Precision Pressure Regulators
Precision Fluidics
Parker precision regulators, valves and controllers are designed specifically for critical service in analytical instrumentation. All regulator models are direct-acting, non-relieving, and are supplied with a sintered stainless steel cartridge filter on the inlet. We offer several distinct models with a variety of process connections, spring ranges and diaphragm materials to satisfy the most demanding instrument applications.
# Table of Contents

## Pressure Regulators

<table>
<thead>
<tr>
<th>Models</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Models 8310 &amp; 8311</td>
<td>Forward Pressure Regulators, Flow control from 1 sccm to 3 slpm</td>
<td>2</td>
</tr>
<tr>
<td>Models 8286</td>
<td>Balanced Poppet Regulator, Flow control from 1 slpm to 40 slpm</td>
<td>8</td>
</tr>
<tr>
<td>Models 4000</td>
<td>High Performance Pressure Regulator, Flow control from 0.5 slpm to 10 slpm</td>
<td>14</td>
</tr>
<tr>
<td>Models 9000</td>
<td>Back Pressure Regulator, Flow control from 10 sccm to 1 slpm</td>
<td>20</td>
</tr>
<tr>
<td>Value Added</td>
<td>Application-Specific Solutions</td>
<td>26</td>
</tr>
</tbody>
</table>
# Model 8310/8311 Precision Pressure Regulator

## Typical Applications
- Environmental Analyzers — Helium or Hydrogen Carrier Gas
- Precision Nitrogen Control for Chemical Analysis
- Laboratory and Process Gas Chromatography applications

## Physical Properties

<table>
<thead>
<tr>
<th>Valve Technology:</th>
<th>Quad Ring Poppet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media:</td>
<td>Air, Nitrogen, Helium, Argon, Hydrogen, Oxygen, Krypton, Neon, Xenon, and other non-corrosive gases</td>
</tr>
</tbody>
</table>

### Wetted Materials
- **Body:** Aluminum or 303 Stainless Steel
- **Diaphragm:** Fairprene BN-5029 (Buna-N on Nylon), 300 Series Stainless Steel, or FKM on Nomex®
- **O-Rings:** Buna-N or FKM
- **Filter Element:** Sintered Stainless Steel (100 micron)

### Non-Wetted Materials
- **Bonnet:** Aluminum
- **Range Spring:** Music Wire (ASTM A228) or Nickel Iron Alloy (AMS 5221)

## Performance Ratings

### Ratings:
- **Max inlet pressure:** 250 psig (17.3 barg)
- **Max working temperature:** 160°F (71°C)
- **Pressure Drop:**
  - Minimum: 10 psid (0.7 barg)
  - Maximum: 250 psid (17.3 barg)

### Performance Characteristics

1. **Supply Pressure Effect:**
   - 10 psi change < 0.07 psi
   - (0.69 barg change ≤ 0.005 barg)

2. **Ambient Temperature Effect:** (Temperature coefficient)
   - Music Wire (ASTM A228) – (60 psig (4.14 bar) range)
   - Nickel Iron Alloy (AMS 5221) – (60 psig (4.14 bar) range)

3. **Long-Term Drift:**
   - Fairprene: 0.2%
   - Stainless steel: 0.8%

4. **Flow Regulation:**
   - From 2 sccm to 250 sccm Helium, outlet pressure will not decrease more than 0.17 psig (0.01 barg) for unit with elastomer diaphragm, 0.3 psig (0.02 barg) for unit with stainless steel diaphragm

5. **Regulating Range:**
   - 0 - 2.5 psig (0 - 0.17 barg)
   - 0 - 5 psig (0 - 0.35 barg)
   - 0 - 10 psig (0 - 0.69 barg)
   - 0 - 15 psig (0 - 1.03 barg)
   - 0 - 30 psig (0 - 2.07 barg)
   - 0 - 60 psig (0 - 4.14 barg)
   - 0 - 100 psig (0 - 6.89 barg)

