GENTEC®

www.gentec.com

ULTRA HIGH PURITY

Regulators • Diaphragm Valves • Pressure Gauges • Fittings • Vacuum Generators

Solutions for Life

Company Overview

Genstar Technologies is a global leader in Gas Flow Control Systems for the industrial, specialty gas and medical sectors. We pride ourselves in our ability to provide our customers with high quality, value-added products and services that go beyond the industry standards. As a result, we have a global network of thousands of satisfied customers in over 60 countries.

Our Team

Our highly educated team of engineers, salespeople, technicians, managers, and customer service personnel are dedicated to providing you with products with the highest quality, reliability and performance. We hold the highest standards to our manufacturing processes; our total process management maximizes our production efficiency while ensuring product quality.

We work closely with all of our customers to design products specific to your needs. This includes developing new products, redesigning existing products, and customizing configuration / packaging. It is our priority to foster a strong relationship with each and every customer.

Quality Assurance

All of our products are manufactured under stringent quality control. We are ISO 9001:2001 and API certified.
Our products meet UL, CE, SEMI, and various international standards and certifications.

Manufacturing Capabilities

The manufacturing facility is equipped with CNC machines, electro-polishing equipment, and precision automated orbital welding systems, among other features, to ensure the production of the highest quality products.

Clean Room Facilities

Our class 10/100/1000 clean rooms are designed for Ultra High Purity (UHP) products. UHP products undergo precision machining, surface finishing, electro-polishing and passivation. All UHP products are cleaned by 18MΩ DI water in a cascade ultrasonic tank. To ensure the highest UHP product quality, they are then vacuum-dried and double-bagged.

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UHP REGULATORS

U Series

100% Helium Leak Test

Pressure Gauge

- 316L stainless steel case provides durability
- German imported Bourdon tubes provide high accuracy and stability

Connection Point

- Connection points at the pressure gauge and body, inlet/outlet connection and body, are arc welded using advanced automated welding machines, effectively preventing leakage, enhancing seal characteristics

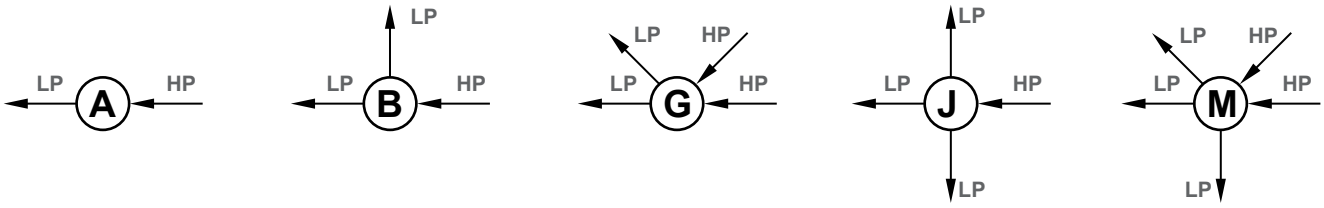
Body

- Fabricated from high-strength corrosion-resistant 316L stainless steel bar stocks
- Fabricated with advanced CNC machines to produce the highest quality of parts
- Wetted area are electropolished, Surface Finish of 10μin is optional
- 316L & Hastelloy diaphragms produce a metal to metal, leak-proof seal
- Multiple Port Configurations and inlet/outlet connections to satisfy all requirements

Inlet / Outlet Connection

- Fabricated from 316L stainless steel
- Multiple connection styles available: Face Seal Male FSR(M), Face Seal Female FSR(F) as well as swivel face seal fittings and tube weld connections

Regulator Port Configurations



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.

U21SLGK-DIP-91-91

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

Materials

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

Functional Performance

- Flow capacity: Cv=0.14
- Maximum leak Rate:
  Inboard leakage: 2 x 10^{-9} atm cc/sec He
  Across seat leakage: 4 x 10^{-8} atm cc/sec He
- Proof pressure: 150% of maximum rated pressure
- Burst pressure: 400% of maximum rated pressure

Surface Finish

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

Internal Volume

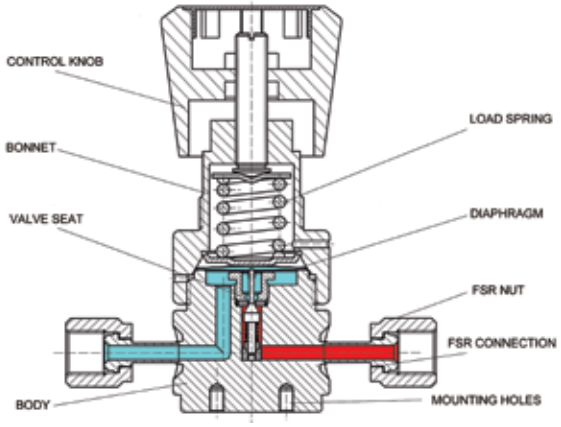
- 4.6 cc

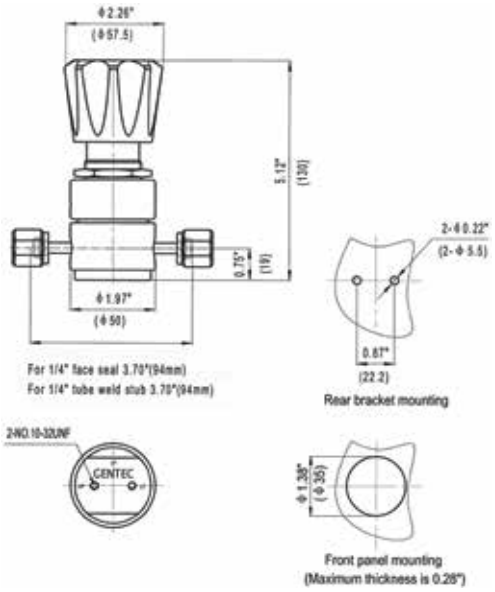
Operating Conditions

- 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 ~ 165°F(-40°C ~ 74°C)

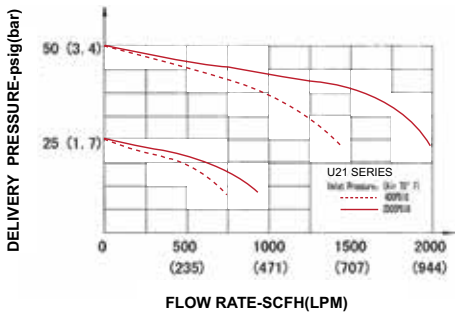
*: Standard Material

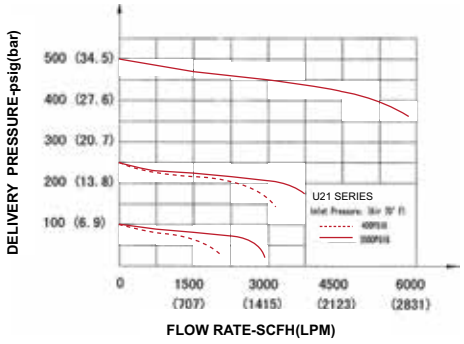
Dimensions





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: Vespel®	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: 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

*: Gauges' connection: 1/4"FSR , other connection type please conect 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.

U22SLGK-DIP-91-91

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

Materials

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

Functional Performance

- Flow capacity: Cv=1.1
- Maximum leak Rate:
  Inboard leakage: 2 x 10^{-9} atm cc/sec He
  Across seat leakage: 4 x 10^{-8} atm cc/sec He
- Proof pressure: 150% of maximum rated pressure
- Burst pressure: 400% of maximum rated pressure

Surface Finish

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

Internal Volume

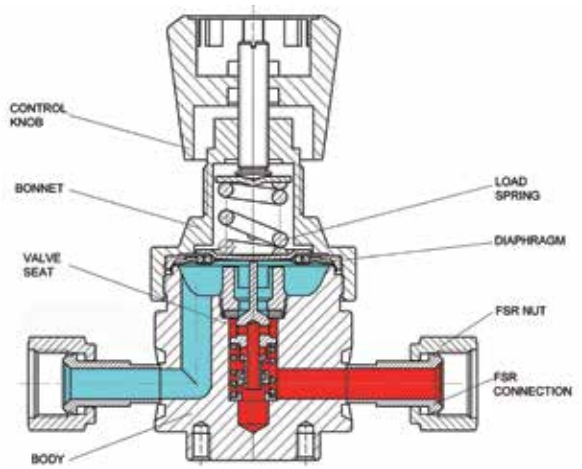
- 22.6 cc

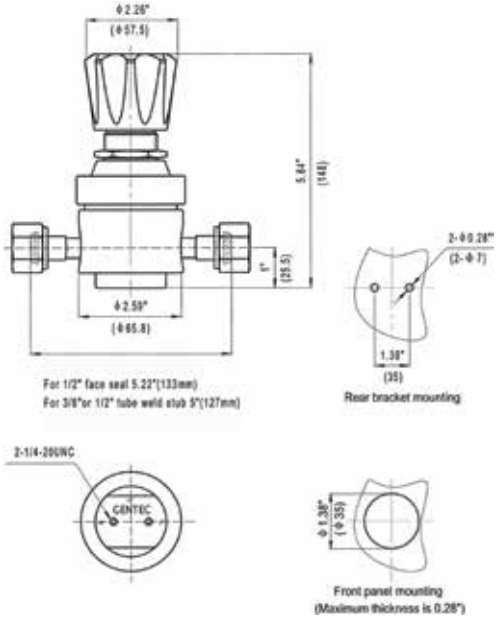
Operating Conditions

- 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 ~ 165°F(-40°C ~ 74°C)

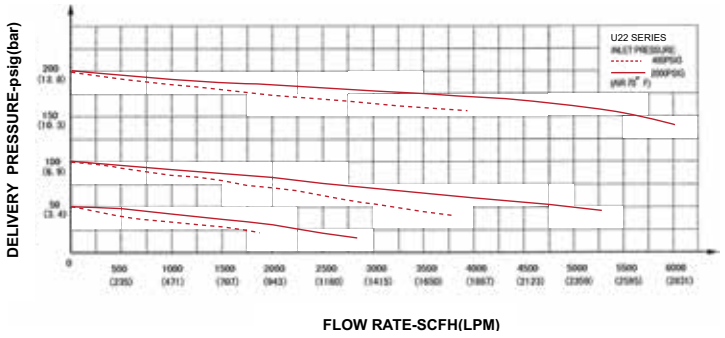
*: Standard Material

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 B G J M	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: psi / bar Gauge	95: 1/2" FSR(F) 96: 1/2" FSR(M)	E: Ra 10 µin P: Panel Mounting H: Hastelloy® Diaphragm

*: Gauges' connection: 1/4"FSR , other connection type please conect 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.

