

## PR-1 Series\*

### Adjustable Pressure Control Regulator



The PR-1 Series is a versatile specialty pressure reducing control regulator designed to fulfill a wide range of needs in instrumentation sample systems and other applications such as semiconductor processing gases. The many features of the PR-1 make it ideal for a wide range of applications controlling pressures at low to moderate flows in gas or liquid service. 316L material is used to facilitate welded connections. Stainless steel caps and adjusting screws prevent atmospheric corrosion and maintain appearance. Enhanced internal body surface finish of better than 25 Ra plus electropolishing allows easier cleaning and potentially less particle contamination in the flow stream.

Six different seat materials, three alternate orifice sizes and eight pressure control ranges with stainless diaphragms offer the user a wide spectrum of capabilities for pressure control with inlet pressures up to 6,000 psig and standard operating temperatures up to 500° F (260° C).

\* Replaces the LPR and MR Series.

#### Features & Specifications

- Gas or liquid service
- 316L stainless steel, Inconel®, Teflon®, and Tefzel® only in flow stream
- Electropolished 316L body with better than 25 Ra diaphragm cavity surface finish
- Stainless steel cap with stainless steel adjusting screw
- Inlet pressures of up to 6,000 psi
- Adjustable outlet pressure ranges of 0–6 psig, 0–10 psig, 0–25 psig, 0–50 psig, 0–100 psig, 0–250 psig, 0–500 psig, and 0–750 psig
- Operating temperatures of –40° F to +500° F (–40° C to +260° C)
- 20µ filters
- Bubble-tight shutoff under most conditions
- Cv flow coefficient: 0.06

#### Options

- Wetted materials of construction: Monel®, Hastelloy® and titanium
- Diaphragm attached poppet
- Special fittings
- Diaphragm assist spring for vacuum purging
- Larger Cv's of 0.2 and 0.5, smaller Cv's of 0.025
- Panel mount (1 $\frac{3}{8}$ " mounting hole)

#### Maximum Temperature & Operating Inlet Pressures

Seat Material	Maximum Temperature*	@	Maximum Operating Inlet Pressure
Tefzel®	150° F (66° C)	@	3,600 psig (24.82 MPa)
High density Teflon®	150° F (66° C)	@	3,600 psig (24.82 MPa)
CF Teflon®	175° F (80° C)	@	3,600 psig (24.82 MPa)
PCTFE (formerly Kel-F® 81)	175° F (80° C)	@	6,000 psig (41.37 MPa)
Polyimide	500° F (260° C)	@	3,600 psig (24.82 MPa)
Polyimide	175° F (80° C)	@	6,000 psig (41.37 MPa)
PEEK™	500° F (260° C)	@	3,600 psig (24.82 MPa)
PEEK™	175° F (80° C)	@	6,000 psig (41.37 MPa)

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

#### Circle Seal Controls

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 Phone (951) 270-6200 • Fax (951) 270-6201  
 www.circle-seal.com

pressure regulators

# PR-1 Series

## How to Order

**K/ PR1 - 1 A 1 1 A 3 C 1 1 1 C**

### REPAIR KIT

### BODY MATERIALS

- 1 316L stainless steel
- 4 Monel®
- 5 Hastelloy® B
- 6 Hastelloy® C
- 7 Titanium
- 0 Inconel® 625

### PORT CONFIGURATION

- A Standard (one inlet & one outlet port)
- For more port configurations, see page 35.

### PROCESS PORT TYPES

- 0 1/8" FNPT
- 1 1/4" FNPT
- 3 1/4" sch 80 pipe (1/4" FNPT gauge ports)
- 4 3/8" FNPT
- 8 SAE J514 (1/4" NPT gauge ports)
- 9 MS33649 (1/4" NPT gauge ports)
- A 1/4" ISO 7-Rc taper
- H 1/2" sch 160 pipe
- K 1/4" sch 40 pipe

### CAVITY FINISH

- 1 < 25 Ra, standard

### SEAT MATERIALS

- A Tefzel®
- B CF Teflon®
- C Polyimide, high temperature service
- H PCTFE (formerly Kel-F® 81)
- I High-density Teflon®
- N Polyimide, low temperature service
- Q PEEK™

### FLOW COEFFICIENT

- 3 0.06 (standard)
- 5 0.2
- C 0.025
- H 0.50

### OUTLET RANGE

- C 0-10 psig
- D 0-25 psig
- E 0-50 psig
- G 0-100 psig
- I 0-250 psig
- J 0-500 psig
- L 0-6 psig
- W 0-750 psig

### CAP ASSEMBLY

- 1 Standard stainless steel
- 4 Panel mount, stainless steel
- 5 Captured vent, aluminum
- 6 Captured vent, panel mount, aluminum
- 8 Tamper-proof, stainless steel
- 9 Fine adjust, 1/2" panel mount, aluminum
- 0 Fine adjust, 1/8" panel mount, aluminum
- A Captured vent, tamper-proof, aluminum
- E Tamper-proof, panel mount, aluminum
- H 1/4" NPT dome-loaded, stainless steel

### DIAPHRAGM FACING/BACKING

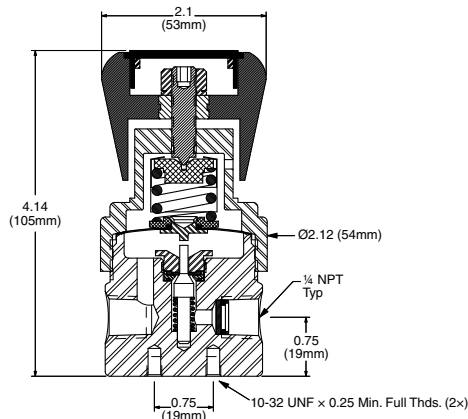
- 1 Teflon®/stainless steel
- 2 Teflon®/Viton® (0-50 psig max.)
- 6 Tefzel® ring/stainless steel
- 7 Viton®/stainless steel
- 8 Teflon®/Inconel®
- 9 Teflon®/Hastelloy® B
- 0 Teflon®/Hastelloy® C
- A Teflon®/tantalum
- B Teflon®/Inconel® 625
- J Tefzel® ring/Inconel®

### DIAPHRAGM TYPE

- 1 Standard diaphragm
- 2 Diaphragm attached poppet
- 3 Self-relieving
- 4 Vacuum assist spring, standard diaphragm
- 5 Vacuum assist spring, diaphragm attached poppet
- 6 Vacuum assist spring, self-relieving
- 7 Liquid service

## Outline & Mounting Dimensions

Weight = 1.9 lbs (0.86kg)



## 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.

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 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.

## PR-2 Series\*

### Economy Brass Pressure Reducing Regulator



The PR-2 Series are compact brass body regulators designed for maximum flexibility in many classes of instrumentation service. Specifically designed for gas applications, this regulator is capable of accepting high pressures directly from cylinders and other high pressure, non-corrosive systems. It is ideally suited for carrier gas pressure regulation, yet it is economical enough to use in low-pressure air systems such as instrument cabinet air purge service.

\* Replaces the LPR Series.

#### Features & Specifications

- Gas or liquid service
- Brass (alloy 360) construction
- Stainless steel diaphragm with Teflon® lining
- Stainless steel poppet
- Better than 25 Ra finish in diaphragm cavity
- 20µ inlet filter
- Bubble-tight shutoff
- Outlet pressure ranges: 0–10 psig, 0–25 psig, 0–50 psig, 0–100 psig, 0–250 psig, 0–500 psig and 0–750 psig
- Operating temperatures: –40° F to +175° F (–40° C to +80° C)
- Inlet and outlet connection: ¼" FNPT

#### Options

- ½" or ¾" FNPT connections
- Panel mount (requires 1 ⅜" mounting hole)
- Extra ports
- Pressure gauges

#### Maximum Temperature & Operating Inlet Pressures

Seat Material	Maximum Temperature*	@	Maximum Operating Inlet Pressure
Tefzel®	150° F (66° C)	@	3,600 psig (24.82 MPa)
High density Teflon®	150° F (66° C)	@	3,600 psig (24.82 MPa)
CF Teflon®	175° F (80° C)	@	3,600 psig (24.82 MPa)
PCTFE (formerly Kel-F® 81)	175° F (80° C)	@	3,600 psig (24.82 MPa)
Polyimide	175° F (80° C)	@	3,600 psig (24.82 MPa)
PEEK™	175° F (80° C)	@	3,600 psig (24.82 MPa)

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

#### Circle Seal Controls

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pressure regulators

# PR-2 Series

## How to Order

**K/ PR2 - 2 A 1 1 A 3 C 1 1 1 C**

**REPAIR KIT** ————

**BODY MATERIALS** ————

- 2 Brass
- 8 Brass, chrome-plated
- A Brass, nickel-plated

**PORT CONFIGURATION** ————

- A Standard (one inlet & one outlet port)  
For more port configurations, see page 35.

**PROCESS PORT TYPES** ————

- 1 1/4" FNPT (1/4" FNPT gauge ports)
- 4 3/8" FNPT (1/4" FNPT gauge ports)
- 0 1/8" FNPT (1/8" FNPT gauge ports)
- A 1/4" ISO 7-Rc taper (1/4" FNPT gauge ports)

**SURFACE FINISH/DIAPHRAGM CAVITY** ————

- 1 < 25 Ra, standard

**SEAT MATERIALS** ————

- A Tefzel®
- B CF Teflon®
- C Polyimide
- H PCTFE (formerly Kel-F® 81)
- I High-density Teflon®
- Q PEEK™

**FLOW COEFFICIENT** ————

- 3 0.06
- 5 0.2
- C 0.025
- H 0.50

**OUTLET RANGE** ————

- 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

**OPTIONAL CAP FINISH**

- Blank Black anodize (standard)
- 1 Chrome-plated
- 2 Electroless nickel-plated

**CAP ASSEMBLY**

- 1 Standard, aluminum
- 3 1" panel mount, aluminum
- 4 Panel mount, aluminum
- 5 Captured vent, aluminum
- 6 Captured vent, panel mount, aluminum
- 8 Tamper-proof, aluminum
- 9 Fine adjust, 1/2" panel mount, aluminum
- 0 Fine adjust, 1 3/8" panel mount, aluminum
- A Captured vent, tamper-proof, aluminum
- E Tamper-proof, panel mount, aluminum

**DIAPHRAGM FACING/BACKING**

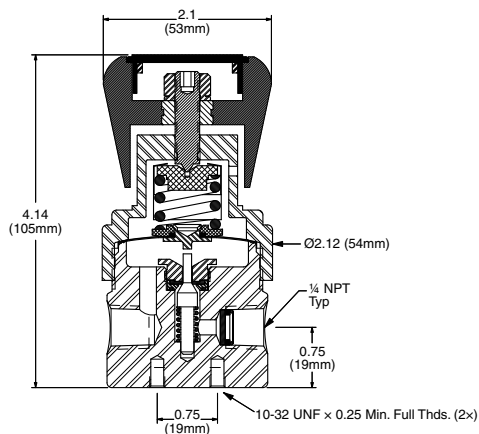
- 1 Teflon®/stainless steel
- 2 Teflon®/Viton®
- 6 Tefzel® ring/stainless steel

**DIAPHRAGM TYPE**

- 1 Standard diaphragm
- 2 Diaphragm attached poppet
- 3 Self-relieving
- 4 Vacuum assist spring, standard diaphragm
- 5 Vacuum assist spring, diaphragm attached poppet
- 6 Vacuum assist spring, self-relieving
- 7 Liquid service

## Outline & Mounting Dimensions

Weight = 1.7 lbs (0.77kg)



## For Your Safety

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PEEK™ is a trademark of Victrex PLC.  
Kel-F® is a registered trademark of 3M Company.

# PVR Series

*Low Pressure Regulator*

*Inlet 0 to 3,000 psig & Outlet 2" H<sub>2</sub>O to 60 psig*



## Features

- Low pressure control
- Exceptional accuracy & response
- Compatible with corrosive and non-corrosive gases & liquids

## Applications

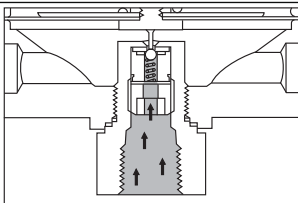
- Chromatography
- Process stream sampling
- Bubbling operations
- Medical instrumentation
- Research laboratories
- Instrument calibration

## Technical Data

<b>Body Construction Material</b>	Polyvinyl chloride
<b>Spring Housing Materials</b>	• PVR1, PVR2 & PVR3: Polyvinyl chloride • PVR4 & PVR5: Aluminum alloy
<b>Seat Materials</b>	Kel-F® with synthetic sapphire ball poppet
<b>Diaphragm Material</b>	Teflon®
<b>Adjustment Screw Material</b>	Delrin®
<b>Trim Material</b>	316 stainless steel or Monel®
<b>Port Sizes</b>	1/4" NPT female
<b>Pressure Ratings</b>	Inlet: 3,000 psig (207 BAR) Outlet: 2" H <sub>2</sub> O to 60 psig (4 BAR), 5 ranges
<b>Temperature Range</b>	0° F to +125° F (-18° C to +52° C)
<b>Flow Capacity</b>	Cv = 0.011 maximum Orifice diameter = 0.025"
<b>Weight</b>	PVR1, PVR2 & PVR3: 14 oz PVR4 & PVR5: 1.5 lbs
<b>Leakage</b>	Bubble-tight
<b>Sensitivity</b>	Less than 1/2 psi on all ranges over 2 psig

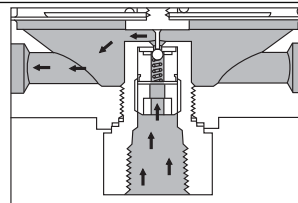
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

## How it Works



### Closed

With the poppet against the seat, full upstream pressure is applied to the poppet effecting a bubble-tight seal.



