = 0 to 10 psig (0 to 0.68 bar)\(^{1}\)
6 D = 0 to 25 psig (0 to 1.7 bar)\(^{1}\)
4 E = 0 to 50 psig (0 to 3.4 bar)
6 F = 0 to 100 psig (0 to 6.8 bar)
4 G = 0 to 250 psig (0 to 17.2 bar)
6 J = 0 to 500 psig (0 to 34.4 bar)

6 Maximum Inlet Pressure\(^{1,2}\)
4 F = 100 psig (6.8 bar)
6 J = 500 psig (34.4 bar)
6 L = 1000 psig (68.9 bar)
6 P = 3000 psig (206 bar)
6 R = 3600 psig (248 bar)
6 T = 4351 psig (300 bar)
6 W = 6000 psig (413 bar)\(^{3,4}\)

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
T = 1/4 in. x 0.035 in. tube butt weld\(^{1}\)
V = 1/4 in. VCR gland, no nuts\(^{1,2}\)
X = 1/4 in. rotatable female VCR fitting\(^{1}\)
Y = 1/4 in. rotatable male VCR fitting\(^{1}\)

9 Seat Material
1 = PCTFE
2 = PEEK

10 Flow Coefficient \((C_r)\)
1 = 0.02
2 = 0.06
5 = 0.20
7 = 0.50

11 Sensing Mechanism, Vent
A = Alloy X-750 diaphragm, no vent
C = Alloy X-750 diaphragm, self vent\(^{1}\)
E = Alloy X-750 diaphragm, captured vent, no self vent
F = Alloy X-750 diaphragm, self and captured vent\(^{1}\)
H = Alloy C-276 diaphragm, no vent

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

| Flow Coefficient ($C_v$) | Pressure Control Range
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 100 psig (6.8 bar)</td>
</tr>
<tr>
<td>Supply Pressure Effect, %</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>0.06</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
- 4.2 lb (1.9 kg)

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

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>316 SS</th>
<th>Brass CW721R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knob handle, cover</td>
<td>Nylon</td>
<td>316 SS</td>
</tr>
<tr>
<td>Spring buttons</td>
<td>316 SS (1st stage)</td>
<td>Zinc-plated steel (2nd stage)</td>
</tr>
<tr>
<td>Spring stabilizer$^1$</td>
<td>301 SS</td>
<td></td>
</tr>
<tr>
<td>Range springs</td>
<td>316 SS</td>
<td></td>
</tr>
<tr>
<td>(0 to 10 through 0 to 100 psig control ranges)$^2$</td>
<td>Zinc-plated steel</td>
<td></td>
</tr>
<tr>
<td>(0 to 250 and 0 to 500 psig control ranges)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stems, stem nut, cap rings, stop plates, body caps, panel nuts,$^3$ antitamper nut</td>
<td>316 SS</td>
<td></td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
<td></td>
</tr>
<tr>
<td>Seat retainer, filter</td>
<td>316 SS</td>
<td></td>
</tr>
<tr>
<td>Seats</td>
<td>PCTFE or PEEK</td>
<td></td>
</tr>
<tr>
<td>Diaphragms,$^6$ poppet springs</td>
<td>Alloy X-750</td>
<td></td>
</tr>
<tr>
<td>Poppets</td>
<td>S17400 SS</td>
<td></td>
</tr>
<tr>
<td>Poppet dampers, filter carrier</td>
<td>PTFE</td>
<td></td>
</tr>
<tr>
<td>Interstage port plug</td>
<td>316 SS with PTFE tape</td>
<td></td>
</tr>
<tr>
<td>Self-vent seal$^5$</td>
<td>Fluorocarbon FKM</td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td>316 SS</td>
<td></td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</td>
<td></td>
</tr>
</tbody>
</table>

Wetted components listed in italics.

$^1$ Not required in all configurations.
$^2$ Regulators with control range 0 to 100 psig (0 to 6.8 bar) and 0.20 $C_v$ have zinc-plated steel range spring.
$^3$ Not shown.
$^4$ Regulators with control ranges higher than 0 to 100 psig (0 to 6.8 bar) are assembled with two diaphragms.

Wetted components listed in italics.
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>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>Body Material</td>
<td>Ports</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>
<td>Flow Coefficient ((C_v))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = 316 SS</td>
<td>4 = 1/4 in. female NPT</td>
<td>1 = PCTFE</td>
<td>2 = 0.06</td>
<td>A = Alloy X-750 diaphragm, no vent</td>
<td>2 = Knob</td>
<td>0 = No valves</td>
<td>0 = No connections</td>
<td>0 = No gauges</td>
<td>3 = 3 ft, 1/4 in. FX series metal flexible hose, 1/4 in. female NPT inlet</td>
<td>5 = 0.20</td>
<td>5 = 0.20</td>
<td></td>
</tr>
<tr>
<td>2 = Brass CW721R</td>
<td>2 = PEEK</td>
<td>5 = 0.20</td>
<td>C = Alloy X-750 diaphragm, self vent (^\circ)</td>
<td>E = Alloy X-750 diaphragm, captured vent, no self vent</td>
<td>3 = Antitamper nut</td>
<td>For isolation and relief valve options, see page 54.</td>
<td>For cylinder connection options and pressure ratings, see page 53.</td>
<td>For inlet and outlet gauge options, see page 54.</td>
<td>6 = Knob, second-stage panel mount</td>
<td>7 = Antitamper nut, second-stage panel mount</td>
<td>7 = 0.50</td>
<td></td>
</tr>
<tr>
<td>A = 316 SS, ASTM G93 Level E-cleaned</td>
<td>7 = Knob, first-stage panel mount</td>
<td>11 = 0.50</td>
<td>F = Alloy X-750 diaphragm, self and captured vent (^\circ)</td>
<td>9 = Knob, first-stage panel mount</td>
<td>9 = Antitamper nut</td>
<td>For hose options and pressure ratings, see page 56.</td>
<td>(^\circ) Not available for ASTM G93 Level E-cleaned and SC-11–cleaned regulators.</td>
<td>(^\circ) Not available for regulators assembled with isolation valves.</td>
<td>Flow Coefficient ((C_v))</td>
<td>(^\circ) Not available for regulators assembled with isolation valves.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B = Brass, ASTM G93 Level E-cleaned</td>
<td>For knob handle color options, see page 56.</td>
<td>(^\circ) Available with 0.06 and 0.2 (C_v) only. Self vent through second stage only.</td>
<td>(^\circ) Available with 0.06 and 0.2 (C_v) only. Self vent through second stage only.</td>
<td>(^\circ) Available with 0.06 and 0.2 (C_v) only. Self vent through second stage only.</td>
<td>(^\circ) Available with 0.06 and 0.2 (C_v) only. Self vent through second stage only.</td>
<td>First stage assembled with antitamper nut.</td>
<td>First stage assembled with antitamper nut.</td>
<td>First stage assembled with antitamper nut.</td>
<td>First stage assembled with antitamper nut.</td>
<td>First stage assembled with antitamper nut.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C = 316 SS, SC-11–cleaned</td>
<td>8 = 0.60</td>
<td>6 = Knob, second-stage panel mount</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D = Brass, SC-11–cleaned</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td>8 = 0.60</td>
<td></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>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 10 psig (0.68 bar)</td>
<td>25 psig (1.7 bar) and Higher</td>
</tr>
<tr>
<td>0.02</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>0.06</td>
<td>0.4</td>
<td>0.6</td>
</tr>
<tr>
<td>0.20</td>
<td>0.7</td>
<td>0.9</td>
</tr>
<tr>
<td>0.50</td>
<td>1.0</td>
<td>1.4</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</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</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) p*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>KLF</th>
<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>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</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)\(^1\)
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\(^2\)\(^3\)
C = 15 psig (1.0 bar)\(^3\)
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)
\(^2\) For better resolution and control, select a pressure that closely matches system pressure.
\(^3\) Available with 0 to 2.0 psig (0 to 0.13 bar) pressure control range only.

