

Company Profile

History:

K **KEY HIGH VACUUM PRODUCTS, INC.** was founded in 1976 and from its inception the objective of the company has been to provide high quality vacuum components at a competitive cost. **KEY HIGH** supplied primarily the research and defense industries. During this period, due to the commitment of our employees and the loyalty of our clientele, the company undertook dynamic expansions. By 1981 the company had outgrown its facilities and moved to its present day facility in Nesconset N.Y.. During the early and mid 1980's **KEY HIGH VACUUM PRODUCTS, INC.** began to expand its manufactured product offerings significantly by additionally supplying the semiconductor, coating and industrial markets. It was during this timeframe that the company's production capabilities were greatly enlarged to serve these additional markets. Our objective for the company from day one has been one of planned, controlled and sustained growth.

Solutions;

At **KEY HIGH** everything we do, is a result of the "**Customer First**" philosophy, built on the pledge that for every manufactured product we offer, that it will conform or surpass the requirements. Nowhere in our industry is product delivery taken as seriously as it is at **KEY HIGH VACUUM PRODUCTS, INC.** Even with the wide range of options offered by **KEY HIGH**, shipping time, in most cases, is one to four working days. In today's fast paced competitive market, we understand the need for a quick turnaround. We work hand in hand with our clientele; this results in lower costs, an improved delivery, higher quality, and unmatched customer service. By working in a genuine partnership with our customers allows the relationship to be a winning proposition for both parties.

Today's World:

With a large majority of our customers involved in today's fast-paced competitive semiconductor industry, or the production coating industry, you can be confident **KEY HIGH** holds itself to the highest standards. Regularly our components are installed in some of the world's most advanced production tools, and **we realize the need for a quick turn around!** These are the markets that we have elected to serve; and in these markets often there is no allowance for error, no justification for failure and this is where a performance company such as **KEY HIGH**; will excel and where we perform daily!

Delivery:

Nowhere in our industry is product delivery taken as seriously as it is at **KEY HIGH**. Even with the wide range

of options we offer, shipping time, in most cases is one to four working days. In today's fast paced competitive market we understand the need for quick turnaround. The character of the company has been molded by its commitment to continuous improvement, while working in a highly specialized and competitive field. **KEY'S** management has placed a priority on engineering talent and on an environment for personal contribution and achievement.

Service:

KEY HIGH VACUUM PRODUCTS, INC.'s policy has always been based on the philosophy that quality products and excellent customer service are the highest priority goals for a manufacturing company. Our dedicated staff of professionals and a well-trained work force are committed to providing you with the finest service in the high vacuum industry. With over thirty years of faithful service in manufacturing products of uncompromised value, **KEY HIGH VACUUM PRODUCTS, INC.** is your best choice for value.

Custom Products:

In addition to our products listed in our catalog, we have designed and manufacture an assortment of priority components for leading equipment builders. We specialize in creating additional value for equipment manufacturers with the development of innovative, problem solving, even award winning components, with the objective of enhancing our customers productivity. We add to our product line continually, so please call us if you have questions about components listed in this catalog. **Unique applications require unique components.** With our many years of experience, our Custom Products Team welcomes special requests for products, regardless of quantity or frequency of order.

Commitment:

KEY HIGH VACUUM PRODUCTS, INC. is proud to remain a privately owned corporation for over thirty years and continues to meet our original goals of a quality product, competitive pricing and a personal timely response to our customers' needs and requirements.

Thank you for taking the time to review this catalog, the interest in our company and we look forward to working with you on your vacuum component requirements in the future.

If you have any questions or comments, please do not hesitate to contact us at sales@keyhigh.com, telephone 631-360-3970 or fax 631-360-3973.



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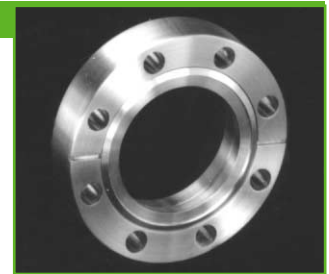
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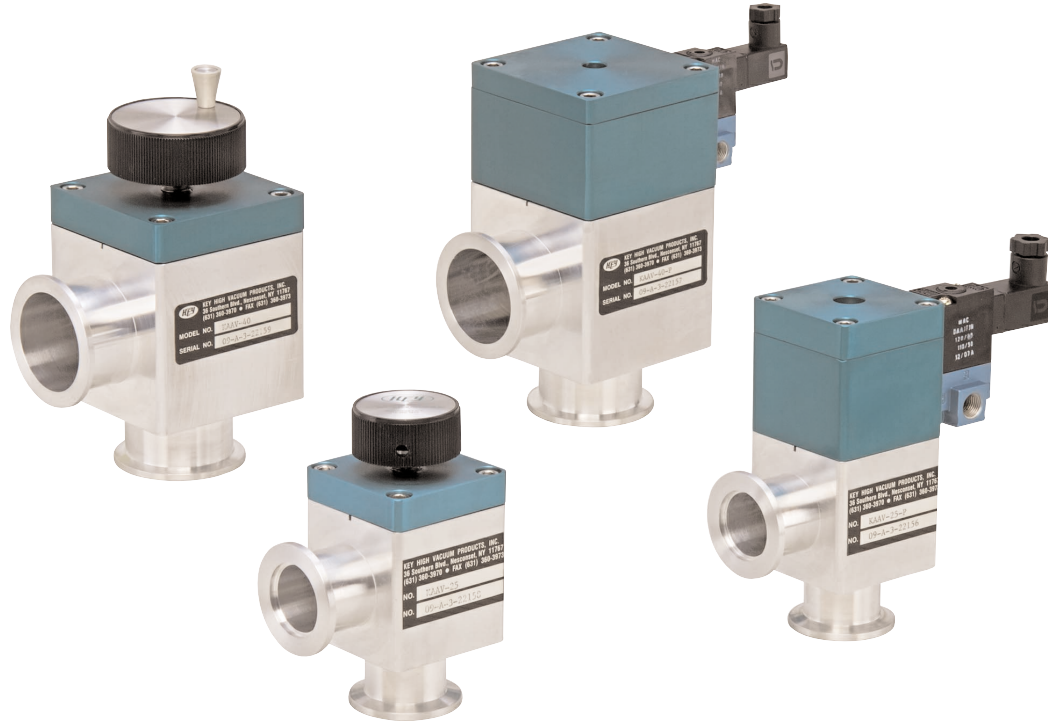


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"ISO-Mono" Valve Features

- Compact, one piece, "Mono-Valve" design
- Reliable, low particulate, formed bellows assemblies
- Viton® sealed bonnet and poppets
- Manual and pneumatic operation
- Right angle and inline mounting configurations