### Regulating

When the downstream process demands flow, the pressure acting on the bottom of the diaphragm decays, allowing the adjusting spring force to push the poppet down. This in turn unseats the poppet, allowing flow to begin and pressure under the diaphragm to increase until balance is achieved between adjusting spring force and downstream pressure. This condition continues until process ceases. At this point, increasing pressure overcomes spring force, moving diaphragm up and allowing the poppet to close.

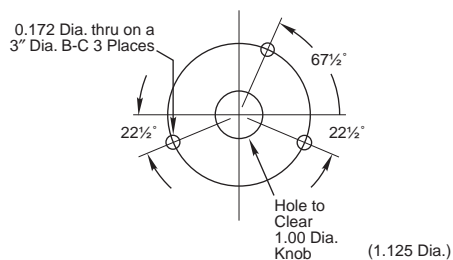
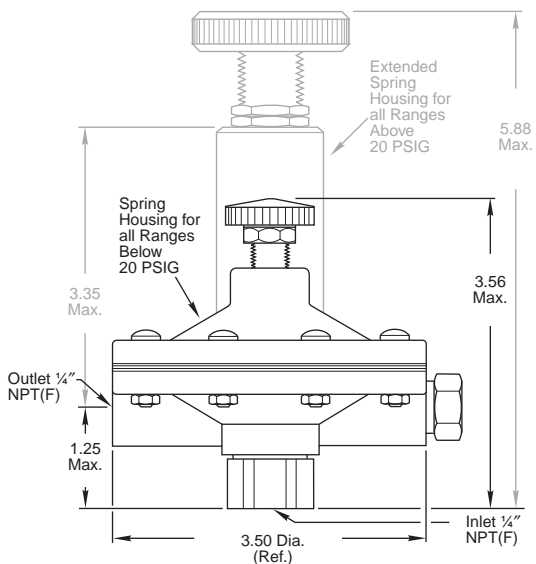
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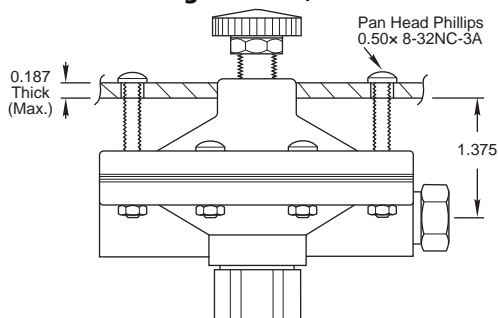
pressure regulators

# PVR Series

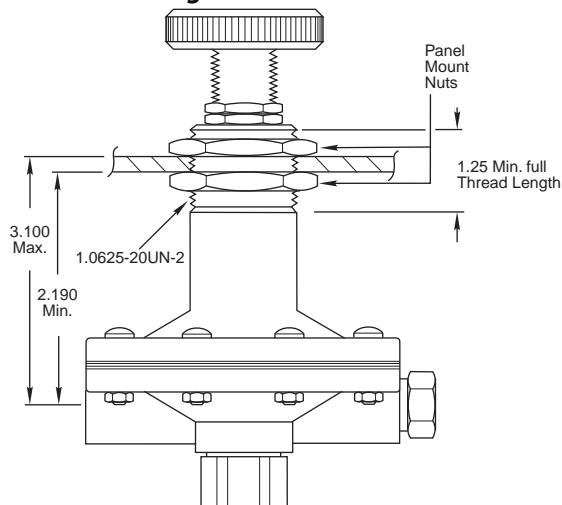
## Dimensions



### Panel Mounting for PVR1, PVR2 & PVR3



### Panel Mounting for PVR4 & PVR5



## How to Order

**K/ PVR 3 M PM**

### REPAIR KIT

### PRESSURE RANGE

- 1 2" to 27" H<sub>2</sub>O\*
- 2 1 to 6 psig
- 3 6 to 20 psig
- 4 20 to 40 psig
- 5 40 to 60 psig

### OPTIONS

- Blank None
- PM Panel mount

### TRIM MATERIAL

- Blank 316 stainless steel
- M Monel®

\* 27" H<sub>2</sub>O model is not recommended for dead-end service

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

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 Teflon® is a registered trademark of the DuPont Company.  
 Delrin® is a registered trademark of DuPont.  
 Monel® is a registered trademark of Special Metals Corporation.



# PR01 Series

*Miniature Non-venting Regulator  
Inlet 200 to 3,000 psig & Outlet 10 to 720 psig*



### Features

- Miniature size: 1¾" diameter by 3½" high
- Soft seat—suitable for dead-end service
- Tight shutoff
- Single hole panel mounting
- Optional pressure gauges

### Applications

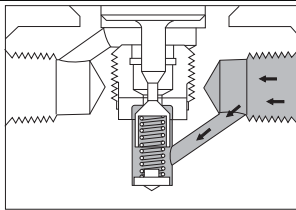
- R & D pilot plants
- Research laboratories
- Chromatography
- Cylinder pressurization
- Bubbling operations
- Instrument pressurization
- Slow gas purge control
- Inert gas blanketing (food processing)
- Pilot control for large control units
- Lecture bottles

### Technical Data

<b>Body Construction Materials</b>	Aluminum alloy, anodized blue, or brass
<b>Seat Materials</b>	Kel-F® or Nylatron®
<b>Seal Materials</b>	Buna N, ethylene propylene, neoprene, or Viton®
<b>Trim Material</b>	Stainless steel or plated steel
<b>Handle Material</b>	ABS plastic
<b>Gauge material</b>	Brass
<b>Port Size</b>	½" NPT female
<b>Media</b>	Inert gases
<b>Pressure Ratings</b>	Inlet: 200 to 3,000 psig (207 BAR) Outlet: 10 to 720 psig
<b>Temperature Range</b>	-65° F to +160° F (-54° C to +71° C)
<b>Weight</b>	Regulators: 8.2 oz Gauges: 5.2 oz

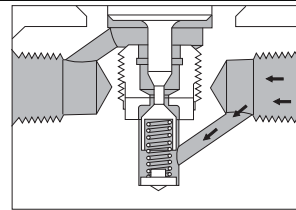
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

### How it Works



#### Closed

With the poppet against seat, full upstream pressure is applied to the poppet, effecting a bubble-tight seal.



#### Regulating

As the downstream process demands flow, the pressure acting on the piston decays, allowing the adjusting spring force to push the piston down, which in turn unseats the poppet. This permits flow to start, and pressure under the piston to increase, until balance is achieved between adjusting spring force and downstream pressure. This condition continues until process demand ceases, at which point increasing pressure overcomes spring force, moving piston up and allowing the poppet to close.

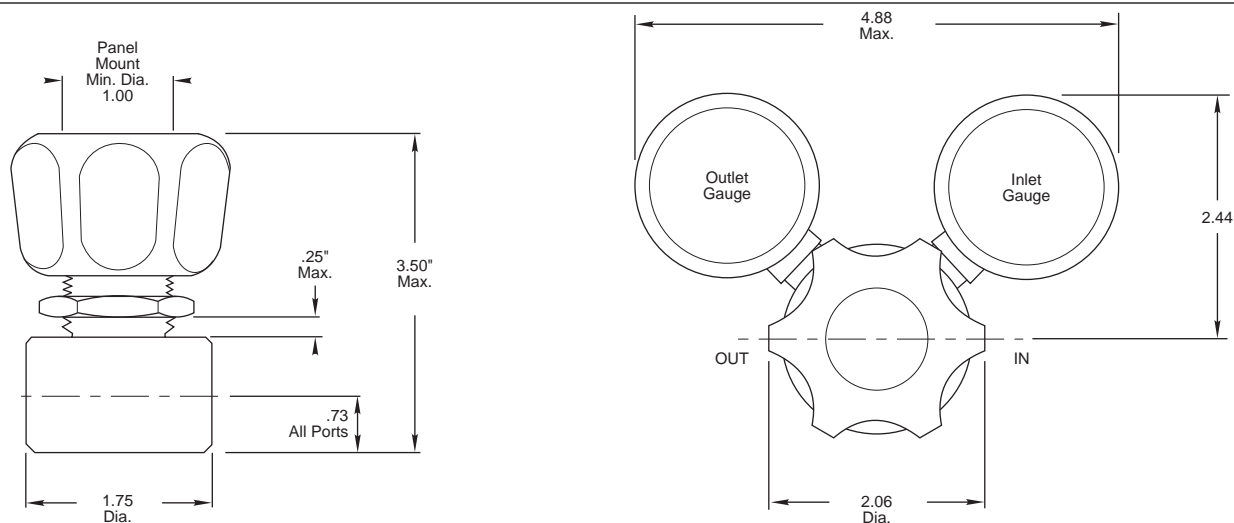
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pressure regulators

# PR01 Series

## Dimensions



## How to Order

**K/ PR01 3 A 1P N D O**

**REPAIR KIT** ————— **K**

**MAXIMUM OUTLET PRESSURE** ————— **3**

**1** 100 psig (7 BAR)  
    **2** 200 psig (14 BAR)  
    **3** 400 psig (28 BAR)  
    **4** 800 psig (55 BAR)

**BODY & PANEL NUT MATERIAL** ————— **A**

**A** Aluminum alloy, anodized blue  
    **B** Brass

**PORT SIZE & TYPE** ————— **1P**

**1P** 1/8" NPT female

**OPTIONS**

**O** None  
    **G** Gauges, 1 1/2" diameter  
    **P** Panel mount

**SEAL MATERIAL**

**D** Nylatron® (standard)  
    **B** Kel-F®

**SEAL MATERIAL**

**E** Ethylene propylene  
    **N** Neoprene  
    **V** Viton®  
    **9** Buna N

Model Number	Operating Pressure Range (psi)	Approx. Outlet Pressure Increase per 100 psi, Inlet Decrease PSI	Approx. Air Flow vs. Outlet Pressure (SCFM/PSI)*	Approx. Cv*
PR011	10–90 psi	3.5 psi	10 scfm/70 psi	0.007
PR012	20–180 psi	3.5 psi	18 scfm/140 psi	0.012
PR013	40–360 psi	3.5 psi	31 scfm/280 psi	0.021
PR014	80–720 psi	8.0 psi	47 scfm/560 psi	0.031

\* At maximum inlet and set at maximum rated outlet lock-up pressure. 40µ absolute filtration of inlet fluid media recommended. Relief valve downstream of outlet port should always be used. Main seat is factory tested to be bubble-tight for a period of one minute with full inlet pressure.

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

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 Nylatron® is a registered trademark of DSM Engineering Plastic Products.  
 Viton® is a registered trademark of DuPont Dow Elastomers.



# SR800 Series

*High Capacity Pressure Regulator  
Inlet to 3,600 psig & Outlet to 250 psig*



## Features

- High flow rates of 1.65 Cv
- Diaphragm provides maximum sensitivity
- Pressure relief valve for safety protection
- Panel mounting standard
- Wide range of fluid compatibility

## Applications

- Manifold pressure control
- Process gas control
- Blanket or purge gas control
- High flow station or main line controls

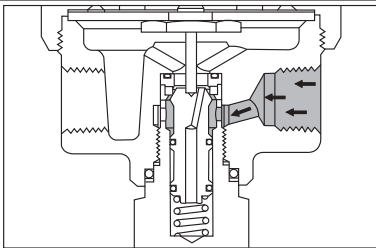
## Technical Data

<b>Body Construction Material</b>	Brass forging
<b>Seat Material</b>	Nylatron® GS (standard)*
<b>Seal &amp; Diaphragm Material</b>	Neoprene (standard)*
<b>Spring Material</b>	Steel
<b>Spring Housing Material</b>	Brass
<b>Port Size</b>	½" NPT female
<b>Pressure Ratings</b>	Inlet: 3,600 psig (248 BAR) Outlet: • SR800: 250 psig (17 BAR) max. • SR830: 125 psig (8.6 BAR) max.
<b>Temperature Range</b>	-60° F to +160° F (-51° C to +71° C)
<b>Flow Capacity</b>	Cv = 1.65 max. Orifice diameter = 0.30"

\* See "How to Order" for optional materials

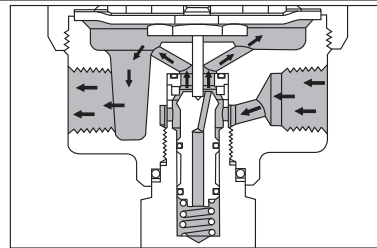
Note: Proper filtration is recommended to prevent damage to sealing surfaces.

## How it Works



### Closed

Balanced poppet is spring-loaded against the seat. When full upstream pressure is applied, a slightly unbalanced force is developed which enhances sealing.



### Regulating

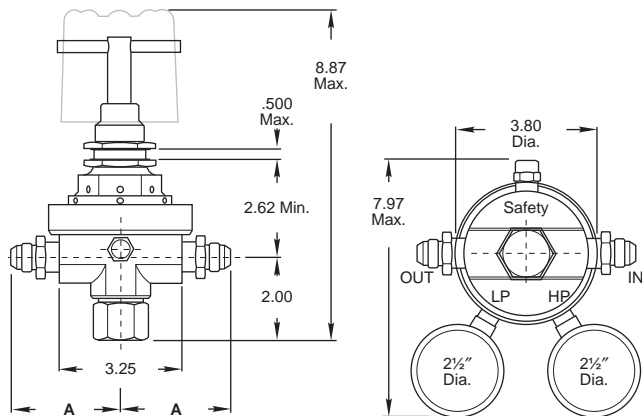
As the downstream process demands flow, the pressure acting on the bottom of the diaphragm decays, allowing the adjusting spring force to push the poppet down. This in turn unseats the poppet, allowing flow to begin and pressure under the diaphragm to increase until balance is achieved between adjusting spring force and downstream pressure. This condition continues until process demand ceases. At this point, increasing pressure overcomes the spring force, moving the diaphragm up and allowing the poppet to close.

