Pressure Regulators
RHPS Series

- Pressure-reducing models
- Back-pressure models
- Spring-, dome-, and air-loaded
- 1/4 to 4 in. end connections
- Working pressures up to 10,150 psig (700 bar)
- Temperatures from –49 to 176°F (–45 to 80°C)
Contents
Features, 4
Types of Regulators, 5
Terminology, 5
Components, 6
Testing, 7
Cleaning and Packaging, 7

Pressure-Reducing Regulators
Spring-Loaded—RS Series, 8

RS Series Maintenance Kits, 42

- Compact, General-Purpose RS(H)2 Series, 10
- General-Purpose RS(H)4, 6, 8 Series, 14
- General-Purpose RS(H)10, 15, 20 Series, 22
- High-Sensitivity LRS(H)4 Series, 29
- High-Sensitivity LPRS4, 6, 8 Series, 33
- High-Sensitivity LPRS10, 15 Series, 38

Pressure-Reducing Regulators
Dome-Loaded—RD Series, 43

RD Series Maintenance Kits, 94

- Compact, General-Purpose RD2 Series, 46
- General-Purpose RD(H)6, 8 Series, 50
- Differential RD(H)6DP Series, 55
- Integral Pilot-Operated RD(H)10, 15 Series, 59
- Integral Pilot-Operated RD(H)20, 25 Series, 69
<table>
<thead>
<tr>
<th>Pressure-Reducing Regulators</th>
<th>Back-Pressure Regulators</th>
<th>Back-Pressure Regulators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dome-Loaded—RD Series</strong></td>
<td><strong>Spring-Loaded—BS Series, 95</strong></td>
<td><strong>Dome-Loaded—BD Series</strong></td>
</tr>
<tr>
<td><img src="image1" alt="Integral Pilot-Operated" /></td>
<td><strong>BS Series Maintenance Kits, 116</strong></td>
<td>Contact your authorized Swagelok sales and service center for information about dome-loaded, back-pressure regulators.</td>
</tr>
<tr>
<td>RD(H)30, 40 Series, 77</td>
<td>Compact,</td>
<td></td>
</tr>
<tr>
<td><img src="image2" alt="Integral Pilot-Operated" /></td>
<td>General-Purpose</td>
<td></td>
</tr>
<tr>
<td>High-Sensitivity LPRD20, 25, 30, 40 Series, 87</td>
<td>BS(H)2 Series, 97</td>
<td></td>
</tr>
<tr>
<td><img src="image3" alt="Air-Loaded" /></td>
<td>General-Purpose</td>
<td></td>
</tr>
<tr>
<td>RA4, 6, 8 Series, 89</td>
<td>BS(H)4, 6, 8 Series, 101</td>
<td></td>
</tr>
<tr>
<td><img src="image4" alt="General-Purpose" /></td>
<td>General-Purpose</td>
<td></td>
</tr>
<tr>
<td>BS(H)10, 15 Series, 106</td>
<td>BS(H)10, 15 Series, 106</td>
<td></td>
</tr>
<tr>
<td><img src="image5" alt="High-Sensitivity" /></td>
<td>High-Sensitivity LBS4 Series, 112</td>
<td></td>
</tr>
</tbody>
</table>
**Features**

**Regulator Adjusting Screw**
Fine pitched threads provide improved adjustability and resolution when setting or adjusting pressure.

**Set-Pressure Spring**
- Provides pressure control across a wide range of flow rates
- Long spring improves droop performance.

**Diaphragm Sensing Mechanism**
- Typically used in low outlet pressure applications
- Provides greater accuracy in sensing changes in outlet pressure
- Available in PTFE and a variety of elastomers
- Designed with a short stroke to maximize cycle life.

**Diaphragm Support Plate**
Promotes diaphragm life.

**Seal Materials**
Available in a variety of materials for enhanced chemical compatibility in a wide range of applications.

**Body Material**
316L SS for improved corrosion resistance.

**Piston Sensing Mechanism**
- Typically used to regulate higher pressures than a diaphragm sensing mechanism
- More resistant to damage caused by pressure spikes
- Designed with a short stroke to maximize cycle life.

**Threaded Vent**
Allows monitoring of the diaphragm or piston sensing mechanism.

⚠️ **WARNING:** Threaded-vent regulators can release system fluid to atmosphere. Position the threaded vent connection away from operating personnel.

**Bottom Spring Guide**
- Engages diaphragm to distribute forces evenly
- Protects diaphragm from premature failure.

**Outlet**

**Seat Seal Materials**
Available in PCTFE, PEEK, and a variety of elastomers.

**Balanced Poppet Design**
Reduces supply-pressure effect and lockup.

**Body Plug**
Allows for easy maintenance and more up-time.
Types of Regulators
There are two types of RHPS series pressure regulators
- **Pressure-reducing** regulators with spring or dome loading
- **Back-pressure** regulators with spring or dome loading

How a Pressure Regulator Works
A pressure regulator has a sensing element (piston or diaphragm) which, on one side, is subjected to a load force ($F_S$) created by a spring (as shown below) or a gas pressure. On the other side, the sensing element is subject to the force ($F$) of the system fluid.

![Pressure Reducing Regulator Diagram](image1)

The function of a pressure-reducing regulator is to reduce a pressure and to keep this pressure as constant as possible while the inlet pressure and the flow may vary. This is accomplished by the fluid force ($F$) being equal to or slightly lower than load force ($F_S$) causing the poppet to open.

![Back Pressure Regulator Diagram](image2)

The function of a back-pressure regulator is to keep inlet pressure below a set pressure. This means the regulator can either open in case of excess pressure or close when the pressure drops below a desired pressure. This is accomplished by the fluid force ($F$) being equal to or slightly lower than load force ($F_S$) causing the poppet to close.

Terminology

- **Accumulation**—an increase in inlet pressure caused by an increase in flow rate to a back-pressure regulator.
- **Creep**—an increase in outlet pressure typically caused by regulator seat leakage.
- **Dependency**—see supply pressure effect (SPE).
- **Droop**—a decrease in outlet pressure caused by an increase in flow rate to a pressure-reducing regulator.
- **Lockup**—an increase in outlet pressure that occurs as the flow rate is decreased to zero.
- **Self-venting**—a feature that reduces outlet pressure in a pressure-reducing regulator when the regulator set point is decreased and there is no flow through the regulator.
- **Sensitivity**—the degree to which the regulator responds to force balance changes.
- **Set pressure**—the desired outlet pressure of a pressure-reducing regulator, normally stated at a no-flow condition.

**Supply pressure effect (SPE)**—the effect on the set pressure of a pressure-reducing regulator as a result of a change in inlet pressure, normally experienced as an increase in outlet pressure due to a decrease in inlet pressure. Also known as Dependency.

**Threaded vent**—a connection that allows monitoring of the diaphragm or piston sensing mechanism.

**Gauge Connection Configuration Symbols**
- $G_i$ = Inlet gauge
- $G_o$ = Outlet gauge

**Gauge Connection Configurations—Pressure-Reducing Regulators**

<table>
<thead>
<tr>
<th>Standard</th>
<th>GN2</th>
<th>GN4</th>
<th>GN5</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3" alt="Configuration" /></td>
<td><img src="image4" alt="Configuration" /></td>
<td><img src="image5" alt="Configuration" /></td>
<td><img src="image6" alt="Configuration" /></td>
</tr>
</tbody>
</table>
**Components**

Every RHPS series pressure regulator has three common design components:
- Loading mechanism (spring, dome, or combination spring and dome)
- Sensing mechanism (diaphragm or piston)
- Controlling mechanism (poppet)

**Loading Mechanism**

The loading mechanism is the component of the regulator that balances the force or pressure.

**Spring-Loaded**

In a spring-loaded regulator, a coil spring is used to generate a load ($F_S$) against the sensing mechanism. The amount of spring force or load can be adjusted by turning the handle or adjusting screw of the regulator.

**Dome-Loaded**

In a dome-loaded regulator, a gas is fed into the dome chamber above the sensing mechanism at a pressure equal to or slightly above the required outlet pressure. This volume of gas is used like a spring. The dome pressure ($F_d$) is typically supplied by a second regulator called a pilot regulator.

**Combination Spring- and Dome-Loaded**

The spring- and dome-loaded mechanisms can be used in combination with one another. The resulting effect provides the function of a differential pressure regulator. This regulator is designed to control pressure which is the sum of a reference pressure (provided by the dome) and a bias pressure (provided by the spring). See RD(H)6DP series on page 55 for details.
Components

Sensing Mechanisms

The sensing mechanism is the component separating the spring/dome force and the fluid force. It senses changes in pressure and allows the regulator to react and to try to restore the original set pressure.

- **Diaphragm Sensing**
  
  The diaphragm is a large, flat piece of material usually made of an elastomer, PTFE, or metal depending on the application. A diaphragm is normally used for low control-pressure applications in spring-loaded regulators and in all dome-loaded regulators.

- **Piston Sensing**
  
  A piston is a cylindrical metal component which is generally used to regulate higher control pressures than a spring-loaded regulator with a diaphragm. They are also more resistant to damage caused by pressure spikes.

Controlling Mechanisms

The controlling mechanism, also known as a poppet, acts to reduce a high inlet pressure to a lower outlet pressure. There are two designs used in RHPS regulators.

- **Balanced Poppet**
  
  In a balanced poppet design, the area on which the inlet pressure acts is reduced due to the orifice through the poppet and balancing O-ring. The advantages of this design are a reduced seat load, less sensitivity to SPE, and the ability to have a larger seat for more flow.

- **Unbalanced Poppet**
  
  In an unbalanced poppet design, the inlet pressure provides the majority of the shutoff force. Unbalanced poppets are generally used in small regulators or larger regulators in low-pressure applications.

Seat Design

The poppet within the RHPS series regulator can have a hard or soft seat seal depending on the pressure requirements of the application.

- **Soft Seat Seal**
  
  A soft seat seal is designed to regulate pressures up to 1015 psig (70.0 bar). The seat seal materials are generally elastomeric, and include fluorocarbon FKM, perfluorocarbon FFKM, nitrile, and EPDM.

- **Hard Seat Seal**
  
  A hard seat seal is designed to regulate pressures up to 10 150 psig (700 bar). The seat seal materials are PCTFE for pressures up to 5800 psig (400 bar) and PEEK for pressures up to 10 150 psig (700 bar).

Testing

Every RHPS series regulator is factory tested with nitrogen or air. Shell testing is performed to a requirement of no detectable leakage with a liquid leak detector.

Cleaning and Packaging

Every RHPS series 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 C is available.

Oxygen Service Hazards


⚠️ RHPS series 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.

⚠️ WARNING: Self-venting and threaded-vent regulators can release system fluid to atmosphere. Position the self-vent hole or the threaded vent connection away from operating personnel.
Pressure-Reducing, Spring-Loaded Regulators—RS Series

The RS series pressure-reducing regulators are suitable for most gases and liquids. The RS series regulators feature various poppet designs, a choice of sensing types (diaphragm or piston), and seat and seal materials to accommodate a variety of pressure, temperature, and flow conditions. The RS series regulators are available in sizes from 1/4 to 2 in. with a choice of threaded or flange end connections.

Features

- Spring-loaded pressure control
- Diaphragm or piston sensing mechanisms
- Red knob handle or screw adjustment
- 316L stainless steel materials of construction for corrosion resistance
- Maximum inlet pressure ratings: 232 to 10 150 psig (16.0 to 700 bar)
- Pressure control ranges: Up to 0 to 10 150 psig (0 to 700 bar)

Pressure-Temperature Ratings

<table>
<thead>
<tr>
<th>Seal Material</th>
<th>Temperature Range °F (°C)</th>
<th>Material Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorocarbon FKM</td>
<td>-49 to -4 (–45 to –40)</td>
<td>–</td>
</tr>
<tr>
<td>Standard Nitrile</td>
<td>95 (35)</td>
<td>–</td>
</tr>
<tr>
<td>Low-Temp Nitrile</td>
<td>149 (65)</td>
<td>10 150 (700)</td>
</tr>
<tr>
<td>EPDM</td>
<td>176 (80)</td>
<td>1812 (125)</td>
</tr>
</tbody>
</table>

To order gauge ports without factory plugs installed, contact your authorized Swagelok sales and service center.

Technical Data—Performance

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Flow Coefficient (Cv)</th>
<th>Sensing Type</th>
<th>Flow Data on Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS2</td>
<td>5 800 (400)</td>
<td>5 075 (350)</td>
<td>0.05</td>
<td>Piston</td>
<td></td>
</tr>
<tr>
<td>RSH2</td>
<td>10 150 (700)</td>
<td>10 150 (700)</td>
<td>1.84</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RS4</td>
<td>1 015 (70.0)</td>
<td>406 (28.0) diaphragm 5 800 (400) piston</td>
<td>1.95</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RSH4</td>
<td>5 800 (400)</td>
<td>203 (14.0) diaphragm 5 800 (400) piston</td>
<td>2.07</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RS6</td>
<td>1 015 (70.0)</td>
<td>203 (14.0) diaphragm 5 800 (400) piston</td>
<td>2.07</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RSH6</td>
<td>5 800 (400)</td>
<td>203 (14.0) diaphragm 5 800 (400) piston</td>
<td>2.07</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RS8</td>
<td>1 015 (70.0)</td>
<td>203 (14.0) diaphragm 5 800 (400) piston</td>
<td>2.07</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RSH8</td>
<td>5 800 (400)</td>
<td>203 (14.0) diaphragm 5 800 (400) piston</td>
<td>2.07</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RS10</td>
<td>1 015 (70.0)</td>
<td>290 (20.0) diaphragm 3 625 (250) piston</td>
<td>3.79</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RSH10</td>
<td>5 800 (400)</td>
<td>290 (20.0) diaphragm 3 625 (250) piston</td>
<td>3.79</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RS15</td>
<td>1 015 (70.0)</td>
<td>290 (20.0) diaphragm 3 625 (250) piston</td>
<td>7.30</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RSH15</td>
<td>5 800 (400)</td>
<td>290 (20.0) diaphragm 3 625 (250) piston</td>
<td>7.30</td>
<td>Diaphragm or piston</td>
<td></td>
</tr>
<tr>
<td>RS20</td>
<td>1 015 (70.0)</td>
<td>290 (20.0)</td>
<td>13</td>
<td>Diaphragm</td>
<td></td>
</tr>
<tr>
<td>RSH20</td>
<td>5 800 (400)</td>
<td>290 (20.0)</td>
<td>13</td>
<td>Diaphragm</td>
<td></td>
</tr>
<tr>
<td>LRS4</td>
<td>507 (35.0)</td>
<td>290 (20.0)</td>
<td>0.73</td>
<td>Diaphragm</td>
<td></td>
</tr>
<tr>
<td>LRSH4</td>
<td>5 800 (400)</td>
<td>290 (20.0)</td>
<td>0.10</td>
<td>Diaphragm</td>
<td></td>
</tr>
<tr>
<td>LPRS4</td>
<td>232 (16.0)</td>
<td>43 (3.0)</td>
<td>1.84</td>
<td>Diaphragm</td>
<td></td>
</tr>
<tr>
<td>LPRS6</td>
<td>232 (16.0)</td>
<td>43 (3.0)</td>
<td>1.84</td>
<td>Diaphragm</td>
<td></td>
</tr>
<tr>
<td>LPRS8</td>
<td>232 (16.0)</td>
<td>43 (3.0)</td>
<td>1.84</td>
<td>Diaphragm</td>
<td></td>
</tr>
<tr>
<td>LPRS10</td>
<td>232 (16.0)</td>
<td>43 (3.0)</td>
<td>1.84</td>
<td>Diaphragm</td>
<td></td>
</tr>
<tr>
<td>LPRS15</td>
<td>232 (16.0)</td>
<td>43 (3.0)</td>
<td>1.84</td>
<td>Diaphragm</td>
<td></td>
</tr>
</tbody>
</table>

① Regulator pressure rating may be limited by end connection type.
Pressure-Reducing, Spring-Loaded Regulators—RS Series

RS Series Regulator with Diaphragm Sensing and Standard Knob Handle

RSH Series Regulator with Piston Sensing and Antitamper Option

Soft seat design for low-pressure applications

Hard seat design for high-pressure applications

Inlet

Outlet

Technical Data—Design

<table>
<thead>
<tr>
<th>Series</th>
<th>Seat Diameter In. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge Connection</th>
<th>Weight (Without Flanges) lb (kg)</th>
<th>More Information on Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS2</td>
<td>0.087 (2.2)</td>
<td>1/4 in. NPT</td>
<td>1/4 in. NPT</td>
<td>3.3 (1.5)</td>
<td>10</td>
</tr>
<tr>
<td>RS4</td>
<td>0.39 (10.0)</td>
<td>1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>7.7 (3.5)</td>
<td>14</td>
</tr>
<tr>
<td>RS6</td>
<td>0.39 (10.0)</td>
<td>3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>9.9 (4.5)</td>
<td>14</td>
</tr>
<tr>
<td>RS8</td>
<td>0.39 (10.0)</td>
<td>1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>9.9 (4.5)</td>
<td>14</td>
</tr>
<tr>
<td>RSH8</td>
<td>0.39 (10.0)</td>
<td>1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>9.9 (4.5)</td>
<td>14</td>
</tr>
<tr>
<td>RS10</td>
<td>0.55 (14.0)</td>
<td>1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT or ISO/BSP parallel thread</td>
<td>16.5 (7.5)</td>
<td>22</td>
</tr>
<tr>
<td>RSH10</td>
<td>0.53 (13.5)</td>
<td>1 1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT or ISO/BSP parallel thread</td>
<td>22.0 (10.0)</td>
<td>22</td>
</tr>
<tr>
<td>RS15</td>
<td>0.75 (19.0)</td>
<td>1 1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT or ISO/BSP parallel thread</td>
<td>22.0 (10.0)</td>
<td>22</td>
</tr>
<tr>
<td>RSH15</td>
<td>0.75 (19.0)</td>
<td>1 1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT or ISO/BSP parallel thread</td>
<td>22.0 (10.0)</td>
<td>22</td>
</tr>
<tr>
<td>RS20</td>
<td>0.98 (25.0)</td>
<td>2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>ISO/BSP parallel thread</td>
<td>39.6 (18.0)</td>
<td>22</td>
</tr>
<tr>
<td>LRS4</td>
<td>0.23 (6.0)</td>
<td>1/2 in. NPT</td>
<td>1/4 in. NPT</td>
<td>5.7 (2.6)</td>
<td>29</td>
</tr>
<tr>
<td>LRSH4</td>
<td>0.087 (2.2)</td>
<td>1/2 in. NPT</td>
<td>1/4 in. NPT</td>
<td>5.7 (2.6)</td>
<td>29</td>
</tr>
<tr>
<td>LPR54</td>
<td>0.39 (10.0)</td>
<td>1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>11.0 (5.0)</td>
<td>33</td>
</tr>
<tr>
<td>LPR56</td>
<td>0.39 (10.0)</td>
<td>3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>12.1 (5.5)</td>
<td>33</td>
</tr>
<tr>
<td>LPR58</td>
<td>0.39 (10.0)</td>
<td>1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>12.1 (5.5)</td>
<td>33</td>
</tr>
<tr>
<td>LPR510</td>
<td>0.55 (14.0)</td>
<td>1 in. NPT, ISO/BSP parallel thread, EN or ASME flange</td>
<td>1/4 in. NPT or ISO/BSP parallel thread</td>
<td>17.6 (8.0)</td>
<td>38</td>
</tr>
<tr>
<td>LPR515</td>
<td>0.75 (19.0)</td>
<td>1 1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT or ISO/BSP parallel thread</td>
<td>22.0 (10.0)</td>
<td>38</td>
</tr>
</tbody>
</table>
Compact, General-Purpose, Spring-Loaded Pressure-Reducing Regulators—RS(H)2 Series

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

**Options**
- No filter—for liquid applications
- NACE MR0175/ISO 15156-compliant models (nonventing and no-filter models only)
- Nonventing
- Special cleaning to ASTM G93 Level C
- Panel mounting kit sold separately—no disassembly required

**Technical Data**

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure</th>
<th>Maximum Outlet Control Pressure</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient ($C_v$)</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge / Vent Connections</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS2</td>
<td>5 800 (400)</td>
<td>5 075 (350)</td>
<td>Piston</td>
<td>–40 to 176 (–40 to 80)</td>
<td>0.05</td>
<td>0.087 (2.2)</td>
<td>1/4 in. NPT</td>
<td>Gauge: 1/4 in. NPT Vent: 1/8 in. NPT</td>
<td>3.3 (1.5)</td>
</tr>
<tr>
<td>RSH2</td>
<td>10 150 (700)</td>
<td>10 150 (700)</td>
<td></td>
<td>–4 to 176 (–20 to 80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See Pressure-Temperature Ratings, page 8, for ratings. See Flow Data, pages 11 to 12.