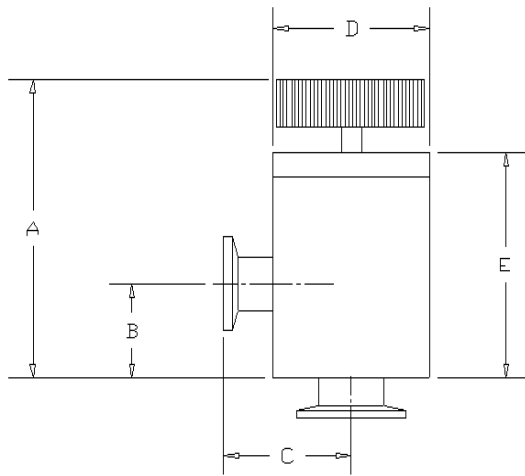
Features:

ISO-Mono valves feature valve bodies which are fabricated from a single piece of 6061t6 billet aluminum. This translates to a sleek efficient design, with extremely smooth flow paths. There are no seams, virtual leaks are eliminated, and valve bodies very easy to clean. **ISO-Mono** valve bodies are light, strong, and have a high fluorine resistance. Aluminum also has excellent thermal conductivity. Naturally this thermal conductivity is uniform, allows the body to reach a uniform temperature quickly, thereby minimizing cold spots, making **ISO-Mono** valves a great choice for CVD applications. Furthermore since the valve body is machined completely from one piece of material, flange interfaces are flat, straight, square, and abide by ISO mounting principles.

Key High Vacuum Products, Inc. pneumatic ISO-Mono valves are versatile and reliable shut-off valves. Our pneumatic versions are fail safe, single acting (spring loaded, normally closed), and will function in any position. ISO-Mono valves are provided, (inclusive) with a 120/60 Solenoid. All valve assemblies are leak tested on a helium mass spectrometer @ 3×10^{-9} torr (with a one atmosphere differential). ISO-Mono valves bodies are bakeable to 150° C. See ordering blocks for additional options, and soft goods maintenance kits.



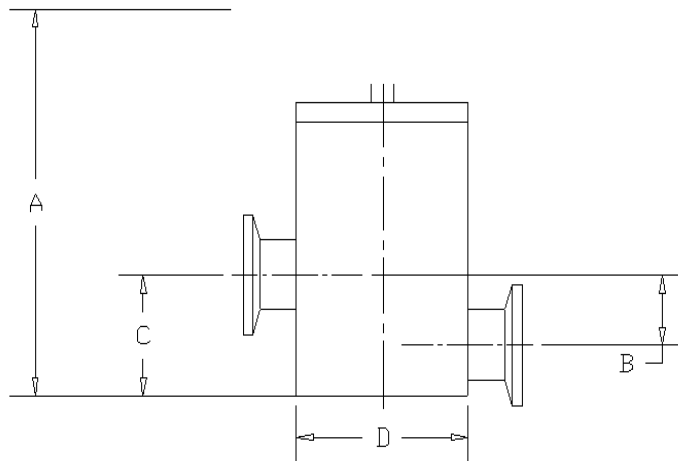
Aluminum ISO-Mono Valves



Manual Right Angle Valves

Part Number	Flange (port) Size	A	B	C	D	E
KAHV-16★	NW 16	3.2	1.57	1.57	2.05	2.50
KAHV-25★	NW 25	3.37	1.97	1.97	2.05	2.45
KAHV-40★	NW 40	4.75	2.57	2.57	3.05	3.49
KAHV-50★	NW 50	5.00	2.80	2.80	3.89	4.36

★ = New Product



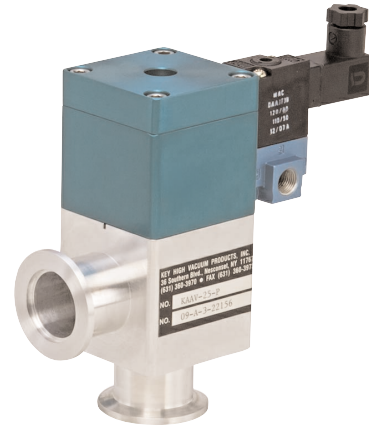
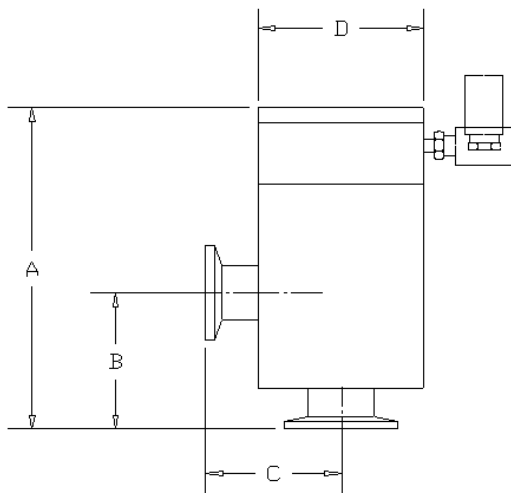
Manual Inline Valves

Part Number	Flange (port) Size	A	B	C	D
KAIV-16★	NW 16	4.35	0.87	1.58	2.00
KAIV-25★	NW 25	4.50	1.25	1.98	2.00
KAIV-40★	NW 40	5.87	1.77	2.57	3.00

★ = New Product



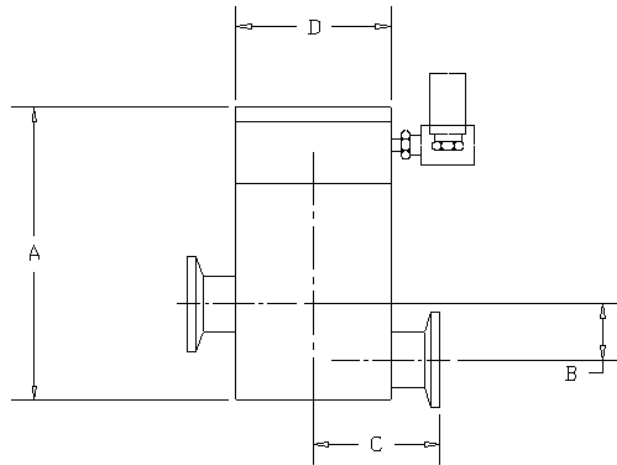
Aluminum ISO-Mono Valves



Pneumatic Right Angle Valves

Part Number	Flange (port) Size	A	B	C	D
KAHV-16-P★	NW 16	4.58	1.57	1.57	2.00
KAHV-25-P★	NW 25	4.94	1.97	1.97	2.00
KAHV-40-P★	NW 40	6.04	2.57	2.57	3.00
KAHV-50-P★	NW 50	7.03	2.80	2.80	3.90

★ = New Product



Pneumatic Inline Valves

Part Number	Flange (port) Size	A	B	C	D
KAIV-16-P★	NW 16	4.89	0.87	1.58	2.00
KAIV-25-P★	NW 25	5.26	1.25	1.98	2.00
KAIV-40-P★	NW 40	6.65	1.77	2.57	3.00

★ = New Product



Aluminum ISO-Mono Valves



Pneumatic valve options (Add option code to suffix of part number)

Description	Option Code	
24 Volt DC solenoid	-24VDC	Add
24 Volt AC solenoid	-24VAC	Add
220 Volt AC solenoid	-220VAC	Add
Mechanical Limit Switches	-LS	Add
No Solenoid	-NS	Deduct

"Soft Goods" (Viton®) manual valves

Part Number	Description
OR-KAAV-16★	Fits NW 16
OR-KAAV-25★	Fits NW 25
OR-KAAV-40★	Fits NW 40
OR-KAAV-50★	Fits NW 50

"Soft Goods" (Viton®) pneumatic valves

Part Number	Description
OR-KAAV-16-P★	Fits NW 16
OR-KAAV-25-P★	Fits NW 25
OR-KAAV-40-P★	Fits NW 40
OR-KAAV-50-P★	Fits NW 50



Replacement bellows assemblies

Part Number	Description
AVB-16★	Fits NW 16
AVB-25★	Fits NW 25
AVB-40★	Fits NW 40
AVB 50★	Fits NW 50

Note: Key High Vacuum Products, Inc. routinely modifies our product line to fit individual requirements. Nickel plating, Kalrez® 4079, Chemrez® seals, etc. are all available upon request.