## Circle Seal Controls

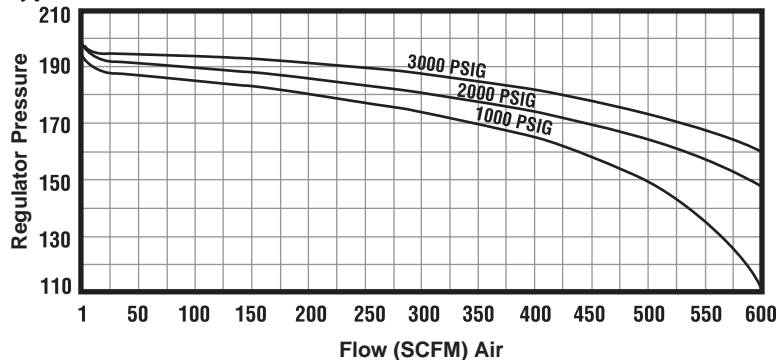
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www.circle-seal.com

# SR800 Series

## Dimensions & Flow Curves



### Typical Flow Curve



### Inlet Connections

Part No.	Connection	A
-1	MS33656-8	2 <sup>2</sup> / <sub>3</sub> 2"
-2	MS33656-12	3 <sup>3</sup> / <sub>4</sub> 4"
-3	1/2" NPT female	1 <sup>1</sup> / <sub>2</sub> "
-xxx	CGA fitting	—

### Pressure Range

Gauge Ranges		Safety Valve Set
Inlet	Outlet	Pressure
0-5,000 psig	0-600 psig	400 psig
0-5,000 psig	0-200 psig	200 psig

## How to Order

**K/ SR800 B 3 3 1 1 2 G**

### REPAIR KIT

### BASIC MODEL NUMBER & OUTLET PRESSURE RANGE

**SR800** 0 to 250 psig (0 to 17 BAR)

**SR830** 0 to 125 psig (0 to 9 BAR)

### BODY MATERIAL

**B** Brass forging

### INLET CONNECTION

**1** MS33656-8

**2** MS33656-12

**3** 1/2" NPT female

**xxx** Insert CGA number (example: 580)

### OUTLET CONNECTION

**1** MS33656-8

**2** MS33656-12

**3** 1/2" NPT female

### OPTIONS

**G** Pressure gauges, brass

**B** Bell handle

**L** Hex head adjustable screw with lock nut

### CLEANING LEVELS\*

**1** For general oxygen service

**2** For general pneumatic service

**3** Specify (define on sales order)

**4** For precision pneumatic service

### SEAT MATERIAL

**1** Nylatron® GS (standard)

**2** Kel-F® (3,000 psig max.)

**4** KYNAR®

**5** Polyimide (Vespel® SP-21)

**6** Polyurethane

### SEAL & DIAPHRAGM MATERIAL

**1** Neoprene (standard)

**3** Viton®

**4** Buna N

**5** Teflon® seal, Teflon®-coated neoprene diaphragm

\* 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. Vespel® SP-21 or Kel-F® seat, Viton® diaphragm and seals. Temperature range: -20° F to +250° F.

Outlet pressure rise per 100 psi inlet pressure decay 1/4 psi max.

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

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

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

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

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

Viton® is a registered trademark of DuPont Dow Elastomers.

Teflon® is a registered trademarks of the DuPont Company.

## 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.

# IR10 Series

**Brass Pressure Regulator**

**Inlet to 4,000 psig & Outlet to 2,500 psig**



## Features

- Medium pressure and high flow
- Balanced poppet provides precise control
- Soft seat for dead-end service
- Pressure relief valve for extra safety

## Applications

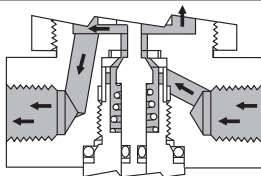
- Chromatography
- Manifold & cylinder regulation
- Bubbling operations
- Hydrogenation
- Research laboratories
- Pressure testing

## Technical Data

<b>Body Construction Material</b>	Brass
<b>Seat Material</b>	Nylatron®
<b>Seal Material</b>	Neoprene
<b>Diaphragm Material</b>	Stainless steel
<b>Gauge Material</b>	Brass, 2½" diameter
<b>Trim Materials</b>	Brass or stainless steel
<b>Port Size</b>	¼" NPT female, CGA inlet fitting optional
<b>Pressure Ratings</b>	Inlet: 0 to 4,000 psig (276 BAR) Outlet: 0 to 2,500 psig (172 BAR)
<b>Temperature Range</b>	-40° F to +160° F (-40° C to +71° C)
<b>Flow Capacity</b>	Cv = 0.42 Orifice diameter = 0.15"
<b>Weight</b>	Approximately 4 lbs

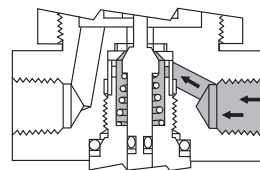
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

## How it Works



### Closed

Balanced poppet is spring-loaded against the seat. When full upstream pressure is applied, a slightly unbalanced force is developed which enhances sealing.



### Regulating

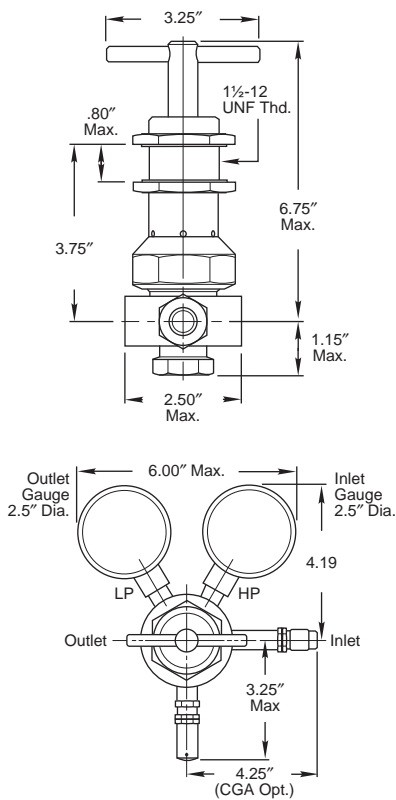
As the downstream process demands flow, the pressure acting on the bottom of the diaphragm decays, allowing the adjusting spring force to push the poppet down. This in turn unseats the poppet, allowing flow to begin and pressure under the diaphragm to increase until balance is achieved between adjusting spring force and downstream pressure. This condition continues until process demand ceases. At this point, increasing pressure overcomes the spring force, moving the diaphragm up, allowing the poppet to close.

## Circle Seal Controls

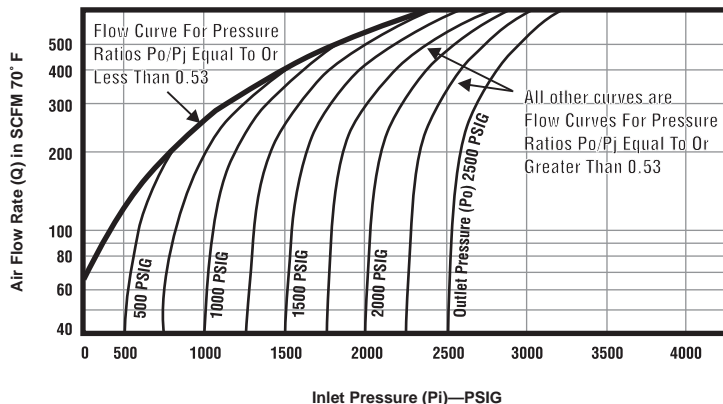
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www.circle-seal.com

# IR10 Series

## Dimensions & Flow Curves



### Air Flow Chart



### Correction factors for gases other than air:

Gas	Correction Factor
Air	1.000
Helium	2.690
Hydrogen	3.795
Nitrogen	1.016
Oxygen	0.951

### Flow rates for gases other than air:

Air Flow Rate (Q) × correction factor

## How to Order

**K/ IR1 0 250 G**

**REPAIR KIT**

**OUTLET PRESSURE RANGE**

- 0** 0 to 500 psig (0 to 34 BAR)
- 1** 0 to 1,000 psig (0 to 70 BAR)
- 2** 0 to 2,500 psig (0 to 172 BAR)

**OPTIONS**

- G** Inlet & outlet gauges
- P** Panel mounting provisions

**INLET PORT**

- 250** 1/4" NPT female
- 500** Specify CGA fitting number

Outlet pressure rise per 100 psi pressure decay: 0.1 psi max. Maximum inlet pressure: 4,000 psi

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

Fluid media: non-corrosive gases and liquids.

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

### Inlet/Outlet Ranges

Model	Outlet Pressure Range	Inlet Gauge Range	Outlet Gauge Range	Safety Valve Set Pressure	Max. Air Flow
IR10	0–500 psig	0–5,000 psi	0–600 psi	0–600 psi	200 scfm
IR11	0–1,000 psig	0–5,000 psi	0–1,500 psi	0–1,400 psi	400 scfm
IR12	0–2,500 psig	0–5,000 psi	0–3,000 psi	0–2,900 psi	1,000 scfm

## For Your Safety

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# PR50 Series

*High Pressure Self-venting Pressure Regulator  
Inlet & Outlet to 10,000 psig*



## Features

- Balanced poppet design
- Self-relieving captured vent
- Low operating torque

## Applications

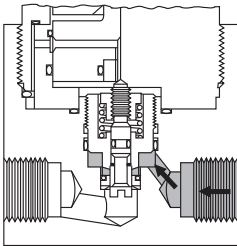
- High pressure testing
- Purging & charging
- Research laboratories
- Chemical/petroleum plants
- Manufacturing processes

## Technical Data

<b>Body Construction Materials</b>	Brass, 303 or 316 stainless steel
<b>Seat Materials</b>	Kel-F® or Vespel®
<b>Seal Materials</b>	Buna N, ethylene propylene, neoprene or Viton®
<b>Port Sizes</b>	¼" and ½" NPT female, ½" male tube, or ½" British parallel pipe
<b>Pressure Ratings</b>	Inlet: • CRES: to 10,000 psig (690 BAR) • Brass: to 6,000 psig (414 BAR) Outlet: 40 to 10,000 psig (2.7 to 690 BAR)
<b>Temperature Range</b>	Viton®: -20° F to +225° F (-29° C to +107° C) All others: -40° F to +225° F (-40° C to +107° C)
<b>Flow Capacity</b>	Cv = 0.30 Orifice diameter = 0.13"
<b>Weight</b>	8.5 lbs (less gauges)
<b>Leakage</b>	Bubble-tight (air)

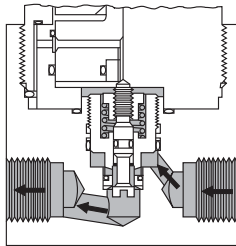
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

## How it Works



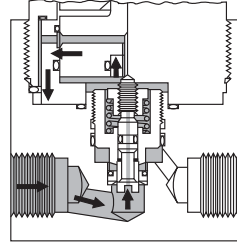
### Closed

Balanced poppet is spring-loaded against the seat. When full upstream pressure is applied, a slightly unbalanced force is developed which enhances sealing.



### Regulating

As the downstream process demands flow, the pressure acting on the piston decays, allowing the adjusting spring force to push the piston down. This unseats the poppet, allowing flow to begin and pressure under the piston to increase until balance is achieved between adjusting spring force and downstream pressure. This condition continues until process demand ceases. At this point, increasing pressure overcomes the spring force, moving the piston up, allowing the poppet to close.



### Venting

If the downstream pressure should increase beyond regulation set point or handle is backed off to decrease regulated pressure level, downstream pressure will vent through the piston and guide to the vent port. The pressure load from the piston overcomes the "set" spring load and moves the piston upward. The poppet is thereby unseated to allow venting flow. As pressure decreases under the piston, the reverse action occurs and the vent seat is closed off.

