Precision Pressure Regulators
Precision Fluidics
Innovative solutions for health care success

ENGINEERING YOUR SUCCESS.

When you partner with the global leader in motion and control technologies, expect to move your business and the world forward. From miniature solenoid valves to highly integrated automation systems, our innovations are critical to life-saving medical devices and scientific instruments used for drug discovery and pathogen detection. Not to mention, critical to decreasing time to market and lowering your overall cost of ownership. So partner with Parker, and get ready to move, well, anything.

www.parker.com/precisionfluidics 1 603 595-1500
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Visit [www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics)
# Model 8310/8311 Precision Pressure Regulator

**Forward Pressure Regulators**

Parker Precision Fluidics Model 8310/8311 Regulators incorporate a threadless valve seat assembly with a precision glass ball. It is ideal for very low flow carrier gas applications and provides bubble tight shut-off. The 8310/8311 is a direct-acting, non-relieving pressure regulator supplied with a replaceable sintered stainless steel cartridge filter on the inlet. It can be configured with a stainless steel diaphragm to reduce permeability. Each regulator is performance tested and ideally suited for manufacturers of analytical equipment.

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

## 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

## 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>1.875” (47.63 mm)</td>
</tr>
</tbody>
</table>
| Height:           | Model 8310 – 3.06” (77.72 mm) without compression fittings  
|                   | Model 8311 – 3.81” (96.77 mm) with compression fittings |
| Weight:           | 0.5 lbs (0.23 kg) (typical) |
| Porting:          | 1/8” FNPT, Side Ports (8310 Model) 5/16-24 UNF-2-A, Bottom Ports, Supplied with 1/8” Compression Fittings (8311 Model) |

## 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:  
|-------------------------|  
| Max change < 0.07 psi  
| (0.69 barg change ≤ 0.005 barg) |
| Ambient Temperature Effect: (Temperature coefficient)  
| Music Wire (ASTM A228) –  
| (60 psig (4.14 bar) range)  
| 0.008 psig/°F (0.99 mbarg/°C)  
| Nickel Iron Alloy (AMS 5221) –  
| (60 psig (4.14 bar) range)  
| 0.004 psig/°F (0.50 mbarg/°C)  
| Long-Term Drift:  
| Fairprene diaphragm: 0.2%  
| Stainless steel diaphragm: 0.8%  
| 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  
| 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 8310/8311 Precision Pressure Regulator

Typical Flow Curves

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

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

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

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

Typical Flow Curves

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

![Typical Droop (Flow Sensitivity) Curve (Stainless Steel Diaphragm)](image)

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

![Typical Regulator Output vs. Change in Supply Pressure (Supply Pressure Effect) (Stainless Steel Diaphragm)](image)

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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

<table>
<thead>
<tr>
<th>Units</th>
<th>In (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FILTER</td>
<td>1-7/8&quot; (4.76 cm)</td>
</tr>
<tr>
<td>OUT</td>
<td>1-3/4&quot; (4.45 cm)</td>
</tr>
<tr>
<td>NPT</td>
<td>1-5/16&quot; (3.33 cm)</td>
</tr>
<tr>
<td>GAUGE</td>
<td>1-5/8&quot; (4.13 cm)</td>
</tr>
<tr>
<td>FILTER</td>
<td>4.84&quot; (12.31 cm)</td>
</tr>
<tr>
<td>Maximum</td>
<td>1-1/32&quot; (2.62 cm)</td>
</tr>
<tr>
<td>Fully Open</td>
<td>3/4&quot; (1.91 cm)</td>
</tr>
<tr>
<td>8310</td>
<td>1/2&quot; (1.27 cm)</td>
</tr>
<tr>
<td>8311</td>
<td>1/2&quot; (1.27 cm)</td>
</tr>
</tbody>
</table>

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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>A</th>
<th>M</th>
<th>B</th>
<th>F</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Model</td>
<td>Body Material</td>
<td>Spring Material</td>
<td>O-Ring Material</td>
<td>Diaphragm Material</td>
<td>Pressure Range</td>
</tr>
<tr>
<td>Options</td>
<td>8310</td>
<td>A: Aluminum*</td>
<td>M: Music Wire (ASTM A228)</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>8311</td>
<td>S: Stainless Steel</td>
<td>N: Nickel Iron Alloy (AMS 5221)</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></td>
<td>V: FKM and Nomex</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>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/precision fluiddics/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 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

Product Specifications

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 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)

Performance Characteristics

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)

Non-Wetted Materials

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

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

Performance Ratings

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)

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Fairprene diaphragm: 0.2% Stainless steel diaphragm: 0.8%

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0 - 100 psig (0 - 6.89 barg)
Model 8286 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)

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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

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Model 8286  Precision Pressure Regulator

Typical Flow Diagram
Model 8286  Precision Pressure Regulator

Ordering Information

<table>
<thead>
<tr>
<th>Sample Part #</th>
<th>8286</th>
<th>A</th>
<th>M</th>
<th>B</th>
<th>F</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Model</td>
<td>Body Material</td>
<td>Spring Material</td>
<td>O-Ring Material</td>
<td>Diaphragm Material</td>
<td>Pressure Range</td>
</tr>
<tr>
<td>Options</td>
<td>8286</td>
<td>A: Aluminum*</td>
<td>M: Music Wire (ASTM A228)</td>
<td>B: Buna-N</td>
<td>F: Fairprene BN-5029</td>
<td>2.5*: 2.5 psig (0.17 barg)</td>
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<td>N: Nickel Iron Alloy (AMS 5221)</td>
<td>V: FKM</td>
<td>S: Stainless Steel</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V: FKM and Nomex</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>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/precision fluidics/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.