U23SLGK-DIP-91-91

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

Materials

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

Functional Performance

- Flow capacity: Cv=1.8
- Maximum leak Rate:
  Inboard leakage: 2 x 10^{-9} atm cc/sec He
  Across seat leakage: 4 x 10^{-8} atm cc/sec He
- Proof pressure: 150% of maximum rated pressure
- Burst pressure: 400% of maximum rated pressure

Surface Finish

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

Internal Volume

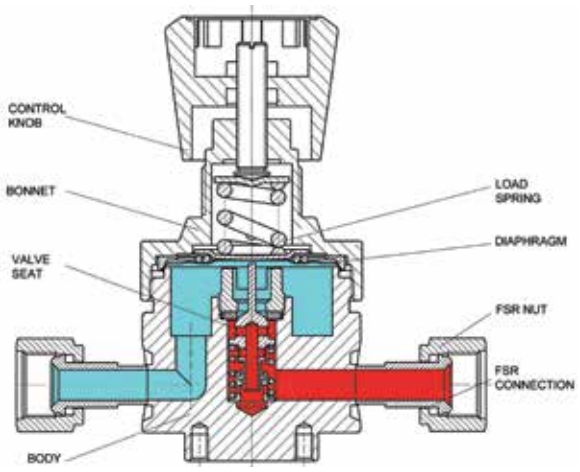
- 59.9 cc

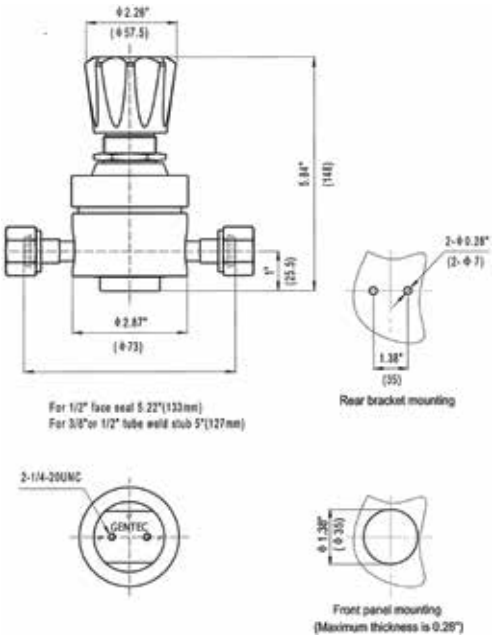
Operating Conditions

- 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 ~ 165°F(-40°C ~ 74°C)

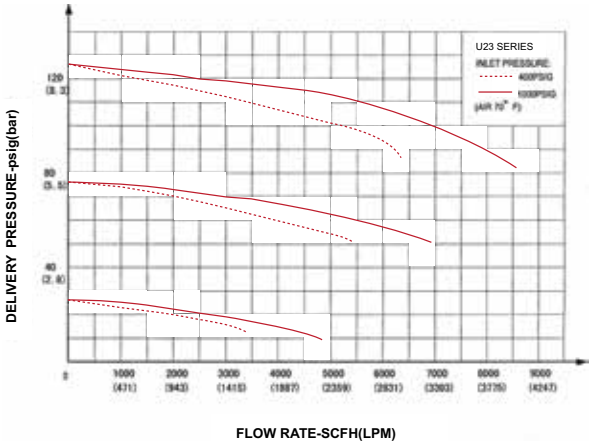
*: Standard Material

Dimensions





Flow Data



Ordering Information

EX:	U23	SL	B	K	- D	H	P -	95 - 95	- P
	Series	Body Material	Body Ports	Seat	Inlet Pressure	Outlet Pressure	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: psi / bar Gauge	95: 1/2" FSR(F) 96: 1/2" FSR(M)	E: Ra 10 µin P: Panel Mounting H: Hastelloy® Diaphragm

*: Gauges' connection: 1/4"FSR , other connection type please conect 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.

U53SLGK-GLP-91-91

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

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: 5 x 10^{-10} atm cc/sec He
  Outboard leakage: 2 x 10^{-9} atm cc/sec He
  Across seat leakage: 4 x 10^{-9} atm cc/sec He
- Proof pressure: 150% of maximum rated pressure
- Burst pressure: 400% of maximum rated pressure

Surface Finish

- Standard Ra (EP): 10 µin

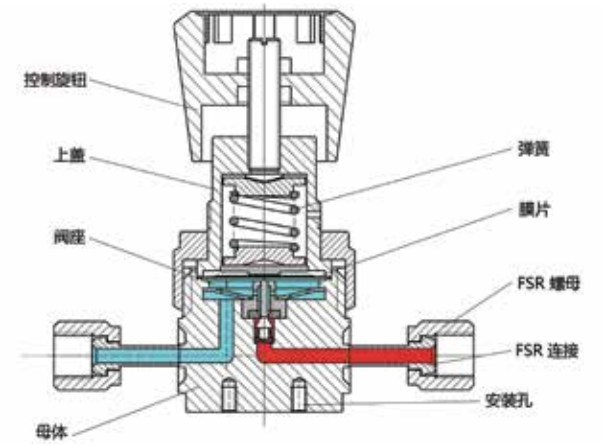
Internal Volume

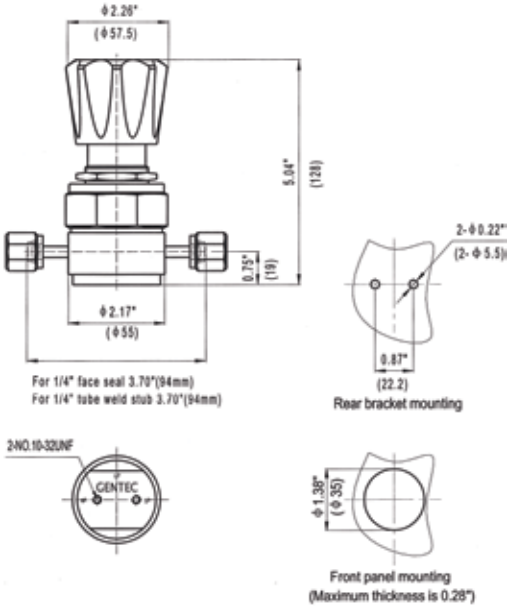
- 9.3 cc

Operating Conditions

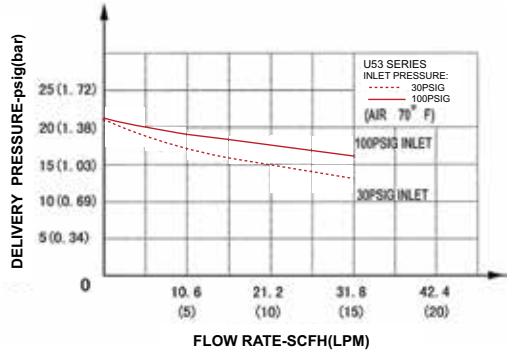
- Maximum inlet pressure: 300 psi (20 bar)
- Outlet pressure: 0 ~ 30 psi (2 bar)
- Temperature: 0°F ~ 140°F(-18°C ~ 60°C)

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
	U53	SL: 316L	A B G J	K: PCTFE	G: 300 psi	L: 0~30 psi	W: Without Gauge P: 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

*: Gauges' connection: 1/4"FSR , other connection type please conect GENTEC.