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

13 Isolation and Relief Valves
0 = No valves

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 $C_v$—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 ($C_v$)**
- 1.0

See page 44 for flow graphs.

**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 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>

**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) Zinc-plated steel (all other ranges)</td>
</tr>
<tr>
<td>Spring stabilizer$^*$</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>Stem, stem nut, cap ring, stop plate, body cap, panel nuts$^{**}$</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$^{***}$</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.

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

$^{**}$ Not shown.

$^{***}$ 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 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
```

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
F = 100 psig (6.8 bar)
J = 500 psig (34.4 bar)
L = 1000 psig (68.9 bar)
R = 3600 psig (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)

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 port

9 Seat Material
1 = PCTFE
2 = 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 Isolation and Relief Valves
0 = No valves
For isolation and relief 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

For better resolution and control, select a pressure that closely matches system pressure.
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>
<th>Supply Pressure Effect, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 250 psig (17.2 bar)</td>
<td>500 psig (34.4 bar) and Higher</td>
</tr>
<tr>
<td>0.02</td>
<td>0.4</td>
<td>2.6</td>
</tr>
<tr>
<td>0.06</td>
<td>1.3</td>
<td>8.6</td>
</tr>
<tr>
<td>0.20</td>
<td>2.1</td>
<td>14.5</td>
</tr>
<tr>
<td>0.50</td>
<td>3.0</td>
<td>22.6</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, depending on configuration</td>
</tr>
<tr>
<td>Stem, stem nut, body cap, panel</td>
<td>316 SS</td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, seat retainer, piston, filter</td>
<td>316 SS</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.

➀ Not shown.

➁ 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>KCP</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>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body Material</td>
<td>Pressure Control Range</td>
<td>Port Configuration</td>
<td>Ports</td>
<td>Seat, Seal Material</td>
<td>Flow Coefficient (Cv)</td>
<td>Sensing Mechanism</td>
<td>Handle, Mounting</td>
<td>Isolation Valves</td>
<td>Cylinder Connections</td>
<td>Gauges</td>
<td>Options</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Body Material</td>
<td>Pressure Control Range</td>
<td>Port Configuration</td>
<td>Ports</td>
<td>Seat, Seal Material</td>
<td>Flow Coefficient (Cv)</td>
<td>Sensing Mechanism</td>
<td>Handle, Mounting</td>
<td>Isolation Valves</td>
<td>Cylinder Connections</td>
<td>Gauges</td>
<td>Options</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Body Material</td>
<td>Pressure Control Range</td>
<td>Port Configuration</td>
<td>Ports</td>
<td>Seat, Seal Material</td>
<td>Flow Coefficient (Cv)</td>
<td>Sensing Mechanism</td>
<td>Handle, Mounting</td>
<td>Isolation Valves</td>
<td>Cylinder Connections</td>
<td>Gauges</td>
<td>Options</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

4 Body Material
1 = 316 SS
A = 316 SS, ASTM G93 Level E-cleaned
C = 316 SS, SC-11-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)
L = 0 to 1000 psig (0 to 68.9 bar)
M = 0 to 1500 psig (0 to 103 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)

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

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

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

10 Flow Coefficient (Cv)
1 = 0.02
2 = 0.06
5 = 0.20
7 = 0.50

11 Sensing Mechanism
P = 316 SS piston

12 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.

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

[Diagram of regulator with dimensions and configurations]
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

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></td>
<td>Zinc-plated steel (all other ranges)</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,</td>
<td>316 SS</td>
</tr>
<tr>
<td>panel nuts</td>
<td></td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, seat retainer, filter, piston,</td>
<td>316 SS</td>
</tr>
<tr>
<td>piston guide</td>
<td></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>Seat, piston seal, filter, body seal</td>
<td>PTFE</td>
</tr>
<tr>
<td>body seal</td>
<td></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.

![Dimensions Diagram]

<table>
<thead>
<tr>
<th>Panel</th>
<th>Thickness</th>
<th>Lock Nuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.39</td>
<td>(10.0)</td>
<td>2</td>
</tr>
<tr>
<td>0.63</td>
<td>(16.0)</td>
<td>1</td>
</tr>
</tbody>
</table>

Panel cutout: 1.38 (35.0) dia

Mounting holes: 10-32, 0.33 deep (M5 x 0.8, 8.5 deep)

### Ordering Information

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

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

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

2. **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)\(^1\)
   - R = 0 to 3600 psig (0 to 248 bar)\(^1\)

3. **Maximum Inlet Pressure**\(^1\)
   - N = 2000 psig (137 bar)
   - S = 4000 psig (275 bar)
   - W = 6000 psig (413 bar)

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

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

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

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

8. **Sensing Mechanism, Vent**
   - P = 316 SS piston, no vent
   - V = 316 SS piston, 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

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

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

12. **Gauges**
    - 0 = No gauges

13. **Options**
    - 0 = No options

---

\(^1\) Not available with 2000 psig (137 bar) maximum inlet pressure.

---

For better resolution and control, select a pressure that closely matches system pressure.
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)</td>
</tr>
<tr>
<td></td>
<td>Zinc-plated steel (all other ranges)</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,</td>
<td>316 SS</td>
</tr>
<tr>
<td>panel nuts</td>
<td></td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, spring retainer, seat retainer,</td>
<td>316 SS</td>
</tr>
<tr>
<td>filter, piston, piston guide,</td>
<td></td>
</tr>
<tr>
<td>poppet seal retainer</td>
<td></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</td>
<td>PTFE</td>
</tr>
<tr>
<td>seal</td>
<td></td>
</tr>
<tr>
<td>Piston seal spring, poppet seal</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>

Wetted components listed in italics.

- Not included in regulators with 316 SS spring button.
- Not shown.
Dimensions

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

![Diagram of Pressure Regulator K Series]

Ordering Information

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