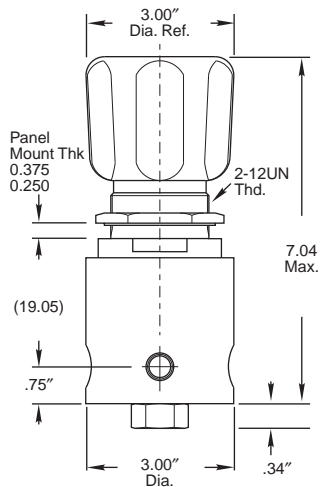
## Circle Seal Controls

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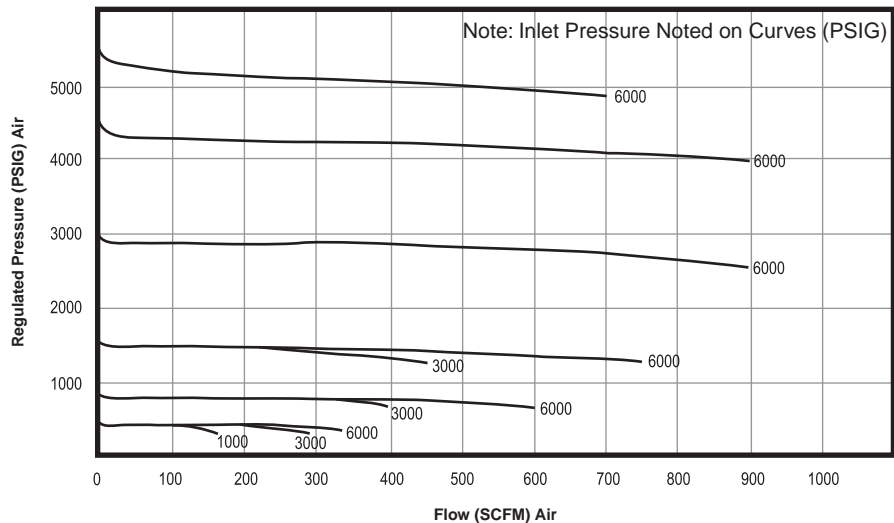
pressure regulators

# PR50 Series

## Dimensions & Flow Curves



**Air Flow Chart**



## How to Order

**K/ PR5 2 U 1 1 1 2 G**

**REPAIR KIT**

**MAXIMUM OUTLET PRESSURE**

- 2 40 to 400 psig (28 BAR)
- 3 80 to 800 psig (55 BAR)
- 4 150 to 1,500 psig (103 BAR)
- 5 300 to 3,000 psig (207 BAR)
- 6 450 to 4,500 psig (310 BAR)
- 7 600 to 6,000 psig (414 BAR)
- 8 1,000 to 10,000 psig (690 BAR)

**BODY MATERIAL**

- B Brass
- U 316 stainless steel
- T 303 stainless steel

**INLET & OUTLET PORTS**

- 1 1/4" NPT female
- 2 1/2" NPT female
- 3 1/2" tube (MS55649-8)
- 4 1/2" British parallel pipe thread  
(vent port 1/4" BPPT, gauge port  
1/4" BS taper thread)

**OPTIONS**

- G Gauges
- N 316 CRES panel nut

**CLEANING LEVELS**

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

**SEAT MATERIAL**

- 1 Vespel®
- 2 Kel-F® (limited to 3,000 psi inlet pressure, PR52-PR55 Series only)

**SEAL MATERIAL**

- 0 Ethylene propylene
- 1 Neoprene (standard)
- 3 Viton® (standard for oxygen service)
- 4 Buna N

\* For best regulating characteristics, use only within 10% to 90% of maximum outlet pressure range. Either liquid or gas is handled equally well by the PR50 Series. No modification is required to convert from gas service to liquid. Seals and seats are available for nearly all liquids or gases. The PR50 is not recommended for continuous liquid service.

\*\* For oxygen service, use Vespel® SP-21 seat and Viton® or neoprene 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

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Kel-F® is a registered trademark of 3M Company.  
Vespel® is a registered trademark of E.I. du Pont de Nemours and Company.  
Viton® is a registered trademark of DuPont Dow Elastomers.

# HPR50 Series

*High Pressure, High Flow, Fluid Pressure Regulator  
Inlet 0 to 10,000 psig & Outlet 40 to 10,000 psig*



## Features

- Balanced poppet design
- Metal-to-metal seating
- Captured self-venting
- 303 or 316 stainless steel, or brass body
- High pressure 0–10,000 psig inlet and outlet range
- High flow equal to Cv of 0.30
- Internal damper for surge flows
- Ryton™ 7 plastic handle

## Applications

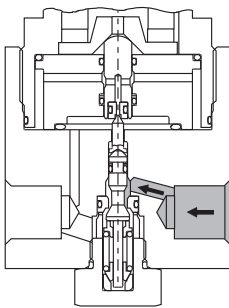
- Hydraulic test systems—high pressure
- Off-shore platforms—valve actuation
- Deep water drilling—hydraulic support
- Manufacturing processes

## Technical Data

<b>Body Construction Materials</b>	303 or 316 stainless steel, or brass construction
<b>Seat Material</b>	17-4 PH CRES
<b>Port Sizes</b>	¼" and ½" NPT female, ½" tube, or ½" BSPP
<b>Pressure Ratings</b>	Inlet: • CRES: to 10,000 psig (690 BAR) • Brass: to 6,000 psig (414 BAR) Outlet: 40 to 10,000 psig (2.7 to 690 BAR)
<b>Temperature Range</b>	–40° F to +225° F (–40° C to +107° C)
<b>Flow Capacity</b>	Cv = 0.30

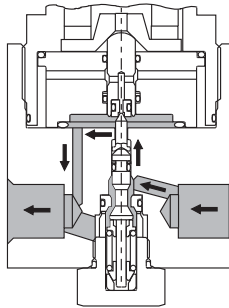
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

## How it Works



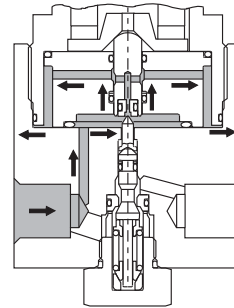
### Closed

The balanced poppet is spring-loaded against the seat.



### Regulating

As the downstream process demands flow, the pressure acting on the piston decays, allowing the adjusting spring force to push the piston down, at which point increasing pressure overcomes spring force, moving the piston up and allowing the poppet to close.



### Venting

If the downstream pressure should increase beyond regulation set point or the handle is backed off to decrease the regulated pressure level, the downstream pressure will vent through the piston and the guide to the vent port.

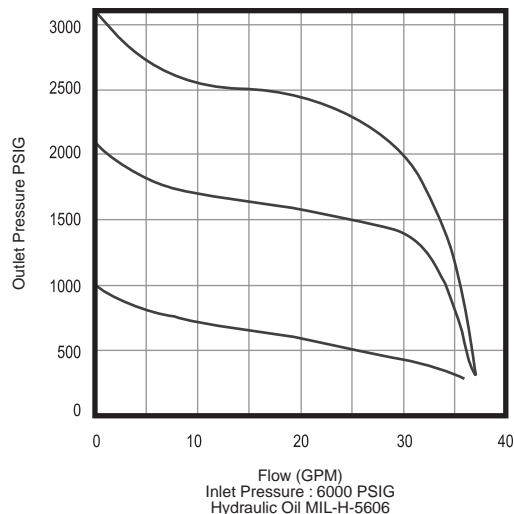
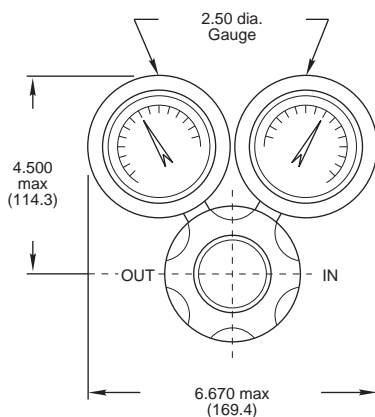
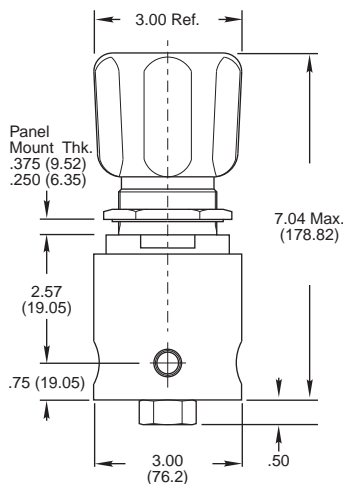
## Circle Seal Controls

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# HPR50 Series

## Dimensions, Gauges & Typical Flow Curves



## How to Order

**K/ HPR5 0 T 1 1 N**

### REPAIR KIT

### OUTLET PRESSURE RANGE

- 0** 150 to 1,500 psig (10 to 103 BAR)
- 1** 300 to 3,000 psig (20 to 206 BAR)
- 2** 600 to 6,000 psig (40 to 414 BAR)
- 3** 1,000 to 10,000 psig (69 to 690 BAR)
- 4** 40 to 400 psig (2.7 to 28 BAR)

### BODY MATERIAL

- B** Brass
- T** 303 stainless steel
- U** 316 stainless steel

### OPTIONS

- N** 316 stainless steel panel nut

### SEAT MATERIALS

- 0** Ethylene propylene
- 1** Neoprene
- 3** Viton®
- 4** Buna N

### INLET & OUTLET PORTS

- 1** ¼" NPT female
- 2** ½" NPT female
- 3** ½" tube (MS33649-8)
- 4** ½" British parallel pipe (vent pipe: ¼" BSPP) (gauge ports: ¼" BSP)

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

## For Your Safety

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# GD720 Series

*High Pressure, Manually Controlled Pressure Reducing Regulator  
Inlet 0 to 10,000 psig & Outlet 5 to 6,000 psig*



## Features

- Full range capability
- Single hand wheel control
- Balanced poppet insures accuracy
- Integral vent valve

## Applications

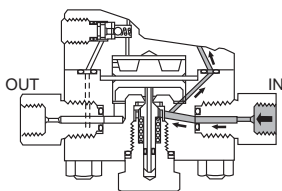
- Air compressor systems
- Oxygen system charging
- Aircraft tire struts
- Aircraft component pressure testing

## Technical Data

<b>Body Construction Materials</b>	Bronze or stainless steel
<b>Seat Material</b>	Vespel® SP-21
<b>Seals &amp; Diaphragm Material</b>	Neoprene
<b>Adjustment Spring Material</b>	Zinc chromate over black oxide high carbon steel
<b>Valve Spring Material</b>	Stainless steel
<b>Other Components</b>	Same as body material, stainless steel & Teflon®
<b>Port Sizes</b>	¼", ½" NPT female; ¼", ⅝" Aminco, AND10050-4 or AND10050-8
<b>Pressure Ratings</b>	Maximum inlet pressure: • Bronze: 7,000 psig (483 BAR) • Stainless steel: 10,000 psig (690 BAR) Maximum outlet pressure: 6,000 psig (414 BAR)
<b>Temperature Range</b>	-65° F to +160° F (-54° C to +71° C)
<b>Flow Capacity</b>	Cv = 0.44 Orifice diameter = 0.155"
<b>Weight</b>	11 lbs

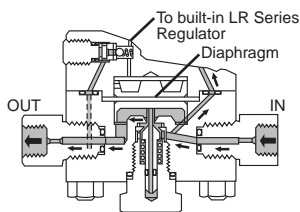
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

## How it Works



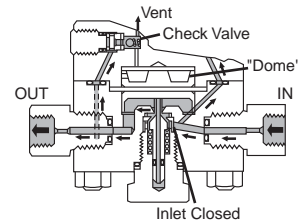
### Closed

Balanced poppet is spring-loaded against the seat. When full upstream pressure is applied, a slightly unbalanced force is developed which enhances sealing.



### Regulating

As the downstream process demands flow, the downstream pressure acting on the bottom of the diaphragm decays, allowing the adjusting spring force to push the poppet down. This in turn unseats the poppet, allowing flow to begin and pressure under the diaphragm to increase until balance is achieved between dome pressure and downstream pressure. This condition continues until process demand ceases. At this point, increasing pressure overcomes dome pressure force, moving diaphragm up, allowing poppet to close.



### Venting

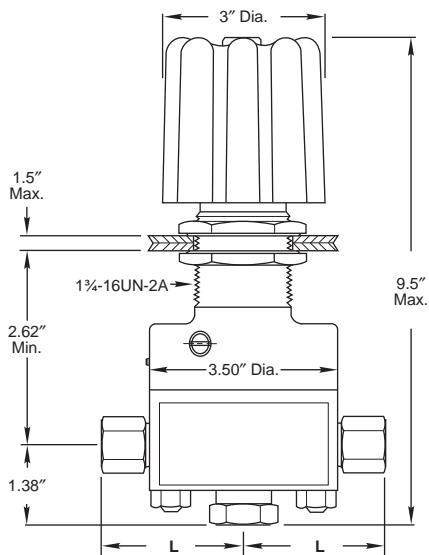
If the downstream pressure should increase beyond regulation set point, or handle is backed off to decrease regulated pressure level, downstream and dome pressure will vent through check valve and through the built-in LR Series regulator.

## Circle Seal Controls

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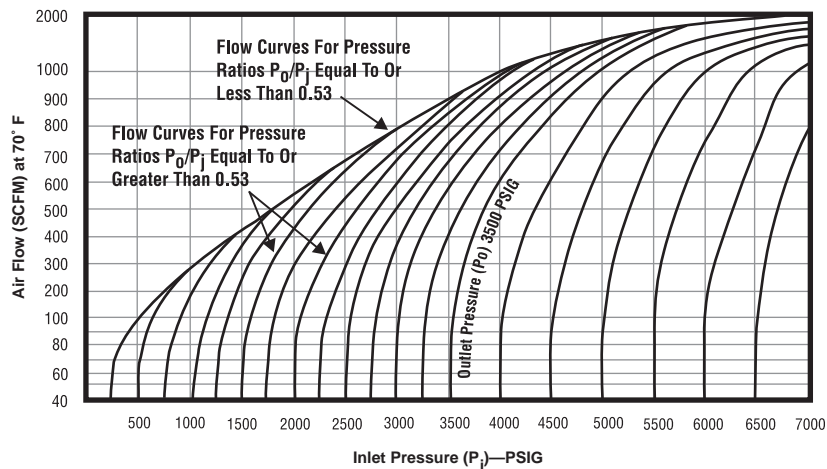
# GD720 Series

## Dimensions & Flow Curve



Port Size	L
AND10050-4	2.90
AND10050-8	3.16
1/4" NPT female	2.72
1/2" NPT female	3.16
1/4" Aminco	2.90
5/16" Aminco	3.34

## Air Flow Chart



## Correction factors for gases other than air:

Gas	Correction Factor
Air	1.000
Helium	2.690
Hydrogen	3.795
Nitrogen	1.016
Oxygen	0.951

## Flow rates for gases other than air:

Air Flow Rate (Q) × correction factor

## How to Order

**K/ GD72 0 B 3 3 2 D**

### REPAIR KIT

### OUTLET PRESSURE

- 0** 20 to 3,600 psig (1.40 to 248 BAR)
- 1** 15 to 2,000 psig (1.04 to 138 BAR)
- 2** 10 to 800 psig (0.69 to 55 BAR)
- 3** 5 to 200 psig (0.35 to 14 BAR)
- 4** 40 to 6,000 psig (2.76 to 414 BAR)

### BODY MATERIAL

- B** Bronze
- T** 303 stainless steel

### INLET PORT

- 1** AND10050-4
- 2** AND10050-8
- 3** 1/4" NPT female
- 4** 1/2" NPT female
- 5** 1/4" Aminco
- 6** 5/16" Aminco

### OPTIONS

- D** 1/8" NPT female, dome pressure tap port
- G** Gauges, 2 1/2" brass only  
1/4" NPT female gauge port

### CLEANING LEVELS

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

### OUTLET PORT

- 1** AND10050-4
- 2** AND10050-8
- 3** 1/4" NPT female
- 4** 1/2" NPT female
- 5** 1/4" Aminco
- 6** 5/16" Aminco

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

## For Your Safety

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## PR-57 Series\*

*High Pressure Corrosion Resistant Regulator (10,000 psig Inlet)*



To meet the demands for the safe reduction of inlet pressures up to 10,000 psig, Circle Seal Controls provides the PR-57 Series regulator. This precision regulator features a piston-sensing design which provides the operator with low adjusting torque requirements when setting the outlet pressure. The body is constructed from 316L stainless steel, providing the ultimate in safety and corrosion resistance.