SA / SL Performance Series Valves

1



3/8 thru 4"
Port Sizes





KEY HIGH VACUUM PRODUCTS, INC.

manufactures a wide range of quality stainless steel valves which are at the forefront of the high vacuum industry, in terms of design, quality, reliability, durability and value. Our attention to details from raw material selection, machining practices, parts handling, part fitup, welding, surface finishing, electropolishing, assembly, testing; all are part of the quality cycle that we excel at.

The commitment to perfection in the quality of our valves, immediate responsive service and very competitive pricing, have led to universal recognition and acceptance of our valves. We also have earned the enviable reputation of manufacturing the highest quality valves to the consistently high level of craftsmanship. **KEY HIGH VACUUM PRODUCTS, INC.** strives to set the standard of excellence in manufacturing a high quality, extremely reliable high vacuum valve which is second to none. If you require quality high vacuum valves, immediate service and competitive pricing contact **KHVP**. You'll be glad you did.

General Features:

- Stainless steel type 304L electropolished valve bodies
- All valve bodies are manufactured using the "Pulled Port" method
- All valve bodies are electropolished for corrosion resistance, minimal surface area and faster pump downs
- Compact physical "footprint" of valve assembly
- Viton® seals standard, upon request other appropriate materials are available
- High conductance design
- Long life stainless steel bellow assembly stem seals
- 3/8" through 3" valves have welded bellows stem seals; 4" valves have formed bellows stem seals
- All weld joints are internal or 100% penetration

Manufacturing:

We manufacture with only the finest in raw materials. All materials arrive at our facility with certifications from the mills listing the chemical composition of the stainless steel materials. All machining is done with only water-soluble cutting oil. Once computer numerical control (CNC) machining cells have completed all sub components; all parts are washed in deionized water before welding.



Welding:

Weld acceptance criteria is today more critical than ever before for vacuum components. We, at **KEY HIGH VACUUM PRODUCTS, INC.** devote an exceptional amount of time and effort into the welding process.

This is one of the most critical areas of valve manufacturing, as welded components have a significant effect on the quality of the product being produced or the experiment being conducted. A uniformly thin, smooth weld bead is desired as it will prevent adherence of moisture and particulate, as well as maximize conductance and decreases the surface area within the vacuum envelope when compared to TIG welds that are generated using conventional non microprocessor based methods.

KEY HIGH VACUUM PRODUCTS, INC. uses a mechanized microprocessor based gas tungsten arc welding system (GTAW) also known as tungsten inert gas (TIG). These welds are preformed autogenously, without the use of filler materials in the weld. The orbital type computer based TIG welding system uses a pulsed arc for welds of unequalled quality. Results of using a microprocessor pulsed-based system are a smoother "Flat" weld that does not project into the tube ID, less heat (maximizing corrosion resistance), and a smaller more uniform bead. The result of the automated weld bead is unequalled quality and repeated consistently from the first weld to the last weld throughout the day.



Mounting styles:

Right angle, inline, straight through and combination.

Standard ports:

Tube End, NW-ISO, MET-SEAL and VCR®

Electropneumatic valve:

- Standard 1/8" female NPT inlet for compressed air supply
- Field proven piston design
- 60 to 100 psi operation
- 3/8" OD through 2" OD valves are spring loaded (fail-safe) normally closed; valves with 2-1/2" OD and larger ports are air to open, air to close.
- 120/60 solenoid supplied standard; other voltages are available, see options data block located on valve specification sheet

Mounting / Testing

Valves can be mounted in any position. However the correct or preferred method is to mount the lower port of the valve (the poppet side) towards the vacuum pump. This helps minimize volume and also helps by "pulling" the poppet closed. All valves guaranteed leak tested on a helium mass spectrometer with a sensitivity of 5 x 10⁻¹⁰ torr.

Bakeability:

Viton® seals bakeable to 205° C with the valve in the open position while under a high vacuum,(150°C with valve in the closed position). Care should be taken on pneumatic valves during a bakeout cycle.

Do not heat the actuator assembly over 70°C as damage can occur to the pneumatic actuator components.

Maintenance:

Removing the bellows assembly on **SA/SL** series valves is as simple as removing the bonnet flange screws for o-ring or bellows service. On spring loaded valves, great care should be taken as the air cylinder is under considerable spring tension. The air cylinder should always be restrained or externally clamped before removing any screws to minimize potential hazards to personnel and equipment. It is not necessary to remove the valve body from the system for maintenance issues. Replacement parts are available for all valves from stock.

Quality:

KEY HIGH VACUUM PRODUCTS, INC. takes great pride in our valves and every effort will be made to accomplish the highest quality vacuum valves that will be delivered on time, to compete in a world class market with zero escaping defects (ZED). Every valve is factory tested prior to shipment.

Custom Fabrication:

SA/SL performance series are available from stock in manual and pneumatic versions. We routinely modify are existing valves to meet individual customer requirements; please feel free to contact us.

Conductance SA valves

Part Number	Liters / Sec
SA / PSA-37	2.0
SA / PSA-50	4.0
SA / PSA-75	13.0
SA / PSA-100	15.0
SA / PSA-150	47.0
SA / PSA-200	85.0
SA / PSA-250	130.0
SA / PSA-300	190.0
PSA-400	400.0

Conductance CSAL valves

Part Number	Liters / Sec
CSAL-75	2.2
CSAL-100	4.2
CSAL-150	13.0
CSAL-200	25.0

Conductance SL valves

Part Number	Liters / Sec
SL-37 / PSL-37	2.0
SL-50 / PSL-50	4.0
SL-75 / PSL-75	12.0
SL-100 / PSL-100	13.0
SL-150 / PSL-150	32.0
SL-200 / PSL-200	58.0
SL-250 / PSL-250	92.0
SL-300 / PSL-300	140.0

Conductance ILV valves

Part Number	Liters / Sec
ILV-75	8.0
ILV-100	14.0
ILV-150	31.0

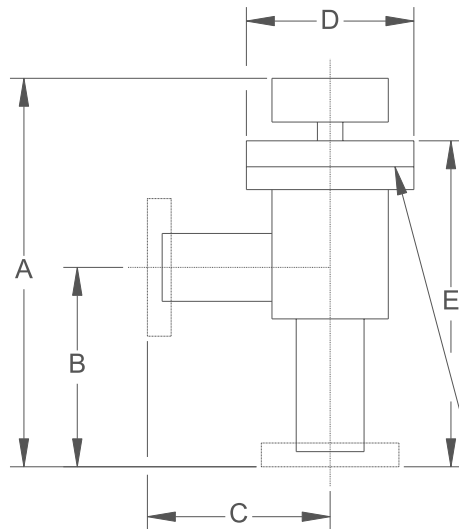
Note: Conductance calculations are based on air valves at molecular flow.



