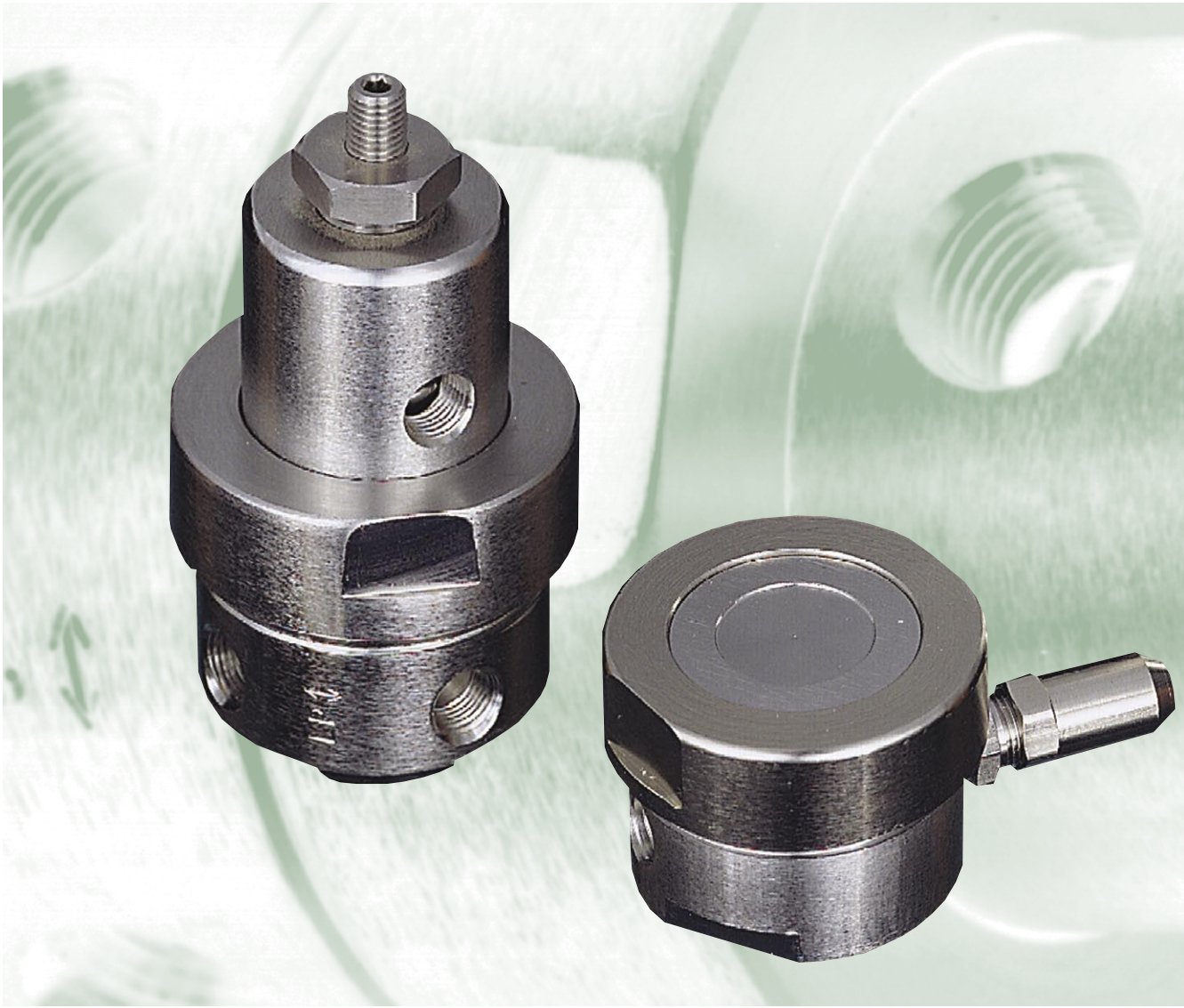
Flow Controllers

Instrument / Analyzer Products

Catalog 4513/USA
April 2005



VERIFLO

Veriflo

A Leading Manufacturer of Precision Valves, Regulators & Surface Mount Components

Veriflo Division, Parker Hannifin Corporation is a leading manufacturer of precision valves, regulators and surface mount components for the control and application of liquids and gases used in the fabrication of semiconductors, as well as in the chemical and petrochemical industries.

