



**Registered Federal Government supplier**

**Our Strength**

- a) Design for manufacturing
- b) Catalog wholesale
- c) Logistics
- d) Cost reduction

Release: 12/21/2025

# Mission & Core Value

## Mission Statement

We are an engineering-driven company of vacuum components.  
Our manufacturing facilities are strategically situated across USA and Asia.  
Our catalog carries complete line of items such that one can build a complete process equipment from it.  
Fully automated procurement system allow us to provide highly competitive price.

Every part is 100%

- \* Made to source-control dwg.
- \* Cleaned and leak checked.
- \* Material certified

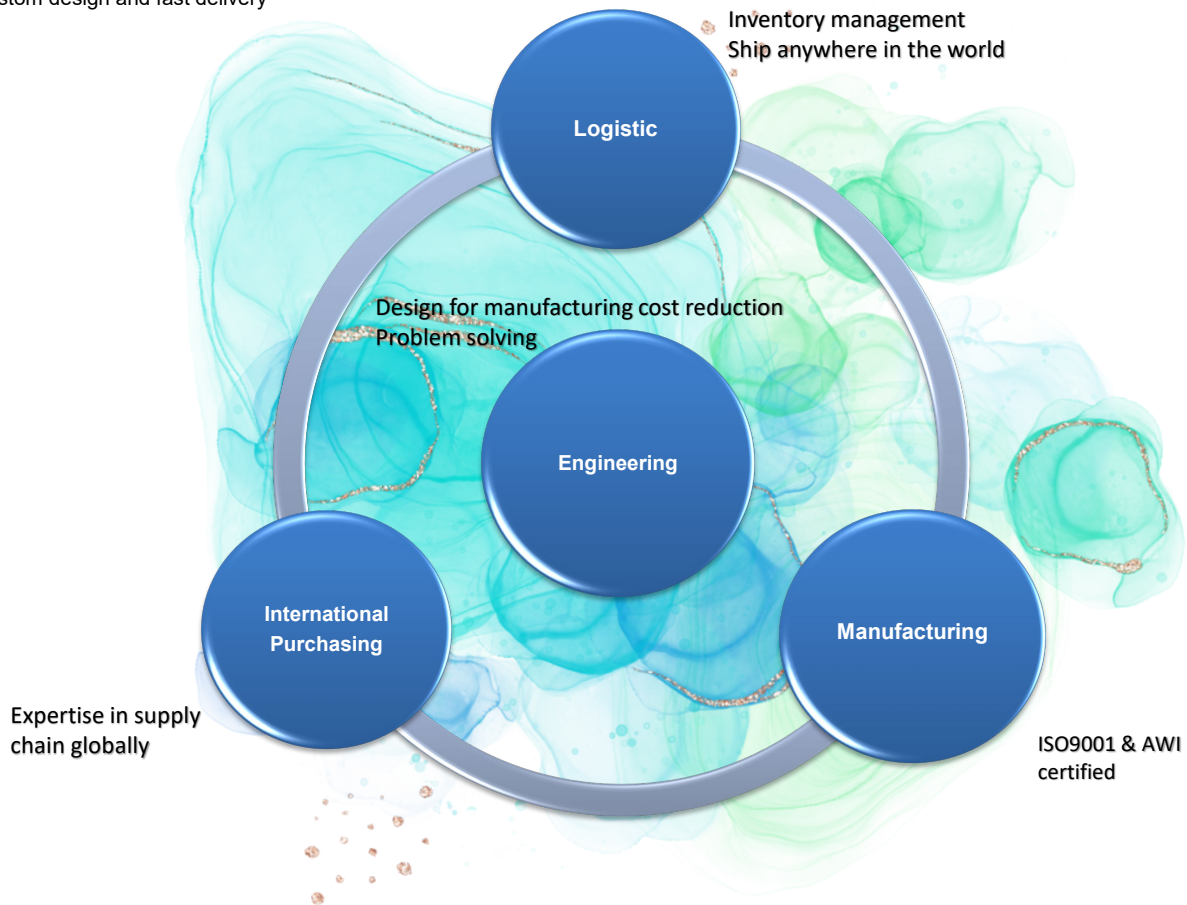
## Core Value

Head quarter located in northern California to serve Semiconductor, Industrial, R&D, and Life-science industries. We have expertise in the vacuum science applications.

We are an extension of your manufacturing and procurement. We provide cost reduction through design, manufacturing, consign inventory and on-time delivery. We handle your back-end so you can focus on your core business.

Our standard service includes:

- \* Inventory management and order status reporting
- \* Inventory consignment
- \* Problem solving
- \* Custom design and fast delivery



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# Poppet Valve



*Available in angle, Inline, Z-style. CF, KF, ISO flange. Size from 16 mm to 630 mm. Bellows sealed*

- Standard** For all vacuum application. Size from 16 mm to 630 mm. HV and UHV with bellows.
- Low Particle** Bellows is encapsulated from process gases. Designed for upstream process (e.g. Loadlock).
- Block** Standard & integrated with position indicator & solenoid; 6M cycle life.
- Toggle** Quick action between open and close with a flip of finger. Detent in both positions. Locking optional.
- All Metal** For ultra high vacuum up to  $1 \times 10^{-10}$  torr or extreme temperature.

# Poppet Valve

## Stainless and Aluminum Angle & Inline Valve

Our valves are uniquely designed for:

- ∅ High conductance
- ∅ Best value
- ∅ KF, ISO, CF flange configuration
- ∅ Size from 0.63" (16mm) to 24" (630mm)
- ∅ Leak rate to  $2 \times 10^{-10}$  standard cc/sec, He

These valves are designed for 3 million cycles. It has the highest sealing force in the industry.

The valve body is made of 304 stainless steel. Welded bellows is made of AM350 for long life. The valve housing is machined and honed to micron precision so that O-Ring wear is minimized. This feature has a competitive advantage to conventional valve that uses tube housing which is neither round nor straight.

Pneumatic valves from 16mm to 50 mm are normally closed (spring close). Sizes above 50mm are double acting (air open / aor close). Optional "pneumatic lock" is available.

### Options:

- ∅ Custom configuration
- ∅ Solenoid valve
- ∅ Reed position sensor
- ∅ Kalrez O-Ring
- ∅ Heating jacket

### VPC Core Competencies

- ∅ Application expertise
- ∅ Strong engineering R&D
- ∅ System level know-how

### Specification:

Vacuum range :	$1 \times 10^{-9}$ Torr
Leak test :	$1 \times 10^{-9}$ std cc/sec He
Bake temperature :	150° C
MTTF (life) :	1.5 million cycle
Time from open-close :	<0.5 sec
Operating temperature :	20° to 90° C
Differential pressure :	15 psi
Position indicator :	24 VDC or 120 VAC
Operating pressure :	60 - 95 psi



# Poppet Valve

## Standard Z Angle Valve

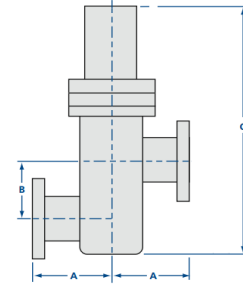
\* Any flange configuration.

\* Large conductance

\* Cycle life of 1.5 million

### Pneumatic Z Valve-KF Flange

Part No.	A (inch)	B (inch)	C (inch)
ZVP-KF16	2.15	1.12	N/A
ZVP-KF25	2.03	1.37	N/A
ZVP-KF40	2.40	1.88	N/A
ZVP-KF50	3.40	2.62	N/A



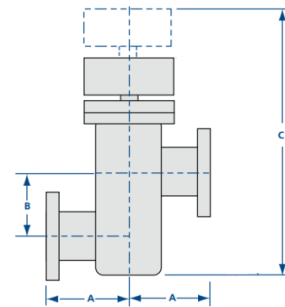
### Pneumatic Z Valve-CF Flange

Part No.	A (inch)	B (inch)	C (inch)
ZVP-CF1.33-HV	2.50	1.12	N/A
ZVP-CF2.12-HV	2.05	1.37	N/A
ZVP-CF2.75-HV	2.46	1.88	N/A
ZVP-CF3.38-HV	3.48	2.62	N/A
ZVP-CF4.50-HV	3.38	3.12	N/A



### Manual Z Valve-KF Flange

Part No.	A (inch)	B (inch)	C (inch)
ZVM-KF16	2.15	1.13	5.86
ZVM-KF25	2.03	1.37	6.11
ZVM-KF40	2.40	1.88	8.44
ZVM-KF50	3.40	2.62	10.61



### Manual Z Valve-CF Flange

Part No.	A (inch)	B (inch)	C (inch)
ZVM-CF1.33-HV	2.50	1.13	5.86
ZVM-CF2.12-HV	2.05	1.37	6.11
ZVM-CF2.75-HV	2.46	1.88	8.44
ZVM-CF3.38-HV	3.62	2.84	10.61
ZVM-CF4.50-HV	3.38	3.92	N/A



# Poppet Valve

## Standard KF Angle & Inline Valve

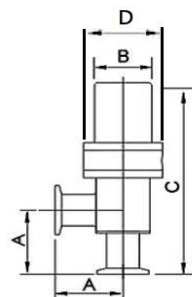
\* Any flange configuration.

\* Large conductance

\* Cycle life of 1.5 million

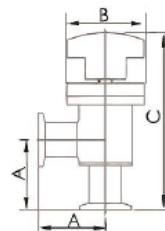
### Pneumatic Angle Valve-KF Flange

Part No.	A (inch)	B (inch)	C (inch)	D (inch)
AVP-KF16	2.15	1.69	6.79	2.24
AVP-KF25	2.03	1.69	6.54	2.24
AVP-KF40	2.40	2.17	8.29	2.98
AVP-KF50	3.40	2.56	9.80	3.48



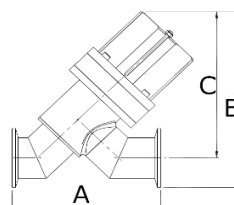
### Manual Angle Valve-KF Flange

Part No.	A (inch)	B (inch)	C (inch)
AVM-KF16	2.15	2.24	5.41
AVM-KF25	2.05	2.24	5.13
AVM-KF40	2.56	2.98	6.45
AVM-KF50	3.00	3.48	8.15



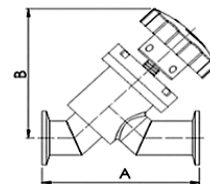
### Pneumatic In-Line Valve-KF Flange

Part No.	A (inch)	B (inch)	C (inch)
IVP-KF16	4.00	4.69	2.24
IVP-KF25	4.20	4.72	2.24
IVP-KF40	5.12	6.22	2.98
IVP-KF50	7.00	7.04	3.48



### Manual In-Line Valve-KF Flange

Part No.	A (inch)	B (inch)
IVM-KF16	4.00	3.89
IVM-KF25	4.20	3.89
IVM-KF40	5.12	4.89
IVM-KF50	7.01	6.19



# Poppet Valve

## Standard CF Angle and Inline Valve - HV (High Vacuum)

\* Any flange configuration.

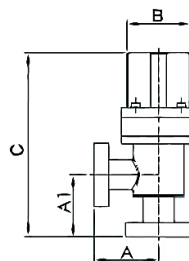
\* Large conductance

\* Cycle life of 1.5 million

\* Viton O-Ring @ bonnet

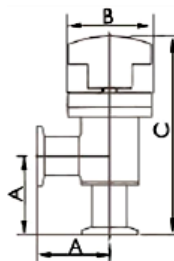
### Pneumatic Angle Valve-CF Flange

Part No.	A (inch)	B (inch)	C (inch)
AVP-CF1.33-HV	2.18	2.03	6.38
AVP-CF2.12-HV	2.07	2.03	6.14
AVP-CF2.75-HV	2.47	2.56	7.00
AVP-CF3.38-HV	3.08	2.62	9.44
AVP-CF4.50-HV	3.38	2.76	9.68
AVP-CF4.62-HV	3.63	3.25	11.28
AVP-CF6.00-HV	4.66	3.51	13.70
AVP-CF8.00-HV	5.68	5.51	17.66



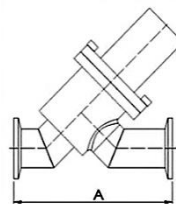
### Manual Angle Valve-CF Flange

Part No.	A (inch)	B (inch)	C (inch)
AVM-CF1.33-HV	2.18	2.24	5.43
AVM-CF2.12-HV	2.07	2.39	5.24
AVM-CF2.75-HV	2.46	2.98	6.50
AVM-CF3.38-HV	3.62	3.48	8.00
AVM-CF4.50-HV	3.38	4.00	8.00



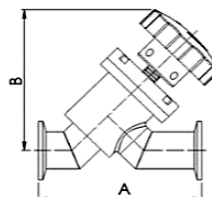
### Pneumatic In-Line Valve-CF Flange

Part No.	A (inch)	B (inch)	C (inch)
IVP-CF1.33-HV	4.70	N/A	N/A
IVP-CF2.12-HV	4.24	N/A	N/A
IVP-CF2.75-HV	5.26	N/A	N/A
IVP-CF3.38-HV	7.00	N/A	N/A
IVP-CF4.50-HV	N/A	N/A	N/A



### Manual In-Line Valve-CF Flange

Part No.	A (inch)	B (inch)
IVM-CF1.33-HV	4.70	3.92
IVM-CF2.12-HV	4.24	3.83
IVM-CF2.75-HV	5.24	4.83
IVM-CF3.38-HV	7.00	5.97
IVM-CF4.50-HV	7.30	6.72



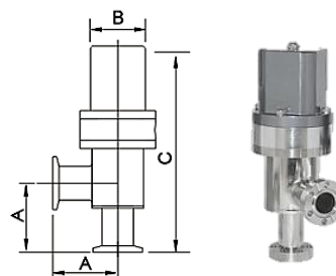
# Poppet Valve

## Standard CF Angle and Inline Valve - UHV (Ultra High Vacuum)

- \* Any flange configuration.
- \* Cycle life of 1.5 million
- \* Large conductance
- \* Cu gasket @ Bonnet

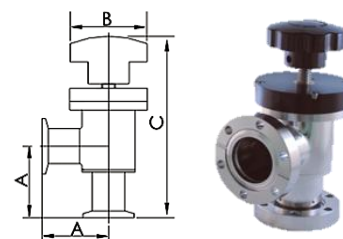
### Pneumatic Angle Valve-CF Flange

Part No.	A (inch)	B (inch)	C (inch)
AVP-CF1.33-UHV	2.18	2.03	6.38
AVP-CF2.12-UHV	2.07	2.03	6.14
AVP-CF2.75-UHV	2.47	2.56	7.00
AVP-CF3.38-UHV	3.08	2.62	9.44
AVP-CF4.50-UHV	3.38	2.76	9.68
AVP-CF4.62-UHV	3.63	3.25	11.28
AVP-CF6.00-UHV	4.66	3.51	13.70
AVP-CF8.00-UHV	6.50	9.97	18.47



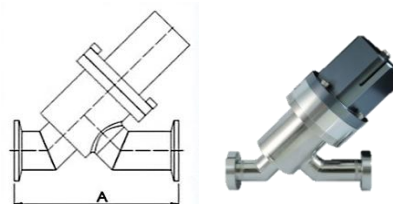
### Manual Angle Valve-CF Flange

Part No.	A (inch)	B (inch)	C (inch)
AVM-CF1.33-UHV	2.18	2.36	5.47
AVM-CF2.12-UHV	2.07	2.36	5.22
AVM-CF2.75-UHV	2.62	2.36	6.50
AVM-CF3.38-UHV	3.08	2.36	7.85
AVM-CF4.50-UHV	3.38	2.36	8.15



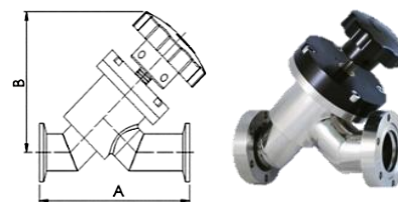
### Pneumatic In-Line Valve-CF Flange

Part No.	A (inch)	B (inch)	C (inch)
IVP-CF1.33-UHV	4.70	N/A	N/A
IVP-CF2.12-UHV	4.24	N/A	N/A
IVP-CF2.75-UHV	5.24	N/A	N/A
IVP-CF3.38-UHV	7.15	N/A	N/A
IVP-CF4.50-UHV	N/A	N/A	N/A



### Manual In-Line Valve-CF Flange

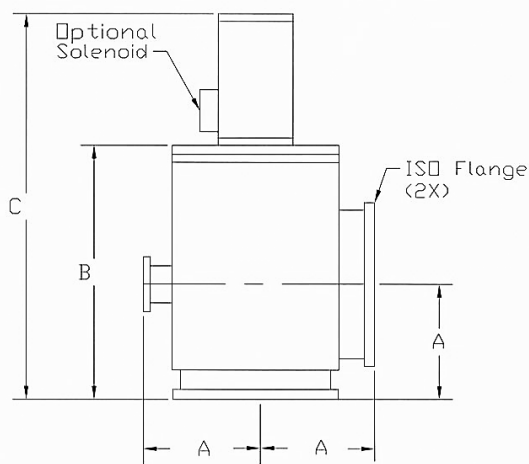
Part No.	A (inch)	B (inch)	C (inch)
IVM-CF1.33-UHV	4.70	3.93	N/A
IVM-CF2.12-UHV	4.24	3.83	N/A
IVM-CF2.75-UHV	5.24	4.88	N/A
IVM-CF3.38-UHV	7.00	5.97	N/A
IVM-CF4.50-UHV	N/A	N/A	N/A



# Poppet Valve

## Standard ISO Stainless Steel Angle Valve

Sizes from ISO63 to ISO630



### Angle Valve Features:

Valve body and poppet material: 304L

Electropolished interior surface finish

Rotatable ISO flange on 200mm and up

Magnetic position indicator included on 200 mm and up

Edge welded bellow with 90% full conductance

Viton O-Ring

### Specification :

Leak rate  $1 \times 10^{-9}$  atm cc/sec He

Vacuum rating  $1 \times 10^{-9}$  Torr

Bake temperature  $120^{\circ}$  C

Operating temperature  $20^{\circ}$  C --  $90^{\circ}$  C

Mounting position Any

Air pressure required 60 -- 95 psig

Cycle life 100K cycles

### Manual

Part No	A (inch)	B (inch)	C (inch)	Mtg. hole	B.C.	Side port
AVM-ISO63	3.47	3.15	10.98	4x-9	----	
AVM-ISO80	3.86	3.15	11.61	8x-9	----	
AVM-ISO100	4.25	3.94	13.01	8x-9	----	

### Pneumatic

Part No	A (inch)	B (inch)	C (inch)	Mtg. hole	B.C.	Side port
AVP-ISO63	3.25	2.76	9.55	4x-9	----	----
AVP-ISO80	3.50	3.25	11.15	8x-9	----	----
AVP-ISO100	4.47	3.51	13.53	8x-9	----	----
AVP-ISO160	6.25	5.51	18.23	8x-11	----	DN40
AVP-ISO200	8.27	14.57	23.31	12x-11	10.24	DN50
AVP-ISO250	10.39	18.46	28.50	12x-11	12.20	DN63
AVP-ISO320	9.84	19.45	32.99	12x-14	15.55	DN 80
AVP-ISO400	12.99	24.57	40.94	12x-14	18.90	DN100
AVP-ISO500	14.17	29.13	39.53	16x-14	22.83	DN125
AVP-ISO630	17.72	33.86	52.36	20x-14	28.35	DN160

# Poppet Valve

## Low Particle Valve

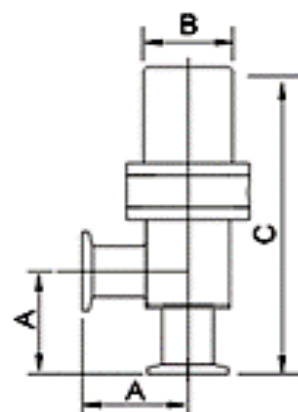
**Low Particle (LP)** poppet valve was field tested and proven to improve yield in a harsh or corrosive environment such as Etch or CVD processes. The entire mechanisms are shielded and completely cleared from gas flow, thus creating a very clean environment. Can be installed upstream of the chamber if necessary. Sizes available in 1.0", 1.5" and 2.0". To specify a **LP** style, add -LP at the end of part number. Example: AVP-KF25-**LP**.

## Pneumatic stainless poppet valve -- Low Particle

### Specification:

Vacuum range	$1 \times 10^{-9}$ Torr
Leak test	$1 \times 10^{-9}$ std cc/sec He
Bake temperature	120° C
MTTF (life)	1.5 million cycle
Time from open-close	<0.5 sec
Operating temperature	20° to 90° C
Differential pressure	15 psi
Position indicator	24 VDC or 120 VAC
Operating pressure	60 -- 95 psi

Part No	A (inch)	B (inch)	C (inch)
AVP-KF25-LP	2.06	2.03	6.2
AVP-KF40-LP	2.40	2.56	7.83
AVP-KF50-LP	2.75	2.01	10.4



# Poppet Valve

## Standard Block Valve

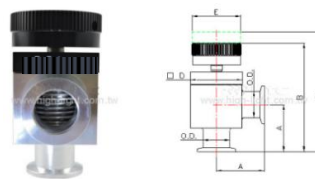
- \* One piece, compact design
- \* Low particle, formed bellows assembly
- \* Right angle or inline configuration

Body is machined from a single piece 6061-T6 aluminum billet. There is no seam; virtual leak is eliminated and flow path is extremely smooth. Aluminum has high fluorine resistance and excellent thermal conductivity, a great choice for CVD application. Aluminum's transparency to X-Ray makes it suitable for high energy research.

Solenoid is an optional item, in 24 VDC or 120 VAC.

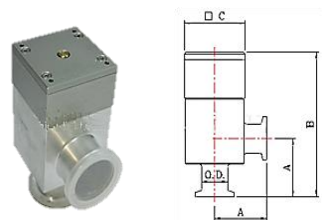
## Manual Alum. Block Valve

Part No.	A (inch)	B (inch)	C (inch)	OD (inch)
AVM-KF16-ALNC	1.57	4.06	4.21	0.79
AVM-KF25-ALNC	1.97	4.33	4.53	1.10
AVM-KF40-ALNC	2.56	5.83	6.18	1.77



## Pneumatic Alum. Block Valve

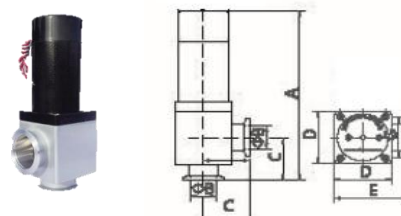
Part No.	A (inch)	B (inch)	C (inch)	OD (inch)
AVP-KF16-ALNC	1.57	3.90	1.83	0.79
AVP-KF25-ALNC	1.97	4.13	2.18	1.10
AVP-KF40-ALNC	2.36	5.79	2.77	1.77



## Electrically actuated, KF Flange, Aluminum Body

Electrically actuated valve is used where compressed air is not available such as in a Lab. Aluminum body does not affect the electro-magnetic field, thus provides a smooth motion.

Part No.	A (inch)	B (inch)	C (inch)	D (inch)	E (inch)
AVE-KF16	6.48	0.63	1.50	1.89	2.46
AVE-KF25	7.48	0.98	1.77	2.20	2.89
AVE-KF40	8.54	1.57	2.17	2.83	3.60
AVE-KF50	9.57	1.97	2.28	3.07	3.84



# Poppet Valve

## Integrated Block Valve

- \* 6.5 million cycle life
- \* Operation temperature: 250°C
- \* Right angle or inline configuration

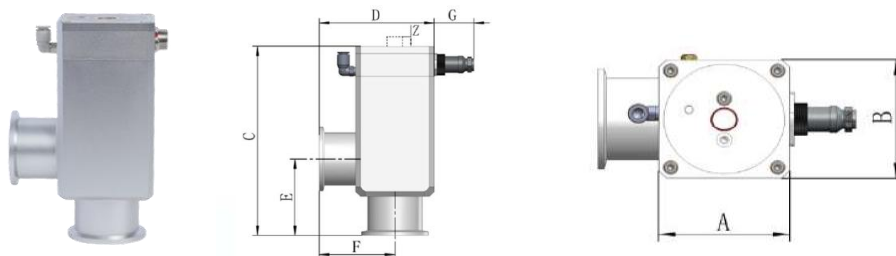
Body machined from a solid block to create robust structure.  
 Long life allows for high frequency operation.  
 High fluorine resistance and excellent thermal conductivity,  
 CVD, ALD, Etch, and battery production application  
 Transparency to X-Ray makes it suitable for high energy research.  
 Position indicator, solenoid, and actuator are integrated

Solenoid: 24 VDC or 120 VAC

Chemraz or Kalrez O-Rings are available.

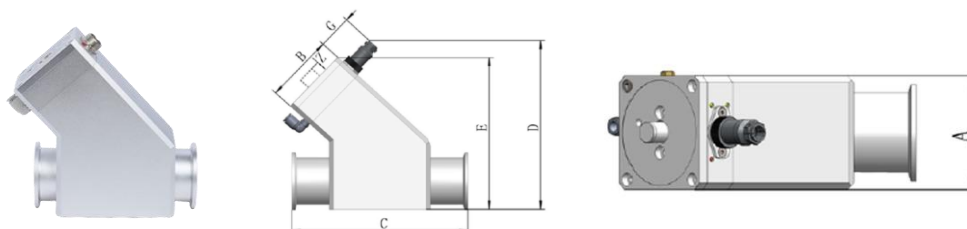
## Angle Block Valve

Port Size	A (inch)	B (inch)	C (inch)	D (inch)	E (inch)	F (inch)	G (inch)	Z (inch)
KF50	3.07	3.07	7.44	4.29	2.76	2.76	1.27	0.39
KF40	2.56	2.56	6.36	3.84	2.56	2.56	1.27	0.39
KF25	2.05	2.05	5.37	3.07	1.97	1.97	1.27	0.31
KF16	1.65	1.65	4.45	2.40	1.57	1.57	1.27	0.16
KF10	1.65	1.65	4.29	2.40	1.18	1.18	1.27	0.16



## Inline Block Valve

Port Size	A (inch)	B (inch)	C (inch)	D (inch)	E (inch)	G (inch)
KF50	3.07	3.07	7.01	7.80	7.32	1.27
KF40	2.56	2.56	5.12	6.40	5.83	1.27
KF25	2.05	2.05	3.94	5.35	4.80	1.27
KF16	1.65	1.65	3.15	4.49	4.09	1.27
KF10	1.65	1.65	3.15	4.49	4.09	1.27



# Poppet Valve

## Toggle Valve

Quick action, open or close the valve with a flick of a finger. The handle position also gives a clear indication whether the valve is open or close. Used where frequent on/off is required, such as in leak checking. Detent in both direction. Mechanical lock is available.

### Specification

Angle and line versions available  
 Manual operated  
 1 million cycles  
 Vacuum Range  $1 \times 10^{-7}$  Torr  
 Helium Leak Rate:  $< 1 \times 10^{-9}$  mbar l/s  
 Temperature 120C

### Features & Benefit

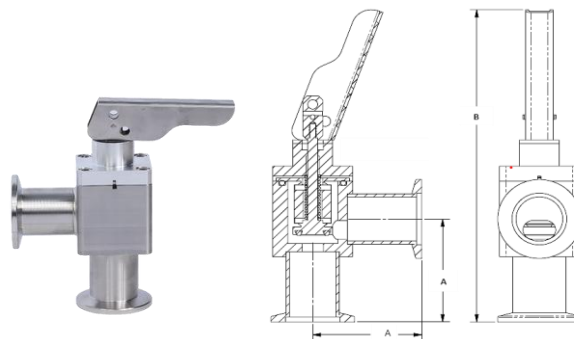
Easy to use  
 Form bellow sealed  
 Small footprint  
 Visualize open/close position

### Manual

#### KF Angle valve

Part No.	A	B
AVM-KF16-T	2.05	6.21
AVM-KF25-T	2.05	6.21
AVM-KF40-T	2.55	8.74
AVM-KF50-T	3.05	9.40

\*\* Dimension subject to change without notice

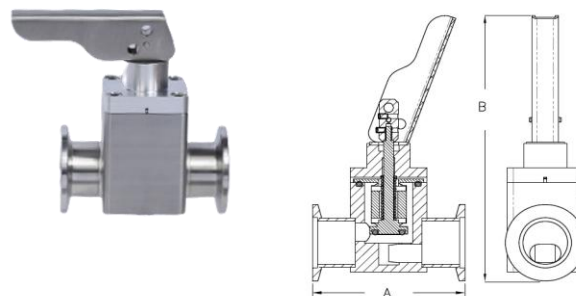


### Manual

#### KF Inline valve

Part No.	A	B
IVM-KF16-T	3.00	5.43
IVM-KF25-T	3.00	5.43
IVM-KF40-T	5.55	8.18
IVM-KF50-T	5.11	8.18

\*\* Dimension subject to change without notice

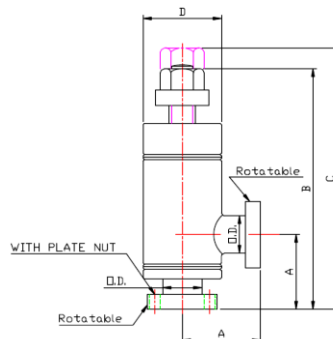


# Poppet Valve

## All-Metal Valve

All Metal Valve uses oxygen-free copper gasket as dynamic seal to press against a conical knife edge on the opposing part, thus forming an all metal seal

Copper gasket has a life of few hundred uses. Gasket replacement is easily done by a screw driver



## Specification:

Model	CF1.33	CF2.75	CF4.50	
Bakeability	Open	400 °C		
	Closed	300 °C		
Pressure Range	Below 10 <sup>-10</sup> torr			
Leak Rate	10 <sup>-10</sup> mbar. l/sec			
Material	Body	SUS304 & SUS316		
	Bellows	SUS316		
	Seal	OFHC Copper		
Closure	First	120 ~ 150kg-cm	200 ~ 300kg-cm	200 ~ 300kg-cm
Torque	Max	250 kg-cm	600 kg-cm	900 kg-cm
Port		CF1.33	CF2.75	CF4.50
Gasket Life	Above 50 times			
Spare Parts	Poppet seal gasket : 1 pc			

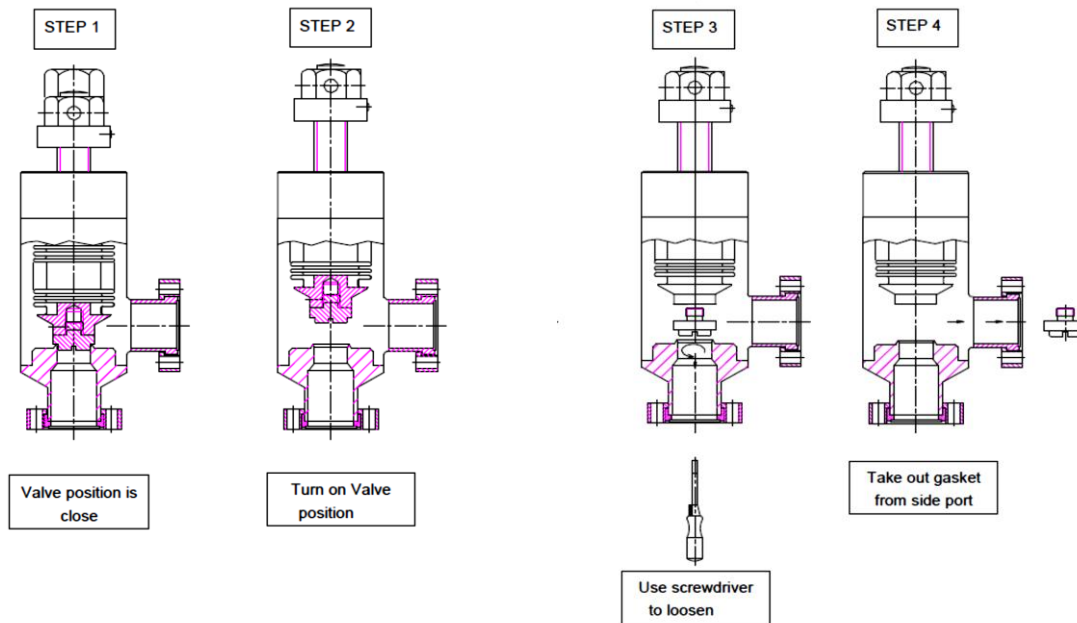
Part No	OD	A	B	C	D
AVP-CF1.33-UHV-AM	19.05	38.10	121.20	131.00	38.10
AVP-CF2.75-UHV-AM	38.10	62.50	170.00	187.00	54.00
AVP-CF4.5-UHV-AM	63.50	105.00	266.00	294.00	76.20

# Poppet Valve

## Feature and Notice:

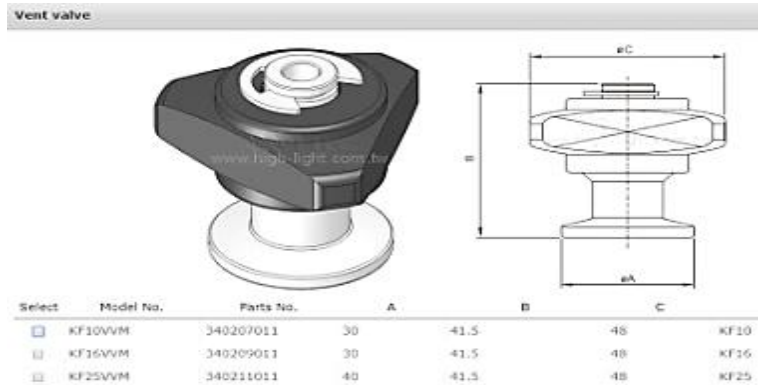
- 1 Bake temperature : 400 °C (open), 300 C (close)
- 2 The Cu gasket is easily replaced by a screw driver; removable from side port
- 3 All stainless steel construction.
- 4 Bellows stem seal.
- 5 3/4", 1-1/2" and 2-1/2" port sizes.
- 6 A calibrated dial for closure is provided on the top of the valve body, but the max. torque should not exceed 250 kg-cm (CF1.33), 600 kg-cm (CF2.75), and 900 kg-cm (CF4.5)
- 7 Must lubricate the drive shaft after maximum high temperature bake
- 8 Properly lubricate the drive shaft to prevent wearing the thread.
- 9 Orientation : Any position.

## Metal Gasket unload steps:



# Poppet Valve

## Vent Valve



## Features

Manually operated. Vent system to ambient air  
Indicator for pressure balance

## Technical Data

Flange size	KF10
Vent time (50 L)	14 sec.
Pressure range	1x10 <sup>-8</sup> torr to 760 torr
Leak rate	1x10 <sup>-9</sup> torr8l/sec
Valve body	SUS 304
Washer	Teflon
O-Ring	Viton
Screw cap	Aluminum

## Custom Valve

VPC core strength is custom design and manufacture. When you need a custom valve, our engineering will work with you from design to production.

Give us a call or email us to [support@vacproducts.com](mailto:support@vacproducts.com).

An engineer will reach out to you to discuss your requirement within 24 hours.

We can be reached at (510) 498-8518 Monday - Friday from 9:00 am - 6:00 pm PST.

# Gate Valve



**Standard** HV. Economical. For general vacuum such as industrial coating. Size ISO63 to 320 mm.

**Semiconductor** HV and UHV. For ultra clean environment such as semiconductor industry. Size KF25 to 320 mm.

**Harsh** HV. Robust with no moving components. Used in corrosive environment or extreme temperature. Lockout-tagout optional.

