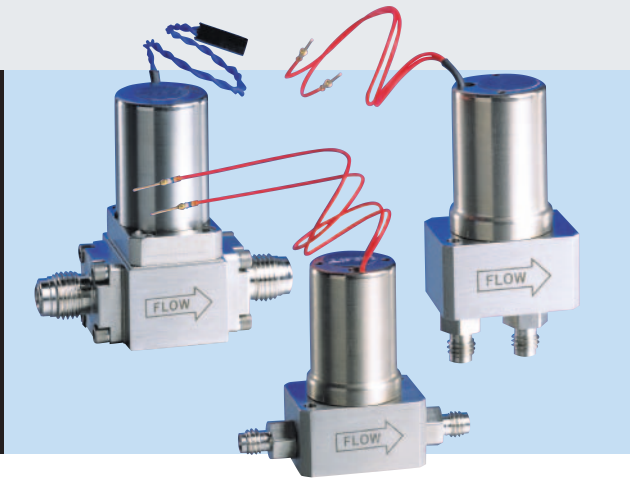
122 and 132 Series Performance Plus

High Performance Proportional Valves for Low to Medium Flow (5 sccm—30 slm)

» Outstanding reliability
» Unmatched repeatability
» No virtual leaks
» No particle generation
» Small wetted volume
» No un-swept volume



Features at a glance

- Flow range: 5 sccm—30 slm (N_2)
- Proportional voltage control: 0-15 VDC, 150 mA max.
- Greater than a 1000 to 1 turn-down ratio
- Electromagnetic coil is isolated from the flow path
- Frictionless free floating plunger
- Wetted surfaces: 316L, 304, KM45, KEL-F®, Viton®
- Cleanroom assembly

Performance

Based on proven designs developed for the demanding processes in the semiconductor industry, Celerity's valves provide the latest advances in control with high accuracy, repeatability, and fast response.

The 122 and 132 Series are the most advanced proportional control valves on today's market. The 1000:1 turndown ratio provides superior precision and control. Its unique frictionless, free floating plunger has been optimized to eliminate threads and shims that can trap dirt and moisture. Its design has been subjected to over 8 million cycles with no degradation in performance.

The electromagnetic actuator is proven to have superior reliability to Piezo actuators and can operate over a larger pressure range.

Typical applications

- All gases
- High temperature
- Fiber optics and glass coating
- Vacuum processes
- Combustion control
- Leak testing
- Environmental gas control
- Medical equipment gas control
- Plasma spray coating
- Gas sampling
- Carrier gas monitoring
- Central gas distribution
- Orifice sizing
- Particulate sampling
- Gas chromatography
- Argon flow for electro-surgery
- Chemical and petrochemical gas control
- Pharmaceutical manufacturing

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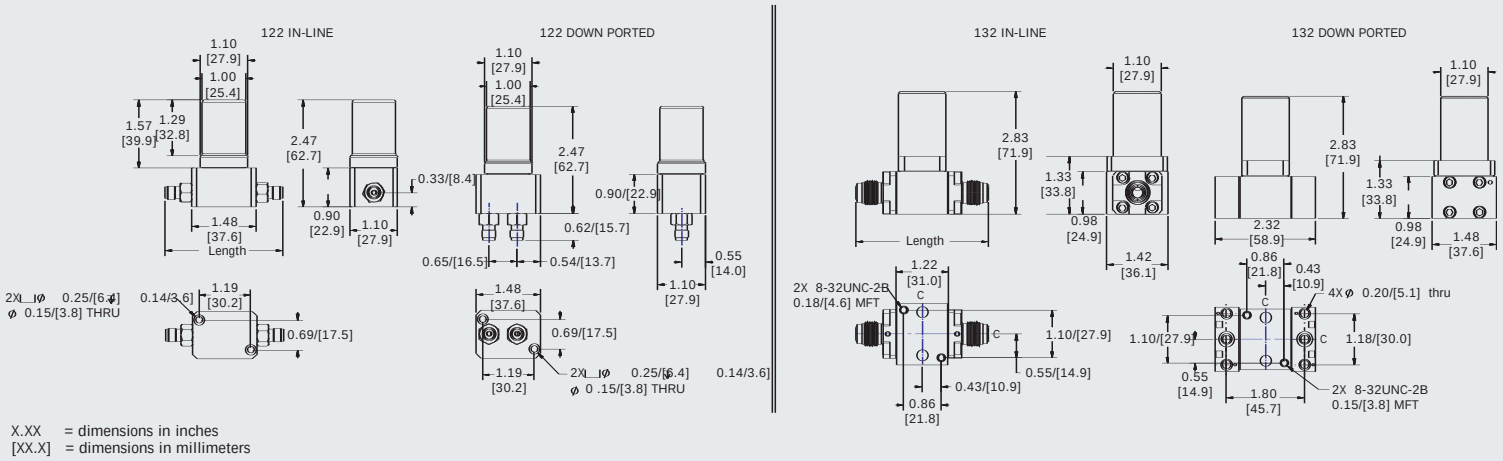
Product dimensions



This design has been used in over 100,000 mass flow controllers, demonstrating unmatched reliability with a MTBF of over 10 years.

122 series elastomer valve

The 122 Series is a high performance proportional control valve used for precise control of inert gases. The flow path of the valve is isolated from the electromagnetic coil providing exceptional contamination control as well as corrosion resistance. The elastomeric valve seat provides a tight shut-off and is designed for normally closed operations. The 122 can be easily disassembled for maintenance, cleaning, and elastomer seal replacement.