Veriflo has maintained industry leadership over the past 95 years through innovative engineering, manufacturing and by placing a premium on quality customer care.

The division maintains two state-of-the-art Class 10 Clean Rooms at its Richmond, CA, facility and has adopted a corporate wide "Lean Manufacturing" philosophy, which is delivering greater value to the customer by eliminating wasteful steps through continuous improvement activities.

Veriflo Division's two manufacturing facilities develop and manufacture applications for the Semiconductor/High Purity and Instrument/Analyzer industries.

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Veriflo Division
Richmond, CA, USA
http://www.veriflo.com

Placing a Premium on Quality Customer Care

With the focus of maintaining the highest industry standards, Veriflo Division has achieved an ISO 9001 registration at both its Richmond, CA, manufacturing plant and at its Carson City, NV, facility. This certification confirms Veriflo's commitment to quality and excellence as recognized by the international community.

The Instrumentation Group of Parker Hannifin specializes in high quality, critical flow components for world-wide process instrumentation, ultra-high purity, medical, analytical and biopharmaceutical applications.

Parker's Instrumentation Group has ten manufacturing plants and over 300 authorized distributor locations around the world to provide local inventory and technical support. Key markets for the Instrumentation Group include: Chemical Process, Power Generation, Oil and Gas Exploration, Semiconductor Manufacturing, Biomedical, and Analytical Equipment.

VERIFLO
ISO 9001 Certified

Visit Us on the Web

For further information on Veriflo Division and or its product line visit the division web site at www.veriflo.com. For more information on Parker Hannifin Corporation visit the corporation's web site at www.parker.com.

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Precision Low Flow Control

Parker Hannifin Corporation's Veriflo Division presents the SC423XL. The SC423XL is a unique device which supplies a constant flow with a self correcting action to compensate for changes in downstream pressure.

The SC423XL was designed for air and analyzer sampling systems which require very low flow rates (less than 10 sccm). Connected to a vacuum cylinder, the SC423XL provides consistent flow control despite changes in the vacuum.

Features

- Rugged Design.
- Reliable Precision Flow Control as low as 1 sccm.
- Adjustable Flows.
- Hastelloy C-22® Diaphragms.
- Stable flows as vacuum pressure changes from 28 in Hg to 5 in Hg.
- Stable flows over a wide temperature band.
- Color coded orifices.
- Special CFC Free Cleaning.
- Tamper Proof.
- O_2 Cleaned.

Materials of Construction

Wetted

Body	316L Stainless Steel
Seat	Fluorocarbon
Seals	Fluorocarbon
Piston	316L Stainless Steel
Diaphragm	Hastelloy C-22®
Inlet Fitting	316 Stainless Steel
Outlet Fitting	316 Stainless Steel

Non-wetted

Cap	316L Stainless Steel
Filter	Sintered Hastelloy
Cap Nut	316 Stainless Steel
Retaining Ring	Stainless Steel
O-Ring	Fluorocarbon
Plug	Stainless Steel

Operating Conditions

Inlet pressure	Atmospheric
Outlet pressure	Vacuum
Flow	As low as 1 sccm (See Flow Curve)

Functional Performance

Design Leak Rate:
(outboard) ..... $1x10^{-6}$ scc/sec He

Temperature Range

-40°F to 200°F (-40°C to 94°C)

Standard Configurations

1/4" NPT Female ..... Inlet and Outlet

Connections

Inlet (Atmosphere)	1/4" NPT x 1/4" Compression Fitting
Outlet (Vacuum)	1/4" NPT X 1/4" Tube Adapter

Approximate Weight

1.75 lbs. (.80 kg)