DIAPHRAGM VALVES

DV Series

100% Helium Leak Test

Control Knob

- Diaphragm design for smooth operation
- Easy to read status window (Open/Close)

Inlet / Outlet Connections

- Multiple inlet/outlet connections: FSR, NPT, GENLOK

Body

- Fabricated from 316L Stainless Steel
- Fabricated with advanced CNC machines to produce the highest quality of parts
- Wetted area are electropolished
- Elgiloy® diaphragm produce metal to metal, leak-proof seal

Handgrip (300psi)

Handwheel (300psi)

Pneumatic (150psi)

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®

Specifications

- Flow capacity: Cv=0.2
- Maximum leak rate:

  Body leak rate: 1 x 10^{-9} atm cc/sec He

  Valve seat leak rate: 4 x 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)

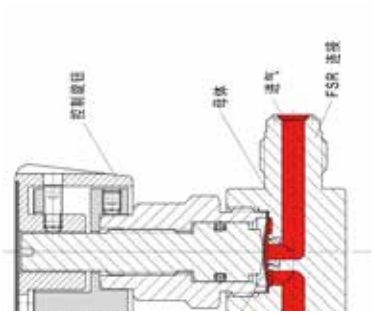
Actuator Specifications

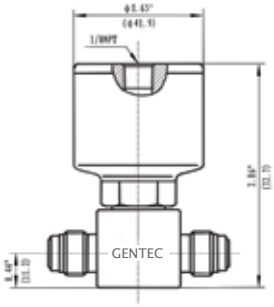
- Operating pressure: 70 ~ 125 psi
- Inlet connection: 1/8” NPT (Female)
- Normally: closed, open

Surface Finish

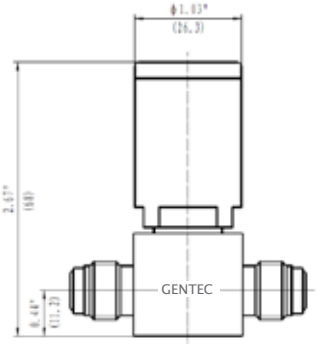
- Standard Ra: 20µin

Dimensions

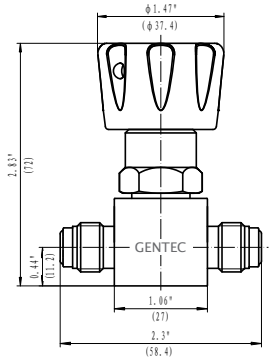




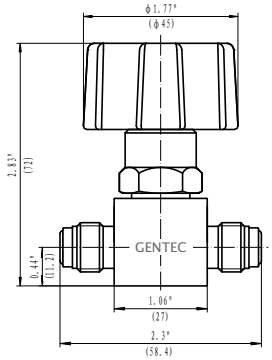
Pneumatic (300 psi)



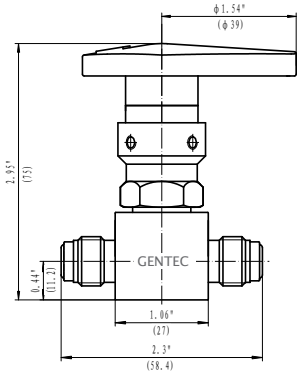
Pneumatic (150 psi)



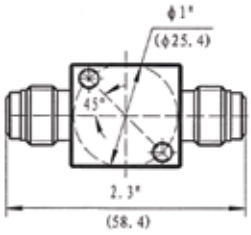
Handwheel (300 psi)
With Display



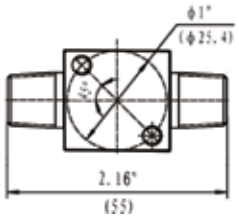
Handwheel (300 psi)
Without Display



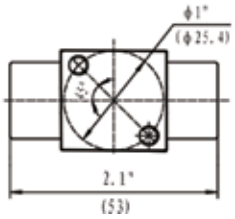
Handgrip (300 psi)
Without Display



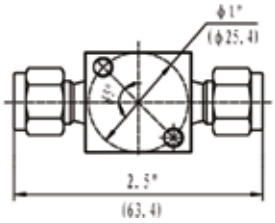
Face Seal Male Fittings



NPT Fittings



FNPT 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 S: 150 psi	NT4, FNT4, TF4, VM4	Blank: Standard (N/C) NO: Normally open (Pneumatic)

Manual (300psi)

Manual (3500psi)

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®

Specifications

- Flow capacity: Cv=0.3
- Maximum leak rate:
  Body leak rate: 1 x 10^{-9} atm cc/sec He
  Valve seat leak rate: 4 x 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 ~ 150°F (-40°C ~ 65°C)

Actuator Specifications

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

Surface Finish

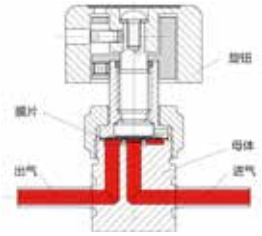
- Standard Ra: 10 - 15µin

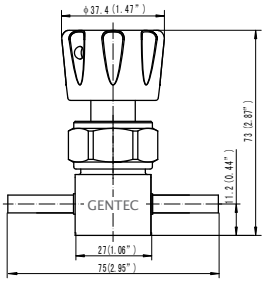
Internal Volume

- 1.6 cc

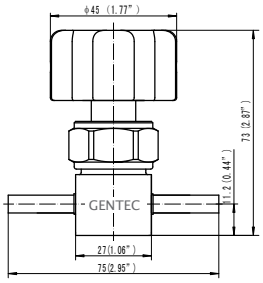
* Standard Material
** Vespel® seat is recommended for Nitrous Oxide (N2O) service but is not available for low pressure pneumatic actuation.

Dimensions

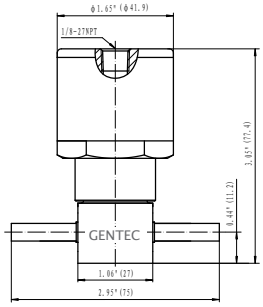




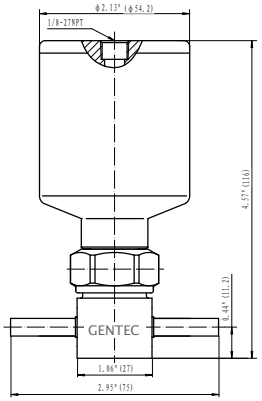
Manual (300 psi)



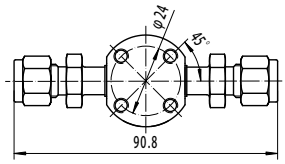
Manual (3500 psi)



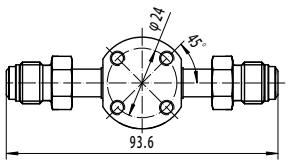
Pneumatic (300 psi)



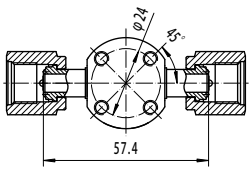
Pneumatic (3500 psi)



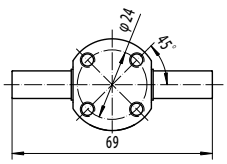
TF4



VSM4

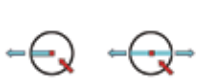
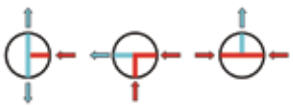


VSF4



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 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) I: 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.

Manual (3500psi)

Pneumatic (3500psi)

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®

Specifications

- Flow capacity: Cv=0.3
- Maximum leak rate:
  Body leak rate: 1 x 10^{-9} atm cc/sec He
  Valve seat leak rate: 4 x 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 ~ 150°F (-40°C ~ 65°C)

Actuator Specifications

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

Surface Finish

- Standard Ra: 7µin

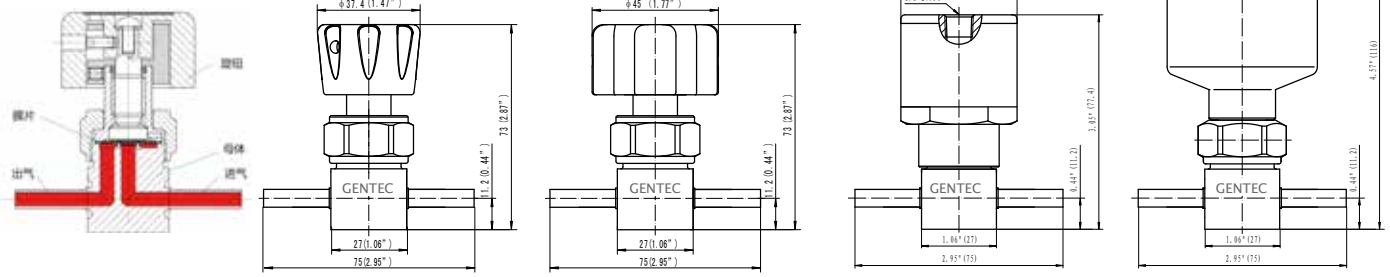
Internal Volume

- 1.6 cc

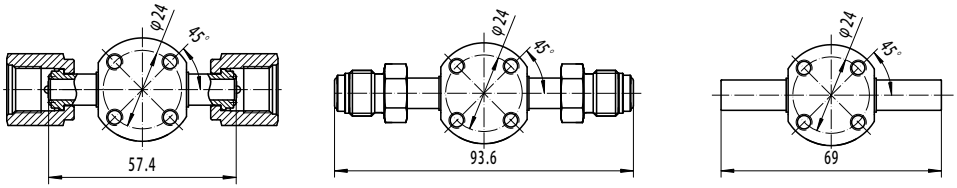
* Standard Material

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

Dimensions

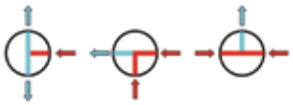


Manual (300 psi) | Manual (3500 psi) | Pneumatic (300 psi) | Pneumatic (3500 psi)



VSF4 | VSM4 | 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) I: 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.

