Back Pressure Regulators

Manual Adjusted and Dome-loaded

Index

PVRB Series 1
BP-3 Series 3
BP-60 Series 5
BPR30 Series 7
BP-66 Series 9
BPR21 Series 11
PVRB Series
Ultra-sensitive Back Pressure Regulator
Inlet & Outlet to 60 psig

How it Works

Closed
With the unit spring load adjusted to the desired regulated “set” pressure, a dead-tight seal is affected against the applied upstream pressure.

Regulating
When the upstream process pressure (applied on the diaphragm) increases, an opposing force is generated which, through the diaphragm plate, acts against the “set” spring load.

As the increasing upstream pressure level reaches the “set” pressure, the poppet is gradually lifted off its seat. A consequent decrease in upstream pressure is experienced when the flowing fluid is relieved to the downstream side of the process at a faster rate than the upstream pressure can supply.

With decreasing upstream pressure, the spring force starts the poppet moving toward its closed position, thus maintaining the desired “set” pressure level within a narrow band.

When the upstream pressure has decreased to a level just below “crack”, the adjusting spring load again creates a tight seal between the poppet and the sharp edge of the valve seat.

Features

• Low pressure control
• Full range capability
• Compatible with corrosive and non-corrosive gases & liquids
• Ultra-sensitive pressure regulator

Applications

• Chromatography
• Process stream sampling
• Bubbling operations
• Medical instrumentation
• Research laboratories
• Instrument calibration

Technical Data

<table>
<thead>
<tr>
<th>Body Construction Material</th>
<th>Polyvinyl chloride</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Housing Materials</td>
<td>PVRB2 &amp; PVRB3: Polyvinyl chloride, PVRB4 &amp; PVRB5: Aluminum alloy</td>
</tr>
<tr>
<td>Seat Material</td>
<td>Kel-F®</td>
</tr>
<tr>
<td>Diaphragm Material</td>
<td>PTFE</td>
</tr>
<tr>
<td>Adjustment Screw Material</td>
<td>Delrin®</td>
</tr>
<tr>
<td>Port Sizes</td>
<td>¼˝ NPT female</td>
</tr>
<tr>
<td>Pressure Ratings</td>
<td>Maximum control pressure: 60 psig (4 BAR)</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>0°F to +125°F (−18°C to +52°C)</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>Cv = 0.011 maximum, Orifice diameter = 0.025”</td>
</tr>
<tr>
<td>Weight</td>
<td>PVRB2 &amp; PVRB3: 14 oz, PVRB4 &amp; PVRB5: 1.5 lbs</td>
</tr>
<tr>
<td>Leakage</td>
<td>Bubble-tight</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>Less than ½ psi</td>
</tr>
</tbody>
</table>

Note: Proper filtration is recommended to prevent damage to sealing surfaces.
BP-3 Series

Dimensions

How to Order

REPAIR KIT

PRESSURE RANGE

K/ PVRB 3 M PM

OPTIONS

Blank None
PM Panel mount

TRIM MATERIAL

Blank 316 stainless steel
M Monel®

Note: if this regulator is to be used in oxygen service, specify “GENERAL OXYGEN SERVICE” when ordering or furnish the factory a copy of the special requirements.

Please consult your Circle Seal Controls distributor, representative, or the factory for information on special connections, operating pressures and temperature ranges.

For Your Safety

It is solely the responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation, and maintenance of these products. Material compatibility, product ratings and application details should be considered in the selection. Improper selection or use of products described herein can cause personal injury or property damage.

Kel-F® is a registered trademark of 3M Company.
Delrin® is a registered trademark of DuPont.
Monel® is a registered trademark of Special Metals Corporation.
The BP-3 Series is designed for either liquid or gas service in instrumentation systems. Similar in design to pressure reducing control regulators which regulate outlet pressures, back pressure regulators control the inlet pressure. The many features of this regulator, particularly its precise throttling action, make it ideal for this type of application. In low flow or closed systems, overpressures often are released by pressure relief valves. This type of relief is on-off with no throttling control. In contrast to relief valves, the back pressure control regulator with its throttling action substantially improves system pressure regulation.