**Aluminum** Better vacuum than stainless steel. Transparent to radiation.

**Mini** Quick action. Economical. Small footprint. For sample transfer. Size KF25 to KF50.

# Gate Valve

## Standard Industrial Grade

### Stainless Steel

- \* Any flange configuration.
- \* Cycle life of 100,000
- \* Larger sizes up to 3000 mm available
- \* Customization available for special projects

### Specification:

Vacuum range:	1x10 <sup>-9</sup> Torr
Leak test:	1x10 <sup>-9</sup> atm cc/sec of He
Bake temperature:	150° C
Life:	100,000 Cycle
Time from open-close:	< 1.5 sec
Operating temperature:	up to 100° C
Position Indicator:	28 VDC or 115 VAC



**GVP**



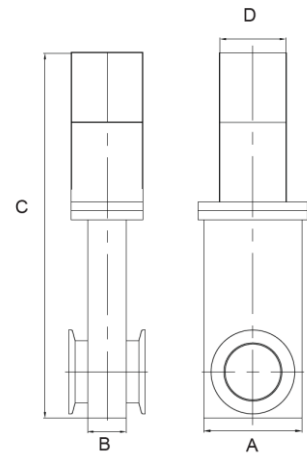
**GVM**

## Pneumatic - KF / ISO Flange

Part No.	A (inch)	B (inch)	C (inch)	D (inch)	Port Size (ID)
GVP-KF25-24-PI	2.44	1.34	11.18	2.52	1.0"
GVP-KF40-24-PI	2.99	1.34	12.40	2.52	1.5"
GVP-KF50-24-PI	3.47	1.34	12.81	2.52	2.0"
GVP-ISO63F-24-PI	4.33	1.34	14.39	2.83	2.5"
GVP-ISO80F-24-PI	5.12	1.42	17.60	3.31	3.0"
GVP-ISO100F-24-PI	5.67	1.57	24.21	2.95	4.0"
GVP-ISO160F-24-PI	7.91	1.77	30.37	2.95	6.0"
GVP-ISO200F-24-PI	10.16	1.85	35.33	3.74	8.0"
GVP-ISO250F-24-PI	12.20	2.15	37.28	4.61	10.0"
GVP-ISO300F-24-PI	16.73	3.07	52.32	4.53	12.0"

\* Also available in ISO-K, CF HV

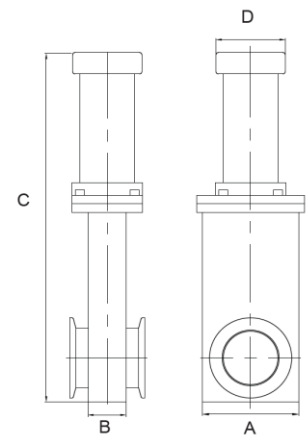
\* Solenoid, Position Indicator included with pneumatic gate valve



## Manual - KF / ISO Flange

Part No.	A (inch)	B (inch)	C (inch)	D (inch)	Port Size (ID)
GVM-KF25	2.44	1.34	10.94	2.48	1.0"
GVM-KF40	2.99	1.34	12.30	2.48	1.5"
GVM-KF50	3.47	1.34	12.85	2.48	2.0"
GVM-ISO63F	4.33	1.34	14.88	3.94	2.5"
GVM-ISO80F	5.12	1.42	18.17	3.94	3.0"
GVM-ISO100F	5.67	1.57	19.69	3.94	4.0"
GVM-ISO160F	7.91	1.77	25.69	3.94	6.0"
GVM-ISO200F	10.16	1.85	30.06	3.94	8.0"
GVM-ISO250F	12.20	2.15	37.70	4.92	10.0"
GVM-ISO300F	16.73	3.07	46.91	4.92	12.0"

\* Also available in ISO-K, CF HV



# Gate Valve

## Semiconductor Grade

### Stainless Steel

- \* Low particle by ceramic ball bearing
- \* Cycle life of 250,000
- \* Kalrez O-Ring available
- \* Easy maintenance
- \* Customization available for special projects

### Specification:

Vacuum range:	1x10 <sup>-9</sup> Torr
Leak test:	1x10 <sup>-9</sup> atm cc/sec of He
Bake temperature:	150° C
Life:	100,000 Cycle
Time from open-close:	< 1.5 sec
Operating temperature:	up to 100° C
Position Indicator:	28 VDC or 115 VAC



GVPS

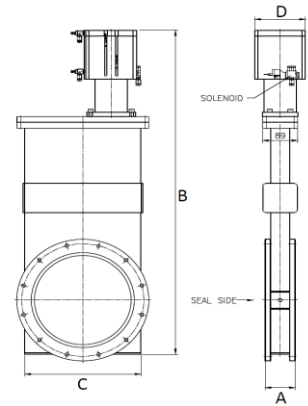
GVMS

## Pneumatic

Part No.	A (inch)	B (inch)	C (inch)	D (inch)	Port Size (ID)
GVPS-CF2.75-HV-24-PI	2.06	10.12	2.74	2.28	1.5"
GVPS-CF3.38-HV-24-PI	2.85	13.17	3.92	2.68	2.0"
GVPS-CF4.50-HV-24-PI	2.66	13.17	3.92	2.68	2.5"
GVPS-CF4.62-HV-24-PI	2.52	19.27	5.51	2.68	3.0"
GVPS-CF6.00-HV-24-PI	3.15	19.27	5.83	2.52	4.0"
GVPS-CF8.00-HV-24-PI	3.39	23.48	7.48	3.03	6.0"
GVPS-CF10.00-HV-24-PI	3.39	29.25	9.41	3.70	8.0"
GVPS-CF12.00-HV-24-PI	4.09	35.55	11.57	4.88	10.0"
GVPS-CF14.00-HV-24-PI	4.16	41.97	14.49	5.51	12.0"
GVPS-CF16.00-HV-24-PI	4.55	47.56	16.77	6.26	14.0"

\* Also available in UHV (CF), JIS, ASA, KF, and ISO flange

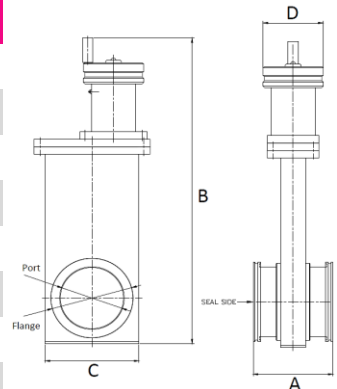
\* Solenoid, Position Indicator included with pneumatic gate valve



## Manual

Part No.	A (inch)	B (inch)	C (inch)	D (inch)	Port Size (ID)
GVMS-CF2.75-HV	2.06	10.58	2.74	2.56	1.5"
GVMS-CF3.38-HV	2.85	13.06	3.92	2.52	2.0"
GVMS-CF4.50-HV	2.66	13.06	3.92	2.52	2.5"
GVMS-CF4.62-HV	2.52	19.27	5.51	2.68	3.0"
GVMS-CF6.00-HV	3.15	19.71	5.83	3.74	4.0"
GVMS-CF8.00-HV	3.39	23.00	7.48	3.74	6.0"
GVMS-CF10.00-HV	3.39	28.41	9.41	3.90	8.0"
GVMS-CF12.00-HV	4.09	34.28	11.57	4.33	10.0"

\* Also available in UHV (CF), JIS, ASA, KF, and ISO flange



# Gate Valve

## Semiconductor Grade - Shield Gate Valve

### Benefits and Features:

- Less than 1mm gap between valve body and blocker
- Prevents in flow gas(powder) into inside of valve body
- Applications: Pump isolation, High level of process by product in the gas stream



### Specification:

GATE SEAL TYPE	SHIELD GATE VALVE
Operation	Manual / Pneumatic
Flange Size (ID)	2.5" ~ 10"
Flange Type	ISO, JIS, ASA, CF
Feedthrough	Welded Bellows
Gate Seal	Viton O-Ring / Kalrez O-Ring / EPDM
Bonnet Seal	Viton O-Ring
Response Time	≤ 2 sec
Operate Pressure Range	2.5" ~ 6": $1 \times 10^{-10}$ mbar to 1400 mbar 8" ~ 10": $1 \times 10^{-10}$ mbar to 1200 mbar
Differential pressure at opening	≤ 30 mbar
Differential pressure on the gate	2.5" ~ 6": ≤ 1400 mbar / 8" ~ 10" ≤ 1200 mbar
Leak rate	$< 1 \times 10^{-10}$ mbar ℓ/sec
Cycles until first service	200,000
Temperature for Valve Body	≤ 200 °C
Temperature for Actuator	≤ 60 °C
Bake Temperature	≤ 150 °C
Materials	Body (Stainless Steel 304) / Actuator (Al 6061 Anodizing)
Mounting Position	Any
Operating Pressure (N2)	4 ~ 7 bar

# Gate Valve

## Semiconductor Grade - 3<sup>rd</sup> (Multi) Position Gate Valve

### Benefits and Features:

- 3 Position Function
  - Valve Open, Valve Close, 3rd POSITION
- Equipment can read valve state through connect to 9 Pin D-Sub of the valve
- Manual and Pneumatic valve combination
- Applications: Any other process that requires pressure control



### Specification:

GATE SEAL TYPE	3rd(MULTI) POSITION GATE VALVE
Operation	Pneumatic
Flange Size (ID)	2.5" ~ 12"
Flange Type	ISO, JIS, ASA, CF
Feedthrough	Welded Bellows
Gate Seal	Viton O-Ring / Kalrez O-Ring / EPDM
Bonnet Seal	Viton O-Ring
Response Time	≤ 2 sec
Operate Pressure Range	2.5" ~ 6": $1 \times 10^{-10}$ mbar to 1400 mbar 8" ~ 12": $1 \times 10^{-10}$ mbar to 1200 mbar
Differential pressure at opening	≤ 30 mbar
Differential pressure on the gate	2.5" ~ 6": ≤ 1400 mbar / 8" ~ 12" ≤ 1200 mbar
Leak rate	$< 1 \times 10^{-10}$ mbar ℓ/sec
Cycles until first service	200,000
Temperature for Valve Body	≤ 200 °C
Temperature for Actuator	≤ 60 °C
Bake Temperature	≤ 150 °C
Materials	Body (Stainless Steel 304) / Actuator (Al 6061 Anodizing)
Mounting Position	Any
Operating Pressure (N2)	4 ~ 7 bar

# Gate Valve

## Semiconductor Grade - Heating Gate Valve

### Benefits and Features:

- Heating Function using Jacket or Heater inserted
- Heating Controller
- Applications: Process with by products such as powder, gas



### Specification:

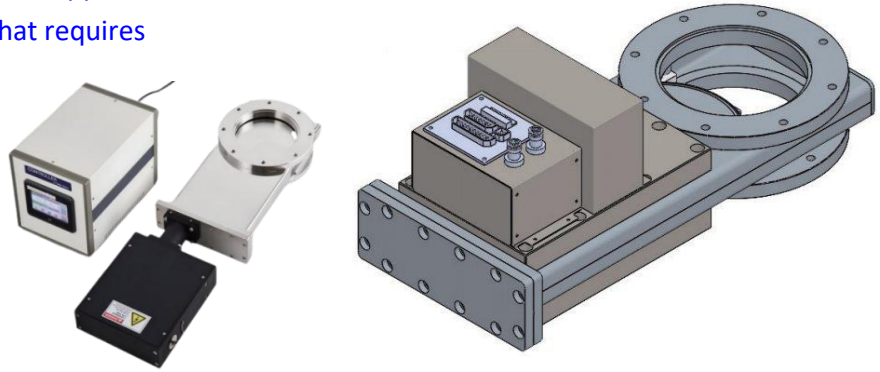
GATE SEAL TYPE	HEATING GATE VALVE
Operation	Manual / Pneumatic
Flange Size (ID)	1.5" ~ 12"
Flange Type	ISO, JIS, ASA, CF
Feedthrough	Welded Bellows
Gate Seal	Viton O-Ring / Kalrez O-Ring / EPDM
Bonnet Seal	Viton O-Ring
Response Time	≤ 2 sec
Operate Pressure Range	1.5" ~ 6": $1 \times 10^{-10}$ mbar to 1400 mbar 8" ~ 12": $1 \times 10^{-10}$ mbar to 1200 mbar
Differential pressure at opening	≤ 30 mbar
Differential pressure on the gate	1.5" ~ 6": ≤ 1400 mbar / 8" ~ 12" ≤ 1200 mbar
Leak rate	$< 1 \times 10^{-10}$ mbar ℓ/sec
Cycles until first service	200,000
Temperature for Valve Body	≤ 200 °C
Temperature for Actuator	≤ 80 °C
Bake Temperature	≤ 200 °C
Materials	Body (Stainless Steel 304) / Actuator (Al 6061 Anodizing)
Mounting Position	Any
Operating Pressure (N2)	4 ~ 7 bar

# Gate Valve

## Semiconductor Grade - Gate Valve Control System

### Benefits and Features:

- Body Material: Stainless Steel
- Compact Design
- Integrated pressure controller with stepper motor
- Applications: Any other process that requires pressure control and isolation



### Specification:

GATE SEAL TYPE		GATE VALVE CONTROL SYSTEM	
Body		STS304	
Materials	Mechanism	STS304, STS420	
	Gate Sealing	FKM(VITON)	
Flange Size (ID)		1.5" ~ 10"	
Feedthrough		Rotary Feedthrough	
Actuator		Stepper Motor	
He Leak Rate		$1 \times 10^{-9}$ mbar $\ell$ /sec	
Pressure Range		$1 \times 10^{-8}$ mbar to 1.4 bar	
Differential pressure on the gate		$\leq 1.4$ bar	
Differential pressure at opening		$\leq 30$ mbar	
Cycles until first service	Pressure Control	1,000,000	
	Open/Close	200,000	
Temperature	Body	$\leq 150$ °C	
	Controller	$\leq 35$ °C	
Installation Direction		Any	
Interface		RS232, RS485, Devicenet, Profibus, EtherCat	

# Gate Valve

## Semiconductor Grade - Transfer Valve(I-Motion)

### Benefits and Features:

- Body Material: Aluminum or Stainless Steel
- Compact Design
- Easy Maintenance using Repair Parts Kit
- Applications: Transfer and process chamber isolation in semiconductor systems for less than 450mm wafers



### Specification:

GATE SEAL TYPE	TRANSFER VALVE(I-MOTION)
Operation	Pneumatic
Flange Size (ID)	32 × 222 / 46 × 236 / 50 × 336 / 56 × 500
Feedthrough	Welded Bellows
Gate Seal	Viton O-Ring / Vulcanized Seal
Bonnet Seal	Viton O-Ring
Response Time	≤ 2 sec
Operate Pressure Range	1×10 <sup>-8</sup> mbar to 1200 mbar
Differential pressure at opening	≤ 30 mbar
Differential pressure on the gate	≤ 1200 mbar
Leak rate	Stainless: < 1×10 <sup>-9</sup> mbar ℓ/sec Aluminum: < 1×10 <sup>-5</sup> mbar ℓ/sec
Cycles until first service	≥ 1,000,000
Temperature for Valve Body	≤ 200 °C
Temperature for Actuator	≤ 80 °C
Bake Temperature	≤ 200 °C
Materials	Stainless Steel 304, AL6061 Anodizing
Mounting Position	Any
Operating Pressure (N2)	4 ~ 7 bar

# Gate Valve

## Semiconductor Grade - Transfer Valve(L-Motion)

### Benefits and Features:

- Body Material: Aluminum or Stainless Steel
- Compact Design
- Easy Maintenance using Repair Parts Kit
- Applications: Transfer and process chamber isolation in semiconductor systems for less than 450mm wafers



### Specification:

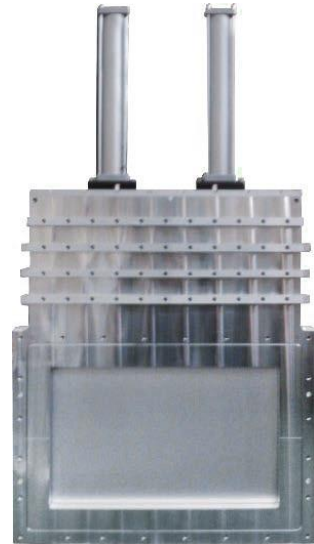
GATE SEAL TYPE	TRANSFER VALVE(L-MOTION)
Operation	Pneumatic
Flange Size (ID)	32 × 222 / 46 × 236 / 50 × 336 / 56 × 500
Feedthrough	Welded Bellows
Gate Seal	Viton O-Ring / Vulcanized Seal
Bonnet Seal	Viton O-Ring
Response Time	≤ 2 sec
Operate Pressure Range	1×10 <sup>-8</sup> mbar to 1200 mbar
Differential pressure at opening	≤ 30 mbar
Differential pressure on the gate	≤ 1200 mbar
Leak rate	Stainless: < 1×10 <sup>-9</sup> mbar ℓ/sec Aluminum: < 1×10 <sup>-5</sup> mbar ℓ/sec
Cycles until first service	≥ 1,000,000
Temperature for Valve Body	≤ 200 °C
Temperature for Actuator	≤ 80 °C
Bake Temperature	≤ 200 °C
Materials	Stainless Steel 304, AL6061 Anodizing
Mounting Position	Any
Operating Pressure (N2)	4 ~ 7 bar

# Gate Valve

## Semiconductor Grade - Customized Large Transfer Valve

### Benefits and Features:

- Customized Order Made
- Applications : Large coating systems



### Specification:

GATE SEAL TYPE	CUSTOMIZED LARGE TRASFER VALVE
Operation	Pneumatic
Flange Size (ID)	80 × 500 / 100 × 400 / 200 × 1800 / 650 × 1050, etc
Flange Type	Customized
Feedthrough	Welded Bellows / O-Ring Seal
Gate Seal	Viton O-Ring / Kalrez O-Ring
Bonnet Seal	Viton O-Ring
Response Time	≤ 2 sec
Operate Pressure Range	1×10 <sup>-8</sup> mbar to 1000 mbar
Differential pressure at opening	≤ 30 mbar
Differential pressure on the gate	≤ 1000 mbar
Leak rate	< 5×10 <sup>-9</sup> mbar ℓ/sec
Cycles until first service	10,000 ~ 200,000
Temperature for Valve Body	≤ 200 °C
Temperature for Actuator	≤ 60 °C
Bake Temperature	≤ 150 °C
Materials	Stainless Steel 304, A5083 ~ A7075
Mounting Position	Any
Operating Pressure (N2)	6 ~ 8 bar

# Gate Valve

## Harsh Environment

### Benefits and Features:

#### \* Robust & Reliable

- No bearings or linkages
- No hard impact, thus runs smooth
- No vibration
- Low particle generation

#### \* Low Maintenance

- One single plate actuated by an air cylinder
- Simple to assemble or disassemble

\* **Available sizes:** DN50, DN80, DN100, DN160

**Application:** LED, Abatement or any harsh environment



## Specification:

Pressure range: 1x10<sup>-9</sup> mbar

Leak rate: 1x10<sup>-9</sup> mbar, l/s

Different pressure: 7 bar

Operating temperature: 120 C

Pneumatic pressure: 60-80 psi

Solenoid: 24 vdc or 120 vac

Mounting position: Any

Cycle life: 50000

# Gate Valve

## Aluminum

Our aluminum gate valves are machined from solid blocks, resulting in better rigidity and strength. These high-quality valves are ideal for various industrial applications where reliability and performance are critical.

### Feature:

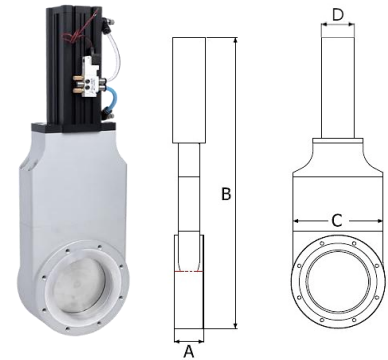
- \* Chlorine resistant
- \* Lower H2 outgassing
- \* Low particle by ceramic ball mechanism
- \* Cycle life of 250,000
- \* Easy maintenance and repair
- \* Customization available for special projects

### Specification:

Vacuum range	8x10 <sup>-8</sup> Torr
Leak test	1x10 <sup>-9</sup> atm cc/sec of He
Bake temperature	150° C
Life	250,000 Cycle
Time from open-close	< 1.5 sec
Operating temperature	up to 100° C
Position Indicator	28 VDC, or 115VAC
Air pressure	82 psig
Differential pressure at opening	< 30 mbar
Body & mechanism material	6061-T6 AL
Shaft material	DN40-80AL/DN100-500 304SS
Carriage	6061-T6 AL /Peek

### Pneumatic Aluminum Gate Valve - KF / ISO Flange

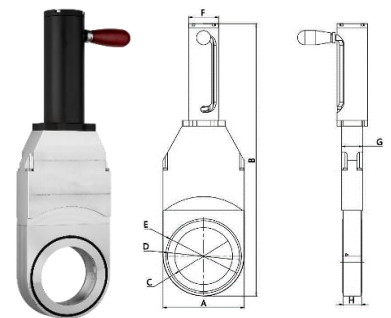
Part No.	A (inch)	B (inch)	C (inch)	D (inch)	Port Size (ID)
GVAPS-KF40-24-PI	2.36	11.54	2.52	2.52	1.5"
GVAPS-KF50-24-PI	2.24	11.50	3.27	2.24	2.0"
GVAPS-ISO63F-24-PI	2.36	17.54	4.61	2.52	2.5"
GVAPS-ISO80F-24-PI	2.36	22.07	6.50	2.52	3.0"
GVAPS-ISO100F-24-PI	2.76	29.63	8.46	3.03	4.0"
GVAPS-ISO160F-24-PI	2.76	34.84	10.43	3.03	6.0"
GVAPS-ISO200F-24-PI	3.23	41.42	12.40	3.70	8.0"



\* Solenoid, Position Indicator included with pneumatic gate valve

### Manual Aluminum Gate Valve - KF / ISO Flange

Part No.	A (inch)	B (inch)	C (inch)	D (inch)	Port Size (ID)
GVAPS-KF40-24-PI	2.36	11.54	2.52	2.52	1.5"
GVAPS-KF50-24-PI	2.24	11.50	3.27	2.24	2.0"
GVAPS-ISO63F-24-PI	2.36	17.54	4.61	2.52	2.5"
GVAPS-ISO80F-24-PI	2.36	22.07	6.50	2.52	3.0"
GVAPS-ISO100F-24-PI	2.76	29.63	8.46	3.03	4.0"



# Gate Valve

## Mini

A substitute for gate valve at a fraction of the cost. This valve has very few parts with only one axis motion, thus extremely robust. Available in manual and electrical version. The electrical version is a throttling valve with unlimited positions to control the flow. Ideal application for loadlock chamber to avoid turbulence.

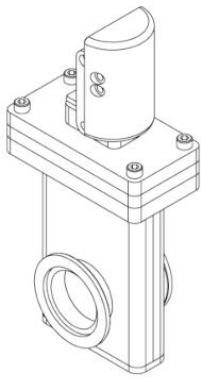
The Manual Mini Gate Valve works with handle locking mechanism which was to provide reliable gate sealing without any friction. The locking mechanism locks the gate in the closed position.

### Features & Benefit

- Reliable, robust
- secure locking in closed position on both gate sides
- Actuator solenoid available in AC or DC
- Reliable performance
- Extended maintenance free cycle

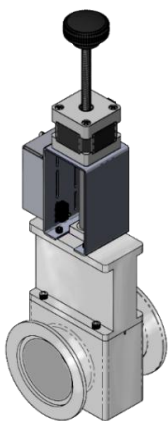
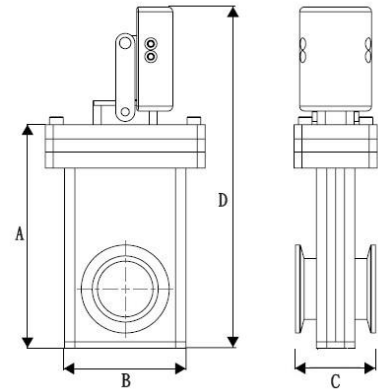
### Specification

- Temperature: 150°C
- 250,000 cycles
- Vacuum Range: 1x10<sup>-7</sup> Torr
- Helium Leak Rate: < 1x10<sup>-9</sup> mbar l/s
- With standard Viton O-ring
- \*Higher temperature version available*



### Manual Valve Mini Gate Valve Manual

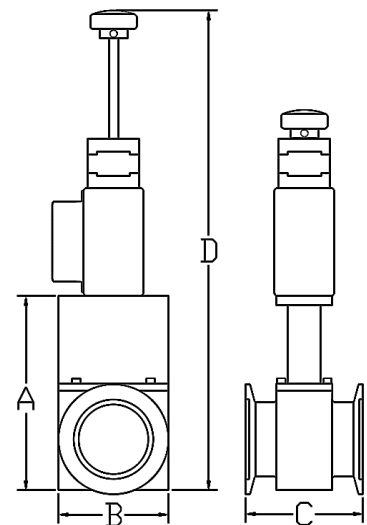
Size	A	B	C	D
KF16	3.32	1.87	2.76	6.50
KF25	3.32	1.87	2.76	6.50
KF40	5.51	2.99	1.97	9.17
KF50	5.22	2.95	3.15	8.40



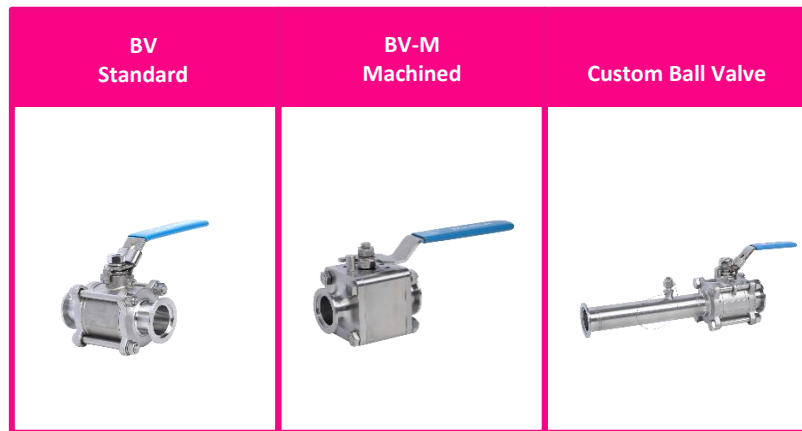
### Electrical Valve 2-Phase Linear motor, 3.3V / 1A Throttling with unlimited positions

### Mini Gate Valve Electrical

Size	A	B	C	D
KF16	3.32	1.87	2.76	10.49
KF25	3.32	1.87	2.76	10.49
KF40	5.22	2.95	3.15	12.39
KF50	5.22	2.95	3.15	12.39



# Ball Valve



**Standard** Casting body. PTFE sealed. Vacuum to  $1 \times 10^{-8}$  torr. Pressure to 200 psi.

**Machined** Machined body. PTFE sealed. Vacuum to  $1 \times 10^{-8}$  torr. Used in high pressure, temperature, cryogenics and corrosive environment.

**Custom** Make to print.

# Ball Valve

\*\*\* 3 Piece Structure Ball Valve \*\*\*

## Stainless Steel Ball Valve

### Application :

Ball Valve is ideal for isolating reactor, trap and scrubber on thin-film coating tool for harsh and corrosive environment. Commonly used on MOCVD & CVD equipment; down stream from process chamber or mechanical pump.

Ball Valve has less wetted surface than Poppet Valve. Wiping action of the Teflon across the ball reduces particulate buildup, making this valve robust in particulate rich effluent streams.

Body, stem, ball and end caps are made of 316L stainless steel. Fluoroelastomers are used to seal the stem from atmosphere. PTFE (Teflon) seals around the ball to isolate processes. Blow-out proof stem, full bore with internal surface of  $Ra < 0.4$  give the valve extended life.

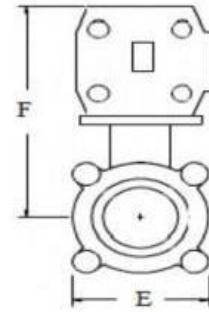
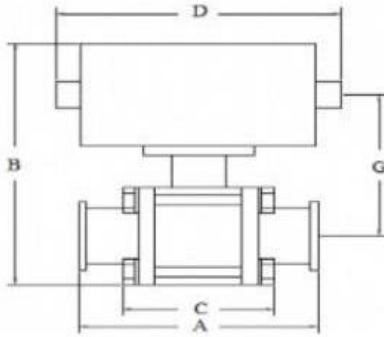
### Features :

- Vacuum rating of  $1 \times 10^{-8}$  torr
- Bakeable to 150°C (200°C intermittent)
- Manufactured from 316L stainless steel
- Particulate resistant ball/seat design lengthens mean time to repair
- High conductance; straight through flow
- Service valve without removal from the system
- "Fail Safe" air-to-open, spring-to-close available
- 80-120 psig operating air pressure
- Leak Rate :  $1 \times 10^{-8}$  atm-cc/sec
- Available connection : Tube end, KF, ISO

# Ball Valve

## Standard Ball Valve

### Single Acting



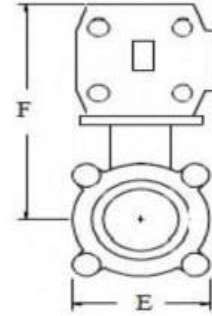
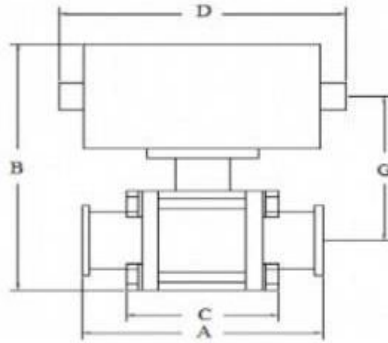
### Pneumatic Ball Valve, Single Acting (Fail safe)

Part Number	A	B	D	E	F	G	Ball size	Conductance (L/Sec)	ISO - 5211	Port Size
BVP-S-KF10	3.50 (89)	4.43 (112)	5.33 (135)	1.80 (46)	3.51 (89)	2.60 (66)	0.38	3	F03	1/2"
BVP-S-KF16	3.50 (89)	4.43 (112)	5.33 (135)	1.80 (46)	3.51 (89)	2.60 (66)	0.56	5	F03	3/4"
BVP-S-KF25	4.70 (119)	5.80 (147)	6.10 (155)	2.22 (56)	4.70 (119)	3.40 (86)	0.81	13	F04	1"
BVP-S-KF40	5.80 (147)	7.40 (187)	7.20 (182)	3.00 (76)	5.90 (150)	4.40 (101)	1.25	35	F05	1-1/2"
BVP-S-KF50	7.20 (182)	8.00 (203)	7.20 (182)	3.50 (89)	6.15 (156)	4.55 (115)	1.50	57	F05	2"
BVP-S-ISO63	7.76 (197)	9.50 (241)	12.00 (305)	5.00 (127)	9.00 (228)	6.20 (157)	2.00	180	F07	2-1/2"
BVP-S-ISO80	9.01 (229)	15.50 (394)	12.00 (305)	6.40 (163)	12.30 (312)	7.76 (197)	2.50	260	F07	3"
BVP-S-ISO100	9.57 (243)	17.10 (434)	12.00 (305)	8.10 (206)	13.00 (330)	10.10 (257)	3.27	490	F10	4"

# Ball Valve

## Standard Ball Valve

### Double Acting

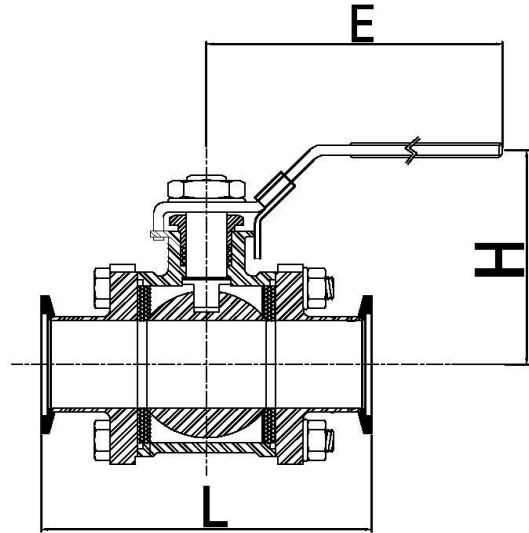


### Pneumatic Ball Valve, Double Acting

Part Number	A	B	D	E	F	G	Ball Size	Conductance (L/Sec)	ISO - 5211	Port Size
BVP-D-KF10	3.50 (89)	4.43 (112)	5.33 (135)	1.80 (46)	3.51 (89)	2.60 (66)	0.38	3	F03	1/2"
BVP-D-KF16	3.50 (89)	4.43 (112)	5.33 (135)	1.80 (46)	3.51 (89)	2.60 (66)	0.56	5	F03	3/4"
BVP-D-KF25	4.70 (119)	5.80 (147)	6.10 (155)	2.22 (56)	4.70 (119)	3.40 (86)	0.81	13	F04	1"
BVP-D-KF40	5.80 (147)	7.40 (187)	7.20 (182)	3.00 (76)	5.90 (150)	4.40 (101)	1.25	35	F05	1-1/2"
BVP-D-KF50	7.20 (182)	8.00 (203)	7.20 (182)	3.50 (89)	6.15 (156)	4.55 (115)	1.50	57	F05	2"
BVP-D-ISO63	7.76 (197)	9.50 (241)	12.00 (305)	5.00 (127)	9.00 (228)	6.20 (157)	2.00	180	F07	2-1/2"
BVP-D-ISO80	9.01 (229)	15.50 (394)	12.00 (305)	6.40 (163)	12.30 (312)	7.76 (197)	2.50	260	F07	3"
BVP-D-ISO100	9.57 (243)	17.10 (434)	12.00 (305)	8.10 (206)	13.00 (330)	10.10 (257)	3.27	490	F10	4"

# Ball Valve

## Standard Ball Valve



## Manual Ball Valve

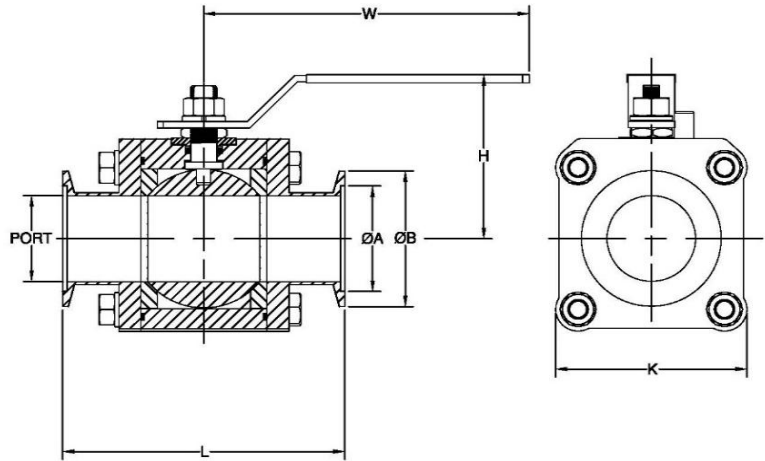
Part No#	Tube I.D.	Tube O.D.	L	H	E	Torque (in/lb)	Port Size
BVM-KF10	0.37 (9.50)	0.50 ( 12.7)	3.62 (92)	2.05 (52)	4.17 (106)	40.00	1/2"
BVM-KF16	0.63 (15.9)	0.75 ( 19.1)	3.62 (92)	2.17 (55)	4.17 (106)	64.00	3/4"
BVM-KF25	0.87 (22.2)	1.00 ( 25.4)	4.21 (107)	2.76 (70)	5.31 (135)	130.00	1"
BVM-KF40	1.38 (35.0)	1.50 ( 38.2)	5.12 (130)	3.50 (89)	7.17 (182)	195.00	1-1/2"
BVM-KF50	1.87 (47.6)	2.00 ( 50.8)	5.94 (151)	3.90 (99)	7.17 (182)	250.00	2"
BVM-ISO63	2.37 (60.3)	2.50 ( 63.4)	7.76 (197)	5.00 (127)	12.20 (310)	512.00	2-1/2"
BVM-ISO80	2.87 (73.0)	3.00 ( 76.2)	9.01 (229)	5.31 (135)	12.30 (310)	685.00	3"
BVM-ISO100	3.83 (97.4)	4.00 (101.6)	9.57 (243)	6.50 (165)	15.75 (400)	996.00	4"

# Ball Valve

## Machined Ball Valve

- \* Op. temperature: -200 to 260°C (-328 to 500 F)
- \* Tube End configuration available

Machined from corrosive resistant 316L stainless steel. Fluoroelastomers are used to seal the stem and end caps while the PTFE seats cold flow around the ball to isolate the process when closed. Machined ball valves are used in high pressure, high temperature, cryogenic and corrosive environment. It is stronger and cleaner than cast valve. More suited for oil, gas and harsh vacuum application.



## Manual Machined Ball Valve

Part Number	Nom.	A	B	L	H	W	K	Port Size
BVM-KF25-M	1"	1.03	1.57	3.92	2.99	6.54	2.40	0.87
BVM-KF40-M	1.5"	1.62	2.17	5.16	3.13	6.93	3.20	1.38
BVM-KF50-M	2"	2.06	2.95	6.31	4.78	7.56	4.10	1.87

# Butterfly Valve



## Standard

Flow and pressure control. Vacuum to  $1 \times 10^{-8}$  torr. Used to adjust flow rate. Self-wiping.

## Chevron Vane

Low profile, high conductance, optimum pressure control. Size range 4" to 35".

## Custom

Throttling pressure control. Plug-in compatible to VAT.

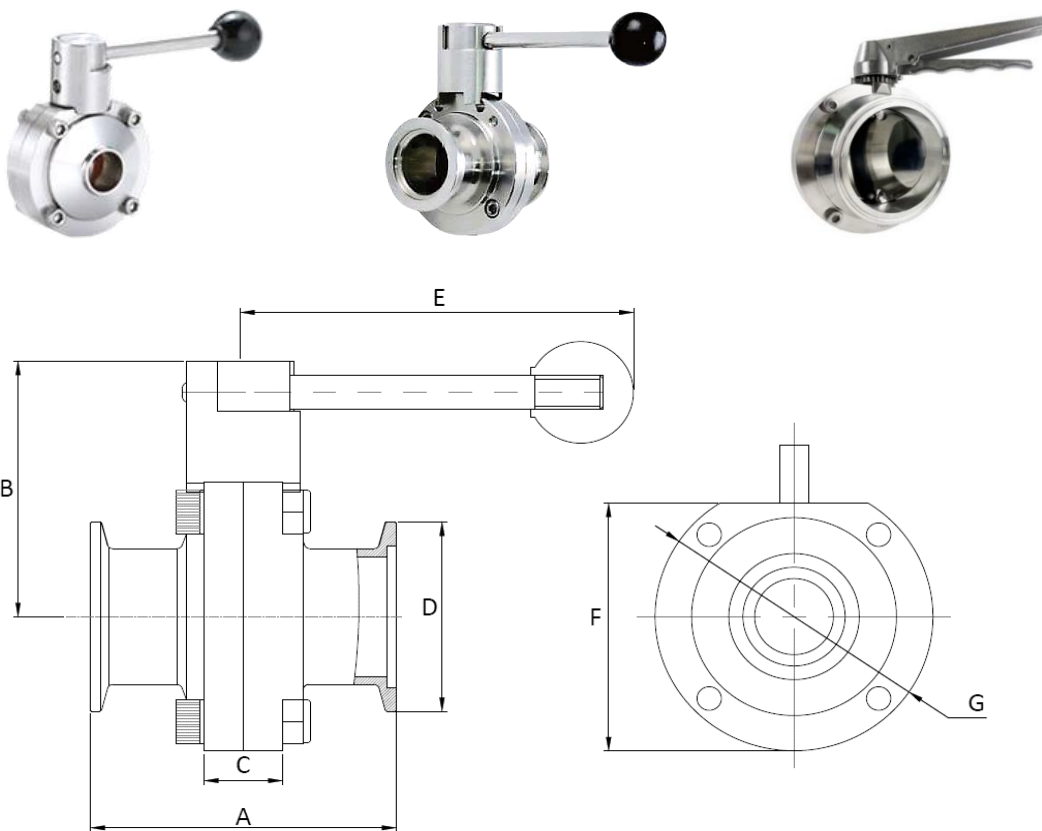
# Butterfly Valve

## Standard Butterfly Valve

Quick action with a quarter turn to go from fully open to fully close with positive lock.  
 Butterfly valve functions both as shut-off and throttling for sizes from 3/4" to 2".  
 All wetted area are made of stainless steel. The knob is made of polymer.