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®

Specifications

- Flow capacity: Cv=0.16
- Maximum leak rate:
  Body leak rate: 1 x 10^{-9} atm cc/sec He
  Valve seat leak rate: 4 x 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: 3500 psi (240 bar)
  Pneumatic and manual actuation
- Minimum operating pressure: vacuum
- Temperature: -40°F ~ 150°F (-40°C ~ 65°C)
- Pneumatic actuator
  Operating pressure: 70 ~ 125 psi
  Inlet connection: 1/8” NPT (Female)
  Normally: closed

Surface Finish

- Standard Ra: 15 ~ 20 µin

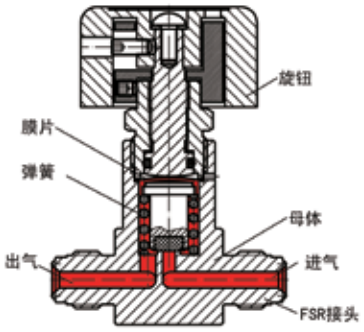
Internal Volume

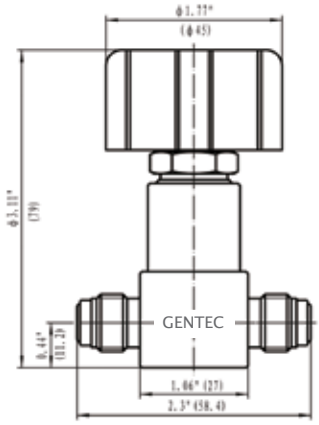
- 0.8 cc

* Standard Material

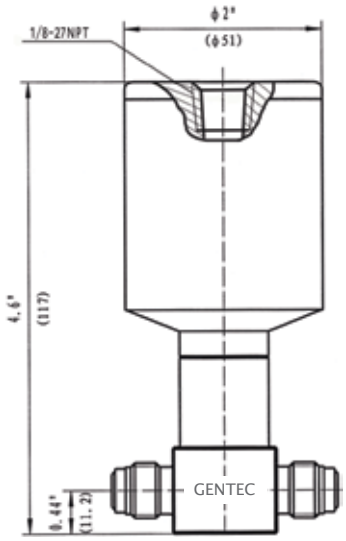
** Vespel® seat is recommended for Nitrous Oxide (N2O) service but is not available for low pressure pneumatic actuation.

Dimensions

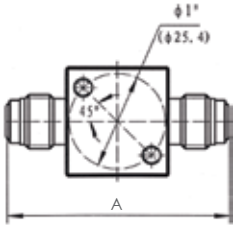




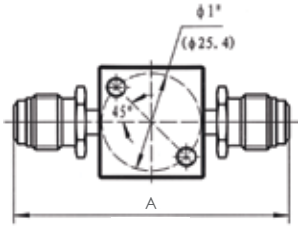
Handwheel



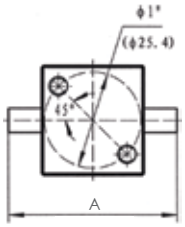
Pneumatic



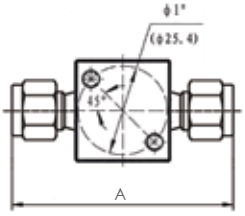
Face Seal Male Fittings



Face Seal Swivel Male Fittings



Tube Weld Stub



GENLOK Fittings

Ordering Information

EX: SL	- DV82	M	H	- VM4 - TW4	- K	- IS
Body	Valve Series	Valve Type	Working Pressure	Inlet / Oulet Connection	Seat	Options
SL: 316L	DV82	M: Manual (Handwheel) P: Pneumatic actuator	H: 3500 psi	VM4, VM8, VSM4, VSF4, TW4, TW8, TF4	K: PCTFE* V: Vespel®	NO: Normally open (Pneumatic) 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	
VSF: Face seal swivel female (FSR fittings)	4	
TW: Tube weld	4, 8	
TF: GENLOK fittings	4	

Type*	A (mm)
VM4	58.4
VM8	67.6
VSM4	70.8
VSF4	70.6
TW4	44.2
TW8	44.2
TF4	63.4

*: Applies to both inlet & outlet connections

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®

Specifications

- Flow capacity: Cv=0.17
- Maximum leak rate:
  Body leak rate: 1 x 10^{-9} atm cc/sec He
  Valve seat leak rate: 4 x 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 (17 bar), 3500 psi (240 bar)
- Minimum operating pressure: vacuum
- Temperature: -40°F ~ 150°F (-40°C ~ 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

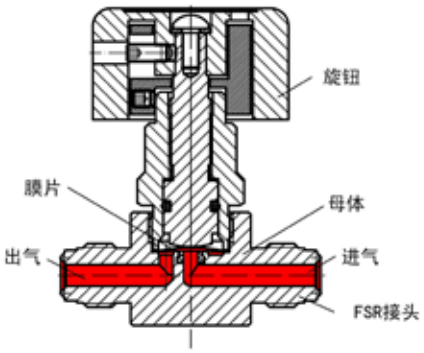
Internal Volume

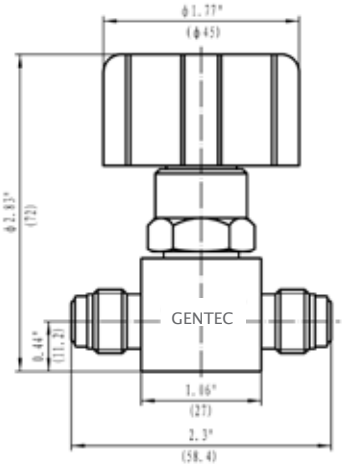
- 0.8 cc

* Standard Material

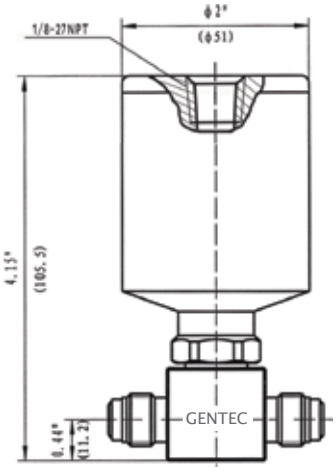
** Vespel® seat is recommended for Nitrous Oxide (N2O) service but is not available for low pressure pneumatic actuation.

Dimensions

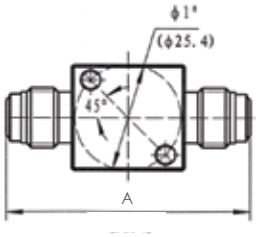




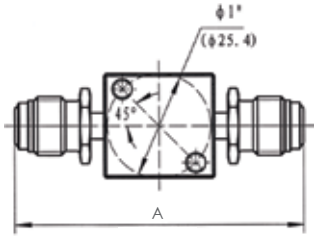
Handwheel



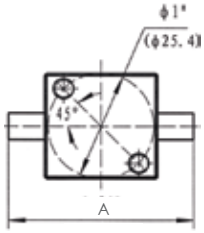
Pneumatic (HP)



Face Seal Male Fittings



Face Seal Swivel Male Fittings



Tube Weld Stub

Ordering Information

EX: SL	- DV84	M	H	- VM4 - TW4	- K	E	- IS
Body	Valve Series	Valve Type	Working Pressure	Inlet / Oulet Connection	Seat	Options	Options
SL: 316L	DV84	M: Manual (Handwheel) P: Pneumatic actuator (Normally closed)	H: 3500 psi	VM4, VM8, VSM4, VSF4, TW4, TW6, TW8	K: PCTFE V: Vespel®	None: 10~15 µin E: 7 µin(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” 6=3/8” 8=1/2”
VSM: Face seal swivel male (FSR fittings)	4	
VSF: Face seal swivel female (FSR fittings)	4	
TW: Tube weld	4, 6, 8	

Type*	A (mm)
VM4	58.4
VM8	67.6
VSM4	70.8
VSF4	70.6
TW4	44.2
TW6	44.2
TW8	44.2

*: Applies to both inlet & outlet connections

Handwheel (3500psi)

Pneumatic (300psi)

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®

Specifications

- Flow capacity: Cv=0.3
- Maximum leak rate:
  Body leak rate: 1 x 10^{-9} atm cc/sec He
  Valve seat leak rate: 4 x 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 (17 bar), 3500 psi (240 bar)
- Minimum operating pressure: vacuum
- Temperature: -40°F ~ 150°F (-40°C ~ 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

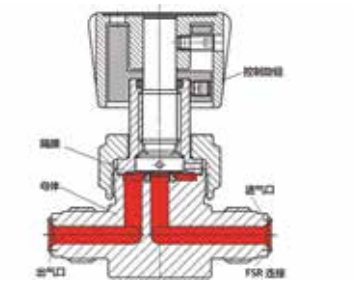
Internal Volume

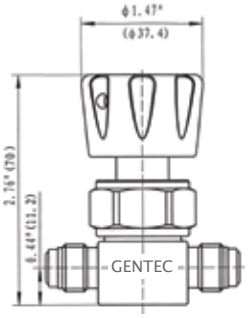
- 1.6 cc

* Standard Material

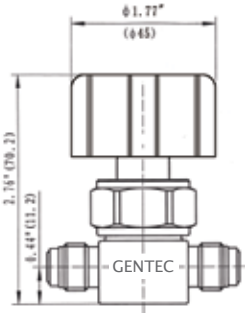
** Vespel® seat is recommended for Nitrous Oxide (N2O) service but is not available for low pressure pneumatic actuation.