The optional self-relieving feature provides an additional level in operational ease, as it allows for trapped downstream pressure to be safely vented to atmosphere through the bonnet.

\* Replaces the LRxxE Series.

### Features & Specifications

- Gas or liquid service
- 316L stainless steel construction
- Better than 25 Ra finish in diaphragm cavity
- Stainless steel spring-loaded piston sensor
- 20 $\mu$  filter
- Bubble-tight shutoff
- Inlet pressure maximum 10,000 psig
- Outlet pressure ranges are 0–250 psig, 0–500 psig, 0–750 psig, 0–1,000 psig, 0–2,000 psig, 0–4,000 psig, 0–6,000 psig, 0–7,500 psig, and 0–10,000 psig
- Operating temperatures: –40° F to +150° F (–40° C to +66° C)
- Cv flow coefficient 0.05 or 0.2 (optional)

### Applications

- Pilot plants
- Specialty gas
- Compressors
- High pressure test systems
- Breathing air tank refill

### Options

- Gauges and CGA fittings for cylinder gas applications
- Self-relieving and captured vent
- 3/8" FNPT, 1/4" AND10050–4, 1/4" SAE J514, 1/4" MS33649, 1/4" Aminco, or 1/4" sch 40 pipe

### Circle Seal Controls

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 www.circle-seal.com

pressure regulators

# PR-57 Series

## How to Order

**K/ PR57 - 1 A 1 1 C 2 N 1 4 1 C**

**REPAIR KIT** ————

**BODY MATERIALS** ————

- 1 316L stainless steel
- 4 Monel®

**PORT CONFIGURATION** ————

**A** Standard (one inlet & one outlet port)  
For more port configurations, see page 35.

**PROCESS PORT TYPES** ————

- 1 ¼" FNPT (¼" FNPT gauge ports)
- 2 ¼" tube (¼" tube gauge ports)
- 4 ⅜" FNPT (¼" FNPT gauge ports)
- 7 AND10050-4 (¼" FNPT gauge ports)
- 8 SAE J514 (¼" FNPT gauge ports)
- 9 MS33649 (¼" FNPT gauge ports)
- F ¼" Aminco (¼" FNPT gauge ports)
- K ¼" sch 40 pipe (¼" FNPT gauge ports)

**SURFACE FINISH/DIAPHRAGM CAVITY** ————

- 1 < 25 Ra
- 5 < 25 Ra, with 10-32 mounting holes

**SEAT MATERIALS** ————

- C Polyimide (standard)
- Q PEEK™

**FLOW COEFFICIENT** ————

- 2 0.05 (standard)
- 5 0.2

**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
- W Panel mount, stainless steel
- V Captured vent, panel mount, stainless steel

**PISTON MATERIAL**

- 4 Stainless steel/Teflon® cavity o-ring
- 5 Stainless steel/Viton® cavity o-ring
- 6 Monel®/Viton® cavity o-ring
- 7 Monel®/Teflon® cavity o-ring

**PISTON TYPE**

- 1 Non-self-relieving
- 3 Self-relieving

**OUTLET RANGE**

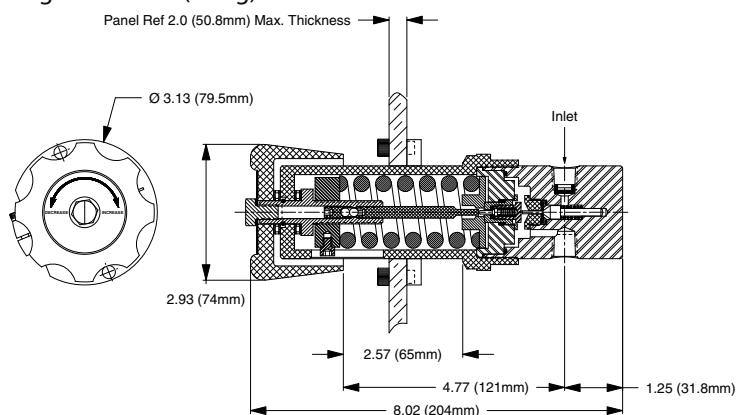
- I 0-250 psig
- J 0-500 psig
- W 0-750 psig
- K 0-1,000 psig
- L 0-2,000 psig
- N 0-4,000 psig
- O 0-6,000 psig
- P 0-7,500 psig
- Q 0-10,000 psig

## Maximum Temperature & Operating Inlet Pressures

Seat Material	Maximum Temperature*	@	Maximum Operating Inlet Pressure
Polyimide	150° F (66° C)	@	10,000 psig (68.95 MPa)
PEEK™	150° F (66° C)	@	10,000 psig (68.95 MPa)

## Outline & Mounting Dimensions

Weight = 4.4 lbs (2.0kg)



## 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.

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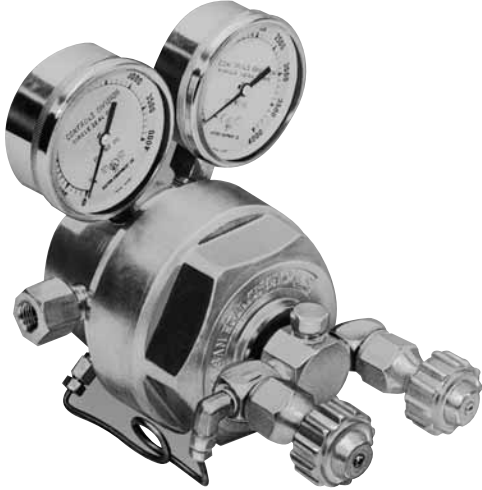
PEEK™ is a trademark of Victrex PLC.

Teflon® is a registered trademark of the DuPont Company.

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# GD30 Series

*Inlet & Outlet 0–3,600 psig Dome-loaded Pressure Regulators*



## Features

- Bubble-tight seal
- Precise control
- Rapid delivery
- Easily adjusted

## Applications

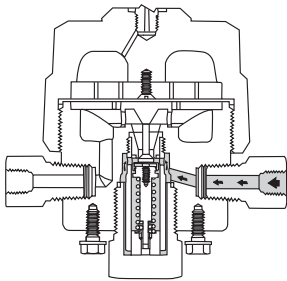
- Breathing systems
- Research laboratories
- Aircraft servicing
- Gas manifold systems
- Industrial gas plants
- Process gas control

## Technical Data

<b>Body Construction Material</b>	Bronze
<b>Seat Material</b>	Neoprene
<b>Seal Material</b>	Copper
<b>Diaphragm Material</b>	Stainless steel
<b>Gauge Material</b>	Brass, 2½" diameter
<b>Spring Material</b>	Stainless steel
<b>Port Sizes</b>	<ul style="list-style-type: none"> <li>• ¼", ½" pipe; AND10050–4 or –8</li> <li>• Gauge ports: ¼" pipe</li> <li>• Dome-loaded ports: AS4395 (MS33656–4)</li> </ul>
<b>Pressure Rating</b>	Inlet/Outlet: to 3,600 psig (248 BAR)
<b>Temperature Range</b>	–65° F to +160° F (–54° C to +71° C)
<b>Flow Capacity</b>	Cv = 0.35 Orifice diameter = 0.14"
<b>Weight</b>	<ul style="list-style-type: none"> <li>• GD31 = 14.00 lbs</li> <li>• GD31R = 12.00 lbs</li> </ul>

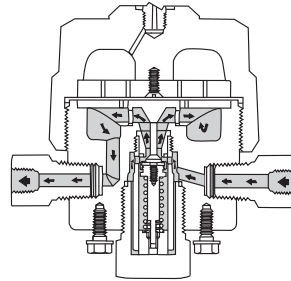
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

## How it Works



### Closed

The unbalanced poppet is spring-loaded against the valve seat. Dead-tight sealing is ensured by a considerable force when full upstream pressure is applied over the entire effective area of the seating diameter.



### Regulating

Dome-loading may be accomplished by the built-in load and bleed valve combination (or by an externally located pressure regulator) depending upon the specific model used for the application.

As the downstream process demands flow, the decreasing pressure (acting on the outlet side of the diaphragm) allows the dome pressure force to push the diaphragm and lower plate down which, in turn, unseats the poppet.

The described action permits flow to start and the pressure under the piston to gradually increase until balance is achieved between dome pressure forces and opposing downstream pressure forces.

The modulation of the poppet position continues in this manner until process flow demand ceases. The diaphragm is then moved in an upward direction, thus allowing the spring-loaded poppet to close off flow from the upstream side of the regulator

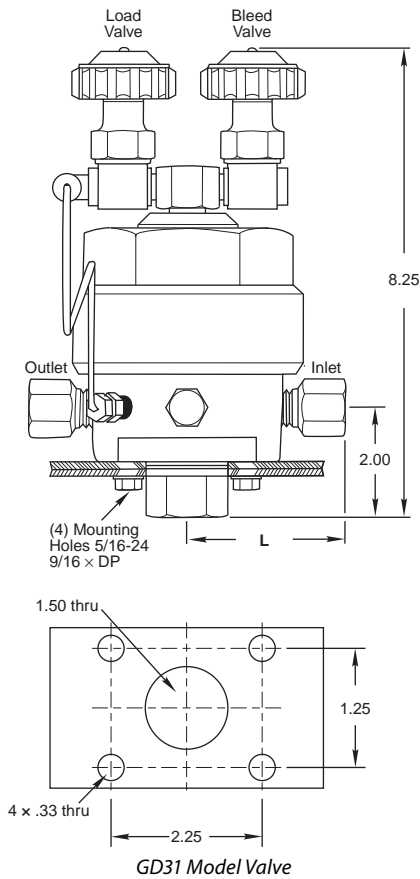
## Circle Seal Controls

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 Phone (951) 270-6200 • Fax (951) 270-6201  
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pressure regulators

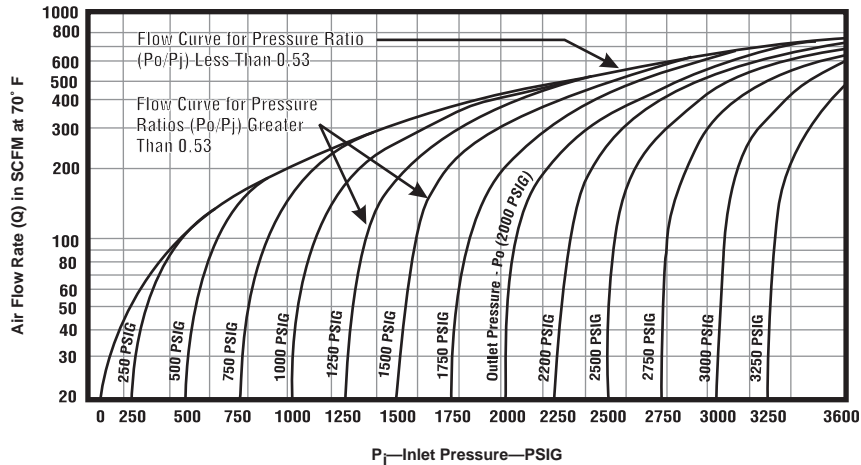
# GD30 Series

## Dimensions & Flow Curves



Connection	Dim. L
-1 AND10050-4	3.06
-2 AND10050-8	3.31
-3 1/4" NPT female	2.75
-4 1/2" NPT female	3.31

### Air Flow Chart



### Correction factors for gases other than air:

Gas	Correction Factor
Air	1.000
Helium	2.690
Hydrogen	3.795
Nitrogen	1.016
Oxygen	0.951

### Flow rates for gases other than air:

Air Flow Rate (Q) × correction factor

## How to Order

**K/ GD31 B 4 4 2 G**

**REPAIR KIT** —————

**BASIC MODEL NUMBER** —————

**GD31** Internal dome-loaded  
**GD31R** Externally dome-loaded

**BODY MATERIAL** —————

**B** Bronze

**INLET PORT** —————

**1** AND10050-4  
**2** AND10050-8  
**3** 1/4" NPT female  
**4** 1/2" NPT female

**OPTIONS** —————

**G** Gauges (0-5,000 psig)

**CLEANING LEVELS** —————

**1** For general oxygen service\*  
**2** For general pneumatic service  
**3** Specify (define on sales order)

**OUTLET PORT** —————

**1** AND10050-4  
**2** AND10050-8  
**3** 1/4" NPT female  
**4** 1/2" NPT female

Outlet pressure changer per 100 psig inlet pressure change = 2.2 psi.

