



Hydraulik - Pneumatik

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Flow Controller

4513
April 2005

KATALOG

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Technischer Außendienst:

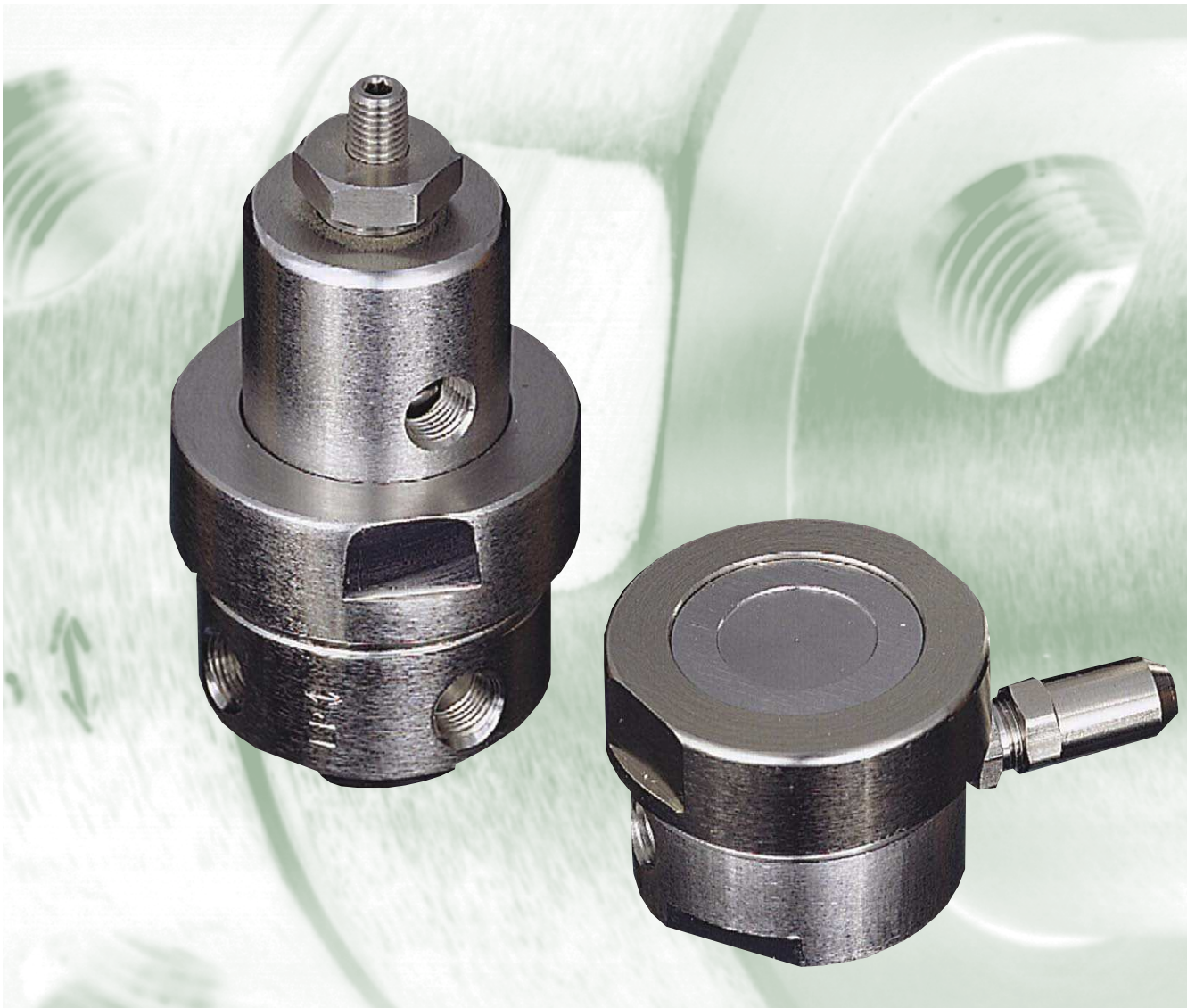
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Flow Controllers

Instrument / Analyzer Products

*Catalog 4513/USA
April 2005*



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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.



WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale."



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.



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](http://www.veriflo.com). For more information on Parker Hannifin Corporation [visit the corporation's web site at www.parker.com](http://www.parker.com).



Hastelloy C-22® is a registered trademark of Haynes International, Inc.
Kalrez® is a registered trademark of the DuPont Company.
Tefzel® is a registered trademark of the DuPont Company.
Elgiloy® is a registered trademark of Elgiloy Corp.

Low Flow Controller

Parker Hannifin Corporation's Veriflo Division presents the SC420 Series low flow controller. The SC420 is manufactured for precise flow control of corrosive and non-corrosive gases at extremely low flow rates.