Dimensions

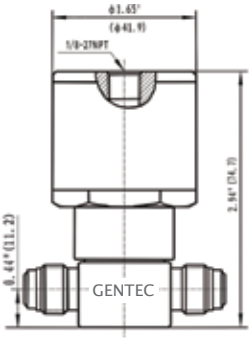




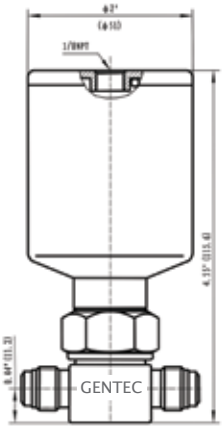
Handwheel (300 psi)



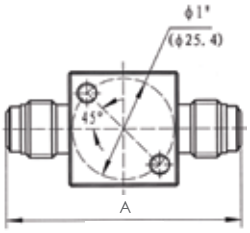
Handwheel (3500 psi)



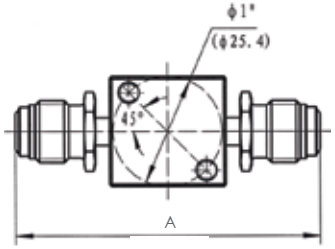
Pneumatic (300 psi)



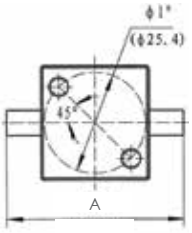
Pneumatic (3500 psi)



Face Seal Male Fittings



Face Seal Swivel Male Fittings



Tube Weld Stub

Ordering Information

EX: SL	- DV86	M	H	- VM4 - TW8	- K	E	- IS
Body	Valve Series	Valve Type	Working Pressure	Inlet / Oulet Connection	Seat	Options	Options
SL: 316L	DV86	M: Manual (Handwheel) P: Pneumatic actuator (Nomally closed)	H: 3500 psi L: 300 psi	VM4, VM8, VSM4, VSF4, TW4, TW6, TW8	K: PCTFE V: Vespel®	None: 10~15 µin E: 7 µin(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” 6=3/8” 8=1/2”
VSM: Face seal swivel male (FSR fittings)	4	
VSF: Face seal swivel female (FSR fittings)	4	
TW: Tube weld	4, 6, 8	

Type*	A (mm)
VM4	58.4
VM8	67.6
VSM4	70.8
VSF4	70.6
TW4	44.2
TW6	44.2
TW8	44.2

*: Applies to both inlet & outlet connections

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®

Specifications

- Flow capacity: Cv=1.0 (3500 psi)
  Cv=1.7 (1000psi)
- Maximum leak rate:
  Body leak rate: 1 x 10^{-9} atm cc/sec He
  Valve seat leak rate: 4 x 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:
  3500 psi (240 bar), 1500 psi (100 bar)
- Minimum operating pressure: vacuum
- Temperature: -40°F ~ 150°F (-40°C ~ 65°C)

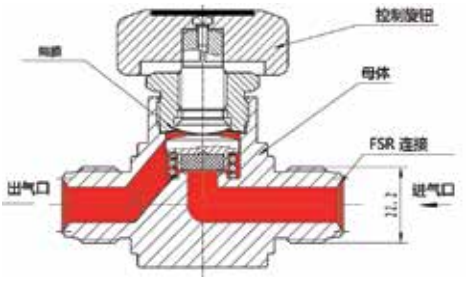
Surface Finish

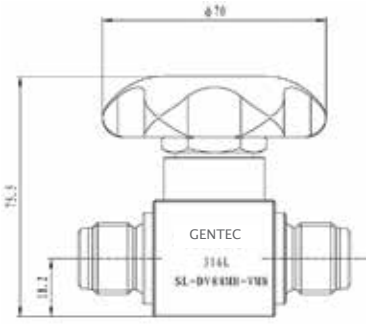
- Standard Ra: 20 µin

Internal Volume

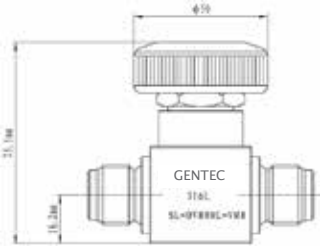
- 20 cc

Dimensions

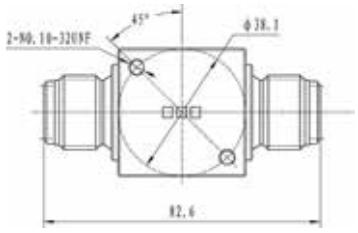




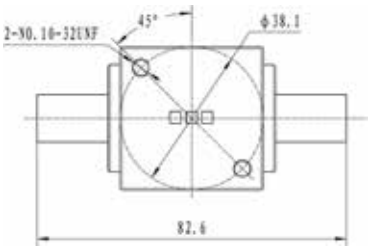
Handwheel (3500 psi)



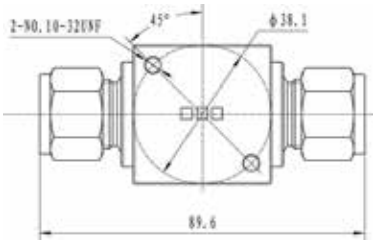
Handwheel (1500 psi)



Face Seal Male Fittings



Compression Tube Fittings



Tube Weld Stub

Ordering Information

EX:	SL	- DV88	M	H	- VM8
	Body	Valve Series	Valve Type	Working Pressure	Inlet / Oulet Connection
	SL: 316L	DV88	M: Manual	H: 3500 psi M: 1500 psi	VM8: 1/2” Face seal male (FSR fittings) TF8: 1/2” Tube fitting TW8: 1/2” Tube weld

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®

Specifications

- Flow capacity: Cv=2.8

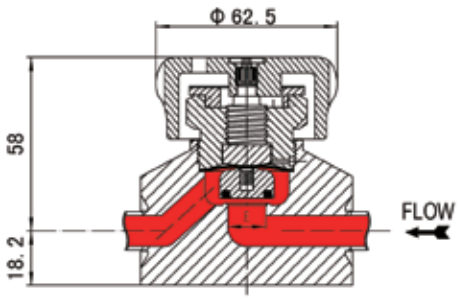
Operating Conditions

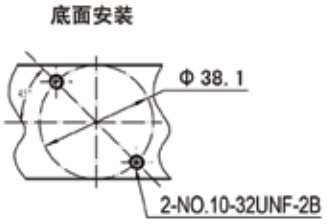
- Maximum operating pressure: 300 psi (20 bar)
- Minimum operating pressure: vacuum
- Temperature: -40°F ~ 150°F (-40°C ~ 65°C)

Surface Finish

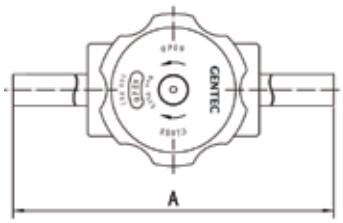
- Standard Ra: 20 µin
- Optional Ra (EP): 7 µin

Dimensions

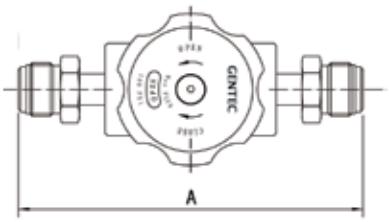




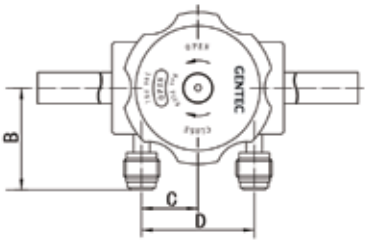
Dimensions



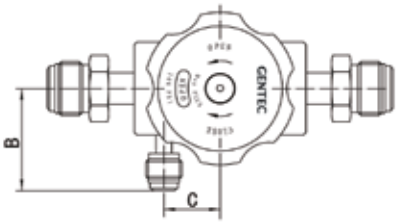
SL-DV90-TW8-E



SL-DV90-VSM8-E



SL-DV90B-TW8-E



SL-DV90D-VSM8-E

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	Valve Type	Inlet / Oulet Connection	Options
	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	None: 20 µin E: 7 µin(EP)

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

PRESSURE GAUGES

GU 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. 1/4” FSR(F)*	Pressure Ranges (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

GENTEC® specializes in designing and manufacturing high quality valves and fittings for High Purity and Ultra-High Purity applications. GENTEC® FSR fittings are availabe 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	SS	Bar Stock: ASME SA479, ASTM A276 Forged Shapes: ASME SA182, ASTM A314
Glands		
316L	SL	Bar Stock: ASME SA479, ASTM A276 Forged Shapes: ASME SA182
316L VAR	SLV	Bar Stock: ASME SA479, ASTM A276 Forged Shapes: ASME SA182
Gaskets		
Nickel	NI	ASTM B162
316L	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 Pressureratings determined at room temperature. Allowable Working Pressureof 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 x10^{-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 (°C)	Temperature (°F)	Favtors
38	100	1.0
93	200	1.0
145	300	1.0
204	400	0.96
260	500	0.90
315	600	0.85
371	700	0.82
427	800	0.79
482	900	0.78
537	1000	0.76

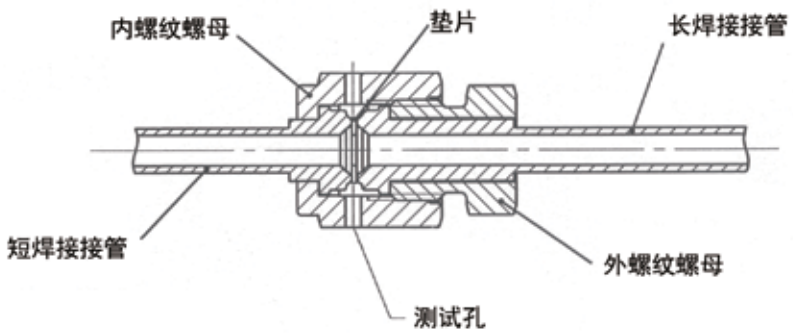
Ordering Information

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

Example: SLV-VDS-FSR4-T4L7P

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

Configuration



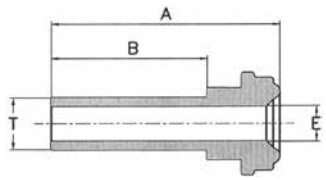
- Female Nut: female thread is silver-plated to prevent galling, an ensure ease of assembly with consistent make-up.
- Visual Check & Leak Test Port: test port at two locations for easy leak testing.