Stainless Steel Valves

Right Angle Valves, Stainless Steel, Manual, Viton® Bonnet and Poppet

Part Number	Tube OD	Port Style	A	B	C	D	E
SA-37-N	3/8"	Tube End	4.37	1.50	1.50	2.00	3.38
SA-37-K-N	3/8"	NW 10	4.50	1.65	1.65	2.00	3.54
SA-37-N-MS	3/8"	Mini MET-SEAL	4.20	1.56	1.56	2.00	3.38
SA-37-N-FVCR	3/8"	1/4" Female VCR®	4.75	1.87	1.87	2.00	3.75
SA-50-N	1/2"	Tube End	4.37	1.50	1.50	2.00	3.38
SA-50-K-N	1/2"	NW 16	4.50	1.65	1.65	2.00	3.54
SA-50-N-MS	1/2"	Mini MET-SEAL	4.20	1.56	1.56	2.00	3.38
SA-75-N	3/4"	Tube End	4.50	2.00	2.00	2.00	3.53
SA-75-K-N	3/4"	NW 16	4.68	2.12	2.12	2.00	3.66
SA-75-N-MS	3/4"	Mini MET-SEAL	5.00	2.50	2.50	2.00	4.03
SA-100-N	1"	Tube End	4.62	2.12	2.12	2.00	3.62
SA-100-K-N	1"	NW 25	4.80	2.25	2.25	2.00	3.78
SA-100-N-MS	1"	2-1/8" MET-SEAL	4.80	2.42	2.42	2.00	3.79
SA-150-N	1-1/2"	Tube End	5.43	2.25	2.25	2.75	4.04
SA-150-K-N	1-1/2"	NW 40	5.60	2.46	2.46	2.75	4.20
SA-150-N-MS	1-1/2"	2-3/4" MET-SEAL	5.64	2.46	2.46	2.75	4.50
SA-200-N	2"	Tube End	7.39	3.25	3.25	3.50	6.16
SA-200-K-N	2"	NW 50	7.55	3.50	3.50	3.50	6.32
SA-200-N-MS	2"	3-3/8" MET-SEAL	7.62	3.47	3.47	3.50	6.39
SA-250-N	2-1/2"	Tube End	10.80	3.25	3.25	4.00	7.75
SA-250-K-N	2-1/2"	NW 63	11.05	3.50	3.50	4.00	8.00
SA-250-N-MS	2-1/2"	4-1/2" MET-SEAL	11.20	3.62	3.62	4.00	8.12
SA-300-N	3"	Tube End	11.70	3.50	3.50	4.50	8.87
SA-300-K-N	3"	NW 80	11.95	3.75	3.75	4.50	9.12
SA-300-N-MS	3"	4-5/8" MET-SEAL	11.98	3.78	3.78	4.50	9.15



Viton® Bonnet

Viton® Gasket Kits

Part Number	Fits Valve Series	Price
OR-SA-100-N	37,50,75,100	\$13.00
OR-SA-150-N	150	\$13.00
OR-SA-200-N	200	\$18.00
OR-SA-250-N	250	\$18.00
OR-SA-300-N	300	\$18.00

Manual Bellows Assemblies

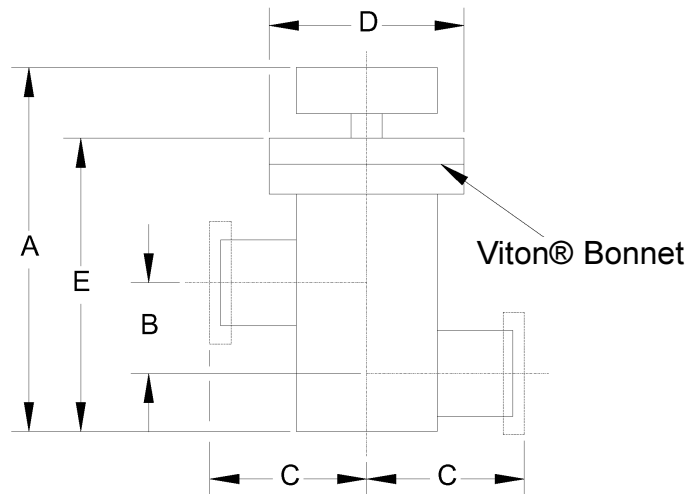
Part Number	Fits Valve Series
RS-B-100-N	37,50,75,100
RS-B-150-N	150
RS-B-200-N	200
RS-B-250-N	250
RS-B-300-N	300



Stainless Steel Valves

Inline Valves, Stainless Steel, Manual, Viton® Bonnet and Poppet

Part Number	Tube OD	Port Style	A	B	C	D	E
SL-37-N	3/8"	Tube End	4.06	.93	1.50	2.00	3.01
SL-37-K-N	3/8"	NW 10	4.06	.93	1.65	2.00	3.01
SL-37-N-MS	3/8"	Mini MET-SEAL	4.06	.93	1.56	2.00	3.01
SL-37-N-FVCR	3/8"	1/4" Female VCR®	4.06	.93	1.87	2.00	3.01
SL-50-N	1/2"	Tube End	4.06	.93	1.50	2.00	3.01
SL-50-K-N	1/2"	NW 16	4.06	.93	1.65	2.00	3.01
SL-50-N-MS	1/2"	Mini MET-SEAL	4.06	.93	1.56	2.00	3.01
SL-75-N	3/4"	Tube End	4.62	1.37	2.12	2.00	3.57
SL-75-K-N	3/4"	NW 16	4.62	1.37	2.12	2.00	3.57
SL-75-N-MS	3/4"	Mini MET-SEAL	4.62	1.37	2.62	2.00	3.57
SL-100-N	1"	Tube End	4.62	1.37	2.12	2.00	3.57
SL-100-K-N	1"	NW 25	4.62	1.37	2.25	2.00	3.57
SL-100-N-MS	1"	2-1/8" MET-SEAL	4.62	1.37	2.30	2.00	3.57
SL-150-N	1-1/2"	Tube End	6.00	1.87	2.25	2.75	4.75
SL-150-K-N	1-1/2"	NW 40	6.00	1.87	2.46	2.75	4.75
SL-150-N-MS	1-1/2"	2-3/4" MET-SEAL	6.00	1.87	2.46	2.75	4.75
SL-200-N	2"	Tube End	7.85	2.37	3.25	3.50	6.60
SL-200-K-N	2"	NW 50	7.85	2.37	3.50	3.50	6.60
SL-200-N-MS	2"	3-3/8" MET-SEAL	7.85	2.37	3.47	3.50	6.60
SL-250-N	2-1/2"	Tube End	10.00	3.12	3.00	4.00	9.31
SL-250-K-N	2-1/2"	NW 63	10.00	3.12	3.25	4.00	9.31
SL-250-N-MS	2-1/2"	4-1/2" MET-SEAL	10.00	3.12	3.47	4.00	9.31
SL-300-N	3"	Tube End	11.00	3.62	3.25	4.50	10.75
SL-300-K-N	3"	NW 80	11.00	3.62	3.50	4.50	10.75
SL-300-N-MS	3"	4-5/8" MET-SEAL	11.00	3.62	3.54	4.50	10.75