\* Temperature range for oxygen service = -20° F to +250° F

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

## For Your Safety

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# BLR50 Series

*Dynadome Pressure Regulator*

*Inlet: 600–6,000 psig ; Outlet: 100–5,800 psig*



## Features

- Quarter-turn control
- Accurate
- Self-venting
- High flow ( $C_v = 0.50$ )
- Highly reliable (no springs, diaphragms, or pistons)
- Excellent sensitivity
- 100% tested

## Applications

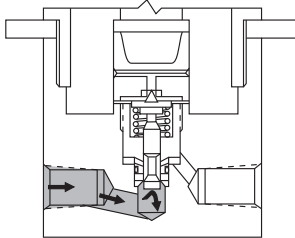
- Manufacturing process
- High pressure test systems
- Compressors
- Bulk gas delivery

## Technical Data

<b>Body Construction Material</b>	Brass
<b>Seat Materials</b>	Nylatron®, Kel-F® or Polyimide
<b>Seal Materials</b>	Ethylene propylene, neoprene, Viton® or Buna
<b>Port Sizes</b>	¼", ½" pipe or ½" AND10050 ¼" gauge and vent port
<b>Pressure Ratings</b>	• Inlet = 600–6,000 psig (41.4–414 BAR) • Outlet = 100–5,800 psig (7–400 BAR)
<b>Temperature Range</b>	–65° F to +160° F (–54° C to +71° C)
<b>Flow Capacity</b>	$C_v = 0.50$

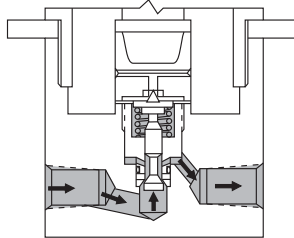
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

## How it Works



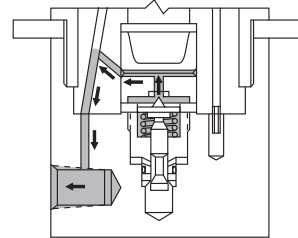
### Closed

The balanced poppet is spring-loaded against the valve seat. When full upstream pressure is applied, a slight unbalanced force is developed which further enhances sealing.



### Regulating

As the downstream process demands flow, the decreasing pressure (acting on the outlet side of the piston) allows the dome pressure force to push the piston down. This in turn unseats the poppet, which permits flow to start and pressure under the piston to gradually increase until a balance is achieved between the dome pressure forces. The modulation of the poppet position continues in this manner until the process flow demand ceases.



### Venting

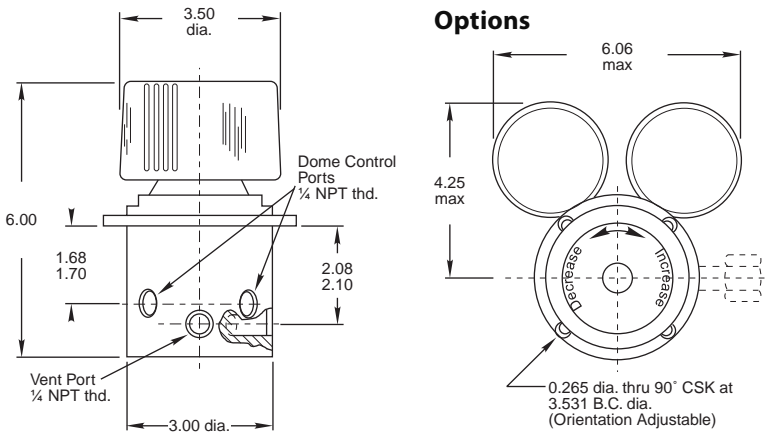
When the handle is turned to decrease the regulated pressure level, the dome pressure will vent through the dome vent and the downstream pressure will vent through the piston to the vent port.

## Circle Seal Controls

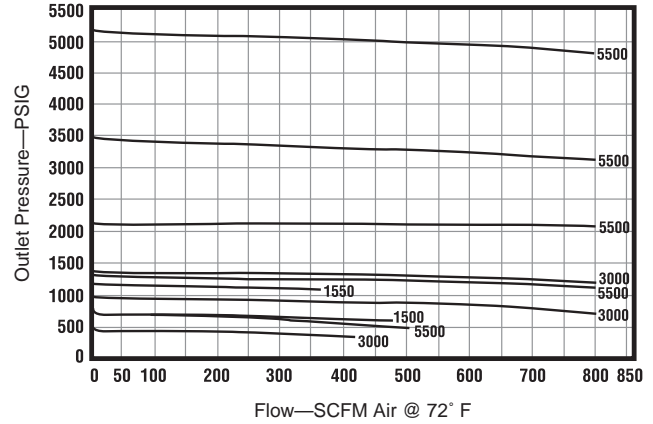
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# BLR50 Series

## Dimensions



## Air Flow Curve



## How to Order

**K/ BLR50 B 1 1 1 2 G**

**REPAIR KIT** ————— K

**BODY MATERIAL** ————— B  
**B** Brass

**BODY PART NUMBER INLET & OUTLET PORTS** ————— 1 1 1 2  
**1** 1/4" NPT female  
**2** 1/2" NPT female  
**3** AND10050-8

**SEAT MATERIAL** ————— 1  
**0** Ethylene propylene  
**1** Neoprene (standard)  
**3** Viton®  
**4** Buna N

**OPTIONS** ————— G  
**G** Gauges (0-7,500 psig)

**CLEANING LEVELS** ————— 1 2  
**1** General oxygen\* (CSC/CCD 29.20)  
**2** General pneumatic (GEN CL'G)  
**3** Specify (define on sales order)

**SEAT MATERIALS** ————— 1 2 9  
**1** Nylatron® GS (standard)  
**2** Kel-F® (limited to 3,600 psig max. inlet, 3,400 psig max. outlet)  
**9** Polyimide (Vespel® SP-21)

\* For oxygen service: 3,600 psig max. inlet pressure and temperature range of -20° F to +250° F.

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

## For Your Safety

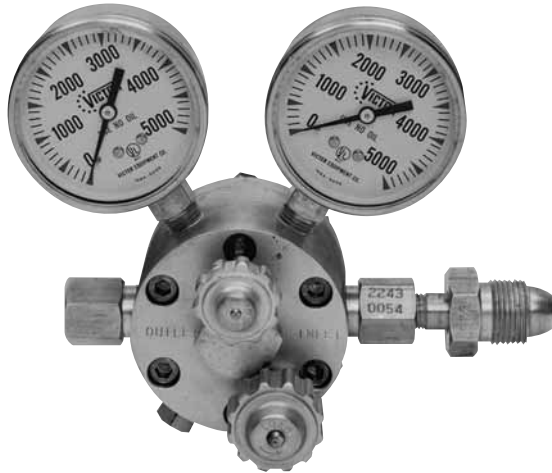
It is solely the responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation, and maintenance of these products. Material compatibility, product ratings and application details should be considered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

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 Kel-F® is a registered trademark of 3M Company.  
 Viton® is a registered trademark of DuPont Dow Elastomers.  
 Vespel® is a registered trademark of E.I. du Pont de Nemours and Company.



# GD62C & GD65C Series

*Internally Dome-loaded Regulator  
Inlet & Outlet to 7,000 psig*



## Features

- Bubble-tight seal
- High pressure
- Constant rapid delivery

## Applications

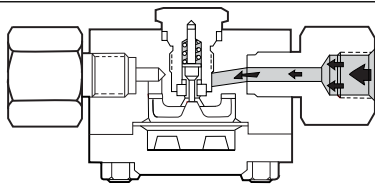
- Breathing systems
- Research laboratories
- Aircraft servicing
- Facility gas systems
- Industrial gas products
- Process gas control

## Technical Data

<b>Body Construction Material</b>	Bronze
<b>Seal &amp; Diaphragm Materials</b>	Neoprene or Viton®
<b>Seat Material</b>	Nylatron® or Vespel® SP-21
<b>Gauge Material</b>	Brass, 2½" diameter
<b>Port Sizes</b>	¼", ½" pipe, AND10050-4 or -8 or CGA fittings
<b>Pressure Ratings</b>	Inlet/Outlet: • GD62C Series: to 3,500 psig (241 BAR) • GD65C Series: to 7,000 psig (483 BAR)
<b>Temperature Range</b>	-65° F to +160° F (-54° C to +71° C)
<b>Flow Capacity</b>	Cv = 0.17 Orifice diameter = 0.095"
<b>Weight</b>	• GD62C = 7.00 lbs • GD65C = 10.25 lbs

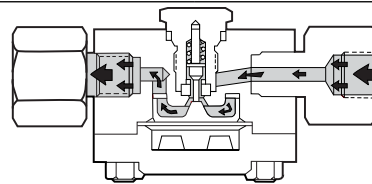
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

## How it Works



### Closed

The unbalanced poppet is spring-loaded against the valve seat. Dead-tight sealing is ensured by a considerable force when full upstream pressure is applied over the entire effective area of the seating diameter.



### Regulating

Dome-loading may be accomplished by the built-in load and bleed valve combination. The rate of pressurization of the dome may be adjusted by the small screw-type needle valve located on the side of the unit.

As the downstream process demands flow, the decreasing pressure (acting on the outlet side of the diaphragm) allows the dome pressure force to push the diaphragm and lower plate down which, in turn, unseats the poppet.

The described action permits flow to start and the pressure under the piston to gradually increase until balance is achieved between dome pressure forces and opposing downstream pressure forces.

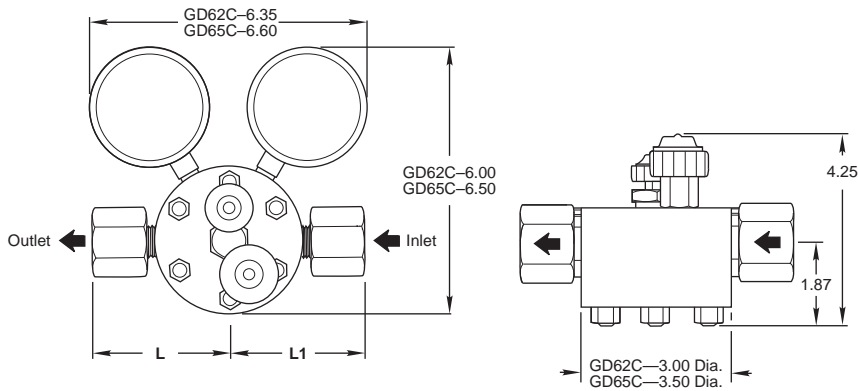
The modulation of the poppet position continues in this matter until process flow demand ceases. The diaphragm is then moved in an upward direction, thus allowing the spring-loaded poppet to close off flow from the upstream side of the regulator.

## Circle Seal Controls

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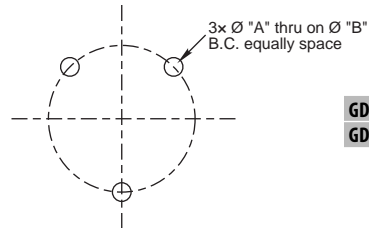
# GD62C & GD65C Series

## Dimensions & Flow Curves



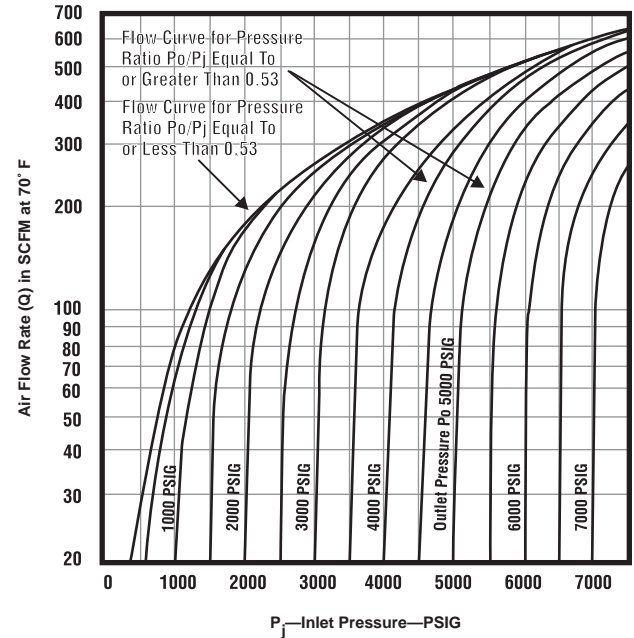
Connection	Dim	GD62C	GD65C
-1	L, L1	2.75	2.90
-2	L, L1	3.00	3.15
-3	L, L1	2.57	2.72
-4	L, L1	3.00	3.15
-7 & -8	L1	4.20	4.35