* Replaces the BPR7A and BPR8A Series.

**Applications**
- Analytical instrumentation
- Pilot plants
- Specialty gas systems
- Compressors
- Pump bypass
- Process vessel protection

**Features & Specifications**
- Only 316L stainless steel and PTFE in flow stream
- 316L stainless steel construction
- Operating temperatures of −40° F to +500° F
  
  \((-40° C to +260° C)\)
- Bubble-tight shutoff
- Gas or liquid service
- Adjustable pressure control ranges of 0–6 psig, 0–10 psig, 0–25 psig, 0–50 psig, 0–100 psig, 0–250 psig, 0–500 psig, 0–750 psig, and 0–1,000 psig
- \(C_v\) flow coefficient is 0.2

**Options**
- Wetted materials of construction: brass, Monel®, Hastelloy®, titanium
- Extra ports
- Panel mount (requires a 1 1/8” mounting hole)
- High purity connections (tube stubs, metal face seals, etc.)
- Pressure gauges
- Optional \(C_v\)’s: 0.03, 0.05, 0.06, 0.12, 0.24, 0.3, 0.095, 0.025, 0.04, 0.005, and 0.01

**Maximum Temperature & Control Pressures**

<table>
<thead>
<tr>
<th>Seat Material</th>
<th>Maximum Temperature</th>
<th>@ Maximum Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viton®</td>
<td>250° F (121° C)</td>
<td>@ 250 psig (1.72 MPa)</td>
</tr>
<tr>
<td>Kalrez®</td>
<td>300° F (148° C)</td>
<td>@ 250 psig (1.72 MPa)</td>
</tr>
<tr>
<td>High-density PTFE</td>
<td>200° F (93° C)</td>
<td>@ 500 psig (3.44 MPa)</td>
</tr>
<tr>
<td>Polyimide</td>
<td>500° F (260° C)</td>
<td>@ 1,000 psig (6.89 MPa)</td>
</tr>
<tr>
<td>PEEK™</td>
<td>500° F (260° C)</td>
<td>@ 1,000 psig (6.89 MPa)</td>
</tr>
</tbody>
</table>

Note: Temperatures in excess of 175° F (80° C) require the use of a metal knob or the tamper-proof option.
**How to Order**

**BP3 – 1 A 1 1 I 5 G 1 1 1 C**

**BODY MATERIALS**
- 1  316L stainless steel
- 2  Brass
- 4  Monel®
- 5  Hastelloy® B
- 6  Hastelloy® C
- 7  Titanium

**PORT CONFIGURATION**
- A  Standard (one inlet & one outlet port)
  For more port configurations, see page 13.

**PROCESS PORT TYPES**
- 1  ¼” FNPT (¼” FNPT gauge ports) (standard)
- 2  ¼” sch 80 pipe (¼” FNPT gauge ports)
- 4  ¾” FNPT (¾” FNPT gauge ports)
- 6  ½” tube (½” tube gauge ports)
- 8  ⅛” FNPT (⅛” FNPT gauge ports)
- A  ¼” ISO 7-Rc taper internal (¼” FNPT gauge ports)
- B  ¼” internal VCR (¼” tube gauge ports)
- K  ¾” sch 40 pipe (¾” FNPT gauge ports)

**SURFACE FINISH/DIAPHRAGM CAVITY**
- 1  < 25 Ra

**ACTUATOR MATERIALS**
- B  CF PTFE
- C  Polyimide (metal knob is standard)
- D  Viton®
- I  High-density PTFE
- K  Kalrez®
- Q  PEEK™

**DIAPHRAGM FACING/BACKING MATERIAL**
- 1  PTFE/stainless steel
- 6  Tefzel®/stainless steel
- 7  Viton®/stainless steel
- 8  PTFE/Inconel®
- 9  PTFE/Hastelloy® B
- 0  PTFE/Hastelloy® C
- A  PTFE/tantalum