Viton® Gasket Kits

Part Number	Fits Valve Series	Price
OR-SA-100-N	37,50,75,100,	\$ 13.00
OR-SA-150-N	150	\$ 13.00
OR-SA-200-N	200	\$ 18.00
OR-SA-250-N	250	\$ 18.00
OR-SA-300-N	300	\$ 18.00

Manual Bellows Assemblies

Part Number	Fits Valve Series
RS-B-100-N	37,50,75,100
RS-B-150-N	150
RS-B-200-N	200
RS-B-250-N	250
RS-B-300-N	300



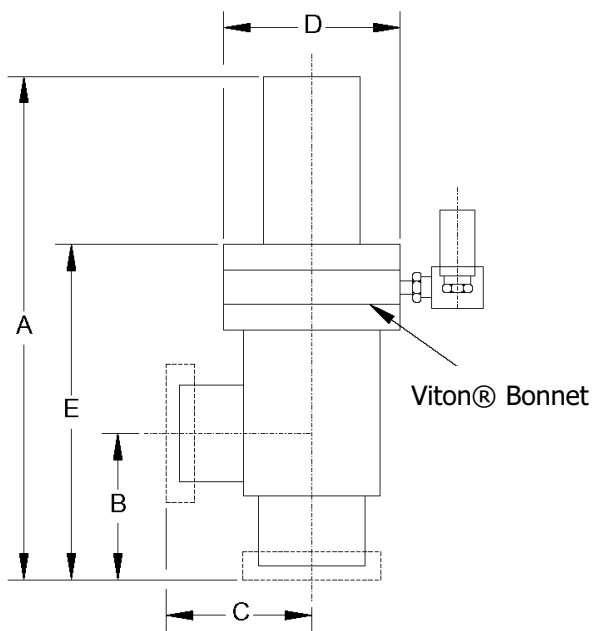
Stainless Steel Valves

Right Angle Valves, Stainless Steel, Electropneumatic, Viton® Bonnet and Poppet

Part Number	Tube OD	Port Style	A	B	C	D	E
PSA-37-N	3/8"	Tube End	5.54	1.50	1.50	2.00	3.64
PSA-37-K-N	3/8"	NW 10	5.70	1.65	1.65	2.00	3.80
PSA-37-N-MS	3/8"	Mini MET-SEAL	5.54	1.65	1.65	2.00	3.64
PSA-37-N-FVCR	3/8"	1/4" Female VCR®	5.91	1.87	1.87	2.00	4.01
PSA-50-N	1/2"	Tube End	5.54	1.50	1.50	2.00	3.64
PSA-50-K-N	1/2"	NW 16	5.70	1.65	1.65	2.00	3.80
PSA-50-N-MS	1/2"	Mini MET-SEAL	5.54	1.56	1.56	2.00	3.64
PSA-75-N	3/4"	Tube End	6.12	2.00	2.00	2.00	4.25
PSA-75-K-N	3/4"	NW 16	6.25	2.12	2.12	2.00	4.37
PSA-75-N-MS	3/4"	Mini MET-SEAL	6.62	2.50	2.50	2.00	4.75
PSA-100-N	1"	Tube End	6.25	2.12	2.12	2.00	4.25
PSA-100-K-N	1"	NW 25	6.37	2.25	2.25	2.00	4.95
PSA-100-N-MS	1"	2-1/8" MET-SEAL	6.42	2.42	2.42	2.00	4.42
PSA-150-N	1-1/2"	Tube End	7.37	2.25	2.25	2.75	4.80
PSA-150-K-N	1-1/2"	NW 40	7.50	2.46	2.46	2.75	4.95
PSA-150-N-MS	1-1/2"	2-3/4" MET-SEAL	7.58	2.46	2.46	2.75	5.01
PSA-200-N	2"	Tube End	10.14	3.25	3.25	3.50	6.77
PSA-200-K-N	2"	NW 50	10.30	3.50	3.50	3.50	6.93
PSA-200-N-MS	2"	3-3/8" MET-SEAL	10.37	3.47	3.47	3.50	7.00
PSA-250-N	2-1/2"	Tube End	10.25	3.25	3.25	4.00	7.25
PSA-250-K-N	2-1/2"	NW 63	11.05	3.50	3.50	4.00	8.00
PSA-250-N-MS	2-1/2"	4-1/2" MET-SEAL	10.63	3.47	3.47	4.00	7.63
PSA-300-N	3"	Tube End	11.25	3.50	3.50	4.50	7.75
PSA-300-K-N	3"	NW 80	11.95	3.75	3.75	4.50	9.12
PSA-300-N-MS	3"	4-5/8" MET-SEAL	11.53	3.78	3.78	4.50	8.03
PSA-400-N	4"	Tube End	13.06	4.25	4.25	6.00	8.83
PSA-400-K-N	4"	NW 100	13.31	4.50	4.50	6.00	9.08
PSA-400-N-MS	4"	6" OD MET-SEAL	13.45	4.69	4.69	6.00	9.27

Options: add code to suffix of part number

Description	Option Code	
24 Volt DC solenoid	-24VDC	Add
24 Volt AC solenoid	-24VAC	Add
220 Volt AC solenoid	-220VAC	Add
Mechanical Limit Switches	-LS	Add
No Solenoid	-NS	Deduct



Viton® Gasket Kits

Part Number	Fits Valve Series
OR-PSA-100-N	37,50,75,100
OR-PSA-150-N	150
OR-PSA-200-N	200
OR-PSA-250-N	250
OR-PSA-300-N	300
OR-PSA-400-N	400

Pneumatic Bellow Assemblies

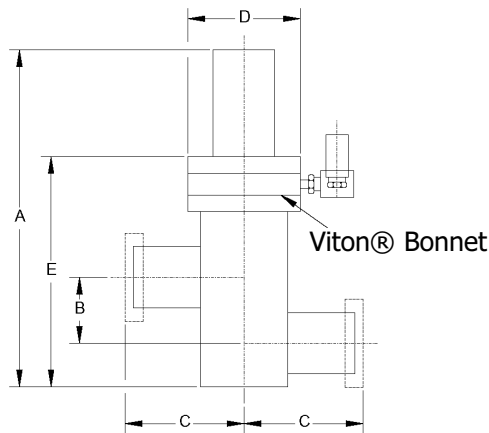
Part Number	Fits Valve Series
PRS-B-100-N	37,50,75,100
PRS-B-150-N	150
PRS-B-200-N	200
PRS-B-250-N	250
PRS-B-300-N	300
PRS-B-400-N	400



