



FLOW CONTROLLERS

Instrument/Analyzer Products

Catalog 4513/USA
April 2003



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SC420 Series

**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



SC423B

features

- ▶ Corrosion resistant.
- ▶ Precise control at extremely low flows.
- ▶ Tamper-proof option available.

materials of construction

Body 316L Stainless Steel or Brass
Seat Viton®
Seals PCTFE
Diaphragm 316L Stainless Steel
Range Spring 17-7PH Stainless Steel

operating conditions

Inlet pressure 150 psig (10 barg)

functional performance

Flow range see flow charts
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

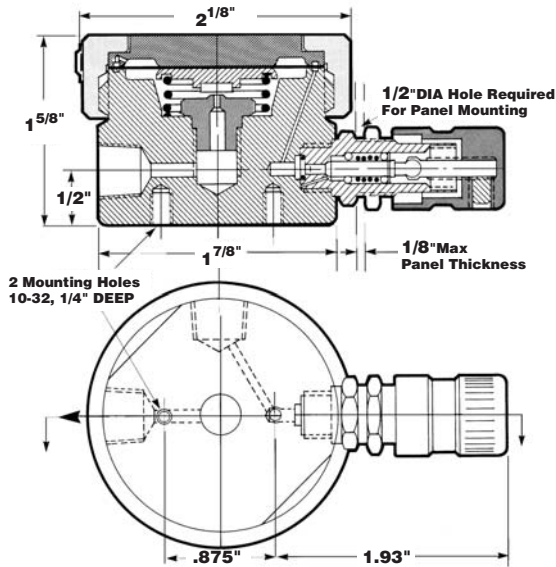
1/8 NPT female

approximate weight

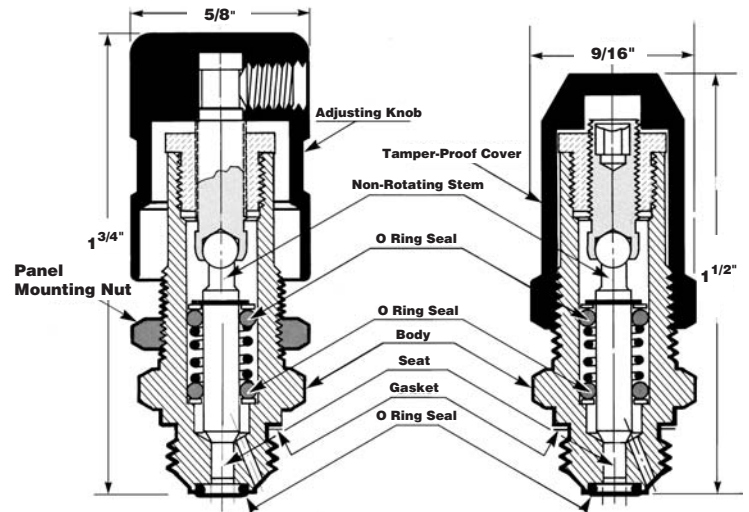
Stainless Steel 1.5 lbs
Brass 1 lb

SC420 Series

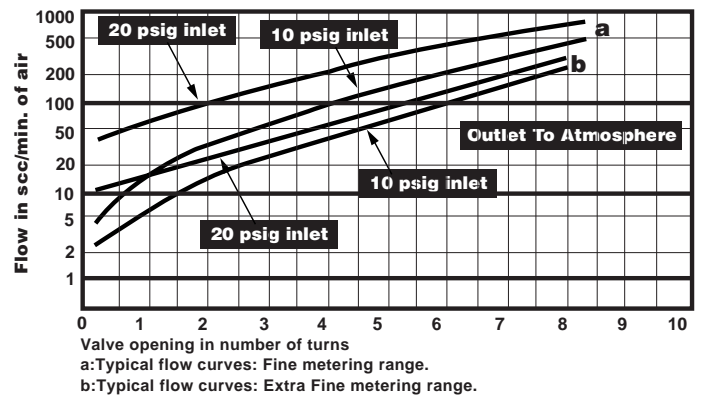
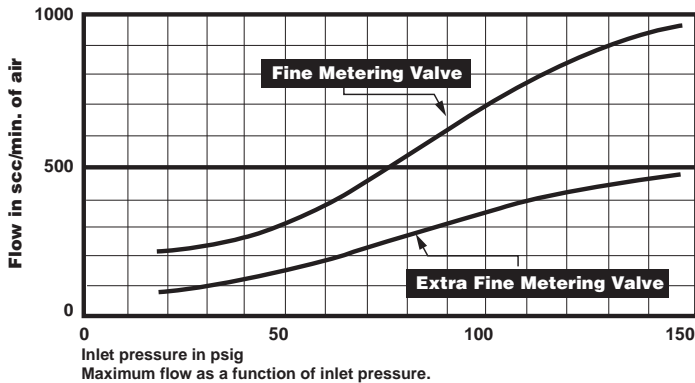
Dimensional Drawing



Micrometering Cartridges



Flow Curves



Ordering Information

SC423 B XF PM

BASIC SERIES
 SC421 = Constant Downstream
 SC423 = Constant Upstream

MATERIALS
 B = Brass
 S = 316L Stainless Steel

OPTIONAL FEATURES
 PM = Panel Mount
 T = Tamper Proof Cover

MICROMETERING VALVE
 F = Fine Metering
 XF = Extra Fine Metering

Viton® is a registered trademark of DuPont Dow Elastomers.