```
KPF 1 L W A 8 A 8 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**
- **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>Piston</td>
<td></td>
</tr>
<tr>
<td>Piston guide</td>
<td></td>
</tr>
<tr>
<td>Piston seal</td>
<td></td>
</tr>
<tr>
<td>Self-vent poppet</td>
<td></td>
</tr>
<tr>
<td>Piston seal backup ring</td>
<td></td>
</tr>
<tr>
<td>Self-vent poppet spring</td>
<td></td>
</tr>
<tr>
<td>Self-vent seat retainer</td>
<td></td>
</tr>
<tr>
<td>Sealing washer</td>
<td></td>
</tr>
<tr>
<td>Seat retainer</td>
<td></td>
</tr>
<tr>
<td>Seat</td>
<td></td>
</tr>
<tr>
<td>Body, seat retainer, filter</td>
<td>316 SS</td>
</tr>
<tr>
<td>Piston, piston guide, self-vent</td>
<td></td>
</tr>
<tr>
<td>seat retainer</td>
<td></td>
</tr>
<tr>
<td>Seat, self-vent seat</td>
<td>PEEK</td>
</tr>
<tr>
<td>Poppet, self-vent poppet</td>
<td>S17400 SS</td>
</tr>
<tr>
<td>Poppet spring</td>
<td>Alloy X-750</td>
</tr>
<tr>
<td>Poppet damper, filter carrier</td>
<td>PTFE</td>
</tr>
<tr>
<td>Self-vent poppet spring</td>
<td>302 SS</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</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.