**DIAPHRAGM TYPE**
- 1  Standard diaphragm
- 4  Vacuum assist spring, standard diaphragm

**CONTROL RANGE**
- B  0–6 psig
- C  0–10 psig
- D  0–25 psig
- E  0–50 psig
- G  0–100 psig
- I  0–250 psig
- J  0–500 psig*
- W  0–750 psig*
- K  0–1,000 psig†

**FLOW COEFFICIENT (CV)**
- 1  0.03
- 2  0.05
- 3  0.06
- 4  0.12
- 5  0.2 (standard)
- 6  0.24
- 7  0.30
- A  0.095
- C  0.025
- E  0.04
- I  0.005
- J  0.01

* Polyimide, PEEK™, or Kel-F® actuators are recommended for these pressure ranges.
† Must use BP-6 top works

---

**For Your Safety**

It is solely the responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation, and maintenance of these products. Material compatibility, product ratings and application details should be considered in the selection. Improper selection or use of products described herein can cause personal injury or property damage.

Tefzel® is a registered trademark of the DuPont Company.
Kalrez® and Viton® are registered trademarks of DuPont Dow Elastomers.
PEEK™ is a trademark of Victrex PLC.
Inconel® and Monel® are registered trademarks of Special Metals Corporation.
Hastelloy® is a registered trademark of Haynes International, Inc.
Kel-F® is a registered trademark of 3M Company.
BP-60 Series*
High Pressure Back Pressure Regulator

The BP-60 Series is the counterpart of the PR-50 pressure reducing series for systems that are higher in pressure and low to moderate flows. This regulator has a diaphragm for maximum sensitivity in providing relief at high pressures. The PTFE stainless seat assembly provides good shutoff in most applications. For economy purposes, the cap assembly and knob are of aluminum construction as in the PR-50 companion unit. Good sensitivity and a wide selection of control ranges make this regulator an excellent selection in many research and pilot plant facilities.

* Replaces the BPR9A Series.

Features & Specifications
- Adjustable pressure control ranges of 0–500 psig, 0–1,000 psig and 0–2,000 psig
- 316L stainless steel or brass (alloy 360) body construction
- Designed for moderate flow applications with standard Cv flow coefficient of 0.04
- Diaphragm sensing with nylon, PTFE, or stainless steel diaphragm
- Operating temperatures of −40° F to +350° F (−40° C to +176° C)
- Bubble-tight shutoff
- Inlet/outlet connections ¼˝ FNPT

Options
- Option Cv’s available: 0.025, 0.005, 0.01
- Panel mounting
- ¾˝ FNPT, AND10050–4, SAE J514 or MS33649 connections
- Monel® and Hastelloy® C body construction

Applications
- Pilot plants
- Analytical instrumentation
- Compressors
- Pump bypass
- Pressure vessel protection
- Hydrostatic testing

Maximum Temperature & Control Pressures

<table>
<thead>
<tr>
<th>Nylon Diaphragm Backing</th>
<th>PTFE Diaphragm Backing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seat Material</strong></td>
<td><strong>Maximum Temperature</strong></td>
</tr>
<tr>
<td>Tefzel®</td>
<td>175° F (80° C)</td>
</tr>
<tr>
<td>PTFE</td>
<td>175° F (80° C)</td>
</tr>
<tr>
<td>Polyimide</td>
<td>175° F (80° C)</td>
</tr>
<tr>
<td>PEEK™</td>
<td>175° F (80° C)</td>
</tr>
</tbody>
</table>

Nylon Diaphragm Backing

<table>
<thead>
<tr>
<th>Seat Material</th>
<th>Maximum Temperature</th>
<th>Maximum Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tefzel®</td>
<td>175° F (80° C)</td>
<td>1,000 psig (6.89 MPa)</td>
</tr>
<tr>
<td>PTFE</td>
<td>175° F (80° C)</td>
<td>1,000 psig (6.89 MPa)</td>
</tr>
<tr>
<td>Polyimide</td>
<td>175° F (80° C)</td>
<td>2,000 psig (13.79 MPa)</td>
</tr>
<tr>
<td>PEEK™</td>
<td>175° F (80° C)</td>
<td>2,000 psig (13.79 MPa)</td>
</tr>
</tbody>
</table>