---

1. Performance characteristics are based on 60 psig (4.14 barg) helium supply pressure at 50 psig (3.45 barg) outlet pressure.
2. Available in Music Wire (ASTM A228) only.
**Model 8310/8311 Precision Pressure Regulator**

**Typical Flow Curves**

Typical Droop (Flow Sensitivity) Curve (Fairprene Diaphragm Unit)

Typical Regulator Output vs. Change in Supply Pressure (Supply Pressure Effect) (Fairprene Diaphragm Unit)

Typical Droop (Flow Sensitivity) Curve (Stainless Steel Diaphragm)

Typical Regulator Output vs. Change in Supply Pressure (Supply Pressure Effect) (Stainless Steel Diaphragm)

For more information call +1 603 595 1500 or email ppinfo@parker.com

Visit [www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics)
**Model 8310/8311 Precision Pressure Regulator**

**Principle of Operation**

As gas enters the regulator body from the inlet (left), the pressure rises which pushes the diaphragm, closing the control inlet valve and preventing any more gas from entering the regulator.

When gas is drawn from the outlet (right) side, the pressure inside the regulator body falls. As a result, the diaphragm is pushed back by the spring and the valve opens, allowing more gas in from the supply until equilibrium is reached between the outlet pressure and the spring.

The outlet pressure is a function of the spring force which may be modified by the adjustment knob. The outlet pressure and the inlet pressure hold the quad ring poppet assembly in the closed position against the force of the spring.
Model 8310/8311 Precision Pressure Regulator

Mechanical Integration

Dimensions

Basic Dimensions

8310

8311

1-1/32" (2.62 cm) Fully Open
3/4" (1.91 cm) Fully Closed

1/2" (1.27 cm)

1-3/4" (4.45 cm)

4.09" (10.40 cm) Maximum

1-5/16" (3.33 cm)

4.84" (12.31 cm) Maximum

1-1/32" (2.62 cm) Fully Open
3/4" (1.91 cm) Fully Closed

1/2" (1.27 cm)

1-3/4" (4.45 cm)

1-5/8" (4.13 cm)

1-5/8" (4.13 cm)

1-7/8" (4.76 cm)

1-5/16" (3.33 cm)

In (cm)

Units

For more information call +1 603 595 1500 or email ppinfo@parker.com
Visit www.parker.com/precisionfluidics
**Model 8310/8311** Precision Pressure Regulator

**Typical Flow Diagram**

VOC Emissions Monitoring Analyzer
Model 8310/8311 Precision Pressure Regulator

Ordering Information

<table>
<thead>
<tr>
<th>Sample Part #</th>
<th>8310</th>
<th>8311</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Model</td>
<td>Body Material</td>
</tr>
<tr>
<td>Options</td>
<td></td>
<td>A: Aluminum*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S: Stainless Steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Supplied with Brass Fittings
** Only available in Music Wire (ASTM A228)

NOTE: In order to provide the best possible solution for your application, please provide the following requirements when contacting Applications Engineering:
- Media, Inlet & Outlet Pressures
- Minimum Required Flow Rate.

Please click on the ORDER ON-LINE button (or go to www.parker.com/precisionfluidics/regulators) to configure your Precision Pressure Regulator. For more detailed information, visit us on the web or call Applications Engineering.

Installation Guide

- For NPT connections, a high quality sealant compatible with the customer’s process gas must be used.
- May be installed in any orientation.
- Support inlet and outlet piping to reduce strain on regulator body.

Key Things to Remember:

- To minimize your Helium gas costs, consider using 2.5 or 5 psig Pressure Range [0.17 or 0.34 barg] only available from Parker.

- Choice of Diaphragm Materials – Stainless Steel Diaphragms provide extremely low permeability. Coated Fabric Diaphragms, available in Buna or FKM, offer unmatched sensitivity.