**Ordering Information**

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

```
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)

Flow Coefficient ($C_v$)
- 0.06
  - See page 47 for flow graphs.
- 0.25 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 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
- 6.1 lb (2.75 kg)

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

Materials of Construction

Component | Material
--- | ---
Knob handle, cover | Nylon with 316 SS insert
Spring buttons, upper spring button set screw, knob handle retainer, vent screw, stem nuts, vent rod nut, body cap | 316 SS
Vent screw spring | 302 SS
Vent rod | 431 SS
Stem | CZ114 bronze
Thrust roller bearing | Hardened carbon steel
Range spring | Chrome vanadium steel
Piston seal backup ring | PEEK
Nonwetted lubricant | Hydrocarbon-based
Body, seat retainer, filter, piston, piston guide, self-vent seat retainer | 316 SS
Self-vent seat | PEEK
Seat | PEEK or 316 SS
Poppet, self-vent poppet | S17400 SS
Poppet spring | Alloy X-750
Poppet damper, filter carrier | PTFE
Self-vent poppet spring | 302 SS
Body seals, piston seals | Fluorocarbon FKM
Wetted lubricant | PTFE-based

Wetted components listed in italics.
Pressure Regulators—K Series

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

### Dimensions

- **Vent**
  - Diameter: 2.83 (72.0 mm)
- **Dia**
  - 3.19 (81.0 mm)
  - 0.75 (19.0 mm)
  - 2.20 (56.0 mm)
  - 0.96 (24.5 mm)
- **Panel cutout minimum dia**
  - 2.25 (57.2 mm)
- **Clearance hole dia**
  - 0.31 (8.0 mm)
- **Allowable**
  - 4.41 to 5.67 (112 to 144 mm)

### Panel-mount assembly shown

- **Mounting holes**
  - 10-32, 0.33 deep
  - (M5 x 0.8, 8.5 deep)

### Ordering Information

Build a KHR 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>Body Material</td>
<td>KHR</td>
<td>T</td>
<td>X</td>
<td>A</td>
<td>4</td>
<td>J</td>
<td>2</td>
<td>U</td>
<td>2</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

- **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)

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

- **Port Configuration**
  - A, B, C, F, M
  - See Port Configurations, page 52.

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

- **Seat, Seal Material**
  - C = PEEK, fluorocarbon FKM
  - J = 316 SS, fluorocarbon FKM

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

- **Sensing Mechanism, Vent**
  - U = 316 SS piston, self and captured vent

- **Handle, Mounting**
  - 2 = Knob
  - 6 = Knob, 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
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 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>Zinc-plated steel (all other ranges)</td>
</tr>
<tr>
<td>Spring stabilizer$^\text{①}$</td>
<td>301 SS</td>
<td>316 SS</td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS (0 to 10 through 0 to 50 psig control ranges)</td>
<td>Zinc-plated 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$^\text{②}$</td>
<td>316 SS</td>
<td>316 SS</td>
</tr>
<tr>
<td>VCR nuts$^\text{②}$</td>
<td>316 SS</td>
<td>—</td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
<td></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$^\text{②}$</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$^\text{②}$</td>
<td>316L SS</td>
<td>—</td>
</tr>
<tr>
<td>VCR gland ports$^\text{②}$</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.
$^\text{①}$ Not included in regulators with 0 to 500 psig (0 to 34.4 bar) control range.
$^\text{②}$ Not shown.
$^\text{③}$ 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 KBP series regulator ordering number by combining the designators in the sequence shown below.

![Diagram of regulator dimensions]

- **Body Material**
  - 1 = 316 SS
  - 2 = Brass CW721R
  - A = 316 SS, ASTM G93 Level E-cleaned
  - B = Brass, ASTM G93 Level E-cleaned
  - C = 316 SS, SC-11-cleaned
  - D = Brass, 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)

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

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

- **Ports**
  - 4 = 1/4 in. female NPT
  - T = 1/4 in. × 0.035 in. tube butt weld
  - V = 1/4 in. VCR gland, no nuts
  - X = 1/4 in. rotatable female VCR fitting
  - Y = 1/4 in. rotatable male VCR fitting

  ① Available only with 316 SS body material in A port configuration. Not available ASTM G93 Level E-cleaned.

  ② For use with VCR split-nuts, which can be ordered separately. Refer to Swagelok VCR Metal Gasket Face Seal Fittings catalog, MS-01-24.

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

- **Flow Coefficient (Cₜ)**
  - 5 = 0.20

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

- **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.*

- **Valves**
  - 0 = No valves

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

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

- **Options**
  - 0 = No options
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&lt;sup&gt;1&lt;/sup&gt;</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, 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, seat retainer</td>
<td>316 SS</td>
</tr>
<tr>
<td>Retainer seal</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>Seat</td>
<td>Fluorocarbon FKM</td>
</tr>
<tr>
<td>Diaphragm&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Alloy X-750</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.

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,(^{(1)}) cover(^{(1)})</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) Zinc-plated steel (all other control ranges)</td>
</tr>
<tr>
<td>Body cap</td>
<td>316 SS</td>
</tr>
<tr>
<td>Seating</td>
<td>316 SS</td>
</tr>
<tr>
<td>Piston seal</td>
<td>Fluorocarbon FKM or Kalrez</td>
</tr>
<tr>
<td>Seat retainer</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>Retainer seal</td>
<td>PTFE-based</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.

<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.

Panel 0.50 (12.7) thick maximum between two nuts
Panel cutout 1.38 (35.0) dia

Mounting holes 10-32, 0.33 deep
(M5 x 0.8, 8.5 deep)

For knob handle color options, see page 56.

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

<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 500 psig range)</td>
</tr>
<tr>
<td>Spring stabilizer(^\text{1})</td>
<td>301 SS</td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS (0 to 3000 and 0 to 4000 psig range)</td>
</tr>
<tr>
<td>Stem, stem nut, cap ring, body cap, panel nuts(^\text{2})</td>
<td>316 SS</td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, seat retainer, seat support, poppet retainer, piston, piston guide</td>
<td>316 SS</td>
</tr>
<tr>
<td>Seat, seat retainer seal</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>Piston seal retainer</td>
<td>PEEK</td>
</tr>
<tr>
<td>Poppet way</td>
<td>S17400 SS</td>
</tr>
<tr>
<td>Piston</td>
<td>302 SS</td>
</tr>
<tr>
<td>Piston seal, body seal</td>
<td>PTFE</td>
</tr>
<tr>
<td>Piston seal spring, body seal spring</td>
<td>Eligiloy</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 3000 psig (0 to 206 bar) and 0 to 4000 psig (0 to 275 bar) control ranges.

\(^{2}\) Not shown.
## Dimensions

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

![Dimensions Diagram]

### Ordering Information

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

<table>
<thead>
<tr>
<th>Designator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Body Material</td>
</tr>
<tr>
<td>5</td>
<td>Pressure Control Range</td>
</tr>
<tr>
<td>6</td>
<td>Maximum Inlet Pressure</td>