### Panel Mount Detail



	A	B
GD62C	0.328	2.437
GD65C	0.390	2.812

### Air Flow Chart



### Correction factors for gases other than air:

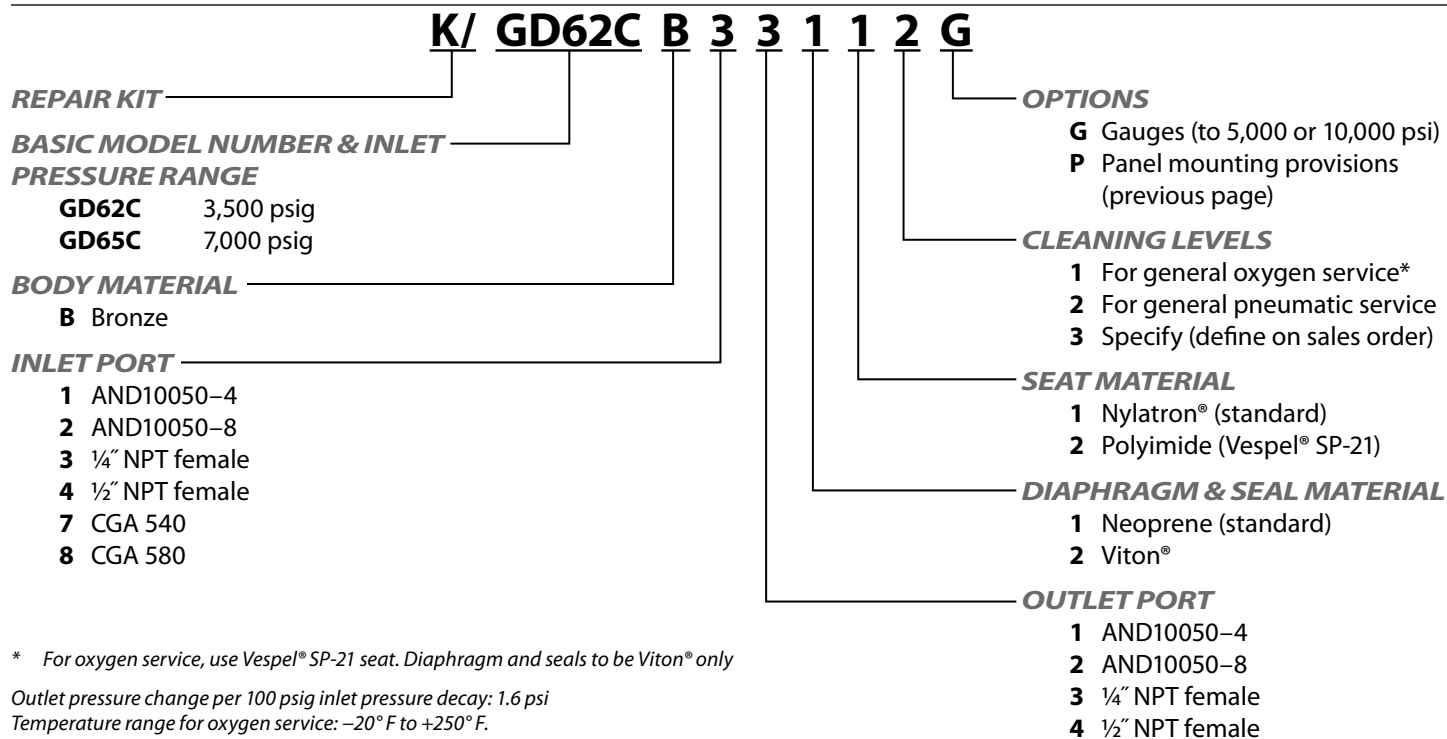
Gas	Correction Factor
Air	1.000
Helium	2.690
Hydrogen	3.795
Nitrogen	1.016
Oxygen	0.951

### Flow rates for gases other than air:

Air Flow Rate (Q) × correction factor

# GD62C & GD65C Series

## How to Order



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

## For Your Safety

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# GD67A Series

*High Pressure Dome-loaded Regulator  
Inlet & Outlet to 6,000 psig*



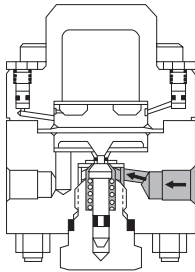
## Features

- Reliable
- Accurate
- Positive shutoff for zero-leak
- Remote operated
- Rapid response
- High pressure, medium flow
- Internal pressure load or external dome loading
- Panel mount option

## Applications

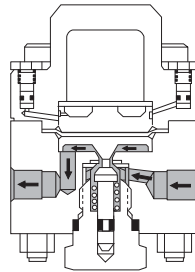
High pressure testing  
 Facility gas systems  
 Industrial gas plants  
 Process gas controls  
 Chemical/petroleum plants

## How it Works



### Closed

The balanced poppet is spring-loaded against the valve seat. When full upstream pressure is applied, a slightly unbalanced force is developed which further enhances sealing.



### Regulating

Dome-loading may be accomplished by the built-in load and bleed valve combination or by an externally located pressure regulator. As the downstream process demands flow, the decreasing pressure (acting on the outlet side of the diaphragm) allows the dome pressure force to push the diaphragm and lower plate down which, in turn, unseats the poppet. This action permits flow to start and the pressure under the piston to gradually increase until balance is achieved between dome pressure forces and opposing downstream pressure forces. The modulation of the poppet position continues in this manner until process flow demand ceases. The diaphragm is then moved in an upward direction, thus allowing the spring-loaded poppet to close off flow from the upstream side of the regulator.

## Technical Data

<b>Body Construction Materials</b>	Bronze or 303 stainless steel
<b>Seal Materials</b>	Neoprene, butyl, Viton® or Buna N
<b>Seat Material</b>	Polyimide or Kel-F®
<b>Diaphragm Materials</b>	Neoprene, butyl, Viton® or Buna N
<b>Trim Material</b>	Stainless steel
<b>Port Size</b>	¼" NPT female
<b>Pressure Ratings</b>	Inlet/Outlet: 0 to 6,000 psig (0 to 414 BAR)
<b>Temperature Range</b>	-65° F to +160° F (-54° C to +71° C)
<b>Flow Capacity</b>	Cv = 0.37 Orifice diameter = 0.145"
<b>Weight</b>	• Bronze = 5.50 lbs • Stainless steel = 5.00 lbs

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

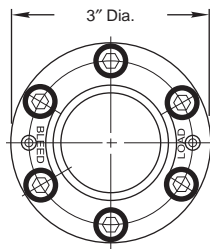
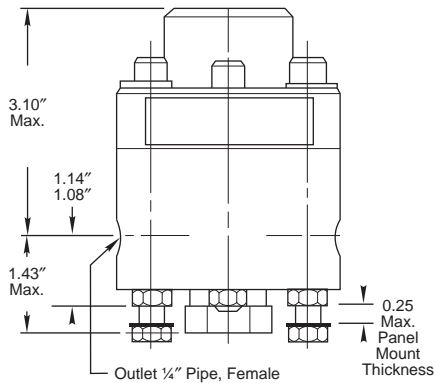
pressure regulators

## Circle Seal Controls

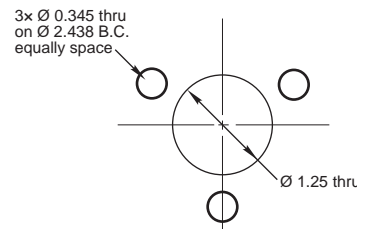
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# GD67A Series

## Dimensions



### Panel Mount Detail



## How to Order

**K/ GD67A E B 4 1 5 2 P**

**REPAIR KIT**

**DOME-LOADING**

- E** External
- I** Internal

**INLET PORT**

- B** Bronze
- T** 303 stainless steel

**INLET/OUTLET PORT**

- 4** 1/4" NPT female

**SPECIAL FEATURES**

- P** Panel mounting (see below)

**CLEANING LEVELS**

- 1** For general oxygen service
- 2** For general pneumatic service
- 3** To customer specifications

**SEAT MATERIAL**

- 2** Kel-F®
- 5** Polyimide (Vespel® SP-21)

**DIAPHRAGM & SEAL MATERIAL**

- 1** Neoprene (standard)
- 2** Butyl
- 3** Viton®
- 4** Buna N

\* Adapter can be used to accommodate other port configurations

\*\* For oxygen service, use Vespel® SP-21 seat, diaphragm and seals to be Viton® only. Temperature range: -20° F to +250° F.

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

## For Your Safety

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

## GD80 Series

*High Pressure Dome-loaded Regulator  
Inlet & Outlet to 10,000 psig*



### Features

- High pressure
- Bubble-tight seal
- Internally or externally dome loaded

### Applications

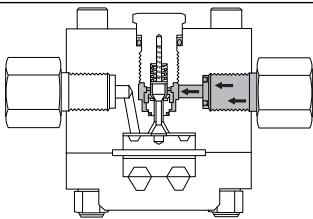
- High pressure testing
- Facility gas systems
- Industrial gas plants
- Process gas controls
- Chemical/petroleum plants

### Technical Data

<b>Body Construction Material</b>	303 stainless steel
<b>Seal &amp; Diaphragm Material</b>	Neoprene
<b>Seat Material</b>	Nylatron® GS
<b>Spring Material</b>	Stainless steel
<b>Port Size</b>	<ul style="list-style-type: none"> <li>• Inlet &amp; outlet: ¼" &amp; ½" NPT female, ¼" &amp; ⅝" Aminco</li> <li>• Dome port GD81B Series only: ¼" NPT female or ¼" Aminco</li> </ul>
<b>Pressure Ratings</b>	Inlet/Outlet: 0 to 10,000 psig (690 BAR)
<b>Temperature Range</b>	-65° F to +160° F (-54° C to +71° C)
<b>Flow Capacity</b>	Cv = 0.365
<b>Weight</b>	28 lbs

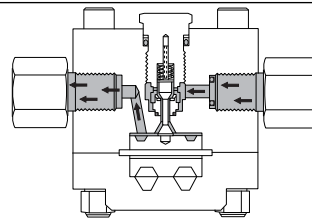
*Note: Proper filtration is recommended to prevent damage to sealing surfaces.*

### How it Works



#### Closed

The balanced poppet is spring-loaded against the seat. Bubble-tight sealing is ensured (by a considerable force) when full upstream pressure is applied over the entire effective area of the seating diameter.



#### Regulating

Dome-loading may be accomplished by the built-in load and bleed valve combination or by an externally located pressure regulator.

As the downstream process demands flow, the decreasing pressure (acting on the outlet side of the diaphragm) allows the dome pressure force to push the diaphragm and lower plate up which, in turn, unseats the poppet.

This action permits flow to start and the pressure under the piston to gradually increase until balance is achieved between dome pressure forces and opposing downstream pressure forces. The modulation of the poppet position continues in this manner until process flow demand ceases. The diaphragm is then moved in a downward direction, thus allowing the spring-loaded poppet to close off flow from the upstream side of the regulator.

### Circle Seal Controls

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# GD80 Series

## How to Order

**K/ GD80A T 4 2 L M**

**REPAIR KIT**

**BASIC MODEL NUMBER**

**GD80A** Internally dome-loaded  
**GD81B** Externally dome-loaded

**BODY MATERIAL**

**T** 303 stainless steel

**OPTIONS**

**L** 10,000 psig 2-12" brass gauges, gauge port 1/4" pipe  
**M** Extended bolts for mounting

**CLEANING LEVELS**

**2** For general pneumatic service  
**3** Specify\*  
**4** Precision pneumatic service

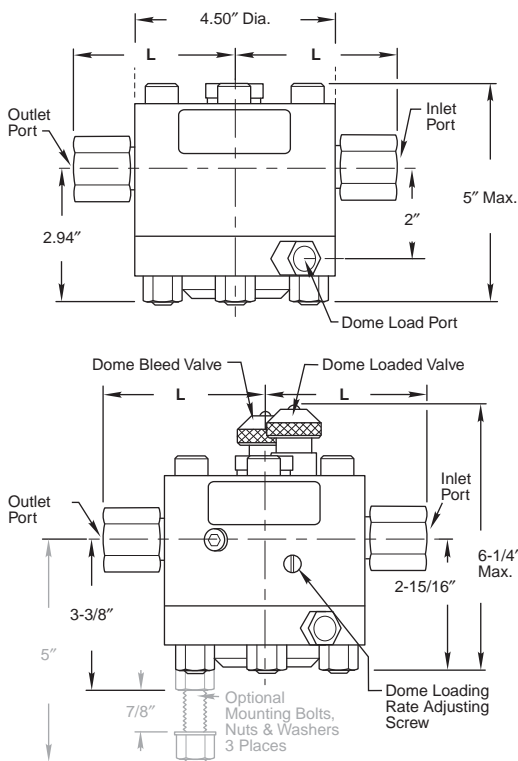
**INLET/OUTLET PORT**

	Size & Type	Dimension "L" (below)
<b>4</b>	1/4" NPT female	3 11/32"
<b>6</b>	1/2" NPT female	3 19/32"
<b>7</b>	1/4" Aminco	3 11/32"
<b>8</b>	3/16" Aminco	3 25/32"

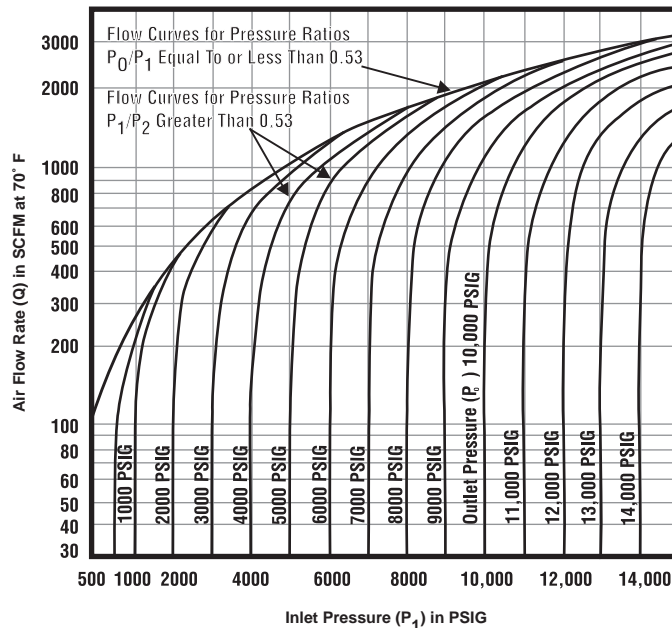
\* List requirements or furnish the factory a copy of the requirements or specifications.