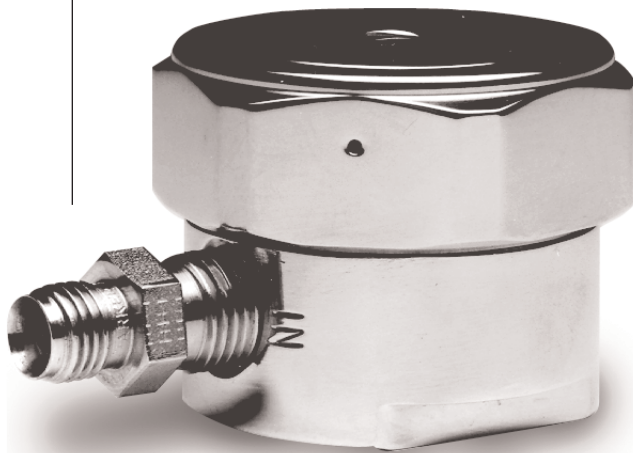
SC423XL Series

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 scc/m). 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 scc/m.
- ▶ 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.

materials of construction

Wetted

Body 316L Stainless Steel
Seat Viton[®]
Seals Viton[®]
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

operating conditions

Inlet pressure Atmospheric
Outlet pressure Vacuum
Flow As low as 1 scc/m
(See Flow Curve)

functional performance

Design Leak Rate:
(outboard) 1×10^{-4} scc/sec HE

temperature range

-40°F (-40°C) to 200°F (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

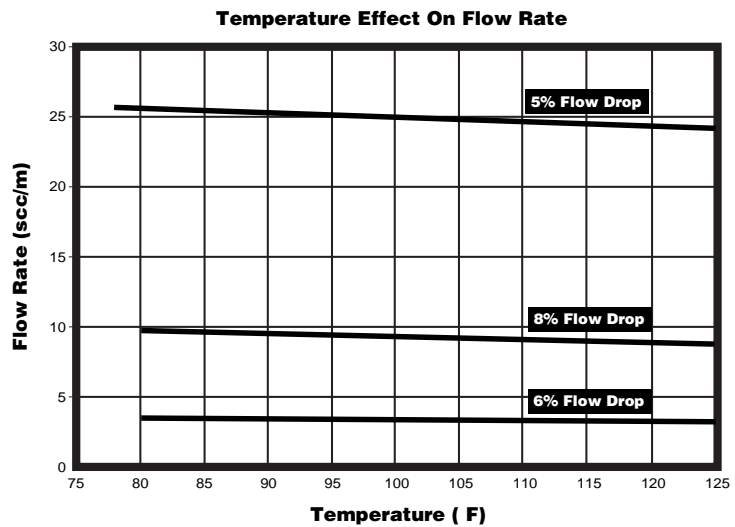
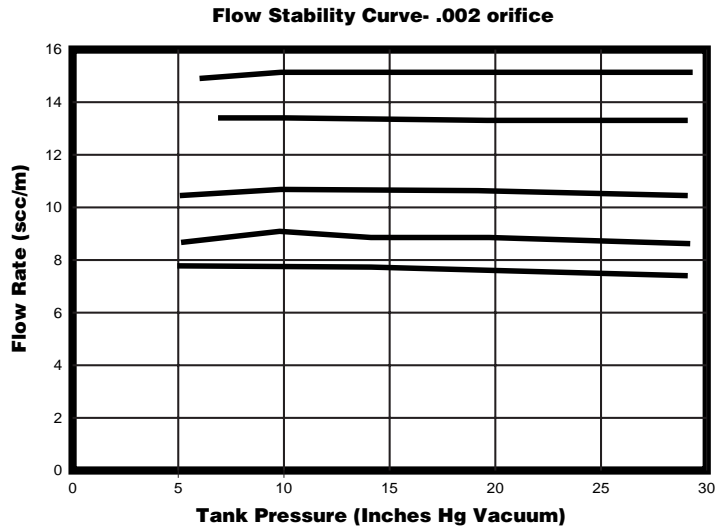
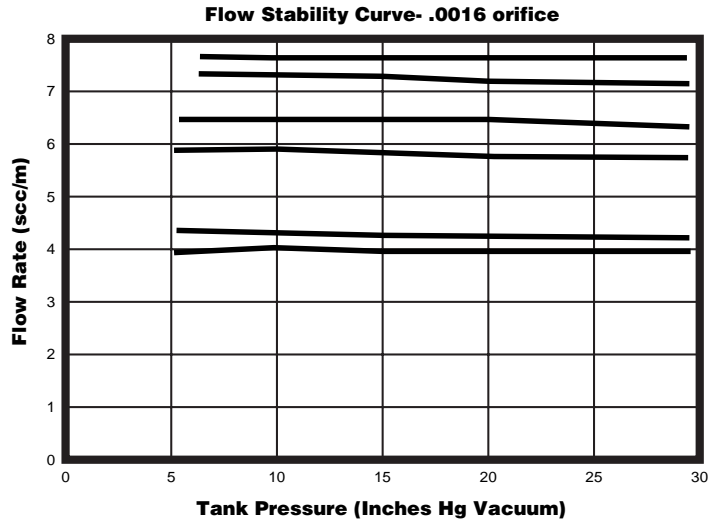
approximate weight