### Specification

- \* Vacuum range: 1x10<sup>-8</sup> Torr
- \* Op. temperature: -55° C to 225° C



### KF Flange Butterfly Valve

NOM. Size	ISO Ref	A	B	C	D	E	F	G
3/4"	KF16	2.87	2.64	0.87	1.18	4.61	2.83	3.07
1"	KF25	2.87	2.64	0.87	1.57	4.61	2.83	3.07
1-1/2"	KF40	3.38	2.64	0.87	2.17	4.61	2.83	3.07
2"	KF50	3.57	2.99	0.87	2.95	4.49	--	3.90

\* Available in tube end

\* Internal seating available in FKM, EPDM

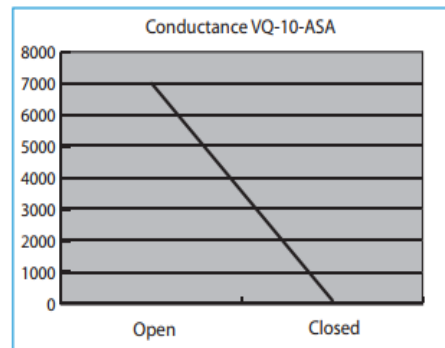
# Butterfly Valve

## Vari-Q Throttling Valve

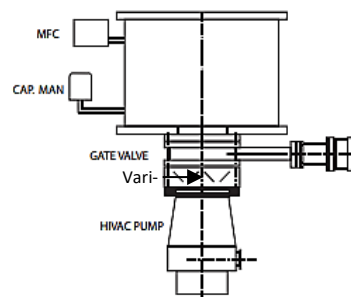
Vari-Q Throttling Valve Provide improved conductance control than butterfly valve. The vanes are counter-rotated providing optimal pressure control over wide range of operation. In the open position, the low-profile vanes offer little restriction in the pumping path. Vari-Q valve is the industry's standard of choice for valve sizes from 4" to 35".

### Feature & Benefit:

- \* Linear conductance control
- \* Highly repeatable
- \* Low profile
- \* Upstream or Downstream pressure control
- \* Corrosion Resistant
- \* Sizes from 4" to 35"
- \* Available in SST or Aluminum
- \* Available in RS232 or 1-10 V DC.
- \* Build-in diagnostics
- \* Manual override for set up and maintenance



Conductance (l/s)		
Flange	Max	Min
6" ASA	2,450	20
10" ASA	6,900	40
16" ASA	16,200	100
20" ASA	22,000	150
32" ASA	51,200	270
35" ASA	61,700	300



Vari-Q valve can be supplied with integrated controller. These controller offer either digital or analog modes integrated into the process control system. The mounting configuration is integrated into pneumatic or servo drives at the valve body.

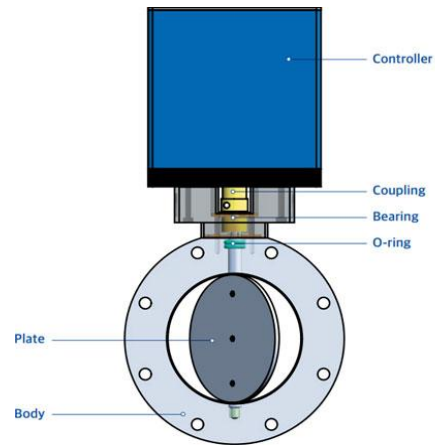
# Butterfly Valve

## Throttling Valve

Butterfly Throttling Valve is optimal for throttling downstream pressure control

### Feature & Benefit:

- \* Perfect solution for the pressure control and isolation
- \* Plug-in Compatible with VAT
- \* Low particle generation
- \* Space and cost saving
- \* Any mounting position
- \* High temperature version available at 300°C

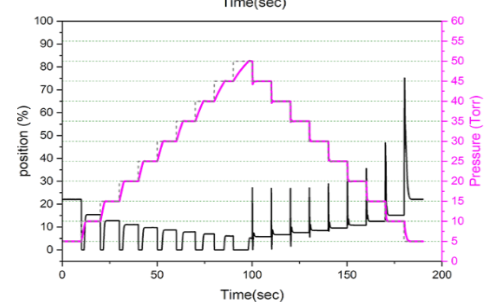
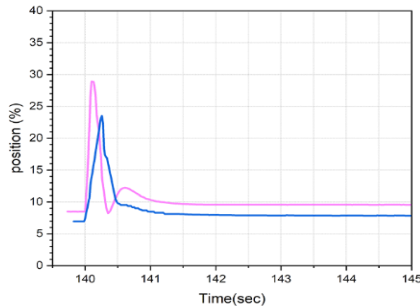
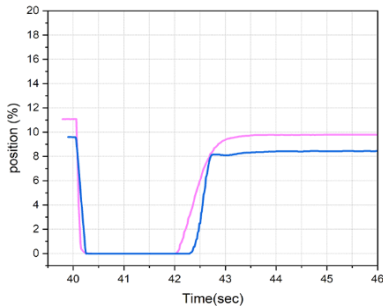
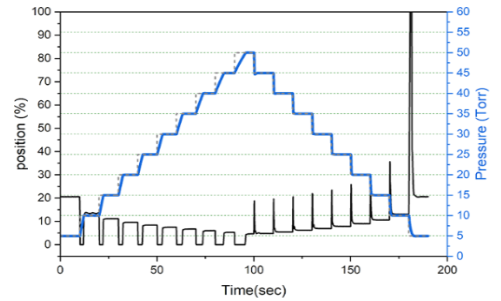
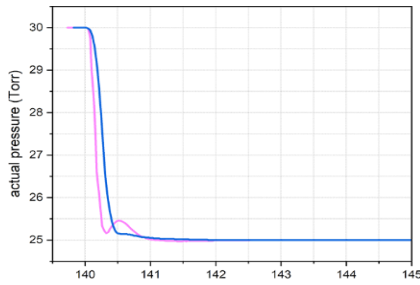
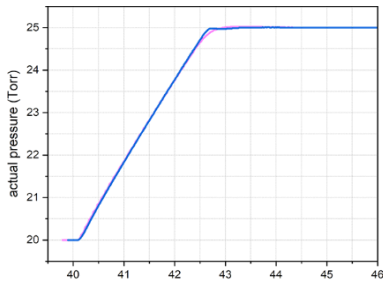


## Specification:

Vacuum range	1 x 10 <sup>-8</sup> mbar to 1.2 bar
Leak test	1x 10 <sup>-9</sup> mbar l/s
Operating temperature	+10°C to +150°C
Life	2 million (Unheated and under clean condition)
Mounting Position	Any position ISO-KF needs support in horizontal position
Shaft Seal	Viton. Kalrez seal available
Power Input	+24 VDC (±10%) @ 0.5V pk-pk max.
Power consumptoin	80 W max
Sensor power supply	Input +24VDC/1500 mA max Output ± 15 VDC (±5%) / 667 mA max
Sensor input	0-10 VDC / Ri > 100kΩ ADC resolution - 0.16 mV Sampling time - 1 ms
Digital inputs	±24 VDC max
Digital outputs	70 VDC or 70 V peak max 0.5 ADC or 0.5 A peak max 10 W max
Ambient temperature	0 °C to +50 °C max. (<35 °C recommended)
Pressure control accuracy	5 mV or 0.1% of setpoint, whichever is greater
Position resolution	20000
Actuating time	Closing - 0.3 s typ. Opening - 0.3 s typ.

# Butterfly Valve

Blue VPC      Pink Competitor



Pressure Up

Pressure Down

Control Response

## KF Flange Throttling Butterfly Valve

Nom. I.D.	Port Size	A (inch)	B (inch)	C (inch)	D (inch)	Conductance	Min. Controllable Conductance	Max. Differential Pressure
1.5"	KF40	80.0	89.2	54.9	41.3	80 l/s	0.25 l/s	1,000 mbar
2.0"	KF50	90.0	95.5	74.9	52.3	150 l/s	0.30 l/s	1,000 mbar

## ISO Flange Throttling Butterfly Valve

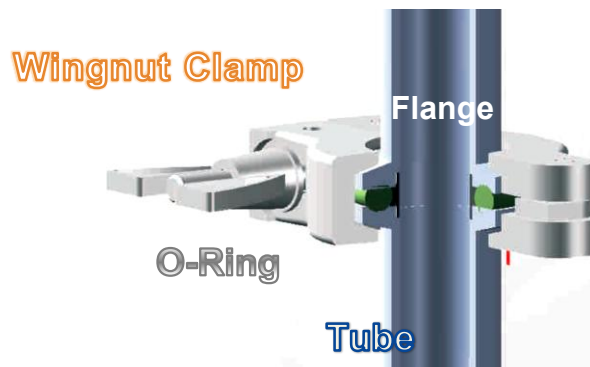
Nom. I.D.	Port Size	A (inch)	B (inch)	C (inch)	D (inch)	Conductance	Min. Controllable Conductance	Max. Differential Pressure
2.5"	ISO63	130	100	70	63	360 l/s	0.45 l/s	1,000 mbar
3.0"	ISO80	145	108	83	80	850 l/s	0.65 l/s	1,000 mbar
4.0"	ISO100	165	119	102	100	1,400 l/s	0.85 l/s	800 mbar
6.0"	ISO160	225	150	153	150	3,800 l/s	1.70 l/s	300 mbar
8.0"	ISO200	285	180	213	200	7,800 l/s	2.80 l/s	150 mbar
10.0"	ISO250	335	206	261	250	15,000 l/s	5.00 l/s	100 mbar

## KF Flange & Component

- \* KF flange is suitable for applications requiring rapid and frequent assembly and disassembly. KF flange is often referred to as NW flange.
- \* KF flange is available for tube size from 1/2" to 2". For larger tube size, ISO flange is used.
- \* KF flange can be adapted to CF, ISO flange, pipe thread, or VCR fitting (through adapter). Please refer to our catalog under "adapter".

VCR is a trademark of Swagelok

Vacuum Products Corp is not affiliated with Swagelok



### *Standard Specification*

<b>Application:</b>	High vacuum
<b>Materials:</b>	304, 316L or Aluminum
<b>Flanges Sizes:</b>	KF10 ~ KF50
<b>Tube Sizes:</b>	1/2" ~2.0"
<b>Vacuum Range :</b>	760 Torr ~ $1 \times 10^{-9}$ Torr
<b>Gasket Materials :</b>	Viton, Buna-N or Silicon

\*\* All Dimensions are in millimeters unless otherwise specified.

\*\* Quantity Discount is available

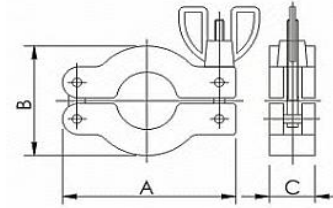
# KF Flange & Component

## KF Wing-Nut Clamp

Material : Aluminum

Material : 304SS

Part No.	Part No.	A (Inch)	B (Inch)	C (INCH)
KF16-CL	KF16-CL-304	2.45	1.61	0.65
KF25-CL	KF25-CL-304	2.85	2.13	0.65
KF40-CL	KF40-CL-304	3.53	2.72	0.65
KF50-CL	KF50-CL-304	4.49	3.54	0.85

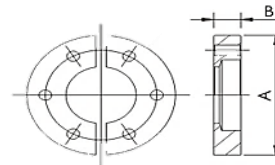
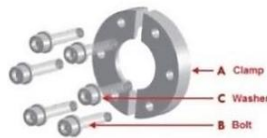


## KF Bulkhead Clamp SET

Material : Aluminum

Part No.	A (Inch)	B (Inch)	Bolt Hole Size	# of Bolt Hole	Bolt Circle
KF16-BHC	2.00	0.36	0.21	6	1.50
KF25-BHC	2.37	0.39	0.21	6	1.89
KF40-BHC	2.94	0.37	0.21	6	2.44
KF50-BHC	3.75	0.41	0.21	8	3.25

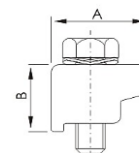
\*\* 10-32 threaded bolt



## Single Claw Clamp

Material : Aluminum

Part No.	A (Inch)	B (Inch)
KF10/50-SCP	0.79	0.55



# KF Flange & Component

## KF Centering Ring w/O-Ring

Material : 304SS

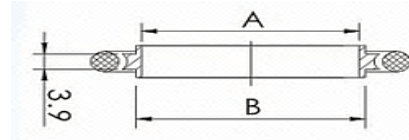
Material : Aluminum

O-Ring : Viton

O-Ring : Buna

O-Ring: Viton

Part No.	Part No.	Part No.	A (Inch)	B (Inch)
KF10-CR	KF10-CR-B	KF10-CRA	0.39	0.47
KF16-CR	KF16-CR-B	KF16-CRA	0.63	0.67
KF25-CR	KF25-CR-B	KF25-CRA	0.98	1.02
KF40-CR	KF40-CR-B	KF40-CRA	1.57	1.61
KF50-CR	KF50-CR-B	KF50-CRA	1.97	2.05



## KF Centering Ring w/Retainer Ring

Centering Ring Material : 304SS

Retainer Material : Aluminum

O-Ring : Viton

Part No.	A (Inch)	B (Inch)	C (Inch)
KF16-CR-R	1.28	0.63	0.28
KF25-CR-R	1.67	0.98	0.28
KF40-CR-R	2.26	1.57	0.28
KF50-CR-R	3.05	1.97	0.28

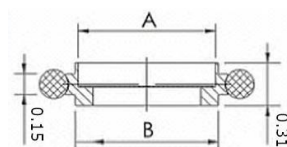


## KF Screened Centering Ring w/O-Ring

Material : 304SS , O-Ring : Viton

70 Mesh Screen

Part No.	A (Inch)	B (Inch)
KF10-CRM	0.39	0.47
KF16-CRM	0.63	0.67
KF25-CRM	0.98	1.02
KF40-CRM	1.57	1.61
KF50-CRM	1.97	2.05



# KF Flange & Component

## KF Adaptive Centering Rings

Material : 304SS

O-ring: Viton

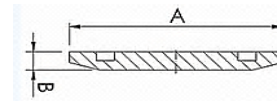
Part No.	A (Inch)	B (Inch)	C (Inch)
KF10-16	0.67	0.47	0.39
KF20-25	1.02	0.87	0.83
KF32-40	1.61	1.34	1.26



## KF Blank Flange

Material : 304SS

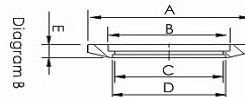
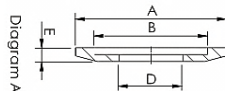
Part No.	A (Inch)	B (Inch)
KF10-CF	1.18	0.20
KF16-CF	1.18	0.20
KF25-CF	1.57	0.20
KF40-CF	2.17	0.20
KF50-CF	2.95	0.20



## KF Bored Weld Flange

Material : 304SS (Also available: SS316, Aluminum (please call to request))

Part No.	Diagram	A(Inch)	B(Inch)	C(Inch)	D(Inch)
KF10-0.38-BF	A	1.18	0.50	N/A	0.38
KF16-0.25-BF	A	1.18	0.68	N/A	0.26
KF16-0.75-BF	B	1.18	0.68	0.64	0.76
KF25-0.50-BF	B	1.57	1.03	0.45	0.51
KF25-0.75-BF	B	1.57	1.03	0.64	0.76
KF25-1.00-BF	B	1.57	1.03	0.94	1.01
KF40-0.50-BF	B	2.17	1.62	0.40	0.51
KF40-0.75-BF	B	2.17	1.62	0.65	0.76
KF40-1.0-BF	B	2.17	1.62	0.94	1.01
KF40-1.5-BF	B	2.17	1.62	1.44	1.51
KF50-0.75-BF	B	2.95	2.06	0.65	0.76
KF50-1.0-BF	B	2.95	2.06	0.94	1.01
KF50-1.5-BF	B	2.95	2.06	1.44	1.51
KF50-2.0-BF	B	2.95	2.06	1.90	2.01

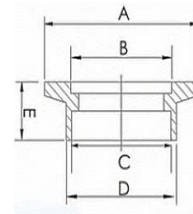


# KF Flange & Component

## KF Socket Weld Flange

Material : 304SS (Also available: SS316, Aluminum (please call to request))

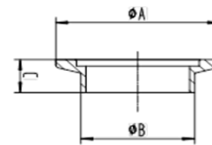
Part No.	A (Inch)	B (Inch)	C (Inch)	D (Inch)	E (Inch)
KF10-SW x 0.5	1.18	0.48	0.51	0.61	0.50
KF16-SW x 0.5	1.18	0.68	0.76	0.87	0.50
KF25-SW x 0.5	1.57	1.03	1.02	1.13	0.50
KF40-SW x 0.5	2.17	1.62	1.52	1.75	0.50
KF50-SW x 0.5	2.95	2.06	2.02	2.25	0.50
KF25-SW x 0.75	1.57	1.03	1.02	1.13	0.75
KF40-SW x 0.75	2.17	1.62	1.52	1.75	0.75
KF50-SW x 0.75	2.95	2.06	2.02	2.25	0.75



## KF Weld Stub Flange, Short

Material : 304SS

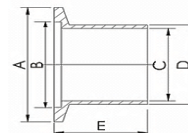
Part No.	A (Inch)	B (Inch)	C (Inch)
KF10-WSS X 0.5	1.18	0.50	0.50
KF16-WSS x 0.5	1.18	0.75	0.50
KF16-WSS x 0.75	1.18	0.75	0.75
KF25-WSS X 0.5	1.57	1.00	0.50
KF40-WSS x 0.75	2.17	1.50	0.75
KF50-WSS x 0.75	2.95	2.00	0.75



## KF Weld Stub Flange, Long

Material : 304SS (Also available: 316SS, Aluminum (please call to request))

Part No.	A (Inch)	B (Inch)	C (Inch)	D (Inch)	E (Inch)
KF10-WSL x 1.58	1.18	0.48	0.37	0.50	1.58
KF16-WSL x 1.58	1.18	0.68	0.62	0.75	1.58
KF25-WSL x 1.58	1.57	1.03	0.87	1.00	1.58
KF40-WSL x 1.58	2.17	1.62	1.37	1.50	1.58
KF50-WSL x 1.58	2.95	2.06	1.87	2.00	1.58

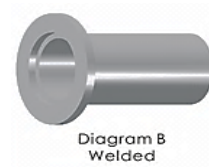
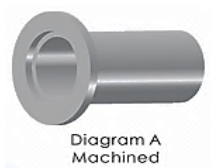
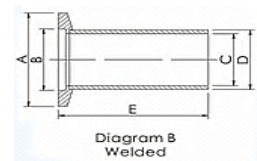
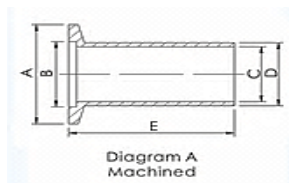


# KF Flange & Component

## KF Half Nipple

Material : 304SS

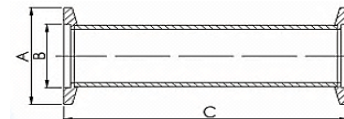
Part No.	Diagram	A (Inch)	B (Inch)	C (Inch)	D (Inch)
KF10-HN x 1.25	A	1.18	0.48	0.37	0.50
KF16-HN x 1.15	A	1.18	0.68	0.62	0.75
KF25-HN x 2.03	B	1.57	1.03	0.87	1.00
KF40-HN x 2.40	B	2.17	1.62	1.37	1.50
KF50-HN x 3.15	B	2.95	2.06	1.87	2.00



## KF full Nipple

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)
KF10-FN x 2.50	1.18	0.48	2.50
KF16-FN x 2.30	1.18	0.68	2.30
KF25-FN x 4.00	1.57	1.03	4.06
KF40-FN x 4.80	2.17	1.62	4.80
KF50-FN x 6.30	2.95	2.06	6.30

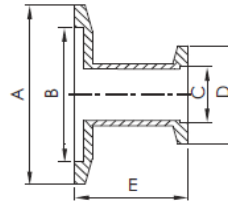


# KF Flange & Component

## KF Straight Reducer

Material : 304SS

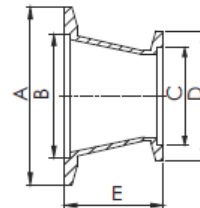
Part No.	A (Inch)	B (Inch)	C (Inch)	D (Inch)	E (Inch)
KF25/16-R	1.57	1.03	0.68	1.18	1.70
KF40/16-R	2.17	1.62	0.68	1.18	1.70
KF40/25-R	2.17	1.62	1.03	1.57	1.70
KF50/16-R	2.95	2.06	0.68	1.18	1.70
KF50/25-R	2.95	2.06	1.03	1.57	1.70
KF50/40-R	2.95	2.06	1.62	2.17	1.70



## KF Conical Reducer

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)	D (Inch)	E (Inch)
KF25/16-RC	1.57	1.03	0.68	1.18	1.57
KF40/16-RC	2.17	1.62	0.68	1.18	1.57
KF40/25-RC	2.17	1.62	1.03	1.57	1.57
KF50/16-RC	2.95	2.06	0.68	1.18	1.57
KF50/25-RC	2.95	2.06	1.03	1.57	1.57
KF50/40-RC	2.95	2.06	1.62	2.17	1.57

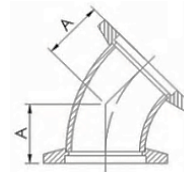


# KF Flange & Component

## KF 45° Elbow

Material : 304SS

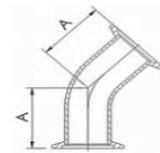
Part No.	A (Inch)
KF16-E45	0.62
KF25-E45	0.77
KF40-E45	1.08
KF50-E45	1.39



## KF 45° Elbow With Tangent

Material : 304SS

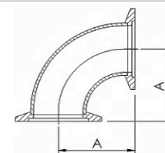
Part No.	A (Inch)
KF16-E45T	0.91
KF25-E45T	1.33
KF40-E45T	1.78
KF50-E45T	2.46



## KF 90° & DN 90° Elbow

Material : 304SS

Part No.	A (Inch)	TUBE SIZE
KF16-E90	1.15	
KF25-E90	1.65	
KF40-E90	2.40	
KF50-E90	3.15	
DN16-E90	1.57	20.0 x 1.5mmt
DN25-E90	1.97	28.0 x 1.5mmt

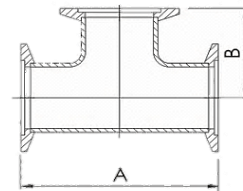


# KF Flange & Component

## KF & DN Equal Tee

Material : 304SS

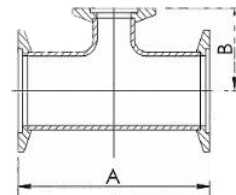
Part No.	A (Inch)	B (Inch)	TUBE SIZE
KF10-T	2.50	1.25	
KF16-T	2.30	1.15	
KF25-T	4.05	2.02	
KF40-T	4.80	2.40	
KF50-T	6.3	3.15	
DN16-T	3.15	1.57	20.0 x 1.5mmt
DN25-T	3.94	1.97	28.0 x 1.5mmt
DN40-T	5.12	2.56	44.5 x 2.0mmt



## KF Reducing Tee

Material : 304SS

Part No.	A (Inch)	B (Inch)
KF25/16-TR	4.06	1.27
KF40/16-TR	4.80	1.53
KF40/25-TR	4.80	2.28
KF50/16-TR	6.30	1.78
KF50/40-TR	6.30	2.65

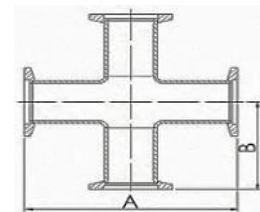


# KF Flange & Component

## KF 4-Way Cross

Material : 304SS

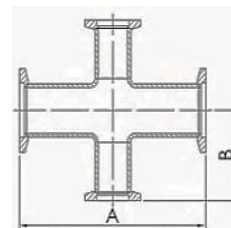
Part No.	A (Inch)	B (Inch)
KF10-4X	2.50	1.25
KF16-4X	2.30	1.15
KF25-4X	4.05	2.02
KF40-4X	4.80	2.40
KF50-4X	6.30	3.15



## KF 4-Way Cross , Reducing

Material : SS304

Part No.	A (Inch)	B (Inch)
KF25/16-4X	2.50	1.25
KF40/16-4X	4.80	1.53
KF40/25-4X	4.80	2.28
KF50/16-4X	6.30	1.78
KF50/40-4X	6.30	3.15

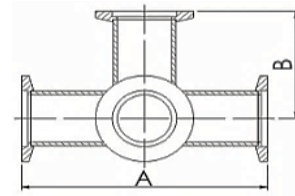


# KF Flange & Component

## KF 5-Way Cross

Material : SS304

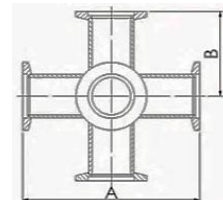
Part No.	A (Inch)	B (Inch)
KF16-5X	3.14	1.57
KF25-5X	3.94	1.97
KF40-5X	5.12	2.56
KF50-5X	5.52	2.76



## KF 6-Way Cross

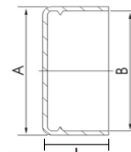
Material : SS304

Part No.	A (Inch)	B (Inch)
KF16-6X	3.14	1.57
KF25-6X	3.94	1.97
KF40-6X	5.12	2.56
KF50-6X	5.52	2.76



## KF Protection Plastic Cap

Part No.	A (Inch)	B (Inch)	L(Inch)
KF10/16-CAP	1.26	1.18	0.276
KF25-CAP	1.65	1.57	0.276
KF40-CAP	2.24	2.17	0.276
KF50-CAP	3.03	2.95	0.276



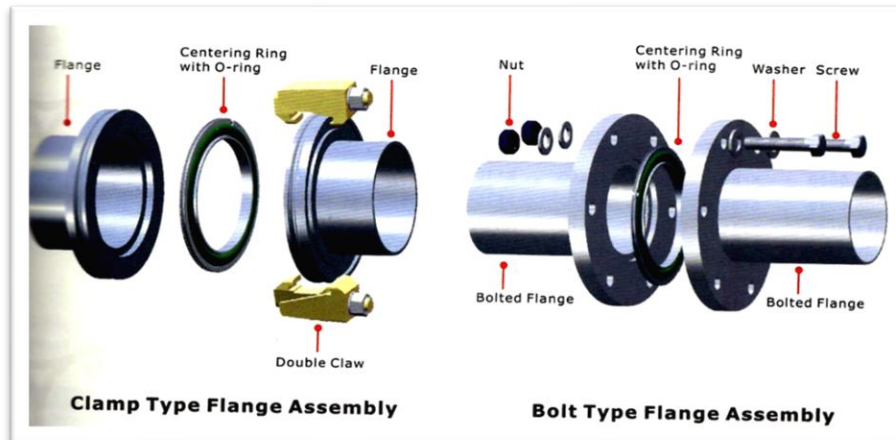
# ISO Flange & Fitting

ISO flange comes in KF (Kwik flange) and LF (large flange). KF's primary method of fastening is using claw clamps while LF flange is fastened by using bolts. Claw clamp comes in single claw and double claw.

Bolt pattern to fasten clamp flange using **single** claw clamp is the same as the pattern on LF flange, except the former is tapped and the latter is through hole.

Picture below shows an example of KF style and LF style mounting method.

ISO flange is available in sizes from 2.5" to 20" tube. Center ring is available in Alum. or 304 stainless steel, bakable to 150 C. These flanges can operate in high vacuum environment in the  $1 \times 10^{-8}$  Torr range.



## Standard Specification

Application:	High vacuum
Materials:	304SS, 316L or Aluminum
Flanges Sizes:	ISO63 ~ ISO320
Vacuum Range:	761 Torr ~ $1 \times 10^{-8}$ Torr
Gasket Materials :	Viton, Buna-N or Silicon

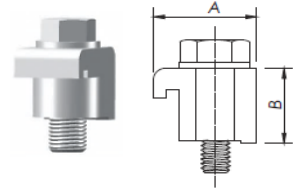
\*\* All Dimensions are in millimeters unless otherwise specified.

# ISO Flange & Fitting

## Claw Clamp, Single

Material : Aluminum

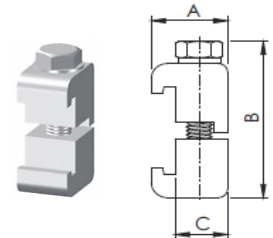
Part No.	A (Inch)	B (Inch)	Thread Size
ISO 63/100-SCP-M	0.95	0.89	M8X35L
ISO160/250-SCP-M	1.15	0.91	M10X35L
ISO320/500-SCP-M	1.18	1.18	M12X40L



## Claw Clamp, Double

Material : Aluminum

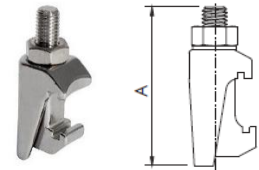
Part No.	A (Inch)	B (Inch)	C (Inch)	Thread Size
ISO63/100-DCP-M	0.95	1.98	0.62	M8X45L
ISO160/250-DCP-M	1.10	2.05	0.80	M10X45L
ISO320/500-DCP-M	1.34	2.56	1.03	M12X55L



## Claw Clamp, Double

Material : 304SS

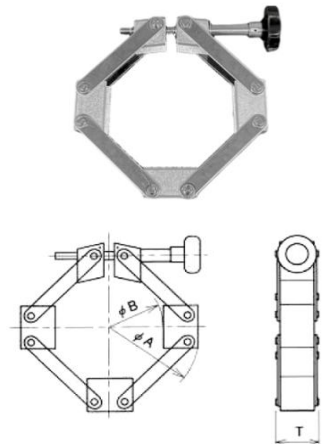
Part No.	A (Inch)	Thread Size
ISO63/250-DCP-S	2.36	M10
ISO320/500-DCP-S	3.01	M12



## Chain Clamp Taper Flanges, Aluminum

Material : Aluminum and 304SS

Part No.	A (Inch)	B (Inch)	T (Inch)	MAX Temp.
ISO80-CC	6.50	3.94	1.46	150°C
ISO100-CC	7.28	4.80	1.46	150°C
ISO160-CC	9.25	6.85	1.46	150°C
ISO200-CC	11.81	9.41	1.46	150°C
ISO250-CC	13.78	11.34	1.46	150°C

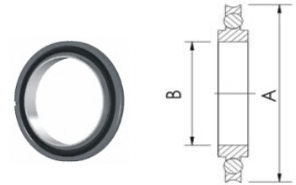


# ISO Flange & Fitting

## Center Ring, Alum w/ Retainer, Alum, Viton

Material : Aluminum, Viton O-ring, Aluminum Retainer

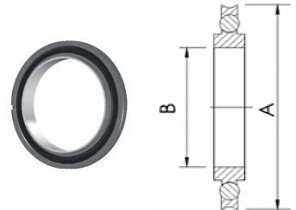
Part No.	A (Inch)	B (Inch)
ISO63-CRA-R	3.70	2.64
ISO80-CRA-R	4.29	3.15
ISO100-CRA-R	5.04	3.94
ISO160-CRA-R	7.05	5.91
ISO200-CRA-R	9.37	8.27
ISO250-CRA-R	11.30	10.14



## Center Ring, SST w/Retainer, Alum, Viton

Material : SS304 Ring , Viton O-ring, Alum. Retainer

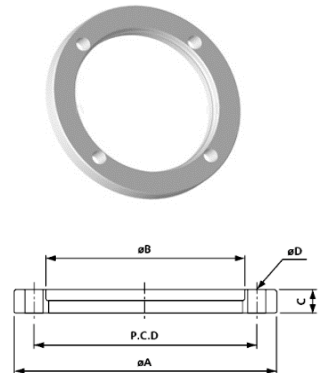
Part No.	A (Inch)	B (Inch)
ISO 63-CR-R	3.70	2.64
ISO 80-CR-R	4.29	3.15
ISO100-CR-R	5.04	3.94
ISO160-CR-R	7.05	5.91
ISO200-CR-R	9.37	8.27
ISO250-CR-R	11.30	10.14



## Rotatable Bolt Ring

Material : 304SS Bolt Flange, Split Retainer Ring

Part No.	A (Inch)	B (Inch)	C (Inch)	D (Inch)
ISO63-BR-R	5.12	3.88	0.47	0.35
ISO80-BR-R	5.71	4.47	0.47	0.35
ISO100-BR-R	6.50	5.26	0.47	0.35
ISO160-BR-R	8.86	7.31	0.63	0.43
ISO200-BR-R	11.22	9.67	0.63	0.43
ISO250-BR-R	13.19	11.64	0.63	0.43
ISO320-BR-R	16.73	14.80	0.79	0.55

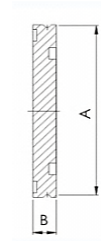


# ISO Flange & Fitting

## Blank Flange

Material : 304SS or Almuinum

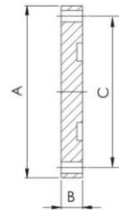
Part No.		A (Inch)	B (Inch)
ISO 63-CF	304	3.74	0.47
ISO 80-CF	304	4.33	0.47
ISO100-CF	304	5.12	0.47
ISO160-CF	304	7.09	0.47
ISO200-CF	304	9.45	0.47
ISO250-CF	304	11.42	0.47
ISO 63-CF-A	Alum.	3.74	0.47
ISO 80-CF-A	Alum.	4.33	0.47
ISO100-CF-A	Alum.	5.12	0.47
ISO160-CF-A	Alum.	7.09	0.47
ISO200-CF-A	Alum.	9.45	0.47
ISO250-CF-A	Alum.	11.42	0.47



## Blank Flange, Bolted

Material : 304SS or Aluminum

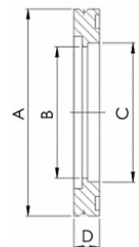
Part No.	A (Inch)	B (Inch)	C (Inch)	Bolt Holes
ISO 63-CF-H	5.12	0.47	4.33	4
ISO 80-CF-H	5.71	0.47	4.92	8
ISO100-CF-H	6.50	0.47	5.71	8
ISO160-CF-H	8.86	0.63	7.87	8
ISO200-CF-H	11.22	0.63	10.24	12
ISO250-CF-H	13.19	0.63	12.2	12



## Bored Flange

Material : 304SS or Aluminum

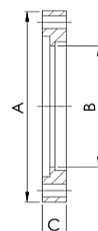
Part No.	A (Inch)	B (Inch)	C (Inch)	D (Inch)
ISO 63-2.5-BF	3.74	2.37	2.51	0.47
ISO 80-3.0-BF	4.33	2.87	3.01	0.47
ISO100-4.0-BF	5.12	3.87	4.01	0.47
ISO160-6.0-BF	7.09	5.87	6.02	0.47
ISO200-8.0-BF	9.45	7.76	8.02	0.47
ISO250-10-BF	11.42	9.75	10.02	0.47



## Bored Flange, Bolted

Material : 304SS or Aluminum

Part No.	A (Inch)	B (Inch)	C (Inch)	Bolt Holes
ISO 63-2.5-BF-H	5.12	2.44	0.47	4
ISO 80-3.0-BF-H	5.71	2.94	0.47	8
ISO100-4.0-BF-H	6.50	3.91	0.47	8
ISO160-6.0-BF-H	8.86	5.87	0.63	8
ISO200-8.0-BF-H	11.22	7.87	0.63	12
ISO250-10-BF-H	13.19	9.87	0.63	12

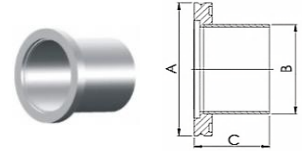


# ISO Flange & Fitting

## Half Nipple

Material : 304SS

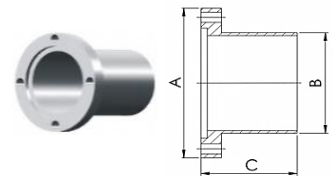
Part No.	A (Inch)	B (Inch)	C (Inch)
ISO 63-HN	3.74	2.50	3.94
ISO 80-HN	4.33	3.00	3.94
ISO100-HN	5.12	4.00	3.94
ISO160-HN	7.09	6.00	3.94



## Half Nipple, Bolted

Material : 304SS

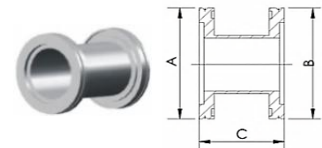
Part No.	A (Inch)	B (Inch)	C (Inch)
ISO 63-HN-H	5.12	2.50	3.94
ISO 80-HN-H	5.71	3.00	3.94
ISO100-HN-H	6.50	4.00	3.94
ISO160-HN-H	8.86	6.00	3.94
ISO200-HN-H	11.22	8.00	3.94



## Full Nipple

Material : 304SS

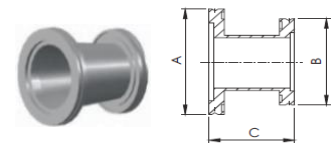
Part No.	A (Inch)	B (Inch)	C (Inch)
ISO63-FN	ISO63	ISO63	6.50
ISO80-FN	ISO80	ISO80	7.00
ISO100-FN	ISO100	ISO100	8.26
ISO160-FN	ISO160	ISO160	10.76



## Straight Reducer

Material : 304SS

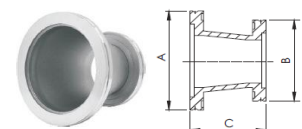
Part No.	A (Inch)	B (Inch)	C (Inch)
ISO 80/63-R	ISO80	ISO63	3.00
ISO 100/63-R	ISO100	ISO63	3.00
ISO 100/80-R	ISO100	ISO80	3.00
ISO160/63-R	ISO160	ISO63	3.00
ISO160/80-R	ISO160	ISO80	3.00
ISO160/100-R	ISO160	ISO100	3.00