Outlet pressure change per 100 psig of inlet pressure change is 2 psig.

## Dimensions & Flow Curves



## Air Flow Chart



## For Your Safety

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



# GD90 Series

*Dynadome High Flow Dome-loaded Regulator  
Inlet & Outlet to 6,000 psig*



## Features

- High flow capacity
- Accurate pressure regulation
- Wide fluid compatibility

## Applications

- High pressure testing
- Facility gas systems
- Industrial gas plants
- Process gas controls
- Bulk facility installations
- Gas turbine engine starter

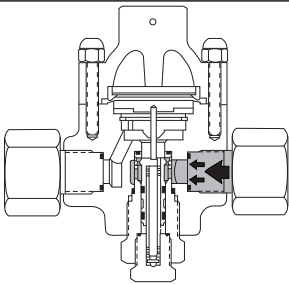
## Technical Data

<b>Body Construction Material</b>	Bronze
<b>Seal &amp; Diaphragm Material</b>	Neoprene*
<b>Seat Material</b>	Nylatron**
<b>Spring Material</b>	Stainless steel
<b>Port Sizes</b>	Inlet & outlet: 3/4", 1" & 1 1/4" NPT female, AND10050-12, -16, or -24
<b>Pressure Ratings</b>	Inlet/Outlet to 6,000 psig (414 BAR)
<b>Temperature Range</b>	-65° F to +160° F (-54° C to +71° C)
<b>Flow Capacity</b>	Cv = 5.0 Orifice diameter = 0.50"
<b>Weight</b>	Approx. 25 lbs

\* Optional materials available, see "How to Order".

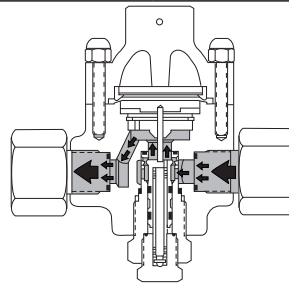
Note: Proper filtration is recommended to prevent damage to sealing surfaces.

## How it Works



### Closed

The balanced poppet is spring-loaded against the valve seat. When full upstream pressure is applied, a slight unbalanced force is developed which further enhances sealing.



### Regulating

Dome-loading may be accomplished by the load and bleed valve combination or by an externally located pressure regulator, depending on the specific model used for the application.

As the downstream process demands flow, the decreasing pressure (acting on the outlet side of the diaphragm) allows the dome pressure force to push the diaphragm and lower plate down which, in turn, unseats the poppet.

The described action permits flow to start and the pressure under the piston to gradually increase until balance is achieved between dome pressure forces and opposing downstream pressure forces.

The modulation of the poppet position continues in this manner until process flow demand ceases. The diaphragm is then moved in an upward direction, thus allowing the spring-loaded poppet to close off flow from the upstream side of the regulator.

## Circle Seal Controls

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Phone (951) 270-6200 • Fax (951) 270-6201  
www.circle-seal.com

# GD90 Series

## How to Order

**K/ GD91 B 1 1 1 1 1 M X**

**REPAIR KIT** —————

**BASIC MODEL NUMBER** —————  
**GD91** Externally remote dome-loaded  
**GD92** Internally dome-loaded

**BODY MATERIAL** —————  
**B** Bronze

**INLET PORT TYPE & SIZE** —————  
**1** AND10050-12  
**2** AND10050-16  
**3** AND10050-24  
**4** 3/4" NPT female  
**5** 1" NPT female  
**6** 1 1/4" NPT female

**OUTLET PORT TYPE & SIZE** —————  
**1** AND10050-12  
**2** AND10050-16  
**3** AND10050-24  
**4** 3/4" NPT female  
**5** 1" NPT female  
**6** 1 1/4" NPT female

**OPTIONS**  
**M** Extended bolts for mounting  
**X** Downstream sensing

**CLEANING LEVELS**  
**1** For general oxygen service\*  
**2** For general pneumatic service  
**3** Specify (define on sales order)  
**4** Precision pneumatic service

**SEAT MATERIAL**  
**1** Nylatron® GS (standard)  
**2** Kel-F®\*\*  
**3** Polyimide (VespeI®)

**SEAL MATERIAL**  
**1** Neoprene (standard)  
**2** EPR  
**3** Viton®  
**4** Buna N

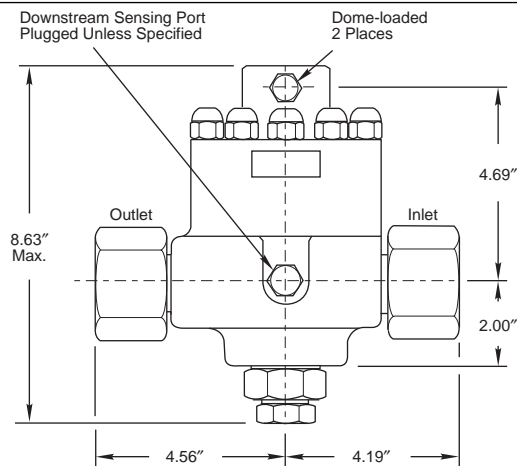
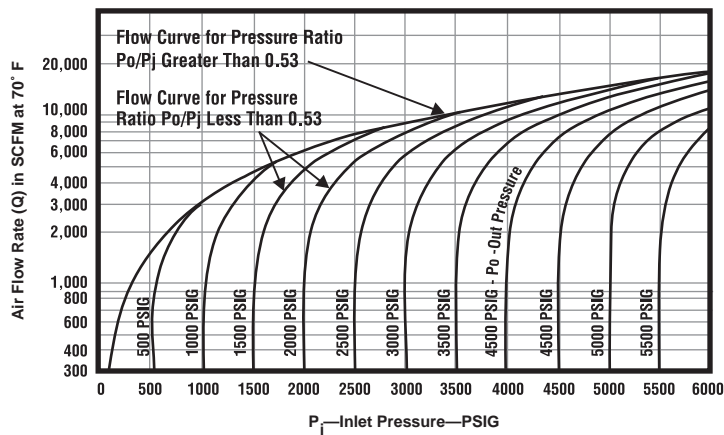
\* For oxygen service, use VespeI® seat; seal and diaphragm to be Viton® only  
 \*\* Kel-F® seat: inlet & outlet pressures limited to 3,000 psig

Dome-loading ports are AND10050-4 with tube fittings and 1/4" NPT female with pipe on inlet and outlet fittings.  
 Outlet pressure change rate: 0.10 psi per 100 psi inlet pressure change

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

## Flow Curves & Dimensions

### Air Flow Chart



### Correction factors for gases other than air:

Gas	Correction Factor
Air	1.000
Helium	2.690
Hydrogen	3.795
Nitrogen	1.016
Oxygen	0.951

### Flow rates for gases other than air:

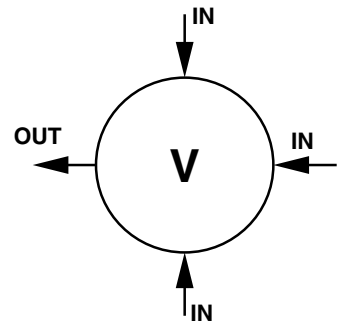
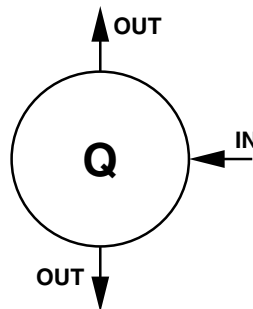
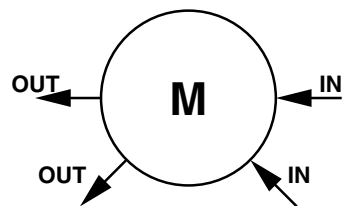
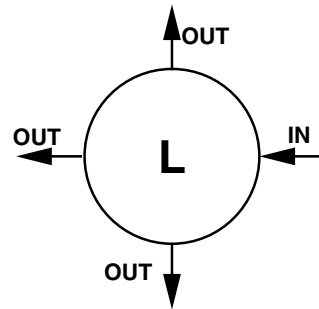
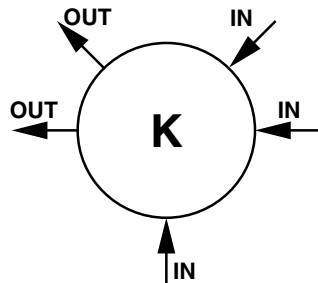
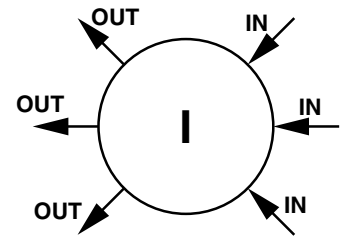
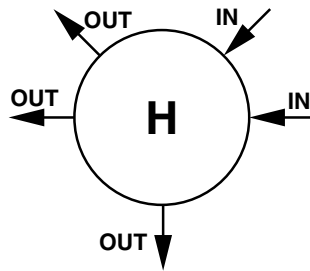
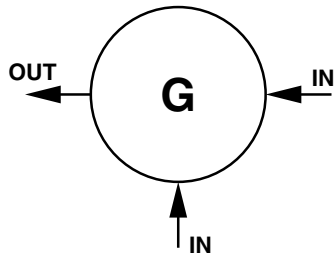
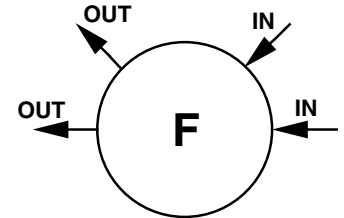
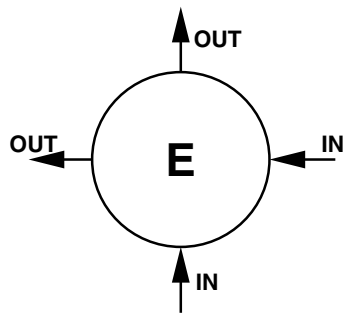
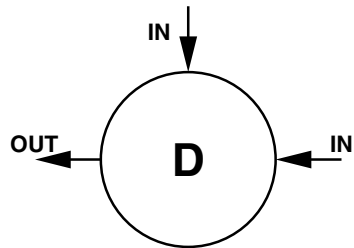
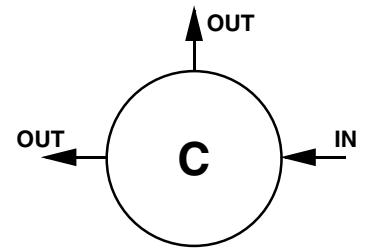
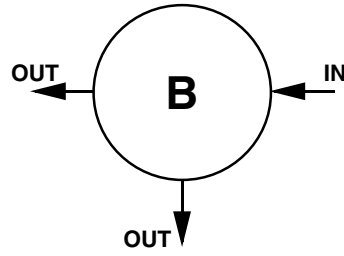
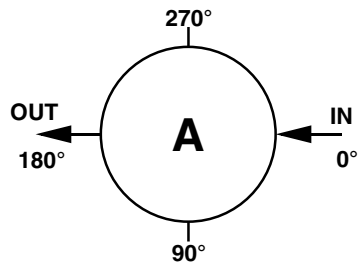
Air Flow Rate (Q) × correction factor

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 Kel-F® is a registered trademark of 3M Company.  
 VespeI® is a registered trademark of E.I. du Pont de Nemours and Company.  
 Viton® is a registered trademark of DuPont Dow Elastomers.

## 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.

# Porting Configurations for Pressure Regulators



Location Of Ports From Top View

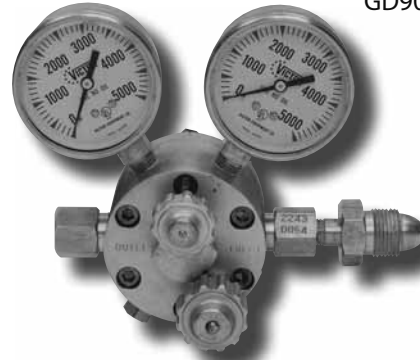


# Pressure Regulators

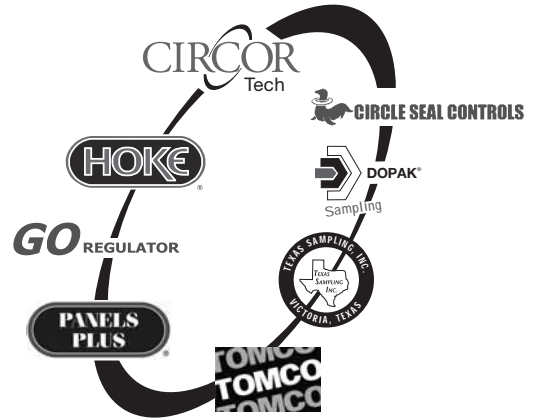
*Manual Adjusted and Dome-loaded*

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*pressure regulators*



**Hoke • GO Regulator • Tomco • CIRCOR Tech**

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**CIRCOR Instrumentation Technologies**

CIRCOR Instrumentation Technologies (CIT) is a product group of CIRCOR International (NYSE: CIR), specializing in fluid process control solutions with orifice sizes typically up to 1". Our main product lines include ball, needle, packless, diaphragm, solenoid, and metering valves, pressure regulators, quick couplers, Gyrolok® compression tube fittings, and fully integrated sampling systems.

CIT markets primarily to the petrochemical, refining, power generation, food and beverage, semiconductor, and pharmaceutical industries, and to OEM's. CIT separates itself from the competition by offering highly engineered components manufactured to exacting standards and a variety of custom options.