**Materials of Construction**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knob assembly with adjusting screw, nuts, washer Red ABS with 431 SS</td>
</tr>
<tr>
<td>2</td>
<td>Spring housing cover 431 SS / A276</td>
</tr>
<tr>
<td>3</td>
<td>Spring housing 316L SS / A479</td>
</tr>
<tr>
<td>4</td>
<td>C-ring A2</td>
</tr>
<tr>
<td>5</td>
<td>Spring guide 316L SS / A479</td>
</tr>
<tr>
<td>6</td>
<td>Set spring 50CRV4</td>
</tr>
<tr>
<td>7</td>
<td>Bottom spring guide 316L SS / A479</td>
</tr>
<tr>
<td>8</td>
<td>Relief seat PEEK or PCTFE</td>
</tr>
<tr>
<td>9</td>
<td>O-rings EPDM, FKM, FFKM, or nitrile</td>
</tr>
<tr>
<td>10</td>
<td>Poppet housing 316L SS / A479</td>
</tr>
<tr>
<td>11</td>
<td>Seat PEEK or PCTFE</td>
</tr>
<tr>
<td>12</td>
<td>Poppet S17400 SS or 431 SS</td>
</tr>
<tr>
<td>13</td>
<td>Seat retainer 316L SS / A479</td>
</tr>
<tr>
<td>14</td>
<td>Piston plate 316L SS / A479</td>
</tr>
<tr>
<td>15</td>
<td>Filter 316L SS</td>
</tr>
<tr>
<td>16</td>
<td>Plug 316L SS / A479</td>
</tr>
<tr>
<td>17</td>
<td>Piston 316L SS / A479</td>
</tr>
<tr>
<td>18</td>
<td>Poppet spring 302 SS / A313</td>
</tr>
<tr>
<td>19</td>
<td>Body 316L SS / A479</td>
</tr>
</tbody>
</table>

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in italics.

Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RS2 Series

**Flow Coefficient: 0.05**

**Maximum Inlet Pressure: 5800 psig (400 bar)**

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

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 362 psig (0 to 25.0 bar)</td>
<td>![Graph 1]</td>
</tr>
<tr>
<td>0 to 145 psig (0 to 10.0 bar)</td>
<td>![Graph 1]</td>
</tr>
</tbody>
</table>

RS2 Series

**Flow Coefficient: 0.05**

**Maximum Inlet Pressure: 5800 psig (400 bar)**

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

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5075 psig (0 to 350 bar)</td>
<td>![Graph 2]</td>
</tr>
<tr>
<td>0 to 2537 psig (0 to 175 bar)</td>
<td>![Graph 2]</td>
</tr>
<tr>
<td>0 to 1450 psig (0 to 100 bar)</td>
<td>![Graph 2]</td>
</tr>
</tbody>
</table>
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RSH2 Series
Flow Coefficient: 0.05
Maximum Inlet Pressure: 10 150 psig (700 bar)
Outlet Pressure Control Range: 0 to 10 150 psig (0 to 700 bar)

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

Build an RS2 or RSH2 series regulator ordering number by combining the designators in the sequence shown below.

```
1  2  3  4  5  6  7  8
RS  N2 - 02 - 1 - V  V  K - LNV
```

1 **Series**
   - **RS**: 5800 psig (400 bar) maximum inlet pressure
   - **RSH**: 10 150 psig (700 bar) maximum inlet pressure

2 **Inlet / Outlet**
   - **N2**: 1/4 in. female NPT

3 **Body Material**
   - **02**: 316L SS

4 **Pressure Control Range**
   - **RS** and **RSH** series
     - **1**: 0 to 145 psig (0 to 10.0 bar)
     - **2**: 0 to 362 psig (0 to 25.0 bar)
     - **3**: 0 to 1450 psig (0 to 100 bar)
     - **4**: 0 to 2537 psig (0 to 175 bar)
     - **5**: 0 to 5075 psig (0 to 350 bar)
   - **RS series only**
     - **6**: 0 to 10 150 psig (0 to 700 bar)

5 **Seal Material**
   - **RS** and **RSH** series
     - **V**: Fluorocarbon FKM
     - **N**: Nitrile
     - **E**: EPDM
     - **F**: FFKM
   - **RS series only**
     - **L**: Low temperature Nitrile

6 **Piston Seal Material**
   - **RS** and **RSH** series
     - **V**: Fluorocarbon FKM
     - **N**: Nitrile
     - **E**: EPDM
     - **F**: FFKM
   - **RS series only**
     - **L**: Low temperature Nitrile

7 **Seat Seal Material**
   - **RS** series
     - **K**: PCTFE
     - **P**: PEEK
   - **RSH** series
     - **P**: PEEK

8 **Options**
   - **L**: No filter
   - **N**: NACE MR0175/ISO 15156
   - **NV**: Nonventing
   - **G93**: ASTM G93 Level C-cleaned
General-Purpose, Spring-Loaded Pressure-Reducing Regulators—RS(H)4, RS(H)6, and RS(H)8 Series

Features
- Balanced poppet design
- Diaphragm or piston sensing
- Threaded vent to monitor sensing seal integrity

Options
- Antitamper
- Gauge connections—choice of 4 configurations
- NACE MR0175/ISO 15156-compliant models
- Self-venting
- Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Connections</th>
<th>Weight (Without Flanges) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS(H)4</td>
<td>RS: 1015 (70.0) RSH: 5800 (400)</td>
<td>RS: 406 (28.0) RSH: 5800 (400)</td>
<td>Diaphragm: RS4: 0 to 406 psig (28.0 bar) RS6, 8: 0 to 203 psig (14.0 bar) Piston: 0 to 5800 psig (400 bar)</td>
<td>–49 to 176 (–45 to 80)</td>
<td>See Pressure-Temperature Ratings, page 8.</td>
<td>1.84 0.39 (10.0) 2.07</td>
<td>Inlet and Outlet Size Type Gauge and Vent</td>
<td>7.7 (3.5)</td>
</tr>
<tr>
<td>RS(H)6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1/2 in. DN15 NPT ISO/BSP parallel thread Gauge: 1/4 in. NPT Vent: 1/8 in. ISO/BSP parallel thread</td>
<td>9.9 (4.5)</td>
</tr>
<tr>
<td>RS(H)8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3/4 in. DN20 ASME or EN flange</td>
<td>11</td>
</tr>
</tbody>
</table>

See pages 15 to 20 for flow data.

Materials of Construction

Swagelok®

Common Components

- Spring housing
- Spring guide
- Ball
- Set spring
- Cap screw
- Washer
- Bottom spring guide
- Body
- Poppet

Actuation

- Knob assembly with adjusting screw, nuts, washers
- Antitamper option with O-ring, set screw

Diaphragm Only

- Diaphragm
- Diaphragm plate

Piston Only

- Piston
- Piston plate
- Seat
- Seat seal
- Poppet housing
- Seat

Wetted components listed in italics.
Gauge plugs (not shown): 431 SS / A276.

Wetted lubricant: Silicone-based, synthetic hydrocarbon-based
**RS4 Series**

*Flow Coefficient: 1.84*

*Maximum Inlet Pressure: 1015 psig (70.0 bar)*

*Outlet Pressure Control Range: 0 to 406 psig (0 to 28.0 bar)*

<table>
<thead>
<tr>
<th>Nitrogen Flow, std ft³/min</th>
<th>Inlet Pressure, psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1015 (70.0)</td>
</tr>
<tr>
<td>100</td>
<td>600 (42.0)</td>
</tr>
<tr>
<td>200</td>
<td>400 (28.0)</td>
</tr>
<tr>
<td>300</td>
<td>200 (14.0)</td>
</tr>
<tr>
<td>400</td>
<td>100 (7.0)</td>
</tr>
<tr>
<td>500</td>
<td>50 (4.0)</td>
</tr>
<tr>
<td>600</td>
<td>10 (1.0)</td>
</tr>
</tbody>
</table>

**RS(H)4 Series**

*Flow Coefficient: 1.84*

*Maximum Inlet Pressure: RS4—1015 psig (70.0 bar); RSH4—5800 psig (400 bar)*

*Outlet Pressure Control Range: 0 to 1160 psig (0 to 80.0 bar)*

<table>
<thead>
<tr>
<th>Nitrogen Flow, std ft³/min</th>
<th>Inlet Pressure, psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1015 (70.0)</td>
</tr>
<tr>
<td>100</td>
<td>580 (40.0)</td>
</tr>
<tr>
<td>200</td>
<td>300 (21.0)</td>
</tr>
<tr>
<td>300</td>
<td>200 (14.0)</td>
</tr>
<tr>
<td>400</td>
<td>100 (7.0)</td>
</tr>
<tr>
<td>500</td>
<td>10 (1.0)</td>
</tr>
</tbody>
</table>

Flow Data

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

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

RSH4 Series
Flow Coefficient: 1.84
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)

Pressure Control Range
- 0 to 5800 psig (0 to 400 bar)
- 0 to 4060 psig (0 to 280 bar)
- 0 to 2175 psig (0 to 150 bar)

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

RS6 Series
Flow Coefficient: 1.95
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 406 psig (0 to 28.0 bar)

RS(H)6 Series
Flow Coefficient: 1.95
Maximum Inlet Pressure: RS6—1015 psig (70.0 bar); RSH6—5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 1160 psig (0 to 80.0 bar)
Flow Data

The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok sales and service center.

RSH6 Series

*Flow Coefficient: 1.95*

*Maximum Inlet Pressure: 5800 psig (400 bar)*

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

---

**Pressure Control Range**

- 0 to 5800 psig (0 to 400 bar)
- 0 to 4060 psig (0 to 280 bar)
- 0 to 2175 psig (0 to 150 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RS8 Series
Flow Coefficient: 2.07
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 406 psig (0 to 28.0 bar)

RS(H)8 Series
Flow Coefficient: 2.07
Maximum Inlet Pressure: RS8—1015 psig (70.0 bar); RSH8—5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 1160 psig (0 to 80.0 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RSH8 Series
Flow Coefficient: 2.07
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5800 psig (0 to 400 bar)</td>
<td>Inlet Pressure, psig (bar)</td>
</tr>
<tr>
<td>0 to 4060 psig (0 to 280 bar)</td>
<td>Nitrogen Flow, std ft³/min</td>
</tr>
<tr>
<td>0 to 2175 psig (0 to 150 bar)</td>
<td></td>
</tr>
</tbody>
</table>

![Diagram showing flow data and pressure control range for RSH8 Series regulators and filters.](image-url)
**Dimensions**

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size</th>
<th>Dimensions, in (mm)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS(H)4</td>
<td>1/2 in.</td>
<td>9.06 (230)</td>
<td>2.83 (72.0)</td>
<td>3.07 (78.0)</td>
<td>2.09 (53.0)</td>
<td>3.62 (92.0)</td>
<td></td>
</tr>
<tr>
<td>RS(H)6</td>
<td>3/4 in.</td>
<td>9.25 (235)</td>
<td>3.23 (82.0)</td>
<td>3.50 (89.0)</td>
<td>2.20 (56.0)</td>
<td>3.94 (100)</td>
<td></td>
</tr>
<tr>
<td>RS(H)8</td>
<td>1 in.</td>
<td>9.25 (235)</td>
<td>3.07 (78.0)</td>
<td>3.50 (89.0)</td>
<td>2.20 (56.0)</td>
<td>3.94 (100)</td>
<td></td>
</tr>
</tbody>
</table>

**Ordering Information**

Build an RS(H)4, RS(H)6, and RS(H)8 series regulator ordering number by combining the designators in the sequence shown below.

1. **Series**
   - **RS** = 1015 psig (70.0 bar) maximum inlet pressure
   - **RSH** = 5800 psig (400 bar) maximum inlet pressure

2. **Inlet / Outlet**
   - **B** = Female ISO/BSP parallel thread
   - **N** = Female NPT
   - **FA** = ASME B16.5 flange
   - **FD** = EN 1092 (DIN) flange

3. **Size**
   - 4 = 1/2 in. / DN15
   - 6 = 3/4 in. / DN20
   - 8 = 1 in. / DN25

4. **Pressure Class**
   - Omit designator if flanges are not ordered.
   - **A** = ASME class 150
   - **B** = ASME class 300
   - **C** = ASME class 600
   - **E** = ASME class 1500
   - **F** = ASME class 2500
   - **M** = EN class PN16
   - **N** = EN class PN40

5. **Flange Facing**
   - Omit designator if flanges are not ordered.
   - **1** = Raised face smooth
   - **3** = RTJ

6. **Body Material**
   - **02** = 316L SS

7. **Pressure Control Range**
   - **Diaphragm sensing**
     - **1** = 0 to 43 psig (0 to 3.0 bar)
     - **2** = 0 to 101 psig (0 to 7.0 bar)
     - **3** = 0 to 203 psig (0 to 14.0 bar)
     - **4** = 0 to 406 psig (0 to 28.0 bar)
   - **Piston sensing**
     - **4** = 0 to 406 psig (0 to 28.0 bar)
     - **5** = 0 to 580 psig (0 to 40.0 bar)
     - **6** = 0 to 1160 psig (0 to 80.0 bar)
     - **7** = 0 to 2175 psig (0 to 150 bar)
     - **9** = 0 to 4060 psig (0 to 280 bar)
     - **11** = 0 to 5800 psig (0 to 400 bar)

8. **Seal Material**
   - **V** = Fluorocarbon FKM
   - **N** = Nitrile
   - **E** = EPDM
   - **L** = Low temperature Nitrile

9. **Diaphragm / Piston O-Rings**
   - **V** = Fluorocarbon FKM
   - **N** = Nitrile
   - **E** = EPDM
   - **L** = Low temperature Nitrile

10. **Seat Seal Material**
    - **RS** series
      - **V** = Fluorocarbon FKM
      - **N** = Nitrile
      - **E** = EPDM
      - **L** = Low temperature Nitrile
    - **RSH** series
      - **K** = PCTFE
      - **P** = PEEK

11. **Options**
    - **A** = Antitamper
    - **GN2** = Gauge connection, see below
    - **GN4** = Gauge connection, see below
    - **GN5** = Gauge connection, see below
    - **None** = Standard connection, see below

**Gauge Connection Configuration**

- **Standard**
- **GN2**
- **GN4**
- **GN5**

- **N** = NACE MR0175/ISO 15156
- **S** = Self-venting (with 1/8 in. NPT)
- **G93** = ASTM G93 Level C-cleaned
General-Purpose, Spring-Loaded Pressure-Reducing Regulators—RS(H)10, RS(H)15, and RS(H)20 Series

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

Options
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Connections</th>
<th>Weight (Without Flanges) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS(H)10</td>
<td>RS: 1015 (70.0)</td>
<td>RS: 290 (20.0)</td>
<td>Diaphragm: 0 to 290 psig (20.0 bar)</td>
<td>–49 to 176 (~45 to 80)</td>
<td>3.79</td>
<td>0.55 (14.0)</td>
<td>1 in. DN25</td>
<td>16.5 (7.5)</td>
</tr>
<tr>
<td></td>
<td>RSH: 5800 (400)</td>
<td>RSH: 3625 (250)</td>
<td>Piston: 0 to 3625 psig (0 to 250 bar)</td>
<td>See Pressure-Temperature Ratings, page 8.</td>
<td></td>
<td>0.53 (13.5)</td>
<td>NPT ISO/BSP parallel thread ASME</td>
<td>22.0 (10.0)</td>
</tr>
<tr>
<td>RS(H)15</td>
<td>290 (20.0)</td>
<td>Diaphragm</td>
<td></td>
<td></td>
<td>7.30</td>
<td>0.75 (19.0)</td>
<td>1 1/2 in. DN40</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13</td>
<td>0.98 (25.0)</td>
<td>2 in. DN50</td>
<td></td>
</tr>
</tbody>
</table>

See pages 23 to page 27 for flow data.

Materials of Construction

RS Series Regulator with Diaphragm Sensing and Soft Seat Seal

RSH Series Regulator with Piston Sensing and Hard Seat Seal

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Adjusting screw</td>
<td>A2-70</td>
</tr>
<tr>
<td>2 Nut</td>
<td>A2</td>
</tr>
<tr>
<td>3 Ball</td>
<td>420 SS (Hardened)</td>
</tr>
<tr>
<td>4 Upper spring guide</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>5 Spring housing assembly</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>6 Set spring</td>
<td>50CRV4</td>
</tr>
<tr>
<td>7 Cap screw</td>
<td>A4-80</td>
</tr>
<tr>
<td>8 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>9 Bottom spring guide</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>10 Poppet</td>
<td>S17400 SS or 316L SS</td>
</tr>
<tr>
<td>11 Seat</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>12 Seat O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>13 Poppet housing</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>14 Body</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>15 O-rings</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>16 Poppet spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>17 Body plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>18 Diaphragm</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>19 Diaphragm plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>20 Retaining ring</td>
<td>Commercial stainless steel</td>
</tr>
<tr>
<td>21 Body plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>22 Seat seal</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>23 Piston</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>24 Piston O-rings</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>25 Piston plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>26 Seat seal</td>
<td>PEEK or PCTFE</td>
</tr>
</tbody>
</table>

Wetted components listed in italics.

Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RS10 Series
Flow Coefficient: 3.79
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 406 psig (0 to 28.0 bar)

RSH10 Series
Flow Coefficient: 3.79
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RS15 Series
Flow Coefficient: 7.30
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 72 psig (0 to 5.0 bar)

Pressure Control Range
- 0 to 72 psig (0 to 5.0 bar)
- 0 to 43 psig (0 to 3.0 bar)

RS15 Series
Flow Coefficient: 7.30
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 145 psig (0 to 10.0 bar)

Pressure Control Range
- 0 to 145 psig (0 to 10.0 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RS15 Series

Flow Coefficient: 7.30

Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 580 psig (0 to 40.0 bar)

Pressure Control Range

- 0 to 580 psig (0 to 40.0 bar)
- 0 to 290 psig (0 to 20.0 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok sales and service center.

RSH15 Series
Flow Coefficient: 7.30
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 580 psig (0 to 40.0 bar)

Pressure Control Range
- 0 to 580 psig (0 to 40.0 bar)

RSH15 Series
Flow Coefficient: 7.30
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)

Pressure Control Range
- 0 to 3625 psig (0 to 250 bar)
- 0 to 2610 psig (0 to 180 bar)
- 0 to 1450 psig (0 to 100 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RS20 Series
Flow Coefficient: 13
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 72 psig (0 to 5.0 bar)

RS20 Series
Flow Coefficient: 13
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)
Dimensions

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS(H)10</td>
<td>1 in.</td>
<td>10.5 (266)</td>
<td>3.54 (90.0)</td>
<td>3.07 (78.0)</td>
<td>2.28 (58.0)</td>
<td>1.97 (50.0)</td>
<td>1.77 (45.0)</td>
<td>4.53 (115)</td>
</tr>
<tr>
<td>RS(H)15</td>
<td>1 1/2 in.</td>
<td>10.8 (275)</td>
<td>4.53 (115)</td>
<td>3.78 (96.0)</td>
<td>2.44 (62.0)</td>
<td>2.01 (51.0)</td>
<td>1.77 (45.0)</td>
<td>4.53 (115)</td>
</tr>
<tr>
<td>RS(H)20</td>
<td>2 in.</td>
<td>11.3 (288)</td>
<td>5.51 (140)</td>
<td>3.93 (100)</td>
<td>2.44 (62.0)</td>
<td>1.85 (47.0)</td>
<td>2.56 (65.0)</td>
<td>6.30 (160)</td>
</tr>
</tbody>
</table>

Gauge Connection

Only one gauge with a 50 mm (2 in.) or larger dial size fits directly into the body.

Configuration

Outlet gauge connection

Inlet gauge connection

Outlet

2 gauge connections

Shown with tubing for clarity; tubing not included.

Ordering Information

Build an RS(H)10, RS(H)15, and RS(H)20 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
RS FA 10 A 1 - 02 - 1 - V V V G93

1 Series
RS = 1015 psig (70.0 bar) maximum inlet pressure
RSH = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet
B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size
10 = 1 in. / DN25
15 = 1 1/2 in. / DN40
20 = 2 in. / DN50

4 Pressure Class
A = ASME class 150
B = ASME class 300
C = ASME class 600
E = ASME class 1500
F = ASME class 2500
M = EN class PN16
N = EN class PN40

5 Flange Facing
Omit designator if flanges are not ordered.
1 = Raised face smooth
3 = RTJ

6 Body Material
02 = 316L SS

7 Pressure Control Range
Diaphragm sensing
1 = 0 to 43 psig (0 to 3.0 bar)
2 = 0 to 72 psig (0 to 5.0 bar)
3 = 0 to 145 psig (0 to 10.0 bar)
4 = 0 to 290 psig (0 to 20.0 bar)

Piston sensing
5 = 0 to 580 psig (0 to 40.0 bar)
6 = 0 to 1450 psig (0 to 100 bar)
7 = 0 to 2610 psig (0 to 180 bar)
8 = 0 to 3625 psig (0 to 250 bar)

8 Seal Material
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Diaphragm / Piston O-Rings
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

10 Seat Seal Material
RS series
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile
RSH series
K = PCTFE
P = PEEK

11 Options
N = NACE MR0175/ISO 15156
G93 = ASTM G93 Level C-cleaned
High-Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LRS(H)4 Series

Features
■ Diaphragm sensing
■ Large diaphragm for higher accuracy
■ Diaphragm materials: PTFE or 316L SS for most pressure control ranges
■ Bottom mounting
■ Low torque minimizes stem wear
■ Nonventing
■ Cartridge poppet assembly in LRSH4 for ease of service

Options
■ External feedback
■ Filter, 25 μm
■ NACE MR0175/ISO 15156-compliant models
■ Self-venting
■ Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient Cₜ</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge / Vent Connections</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LRS4</td>
<td>507 (35.0)</td>
<td>290 (20.0)</td>
<td>Diaphragm</td>
<td>-49 to 176 (-45 to 80)</td>
<td>0.73</td>
<td>0.23 (6.0)</td>
<td>1/2 in. NPT</td>
<td>Gauge: 1/4 in. NPT Vent: 1/8 in. NPT</td>
<td>5.7 (2.6)</td>
</tr>
<tr>
<td>LRSH4</td>
<td>5800 (400)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See pages 30 to 31 for flow data.