1.75 lbs. (.80 kg)



SC423XL Series

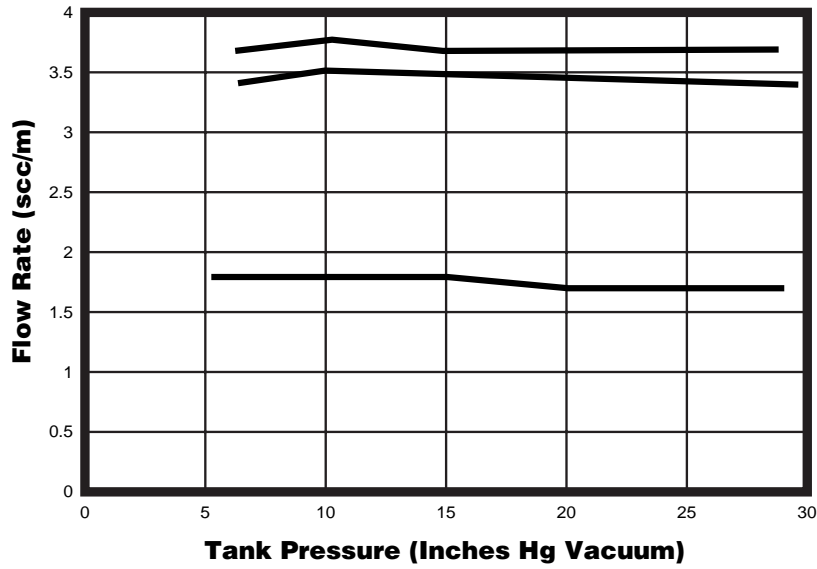
Flow Curves



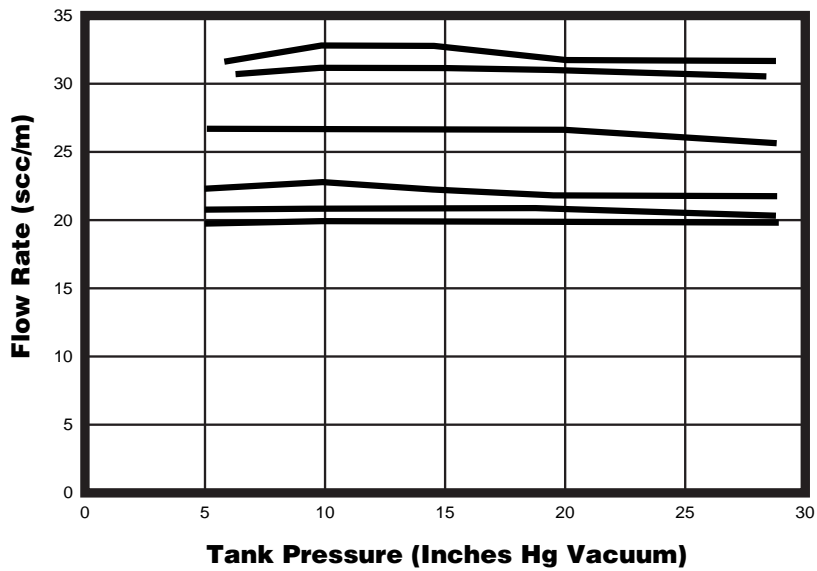
SC423XL Series

Flow Curves

Flow Stability Curve- .0012 orifice

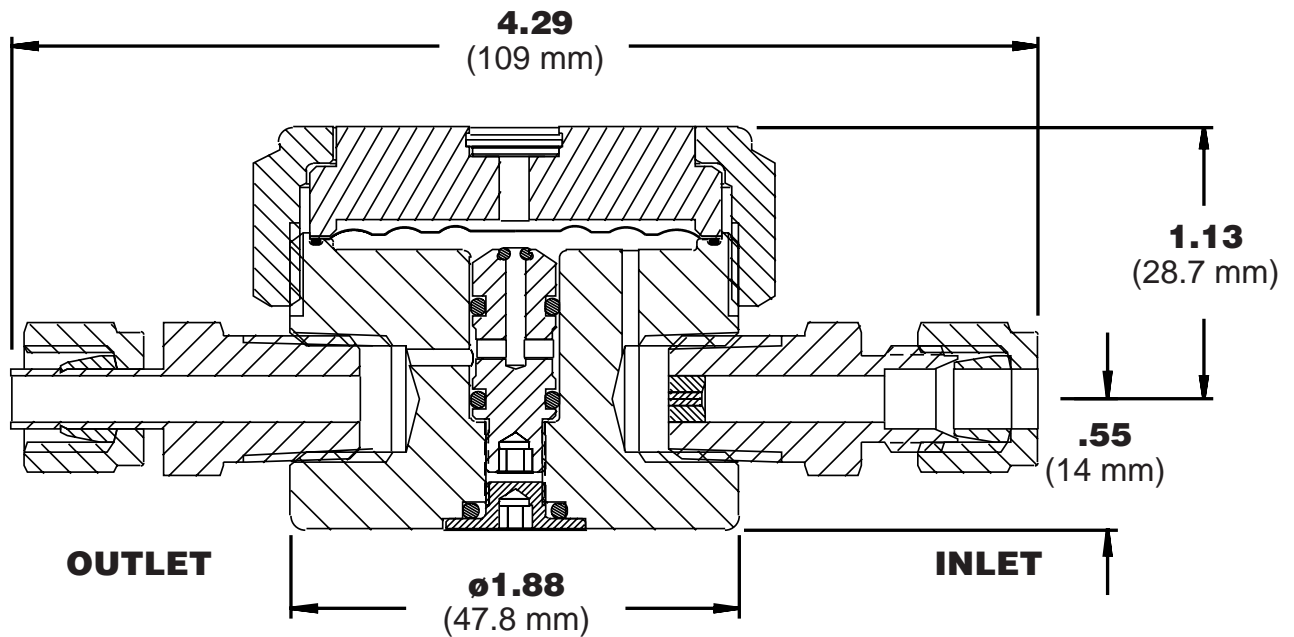


Flow Stability Curve- .003 orifice