Stainless Steel Valves

Inline Valves, Stainless Steel, Electropneumatic, Viton® Bonnet and Poppet

Part Number	Tube OD	Port Style	A	B	C	D	E
PSL-37-N	3/8"	Tube End	5.62	.93	1.50	2.00	3.62
PSL-37-K-N	3/8"	NW 10	5.62	.93	1.65	2.00	3.62
PSL-37-N-FVCR	3/8"	1/4" Female VCR®	5.62	.93	1.87	2.00	3.62
PSL-37-N-MS	3/8"	Mini MET-SEAL	5.62	.93	1.56	2.00	3.62
PSL-50-N	1/2"	Tube End	5.62	.93	1.50	2.00	3.62
PSL-50-K-N	1/2"	NW 16	5.62	.93	1.65	2.00	3.62
PSL-50-N-MS	1/2"	Mini MET-SEAL	5.62	.93	1.56	2.00	3.62
PSL-75-N	3/4"	Tube End	6.20	1.37	2.12	2.00	4.18
PSL-75-K-N	3/4"	NW 16	6.20	1.37	2.25	2.00	4.18
PSL-75-N-MS	3/4"	Mini MET-SEAL	6.20	1.37	2.50	2.00	4.18
PSL-100-N	1"	Tube End	6.20	1.37	2.12	2.00	4.18
PSL-100-K-N	1"	NW 25	6.20	1.37	2.25	2.00	4.18
PSL-100-N-MS	1"	2-1/8" MET-SEAL	6.20	1.37	2.28	2.00	4.18
PSL-150-N	1-1/2"	Tube End	8.30	1.87	2.25	2.75	5.45
PSL-150-K-N	1-1/2"	NW 40	8.30	1.87	2.46	2.75	5.45
PSL-150-N-MS	1-1/2"	2-3/4" MET-SEAL	8.30	1.87	2.46	2.75	5.45
PSL-200-N	2"	Tube End	10.60	2.37	3.25	3.50	7.20
PSL-200-K-N	2"	NW 50	10.60	2.37	3.50	3.50	7.20
PSL-200-N-MS	2"	3-3/8" MET-SEAL	10.60	2.37	3.47	3.50	7.20
PSL-250-N	2-1/2"	Tube End	12.00	3.12	3.00	4.00	9.12
PSL-250-K-N	2-1/2"	NW 63	12.00	3.12	3.25	4.00	9.12
PSL-250-N-MS	2-1/2"	4-1/2" MET-SEAL	12.00	3.12	3.47	4.00	9.12
PSL-300-N	3"	Tube End	13.50	3.62	3.25	4.50	10.25
PSL-300-K-N	3"	NW 80	13.50	3.62	3.50	4.50	10.25
PSL-300-N-MS	3"	4-5/8" MET-SEAL	13.50	3.62	3.54	4.50	10.25



Options: add code to suffix of part number

Description	Option Code	Price	Part Number	Fits Valve Series
24 Volt DC Solenoid	-24VDC	Add \$ 20.00	OR-PSL-100-N	37,50,75,100
24 Volt AC Solenoid	-24VAC	Add \$ 20.00	OR-PSL-150-N	150
220 Volt AC Solenoid	-220VAC	Add \$ 20.00	OR-PSL-200-N	200
Mechanical Limit Switches	-LS	Add \$ 300.00	OR-PSL-250-N	250
No Solenoid	-NS	Deduct \$ 10.00	OR-PSL-300-N	300

Viton® Gasket Kits

Pneumatic Bellow Assemblies

Part Number	Fits Valve Series
PRS-B-100-N	37,50,75,100
PRS-B-150-N	150
PRS-B-200-N	200
PRS-B-250-N	250
PRS-B-300-N	300

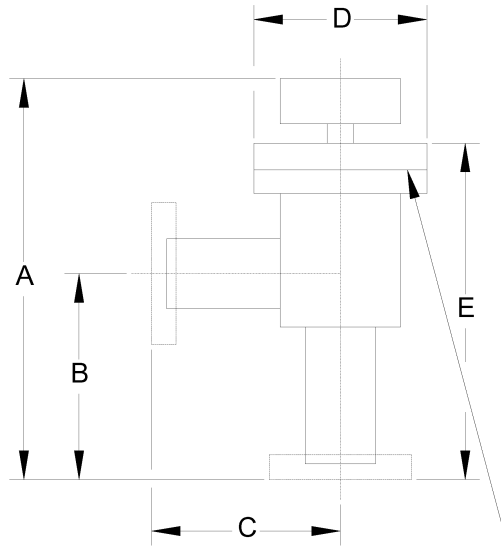


Stainless Steel Valves



Right Angle Valves, Stainless Steel, Manual OFHC® Bonnet, Viton® Poppet

Part Number	Tube OD	Port Style	A	B	C	D	E
SA-37-N-C	3/8"	Tube End	4.37	1.50	1.50	2.00	3.38
SA-37-N-MS-C	3/8"	Mini MET-SEAL	4.37	1.56	1.56	2.00	3.38
SA-37-N-FVCR-C	3/8"	1/4" Female VCR®	5.91	1.87	1.87	2.00	4.01
SA-50-N-C	1/2"	Tube End	4.37	1.50	1.50	2.00	3.38
SA-50-N-MS-C	1/2"	Mini MET-SEAL	4.37	1.56	1.56	2.00	3.38
SA-75-N-C	3/4"	Tube End	4.50	2.00	2.00	2.00	3.53
SA-75-N-MS-C	3/4"	Mini MET-SEAL	5.00	2.50	2.50	2.00	4.03
SA-100-N-C	1"	Tube End	4.62	2.12	2.12	2.00	3.62
SA-100-N-MS-C	1"	2-1/8" MET-SEAL	4.80	2.42	2.42	2.00	3.79
SA-150-N-C	1-1/2"	Tube End	5.43	2.25	2.25	2.75	4.04
SA-150-N-MS-C	1-1/2"	2-3/4" MET-SEAL	5.64	2.46	2.46	2.75	4.50
SA-200-N-C	2"	Tube End	7.39	3.25	3.25	3.50	6.16
SA-200-N-MS-C	2"	3-3/8" MET-SEAL	7.62	3.47	3.47	3.50	6.39
SA-250-N-C	2-1/2"	Tube End	10.80	3.25	3.25	4.00	7.75
SA-250-N-MS-C	2-1/2"	4-1/2" MET-SEAL	11.20	3.62	3.62	4.00	8.12
SA-300-N-C	3"	Tube End	11.70	3.50	3.50	4.50	8.87
SA-300-N-MS-C	3"	Tube End	11.98	3.78	3.78	4.50	9.15



OFHC® Copper Bonnet

Gasket Kits OFHC® Bonnet, Viton® Poppet

Part Number	Fits Valve Series	Price
OR-SA-100-N-C	37,50,75,100	\$ 18.00
OR-SA-150-N-C	150	\$ 22.00
OR-SA-200-N-C	200	\$ 25.00
OR-SA-250-N-C	250	\$ 27.00
OR-SA-300-N-C	300	\$ 28.00