## Conical Reducer

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)
ISO 80/63-RC	ISO80	ISO63	4.12
ISO 100/63-RC	ISO100	ISO63	4.12
ISO 100/80-RC	ISO100	ISO80	4.12

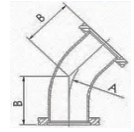


# ISO Flange & Fitting

## 45° Elbow

Material : 304SS

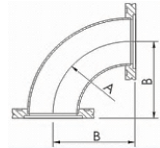
Part No.	A (Inch)	B (Inch)
ISO 63-E45	3.75	3.24
ISO 80-E45	4.50	3.94
ISO100-E45	6.00	5.06



## 90° Elbow

Material : 304SS

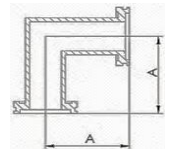
Part No.	A (Inch)	B (Inch)
ISO 63-E90	3.75	4.00
ISO 80-E90	4.50	4.75
ISO100-E90	6.00	6.25



## 90° Elbow, Mitered

Material : 304SS

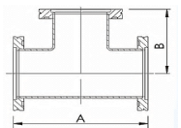
Part No.	A (Inch)
ISO 63-E90-M	3.25
ISO 80-E90-M	3.50
ISO100-E90-M	4.13
ISO160-E90-M	5.43
ISO250-E90-M	9.88



## Equal Tee

Material : 304SS

Part No.	A (Inch)	B (Inch)
ISO 63-T	6.50	3.25
ISO 80-T	7.00	3.50
ISO100-T	8.24	4.12
ISO160-T	10.50	5.25

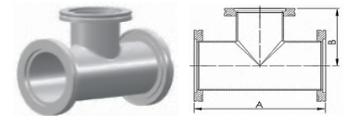


# ISO Flange & Fitting

## Reducer Tee

Material : 304SS

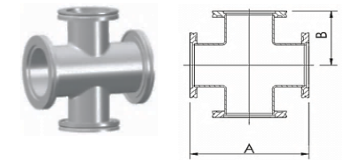
Part No.	A (Inch)	B (Inch)
ISO80/63-TR	7.00	3.50
ISO100/63-TR	8.26	4.00
ISO100/80-TR	8.26	4.00
ISO160/63-TR	10.50	5.00
ISO160/80-TR	10.50	5.00
ISO160/100-TR	10.50	5.13



## 4-Way Cross

Material : 304SS

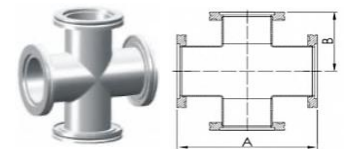
Part No.	A (Inch)	B (Inch)
ISO 63-4X	6.50	3.25
ISO 80-4X	7.00	3.50
ISO100-4X	8.24	4.12
ISO160-4X	10.50	5.25



## 4-Way Cross, Reducing

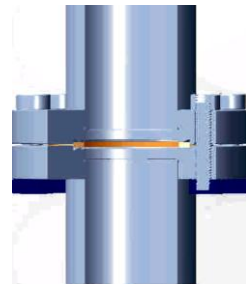
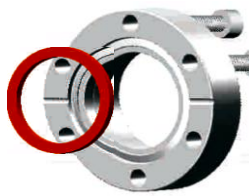
Material : 304SS

Part No.	A (Inch)	B (Inch)
ISO80/63-4X	7.00	3.50
ISO100/63-4X	8.26	4.00
ISO100/80-4X	8.26	4.00
ISO160/63-4X	10.50	5.00
ISO160/80-4X	10.50	5.00
ISO160/100-4X	10.50	5.13



# Conflat Flange

- \* Our standard material is in SS 304 that has been specially treated to remove impurities
- \* Our standard flange material is certified to meet ASTM-A-240 and has less than 0.02% sulfur to prevent sulfur strigers
- \* When copper gasket is pressed between flanges, cold flow is limited by vertical wall. Pressure developed cause gasket to fill surface imperfections and produce a highly reliable seal
- \* CF flanges can be baked to 450 C and cooled to -200 C and suitable for vacuum of  $1 \times 10^{-13}$  Torr
- \* CF fittings such as elbow, tee, nipple, cross comes standard with one end fixed and other end rotatable for ease of intallation



## Standard Specification

Application:	Ultra High vacuum
Materials:	304SS, 316L
Flanges Sizes:	CF1.33" ~ CF14.00"
Tube Sizes:	1/2" ~ 12.0"
Vacuum Range	760 Torr ~ $1 \times 10^{-13}$ Torr
Gasket Materials :	OFHC Copper or Silver Plated

\*\* Available size from CF1.33 through CF16.5

\*\* Quantity Discount available

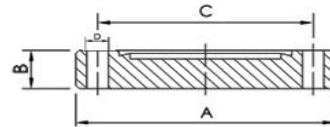
# Conflat Flange

## Blank Flange, Non-Rotate

Flange Size	CF1.33	CF2.12	CF2.75	CF3.38	CF4.50	CF4.62	CF6.00	CF8.00
Hole Quantity	6	4	6	8	8	10	16	20

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)	Diameter/ Thread (Inch)
CF1.33-000-N	1.33	0.30	1.06	0.17
CF2.12-000-N	2.12	0.47	1.63	0.26
CF2.75-000-N	2.73	0.50	2.31	0.26
CF3.38-000-N	3.36	0.63	2.85	0.33
CF4.50-000-N	4.47	0.68	3.62	0.33
CF4.62-000-N	4.61	0.69	4.02	0.33
CF6.00-000-N	5.97	0.78	5.13	0.33
CF8.00-000-N	7.97	0.88	7.13	0.33

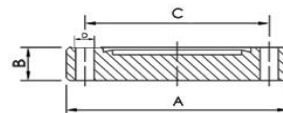


## Blank Flange, Non-Rotate Tapped

Flange Size	CF1.33	CF2.12	CF2.75	CF3.38	CF4.50	CF4.62	CF6.00	CF8.00
Hole Qty	6	4	6	8	8	10	16	20
Thread Size	8-32	1/4-28	1/4-28	5/16-24	5/16-24	5/16-24	5/16-24	5/16-24

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)	Diameter / Thread (Inch)
CF1.33-000-NT	1.33	0.30	1.06	8-32
CF2.12-000-NT	2.12	0.47	1.63	1/4-28
CF2.75-000-NT	2.73	0.50	2.31	1/4-28
CF3.38-000-NT	3.36	0.63	2.85	5/16-24
CF4.50-000-NT	4.47	0.68	3.63	5/16-24
CF4.62-000-NT	4.61	0.69	4.03	5/16-24
CF6.00-000-NT	5.97	0.78	5.13	5/16-24
CF8.00-000-NT	7.97	0.88	7.13	5/16-24



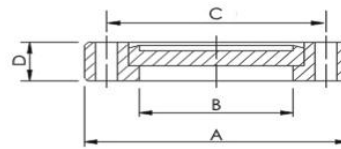
# Conflat Flange

## Blank Flange, Rotatable

Flange Size	CF1.33	CF2.12	CF2.75	CF3.38	CF4.50	CF4.62	CF6.00	CF8.00
Hole Qty	6	4	6	8	8	10	16	20
Hole Dia.	0.17	0.26	0.26	0.33	0.33	0.33	0.33	0.33

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)	Diameter / Thread (Inch)
CF1.33-000-R	1.33	0.76	1.06	0.30
CF2.12-000-R	2.12	1.10	1.63	0.47
CF2.75-000-R	2.73	1.90	2.31	0.50
CF3.38-000-R	3.36	2.15	2.85	0.69
CF4.50-000-R	4.47	2.85	3.63	0.75
CF4.62-000-R	4.61	3.14	4.03	0.69
CF6.00-000-R	5.97	4.18	5.13	0.84
CF8.00-000-R	7.97	6.13	7.13	0.94

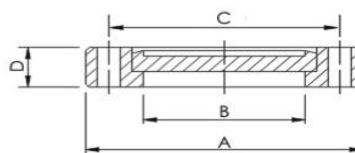


## Blank Flange, Rotatable Tapped

Flange Size	CF1.33	CF2.12	CF2.75	CF3.38	CF4.50	CF4.62	CF6.00	CF8.00
Hole Qty	6	4	6	8	8	10	16	20
Thread Size	8-32	1/4-28	1/4-28	5/16-24	5/16-24	5/16-24	5/16-24	5/16-24

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)	Diameter / Thread (Inch)
CF1.33-000-RT	1.33	0.76	1.06	0.30
CF2.12-000-RT	2.12	1.10	1.63	0.47
CF2.75-000-RT	2.73	1.90	2.31	0.50
CF3.38-000-RT	3.36	2.15	2.85	0.69
CF4.50-000-RT	4.47	2.85	3.63	0.75
CF4.62-000-RT	4.61	3.14	4.03	0.69
CF6.00-000-RT	5.97	4.18	5.13	0.84
CF8.00-000-RT	7.97	6.13	7.13	0.94



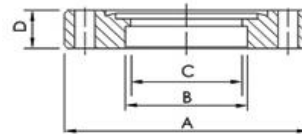
# Conflat Flange

## Bored Flange, Non-Rotatable

Flange Size	CF1.33	CF2.12	CF2.75	CF3.38	CF4.50	CF4.62	CF6.00	CF8.00
Hole Quantity	6	4	6	8	8	10	16	20

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)	D (Inch)
CF1.33-025-N	1.33	0.25	0.13	0.30
CF1.33-038-N	1.33	0.38	0.26	0.30
CF1.33-050-N	1.33	0.51	N/A	0.30
CF1.33-075-N	1.33	0.76	0.63	0.30
CF2.12-075-N	2.12	0.76	0.69	0.47
CF2.12-100-N	2.12	1.01	0.94	0.47
CF2.75-025-N	2.73	0.25	N/A	0.50
CF2.75-050-N	2.73	0.50	N/A	0.50
CF2.75-075-N	2.73	0.76	0.63	0.50
CF2.75-100-N	2.73	1.01	0.87	0.50
CF2.75-125-N	2.73	1.26	1.13	0.50
CF2.75-150-N	2.73	1.51	1.44	0.50
CF2.75-175-N	2.73	1.76	1.62	0.50
CF3.38-200-N	3.37	2.01	1.88	0.62
CF4.50-250-N	4.47	2.51	2.44	0.69
CF6.00-400-N	5.97	4.01	3.92	0.78
CF8.00-600-N	7.97	6.02	5.92	0.88
CF10.0-800-N	9.97	8.02	7.89	0.97



## Bored Flange, Non-Rotatable Tapped

Flange Size	CF1.33	CF2.12	CF2.75	CF3.38	CF4.50	CF4.62	CF6.00	CF8.00
Hole Qty	6	4	6	8	8	10	16	20
Thread Size	8-32	1/4-28	1/4-28	5/16-24	5/16-24	5/16-24	5/16-24	5/16-24

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)	D (Inch)
CF1.33-050-NT	1.33	0.51	N/A	0.30
CF1.33-075-NT	1.33	0.76	0.63	0.30
CF2.12-100-NT	2.12	1.01	0.94	0.47
CF2.75-150-NT	2.73	1.51	1.44	0.50
CF2.75-175-NT	2.73	1.76	1.62	0.50
CF3.38-200-NT	3.37	2.01	1.88	0.62
CF4.50-250-NT	4.47	2.51	2.44	0.69
CF4.62-300-NT	4.62	3.01	2.88	0.69
CF6.00-400-NT	5.97	4.01	3.92	0.78
CF8.00-600-NT	7.97	6.02	5.92	0.88

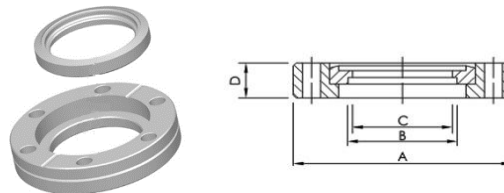
# Conflat Flange

## Bored Flange, Rotatable

Flange Size	CF1.33	CF2.12	CF2.75	CF3.38	CF4.50	CF4.62	CF6.00	CF8.00
Hole Quantity	6	4	6	8	8	10	16	20

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)	D (Inch)
CF1.33-025-R	1.33	0.25	0.13	0.30
CF1.33-038-R	1.33	0.38	0.26	0.30
CF1.33-050-R	1.33	0.50	0.50	0.30
CF1.33-075-R	1.33	0.76	0.63	0.30
CF2.12-075-R	2.12	0.76	0.63	0.47
CF2.12-100-R	2.12	1.02	0.94	0.47
CF2.75-025-R	2.75	0.25	0.13	0.50
CF2.75-050-R	2.75	0.50	0.50	0.50
CF2.75-075-R	2.75	0.76	0.63	0.50
CF2.75-100-R	2.75	1.02	0.94	0.50
CF2.75-125-R	2.75	1.26	1.13	0.50
CF2.75-150-R	2.75	1.52	1.44	0.50
CF3.38-150-R	3.38	1.52	1.44	0.71
CF3.38-200-R	3.38	2.02	1.94	0.71
CF4.50-250-R	4.50	2.52	2.44	0.71
CF6.00-400-R	6.00	4.02	3.92	0.79
CF8.00-600-R	8.00	6.02	5.92	0.87
CF10.0-800-R	10.00	8.02	7.89	0.98



## Bored Flange, Rotatable Tapped

Flange Size	CF1.33	CF2.12	CF2.75	CF3.38	CF4.50	CF4.62	CF6.00	CF8.00
Hole Qty	6	4	6	8	8	10	16	20
Thread Size	8-32	1/4-28	1/4-28	5/16-24	5/16-24	5/16-24	5/16-24	5/16-24

Material : 304SS

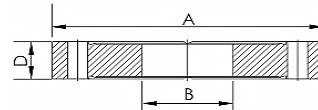
Part No.	A (Inch)	B (Inch)	C (Inch)	D (Inch)
CF1.33-050-RT	1.33	0.50	0.50	0.30
CF1.33-075-RT	1.33	0.76	0.63	0.30
CF2.12-100-RT	2.12	1.02	0.94	0.45
CF2.75-150-RT	2.75	1.52	1.44	0.50
CF3.38-150-RT	3.38	1.52	1.44	0.63
CF3.38-200-RT	3.38	2.02	1.94	0.63
CF4.50-250-RT	4.50	2.52	2.44	0.71
CF4.62-300-RT	4.62	3.02	2.94	0.69
CF6.00-400-RT	6.00	4.02	3.92	0.79
CF8.00-600-RT	8.00	6.02	5.92	0.87

# Conflat Flange

## CF Double-Sided Flanges

Material : 304SS

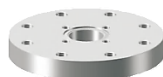
Part No.	A (Inch)	B (Inch)	D (Inch)
CF1.33-075-DSx0.30	1.33	0.75	0.30
CF2.75-125-DSx0.75	2.75	1.25	0.75
CF2.75-150-DSx0.50	2.75	1.50	0.50
CF2.75-150-DSx0.75	2.75	1.50	0.75



## Zero Length Reducer Adapter

Material : 304SS

Part No.	B (Inch)	D (Inch)		
CF2.12/1.33-Z	0.62	0.47	CF1.33" Tapped holes	CF2.12" Tapped holes
CF2.75/1.33-Z	0.62	0.50	CF1.33" Tapped holes	CF2.75" Thru holes
CF2.75/2.12-Z	1.00	0.50	CF2.12" Tapped holes	CF2.75" Tapped holes
CF3.38/1.33-Z	0.62	0.63	CF1.33" Tapped holes	CF3.38" Thru holes
CF3.38/2.12-Z	1.00	0.63	CF2.12" Tapped holes	CF3.38" Thru holes
CF3.38/2.75-Z	1.50	0.63	CF2.75" Tapped holes	CF3.38" Tapped holes
CF4.50/1.33-Z	0.62	0.69	CF1.33" Tapped holes	CF4.50" Thru holes
CF4.50/2.12-Z	1.00	0.69	CF2.12" Tapped holes	CF4.50" Thru holes
CF4.50/2.75-Z	1.50	0.69	CF2.75" Tapped holes	CF4.50" Thru holes
CF4.50/3.38-Z	2.00	0.69	CF3.38" Tapped holes	CF4.50" Tapped holes
CF4.62/1.33-Z	0.62	0.69	CF1.33" Tapped holes	CF4.62" Thru holes
CF4.62/2.12-Z	1.00	0.69	CF2.12" Tapped holes	CF4.62" Thru holes
CF4.62/2.75-Z	1.50	0.69	CF2.75" Tapped holes	CF4.62" Thru holes
CF4.62/3.38-Z	2.00	0.69	CF3.38" Tapped holes	CF4.62" Thru holes
CF6.00/1.33-Z	0.62	0.78	CF1.33" Tapped holes	CF6.00" Thru holes
CF6.00/2.75-Z	1.50	0.78	CF2.75" Tapped holes	CF6.00" Thru holes
CF6.00/3.38-Z	2.00	0.78	CF3.38" Tapped holes	CF6.00" Thru holes
CF6.00/4.50-Z	2.50	0.78	CF4.50" Tapped holes	CF6.00" Thru holes
CF6.00/4.62-Z	3.00	0.78	CF4.62" Tapped holes	CF6.00" Thru holes
CF6.75/2.75-Z	1.50	0.84	CF2.75" Tapped holes	CF6.75" Thru holes
CF6.75/4.50-Z	2.50	0.84	CF4.50" Tapped holes	CF6.75" Thru holes
CF8.00/1.33-Z	0.62	0.88	CF1.33" Tapped holes	CF8.00" Thru holes
CF8.00/2.75-Z	1.50	0.88	CF2.75" Tapped holes	CF8.00" Thru holes
CF8.00/4.50-Z	2.50	0.88	CF4.50" Tapped holes	CF8.00" Thru holes
CF8.00/6.00-Z	4.00	0.88	CF6.00" Tapped holes	CF8.00" Thru holes

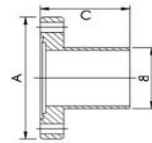


# Conflat Flange

## Half Nipple, Non-Rotate

Material : 304SS

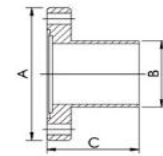
Part No.	A (Inch)	B (Inch)	C (Inch)
CF1.33-075-HN	1.33	0.75	1.50
CF2.12-100-HN	2.12	1.00	2.05
CF2.75-150-HN	2.75	1.50	2.46
CF3.38-200-HN	3.38	2.00	3.22
CF4.50-250-HN	4.50	2.50	3.38
CF4.62-300-HN	4.62	3.00	3.53
CF6.00-400-HN	6.00	4.00	4.32
CF8.00-600-HN	8.00	6.00	5.50



## Half Nipple, Non-Rotate Tapped

Material : 304SS

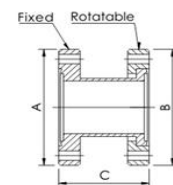
Part No.	A (Inch)	B (Inch)	C (Inch)
CF1.33-075-HNT	1.33	0.75	1.50
CF2.12-100-HNT	2.12	1.00	2.05
CF2.75-150-HNT	2.75	1.50	2.46
CF3.38-200-HNT	3.38	2.00	3.22
CF4.50-250-HNT	4.50	2.50	3.38
CF4.62-300-HNT	4.62	3.00	3.53
CF6.00-400-HNT	6.00	4.00	4.32
CF8.00-600-HNT	8.00	6.00	5.50



## Full Nipple, Rotatable

Material : 304SS

Part No.	A (Inch)	B (Inch)	C (Inch)
CF1.33-075-FN	1.33	1.33	3.00
CF2.12-100-FN	2.12	2.12	4.10
CF2.75-150-FN	2.75	2.75	4.92
CF3.38-200-FN	3.38	3.38	6.44
CF4.50-250-FN	4.50	4.50	6.76
CF4.62-300-FN	4.62	4.62	7.06
CF6.00-400-FN	6.00	6.00	8.64
CF8.00-600-FN	8.00	8.00	11.00

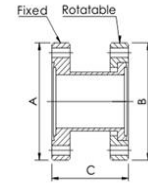


# Conflat Flange

## Full Nipple, Rotatable Tapped

Material : 304SS

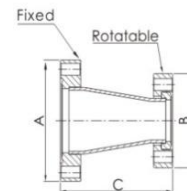
Part No.	A (Inch)	B (Inch)	C (Inch)
CF1.33-075-FNT	1.33	1.33	3.00
CF2.12-100-FNT	2.12	2.12	4.10
CF2.75-150-FNT	2.75	2.75	4.92
CF3.38-200-FNT	3.38	3.38	6.44
CF4.50-250-FNT	4.50	4.50	6.76
CF4.62-300-FNT	4.62	4.62	7.06
CF6.00-400-FNT	6.00	6.00	8.64
CF8.00-600-FNT	8.00	8.00	11.00



## Conical Reducer

Material : 304SS

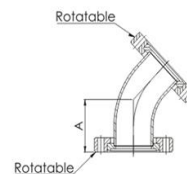
Part No.	A (Inch)	B (Inch)	C (Inch)
CF2.75/1.33-RC	2.75	1.33	3.08
CF4.50/2.75-RC	4.50	2.75	2.96
CF6.00/2.75-RC	6.00	2.75	4.29
CF6.00/4.50-RC	6.00	4.50	4.44



## Elbow 45°

Material : 304SS

Part No.	A (Inch)
CF1.33-E45	0.94
CF2.12-E45	1.14
CF2.75-E45	1.74
CF3.38-E45	2.07
CF4.50-E45	3.37
CF4.62-E45	3.96
CF6.00-E45	5.22

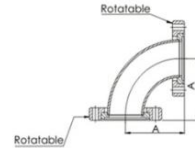


# Conflat Flange

## Elbow 90°

Material : 304SS

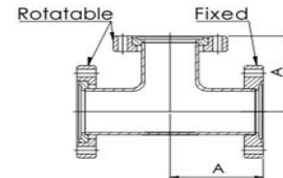
Part No.	A (Inch)
CF1.33-E90	1.50
CF2.12-E90	1.67
CF2.75-E90	2.46
CF3.38-E90	3.22
CF4.50-E90	4.12
CF4.62-E90	4.78
CF6.00-E90	6.44



## Equal Tee

Material : 304SS

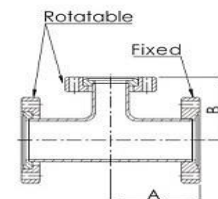
Part No.	A (Inch)
CF1.33-T	1.50
CF2.12-T	2.05
CF2.75-T	2.46
CF3.38-T	3.22
CF4.50-T	3.38
CF4.62-T	3.53
CF6.00-T	4.32
CF8.00-T	5.50



## Reducing Tee

Material : 304SS

Part No.	A (Inch)	B (Inch)
CF2.75/1.33-TR	2.46	1.87
CF2.75/2.12-TR	2.46	2.29
CF3.38/1.33-TR	3.22	2.13
CF3.38/2.75-TR	3.22	2.71
CF4.50/2.75-TR	3.38	2.96
CF4.50/3.38-TR	3.38	3.48
CF4.62/3.38-TR	3.53	3.73
CF4.62/4.50-TR	3.53	3.63
CF6.00/2.75-TR	4.32	3.71
CF6.00/3.38-TR	4.32	4.23
CF6.00/4.50-TR	4.32	4.13
CF6.00/4.62-TR	4.32	4.03

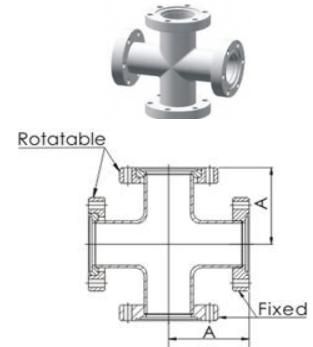


# Conflat Flange

## 4-Way Cross

Material : 304SS

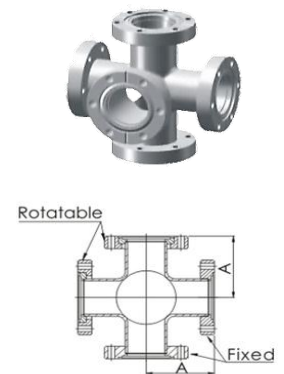
Part No.	A (Inch)
CF1.33-4X	1.50
CF2.12-4X	2.05
CF2.75-4X	2.46
CF3.38-4X	3.22
CF4.50-4X	3.38
CF4.62-4X	3.53
CF6.00-4X	4.32



## 5 Way Cross

Material : 304SS

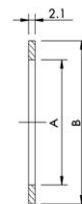
Part No.	A (Inch)
CF1.33-5X	1.50
CF2.12-5X	2.05
CF2.75-5X	2.46
CF3.38-5X	3.22
CF4.50-5X	3.38
CF4.62-5X	3.63
CF6.00-5X	5.31



## OFHC Copper Gasket

Material : OFHC Copper

Part No.	A (Inch)	B (Inch)
CF1.33-CU	0.64	0.84
CF2.12-CU	1.01	1.29
CF2.75-CU	1.45	1.89
CF3.38-CU	2.01	2.43
CF4.50-CU	2.50	3.24
CF4.62-CU	3.01	3.60
CF6.00-CU	4.01	4.74
CF6.75-CU	5.01	5.57
CF8.00-CU	6.01	6.74
CF10.00-CU	8.01	8.74



\*\* We have inventory up to size 16.50".

# Conflat Flange

## 12-pt silver-plated bolts for CF flange - with Hex Nuts

Part No.	Type
SAN-32-075	Allen head, CF1.33, 8-32x0.75
SBN-28-125	12-pt head, CF2.75, 1/4-28x1.25
SBN-28-212	12-pt head, CF2.75, 1/4-28x2.13
SBN-24-175	12-pt head, CF3.38, 5/16-24x1.75
SBN-24-200	12-pt head, CF4.50, 5/16-24x2.00
SBN-24-200	12-pt head, CF6.00, 5/16-24x2.00
SBN-24-225	12-pt head, CF6.00, 5/16-24x2.25
SBN-24-225	12-pt head, CF8.00, 5/16-24x2.25



## 12-pt silver-plated bolts for CF flange - with PlateNuts

Part No.	Type
SPAN-32-075-133	Allen head, CF1.33, 8-32x0.75
SPBN-28-125-275	12-pt head, CF2.75, 1/4-28x1.25
SPBN-28-212-275	12-pt head, CF2.75, 1/4-28x2.13
SPBN-24-175-338	12-pt head, CF3.38, 5/16-24x1.75
SPBN-24-200-450	12-pt head, CF4.50, 5/16-24x2.00
SPBN-24-200-600	12-pt head, CF6.00, 5/16-24x2.00
SPBN-24-225-600	12-pt head, CF6.00, 5/16-24x2.25
SPBN-24-225-800	12-pt head, CF8.00, 5/16-24x2.25



## Silver-plated bolts for Tapped CF flanges

Part No.	Type
SAX-32-050	Allen head, CF1.33, 8-32x0.50
SBX-28-087	12-pt head, CF2.75, 1/4-28x0.88
SBX-24-125	12-pt head, CF2.75, 5/16-24-1.25
SBX-24-175	12-pt head, CF3.38, 5/16-24x1.75

## Plate Nut for CF flange

Part No.	Type
PN-133-25	Platenut, CF1.33, 8-32x0.50
PN-212-25	Platenut, CF2.12, 1/4-28
PN-275-25	Platenut, CF2.75, 1/4-28
PN-338-25	Platenut, CF3.38, 5/16-24
PN-450-25	Platenut, CF4.50, 5/16-24
PN-600-25	Platenut, CF6.00, 5/16-24
PN-800-25	Platenut, CF8.00, 5/16-24
PN-1000-25	Platenut, CF10.0, 5/16-24
PN-1200-25	Platenut, CF12.0, 5/16-24

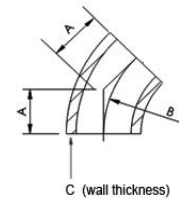


# Weld Tube

## 45° Elbow

Material : 304

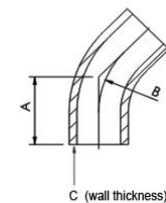
Part No.	A(inch)	B(inch)	C(inch)
WT3/4-E45	0.47	1.13	0.06
WT1.0-E45	0.62	1.50	0.06
WT1.5-E45	0.93	2.25	0.06
WT2.0-E45	1.24	3.00	0.06
WT2.5-E45	1.56	3.75	0.06
WT3.0-E45	1.86	4.50	0.06
WT4.0-E45	2.49	6.00	0.08



## 45° Elbow with Tangent

Material : 304

Part No.	A(inch)	B(inch)	C(inch)
WT3/4-E45T	0.76	1.13	0.06
WT1.0-E45T	1.19	1.50	0.06
WT1.5-E45T	1.63	2.25	0.06
WT2.0-E45T	2.31	3.00	0.06
WT2.5-E45T	3.00	3.75	0.06
WT3.0-E45T	3.68	4.50	0.06
WT4.0-E45T	4.81	6.00	0.08

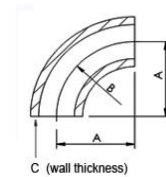


# Weld Tube

## 90° Elbow

Material : 304SS

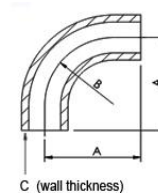
Part No.	A(inch)	B(inch)	C(inch)
WT3/4-E90	1.13	1.13	0.06
WT1.0-E90	1.50	1.50	0.06
WT1.5-E90	2.25	2.25	0.06
WT2.0-E90	3.00	3.00	0.06
WT2.5-E90	3.75	3.75	0.06
WT3.0-E90	4.50	4.50	0.06
WT4.0-E90	6.00	6.00	0.08



## 90° Elbow with Tangent

Material : 304SS

Part No.	A(inch)	B(inch)	C(inch)
WT3/4-E90T	1.42	1.00	0.06
WT1.0-E90T, 46.23mm	1.82	1.50	0.06
WT1.0-E90T, 52.40mm	2.06	1.50	0.06
WT1.5-E90T	2.94	2.25	0.06
WT2.0-E90T	4.06	3.00	0.06
WT2.5-E90T	5.19	3.75	0.06
WT3.0-E90T	6.31	4.50	0.06
WT4.0-E90T	8.31	6.00	0.08

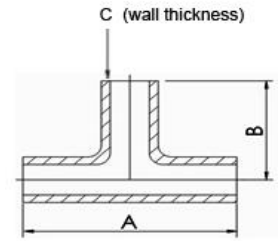
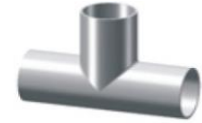


# Weld Tube

## Equal Tee

Material : 304SS

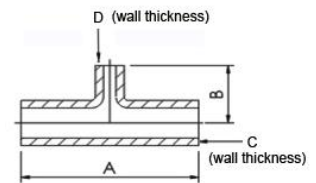
Part No.	A(inch)	B(inch)	C(inch)
WT3/4-T	2.00	1.00	0.06
WT1.0-T	3.75	1.87	0.06
WT1.5-T	4.50	2.25	0.06
WT2.0-T	6.00	3.00	0.06
WT2.5-T	6.00	3.00	0.06
WT3.0-T	6.50	3.25	0.06
WT4.0-T	7.75	3.87	0.08



## Reducing Tee

Material : 304SS

Part No.	A(inch)	B(inch)	C(inch)	D(inch)
WT1.0/0.75-TR	3.76	1.12	0.06	0.06
WT1.5/0.75-TR	4.50	1.38	0.06	0.06
WT1.5/1.0-TR	4.50	2.12	0.06	0.06
WT2.0/0.75-TR	6.00	1.63	0.06	0.06
WT2.0/1.0-TR	6.00	2.38	0.06	0.06
WT2.0/1.5-TR	6.00	2.50	0.06	0.06
WT2.5/1.5-TR	6.00	2.75	0.06	0.06
WT2.5/2.0-TR	6.00	3.25	0.06	0.06
WT3.0/1.5-TR	6.50	3.00	0.06	0.06
WT3.0/2.0-TR	6.50	3.25	0.06	0.06
WT3.0/2.5-TR	6.50	3.50	0.06	0.06
WT4.0/1.5-TR	7.76	3.50	0.08	0.06
WT4.0/2.0-TR	7.76	4.00	0.08	0.06
WT4.0/2.5-TR	7.76	3.75	0.08	0.06
WT4.0/3.0-TR	7.76	3.75	0.08	0.06
WT6.0/4.0-TR	10.00	4.88	0.08	0.08

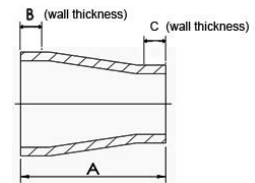


# Weld Tube

## Conical Reducer

Material : 304SS

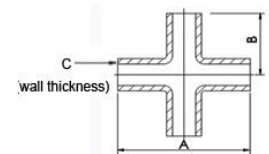
Part No.	A(inch)	B(inch)	C(inch)
WT1.0/0.75-RC	1.37	0.06	0.06
WT1.5/0.75-RC	2.37	0.06	0.06
WT1.5/1.0-RC	2.37	0.06	0.06
WT2.0/1.0-RC	2.37	0.06	0.06
WT2.0/1.5-RC	2.37	0.06	0.06
WT2.5/1.5-RC	2.37	0.06	0.06
WT2.5/2.0-RC	2.37	0.06	0.06
WT3.0/1.5-RC	3.63	0.06	0.06
WT3.0/2.0-RC	3.63	0.06	0.06
WT3.0/2.5-RC	3.63	0.06	0.06
WT4.0/2.0-RC	3.63	0.08	0.06
WT4.0/2.5-RC	3.63	0.08	0.06
WT4.0/3.0-RC	3.63	0.08	0.06



## 4-Way Cross

Material : 304SS

Part No.	A(inch)	B(inch)	C(inch)
WT3/4-4X	3.75	1.87	0.06
WT1.0-4X, 47.6mm	3.75	1.87	0.06
WT1.0-4X, 45.7mm	3.60	1.80	0.06
WT1.5-4X	4.50	2.25	0.06
WT2.0-4X	6.00	3.00	0.06
WT2.5-4X	6.00	3.00	0.06
WT3.0-4X	6.50	3.25	0.06
WT4.0-4X	7.75	3.88	0.08

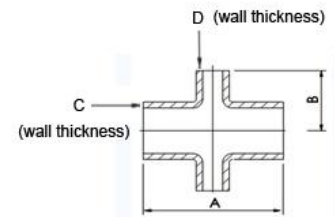


# Weld Tube

## 4-Way Cross , Reducing

Material : 304SS

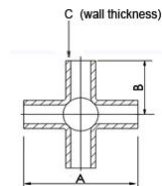
Part No.	A(inch)	B(inch)	C(inch)	D(inch)
WT1.0/0.75-4X	3.76	1.12	0.06	0.06
WT1.5/0.75-4X	4.50	1.38	0.06	0.06
WT1.5/1.0-4X	4.50	2.13	0.06	0.06
WT2.0/0.75-4X	6.00	1.63	0.06	0.06
WT2.0/1.0-4X	6.00	1.63	0.06	0.06
WT2.0/1.5-4X	6.00	2.50	0.06	0.06
WT2.5/1.5-4X	6.00	2.75	0.06	0.06
WT2.5/2.0-4X	6.00	3.25	0.06	0.06
WT3.0/1.5-4X	6.50	3.00	0.06	0.06
WT3.0/2.0-4X	6.50	3.50	0.06	0.06
WT3.0/2.5-4X	6.50	3.25	0.06	0.06
WT4.0/1.5-4X	7.76	3.50	0.08	0.06
WT4.0/2.0-4X	7.76	4.00	0.08	0.06
WT4.0/2.5-4X	7.76	3.75	0.08	0.06
WT4.0/3.0-4X	7.76	3.75	0.08	0.06



## 5-Way Cross

Material : 304SS

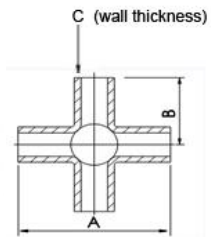
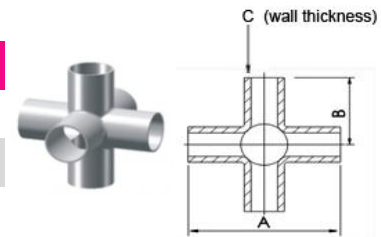
Part No.	A(inch)	B(inch)	C(inch)
WT3/4-5X	2.00	1.00	0.06
WT1.0-5X	3.76	1.88	0.06
WT1.5-5X	4.50	2.25	0.06
WT2.0-5X	6.00	3.00	0.06
WT2.5-5X	6.00	3.00	0.06
WT3.0-5X	6.50	3.25	0.06
WT4.0-5X	7.76	3.88	0.08