PTFE Diaphragm Backing

<table>
<thead>
<tr>
<th>Seat Material</th>
<th>Maximum Temperature</th>
<th>Maximum Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tefzel®</td>
<td>175° F (80° C)</td>
<td>2,000 psig (13.79 MPa)</td>
</tr>
<tr>
<td>PTFE</td>
<td>175° F (93° C)</td>
<td>2,000 psig (13.79 MPa)</td>
</tr>
<tr>
<td>Polyimide</td>
<td>350° F (176° C)</td>
<td>2,000 psig (13.79 MPa)</td>
</tr>
<tr>
<td>PEEK™</td>
<td>350° F (176° C)</td>
<td>2,000 psig (13.79 MPa)</td>
</tr>
</tbody>
</table>

Circle Seal Controls
2301 Wardlow Circle • Corona, CA 92880
Phone (951) 270-6200 • Fax (951) 270-6201
www.circlesealcontrols.com
BP-3 Series

How to Order

**BP60 – 1 A 1 I 5 G 1 1 C**

**BODY MATERIALS**
1. 316L stainless steel
2. Brass
3. Monel®
4. Hastelloy® C

**PORT CONFIGURATION**
A. Standard (one inlet & one outlet port)
   For more port configurations, see page 13.

**PROCESS PORT TYPES**
1. ¼” FNPT (¼” FNPT gauge ports) (standard)
2. ¾” tube (¾” tube gauge ports)
3. ¾” FNPT (¾” FNPT gauge ports)
4. AND10050-4 (¾” FNPT gauge ports)
5. SAE J514 (¼” FNPT gauge ports)
6. MS 33649 (¼” FNPT gauge ports)

**SURFACE FINISH/DIAPHRAGM CAVITY**
1. < 25 Ra (standard)
2. < 25 Ra with 10-32 mounting holes

**ACTUATOR MATERIALS**
A. Tefzel®
B. CF PTFE
C. Polyimide
I. PTFE
Q. PEEK™

**CAP ASSEMBLY**
1. Standard, aluminum
4. Panel mount, aluminum
5. Captured vent, aluminum

**DIAPHRAGM FACING/BACKING MATERIAL**
Facing
1. SS
2. Inconel®
3. SS
4. Inconel®
5. SS
6. Inconel®
7. SS
8. Inconel®
9. SS

O-rings
1. Viton®
2. PTFE
3. Viton®
4. PTFE
5. SS
6. Kalrez®
7. PTFE
8. Kalrez®
9. SS

Actuator
1. SS
2. Monel®
3. SS
4. Monel®
5. SS
6. Hastelloy® C
7. Hastelloy® C
8. Hastelloy® C

**DIAPHRAGM TYPE**
1. Standard

**CONTROL RANGE**
J. 0–500 psig
K. 0–1,000 psig
L. 0–2,000 psig

**FLOW COEFFICIENT (CV)**
C. 0.025
E. 0.04 (standard)
I. 0.005
J. 0.01
G. 0.09

Outline & Mounting Dimensions

For Your Safety
It is solely the responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation, and maintenance of these products. Material compatibility, product ratings and application details should be considered in the selection. Improper selection or use of products described herein can cause personal injury or property damage.

Tefzel® is a registered trademark of the DuPont Company.
Kalrez® and Viton® are registered trademarks of DuPont Dow Elastomers.
PEEK™ is a trademark of Victrex PLC.
Inconel® and Monel® are registered trademarks of Special Metals Corporation.
Hastelloy® is a registered trademark of Haynes International, Inc.
BPR30 Series
Corrosion Resistant Back Pressure Regulator
160 to 2,500 psig

How it Works

Closed
With the unit spring load adjusted to the desired regulated “set” pressure, a dead-tight seal if effected against the applied upstream pressure by the small seating spring contained within the poppet and spring retainer.