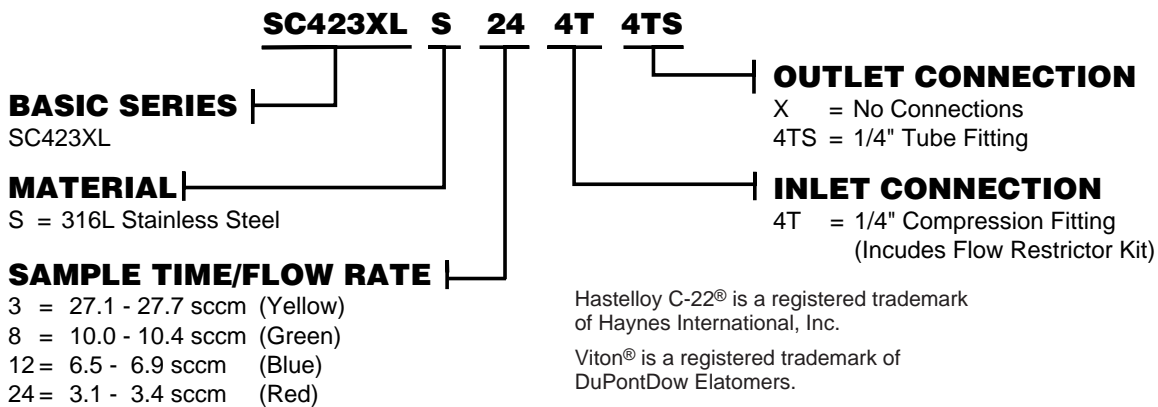


SC423XL Series

Cross Sectional View



Ordering Information



LC221S Series

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 scc/m to 1 slpm.
- ▶ Wide pressure range: 200 to 4000 psig (14 - 275 barg).
- ▶ Flow trimming adjustment.
- ▶ Corrosion resistant.