SC423S_T



SC423

Features

- ▶ Corrosion resistant.
- ▶ Precise control at extremely low flows.
- ▶ Tamper-proof and Panel Mount options available.
- ▶ O₂ Cleaned.
- ▶ Repeatability: Flow is stable within $\pm 2\%$ of the flow value under the following conditions:
 1. Reference pressure varies no more than $\pm 1\%$.
 2. The difference between inlet and outlet pressure is a minimum on 10 psig.
 3. Ambient temperature varies no more than $\pm 10^\circ\text{F}$.

Materials of Construction

Stainless Steel

Wetted

Body	316L Stainless Steel
Seat	316 Stainless Steel
Seals.....	PTFE and Fluorocarbon
Diaphragm Plate.....	316L Stainless Steel
Diaphragm.....	PCTFE
Range Spring	17-7PH Stainless Steel
Filter.....	Stainless Steel

Brass

Wetted

Body	Brass
Seat	Brass
Seal	Fluorocarbon
Diaphragm Plate.....	Aluminum
Diaphragm.....	PCTFE
Range Spring	17-7PH Stainless Steel
Filter.....	Stainless Steel

Non-Wetted

Cap	Aluminum
Cap Nut	Brass Nickel Plated

Micrometering Valve

Wetted

Body	Stainless Steel
Washer	Stainless Steel
Valve Stem	Stainless Steel
O-Ring	PTFE
Gasket.....	Silver

Operating Conditions

Inlet Pressure	150 psig (10 barg)
Temperature	-40°F to 150°F (-40°C to 66°C)

Functional Performance

Flow range: Ratio of maximum to minimum is 100 to 1 for any given inlet pressure.

Supply Pressure Effect.....	0.6 psig (0.03 barg)
	per 100 psig (6.80 barg)

Flow Control:

Fine.....	to 1000 scc/min. (see chart)
Extra Fine	to 500 scc/min. (see chart)