## 6-Way Cross

Material : 304SS

Part No.	A(inch)	B(inch)	C(inch)
WT3/4-6X	2.00	1.00	0.06
WT1.0-6X	3.76	1.88	0.06



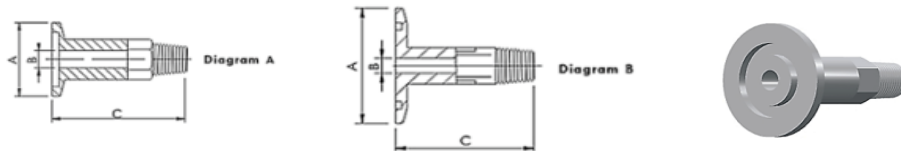
# Adapters

## KF Flange to Male NPT

VCR is trademark of Swagelok  
Vac. Products Corp is not affiliated to Swagelok

Materials : 304 (Flange) & 316L (Gland)-Call to request

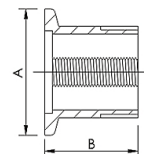
Part No.	Size	A (inch)	B (inch)	C (inch)	Diagram
KF16-1/8 MPT	KF16 X 1/8" Male NPT adaptor, 304	1.18	0.19	1.47	A
KF16-1/4 MPT	KF16 X 1/4" Male NPT adaptor, 304	1.18	0.28	1.47	A
KF16-1/2 MPT	KF16 X 1/2" Male NPT adaptor, 304	1.18	0.47	1.69	A
KF25-1/8 MPT	KF25 X 1/8" Male NPT adaptor, 304	1.57	0.19	1.47	B
KF25-1/4 MPT	KF25 X 1/4" Male NPT adaptor, 304	1.57	0.28	1.47	B
KF25-1/2 MPT	KF25 X 1/2" Male NPT adaptor, 304	1.57	0.47	1.69	B
KF25-3/4 MPT	KF25 X 3/4" Male NPT adaptor, 304	1.57	0.63	1.69	B
KF40-1/4 MPT	KF40 X 1/4" Male NPT adaptor, 304	2.17	0.28	1.47	B
KF40-1/2 MPT	KF40 X 1/2" Male NPT adaptor, 304	2.17	0.47	1.69	B
KF40-3/4 MPT	KF40 X 3/4" Male NPT adaptor, 304	2.17	0.63	1.69	B
KF50-1/4 MPT	KF50 X 1/4" Male NPT adaptor, 304	2.95	0.28	1.38	B
KF50-1/2 MPT	KF50 X 1/4" Male NPT adaptor, 304	2.95	0.47	1.69	B
KF50-3/4 MPT	KF50 X 3/4" Male NPT adaptor, 304	2.95	0.63	1.69	B



## KF Flange to Female NPT

Materials : 304, or 316L (call to request)

Part No.	Size	A (inch)	B (inch)
KF16-1/8 FPT	KF16 X 1/8" Female NPT adaptor, 304	1.18	0.75
KF16-1/4 FPT	KF16 X 1/4" Female NPT adaptor, 304	1.18	0.75
KF25-1/8 FPT	KF25 X 1/8" Female NPT adaptor, 304	1.57	0.75
KF25-3/8 FPT	KF25 X 3/8" Female NPT adaptor, 304	1.57	0.75
KF25-1/4FPT	KF25 X 1/4" Female NPT adaptor, 304	1.57	0.75
KF25-3/4 FPT	KF25 X 3/4" Female NPT adaptor, 304	1.57	1.00
KF25-1/2 FPT	KF25 X 1/2" Female NPT adaptor, 304	1.57	1.00
KF40-1/8 FPT	KF40 X 1/8" Female NPT adaptor, 304	2.17	1.00
KF40-1/4 FPT	KF40 X 1/4" Female NPT adaptor, 304	2.17	1.00
KF40-1/2 FPT	KF40 X 1/2" Female NPT adaptor, 304	2.17	1.00
KF40-3/4 FPT	KF40 X 3/4" Female NPT adaptor, 304	2.17	1.00
KF50-1/8 FPT	KF50 X 1/8" Female NPT adaptor, 304	2.95	1.00
KF50-1/4 FPT	KF50 X 1/4" Female NPT adaptor, 304	2.95	1.00
KF50-1/2 FPT	KF50 X 1/2" Female NPT adaptor, 304	2.95	1.00

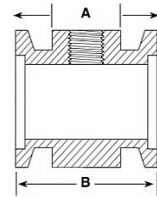


# Adapters

## KF Flange to FPT TEE

Material: Aluminum, or SS304 (call to request)

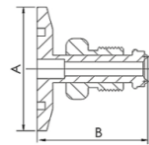
Part No.	Size	A (inch)	B (inch)
KF16-1/8 FPT-AT	KF16-1/8 Female pipe thread	0.75	1.57
KF16-1/4 FPT-AT	KF16-1/4 Female pipe thread	0.75	1.57
KF25-1/8 FPT-AT	KF25-1/8 Female pipe thread	0.75	1.57
KF25-1/4 FPR-AT	KF25-1/4 Female pipe thread	0.75	1.57
KF40-1/8 FPT-AT	KF40-1/8 Female pipe thread	0.75	1.57
KF40-1/4 FPT-AT	KF40-1/4 Female pipe thread	0.75	1.57
KF50-1/8FPT-AT	KF50-1/8 Female pipe thread	0.75	1.57
KF50-1/4 FPT-AT	KF50-1/4 Female pipe thread	0.75	1.57



## KF Flange to Male VCR

Materials : 304, or 316L (call to request)

Part No.	Size	A (inch)	B (inch)
KF16-1/4 MVCR	KF16-1/4" Male VCR adaptor, 304	1.18	1.46
KF16-3/8 MVCR	KF16-3/8" Male VCR adaptor, 304	1.18	1.65
KF16-1/2 MVCR	KF16-1/2" Male VCR adaptor, 304	1.18	1.65
KF25-1/4 MVCR	KF25-1/4" Male VCR adaptor, 304	1.57	1.46
KF25-3/8 MVCR	KF25-3/8" Male VCR adaptor, 304	1.57	1.65
KF25-1/2 MVCR	KF25-1/2" Male VCR adaptor, 304	1.57	1.65
KF25-3/4 MVCR	KF25-3/4" Male VCR adaptor, 304	1.57	2.15
KF40-1/4 MVCR	KF40-1/4" Male VCR adaptor, 304	2.17	1.46
KF40-3/8 MVCR	KF40-3/8" Male VCR adaptor, 304	2.17	1.65
KF40-1/2 MVCR	KF40-1/2" Male VCR adaptor, 304	2.17	1.65
KF40-3/4 MVCR	KF40-3/4" Male VCR adaptor, 304	2.17	2.15
KF50-1/4 MVCR	KF50-1/4" Male VCR adaptor, 304	2.95	1.46
KF50-3/8 MVCR	KF50-3/8" Male VCR adaptor, 304	2.95	1.65
KF50-1/2 MVCR	KF50-1/2" Male VCR adaptor, 304	2.95	1.65
KF50-3/4 MVCR	KF50-3/4" Male VCR adaptor, 304	2.95	2.15

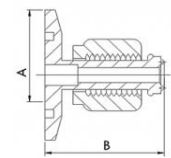


# Adapters

## KF Flange to Female VCR

Materials : 304, or 316L (call to request)

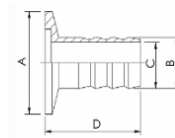
Part No.	Size	A (inch)	B (inch)
KF16-1/4 FVCR	KF16 X 1/4" Female VCR adaptor, 304	1.18	1.46
KF16-3/8 FVCR	KF16 X 3/8" Female VCR adaptor, 304	1.18	1.65
KF16-3/8 FVCR	KF16 X 3/8" Female VCR adaptor, 304	1.18	1.65
KF25-1/4 FVCR	KF25 X 1/4" Female VCR adaptor, 304	1.57	1.46
KF25-3/8 FVCR	KF25 X 3/8" Female VCR adaptor, 304	1.57	1.65
KF25-1/2 FVCR	KF25 X 1/2" Female VCR adaptor, 304	1.57	1.65
KF25-3/4 FVCR	KF25 X 3/4" Female VCR adaptor, 304	1.57	2.15
KF40-1/4 FVCR	KF40 X 1/4" Female VCR adaptor, 304	2.17	1.46
KF40-3/8 FVCR	KF40 X 3/8" Female VCR adaptor, 304	2.17	1.65
KF40-1/2 FVCR	KF40 X 1/2" Female VCR adaptor, 304	2.17	1.65
KF40-3/4 FVCR	KF40 X 3/4" Female VCR adaptor, 304	2.17	2.15
KF50-1/4 FVCR	KF50 X 1/4" Female VCR adaptor, 304	2.95	1.46
KF50-3/8 FVCR	KF50 X 3/8" Female VCR adaptor, 304	2.95	1.65
KF50-1/2 FVCR	KF50 X 1/2" Female VCR adaptor, 304	2.95	1.65
KF50-3/4 FVCR	KF50 X 3/4" Female VCR adaptor, 304	2.95	2.15



## KF to Barb ftg - Hose Connector

Materials : 304

Part No.	Hose ID	A	B	C	D
KF10- 8	0.31"	1.18	0.31	0.16	1.57
KF10-12	0.47"	1.18	0.47	0.31	1.57
KF16- 8	0.31"	1.18	0.31	0.16	1.57
KF16-12	0.47"	1.18	0.47	0.31	1.57
KF25- 8	0.31"	1.57	0.31	0.16	1.57
KF25-12	0.47"	1.57	0.47	0.31	1.57
KF25-16	0.63"	1.57	0.63	0.47	1.57
KF25-20	0.79"	1.57	0.79	0.36	1.57
KF40-12	0.47"	2.17	0.47	0.31	1.57
KF40-16	0.63"	2.17	0.63	0.47	1.57
KF40-20	0.79"	2.17	0.79	0.63	1.57
KF40-25	0.98"	2.17	0.98	0.79	1.57
KF50-25	0.98"	2.95	0.98	0.98	1.57

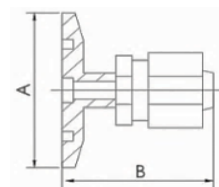


# Adapters

## KF to Compression fitting

Materials : 316

Part No.	Size	A (inch)	B (inch)
KF10-1/4-SWAG	KF10X 1/4" SWAG	1.18	1.31
KF16-1/4-SWAG	KF16X 1/4" SWAG	1.18	1.55
KF16-3/8-SWAG	KF16X 3/8" SWAG	1.18	1.63
KF16-1/2-SWAG	KF16X 1/2" SWAG	1.18	1.97
KF16-3/4-SWAG	KF16X 3/4" SWAG	1.18	2.08
KF25-1/4-SWAG	KF25X 1/4" SWAG	1.57	1.55
KF25-3/8-SWAG	KF25X 3/8" SWAG	1.57	1.63
KF25-1/2-SWAG	KF25X 1/2" SWAG	1.57	1.97
KF25-3/4-SWAG	KF25X 3/4" SWAG	1.57	2.08
KF25-1-SWAG	KF25X 1" SWAG	1.57	2.59
KF25-1 1/8-SWAG	KF25X 1 1/8" SWAG	1.57	2.90
KF40-1/4-SWAG	KF40X 1/4" SWAG	2.17	1.55
KF40-3/8-SWAG	KF40X 3/8" SWAG	2.17	1.63
KF40-1/2-SWAG	KF40X 1/2" SWAG	2.17	1.97
KF40-3/4-SWAG	KF40X 3/4" SWAG	2.17	2.08
KF40-1-SWAG	KF40X 1" SWAG	2.17	2.59
KF40-1 1/8-SWAG	KF40X 1 1/8" SWAG	2.17	2.90
KF50-1/4-SWAG	KF50X 1/4" SWAG	2.95	1.50
KF50-3/8-SWAG	KF50X 3/8" SWAG	2.95	1.63
KF50-1/2-SWAG	KF50X 1/2" SWAG	2.95	1.97
KF50-3/4-SWAG	KF50X 3/4" SWAG	2.95	2.08
KF50-1-SWAG	KF50X 1" SWAG	2.95	2.59
KF50-1 1/8-SWAG	KF50X 1 1/8" SWAG	2.95	2.90

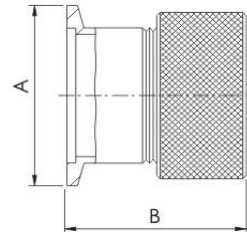


# Adapters

## KF Flange to Quick Couplings with Viton O-Ring

Materials : 304

Part No.	Size	Tube Size	A	B
KF16-1/8-QC	NW16-1/8"	1/8"	1.18	1.42
KF16-3/16-QC	NW16-3/16"	3/16"	1.18	1.42
KF16-1/4-QC	NW16-1/4"	1/4"	1.18	1.42
KF16-3/8-QC	NW16-3/8"	3/8"	1.18	1.42
KF16-1/2-QC	NW16-1/2"	1/2"	1.18	1.50
KF16-3/4-QC	NW16-3/4"	3/4"	1.18	1.81
KF25-1/8-QC	NW25-1/8"	1/8"	1.57	1.42
KF25-3/16-QC	NW25-3/16"	3/16"	1.57	1.42
KF25-1/4-QC	NW25-1/4"	1/4"	1.57	1.42
KF25-3/8-QC	NW25-3/8"	3/8"	1.57	1.42
KF25-1/2-QC	NW25-1/2"	1/2"	1.57	1.50
KF25-3/4-QC	NW25-3/4"	3/4"	1.57	1.81
KF25-1.0-QC	NW25-1"	1"	1.57	2.01
KF40-1/8-QC	NW40-1/8"	1/8"	2.17	1.42
KF40-3/16-QC	NW40-3/16"	3/16"	2.17	1.42
KF40-1/4-QC	NW40-1/4"	1/4"	2.17	1.42
KF40-3/8-QC	NW40-3/8"	3/8"	2.17	1.42
KF40-1/2-QC	NW40-1/2"	1/2"	2.17	1.50
KF40-3/4-QC	NW40-3/4"	3/4"	2.17	1.81
KF40-1.0-QC	NW40-1"	1"	2.17	2.01
KF40-1.5-QC	NW40-1.5"	1.5"	2.17	2.40
KF50-1/2-QC	NW50-1/2"	1/2"	2.95	1.50
KF50-3/4-QC	NW50-3/4"	3/4"	2.95	1.81
KF50-1.0-QC	NW50-1"	1"	2.95	2.01
KF50-1.5-QC	NW50-1.5"	1.5"	2.95	2.40
KF50-2.0-QC	NW50-2.0"	2"	2.95	2.40

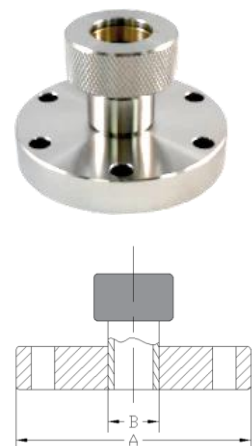


# Adapters

## CF Flange to Quick Couplings

Materials : 316

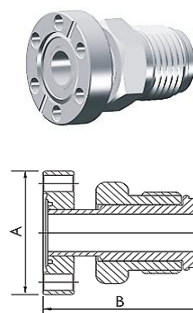
Part No.	A (Inch)	B (Inch)
CF1.33-1/4-QC	CF1.33	1/4"
CF1.33-3/8-QC	CF1.33	3/8"
CF1.33-1/2-QC	CF1.33	1/2"
CF2.75-1/4-QC	CF2.75	1/4"
CF2.75-3/8-QC	CF2.75	3/8"
CF2.75-0.5-QC	CF2.75	1/2"
CF2.75-0.75-QC	CF2.75	3/4"
CF2.75-1.0-QC	CF2.75	1.0"
CF2.75-1.5-QC	CF2.75	1.5"



## CF Flange to Male VCR

Materials : 316

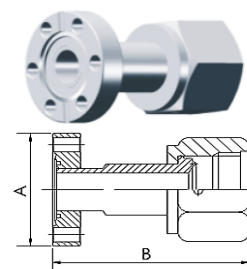
Part No.	Size	A (inch)	B (inch)
CF1.33-1/4 MVCR	CF1.33X 1/4" Male VCR adaptor	CF1.33	1.43
CF1.33-3/8 MVCR	CF1.33X 3/8" Male VCR adaptor	CF1.33	1.55
CF1.33-1/2 MVCR	CF1.33X 1/2" Male VCR adaptor	CF1.33	1.55
CF2.75-1/4 MVCR	CF2.75X 1/4" Male VCR adaptor	CF2.75	1.52
CF2.75-3/8 MVCR	CF2.75X 3/8" Male VCR adaptor	CF2.75	1.71
CF2.75-1/2 MVCR	CF2.75X 1/2" Male VCR adaptor	CF2.75	1.71



## CF Flange to Female VCR

Materials : 316

Part No.	Size	A (inch)	B (inch)
CF1.33-1/4 FVCR	CF1.33X 1/4" Female VCR adaptor	CF1.33	1.43
CF1.33-3/8 FVCR	CF1.33X 3/8" Female VCR adaptor	CF1.33	1.55
CF1.33-1/2 FVCR	CF1.33X 1/2" Female VCR adaptor	CF1.33	1.55
CF2.75-1/4 FVCR	CF2.75X 1/4" Female VCR adaptor	CF2.75	1.52
CF2.75-3/8 FVCR	CF2.75X 3/8" Female VCR adaptor	CF2.75	1.71
CF2.75-1/2 FVCR	CF2.75X 1/2" Female VCR adaptor	CF2.75	1.71

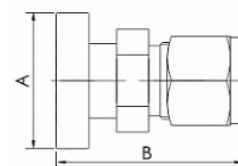
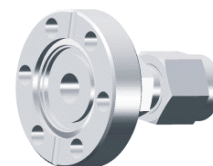


# Adapters

## CF to Compression fitting

Materials : 316

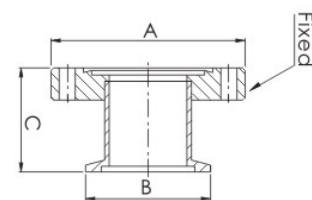
Part No.	Size	A	B
CF1.33-1/4-SWAG	CF1.33X 1/4" SWAG	CF1.33	1.37
CF1.33-3/8-SWAG	CF1.33X 3/8" SWAG	CF1.33	1.66
CF1.33-1/2-SWAG	CF1.33X 1/2" SWAG	CF1.33	1.70
CF2.75-1/4-SWAG	CF2.75X 1/4" SWAG	CF2.75	1.53
CF2.75-3/8-SWAG	CF2.75X 3/8" SWAG	CF2.75	1.69
CF2.75-1/2-SWAG	CF2.75X 1/2" SWAG	CF2.75	1.83
CF2.75-3/4-SWAG	CF2.75X 3/4" SWAG	CF2.75	2.20
CF2.75-1-SWAG	CF2.75X 1" SWAG	CF2.75	2.66



## CF to KF Flange Adaptor

Materials : 304

Part No.	Tube Size	A	B	C
CF1.33/KF16-ADP	CF1.33-KF16	CF 1.33	KF16	1.69
CF1.33/KF25-ADP	CF1.33-KF25	CF 1.33	KF25	1.69
CF1.33/KF40-ADP	CF1.33-KF40	CF 1.33	KF40	1.69
CF1.33/KF50-ADP	CF1.33-KF50	CF 1.33	KF50	1.69
CF2.75/KF16-ADP	CF2.75-KF16	CF 2.75	KF16	1.78
CF2.75/KF25-ADP	CF2.75-KF25	CF 2.75	KF25	1.78
CF2.75/KF40-ADP	CF2.75-KF40	CF 2.75	KF40	1.78
CF2.75/KF50-ADP	CF2.75-KF50	CF 2.75	KF50	1.78
CF3.38/KF40-ADP	CF3.38-KF40	CF 3.38	KF40	1.80
CF3.38/KF50-ADP	CF3.38-KF50	CF 3.38	KF50	1.80
CF4.50/KF50-ADP	CF4.50-KF50	CF 4.50	KF50	1.95

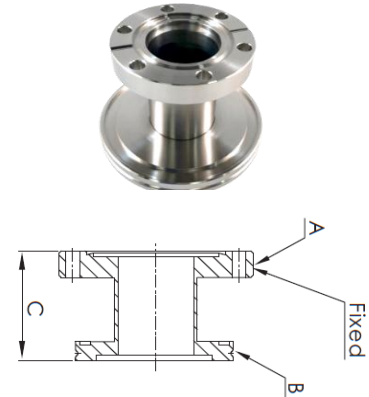


# Adapters

## ISO to CF Flange Adaptor

Materials : 304

Part No.	Tube Size	A	B	C
ISO63/CF2.75-ADP	ISO63-CF2.75	CF2.75	ISO63	2.83
ISO63/CF4.50-ADP	ISO63-CF4.50	CF4.50	ISO63	4.44
ISO80/CF4.62-ADP	ISO80-CF4.62	CF4.62	ISO80	4.44
ISO80/CF6.00-ADP	ISO80-CF6.00	CF6.00	ISO80	4.44
ISO100/CF4.50-ADP	ISO100-CF4.50	CF4.50	ISO100	4.44
ISO100/CF6.00-ADP	ISO100-CF6.00	CF6.00	ISO100	4.44
ISO160/CF8.00-ADP	ISO160-CF8.00	CF8.00	ISO160	4.44
ISO200/CF10.00-ADP	ISO200-CF10.00	CF10.00	ISO200	4.44



## ISO to KF Flange Adaptor

Materials : 304

Part No.	Tube Size	A	B	C
ISO63/KF25-ADP	ISO63-KF25	ISO63	KF25	1.75
ISO63/KF40-ADP	ISO63-KF40	ISO63	KF40	1.75
ISO63/KF50-ADP	ISO63-KF50	ISO63	KF50	1.75
ISO80/KF40-ADP	ISO80-KF40	ISO80	KF40	1.75
ISO80/KF50-ADP	ISO80-KF50	ISO80	KF50	1.75
ISO100/KF25-ADP	ISO100-KF25	ISO100	KF25	1.75
ISO100/KF40-ADP	ISO100-KF40	ISO100	KF40	1.75
ISO100/KF50-ADP	ISO100-KF50	ISO100	KF50	1.75
ISO160/KF40-ADP	ISO160-KF40	ISO160	KF40	1.75
ISO160/KF50-ADP	ISO160-KF50	ISO160	KF50	1.75



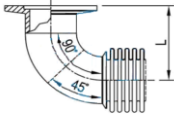
# Metal - Flex Hose (vacuum connection)

## Flexible vacuum coupling

Thin wall, between 0.006 - 0.008" thick resulting in greater flexibility and stroke.  
Used for alignment or vibration isolation. Maximum compression is typically 20% and max. extension is 10% of the flexible length .

\* Standard material is: SUS 316.

\* Max. length: 2,000 mm



## Bellow Specification

Dia (in)	ID (in)	OD (in)	Pitch	Bent R (in)	Max. psi
0.75	0.74	1.0	0.13	1.1	atm
1.00	0.98	1.4	0.15	1.3	atm
1.50	1.56	2.1	0.20	1.6	atm
2.00	1.94	2.6	0.20	2.1	atm
2.50	2.50	3.1	0.20	2.7	atm
3.00	3.10	3.8	0.26	2.8	atm
4.00	3.90	5.0	0.30	3.5	atm
6.00	5.90	6.9	0.40	5.2	atm

## Flexible vacuum hose

Medium wall, between 0.008 - 0.015" thick results in stronger structure. Less susceptible to mechanical damage. Used for vacuum connection.

\* Standard material : SUS 316

\* Max. length: 3,000 mm

## Actuator

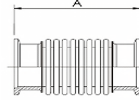
We have a distinguished competitive advantage in small actuators.  
Build with ultra-flexible formed bellows as small as 1/4" ID.



Welded bellows are available.  
See the welded bellows section



# Metal - Flex Hose (vacuum connection)



## KF Flange Thin Wall Bellow

Material: SS 316

Wall Thickness: .006"

## KF Flange Medium Wall Bellow

Wall Thickness: .008"

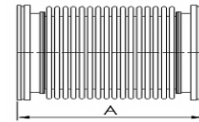
Part No.	FREE LENGTH	Part No.	FREE LENGTH
FH-KF16-100-006-316	4.00	FH-KF16-100-008-316	4.00
FH-KF16-250-006-316	10.00	FH-KF16-250-008-316	10.00
FH-KF16-305-006-316	12.00	FH-KF16-305-008-316	12.00
FH-KF16-500-006-316	20.00	FH-KF16-500-008-316	20.00
FH-KF16-610-006-316	24.00	FH-KF16-610-008-316	24.00
FH-KF16-750-006-316	30.00	FH-KF16-750-008-316	30.00
FH-KF16-915-006-316	36.00	FH-KF16-915-008-316	36.00
FH-KF16-1000-006-316	39.00	FH-KF16-1000-008-316	39.00
FH-KF16-1219-006-316	48.00	FH-KF16-1219-008-316	48.00
FH-KF16-2000-006-316	79.00	FH-KF16-2000-008-316	79.00
FH-KF25-100-006-316	4.00	FH-KF25-100-008-316	4.00
FH-KF25-250-006-316	10.00	FH-KF25-250-008-316	10.00
FH-KF25-305-006-316	12.00	FH-KF25-305-008-316	12.00
FH-KF25-500-006-316	20.00	FH-KF25-500-008-316	20.00
FH-KF25-610-006-316	24.00	FH-KF25-610-008-316	24.00
FH-KF25-750-006-316	30.00	FH-KF25-750-008-316	30.00
FH-KF25-915-006-316	36.00	FH-KF25-915-008-316	36.00
FH-KF25-1000-006-316	39.00	FH-KF25-1000-008-316	39.00
FH-KF25-1219-006-316	48.00	FH-KF25-1219-008-316	48.00
FH-KF25-2000-006-316	79.00	FH-KF25-2000-008-316	79.00
FH-KF25-2500-006-316	98.00	FH-KF25-2500-008-316	98.00
FH-KF40-100-006-316	4.00	FH-KF40-100-008-316	4.00
FH-KF40-250-006-316	10.00	FH-KF40-250-008-316	10.00
FH-KF40-305-006-316	12.00	FH-KF40-305-008-316	12.00
FH-KF40-500-006-316	20.00	FH-KF40-500-008-316	20.00
FH-KF40-610-006-316	24.00	FH-KF40-610-008-316	24.00
FH-KF40-750-006-316	30.00	FH-KF40-750-008-316	30.00
FH-KF40-915-006-316	36.00	FH-KF40-915-008-316	36.00
FH-KF40-1000-006-316	39.00	FH-KF40-1000-008-316	39.00
FH-KF40-1219-006-316	48.00	FH-KF40-1219-008-316	48.00
FH-KF40-2000-006-316	79.00	FH-KF40-2000-010-316	79.00
FH-KF50-100-006-316	4.00	FH-KF50-100-008-316	4.00
FH-KF50-250-006-316	10.00	FH-KF50-250-008-316	10.00
FH-KF50-305-006-316	12.00	FH-KF50-305-008-316	12.00
FH-KF50-500-006-316	20.00	FH-KF50-500-008-316	20.00
FH-KF50-610-006-316	24.00	FH-KF50-610-008-316	24.00
FH-KF50-750-006-316	30.00	FH-KF50-750-008-316	30.00
FH-KF50-915-006-316	36.00	FH-KF50-915-008-316	36.00
FH-KF50-1000-006-316	39.00	FH-KF50-1000-008-316	39.00
FH-KF50-1215-006-316	48.00	FH-KF50-1215-008-316	48.00
FH-KF50-2000-006-316	79.00	FH-KF50-2000-010-316	79.00

# Metal - Flex Hose (vacuum connection)

## ISO Flange Bellow --flex hose

Materials : SS 316

Part No.	A (Inch)
FH-ISO63-100-007-316	4.00
FH-ISO63-250-007-316	10.00
FH-ISO63-305-007-316	12.00
FH-ISO63-500-007-316	20.00
FH-ISO63-610-007-316	24.00
FH-ISO63-750-007-316	30.00
FH-ISO63-915-007-316	36.00
FH-ISO63-1000-007-316	39.00
FH-ISO63-1219-007-316	48.00
FH-ISO80-100-007-316	4.00
FH-ISO80-250-007-316	10.00
FH-ISO80-305-007-316	12.00
FH-ISO80-500-007-316	20.00
FH-ISO80-610-007-316	24.00
FH-ISO80-750-007-316	30.00
FH-ISO80-915-007-316	36.00
FH-ISO80-1000-007-316	39.00
FH-ISO80-1219-007-316	48.00
FH-ISO100-100-008-316	4.00
FH-ISO100-250-008-316	10.00
FH-ISO100-305-008-316	12.00
FH-ISO100-500-008-316	20.00
FH-ISO100-610-008-316	24.00
FH-ISO100-750-008-316	30.00
FH-ISO100-910-008-316	36.00
FH-ISO100-1000-008-316	39.00
FH-ISO100-1219-008-316	48.00
FH-ISO160-100-010-316	4.00
FH-ISO160-250-010-316	10.00
FH-ISO160-305-010-316	12.00
FH-ISO160-500-010-316	20.00
FH-ISO160-610-010-316	24.00
FH-ISO160-750-010-316	30.00
FH-ISO160-915-010-316	36.00
FH-ISO160-1000-010-316	39.00
FH-ISO160-1219-010-316	48.00



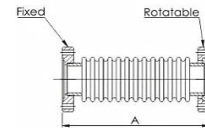
# Metal - Flex Hose (vacuum connection)

## CF Flange Bellow --flex hose

Materials : SS 316

Wall Thickness: .006"

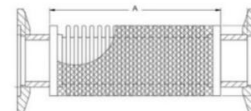
Part No.	A (Inch)
FH-CF1.33-100-006-316	4.00
FH-CF1.33-250-006-316	10.00
FH-CF1.33-305-006-316	12.00
FH-CF1.33-500-006-316	20.00
FH-CF1.33-610-006-316	24.00
FH-CF1.33-750-006-316	30.00
FH-CF1.33-915-006-316	36.00



## Braided Bellow - KF Flange

Materials : SS 304

Part No.	A (Inch)
FHB-KF16-250	10.00
FHB-KF16-500	20.00
FHB-KF16-750	30.00
FHB-KF16-1000	39.00
FHB-KF25-250	10.00
FHB-KF25-500	20.00
FHB-KF25-750	30.00
FHB-KF25-1000	39.00
FHB-KF40-250	10.00
FHB-KF40-500	20.00
FHB-KF40-750	30.00
FHB-KF40-1000	39.00
FHB-KF50-250	10.00
FHB-KF50-500	20.00
FHB-KF50-750	30.00
FHB-KF50-1000	39.00



# Welded Bellow

## Welded Metal Bellow

To order, please send request for price

### Applications

Semiconductor, Flat Panel Display,  
Mechanical Seals, Valves & other vacuum systems

- Valve Stem Seals
- Damping Devices
- Beam Lines
- Flexible & Torque Couplings
- Feed Throughs
- Sensors
- Fuel Drains
- Wafer/Glass Handlers
- Accumulators & Reservoirs
- Actuators & Pistons
- Expansion Joints
- X-Y-Z Manipulators
- Mechanical Seals & Kiss Seals
- Others



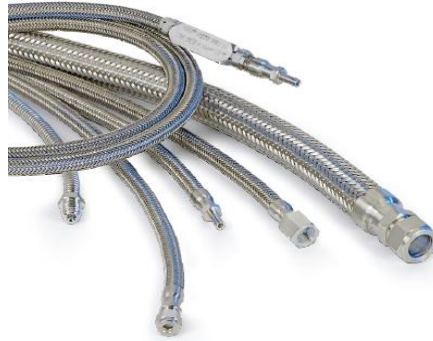
## Material Characteristics

Material	Treatment	Max Tensile Strength psi x10 <sup>3</sup>	Max Tensile Strength 2% psi x10 <sup>3</sup>	Elongation in 2 inch (%)	Hardness	Module Elasticity (psi x10 <sup>6</sup> )	Density (lb/in <sup>3</sup> )	Thermal Expansion Coefficient 68~212oF (in/in oF x10 <sup>-6</sup> )	Thermal Conduction 212oF (Btu/hr-ft oF)	Magnetic Permeability 200H (annealed)
304	Annealed	81	39	55	79R0	28	0.29	9.6	9.4	1.02 max
316L	Annealed	81	42	55	79R0	29	0.29	8.9	9.4	10.2 max
321	Annealed	90	35	55	80R0	28	0.29	9.3	9.3	10.2 max
347	Annealed	95	40	50	85R0	28	0.29	9.3	9.3	10.2 max
Alloy 20	Annealed	93	46	38	90R0	28	0.29	8.2	7.6	1.002
AM350	Annealed	145	60	40	20R0	29	0.286	8.5	8.2	12 max
AM350	SCT850oF	206	173	12.5	45R0	29.4	0.282	6.3	8.9	12.3 max
HC-276	Annealed	115	55	60	90R0	29.8	0.321	6.8	6.4	1.0002
Haynes 242	Annealed	128	65	47	-	33.2	0.327	6	7	-
Haynes 242	Aged	196	135	32	-	33.2	0.327	6	7	-
Inconel 625	Annealed	120	60	55	88R0	29.8	0.305	7.1	6.2	1.0006
Inconel 718	Annealed	117	44	-	-	29	0.296	-	6.5	1.0013
Inconel 718	Aged	180	150	12	26R0	29	0.297	6.8	6.6	1.0011
Inconel X-750	Aged	177	123	27	-	31	0.298	7	6.9	1.002
Monel 400	Annealed	70	28	55	68R0	26	0.316	7.7	13.9	-
Titanium CP2	Annealed	50	40	-	-	-	0.162	-	-	1.00005

# Flex Gas Line

## Flexible metal hose

Hydroformed gasline yields a very clean product. Standard cleaning procedure includes degreasing and rinse. Gaslines are 100% tested and leak checked.



Optional cleaning methods are:

- \* Oxygen clean
- \* Ultrasonic clean

Four (4) factors to consider when selecting a flexible gasline

## Temperature

As temperature increases, the hose's working pressure decreases. To figure out the actual working pressure at a particular temperature, multiply the pressure by the temperature factor in the table.

## Dynamic Pressure

Pulsating, surge or shock pressure can inflict severe damage on a hose. For pulsating pressure, the working pressure should be de-rated by 1/2. For shock pressure, the working pressure should be de-rated by 1/6.

## Flexibility

Bend radius should not be less than the rated radius

## Chemical Compatibility

Both hose and braid must be compatible with the media that flows through the hose. Refer to NACE (National Assoc of Corrosion Engineers) for information.

Working pressure de-rating factor

Degree (F)	400	500	600	700	800	900	1000	1100	1200
Degree (C )	205	260	315	370	370	480	540	595	650
Temp. factor	0.93	0.86	0.81	0.77	0.74	0.71	0.67	0.61	0.38

## Available end fitting



Male, NPT  
(MPT)



Female, NPT  
(FPT)



Male  
Face Seal  
(MVCR)



Female  
Face Seal  
(FVCR)



Tube connector  
(swag)



Weld tube  
(WT)

# Flex Gas Line

## Flexible Gas Line

We offer two types of gas lines; "General Use" and "Stay-Put".

General Use is for industrial application of gas & liquid lines with high temperature, corrosive media and harsh environment

Stay-Put can fit into a tight space without creating stress

### General Use series:

- \* Braided, double braided or unbraided corrugated tube assembly
- \* Core tube is made of 316L stainless steel
- \* Braid is made of 304 stainless steel
- \* Tube ID from 1/4" to 2"
- \* Max. working pressure 2,700 psi (186 bar)
- \* Min. static bend radius for braided hose 1.0" (25 mm)
- \* Min. dynamic bend radius for braided hose 4.5" (114 mm)
- \* Full range of end connections



Inside Diameter		Number of Braids (#)	Outside Diameter		Static Minimum Bend Radius		Dynamic Minimum Bend Radius		Maximum Working Pressure		Burst Pressure		Weight Per Foot	Weight Per Meter
inch	mm		inch	mm	inch	mm	inch	mm	psi	bar	psi	bar	lbs	kg
1/4	6.35	0	0.41	10.4	1.0	25	4.5	114	90	6	n/a	n/a	0.04	0.06
		1	0.47	11.9					1,800	124	7,233	499	0.11	0.16
		2	0.53	13.5					2,700	186	9,100	627	0.18	0.27
3/8	9.53	0	0.65	16.5	1.2	30	5.0	127	70	5	n/a	n/a	0.10	0.15
		1	0.71	18.0					1,558	107	6,230	430	0.20	0.30
		2	0.77	19.6					2,336	161	9,345	644	0.30	0.45
1/2	12.70	0	0.77	19.6	1.5	38	5.5	140	70	5	n/a	n/a	0.11	0.16
		1	0.83	21.1					1,186	82	4,743	327	0.22	0.33
		2	0.89	22.6					1,779	123	7,115	491	0.33	0.49
5/8	15.88	0	0.96	24.4	1.8	46	7.0	178	57	4	n/a	n/a	0.17	0.25
		1	1.02	25.9					1,205	83	4,820	332	0.33	0.49
		2	1.08	27.4					1,808	125	7,230	498	0.49	0.73
3/4	19.05	0	1.16	29.5	2.1	53	8.0	203	43	3	n/a	n/a	0.19	0.28
		1	1.22	31.0					898	62	3,591	248	0.37	0.55
		2	1.28	32.5					1,347	93	5,387	371	0.55	0.82
1	25.40	0	1.47	37.3	2.7	69	9.0	229	43	3	n/a	n/a	0.26	0.39
		1	1.53	38.9					718	50	2,872	198	0.50	0.74
		2	1.59	40.4					1,077	74	4,308	297	0.74	1.10
1 1/4	31.75	0	1.75	44.5	3.1	79	10.0	254	43	3	n/a	n/a	0.29	0.43
		1	1.83	46.5					645	44	2,581	178	0.61	0.91
		2	1.91	48.5					968	67	3,872	267	0.93	1.38
1 1/2	38.10	0	2.08	52.8	3.9	99	11.0	279	28	2	n/a	n/a	0.47	0.70
		1	2.16	54.9					531	37	2,125	147	0.85	1.26
		2	2.24	56.9					797	55	3,188	220	1.23	1.83
2	50.80	0	2.61	66.3	5.1	130	13.0	330	14	1	n/a	n/a	0.59	0.88
		1	2.69	68.3					449	31	1,797	124	1.11	1.65
		2	2.77	70.4					674	46	2,696	186	1.63	2.43

# Flex Gas Line

## Stay-Put Gas Line

This hose series is formable and stay put. They can be bent, compressed or stretched to fit into exact space in a system without stress. Commonly used to connect piping. Formable gas line comes in 1/2", 3/8" and 1/2" ID only

### Stay-put:

- \* Braided or unbraided
- \* Core tube is made of SUS 316L. Braid is made of SUS 304
- \* Tube ID 1/4", 3/8", 1/2"
- \* Max. working pressure 900 psi
- \* Min. static bend radius for braided hose 1.0"



Formable and stay-put

ID (in)	OD (in)	Static bent R (in)	Pitch	# of braid	Max. psi
0.25	0.38	1.0	0.08	0	90
	0.47			1	900
0.38	0.65	1.20	0.10	0.00	70.00
	0.79			1.00	800.00
0.50	0.66	1.5	0.12	0	70
	0.83			1	665

## P/N system for Gas Line

### General Use Series

Braided hose                      FHB - ftg/ftg - ID - (length) - GU  
 Unbraided hose                 FH - ftg/ftg - ID - (length) - GU

#### Example

FHB - MPT/FPT - 0.5 - 36 - GU                      Braided metal hose - male/female thread - 1/2" ID - 36" lg, general use  
 FH - MPT/FPT - 0.5 - 36 - GU                      Unbraided metal hose - male/female thread - 1/2" ID - 36" lg, general use

### Stay-Put Series

Braided hose:                      FHB - ftg/ftg - ID - (length) - SP  
 Unbraided hose:                 FH - ftg/ftg - ID - (length) - SP

#### Example

FHB-WT/VCR-0.25-24 - SP                      Braided flex hose, weld tubeVCR, 1/4" ID, 24" lg, Stay-Put  
 FH-MPT/FPT-0.25-36 - SP                      Unbraided flex hose, male/female NPT, 1/4" ID, 36" lg, Stay-Put

# High Purity Fitting and Valve

Vacuum Products Corp (VPC) is a global provider of ultra-pure fluid system for the research, thin-film, instrumentation, power, petrochemical industries. We use only the highest grade raw material and 1/1000" tolerance control on each and every part, we assure a leak-tight seal in every application. We offer immediate delivery of parts made of VIM-VAR

Diaphragm valve is for ultra pure fluids system; pressure relief valve protects the line from over pressurization; check valves protect the system from back flow; and strainer-contained filters prevent any impurity in the system. We use materials that conform to NACE specifications.