Regulating
When the upstream process pressure (acting on the regulating piston) increases, an opposing force is generated which, through the regulating piston, acts against the “set” spring load. As the increasing upstream pressure level reaches the “set” pressure, the poppet is gradually lifted off its seat. A consequent decrease in upstream pressure is experienced when the flowing fluid is relieved to the downstream side of the poppet at a faster rate than the upstream pressure can supply.

Features
• Positive shutoff at zero flow
• Compatible with corrosive or non-corrosive media
• Full range capability
• Unique design prevents clogging
• Tee handle for fast & precise control

Applications
• Compressors
• Pump bypass
• Hydrostatic testing
• Water descaling systems
• Pressure vessel protection
• Reverse osmosis systems

Technical Data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Construction Materials</td>
<td>Brass or 316 stainless steel</td>
</tr>
<tr>
<td>Seal Materials</td>
<td>Ethylene propylene, Neoprene, PTFE or Viton®</td>
</tr>
<tr>
<td>Seat Material</td>
<td>Kel-F®</td>
</tr>
<tr>
<td>Trim Material</td>
<td>Stainless steel exposed to line fluids</td>
</tr>
<tr>
<td>Port Sizes</td>
<td>¼” or ½” NPT female</td>
</tr>
<tr>
<td>Weight</td>
<td>2.75 lbs</td>
</tr>
<tr>
<td>Pressure Ratings</td>
<td>160 to 2,500 psig (11 to 172 BAR)</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>−65° F to +250° F (−54° C to +121° C)</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>CV = 0.25</td>
</tr>
</tbody>
</table>

Note: Proper filtration is recommended to prevent damage to sealing surfaces.
**BP-3 Series**

### Dimensions & Flow Curves

![Diagram of BP-3 Series back pressure regulator]

- **Inlet**
  - 1.50 Dia.
- **Outlet**
  - 1.25 Dia.
- **Panel**
  - 3.28 Max.
- **Flats**
  - 0.375 Min. Full Thd. 2 Places
- **Bolt Circle**
  - 2.00 Dia.
- **10-32 UNF Thd.**
  - 2 Places
- **Max.**
  - 3.75
- **Min.**
  - 2.50

**BPR30 Flow Chart**

- **Flow, Water (GPM)**
- **Inlet Pressure (PSIG-Cracking)**

### How to Order

#### K/ BPR32 B 2 1 2

- **REPAIR KIT**
- **BASIC MODEL NUMBER**
  - BPR32 160 to 1,000 psig (11 to 69 BAR)
  - BPR31 200 to 2,500 psig (14 to 172 BAR)
- **BODY MATERIALS**
  - B Brass
  - U 316 stainless steel
- **INLET & OUTLET PORTS**
  - 1 ¼” NPT female
  - 2 ½” NPT female

#### CLEANING LEVELS*

- 1 General oxygen service
- 2 General pneumatic service
- 3 Specify (define on sales order)

#### SEAL MATERIAL

- 1 Neoprene
- 3 Viton®
- 4 Ethylene propylene
- 5 PTFE (Viton® static seal is used under the seat with PTFE piston seals)

---

These units are not intended for applications where the exhaust connection will see buildup of downstream pressure. If this regulator is to be used in oxygen service, Vespel® SP-21 seat and Viton® seal are used and specify "General Oxygen Service" when ordering. Temperature range: −20° F to +250° F.

Viton® static seal is used under the seat with PTFE piston seals.

Please consult your Circle Seal Controls distributor, representative, or the factory for information on special connections, operating pressures and temperature ranges.

---

**For Your Safety**

It is solely the responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation, and maintenance of these products. Material compatibility, product ratings and application details should be considered in the selection. Improper selection or use of products described herein can cause personal injury or property damage.