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knob assembly with adjusting screw, nuts, Red ABS with 431 SS</td>
</tr>
<tr>
<td>2</td>
<td>Spring housing cover, 431 SS / A276</td>
</tr>
<tr>
<td>3</td>
<td>Spring housing, 316L SS / A479</td>
</tr>
<tr>
<td>4</td>
<td>C-ring, A2</td>
</tr>
<tr>
<td>5</td>
<td>Spring guide, 316L SS / A479</td>
</tr>
<tr>
<td>6</td>
<td>Set spring, 50CRV4</td>
</tr>
<tr>
<td>7</td>
<td>Cap screw, A4-80</td>
</tr>
<tr>
<td>8</td>
<td>Washer, A2</td>
</tr>
<tr>
<td>9</td>
<td>Bottom spring guide, 316L SS / A479</td>
</tr>
<tr>
<td>10</td>
<td>Clamp ring, 316L SS / A479</td>
</tr>
<tr>
<td>11</td>
<td>Diaphragm, PTFE or 316L SS</td>
</tr>
<tr>
<td>12</td>
<td>Diaphragm screw, 316L SS / A479</td>
</tr>
<tr>
<td>13</td>
<td>Body, 316L SS / A479</td>
</tr>
<tr>
<td>14</td>
<td>Poppet, S17400 or 431 SS</td>
</tr>
<tr>
<td>15</td>
<td>Seat retainer, 316L SS / A479</td>
</tr>
<tr>
<td>16</td>
<td>O-ring, EPDM, FKM, or FFKM</td>
</tr>
<tr>
<td>17</td>
<td>Seat, LRS 316L SS / A479, LRSH PCTFE or PEEK</td>
</tr>
<tr>
<td>18</td>
<td>Seat seal (LRS only), EPDM, FKM, or FFKM</td>
</tr>
<tr>
<td>19</td>
<td>Poppet spring, 302 SS / A313</td>
</tr>
<tr>
<td>20</td>
<td>Poppet housing, 316L SS / A479</td>
</tr>
<tr>
<td>21</td>
<td>Fluid case, 316L SS / A479</td>
</tr>
<tr>
<td>22</td>
<td>Cartridge plug</td>
</tr>
</tbody>
</table>

Wetted lubricants: Silicone-based, synthetic hydrocarbon-based

Wetted components listed in italics.
Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

LRS4 Series
Flow Coefficient: 0.73
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

LRS4 Series with Optional External Feedback
Flow Coefficient: 0.73
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

LRSH4 Series with Optional 316L SS Diaphragm
Flow Coefficient: 0.73
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Comparative Flow

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>316L SS Diaphragm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nitrogen Flow, std ft³/min</strong></td>
<td>30 25 20 15 10 5 0</td>
<td>30 25 20 15 10 5 0</td>
</tr>
<tr>
<td><strong>Inlet Pressure, psig (bar)</strong></td>
<td>0 15 60 45 30 75 90</td>
<td>0 15 60 45 30 75 90</td>
</tr>
<tr>
<td><strong>Outlet Pressure, psig</strong></td>
<td>0 5.0 10 15 20 25 30</td>
<td>0 5.0 10 15 20 25 30</td>
</tr>
<tr>
<td><strong>Nitrogen Flow, Nm³/h</strong></td>
<td>0 1200 400 2000 1450 (100)</td>
<td>0 1200 400 2000 1450 (100)</td>
</tr>
<tr>
<td><strong>Pressure Control Range</strong></td>
<td>0 to 130 psig (0 to 9.0 bar)</td>
<td>0 to 130 psig (0 to 9.0 bar)</td>
</tr>
</tbody>
</table>

LRSH4 Series
Flow Coefficient: 0.10
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range

<table>
<thead>
<tr>
<th></th>
<th>0 to 290 psig (0 to 20.0 bar)</th>
<th>0 to 130 psig (0 to 9.0 bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nitrogen Flow, Nm³/h</strong></td>
<td>0 250 200 150 100 50 0</td>
<td>0 250 200 150 100 50 0</td>
</tr>
<tr>
<td><strong>Inlet Pressure, psig (bar)</strong></td>
<td>0 20 60 40 80 100 140</td>
<td>0 20 60 40 80 100 140</td>
</tr>
<tr>
<td><strong>Outlet Pressure, psig</strong></td>
<td>0 362 (25.0) 362 (25.0) 362 (25.0)</td>
<td>0 362 (25.0) 362 (25.0) 362 (25.0)</td>
</tr>
<tr>
<td><strong>Inlet Pressure, bar</strong></td>
<td>0 20.0 10.0 5.0 2.5 0.9 0.3</td>
<td>0 20.0 10.0 5.0 2.5 0.9 0.3</td>
</tr>
<tr>
<td><strong>Outlet Pressure, bar</strong></td>
<td>0 25.0 13.0 9.0 4.0 0</td>
<td>0 25.0 13.0 9.0 4.0 0</td>
</tr>
</tbody>
</table>

Flow Coefficient: 0.73
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)
### Dimensions
Dimensions, in inches (millimeters), are for reference only and are subject to change.

**Pressure Regulators and Filters**

**RHPS REGULATORS**

Dimensions, in

**Ordering Information**
Build an LRS4 or LRSH4 series regulator ordering number by combining the designators in the sequence shown below.

1. **Series**
   - LRS = 507 psig (35 bar) maximum inlet pressure
   - LRSH = 5800 psig (400 bar) maximum inlet pressure

2. **Inlet / Outlet**
   - N4 = 1/2 in. female NPT

3. **Body Material**
   - 02 = 316L SS

4. **Pressure Control Range**
   - 1 = 0 to 43 psig (0 to 3.0 bar)
   - 2 = 0 to 130 psig (0 to 9.0 bar)
   - 3 = 0 to 290 psig (0 to 20.0 bar)

5. **Seal Material**
   - V = Fluorocarbon FKM
   - N = Nitrile
   - E = EPDM
   - F = FFKM
   - L = Low temperature Nitrile

6. **Diaphragm**
   - T = PTFE
   - M = 316L SS; only for 0 to 43 psig (0 to 3.0 bar) and 0 to 130 psig (0 to 9.0 bar) pressure control ranges
   - L = Low temperature Nitrile
   - N = Nitrile
   - E = EPDM
   - V = Fluorocarbon FKM

7. **Seat Seal Material**
   - LRS series (seat seal)
     - V = Fluorocarbon FKM
     - N = Nitrile
     - E = EPDM
     - F = FFKM
     - L = Low temperature Nitrile
   - LRSH series (seat)
     - K = PCTFE
     - P = PEEK

8. **Options**
   - EF = External feedback
   - F = Filter, 25 μm
   - N = NACE MR0175/ISO 15156
   - S = Self venting
   - G93 = ASTM G93 Level C-cleaned

---

**Options**

- **Self Venting**
  - Threaded vent connection is below the panel in self-venting version.

- **External Feedback**
  - Compensates for pressure loss (droop).

- **25 μm Filter**
  - Reduces potential seat damage; will reduce flow.

---

**Panel Mounting**

- 2 mounting holes for M5 × 20 screws

---

**Bottom Mounting**

- 4 mounting holes, M6 thread, 0.39 (10.0) deep

---

**Configuration**

- Top
- Outlet gauge connection

---

**Threaded vent connection**

- Below the panel in self-venting version.

---

**Gauge connection**

- Shown with tubing for clarity; tubing not included.

---

**1 2 3 4 5 6 7 8**

- LRS
- N4 - 02 - 1 - V T V - S

---

**Swagelok**
High Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LPRS4, LPRS6, and LPRS8 Series

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

Options
- Antitamper
- Gauge connections—choice of 4 configurations
- Special cleaning to ASTM G93 Level C

Technical Data

| Series | Maximum Inlet Pressure psig (bar) | Maximum Outlet Control Pressure psig (bar) | Sensing Type | Temperature Range °F (°C) | Flow Coefficient \(C_v\) | Seat Diameter In. (mm) | Connections Inlet and Outlet Size | Type | Gauge | Weight
|--------|---------------------------------|---------------------------------|--------------|-------------------|-----------------|-----------------|---------------------------------|------|-------|-------
| LPRS4  | 232 \((16.0)\)                  | 43.0 \((3.0)\)                  | Diaphragm    | –49 to 176 \((-45 to 80)\) | 1.84            | 0.39 \((10.0)\)   | 1/2 in. DN15  NPT ISO/BSP parallel thread | 1/4 in. NPT | See Dimensions, page 36. |
| LPRS6  |                                |                                |              |                   |                 |                 | 3/4 in. DN20 ASME or EN flange    |
| LPRS8  |                                |                                |              |                   |                 |                 | 1 in. DN25            |

See pages 34 to 35 for flow data.

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Spring housing assembly</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>2 Ball</td>
<td>Commercial stainless steel</td>
</tr>
<tr>
<td>3 Spring guide</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>4 Set spring</td>
<td>50CRV4</td>
</tr>
<tr>
<td>5 Nut</td>
<td>A2</td>
</tr>
<tr>
<td>6 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>7 Cap screw</td>
<td>A4-80</td>
</tr>
<tr>
<td>8 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>9 Nut</td>
<td>A4-80</td>
</tr>
<tr>
<td>10 Body</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>11 Seat</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>12 Poppet housing</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>13 Poppet spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>14 Body plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>15 Knob assembly with adjusting screw, nuts</td>
<td>Red ABS with A2-70</td>
</tr>
<tr>
<td>16 Antitamper assembly with O-ring, adjusting screw</td>
<td>316L SS, nitrile, A2-70</td>
</tr>
<tr>
<td>17 Diaphragm plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>18 Diaphragm</td>
<td>PTFE, EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>19 Diaphragm screw</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>20 Poppet</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>21 O-rings</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>22 Seat seal</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>23 Backup ring</td>
<td>PTFE</td>
</tr>
</tbody>
</table>

Wetted lubricants: Silicone-based, synthetic hydrocarbon-based

Wetted components listed in italics.

Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok sales and service center.

LPRS4 Series
Flow Coefficient: 1.84
Maximum Inlet Pressure: 218 psig (15.0 bar)
Outlet Pressure Control Range: 1.4 to 43 psig (0.10 to 3.0 bar)

Pressure Control Range
- 4.3 to 43 psig (0.30 to 3.0 bar)
- 1.4 to 14.5 psig (0.10 to 1.0 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

LPRS8 Series
Flow Coefficient: 2.07
Maximum Inlet Pressure: 218 psig (15.0 bar)
Outlet Pressure Control Range: 1.4 to 43 psig (0.10 to 3.0 bar)

Pressure Control Range
- 4.3 to 43 psig (0.30 to 3.0 bar)
- 1.4 to 14.5 psig (0.10 to 1.0 bar)
### Dimensions

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size and Type</th>
<th>Dimensions, in. (mm)</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>LPRS4</td>
<td>1/2 in. NPT or ISO/BSP parallel thread</td>
<td>2.83 (72.0)</td>
<td>10.2 (260)</td>
</tr>
<tr>
<td></td>
<td>DN15 PN40—EN 1092</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1/2 in. ASME class 150—B16.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LPRS6</td>
<td>3/4 in. NPT or ISO/BSP parallel thread</td>
<td>3.23 (82.0)</td>
<td>10.2 (260)</td>
</tr>
<tr>
<td></td>
<td>DN20 PN40—EN 1092</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3/4 in. ASME class 150—B16.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LPRS8</td>
<td>1 in. NPT or ISO/BSP parallel thread</td>
<td>3.07 (78.0)</td>
<td>10.2 (260)</td>
</tr>
<tr>
<td></td>
<td>DN25 PN40—EN 1092</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Regulators with Pipe Connections

#### Standard Configuration

<table>
<thead>
<tr>
<th>Top</th>
<th>Outlet gauge connection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inlet</td>
</tr>
<tr>
<td></td>
<td>Outlet</td>
</tr>
</tbody>
</table>

Shown with tubing for clarity; tubing not included.

#### Regulators with Flange Connections

#### Gauges

Due to the size of the diaphragm enclosure it is not possible to fit a gauge without an adapter, unless a gauge with 40 mm (1 1/2 in.) dial and center-back mount is used.

**RHPS Gauge Adapter**

- 40 mm (1 1/2 in.) gauge dial size with center-back mount
- 63 mm (2 1/2 in.) or larger gauge dial size requires the use of an adapter.
Flow Table

1/2 in. DN15, 3/4 in. DN20, 1 in. DN25 Connections

<table>
<thead>
<tr>
<th>Inlet Pressure P1 psig (bar)</th>
<th>Set Pressure P2 psig (bar)</th>
<th>Pressure Control Range psig (bar)</th>
<th>Flow std ft³/min (Nm³/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.5 (1.0)</td>
<td>1.4 (0.10)</td>
<td>1.4 to 14.5 (0.10 to 1.0)</td>
<td>12.9 (22)</td>
</tr>
<tr>
<td></td>
<td>4.3 (0.30)</td>
<td></td>
<td>17.6 (30)</td>
</tr>
<tr>
<td>43 (3.0)</td>
<td>1.4 (0.10)</td>
<td>1.4 to 14.5 (0.10 to 1.0)</td>
<td>12.9 (22)</td>
</tr>
<tr>
<td></td>
<td>4.3 (0.30)</td>
<td></td>
<td>23.5 (40)</td>
</tr>
<tr>
<td></td>
<td>11 (0.80)</td>
<td></td>
<td>35.3 (60)</td>
</tr>
<tr>
<td></td>
<td>29 (2.0)</td>
<td>4.3 to 43 (0.30 to 3.0)</td>
<td>47.0 (80)①</td>
</tr>
<tr>
<td>72 (5.0)</td>
<td>1.4 (0.10)</td>
<td>1.4 to 14.5 (0.10 to 1.0)</td>
<td>12.9 (22)</td>
</tr>
<tr>
<td></td>
<td>4.3 (0.30)</td>
<td></td>
<td>23.5 (40)</td>
</tr>
<tr>
<td></td>
<td>11 (0.80)</td>
<td></td>
<td>35.3 (60)</td>
</tr>
<tr>
<td></td>
<td>29 (2.0)</td>
<td>4.3 to 43 (0.30 to 3.0)</td>
<td>76.5 (130)①</td>
</tr>
<tr>
<td>145 (10.0)</td>
<td>4.3 (0.30)</td>
<td>1.4 to 14.5 (0.10 to 1.0)</td>
<td>23.5 (40)</td>
</tr>
<tr>
<td></td>
<td>11 (0.80)</td>
<td></td>
<td>35.3 (60)</td>
</tr>
<tr>
<td></td>
<td>29 (2.0)</td>
<td>4.3 to 43 (0.30 to 3.0)</td>
<td>76.5 (130)①</td>
</tr>
<tr>
<td>232 (16.0)</td>
<td>4.3 (0.30)</td>
<td>1.4 to 14.5 (0.10 to 1.0)</td>
<td>23.5 (40)</td>
</tr>
<tr>
<td></td>
<td>11 (0.80)</td>
<td></td>
<td>35.3 (60)</td>
</tr>
<tr>
<td></td>
<td>29 (2.0)</td>
<td>4.3 to 43 (0.30 to 3.0)</td>
<td>76.5 (130)①</td>
</tr>
</tbody>
</table>

① Droop is approximately 15%.

Droop
Due to the working of the suction tube, LPRS series regulators show little or no droop.

Flow
If the flows given in the table are exceeded, the set pressure P2 may rise above the original setting.

Typical 2-Stage Reduction for improved set-pressure control

Ordering Information
Build an LPRS4, LPRS6, and LPRS8 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
LPRS FA 4 A 1 - 02 - 2 - V V V - GN2

1 Series
LPRS = 232 psig (16.0 bar) maximum inlet pressure

2 Inlet / Outlet
B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size
4 = 1/2 in. / DN15
6 = 3/4 in. / DN20
8 = 1 in. / DN25

4 Pressure Class
Omit designator if flanges are not ordered.
A = ASME class 150
N = EN class PN40

5 Flange Facing
Omit designator if flanges are not ordered.
1 = Raised face smooth

6 Body Material
02 = 316L SS

7 Pressure Control Range
2 = 1.4 to 14.5 psig (0.10 to 1.0 bar)
3 = 4.3 to 43 psig (0.30 to 3.0 bar)

8 Seal Material
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Diaphragm
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

10 Seat Seal Material
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

11 Options
A = Antitamper
GN2 = Gauge connection, see below
GN4 = Gauge connection, see below
GN5 = Gauge connection, see below
None = Standard connection, see below

Gauge Connection Configuration
Standard GN2 GN4 GN5
G93 = ASTM G93 Level C-cleaned
Pressure Regulators and Filters

High-Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LPRS10 and LPRS15 Series

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

Options
- Antitamper
- Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (C_v)</th>
<th>Seat Diameter in. (mm)</th>
<th>Connections</th>
<th>Weight (Without Flanges) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPRS10</td>
<td>232 (16.0)</td>
<td>43.0 (3.0)</td>
<td>Diaphragm</td>
<td>–49 to 176 (~45 to 80)</td>
<td>3.79</td>
<td>0.55 (14.0)</td>
<td>1 in. DN25 NPT ISO/BSP parallel thread ASME or EN flange</td>
<td>17.6 (8.0)</td>
</tr>
<tr>
<td>LPRS15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.30</td>
<td>0.75 (19.0)</td>
<td>1 1/2 in. DN40 ASME or EN flange</td>
<td>22.0 (10.0)</td>
</tr>
</tbody>
</table>

See page 39 for flow data.

Materials of Construction

1. Adjusting screw A2-70
2. Nut A2
3. Ball Commercial stainless steel
4. Spring guide 316L SS / A479
5. Set spring 50CRV4
6. Spring housing assembly 316L SS / A479
7. Nut A2
8. Washer A4
9. Diaphragm plate 316L SS / A479
10. Cap screw A4-80
11. Washer A2
12. Nut A2
13. Diaphragm PTFE, FKM, EPDM, or nitrile
14. Diaphragm screw 316L SS / A479
15. Bottom cover 316L SS / A479
16. Retaining ring Commercial stainless steel
17. Body plate 316L SS / A479
18. O-rings EPDM, FKM, or nitrile
19. Seat seal
20. Suction tube
21. Poppet 316L SS / A479
22. Seat
23. Poppet housing
24. Body
25. Poppet spring 302 SS / A313
26. Body plug 316L SS / A479
27. Backup ring PTFE

Wetted lubricant: Silicone-based, synthetic hydrocarbon-based

Gauge plugs (not shown): 431 SS / A276.

See page 39 for flow data.

Regulators with NPT inlet / outlet connections have 1/4 in. NPT gauge connections.

Wetted components listed in italics.
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

LPRS10 Series
Flow Coefficient: 3.79
Maximum Inlet Pressure: 232 psig (16.0 bar)
Outlet Pressure Control Range: 1.4 to 43 psig (0.10 to 3.0 bar)

Pressure Control Range
- 4.3 to 43 psig (0.30 to 3.0 bar)
- 1.4 to 14.0 psig (0.10 to 1.0 bar)

LPRS15 Series
Flow Coefficient: 7.3
Maximum Inlet Pressure: 232 psig (16.0 bar)
Outlet Pressure Control Range: 1.4 to 43 psig (0.10 to 3.0 bar)

Pressure Control Range
- 4.3 to 43 psig (0.30 to 3.0 bar)
- 1.4 to 14.0 psig (0.10 to 1.0 bar)
Dimensions

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size and Type</th>
<th>Dimensions, in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>LPRS10</td>
<td>1 in. NPT or ISO/BSP parallel thread</td>
<td>10.8 (275)</td>
</tr>
<tr>
<td></td>
<td>DN25 PN40—EN 1092</td>
<td>11.3 (286)</td>
</tr>
<tr>
<td></td>
<td>1 in. ASME class 150—B16.5</td>
<td>12.4 (314)</td>
</tr>
<tr>
<td>LPRS15</td>
<td>1 1/2 in. NPT or ISO/BSP parallel thread</td>
<td>11.0 (280)</td>
</tr>
<tr>
<td></td>
<td>DN40 PN40—EN 1092</td>
<td>12.4 (314)</td>
</tr>
<tr>
<td></td>
<td>1 1/2 in. ASME class 150—B16.5</td>
<td></td>
</tr>
</tbody>
</table>

Regulators with Pipe Connections

Regulators with Flange Connections

Configuration

Top

Gauge Connection

Only one gauge with a 50 mm (2 in.) or larger dial size fits directly into the body.