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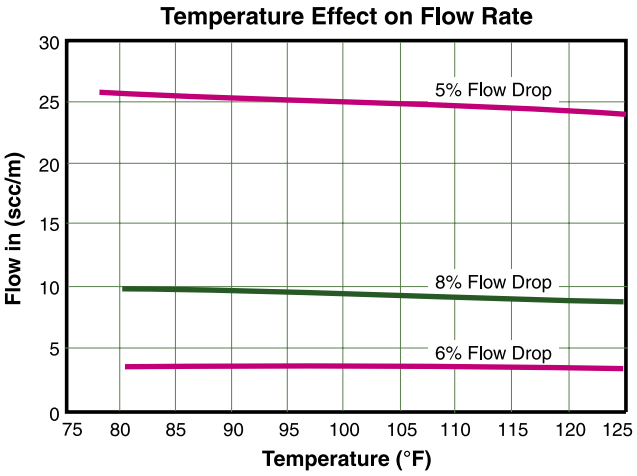
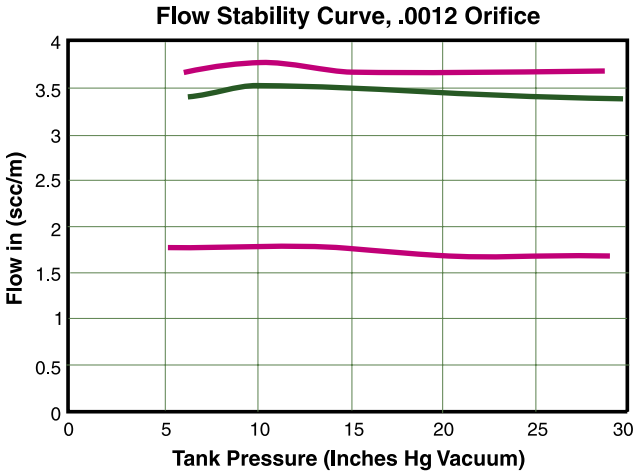
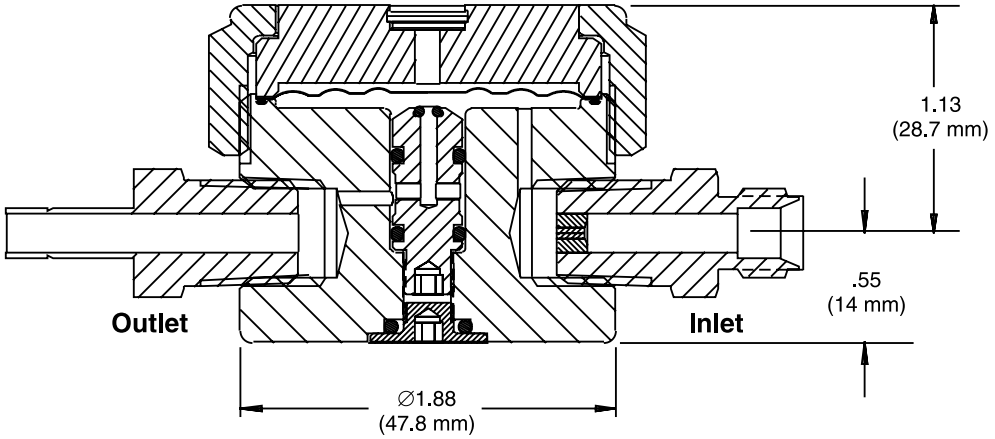
Flow Curves





Dimensional Data



Ordering Information

SC423XL — **Basic Series**
SC423XL

S — **Material**
S 316L Stainless Steel

24 — **Sample Time / Flow Rate**

Hours		Flow Rate	
3	=	27.1 - 27.7 sccm	(Yellow)
8	=	10.0 - 10.4 sccm	(Green)
12	=	6.5 - 6.9 sccm	(Blue)
24	=	3.1 - 3.4 sccm	(Red)

4T — **Inlet Connection**
4T 1/4" Compression Fitting (includes Flow Restrictor)

4TS — **Outlet Connection**
X No Connections
4TS 1/4" Tube Fitting

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Excess Flow Shut-Off Valve

Parker Hannifin Corporation's Veriflo Division presents the FS190. The FS190 is a non-attitude sensitive, excess flow shut-off valve designed to operate with a wide range of inlet pressures.