Our components exceed the requirements of the refinery and petrochemical industry.

100% compatible with Swagelok fittings

We specialize in custom design and quick delivery. No minimum order is required.

We have 10,000 different parts. Please call: **510-498-8518**  
Submit inquiry at: [sales@vacproducts.com](mailto:sales@vacproducts.com)

## Specification:

Material: 316, 316 VIM-VAR  
Cleaning: Only biodegradable, phosphate and caustic-free alkaline cleaner is used  
Surface Finish: 15Ra, 10Ra, 5Ra, Brite Anneal or Electropolish  
Ferrule nut threads are silver plated



Compressing fitting



Face Seal fitting



Valve



Quick Connect/Felx tube



Filter



Regulator

# High Purity Valve

## Ball Valve



- \* Smooth and low operating torques
- \* Variety of handle colors
- \* Pneumatic and electric actuators available
- \* Panel mountable
- \* Leak-tight testing for every valve at the maximum working pressure with nitrogen

### \* Specification

<b>Material:</b>	SS316, 316L, 904L, 304, 304L, 321
<b>Maximum working pressure:</b>	Up to 10000 psig
<b>Working temperature:</b>	-65°F ~ 450°F (-54°C ~ 232°C)
<b>Orifice size:</b>	1.3mm ~ 18mm
<b>Thread:</b>	NPT, socket weld, tube fitting

## Check Valve



- \* Fixed and adjustable cracking pressure
- \* Can be installed in any direction
- \* Variety of springs available

### \* Specification

<b>Material:</b>	Stainless steel
<b>Maximum working pressure:</b>	Up to 6000 psig
<b>Cracking pressure:</b>	1/3 ~ 600psig
<b>Working temperature:</b>	-65°F ~ 900°F (-54°C ~ 482°C)
<b>Orifice size:</b>	1/8" ~ 1" and 6mm ~ 12mm
<b>Thread:</b>	NPT, BSPT, socket weld, butt weld, tube fitting

# High Purity Valve

## Relief Valve



- \* Liquid or gas service
- \* Adjustable connect cap and adjustable set pressure
- \* Lock wired secure cap to maintain the set pressure
- \* Variety of seal materials
- \* Label identifies the set pressure range
- \* Manual override available to open the valve without changing the set pressure

### \* Specification

<b>Material:</b>	Stainless steel
<b>Set Pressure:</b>	10 ~ 6000 psig @ 70°F (20°C)
<b>Maximum outlet pressure:</b>	Up to 1500 psig
<b>Working temperature:</b>	-10°F ~ 300°F (-23°C ~ 148°C)
<b>Orifice size:</b>	0.14" ~ 0.25"
<b>Thread:</b>	NPT, tube fitting

## Metering Valve



### \* Specification

<b>Material:</b>	Stainless steel
<b>Maximum working pressure:</b>	Up to 5000 psig
<b>Working temperature:</b>	-65°F ~ 850°F (-54°C ~ 454°C)
<b>Orifice size:</b>	0.032" ~ 1.128"
<b>Thread:</b>	NPT, FR fitting, tube fitting

For Product Selection, please call  
Or make inquiry:

510-498-8518  
sales@vacproducts.com

# High Purity Valve

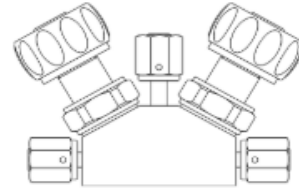
## Diaphragm Valve



316 SST, 3 valves & 4 ports, 1/4"



316 SST, 1/4"



316 SST, 2 valves 3 ports

## Filter



### \* Specification

Material:	SS316, 316L, 304, 304L, 904L, 321L
Maximum working pressure:	Up to 6000 psig
Working temperature:	-20°F ~ 900°F (-29°C ~ 482°C)
Orifice size:	1/8" ~ 1/2"
Nominal pore sizes for sintered element:	0.5, 2, 7, 15, 40, 60, 80 µm
Nominal pore sizes for strainer element:	100, 150, 250, 450 µm
Thread:	NPT, socket weld, tube fitting

For Product Selection and Quote

Please Call

510-498-8518

Or make inquiry:

sales@vacproducts.com

# Compression Fitting

Two ferrule mechanical grip design. 100% compatible to Swagelok fitting. We cross reference to Swagelok part number. Unlike other equivalent parts, we are the only supplier with parts that passed the salt water test under high pressure and temperature.

**We carry sizes from 1/8" to 1.0"**

**Union**



**Bulkhead Union**



**Reducing Union**



**Union Elbow**



**Male Connectors**



**Female Connectors**



**Male Run Tee**



**Male Branch Tee**



**Union Tee**



**Male Elbow**



**Female Elbow**



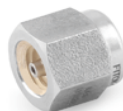
**Reducer**



**Cap**



**Plug**



**Nut + Ferrule**



# Face Seal Fittings

We carry thousands of parts in inventory. Please send inquiry.  
We cross reference to Swagelok part numbers.

FR Gland to Short Tube Butt Weld



FR Gland to Tube Butt Weld



Silver Plated/Unplated Gasket, Nonretained



FR Gland to Tube Port



FR Body to Female NPT



Gasket Retainer Assembly



FR Body to Tube Fitting



Union Bodies



Female Nut



Bulkhead Union Bodies



FR Body to Male NPT



Cap



FR Body to Male NPT Elbow



FR Body Union Elbow



Male Nut



FR Body Union Tee



FR Body Union Cross



Plug



# Quick-Connects and Hose Connector

## Quick Connect



### \* Specification

<b>Material:</b>	Stainless steel
<b>Maximum working pressure:</b>	Up to 6000 psig
<b>Working temperature:</b>	-10°F ~ 400°F (-23°C ~ 204°C)
<b>Orifice size:</b>	1/8" ~ 1" and 6mm ~ 12mm
<b>Thread:</b>	NPT, hose connector, tube fitting
<b>Type Available:</b>	Single-end shutoff, double-end shutoff, full-flow quick-connects

## Metal Flexible Hose Assemblies



### \* Specification

<b>Material:</b>	Stainless steel
<b>Maximum working pressure:</b>	Up to 3100 psig
<b>Working temperature:</b>	-325°F ~ 800°F (-200°C ~ 426°C)
<b>Orifice size:</b>	1/4" ~ 2"
<b>Thread:</b>	NPT, tube fitting

For Product Selection and Quote

Please Call

408-805-5607

Or make inquiry:

sales@vacproducts.com

# Vacuum Gauge

## Thyracont Vacuum Instruments GmbH

Over 40 years in development and manufacturing of innovative vacuum instrumentation  
Strong background in Research and Development, customized service available

**\*\*All Thyracont products are CE marked and carry a 2 year warranty**

### VD8 Series-Digital Compact Vacuum Meters/ Data Loggers

Range: 1600 -  $5 \times 10^{-4}$  mbar

High Functionality and compact dimensions, ideal for pump and plant maintenance  
Handheld or fixed installation, operated with battery for 5000 hours or power supply  
Internal memory save up to 2000 measurement and USB interface for data export  
VacuGraph software available for data analysis

Applications: checking setup for vacuum plant, maintenance of pump, leak check  
Packing machines, coating plant, chemical process engineering



Model	Description
VD81	Piezo, 1600-1 mbar, DN16KF with G1/4 female thread, USB-interface
VD83	Pirani, 100- $5 \times 10^{-4}$ mbar, metal sealed, DN16KF USB-interface
VD84/1	Pirani external, 100- $1 \times 10^{-3}$ mbar, DN16KF, USB-interface
VD84/2	Pirani external, 100- $1 \times 10^{-3}$ mbar, 1/8" NPT-thread USB-interface
VD85	Piezo / Pirani, 1200- $5 \times 10^{-4}$ mbar, USB-interface

\*\* Sell as a kit and including instrument, carry case, power supply, 9V battery

### Smartline- New generation Smartline Intelligent Vacuum transducer

Range: 1200- $5 \times 10^{-10}$  mbar

Correct pressure reading due to separate gas correction factor for each sensor  
Low thermal and electric interference with the vacuum process insensitive to shock venting



### VSR Series- Piezo/Pirani transducer, 1200- $1 \times 10^{-4}$ mbar

Application: Load lock, Analysis technology, vacuum furnaces, leak test, process engineering

Model	Description
VSR53D	Piezo / Pirani, 1200- $1 \times 10^{-4}$ mbar, metal sealed, DN16KF
VSR54D	Piezo /Pirani, 1200- $1 \times 10^{-4}$ mbar, metal sealed, DN16CF

### VSP Series- Pulsed Pirani transducer, 1000 - $1 \times 10^{-4}$ mbar

Applications: Freeze Drier Chambers, Vacuum Loadlocks, Vacuum Distillation  
Vacuum Pump Monitoring, Leak Detectors, Vacuum Forelines

Model	Description
VSP63D	Pirani, 1000- $1 \times 10^{-4}$ mbar, metal sealed, DN16KF
VSP64D	Pirani, 1000- $1 \times 10^{-4}$ mbar, metal sealed, DN16CF

# Vacuum Gauge

## VSM Series- Pulsed Pirani & Inverted Magnetron cold cathode sensors, 1000-5 x10-9 mbar

Applications: Vacuum Furnaces & Ovens, Thin Film Deposition Systems  
Gas Laser Manufacture, Low-e Glass Coating System

Model	Description
VSM77D	Cold cathode / Pirani, 1000-5e-9 mbar, metal sealed, DN25KF
VSM78D	Cold cathode / Pirani, 1000-5e-9 mbar, metal sealed, DN40KF
VSM79D	Cold cathode / Pirani, 1000-5e-9 mbar, metal sealed, DN40CF

## VSH Series- Pulsed Pirani & dual filament Bayard-Alpert ionization sensors, 1000-5 x10-9 mbar

Applications: Ion Beam Etch & Deposition, Optical Coating, Particle Accelerators  
Vacuum Glove Boxes, Freeze Drying, House Vacuum Systems

Model	Description
VSH77D	Hot cathode / Pirani, 1000-5e-9 mbar, metal sealed, DN25KF
VSH78D	Hot cathode / Pirani, 1000-5e-9 mbar, metal sealed, DN40KF
VSH79D	Hot cathode / Pirani, 1000-5e-9 mbar, metal sealed, DN40CF

- \*\* Replace part number "D" with "DL" for optional large LED display
- \*\* Replace part number "D" with "E" for EtherCAT
- \*\* All smartline transducers can operate independently or with VD12 or VD14 Digital Controller.

## Analogline Transducer

Range: 1400-1 x 10-4 mbar  
Robust build and insensitive against shock venting and vibration  
Ceramic sensor, dirt resistance and contamination insensitive  
Excellent measurement accuracy  
Analog stand output signal 0-10V or 40-2- ma for PLCs



## VCC series- capacitance vacuum sensor, 200 - 1 x 10-1 mbar

Independent of gas type  
Applications: Vacuum Insulations, Packing Machines, Medical Technology  
Chemical Process Engineering, Evacuation and Filling

Model	Description
VCC200MA4	Capacitance, 200-0.1 mbar, 4-20 mA, linear, DN16KF

## VSC series- Piezo resistive sensor with Viton sealing, 1400 - 1 mbar

Applications: Appliance Engineering, Medical Technology, Packing Machines  
Operation control and documentation of Vacuum plants and pumps

Model	Description
VSC43MA4	Ceramic, 1400-1 mbar, 4-20 mA, linear, DN16KF
VSC43MV	Ceramic, 1400-1 mbar, 0-10 V, linear, DN16KF



## VSP Series- Pulsed Pirani transducer, 1000 -1x 10-4 mbar

Applications: Freeze drying, lyophilization, Analysis instruments, process engineering  
Vacuum Pump Monitoring, Leak Detectors, Vacuum Forelines

# Vacuum Gauge

Model	Description
VSP63MA4	Pirani, 1000-1e-4 mbar, 4-20 mA, logarithmic, metal sealed, DN16KF
VSP63MV	Pirani, 1000-1e-4 mbar, 0-10 V, logarithmic, metal sealed, DN16KF
VSP64MV	Pirani, 1000-1e-4 mbar, 0-10 V, logarithmic, metal sealed, DN16CF

## Display and Control Unit

### VD12

Single channel unit for any Thyracont transducer  
 2 configurable independent set points.  
 Pressure display in Torr, mbar or hPa  
 USB port and VacuGraph software available for data analysis  
 Shielded metal cases for preventing electromagnetic interface



### VD14

4 channel unit for any Thyracont transducer  
 2 configurable set points per measurement channel  
 Pressure display in Torr, mbar or hPa  
 RS232 port and VacuGraph software available for data analysis  
 Shielded metal cases for preventing electromagnetic interface



Model	Description
VD12S2	2 channels, 1400-5e-10 mbar, for Smartline transducers and Analogline transducers with 0-10 V output, metal sealed, USB-interface
VD14S4	4 channels, 1200-5e-10 mbar, for Smartline transducers and Analogline transducers with

\*\* Products listed above are most favorable items, but not the complete Thyracont product line.  
 Please feel free to contact us if you need anything else.

# Vacuum Accessory

## Sealant & Lubricant

### High Vacuum Sealant

Low vapor pressure resin sealant for sealing leaks.

### Loctite Epoxi-Patch Kit

Useful to  $1 \times 10^{-9}$  Torr. Forms strong bond with glass, ceramic and metal. Hardens at room temperature. Contains no solvent. Max. bake temperature is 125 C

### Celvaseal

Silicone resin, useful to  $1 \times 10^{-11}$  Torr. Much less weight loss compare to Loctite after bake. RGA indicates no evidence of hydrocarbons or other contaminations. Withstand repeated temperature cycling from -200 C to 450 C over long intervals of time.



### High Vacuum Lubricant

High vacuum grease and lubricant has low vapor pressure. Generally used to wet O-Ring to improve sealing when ultra vacuum is not required. Also used on threaded fasteners to keep from sticking inside a vacuum environment.



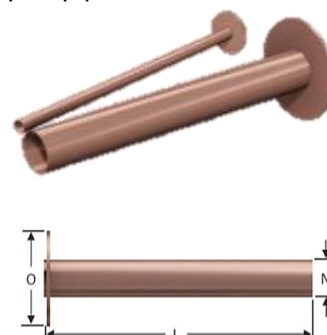
#### Available in:

Apezon, L-Type	Hydrocarbon base
Apiezon, M-Type	Hydrocarbon base
Krytox, LVP	Fluorinated oil. Up to 570 F
Loctite, 51609	Contain MoSi <sub>2</sub> dry Lub. -129 C to 131 C
Dow Corning	Silicone base. -40 C to 260 C

### PinchOff Tube

Made from OFE Copper. Commonly used on portable device as a pump port for vacuum.

Flange Size	L	N	O
1- 1/3"	6.00"	0.25	0.83
1- 1/3"		0.37	0.83
1- 1/3"		0.50	0.83
2-3/4"		0.25	1.89
2-3/4"		0.37	1.89
2-3/4"		0.50	1.89

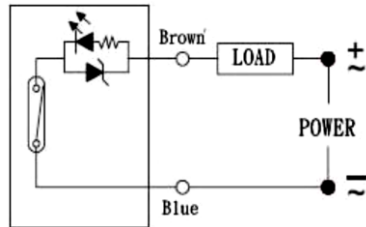


# Vacuum Accessory

## Solenoid Valve

### Position Sensor

Part No#	Specification	Size
Position Indicator	POSITION INDICATOR, DC/AC 5-120V	KF16 ~ ISO250



Air supply fitting  
Voltage option

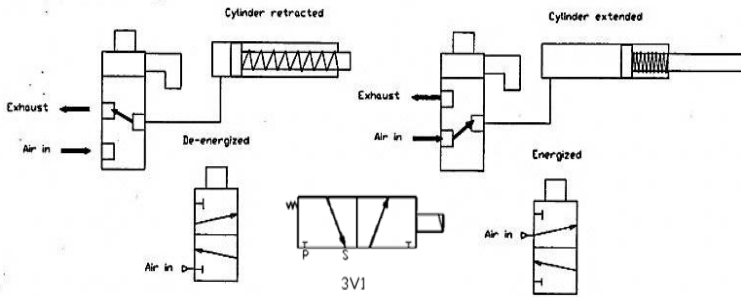
1/8" NPT (KF16-KF50) / 1/4" NPT (ISO63-ISO250)  
DC: 24V / AC: 110V / 220V

## Solenoid Valve

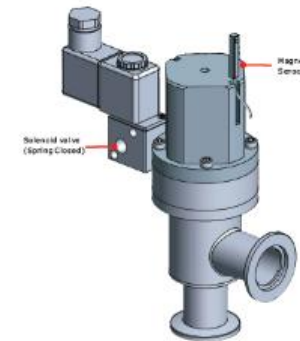
Part No#	Specification	Size
3V1-06-24	DC 24V, 1/8" NPT	
3V1-06-110	AC110V, 1/8" NPT	
4V-210-08-24	DC 24V, 1/4" NPT	
4V-210-08-110	AC110V, 1/4" NPT	



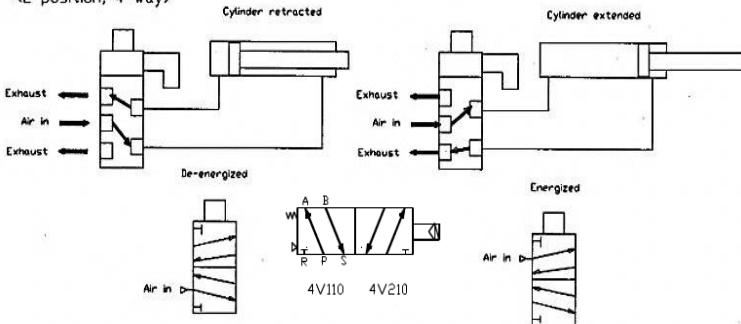
Poppet & Spool Valve, 3-Way, 3-Port  
(2 position, 3-Way)



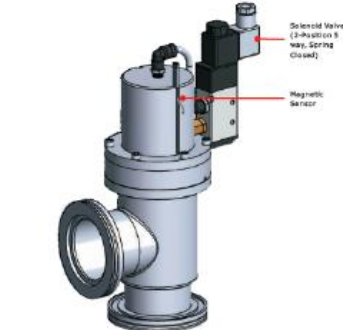
Electro-pneumatic Valve (Single acting)



Spool Valve, 4-Way, 5-Port  
(2 position, 4-Way)



Electro-pneumatic Valve (Double acting)



# Viewport

Available in different material types and surface treatments to allow for optimal transmission of specified wavelengths.



Optical disk for viewing only uses borosilicate glass such as 7056 or Kodial. For optical critical applications, fused silica, quartz, sapphire, Pyrex are used. Choose optical material that has a high transmission at the wavelength of interest.

Kodial viewport can withstand repeated bakeout cycle to 350° C. However, to avoid thermal stress, the heating rate should not exceed 2 deg. per minute. For clamp style viewport, finger-tight the bolts; use cross-flange tightening pattern, and never rotate any bolt more than 1/8 turn at a time.

UV grade fused silica viewports has a bakeout temperature of 200°C. Sapphire Viewport has a bakeout temperature of 450°C.

Pyrex Viewports provide a convenient and economical solution for vacuum systems requiring periodic glass substrate replacement. Applications like vacuum coating will deposit materials on viewports which will eventually render them useless. The Pyrex substrate is sealed against a gasket and clamped in place with an aluminum flange which prevents metal to glass contact.

Please email your inquiry to [support@vacproducts.com](mailto:support@vacproducts.com) or call (510) 498-8518

## HV ViewPorts

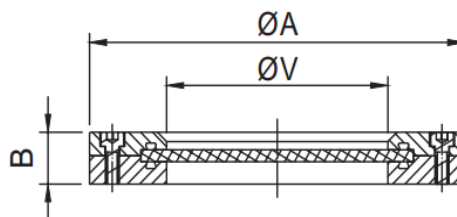
### Standard Specification

Application : High Vacuum

Flange Materials : SUS304, SUS316L

Vacuum Range: 760 Torr ~  $1 \times 10^{-9}$ Torr

Glass Materials : Borosilicate



### Clamp Type

Part Number	Flange size	V	A	B
ISO 63-VP	ISO 63	60.20	130.00	22.00
ISO100-VP	ISO 100	97.30	165.00	22.00
ISO160-VP	ISO 160	148.10	225.00	26.00

# Viewport

## Weld Type

### UHV ViewPorts

#### Standard Specification

Application : Ultra High Vacuum

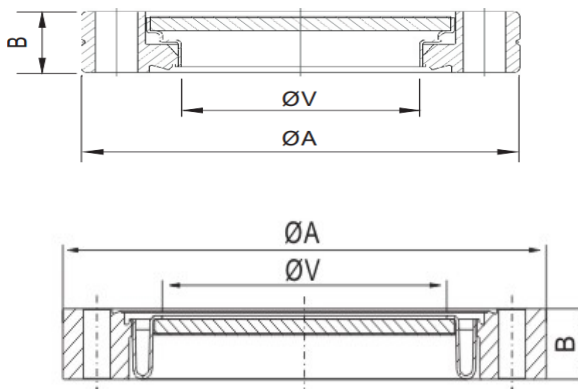
Vacuum Range: 760 Torr ~  $1 \times 10^{-13}$  Torr

Glass Materials : Kodial

Flange Materials : SUS304, SUS316L,

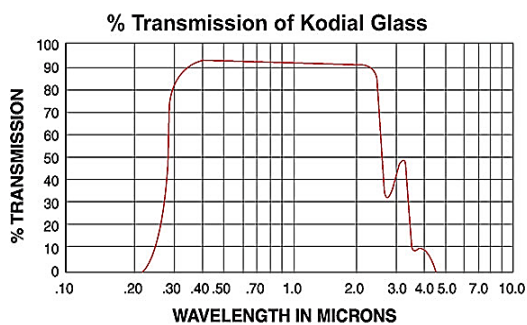
SUS304ESR, SUS316LN

Optical Coating : Optional

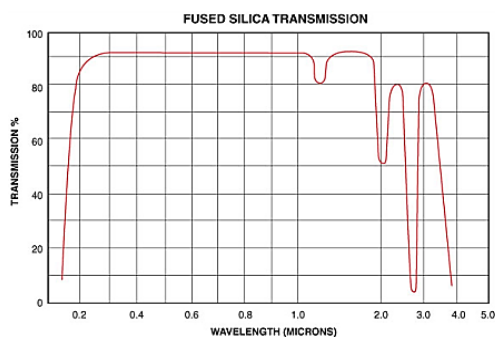


P/N	A mm	B mm	V mm	view angle	max. temp	min. temp
CF1.33-VP	34.00	8.00	15.80	65.00	400°C	-170°C
CF2.75-VP	70.00	13.00	38.00	98.00	400°C	-170°C
CF4.53-VP	114.00	17.50	63.60	120.00	400°C	-170°C
CF6.00-VP	152.00	20.00	89.20	122.00	400°C	-170°C
CF8.00-VP	203.00	22.00	137.00	140.00	400°C	-170°C

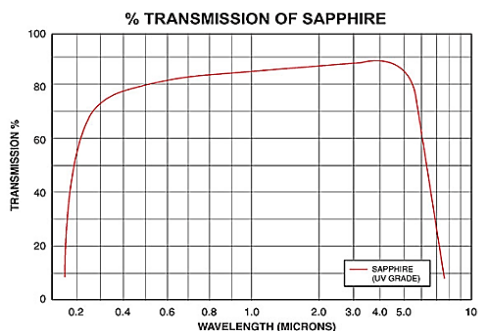
### Kodial Glass



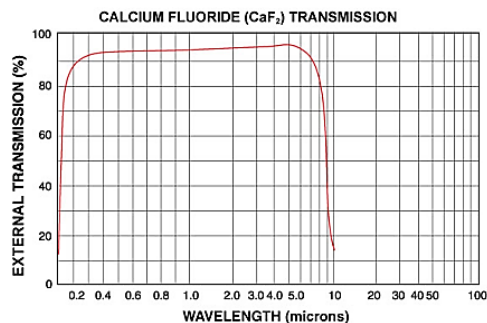
### Fused Silica / Quartz



### Sapphire



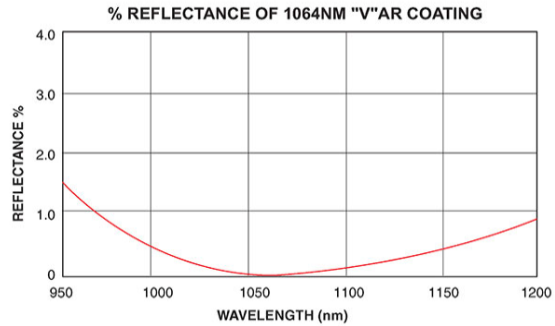
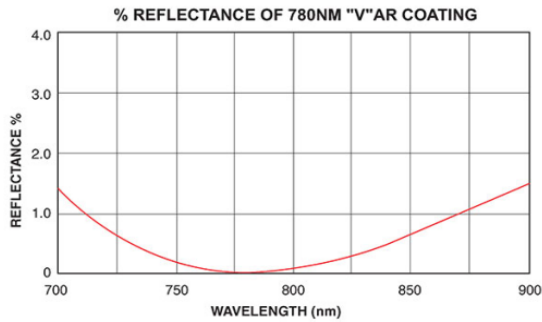
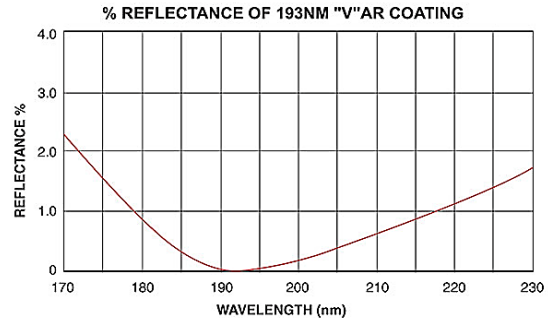
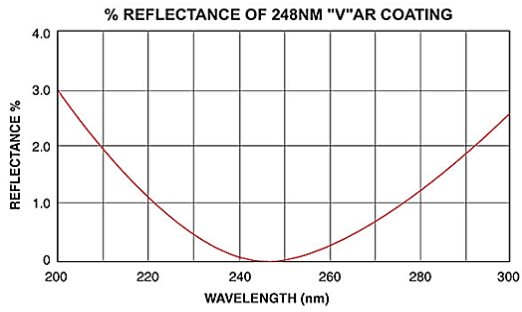
### Exotic Glass



# Viewport

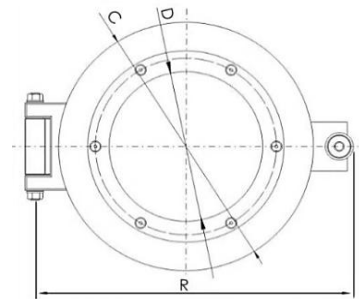
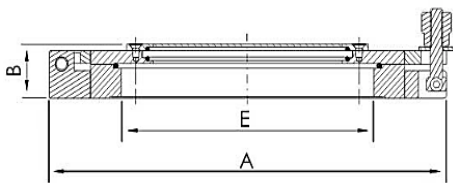
## Door

### Laser Transmission Viewport



### Door

Door can be equipped with a viewport.  
For Blank door, dimension "D" does not apply



### Viewport Door

P/N	A	B	C	D	E
QDV-CF4.5	6.97	1.26	4.49	2.52	2.52
QDV-CF6.0	8.46	1.38	5.98	4.02	4.02
QDV-CF8.0	10.87	1.46	7.95	5.98	6.02
QDV-CF10.0	12.83	1.54	9.96	5.98	8.03

\* For blank-off door, please use QDB for P/N prefix

# Viewport

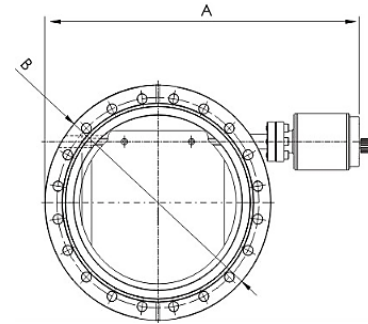
## Shutter

### Shutter, bellows sealed

Viewport can become contaminated from the coating material. Shutter is used to prevent deposition onto the viewport, thus preserve the quality of viewport.

Shutter can be locked in either open or close position.

Available in manual, pneumatic or motorized configuration.



Material: 304  
Max. bake temperature: 250 °C  
Operating temperature : 120° C to 150° C  
Pressure range: 1x10<sup>-11</sup> Torr

P/N	Flange	A (inch)	A (mm)	B (inch)	B (mm)
STR-CF2.75	CF2.75	5.98	152.00	2.72	69.00
STR-CF4.5	CF4.5	7.76	197.00	4.49	114.00
STR-CF6.0	CF6.0	9.25	235.00	5.98	152.00
STR-CF8.0	CF8.0	11.22	285.00	7.95	202.00

### Pneumatic Shutter

Adjustable stop  
Flow regulator: Standard  
Solenoid operated: 100 psi, max  
Bake temperature: 150° C



# Chamber

## Custom Build-to-Print Chamber

Chambers come in many shapes and sizes consist of Bell Jar, Rectangular, and Cylindrical configurations. Available in Stainless Steel, supplied with electropolished surface finish with mounting bosses and can be ordered with support frame. Additionally, seamless integration with feedthrough options is provided for applications. Please refer to the next page for the feedthrough selection.

### Specification:

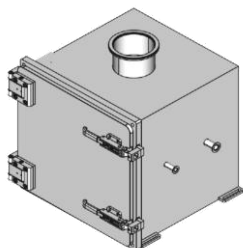
Vacuum range:  $1 \times 10^{-9}$  Torr

Leak test:  $1 \times 10^{-9}$  std cc/sec He



## Standard Chamber

These chambers are robust, economical, and made of Stainless Steel with an electropolished surface finish. They can be customized with different ports and accessories to meet specific requirements.



### Box Chamber

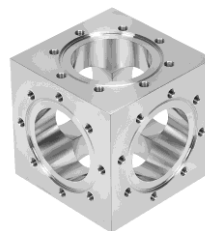
Material: 304 SS

Sturdy hinged door providing quick and easy access

Size	Port	Cost
12"		\$4,463
16"	Up to 4 ports: KF16, KF25, KF40, ISO100	\$6,767
24"		\$12,077

\* Port available in KF, CF, ISO, NPT, ASA, and through hole

\* Customization available for an additional price.



### 6-Way Cube

Material: 304 SS

compact and versatile

Size	Thread	Cost
6"	8-32	\$2,436
12"	1/4-28	P.O.R
18"	5/16-24	P.O.R
24"	5/16-24	P.O.R

\* 316 material available upon request

**Additional discount when ordered with electrical feedthrough, pump, and accessories**

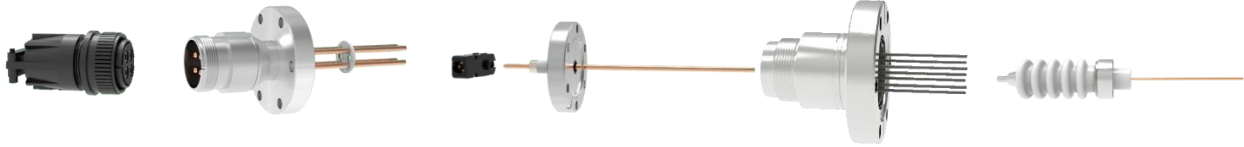
\* Drawings and specification available upon request.

\* If needed custom chambers, please email your inquiry to [sales@vacproducts.com](mailto:sales@vacproducts.com) or call 510-498-8518

# Ceramic Feedthrough

## Power Feedthrough

High volt and current. 1-12 pins



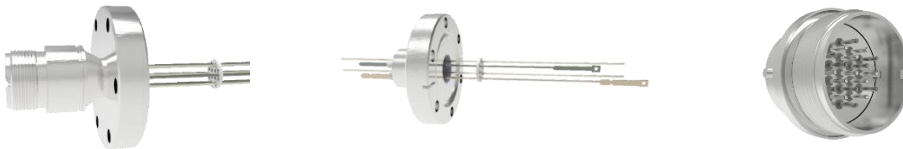
## Coaxial Feedthrough

(BNC, MHV, SHV, SMA), 1-15 pins



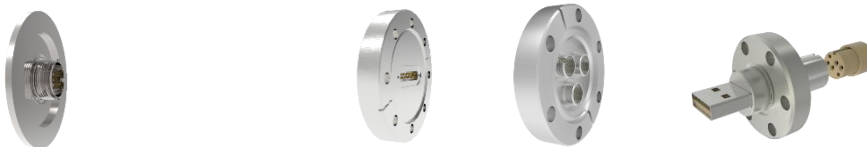
## Thermalcouple

K, C, E, J, T, N, R/S, Single Lead



## Multi-pin FT

Sub-D, Micro-D, Mil-C-5015, Mil-C-26482



## Ceramic Break (Isolator)

Ceramic or Glass, 5-60KV



## Connector & Cable



## Liquid Feedthrough

Gas, Fluid & LN2



# Ceramic Feedthrough

## Power Feedthrough



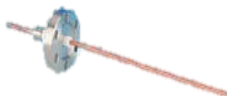
High current



High voltage



3 Pin



Med. Power



Power FT is used for the transmission of high voltages or high current into vacuum systems. Power feedthroughs offer a broad range of voltage and current. FT is widely used in Aerospace, Nonotechnology, Communication and Semiconductor.

Quality is Endorsed by NASA, Sandia, Argonne, AMAT, LAM, KLA, Raytheon and more

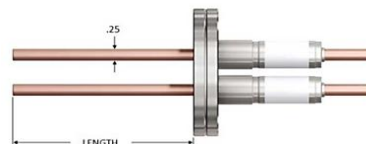
We custom build FT to your specification. Please send requirements.

	volt/amp	Conductor	# of Pin	Op. Temp.	
Med. Voltage	10k/25	BeCu	1-8	-100°C to 450°C	Bake temp.:
High Voltage	100k/180	BeCu	1-4	-100°C to 450°C	CF flange: 450 C.
High power	12k/600	Cu, Ni, SST	1-10	-100°C to 450°C	KF flange: 150C.
Water cooled	8k/1,000	Cu	1-4	-100°C to 450°C	

Base plate style operating temperature is -20<sup>0</sup>C to 150<sup>0</sup> C

### High current conductor selection guide:

	Current	Corrosion Resistance
Copper	High	Low
SST	Low	Medium
Nickel	Medium	High



The important criteria are maximum operating voltage, maximum current per conductor, base pressure and working environment (gas type and pressure). Standard High Power and High Voltage FT of different rating and flange style are in stock.

Several mounting options for power feedthroughs: Weldable, KF, CF, and Baseplate. Baseplate versions of power FT are commonly used in vacuum furnaces and coating applications. Many designs are also configured for NPT style adapter.

# Ceramic Feedthrough

## Coaxial Cable

A coaxial cable has a center conductor insulated from a conducting outer shield which blocks electrical noise from surrounding, thus provide stable, repeatable signal

Designed to transfer low-current, low or high voltage signals from low or high impedance sources across the vacuum wall.

A coaxial cable's main characteristic is its impedance. Impedance is a function of the diameter and spacing of conductors and the insulator's dielectric constant, but not the function of its length.