▶ materials of construction

Body 316L Stainless Steel
Seat 316L Stainless Steel
Seals Teflon® and PCTFE
Kalrez® and PCTFE

▶ operating conditions

Maximum inlet pressure . . . 4000 psig (275 barg)

Maximum downstream pressure:
..... 3800 psig (262 barg)

Operating differential pressure:
..... 100 psig maximum (7 barg)

Operating Temperature -20°F to +200°F
(-29°C to +94°C)

▶ internal volume

Dome 3.2 cc
Body 1.9 cc

▶ standard configuration

Ports: Body and Dome 1/8" NPT female

▶ functional performance

Flow range:
Less than 0.1 scc/m to 1 lpm

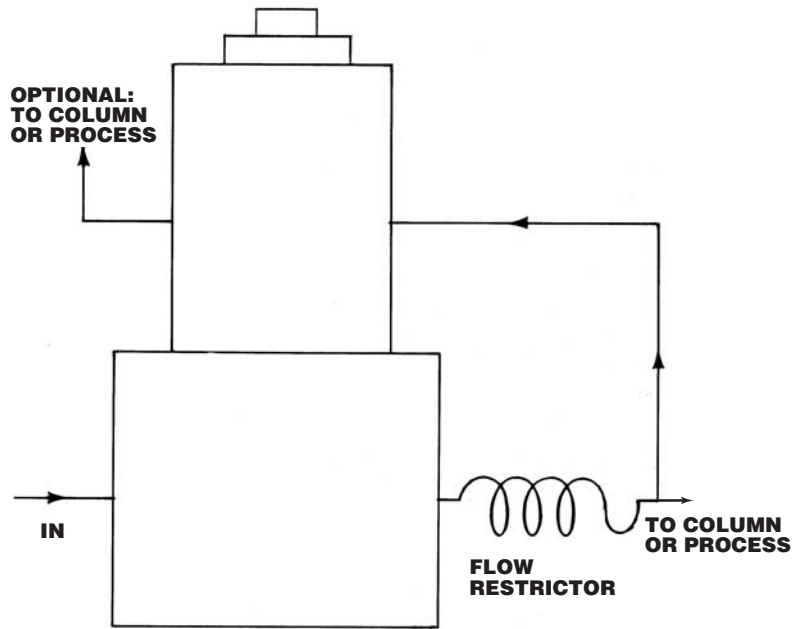
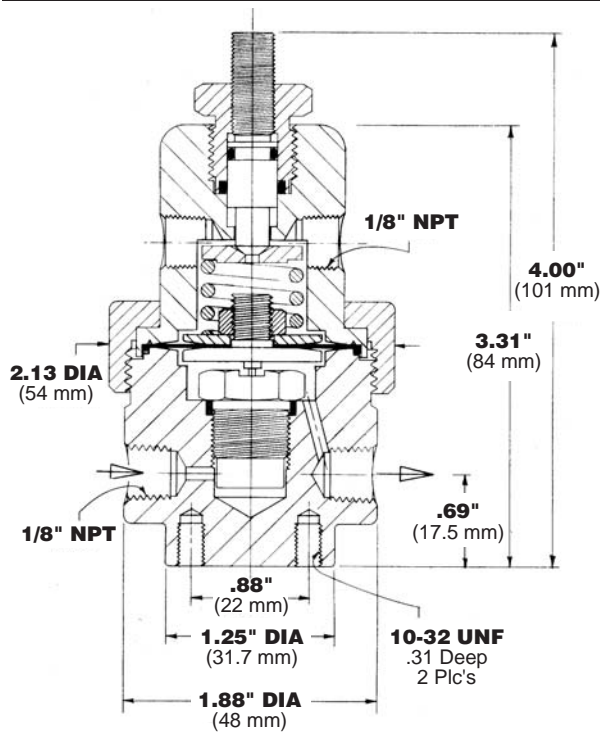


LC221S Series

Specifications

- ▶ Flow Range: Less than 0.1scc/m to 1 slpm established by flow restrictor (user supplied).
- ▶ Flow Adjustment: Trimmable 2 1/2 to 1 with preselected flow restrictor (user supplied).
- ▶ 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.

Cross Sectional Drawing



Ordering Information

LC221S PCTFE and Teflon®	421 00 500
LC221SK PCTFE and Kalrez®	421 00 550

Teflon® and Kalrez® are registered trademarks of DuPont.

LC223S Series

**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 scc/m to 40 slpm.
- ▶ Wide pressure range: 200-5000 psig (13-345 barg).
- ▶ Corrosion resistant.
- ▶ Repeatability: Flow is stable within \pm 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.

▶ **materials of construction**
Body 316L Stainless Steel
Seal Teflon®, PCTFE
Spring 316L Stainless Steel
O-Ring Viton®
Diaphragm 316L 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)

Temperature:
Teflon® -20°F to 200°F (-29°C to 94°C)
PCTFE -20°F to 150°F (-29°C to 66°C)

▶ **functional performance**
Flow range 25 scc/m to 40 slpm
Established by customer supplied flow restriction device.

