

# IR4000 Series

## High Pressure Regulator Internally Threadless Design



Parker Hannifin Corporation's Veriflo Division introduces the IR4000 Series internally threadless pressure regulator for instrument/analyzer and semiconductor applications.

Instrument applications include gas management in refineries and process analyzer systems. Semiconductor applications for use on general purpose gas management (Air, Condensed Dry Air (CDA), and Plant Nitrogen).

The brass model has been independently tested by BAM and found compliant to DIN EN ISO 2503. The BAM testing is for oxygen service.

The IR4000 is a high pressure regulator that can be ordered with a variety of options to meet a wide range of system design requirements.

*Note: Please see **Product Features and Benefits** on page two.*



### materials of construction

#### Wetted

Body . . . . . 316L Stainless Steel, Hastelloy C-22<sup>®</sup>,  
Brass, Monel<sup>®</sup>  
Compression Member . . . . . Inconel<sup>®</sup>  
Diaphragm . . . . . Hastelloy C-22<sup>®</sup>  
Poppet . . . . . Elgiloy<sup>®</sup>,  
Phosphor Bronze (Brass body)  
Poppet Spring . . . . . Inconel<sup>®</sup>  
Carrier . . . . . Stainless Steel\*, Hastelloy C-22<sup>®</sup>  
Back-up Washer . . . . . Hastelloy C-22<sup>®</sup>  
Seat . . . . . PCTFE, PEEK<sup>™</sup>, Vespel<sup>®</sup>  
Back-up O-ring . . . . . Viton<sup>®</sup>  
Optional Teflon<sup>®</sup>  
Inlet Screen/Filter . . . . . 316L Stainless Steel,  
Copper and Phosphor Bronze (Brass body),  
Hastelloy C-22<sup>®</sup> (Hastelloy<sup>®</sup>, Monel<sup>®</sup> bodies)

#### Non-Wetted

Nut . . . . . 316L Stainless Steel  
Cap . . . . . Nickel Plated Brass,  
Optional Stainless Steel  
Knob (black) . . . . . ABS Plastic

### operating conditions

Maximum inlet . . . . . 4000<sup>†</sup> psig (276 barg)  
Outlet . . . . . 1-10 psig<sup>†</sup> (.7 barg), 1-30 psig (2 barg),  
1-60 psig (4 barg), 2-100 psig (7 barg),  
2-250 psig (17 barg), 5-500 psig (35 barg)  
Temperature:  
PCTFE . . . . . -40°F to 150°F (-40°C to 65°C)  
\*\*PEEK<sup>™</sup> . . . . . -40°F to 275°F (-40°C to 135°C)  
\*\*Vespel<sup>®</sup> . . . . . -40°F to 500°F (-40°C to 260°C)

### functional performance

Flow capacity . . . . . C<sub>v</sub> = 0.02, 0.06, 0.15<sup>†</sup>  
(SEMI Flow Coefficient Test #F-32-0998)  
Design Proof Pressure . . . . . 6000 psig (414 barg)  
Design Burst Pressure . . . . . 12000 psig (828 barg)  
Design Leak Rate:  
Outboard . . . . . 1 x 10<sup>-9</sup> scc/sec He  
Inboard . . . . . 2 x 10<sup>-9</sup> scc/sec He  
Across seat . . . . . 4 x 10<sup>-8</sup> scc/sec He  
Supply Pressure Effect:  
.02 C<sub>v</sub> . . . . . 0.23 psig per 100 psig  
(.016 barg per 7 barg)  
.06 C<sub>v</sub> . . . . . 0.6 psig per 100 psig  
(.04 barg per 7 barg)  
.15 C<sub>v</sub> . . . . . 1.5 psig per 100 psig  
(.1 barg per 7 barg)

### standard configurations

See Dimension Table on back page

### internal volume

4.0 cc without fittings

### approximate weight

1.5 lbs (.7 kg)

\* Proprietary Carpenter Stainless Steel with corrosion resistance equal or better than 316 Stainless Steel.