Double-ended is used where continuous air and vacuum RF shielding is required

Single-ended is used where continuous shielding is not important

### Connector selection :

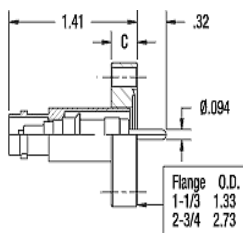
**BNC** : Used in 50 and 75 ohms low power transmission lines

**MHV** : Used in medium power with high voltage requirement. Pins are exposed.

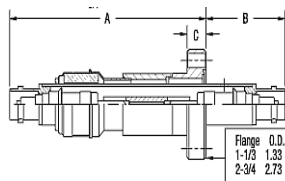
**SHV** : Used in high voltage. Male and female contacts are recessed for higher safety in disconnected condition

Multiple conductors are available depending on the connector type

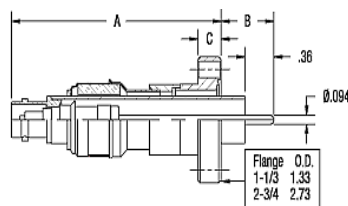
Grounded, Single end:



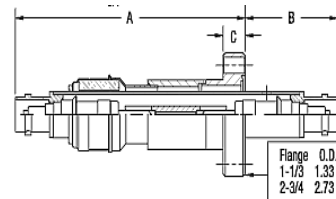
Grounded, Double end:



Floating Shield ,Single & Double end



Single end



Double end

# Ceramic Feedthrough

## Thermal Couple

Force induced when heat is applied to two dissimilar metal wires. A variety of vacuum-side connectors are available. Thermal Couple is available from one to five TC pairs



2 TC pairs



5 TC pairs



screw-mount connection



weld-end connection



The wires are air-side terminated to accept one of the several connections methods: plug, push-on split connectors or screw connections. Vacuum-side connections might be push-on split connector, or screw mounted.

When selecting T/C feedthrough, major consideration are the temperature range, number of measurement location, and the requirement of power conductor built into the same FT

### Basic selection

Type	TC Material		Temperature °C	Compensate Wire Junction
	positive	Negative		
T	Copper	Constantan	-184 to 400	N/A
K	Chromel	Alumel	-184 to 1260	N/A
J	Iron	Constantan	0 to 750	N/A
C	Tungsten	Tungsten	0 to 2,760	N/A

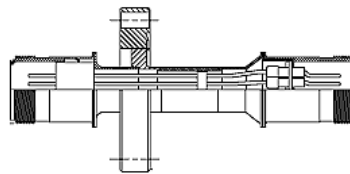
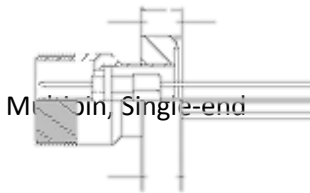
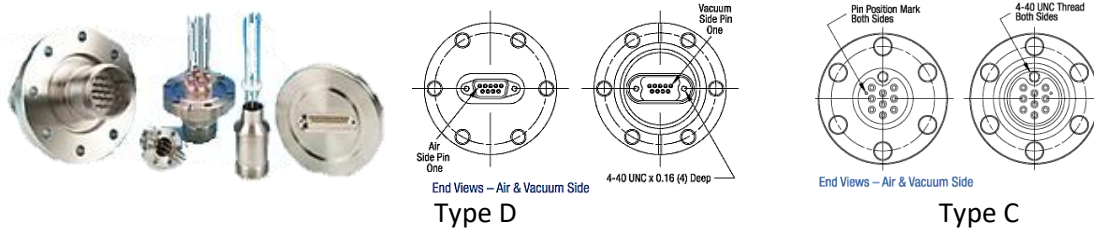
Type R: Noble metal (Platinum-Rhodium) thermal couple is good up to 1540 C

Type C: Refractory metal (Tungsten-Rhenium) thermal couple is good up to 2760 C

\* Drawings and specification available upon request.

# Ceramic Feedthrough

## Multi-Pin Feedthrough



Multipin FT are commonly used for transmission of electrical signals and/or low power applications. They are sometimes refer to as Instrumentation FT as in surface analysis, electron microscopy and process.

Multi-pin FT, not coaxially shielded, are used for low impedance source where induced noise is less significant.

### Product Series:

Type C	Gold plated 9 pin, is used where space is at a premium.
Type D	Gold plated 9,15,25,50 pin; meet MIL-C-24308 specification
Multipin	Gold plated 4 to 35 pins. Thread connector meets MIL-C-5015

Available in CF or KF flanges

Atmosphere connector is supplied (require customer wiring).

Vacuum connector is purchased separately.

	Volt-Amp / Pin	Pin mat'l	# of Pin
Type C	up to 300 V, <10 amp	Be-Cu	9
Type D	up to 500 V, < 10 amp	Be-Cu	9,15,25,50
Multipin	up to 700 V, <10 amp	Alumel	4 to 35

Bake temperature: CF: 450 C. KF: 150 C. Connector: 65 C

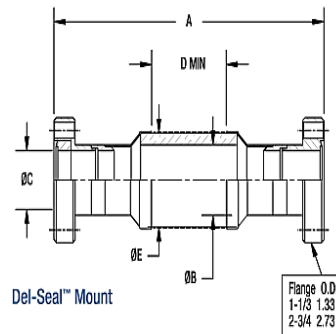
# Ceramic Feedthrough

## Ceramic Break

An electrical insulator. Metal ends provide a means of attaching to a vacuum chamber

Voltage rating: between 3kV to 40kV.

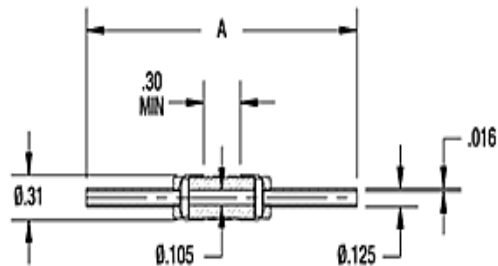
Tube size: from 3/4" to 1 1/2" ID. However up to 8" diameter can be accommodated.



**Liquid Break** is used to transmit coolant fluid to provide electrical break in the transmission line. When external part of chamber is isolated from ground, yet needs a cryogenic or water supply, small diameter ceramic-metal Break is used (mounted externally to the chamber)

Temperature range: -200 °C to 450 °C

Thermal gradients of 25 °C per minute must be observed with these products.



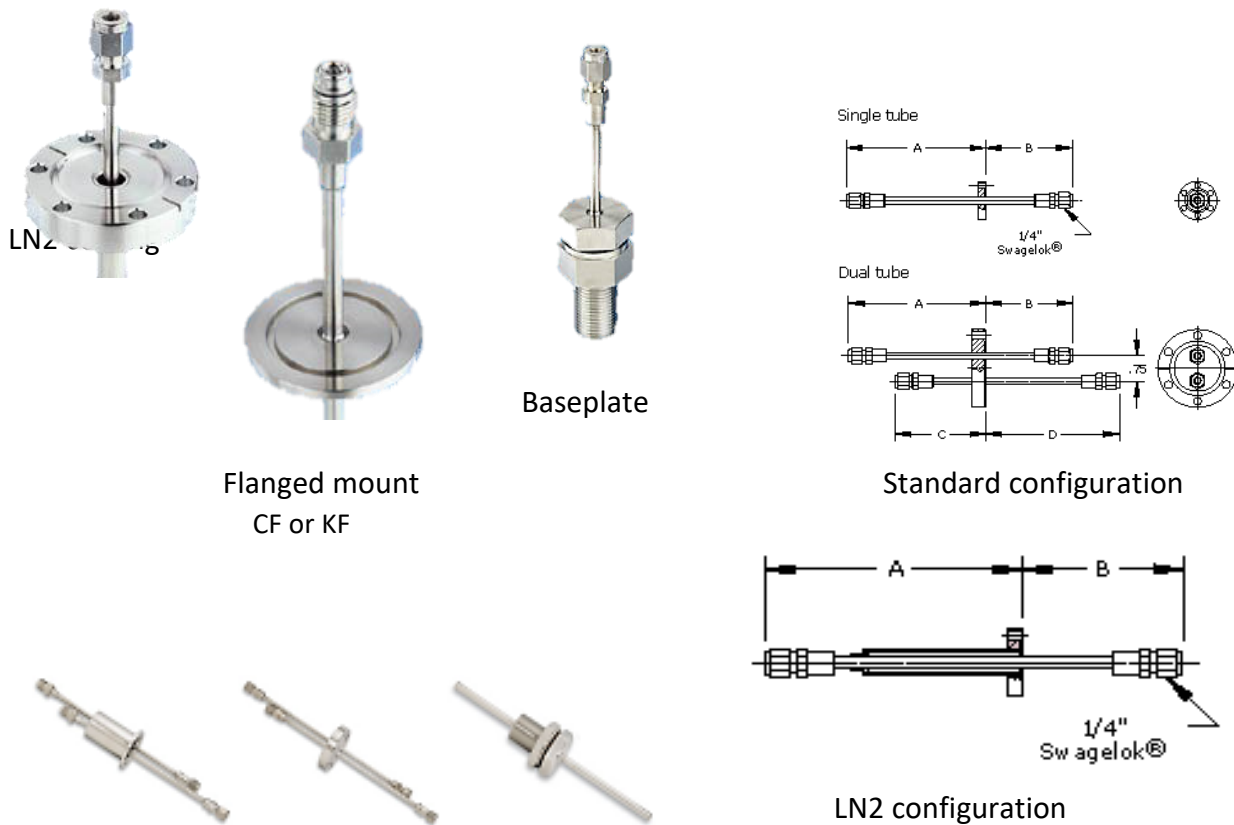
Glass in place of ceramic is available upon request.

# Ceramic Feedthrough

## Liquid Feedthrough

Mainly for delivering liquid or gas to a device inside a vacuum chamber, often to maintain the device's temperature or to actuate a pneumatic mechanism. Occasionally, liquid-gas FT connects to internal devices that are not electrically grounded. For these applications, use electrically isolated power FT with tube conductors.

Cryogenic FT are similar to gas-liquid FT except for a long thermal path between tube and flange. Heat transfer is reduced and hence cryogenic evaporation rate.



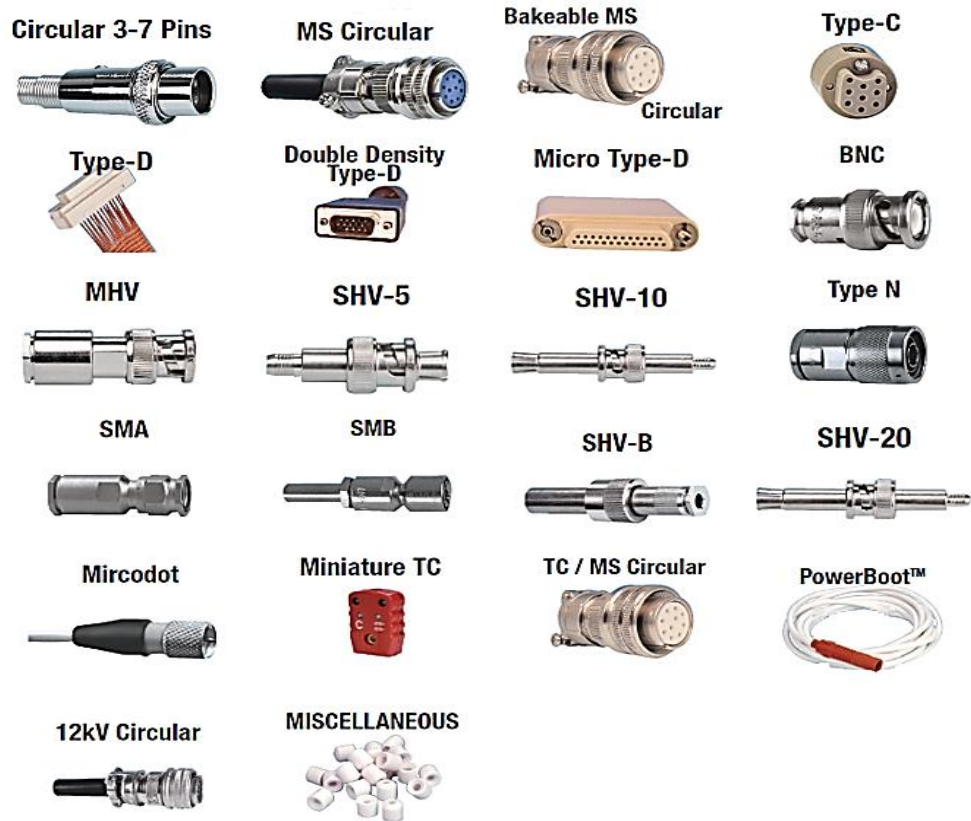
End connection is available in Swagelok, VCR or welded

\* Drawings and specification available upon request.

# Ceramic Feedthrough

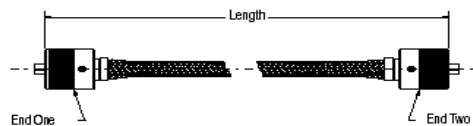
## Connectors

### Available connector types



### Coaxial Cable

Specifications	
Termination Type	A, B, C, D, BNC, MHV, Microdot, BNC-Kapton®
Cable Type	0.125", 0.250"
Application	Feedthroughs
Voltage	To 3kV-DC
Current	To 15A
Service Temperature	to 400°C
Materials	304-Stainless Steel Braid Aluminium Hardware Beryllium-Copper Contacts Alumina Ceramic Copper Conductor



\* Drawings and specification available upon request.

# Ferromagnetic Feedthrough

## Ferro Feedthrough for Rotation Transmission

### Standard Feedthrough

Magnetic feedthrough is the ideal way to transfer rotational motion from atmosphere to vacuum or overpressure environment. Benefits are friction-less motion, high torque transmission, high speed (>10,000 Rpm), low drag, smooth motion and no particle generation. Withstand corrosive process without degrading.

Common use of ferro feedthrough are:

- 1) Cost effective O-ring feedthrough replacement
- 2) Sample handling, position and Robotics
- 3) Substrate rotation in vacuum chamber
- 4) Agitate fluid under vacuum
- 5) Damper for vibration-free application
- 6) Hematic seal for clean environment

Our Product range includes **standard** and **special** feedthrough. We also supply **retrofits** of conventional feedthroughs of other manufacturers.

We specialize in **customized design** to optimize performance at competitive price

### Standard Specification

Leak rate:  $1 \times 10^{-9}$  std. cc/sec, He

Vacuum range:  $8 \times 10^{-7}$  Torr

Max. operation pressure: 28 psi

Bearing lubrication: Fomblin / Krytox

### **Specification for CF flange**

Leak rate:  $1 \times 10^{-11}$  std cc/sec, He

Vacuum range:  $5 \times 10^{-10}$  Torr

### **Standard ferrofluid**

Base oil: Hydrocarbon

Max. operation temperature: 0-80 °C

### **Reactive gas ferrofluid**

Base oil: Perfluorinated Polyether

Max. operation temperature: 0-90 °C

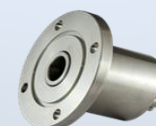
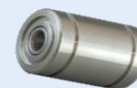
### Solid Shaft Thread Mounting



### Solid Shaft Nose Mounting



### Hollow Shaft



# Ferromagnetic Feedthrough

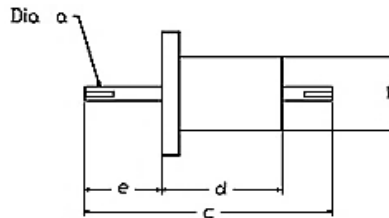
## Part number system

S	F	N	Shaft size	Cooling	Bearing	Mounting
S= solid shaft H= hollow shaf	F= flange B= base plate T= thread C= cartridge	N= non-active A= active	025= 0.25" 100= 1.00"	W= water cooling N= no cooling	N= ordinary H= overload C= cantilever O= special	C133=CF1.33 C275=CF2.75 O6=6" flange w/o-ring O7=7" flange w/o-ring 516= 5/16-24 thread 716= 7/16-20 thread 100= 1" mtg plate

## Solid Shaft - CF Flange

VPC P/N	a	b	c	d	e	Torque [lb.in]	Speed (RPM)
SFN025NN-C133	0.25	0.75	3.25	1.75	0.75	8.40	6300
SFN025NN-C275	0.25	1.50	4.06	2.56	0.75	8.40	6300
SFN025WN-C275	0.25	1.50	4.06	2.56	0.75	8.40	7000
SFN038NN-C275	0.38	1.50	4.06	2.56	0.75	53.80	3820
SFN038WN-C275	0.38	1.50	4.56	3.06	0.75	53.80	7000
SFN050NN-C275	0.50	2.38	8.66	4.91	2.50	107.00	3100

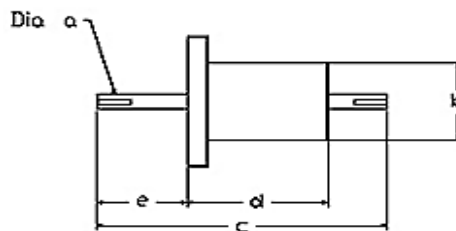
(Dimension: Inch)



## Solid Shaft - O-Ring

VPC P/N	a	b	c	d	e	B.C.	O-R face	Torque [lb.in]	Speed (RPM)
SFN050NN-O6	0.50	2.87	6.03	3.56	1.22	4.75 x 4	V234	107	3100
SFN050WN-O6	0.50	2.87	6.03	3.56	1.22	4.75 x 4	V234	107	7000
SFN050WN-O7	0.50	5.00	16.32	6.00	4.32	6.00 x 6	V351	107	7000
SFN075WN-O5	0.75	3.00	9.39	4.88	1.84	6.00 x 6	V337	205	6300
SFN075NN-O6	0.75	2.87	6.03	3.56	1.25	4.75 x 4	V234	205	1910
SFN100WN-O6	1.00	4.00	12.625	5.38	3.00	5.00 x 6	V340	709	2730

(Dimension: Inch)

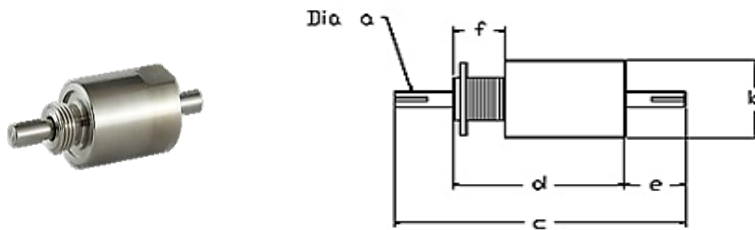


# Ferromagnetic Feedthrough

## Solid Shaft - Thread Mount

VPC P/N	a	b	c	d	e	B.C.	O-R face	Torque [lb.in]	Speed (RPM)
STN019NN-516	0.19	0.63	2.56	1.58	0.48	0.28	V012	5	7600
STN025NN-716	0.25	0.75	3.44	1.94	0.75	0.38	V015	6	6300
STN050NN-114	0.50	2.87	8.81	5.07	1.25	1.51	V128	205	3100
STN050WN-114	0.50	2.87	8.81	5.07	1.25	1.51	V128	205	7000
STN075NN-114	0.75	2.87	8.81	5.07	1.25	1.51	V128	709	1910
STN075WN-114	0.75	2.87	8.81	5.07	1.25	1.51	V128	709	6300

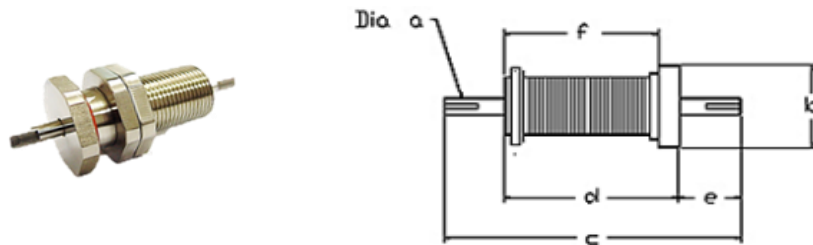
(Dimension: Inch)



## Solid Shaft - Baseplate Mount

VPC P/N	a	b	c	d	e	B.C.	O-R face seal	Torque [lb.in]	Speed (RPM)
SBN025NN-100	0.25	1.625	3.44	1.93	0.75	1.68	V026	8	6300
SBN025NN-100E	0.25	1.618	3.12	1.62	0.75	1.37	V026	8	6300
SBN025NN-150	0.25	2.12	3.97	2.47	0.75	2.22	V132	8	6300
SBN025NN-075	0.25	1.625	3.44	1.93	0.75	1.68	V026	8	6300
SBN038NN-100	0.375	1.62	3.39	1.65	0.865	1.30	V026	54	3820
SBN038NN-150	0.375	2.12	3.97	2.47	0.75	2.22	V132	54	3820

(Dimension: Inch)

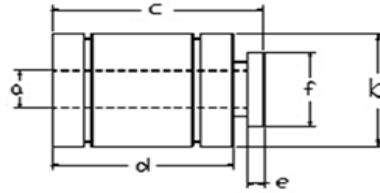


# Ferromagnetic Feedthrough

## Hollow Shaft - Cartridge Mount

VPC P/N	a	b	c	d	e	f	O-R OUTER	O-R INNER	Speed (RPM)
HCN050NN	0.50	2.00	3.22	2.75	0.38	1.25	V032	V014	3100
HCN100NN	1.00	2.62	3.34	2.75	0.50	2.00	V037	V022	1500
HCN150NN	1.50	3.25	3.71	3.00	0.63	3.00	V041	V029	950
HCN200NN	2.00	3.75	3.97	3.25	0.63	3.50	V153	V033	760
HCN300NN	3.00	5.25	4.46	3.63	0.75	4.50	V159	V151	500

(Dimension: Inch)



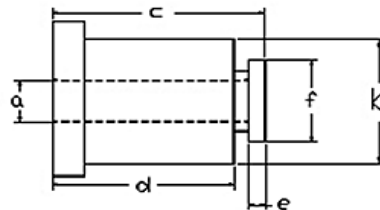
Now available in magnetically coupled version.

Max. RPM: 36 RPM  
 Max Torque: 260 in-lb  
 Bake Temperature: 150° C  
 Flange size: CF2.75, CF4.5  
 Actuator: manual or motor drive

## Hollow Shaft - O-Ring Flanged

VPC P/N	a	b	c	d	e	f	O-R OUTER	O-R INNER	Speed (RPM)
HFN050NN-O6	0.50	2.75	3.22	2.75	0.38	1.25	V238	V014	3100
HFN050WN-O6	0.50	2.75	3.22	2.75	0.38	1.25	V238	V014	6300
HFN100NN-O7	1.00	3.00	3.34	2.75	0.50	2.00	V244	V022	1500
HFN100WN-O7	1.00	3.00	3.34	2.75	0.50	2.00	V244	V022	2730
HFN150NN-O7	1.50	3.75	3.71	3.00	0.63	3.00	V244	V029	955
HFN150WN-O7	1.50	3.75	3.71	3.00	0.63	3.00	V244	V029	1600
HFN200NN-O7	2.00	4.18	3.97	3.25	0.63	3.50	V244	V033	764
HFN200WN-O7	2.00	4.18	3.97	3.25	0.63	3.50	V244	V033	1100
HFN300NN-O10	3.00	5.87	4.72	3.88	0.75	4.50	V262	V151	500
HFN300WN-O10	3.00	5.87	4.72	3.88	0.75	4.50	V262	V151	610

(Dimension: Inch)



# Ferromagnetic Feedthrough

## Cross Reference Chart

### Solid Shaft - CF Flange

VPC P/N	LESKER P/N	FERROTEC P/N	REGAKU P/N	Description
SFN025NN-C133	KLFDCF025133	FE103915	FD-CFM-0250	1/4" shaft, CF1.33 flange
SFN025NN-C275	KLFDCF025275	FE103532	FD-CF-0250	1/4" shaft, CF2.75 flange
SFN025WN-C275	KLFDCF025275W	FE103501	FD-CF-0250-W	1/4" shaft, CF2.75 flange, water cool
SFN038NN-C275	KLFDCF037276	FE103154	FD-CF-0375	3/8" shaft, CF2.75 flange
SFN038WN-C275	KLFDCF037275W	FE103912	FD-CF-0375-W	3/8" shaft, CF2.75 flange, water cool
SFN050NN-C275	KLFDCF050276	FE103909	FD-CF-0500	1/2" shaft, CF2.75 flange

### Solid Shaft - O-Ring

VPC P/N	LESKER P/N	FERROTEC P/N	REGAKU P/N	Description
SFN050NN-O6	KLFDOF05060	FE103244	FD-F1-0500	1/2" shaft, 6" flange, Viton
SFN050WN-O6	KLFDOF05060W	FE103182	FD-F1-0500-W	1/2" shaft, 6" flange, Viton, water cool
SFN050WN-O7	KLFDOF05070W	FE103329		1/2" shaft, 7" flange, Viton, water cool
SFN075WN-O5	KLFDOF07550W	FE103904	FD-F1-0750-W	3/4" shaft, 5" flange, Viton, water cool
SFN075NN-O6	KLFDOF07560	FE103246		3/4" shaft, 6" flange, Viton
SFN100WN-O6	KLFDOF10060W	FE103259		1" shaft, 6" flange, Viton, water cool

### Solid Shaft - Thread Mount

VPC P/N	LESKER P/N	FERROTECH P/N	REGAKU P/N	Description
STN019NN-516	KLFDTM018516	FE103971		3/16" shaft, 5/16-25
STN025NN-716	KLFDTM025716	FE103978	FD-BS-0250	1/4" shaft, 7/16-21
STN0505NN-114	KLFDTM050114	FE103191		1/2" shaft, 1"-15
STN0505WN-114	KLFDTM050114W	FE103204	FD-BS-0500-W	1/2" shaft, 1"-14, water cool
STN075NN-114	KLFDTM075114	FE103193		3/4" shaft, 1"-15
STN075WN-114	KLFDTM075114W	FE103206	FD-BS-0750-W	3/4" shaft, 1"-14, water cool

### Solid Shaft - Baseplate Mount

VPC P/N	LESKER P/N	FERROTECH P/N	REGAKU P/N	Description
SBN025NN-10	KLFDBP02510	FE103237	FD-LSR-0250-A	1/4" shaft, 1.0" mtg plate
SBN025NN-10E	KLFDBP02510E	FE103519		1/4" shaft, 1.0" mtg plate
SBN025NN-15	KLFDBP02515	FE103979	FD-LSR-0250-C	1/4" shaft, 1.5" mtg plate
SBN025NN-075	KLFDBP02575	FE103236	FD-LSR-0250-D	1/4" shaft, 0.75" mtg plate
SBN038NN-10	KLFDBP03710	FE103664		3/8" shaft, 1.0" mtg plate
SBN038NN-15	KLFDBP03715	FE103991	FD-CF-.375-B	3/8" shaft, 1.5" mtg plate

# Ferromagnetic Feedthrough

## Hollow Shaft - Cartridge Mount

VPC P/N	LESKER P/N	FERROTECH P/N	REGAKU P/N	Description
HCN050NN	KLFDHC050	FE132405		1/2" hollow cartridge
HCN100NN	KLFDHC100	FE103319	10C-8925-B	1" hollow cartridge
HCN150NN	KLFDHC150	FE103320	10C-8925-C	1.5" hollow cartridge
HCN200NN	KLFDHC200	FE103321	10C-8925-D	2" hollow cartridge
HCN300NN	KLFDHC300	FE103322	10C-8925-E	3" hollow cartridge

## Hollow Shaft - O-Ring Flanged

VPC P/N	LESKER P/N	FERROTECH P/N	REGAKU P/N	Description
HFN050NN-O6	KLFDHOF05060	FE103358		0.5" hollow shaft, 6" flange
HFN050WN-O6	KLFDHOF05060W	FE105395		0.5" hollow shaft, 6" flange, water cool
HFN100NN-O7	KLFDHOF10070	FE103359		1" hollow shaft, 7" flange
HFN100WN-O7	KLFDHOF10070W	FE105396		1" hollow shaft, 7" flange, water cool
HFN150NN-O7	KLFDHOF15070	FE103360		1.5" hollow shaft, 7" flange
HFN150WN-O7	KLFDHOF15070W	FE103354		1.5" hollow shaft, 7" flange, water cool
HFN200NN-O7	KLFDHOF20070	FE103361		2" hollow shaft, 7" flange
HFN200WN-O7	KLFDHOF20070W	FE103921		1.5" hollow shaft, 7" flange, water cool
HFN300NN-O10	KLFDHOF30010	FE133218		3" hollow shaft, 10" flange
HFN300WN-O10	KLFDHOF30010W	FE133760		3" hollow shaft, 10" flange, water cool

### Now available in magnetically coupled version.

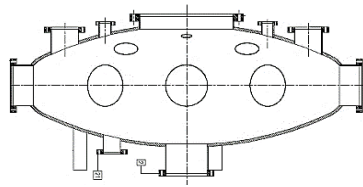
Max. RPM:	36 RPM
Max Torque:	260 in-lb
Bake Temperature:	150° C
Flange size:	CF2.75, CF4.5
Actuator:	manual or motor drive

# Transfer System

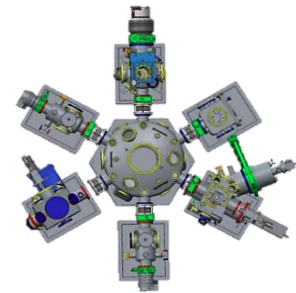
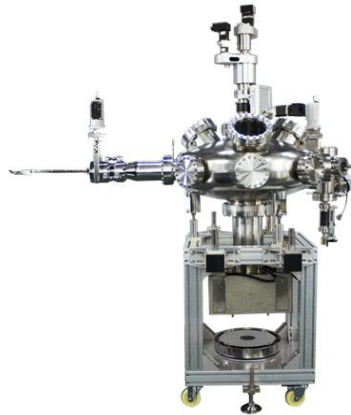
There are two common type of transfer systems: Linear and Radial. While Linear system has nearly unlimited scalability, the Radial system is used where small footprint is critical.

## Radial Transfer System

The Radial transfer System is hosted in an UFO-shaped chamber. It allows sample to go through many different process chambers "in-situ" without being exposed to atmosphere. It eliminates any chance of potential contamination. Up to 8 sub-systems can be connected to an UFO. Our UFO is equipped with transfer mechanism that extends up to 820 mm from port edge.



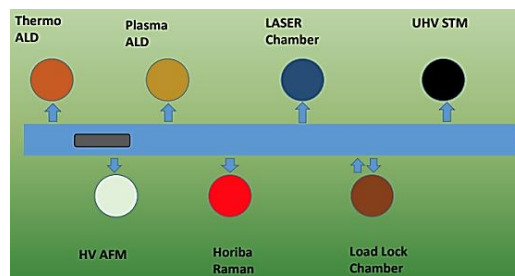
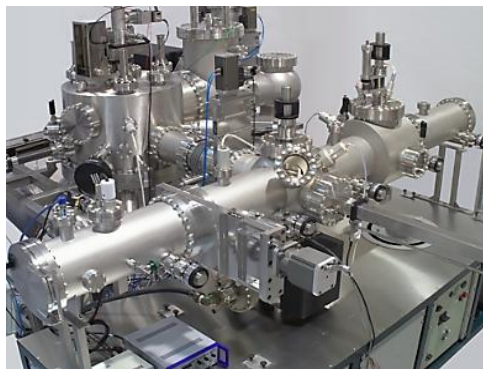
UFO



### Features

- \* Base pressure: <math>< 5 \times 10^{-10}</math> mbar
- \* Capacity: up to 8 sub-systems
- \* Stroke: 820 mm, measured from port edge
- \* Actuation: Manual or motorized

## Linear Transfer System



- \* Unlimited transfer distance via extensions
- \* Movable trolley holds up to 12 samples
- \* Trolley on a stainless steel track in vacuum
- \* Trolley is magnetically coupled to transporter (outside the vacuum)
- \* Buffer module to house process chambers and analysis

# Transfer System

## Magnetic Transporter for UHV

Magnetic Transporters are UHV devices to manipulate a sample inside a vacuum chamber. Motion is achieved by use of magnets outside the vacuum to manipulate the sample inside the vacuum. The unique (patented) design of our heavy-duty transporters use a strong square hollow shaft instead of a round shaft providing very high performance. Conventional single shaft transporters are also available.

### Product advantages:

- \* Higher rigidity
- \* Higher decoupling force
- \* Higher precision
- \* Longer extension without sagging
- \* Built-in 2nd operation for pick-and-place, etc

Models of magnetic transporters:

**VFMS:** Linear only; single shaft -- uses heavy duty **square** shaft.

**VFMD:** Linear + rotary; dual shaft -- a round shaft inside a heavy duty **square** shaft

**VFML:** Linear and/or Linear+rotary; single shaft -- uses single **round** shaft

**VFMS** and **VFMD** perform better than competition due to the use of heavy duty **square** shaft. Higher rigidity allows linear extension beyond 160" in vertical position and 60" in horizontal with little sagging.

**VFMD** construction has a round shaft that rotates inside a **square hollow shaft**. Two shafts working independently allowing secondary operation such as clamping, lifting, rotation, lock and rotate stages which make them the best on the market.

**VFML** is designed for light duty. It is based on conventional design (single round shaft) at a greater savings.

All magnetic transporters have the following common features

Actuator Housing	Anodized Aluminum
Magnets	NdFeB
Vac. Range	1x10 <sup>-11</sup> Torr
Bake Temp	250°C (carriage removed)



## Square Shaft Magnetic Transporters

### Dual Shaft

**VFMD-LR:** Linear + rotary, dual shaft

### Single Shaft

**VFMS-L:** Linear only, single shaft

Metal bearing is ideal for applications where excellent tactile feedback is desired or for high duty cycle use.

Carriages glide on polymeric bushings (outside of vacuum) are for use where a slight stiction is

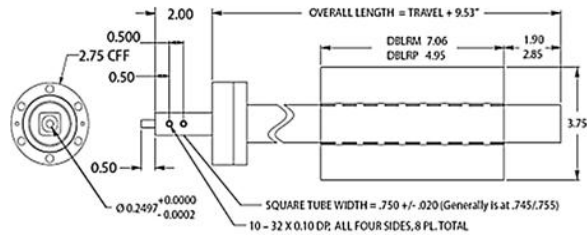
# Transfer System

## Dual Shaft, with square shaft

### Linear + Rotary, VFMD-LR

#### Specifications:

Linear Compliance: 0.0035 in/lb  
Linear Decoupling 26 lbs  
Rotary Torque 12 in-lbs  
Pneumatic and Motor drive available



NOTE: Magnetic Manipulator shown extended by 2"  
DB Series Manipulators Protected  
by U.S. Patent #5,105,932



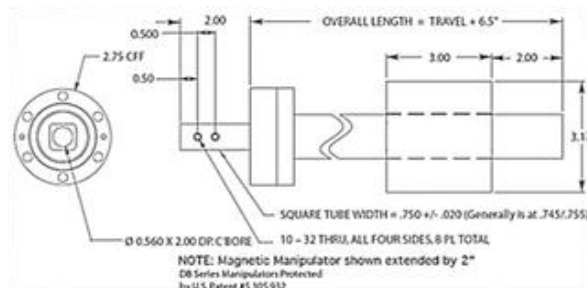
Numerous end-effectors are available for Magnetic Transporters. The independent motions of the VFMD-LR manipulators allow the rotation of the inner shaft to operate a cam for vertical lift, flex a gripper, open/close a pincher, rotate gear-box or secure a locking device. Available end-effectors include: Lift, Grip, Pinch and more.

## Single square shaft

### Linear only, VFMS-L

#### Specifications:

Linear Compliance: 0.0025 in/lb  
Linear Decoupling 26 lbs  
Pneumatic and Motor drives available



NOTE: Magnetic Manipulator shown extended by 2"  
DB Series Manipulators Protected  
by U.S. Patent #5,105,932



## Round Shaft Magnetic Transporters

### Lite Duty, with round shaft

### Lite duty transporter, VFML

In addition to Square shaft, we also has the conventional round shaft design for the lite duty application at a cost saving.

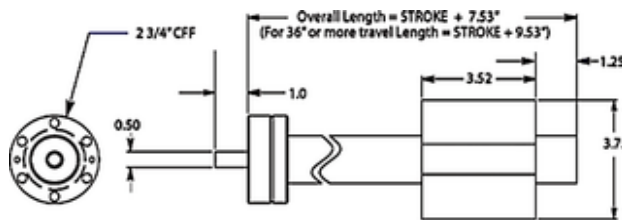
#### Linear + Rotary VFML-LR

**VFML-LR:** Single round shaft magnetic manipulator is ideal for simple transfers requiring linear and/or rotary motion. It is less expensive than VFMD, and it offers superior linear force and torque to that of other conventional manipulators.

# Transfer System

## Specifications:

Linear Travel:	Up to 36"
Linear Decoupling	13 lbs
Rotary Torque	8 in-lbs
Pneumatic and Motor drives available	



## Wobble stick, VFML-WS

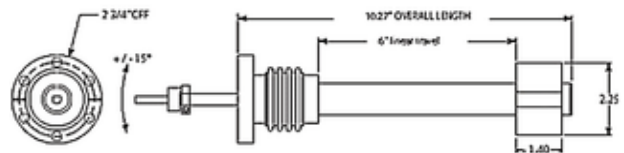
Magnetically-Coupled Transfer Sticks are an economical way to perform simple linear-angular motion within a vacuum system. They are robust and reliable reducing the risk of leaks by eliminating the use of edge welded bellows. Rare earth magnets "outside of vacuum" provide a strong magnetic coupling. With the external magnet carriage assembly removed, it is bakeable to 250°C.

Standard TransferSticks are available with up to 12 inches of push-pull linear travel and an angular tilt of ± 11 degrees.

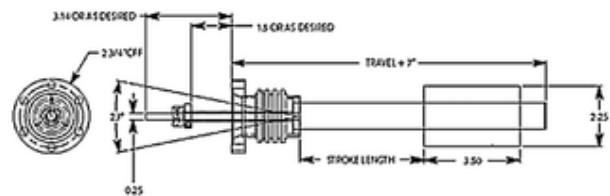
## Specifications:

Actuator Housing	Anodized Aluminum
Magnets	NdFeB
Vac Range	1x10-11 Torr
Linear decoupling	4 lbs
Angular Movement	+/- 11 degrees
Flange	CF2.75

## Linear only - VFML-WS-L



## Linear + Rotary - VFML-WS-LR

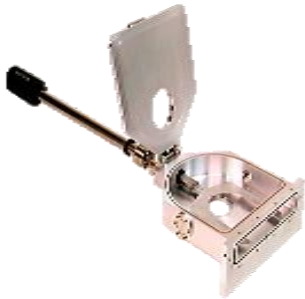


# HV/UHV Loadlock and Transfer Systems

High-vacuum compatible loadlocks are designed to load wafers or other substrates into a SEMI-standard or custom process module. Using magnetically coupled transfer devices, wafers or other substrates can be repeatedly loaded and removed without breaking vacuum. Chambers are available for wafers or substrates up to 200, 300 or 450mm. Loadlock systems can be manually operated and motorized. Customized systems are available.