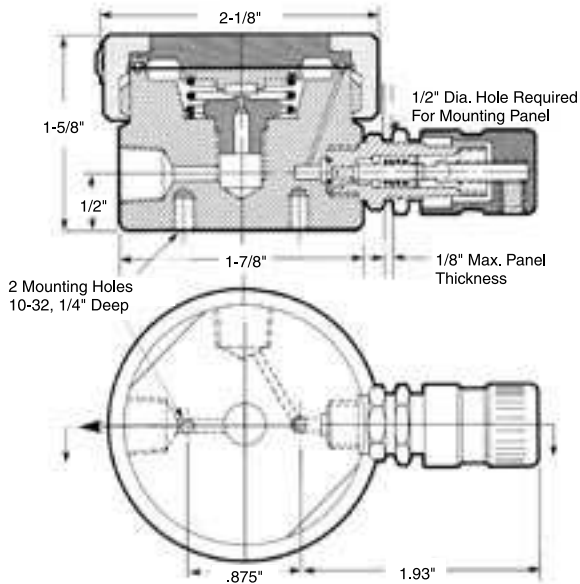
Standard Connections

1/8 NPT female

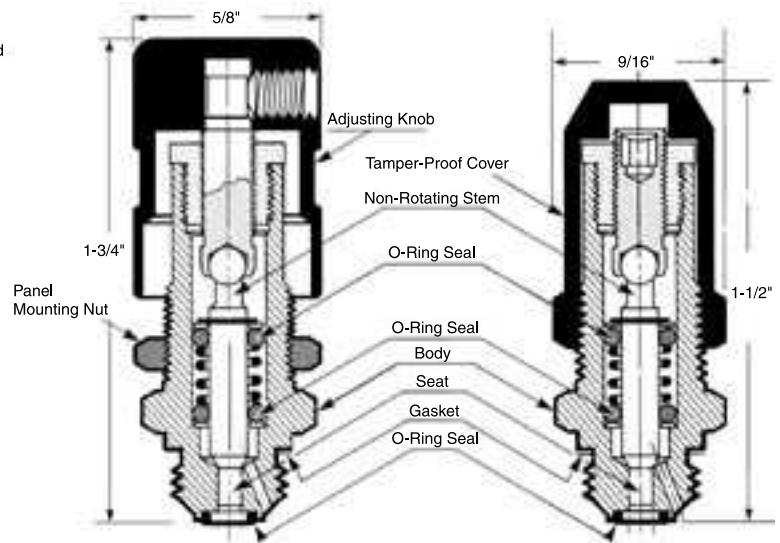
Approximate Weight

Stainless Steel.....	1.5 lbs
Brass	1 lb

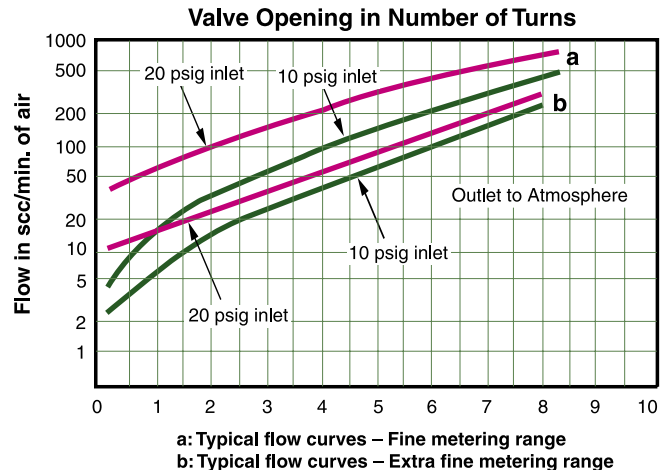
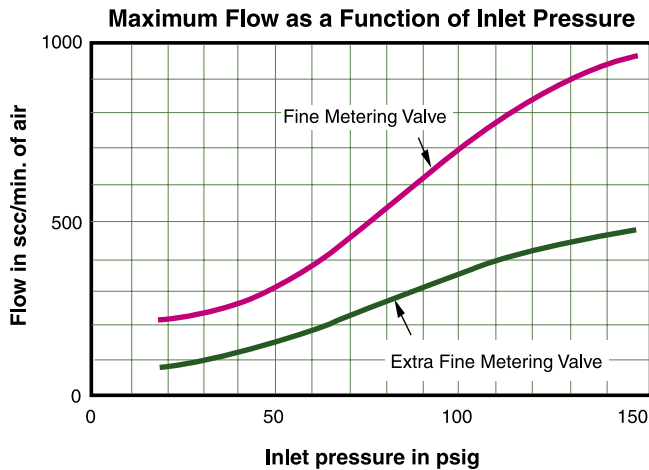
Dimensional Data



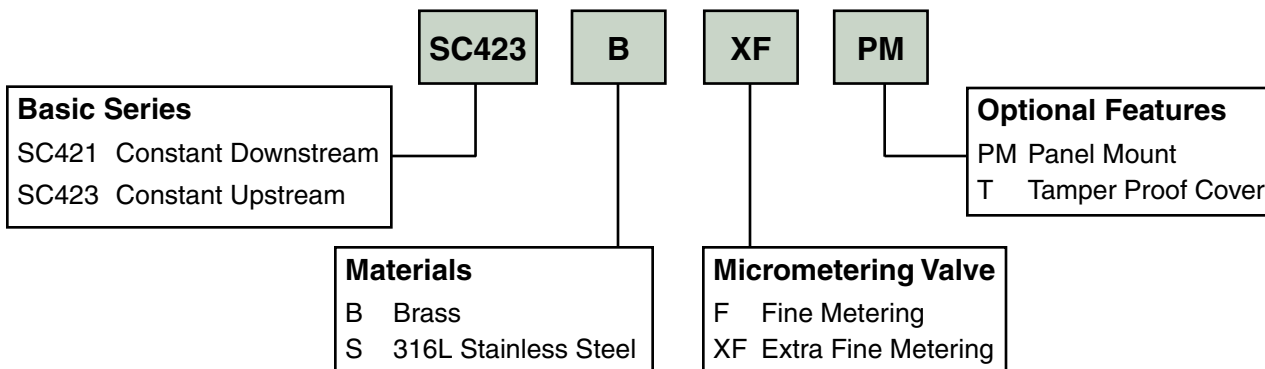
Micrometering Cartridges



Flow Curves



Ordering Information



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.
- ▶ O₂ 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
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Temperature Range

-40°F to 200°F (-40°C to 94°C)