</tr>
<tr>
<td>7</td>
<td>Port Configuration</td>
</tr>
<tr>
<td>8</td>
<td>Ports</td>
</tr>
<tr>
<td>9</td>
<td>Seat, Seal Material</td>
</tr>
<tr>
<td>10</td>
<td>Flow Coefficient ($C_v$)</td>
</tr>
<tr>
<td>11</td>
<td>Sensing Mechanism</td>
</tr>
<tr>
<td>12</td>
<td>Handle, Mounting</td>
</tr>
<tr>
<td>13</td>
<td>Valves</td>
</tr>
<tr>
<td>14</td>
<td>Cylinder Connections</td>
</tr>
<tr>
<td>15</td>
<td>Gauges</td>
</tr>
<tr>
<td>16</td>
<td>Options</td>
</tr>
</tbody>
</table>

**Example**

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 button set screw, knob handle retainer, stem nuts, body cap</td>
<td>316 SS</td>
</tr>
<tr>
<td>Stem</td>
<td>CZ114 bronze</td>
</tr>
<tr>
<td>Thrust roller bearing</td>
<td>Hardened carbon steel</td>
</tr>
<tr>
<td>Range spring</td>
<td>Chrome vanadium steel</td>
</tr>
<tr>
<td>Piston seal backup ring</td>
<td>PEEK</td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Body, poppet retainer, seat retainer, seat support, piston, piston guide</td>
<td>316 SS</td>
</tr>
<tr>
<td>Seat</td>
<td>PEEK or 316 SS</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>Piston seal, body seal, seat support seal</td>
<td>Fluorocarbon FKM</td>
</tr>
<tr>
<td>Wetted lubricant</td>
<td>PTFE-based</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.

<p>| | | | | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>H</td>
<td>B</td>
<td>1</td>
<td>T</td>
<td>0</td>
<td>D</td>
<td>4</td>
<td>C</td>
<td>2</td>
<td>P</td>
<td>2</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
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

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

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

For knob handle color options, see page 56.
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 (Cv)
- 0.06

Supply-Pressure Effect

<table>
<thead>
<tr>
<th>Flow Coefficient (Cv)</th>
<th>Pressure Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 100 psig (6.8 bar)</td>
</tr>
<tr>
<td>0.06</td>
<td>0.01</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.

Materials of Construction

The KCM series gas changeover uses Swagelok KPR series pressure-reducing regulators. For more information, see General-Purpose Diaphragm Sensing, Pressure-Reducing Regulators (KPR Series), page 6.

The table below lists additional components not shown in the KPR series section.

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstage fitting</td>
<td>316 SS with PTFE tape</td>
</tr>
<tr>
<td>Line-regulator mounting block</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Line-regulators mounting screws,</td>
<td>316 SS</td>
</tr>
<tr>
<td>mounting bracket</td>
<td></td>
</tr>
</tbody>
</table>

Wetted components listed in italics.

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>

Supply 2 can deplete below some of the available pressure control range limits. Setting the line regulator near the nominal changeover pressure will cause flow to the system to decrease or stop as the supply nears depletion.

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.

**Ordering Information**

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

<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>I</td>
<td>Go/R</td>
<td>I</td>
<td>Go/R</td>
<td>I</td>
<td>Go/R</td>
</tr>
<tr>
<td></td>
<td>Go/R</td>
<td></td>
<td>Go</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Go</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Go/R</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
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<td>Go/R</td>
<td></td>
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<td></td>
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<td></td>
<td>Go/R</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Go/R</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Go/R</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Go/R</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Go/R</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Body Material**

1 = 316 SS  
A = 316 SS, ASTM G93 Level E-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)

1 Not available with 100 psig (6.8 bar) changeover pressure.  
2 Only available with 500 psig (34.4 bar) changeover pressure.

**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)

1 Inlet pressure must exceed changeover pressure for automatic switching to occur.  
2 Only available with PEEK seat.

**Port Configuration**

B, C, L  
See Port Configurations, below.

**Ports**

4 = 1/4 in. female NPT

**Seat Material**

1 = PCTFE  
2 = PEEK

**Flow Coefficient (Cv)**

2 = 0.06

**Sensing Mechanism, Vent**

A = Alloy X-750 diaphragm, no vent  
C = Alloy X-750 diaphragm, self vent  
E = Alloy X-750 diaphragm, captured vent, no self vent  
F = Alloy X-750 diaphragm, self and captured vent

1 Self and captured vent options on line regulator only.

**Line Regulator Handle**

D = Knob  
E = 316 SS antitamper nut

Selector regulator has knob handle. For knob handle color options, see page 56.

**Isolation and Relief Valves**

0 = No valves  
For isolation and relief valve options, see page 54.

**Cylinder Connections**

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

**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.

**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.

1 Not available for ASTM G93 Level E-cleaned regulators.

---

**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>I</td>
<td>Go/R</td>
<td>I</td>
<td>Go/R</td>
<td>I</td>
<td>Go/R</td>
</tr>
<tr>
<td></td>
<td>Go/R</td>
<td></td>
<td>Go</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Go</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Go/R</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Go/R</td>
<td></td>
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<tr>
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<td></td>
<td></td>
<td>Go/R</td>
<td></td>
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<td>Go/R</td>
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<td>Go/R</td>
<td></td>
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<td>Go/R</td>
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<td>Go/R</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Go/R</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Go/R</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Go = Outlet gauge.  
Go/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>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, 0.065 in. wall

Materials of Construction

Antitamper nut, stem, cap ring, stop plate, body cap, panel nuts
- 316 SS

Spring button
- Zinc-plated steel

Spring stabilizer
- 301 SS

Range spring
- 316 SS or zinc-plated steel, depending on configuration

Nonwetted lubricant
- Hydrocarbon-based

Body, seat retainer, steam tube
- 316 SS

Seat
- PEEK

Diaphragm,® poppet spring
- Alloy X-750

Poppet
- S17400 SS

Wetted lubricant
- PTFE-based

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.

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

| KSV | 1 | F | R | 1 | 3 | 2 | 2 | A | 3 | 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)
J = 0 to 500 psig (0 to 68.9 bar)
R = 3600 psig (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)

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>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet in bottom of body</td>
<td>1</td>
</tr>
<tr>
<td>Steam tubes</td>
<td>4</td>
</tr>
</tbody>
</table>
