

# 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

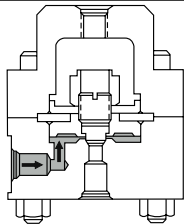
- System bypass valve
- Pressure vessel protection
- Chemical/petroleum plants
- Industrial controls
- Pumps or compressors
- Heat exchangers

## Technical Data

<b>Body Construction Materials</b>	Brass or 316 stainless steel
<b>Seat Materials</b>	Hastelloy® C, Kel-F®, KYNAR®, Nylatron®, Polyimide, stainless steel, or Vespel® SP-21
<b>Port Sizes</b>	¼" NPT female, ⅜" NPT female, AND10050-4 or AND10050-6
<b>Pressure Ratings</b>	Brass: 25 to 3,500 psig (1.7 to 241 BAR) Stainless steel: 25 to 6,000 psig (1.7 to 414 BAR)
<b>Temperature Range</b>	-65° F to +400° F (-54° C to +204° C)
<b>Flow Capacity</b>	Cv = 0.90 Orifice diameter = 0.23"

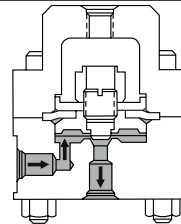
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

## 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.

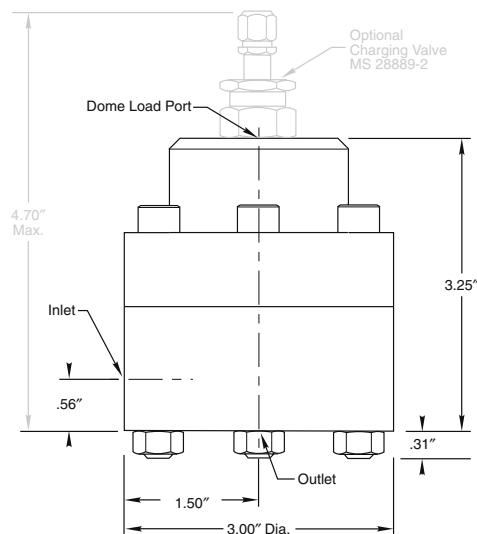
## Circle Seal Controls

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back pressure regulators

# BPR 21 Series

## Dimensions



## How to Order

**K/ BPR21 B 2 2 1 3 2 C**

**REPAIR KIT** —————

**BODY MATERIALS** —————

**B** Brass  
**U** 316 stainless steel

**INLET & OUTLET PORT** —————

**1** AND10050-4  
**2** 1/4" NPT female (standard)  
**3** AND10050-6  
**4** 3/8" NPT female

**DOME-LOAD PORT** —————

**1** AND10050-4  
**2** 1/4" NPT female (standard)

**SEAL & DIAPHRAGM MATERIAL** —————

**1** Neoprene (standard)  
**3** Viton®\*\*  
**4** Buna N  
**5** Teflon®-coated Neoprene diaphragm, Teflon® o-ring

**OPTIONS**

**C** Charging valve

**CLEANING LEVELS**

**1** General oxygen service\*  
**2** General pneumatic service  
**3** Specify\*\*\*  
**4** Precision pneumatic service

**SEAT MATERIAL**

**1** Nylatron® (standard)  
**2** Kel-F® (limited to 3,600 psig)  
**3** KYNAR®  
**4** Stainless steel  
**5** Polyimide (Vespel® SP-21)\*\*  
**7** Hastelloy® C

\* If this regulator is to be used in oxygen service, specify "OXYGEN SERVICE" when ordering or furnish a copy of the special requirements.

\*\* Standard for oxygen service (Vespel® seat and Viton® seal & diaphragm).  
Temperature range: -20° F to +250° F

\*\*\* List requirements or furnish the factory a copy of the requirements or specifications

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.

Hastelloy® is a registered trademark of Haynes International, Inc.

Kel-F® is a registered trademark of 3M Company.

KYNAR® is a registered trademark of ATOFINA Chemicals, Inc.

Nylatron® is a registered trademark of DSM Engineering Plastic Products.

Vespel® is a registered trademark of E.I. du Pont de Nemours and Company.

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