- Fine Pitch Adjusting Stem – 56 threads/in. [2.2 threads/mm] stem for 15 turns resolution pitch on all regulator adjusting stems gives precise control over incremental pressure adjustments.

- Bar Stock Construction and Analytical Service Cleaning – Machined from bar stock in your choice of aluminum or stainless steel. All parts are cleaned to procedures developed specifically for analytical service use, minimizing contaminant generation in low-level analyzer applications.

- Extensive Choice of Pressure Range – This ensures maximum resolution at specific pressure and temperature requirements.

For more information call +1 603 595 1500 or email ppinfo@parker.com
Visit www.parker.com/precisionfluidics
Model 8286 Precision Pressure Regulator

Balanced Poppet Regulator

The Parker Precision Fluidics Model 8286 Regulator utilizes a pneumatically balanced poppet valve to ensure maximum stability over wide variations in supply pressure. Based on Parker’s popular 8310 model, the 8286 offers higher flow capability combined with precision pressure control. It can be equipped with a stainless diaphragm for reduced permeability. The Model 8286 is performance tested under simulated operating conditions and is cleaned for analytical instrument service.

**Features**
- Direct-acting and non-relieving
- Compact design enables panel mounting
- All bar stock construction reduces production variation
- Bubble tight shut-off
- Cleaned for Analytical Service Use
- Pressure gauge port included
- RoHS and REACH compliant

**Typical Applications**
- Environmental Analyzers — Helium or Hydrogen Carrier Gas
- Precision Nitrogen Control for Chemical Analysis
- Laboratory and Process Gas Chromatography applications

**Physical Properties**

- **Valve Technology:** Quad Ring Poppet
- **Media:** Air, Nitrogen, Helium, Argon, Hydrogen, Oxygen, Krypton, Neon, Xenon, and other non-corrosive gases
- **Width:** 1.875" (47.63 mm)
- **Height:** 3.06" (77.72 mm)
- **Weight:** 0.5 lb (0.23 kg) (typical)
- **Porting:** 1/8" FNPT side ports, inlet, outlet and gauge

**Performance Ratings**

- **Ratings:**
  - Max inlet pressure: 250 psig (17.3 barg)
  - Max working temperature: 160°F (71°C)
- **Pressure Drop**
  - Minimum: 10 psig (0.7 barg)
  - Maximum: 250 psig (17.3 barg)

**Wetted Materials**

- **Body:** Aluminum or 303 Stainless Steel
- **Diaphragm:** Fairprene BN-5029 (Buna-N on Nylon), 300 Series Stainless Steel, or FKM on Nomex®
- **O-Rings:** Buna-N or FKM
- **Filter Element:** Sintered Stainless Steel (100 micron)
- **Internal Ball Seat Valve:** Glass

**Non-Wetted Materials**

- **Bonnet:** Aluminum
- **Range Spring:**
  - Music Wire (ASTM A228) or Nickel Iron Alloy (AMS 5221)

**Performance Characteristics**

**Supply Pressure Effect:**
10 psi change < 0.07 psi (0.69 barg change ≤ 0.005 barg)

**Ambient Temperature Effect:**
- Music Wire (ASTM A228) – (60 psig (4.14 barg) range) 0.008 psig/°F (0.99 mbarg/°C)
- Nickel Iron Alloy (AMS 5221) – (60 psig (4.14 barg) range) 0.004 psig/°F (0.50 mbarg/°C)

**Long-Term Drift:**
- Fairprene diaphragm: 0.2%
- Stainless steel diaphragm: 0.8%

**Flow Regulation:**
- From 1 slpm to 20 slpm helium, outlet pressure will not decrease more than 1 psig (0.069 barg) for unit with elastomer diaphragm

**Regulating Range:**
- 0 - 2.5 psig (0 - 0.17 barg)
- 0 - 5 psig (0 - 0.35 barg)
- 0 - 10 psig (0 - 0.69 barg)
- 0 - 30 psig (0 - 2.07 barg)
- 0 - 60 psig (0 - 4.14 barg)
- 0 - 100 psig (0 - 6.89 barg)

---

1 Performance characteristics are based on 60 psig (4.14 barg) helium supply pressure at 50 psig (3.45 barg) outlet pressure.