**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>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>0.3</td>
</tr>
<tr>
<td></td>
<td>250 psig (17.2 bar)</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>500 psig (34.4 bar)</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>1000 psig (68.9 bar) and Higher</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.2</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+H2 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)
- CSA (Canada and U.S.A.)—Class I, Div 1, Groups B, C, and D; T3; CSA Encl Type 4
  - Ambient temperatures: -58 to 122°F (-50 to 50°C)

**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

**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**
There is a potential for air to become trapped within the piping system, creating the possibility of a combustible mixture. This could occur during system startup or shutdown. In order to allow the KEV heater tube to stabilize at ambient temperature, turn off the power to the regulator during system startup and shutdown. The amount of time needed for the system to reach ambient conditions depends on several system parameters including, but not limited to, set point, flow rate, ambient temperature, and the thermal properties of the system and fluid.

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antitamper nut, stem, cap ring, stop plate,①</td>
<td>316 SS</td>
</tr>
<tr>
<td>Body cap</td>
<td></td>
</tr>
<tr>
<td>Spring button</td>
<td></td>
</tr>
<tr>
<td>Range spring</td>
<td></td>
</tr>
<tr>
<td>Seat retainer</td>
<td></td>
</tr>
<tr>
<td>Poppet</td>
<td></td>
</tr>
<tr>
<td>Poppet spring</td>
<td></td>
</tr>
<tr>
<td>Body</td>
<td></td>
</tr>
<tr>
<td>Heater sheath</td>
<td></td>
</tr>
<tr>
<td>Inlet</td>
<td></td>
</tr>
<tr>
<td>Retainer nut</td>
<td></td>
</tr>
<tr>
<td>Flange (bolts not shown)</td>
<td></td>
</tr>
<tr>
<td>Lock nut</td>
<td></td>
</tr>
<tr>
<td>Connector tube</td>
<td></td>
</tr>
<tr>
<td>Side-Mounted</td>
<td></td>
</tr>
<tr>
<td>Outlet</td>
<td></td>
</tr>
<tr>
<td>Heater sheath seal</td>
<td></td>
</tr>
<tr>
<td>Connector tube seal</td>
<td></td>
</tr>
<tr>
<td>Nonwetted lubricant</td>
<td>Hydrocarbon-based</td>
</tr>
<tr>
<td>Range spring</td>
<td>316 SS or zinc-plated steel, depending on configuration</td>
</tr>
<tr>
<td>Connector tube seal</td>
<td>Nitrile</td>
</tr>
<tr>
<td>Body, seat retainer, heater sheath</td>
<td>316 SS</td>
</tr>
<tr>
<td>Heater sheath seal</td>
<td>Alloy 718</td>
</tr>
<tr>
<td>Seat</td>
<td>PEEK</td>
</tr>
<tr>
<td>Diaphragm ②③④</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>Wetted lubricant</td>
<td>PTFE-based</td>
</tr>
</tbody>
</table>

Piston Sensing Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piston seal, body seal</td>
<td>PTFE</td>
</tr>
<tr>
<td>Piston, piston guide</td>
<td>316 SS</td>
</tr>
<tr>
<td>Piston seal retainer</td>
<td>PEEK</td>
</tr>
<tr>
<td>Piston seal spring, body seal spring</td>
<td>Elgiloy</td>
</tr>
</tbody>
</table>

Dimensions

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

Side-Mounted

Base-Mounted
Ordering Information

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

| KEV | F | R | A | 3 | 2 | 2 | A | X | 0 | 0 | 0 | G |

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)

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 (Cv)**
    - 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
    - G = 50 W
    - H = 100 W
    - J = 150 W
    - K = 200 W
    - 75 to 380°F (23 to 193°C), 240 V
    - G = 75 W
    - H = 150 W
    - J = 225 W
    - K = 250 W

### Port Configurations

Outlet and auxiliary ports on the same face.

<table>
<thead>
<tr>
<th>Designator</th>
<th>Configuration</th>
<th>Side Mount View</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><img src="image1" alt="Side Mount Configuration 1" /></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><img src="image2" alt="Side Mount Configuration 2" /></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td><img src="image3" alt="Side Mount Configuration A" /></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td><img src="image4" alt="Side Mount Configuration X" /></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Designator</th>
<th>Configuration</th>
<th>Base Mount View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td><img src="image5" alt="Base Mount Configuration Y" /></td>
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</tr>
<tr>
<td>Z</td>
<td><img src="image6" alt="Base Mount Configuration Z" /></td>
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</tr>
<tr>
<td>A</td>
<td><img src="image7" alt="Base Mount Configuration A" /></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td><img src="image8" alt="Base Mount Configuration X" /></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td><img src="image9" alt="Base Mount Configuration B" /></td>
<td></td>
</tr>
</tbody>
</table>

1. Regulator is rotatable 360° in relation to terminal box.
K Series Pressure-Reducing Regulator Flow Data

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

<table>
<thead>
<tr>
<th>Pressure Control Ranges</th>
<th>Nitrogen Flow, std L/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10 psig (0 to 0.68 bar)</td>
<td>0 to 25 psig (0 to 1.7 bar)</td>
</tr>
</tbody>
</table>

- **Outlet Pressure, psig**
  - 100 psig (6.8 bar)
  - 500 psig (34.4 bar)

- **Inlet Pressure**
  - 500 psig (34.4 bar)

<table>
<thead>
<tr>
<th>Pressure Flow, std ft^3/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, std L/min</th>
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</thead>
<tbody>
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<td>0 to 25 psig (0 to 1.7 bar)</td>
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</tr>
</tbody>
</table>

- **Outlet Pressure, psig**
  - 0 to 25 psig (0 to 1.7 bar)
  - 100 psig (6.8 bar)
  - 500 psig (34.4 bar)

- **Inlet Pressure**
  - 500 psig (34.4 bar)

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<tr>
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<td>0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400</td>
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---

**Swagelok**
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)

Pressure Control Range

- 0 to 10 psig
- 0 to 0.68 bar

Nitrogen Flow, std L/min

Outlet Pressure, psig

Outlet Pressure, bar

Inlet Pressure

500 psig (34.4 bar)

Pressure Control Range

- 0 to 50 psig
- 0 to 3.4 bar

Nitrogen Flow, std L/min

Outlet Pressure, psig

Outlet Pressure, bar

Inlet Pressure

2200 psig (151 bar)

Pressure Control Range

- 0 to 250 psig
- 0 to 17.2 bar

Nitrogen Flow, std L/min

Outlet Pressure, psig

Outlet Pressure, bar

Inlet Pressure

500 psig (34.4 bar)

1000 psig (68.9 bar)

2200 psig (151 bar)

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

Pressure Control Ranges

- 0 to 10 psig
- 0 to 0.68 bar

Nitrogen Flow, std L/min

Outlet Pressure, psig

Outlet Pressure, bar

Inlet Pressure

2200 psig (151 bar)

Pressure Control Ranges

- 0 to 100 psig
- 0 to 6.8 bar

Nitrogen Flow, std L/min

Outlet Pressure, psig

Outlet Pressure, bar

Inlet Pressure

2200 psig (151 bar)

Pressure Control Ranges

- 0 to 250 psig
- 0 to 17.2 bar

Nitrogen Flow, std L/min

Outlet Pressure, psig

Outlet Pressure, bar

Inlet Pressure

500 psig (34.4 bar)

1000 psig (68.9 bar)

2200 psig (151 bar)
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**
- 0 to 250 psig (0 to 17.2 bar)
- 0 to 500 psig (0 to 34.4 bar)
- 0 to 1000 psig (0 to 68.9 bar)

**Flow Data**
- Nitrogen Flow, std ft³/min