Heat Code Traceability

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

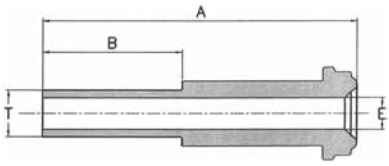
Glands

Short Tube Butt Weld



FSR Size	T TUBE O.D.	Ordering Number	Dimensions			Normal Wall Thickness	Working Pressure (psi)
			B	E	A		
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

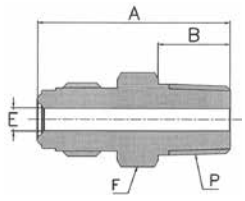


FSR Size	T TUBE O.D.	Ordering Number	Dimensions			Normal Wall Thickness	Working Pressure (psi)
			B	E	A		
1/4”	1/4”	SL*-VD-FSR4-T4L2	0.25	0.18	1.20	0.035	5100
1/4”	1/4”	SL*-VD-FSR4-T4L7	0.75	0.18	1.70	0.035	5100
1/2”	3/8”	SL*-VD-FSR8-T6L7	0.75	0.31	1.79	0.035	3300
1/2”	1/2”	SL*-VD-FSR8-T8L2	0.25	0.40	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.

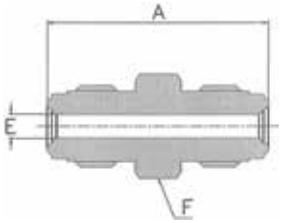
Bodies

Male NPT Connector



FSR Size	P Male NPT Size	Ordering Number	Dimensions				Working Pressure (psi)
			B	E	F	A	
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

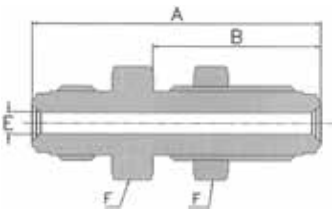
Double Male Union



FSR Size	Ordering Number	Dimensions			Working Pressure (psi)
		E	F	A	
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

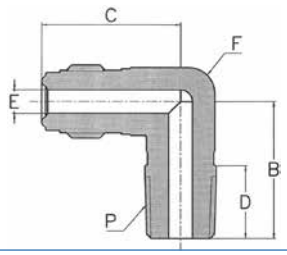
Bodies

Bulkhead Union



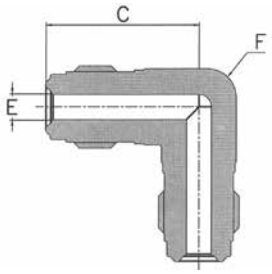
FSR Size	Ordering Number	Dimensions				Panel Hole Size	MAX. Panel Thickness	Working Pressure (psi)
		B	E	F	A			
1/4”	SS-VBU-VM4	1.30	0.18	3/4	2.23	19/32	0.44	8000
1/2”	SS-VBU-VM8	1.48	0.40	1 1/16	2.57	29/32	0.5	3500

FSR to Male NPT Elbow



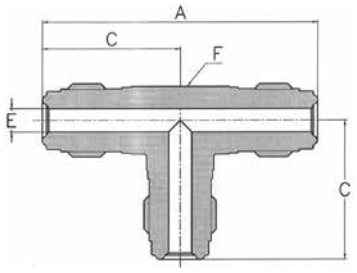
FSR Size	P Male NPT Size	Ordering Number	Dimensions				F Wrench Flat	Working Pressure (psi)
			C	B	D	E		
1/4”	1/4”	SS-VME-VM4-NT4	1.07	1.05	0.56	0.18	1/2	8000
1/2”	1/2”	SS-VME-VM8-NT4	1.45	1.45	0.75	0.40	13/16	3500

Union Elbow



FSR Size	Ordering Number	Dimensions		F Wrench Flat	Working Pressure (psi)
		C	E		
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

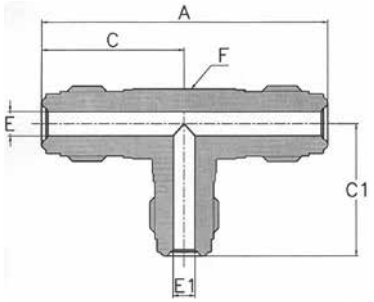
Union Tee



FSR Size	Ordering Number	Dimensions			F Wrench Flat	Working Pressure (psi)
		C	E	A		
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

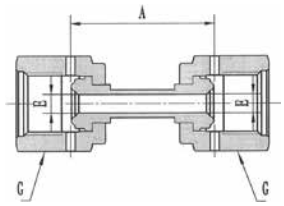
Reducing Tee



FSR Size	Ordering Number	Dimensions					F Wrench Flat	Working Pressure (psi)
		C	C1	E	E1	A		
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

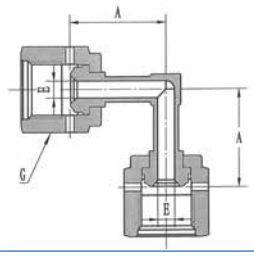
Welding Assemblies

Rotating Female Union



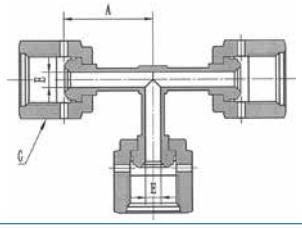
FSR Size	Ordering Number	Dimensions			Working Pressure (psi)
		E	G	A	
1/4”	SS-VSU-VSF4	0.18	3/4	1.71	5100
1/2”	SS-VSU-VSF8	0.4	1 1/16	1.84	3500

Female Elbow



FSR Size	Ordering Number	Dimensions			Working Pressure (psi)
		E	G	A	
1/4”	SS-VSUE-VSF4	0.18	3/4	1.0	5100
1/4”	SS-VSUE-VSM4	0.18	3/4	1.5	5100

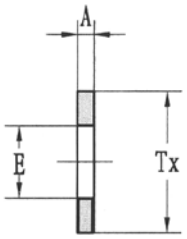
Female Tee



FSR Size	Ordering Number	Dimensions			Working Pressure (psi)
		E	G	A	
1/4”	SS-VSUT-VSF4	0.18	3/4	1.0	5100
1/4”	SS-VSUT-VSM4	0.18	3/4	1.5	5100

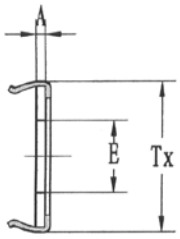
Gasket

Silver Plated (Stainless Steel)
Non-Retained Style



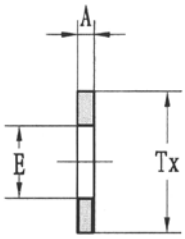
FSR Size	Ordering Number	Dimensions		
		E	A	TX
1/4”	SS-VG-FSR4	0.22	0.03	0.47
1/2”	SS-VG-FSR8	0.44	0.03	0.78
3/4”	SS-VG-FSR12	0.66	0.03	1.14

Silver Plated (Stainless Steel)
Gasket Retainer Assembly



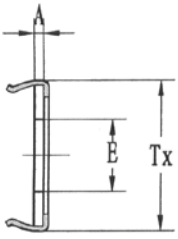
FSR Size	Ordering Number	Dimensions		
		E	A	TX
1/4”	SS-VGR-FSR4	0.24	0.03	0.5
1/2”	SS-VGR-FSR8	0.44	0.03	0.79
3/4”	SS-VGR-FSR12	0.66	0.03	1.14

Unplated (Nickel)
Non-Retained Style



FSR Size	Ordering Number	Dimensions		
		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

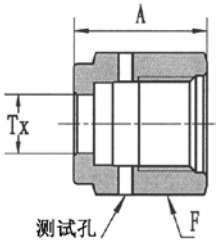
Unplated (Nickel)
Gasket Retainer Assembly



FSR Size	Ordering Number	Dimensions		
		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

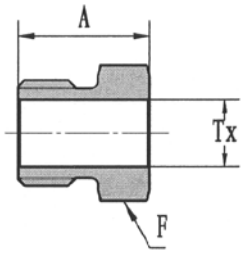
Nuts,Caps,Plugs

Female Nut



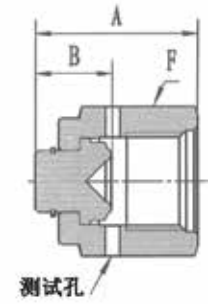
FSR Size	Ordering Number	Dimensions		
		F	A	TX
1/4”	SS-VN-FSR4	3/4	0.81	0.36
1/2”	SS-VN-FSR8	1 1/16	0.88	0.61
3/4”	SS-VN-FSR12	1 1/2	1.12	0.89