\*\* Temperature Applications not available in Brass body.

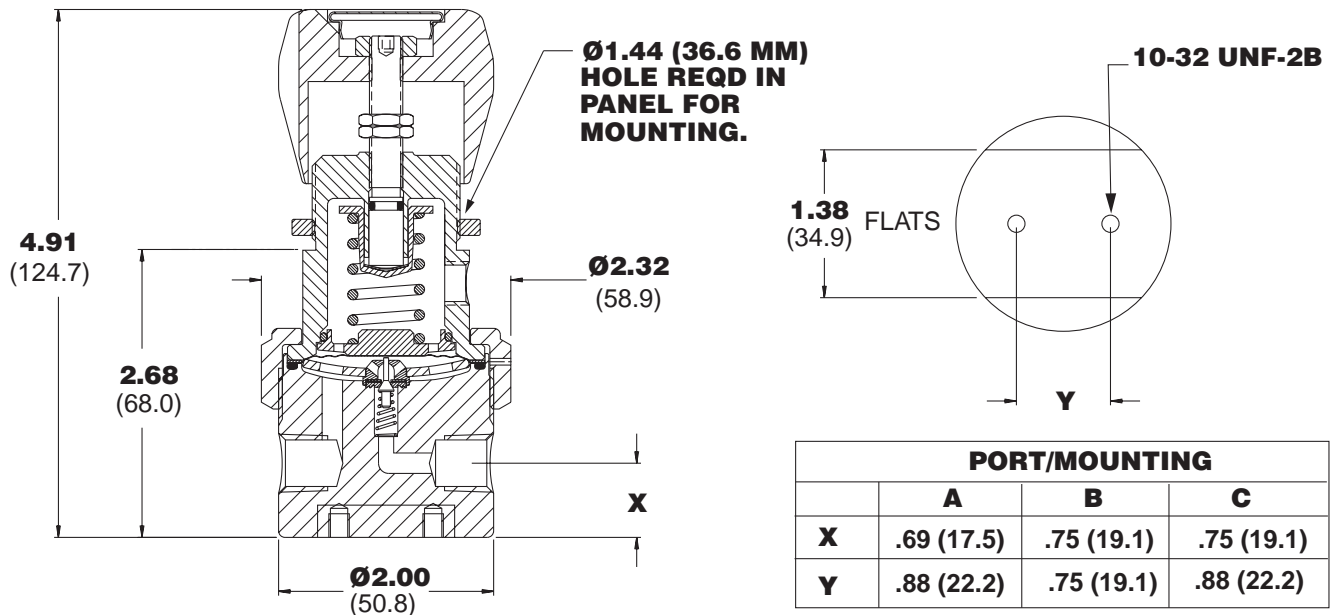
<sup>†</sup> Refer to Range Table for specific information.