Shown with tubing for clarity; tubing not included.
Ordering Information

Build an LPRS10 and LPRS15 series regulator ordering number by combining the designators in the sequence shown below.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPRS</td>
<td>FA</td>
<td>10</td>
<td>A</td>
<td>1</td>
<td>-</td>
<td>02</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>V</td>
</tr>
</tbody>
</table>

1. **Series**
   - LPRS = 232 psig (16.0 bar) maximum inlet pressure

2. **Inlet / Outlet**
   - B = Female ISO/BSP parallel thread
   - N = Female NPT
   - FA = ASME B16.5 flange
   - FD = EN 1092 (DIN) flange

3. **Size**
   - 10 = 1 in. / DN25
   - 15 = 1 1/2 in. / DN40

4. **Pressure Class**
   - Omit designator if flanges are not ordered.
   - A = ASME class 150
   - N = EN class PN40

5. **Flange Facing**
   - Omit designator if flanges are not ordered.
   - 1 = Raised face smooth

6. **Body Material**
   - 02 = 316L SS

7. **Pressure Control Range**
   - 2 = 1.4 to 14.5 psig (0.10 to 1.0 bar)
   - 3 = 4.3 to 43 psig (0.30 to 3.0 bar)

8. **Seal Material**
   - V = Fluorocarbon FKM
   - N = Nitrile
   - E = EPDM
   - L = Low temperature Nitrile

9. **Diaphragm**
   - V = Fluorocarbon FKM
   - N = Nitrile
   - E = EPDM
   - L = Low temperature Nitrile

10. **Seat Seal Material**
    - V = Fluorocarbon FKM
    - N = Nitrile
    - E = EPDM
    - L = Low temperature Nitrile

11. **Options**
    - A = Antitamper
    - G93 = ASTM G93 Level C-cleaned
Pressure Reducing Regulators  
Spring-Loaded—RS Series Maintenance Kits

Regular maintenance of pressure regulator components is an important part of keeping pressure regulators operating successfully. Swagelok offers several maintenance kit options to help keep components and systems performing well. Outlined below are the standard maintenance kit offerings and an example of which parts are included in each kit. For more detailed information of which parts will be included within a kit for a specific regulator model, please reference the appropriate owner’s manual or contact your authorized Swagelok sales and service center.

**Ordering Information**

To order a maintenance kit, add the **kit type designator** to the regulator ordering number. Example: RSN4-02-1-VVV-B1

<table>
<thead>
<tr>
<th>Designator</th>
<th>Kit Type</th>
<th>Diaphragm Sensing Typical Contents</th>
<th>Piston Sensing Typical Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Valve kit</td>
<td>Poppet and housing (9, 21, 22), O-rings (10a, 10b), Back-up ring (11a), Seat (20)</td>
<td>Poppet (9), O-rings (10a, 10b), Back-up rings (11a), Seat (23), Seat seal (24)</td>
</tr>
<tr>
<td>A2</td>
<td>Soft valve kit</td>
<td>Poppet and housing (9, 21, 22), O-ring (10b), Back-up ring (11a)</td>
<td>O-ring (10a), Seat (23), Seat seal (24)</td>
</tr>
<tr>
<td>B1</td>
<td>Service kit</td>
<td>Poppet and housing (9, 21, 22), O-rings (10a, 10b, 10c), Back-up ring (11a), Diaphragm (16) (Seat 20)</td>
<td>Poppet (9), O-rings (10a, 10b, 10c, 10d, 10e), Back-up rings (11a, 11b, 11c), Seat (23), Seat seal (24)</td>
</tr>
<tr>
<td>B2</td>
<td>Seal kit</td>
<td>O-rings (10a, 10b, 10c), Back-up ring (11a), Diaphragm (16)</td>
<td>O-rings (10a, 10b, 10c, 10d, 10e), Back-up rings (11a, 11b, 11c)</td>
</tr>
<tr>
<td>C1</td>
<td>Overhaul kit</td>
<td>Spring guides (2, 7), Ball (3), Set spring (4), Poppet and housing (9, 21, 22), O-rings (10a, 10b, 10c), Back-up ring (11a), Diaphragm (16), Body plug (13)</td>
<td>Spring guide (2), Ball (3), Set spring (4), Poppet (9), O-rings (10a, 10b, 10c, 10d, 10e), Back-up rings (11a, 11b, 11c), Poppet spring (12), Body plug (13), Piston (18), Piston plate (19), Seat (23), Seat seal (24)</td>
</tr>
<tr>
<td>C2</td>
<td>Body plug kit</td>
<td>O-ring (10c), Body plug (13)</td>
<td>O-ring (10c), Body plug (13), Back-up ring (11b)</td>
</tr>
<tr>
<td>C3</td>
<td>Sensing kit</td>
<td>Diaphragm (16)</td>
<td>Piston (18), Piston plate (19), O-rings (10d, 10e), Back-up ring (11c)</td>
</tr>
<tr>
<td>C4</td>
<td>Range spring kit</td>
<td>Range spring (4)</td>
<td>Range spring (4)</td>
</tr>
<tr>
<td>C5</td>
<td>Poppet spring kit</td>
<td>Poppet spring (12)</td>
<td>Poppet spring (12)</td>
</tr>
<tr>
<td>D1</td>
<td>Handle kit</td>
<td>Handle assembly (14)</td>
<td>Handle assembly (14)</td>
</tr>
<tr>
<td>E1</td>
<td>Hardware kit</td>
<td>Bolts (5), Washers (6)</td>
<td>Bolts (5), Washers (6)</td>
</tr>
</tbody>
</table>
Pressure-Reducing, Dome-Loaded and Air-Loaded Regulators—RD and RA Series

These pressure-reducing, dome-loaded and air-loaded regulators are suitable for most gases and liquids, including acids and oils. These regulators feature various poppet designs, a pressure-sensing diaphragm (piston in RD2 series), and a choice of seat and seal materials to accommodate a variety of pressure, temperature, and flow conditions. These regulators are available with a choice of threaded end connections from 1/4 to 2 in., and with flange end connections from 1/2 to 4 in.

Features
- Dome-loaded and air-loaded pressure control
- Diaphragm sensing design except RD2 series
- 316L stainless steel materials of construction for corrosion resistance
- Maximum inlet pressure ratings: 1015 to 5800 psig (70.0 to 400 bar)
- Outlet pressure control ranges: Up to 0 to 5800 psig (0 to 400 bar)

The RDH series regulators are high-pressure versions of the RD series regulators, and the LPRD series are low-pressure, high-accuracy versions of the RD series regulators. The RA series regulators are air-loaded regulators.

These regulators are available with many options, including a variety of gauge connection configurations, a pilot regulator (RD series only), external feedback (RD series only), special cleaning to ASTM G93 Level C, and NACE MR0175/ISO 15156-compliant models.

⚠️ Improper installation of gauges in NPT threaded ports can result in galling issues.

To order gauge ports without factory plugs installed, contact your authorized Swagelok sales and service center.
Pressure-Reducing, Dome-Loaded and Air-Loaded Regulators—RD and RA Series

Pressure-Temperature Ratings

<table>
<thead>
<tr>
<th>Seal Material</th>
<th>Temperature Range °F (°C)</th>
<th>Material Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorocarbon FKM</td>
<td>5 to 176 (-15 to 80)</td>
<td>V</td>
</tr>
<tr>
<td>Standard Nitrile</td>
<td>-4 to 176 (-20 to 80)</td>
<td>N</td>
</tr>
<tr>
<td>Low-Temp Nitrile</td>
<td>-49 to 176 (-45 to 80)</td>
<td>L</td>
</tr>
<tr>
<td>EPDM</td>
<td>-4 to 176 (-20 to 80)</td>
<td>E</td>
</tr>
<tr>
<td>FFKM</td>
<td>14 to 176 (-10 to 80)</td>
<td>F</td>
</tr>
</tbody>
</table>

Pressure-Reducing, Dome-Loaded and Air-Loaded Regulators—RD and RA Series

Technical Data—Performance

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure(1) psig (bar)</th>
<th>Maximum Outlet Control Pressure(1) psig (bar)</th>
<th>Flow Coefficient ($C_v$)</th>
<th>Sensing Type</th>
<th>Flow Data on Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD2</td>
<td>5800 (400)</td>
<td>5800 (400)</td>
<td>0.05</td>
<td>Piston</td>
<td>47</td>
</tr>
<tr>
<td>RD6DP</td>
<td>1015 (70.0)</td>
<td>1015 (70.0)</td>
<td>1.95</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RDH6DP</td>
<td>5800 (400)</td>
<td>3335 (230)</td>
<td>1.95</td>
<td>Diaphragm</td>
<td>51</td>
</tr>
<tr>
<td>RD6</td>
<td>1015 (70.0)</td>
<td>1015 (70.0)</td>
<td>1.95</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RDH6</td>
<td>5800 (400)</td>
<td>5800 (400)</td>
<td>2.07</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RD8</td>
<td>1015 (70.0)</td>
<td>1015 (70.0)</td>
<td>3.79</td>
<td>Diaphragm</td>
<td>61</td>
</tr>
<tr>
<td>RDH8</td>
<td>5800 (400)</td>
<td>5800 (400)</td>
<td>7.30</td>
<td>Diaphragm</td>
<td>64, 65</td>
</tr>
<tr>
<td>RD10</td>
<td>1015 (70.0)</td>
<td>1015 (70.0)</td>
<td>13</td>
<td>Diaphragm</td>
<td>70, 71</td>
</tr>
<tr>
<td>RDH10</td>
<td>5800 (400)</td>
<td>3625 (250)</td>
<td>21</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RD15</td>
<td>1015 (70.0)</td>
<td>1015 (70.0)</td>
<td>36</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RDH15</td>
<td>5800 (400)</td>
<td>3625 (250)</td>
<td>73</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RD20</td>
<td>1015 (70.0)</td>
<td>1015 (70.0)</td>
<td>36</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RDH20</td>
<td>5800 (400)</td>
<td>2900 (200)</td>
<td>73</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RD25</td>
<td>1015 (70.0)</td>
<td>1015 (70.0)</td>
<td>21</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RDH25</td>
<td>4060 (280)</td>
<td>2900 (200)</td>
<td>21</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RD30</td>
<td>1015 (70.0)</td>
<td>1015 (70.0)</td>
<td>36</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RDH30</td>
<td>4060 (280)</td>
<td>2900 (200)</td>
<td>36</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RD40</td>
<td>1015 (70.0)</td>
<td>1015 (70.0)</td>
<td>73</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RDH40</td>
<td>4060 (280)</td>
<td>2900 (200)</td>
<td>73</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>LPRD20</td>
<td>232 (16.0)</td>
<td>29 (2.0)</td>
<td>13</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>LPRD25</td>
<td>232 (16.0)</td>
<td>29 (2.0)</td>
<td>21</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>LPRD30</td>
<td>232 (16.0)</td>
<td>29 (2.0)</td>
<td>36</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>LPRD40</td>
<td>232 (16.0)</td>
<td>29 (2.0)</td>
<td>73</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RA4</td>
<td>5800 (400)</td>
<td>5800 (400)</td>
<td>1.84</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RA6</td>
<td>5800 (400)</td>
<td>5800 (400)</td>
<td>1.84</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
<tr>
<td>RA8</td>
<td>5800 (400)</td>
<td>5800 (400)</td>
<td>1.84</td>
<td>Diaphragm</td>
<td>–</td>
</tr>
</tbody>
</table>

(1) Regulator pressure rating may be limited by connection type.
## Pressure-Reducing, Dome-Loaded and Air-Loaded Regulators—RD and RA Series

### RD Series Pressure-Reducing, Dome-Loaded Regulator

- **Dome-loading mechanism**
- **Diaphragm sensing mechanism**

### Technical Data—Design

<table>
<thead>
<tr>
<th>Series</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge Connection</th>
<th>Dome Connection</th>
<th>Weight (Without Flanges)</th>
<th>More Information on Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD2</td>
<td>0.087 (2.2)</td>
<td>1/4 in. NPT</td>
<td>1/4 in. NPT</td>
<td>1/8 in. NPT</td>
<td>3.1 (1.4)</td>
<td>46</td>
</tr>
<tr>
<td>RD6DP</td>
<td>0.39 (10.0)</td>
<td>3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>1/4 in. NPT</td>
<td>10.6 (4.8)</td>
<td>55</td>
</tr>
<tr>
<td>RD6H6DP</td>
<td>0.39 (10.0)</td>
<td>3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>8.8 (4.0)</td>
<td>50</td>
</tr>
<tr>
<td>RD6</td>
<td>0.39 (10.0)</td>
<td>3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>8.8 (4.0)</td>
<td>50</td>
</tr>
<tr>
<td>RD8</td>
<td>0.39 (10.0)</td>
<td>1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>17.6 (6.0)</td>
<td>59</td>
</tr>
<tr>
<td>RD10</td>
<td>0.55 (14.0)</td>
<td>1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT or ISO/BSP parallel thread</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>19.8 (9.0)</td>
<td>59</td>
</tr>
<tr>
<td>RD10H10</td>
<td>0.53 (13.5)</td>
<td>1 1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT or ISO/BSP parallel thread</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>19.8 (9.0)</td>
<td>59</td>
</tr>
<tr>
<td>RD15</td>
<td>0.75 (19.0)</td>
<td>2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>Use P1 gauge connections on pilot regulator</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>44.0 (20)</td>
<td>69</td>
</tr>
<tr>
<td>RD20</td>
<td>0.98 (25.0)</td>
<td>Use P1 gauge connections on pilot regulator</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>88.0 (40)</td>
<td>69</td>
</tr>
<tr>
<td>RD25</td>
<td>1.25 (32.0)</td>
<td>2 1/2 in. EN or ASME flanges</td>
<td>Use P1 gauge connections on pilot regulator</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>136 (62)</td>
<td>77</td>
</tr>
<tr>
<td>RD30</td>
<td>1.65 (42.0)</td>
<td>3 in. EN or ASME flanges</td>
<td>Use P1 gauge connections on pilot regulator</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>183 (83)</td>
<td>77</td>
</tr>
<tr>
<td>RD40</td>
<td>2.36 (60.0)</td>
<td>4 in. EN or ASME flanges</td>
<td>Use P1 gauge connections on pilot regulator</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>Varies with model and end connection</td>
<td>87</td>
</tr>
<tr>
<td>RDH20</td>
<td>0.98 (25.0)</td>
<td>1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>Inlet and outlet gauges included</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>12.5 (5.7)</td>
<td>87</td>
</tr>
<tr>
<td>LPRD20</td>
<td>1.25 (32.0)</td>
<td>2 1/2 in. EN or ASME flanges</td>
<td>Inlet and outlet gauges included</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>13.6 (6.2)</td>
<td>89</td>
</tr>
<tr>
<td>LPRD30</td>
<td>1.65 (42.0)</td>
<td>3 in. EN or ASME flanges</td>
<td>Inlet and outlet gauges included</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>13.6 (6.2)</td>
<td>89</td>
</tr>
<tr>
<td>LPRD40</td>
<td>2.36 (60.0)</td>
<td>4 in. EN or ASME flanges</td>
<td>Inlet and outlet gauges included</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>13.6 (6.2)</td>
<td>89</td>
</tr>
<tr>
<td>RA4</td>
<td>0.39 (10.0)</td>
<td>1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>12.5 (5.7)</td>
<td>87</td>
</tr>
<tr>
<td>RA6</td>
<td>0.39 (10.0)</td>
<td>3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>13.6 (6.2)</td>
<td>89</td>
</tr>
<tr>
<td>RA8</td>
<td>1 in. ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>1/4 in. ISO/BSP parallel thread</td>
<td>13.6 (6.2)</td>
<td>89</td>
<td></td>
</tr>
</tbody>
</table>
Compact, General-Purpose Dome-Loaded Pressure-Reducing Regulators—RD2 Series

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

Options
- No filter—for liquid applications
- NACE MR0175/ISO 15156-compliant models (nonventing and no-filter models only)
- Special cleaning to ASTM G93 Level C
- Panel mounting kit sold separately—no disassembly required

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient $C_v$</th>
<th>Seat Diameter (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge / Dome Connection</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD2</td>
<td>5800 (400)</td>
<td>5800 (400)</td>
<td>Piston</td>
<td>–40 to 95 (–40 to 35)</td>
<td>0.05</td>
<td>0.087 (2.2)</td>
<td>1/4 in. NPT</td>
<td>Gauge: 1/4 in. NPT  Dome: 1/8 in. NPT</td>
<td>3.1 (1.4)</td>
</tr>
</tbody>
</table>

See page 47 to 48 for flow data.

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dome plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>2 Dome</td>
<td></td>
</tr>
<tr>
<td>3 Dome plug O-ring</td>
<td>FKM, EPDM, nitrile, or FFKM</td>
</tr>
<tr>
<td>4 Non-relieving plug</td>
<td></td>
</tr>
<tr>
<td>5 Piston</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>6 Piston plate</td>
<td></td>
</tr>
<tr>
<td>7 Piston O-rings</td>
<td>FKM, EPDM, nitrile, or FFKM</td>
</tr>
<tr>
<td>8 Poppet</td>
<td>431 SS / A276</td>
</tr>
<tr>
<td>9 Poppet housing</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>10 O-rings</td>
<td>FKM, EPDM, nitrile, or FFKM</td>
</tr>
<tr>
<td>11 Seat</td>
<td>PEEK or PCFTE</td>
</tr>
<tr>
<td>12 Seat retainer</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>13 Poppet spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>14 Filter</td>
<td>316L SS</td>
</tr>
<tr>
<td>15 Plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>16 Body</td>
<td></td>
</tr>
</tbody>
</table>

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in italics.
Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RD2 Series
Flow Coefficient: 0.05
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)

RD2 Series
Flow Coefficient: 0.05
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RD2 Series
*Flow Coefficient: 0.05*
*Maximum Inlet Pressure: 5800 psig (400 bar)*
*Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)*
**Dimensions**

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

![Configuration Diagram]

**Ordering Information**

Build an RD2 series regulator ordering number by combining the designators in the sequence shown below.

`RD N2 - 02 - V V K - L`

<table>
<thead>
<tr>
<th>1 Series</th>
<th>2 Inlet / Outlet</th>
<th>3 Body Material</th>
<th>4 Seal Material</th>
<th>5 Piston Seal Material</th>
<th>6 Seat Material</th>
<th>7 Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD = 5800 psig (400 bar) maximum inlet pressure</td>
<td>N2 = 1/4 in. female NPT</td>
<td>02 = 316L SS</td>
<td>V = Fluorocarbon FKM</td>
<td>V = Fluorocarbon FKM</td>
<td>K = PCTFE</td>
<td>L = No filter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N = Nitrile</td>
<td>N = Nitrile</td>
<td>P = PEEK</td>
<td>N = NACE MR0175/ISO 15156</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E = EPDM</td>
<td>E = EPDM</td>
<td></td>
<td>G93 = ASTM G93 Level C-cleaned</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>F = FFKM</td>
<td>F = FFKM</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L = Low temperature Nitrile</td>
<td>L = Low temperature Nitrile</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Panel Mounting Kit**

No disassembly required when using panel mount kit. Panel mounting kit ordering number: RS2-P-02

![Panel Mounting Kit Diagram]
General-Purpose, Dome-Loaded Pressure-Reducing Regulators—RD(H)6 and RD(H)8 Series

Features

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

Options

- Antitamper
- Pilot regulator (not shown)
- Gauge connections—choice of 4 configurations
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge / Dome Connection</th>
<th>Weight (Without Flanges) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD6</td>
<td>RD: 1015 (70.0)</td>
<td>RDH: 5800 (400)</td>
<td>Diaphragm</td>
<td>~49 to 176 (~45 to 80)</td>
<td>1.95</td>
<td>0.39 (10.0)</td>
<td>3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flange</td>
<td>Gauge: 1/4 in. NPT; Dome: 1/4 in. ISO/BSP parallel thread</td>
<td>8.8 (4.0)</td>
</tr>
<tr>
<td>RDH6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 in. NPT, ISO/BSP parallel thread, EN or ASME flange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RD8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See Pressure-Temperature Ratings, page 44.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RDH8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.07</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See page 51 to 53 for flow data.

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dome</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>2 Cap screw</td>
<td>A4-80</td>
</tr>
<tr>
<td>3 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>4 Dome plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>5 Diaphragm</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>6 Diaphragm plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>7 O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>8 Backup ring</td>
<td>PTFE</td>
</tr>
<tr>
<td>9 Plug O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>10 Body</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>11 Poppet spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>12 Body plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>13 Poppet</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>14 Seat</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>15 Seat seal</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>16 Poppet housing</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>17 Poppet</td>
<td>S17400 or 431 SS / A276</td>
</tr>
<tr>
<td>18 Seat</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>19 Seat seal</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>20 Backup ring</td>
<td>PTFE</td>
</tr>
</tbody>
</table>

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based.

Wetted components listed in italics.

Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

**RDH6 Series**

*Flow Coefficient: 1.95*

*Maximum Inlet Pressure: 5800 psig (400 bar)*

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

**RDH6 Series**

*Flow Coefficient: 1.95*

*Maximum Inlet Pressure: 5800 psig (400 bar)*

*Outlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)*
Flow Data
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RDH6 Series
Flow Coefficient: 1.95
Maximum Inlet Pressure: 3990 psig (275 bar)
Outlet Pressure Control Range: 0 to 2537 psig (0 to 175 bar)

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

RDH6 Series
Flow Coefficient: 1.95
Maximum Inlet Pressure: 3990 psig (275 bar)
Outlet Pressure Control Range: 0 to 2537 psig (0 to 175 bar)

Pressure Control Range

0 to 2537 psig (0 to 175 bar)

Nitrogen Flow, Nm³/h

Nitrogen Flow, std ft³/min

Outlet Pressure, psig

Outlet Pressure, bar

Inlet Pressure, psig (bar)

Outlet Pressure, bar

Nitrogen Flow, std ft³/min

RD8 Series
Flow Coefficient: 2.07
Maximum Inlet Pressure: 2900 psig (200 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

0 to 1015 psig (0 to 70.0 bar)

Nitrogen Flow, Nm³/h

Nitrogen Flow, std ft³/min

Outlet Pressure, psig

Outlet Pressure, bar

Inlet Pressure, psig (bar)

Outlet Pressure, bar

Nitrogen Flow, std ft³/min

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

RDH8 Series
Flow Coefficient: 2.07
Maximum Inlet Pressure: 2175 psig (150 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

RDH8 Series
Flow Coefficient: 2.07
Maximum Inlet Pressure: 3990 psig (275 bar)
Outlet Pressure Control Range: 0 to 2537 psig (0 to 175 bar)
**Dimensions**

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size</th>
<th>Dimensions, in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD(H)6</td>
<td>3/4 in.</td>
<td>A: 5.12 (130)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B: 3.22 (82.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C: 3.50 (89.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D: 2.16 (55.0)</td>
</tr>
<tr>
<td>RD(H)8</td>
<td>1 in.</td>
<td></td>
</tr>
</tbody>
</table>

**Ordering Information**

Build an RD(H)6 and RD(H)8 series regulator ordering number by combining the designators in the sequence shown below.

1. **Series**
   - RD = 1015 psig (70.0 bar) maximum inlet pressure
   - RDH = 5800 psig (400 bar) maximum inlet pressure

2. **Inlet / Outlet**
   - B = Female ISO/BSP parallel thread
   - N = Female NPT
   - FA = ASME B16.5 flange
   - FD = EN 1092 (DIN) flange

3. **Size**
   - 6 = 3/4 in. / DN20
   - 8 = 1 in. / DN25

4. **Pressure Class**
   - Omit designator if flanges are not ordered.
   - A = ASME class 150
   - B = ASME class 300
   - C = ASME class 600
   - E = ASME class 1500
   - F = ASME class 2500
   - M = EN class PN16
   - N = EN class PN40

5. **Flange Facing**
   - Omit designator if flanges are not ordered.
   - 1 = Raised face smooth
   - 3 = RTJ

6. **Body Material**
   - 02 = 316L SS

7. **Pressure Control Range**
   - X = No pilot regulator, standard
   - RD series with RS2 series pilot regulator
   - 3 = 0 to 1015 psig (0 to 70.0 bar)
   - RDH series with RS2 series pilot regulator
   - 4 = 0 to 145 psig (0 to 10.0 bar)
   - 5 = 0 to 362 psig (0 to 25.0 bar)
   - 6 = 0 to 1450 psig (0 to 100 bar)
   - 7 = 0 to 2537 psig (0 to 175 bar)
   - For higher pressure control ranges with a pilot regulator, contact your authorized Swagelok sales and service center for information.

8. **Seal Material**
   - V = Fluorocarbon FKM
   - N = Nitrile
   - E = EPDM
   - L = Low temperature Nitrile

9. **Diaphragm / Piston O-Rings**
   - V = Fluorocarbon FKM
   - N = Nitrile
   - E = EPDM
   - L = Low temperature Nitrile

10. **Seat Seal Material**
    - RD series
    - V = Fluorocarbon FKM
    - N = Nitrile
    - E = EPDM
    - L = Low temperature Nitrile
    - RDH series
    - K = PCTFE
    - P = PEEK

11. **Options**
    - A = Antitamper
    - GN2 = Gauge connection, see below
    - GN4 = Gauge connection, see below
    - GN5 = Gauge connection, see below
    - None = Standard connection, see below

**Gauge Connection Configuration**

<table>
<thead>
<tr>
<th>Standard</th>
<th>GN2</th>
<th>GN4</th>
<th>GN5</th>
</tr>
</thead>
<tbody>
<tr>
<td>G0</td>
<td></td>
<td></td>
<td>G0</td>
</tr>
<tr>
<td>G1</td>
<td>G0</td>
<td></td>
<td>G0</td>
</tr>
</tbody>
</table>

Standard (GN1) and GN4 only available with no pilot.

- N = NACE MR0175/ISO 15156
- G93 = ASTM G93 Level C-cleaned
Differential Pressure, Dome-Loaded Pressure Reducing Regulators—RD(H)6DP Series

Features
- Balanced poppet design
- Diaphragm sensing
- Adjustable bias
- Dome-to-outlet pressure ratio approximately 1:1
- Antitamper and anti-blowout stem

Options
- Gauge connection—choice of 4 configurations
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Bias Range psig (bar)</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge / Dome Connection</th>
<th>Weight (Without Flanges) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD6DP</td>
<td>1015 (70.0)</td>
<td>1015 (70.0)</td>
<td>Diaphragm</td>
<td>14.5 to 145 (1.0 to 10.0)</td>
<td>~49 to 176 (~45 to 80)</td>
<td>1.95</td>
<td>0.39 (10.0)</td>
<td>3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flange</td>
<td>Gauge: 1/4 in. NPT; Dome: 1/4 in. NPT</td>
<td>11.2 (5.1)</td>
</tr>
<tr>
<td>RDH6DP</td>
<td>5800 (400)</td>
<td>3335 (230)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See page 56 to 57 for flow data.

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adjustment screw 316L SS / A479</td>
</tr>
<tr>
<td>2</td>
<td>Backup ring PTFE</td>
</tr>
<tr>
<td>3</td>
<td>O-ring EPDM, FKM, nitrile</td>
</tr>
<tr>
<td>4</td>
<td>Cap screw A4-80</td>
</tr>
<tr>
<td>5</td>
<td>Washer A4</td>
</tr>
<tr>
<td>6</td>
<td>Dome 316L SS / A479</td>
</tr>
<tr>
<td>7</td>
<td>Upper spring guide 316L SS / A479</td>
</tr>
<tr>
<td>8</td>
<td>Differential spring 50CRV4</td>
</tr>
<tr>
<td>9</td>
<td>Lower spring guide 316L SS / A479</td>
</tr>
<tr>
<td>10</td>
<td>Diaphragm EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>11</td>
<td>Diaphragm plate 316L SS / A479</td>
</tr>
<tr>
<td>12</td>
<td>Body 316L SS / A479</td>
</tr>
<tr>
<td>13</td>
<td>Poppet spring 302 SS / A313</td>
</tr>
<tr>
<td>14</td>
<td>Body plug 316L SS / A479</td>
</tr>
<tr>
<td>15</td>
<td>Antitamper cover 316L SS / A479</td>
</tr>
<tr>
<td>16</td>
<td>Lock Nut A4-80</td>
</tr>
</tbody>
</table>

**RD Series Only Components**
- Poppet 316L SS / A479
- Seat 316L SS / A479
- Seat seal EPDM, FKM, or nitrile
- Poppet housing 316L SS / A479

**RDH Series Only Components**
- Poppet S17400 / A276 or 431 SS
- Seat 316L SS / A479
- Seat seal PCTFE or PEEK

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in italics.
Gauge plugs (not shown): 431 SS / A276.
Lockwire and lead seal for anti-tamper (not shown): 304 LEAD
Flow Data
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RD6DP Series
*Flow Coefficient: 1.95*
*Maximum Inlet Pressure: 1015 psig (70.0 bar)*
*Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)*

Pressure Control Range
- 0 to 1015 psig (0 to 70.0 bar)
- All curves 29 psig (2.0 bar) bias

---

RD6DP Series
*Flow Coefficient: 1.95*
*Maximum Inlet Pressure: 1015 psig (70.0 bar)*
*Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)*

Pressure Control Range
- 0 to 1015 psig (0 to 70.0 bar)
- All curves 116 psig (8.0 bar) bias

---

Swagelok
Flow Data

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

RDH6DP Series

Flow Coefficient: 1.95
Maximum Inlet Pressure: 3990 psig (275 bar)
Outlet Pressure Control Range: 0 to 3335 psig (0 to 230 bar)

Pressure Control Range

Nitrogen Flow, Nm³/h

Inlet Pressure, psig (bar)

Outlet Pressure, psig

Nitrogen Flow, std ft³/min

RDH6DP Series

Flow Coefficient: 1.95
Maximum Inlet Pressure: 3990 psig (275 bar)
Outlet Pressure Control Range: 0 to 3335 psig (0 to 230 bar)

Pressure Control Range

Nitrogen Flow, Nm³/h

Inlet Pressure, psig (bar)

Outlet Pressure, psig

Nitrogen Flow, std ft³/min
Dimensions

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

![Diagram of Dimensions]

Standard Configuration

Top

Outlet gauge connection

Outlet

Outlet gauge connection

Outlet

Inlet

Shown with tubing for clarity; tubing not included.

Ordering Information

Build an RD(H)6DP series regulator ordering number by combining the designators in the sequence shown below.

1 Series
RD = 1015 psig (70.0 bar) maximum inlet pressure
RDH = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet
B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size
6 = 3/4 in. / DN20
8 = 1 in. / DN25

4 Pressure Class
Omit designator if flanges are not ordered.
A = ASME class 150
B = ASME class 300
C = ASME class 600
E = ASME class 1500
F = ASME class 2500
M = EN class PN16
N = EN class PN40

5 Flange Facing
Omit designator if flanges are not ordered.
1 = Raised face smooth
3 = RTJ

6 Body Material
02 = 316L SS

7 Seal Material
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

8 Diaphragm Material
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Seat Seal Material
RD series
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile
RDH series
K = PCTFE
P = PEEK

10 Differential Pressure
DP2 = 0 to 43 psig
(0 to 3.0 bar) bias
DP3 = 0 to 145 psig
(0 to 10.0 bar) bias

11 Options
GN2 = Gauge connection, see below
GN4 = Gauge connection, see below
GN5 = Gauge connection, see below
None = Standard connection, see below

<table>
<thead>
<tr>
<th>Gauge Connection Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
</tr>
<tr>
<td>![Symbol]</td>
</tr>
<tr>
<td>N = NACE MR0175/ISO 15156</td>
</tr>
<tr>
<td>G93 = ASTM G93 Level C-cleaned</td>
</tr>
</tbody>
</table>
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)10 and RD(H)15 Series

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

Options
- External feedback (EF) to pilot regulator for improved performance
  - EF to pilot regulator limited to 290 psig (20.0 bar)
- Gauge connections
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge / Dome Connection</th>
<th>Weight (Without Flanges and PR) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD10</td>
<td>RD: 1015 (70.0) (507 [35.0])</td>
<td>RD: 1015 (70.0)</td>
<td>Diaphragm</td>
<td>-49 to 176 (-45 to 80)</td>
<td>3.79</td>
<td>0.55 (14.0)</td>
<td>1 in.</td>
<td>NPT, ISO/BSP parallel thread, EN or ASME flange</td>
<td>17.6 (8.0)</td>
</tr>
<tr>
<td>RDH10</td>
<td>RDH: 3625 (250)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.53 (13.5)</td>
<td>1 1/2 in.</td>
<td>Dome: 1/4 in. ISO/BSP parallel thread</td>
<td></td>
</tr>
<tr>
<td>RD15</td>
<td>RD: 1175 (75.0) (620 [44])</td>
<td>RD: 1175 (75.0)</td>
<td></td>
<td></td>
<td>7.30</td>
<td>0.75 (19.0)</td>
<td>1 in.</td>
<td>NPT, ISO/BSP parallel thread, EN or ASME flange</td>
<td>19.8 (9.0)</td>
</tr>
<tr>
<td>RDH15</td>
<td>RDH: 3825 (275)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.75 (19.0)</td>
<td>1 1/2 in.</td>
<td>Dome: 1/4 in. ISO/BSP parallel thread</td>
<td></td>
</tr>
</tbody>
</table>

See pages 60 to 67 for flow data.
➀ Regulators with NPT inlet / outlet connections have 1/4 in. NPT gauge connections.

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dome</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>2 Cap screw</td>
<td>A4-80</td>
</tr>
<tr>
<td>3 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>4 Dome plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>5 Diaphragm</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>6 Diaphragm plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>7 Retaining ring</td>
<td>Commercial stainless steel</td>
</tr>
<tr>
<td>8 Body plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>9 Poppet</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>10 Seat</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>11 O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>12 Body</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>13 Poppet housing</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>14 Poppet spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>15 Body plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>16 O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>17 Plug O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
</tbody>
</table>

RD Series Only Components
- Seat seal: EPDM, FKM, or nitrile

RDH Series Only Components
- Backup ring (RDH10 only): PTFE
- Seat seal: PCTFE or PEEK

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in italics.
Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

**RD10 Series**
*Flow Coefficient: 3.79*
*Maximum Inlet Pressure: 1015 psig (70.0 bar)*
*Outlet Pressure Control Range: 0 to 43 psig (0 to 3.0 bar)*

**Nitrogen Flow, std ft³/min**

<table>
<thead>
<tr>
<th>Nitrogen Flow, Nm³/h</th>
<th>Inlet Pressure, psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>50</td>
<td>3.0</td>
</tr>
<tr>
<td>100</td>
<td>2.4</td>
</tr>
<tr>
<td>150</td>
<td>2.0</td>
</tr>
<tr>
<td>200</td>
<td>1.8</td>
</tr>
<tr>
<td>250</td>
<td>1.2</td>
</tr>
<tr>
<td>300</td>
<td>0</td>
</tr>
</tbody>
</table>

**Pressure Control Range**
- 0 to 43 psig (0 to 3.0 bar)

---

**RD10 Series**
*Flow Coefficient: 3.79*
*Maximum Inlet Pressure: 1015 psig (70.0 bar)*
*Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)*

**Nitrogen Flow, std ft³/min**

<table>
<thead>
<tr>
<th>Nitrogen Flow, std ft³/min</th>
<th>Outlet Pressure, psig</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>43</td>
</tr>
<tr>
<td>120</td>
<td>34</td>
</tr>
<tr>
<td>240</td>
<td>25</td>
</tr>
<tr>
<td>360</td>
<td>16</td>
</tr>
<tr>
<td>480</td>
<td>7</td>
</tr>
<tr>
<td>600</td>
<td>0</td>
</tr>
</tbody>
</table>

**Pressure Control Range**
- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)
- 0 to 130 psig (0 to 9.0 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RDH10 Series
Flow Coefficient: 3.79
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)
Pressure Control Range
- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)

RDH10 Series
Flow Coefficient: 3.79
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 2537 psig (0 to 175 bar)
Pressure Control Range
- 0 to 2537 psig (0 to 175 bar)
- 0 to 1450 psig (0 to 100 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RDH10 Series
Flow Coefficient: 3.79
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)
**Flow Data**
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

**RD10-EFP Series**

*Flow Coefficient: 3.79*

*Maximum Inlet Pressure: 218 psig (15.0 bar)*

*Outlet Pressure Control Range: 0 to 500 psig (0 to 34.5 bar)*

**Pressure Control Range**

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

RD15 Series
Flow Coefficient: 7.30
Maximum Inlet Pressure: 508 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 43 psig (0 to 3.0 bar)

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

RD15 Series
Flow Coefficient: 7.30
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range
- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)
- 0 to 130 psig (0 to 9.0 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok sales and service center.

RDH15 Series

Flow Coefficient: 7.30
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

RDH15 Series

Flow Coefficient: 7.30
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 2537 psig (0 to 175 bar)
Flow Data

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

RDH15 Series

Flow Coefficient: 7.30

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)

Pressure Control Range

Nitrogen Flow, std ft³/min

Outlet Pressure, psig

Outlet Pressure, bar

Nitrogen Flow, Nm³/h

Inlet Pressure, psig (bar)

Flow Data

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

RDH15 Series

Flow Coefficient: 7.30

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RD15-EFP Series
Flow Coefficient: 7.30
Maximum Inlet Pressure: 508 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)
Pressure Regulators and Filters

Dimensions

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size</th>
<th>Dimensions, in. (mm)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD(H)10</td>
<td>1 in.</td>
<td>6.18 (157)</td>
<td>2.28 (58.0)</td>
<td>3.07 (78.0)</td>
<td>3.54 (90.0)</td>
<td>1.97 (50.0)</td>
<td></td>
</tr>
<tr>
<td>RD(H)15</td>
<td>1 1/2 in.</td>
<td>6.61 (168)</td>
<td>2.44 (62.0)</td>
<td>3.78 (96.0)</td>
<td>4.53 (115)</td>
<td>2.03 (51.5)</td>
<td></td>
</tr>
</tbody>
</table>

Ordering Information

Build an RD(H)10 and RD(H)15 series regulator ordering number by combining the designators in the sequence shown below.

1 Series
   RD = 1015 psig (70.0 bar) maximum inlet pressure (507 psig [35.0 bar] with pilot regulator, options 0, 1, or 2)
   RDH = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet
   B = Female ISO/BSP parallel thread
   N = Female NPT
   FA = ASME B16.5 flange
   FD = EN 1092 (DIN) flange

3 Size
   10 = 1 in. / DN25
   15 = 1 1/2 in. / DN40

4 Pressure Class
   Omit designator if flanges are not ordered.
   A = ASME class 150
   B = ASME class 300
   C = ASME class 600
   E = ASME class 1500
   F = ASME class 2500
   M = EN class PN16
   N = EN class PN40

5 Flange Facing
   Omit designator if flanges are not ordered.
   1 = Raised face smooth
   3 = RTJ

6 Body Material
   02 = 316L SS

7 Pilot Regulator Options

8 Seal Material
   V = Fluorocarbon FKM
   N = Nitrile
   E = EPDM
   L = Low temperature Nitrile

9 Diaphragm Material
   V = Fluorocarbon FKM
   N = Nitrile
   E = EPDM
   L = Low temperature Nitrile

10 Seat Seal Material
    RD series
    V = Fluorocarbon FKM
    N = Nitrile
    E = EPDM
    L = Low temperature Nitrile
    RDH series
    K = PCTFE
    P = PEEK

11 Options
   EFP = External feedback to pilot regulator, limited to 290 psig (20.0 bar)
   N = NACE MR0175/ISO 15156
   G93 = ASTM G93 Level C-cleaned
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)20 and RD(H)25 Series

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

Options
- External feedback (EF) to pilot regulator for improved performance
  - EF to pilot regulator limited to 290 psig (20.0 bar)
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge / Dome Connection</th>
<th>Weight (Without Flanges) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD20</td>
<td>RD: 1015 (70.0) (507 [35.0] with LRS4 pilot regulator) RDH: 5800 (400)</td>
<td>RD: 1015 (70.0) RDH: 2900 (200)</td>
<td>Diaphragm</td>
<td>–49 to 176 (~45 to 80)</td>
<td>13</td>
<td>0.98 (25.0)</td>
<td>2 in. NPT, ISO/BSP parallel thread, EN or ASME flange</td>
<td>Use P1 gauge connection of pilot regulator.</td>
<td>44 (20)</td>
</tr>
<tr>
<td>RD25</td>
<td>RD: 1015 (70.0) (507 [35.0] with LRS4 pilot regulator) RDH: 4060 (280)</td>
<td>RD: 1015 (70.0) RDH: 2900 (200)</td>
<td>Diaphragm</td>
<td>–49 to 176 (~45 to 80)</td>
<td>21</td>
<td>1.25 (32.0)</td>
<td>2 1/2 in. EN or ASME flange</td>
<td>Dome: 1/4 in. ISO/BSP parallel thread</td>
<td>88 (40)</td>
</tr>
</tbody>
</table>

See pages 70 to 75 for flow data.