2 Available in Music Wire (ASTM A228) only.
Model 8286  Precision Pressure Regulator

Typical Flow Curves

![Typical Droop (Flow Sensitivity) Curve (Fairprene Diaphragm Unit)](chart1)

![Typical Regulator Output vs. Change in Supply Pressure (Supply Pressure Effect) (Fairprene Diaphragm Unit)](chart2)

For more information call +1 603 595 1500 or email ppinfo@parker.com
Visit www.parker.com/precisionfluidics
Model 8286 Precision Pressure Regulator

Principle of Operation

As gas enters the regulator body from the inlet (left), the pressure rises which pushes the diaphragm, closing the control inlet valve and preventing any more gas from entering the regulator.

When gas is drawn from the outlet (right) side, the pressure inside the regulator body falls. As a result, the diaphragm is pushed back by the spring and the valve opens, allowing more gas in from the supply until equilibrium is reached between the outlet pressure and the spring.

The outlet pressure is a function of the spring force which may be modified by the adjustment knob.

The outlet pressure and the inlet pressure hold the dual poppet assembly in the closed position against the force of the spring.
Model 8286  Precision Pressure Regulator

Mechanical Integration
Dimensions
Model 8286  Precision Pressure Regulator

Typical Flow Diagram

VOC Emissions Monitoring Analyzer
Model 8286 Precision Pressure Regulator

Ordering Information

<table>
<thead>
<tr>
<th>Description</th>
<th>Model</th>
<th>Body Material</th>
<th>Spring Material</th>
<th>O-Ring Material</th>
<th>Diaphragm Material</th>
<th>Pressure Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td>8286</td>
<td>A: Aluminum*</td>
<td>M: Music Wire</td>
<td>B: Buna-N</td>
<td>F: Fairprene BN-5029</td>
<td>2.5*: 2.5 psig (0.17 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S: Stainless Steel</td>
<td>(ASTM A228)</td>
<td>V: FKM</td>
<td>S: Stainless Steel</td>
<td>5*:  5 psig (0.34 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N: Nickel Iron Alloy (AMS 5221)</td>
<td></td>
<td>V: FKM and Nomex</td>
<td>10: 10 psig (0.69 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30: 30 psig (2.07 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60: 60 psig (4.14 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100: 100 psig (6.89 barg)</td>
</tr>
</tbody>
</table>

* Supplied with Brass Fittings
** Available in Music Wire (ASTM A228) only

NOTE: In order to provide the best possible solution for your application, please provide the following requirements when contacting Applications Engineering:
- Media, Inlet & Outlet Pressures
- Minimum Required Flow Rate.

Please click on the ORDER ON-LINE button (or go to www.parker.com/precisionfluidics/regulators) to configure your Precision Pressure Regulator. For more detailed information, visit us on the web or call Applications Engineering.

Installation Guide

- For NPT connections, a high quality sealant compatible with the customer’s process gas must be used.
- May be installed in any orientation.
- Support inlet and outlet piping to reduce strain on regulator body.

Key Things to Remember:

- To minimize your Helium gas costs, consider using 2.5 or 5 psig Pressure Range (0.17 or 0.34 barg) only available from Parker.
- Choice of Diaphragm Materials – Stainless Steel Diaphragms provide extremely low permeability. Coated Fabric Diaphragms, available in Buna or FKM, offer unmatched sensitivity.
- Fine Pitch Adjusting Stem – 56 threads/in. [2.2 threads/mm] stem for 15 turns resolution pitch on all regulator adjusting stems gives precise control over incremental pressure adjustments.
- Bar Stock Construction and Analytical Service Cleaning – Machined from bar stock in your choice of aluminum or stainless steel. All parts are cleaned to procedures developed specifically for analytical service use, minimizing contaminant generation in low-level analyzer applications.
- Extensive Choice of Pressure Range – This ensures maximum resolution at specific pressure and temperature requirements.
# Model 4000 Precision Pressure Regulator