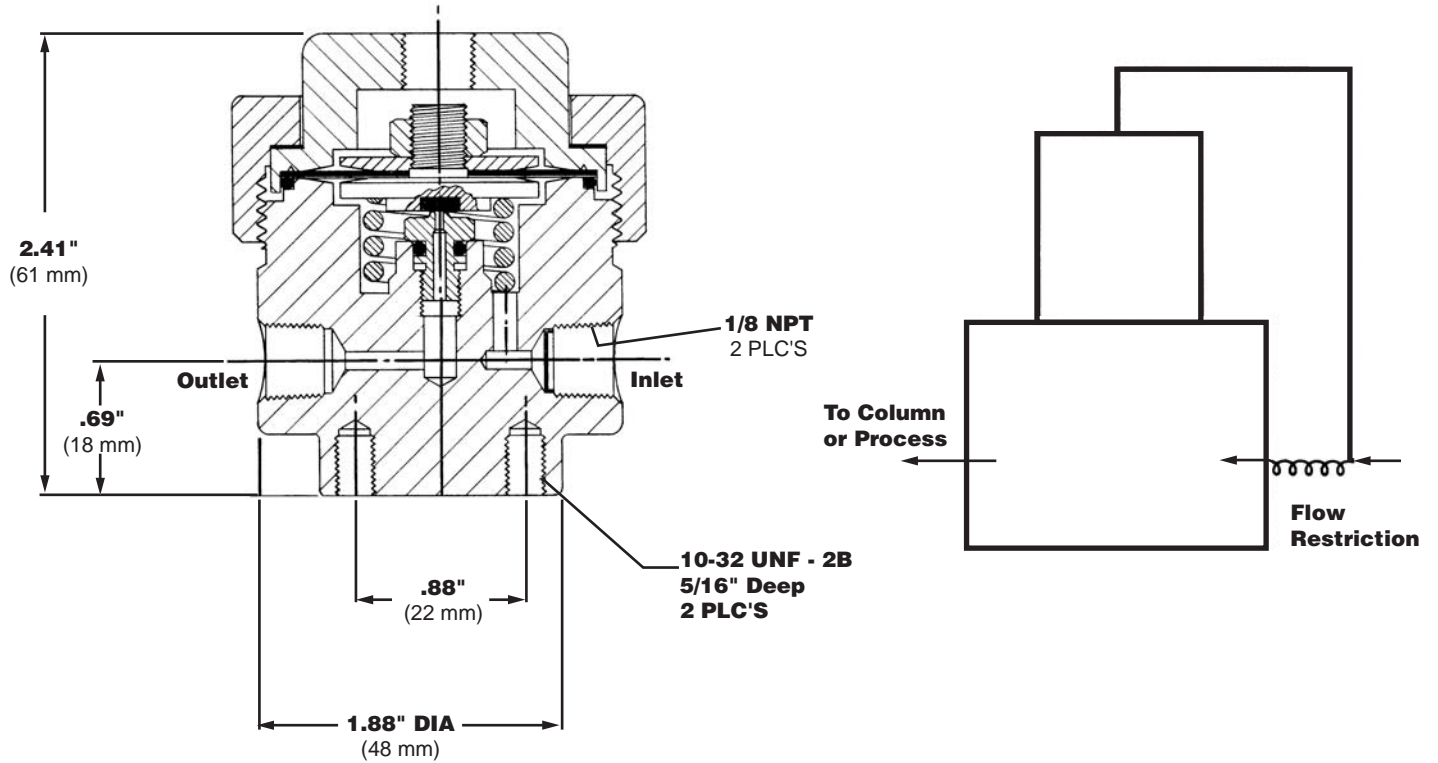
▶ **internal volume**
Dome 2.0 cc
Body 2.1 cc

▶ **standard configurations**
Body Ports 1/8" NPT female
Dome Port 1/8" NPT female



LC223S Series

Dimensional Drawing



Ordering Information

LC223K PCTFE	423 00 249
LC223S (Teflon®)	423 00 250

Teflon® is a registered trademark of DuPont Company.
 Viton® is a registered trademark of DuPont Dow Elastomers.



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).