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dome</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>2 Cap screw</td>
<td>A4-80</td>
</tr>
<tr>
<td>3 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>4 Dome plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>5 Diaphragm</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>6 Diaphragm plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>7 Retaining ring</td>
<td>Commercial stainless steel</td>
</tr>
<tr>
<td>8 Body plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>9 Poppet</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>10 O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>11 Seat</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>12 Seat seal</td>
<td>RD EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td></td>
<td>RDH PCTFE or PEEK</td>
</tr>
<tr>
<td>13 Poppet housing</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>14 O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>15 Backup ring</td>
<td>PTFE</td>
</tr>
<tr>
<td>16 Poppet spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>17 Body</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>18 Plug O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>19 Body plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>20 Conical spring (RDH20 only)</td>
<td>302 SS / A313</td>
</tr>
</tbody>
</table>

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based.
Flow Data
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RD20 Series
Flow Coefficient: 13
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 43 psig (0 to 3.0 bar)

Pressure Control Range
- 0 to 43 psig (0 to 3.0 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RDH20 Series
Flow Coefficient: 13
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range
- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)

RDH20 Series
Flow Coefficient: 13
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)

Pressure Control Range
- 0 to 2900 psig (0 to 200 bar)
- 0 to 2537 psig (0 to 175 bar), calculated
- 0 to 1450 psig (0 to 100 bar), calculated
- 0 to 1450 psig (0 to 100 bar)
- 0 to 1450 psig (0 to 100 bar), calculated
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RD20-EFP Series

*Flow Coefficient: 13*

*Maximum Inlet Pressure: 507 psig (35.0 bar)*

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

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, (\text{Nm}^3/\text{h})</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 130 psig (0 to 9.0 bar)</td>
<td>Inlet Pressure, psig (bar)</td>
</tr>
<tr>
<td>0 to 43.0 psig (0 to 3.0 bar)</td>
<td>Nitrogen Flow, std ft(^3)/min</td>
</tr>
</tbody>
</table>

![Graph showing Pressure Control Range and Nitrogen Flow](image-url)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RD25 Series
Flow Coefficient: 21
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 130 psig (0 to 9.0 bar)</td>
<td>Inlet Pressure, psig (bar)</td>
</tr>
<tr>
<td>0 to 43.0 psig (0 to 3.0 bar)</td>
<td>Outlet Pressure, psig</td>
</tr>
<tr>
<td>218 (15.0)</td>
<td>507 (35.0)</td>
</tr>
</tbody>
</table>

RD25 Series
Flow Coefficient: 21
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1015 psig (0 to 70.0 bar)</td>
<td>Inlet Pressure, psig (bar)</td>
</tr>
<tr>
<td>0 to 290 psig (0 to 20.0 bar)</td>
<td>Outlet Pressure, psig</td>
</tr>
<tr>
<td>1015 (70.0)</td>
<td>507 (35.0)</td>
</tr>
</tbody>
</table>
Flow Data
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RDH25 Series
Flow Coefficient: 21
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range
- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)

RDH25 Series
Flow Coefficient: 21
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)

Pressure Control Range
- 0 to 2900 psig (0 to 200 bar)
- 0 to 2537 psig (0 to 175 bar)
- 0 to 1450 psig (0 to 100 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RD25-EFP Series

*Flow Coefficient: 21*

*Maximum Inlet Pressure: 507 psig (35.0 bar)*

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

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

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size</th>
<th>Dimensions, in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD(H)20</td>
<td>2 in.</td>
<td>9.33 (237) 7.28 (185) 2.44 (62.0) 4.33 (110) 5.51 (140)</td>
</tr>
<tr>
<td>RD(H)25</td>
<td>2 1/2 in.</td>
<td>11.8 (300) 9.25 (235) 3.42 (87.0) 4.92 (125) 6.69 (170)</td>
</tr>
</tbody>
</table>

Shown with RS2 series pilot regulator.

### Ordering Information

Build an RD(H)20 and RD(H)25 series regulator ordering number by combining the designators in the sequence shown below.

1. **Series**
   - RD = 1015 psig (70.0 bar) maximum inlet pressure (507 psig [35.0 bar] with pilot regulator, options 0, 1, or 2)
   - RDH = 5800 psig (400 bar) maximum inlet pressure (RDH20); 4060 psig (280 bar) maximum inlet pressure (RDH25)

2. **Inlet / Outlet**
   - B = Female ISO/BSP parallel thread
   - N = Female NPT
   - FA = ASME B16.5 flange
   - FD = EN 1092 (DIN) flange
   - RD(H)20 only.

3. **Size**
   - 20 = 2 in. / DN50
   - 25 = 2 1/2 in. / DN65

4. **Pressure Class**
   - Omit designator if flanges are not ordered.
   - A = ASME class 150
   - B = ASME class 300
   - C = ASME class 600
   - E = ASME class 1500
   - F = ASME class 2500
   - M = EN class PN16
   - N = EN class PN40

5. **Flange Facing**
   - Omit designator if flanges are not ordered.
   - 1 = Raised face smooth
   - 3 = RTJ

6. **Body Material**
   - 02 = 316L SS

7. **Pilot Regulator Options**
   - Pressure Control Range
     - X = No pilot regulator, optional
     - RD series with LRS4 series pilot regulator
       - 0 = 0 to 43 psig (0 to 3.0 bar)
       - 1 = 0 to 130 psig (0 to 9.0 bar)
       - 2 = 0 to 290 psig (0 to 20.0 bar)
     - RD series with RS2 series pilot regulator
       - 3 = 0 to 1015 psig (0 to 70.0 bar)
     - RDH series with RS2 series pilot regulator
       - 4 = 0 to 145 psig (0 to 10.0 bar)
       - 5 = 0 to 362 psig (0 to 25.0 bar)
       - 6 = 0 to 1450 psig (0 to 100 bar)
       - 7 = 0 to 2537 psig (0 to 175 bar)
       - 8 = 0 to 2900 psig (0 to 200 bar)

8. **Seal Material**
   - V = Fluorocarbon FKM
   - N = Nitrile
   - E = EPDM
   - L = Low temperature Nitrile

9. **Diaphragm Material**
   - V = Fluorocarbon FKM
   - N = Nitrile
   - E = EPDM
   - L = Low temperature Nitrile

10. **Seat Seal Material**
    - RD series
      - V = Fluorocarbon FKM
      - N = Nitrile
      - E = EPDM
      - L = Low temperature Nitrile
    - RDH series
      - K = PCTFE
      - P = PEEK

11. **Options**
    - EFP = External feedback to pilot regulator, limited to 290 psig (20.0 bar)
    - N = NACE MR0175/ISO 15156
    - G93 = ASTM G93 Level C-cleaned
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)30 and RD(H)40 Series

Features
- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator with dynamic regulation
- Dome-to-outlet pressure ratio approximately 1:1
- Large dome for stability
- Floating seat for improved sealing reliability (patent pending)

Options
- External feedback (EF) to pilot regulator for improved performance
- EF to pilot regulator limited to 290 psig (20.0 bar)
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge / Dome Connection</th>
<th>Weight (With Class 150 Flanges) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD</td>
<td>1015 (70.0) [507 [35.0] with LRS4 pilot regulator]</td>
<td>1015 (70.0)</td>
<td>Diaphragm</td>
<td>–49 to 176 (–45 to 80)</td>
<td>RD(H)30: 36</td>
<td>RD(H)40: 73</td>
<td>EN or ASME flanges— RD(H)30: 3 in. RD(H)40: 4 in.</td>
<td>Use P1 gauge connection of pilot regulator. Dome: 1/4 in. ISO/BSP parallel thread</td>
<td>RD(H)30: 136 (62) RD(H)40: 183 (83)</td>
</tr>
<tr>
<td>RDH</td>
<td>4060 (280)</td>
<td>2900 (200)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See pages 78 to 85 for flow data.

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Cap screw</td>
<td>A4-80</td>
</tr>
<tr>
<td>2 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>3 Dome</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>4 Dome plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>5 Diaphragm</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>6 Conical spring (RD(H)30 only)</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>7 Diaphragm plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>8 Retaining ring</td>
<td>Commercial stainless steel</td>
</tr>
<tr>
<td>9 Body assembly (body, reducers, flanges)</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>10 Body plate</td>
<td></td>
</tr>
<tr>
<td>11 Poppet</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>12 O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>13 Seat</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>14 Seat seal</td>
<td>RD EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td></td>
<td>RDH PEEK</td>
</tr>
<tr>
<td>15 Poppet housing</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>16 O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>17 Plug O-ring</td>
<td></td>
</tr>
<tr>
<td>18 Guide ring</td>
<td>PTFE</td>
</tr>
<tr>
<td>19 Poppet spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>20 Body plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>21 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>22 Cap Screw</td>
<td>A4-80</td>
</tr>
</tbody>
</table>

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in italics.

Gauge plugs (not shown): 431 SS / A276.
**Flow Data**
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

**RD30 Series**
*Flow Coefficient: 36*
*Maximum Inlet Pressure: 507 psig (35.0 bar)*
*Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)*

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

**RD30 Series**
*Flow Coefficient: 36*
*Maximum Inlet Pressure: 1015 psig (70.0 bar)*
*Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)*

**Pressure Control Range**
- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RDH30 Series
Flow Coefficient: 36
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

RDH30 Series
Flow Coefficient: 36
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)
Flow Data
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok sales and service center.

RDH30 Series
Flow Coefficient: 36
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok sales and service center.

RD30-EFP Series

Flow Coefficient: 36
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

RD30-EFP Series

Flow Coefficient: 36
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RD40 Series
Flow Coefficient: 73
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

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

RD40 Series
Flow Coefficient: 73
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range
- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.5 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RDH40 Series
Flow Coefficient: 73
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

RDH40 Series
Flow Coefficient: 73
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases. For more flow curve information, contact your authorized Swagelok sales and service center.

RDH40 Series

Flow Coefficient: 73
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)

Pressure Control Range

- 0 to 2900 psig (0 to 200 bar)
- 0 to 2537 psig (0 to 175 bar)

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

Flow Data

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

RD40-EFP Series
Flow Coefficient: 73
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

RD40-EFP Series
Flow Coefficient: 73
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)
**Dimensions**

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size</th>
<th>Dimensions, in. (mm)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RD(H)30</td>
<td>3 in.</td>
<td>12.2 (310)</td>
<td>9.55 (243)</td>
<td>3.33 (84.6)</td>
<td>5.91 (150)</td>
<td>7.48 (190)</td>
</tr>
<tr>
<td>RD(H)40</td>
<td>4 in.</td>
<td>14.0 (356)</td>
<td>11.4 (290)</td>
<td>4.37 (111)</td>
<td>5.91 (150)</td>
<td>8.27 (210)</td>
</tr>
</tbody>
</table>

**Ordering Information**

Build an RD(H)30 and RD(H)40 series regulator ordering number by combining the designators in the sequence shown below.

1  2  3  4  5  6  7  8  9  10  11

**Series**
- **RD** = 1015 psig (70.0 bar) maximum inlet pressure (507 psig [35.0 bar] with pilot regulator, options 0, 1, or 2)
- **RDH** = 4060 psig (280 bar) maximum inlet pressure

**Inlet / Outlet**
- **FA** = ASME B16.5 flange
- **FD** = EN 1092 (DIN) flange

**Size**
- **30** = 3 in. / DN80
- **40** = 4 in. / DN100

**Pressure Class**
- **A** = ASME class 150
- **B** = ASME class 300
- **C** = ASME class 600
- **E** = ASME class 1500
- **F** = ASME class 2500
- **M** = EN class PN16
- **N** = EN class PN40

**Flange Facing**
- **1** = Raised face smooth
- **3** = RTJ

**Body Material**
- **02** = 316L SS

**Pressure Control Range**
- **X** = No pilot regulator, optional
- **RD series with LRS4 series pilot regulator**
  - **0** = 0 to 43 psig (0 to 3.0 bar)
  - **1** = 0 to 130 psig (0 to 9.0 bar)
  - **2** = 0 to 290 psig (0 to 20.0 bar)
- **RD series with RS2 series pilot regulator**
  - **3** = 0 to 1015 psig (0 to 70.0 bar)
- **RDH series with RS2 series pilot regulator**
  - **4** = 0 to 145 psig (0 to 10.0 bar)
  - **5** = 0 to 362 psig (0 to 25.0 bar)
  - **6** = 0 to 1450 psig (0 to 100 bar)
  - **7** = 0 to 2537 psig (0 to 175 bar)
  - **8** = 0 to 2900 psig (0 to 200 bar)

**Seal Material**
- **V** = Fluorocarbon FKM
- **N** = Nitrile
- **E** = EPDM
- **L** = Low temperature Nitrile

**Diaphragm Material**
- **V** = Fluorocarbon FKM
- **N** = Nitrile
- **E** = EPDM
- **L** = Low temperature Nitrile

**Seat Seal Material**
- **RD** series
  - **V** = Fluorocarbon FKM
  - **N** = Nitrile
  - **E** = EPDM
  - **L** = Low temperature Nitrile
- **RDH** series
  - **P** = PEEK

**Options**
- **EFP** = External feedback to pilot regulator [outlet pressure limited to 290 psig (20.0 bar)]
- **N** = NACE MR0175/ISO 15156
- **G93** = ASTM G93 Level C-cleaned
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators, High Sensitivity—LPRD20, LPRD25, LPRD30, LPRD40 Series

Features
- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator (LPRS4 series) with dynamic regulation
- High flow
- Large diaphragm for high accuracy
- Integral feedback line
- Inlet and outlet gauges

Options
- Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauges / Dome Connection</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPRD</td>
<td>232 (16.0)</td>
<td>29.0 (2.0)</td>
<td>Diaphragm</td>
<td>–49 to 176 (~45 to 83)</td>
<td>LPRD20: 0.98 (25.0)</td>
<td>LPRD20: 2 in.</td>
<td>EN or ASME flanges - LPRD20: 2 in.</td>
<td>Inlet and outlet gauges included. Dome: 1/4 in. ISO/BSP parallel thread</td>
<td>Varies with model and end connection</td>
</tr>
</tbody>
</table>

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dome assembly</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>2 Dome plate</td>
<td></td>
</tr>
<tr>
<td>3 Diaphragm</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>4 Cap screw</td>
<td>A4-80</td>
</tr>
<tr>
<td>5 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>6 Nut</td>
<td>A2</td>
</tr>
<tr>
<td>7 Diaphragm screw</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>8 Nut</td>
<td>A2</td>
</tr>
<tr>
<td>9 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>10 O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>11 Push rod</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>12 Guide bushing</td>
<td>PTFE</td>
</tr>
<tr>
<td>13 Retaining ring</td>
<td>Commercial stainless steel</td>
</tr>
<tr>
<td>14 Body plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>15 Poppet</td>
<td>431 SS / A276</td>
</tr>
<tr>
<td>16 Seat</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>17 Poppet spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>18 Body plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>19 Poppet housing</td>
<td></td>
</tr>
<tr>
<td>20 Seat seal</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>21 Body assembly</td>
<td>316L SS / A479</td>
</tr>
</tbody>
</table>

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in italics.
Gauge plugs (not shown): 431 SS / A276.
Flow Data
For flow curve information, contact your authorized Swagelok sales and service center.

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size</th>
<th>Dimensions, in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPRD20</td>
<td>2 in.</td>
<td>A: 5.87 (149)</td>
</tr>
<tr>
<td>LPRD25</td>
<td>2 1/2 in.</td>
<td>B: 3.94 (100)</td>
</tr>
<tr>
<td>LPRD30</td>
<td>3 in.</td>
<td>A: 5.87 (149)</td>
</tr>
<tr>
<td>LPRD40</td>
<td>4 in.</td>
<td>B: 3.94 (100)</td>
</tr>
</tbody>
</table>

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

1. Series LPRD = 232 psig (16.0 bar) maximum inlet pressure
2. Inlet / Outlet FA = ASME B16.5 flange
   FD = EN 1092 (DIN) flange
3. Size
   20 = 2 in. / DN50
   25 = 2 1/2 in. / DN65
   30 = 3 in. / DN80
   40 = 4 in. / DN100
4. Pressure Class
   A = ASME class 150
   N = EN class PN40
5. Flange Facing
   1 = Raised face smooth
   3 = RTJ
6. Body Material
   02 = 316L SS
7. Pressure Control Range
   2 = 1.4 to 14.5 psig (0.10 to 1.0 bar)
   3 = 4.3 to 29 psig (0.30 to 2.0 bar)
8. Seal Material
   V = Fluorocarbon FKM
   N = Nitrile
   E = EPDM
   L = Low temperature Nitrile
9. Diaphragm Material
   V = Fluorocarbon FKM
   N = Nitrile
   E = EPDM
   L = Low temperature Nitrile
10. Seat Seal Material
    V = Fluorocarbon FKM
     N = Nitrile
      E = EPDM
      L = Low temperature Nitrile
11. Options
    G93 = ASTM G93 Level C-cleaned
Air-Loaded, Pressure-Reducing Regulators—RA Series

**Features**

- Balanced poppet design
- Diaphragm sensing
- Air-loaded pressure control with a choice of pilot-to-outlet pressure ratios.
- Remote control
- Captured self-vent
- Choice of dome-to-outlet pressure ratios: 1:15, 1:40, or 1:70
- Pneumatic actuation by spring-loaded regulator or proportional regulator

**Options**

- Gauge connection—choice of 4 configurations
- Special cleaning to ASTM G93 Level C

⚠ **WARNING**

Self-venting regulators can release system fluid to atmosphere. Position the self-vent hole away from operating personnel.

⚠ **WARNING**

Improper installation of gauges in NPT threaded ports can result in galling issues.

To order gauge ports without factory plugs installed, contact your authorized Swagelok sales and service center.

**Technical Data**

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Outlet Control Pressure (^1) psig (bar)</th>
<th>Temperature Range °C (°F)</th>
<th>Flow Coefficient ((C_v))</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge / Dome / Vent Connections</th>
<th>Weight (Without Flanges) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA4</td>
<td>5800 (400)</td>
<td>5800 (400)</td>
<td>–40 to 176 (–40 to 80)</td>
<td>1.84</td>
<td>0.39 (10.0)</td>
<td>1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>Gauge: 1/4 in. NPT Dome: 1/4 in. ISO/BSP parallel thread Vent: 1/8 in. ISO/BSP parallel thread</td>
<td>12.5 (5.7)</td>
</tr>
<tr>
<td>RA6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td></td>
<td>13.6 (6.2)</td>
</tr>
<tr>
<td>RA8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 in. ISO/BSP parallel thread, EN or ASME flanges</td>
<td></td>
<td>13.6 (6.2)</td>
</tr>
</tbody>
</table>

See pages 90 to 92 for flow data.

\(^1\) Outlet control limited to 2175 psig (150 bar) for RA series with dome-to-pressure ratio of 1:15.

**Materials of Construction**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dome assembly</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>2 Cap screw</td>
<td>A4-80</td>
</tr>
<tr>
<td>3 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>4 Nut</td>
<td>A2</td>
</tr>
<tr>
<td>5 Diaphragm / support</td>
<td>EPDM, FKM, or nitrile / PTFE</td>
</tr>
<tr>
<td>6 Diaphragm plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>7 Piston plate assembly</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>8 Backup ring</td>
<td>PTFE</td>
</tr>
<tr>
<td>9 O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>10 Piston</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>11 Body</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>12 Relief seat</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>13 Venting poppet</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>14 Seat</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>15 Seat seal</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>16 Poppet</td>
<td>431 SS / A276</td>
</tr>
<tr>
<td>17 Poppet spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>18 Body plug</td>
<td>316L SS / A479</td>
</tr>
</tbody>
</table>

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in italics.

Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change or "droop" in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RA4 Series
Flow Coefficient: 1.84
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Ratio: 1:15, 1:40, 1:70

Pressure Ratio
1:15, 1:40, 1:70
Flow Data

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

RA4 Series

*Flow Coefficient: 1.84*

**Maximum Inlet Pressure: 5800 psig (400 bar)**

**Outlet Pressure Ratio: 1:40, 1:70**

RA6 and RA8 Series

*Flow Coefficient: 1.84*

**Maximum Inlet Pressure: 5800 psig (400 bar)**

**Outlet Pressure Ratio: 1:15, 1:40, 1:70**
Flow Data
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

RA6 and RA8 Series
Flow Coefficient: 1.84
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Ratio: 1:15, 1:40, 1:70

Pressure Ratio

RA6 and RA8 Series
Flow Coefficient: 1.84
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Ratio: 1:40, 1:70

Pressure Ratio
Dimensions

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA4</td>
<td>1/2 in.</td>
<td>2.83 (72.0)</td>
<td>3.07 (78.0)</td>
<td>2.13 (54.0)</td>
<td>3.72 (94.6)</td>
<td>5.75 (146)</td>
<td>4.56 (116)</td>
</tr>
<tr>
<td>RA6</td>
<td>3/4 in.</td>
<td>3.20 (82.0)</td>
<td>3.50 (89.0)</td>
<td>2.20 (56.0)</td>
<td>3.72 (94.6)</td>
<td>3.07 (78.0)</td>
<td>4.02 (102)</td>
</tr>
<tr>
<td>RA8</td>
<td>1 in.</td>
<td>3.07 (78.0)</td>
<td>3.50 (89.0)</td>
<td>2.20 (56.0)</td>
<td>4.02 (102)</td>
<td>2.13 (54.0)</td>
<td>3.72 (94.6)</td>
</tr>
</tbody>
</table>

Standard Configuration

Ordering Information

Build an RA series regulator ordering number by combining the designators in the sequence shown below.