# IR4000 Series

## Product Features and Benefits

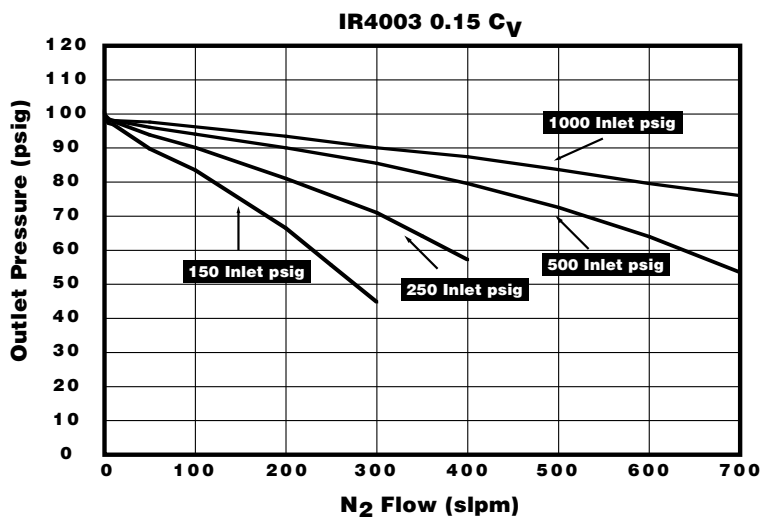
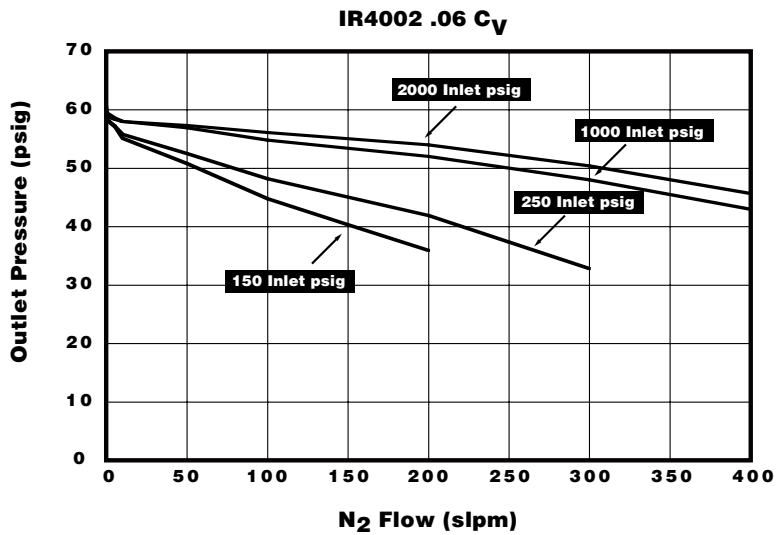
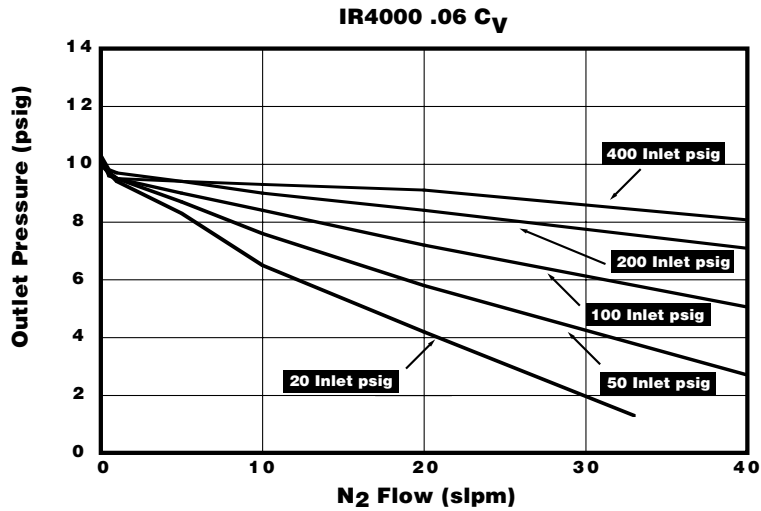
- ▶ Unique patented compression member loads the seal to the body without requiring a threaded nozzle or additional seals to atmosphere.
- ▶ Selection of seat materials for media compatibility and temperature applications.
- ▶ Meets NACE standard MR0175.
- ▶ Cleaned for Oxygen Service.
- ▶ Fully swept design.
- ▶ Internally threadless seat design to promote long seat life.
- ▶ Convuluted, Hastelloy C-22<sup>®</sup> diaphragm provides high corrosion resistance and increases cycle life.
- ▶ Positive upward and downward diaphragm stops increases cycle life by preventing over stroking of the diaphragm.
- ▶ Minimized internal volume reduces cycle time to the analyzer.
- ▶ Captured bonnet allows for safety venting.
- ▶ Standard units can be dome loaded.
- ▶ The use of Inconel<sup>®</sup>, Hastelloy<sup>®</sup>, and Elgiloy<sup>®</sup> provide superior corrosion resistance and high repeatability.
- ▶ Close tolerances and tight alignment of moving components minimizes hysteresis.
- ▶ Unique carrier design disperses gas uniformly through the regulator to improve purging.