Male Nut



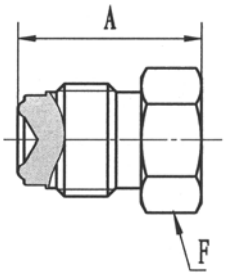
FSR Size	Ordering Number	Dimensions		
		F	A	TX
1/4”	SS-VMN-FSR4	5/8	0.71	0.36
1/2”	SS-VMN-FSR8	15/16	0.81	0.61
3/4”	SS-VMN-FSR12	1 5/16	1.00	0.89

Cap



FSR Size	Ordering Number	Dimensions		
		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

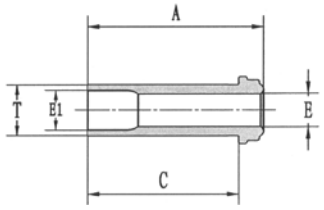
Plug



FSR Size	Ordering Number	Dimensions	
		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

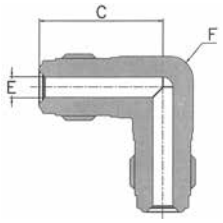
High-Flow Connections

Glands



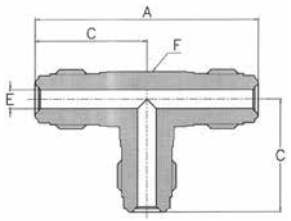
FSR Size	T Tube O.D.	Ordering Number	Dimensions				Normal Wall Thickness	Working Pressure (psi)
			C	E	E1	A		
1/4”	3/8”	SL*-HVDS-FSR4-T6L2	0.41	0.25	0.31	0.60	0.035	3300
1/4”	3/8”	SL*-HVDS-FSR4-T6L7	1.12	0.25	0.31	1.31	0.035	3300

Union Elbow



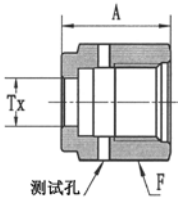
FSR Size	Ordering Number	Dimensions			Working Pressure (psi)
		C	E	F	
1/4”	SS-HVUE-VM4	1.07	0.25	1/2	8000

Union Tee



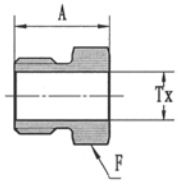
FSR Size	Ordering Number	Dimensions				Working Pressure (psi)
		C	E	A	F	
1/4”	SS-HVUT-VM4	1.07	0.25	2.14	1/2	8000

Female Nut



FSR Size	Ordering Number	Dimensions		
		F	A	TX
1/4”	SS-HVN-FSR4	3/4	0.81	0.39

Male Nut



FSR Size	Ordering Number	Dimensions		
		F	A	TX
1/4”	SS-HVMN-FSR4	5/8	0.71	0.39

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.

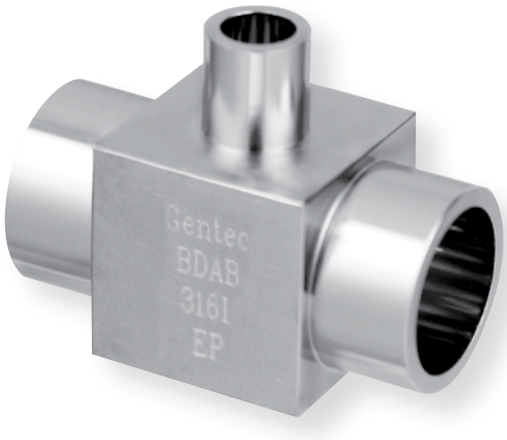
STEP 4 MARK

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.



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

Technical Date

Size	Pressure Rating		Normal Wall Thickness
	psi	bar	
1/4”	5100	350	0.035"
3/8”	3300	220	0.035"
1/8”	8500	580	0.028"
1/2”	3300	220	0.049"
3/4”	2400	160	0.049"
1”	2400	160	0.065"
6M	5100	350	0.039"
8M	5100	350	0.039"
10M	3300	220	0.039"
12M	3300	220	0.039”

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.

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

Ordering Information

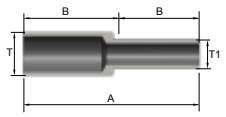
▶ To order EP fittings, use the following Designator code as a suffix to the Ordering Number.

Example: SLV-MRU-4-2P

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

TWRU

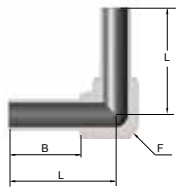
Reducing Union



T	T1	Ordering Number	Dimensions A	Dimensions B	Pressure Rating psi (bar)
3/8	1/4	SL-TWRU-6-4	1.5	0.75	3300 (227)
1/2	1/4	SL-TWRU-8-4	1.5	0.75	3700 (254)
1/2	3/8	SL-TWRU-8-6	1.5	0.75	3300 (227)
3/4	1/2	SL-TWRU-12-8	1.5	0.75	2400 (165)
1	1/2	SL-TWRU-16-8	1.5	0.75	2400 (165)
1	3/4	SL-TWRU-16-12	1.5	0.75	2400 (165)

TWUE

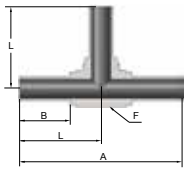
90° Union Elbow



O.D.	Tube Thickness	Ordering Number	Dimensions B	Dimensions F	Dimensions L	Pressure Rating psi (bar)
1/4	0.035	SL-TWUE-4	0.75	7/16	1.23	510 0 (351)
3/8	0.035	SL-TWUE-6	0.75	7/16	1.20	3300 (227)
1/2	0.049	SL-TWUE-8	0.75	11/16	1.34	3700 (254)
3/4	0.049	SL-TWUE-12	0.75	15/16	1.46	2400 (165)

TWUT

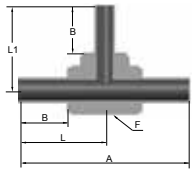
Union Tee



O.D.	Tube Thickness	Ordering Number	Dimensions A	Dimensions B	Dimensions F	Dimensions L	Pressure Rating psi (bar)
1/4	0.035	SL-TWUT-4	2.46	0.75	7/16	1.23	5100 (351)
3/8	0.035	SL-TWUT-6	2.40	0.75	7/16	1.20	3300 (227)
1/2	0.049	SL-TWUT-8	2.68	0.75	11/16	1.34	3700 (254)
3/4	0.049	SL-TWUT-12	2.92	0.75	15/16	1.46	2400 (165)

TWRT

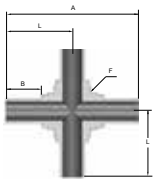
Reducing Tee



Tube O.D.	Tube Thickness	O.D.	Tube Thickness	Ordering Number	Dimensions A	Dimensions B	Dimensions F	Dimensions L	Dimensions L1	Pressure Rating psi (bar)
3/8	0.035	1/4	0.035	SL-TWRT-6-4	2.4	0.75	7/16	1.2	1.23	3300 (227)
1/2	0.049	1/4	0.035	SL-TWRT-8-4	2.68	0.75	11/16	1.34	1.34	3700 (254)
1/2	0.049	3/8	0.035	SL-TWRT-8-6	2.68	0.75	11/16	1.34	1.35	3300 (227)
3/4	0.049	1/2	0.035	SL-TWRT-12-6	2.92	0.75	15/16	1.46	1.35	2400 (165)
3/4	0.04	1/4	0.035	SL-TWRT-12-8	2.92	0.75	15/16	1.46	1.48	2400 (165)

TWUC

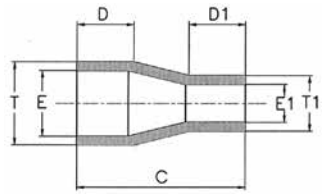
Union Cross



O.D.	Tube Thickness	Ordering Number	Dimensions A	Dimensions B	Dimensions F	Dimensions L	Pressure Rating psi (bar)
1/4	0.035	SL-TWUC-4	2.46	0.75	7/16	1.23	5100 (351)
3/8	0.035	SL-TWUC-6	2.4	0.75	7/16	1.2	3300 (227)
1/2	0.049	SL-TWUC-8	2.55	0.75	11/16	1.27	3700 (254)

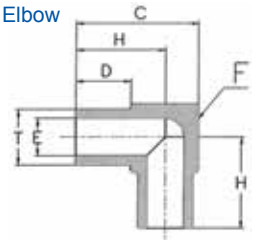
All Dimensions are in inches.