## High Performance Pressure Regulator

The Parker Precision Fluidics Model 4000 Regulator is a high performance miniature size pressure regulator. With a compact diameter of only 1-1/8”, it fits easily into small instruments, yet its performance surpasses that of many competitive large diaphragm regulators. Model 4000 is a direct-acting, non-relieving performance regulator tested under simulated operating conditions and is cleaned for analytical instrument service.

## Typical Applications
- Environmental Analyzers — Helium or Hydrogen Carrier Gas
- Precision Nitrogen Control for Chemical Analysis
- Laboratory and Process Gas Chromatography applications

## Physical Properties

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Technology</td>
<td>Quad Ring Poppet</td>
</tr>
<tr>
<td>Media</td>
<td>Air, Nitrogen, Helium, Argon, Hydrogen, Oxygen, Krypton, Neon, Xenon, and other non-corrosive gases</td>
</tr>
<tr>
<td>Width</td>
<td>1.25” (31.75 mm)</td>
</tr>
<tr>
<td>Height</td>
<td>4.47” (113.54 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.31 lbs (0.14kg) (typical)</td>
</tr>
<tr>
<td>Porting</td>
<td>1/8” compression fittings, inlet, outlet and gauge</td>
</tr>
</tbody>
</table>

* Performance characteristics are based on 60 psig (4.14 barg) helium supply pressure at 50 psig (3.45 barg) outlet pressure.

## Performance Ratings

<table>
<thead>
<tr>
<th>Rating</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max inlet pressure</td>
<td>250 psig (17.3 barg)</td>
</tr>
<tr>
<td>Max working temperature</td>
<td>160°F (71°C)</td>
</tr>
<tr>
<td>Pressure Drop</td>
<td>Minimum: 10 psig (0.7 barg)</td>
</tr>
<tr>
<td></td>
<td>Maximum: 250 psig (17.3 barg)</td>
</tr>
</tbody>
</table>

## Wetted Materials

- **Body:** Aluminum
- **Diaphragm:** 300 Stainless Steel
- **O-Rings:** Buna-N or FKM
- **Internal Ball Seat Valve:** Glass

## Non-Wetted Materials

- **Bonnet:** Aluminum
- **Range Spring:** Music Wire (ASTM A228)

## Performance Characteristics*

- **Flow Capacity:** 15 slpm (typical maximum flow with 60 psig (4.14 barg) helium supply pressure and 15 psig (1.03 barg) outlet)
- **Supply Rejection:** 10 psig (0.69 barg) change in supply will not change outlet more than 0.05 psig (0.003 barg)
- **Ambient Temperature Effect:** (Temperature coefficient)
  - Music Wire (ASTM A228) – (60 psig (4.14 barg) range)
    - 0.008 psig/°F (0.99 mbarg/°C)
- **Long-Term Drift:** Less than 0.2% in first 15 minutes to a total of 0.6% long term
- **Flow Regulation:** From 2 sccm to 250 sccm helium outlet pressure will not change more than 0.2 psig (0.014 barg) for unit with elastomer diaphragm
- **Baseline Oscillation:** 0.0012 psig (0.083 mbarg)
- **Regulating Range:**
  - 0 - 10 psig (0 - 0.69 barg)
  - 0 - 15 psig (0 - 1.03 barg)
  - 0 - 30 psig (0 - 2.07 barg)
  - 0 - 60 psig (0 - 4.14 barg)
  - 0 - 100 psig (0 - 6.89 barg)
**Model 4000** Precision Pressure Regulator

**Typical Flow Curves**

**Typical Droop (Flow Sensitivity) Curve**
(Fairprene Diaphragm Unit)

![Typical Droop Curve](image)

**Typical Regulator Output vs. Change in Supply Pressure**
(Supply Pressure Effect)
(Fairprene Diaphragm Unit)

![Typical Regulator Output Curve](image)

For more information call +1 603 595 1500 or email ppfinfo@parker.com
Visit [www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics)
**Model 4000** Precision Pressure Regulator

**Principle of Operation**

As gas enters the regulator body from the inlet (left), the pressure rises which pushes the diaphragm, closing the control inlet valve and preventing any more gas from entering the regulator.