1 Series
RA = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet
B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size
4 = 1/2 in. / DN15
6 = 3/4 in. / DN20
8 = 1 in. / DN25

4 Pressure Class
Omit designator if flanges are not ordered.
A = ASME class 150
B = ASME class 300
C = ASME class 600
E = ASME class 1500
F = ASME class 2500
M = EN class PN16
N = EN class PN40

5 Flange Facing
Omit designator if flanges are not ordered.
1 = Raised face smooth
3 = RTJ

6 Body Material
02 = 316L SS

7 Seal Materials
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

8 Diaphragm Materials
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Seat Seal Materials
K = PCTFE
P = PEEK

10 Ratio (Dome-to-Outlet Pressure)
15 = 1:15
40 = 1:40
70 = 1:70

11 Options
GN2 = Gauge connection, see below
GN4 = Gauge connection, see below
GN5 = Gauge connection, see below
None = Standard connection, see below

Gauge Connection Configuration

G93 = ASTM G93 Level C-cleaned

① Not available in combination with flanges.
② Outlet control range limited to 2175 psig (150 bar).
Pressure-Reducing Regulators
Dome-Loaded—RD Series Maintenance Kits

Regular maintenance of pressure regulator components is an important part of keeping pressure regulators operating successfully. Swagelok offers several maintenance kit options to help keep components and systems performing well. Outlined below are the standard maintenance kit offerings and an example of which parts are included in each kit. For more detailed information of which parts will be included within a kit for a specific regulator model, please reference the appropriate owner’s manual or contact your authorized Swagelok sales and service center.

<table>
<thead>
<tr>
<th>Designator</th>
<th>Kit Type</th>
<th>Typical Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Valve kit</td>
<td>Poppet and housing (9, 13, 18 or 20), O-rings (11, 16a), Back-up rings (19), Seat (10),</td>
</tr>
<tr>
<td>A2</td>
<td>Soft valve kit</td>
<td>Poppet and housing (9, 13, 18 or 20), O-rings (16a), Back-up rings (19)</td>
</tr>
<tr>
<td>B1</td>
<td>Service kit</td>
<td>Poppet and housing (9, 13, 18 or 20), O-rings (11, 16a, 16b, 17, 21, 22), Back-up rings (19), Diaphragm (5), Seat (10)</td>
</tr>
<tr>
<td>B2</td>
<td>Seal kit</td>
<td>O-rings (11, 16a, 16b, 17, 21, 22), Back-up rings (19), Diaphragm (5)</td>
</tr>
<tr>
<td>C1</td>
<td>Overhaul kit</td>
<td>Poppet and housing (9, 13, 18 or 20), O-rings (11, 16a, 16b, 17, 21, 22), Back-up rings (19), Poppet spring (14), Body plug (15), Diaphragm (5), Diaphragm plate (6), Seat (10)</td>
</tr>
<tr>
<td>C2</td>
<td>Body plug kit</td>
<td>O-ring (17, 16b), Body plug (15)</td>
</tr>
<tr>
<td>C3</td>
<td>Sensing kit</td>
<td>Diaphragm (5)</td>
</tr>
<tr>
<td>C5</td>
<td>Poppet spring kit</td>
<td>Poppet spring (14)</td>
</tr>
<tr>
<td>E1</td>
<td>Hardware kit</td>
<td>Bolts (2), Washers (3)</td>
</tr>
</tbody>
</table>

Ordering Information
To order a maintenance kit, add the kit type designator to the regulator ordering number.
Example: RDN10-02-2-VVV-C1
Back-Pressure, Spring-Loaded Regulators—BS Series

The BS series back-pressure regulators are suitable for most gases and liquids. The BS series regulators feature a choice of sensing types (diaphragm or piston), and seat and seal materials to accommodate a variety of pressure, temperature, and flow conditions.

The BS series regulators are available in sizes from 1/4 to 1 1/2 in. with a choice of threaded or flange end connections.

The BSH series regulators are high-pressure versions of the BS series regulators, and the LBS series are low-pressure, high-accuracy versions of the BS series regulators.

Features
- Spring-loaded pressure control
- Diaphragm or piston sensing types
- Blue knob or screw adjustment
- 316L SS materials of construction for corrosion resistance
- Maximum inlet pressure rating: 507 to 10,150 psig (35.0 to 700 bar)
- Inlet control pressure range: Up to 0 to 10,150 psig (0 to 700 bar)

Pressure-Temperature Ratings

<table>
<thead>
<tr>
<th>Seal Material</th>
<th>Temperature Range °F (°C)</th>
<th>Material Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorocarbon FKM</td>
<td>5 to 176 (–15 to 80)</td>
<td>V</td>
</tr>
<tr>
<td>Standard Nitrile</td>
<td>–4 to 176 (–20 to 80)</td>
<td>N</td>
</tr>
<tr>
<td>Low temperature Nitrile</td>
<td>–49 to 176 (–45 to 80)</td>
<td>L</td>
</tr>
<tr>
<td>EPDM</td>
<td>–4 to 176 (–20 to 80)</td>
<td>E</td>
</tr>
<tr>
<td>FFKM</td>
<td>14 to 176 (–10 to 80)</td>
<td>F</td>
</tr>
</tbody>
</table>

Pressure-Temperature Ratings

<table>
<thead>
<tr>
<th>Temperature °F (°C)</th>
<th>Maximum Inlet Pressure / Working Pressure psig (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>–49 to -40 (–45 to -40)</td>
<td>– / –</td>
</tr>
<tr>
<td>–40 to -4 (–40 to -20)</td>
<td>5800 (400) / 5800 (400)</td>
</tr>
<tr>
<td>95 (35)</td>
<td>1015 (70.0)</td>
</tr>
<tr>
<td>149 (65)</td>
<td>3987 (275) / 10 150 (700)</td>
</tr>
<tr>
<td>176 (80)</td>
<td>1812 (125)</td>
</tr>
</tbody>
</table>

Technical Data—Performance Ratings

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Inlet Control Pressure psig (bar)</th>
<th>Flow Coefficient $C_v$</th>
<th>Sensing Type</th>
<th>Flow Data on Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS2</td>
<td>5 800 (400)</td>
<td>5 075 (350)</td>
<td>0.10</td>
<td>Piston</td>
<td>98</td>
</tr>
<tr>
<td>BSH2</td>
<td>10 150 (700)</td>
<td>10 150 (700)</td>
<td>1.84</td>
<td>Diaphragm or piston</td>
<td>102</td>
</tr>
<tr>
<td>BS4</td>
<td>1 015 (70.0)</td>
<td>406 (28.0) diaphragm / 5 220 (360) piston</td>
<td>1.84</td>
<td>Diaphragm or piston</td>
<td>103</td>
</tr>
<tr>
<td>BSH4</td>
<td>5 800 (400)</td>
<td>1 015 (70.0)</td>
<td>1.95</td>
<td>Diaphragm or piston</td>
<td>104</td>
</tr>
<tr>
<td>BS6</td>
<td>1 015 (70.0)</td>
<td>203 (14.0) diaphragm / 5 220 (360) piston</td>
<td>2.07</td>
<td>Diaphragm or piston</td>
<td>—</td>
</tr>
<tr>
<td>BS8</td>
<td>1 015 (70.0)</td>
<td>203 (14.0) diaphragm / 5 220 (360) piston</td>
<td>2.07</td>
<td>Diaphragm or piston</td>
<td>—</td>
</tr>
<tr>
<td>BSH8</td>
<td>5 800 (400)</td>
<td>1 015 (70.0)</td>
<td>3.84</td>
<td>Diaphragm or piston</td>
<td>—</td>
</tr>
<tr>
<td>BS10</td>
<td>1 015 (70.0)</td>
<td>290 (20.0) diaphragm / 3 625 (250) piston</td>
<td>3.84</td>
<td>Diaphragm or piston</td>
<td>—</td>
</tr>
<tr>
<td>BSH10</td>
<td>3 625 (250)</td>
<td>290 (20.0) diaphragm / 3 625 (250) piston</td>
<td>3.84</td>
<td>Diaphragm or piston</td>
<td>—</td>
</tr>
<tr>
<td>BS15</td>
<td>1 015 (70.0)</td>
<td>290 (20.0) diaphragm / 3 625 (250) piston</td>
<td>7.3</td>
<td>Diaphragm or piston</td>
<td>—</td>
</tr>
<tr>
<td>BSH15</td>
<td>3 625 (250)</td>
<td>290 (20.0) diaphragm / 3 625 (250) piston</td>
<td>7.3</td>
<td>Diaphragm or piston</td>
<td>—</td>
</tr>
<tr>
<td>LBS4</td>
<td>507 (35.0)</td>
<td>290 (20.0)</td>
<td>1.3</td>
<td>Diaphragm</td>
<td>113</td>
</tr>
</tbody>
</table>

1. Regulator pressure rating may be limited by connection type.

Improper installation of gauges in NPT threaded ports can result in galling issues.

To order gauge ports without factory plugs installed, please have your sales and service center contact Swagelok technical service.
Back-Pressure, Spring-Loaded Regulators—BS Series

Technical Data—Design

<table>
<thead>
<tr>
<th>Series</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge Connection</th>
<th>Weight (Without Flanges) lb (kg)</th>
<th>More Information on Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS2</td>
<td>0.087 (2.2)</td>
<td>1/4 in. NPT</td>
<td>1/4 in. NPT</td>
<td>3.3 (1.5)</td>
<td>97</td>
</tr>
<tr>
<td>BSH2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS4</td>
<td>0.39 (10.0) or 0.19 (5.0)</td>
<td>1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>7.7 (3.5)</td>
<td>101</td>
</tr>
<tr>
<td>BSH4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS6</td>
<td>0.39 (10.0) or 0.19 (5.0)</td>
<td>3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>9.9 (4.5)</td>
<td>101</td>
</tr>
<tr>
<td>BSH6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS8</td>
<td>0.39 (10.0) or 0.19 (5.0)</td>
<td>1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT</td>
<td>9.9 (4.5)</td>
<td>101</td>
</tr>
<tr>
<td>BSH8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS10</td>
<td>0.53 (13.5)</td>
<td>1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT or ISO/BSP parallel thread</td>
<td>16.7 (7.6)</td>
<td>106</td>
</tr>
<tr>
<td>BSH10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS15</td>
<td>0.75 (19.0)</td>
<td>1 1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges</td>
<td>1/4 in. NPT or ISO/BSP parallel thread</td>
<td>22.0 (10)</td>
<td>106</td>
</tr>
<tr>
<td>BSH15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LBS4</td>
<td>0.31 (8.0)</td>
<td>1/2 in. NPT</td>
<td>1/4 in. NPT</td>
<td>5.7 (2.6)</td>
<td>112</td>
</tr>
</tbody>
</table>
Compact, General-Purpose, Spring-Loaded Back-Pressure Regulators—BS(H)2 Series

**Features**
- Piston sensing
- Bottom mounting
- Low-friction piston for better control

**Options**
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C
- Panel mounting kit sold separately—no disassembly required

### Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Inlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connections</th>
<th>Gauge / Vent Connection</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS2</td>
<td>5 800 (400)</td>
<td>5 075 (350)</td>
<td>Piston</td>
<td>–40 to 176 (~40 to 80)</td>
<td>0.10</td>
<td>0.087 (2.2)</td>
<td>1/4 in. NPT</td>
<td>Gauge: 1/4 in. NPT Vent: 1/8 in. NPT</td>
<td>3.3 (1.5)</td>
</tr>
<tr>
<td>BSH2</td>
<td>10 150 (700)</td>
<td>10 150 (700)</td>
<td></td>
<td>–4 to 176 (~20 to 80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See Pressure-Temperature Ratings, page 95, for ratings.
See pages 98 to 99 for flow data.

**Materials of Construction**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Knob assembly with adjusting screw, nuts, washer</td>
<td>Blue ABS with 431 SS</td>
</tr>
<tr>
<td>2 Spring housing cover</td>
<td>431 SS / A276</td>
</tr>
<tr>
<td>3 Spring housing</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>4 C-ring</td>
<td>A2</td>
</tr>
<tr>
<td>5 Spring guide</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>6 Set spring</td>
<td>50CRV4</td>
</tr>
<tr>
<td>7 Bottom spring guide</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>8 Backup ring (BSH only)</td>
<td>PTFE</td>
</tr>
<tr>
<td>9 O-rings</td>
<td>EPDM, FKM, FFKM, or nitrile</td>
</tr>
<tr>
<td>10 Piston plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>11 Piston</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>12 Overtravel spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>13 Piston screw</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>14 Body plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>15 Poppet</td>
<td>431 SS / A276</td>
</tr>
<tr>
<td>16 Seat</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>17 Seat retainer</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>18 Body</td>
<td>316L SS / A479</td>
</tr>
</tbody>
</table>

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in italics.
Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

**BS(H)2 Series**

*Flow Coefficient: 0.10*

*Maximum Inlet Pressure: BS2—5800 psig (400 bar); BSH2—10 150 psig (700 bar)*

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

*Pressure Control Range*

- 0 to 1450 psig (0 to 100 bar)
- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)

![Graph showing pressure control range for BS(H)2 Series](image1)

---

**BS(H)2 Series**

*Flow Coefficient: 0.10*

*Maximum Inlet Pressure: BS2—5800 psig (400 bar); BSH2—10 150 psig (700 bar)*

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

*Pressure Control Range*

- 0 to 5075 psig (0 to 350 bar)
- 0 to 5075 psig (0 to 350 bar), calculated
- 0 to 2537 psig (0 to 175 bar)

![Graph showing pressure control range for BS(H)2 Series](image2)
Flow Data
The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

BSH2 Series

*Flow Coefficient: 0.10*

*Maximum Inlet Pressure: 10 150 psig (700 bar)*

*Inlet Pressure Control Range: 0 to 10 150 psig (0 to 700 bar)*
**Dimensions**
Dimensions, in inches (millimeters), are for reference only and are subject to change.

**Panel Mounting Kit**
No disassembly required when using panel mount kit. Panel mounting kit ordering numbers:
- **BS2 series:** RS2-P-02
- **BSH2 series:** RSH2-P-02

**Ordering Information**
Build a BS2 or BSH2 series regulator ordering number by combining the designators in the sequence shown below.

1. **Series**
   - **BS:** 5800 psig (400 bar) maximum inlet pressure
   - **BSH:** 10 150 psig (700 bar) maximum inlet pressure

2. **Inlet / Outlet**
   - **N2:** 1/4 in. female NPT

3. **Body Material**
   - **02:** 316L SS

4. **Pressure Control Range**
   - **BS and BSH series**
     - 1 = 0 to 145 psig (0 to 10.0 bar)
     - 2 = 0 to 362 psig (0 to 25.0 bar)
     - 3 = 0 to 1450 psig (0 to 100 bar)
     - 4 = 0 to 2537 psig (0 to 175 bar)
     - 5 = 0 to 5075 psig (0 to 350 bar)
     - **BSH series only**
       - 6 = 0 to 10 150 psig (0 to 700 bar)

5. **Seal Material**
   - **BS and BSH series**
     - **V:** Fluorocarbon FKM
     - **N:** Nitrile
     - **E:** EPDM
     - **F:** FFKM
   - **BSH series only**
     - **L:** Low temperature Nitrile

6. **Piston Seals**
   - **BS and BSH series**
     - **V:** Fluorocarbon FKM
     - **N:** Nitrile
     - **E:** EPDM
     - **F:** FFKM
   - **BSH series only**
     - **L:** Low temperature Nitrile

7. **Seat Material**
   - **BS series**
     - **K:** PCTFE
     - **P:** PEEK
   - **BSH series**
     - **P:** PEEK

8. **Options**
   - **N:** NACE MR0175/ISO 15156
   - **G93:** ASTM G93 Level C-cleaned
General-Purpose, Spring-Loaded Back-Pressure Regulators—BS(H)4, BS(H)6, and BS(H)8 Series

Features
- Diaphragm sensing: 0 to 406 psig (0 to 28.0 bar)
- Piston sensing: 0 to 5220 psig (0 to 360 bar)
- Threaded vent to monitor seal integrity

Options
- Antitamper
- Gauge connections — choice of 4 configurations
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Inlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Connections</th>
<th>Weight (Without Flanges) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS(H)4</td>
<td>BS: 1015 (70.0) BSH: 5900 (400)</td>
<td>BS4: 0 to 406 psig (28.0 bar) BSH4: 0 to 203 psig (14.0 bar)</td>
<td>Diaphragm: BS4: 0 to 406 psig (28.0 bar) BSH4: 0 to 203 psig (14.0 bar)</td>
<td>–40 to 176 (~40 to 80)</td>
<td>0.39 (10.0) for up to 1160 psig (80.0 bar) 0.19 (5.0) for 5220 psig (150 to 360 bar)</td>
<td>1/2 in. DN15 NPT ISO/BSP parallel thread</td>
<td>Gauge: 1/4 in. NPT Vent: 1/8 in. ISO/BSP parallel thread</td>
<td>7.7 (3.5)</td>
</tr>
<tr>
<td>BS(H)6</td>
<td>BS6: 1015 (70.0) BSH6: 5900 (400)</td>
<td>BS6: 0 to 406 psig (28.0 bar) BSH6: 0 to 203 psig (14.0 bar)</td>
<td>Diaphragm: BS6: 0 to 406 psig (28.0 bar) BSH6: 0 to 203 psig (14.0 bar)</td>
<td>–40 to 176 (~40 to 80)</td>
<td>0.39 (10.0) for up to 1160 psig (80.0 bar) 0.19 (5.0) for 5220 psig (150 to 360 bar)</td>
<td>3/4 in. DN20</td>
<td>Gauge: 1/4 in. NPT Vent: 1/8 in. ISO/BSP parallel thread</td>
<td>9.9 (4.5)</td>
</tr>
<tr>
<td>BS(H)8</td>
<td>BS8: 1015 (70.0) BSH8: 5900 (400)</td>
<td>BS8: 0 to 406 psig (28.0 bar) BSH8: 0 to 203 psig (14.0 bar)</td>
<td>Diaphragm: BS8: 0 to 406 psig (28.0 bar) BSH8: 0 to 203 psig (14.0 bar)</td>
<td>–40 to 176 (~40 to 80)</td>
<td>0.39 (10.0) for up to 1160 psig (80.0 bar) 0.19 (5.0) for 5220 psig (150 to 360 bar)</td>
<td>1 in. DN25</td>
<td>Gauge: 1/4 in. NPT Vent: 1/8 in. ISO/BSP parallel thread</td>
<td>7.7 (3.5)</td>
</tr>
</tbody>
</table>

See pages 102 and 104 for flow data.

Materials of Construction

BS Series Regulator with Diaphragm Sensing and Standard Knob

BSH Series Regulator with Piston Sensing and Antitamper Option

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Spring housing</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>2 Spring guide</td>
<td>Commercial stainless steel</td>
</tr>
<tr>
<td>3 Ball</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>4 Set spring</td>
<td>A4-80</td>
</tr>
<tr>
<td>5 Cap screw</td>
<td>A4</td>
</tr>
<tr>
<td>6 Washer</td>
<td>PCTFE or PEEK</td>
</tr>
<tr>
<td>7 Seat seal</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>8 Body</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>9 Poppet</td>
<td>431 SS / A276</td>
</tr>
<tr>
<td>10 O-rings</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>11 Seat</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>12 Overtravel spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>13 Body plug</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>14 Knob assembly with adjusting screw, nuts, washers</td>
<td>Blue ABS with A2-70</td>
</tr>
<tr>
<td>15 Antitamper with O-ring, adjusting screw</td>
<td>316L SS and A2-70 (O-ring same as item 10)</td>
</tr>
<tr>
<td>16 Diaphragm</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>17 Diaphragm plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>18 Diaphragm screw</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>19 Piston plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>20 Piston</td>
<td>PTFE</td>
</tr>
<tr>
<td>21 Backup ring</td>
<td>316L SS / A479</td>
</tr>
</tbody>
</table>

Wetted lubricant: Silicone-based, synthetic hydrocarbon-based

➀ BSH4 (range 5 and 6), BSH6 (range 6), and BSH8 (range 6) the material will be Alloy 2507.
Wetted components listed in italics.
Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

BS(H)4 Series
Flow Coefficient: 1.84
Maximum Inlet Pressure: BS4—1015 psig (70.0 bar); BSH4—5800 psig (400 bar)

BSH4 Series
Flow Coefficient: 0.49
Maximum Inlet Pressure: 5800 psig (400 bar)
Inlet Pressure Control Range: 0 to 5220 psig (0 to 360 bar)

Pressure Control Range
0 to 5220 psig (360 bar)
Flow Data
The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

BS(H)6 Series
*Flow Coefficient: 1.95*
*Maximum Inlet Pressure: BS6—1015 psig (70.0 bar); BSH6—5800 psig (400 bar)*

<table>
<thead>
<tr>
<th>Regulator Series</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSH6 only</td>
<td></td>
</tr>
<tr>
<td>BS6 and BSH6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BS6 Series</th>
<th>Nitrogen Flow, std ft³/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Coefficient: 0.49</td>
<td></td>
</tr>
<tr>
<td><em>Maximum Inlet Pressure: 5800 psig (400 bar)</em></td>
<td></td>
</tr>
<tr>
<td><em>Inlet Pressure Control Range: 0 to 5220 psig (0 to 360 bar)</em></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5220 psig (360 bar)</td>
<td></td>
</tr>
</tbody>
</table>
Flow Data
The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

BS(H)8 Series
*Flow Coefficient: 2.07*
*Maximum Inlet Pressure: BS8—1015 psig (70.0 bar); BSH8—5800 psig (400 bar)*

- **Regulator Series**
  - BSH8 only
  - BS8 and BSH8

BSH8 Series
*Flow Coefficient: 0.49*
*Maximum Inlet Pressure: 5800 psig (400 bar)*
*Inlet Pressure Control Range: 0 to 5220 psig (0 to 360 bar)*

- **Pressure Control Range**
  - 0 to 5220 psig (360 bar)
Dimensions

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size</th>
<th>Dimensions, in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS(H)4</td>
<td>1/2 in.</td>
<td>A: 9.06 (230) B: 2.83 (72.0) C: 3.07 (78.0) D: 2.09 (53.0) E: 3.62 (92.0)</td>
</tr>
<tr>
<td>BS(H)6</td>
<td>3/4 in.</td>
<td>A: 9.25 (235) B: 3.23 (82.0) C: 3.50 (89.0) D: 2.20 (56.0) E: 3.94 (100)</td>
</tr>
<tr>
<td>BS(H)8</td>
<td>1 in.</td>
<td>A: 9.25 (235) B: 3.07 (78.0) C: 3.50 (89.0) D: 2.20 (56.0) E: 3.94 (100)</td>
</tr>
</tbody>
</table>

Ordering Information

Build a BS(H)4, BS(H)6, and BS(H)8 series regulator ordering number by combining the designators in the sequence shown below.