- Nitrogen Flow, std L/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**
- 0 to 250 psig (0 to 17.2 bar)
- 0 to 500 psig (0 to 34.4 bar)
- 0 to 1000 psig (0 to 68.9 bar)

**Flow Data**
- Nitrogen Flow, std ft³/min
- Nitrogen Flow, std L/min

---

**Swagelok**
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)

Pressure Control Ranges
- 0 to 500 psig (0 to 34.4 bar)
- 0 to 750 psig (0 to 51.6 bar)

Pressure Control Range
- 10 to 1500 psig (0.68 to 103 bar)

Pressure Control Ranges
- 15 to 2500 psig (1.0 to 172 bar)
- 25 to 3600 psig (1.7 to 248 bar)

Pressure Control Ranges
- 50 to 6000 psig (3.4 to 413 bar)
- 100 to 10 000 psig (6.8 to 689 bar)

Inlet Pressure
- 8000 psig (551 bar)
- 5000 psig (344 bar)
- 1000 psig (68.9 bar)
- 1500 psig (103 bar)

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

Nitrogen Flow, std ft³/min: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
Nitrogen Flow, std L/min: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
Outlet Pressure, psig: 0, 250, 500, 750, 1000, 1250, 1500, 1750, 2000, 2250, 2500
Outlet Pressure, bar: 0, 17, 34, 51, 68, 85, 102, 119, 136, 153, 170

Inlet Pressure
- 8000 psig (551 bar)
- 9000 psig (620 bar)

Swagelok
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)*

**Pressure Control Ranges**

<table>
<thead>
<tr>
<th>Nitrogen Flow, std ft³/min</th>
<th>Pressure Control Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 to 500 psig (0 to 34.4 bar)</td>
</tr>
<tr>
<td></td>
<td>10 to 1500 psig (0.68 to 103 bar)</td>
</tr>
</tbody>
</table>

**Outlet Pressure, psig**

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

**Outlet Pressure, bar**

- 6000 bar
- 344 bar
- 103 bar

---

**KHR Series**

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

**Pressure Control Ranges**

<table>
<thead>
<tr>
<th>Water Flow, U.S. gal/min</th>
<th>Pressure Control Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 to 500 psig (0 to 34.4 bar)</td>
</tr>
<tr>
<td></td>
<td>0 to 750 psig (0 to 51.6 bar)</td>
</tr>
</tbody>
</table>

**Outlet Pressure, psig**

- 1000 psig (68.9 bar)
- 5000 psig (344 bar)
- 8000 psig (551 bar)

**Outlet Pressure, bar**

- 68.9 bar
- 344 bar
- 551 bar

---

**Nitrogen Flow, std ft³/min**

- 3 ft³/min

**Nitrogen Flow, std L/min**

- 8.5 L/min

---

**Outlet Pressure, psig**

- 9000 psig (620 bar)
- 5000 psig (344 bar)
- 3500 psig (241 bar)

**Outlet Pressure, bar**

- 620 bar
- 344 bar
- 241 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)**

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, std L/min</th>
<th>Outlet Pressure, psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1000 psig (68.9 bar)</td>
<td>0 to 1000 psig (68.9 bar)</td>
<td>0 to 1000 psig (68.9 bar)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, std L/min</th>
<th>Outlet Pressure, psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 2000 psig (137 bar)</td>
<td>0 to 2000 psig (137 bar)</td>
<td>0 to 2000 psig (137 bar)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Pressure Control Ranges</th>
<th>Nitrogen Flow, std L/min</th>
<th>Outlet Pressure, psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1000 psig (68.9 bar)</td>
<td>0 to 1500 psig (103 bar)</td>
<td>0 to 2000 psig (137 bar)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Pressure Control Ranges</th>
<th>Nitrogen Flow, std L/min</th>
<th>Outlet Pressure, psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 3000 psig (206 bar)</td>
<td>0 to 3600 psig (248 bar)</td>
<td>0 to 5000 psig (344 bar)</td>
</tr>
</tbody>
</table>
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 KBP Series Flow Coefficient 0.20](#)

- **Pressure Control Range**: 0 to 500 psig (0 to 34.4 bar)
- **Inlet Pressure, psig**: 0 to 250 psig (0 to 17.2 bar)
- **Inlet Pressure, bar**: 0 to 100 psig (0 to 6.8 bar)
- **Inlet Pressure, psig**: 0 to 100 psig (0 to 6.8 bar)
- **Inlet Pressure, bar**: 0 to 50 psig (0 to 3.4 bar)
- **Nitrogen Flow, std ft\(^3\)/min**: 0 to 250 psig (0 to 17.2 bar)
- **Nitrogen Flow, std L/min**: 0 to 100 psig (0 to 6.8 bar)

**KFB Series**
*Flow Coefficient 1.0*

![Graph KFB Series Flow Coefficient 1.0](#)

- **Pressure Control Range**: 0 to 500 psig (0 to 34.4 bar)
- **Inlet Pressure, psig**: 0 to 50 psig (0 to 3.4 bar)
- **Inlet Pressure, bar**: 0 to 100 psig (0 to 6.8 bar)
- **Inlet Pressure, psig**: 0 to 100 psig (0 to 6.8 bar)
- **Inlet Pressure, bar**: 0 to 25 psig (0 to 1.7 bar)
- **Nitrogen Flow, std ft\(^3\)/min**: 0 to 50 psig (0 to 3.4 bar)
- **Nitrogen Flow, std L/min**: 0 to 100 psig (0 to 6.8 bar)

**KCB Series**
*Flow Coefficient 0.20*

![Graph KCB Series Flow Coefficient 0.20](#)

- **Pressure Control Range**: 0 to 375 psig (0 to 25.8 bar)
- **Inlet Pressure, psig**: 0 to 250 psig (0 to 17.2 bar)
- **Inlet Pressure, bar**: 0 to 100 psig (0 to 6.8 bar)
- **Inlet Pressure, psig**: 0 to 100 psig (0 to 6.8 bar)
- **Inlet Pressure, bar**: 0 to 50 psig (0 to 3.4 bar)
- **Nitrogen Flow, std ft\(^3\)/min**: 0 to 250 psig (0 to 17.2 bar)
- **Nitrogen Flow, std L/min**: 0 to 100 psig (0 to 6.8 bar)
K Series Back-Pressure Regulator Flow Data

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

**K Series**

**Flow Coefficient 0.06**

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

<table>
<thead>
<tr>
<th>Nitrogen Flow, std ft³/min</th>
<th>Inlet Pressure, psig</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>500</td>
</tr>
<tr>
<td>5</td>
<td>1000</td>
</tr>
<tr>
<td>10</td>
<td>1500</td>
</tr>
<tr>
<td>15</td>
<td>2000</td>
</tr>
<tr>
<td>20</td>
<td>2500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nitrogen Flow, std L/min</th>
<th>Inlet Pressure, bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>60</td>
</tr>
<tr>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>15</td>
<td>120</td>
</tr>
<tr>
<td>20</td>
<td>150</td>
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</tbody>
</table>

**Flow Coefficient 0.20**

Pressure Control Range
0 to 3000 psig
(0 to 206 bar)

<table>
<thead>
<tr>
<th>Nitrogen Flow, std ft³/min</th>
<th>Inlet Pressure, psig</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>500</td>
</tr>
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<th>Nitrogen Flow, std L/min</th>
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<tr>
<td>20</td>
<td>150</td>
</tr>
</tbody>
</table>

Nitrogen Flow, std ft³/min

Inlet Pressure, psig

Inlet Pressure, bar
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**

<table>
<thead>
<tr>
<th>Nitrogen Flow, std ft³/min</th>
<th>Pressure Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 to 1500 psig</td>
</tr>
<tr>
<td></td>
<td>(0.68 to 103 bar)</td>
</tr>
<tr>
<td></td>
<td>0 to 750 psig</td>
</tr>
<tr>
<td></td>
<td>(0 to 51.6 bar)</td>
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<tbody>
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<td>25 to 3600 psig</td>
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<tr>
<td></td>
<td>(1.7 to 248 bar)</td>
</tr>
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<tr>
<td></td>
<td>(6.8 to 689 bar)</td>
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</table>
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>
</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>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>
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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>G</td>
</tr>
</tbody>
</table>

MPC Port Configurations

Pressure Reducing

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