Standard Configurations

1/4" NPT Female	Inlet and Outlet
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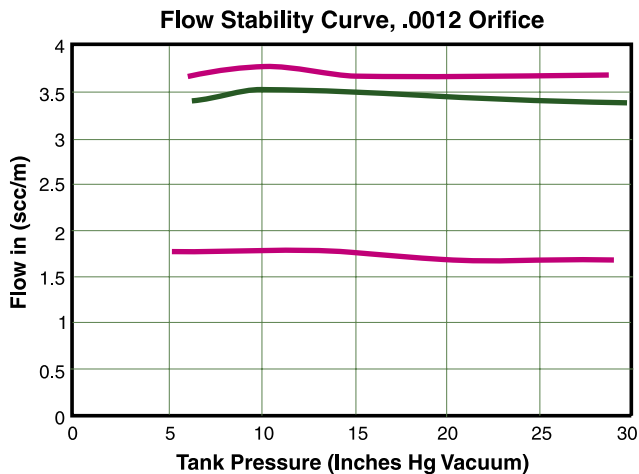
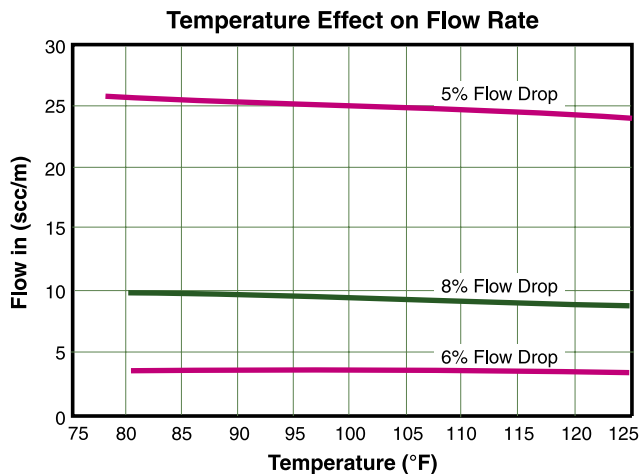
Connections

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

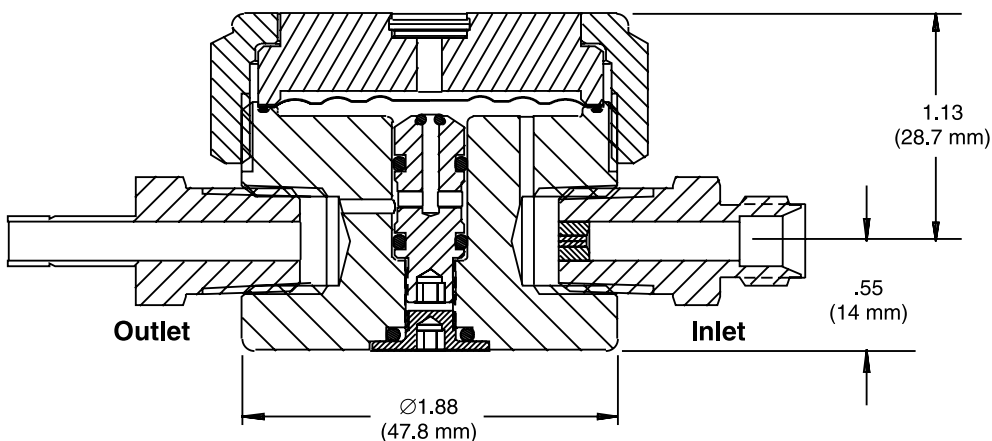
Approximate Weight

1.75 lbs. (.80 kg)

Flow Curves



Dimensional Data



Ordering Information

SC423XL	S	24	4T	4TS												
Basic Series SC423XL	Material S 316L Stainless Steel		Inlet Connection 4T 1/4" Compression Fitting (includes Flow Restrictor)	Outlet Connection X No Connections 4TS 1/4" Tube Fitting												
<table border="1"> <thead> <tr> <th colspan="2">Sample Time / Flow Rate</th> </tr> <tr> <th>Hours</th> <th>Flow Rate</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>= 27.1 - 27.7 sccm (Yellow)</td> </tr> <tr> <td>8</td> <td>= 10.0 - 10.4 sccm (Green)</td> </tr> <tr> <td>12</td> <td>= 6.5 - 6.9 sccm (Blue)</td> </tr> <tr> <td>24</td> <td>= 3.1 - 3.4 sccm (Red)</td> </tr> </tbody> </table>					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)
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Hours	Flow Rate															
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8	= 10.0 - 10.4 sccm (Green)															
12	= 6.5 - 6.9 sccm (Blue)															
24	= 3.1 - 3.4 sccm (Red)															

Liquid Flow Controller

Parker Hannifin Corporation's Veriflo Division presents the LC221S Liquid Flow Controller. The LC221S is designed to control a constant downstream pressure. This is accomplished by maintaining a constant pressure differential across the unit's flow restrictor (customer supplied).

The LC221S is ideally suited for applications in liquid chromatography, chemical injection, sampling systems, research labs and purge flows to instrumentation.



Features

- ▶ Constant liquid flow with varying downstream pressure.
- ▶ Stable flow with upstream pressure variations.
- ▶ Wide flow range: less than 0.1 sccm to 1 slpm.
- ▶ Wide pressure range: 200 to 4000 psig (14 to 275 barg).
- ▶ Flow trimming adjustment: 2-1/2 to 1 with preselected flow restrictor (user supplied).
- ▶ Corrosion resistant.
- ▶ O₂ cleaned.
- ▶ Repeatability: Flow is stable within ±0.5% of flow value under the following conditions:
 1. Ambient temperature varies no more than 1°F.
 2. Inlet pressure does not vary by more than 100 psig.
 3. Downstream pressure does not vary by more than 15% of established value.