When gas is drawn from the outlet (right) side, the pressure inside the regulator body falls. As a result, the diaphragm is pushed back by the spring and the valve opens, allowing more gas in from the supply until equilibrium is reached between the outlet pressure and the spring.

The outlet pressure is a function of the spring force which may be modified by the adjustment knob.

The outlet pressure and the inlet pressure hold the quad ring poppet assembly in the closed position against the force of the spring.
Model 4000 Precision Pressure Regulator

Mechanical Integration
Dimensions

Basic Dimensions

1-13/16" (4.60 cm)
1-5/32" (2.94 cm)
1/2" (1.27 cm)
1-7/32" (3.10 cm)
1-7/16" (3.65 cm)

#10-32 Gauge Port

1/8" Compression Fitting

Units

In (cm)
Model 4000  Precision Pressure Regulator

Typical Flow Diagram

VOC Emissions Monitoring Analyzer
Model 4000  Precision Pressure Regulator

Ordering Information

<table>
<thead>
<tr>
<th>Sample Part #</th>
<th>4000</th>
<th>A: Aluminum*</th>
<th>M: Music Wire (ASTM A228)</th>
<th>B: Buna-N</th>
<th>V: FKM</th>
<th>S: Stainless Steel</th>
<th>Pressure Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td>4000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10: 10 psig (0.69 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15: 15 psig (1.03 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30: 30 psig (2.07 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60: 60 psig (4.14 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100: 100 psig (6.89 barg)</td>
</tr>
</tbody>
</table>

* Supplied with Brass Fittings

NOTE: In order to provide the best possible solution for your application, please provide the following requirements when contacting Applications Engineering:

- Media, Inlet & Outlet Pressures
- Minimum Required Flow Rate.

Please click on the ORDER ON-LINE button (or go to www.parker.com/precisionfluidics/regulators) to configure your Precision Pressure Regulator. For more detailed information, visit us on the web or call Applications Engineering.

Installation Guide

- May be installed in any orientation.

Key Things to Remember:

- Fine Pitch Adjusting Stem – 56 threads/in. (2.2 threads/mm) stem for 15 turns resolution pitch on all regulator adjusting stems gives precise control over incremental pressure adjustments.

- Bar Stock Construction and Analytical Service Cleaning – Machined from bar stock in your choice of aluminum or stainless steel. All parts are cleaned to procedures developed specifically for analytical service use, minimizing contaminant generation in low-level analyzer applications.

- Extensive Choice of Pressure Range – This ensures maximum resolution at specific pressure and temperature requirements.
Model 9000
Precision Pressure Regulator

The Parker Precision Fluidics Model 9000 Regulator is a compact, spring-loaded, diaphragm operated back pressure regulator. Designed specifically for precision regulation in low-flow gas applications, it controls upstream pressure rather than downstream pressure and is similar to a relief valve in operation. Model 9000 is performance tested under simulated operating conditions and is cleaned for analytical instrument service.