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**Model 4000 Precision Pressure Regulator**

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

**Product Specifications**

**Physical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Details</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&quot; (31.75 mm)</td>
</tr>
<tr>
<td>Height</td>
<td>4.47&quot; (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&quot; compression fittings, inlet, outlet and gauge</td>
</tr>
</tbody>
</table>

**Performance Ratings**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Details</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**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Diaphragm</td>
<td>300 Stainless Steel</td>
</tr>
<tr>
<td>O-Rings</td>
<td>Buna-N or FKM</td>
</tr>
<tr>
<td>Internal Ball Seat Valve</td>
<td>Glass</td>
</tr>
</tbody>
</table>

**Non-Wetted Materials**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonnet</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Range Spring</td>
<td>Music Wire (ASTM A228)</td>
</tr>
</tbody>
</table>

**Performance Characteristics**

<table>
<thead>
<tr>
<th>Performance Characteristic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Capacity</td>
<td>15 slpm (typical maximum flow with 60 psig (4.14 barg) helium supply pressure and 15 psig (1.03 barg) outlet)</td>
</tr>
<tr>
<td>Supply Rejection</td>
<td>10 psig (0.69 barg) change in supply will not change outlet more than 0.05 psig (0.003 barg)</td>
</tr>
<tr>
<td>Ambient Temperature Effect</td>
<td>(Temperature coefficient) – (60 psig (4.14 barg) range) 0.008 psig/°F (0.99 mbarg/°C)</td>
</tr>
<tr>
<td>Long-Term Drift</td>
<td>Less than 0.2% in first 15 minutes to a total of 0.6% long term</td>
</tr>
<tr>
<td>Flow Regulation</td>
<td>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</td>
</tr>
<tr>
<td>Baseline Oscillation</td>
<td>0.0012 psig (0.083 mbarg)</td>
</tr>
<tr>
<td>Regulating Range</td>
<td>0 - 10 psig (0 - 0.69 barg)</td>
</tr>
<tr>
<td></td>
<td>0 - 30 psig (0 - 2.07 barg)</td>
</tr>
<tr>
<td></td>
<td>0 - 60 psig (0 - 4.14 barg)</td>
</tr>
<tr>
<td></td>
<td>0 - 100 psig (0 - 6.89 barg)</td>
</tr>
</tbody>
</table>
**Model 4000** Precision Pressure Regulator

**Typical Flow Curves**

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

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

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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

<table>
<thead>
<tr>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>In</td>
<td>1/2&quot; (1.27 cm)</td>
</tr>
<tr>
<td></td>
<td>1-13/16&quot; (4.60 cm)</td>
</tr>
<tr>
<td></td>
<td>1-5/32&quot; (2.94 cm)</td>
</tr>
<tr>
<td></td>
<td>1-7/32&quot; (3.10 cm)</td>
</tr>
<tr>
<td></td>
<td>1-7/16&quot; (3.65 cm)</td>
</tr>
<tr>
<td></td>
<td>#10-32 Gauge Port</td>
</tr>
<tr>
<td></td>
<td>1-1/8&quot; (2.86 cm) Dia.</td>
</tr>
</tbody>
</table>

1/8" Compression Fitting

For more information call +1 603 595 1500 or email ppinfo@parker.com
Visit www.parker.com/precisionfluidics
Model 4000 Precision Pressure Regulator

Typical Flow Diagram

VOC Emissions Monitoring Analyzer

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Visit www.parker.com/precisionfluidics
Model 4000  Precision Pressure Regulator

Ordering Information

<table>
<thead>
<tr>
<th>Sample Part #</th>
<th>4000</th>
<th>A</th>
<th>M</th>
<th>B</th>
<th>S</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Options</td>
<td>4000</td>
<td>A: Aluminum*</td>
<td>M: Music Wire (ASTM A228)</td>
<td>B: Buna-N</td>
<td>V: FKM</td>
<td>S: Stainless Steel</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

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

**Back 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

## Product Specifications

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

### Wetted Materials

- **Body:** Aluminum or 303 Stainless Steel
- **Diaphragm:** Fairprene BN-5029 (Buna-N on nylon) or 300 Stainless Steel
- **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 (0.99 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)
**Model 9000** Precision Pressure Regulator

**Typical Flow Curves**

![Typical Droop (Flow Sensitivity) Curve](image)

- **30 psig (2.07 barg) Range Spring**
- **60 psig (4.14 barg) Range Spring**

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Visit [www.parker.com/precisionfluidics](http://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>Units</th>
<th>In (cm)</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>

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

Typical Flow Diagram

VOC Emissions Monitoring Analyzer
**Model 9000** Precision Pressure Regulator

**Ordering Information**

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<th>M</th>
<th>B</th>
<th>S</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Model</td>
<td>Body Material</td>
<td>Spring Material</td>
<td>O-Ring Material</td>
<td>Diaphragm Material</td>
<td>Pressure Range</td>
</tr>
<tr>
<td>Options</td>
<td>9000</td>
<td>A: Aluminum*</td>
<td>M: Music Wire (ASTM A228)</td>
<td>B: Buna-N</td>
<td>F: Fairprene BN-5029</td>
<td>15: 15 psig (1.03 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S: Stainless Steel</td>
<td></td>
<td>V: FKM</td>
<td>S: Stainless Steel</td>
<td>30: 30 psig (2.07 barg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V: FKM and Nomex</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>
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- 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:**

- 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.
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
WARNING – USER RESPONSIBILITY

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Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems, assuring that all performance, safety, and warning requirements of the application are met.

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