Specifications

Materials of Construction

Wetted

Body	316L Stainless Steel
Seat	PTFE
Diaphragm	316L Stainless Steel
Seals:	
LC221S	PTFE
LC221SK	Kalrez®
Gaskets	PTFE
Screen	316 Stainless Steel

Nonwetted

Cap	Stainless Steel
Cap Nut	Stainless Steel
Stem	Stainless Steel
Bushing	Stainless Steel

Operating Conditions

Maximum Inlet Pressure	4000 psig (275 barg)
Maximum Downstream Pressure	3800 psig (262 barg)
Operating Temperature	-20°F to 200°F (-29°C to 94°C)
Operating Differential Pressure	100 psig maximum (7 barg)

Functional Performance

Flow Range	Less than 0.1 sccm to 1 slpm established by flow restrictor (user supplied)
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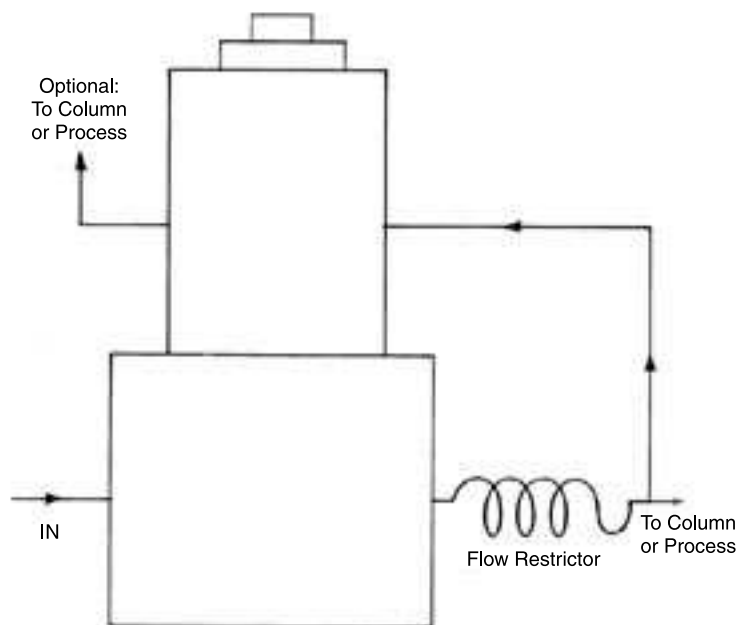
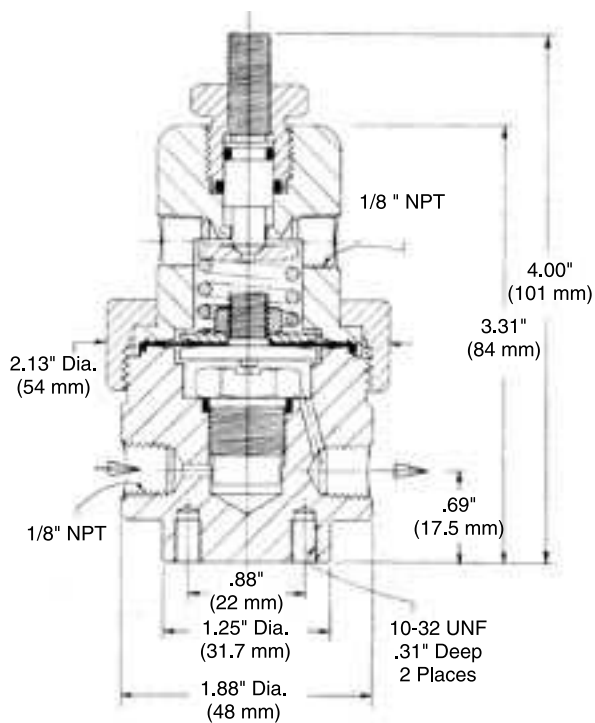
Internal Volume

Dome	3.2 cc
Body	1.9 cc

Standard Configuration

Ports	Body and Dome 1/8" NPT female Less than 0.1 sccm to 1 lpm
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Dimensional Data



Ordering Information

LC221S PCTFE and PTFE.....421 00 500

LC221SK PCTFE and Kalrez®421 00 550

Gas or Liquid Flow Controller

Parker Hannifin Corporation's Veriflo Division presents the LC223S. The LC223S is a high pressure gas or liquid flow controller for liquid chromatography, chemical injection and sampling.