Features
- Direct-acting and non-relieving
- Compact design enables panel mounting
- All bar stock construction reduces production variation
- Bubble tight shut-off
- Panel mount applications
- Cleaned for Analytical Service Use
- Pressure gauge port included
- RoHS and REACH compliant

Typical Applications
- Environmental Analyzers — Helium or Hydrogen Carrier Gas
- Precision Nitrogen Control for Chemical Analysis
- Laboratory and Process Gas Chromatography applications
- Argon Gas Regulation for BioReagent Manufacturing

Physical Properties

<table>
<thead>
<tr>
<th>Valve Technology:</th>
<th>Quad Ring Poppet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media:</td>
<td>Air, Nitrogen, Helium, Argon, Hydrogen, Oxygen, Krypton, Neon, Xenon, and other non-corrosive gases</td>
</tr>
<tr>
<td>Width:</td>
<td>1.25&quot; (31.75 mm)</td>
</tr>
<tr>
<td>Height:</td>
<td>4.5&quot; (114.3 mm)</td>
</tr>
<tr>
<td>Weight:</td>
<td>0.375 lbs (0.17kg) (typical)</td>
</tr>
<tr>
<td>Porting:</td>
<td>1/8&quot; compression fittings, inlet, outlet and gauge</td>
</tr>
</tbody>
</table>

Performance Ratings

<table>
<thead>
<tr>
<th>Flow Capacity: 0 - 1000 sccm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratings:</td>
</tr>
<tr>
<td>Max. operating temperature:</td>
</tr>
<tr>
<td>160°F (71°C)</td>
</tr>
</tbody>
</table>

Wetted Materials

| Body: Aluminum or 303 Stainless Steel |
| Diaphragm: Fairprene BN-5029 (Buna-N on nylon), 300 Stainless Steel, or FKM and Nomex |
| O-Rings: Buna N or FKM |
| Filter Element: Sintered Stainless Steel (100 micron) |
| Internal Ball Seat Valve: Glass |

Non-Wetted Materials

| Bonnet: Aluminum |
| Range Spring: Music Wire (ASTM A228) |

Performance Characteristics*

| Ambient Temperature Effect: (Temperature coefficient) 60 psig (4.14 barg) range 0.008 psig/°F (0.099 mbarg/°C) |
| Long-Term Drift: Fairprene diaphragm: 0.2% Stainless steel diaphragm: 0.8% |
| Flow Regulation: From 10 sccm to 1 sccm Helium, outlet pressure will not decrease more than 1 psig (0.069 barg) for unit with elastomer diaphragm |
| Baseline Oscillation: 0.0012 psig (0.083 mbarg) |
| Regulating Range: 0 - 15 psig (0 - 1.03 barg) 0 - 30 psig (0 - 2.07 barg) 0 - 60 psig (0 - 4.14 barg) 0 - 100 psig (0 - 6.89 barg) |

* Performance characteristics are based on 60 psig (4.14 barg) helium supply pressure at 50 psig (3.45 barg) outlet pressure.
**Model 9000** Precision Pressure Regulator

**Typical Flow Curves**

**Typical Droop**
(Flow Sensitivity) Curve
30 psig (2.07 barg) Range Spring

**Typical Droop**
(Flow Sensitivity) Curve
60 psig (4.14 barg) Range Spring

For more information call +1 603 595 1500 or email ppinfo@parker.com
Visit www.parker.com/precisionfluidics
**Model 9000 Precision Pressure Regulator**

**Principle of Operation**

A backpressure regulator is designed to regulate inlet pressure. The force of the regulator spring holds the valve closed. When the inlet pressure of the process fluid overcomes the spring setting the valve begins to open. Using a backpressure regulator to precisely control upstream gas pressure is typically more accurate than a relief valve.
Model 9000 Precision Pressure Regulator

Mechanical Integration
Dimensions

Basic Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/8&quot;</td>
<td>2.22 cm</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>0.64 cm</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>1.27 cm</td>
</tr>
<tr>
<td>4-1/2&quot;</td>
<td>11.43 cm</td>
</tr>
<tr>
<td>1-1/16&quot;</td>
<td>2.70 cm</td>
</tr>
<tr>
<td>2-9/32&quot;</td>
<td>5.79 cm</td>
</tr>
<tr>
<td>3-1/16&quot;</td>
<td>7.79 cm</td>
</tr>
<tr>
<td>.40&quot;</td>
<td>1.02 cm</td>
</tr>
<tr>
<td>.34&quot;</td>
<td>0.86 cm</td>
</tr>
</tbody>
</table>