Typically a loadlock is mounted to a gate valve attached to a main system chamber. Position a substrate in through the loadlock door. After the loadlock is evacuated to the desired vacuum level, the gate valve would be opened and the substrate transferred into the chamber for processing. This allows repeated substrate loading/unloading without breaking vacuum greatly reducing process time.

## Manual Transfer - Single-Wafer Loadlock System,



The MASCOT can mimic the motions of a complex and costly robot but is convenient to use and significantly less costly. Chambers are available for wafers or substrates up to 200, 300 or 450 mm. Optional items available are vertical lift capability, heavy-duty cart for portability and limit switches.

A linear-only transporter (**VFMD-L**) will precisely transfer a substrate into a process chamber where the receiving station has vertical lift capability to remove the substrate from a carrier on the end of the manipulator. The carriage rotation (**VFMD-LR**) is used to operate a dynamic end effector with vertical motion to lift or lower a substrate onto the receiving stage for processing in a chamber without lift function. The **VFMD** returns to lift the substrate and withdraw it into the loadlock chamber after processing is complete.

### Specifications:

Material	Chamber - Machined from solid aluminum block HV compatible; Viton o-rings Magnetic Transporter - All UHV compatible
Substrate Sizes	100mm, 300mm, 450mm or custom
Pump Port	ISO NW100 (4" ID)
Auxiliary Ports	Three ISO NW40 (1.57" ID)
Transfer Distance	Up to 60 inches

# Motion Feedthrough (FT)

Available in rotation, linear or both

## Rotary Feedthrough (FT), VFR series

Standard:	VFR-S
Economy:	VFR-E
Hi. Temp:	VFR-HT
Precision:	VFR-P
Heavy Duty:	VFR-HD



Rotary FT has 5 design variations; each for a specific requirement. See below table.

Housing are made of aluminum, except Hi Temp series which is all SST

All rotary FT comes standard with a scale.

"Economy Series", which does not have a scale, is a lowest cost version

Torque of Heavy Duty series can be as high as 240 in-lb.

"Precision Series" is equipped with a precision micrometer

## Rotary FT: VFR

### Specification:

	Economy	Standard	Hi Temp	Hy Duty	Precision
Bake temp (°C)	200	200.00	315.00	200.00	200.00
Op. temp. (°C)	-20 to 150	-20 to 150	-20 to 315	-20 to 150	-20 to 150
Scale resolution	5 deg	5 deg	5 deg	5 deg	2 deg
Max Torque	125 in-oz	125 in-oz	125 in-oz	5 ft-lb	320 in-oz
Flange	CF133/275	CF133/275	CF133/275	CF275	CF275
Flange	KF16/40	KF16/40	-----	KF40	KF40
Leak rate	$1 \times 10^{-9}$ standard cc/s				

### Actuator:

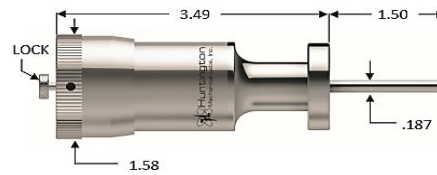
- Manual, bellow-sealed
- Pneumatic, bellow-sealed
- Electric, bellow-sealed
- Magnetic Coupled

\* Drawings and spec. available upon request.

# Motion Feedthrough (FT), Rotary

## Rotary

### "Economy" : VFR-E



Scale resolution: 5°

P/N	FLANGE	DESCRIPTION	WT (LBS)
VFR-E-CF133	1 1/3"	Rotary Feedthrough, Aluminum w/o dial	0.6
VFR-E-CF275	2 3/4"	Rotary Feedthrough, Aluminum w/o dial	1.1
VFR-E-KF16	KF 16	Rotary Feedthrough, Aluminum w/o dial	0.6
VFR-E-KF40	KF 40	Rotary Feedthrough, Aluminum w/o dial	1

### Standard : VFR-S

Same dimension as "Mini Economy"



P/N	FLANGE	DESCRIPTION	WT (LBS)
VFR-S-CF133	1 1/3"	Rotary Feedthrough, anodised with dial	0.6
VFR-S-CF275	2 3/4"	Rotary Feedthrough, anodised with dial	1.1
VFR-S-KF16	KF 16	Rotary Feedthrough, Anodized with dial	0.6
VFR-S-KF40	KF 40	Rotary Feedthrough, Anodized with dial	1

### High Temp. : VFR-HT

Identical dimension as Standard (VFR-S) except equipped with all stainless steel body and housing.



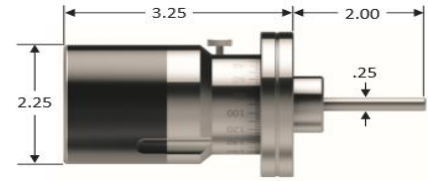
P/N	FLANGE	DESCRIPTION	WT (LBS)
VFR-HT-CF133	1 1/3"	High -Temparture Rotary, 304 SS with dial	0.6
VFR-HT-CF275	2 3/4"	High -Temparture Rotary, 304 SS with dial	1.1

# Motion Feedthrough (FT), Rotary

## Rotary

### Precision: VFR-P

- \* Low backlash
- \* Rotary position lock
- \* Manual or motorized



Resolution: 2°

P/N	FLANGE	DESCRIPTION	WT (LBS)
VFR-P-CF275	2 3/4"	Compact Design, w/ 1/4" shaft	3
VFR-SP-KF40	KF 40	Compact Design, w/ 1/4" shaft	2.5

### Heavy Duty: VFR-HD

- \* 0.375 diameter shaft
- \* Manual or motorized



Resolution : 2°

P/N	FLANGE	DESCRIPTION	WT (LBS)
VFR-HD-CF275	2 3/4"	Vernier Scale, w/ CF FLANGE	5
VFR-HD-KF40	KF 40	Vernier Scale, w/ KF FLANGE	4.3

## Magnetic Feedthrough

Miniature magnetic ally coupled rotary feedthrough is UHV compatible. It is the most economical FT of all . The trade off is not suitable for fast recipricating application.

Actuator: maunal or pneumatic  
 Max. Torque: 3.5 in-lb  
 Bake Temperature: 150° C  
 Etched scale: 5° increment  
 Resolution: 1°  
 Vacuum Range: 1x10-11 Torr  
 Shaft diameter: 6 mm with tap hole



Available in CF1.33 flange only

\* Drawings and spec. available upon request.

# Motion Feedthrough (FT), Linear

## Linear

### Linear Feedthrough (FT), VFL series

Linear Series has 5 variations of design; each for a specific requirement.

Housing are made of Aluminum, except "Hi Temp" series which are all SST

Rotary FT comes with a scale. "Precision Series" comes with a micrometer

Higher load of up to 110 lbs of axial force is available.

	Linear Series: VFL				
	Standard	Hi Temp	Push/Pull	Precision	Hv Duty
Bake temp (C)	200	315	200	200	200
OP. temp (C)	-20 to 150	-20 to 250	-20 to 150	-20 to 80	-20 to 150
dial resolution	.002" (0.5mm)	.002"	-----	.0001"	.002"
linear resolution	.05"	.05"	.05"	.0001"	.05"
M. Axial	10 lb	10 lb	25 lb	5 lb	50
M. Lateral	5 lb	5 lb	20 lb	5 lb	20

\* Pneumatic style requires a male 1/8 NPT fitting

### Linear Series:

Standard	= VFL-S
Hi. Temp	= VFL-HT
Push/Pull	= VFL-PP
Precision	= VFL-P
Heavy duty	= VFL-HD

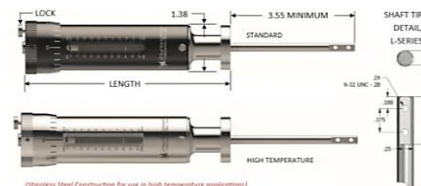
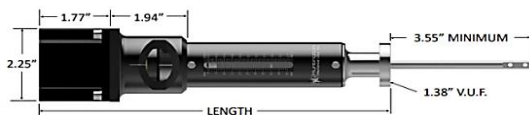
### Actuator:

Manual, bellow-sealed  
 Pneumatic, bellow sealed  
 Electric motor, bellow-sealed  
 Magnetic Coupled

### Standard : VFL-S

Available in manual or motorized. Area exposed to vacuum are stainless steel.

Motor resolution = 51,200 microsteps/rev



P/N	Flange	Stroke	Length	Wt (lbs)
VFL-S-CF133 x 1.0	CF 1.33	1	4.47"	1
VFL-S-CF133 x 2.0		2	5.85"	1.5
VFL-S-CF133 x 4.0		4	8.61"	2.5
VFL-S-CF275 x 1.0	CF 2.75	1	4.47"	1.5
VFL-S-CF275 x 2.0		2	5.85"	2
VFL-S-CF275 x 4.0		4	8.61"	3
VFL-S-KF16 x 1.0	KF 16	1	4.47"	1
VFL-S-KF16 x 2.0		2	5.85"	1.5
VFL-S-KF16 x 4.0		4	8.61"	2.5

# Pump & Trap

## Ebara EV-A Dry Vacuum Pump

The EV-A Series is a family of air-cooled, dry pumps that have industry-leading specifications. The family consists of the EV-A3 (9 cfm), the EV-A6 (21.6 cfm), and the EV-A10 (36 cfm). Typical applications include Load Locks, PVD Systems, Analytical instruments and Electron Microscopes.

These pumps are ideal for replacing wet pumps as well as Scroll type dry vacuum pumps.

### Features and Benefits :

- \* Small Air-Cooling Pump
- \* No-Contact Design
- \* High Pumping Speeds at Atmosphere
- \* Highest Water Vapor Pumping of Any Air-Cooled Dry Pump
- \* UL, CE, and NRTL rated

### Applications:

- \* Load Locks
- \* Analytical Instruments (LCMS, ICPMS)
- \* Electron Microscopes
- \* PVD Systems
- \* Oxygen Plasma Systems

## Model EV-A03

The Model EV-A03 air cooled dry pump offers high pumping speed (9 cfm) and high water vapor pumping (250 g/hr) when used with the optional gas ballast valve.

The pump is available with optional casters/levelers.



### Specifications

<b>Pumping Speed, l/min</b>	Max	250
	Atmospheric Open	150
<b>Ultimate Pressure, Pa</b>	Gas Ballast: Off	1
	Gas Ballast: On	10
<b>Max. Inlet Pressure</b>		Atmospheric Pressure
<b>Max. Water Vapor Pumping Rate (at Gas Ballast: On), g/hr</b>		250
<b>Connection</b>	Gas Inlet	NW25
	Gas Outlet	NW25
<b>Approx. Power at Ultimate Pressure, kW</b>		0.34
<b>Weight</b>	kg	23
	lbs	51
<b>Power Supply</b>	[1 Phase/100V model]	1 Phase, 100-115V, 50/60Hz
	[1 Phase/200V model]	1 Phase, 200-240V, 50/60Hz
	[3 Phase/200V model]	3 Phase, 200-240V, 50/60Hz

# Pump & Trap

## Ebara EV-A Dry Vacuum Pump

### Model EV-A06

The Model EV-A06 air cooled dry pump offers high pumping speed (21.6 cfm) and high water vapor pumping (350 g/hr) when used with the optional gas ballast valve. The pump is available with optional casters/levelers.



#### Specifications

<b>Pumping Speed, l/min</b>	Max	600
	Atmospheric Open	480
<b>Ultimate Pressure, Pa</b>	Gas Ballast: Off	1
	Gas Ballast: On	10
<b>Max. Inlet Pressure</b>		Atmospheric Pressure
<b>Max. Water Vapor Pumping Rate (at Gas Ballast: On), g/hr</b>		350
<b>Connection</b>	Gas Inlet	NW40
	Gas Outlet	NW25
<b>Approx. Power at Ultimate Pressure, kW</b>		0.59
<b>Weight</b>	kg	54
	lbs	119
<b>Power Supply</b>	[1 Phase/100V model]	1 Phase, 100-115V, 50/60Hz
	[1 Phase/200V model]	1 Phase, 200-240V, 50/60Hz
	[3 Phase/200V model]	3 Phase, 200-240V, 50/60Hz

### Model EV-A10

The Model EV-A10 air cooled dry pump offers industry leading specifications in an air cooled dry pump. The pump comes standard with four lockable casters/levelers.



#### Specifications

<b>Pumping Speed, l/min</b>	Max	1000
	Atmospheric Open	800
<b>Ultimate Pressure, Pa</b>	Gas Ballast: Off	1
	Gas Ballast: On	2
<b>Max. Inlet Pressure</b>		Atmospheric Pressure
<b>Max. Water Vapor Pumping Rate (at Gas Ballast: On), g/hr</b>		500
<b>Connection</b>	Gas Inlet	NW40
	Gas Outlet	NW25
<b>Approx. Power at Ultimate Pressure, kW</b>		1.1
<b>Weight</b>	kg	72
	lbs	159
<b>Power Supply</b>	[1 Phase/100V model]	-----
	[1 Phase/200V model]	1 Phase, 200-240V, 50/60Hz
	[3 Phase/200V model]	3 Phase, 200-240V, 50/60Hz

# Pump & Trap

## Vane Pump

### VP Series

VP Series pumps are rugged mechanical oil-sealed pumps with speeds ranging from 8 to 300 m<sup>3</sup>/hr (5 to 178 CFM). Compact and quiet, they feature advanced lubrication circuits, highly reliable to suit specific application. A built-in anti-suckback valve isolates the pump from the process during power interruptions, and keeps oil out of your system.

Vane pump has become industry's standard choice for laboratory and light industrial application. Known for its rapid pumping and ability to handle vapor, vane pumps are designed for reliable and long-term operation. Single phase motors are equipped with thermal overload protection at no extra charge. Distinguished by high pumping speed even in low pressure ranges. It does not require regular maintenance other than oil change at service intervals.

Shipping includes: 1 litre of oil, KF25 center ring and O-Ring. Supplied at no extra charge. Fomblin oil, if required, must be purchased separately for PFPE pumps.

### Application:

- \* Electron Microscopy
- \* Vacuum oven & furnace
- \* Thin-film coating
- \* Vacuum Brazing
- \* Metrology and analytical
- \* Medical instrument
- \* Backing to Turbo pump
- \* Loadlock and transfer chamber
- \* Refrigeration & Freeze drying
- \* Glove box, Oven
- \* Gas bottle filling
- \* Automotive



### Reliable system with anti suck-back protection

Every pump has protection device to prevent oil and air suck-back into the vacuum system if the pump stops while under vacuum. A variety of protection devices are used, depending on the pump size and cost, but emphasis is always placed on reliability and simplicity. When you use gas ballast on the pump, you must use a solenoid operated gas ballast control valve to prevent air suck-back.

The pumps incorporate a positive pressure oil lubrication system to ensure correct lubrication to prevent oil starvation with high gas loads. This oil lubrication level in the reservoir is less critical than other pump design.

### Electric motor option

	VP2-4	VP2-8	VP2-16	VP2-24
115 V, 1 phase	X	X	X	
230 V, 1 phase	X	X	X	X
220 V, 3 phase	X	X	X	X
380 V, 3 phase	X	X	X	X

# Pump & Trap

## Vane Pump

Pump can operate at 50-70% of the maximum oil level .  
A sight glass allows convenient monitoring of the level.

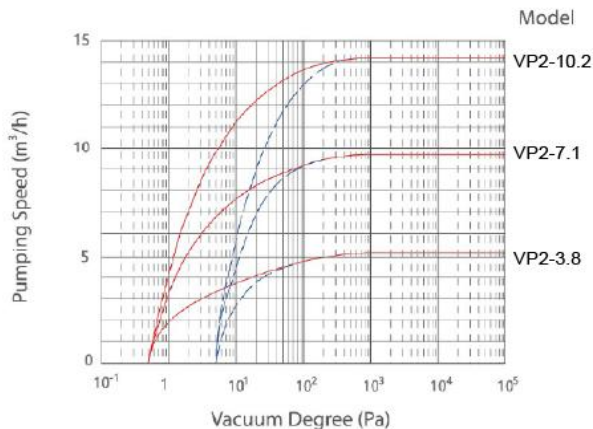
### Specifications

Units	Ult. Pressure	Pump speed	Inlet	Outlet	Power
	Torr	cfm (l/m)	mm	mm	kw (HP)
VP2-3.8	$5 \times 10^{-1}$	3.8 (108)	KF25	KF25	0.4
VP2-7.1	$5 \times 10^{-1}$	7.1 (200)	KF25	KF25	0.4
VP2-10.2	$5 \times 10^{-1}$	10.2 (290)	KF25	KF25	0.55
VP2-16	$3.8 \times 10^{-3}$	11.3 (320)	KF25	KF25	0.74/0.55
VP2-16.5	$5 \times 10^{-1}$	16.5 (467)	KF25	KF40	0.75
VP2-21.2	$5 \times 10^{-1}$	21.2 (600)	KF40	KF40	1.1
VP2-28.3	$5 \times 10^{-1}$	28.3 (800)	KF40	KF40	1.5
VP2-30	$3.8 \times 10^{-3}$	21.2 (600)	KF25	KF40	1.1
VP2-41.2	$5 \times 10^{-1}$	41.2 (1167)	KF40	KF40	2.2
VP2-63.6	$5 \times 10^{-1}$	63.6 (1800)	KF40	KF40	2.2

Power: 380V 50Hz

Vacuum gauge: Pirani Vacuum gauge

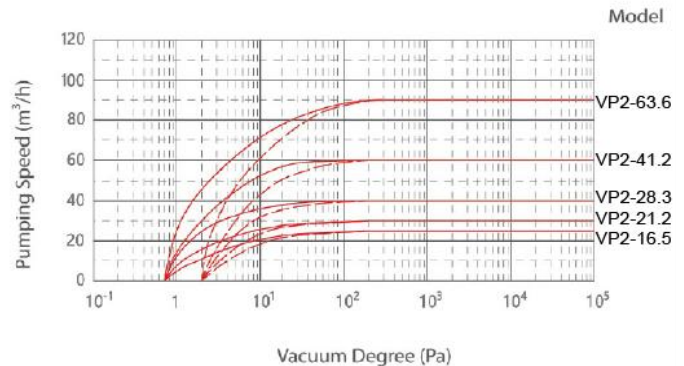
— gas ballast close — gas ballast open



Power: 380V 50Hz

Vacuum gauge: Pirani Vacuum gauge

— gas ballast close — gas ballast open



Accessories:

- 1) Trap – minimize back streaming of oil vapor to vacuum chamber during power failure
- 2) Oil Mist Eliminator – keep oil mist off the exhaust port and recirculate back to reservoir
- 3) Angle valve – to keep pump at high vacuum when chamber is vented for service

# Pump & Trap

## Screw Pump

**Screw pump Series:** PS, PD

**PS:** Standard single-stage pump, water cooled motor  
**PD:** Low energy dual-stage pump, water cooled motor

**PSE:** Air cooled moter  
**PDE:** Air cooled moter



PD Series Screw Pump

## PS Screw Pump

Technical Data for PSE Series Dry Vacuum Pump									
Specification									
Model	Unit	PSE80	PSE160	PSE180	PSE602	PSE902	PSE1302	PSE1802	
Pumping Speed	L/min	1300/1600	2150/2600	2500/3000	8300/10000	12500/15000	17500/21000	25000/30000	
	m <sup>3</sup> /hr	80/96	130/156	150/180	500/600	750/900	1050/1260	1500/1800	
	CFM	47/57	77/92	88/106	294/353	441/530	618/742	883/1060	
Ultimate Pressure	Torr	≤7.5 x 10 <sup>-3</sup>			≤7.5 x 10 <sup>-4</sup>				
Motor	Voltage	V	220~380 (50/60 Hz)						
	Rated Power	kW	3.75	5.6	5.6	3.75+3.75	5.6+3.73	5.6+5.6	5.6+5.6
Connection	Inlet		NW50			ISO100		ISO160	
	Outlet		NW40						
Full Air Mode	Cooler Fan Rated Power	kW	0.373						
	Water Pump Rated Power	kW	0.373						
N2	Pressure	Mpa	0.05						
	Dilute Flow	SLM	0~60 (Process Dependent)						
	Sealing Flow	SLM	6~8						
	Connection		Swagelok 1/4"						
Dim	L x W x H	Inch	51x20x22	51x20x23	51x20x23	51x20x31	51x20x32	51x20x34	55x20x34
Weight	Lbs	662	750	805	1004	1158	1267	1235	
Noise	dB(A)	<68	<70	<70	<70	<70	<70	<70	
Interface		SEMI E73-0299							
Operation Temp.	°F	41°F ~ 104°F							
Operation Moisture	RH	≤90%							

# Pump & Trap

## PD Screw Pump

Technical Data for PD Series Energy Saving Dry Vacuum Pump				
Model		Unit	PDE120	PDE100
Pumping Speed		L/min	1300/2000	4500/5500
		m3/hr	80/120	270/330
		cfm	47/70	160/195
Ultimate Pressure		Torr	$\leq 7.5 \times 10^{-3}$	
		mBar	$\leq 1 \times 10^{-2}$	
		Pa	$\leq 2$	
Motor	Frequency	Hz	50/60	
	Voltage	V	220/380/440±5% (3Phase) 50/60Hz	
	Rated Power	kW	3.73	7.5
Connection	Inlet		NW50	ISO63
	Outlet		NW40	
	Min. Flow	L/min	3	
Cooling Water	Max Pressure	kg/cm2	4	
	Pressure Dif	kf/cm2	1	
	Temp.	°F	64°F ~ 77°F	
	Connection		RC 38"	
N2	Pressure	Mpa	0.05	
	Purge Flow	SLM	6~60	
	Connection		Swagelok 1/4"	
Dim	L x W x H	Inch	46x21x24	54x23x24
Weight		Lbs	616	770
Noise		dB(A)	< 70	< 72
System Max. Leak-rate		mbar l/s	1X10-5	
Operation Temp.		°F	41°F ~ 104°F	
Operation Moisture		RH	$\leq 90\%$	
Interface			SEMI E73-0299	

# Pump & Trap

## Scroll Pump

### SP Series

For those who are on tight budget, we offer an alternative selection to solve your budget concern.

SP series of Scroll pumps are available in sizes from 2.5 cfm to 43 cfm.

This series offers the lowest initial investment. 10,000 hour life warranty.

This series pump has same performance of TriScroll but at a lower cost.

This is a generic pump, designed for customers who does not require the image of a known brand.



### Technical Specification

Model			SP75	SP150	SP300	SP600	SP1000
Pumping Speed	60 Hz	cfm	2.5	5.1	10.9	22.3	42.8
Ultimate pressure	Torr		$\leq 7.5 \times 10^{-2}$	$\leq 6.0 \times 10^{-2}$	$\leq 1.9 \times 10^{-2}$	$\leq 7.5 \times 10^{-3}$	$\leq 7.5 \times 10^{-3}$
Noise Level	dB(A)		$\leq 52$	$\leq 57$	$\leq 61$	$\leq 63$	$\leq 67$
Leakage			0.75x10-3 std cc/ sec				
Max. Inlet/Exhaust Pressure	Atm		1.0 / 1.2				
Ambient Operation Temp.	°C		5 C - 40 C				
Max. Water Treatment	G/h		50			60	
Motor 1 phase	Output	kW	0.15	0.25	0.55	0.75	---
	Voltage	V	110	110	110	110	---
	Frequency	Hz	60	60	60	60	---
	Speed	rpm	1710	1710	1730	1750	---
Motor 1 phase	Output	kW	0.15	0.25	0.55	0.75	---
	Voltage	V	220	220	220	220	---
	Frequency	Hz	50	50	50	50	---
	Speed	rpm	1425	1425	1440	1440	---
Motor 1 phase	Output	kW	0.15	0.25	0.55	0.75	---
	Voltage	V	230	230	230	230	---
	Frequency	Hz	50/60	50/60	50/60	50/60	---
	Speed	rpm	1710	1710	1710	1740	---
Motor 3 phase	Output	kW	---	0.37	0.55	0.75	1.5
	Voltage	V	---	380	380	380	380
	Frequency	Hz	---	50	50	50	50
	Speed	rpm	---	1400	1440	1440	1440
Inlet/Exhaust Flange		KF25/16	KF25/16	KF25/16	KF40/16	KF40/16x2	
Dimensions	mm	350x210x245	430x250x280	492x268x324	530x312x343	580x360x400	
Packing Dimension	mm	400x300x340	550x400x420	650x450x480	650x450x480	750x500x520	
Net Weight	kg	13	18	32	38	52	
Gross Weight	kg	21	27	42	50	65	
Cooling Type		Air cooled					

# Pump & Trap

## Ebara Turbo Pump

### Turbo Pumps, EBT, EMT

Innovative Technology - Ceramic-Bearing

#### Model EBT

Model EBT are mechanical-bearing, compound turbomolecular pumps which compliment line of Model EMT mag-lev turbomolecular pumps. Model EBT pumps are highly efficient, cost effective solutions to your high vacuum pumping requirements. Model EBT compound turbomolecular pumps offer an extremely rugged, mechanical bearing design which provides clean, reliable vacuum generation for high tech manufacturing. Typical applications include semiconductor, thin film, photovoltaic, and analytical instruments. Model EBT of compound turbomolecular pumps can be mounted in any orientation. These pumps offer high pumping speed and high, light gas compression, making them ideal for UHV and analytical systems.



### Features and Benefits

- \* Rugged Bearing Design Ideal for Mobile Applications
- \* High Pumping Speeds
- \* High Compression Ratios for Light Gases
- \* Fast Starts and Stops
- \* Quick Venting (No Vent Pulsing)
- \* Fan or Water Cooling
- \* ISO or Conflat (CF) Flanges
- \* Integrated Controller (Select Models)

### Applications

- \* Surface Treatment
- \* Analytical Instrument Lamps
- \* Electron / X-Ray Tubes
- \* Ion / EB-Source
- \* Sputter
- \* Glass / Film Coating
- \* Exhaust Carts

### Options

- \* Natural Air or Water Cooling
- \* Vent Valve Kit
- \* Nitrogen Purge
- \* Install Kit (Valves, etc.)
- \* Isolation Valves

# Pump & Trap

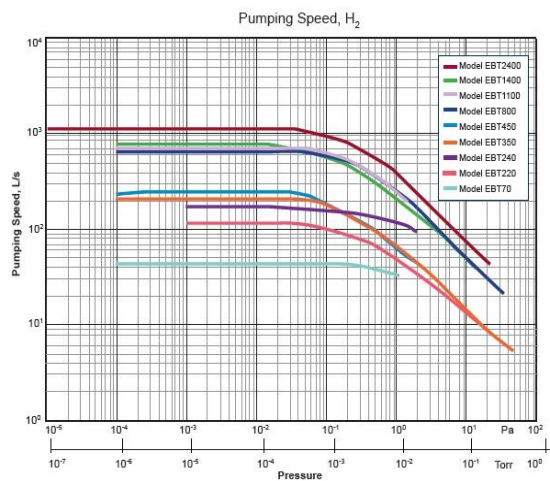
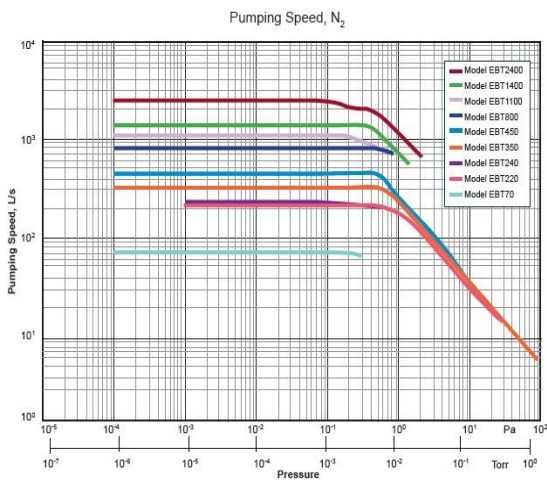
## Ebara Turbo Pump

### Turbo Pumps, EBT, EMT

### Specifications

Model		EBT70	EBT220	EBT240	EBT350	EBT450	EBT800	EBT1100	EBT1400	EBT2400	
Pumping Speed, L/s	N <sub>2</sub>	75	220	240	350	450	820	1100	1400	2400	
	H <sub>2</sub>	45	100	160	210	240	650	720	750	1100	
Compression Ratio	N <sub>2</sub>	1 x 10 <sup>8</sup>									
	H <sub>2</sub>	1.0 x 10 <sup>5</sup>	4.0 x 10 <sup>2</sup>	4.0 x 10 <sup>4</sup>	2.0 x 10 <sup>3</sup>		1.0 x 10 <sup>4</sup>		4.3 x 10 <sup>3</sup>	1.4 x 10 <sup>4</sup>	
Ultimate Pressure	CF	Pa	< 1 x 10 <sup>-7</sup>	< 1 x 10 <sup>-6</sup>	< 5 x 10 <sup>-7</sup>	< 1 x 10 <sup>-6</sup>				-	
		Torr	< 7.5 x 10 <sup>-10</sup>	< 7.5 x 10 <sup>-9</sup>	< 3.8 x 10 <sup>-10</sup>	< 7.5 x 10 <sup>-9</sup>				-	
	ISO-R	Pa	< 5 x 10 <sup>-7</sup>	< 1 x 10 <sup>-6</sup>							-
		Torr	< 3.8 x 10 <sup>-9</sup>	< 7.5 x 10 <sup>-9</sup>							-
Recommend Backing Vacuum Pump	L/min	> 25	> 80				> 250				
	CFM	> 0.88	> 2.85				> 8.80				
Startup Time	min	2.0 - 2.5	1.0 - 1.2	5.5 - 6.0	2.0 - 2.5		7.0 - 9.0		5.5 - 7.0	5.0 - 7.0	
Cooling Type		Air (Fan) / Convection			Air (Fan) / Water						
Weight	CF	kg	5.0	8.0	10.5	9.0	10.0	27.0	28.0	30.0	-
		lb	11.0	17.6	23.1	19.8	22.0	59.5	61.7	66.1	-
	ISO-R	kg	3.0	5.8	7.3	6.0	7.0	26.0	27.0	29.0	45.0
		lb	6.6	12.0	16.1	13.0	15.4	57.3	59.5	63.9	99.2

### Performance Curves



# Pump & Trap

## Trap & Grease

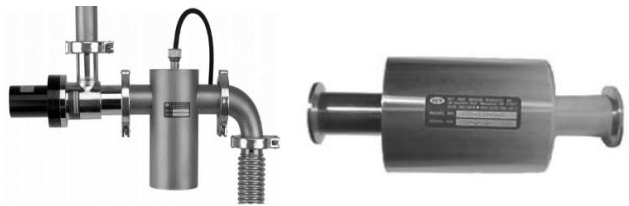
### Foreline Trap

Foreline trap is an essential component when building a vacuum system. It is installed between roughing pump and the work chamber. Its function is to eliminate an oil path to the Chamber and protects the pump from condensable vapor.

The benefit of having a foreline trap is lower base pressure, cleaner chamber and extended periods of operation. A trap practically eliminate hydrocarbon back streaming issues.

Single-piece, coaxial is the most common choice due to low cost and easy replacement.

Flange	Body OD (Inch)	Total Length (Inch)
KF25	4.00	8.84
KF40	4.00	8.92
KF50	4.00	8.95



### TWO-STAGE VACUUM PUMP EXHAUST FILTER KIT

For normal rotary vacuum pumps, it is recommended to vent them outside the room or to an exhaust hood to prevent indoor air contamination. Our exhaust filter enables venting rotary vacuum pumps in rooms where an outside line is neither practical nor possible. The two stage filters contains a replaceable oil mist eliminator element to trap vacuum oil and a replaceable activated charcoal element for the lighter hydrocarbon fractions.



#### Features:

- \* Provides a safe lab environment
- \* Purifies vacuum exhaust gases
- \* Separate replaceable elements for oil mist and lighter fractions
- \* Standard KF25 or KF40 connection
- \* Cartridge Filter Included (Replacement is available)
- \* Low cost solution

Part No.	Model	Connection	Max Flow Rate
OME10-KF25	10 CFM OIL MIST ELIMINATOR	Standard KF25	10 CFM
OME25-KF25	25 CFM OIL MIST ELIMINATOR	Standard KF25	25 CFM
OME50-KF40	50 CFM OIL MIST ELIMINATOR	Standard KF40	50 CFM

Please Call  
Or make inquiry:

408-805-5607    510-498-8518  
[sales@vacproducts.com](mailto:sales@vacproducts.com)

# Special Product

## Thermal Solution - Ebara Ceramic Fiber Cloth Heater Jackets

Pump line heating systems work to reduce buildup of solids in many LPCVD, PECVD, CVD, FPD, ALD and metal etch vacuum piping systems. This reduction in buildup helps reduce particle generation and eliminates unscheduled maintenance downtime, improving the consistency of yields and saving time and money.

### Technology



### Features

#### Temperature range

Up to 250°C (482°F) for class 10 clean room  
Up to 593°C (1100°F) for class 100 clean room

#### All system components are heated and insulated

Standard diameters as small as ¼" and up to 8"  
Heaters available for flanges, valves, custom components, etc.

#### Uniform temperature throughout entire line

Modular heating system

Easy on-off installation with reusable hook and loop fasteners

Energy Efficient Design

Patented grounded heating element

Exception Durability and Quality construction

Long service life, 10+ year

### Applications

LPCVD	Metal etch	FPD	ALD	CVD	PECVD
Silicon nitride	Aluminum			Tungsten	Silicon nitride
Titanium nitride	Tungsten			TEOS	

### Utilization

Gas lines, Exhaust lines, Forelines, Abatement, Valve, Tanks, Drums, vessels  
Laboratory equipment, Analytical equipment, Vacuum Bake-out, Emission testing, Fluid delivery test

# Special Product

## Thermal Solution - Ebara Ceramic Fiber Cloth Heater Jackets

### Specifications

#### Operational

Standard operating temperature up to 220°C (428°F), higher temperatures available

Built-in controlling / High limit thermostat, standard at 260°C

Built-in low limit alarm thermostat

#### Power

120-600 VAC or DC

Single- or three-phase

50 or 60 Hz

#### Standard Materials

Facing - Outside cloth material (PTFE, Samox®, Fiberglass)

Liner - Inside material, touching surface of heated object (PTFE, Samox®, Fiberglass)

Insulation - Placed in between liner and facing closure (Fiberglass, Glassmat, Ceramic Materials)

Power Connector Options - MNL and CPC

Sensor Options - Standard RTD or J Type, K Type thermocouple options

Multi-strand resistance wire

#### Customizable Options

Voltage Options

Power plug / Connector

Built-in controlling / High limit thermostat

Built-in low-limit alarm thermostat

Insulation thickness and type

Temperature sensor type

Cloth jacket material options for higher temperature needs

### VSN® TEMPERATURE CONTROL SYSTEM



#### OPERATOR INTERFACE PANEL

Controls up to 8 strings with up to 128 temperature modules per string, up to 1,024 heaters

User-configurable graphical mapping and naming to match application

Provides complete control and system optimization

Sends e-mail alerts



#### PID CONTROL MODULES

1:1 control for EACH heater

Advanced temperature, safety, diagnostics, and power-savings feature

LED display with highly visible status indicator light

Able to connect directly into CMS/HMI systems

**Temperature range**

High temperature capabilities

- Standard operating temp up to 220°C
- Up to 250°C(482°F) for class 10 cleanrooms
- Up to 593°C (1100°F) for class 100 cleanrooms



# Special Products

## FFKM O-Ring

Our O-Ring are tested under various corrosive condition. Results indicated less corrosion than chemrez.

### Features and Benefits

- For CVD and ETCH
- Kalrez equivalent
- Resistance to NF3
- Good chemical resistance
- Unique bonding structure
- Low compression set
- Temperature range: 250°C



**S705**  
(K9100 equivalent)



**S505E**

**Lower cost**  
**Superior performance**

### Specification:

	S705	S505E
Color	White	White
Hardness	74	82
Tensile Strength, Mpa	11.4	14.1
Elongation	195	260
Modulus at 100% Elongation, Mpa	4.8	5.1
Compression Set, 72hrs. at 200°C	24.2	32.1
Max. Temp.	250°C	250°C

### Test data at customer site indicates S705 is superior than chemrez in corrosion resistance

- 1) Tool / Process / Wafer size – MATTSON Paradigm / Ashing / 300MM
- 2) Test Period - 2012.03~2012.04 (1PM, RF 350 TIME )
- 3) Seal Location/ Size - LID DOME / AS-383 ID804\*3.53 / ID446\*3.53 /AS-277/AS-278/AS-279/AS-224/ AS-035/AS-205/AS-208/AS-230 / Total 11 part

	S** S705	K** K9100
<b>Normal</b>		
<b>Microscope * 50</b>		
<b>Microscope * 50</b>		

**Etching**

\*SSK S705 shows much less etch rate against Plasma & Chemical

\* Please email further inquiry to sales@vacproducts.com or call 510-498-8518

# Special Product

## Weldment



### Application

Make to print

Size from 1/4" to 10"

Full penetration weld up to 3/8" depth



Registered GSA (US Federal Government) Supplier

***Leading the performance in vacuum products***

***Cost Reduction 30% ~ 50%***

"We don't believe valves should be expensive  
It should only be clean, reliable and robust"



**What We Are :**

- \* Guaranteed Consistency & Superior Quality
- \* Saving as much as 50%
- \* Registered Federal Government Supplier
- \* Materials Originated from US Government Designated Countries
- \* Lowest Cost of Ownership