Features

- ▶ Constant flow with varying downstream pressure.
- ▶ Wide flow range: from 25 sccm to 40 slpm.
- ▶ Wide pressure range: 200 to 5000 psig (14 to 345 barg).
- ▶ Corrosion resistant.
- ▶ O₂ cleaned.
- ▶ Repeatability: Flow is stable within ±0.2% of flow value under the following conditions:
 1. Ambient temperature varies no more than 10°F.
 2. Inlet pressure remains constant.
 3. Downstream pressure does not vary by more than 70% of established value.

Specifications

Materials of Construction

Wetted

Body	316L Stainless Steel
Seat	Tefzel®
Spring	316L Stainless Steel
O-Rings:	
LC223S	Fluorocarbon
LC223SK	Kalrez®
Diaphragm	316L Stainless Steel
Diaphragm Gaskets	PTFE
Screen	316 Stainless Steel

Nonwetted

Cap	Stainless Steel
Cap Nut	Stainless Steel

Operating Conditions

Maximum Inlet Pressure	5000 psig (345 barg)
Maximum Dome Pressure	5000 psig (345 barg)
Required Differential Pressure	200 psig (14 barg)
Operating Temperature	-20°F to 200°F (-29°C to 94°C)

Functional Performance

Flow Range	25 sccm to 40 slpm
Established by customer supplied flow restriction device.	

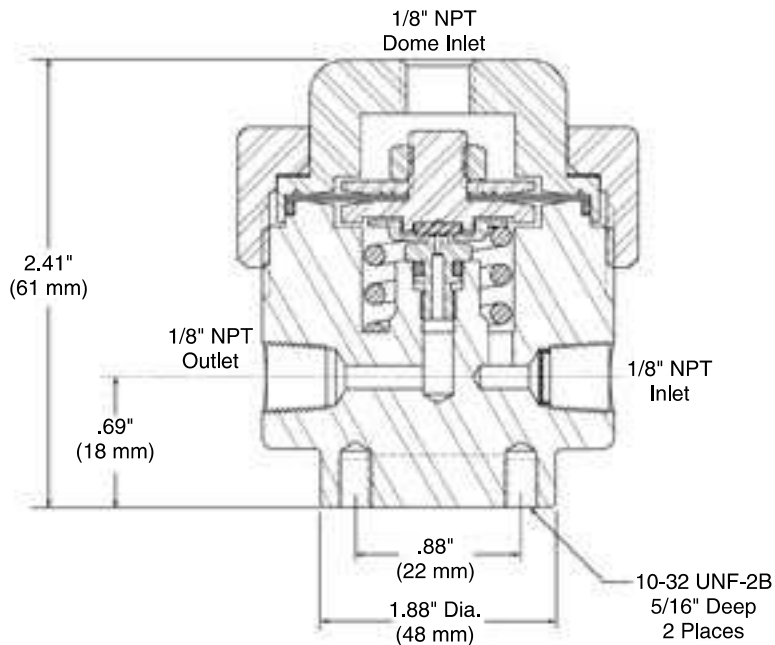
Internal Volume

Dome	2.0 cc
Body	2.1 cc

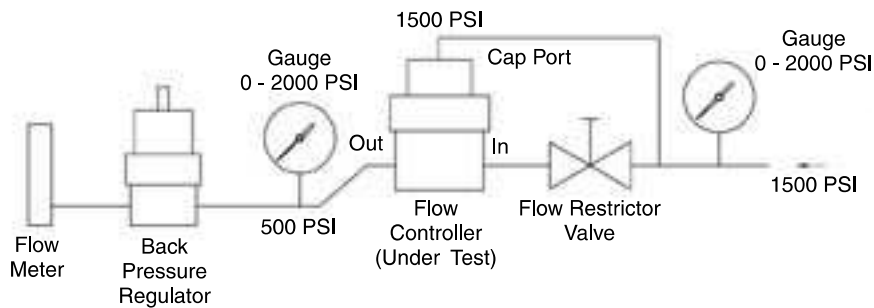
Standard Configuration

Body Ports	1/8" NPT female
Dome Port	1/8" NPT female

Dimensional Data



Example Test Setup



Ordering Information

LC223K Kalrez®	423 00 249
LC223S Fluorocarbon.....	423 00 250

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 Pressure5 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 x 10 ⁻⁹ scc/sec He
Inboard	2 x 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