► 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

Non-wetted

Knob Anodized Aluminum (Red)
Stem 416 stainless steel (lubricated)
Cap 316L stainless steel

► operating conditions

Supply Pressure 10 psig to 3,500 psig
(.7 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 cc/sec. He
Inboard 2×10^{10} cc/sec. He

► standard configurations

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

► internal volume

1.86 cc (including face seal fittings)

► surface finishes

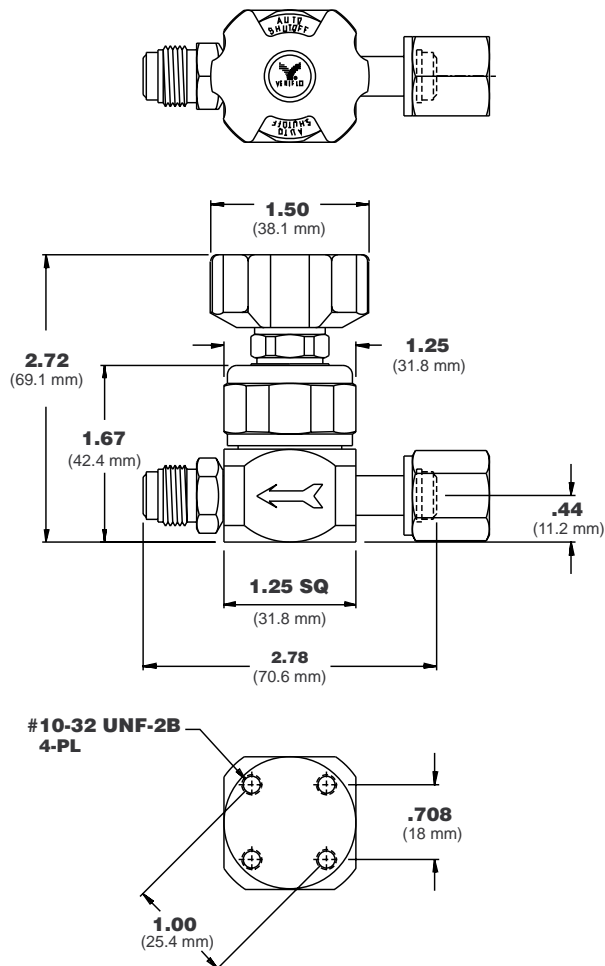
Standard Ra 15-20 micro in
(.38 to .5 micrometer) or less
Optional Ra 10 micro in
(.25 micrometer) or less

► approximate weight

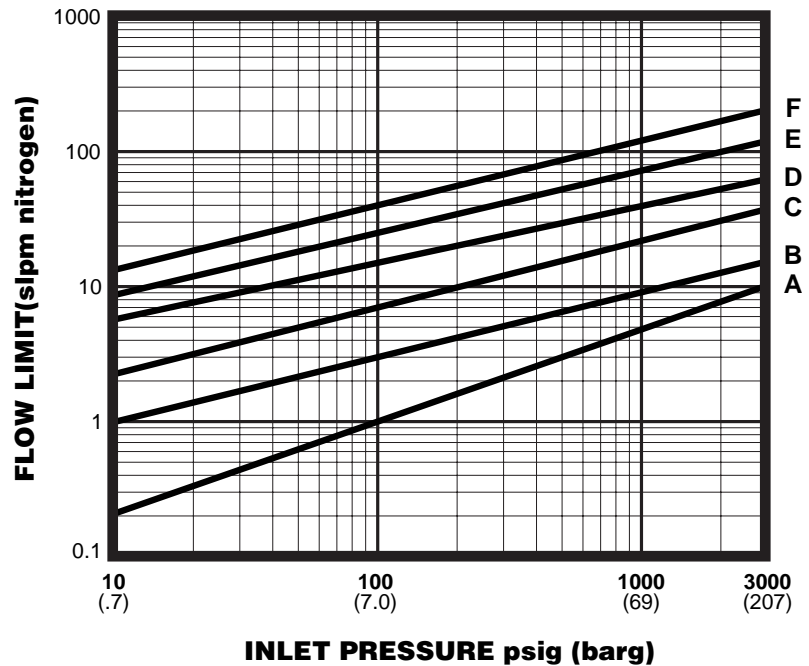
12.5 oz. (.32 kg)

FS190 Series

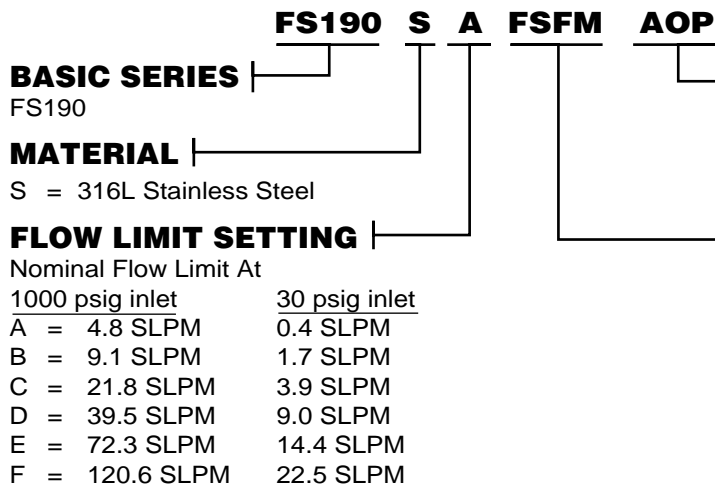
Dimensional Drawings



Flow Curve



Ordering Information



OPTIONS

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

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

Elgiloy[®] is a registered trademark of Elgiloy Company.
Hastelloy C-22[®] is a registered trademark of Haynes International, Inc.