The capability of operating from 10 to 3500 psig allows it to be used either between a high pressure source at the inlet to the pressure regulator, or in the low pressure delivery line to a process. In both applications, this control valve will automatically shut off the delivery of gas if the flow exceeds a preset limit.

The functional components of the FS190 are incorporated within the body style of a 1-1/4 inch Quantum valve. An actuating knob has been designed to manually operate the valve and clearly indicate the relative operating position - either "Open (Reset)" or "Auto (Shut Off)." A pneumatic actuator may be substituted for the knob, which makes it possible to reset the valve by sending a pressure signal from a remote source.

The FS190 is offered with six different pressure/flow limits: A,B,C,D,E, and F (see flow curve). The nominal differential pressure created at the flow limit is 5 psig for limit values A,B,C, and D. For limit values E and F, the differential pressure is 12 psig. The differential pressure that is created is not affected by mounting orientation (non-attitude sensitive).

Specifications

Materials of Construction

Wetted

Body ..... "VeriClean," Veriflo's custom high purity type 316L Stainless Steel™
Compression Member ..... 316L Stainless Steel
Seat ..... PCTFE
Diaphragm ..... Elgiloy® or equivalent
Spring ..... Hastelloy C-22®
Poppet ..... 316L Stainless Steel
Orifice ..... 316L Stainless Steel

Nonwetted

Knob ..... Anodized Aluminum (Red)
Stem ..... 416 Stainless Steel (Lubricated)
Cap ..... 316L Stainless Steel

Operating Conditions

Supply Pressure:
A - D Flow Limit Setting ..... 10 psig to 3,500 psig (.7 barg to 241 barg)
E - F Flow Limit Setting ..... 20 psig to 3,500 psig (1.4 barg to 241 barg)
Differential Pressure ..... 5 psig or 12 psig (.3 barg or .8 barg)
Flow Limit Settings ..... 6 available
Temperature ..... -10 F° to 150 °F (-23° C to 66° C)

Functional Performance

Design Leak Rate:
Outboard ..... 2×10^{-9} scc/sec He
Inboard ..... 2×10^{-10} scc/sec He

Internal Volume

1.86 cc (including face seal fittings)

Surface Finishes

Standard Ra ..... 15-20 micro in (.38 to .5 micrometer) or less
Optional Ra ..... EX = 10 micro in (.25 micrometer) or less
Welded units only

Standard Configuration

1/4" NPT female, 1/4" face seals or 1/4" tube stubs

Approximate Weight

12.5 oz. (.32 kg)