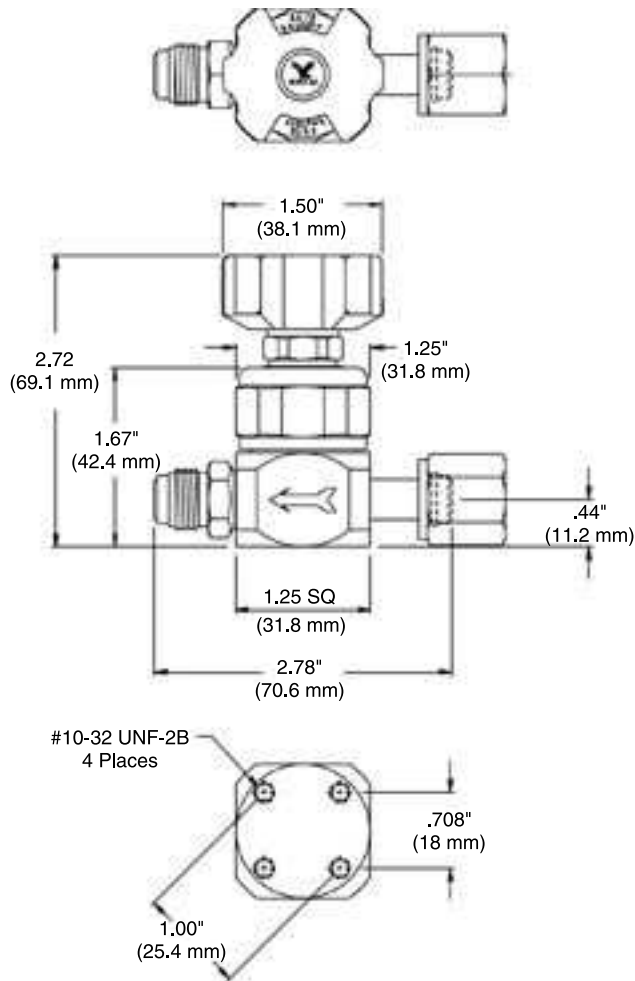
1/4" NPT female, 1/4" face seals or 1/4" tube stubs

Approximate Weight

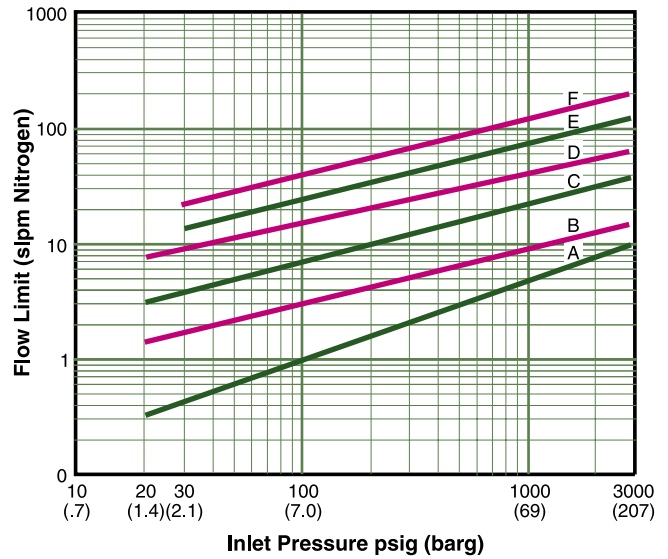
12.5 oz. (.32 kg)

O₂ Cleaned

Dimensional Data



Sizing Chart



Ordering Information

FS190	S	A	FSFM	AOP														
Basic Series FS190	Material S 316L Stainless Steel			Options AOP Air Operated TH Hastelloy C-22® Trim internals* 3.70 FLV 120 Dimensional Replacement 3.46 FLV 110 Dimensional Replacement														
Flow Limit Setting Nominal Flow Limit at: <table border="1"> <thead> <tr> <th>1000 psig Inlet</th> <th>30 psig Inlet</th> </tr> </thead> <tbody> <tr> <td>A = 5 SLPM</td> <td>0.3 SLPM</td> </tr> <tr> <td>B = 9 SLPM</td> <td>2 SLPM</td> </tr> <tr> <td>C = 21 SLPM</td> <td>4 SLPM</td> </tr> <tr> <td>D = 40 SLPM</td> <td>9 SLPM</td> </tr> <tr> <td>E = 72 SLPM</td> <td>15 SLPM</td> </tr> <tr> <td>F = 121 SLPM</td> <td>22 SLPM</td> </tr> </tbody> </table>		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		
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																	

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

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.
- ▶ O₂ 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)
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Functional Performance