132 series metal seal valve

The 132 Series is a high performance, all metal seal proportional control valve used for precise control of reactive and highly corrosive gases. The 132 Series valve utilizes Celerity's high-integrity 316SS metal seal, providing 1 x 10^{-10} atm-cc/sec (He) leak rate. The flow path of the valve is isolated from the electromagnetic coil, providing exceptional contamination control as well as corrosion resistance. The metal valve seat provides a tight shut-off, superior corrosion resistance, and is available in normally open or closed configurations.

The 132 high temperature valve option has a unique coil that is capable of continuous valve operation up to 200ºC.

Tested and field-proven reliability

Reliability is designed into the 122 and 132 Series valves in a variety of different ways. The unique frictionless free floating solenoid control valve eliminates wear and tear on critical valve components. The single valve spring retains its tension, even after millions of flex operations. Reliability is proven with over 100,000 valves under continuous operation in the field. Using actual data, the MTBF for this design is currently over 1,000,000 hours.

Manufacturing capabilities

Celerity is an ISO 9001 registered company. All manufacturing processes are rigorously qualified in the development process. All specifications are certified based on statistically significant samples. Celerity utilizes a world class metrology laboratory which is one of only a handful of gravimetric measurement facilities in the United States.

Fitting type	Length (in.)	Length (mm)
1/8" Swagelok®	2.72	69.1
1/4" Swagelok	2.86	72.6

122 Series product dimensions

Fitting type	Length (in.)	Length (mm)
1/8" Swagelok®	2.54	64.5
1/4" Swagelok	2.66	67.7
1/4" VCR male	3.06	77.7

132 Series product dimensions

24/7 service and support

Celerity is unmatched in the industry for service and support. We have worldwide service locations with calibration, application support, and repair capabilities, operating 24 hours a day, 7 days a week. Celerity's website also provides updated application and technical support.

Visit us at www.celerity.net.

122/132 Series Performance Plus Proportional Valves

Product specifications

Flow range	5 sccm to 30 slm (N_2)[1]
Turn down ratio	1000:1[2]
Operating pressure:	
Maximum inlet pressure:	500 psig
Pressure drop (controller)	7 to 40 psid[3]
Response	20 Hz band width
Max. operating temperature:	
Standard coil	50ºC
High temp coil:	150ºC
Model 250 coil:	200ºC
Shut-off:	
Elastomer seal	< 1% full scale
Metal seal	< 2% full scale
External leak integrity:	
Elastomer seal	$1x10^{-9}$ atm-cc/sec (He)
Metal seal	$1x10^{-10}$ atm-cc/sec (He)
Power	15 VDC max., 150 mA max.
Opening voltage	4 VDC (approximate)
Control range span	1-3 VDC
Coil resistance	100 ohms, ±5%
Coil inductance	185 mH (approximate)
Wetted materials	316L stainless steel, pure nickel seal, 304 stainless steel spring, 7 Mo+ or KM-45
Gases	Inert (122 Series)

[1] The maximum flow rate depends on the available pressure drop and gas molecular weight.

Maximum flow rate for a gas other than N_2 can be estimated using the following formula:

$Q_{max} = 840/MW\ pg$

where MW pg is the molecular weight of the process gas and Q_{max} is the maximum flow in slm.

[2] 1000:1 turn down ratio is valid for units with flow rates greater than 500 sccm N_2.

[3] Lower limit depends on gas density and flow range.

Specifications and features are subject to change without notice.

All specifications reflect nitrogen calibration using Molbloc/Molbox™ transfer standards.

Calibration by primary standards and surrogate gases is available as an additional charge option.

122 Series Product Configuration

V	122	High Performance Elastomer Valve
	XXXX	Gas (See Gas Chart for Configuration)
	XXXX	Range 5-30 slm (005C=5 sccm, 030L=30 slm)
	XX	Gas Temperature (°C)
	XX	Inlet Pressure (psia)
	XX	Minimum Pressure Drop (psid)
	8S	1/8" Swagelok
	4S	1/4" Swagelok
	D	Down-Mounted Fittings
	S	In-Line Fittings
	V	Viton O-Ring
	M	Metal Seat
	F	Kel-F Seat
	S	Standard Coil (0 to 50 °C Ambient)
	H	High Temperature (150 °C Ambient)
	X	Standard Two Wire Pigtail
	C	Normally Closed
	16X	16µ inch Ra Finish
	10E	10µ inch Ra Finish
	04E	4µ inch Ra Finish

Example:

V	122	0004	100C	25	45	7	4S	D	V	F	S	X	C	16X

132 Series Product Configuration

V	132	High Performance Metal Seal Valve
	XXXX	Gas (See Gas Chart for Configuration)
	XXXX	Range 5-30 slm (005C=5 sccm, 030L=30 slm)
	XX	Gas Temperature (°C)
	XX	Inlet Pressure (psia)
	XX	Minimum Pressure Drop (psid)
	8S	1/8" Swagelok (In-line)
	4S	1/4" Swagelok (In-line)
	4R	1/4" VCR (In-line)
	DC	Downported—C Seal
	DB	Downported—B seal
	S	In-Line Fittings
	D	Downported Block Manifold Mounting
	M	Metal Seal
	F	Kel-F Seat
	M	Metal Seat
	S	Standard Coil (0 to 50°C Ambient)
	H	High Temperature (150°C Ambient)
	U	Ultra High Temperature (200°C Ambient)
	X	Standard Two Wire Pigtail
	C	Normally Closed
	16X	16µ inch Ra Finish
	10E	10µ inch Ra Finish
	04E	4µ inch Ra Finish

Example:

V	132	0004	100C	25	35	10	4R	S	M	M	S	X	C	16X

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UNIT

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