Units

In (cm)
Model 9000 Precision Pressure Regulator

Typical Flow Diagram

VOC Emissions Monitoring Analyzer
Model 9000 Precision Pressure Regulator

Ordering Information

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>9000</td>
<td>S: Stainless Steel</td>
<td></td>
<td>S: Stainless Steel</td>
<td>Model</td>
<td></td>
<td></td>
<td></td>
<td>15: 15 psig (1.03 barg)</td>
</tr>
<tr>
<td>Options</td>
<td></td>
<td>S: Stainless Steel</td>
<td></td>
<td>S: Stainless Steel</td>
<td>30: 30 psig (2.07 barg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>V: FKM</td>
<td></td>
<td>S: Stainless Steel</td>
<td>60: 60 psig (4.14 barg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>F: Fairprene BN-5029</td>
<td></td>
<td>S: Stainless Steel</td>
<td>100: 100 psig (6.89 barg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Supplied with Brass Fittings

NOTE: In order to provide the best possible solution for your application, please provide the following requirements when contacting Applications Engineering:

- Media, Inlet & Outlet Pressures
- Minimum Required Flow Rate

Please click on the ORDER ON-LINE button (or go to www.parker.com/precisionfluidics/regulators) to configure your Precision Pressure Regulator. For more detailed information, visit us on the web or call Applications Engineering.

Installation Guide

- May be installed in any orientation.
- Support inlet and outlet piping to reduce strain on regulator body.

Key Things to Remember:


- Fine Pitch Adjusting Stem – 56 threads/in. [2.2 threads/mm] stem for 15 turns resolution pitch on all regulator adjusting stems gives precise control over incremental pressure adjustments.

- Bar Stock Construction and Analytical Service Cleaning – Machined from bar stock in your choice of aluminum or stainless steel. All parts are cleaned to procedures developed specifically for analytical service use, minimizing contaminant generation in low-level analyzer applications.

- Extensive Choice of Pressure Range – This ensures maximum resolution at specific pressure and temperature requirements.
Value Added Application-Specific Solutions

Gassing Control System
- Mixed gassing logic design includes VSO® proportional valves, X-Valve®, pressure switch, pressure sensors, and PCB interface

Pneumatic Module
- Integrated valve manifold
- Compact design
- Single electrical connection
- Valves configured per specifications

Vacuum Gas Control Module
- Tested to $1 \times 10^{-7}$ cc/sec/atm Helium
- Assembly tested on mass spectrometer

6 Position VSO® Proportional Valve Pneumatic Manifold Assembly
- Quick connect fittings
- Circuit board with mass electrical termination

Magnum Manifold Assembly
- Integrated circuit board with single connection
- Compact design
- Easily adaptable
- 2 way and 3 way designs

8 Position SRS Model Pneumatic Manifold
- Integrated circuit board mounting
- Mass electrical termination

10 Position X-Valve® Pneumatic Manifold
- Mixed pneumatic logic design
- Ultra-miniature design with PCB for mass termination

10 Position SRS Model Pneumatic Manifold
- Circuit board with transducers
- Pressed in barbed fittings
Precision Pressure Regulators

Portfolio Review

Customization
Contact Division Applications at (603) 595 1500 or ppfinfo@parker.com.

Models 8310 & 8311
Flow control from 1 sccm to 3 slpm

Model 8286
Flow control from 1 slpm to 40 slpm

Model 4000
Flow control from 0.5 slpm to 10 slpm
Smaller Size

Model 9000
Flow control from 10 sccm to 1 slpm
Back Pressure Regulator

For more information call +1 603 595 1500 or email ppfinfo@parker.com
Visit www.parker.com/precisionfluidics