Reducing Union



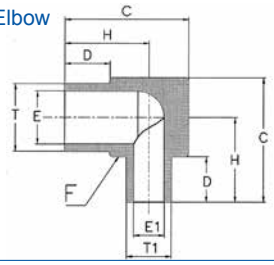
T	T1	Ordering Number	Dimensions					Pressure Rating (psi)
			C	D	D1	E	E1	
1/4	1/8	SL-MRU-4-2	0.75	0.41	0.25	0.18	0.07	5100
3/8	1/4	SL-MRU-6-4	0.75	0.41	0.25	0.18	0.07	5100
1/2	1/4	SL-MRU-8-4	0.75	0.41	0.25	0.18	0.07	5100
1/2	3/8	SL-MRU-8-6	0.75	0.41	0.25	0.18	0.07	5100

90° Union Elbow



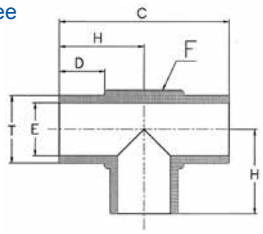
T	Ordering Number	Dimensions					Pressure Rating (psi)
		C	D	E	F	H	
1/4	SL-MUE-4	0.56	0.25	0.18	5/16	0.41	5100
3/8	SL-MUE-6	0.69	0.25	0.31	7/16	0.47	3300
1/2	SL-MUE-8	0.81	0.25	0.4	9/16	0.53	3700

Reducing Elbow



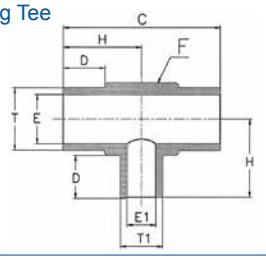
T	T1	Ordering Number	Dimensions						Pressure Rating (psi)
			C	D	E	E1	F	H	
3/8	1/4	SL-MRE-6-4	0.69	0.25	0.31	0.18	7/16	0.47	3300
1/2	1/4	SL-MRE-8-4	0.81	0.25	0.4	0.18	9/16	0.53	3700
1/2	3/8	SL-MRE-8-6	0.81	0.25	0.4	0.31	9/16	0.53	3300

Union Tee



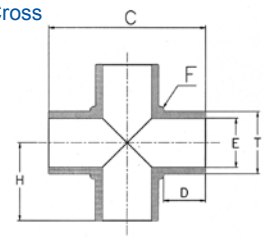
T	Ordering Number	Dimensions					Pressure Rating (psi)
		C	D	E	F	H	
1/4	SL-MUT-4	0.82	0.25	0.18	5/16	0.41	5100
3/8	SL-MUT-6	0.94	0.25	0.31	7/16	0.47	3300
1/2	SL-MUT-8	1.06	0.25	0.4	9/16	0.53	3700

Reducing Tee



T	T1	Ordering Number	Dimensions						Pressure Rating (psi)
			C	D	E	E1	F	H	
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



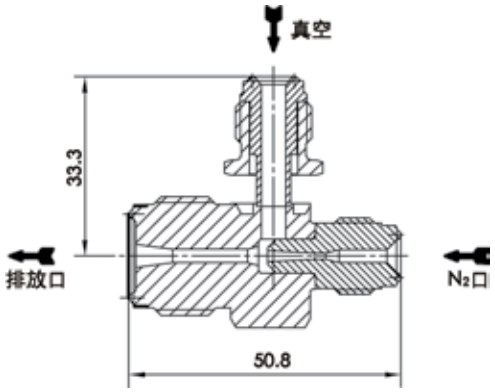
T	Ordering Number	Dimensions					Pressure Rating (psi)
		C	D	E	F	H	
1/4	SL-MUC-4	0.82	0.25	0.18	5/16	0.41	5100
3/8	SL-MUC-6	0.94	0.25	0.31	7/16	0.47	3300
1/2	SL-MUC-8	1.06	0.25	0.4	9/16	0.53	3700

All Dimensions are in inches.

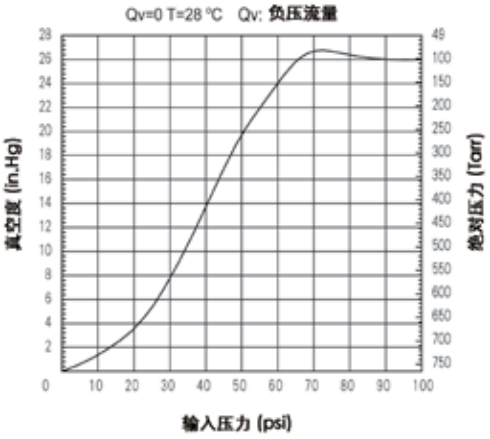
Features

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

Dimensions



Vacuum Chart



Ordering Information

EX: SL	- VG22	- VM4	- VM8	- VM4
Body	Series	N_2 Inlet	Vent Connections	Vacuum Connections
SL: 316L	VG22	VM4	VM4 VM8	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

MATERIAL COMPATIBILITY

A GENTEC® Product Material Compatibility

Solutions for Life

	Material											
Gas	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_2S	•	◦	◦	•	•	◦	◦	•	•	•	•	•
Methane	•	•	•	•	•	•	•	•	•	•	•	•
Nitrogen	•	•	•	•	•	•	•	•	•	•	•	•
N_2O	•	•	•	•	•	•	•	•	•	•	•	•
Oxygen	•	•	•	•	•	•	•	•	•	◦	◦	•
Phosphine	•	◦	◦	•	•	•	◦	•	•	•	•	•
Silane	•	•	•	•	•	•	•	•	•	•	•	•
SO_2	•	•	•	•	•	•	◦	•	◦	•	•	•
F_6S	•	•	•	•	•	•	•	•	•	•	•	•
Arsine	◦	•	◦	•	•	•	•	•	•	•	•	•
Boron Trichloride	◦	◦	•	•	•	•	◦	•	•	◦	•	•
Boron Trifluoride	•	◦	•	•	•	•	◦	•	◦	◦	•	•
Dichloriosilane	◦	◦	◦	•	•	•	◦	•	◦	◦	◦	•
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

ALLOCATION TABLE

Cylinder Connections Allocation Table

Gas	BSP	DIN	CGA	UHP CGA	JIS
Acetylene	BS341 No. 2	==	510	==	==
Air	BS341 No. 3	==	346	==	==
Ammonia	BS341 No. 10	DIN6	705	720	22-R
Argon	BS341 No. 3	DIN6	580	718	22-4 or 23-R
Arsine	==	==	350	632	22-L
Boron Trichloride	==	DIN8	660	634	==
Boron Trifluoride	==	DIN8	330	642	22-L
Butane	BS341 No. 4	==	510	==	==
Carbon Dioxide	BS341 No. 8	DIN6	320	716	==
Carbon Monoxide	BS341 No. 4	DIN5	350	724	22-L
Cyclopropane	BS341 No. 4	==	510	==	==
Diborane	==	==	350	632	22-L
Dichloriosilane	==	DIN5	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)	==	DIN6	660	716	==
R14 (Halocarbon 14)	==	DIN6	320 or 580	716	==
Helium	BS341 No. 3	DIN6	580	718	22-R or 23-L
Hydrogen	BS341 No. 2	DIN1	350	724	22-L
Hydrogen Chloride	==	DIN8	330	634	26-R
Hydrogen Fluoride	==	==	660 or 670	638	26-R
Hydrogen Sulfide	==	DIN5	330	722	==
Iso-Butane	==	==	510	==	==
Krypton	==	DIN6	580	718	22-R or 23-R
Methane	BS341 No. 2	==	350	==	==
Methyl Chloride	==	==	660	==	==
Natural Gas	==	==	350	==	==
Neon	==	DIN6	580	718	22-R or 23-R
Nitric Oxide	==	==	660	==	==
Nitrogen	BS341 No. 3	DIN10	580	718	22-R or 23-R
Nitrogen Trifleoride	==	DIN8	330 or 670	640	==
Nitrous Oxide	BS341 No. 13	DIN9	326	712	==
Oxygen	BS341 No. 3	DIN1	540	714	22-R or 23-R
Phosphine	==	==	350	632	==
Propane	BS341 No. 4	==	510	==	==
Silane	==	==	350	632	==
Silicon Tetrachloride	==	==	330	636	==
Silicon Tetrafluoride	==	==	330	642	22-L
Sulfur Hexafluoride	==	DIN6	590	716	26-R
Tungsten Hexafluoride	==	DIN8	670	638	
Xenon	==	DIN6	580	718	22-R

*Chart is for reference only

Conversion Factors for Units of Pressure

TO COVER FROM TO	psi	mbar	bar	atm	Pa	KPa	MPa	cm H_2O @20 °C	in H_2O @20 °C	ft H_2O @20 °C	mm Hg @20 °C	in Hg @20 °C	kg / cm^2	ft.sea water
psi	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_2O @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_2O @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_2O @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 COVERT FROM TO	I / SEC	L / min (LPM)	m^3 / h	m^3 / min	ft^3 / h (SCFH)	ft^3 / min
I / SEC	1	60	3.6	0.06	127.14	2.119
I / 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	0.588
m^3 / min	16.667	1000	60	1	2118	35.317
ft^3 / h (SCFH)	0.008	0.472	0.0283	0.000	1	0.017
ft^3 / min	0.472	28.315	1.699	0.028	60	1

Gas Control Systems Solutions Overview

- Manifold Systems
- Control Panels
- HP/UHP Regulators
- Pressure Gauges
- Valves & Fittings

Specialty Manifold Systems

- Chrome-plated Brass Specialty Gas Control Panels
- Stainless Steel Specialty Gas Control Panels
- Specialty Gas Manifolds
- Terminal Gas Control Panel
- Other Control Systems
- Accessories

Specialty Gas Regulators & Gauges

- General Purpose Forged Brass Regulators
- High Purity Brass Barstock Regulators
- High Purity Stainless Steel Barstock Regulators
- Accessories

Valves

- Needle Valves
- Ball Valves
- Diaphragm Valves
- Cylinder Valves
- Metering Valves
- Gauge Valves
- Check Valves

Cryogenic Gas Equipment

- Cryogenic Relief Valves
- Cryogenic Shut-Off Valves
- Regulators
- Check Valves & Burst-Disc
- LNG Nozzle/Quick Disconnect, Receptacle
- Excess Flow Valves
- Pressure Gauges

Tube Fittings

- Male Connectors
- Male Elbows
- Male Adapters
- Female Connectors
- Female Elbows
- Unions
- Reducing unions

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