Back Pressure

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

* Available only on select KPR and KCY series regulators. Contact your authorized Swagelok representative.

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

Refer to Swagelok Integral-Bonnet Needle Valves catalog, MS-01-164, for additional 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.

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

Refer to Swagelok Pressure Gauges, Industrial and Process catalog, MS-02-170, for additional 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.

<table>
<thead>
<tr>
<th>Gauge Scale primary unit</th>
<th>Gauge Designator</th>
<th>Valve Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>psig (bar) (North America only)</td>
<td>Inlet and Outlet</td>
<td>Relief Only</td>
</tr>
<tr>
<td>psig (bar)</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>psig (kPa)</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>bar (psig)</td>
<td>5</td>
<td>E</td>
</tr>
<tr>
<td>MPa</td>
<td>2</td>
<td>B</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.

Refer to Swagelok Integral-Bonnet Needle Valves catalog, MS-01-164, for additional information.
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>
</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

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.

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>

Flow Data

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

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)

Refer to Swagelok *Hose and Flexible Tubing* catalog, MS-01-180, for additional 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.

**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.

Refer to Swagelok Catalog, MS-01-180, for additional information.
### 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, KCY, KPB, 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.

**Maintenance Instructions**

Maintenance instructions for all Swagelok regulators are available from your Swagelok website.

**Maintenance Tools**

Specially designed tools and tool kits are available to assist in the service and repair of Swagelok regulators. Contact your authorized Swagelok representative for more information.

### Ordering Information

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

<table>
<thead>
<tr>
<th>Regulator Series</th>
<th>Body Material, Cleaning</th>
<th>Pressure Control Range</th>
<th>Port Configuration</th>
<th>Ports (Filter Size)</th>
<th>Seat, Seal Material</th>
<th>Flow Coefficient ($C_v$)</th>
<th>Sensing Mechanism, Vent</th>
<th>Handle, Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KPR Series</strong></td>
<td>1 = 316 SS and brass</td>
<td><strong>KPR and KBP Series</strong></td>
<td>0 = Not applicable</td>
<td>1/4 in. female NPT</td>
<td><strong>KPR Series</strong></td>
<td>1 = 0.02</td>
<td><strong>KPR Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td></td>
<td>4 = 316 SS and brass, SC-11 cleaned</td>
<td>D = 0 to 10 psig (0 to 0.68 bar) and 0 to 25 psig (0 to 1.7 bar)</td>
<td>0 = Not applicable</td>
<td>1 = PCTFE</td>
<td><strong>KPR Series</strong></td>
<td>2 = 0.06</td>
<td><strong>KPR Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F = 0 to 50 psig (0 to 3.4 bar) and 0 to 100 psig (0 to 6.8 bar)</td>
<td>1/8 in. female NPT</td>
<td>2 = PEEK</td>
<td><strong>KBP Series</strong></td>
<td>5 = 0.20</td>
<td><strong>KBP Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>J = 0 to 250 psig (0 to 17.2 bar) and 0 to 500 psig (0 to 34.4 bar)</td>
<td>0 = All other end connections</td>
<td><strong>KBP Series</strong></td>
<td><strong>KCP Series</strong></td>
<td>7 = 0.50</td>
<td><strong>KCP Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td><strong>KCP Series</strong></td>
<td></td>
<td><strong>KBP Series</strong></td>
<td>0 = Not applicable</td>
<td>316 SS piston</td>
<td><strong>KBP Series</strong></td>
<td>6 = Not available</td>
<td><strong>KBP Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td><strong>KBP Series</strong></td>
<td></td>
<td><strong>KCP Series</strong></td>
<td>0 = Not applicable</td>
<td>316 SS piston</td>
<td><strong>KBP Series</strong></td>
<td>7 = Not available</td>
<td><strong>KBP Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td><strong>KFB Series</strong></td>
<td></td>
<td><strong>KCB Series</strong></td>
<td>0 = Not applicable</td>
<td>316 SS piston</td>
<td><strong>KBP Series</strong></td>
<td>8 = Not available</td>
<td><strong>KBP Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td><strong>KCY Series</strong></td>
<td></td>
<td><strong>KCY Series</strong></td>
<td>0 = Not applicable</td>
<td>316 SS piston</td>
<td><strong>KBP Series</strong></td>
<td>9 = Not available</td>
<td><strong>KBP Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td><strong>KPB Series</strong></td>
<td></td>
<td><strong>KPB Series</strong></td>
<td>0 = Not applicable</td>
<td>316 SS piston</td>
<td><strong>KBP Series</strong></td>
<td>10 = Not available</td>
<td><strong>KBP Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td><strong>KHB Series</strong></td>
<td></td>
<td><strong>KHB Series</strong></td>
<td>0 = Not applicable</td>
<td>316 SS piston</td>
<td><strong>KBP Series</strong></td>
<td>11 = Not available</td>
<td><strong>KBP Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td><strong>KSV Series</strong></td>
<td></td>
<td><strong>KSV Series</strong></td>
<td>0 = Not applicable</td>
<td>316 SS piston</td>
<td><strong>KBP Series</strong></td>
<td>12 = Not available</td>
<td><strong>KBP Series</strong></td>
<td>0 = Not applicable</td>
</tr>
<tr>
<td><strong>KEV Series</strong></td>
<td></td>
<td><strong>KEV Series</strong></td>
<td>0 = Not applicable</td>
<td>316 SS piston</td>
<td><strong>KBP Series</strong></td>
<td>13 = Not available</td>
<td><strong>KBP Series</strong></td>
<td>0 = Not applicable</td>
</tr>
</tbody>
</table>

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
Refer to Swagelok filters, see the *Filters—FW, F, and TF Series* catalog, MS-01-92, for additional information.

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
Refer to Swagelok industrial pressure transducers, see the *Industrial Pressure Transducers* catalog, MS-02-225, for additional information.

⚠️ 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.
Introduction
Since 1947, Swagelok has designed, developed, and manufactured high-quality, general-purpose and specialty fluid system products to meet the evolving needs of global industries. Our focus is on understanding our customers’ needs, finding timely solutions, and adding value with our products and services.

We are pleased to provide this global edition of the book-bound Swagelok Product Catalog, which compiles more than 100 separate product catalogs, technical bulletins, and reference documents into one convenient, easy-to-use volume. Each product catalog is up to date at the time of printing, with its revision number shown on the last page of the individual catalog. Subsequent revisions will supersede the printed version and will be posted on the Swagelok website and in the Swagelok electronic Desktop Technical Reference (eDTR) tool.

For more information, visit your Swagelok website or contact your authorized Swagelok sales and service representative.

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

Safe Product Selection
When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

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