Manual Bellow Assemblies

Part Number	Fits Valve Series
RS-B-100-N	37,50,75,100
RS-B-150-N	150
RS-B-200-N	200
RS-B-250-N	250
RS-B-300-N	300

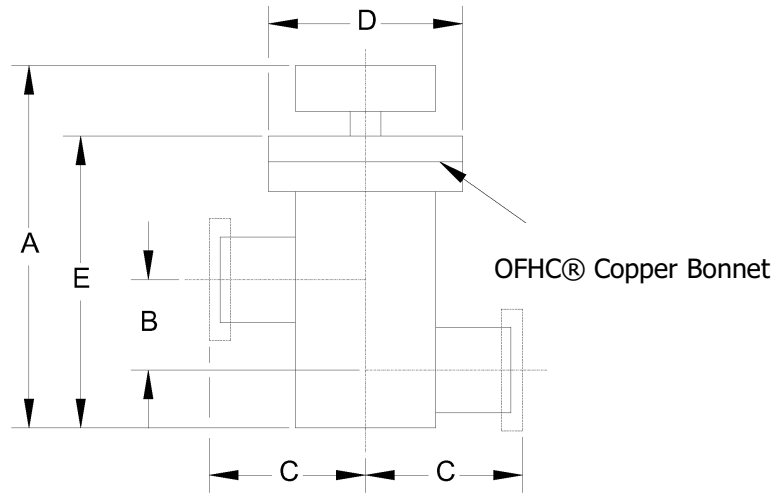


Stainless Steel Valves

1

Inline Valves, Stainless Steel, Manual, OFHC® Bonnet, Viton® Poppet

Part Number	Tube OD	Port Style	A	B	C	D	E
SL-37-N-C	3/8"	Tube End	4.06	.93	1.50	2.00	3.01
SL-37-N-MS-C	3/8"	Mini MET-SEAL	4.06	.93	1.56	2.00	3.01
SL-37-N-FVCR-C	3/8"	1/4" Female VCR®	4.06	.93	1.87	2.00	3.01
SL-50-N-C	1/2"	Tube End	4.06	.93	1.50	2.00	3.01
SL-50-N-MS-C	1/2"	Mini MET-SEAL	4.06	.93	1.56	2.00	3.01
SL-75-N-C	3/4"	Tube End	4.62	1.37	2.12	2.00	3.57
SL-75-N-MS-C	3/4"	Mini MET-SEAL	4.62	1.37	2.62	2.00	3.57
SL-100-N-C	1"	Tube End	4.62	1.37	2.12	2.00	3.57
SL-100-N-MS-C	1"	2-1/8" MET-SEAL	4.62	1.37	2.30	2.00	3.57
SL-150-N-C	1-1/2"	Tube End	6.00	1.87	2.25	2.75	4.75
SL-150-N-MS-C	1-1/2"	2-3/4" MET-SEAL	6.00	1.87	2.46	2.75	4.75
SL-200-N-C	2"	Tube End	7.85	2.37	3.25	3.50	6.60
SL-200-N-MS-C	2"	3-3/8" MET-SEAL	7.85	2.37	3.47	3.50	6.60
SL-250-N-C	2-1/2"	Tube End	10.00	3.12	3.00	4.00	9.31
SL-250-N-MS-C	2-1/2"	4-1/2" MET-SEAL	10.00	3.12	3.47	4.00	9.31
SL-300-N-C	3"	Tube End	11.00	3.62	3.25	4.50	10.75
SL-300-N-MS-C	3"	4-5/8" MET-SEAL	11.00	3.62	3.54	4.50	10.75



Gasket Kits OFHC® Bonnet, Viton® Poppet

Part Number	Fits Valve Series	Price
OR-SA-100-N-C	37,50,75,100	\$ 18.00
OR-SA-150-N-C	150	\$ 22.00
OR-SA-200-N-C	200	\$ 25.00
OR-SA-250-N-C	250	\$ 27.00
OR-SA-300-N-C	300	\$ 28.00

Manual Bellows Assemblies

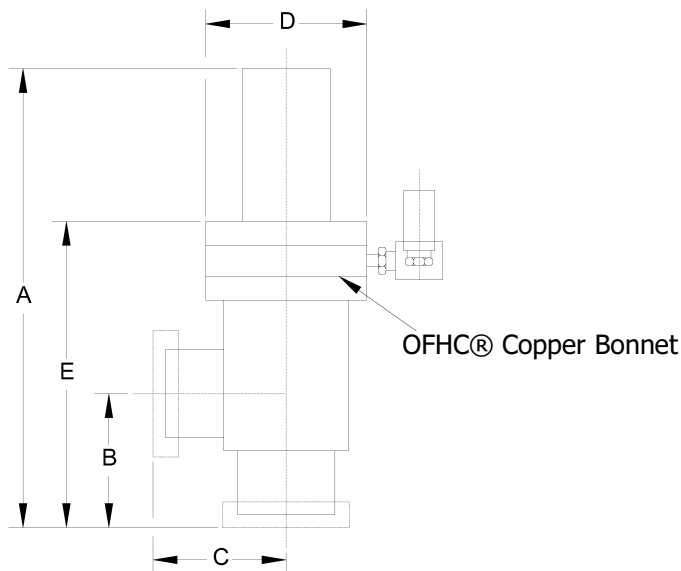
Part Number	Fits Valve Series
RS-B-100-N	37,50,75,100
RS-B-150-N	150
RS-B-200-N	200
RS-B-250-N	250
RS-B-300-N	300



Stainless Steel Valves

Right Angle Valves, Stainless Steel, Electropneumatic, OFHC® Bonnet, Viton® Poppet

Part Number	Tube OD	Port Style	A	B	C	D	E
PSA-37-N-C	3/8"	Tube End	5.54	1.50	1.50	2.00	3.64
PSA-37-N-MS-C	3/8"	Mini MET-SEAL	5.54	1.56	1.56	2.00	3.64
PSA-37-N-FVCR-C	3/8"	1/4" Female VCR®	5.91	1.87	1.87	2.00	4.01
PSA-50-N-C	1/2"	Tube End	5.54	1.50	1.50	2.00	3.64
PSA-50-N-MS-C	1/2"	Mini MET-SEAL	5.54	1.56	1.56	2.00	3.64
PSA-75-N-C	3/4"	Tube End	6.12	2.00	2.00	2.00	4.25
PSA-75-N-MS-C	3/4"	Mini MET-SEAL	6.62	2.50	2.50	2.00	4.75
PSA-100-N-C	1"	Tube End	6.25	2.12	2.12	2.00	4.25
PSA-100-N-MS-C	1"	2-1/8" MET-SEAL	6.42	2.42	2.42	2.00	4.42
PSA-150-N-C	1-1/2"	Tube End	7.37	2.25	2.25	2.75	4.80
PSA-150-N-MS-C	1-1/2"	2-3/4" MET-SEAL	7.58	2.46	2.46	2.75	5.01
PSA-200-N-C	2"	Tube End	10.14	3.25	3.25	3.50	6.77
PSA-200-N-MS-C	2"	3-3/8" MET-SEAL	10.37	3.47	3.47	3.50	7.00
PSA-250-N-C	2-1/2"	Tube End	10.25	3.25	3.25	4.00	7.25
PSA-250-N-MS-C	2-1/2"	4-1/2" MET-SEAL	10.63	3.47	3.47	4.00	7.63
PSA-300-N-C	3"	Tube End	11.25	3.50	3.50	4.50	7.75
PSA-300-N-MS-C	3"	4-5/8" MET-SEAL	11.53	3.78	3.78	4.50	8.03
PSA-400-N-C	4"	Tube End	13.06	4.25	4.25	6.00	8.83
PSA-400-N-MS-C	4"	6" MET-SEAL	13.45	4.69	4.69	6.00	9.27