Flow Capacity	C _v = 0.37 (SEMI Flow Coefficient Test #F-32-0998)
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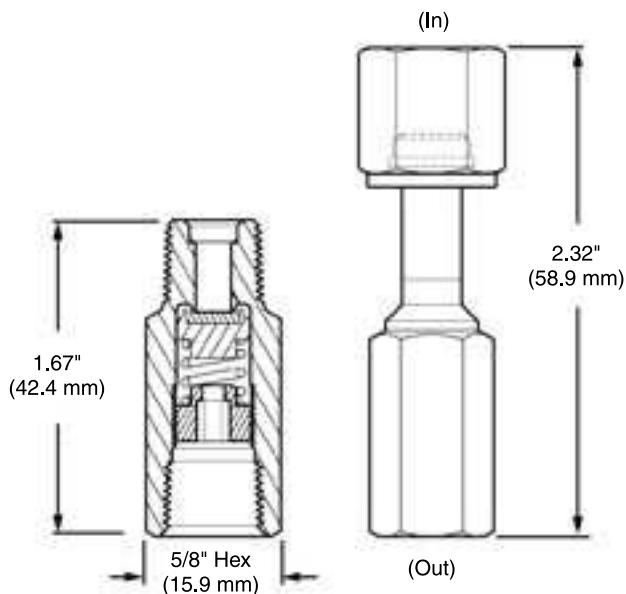
Standard Connections

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

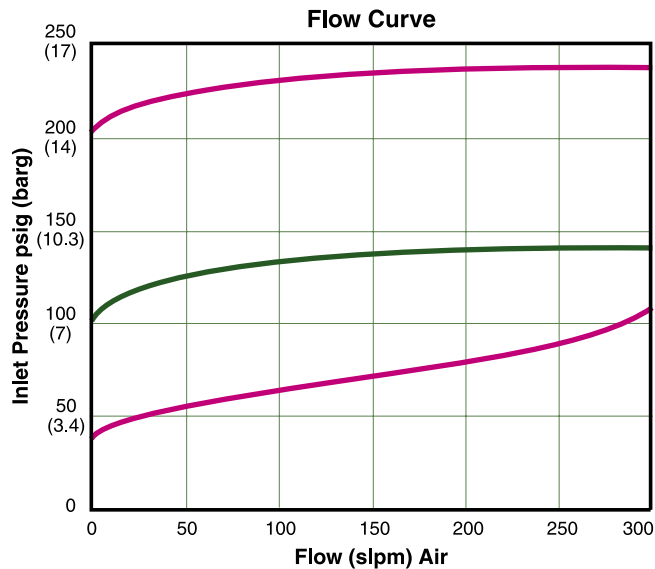
Approximate Weight

2.0 oz. (.06 kg)

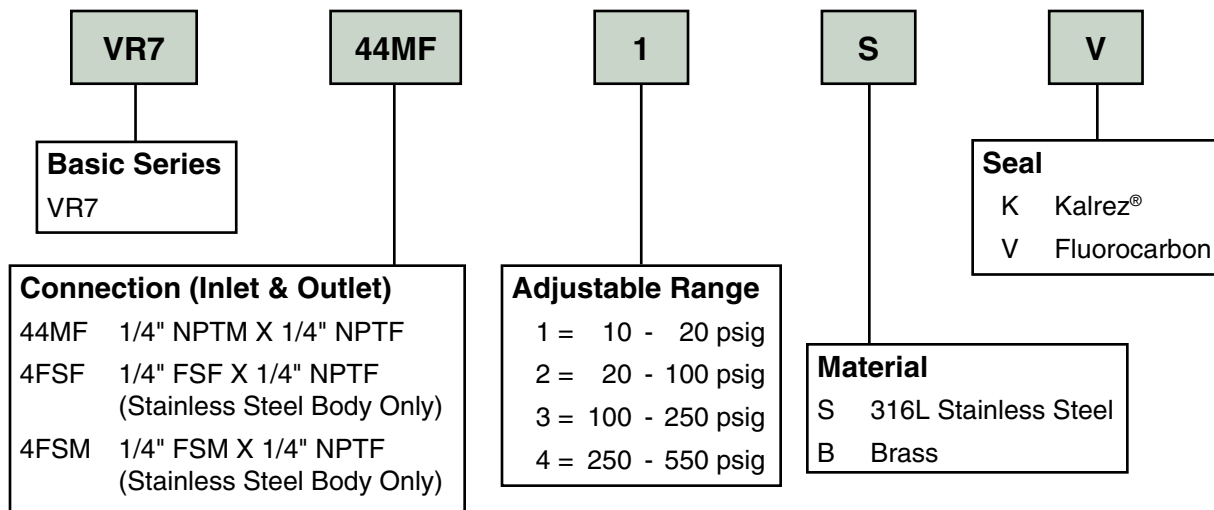
Dimensional Data



Performance Curve



Ordering Information



Note: After relieving, service is required.



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