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



VR7 Series

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

*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.*

materials of construction

Wetted

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

operating conditions

Adjustable Ranges: . . . 10-20 psig (.6-1.4 barg),
20-100 psig (1.4-6.9 barg)
100-250 psig (7-17 barg)
250-500 psig (17-34 barg)

Temperature Range

Viton® and Kalrez® -30°F 400°F
(-35°C to 204°C)
Neoprene® -40°F to 240°F
(-40°C to 116°C)

Maximum Pressure 750 psig

surface finishes

Standard Ra 15-20 micro inch
(.38 to .5 micro meter) or less

functional performance

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

standard connections

¼ inch pipe threads – male inlet, female outlet (NPT).

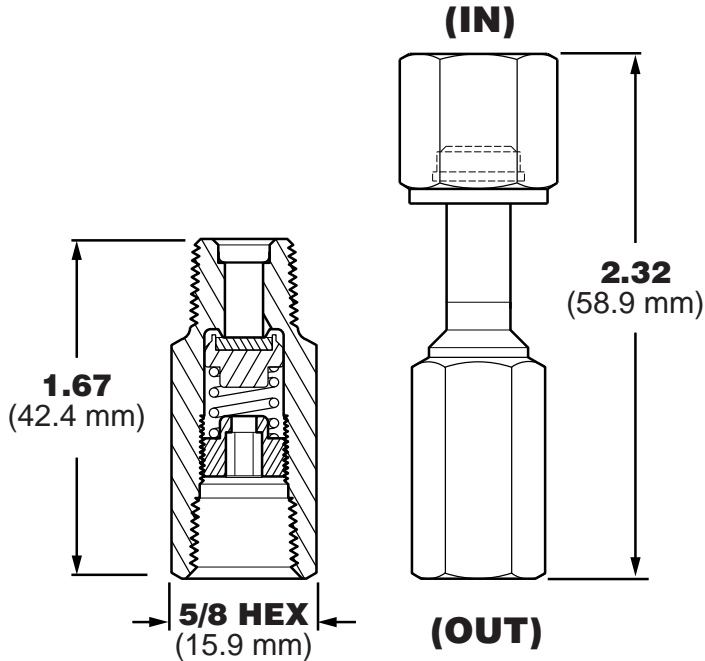
¼ inch female pipe thread outlet, FS male or female fitting inlet.

approximate weight

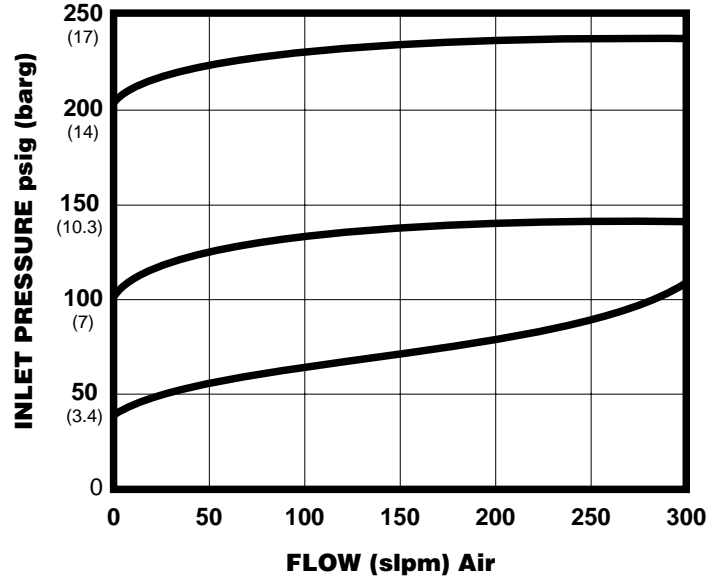
2.0 oz. (.06 kg)

VR7 Series

Dimensional Drawing



Flow Curve



Ordering Information

BASIC SERIES

VR7

CONNECTIONS (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)

Note: After relieving, service is required.

Viton® is a registered trademark of DuPont Dow Elastomers.
Neoprene® and Kalrez® are registered trademarks of DuPont Company

VR7 44MF 1 S V

SEAL

K = Kalrez®

N = Neoprene®

V = Viton®

MATERIAL

S = 316L Stainless Steel

B = Brass

ADJUSTABLE RANGE

1 = 10 - 20 psig

2 = 20 - 100 psig

3 = 100 - 250 psig

4 = 250 - 550 psig



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