O_2 Cleaned

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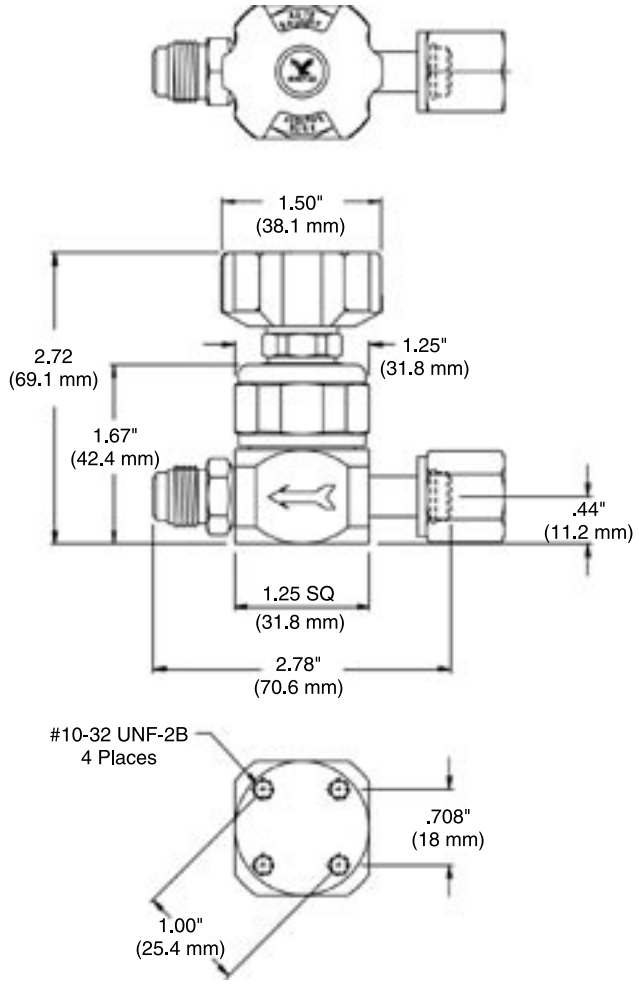
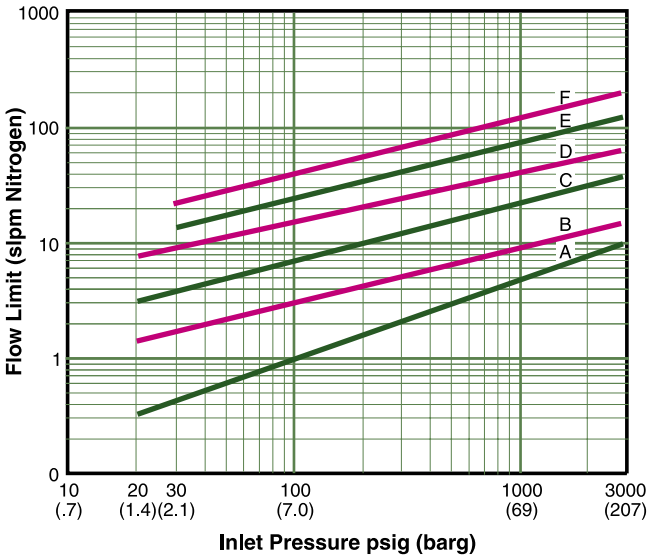
Dimensional Data



Sizing Chart



Ordering Information

FS190	S	A	FSFM	AOP

Basic Series
FS190

Material

S	316L Stainless Steel

Flow Limit Setting
Nominal Flow Limit at:

1000 psig Inlet	30 psig Inlet
A = 5 SLPM	0.3 SLPM
B = 9 SLPM	2 SLPM
C = 21 SLPM	4 SLPM
D = 40 SLPM	9 SLPM
E = 72 SLPM	15 SLPM
F = 121 SLPM	22 SLPM

Connection (Inlet & Outlet)

P	1/4" NPTF
FSMM	1/4" FS Male In - Male Out
FSFF	1/4" FS Female In - Female Out
FSFM	1/4" FS Female In - Male Out
FSMF	1/4" FS Male In - Female Out
TS	1/4" Welded Tube Stubs

Options

AOP	Air Operated
TH	Hastelloy C-22® Trim internals*
3.70	FLV 120 Dimensional Replacement
3.46	FLV 110 Dimensional Replacement

* Includes: Hastelloy C-22® Compression member, poppet, spring and orifice.

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Pressure Relief Valve

Parker Hannifin Corporation's Veriflo Division presents the VR7 Series relief valve. The VR7 is an economical relief valve designed to vent excess pressure from a regulator should a minor seat leak occur.

The VR7 is recommended for use with regulators to protect the regulator and outlet pressure gauge. The VR7 is not intended for applications where repeated or frequent venting is required.

Features

- Choice of seal materials for system compatibility.
- Hex body provides wrench flats.
- Available with a variety of connections, seat materials, and pressure settings.
- O_2 cleaned.

Note: The VR7 ***SHOULD ONLY*** be used to protect Article 3, Paragraph 3 category equipment as defined in Pressure Equipment Directive 97/23/EC Dated: 29, May 1997.