1. Series
   - BS = 1015 psig (70.0 bar) maximum inlet pressure
   - BSH = 5800 psig (400 bar) maximum inlet pressure

2. Inlet / Outlet
   - B = Female ISO/BSP parallel thread
   - N = Female NPT
   - FA = ASME B16.5 flange
   - FD = EN 1092 (DIN) flange

3. Size
   - 4 = 1/2 in. / DN15
   - 6 = 3/4 in. / DN20
   - 8 = 1 in. / DN25

4. Pressure Class
   - Omit designator if flanges are not ordered.
   - A = ASME class 150
   - B = ASME class 300
   - C = ASME class 600
   - E = ASME class 1500
   - F = ASME class 2500
   - M = EN class PN16
   - N = EN class PN40

5. Flange Facing
   - Omit designator if flanges are not ordered.
   - 1 = Raised face smooth
   - 3 = RTJ

6. Body Material
   - 02 = 316L SS

7. Pressure Control Range
   - Diaphragm sensing
     - 1 = 0 to 43 psig (0 to 3.0 bar)
     - 2 = 0 to 101 psig (0 to 7.0 bar)
     - 3 = 0 to 203 psig (0 to 14.0 bar)
     - 4 = 0 to 406 psig (0 to 28.0 bar)
   - Piston sensing
     - 4 = 0 to 406 psig (0 to 28.0 bar)
     - 5 = 0 to 580 psig (0 to 40.0 bar)
     - 6 = 0 to 1160 psig (0 to 80.0 bar)
     - 7 = 0 to 2175 psig (0 to 150 bar)
     - 9 = 0 to 4060 psig (0 to 280 bar)
     - 11 = 0 to 5220 psig (0 to 360 bar)
   - BS(H)4 series only.
   - BS(H)6 and BS(H)8 series only.

8. Seal Material
   - V = Fluorocarbon FKM
   - N = Nitrile
   - E = EPDM
   - L = Low temperature Nitrile

9. Diaphragm / Piston O-Rings
   - V = Fluorocarbon FKM
   - N = Nitrile
   - E = EPDM
   - L = Low temperature Nitrile

10. Seat Seal Material
    - K = PCTFE
    - P = PEEK

11. Options
    - A = Antitamper
    - GN1 = Gauge connection, see below
    - GN2 = Gauge connection, see below
    - GN5 = Gauge connection, see below
    - None = Standard connection, see below

Gauge Connection Configuration

<table>
<thead>
<tr>
<th>Standard</th>
<th>GN1</th>
<th>GN2</th>
<th>GN5</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = NACE MR0175/ISO 15156</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G93 = ASTM G93 Level C-cleaned</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
General-Purpose, Spring-Loaded Back-Pressure Regulators—
BS(H)10 and BS(H)15 Series

Features
■ Balanced poppet design
■ Diaphragm sensing:
  0 to 290 psig (0 to 20.0 bar)
■ Piston sensing:
  0 to 3625 psig (0 to 250 bar)
■ High flow capacity

Options
■ NACE MR0175/ISO 15156-compliant models
■ Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure psig (bar)</th>
<th>Maximum Inlet Control Pressure psig (bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (C_v)</th>
<th>Seat Diameter In. (mm)</th>
<th>Connections Inlet and Outlet Size Type Gauge</th>
<th>Weight (Without Flanges) lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS(H)10</td>
<td>1015 (70.0)</td>
<td>BS: 290 (20.0)</td>
<td>Diaphragm: 0 to 290 psig (20.0 bar)</td>
<td>-49 to 176 (-45 to 80)</td>
<td>3.84</td>
<td>0.53 (13.5)</td>
<td>1 in. DN25 NPT ISO/BSP parallel thread ASME or EN flange</td>
<td>16.7 (7.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BSH: 3625 (250)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS(H)15</td>
<td>7.3</td>
<td>0.75 (19.0)</td>
<td>1 1/2 in. DN40</td>
<td></td>
<td></td>
<td></td>
<td>1/4 in. NPT or ISO/BSP parallel</td>
<td>22.0 (10.0)</td>
</tr>
</tbody>
</table>

See pages 107 to 110 for flow data.
① Regulators with NPT inlet / outlet connections have 1/4 in. NPT gauge connections.

Materials of Construction

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Adjusting screw</td>
<td>A2-70</td>
</tr>
<tr>
<td>2 Set screw nut</td>
<td>A2</td>
</tr>
<tr>
<td>3 Ball</td>
<td>420 SS (Hardened)</td>
</tr>
<tr>
<td>4 Upper spring guide</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>5 Spring housing assembly</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>6 Set spring</td>
<td>50CRV4</td>
</tr>
<tr>
<td>7 Cap screw</td>
<td>A4-80</td>
</tr>
<tr>
<td>8 Washer</td>
<td>A4</td>
</tr>
<tr>
<td>9 Bottom spring guide</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>10 O-ring</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>11 Poppet housing</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>12 Seat seal</td>
<td>BS EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td></td>
<td>BSH PCTFE or PEEK</td>
</tr>
<tr>
<td>13 Seat</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>14 Poppet</td>
<td></td>
</tr>
<tr>
<td>15 Body</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>16 Body plug</td>
<td></td>
</tr>
<tr>
<td>17 Nut</td>
<td>A4</td>
</tr>
<tr>
<td>18 Diaphragm</td>
<td>EPDM, FKM, or nitrile</td>
</tr>
<tr>
<td>19 Clamp plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>20 Retaining ring</td>
<td>1.4122 Steel</td>
</tr>
<tr>
<td>21 Body plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>22 Piston</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>23 Backup ring</td>
<td>PTFE</td>
</tr>
<tr>
<td>24 Piston plate</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>25 Overtravel spring</td>
<td>302 SS / A313</td>
</tr>
<tr>
<td>26 Piston screw</td>
<td>316L SS / A479</td>
</tr>
</tbody>
</table>

Wetted components listed in italics.
Gauge plugs (not shown): 431 SS / A276.
Flow Data
The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

BS10 Series

Flow Coefficient: 3.84
Maximum Inlet Pressure: 1015 psig (70 bar)
Inlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range

<table>
<thead>
<tr>
<th>Pressure Control Range</th>
<th>Nitrogen Flow, Nm³/h</th>
<th>Nitrogen Flow, std ft³/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet Pressure, psig</td>
<td>Inlet Pressure, bar</td>
<td></td>
</tr>
<tr>
<td>0 to 290 psig (0 to 20.0 bar)</td>
<td>0 to 290 psig (0 to 20.0 bar)</td>
<td>0 to 290 psig (0 to 20.0 bar)</td>
</tr>
<tr>
<td>0 to 145 psig (0 to 10.0 bar)</td>
<td>0 to 145 psig (0 to 10.0 bar)</td>
<td>0 to 145 psig (0 to 10.0 bar)</td>
</tr>
<tr>
<td>0 to 72 psig (0 to 5.0 bar)</td>
<td>0 to 72 psig (0 to 5.0 bar)</td>
<td>0 to 72 psig (0 to 5.0 bar)</td>
</tr>
<tr>
<td>0 to 43 psig (0 to 3.0 bar)</td>
<td>0 to 43 psig (0 to 3.0 bar)</td>
<td>0 to 43 psig (0 to 3.0 bar)</td>
</tr>
</tbody>
</table>
Flow Data
The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

BSH10 Series
*Flow Coefficient: 3.84*
*Maximum Inlet Pressure: 3625 psig (250 bar)*
*Inlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)*

**Pressure Control Range**
- 0 to 1450 psig (0 to 100 bar)
- 0 to 580 psig (0 to 40.0 bar)


BSH10 Series
*Flow Coefficient: 3.84*
*Maximum Inlet Pressure: 3625 psig (250 bar)*
*Inlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)*

**Pressure Control Range**
- 0 to 3625 psig (0 to 250 bar)
- 0 to 2610 psig (0 to 180 bar)
Flow Data
The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

BS15 Series
Flow Coefficient: 7.3
Maximum Inlet Pressure: 1015 psig (70 bar)
Inlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)
Flow Data
The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

BSH15 Series
*Flow Coefficient: 7.3*
*Maximum Inlet Pressure: 3625 psig (250 bar)*
*Inlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)*

---

BSH15 Series
*Flow Coefficient: 7.3*
*Maximum Inlet Pressure: 3625 psig (250 bar)*
*Inlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)*
Dimensions

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

<table>
<thead>
<tr>
<th>Series</th>
<th>End Connection Size</th>
<th>Dimensions, in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS(H)10</td>
<td>1 in.</td>
<td>A 10.5 (266) B 3.54 (90.0) C 3.07 (78.0) D 2.28 (58.0) E 1.97 (50.0) F 1.77 (45.0)</td>
</tr>
<tr>
<td>BS(H)15</td>
<td>1 1/2 in.</td>
<td>A 10.8 (275) B 4.53 (115) C 3.78 (96.0) D 2.44 (62.0) E 2.01 (51.0) F 1.77 (45.0)</td>
</tr>
</tbody>
</table>

Ordering Information

Build a BS(H)10 and BS(H)15 series regulator ordering number by combining the designators in the sequence shown below.

1 Series
BS = 1015 psig (70.0 bar) maximum inlet pressure
BSH = 3625 psig (250 bar) maximum inlet pressure

2 Inlet / Outlet
B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange
➀ BS(H)10 and BS15 Series only

3 Size
10 = 1 in. / DN25
15 = 1 1/2 in. / DN40

4 Pressure Class
Omit designator if flanges are not ordered.
A = ASME class 150
B = ASME class 300
C = ASME class 600
E = ASME class 1500
F = ASME class 2500
M = EN class PN16
N = EN class PN40

5 Flange Facing
Omit designator if flanges are not ordered.
1 = Raised face smooth
3 = RTJ

6 Body Material
02 = 316L SS

7 Pressure Control Range
Diaphragm sensing (BS series only)
1 = 0 to 43 psig (0 to 3.0 bar)
2 = 0 to 72 psig (0 to 5.0 bar)
3 = 0 to 145 psig (0 to 10.0 bar)
4 = 0 to 290 psig (0 to 20.0 bar)
Piston sensing (BSH series only)
5 = 0 to 580 psig (0 to 40.0 bar)
6 = 0 to 1450 psig (0 to 100 bar)
7 = 0 to 2610 psig (0 to 180 bar)
8 = 0 to 3625 psig (0 to 250 bar)

8 Seal Material
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Diaphragm / Piston O-Rings
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

10 Seat Seal Material
BS series
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile
BSH series
K = PCTFE
P = PEEK

11 Options
N = NACE MR0175/ISO 15156
G93 = ASTM G93 Level C-cleaned
High-Sensitivity, Spring-Loaded Back-Pressure Regulators—LBS4 Series

Features
■ Diaphragm sensing
■ Bottom mounting and panel mounting

Options
■ NACE MR0175/ISO 15156-compliant model
■ Special cleaning to ASTM G93 Level C

Technical Data

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum Inlet Pressure (psig, bar)</th>
<th>Maximum Inlet Control Pressure (psig, bar)</th>
<th>Sensing Type</th>
<th>Temperature Range °F (°C)</th>
<th>Flow Coefficient (Cv)</th>
<th>Seat Diameter in. (mm)</th>
<th>Inlet and Outlet Connection</th>
<th>Gauge Connection</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LBS4</td>
<td>507 (35.0)</td>
<td>290 (20.0)</td>
<td>Diaphragm</td>
<td>–49 to 176 (–45 to 80)</td>
<td>1.3</td>
<td>0.31 (8.0)</td>
<td>1/2 in. NPT</td>
<td>1/4 in. NPT</td>
<td>5.7 (2.6)</td>
</tr>
</tbody>
</table>

See pages 113 and 114 for flow data.

Maximum inlet control pressure limited to 130 psig (9.0 bar) for regulators built with 316SS diaphragms.

Materials of Construction

LBS Series Regulator with Soft Seat

<table>
<thead>
<tr>
<th>Component</th>
<th>Material / Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Knob assembly with adjusting screw, nuts</td>
<td>Blue ABS with 431 SS</td>
</tr>
<tr>
<td>2 Spring housing cover</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>3 Spring housing</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>4 C-ring</td>
<td>A2</td>
</tr>
<tr>
<td>5 Spring guide</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>6 Set spring</td>
<td>50CRV4</td>
</tr>
<tr>
<td>7 Cap screw</td>
<td>A4-80</td>
</tr>
<tr>
<td>8 Washer</td>
<td>A2</td>
</tr>
<tr>
<td>9 Bottom spring guide</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>10 Clamp ring</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>11 Diaphragm</td>
<td>PTFE or 316L SS</td>
</tr>
<tr>
<td>12 Body</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>13 Seat retainer</td>
<td>316L SS / A479</td>
</tr>
<tr>
<td>14 Poppet housing</td>
<td>FKM, FFKM, EPDM, or nitrile</td>
</tr>
<tr>
<td>15 Seat seal</td>
<td>PTFE</td>
</tr>
<tr>
<td>16 O-ring</td>
<td>431 SS / A276</td>
</tr>
</tbody>
</table>

Wetted components listed in italics.
Gauge plugs (not shown): 431 SS / A276.
Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

LBS4 Series

**Flow Coefficient: 1.3**

**Maximum Inlet Pressure: 507 psig (35.0 bar)**

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

Pressure Control Range

![Graph showing nitrogen flow vs. inlet pressure for LBS4 Series.](image)

LBS4 Series

**Flow Coefficient: 1.3**

**Maximum Inlet Pressure: 507 psig (35.0 bar)**

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

Pressure Control Range

![Graph showing nitrogen flow vs. inlet pressure for LBS4 Series.](image)
Flow Data
The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.
For more flow curve information, contact your authorized Swagelok sales and service center.

**LBS4 Series**

*Flow Coefficient: 1.3*

*Maximum Inlet Pressure: 507 psig (35.0 bar)*

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

<table>
<thead>
<tr>
<th>Nitrogen Flow, Nm³/h</th>
<th>Inlet Pressure, psig</th>
<th>Nitrogen Flow, std ft³/min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

Optional 316L SS Diaphragm

---

**LBS4 Series**

*Flow Coefficient: 1.3*

*Maximum Inlet Pressure: 507 psig (35.0 bar)*

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

<table>
<thead>
<tr>
<th>Nitrogen Flow, Nm³/h</th>
<th>Inlet Pressure, psig</th>
<th>Nitrogen Flow, std ft³/min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

Optional 316L SS Diaphragm
Dimensions
Dimensions, in inches (millimeters), are for reference only and are subject to change.

![Diagram of Pressure Regulators]

Configuration
Top
Inlet gauge connection

Bottom Mounting

Panel Mounting

- Panel hole: 2.40 (61.0)
- 2 mounting holes for M5 × 20 screws
- Vent connection

Shown with tubing for clarity; tubing not included.

Ordering Information
Build an LBS4 series regulator ordering number by combining the designators in the sequence shown below.

1 Series
LBS = 507 psig (35.0 bar) maximum inlet pressure

2 Inlet / Outlet
N4 = 1/2 in. female NPT

3 Body Material
02 = 316L SS

4 Pressure Control Range
1 = 0 to 43 psig (0 to 3.0 bar)
2 = 0 to 130 psig (0 to 9.0 bar)
3 = 0 to 290 psig (0 to 20.0 bar)

5 Seal Material
T = PTFE
L = Low temperature Nitrile
N = Nitrile
E = EPDM
V = Fluorocarbon FKM

6 Diaphragm
T = PTFE®
M = 316L SS: only for 0 to 43 psig (0 to 3.0 bar) and 0 to 130 psig (0 to 9.0 bar) pressure control ranges
L = Low temperature Nitrile
N = Nitrile
E = EPDM
V = Fluorocarbon FKM

7 Seat Seal Material
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
F = FFKM
L = Low temperature Nitrile

8 Options
N = NACE MR0175/ISO 15156
G93 = ASTM G93 Level C-cleaned

Not available with Low temperature Nitrile option

![Diagram of Pressure Regulators]
Back-Pressure Regulators
Spring-Loaded—BS Series Maintenance Kits

Regular maintenance of pressure regulator components is an important part of keeping pressure regulators operating successfully. Swagelok offers several maintenance kit options to help keep components and systems performing well. Outlined below are the standard maintenance kit offerings and an example of which parts are included in each kit. For more detailed information of which parts will be included within a kit for a specific regulator model, please reference the appropriate owner’s manual or contact your authorized Swagelok sales and service center.

<table>
<thead>
<tr>
<th>Designator</th>
<th>Kit Type</th>
<th>Diaphragm Sensing Typical Contents</th>
<th>Piston Sensing Typical Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Valve kit</td>
<td>Poppet (9), Seat seal (7)</td>
<td>Poppet (9), Seat seal (7)</td>
</tr>
<tr>
<td>A2</td>
<td>Soft valve kit</td>
<td>Seat seal (7)</td>
<td>Seat seal (7)</td>
</tr>
<tr>
<td>B1</td>
<td>Service kit</td>
<td>Poppet (9), O-ring (10a), Diaphragm (16), Seat seal (7)</td>
<td>Poppet (9), O-rings (10a, 10b, 10c, 10d), Back-up rings (21a, 21b, 21c), Seat seal (7)</td>
</tr>
<tr>
<td>B2</td>
<td>Seal kit</td>
<td>O-ring (10a), Diaphragm (16)</td>
<td>O-rings (10a, 10b, 10c, 10d), Back-up rings (21a, 21b, 21c)</td>
</tr>
<tr>
<td>C1</td>
<td>Overhaul kit</td>
<td>Spring guide (2), Ball (3), Set spring (4), Poppet (9), O-ring (10a), Overtake spring (12), Body plug (13), Diaphragm (16), Diaphragm plate (17), Diaphragm screw (18), Seat seal (7), Seat (11)</td>
<td>Spring guide (2), Ball (3), Set spring (4), Poppet (9), O-rings (10a, 10b, 10c, 10d), Back-up rings (21a, 21b, 21c), Overtake spring (12), Body plug (13), Piston (20), Piston plate (19), Piston screw (22), Seat seal (7), Seat (11)</td>
</tr>
<tr>
<td>C2</td>
<td>Body plug kit</td>
<td>Body plug (13), O-ring (10a)</td>
<td>Body plug (13), O-ring (10a), Back-up ring (21a)</td>
</tr>
<tr>
<td>C3</td>
<td>Sensing kit</td>
<td>Diaphragm (16)</td>
<td>Piston (20), Piston plate (19), O-rings (10c, 10d), Back-up ring (21c)</td>
</tr>
<tr>
<td>C4</td>
<td>Range spring kit</td>
<td>Range spring (4)</td>
<td>Range spring (4)</td>
</tr>
<tr>
<td>C5</td>
<td>Poppet spring kit</td>
<td>Overtake spring (12)</td>
<td>Overtake spring (12)</td>
</tr>
<tr>
<td>D1</td>
<td>Handle kit</td>
<td>Handle assembly (14)</td>
<td>Handle assembly (14)</td>
</tr>
<tr>
<td>E1</td>
<td>Hardware kit</td>
<td>Bolts (5), Washers (6)</td>
<td>Bolts (5), Washers (6)</td>
</tr>
</tbody>
</table>

Ordering Information
To order a maintenance kit, add the kit type designator to the regulator ordering number. Example: BSN4-02-2-VVK-C1
Additional Products

- For additional Swagelok pressure regulators, refer to Pressure Regulators catalog, MS-02-230.

- For tank blanketing regulators, refer to Tank Blanketing Pressure Regulators, RHPS Series catalog, MS-02-431.

- For Swagelok pressure gauges, refer to Industrial and Process Pressure Gauges catalog, MS-02-170.

- For Swagelok tube fittings products, refer to Gaugeable Tube Fittings and Adapter Fittings catalog, MS-01-140.

- For sanitary pressure regulators, refer to Sanitary Pressure Regulators, RHPS Series catalog, MS-02-436.

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

⚠️ Do not use the regulator as a shutoff device.

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

⚠️ WARNING
Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.