---

*Viton® is a registered trademark of DuPont Dow Elastomers.*

*Kel-F® is a registered trademark of 3M Company.*
BP-66 Series*
High Pressure Back Pressure Regulator (10,000 psig)

The BP-66 Series is the counterpart of the PR-57 pressure reducing series for systems that are higher in pressure and low to moderate flows. This regulator has piston sensing to provide relief at high pressures. The Polyimide/stainless steel assembly provides good shutoff in most applications. For economy purposes, the cap assembly and knob are of aluminum construction as in the PR-57 companion unit. Good sensitivity and a selection of control ranges make this regulator an excellent selection in many research and pilot plant facilities.

* Replaces the BPR1xA Series.

Features & Specifications
- 316L stainless steel construction
- Adjustable pressure control ranges of 0–2,000 psig, 0–4,000 psig, 0–6,000 psig, 0–7,500 psig, and 0–10,000 psig
- Spring-loaded piston sensor
- Gas and liquid service
- Cv flow coefficient: 0.04
- Operating temperature of −40° F to +350° F (−40° C to +176° C)
- ¼˝ FNPT connections standard

Applications
- Pilot plants
- Analytical instrumentation
- Compressors
- Pump bypass
- Pressure vessel protection
- Hydrostatic testing

Options
- Monel® and titanium body construction
- Optional Cv’s: 0.01 and 0.12
- Panel mounting
- AND10050–4, SAE J514, MS 33649, or ⅜˝ FNPT connections

Maximum Temperature & Control Pressures

<table>
<thead>
<tr>
<th>Seat Material</th>
<th>Maximum Temperature</th>
<th>Maximum Control Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyimide</td>
<td>350° F (176° C)</td>
<td>@ 10,000 psig (68.9 MPa)</td>
</tr>
<tr>
<td>PEEK™</td>
<td>350° F (176° C)</td>
<td>@ 10,000 psig (68.9 MPa)</td>
</tr>
</tbody>
</table>

Circle Seal Controls
2301 Wardlow Circle • Corona, CA 92880
Phone (951) 270-6200 • Fax (951) 270-6201
www.circlesealcontrols.com
BP-3 Series

How to Order

BODY MATERIALS
1 316L stainless steel
4 Monel®
7 Titanium

PORT CONFIGURATION
A Standard (one inlet & one outlet port)
For more port configurations, see page 13.

PROCESS PORT TYPES
1 ¼” FNPT (¼” FNPT gauge ports)
2 ¼” tube (¼” tube gauge ports)
4 ½” FNPT (½” FNPT gauge ports)
6 ½” tube (½” tube gauge ports)
7 AND10050–4 (¼” FNPT gauge ports)
8 SAE J514 (¼” FNPT gauge ports)
9 MS 33649 (¼” FNPT gauge ports)

SURFACE FINISH/DIAPHRAGM CAVITY
1 < 25 Ra (standard)
5 < 25 Ra with 10-32 mounting holes

ACTUATOR MATERIALS
C Polymide
Q PEEK™

CAP ASSEMBLY
1 Standard, aluminum
4 Panel mount, aluminum
5 Captured vent, aluminum
6 Captured vent, panel mount, aluminum
7 Captured vent, stainless steel
F Stainless steel

PISTON MATERIAL
5 Stainless steel
B Monel®
5 Titanium

PISTON TYPE
1 Standard

CONTROL RANGE
L 0–2,000 psig
N 0–4,000 psig
O 0–6,000 psig
P 0–7,500 psig
Q 0–10,000 psig

FLOW COEFFICIENT (CV)
4 0.12
E 0.04
J 0.01

Outline & Mounting Dimensions

For Your Safety
It is solely the responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation, and maintenance of these products. Material compatibility, product ratings and application details should be considered in the selection. Improper selection or use of products described herein can cause personal injury or property damage.
BPR21 Series
High Flow Dome-loaded Back Pressure Regulator
25–6,000 psig

Features
- Extremely reliable
- High flow capacity
- Remote control capability
- Large diaphragm provides accuracy & sensitivity
- Compatible with most liquids & gases

Applications
- System bypass valve
- Pressure vessel protection
- Chemical/petroleum plants
- Industrial controls
- Pumps or compressors
- Heat exchangers