Specifications

Materials of Construction

Wetted

Body	316L Stainless Steel, Brass
Seal	Fluorocarbon or Kalrez®
Spring	302 Stainless Steel
Poppet	316L Stainless Steel, Brass
Screw	316L Stainless Steel, Delrin

Operating Conditions

Maximum Pressure	750 psig (52 barg)
Adjustable Ranges	10-20 psig (.6-1.4 barg), 20-100 psig (1.4-7 barg), 100-250 psig (7-17 barg), 250-500 psig (17-34 barg)
Temperature Range	
Fluorocarbon and Kalrez®	-30°F to 400°F (-35°C to 204°C)

Functional Performance

Flow Capacity	C_v = 0.37 (SEMI Flow Coefficient Test #F-32-0998)

Standard Connections

1/4" pipe threads – male inlet, female outlet (NPT).
1/4" female pipe thread outlet, FS male or female fitting inlet.

Approximate Weight

2.0 oz. (.06 kg)

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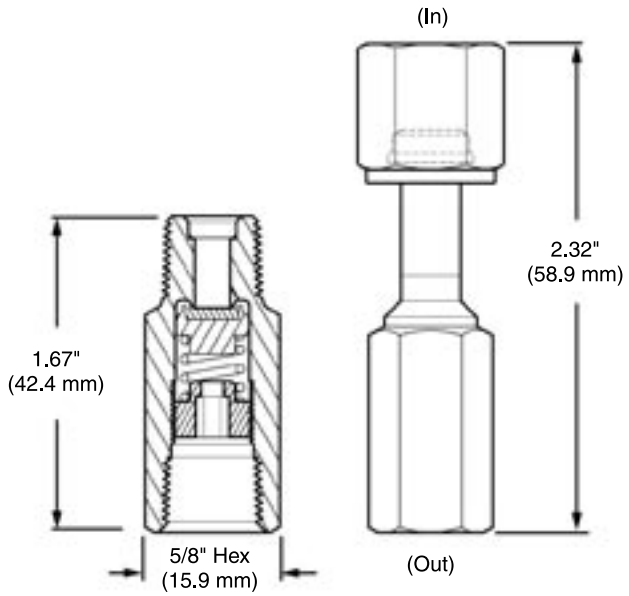
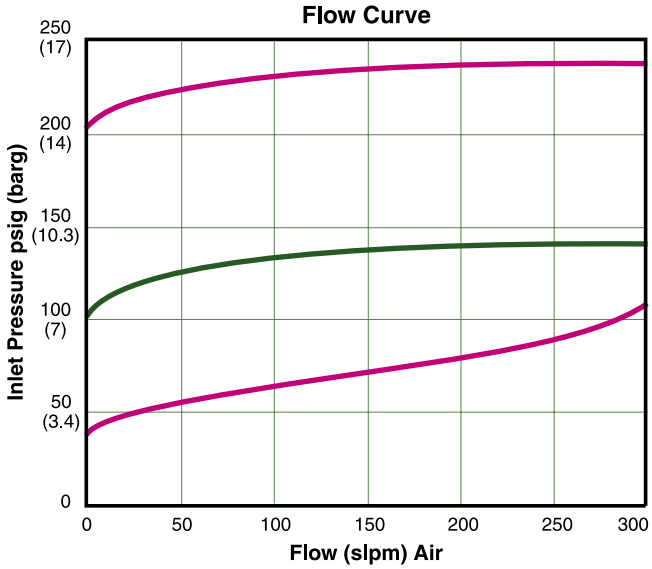
Dimensional Data



Performance Curve



Ordering Information

VR7	44MF	1	S	V

Basic Series
VR7

Connection (Inlet & Outlet)

44MF	1/4" NPTM X 1/4" NPTF
4FSF	1/4" FSF X 1/4" NPTF (Stainless Steel Body Only)
4FSM	1/4" FSM X 1/4" NPTF (Stainless Steel Body Only)

Adjustable Range

1 =	10 - 20 psig
2 =	20 - 100 psig
3 =	100 - 250 psig
4 =	250 - 550 psig

Material

S	316L Stainless Steel
B	Brass

Seal

K	Kalrez®
V	Fluorocarbon

Note: After relieving, service is required.

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