## Dimensional Drawing



# IR4000 Series

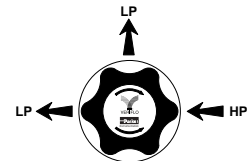
## Flow Curves



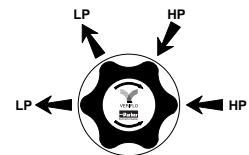
## Porting Configurations



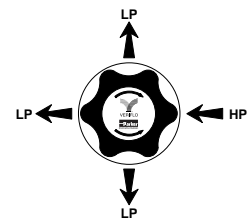
Porting Code  
2P



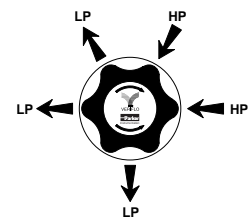
Porting Code  
3P



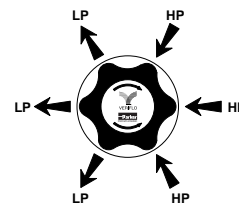
Porting Code  
4P



Porting Code  
4PB



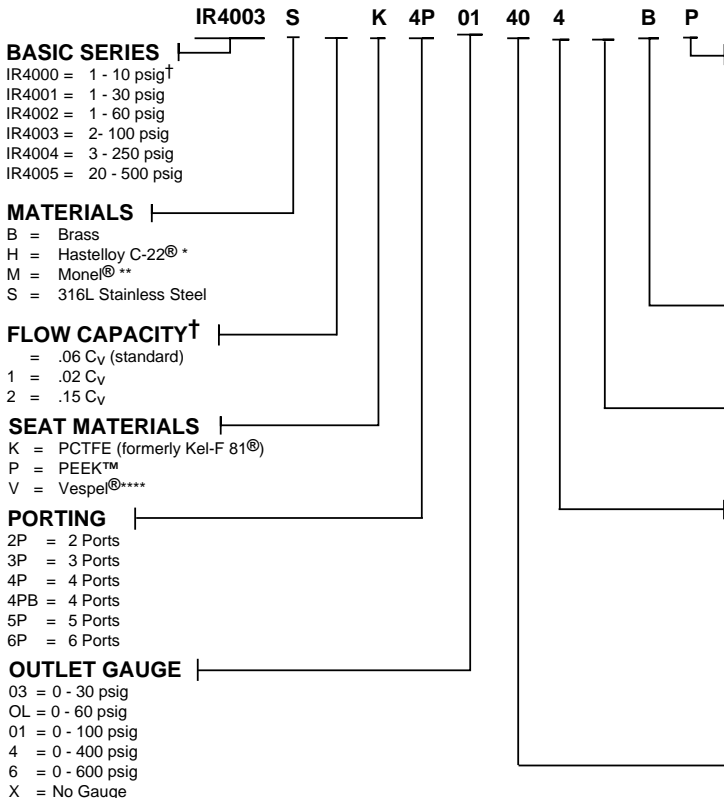
Porting Code  
5P



Porting Code  
6P

# IR4000 Series

## Ordering Information



### BASIC SERIES

IR4000 = 1 - 10 psig†  
 IR4001 = 1 - 30 psig  
 IR4002 = 1 - 60 psig  
 IR4003 = 2 - 100 psig  
 IR4004 = 3 - 250 psig  
 IR4005 = 20 - 500 psig

### MATERIALS

B = Brass  
 H = Hastelloy C-22®\*  
 M = Monel®\*\*  
 S = 316L Stainless Steel

### FLOW CAPACITY†

= .06 Cv (standard)  
 1 = .02 Cv  
 2 = .15 Cv

### SEAT MATERIALS

K = PCTFE (formerly Kel-F 81®)  
 P = PEEK™  
 V = Vespel®\*\*\*\*

### PORTING

2P = 2 Ports  
 3P = 3 Ports  
 4P = 4 Ports  
 4PB = 4 Ports  
 5P = 5 Ports  
 6P = 6 Ports

### OUTLET GAUGE

03 = 0 - 30 psig  
 OL = 0 - 60 psig  
 01 = 0 - 100 psig  
 4 = 0 - 400 psig  
 6 = 0 - 600 psig  
 X = No Gauge

### OPTIONAL FEATURES

CGA No. = CGA Connection (Specify CGA No.)\*\*\*  
 C = External Corrosion Resistant (Stainless Steel Cap)  
 D = Dome Loaded  
 G = Tamper Proof  
 L = Teflon® Back-Up O-Ring (PCTFE & PEEK™ Seats Only)  
 M = Metal Knob  
 N = Nickel Plated Body (Brass Only)  
 P = Panel Mount  
 R = Relief Valve  
 S = Self Relieving  
 T = Internal Corrosion Trim (Hastelloy C-22® Carrier)

### PORT MOUNTING

A = .69 port height w/ .88 mounting hole pattern - Optional  
 B = .75 port height w/ .75 mounting hole pattern - Standard  
 C = .75 port height w/ .88 mounting hole pattern - Optional

### PORT CONFIGURATION

M = Male  
 F = Female  
 I = 1/4" Internal Face Seal Female

### PORT STYLE

2 = 1/8" NPTF  
 4 = 1/4" NPTF  
 6 = 3/8" NPTF (Port Mounting B & C Only)  
 4T = 1/4" Compression Fitting  
 6T = 3/8" Compression Fitting  
 8T = 1/2" Compression Fitting  
 FS = 1/4" Face Seal  
 FS8 = 1/2" Face Seal  
 TS = 1/4" Tube Stub  
 TS6 = 3/8" Tube Stub  
 TS8 = 1/2" Tube Stub

### INLET GAUGE

01 = 0 - 100 psig  
 2 = 0 - 200 psig  
 6 = 0 - 600 psig  
 10 = 0 - 1000 psig  
 20 = 0 - 2000 psig  
 30 = 0 - 3000 psig  
 40 = 0 - 4000 psig  
 X = No Gauge

\* Hastelloy C-22® Material includes: Hastelloy C-22® body, Carrier, Screen & Filter  
 \*\* Monel® Material includes: Monel® body, Hastelloy C-22® Carrier, Screen & Filter  
 \*\*\* Do not exceed the rated pressure of the CGA connection  
 \*\*\*\* Recommended for Nitrous Oxide (N<sub>2</sub>O) Service  
 † Refer to Range Table for specific information

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 Kel-F 81® is a registered trademark of 3M Company.  
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 Viton® is a registered trademark of DuPont Dow Elastomers.  
 PEEK™ is a trademark of Victrex plc.

Range Table			
Model Basic Series	Max Inlet PSIG		
	C <sub>v</sub>		
	.06	.02	.15
IR4000	400	400	400
IR4001	4000	4000	1250
IR4002	4000	4000	1250
IR4003	4000	4000	1250
IR4004	4000	4000	1250
IR4005	4000	4000	1250

Dimension Table	
Connection Type	End to End Dimension
1/8" NPTF	2.00 ± .02 in. (50.8 ± .5 mm)
1/4" & 3/8" NPTF	2.00 ± .02 in. (50.8 ± .5 mm)
1/4" Compression Fitting	3.34 ± .02 in. (84.8 ± .5 mm)
3/8" Compression Fitting	3.48 ± .02 in. (88.4 ± .5 mm)
1/2" Compression Fitting	4.38 ± .03 in. (111.3 ± .8 mm)
1/4" Face Seal	3.70 ± .02 in. (94 ± .5 mm)
1/2" Face Seal	4.82 ± .02 in. (122.4 ± .5 mm)
All Tube Stubs	3.70 ± .02 in. (94 ± .5 mm)

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