Technical Data

<table>
<thead>
<tr>
<th>Body Construction Materials</th>
<th>Brass or 316 stainless steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat Materials</td>
<td>Hastelloy® C, Kel-F®, KYNAR®, Nylatron®, Polyimide, stainless steel, or Vespel® SP-21</td>
</tr>
<tr>
<td>Port Sizes</td>
<td>¼˝ NPT female, ¾˝ NPT female, AND10050–4 or AND10050–6</td>
</tr>
<tr>
<td>Pressure Ratings</td>
<td>Brass: 25 to 3,500 psig (1.7 to 241 BAR)</td>
</tr>
<tr>
<td></td>
<td>Stainless steel: 25 to 6,000 psig (1.7 to 414 BAR)</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>−65° F to +400° F (−54° C to +204° C)</td>
</tr>
<tr>
<td>Flow Capacity</td>
<td>Cv = 0.90</td>
</tr>
<tr>
<td></td>
<td>Orifice diameter = 0.23”</td>
</tr>
</tbody>
</table>

Note: Proper filtration is recommended to prevent damage to sealing surfaces.

How it Works

Closed
With a pressure regulator connected to the dome port and the dome pressure adjusted slightly above the desired regulated “set” pressure, a bubble-tight seal is effected against the applied upstream pressure.

Regulating
When the upstream process pressure (applied to the inlet side of the diaphragm) increases, an opposing force is generated which acts on the diaphragm and attached poppet against the “set” pressure load in the dome.

As the increasing upstream pressure level reaches the “set” pressure, the poppet is gradually lifted off its seat. A consequent decrease in upstream pressure is experienced when the flowing fluid is relieved to the downstream side of the poppet at a faster rate than the upstream pressure can supply.

With decreasing upstream pressure, the pressure-loaded dome starts moving the poppet toward its closed position, thus maintaining the desired “set” pressure level within a narrow band.

When the upstream pressure has decreased to a level just below “crack” the generated forces from the pressure-loaded dome again create a tight seal between the poppet and the sharp edge of the valve seat.

Circle Seal Controls
2301 Wardlow Circle • Corona, CA 92880
Phone (951) 270-6200 • Fax (951) 270-6201
www.circle-seal.com
BPR 21 Series

Dimensions

How to Order

**REPAIR KIT**

**BODY MATERIALS**

- B Brass
- U 316 stainless steel

**INLET & OUTLET PORT**

1. AND10050–4
2. ¼” NPT female (standard)
3. AND10050–6
4. ⅜” NPT female

**DOME-LOAD PORT**

1. AND10050–4
2. ¼” NPT female (standard)

**SEAL & DIAPHRAGM MATERIAL**

1. Neoprene (standard)
2. Viton***
3. Buna N
4. PTFE-coated Neoprene diaphragm, PTFE o-ring

Performance characteristics: Repeatability of cracking (set) pressure: ±2%
Crack pressure to full flow: 110% of set pressure
Reseat pressure: within 2% of set pressure above 400 psig.

CAUTION: These units are not intended for applications where the exhaust connection will see a buildup of downstream pressure.

Please consult your Circle Seal Controls distributor, representative, or the factory for information on special connections, operating pressures and temperature ranges.

For Your Safety

It is solely the responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation, and maintenance of these products. Material compatibility, product ratings and application details should be considered in the selection. Improper selection or use of products described herein can cause personal injury or property damage.
CIRCOR Instrumentation Technologies (CIT) is the logical choice for fluid control solutions. We provide the lowest cost of ownership, offering the best in class reliability and availability of our products. We have global coverage, delivering value in the form of local, flexible service to meet our customer’s needs. CIT is a product group specializing in instrumentation with orifice sizes typically up to 2”.

Our corporate head office and ISO 9001:2000 registered manufacturing facilities are located at
405 Centura Court
Spartanburg, SC, USA, 29303
Tel +1-864-574-7966
Fax +1-864-587-5608
www.hoke.com
www.circortechnologies.com

Proudly Distributed By: