



Ultra High Purity

Regulators Diaphragm Valves Gauges Fittings

Technology for a Better Future

Company Overview

Genstar Technologies Company, Inc. (GENTEC®), founded in 1969, is a global industry leader in the manufacturing of welding apparatus, pressure regulators, and gas control systems.

It is GENTEC®'s mission to provide customers with high quality, value-added products and services that surpass the strictest safety standards. All GENTEC® products are manufactured in an ISO 9001 and ISO 13485 certified facility by our experienced and dedicated workforce, using exquisite craftsmanship in conjunction with computerized automation, stringent quality control, and advanced test equipment. In addition, GENTEC is API Specification Q1 certified for "Design, Manufacturing and service of Gas Flow Control Systems."

Additionally, as a total system solution provider, GENTEC® offers technical support, on-site evaluation, and design/implementation. GENTEC® engineers examine all customer requirements in order to develop and recommend the best customer specific solutions.

The company takes great pride in fostering a strong relationship with each and every customer. Today, GENTEC® sells its products through a vast distribution network which extends to thousands of customers worldwide.





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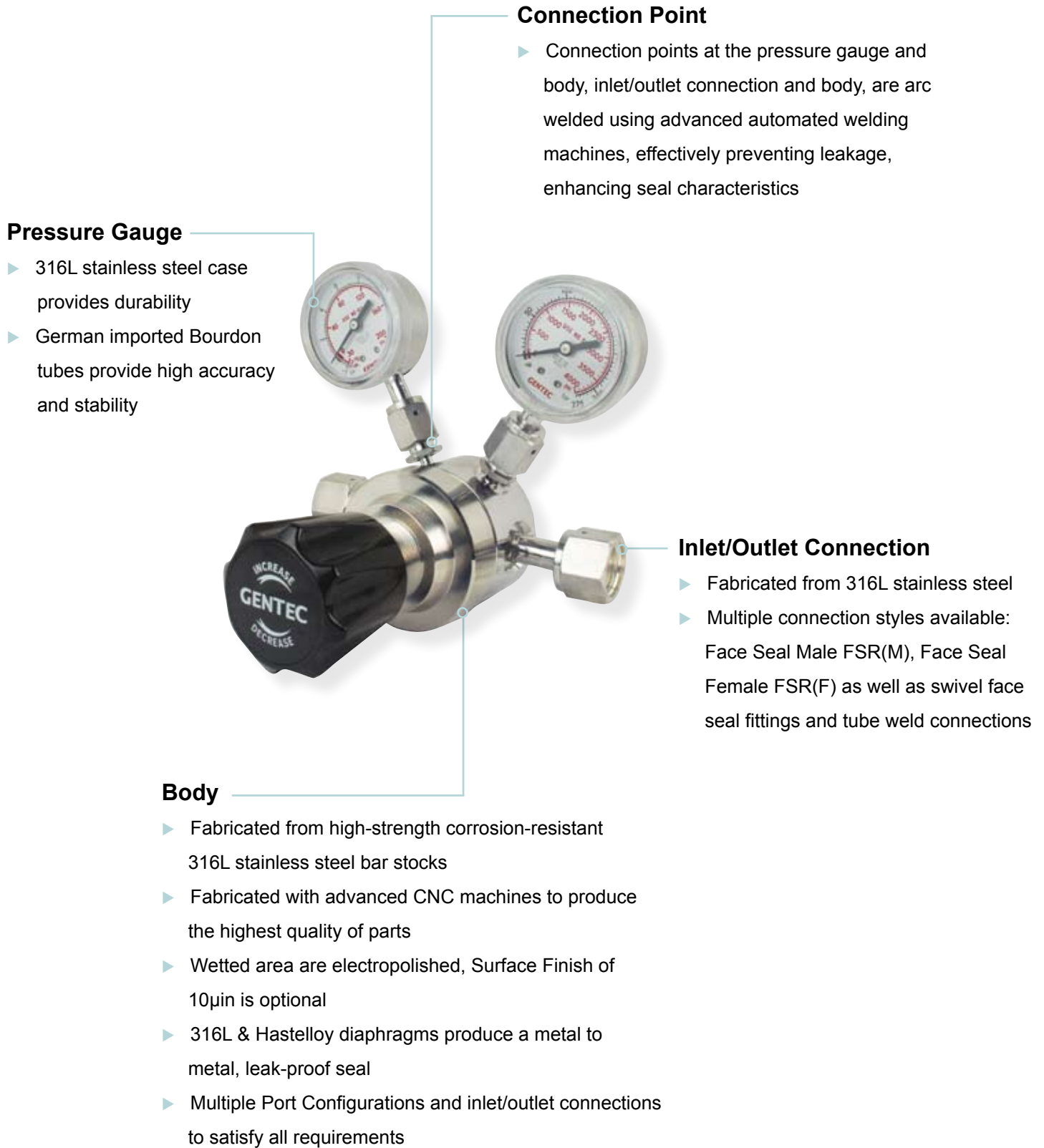
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UHP REGULATORS

U Series



100% Helium Leak Test



■ U21 Series

GENTEC U21 Series single-stage regulators are hand adjustable, pressure reducing regulators for applications ranging from non-corrosive, corrosive, and toxic gases. Our metal-to-metal diaphragm to body seal is designed to minimize leakage and to provide excellent accuracy and longevity.



Features

- ▶ 316L stainless steel body
- ▶ Metal to metal diaphragm to body seal
- ▶ Easy front panel and rear bracket mounting
- ▶ Gauge ports are standard with 1/4" face seal male. Internal 1/4" face seal female is also available
- ▶ Fully internal electropolished
- ▶ Cleaned, assembled and packaged for high purity semiconductor applications
- ▶ High-cycle life
- ▶ 100% Helium-leak tested

Operating Conditions

- ▶ Maximum inlet pressure: 500 psi (35 bar), 3000 psi (206 bar)
- ▶ Outlet pressure: 0-25 psi (1.7 bar), 0-50 psi (3 bar), 0-100 psi (7 bar), 0-250 psi (17 bar), 0-500 psi (35 bar)
- ▶ Temperature: -40°F to 165°F (-40°C to 74°C)

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE*, Vespel®
- ▶ Diaphragm: 316L stainless steel
- ▶ Poppet: 304 stainless steel
- ▶ Remaining part: 316 stainless steel

Surface Finish

- ▶ Standard Ra: 20 µin
- ▶ Optional Ra (EP): 10 µin

Functional Performance

- ▶ Flow capacity: Cv=0.14
- ▶ Maximum leak Rate:
 - Inboard leakage: 2×10^{-8} atm cc/sec He
 - Across seat leakage: 4×10^{-8} atm cc/sec He
- ▶ Proof pressure: 150% of maximum rated pressure
- ▶ Burst pressure: 400% of maximum rated pressure

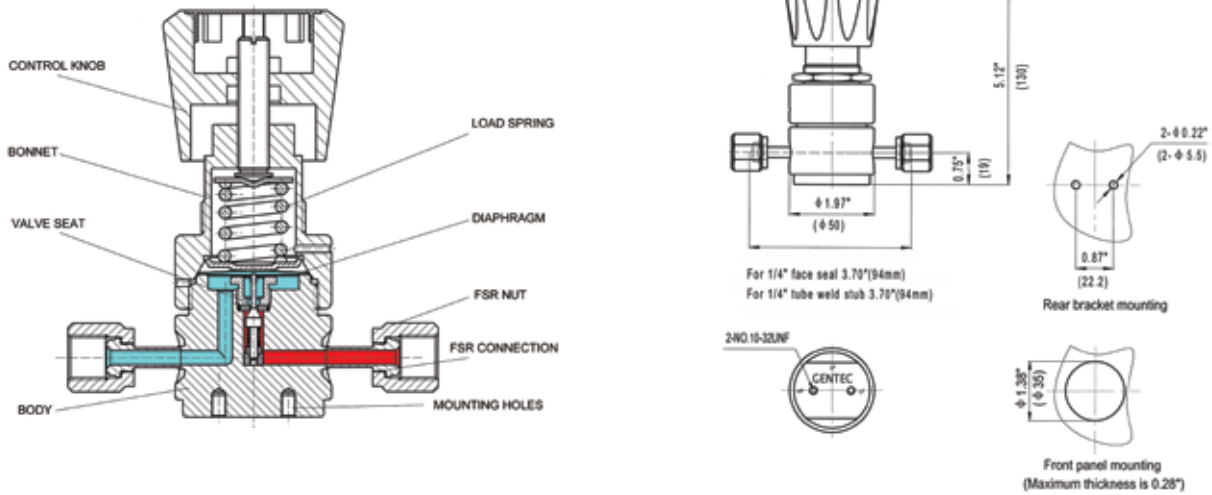
Internal Volume

- ▶ 4.6 cc

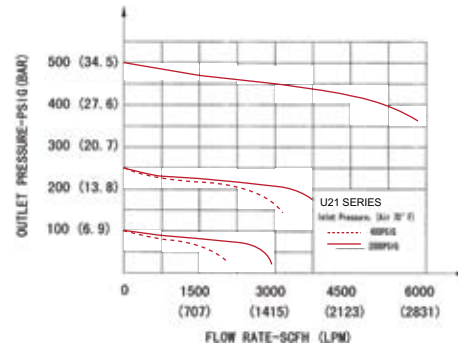
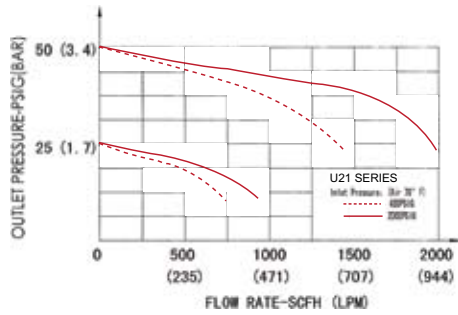
*: Standard Material

U21 Series

Dimensions



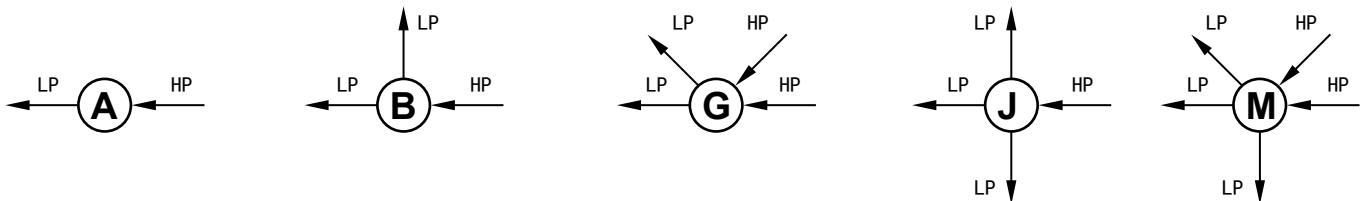
Flow Data



Ordering Information

EX:	U21	SL	B	K	- D	F	P -	91 - 92	- P
	Series	Body	Ports	Seat	Inlet Pressure	Outlet Pressure	Gauge	Inlet / Outlet Connection	Options
	U21	SL: 316L	A B G J M	K: PCTFE V: Vespe [®]	D: 3000 psi F: 500 psi	F: 0~500 psi G: 0~250 psi I: 0~100 psi K: 0~50 psi L: 0~25 psi	W: Without Gauge P: with psi / bar gauge	90: 1/4" internal female FSR 91: 1/4" swivel female FSR 92: 1/4" swivel male FSR 41: 1/4" weld stub	E: Ra 10 μin P: Panel Mounting H: Hastelloy [®] Diaphragm

Port Configurations



■ U22 Series

GENTEC U22 Series single-stage regulators are purge gas, pressure reducing regulators. Applicable to gas system for non-corrosive, corrosive, and toxic gases. Our metal-to-metal diaphragm to body seal is designed to minimize leakage and to provide excellent accuracy and longevity.



Features

- ▶ 316L stainless steel body
- ▶ Metal to metal diaphragm to body seal
- ▶ Easy front panel and rear bracket mounting
- ▶ Gauge ports are standard with 1/4" face seal male. Internal 1/4" face seal female is also available
- ▶ Fully internal electropolished
- ▶ Cleaned, assembled and packaged for high purity semiconductor applications
- ▶ High-cycle life
- ▶ 100% Helium-leak tested

Operating Conditions

- ▶ Maximum inlet pressure: 500 psi (35 bar), 3000 psi (206 bar)
- ▶ Outlet pressure: 0-25 psi (1.7 bar), 0-50 psi (3 bar), 0-100 psi (7 bar), 0-150 psi (10 bar), 0-250 psi (17 bar)
- ▶ Temperature: -40°F to 165°F (-40°C to 74°C)

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE*, Vespel®
- ▶ Diaphragm: 316L stainless steel
- ▶ Poppet: brass (nickel plated)
- ▶ Remaining part: 316 stainless steel

Surface Finish

- ▶ Standard Ra: 20 µin
- ▶ Optional Ra (EP): 10 µin

Functional Performance

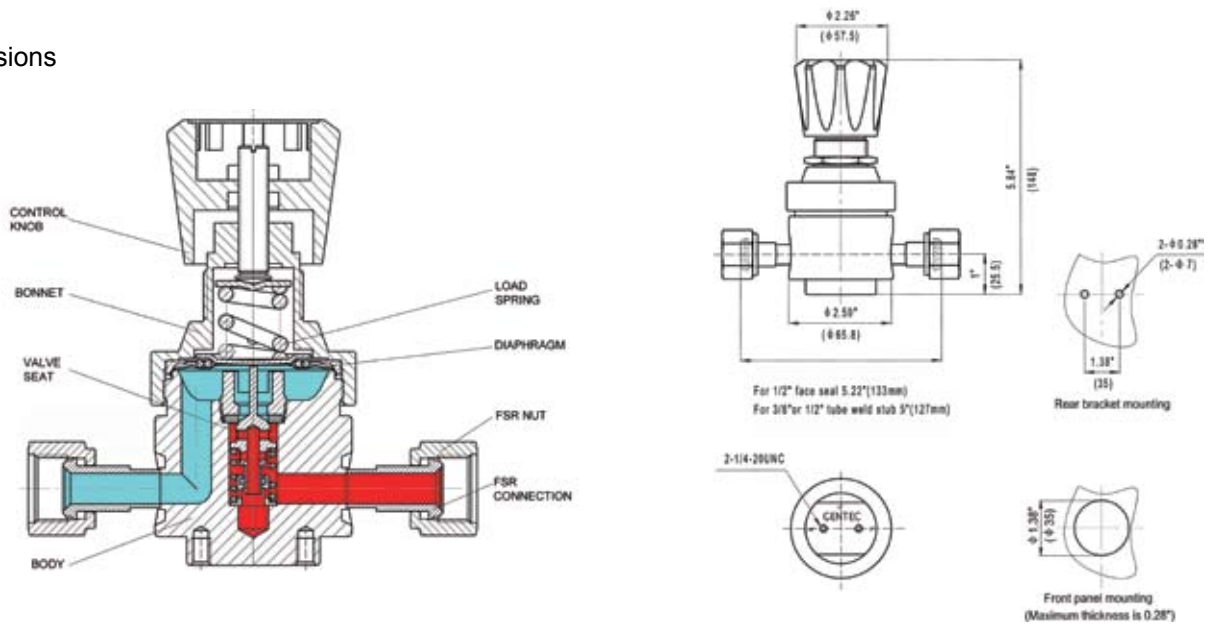
- ▶ Flow capacity: Cv=1.1
- ▶ Maximum leak rate:
 - Inboard leakage: 2×10^{-8} atm cc/sec He
 - Across seat leakage: 4×10^{-8} atm cc/sec He
- ▶ Proof pressure: 150% of maximum rated pressure
- ▶ Burst pressure: 400% of maximum rated pressure

Internal Volume

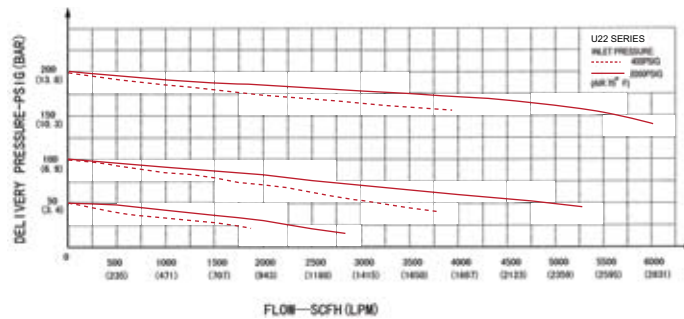
- ▶ 22.6 cc

U22 Series

Dimensions



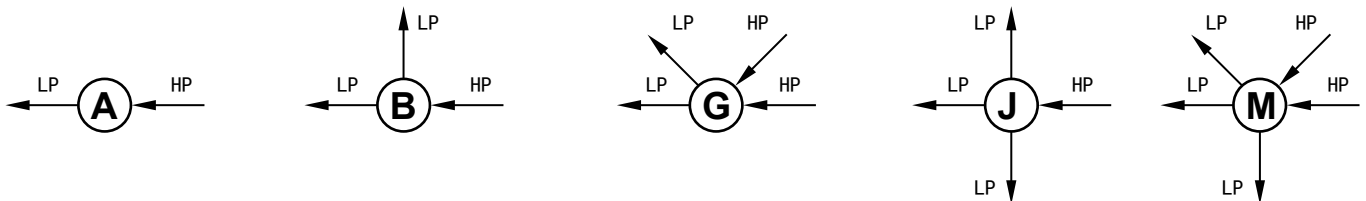
Flow Data



Ordering Information

EX:	U22	SL	B	K	- D	H	P -	95 - 95	- P
	Series	Body	Ports	Seat	Inlet Pressure	Outlet Pressure	Gauge	Inlet / Outlet Connection	Options
	U22	SL: 316L	A: 2 port B: 3 port G: 4 port J: 4 port M: 5 port	K: PCTFE V: Vespel®	D: 3000 psi F: 500 psi	G: 0~250 psi H: 0~150 psi I: 0~100 psi K: 0~50 psi L: 0~25 psi	W: without gauge P: with psi / bar gauge	95: 1/2" FSR(F) 96: 1/2" FSR(M)	E: 10 µin P: Panel mounting H: Hastelloy® Diaphragm

Port Configurations



■ U23 Series

GENTEC U23 Series single-stage regulators are ideal purge regulators for low pressure and high purity systems, especially for heavy duty gas flow applications. Our metal-to-metal diaphragm to body seal is designed to minimize leakage and to provide excellent accuracy and longevity.



Features

- ▶ 316L stainless steel body
- ▶ Metal to metal diaphragm to body seal
- ▶ Easy front panel and rear bracket mounting
- ▶ Gauge ports are standard with 1/4" face seal male. Internal 1/4" face seal female is also available
- ▶ Fully internal electropolished
- ▶ Cleaned, assembled and packaged for high purity semiconductor applications
- ▶ High-cycle life
- ▶ 100% Helium-leak tested

Operating Conditions

- ▶ Maximum inlet pressure: 500 psi (35 bar), 3000 psi (206 bar)
- ▶ Outlet pressure: 0-25 psi (1.7 bar), 0-50 psi (3 bar), 0-100 psi (7 bar), 0-150 psi (10 bar)
- ▶ Temperature: -40°F to 165°F (-40°C to 74°C)

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE*, Vespel®
- ▶ Diaphragm: 316L stainless steel
- ▶ Poppet: 316 stainless steel
- ▶ Remaining part: 316 stainless steel

Surface Finish

- ▶ Standard Ra: 20 μ in
- ▶ Optional Ra (EP): 10 μ in

Functional Performance

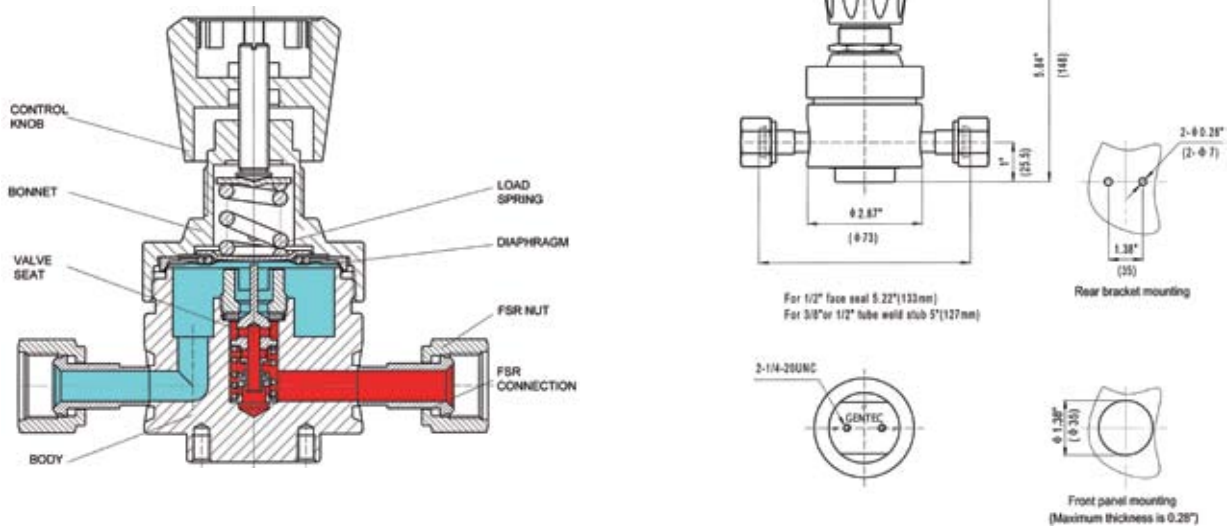
- ▶ Flow capacity: Cv=1.8
- ▶ Maximum leak rate:
 - Inboard leakage: 2×10^{-8} atm cc/sec He
 - Across seat leakage: 4×10^{-8} atm cc/sec He
- ▶ Proof pressure: 150% of maximum rated pressure
- ▶ Burst pressure: 400% of maximum rated pressure

Internal Volume

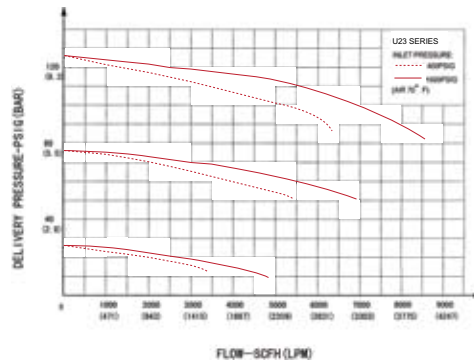
- ▶ 59.9 cc

U23 Series

Dimensions



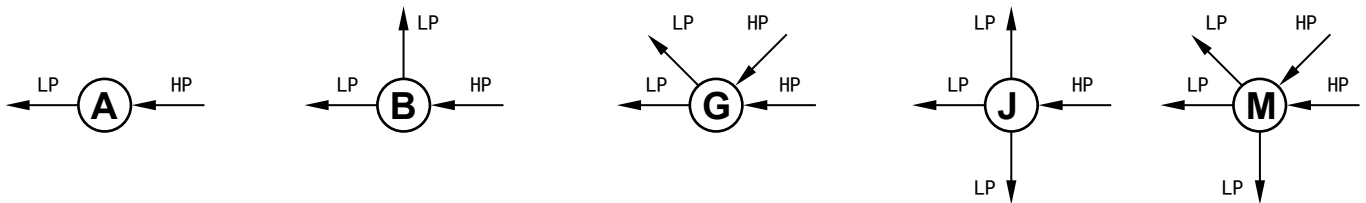
Flow Data



Ordering Information

EX:	U23	SL	B	K	- D	H	P -	95 - 95	- P
	Series	Body	Ports	Seat	Inlet Pressure	Outlet Pressure	Gauge	Inlet / Outlet Connection	Options
	U23	SL: 316L	A B G J M	K: PCTFE V: Vespel®	D: 3000 psi F: 500 psi	H: 0-150 psi I: 0~100 psi K: 0~50 psi L: 0~25 psi	W: without gauge P: with psi / bar gauge	95: 1/2" FSR(F) 96: 1/2" FSR(M)	E: 10 μm P: Panel mounting H: Hastelloy® Diaphragm

Port Configurations



■ U53 Series

GENTEC U53 Series single-stage regulators are a threadless, high purity, non-tied diaphragm design. Our metal-to-metal diaphragm to body seal is designed to minimize leakage and to provide excellent accuracy and longevity.



Operating Conditions

- ▶ Maximum inlet pressure: 300 psi (20 bar)
- ▶ Outlet pressure: 0-30 psi (2 bar)
- ▶ Temperature: 0°F to 140°F (-18°C to 60°C)

Surface Finish

- ▶ Standard Ra (EP): 10 μ m

Internal Volume

- ▶ 9.3 cc

Features

- ▶ 316L body
- ▶ Metal to metal diaphragm to body seal
- ▶ Easy front panel and rear bracket mounting
- ▶ Gauge ports are standard with 1/4" face seal male. Internal 1/4" face seal female is also available
- ▶ Internally threadless nozzle assembly
- ▶ Standard fully internal electropolished
- ▶ Designed for very low particle generation
- ▶ Cleaned, assembled and packaged for high purity semiconductor applications
- ▶ High-cycle life
- ▶ 100% Helium-leak tested

Materials

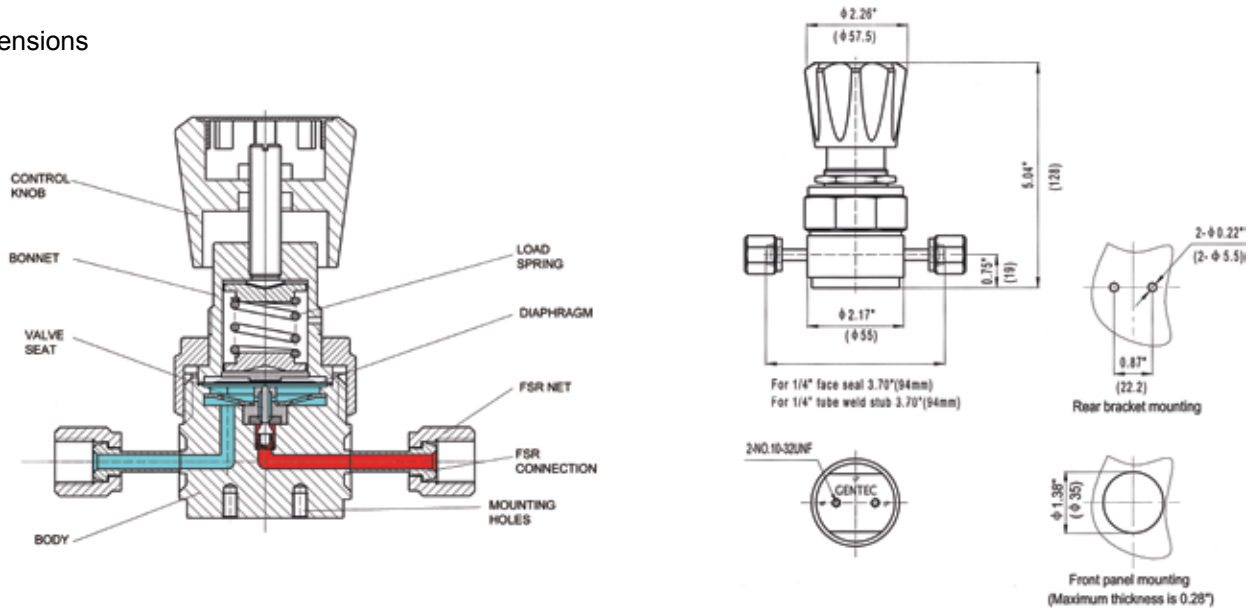
- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE
- ▶ Diaphragm: Elgiloy[®], Hastelloy[®]
- ▶ Poppet: 316 stainless steel, Hastelloy[®]
- ▶ Compression member: 316 stainless steel, Hastelloy[®]
- ▶ Remaining part: 316 stainless steel, Hastelloy[®]

Functional Performance

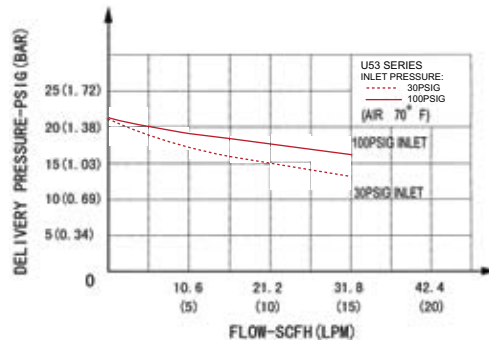
- ▶ Flow capacity: Cv=0.054
- ▶ Maximum leak rate:
 - Inboard leakage: 0.5×10^{-9} atm cc/sec He
 - Across seat leakage: 1×10^{-9} atm cc/sec He
- ▶ Proof pressure: 150% of maximum rated pressure
- ▶ Burst pressure: 400% of maximum rated pressure

U53 Series

Dimensions



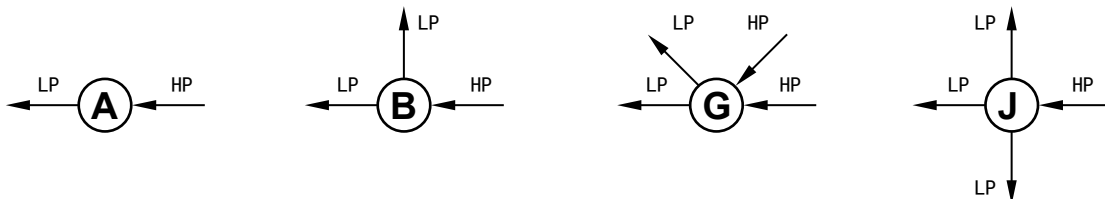
Flow Data



Ordering Information

EX:	U53	SL	B	K	- G	L	P -	91 - 92	- P
	Series	Body	Ports	Seat	Inlet Pressure	Outlet Pressure	Gauge	Inlet / Outlet Connection	Options
	U23	SL: 316L	A B G J	K: PCTFE	G: 300 psi	L: 0~30 psi	W: without gauge P: with psi / bar gauge	90: 1/4" internal female FSR 91: 1/4" swivel female FSR 92: 1/4" swivel male FSR 41: 1/4" weld stub	P: Panel mounting H: Hastelloy® Diaphragm

Port Configurations



DIAPHRAGM VALVES

DV Series



GENTEC

316L AEA

100% Helium Leak Test



■ DV51 Series



Handgrip



Handwheel

Features

- ▶ Suitable for high purity applications
- ▶ Face seal fittings (FSR), NPT or GENLOK connections
- ▶ Internally springless
- ▶ Metal-to-metal diaphragm seals
- ▶ High-cycle life
- ▶ 100% Helium-leak tested

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE
- ▶ Diaphragm: Elgiloy®

Functional Performance

- ▶ Flow capacity: $C_v=0.2$
- ▶ Maximum leak rate:
 - Body leak rate: 1×10^{-9} atm cc/sec He
 - Valve seat leak rate: 4×10^{-9} atm cc/sec He
- ▶ Proof pressure: 150% of maximum working pressure
- ▶ Burst pressure: 400% of maximum working pressure

Operating Conditions

- ▶ Maximum operating pressure: 300 psi (20 bar)
- ▶ Minimum operating pressure: vacuum
- ▶ Temperature: -40°F to 150°F (-40°C to 65°C)

Pneumatic Actuator

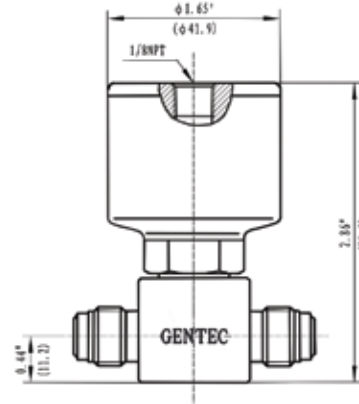
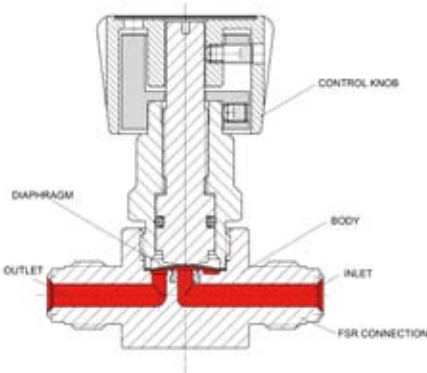
- ▶ Operating pressure: 70 - 125 psi
- ▶ Inlet connection: 1/8" NPT (Female)
- ▶ Normally: closed, open

Surface Finish

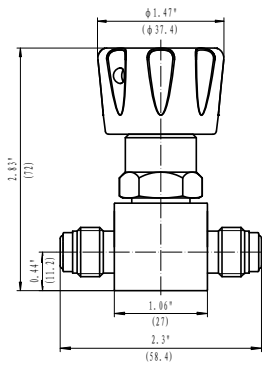
- ▶ Standard Ra: 20µin

DV51 Series

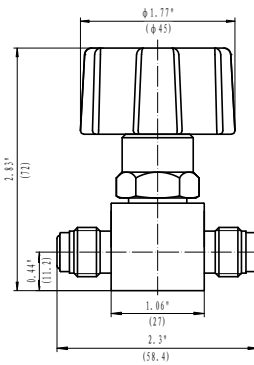
Dimensions



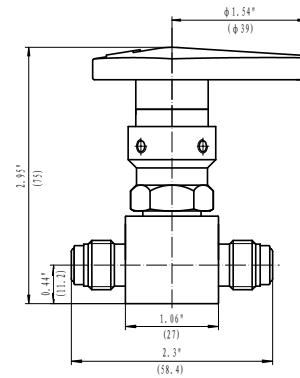
Pneumatic (Low Pressure)



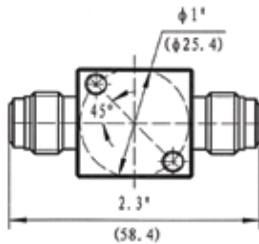
Handwheel (With Display)



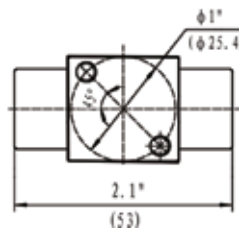
Handwheel (Without Display)



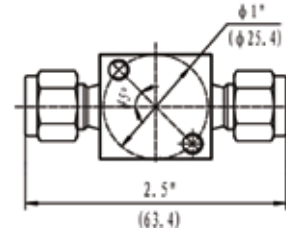
Handgrip (Low Pressure)



Face Seal Male Fittings



NPT Fittings



GENLOK Fittings

Ordering Information

EX:	SL	- DV51	M	L	- VM4 - NT4	- NO
	Body	Valve Series	Valve Type	Working Pressure	Inlet / Outlet Connection	Options
	SL: 316L	DV51	B: handgrip N: Handwheel (Without display) M: Handwheel (With display), 90° switch P: Pneumatic actuator (Normally closed)	L: 300 psi	NT4, FNT4, TF4, VM4	Blank: Standard (N/C) NO: Normally open (Pneumatic)

■ DV54 Series



Manual
(Low Pressure)



Manual
(High Pressure)

Features

- ▶ Suitable for ultra high purity applications
- ▶ 316L stainless steel enhances weldability and resistance to corrosion
- ▶ Manual or pneumatic actuation are available
- ▶ Face seal fittings (FSR) or butt weld connections
- ▶ Internally springless
- ▶ Metal-to-metal diaphragm design creates a leak resistant seal
- ▶ Control knob includes a window indicating working status (i.e. open or closed)
- ▶ 100% helium leak tested
- ▶ Multiple port configurations available

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE, Vespel®
- ▶ Diaphragm: Elgiloy®

Functional Performance

- ▶ Flow capacity: $C_v=0.3$
- ▶ Maximum leak rate:
 - Body leak rate: 1×10^{-9} atm cc/sec He
 - Valve seat leak rate: 4×10^{-9} atm cc/sec He
- ▶ Proof pressure: 150% of maximum working pressure
- ▶ Burst pressure: 400% of maximum working pressure

Operating Conditions

- ▶ Maximum operating pressure:
 - 300 psi (20 bar), 3500 psi (240 bar)
- ▶ Minimum operating pressure: vacuum
- ▶ Temperature: -40°F to 150°F (-40°C to 65°C)

Pneumatic Actuator

- ▶ Operating pressure: 70 - 125 psi
- ▶ Inlet connection: 1/8"NPT (Female)
- ▶ Normally: closed, open

Surface Finish

- ▶ Standard Ra: 10 - 15µin

Internal Volume

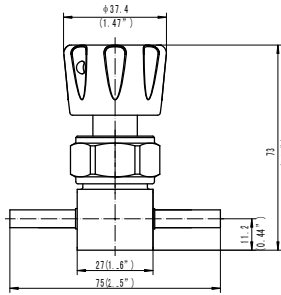
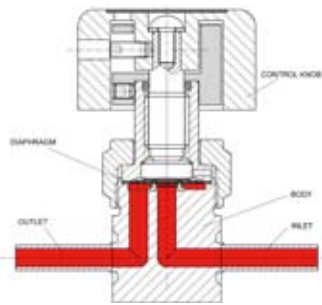
- ▶ 1.6 cc

* Standard Material

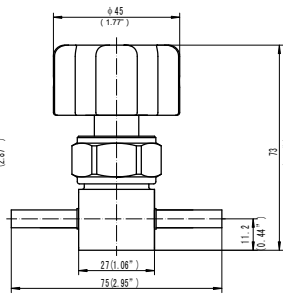
** Vespel® seat is recommended for Nitrous Oxide (N2O) service but is not available for low pressure pneumatic actuation.

DV54 Series

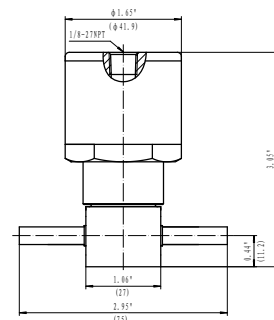
Dimensions



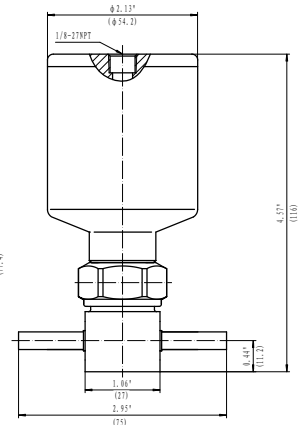
Manual (Low Pressure)



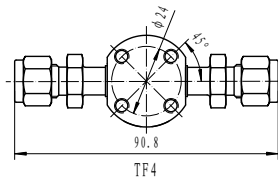
Manual (High Pressure)



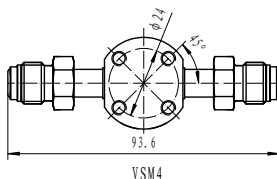
Pneumatic (Low Pressure)



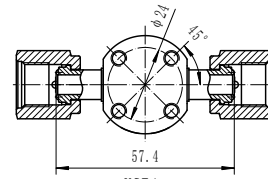
Pneumatic (High Pressure)



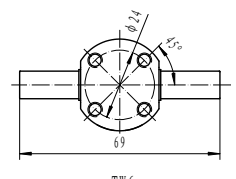
TF4



VSM4



VSP4



TW6

Flow

Types	Bypass	Three-way			Four-way		Rear-entry	
Flow schematic	P	B	C	D	I	J	A	T
Red arrow indicates inlet, Blue arrow indicates outlet*								
Flow schematic	Q	E	F	H	K	L	R	
Red arrow indicates inlet, Blue arrow indicates outlet*								

*All schematics are from top view

Ordering Information

EX:	SL	- DV54	M	H	B	- VSM4 *	- NO
	Body	Valve Series	Valve Type	Working Pressure	Flow Path	Inlet / Outlet Connection	Options
	SL: 316L	DV54	M: Handwheel (With display) P: Pneumatic actuator (Normally closed)	H: 3500 psi L: 300 psi	Blank: In-line Type Elbow Type I: two inlet/ two outlet J: one inlet/ three outlet K: One inlet/one outlet (elbow) L: Three inlet/one outlet Rear-entry valve A: Rear inlet/ one outlet T: Rear inlet/ two outlet R: Rear inlet/ four outlet	TW4, TW6, TF4, VSM4, VSF4	Blank: Standard (N/C) NO: Normally open (Pneumatic)

*: For standard models, if the high pressure (inlet) connections and low pressure (outlet) connections are same, only one is listed. If different, the prior represents inlet connection, and the latter represents outlet connection.

■ DV74 Series



Manual
(Low Pressure)



Pneumatic
(High Pressure)

Features

- ▶ Suitable for ultra high purity applications
- ▶ 316L stainless steel enhances weldability and resistance to corrosion
- ▶ Manual or pneumatic actuation are available
- ▶ Face seal fittings (FSR) or butt weld connections
- ▶ Internally springless
- ▶ Metal-to-metal diaphragm design creates a leak resistant seal
- ▶ Control knob includes a window indicating working status (i.e. open or closed)
- ▶ 100% helium leak tested
- ▶ Multiple port configurations available

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE, Vespel®
- ▶ Diaphragm: Elgiloy®

Functional Performance

- ▶ Flow capacity: $C_v=0.3$
- ▶ Maximum leak rate:
 - Body leak rate: 1×10^{-9} atm cc/sec He
 - Valve seat leak rate: 4×10^{-9} atm cc/sec He
- ▶ Proof pressure: 150% of maximum working pressure
- ▶ Burst pressure: 400% of maximum working pressure

Operating Conditions

- ▶ Maximum operating pressure:
 - 300 psi (20 bar), 3500 psi (240 bar)
- ▶ Minimum operating pressure: vacuum
- ▶ Temperature: -40°F to 150°F (-40°C to 65°C)

Pneumatic Actuator

- ▶ Operating pressure: 70 - 125 psi
- ▶ Inlet connection: 1/8"NPT (Female)
- ▶ Normally: Closed, Open

Surface Finish

- ▶ Standard Ra: $7\mu\text{in}$

Internal Volume

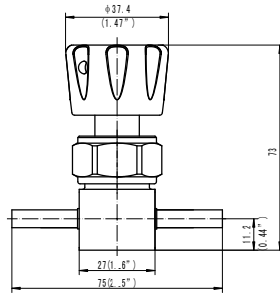
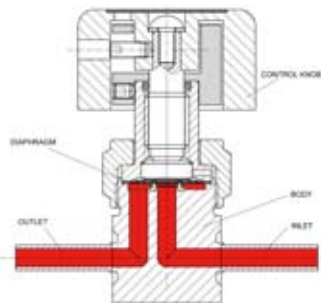
- ▶ 1.6 cc

* Standard Material

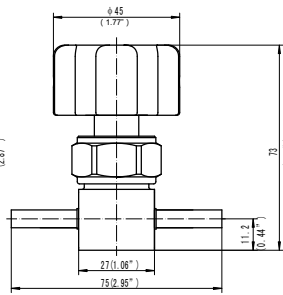
** Vespel® seat is recommended for Nitrous Oxide (N₂O) service but is not available for low pressure pneumatic actuation.

DV74 Series

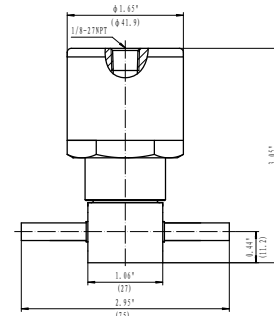
Dimensions



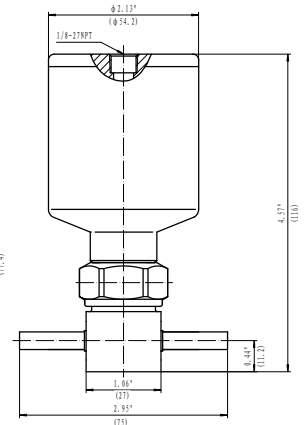
Manual (Low Pressure)



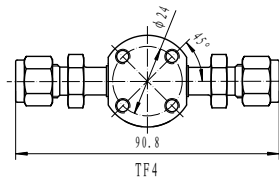
Manual (High Pressure)



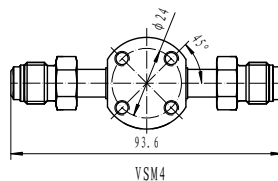
Pneumatic (Low Pressure)



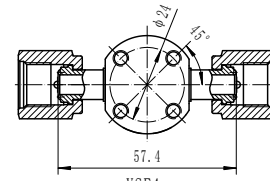
Pneumatic (High Pressure)



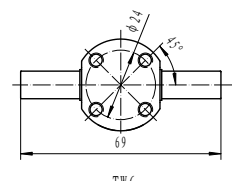
TF4



VSM4



VSP4



TW6

Flow

Types	Bypass	Three-way			Four-way		Rear-entry	
Flow schematic	P	B	C	D	I	J	A	T
Red arrow indicates inlet, Blue arrow indicates outlet*								
Flow schematic	Q	E	F	H	K	L	R	
Red arrow indicates inlet, Blue arrow indicates outlet*								

*All schematics are from top view

Ordering Information

EX:	SL	- DV74	M	H	B	- VSM4 *	- NO
	Body	Valve Series	Valve Type	Working Pressure	Flow Path	Inlet / Outlet Connection	Options
	SL: 316L	DV74	M: Handwheel (With Display) P: Pneumatic actuator (Normally closed)	H: 3500 psi L: 300 psi	Blank: In-line Type Elbow Type P: East in/ North out Q: East in/South out Three-way valve B: Right inlet, left/top outlet C: Right inlet, left/bottom outlet D: Right/top inlet, left outlet E: Right inlet, top/bottom outlet F: Top/bottom inlet, left outlet H: Left/right inlet, top outlet Four-way valve I: two inlet/ two outlet J: one inlet/ three outlet K: One inlet/one outlet (elbow) L: Three inlet/one outlet Rear-entry valve A: Rear inlet/ one outlet T: Rear inlet/ two outlet R: Rear inlet/ four outlet	TW4, TW6, TF4, VSM4, VSF4	Blank: Standard (N/C) NO: Normally open (Pneumatic)

*: For standard models, if the high pressure (inlet) connections and low pressure (outlet) connections are same, only one is listed. If different, the prior represents inlet connection, and the latter represents outlet connection.

■ DV82 Series



Handwheel



Pneumatic

Features

- ▶ Suitable for high purity applications
- ▶ 316L Stainless Steel enhances weldability and resistance to corrosion
- ▶ Both manual and pneumatic actuation are available
- ▶ Face seal fittings (FSR), compression tube fittings or butt weld connections
- ▶ Internally springless
- ▶ Metal-to-metal diaphragm seals
- ▶ High-cycle life
- ▶ 100% Helium-leak tested

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE*, Vespel®**
- ▶ Diaphragm: Elgiloy®

Operating Conditions

- ▶ Maximum operating pressure: 3500 psi (240 bar):
Pneumatic and manual actuation
- ▶ Minimum operating pressure: vacuum
- ▶ Temperature: -40°F to 150°F (-40°C to 65°C)
- ▶ Pneumatic actuator
Operating pressure: 70 - 125 psi
Inlet connection: 1/8"NPT (Female)
Normally: closed

Functional Performance

- ▶ Flow capacity: $C_v=0.16$
- ▶ Maximum leak rate:
Inboard leakage: 1×10^{-9} atm cc/sec He
Outboard leakage: 1×10^{-9} atm cc/sec He
Across seat leakage: 4×10^{-9} atm cc/sec He
- ▶ Proof pressure: 150% of maximum rated pressure
- ▶ Burst pressure: 400% of maximum rated pressure

Surface Finish

- ▶ Standard Ra: 15-20µin

Internal Volume

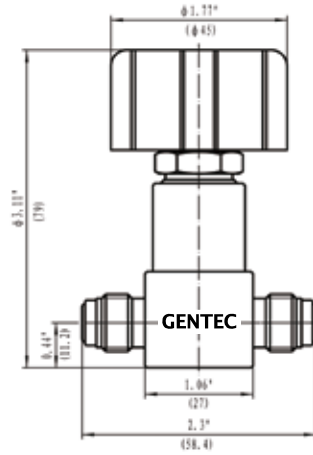
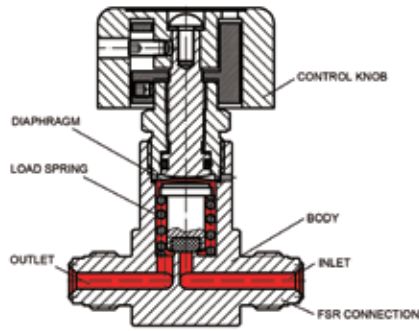
- ▶ 0.8 cc

* Standard Material

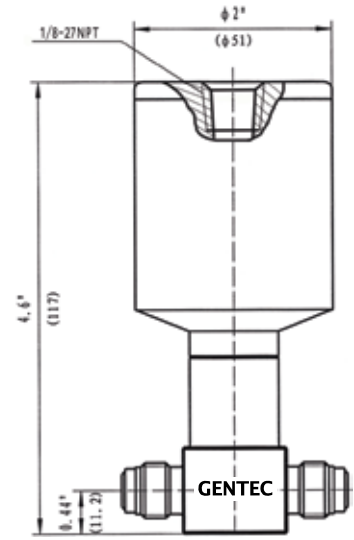
** Vespel® seat is recommended for Nitrous Oxide (N₂O) service but is not available for low pressure pneumatic actuation.

DV82 Series

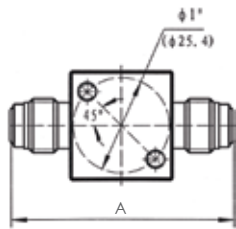
Dimensions



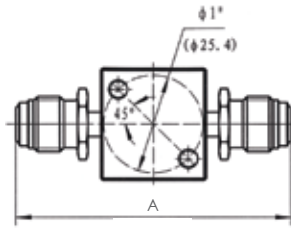
Handwheel



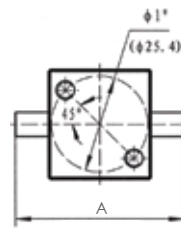
Pneumatic



Face Seal Male Fittings



Face Seal Swivel Male Fittings



Tube Weld Stub

Connections*	A (mm)
VM4	58.4
VM8	67.6
VSM4	70.8
VSF4	70.6
TW4	44.2
TW8	44.2
TF4	47.6

*: Applies to both inlet & outlet connections

Ordering Information

EX:	SL	- DV82	M	H	- VM4 - VM8	- K	IS
	Body	Series	Actuator	Working Pressure	Inlet / Outlet Connection	Seat	Options
	SL: 316L	DV82	M: Manual (Handwheel) P: Pneumatic actuator	H: 3500 psi	VM4, VM8, VSM4, VSM8, VSF4, VSF8 TW4, TW8	K: PCTFE* V: Vespel®	IS: Indicator switch

IS: Electrical Indicator Switch for high pressure Pneumatic Actuator

* Standard Material

Inlet & Outlet Connections		
Type	Size	
VM: Face seal male (FSR fittings)	4, 8	4=1/4" 8=1/2"
VSM: Face seal swivel male (FSR fittings)	4, 8	
VSF: Face seal swivel female (FSR fittings)	4, 8	
TW: Tube weld	4, 8	

■ DV84 Series



Handwheel



Pneumatic

Features

- ▶ Suitable for high purity applications
- ▶ 316L Stainless Steel enhances weldability and resistance to corrosion
- ▶ Both manual and pneumatic actuation are available
- ▶ Face seal fittings (FSR) or butt weld connections
- ▶ Internally springless
- ▶ Designed for very low particle generation
- ▶ Metal-to-metal diaphragm seals
- ▶ High-cycle life
- ▶ 100% Helium-leak tested

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE*, Vespel®**
- ▶ Diaphragm: Elgiloy®

Functional Performance

- ▶ Flow capacity: $C_v=0.17$
- ▶ Maximum leak rate:
 - Inboard leakage: 1×10^{-9} atm cc/sec He
 - Outboard leakage: 1×10^{-9} atm cc/sec He
 - Across seat leakage: 4×10^{-9} atm cc/sec He
- ▶ Proof pressure: 150% of maximum rated pressure
- ▶ Burst pressure: 400% of maximum rated pressure

Operating Conditions

- ▶ Maximum operating pressure:
 - 300 psi (17 bar), 3500 psi (240 bar)
- ▶ Minimum operating pressure: vacuum
- ▶ Temperature: -40°F to 150°F (-40°C to 65°C)
- ▶ Pneumatic actuator
 - Operating pressure: 70 - 125 psi
 - Inlet connection: 1/8"NPT (Female)
 - Normally: closed

Surface Finish

- ▶ Standard Ra: 10~15 μin
- ▶ Optional Ra (EP): 7 μin

Internal Volume

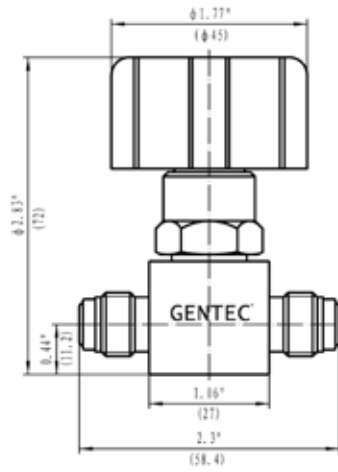
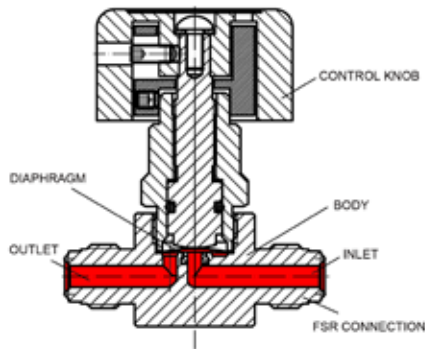
- ▶ 0.8 cc

* Standard Material

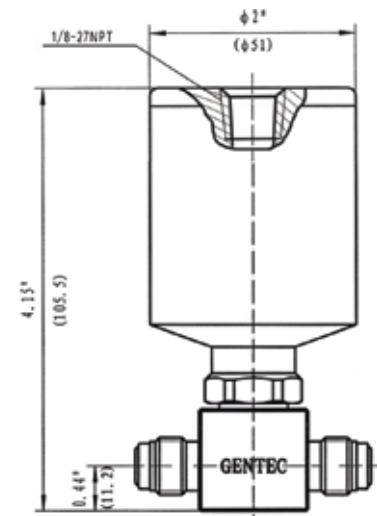
** Vespel® seat is recommended for Nitrous Oxide (N2O) service but is not available for low pressure pneumatic actuation.

DV84 Series

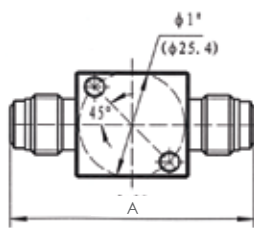
Dimensions



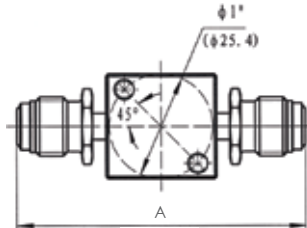
Handwheel



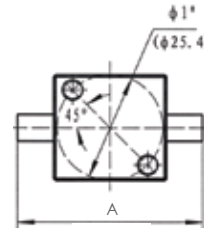
Pneumatic (HP)



Face Seal Male Fittings



Face Seal Swivel Male Fittings



Tube Weld Stub

Connection*	A (mm)
VM4	58.4
VM8	67.6
VSM4	70.8
VSF4	70.6
TW4	44.2
TW8	44.2

*: Applies to both inlet & outlet connections

Ordering Information

EX:	SL	- DV84	M	H	- VM4 - VM8	- K	E	IS
	Body	Series	Actuator	Working Pressure	Inlet / Outlet Connection	Seat	Options	Options
	SL: 316L	DV84	M: Manual (Handwheel) P: Pneumatic actuator (Normally closed)	H: 3500 psi L: 300 psi	VM4, VM8, VSM4, VSM8, VSF4, VSF8 TW4, TW6, TW8	K: PCTFE* V: Vespel®	None: 10~15 μ m E: 5 μ m (EP)	IS: Indicator switch NO: Normally open (Pneumatic)

IS: Electrical Indicator Switch for high pressure Pneumatic Actuator

* Standard Material

Inlet & Outlet Connections		
Type	Size	
VM: Face seal male (FSR fittings)	4, 8	4=1/4"
VSM: Face seal swivel male (FSR fittings)	4, 8	6=3/8"
VSF: Face seal swivel female (FSR fittings)	4, 8	8=1/2"
TW: Tube weld	4, 6, 8	

■ DV86 Series



Handwheel



Pneumatic

Features

- ▶ Suitable for high ultra purity applications
- ▶ 316L Stainless Steel enhances weldability and resistance to corrosion
- ▶ Both manual and pneumatic actuation are available
- ▶ Face seal fittings (FSR) or butt weld connections
- ▶ Internally springless
- ▶ Designed for very low particle generation
- ▶ Metal-to-metal diaphragm seals
- ▶ High-cycle life
- ▶ 1/4 turn of the handle to operate from fully open to closed / Indicator Window
- ▶ Closed and open indication window
- ▶ 100% Helium-leak tested

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE*, Vespel®**
- ▶ Diaphragm: Elgiloy®

Functional Performance

- ▶ Flow capacity: Cv=0.3
- ▶ Maximum leak rate:
 - Inboard leakage: 1×10^{-9} atm cc/sec He
 - Outboard leakage: 1×10^{-9} atm cc/sec He
 - Across seat leakage: 4×10^{-9} atm cc/sec He
- ▶ Proof pressure: 150% of maximum rated pressure
- ▶ Burst pressure: 400% of maximum rated pressure

Operating Conditions

- ▶ Maximum operating pressure:
 - 300 psi (20 bar), 3500 psi (240 bar)
- ▶ Minimum operating pressure: vacuum
- ▶ Temperature: -40°F to 150°F (-40°C to 65°C)
- ▶ Pneumatic actuator
 - Operating pressure: 70 - 125 psi
 - Inlet connection: 1/8" NPT (Female)
 - Normally: Closed

Surface Finish

- ▶ Standard Ra: 10~15 μ in
- ▶ Optional Ra (EP): 7 μ in

Internal Volume

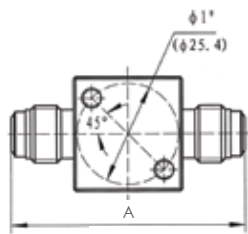
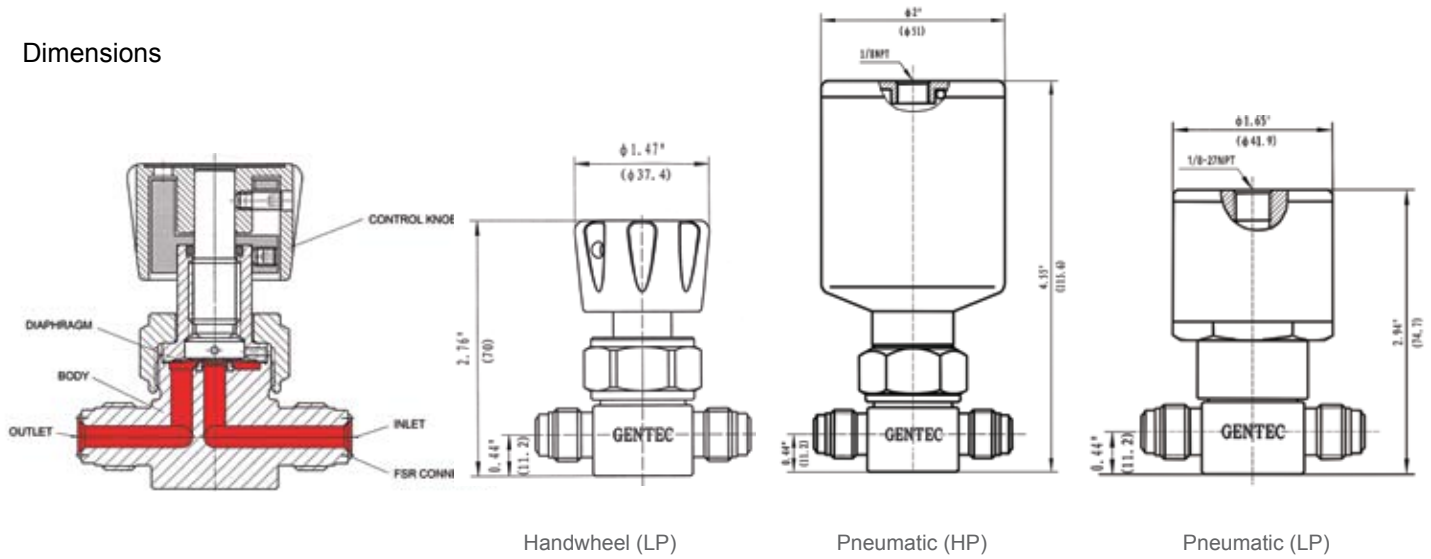
- ▶ 1.6 cc

* Standard Material

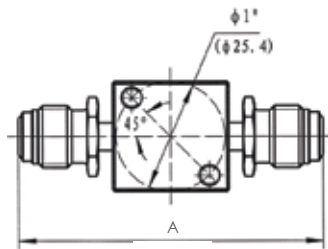
** Vespel® seat is recommended for Nitrous Oxide (N2O) service but is not available for low pressure pneumatic actuation.

DV86 Series

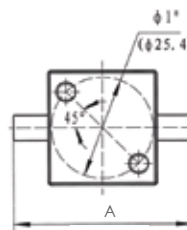
Dimensions



Face Seal Male Fittings



Face Seal Swivel Male Fittings



Tube Weld Stub

Connection*	A (mm)
VM4	58.4
VM8	67.6
VSM4	70.8
VSF4	70.6
TW4	44.2
TW8	44.2

*: Applies to both inlet & outlet connections

Ordering Information

EX:	SL	- DV86	M	H	- VM4 - VM8	- K	IS
	Body	Series	Actuator	Working Pressure	Inlet / Outlet Connection	Seat	Options
	SL: 316L	DV86	M: Manual (Handwheel) P: Pneumatic actuator (Normally closed)	H: 3500 psi L: 300 psi	VM4, VM8, VSM4, VSM8, VSF4, VSF8 TW4, TW6, TW8	K: PCTFE* V: Vespel®	IS: Indicator switch NO: Normally open (Pneumatic)

IS: Electrical Indicator Switch for high pressure Pneumatic Actuator

* Standard Material

Inlet & Outlet Connections		
Type	Size	
VM: Face seal male (FSR fittings)	4, 8	4=1/4"
VSM: Face seal swivel male (FSR fittings)	4, 8	6=3/8"
VSF: Face seal swivel female (FSR fittings)	4, 8	8=1/2"
TW: Tube weld	4, 6, 8	

■ DV88 Series



Features

- ▶ Suitable for high purity applications
- ▶ 316L Stainless Steel enhances weldability and resistance to corrosion
- ▶ Face seal fittings (FSR) or butt weld connections, compression tube fittings
- ▶ Designed for very low particle generation
- ▶ Metal-to-metal diaphragm seals
- ▶ High-cycle life
- ▶ 100% Helium-leak tested

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE
- ▶ Diaphragm: Elgiloy®

Surface Finish

- ▶ Standard Ra: 20µin

Internal Volume

- ▶ 20 cc

Operating Conditions

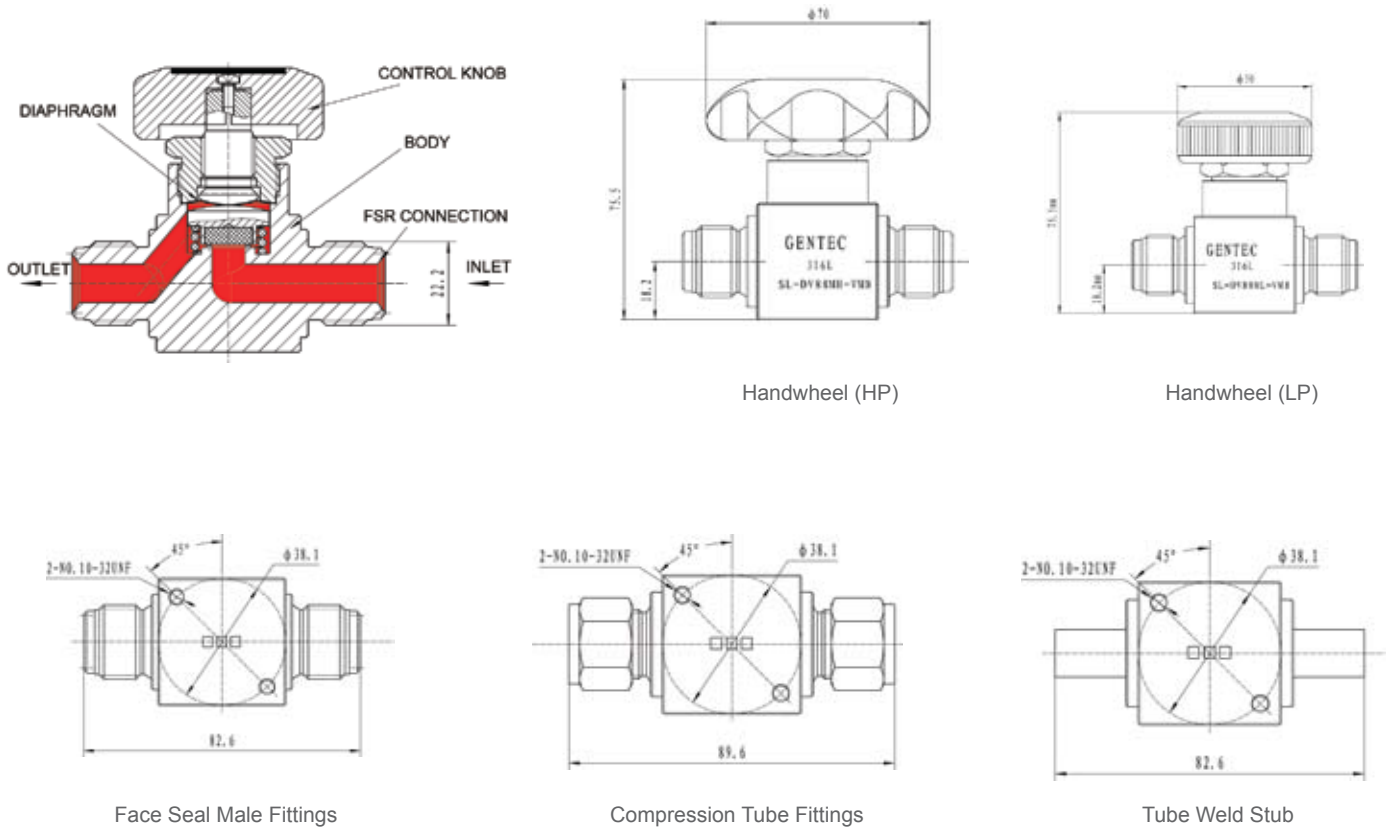
- ▶ Maximum operating pressure: 3500 psi (240 bar), 1000 psi (69 bar)
- ▶ Minimum operating pressure: vacuum
- ▶ Temperature: -40°F to 150°F (-40°C to 65°C)

Functional Performance

- ▶ Flow capacity: Cv=1.0 (3500 psi)
Cv=1.7 (1000psi)
- ▶ Maximum leak rate:
Inboard leakage: 1×10^{-9} atm cc/sec He
Outboard leakage: 1×10^{-9} atm cc/sec He
Across seat leakage: 4×10^{-9} atm cc/sec He
- ▶ Proof pressure: 150% of maximum rated pressure
- ▶ Burst pressure: 400% of maximum rated pressure

DV88 Series

Dimensions



Ordering Information

EX:	SL	- DV88	M	H	- VM8
	Body	Series	Actuator	Working Pressure	Inlet / Outlet Connection
	SL: 316L	DV88	M: Manual	H: 3500 psi M: 1000 psi	VM8: 1/2" Face seal male (FSR fittings) TF8: 1/2" Tube fitting TW8: 1/2" Tube weld

Diaphragm Valves

■ DV90 Series



Features

- ▶ Suitable for high purity applications
- ▶ 316L Stainless Steel enhances welding and corrosion resistance
- ▶ Face seal fitting(FSR), compression tube connections
- ▶ Design for very low particle generation
- ▶ Metal-to-metal diaphragm seals
- ▶ High-cycle life
- ▶ 100% Helium-leak tested

Materials

- ▶ Body: 316L stainless steel
- ▶ Seat: PCTFE
- ▶ Diaphragm: Elgiloy®

Functional Performance

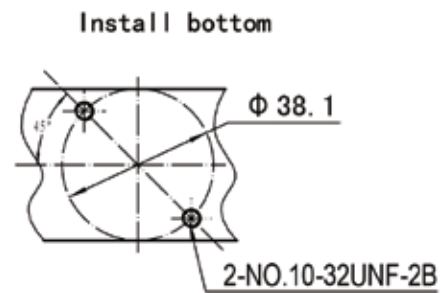
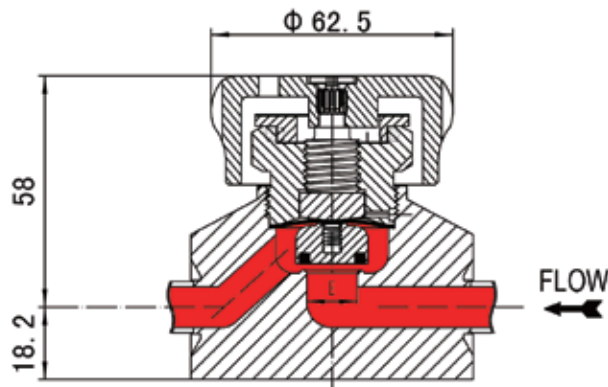
- ▶ Flow capacity: Cv=2.8

Surface Finish

- ▶ Standard Ra: 20 μ m
- ▶ Optional Ra (EP): 7 μ m

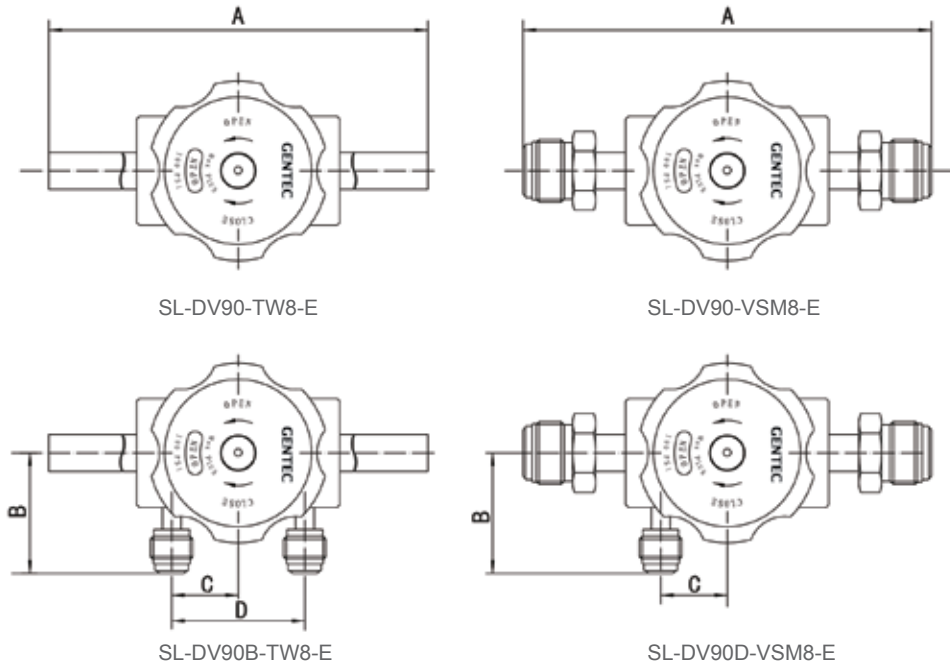
Operating Conditions

- ▶ Maximum operating pressure: 300 psi (20 bar)
- ▶ Temperature: -40°F to 150°F (-40°C to 65°C)



DV90 Series

Dimensions



Model Number	Inlet / Outlet Connections	Orifice (in.)	CV	Dimensions (in.)			
				A	B	C	D
SL-DV90B-VSM8-E	1/2" Face seal swivel male	0.50	2.8	5.61	1.67	0.92	1.83
SL-DV90-VSM8-E	1/2" Face seal swivel male	0.50	2.8	5.61	/	/	/
SL-DV90B-VSF8-E	1/2" Face seal swivel female	0.50	2.8	5.61	1.67	0.92	1.83
SL-DV90-VSF8-E	1/2" Face seal swivel female	0.50	2.8	5.61	/	/	/
SL-DV90B-TW8-E	1/2" Tube weld	0.50	2.8	8.78	1.67	0.92	1.83
SL-DV90-TW8-E	1/2" Tube weld	0.50	2.8	8.78	/	/	/
SL-DV90B-TW12-E	3/4" Tube weld	0.50	2.8	8.78	1.67	0.92	1.83
SL-DV90-TW12-E	3/4" Tube weld	0.50	2.8	8.78	/	/	/

Ordering Information

EX:	SL	- DV90	B	VSM8	- E
	Body	Valve Series	Options	Inlet / Outlet Connections	Surface Finish
	SL: 316L	DV90	(Purge ports, 1/4" male FSR fitting) None: No purge ports U: With inlet purge ports D: With outlet purge ports B: With inlet and outlet purge ports	VSM8 VSF8 TW8 TW12 Please contact GENTEC for more information	E: 7 µin

Inlet & Outlet Connections		
Type	Size	
VSM: Face seal swivel male (FSR fittings)	8	8=1/2"
VSF: Face seal swivel female (FSR fittings)	8	12=3/4"
TW: Tube weld	8, 12	

PRESSURE GAUGES

GU Series



■ GU20SL Series

This 2" pressure gauge is ideal for semiconductor processing, high purity gas delivery, purge panel systems and high purity liquid delivery applications.



Materials

- ▶ Bourdon tube: 316L
- ▶ Socket: 316L
- ▶ Case: 303

Standard

- ▶ ANSI-ASME B40.1 Grade A

Accuracy

- ▶ 2-1-2%

Ordering Information

MODEL NO.	PRESSURE RANGES
1/4" FSR(F)*	(psi)**
GU20SL-30-VSF4	0-30
GU20SL-60-VSF4	0-60
GU20SL-100-VSF4	0-100
GU20SL-200-VSF4	0-200
GU20SL-300-VSF4	0-300
GU20SL-600-VSF4	0-600
GU20SL-1000-VSF4	0-1000
GU20SL-3000-VSF4	0-3000
GU20SL-4000-VSF4	0-4000
GU20SL-V15-VSF4	30 in Hg VAC-15
GU20SL-V30-VSF4	30 in Hg VAC-30
GU20SL-V60-VSF4	30 in Hg VAC-60
GU20SL-V100-VSF4	30 in Hg VAC-100
GU20SL-V200-VSF4	30 in Hg VAC-200

* FSR - Face Seal Fittings

** All gauges are dual scale

FACE SEAL FITTINGS



■ Face Seal Fittings



GENTEC® specializes in designing and manufacturing high quality valves and fittings for High Purity and Ultra-High Purity applications. GENTEC® FSR fittings are available in 316, 316L, or 316 VAR and supplied in BA or EP grade. Fittings are cleaned, bagged individually in nylon bags, and heat-sealed. The inner bag is then placed in a polyethylene outer bag and heat-sealed in a class 100 clean room to meet this stringent demands of the semi-conductor industry.

Material	Ordering Number Designator	Applicable Specification
Bodies, Nuts, Caps and Plugs		
316 stainless steel	SS	Bar Stock: ASME SA479, ASTM A276 Forged Shapes: ASME SA182, ASTM A314
Glands		
316 stainless steel	SL	Bar Stock: ASME SA479, ASTM A276 Forged Shapes: ASME SA182
316L VAR (Vacuum Arc Remelt) stainless steel	SLV	Bar Stock: ASME SA479, ASTM A276 Forged Shapes: ASME SA182
Gaskets		
nickel	NI	ASTM B162
316 stainless steel	SS	ASTM A240, ASTM A167

Plating

FSR female nuts are silver-plated. Avoid chemical processes used for cleaning, electropolishing and passivation that will remove plating. If the plating is damaged or removed, thread galling will occur, damaging fitting components and preventing a proper seal.

Dimensions

- Dimensions are in inches for reference only and subject to change without notice.

Pressure Ratings

- Ratings are based upon tests conducted using FSR assemblies.
- All ratings comply with calculations per ANSI Code for Pressure Piping B31.3.
- Working Pressure ratings determined at room temperature. Allowable Working Pressure of elevated temperatures could be obtained by multiplying factors shown in the following table.

Pressure & Temperature Ratings

Testing

FSR assemblies have been helium-leak tested to a rate of 1×10^{-9} std cc/sec without leakage.

Ultra High Purity

A variety of FSR face seal Glands and Bodies are available with controlled surface finishes, electropolished, and specially cleaned to meet ultra-high-purity system requirements.

COMPONENTS	Material	TEMPERATURE	
		°F	°C
Fittings	316	1000	537
	316L	1000	537
	316L VAR	1000	537
Gaskets	316	1000	537
	nickel	600	315

Temperature (°F)	Favors
100	1.0
200	1.0
300	1.0
400	0.96
500	0.90
600	0.85
700	0.82
800	0.79
900	0.78
1000	0.76

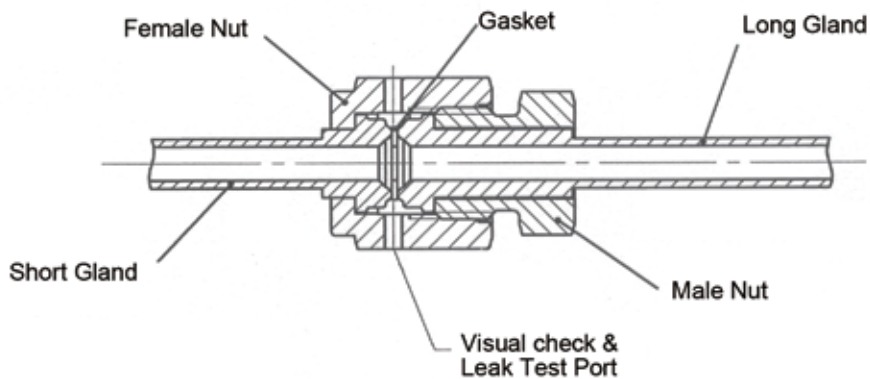
Ordering Information

To order EP fittings, use the following Designator code as a suffix to the Ordering Number.

Example: SLV-VDS-FSR4-T4L7P

Surafave Finish Grade	Desigeator	Surafave Finish
BA	-	10µin (0.25µm)
EP	P	5µin (0.13µm)

Configuration



- Female Nut: female thread is silver-plated to prevent galling, an ensure ease of assembly with consistent make-up.
- Visual Check & Leak Test Port: test port at two locations for easy leak testing.

Heat Code Traceability

Material heat code is stamped on Glands and all shapes to ensure raw Material traceability.

Glands

Short Tube Butt Weld		FSR Size	T Tube OD	Ordering Number	B	E	A	Normal Wall Thickness	Working Pressure (psi)
	1/4"	1/4"	SL*-VDS-FSR4-T4L2	0.25	0.18	0.60	0.035	5100	
	1/4"	1/4"	SL*-VDS-FSR4-T4L7	0.75	0.18	1.10	0.035	5100	
	1/2"	3/8"	SL*-VDS-FSR8-T6L7	0.75	0.31	1.12	0.035	3300	
	1/2"	1/2"	SL*-VDS-FSR8-T8L2	0.25	0.40	0.62	0.049	3500	
	1/2"	1/2"	SL*-VDS-FSR8-T8L7	0.75	0.40	1.12	0.049	3500	
	3/4"	3/4"	SL*-VDS-FSR12-T1	0.75	0.65	1.38	0.049	2400	

Long Tube Butt Weld		FSR Size	T Tube OD	Ordering Number	B	E	A	Normal Wall Thickness	Working Pressure (psi)
	1/4"	1/4"	SL*-VD-FSR4-T4L2	0.25	0.18	1.20	0.035	5100	
	1/4"	1/4"	SL*-VD-FSR4-T4L7	0.75	0.18	1.70	0.035	5100	
	1/2"	3/8"	SL*-VD-FSR8-T6L7	0.75	0.31	1.79	0.035	3300	
	1/2"	1/2"	SL*-VD-FSR8-T8L2	0.25	0.40	1.29	0.049	3500	
	1/2"	1/2"	SL*-VD-FSR8-T8L7	0.75	0.40	1.79	0.049	3500	
	3/4"	3/4"	SL*-VD-FSR12-T12L7	0.75	0.65	2.03	0.049	2400	

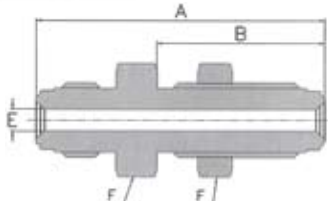
*: 316VCR stainless steel is available, please replace SL with SLV.

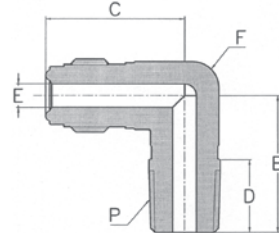
Bodies

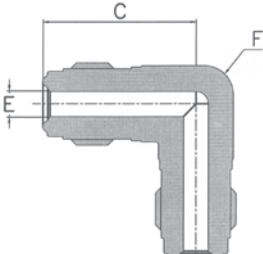
Male NPT Connector		FSR Size	P MALE NPT Size	Ordering Number	B	E	F Hex Flat	A	Working Pressure (psi)
	1/4"	1/4"	SS-VMC-VM4-NT4	0.56	0.18	5/8	1.49	8000	
	1/2"	1/2"	SS-VMC-VM8-NT8	0.75	0.40	15/16	1.84	3500	
	3/4"	3/4"	SS-VMC-VM12-NT12	0.75	0.62	1 5/16	2.19	3000	

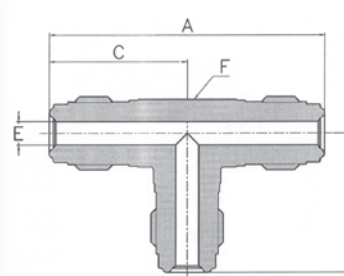
Double Male Union		FSR Size	Ordering Number	E	F Hex Flat	A	Working Pressure (psi)
	1/4"	SS-VU-VM4	0.18	5/8	1.55	5100	
	1/2"	SS-VU-VM8	0.4	15/16	1.84	3500	
	3/4"	SS-VU-VM12	0.62	1 5/16	2.44	2400	

Bodies

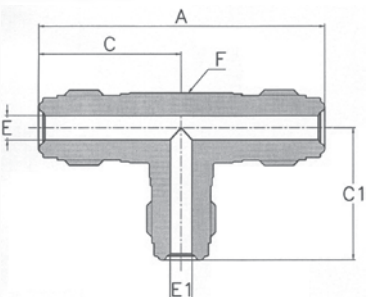
Bulkhead Union		FSR Size	Ordering Number	B	E	F Hex Flat	A	Panel Hole Size	Max. Panel Thickness	Working Pressure (psi)
		1/4"	SS-VBU-VM4	1.30	0.18	3/4	2.23	19/32	0.44	8000
		1/2"	SS-VBU-VM8	1.48	0.40	1 1/16	2.57	29/32	0.5	3500

FSR to Male NPT Elbow		FSR Size	P Male NPT Size	Ordering Number	C	B	D	E	F Wrench Flat	Working Pressure (psi)
		1/4"	1/4"	SS-VME-VM4-NT4	1.07	1.05	0.56	0.18	1/2	8000
		1/2"	1/2"	SS-VME-VM8-NT4	1.45	1.45	0.75	0.40	13/16	3500

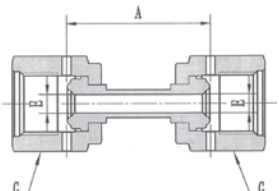
Union Elbow		FSR Size	Ordering Number	C	E	F Wrench Flat	Working Pressure (psi)
		1/4"	SS-VUE-VM4	1.07	0.18	1/2	8000
		1/2"	SS-VUE-VM8	1.45	0.4	13/16	3500
		3/4"	SS-VUE-VM12	1.92	0.62	1 1/4	3000

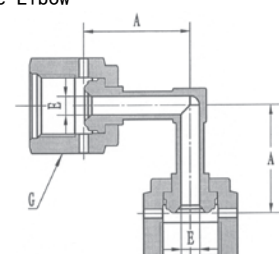
Union Tee		FSR Size	Ordering Number	C	E	A	F Wrench Flat	Working Pressure (psi)
		1/4"	SS-VUT-VM4	1.07	0.18	2.14	1/2	8000
		1/2"	SS-VUT-VM8	1.45	0.4	2.9	13/16	3500
		3/4"	SS-VUT-VM12	1.92	0.62	3.84	1 1/4	3000

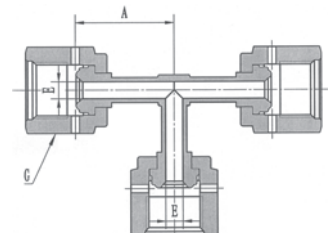
Bodies

Reducing Tee		FSR Size	Ordering Number	C	C1	B	B1	A	F Wrench Flat	Working Pressure (psi)
		1/2" x 1/4" x 1/2"	SS-VRUT-VM8-4-8	1.45	1.25	0.40	0.18	2.90	13/16	3500
		3/4" x 1/4" x 3/4"	SS-VRUT-VM12-4-12	1.92	1.50	0.62	0.18	3.84	1 1/4	3000
		3/4" x 1/2" x 3/4"	SS-VRUT-VM12-8-12	1.92	1.68	0.62	0.40	3.84	1 1/4	3000

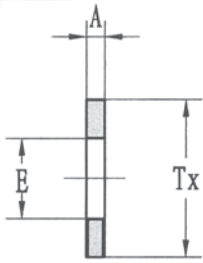
Welding Assemblies

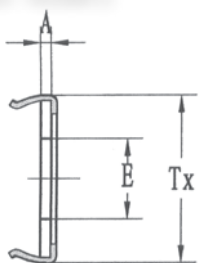
Rotating Female Union		FSR Size	Ordering Number	E	G	A	Working Pressure (psi)
		1/4"	SS-VSU-VSF4	0.18	3/4	2.14	8000
		1/2"	SS-VSU-VSF4	0.4	1 1/16	2.9	3500

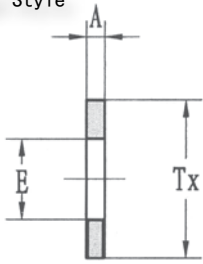
Female Elbow	
	<p>Ordering Number: SLV-VSUE-VSF4</p> <p>Female end: A=1.0</p> <p>Male end: A=1.5</p> <p>Elbows are available with welded male and female ends. For more information, please contact factory.</p>

Female Tee	
	<p>Ordering Number: SLV-VSUT-VSF4</p> <p>Female end: A=1.0</p> <p>Male end: A=1.5</p> <p>Tees are available with welded male and female ends. For more information, please contact factory.</p>

Gasket

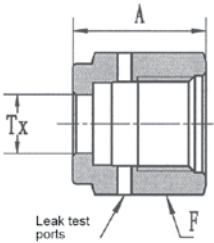
Silver Plated (Stainless Steel) Non-Retained Style	FSR Size	Ordering Number	E	A	TX
	1/4"	SS-VG-FSR4	0.22	0.03	0.47
	1/2"	SS-VG-FSR8	0.44	0.03	0.78
	3/4"	SS-VG-FSR12	0.66	0.03	1.14

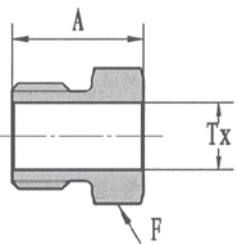
Silver Plated (Stainless Steel) Gasket Retainer Assembly	FSR Size	Ordering Number	E	A	TX
	1/4"	SS-VGR-FSR4	0.24	0.03	0.5
	1/2"	SS-VGR-FSR8	0.44	0.03	0.79
	3/4"	SS-VGR-FSR12	0.66	0.03	1.14

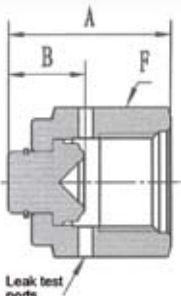
Unplated (Nickel) Non-Retained Style	FSR Size	Ordering Number	E	A	TX
	1/4"	NI-VGS-FSR4	0.22	0.03	0.47
	1/2"	NI-VGS-FSR8	0.44	0.03	0.78
	3/4"	NI-VGS-FSR12	0.66	0.03	1.14

Unplated (Nickel) Gasket Retainer Assembly	FSR Size	Ordering Number	E	A	TX
	1/4"	NI-VGRS-FSR4	0.24	0.03	0.5
	1/2"	NI-VGRS-FSR8	0.44	0.03	0.79
	3/4"	NI-VGRS-FSR12	0.66	0.03	1.14

Nut,Caps,Plugs

Female Nut		FSR Size	Ordering Number	F	A	TX
		1/4"	SS-VN-FSR4	3/4	0.81	0.36
		1/2"	SS-VN-FSR8	1 1/16	0.88	0.61
		3/4"	SS-VN-FSR12	1 1/2	1.12	0.89

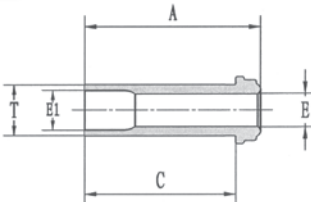
Male Nut		FSR Size	Ordering Number	F	A	TX
		1/4"	SS-VMN-FSR4	5/8	0.71	0.36
		1/2"	SS-VMN-FSR8	15/16	0.81	0.61
		3/4"	SS-VMN-FSR12	1 5/16	1.00	0.89

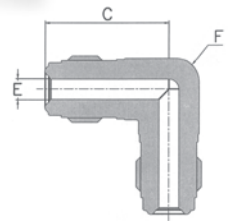
Cap		FSR Size	Ordering Number	B	F	A
		1/4"	SS-VCP-FSR4	0.44	3/4	0.94
		1/2"	SS-VCP-FSR8	0.45	1 1/16	1.01
		3/4"	SS-VCP-FSR12	0.54	1 1/2	1.29

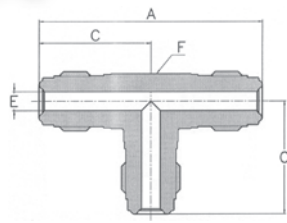
Plug		FSR Size	Ordering Number	F	A
		1/4"	SS-VP-FSR4	5/8	0.92
		1/2"	SS-VP-FSR8	15/16	1.08
		3/4"	SS-VP-FSR12	1 5/16	1.43

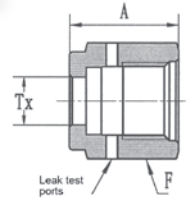
Face Seal Fittings

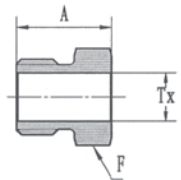
High-Flow Connections

Glands			FSR Size	T Tube OD	Ordering Number	C	E	EI	A	Normal Wall Thickness	Working Pressure (psi)
				1/4"	3/8"	SL*-HVDS-FSR4-T6L2	0.41	0.25	0.31	0.60	0.035
			1/4"	3/8"	SL*-HVDS-FSR4-T6L7	1.12	0.25	0.31	1.31	0.035	3300

Union Elbow			FSR Size	Ordering Number	C	E	F	Working Pressure (psi)
				1/4"	SS-HVUE-VM4	1.07	0.25	1/2

Union Tee			FSR Size	Ordering Number	C	E	A	F	Working Pressure (psi)
				1/4"	SS-HVUT-VM4	1.07	0.25	2.14	1/2

Female Nut			FSR Size	Ordering Number	F	A	Tx
				1/4"	SS-HVN-FSR4	3/4	0.81

Male Nut			FSR Size	Ordering Number	F	A	Tx
				1/4"	SS-HVMN-FSR4	5/8	0.71

Assembly Instructions

STEP 1 PROTECTION



Remove plastic protector cap protecting the gland sealing surfaces. Go to STEP2A for Retainer Assembly, other go to STEP2B.

STEP 2A RETAINER ASSEMBLY



Place retained Gasket over gland face. Be careful not to scratch or nick sealing surface as this could affect performance.

STEP 2B NON-RETAINER ASSEMBLY



Place Gasket into female nut.

STEP 3 FINGERTIGHT



Assemble components and snug to fingertight.

STEP 4 MARK



Mark the hex flat on both the male and female nuts

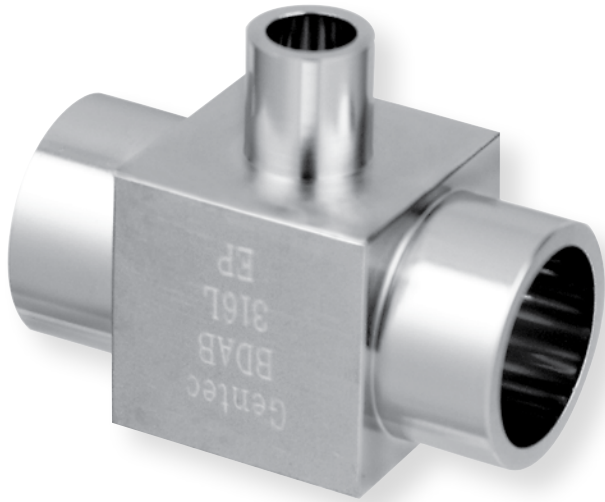
STEP 5 TIGHTEN



Holding the backup wrench stationary, tighten the female nut 1/8 turn past fingertight.

Note: Extreme over tightening will damage surface and cause potential leakage.

High-Plow Connections



GENTEC® weld fittings offer high integrity Connections in ultra high purity systems. GENTEC® weld fittings also provide compact designs for use with orbital weld equipment. The stainless steel weld fittings feature special machining and surface enhancement to prevent outgassing and inhibit corrosion.

Features

- ▶ Compact design
- ▶ Accommodates tubing systems requiring miniaturization
- ▶ Allow close component spacing

Material

- ▶ 316L, 316L VAR and 316L VIM/VAR stainless steel are available. 316L stainless steel is the standard Material. When ordering other Materials, please replace SL with SLV or SLVV.

Ordering InformationS

- ▶ To order EP fittings, use the following Designator code as a suffix to the Ordering Number.
Example: SLV-MRU-4-2P

Technical Date

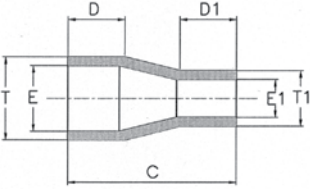
ULTRA HIGH PURITY

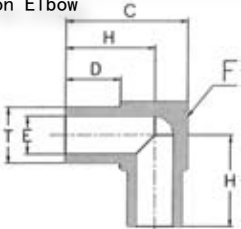
- ▶ Weld fittings are available with controlled Surface Finishing, electropolishing and specialized cleaning to meet ultra-high-purity system requirements.

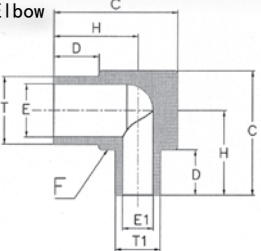
Material	Designator
316L	SL
316 VAR	SLV
316 VIM / VAR	SLVV

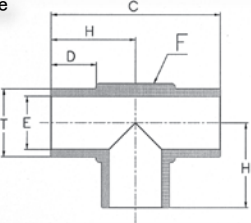
Surafave Finish Grade	Designator	Surafave Finish
BA	-	10µin (0.25µm)
EP	P	5µin (0.13µm)

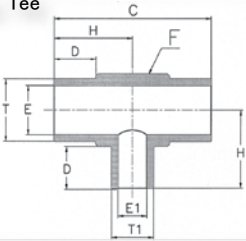
Size	Pressure Rating		Nominal Wall Thickness
	psi	bar	
1/8"	8500	580	0.028"
1/4"	5100	350	0.035"
3/8"	3300	220	0.035"
1/2"	3500	240	0.049"

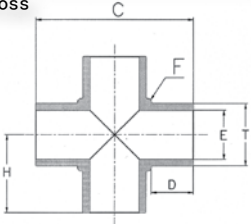
Reducing Union		T	T1	Ordering Number	C	D	D1	E	E1	Pressure Rating (psi)
		1/4	1/8	SL-MRU-4-2	0.75	0.41	0.25	0.18	0.07	5100
		3/8	1/4	SL-MRU-6-4	0.75	0.41	0.25	0.18	0.07	5100
		1/2	1/4	SL-MRU-8-4	0.75	0.41	0.25	0.18	0.07	5100
		1/2	3/8	SL-MRU-8-6	0.75	0.41	0.25	0.18	0.07	5100

90° Union Elbow		T	Ordering Number	C	D	E	F	H	Pressure Rating (psi)
		1/4	SL-MUE-4	0.56	0.25	0.18	5/16	0.41	5100
		3/8	SL-MUE-6	0.69	0.25	0.31	7/16	0.47	3300
		1/2	SL-MUE-8	0.81	0.25	0.4	9/16	0.53	3700

Reducing Elbow		T	T1	Ordering Number	C	D	E	E1	F	H	Pressure Rating (psi)
		3/8	1/4	SL-MRE-6-4	0.69	0.25	0.31	0.18	7/16	0.47	3300
		1/2	1/4	SL-MRE-8-4	0.81	0.25	0.4	0.18	9/16	0.53	3700
		1/2	3/8	SL-MRE-8-6	0.81	0.25	0.4	0.31	9/16	0.53	3300

Union Tee		T	Ordering Number	C	D	E	F	H	Pressure Rating (psi)
		1/4	SL-MUT-4	0.82	0.25	0.18	5/16	0.41	5100
		3/8	SL-MUT-6	0.94	0.25	0.31	7/16	0.47	3300
		1/2	SL-MUT-8	1.06	0.25	0.4	9/16	0.53	3700

Reducing Tee		T	T1	Ordering Number	C	D	E	E1	F	H	Pressure Rating (psi)
		3/8	1/4	SL-MRT-6-4	0.94	0.25	0.31	0.18	7/16	0.47	3300
		1/2	1/4	SL-MRT-8-4	1.06	0.25	0.4	0.18	9/16	0.53	3700
		1/2	3/8	SL-MRT-8-6	1.06	0.25	0.4	0.31	9/16	0.53	3300

Union Cross		T	Ordering Number	C	D	E	F	H	Pressure Rating (psi)
		1/4	SL-MUC-4	0.82	0.25	0.18	5/16	0.41	5100
		3/8	SL-MUC-6	0.94	0.25	0.31	7/16	0.47	3300
		1/2	SL-MUC-8	1.06	0.25	0.4	9/16	0.53	3700

ALL DIMENSIONS ARE IN INCHES

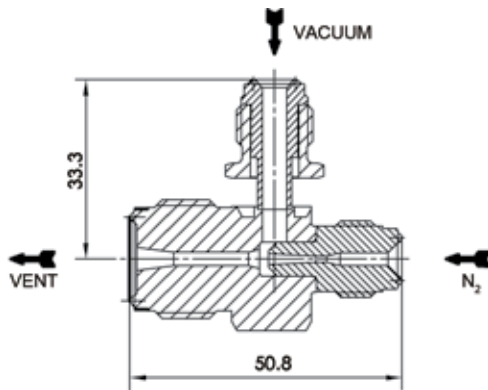
Vacuum Generators



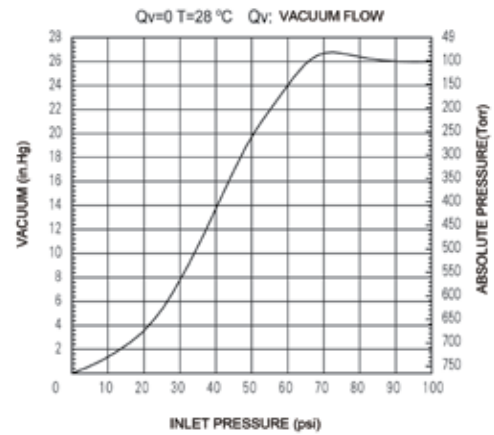
Features

- ▶ Stainless Steel 316L construction
- ▶ Cleaned, welded assembled, tested and packaged in Class 10 clean room
- ▶ Internal Surface Finish 0.4 μ m
- ▶ 660 mmHg (100 Torr) vacuum generated with a minimum source nitrogen pressure of 75 psig
- ▶ Helium leak tested
- ▶ Used in gas delivery systems to assist in purging piping systems.

Dimensions



Vacuum Chart



Ordering Information

EX:	SL	- VG22	- VM4	- VM4	- VM8	Connections
	BODY	Series	N ₂ Inlet	Vent Connections	Vacuum Connections	
	SL: 316L	VG22	VM4	VM4 VM8	VM4 VSM4 VSF4 TW4	VM4: 1/4" face seal male VM8: 1/2" face seal male VSM4: 1/4" face seal swivel male VSF4: 1/4" face seal swivel female TW4: 1/4" tube weld

■ Conversion Factors for Units of Pressure

TO COVER FROM TO	psig	mbar	bar	atm	Pa	KPa	MPa	cm H ₂ O @20 °C	in H ₂ O @20 °C	ft H ₂ O @20 °C	mm Hg @20 °C	in Hg @20 °C	kg / cm ²	ft.sea water
psig	1	68.948	0.069	0.068	6894.76	6.895	6.89476 × 10 ⁻³	70.433	27.730	2.311	51.715	2.036	0.070	2.246
mbar	0.015	1	0.001	9.86923 × 10 ⁻⁴	100	0.1	0.0001	1.022	0.040	0.034	0.750	0.030	0.001	0.033
bar	14.504	1000	1	0.987	100000	100	0.1	1021.5	402.18	33.52	750.06	29.53	1.110	32.571
atm	14.697	1013.25	1.013	1	101325	101.325	0.101	1035.08	407.511	35.959	760.0	29.921	1.033	33.032
Pa	1.45038 × 10 ⁻⁴	0.01	0.00001	9.89623 × 10 ⁻⁶	1	0.001	0.000001	0.010	0.004	3.352 × 10 ⁻⁴	7.5006 × 10 ⁻⁴	2.953 × 10 ⁻⁴	1.019716 × 10 ⁻⁵	3.2571 × 10 ⁻⁴
kPa	0.145	10	0.01	0.010	1000	1	0.001	10.215	4.021	0.335	7.501	0.295	0.102	0.326
MPa	145.024	10000	10	9.869	1000000	1000	1	10215	4021.18	335.2	7500.6	295.300	10.197	325.71
cm H ₂ O @20 °C	0.014	0.979	9.7891 × 10 ⁻⁴	9.66105 × 10 ⁻⁴	97.891	0.098	9.7891 × 10 ⁻⁵	1	0.394	0.035	0.734	0.029	9.9821 × 10 ⁻⁴	0.032
in H ₂ O @20 °C	0.036	2.468	0.002	2.45932 × 10 ⁻³	248.64	0.249	2.4864 × 10 ⁻⁴	2.540	1	0.083	1.865	0.073	0.003	0.081
ft H ₂ O @20 °C	0.433	29.837	0.030	0.294	2983.68	2.984	2.98368 × 10 ⁻³	30.480	12	1	22.380	0.881	0.030	0.972
mm Hg @0 °C	193368	1.333	0.001	0.001	133.322	0.133	1.33322 × 10 ⁻⁴	1.362	0.536	0.045	1	0.039	0.001	0.043
in Hg @0 °C	0.491	33.864	0.034	0.033	3386.39	3.386	3.3869 × 10 ⁻³	34.593	13.619	1.135	25.4	1	0.035	1.103
kg / cm ²	14.223	980.665	0.981	0.968	98060.5	98.067	0.098	1001.8	394.41	32.868	735.559	28.959	1	31.941
ft.sea water	0.445	30.702	0.031	0.030	3070.2	3.070	3.0702 × 10 ⁻³	31.364	12.348	1.029	23.029	0.907	0.031	1

■ Conversion Factors for Units of Flow

TO COVER FROM TO	l / SEC	l / MIN (LPM)	m ³ / h	m ³ / min	ft ³ / h (SCFH)	ft ³ / min
l / SEC	1	60	3.6	0.06	127.14	2.119
l / MIN (LPM)	0.017	1	0.06	0.001	2.119	0.035
m ³ / h	0.278	16.667	1	0.017	35.317	0.059
m ³ / min	16.667	1000	60	1	2118	35.317
ft ³ / h (SCFH)	0.008	0.472	0.283	0.000	1	0.017
ft ³ / min	0.472	28.315	1.699	0.028	60	1

Material Compatibility Table

Gas	Materials											
	Aluminum	Brass	Copper	Mone	Stainless Steel	Carbon Steel	Neoprene	PCTFE (Kel-F)	Viton	Polyethyler	PVC	PTFE (Teflon)
Ammonia	◇	◆	◆	☆	◇	◆	◇	◇	◆	◆	◇	◇
Argon	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
CO ₂	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Chlorine	◆	◆	◆	◇	☆	◇	◆	◇	◇	◇	◆	◇
Diborane	◇	◇	◇	◇	◇	◇	◆	◇	◇	◆	◆	◇
Helium	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Hydrogen	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
HCl	◆	◆	◆	◇	☆	◆	◇	◇	◇	◇	◇	◇
H ₂ S	☆	◆	◆	☆	◇	◆	◆	◇	◇	◇	◇	◇
Methane	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Nitrogen	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
N ₂ O	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Oxygen	◇	◇	◇	◇	◇	◇	◇	◇	◇	◆	◆	◇
Phosphine	◇	◆	◆	◇	◇	◇	◆	◇	◇	◇	◇	◇
Silane	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
SO ₂	◇	◇	☆	◇	◇	◇	◆	◇	◆	◇	◇	◇
F ₆ S	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Arsine	◆	◇	◆	◇	◇	◇	◇	◇	◇	◇	◇	◇
Boron Trichloride	◆	◆	◇	◇	◇	◇	◆	◇	◇	◆	◇	◇
Boron Trifluoride	◇	◆	◇	◇	◇	◇	◆	◇	◆	◆	◇	◇
Dichlorosilane	◆	◆	◆	◇	◇	◇	◆	◇	◆	◆	◆	◇
Silicon Tetrachloride	◆	◆	◆	◇	◇	◇	◆	◇	◆	◆	◆	◇
Acetylene	◇	◇	◆	◇	◇	◇	◇	◇	◇	◇	◆	◇
Air	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Butane	◇	◇	◇	◇	◇	◇	◇	◇	◇	◆	◇	◇
Carbon Monoxide	◇	◇	◇	◇	◇	◇	◆	◇	◇	◇	◇	◇
Cyclopropane	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Ethane	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Ethylene	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◆	◇
Ethylene Oxide	◆	◆	◆	◇	◇	◇	◆	◇	◆	◆	◆	◇
Isobutane	◇	◇	◇	◇	◇	◇	◇	◇	◇	◆	◇	◇
Krypton	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Methyl Chloride	◆	◆	☆	◇	◇	◇	◇	◇	◇	◇	◆	◇
Neon	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
NO	◇	◆	◆	◆	◇	☆	◆	◇	◇	◇	◇	◇
Propane	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Xenon	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

◇ Recommended

◆ Not recommended

☆ Recommended only for dry-grades of gas

■ Cylinder Connections Allocation Table

Gas	BSP	DIN	CGA	UHP CGA	JIS
Acetylene	BS 341 nr.2	/	510	/	/
Air	BS 341 nr.3	/	346	/	/
Ammonia	BS 341 nr.10	DIN 6	705	720	22-R
Argon	BS 341 nr.3	DIN 6	580	718	22-4 or 23-R
Arsine	/	/	350	632	22-L
Boron Trichloride	/	DIN 8	660	634	/
Boron Trifluoride	/	DIN 8	330	642	22-L
Butane	BS 341 nr.4	/	510	/	/
Carbon Dioxide	BS 341 nr.8	DIN 6	320	716	/
Carbon Monoxide	BS 341 nr.4	DIN 5	350	724	22-L
Cyclopropane	BS 341 nr.4	/	510	/	/
Diborane	/	/	350	632	22-L
Dichlorosilane	/	DIN 5	678	636	/
Diethylzinc	/	/	510	726	/
Ethane	/	/	350	/	/
Ethyl Chloride	/	/	510	/	/
Ethylene	/	/	350	/	/
Ethylene Oxide	/	/	510	/	/
Germane	/	/	350 or 660	632	/
R11 (R116) / Halocarbon 11 (116)	/	/	660	716	/
R12 (R13, R23, R115) / Halocarbon 12 (13,23,115)	/	DIN 6	660	716	/
R14 (Halocarbon 14)	/	DIN 6	320 or 580	716	/
Helium	BS 341 nr.3	DIN 6	580	718	22-R or 23-R
Hydrogen	BS 341 nr.2	DIN 1	350	724	22-L
Hydrogen Chloride	/	DIN 8	330	634	26-R
Hydrogen Fluoride	/	/	660 or 670	638	26-R
Hydrogen Sulfide	/	DIN 5	330	722	/
Iso-Butane	/	/	510	/	/
Krypton	/	DIN 6	580	718	22-R or 23-R
Methane	BS 341 nr.2	/	350	/	/
Methyl Chloride	/	/	660	/	/
Natural Gas	/	/	350	/	/
Neon	/	DIN 6	580	718	22-R or 23-R
Nitric Oxide	/	/	660	/	/
Nitrogen	BS 341 nr.3	DIN 10	580	718	22-R or 23-R
Nitrogen Trifluoride	/	DIN 8	330 or 670	640	/
Nitrous Oxide	BS 341 nr.13	DIN 8	326	712	/
Oxygen	BS 341 nr.3	DIN 9	540	714	22-R or 23-R
Phosphine	/	DIN 1	350	632	/
Propane	BS 341 nr.4	/	510	/	/
Silane	/	/	350	632	/
Silicon Tetrachloride	/	/	330	636	/
Silicon Tetrafluoride	/	/	330	642	22-L
Sulfur Hexafluoride	/	DIN 6	590	716	26-R
Tungsten Hexafluoride	/	DIN 8	670	638	/
Xenon	/	DIN 6	580	718	22-R

* Chart is for reference only



F Series Filters

- ▶ Inline Filter
- ▶ T-Type Filter



Specialty Gas Control Panels

- ▶ Specialty Gas Control Panel
- ▶ Terminal Gas Control Panel
- ▶ Generator Back-up Control Panel
- ▶ Accessories



Valves

- ▶ Needle valves
- ▶ Ball valves
- ▶ Diaphragm valves
- ▶ Cylinder valves
- ▶ Gauge valves
- ▶ Check valves



Tube Fittings

- ▶ Male connectors
- ▶ Male elbows
- ▶ Male adapters
- ▶ Female connectors
- ▶ Female elbows
- ▶ Unions
- ▶ Reducing unions



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