Options: add code to suffix of part number

Gasket Kits, OFHC® Bonnet, Viton® Poppet

Description	Option Code	Price	Part Number	Fits Valve Series
24 Volt DC Solenoid	-24VDC	Add \$ 20.00	OR-PSA-100-N-C	37,50,75,100
24 Volt AC Solenoid	-24VAC	Add \$ 20.00	OR-PSA-150-N-C	150
220 Volt AC Solenoid	-220VAC	Add \$ 20.00	OR-PSA-200-N-C	200
Mechanical Limit Switches	-LS	Add \$ 300.00	OR-PSA-250-N-C	250
No Solenoid	-NS	Deduct \$ 10.00	OR-PSA-300-N-C	300
			OR-PSA-400-N-C	400

Pneumatic Bellow Assemblies

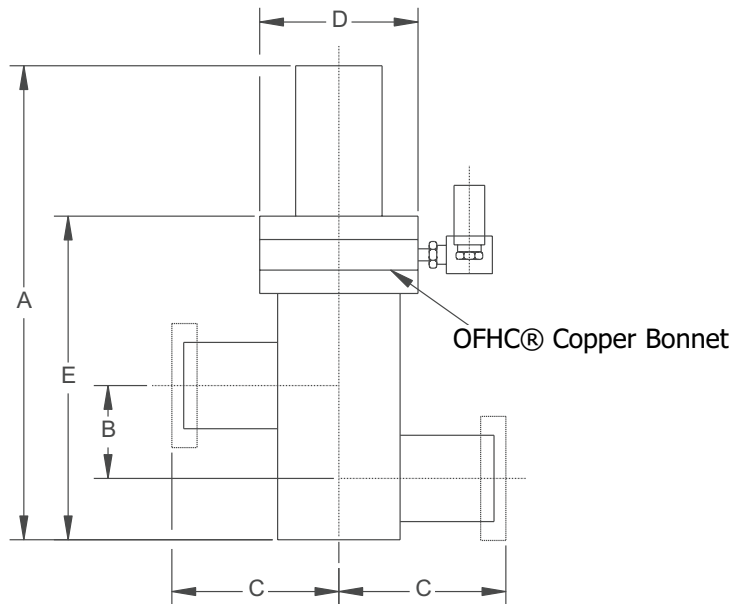
Part Number	Fits Valve Series
PRS-B-100-N	37,50,75,100
PRS-B-150-N	150
PRS-B-200-N	200
PRS-B-250-N	250
PRS-B-300-N	300
PRS-B-400-N	400



Stainless Steel Valves

Inline Valves, Stainless Steel, Electropneumatic, OFHC® Bonnet, Viton® Poppet

Part Number	Tube OD	Port Style	A	B	C	D	E
PSL-37-N-C	3/8"	Tube End	5.62	.93	1.50	2.00	3.62
PSL-37-N-MS-C	3/8"	Mini MET-SEAL	5.62	.93	1.56	2.00	3.62
PSL-37-N-FVCR-C	3/8"	1/4" Female VCR®	5.62	.93	1.87	2.00	3.62
PSL-50-N-C	1/2"	Tube End	5.62	.93	1.50	2.00	3.62
PSL-50-N-MS-C	1/2"	Mini MET-SEAL	5.62	.93	1.56	2.00	3.62
PSL-75-N-C	3/4"	Tube End	6.20	1.37	2.12	2.00	4.18
PSL-75-N-MS-C	3/4"	Mini MET-SEAL	6.20	1.37	2.62	2.00	4.18
PSL-100-N-C	1"	Tube End	6.20	1.37	2.12	2.00	4.18
PSL-100-N-MS-C	1"	2-1/8" MET-SEAL	6.20	1.37	2.30	2.00	4.18
PSL-150-N-C	1-1/2"	Tube End	8.30	1.87	2.25	2.75	5.45
PSL-150-N-MS-C	1-1/2"	2-3/4" MET-SEAL	8.30	1.87	2.46	2.75	5.45
PSL-200-N-C	2"	Tube End	10.60	2.37	3.25	3.50	7.20
PSL-200-N-MS-C	2"	3-3/8" MET-SEAL	10.60	2.37	3.47	3.50	7.20
PSL-250-N-C	2-1/2"	Tube End	12.00	3.12	3.00	4.00	9.12
PSL-250-N-MS-C	2-1/2"	4-1/2" MET-SEAL	12.00	3.12	3.47	4.00	9.12
PSL-300-N-C	3"	Tube End	13.50	3.62	3.25	4.50	10.25
PSL-300-N-MS-C	3"	4-5/8" MET-SEAL	13.50	3.62	3.54	4.50	10.25



Options: add code to suffix of part number

Gasket Kits, OFHC® Bonnet, Viton® Bonnet

Description	Option Code	Price	Part Number	Fits Valve Series
24 Volt DC Solenoid	-24VDC	Add \$ 20.00	OR-PSL-100-N-C	37,50,75,100
24 Volt AC Solenoid	-24VAC	Add \$ 20.00	OR-PSL-150-N-C	150
220 Volt AC Solenoid	-220VAC	Add \$ 20.00	OR-PSL-200-N-C	200
Mechanical Limit Switches	-LS	Add \$ 300.00	OR-PSL-250-N-C	250
No Solenoid	-NS	Deduct \$ 10.00	OR-PSL-300-N-C	300

Pneumatic Bellow Assemblies

Part Number	Fits Valve Series
PRS-B-100-N	37,50,75,100
PRS-B-150-N	150
PRS-B-200-N	200
PRS-B-250-N	250
PRS-B-300-N	300



KEY HIGH VACUUM PRODUCTS, INC.'S SLOW PUMP VALVE SERIES (SPV) are a family of economical, easy to use valves that represent the culmination of over 20 years of experience in the successful design and development of high vacuum valves that increase the production rates at our customers facilities. The **SLOW PUMP VALVE SERIES** reduces turbulence within the vacuum system, therefore reducing disturbance of product and particles. **SLOW PUMP VALVES** feature all the field proven rugged, dependable features found in our Isolation (PSA series) valves. **SPV** valves feature an integral small bypass into the PSA (parent) valve. This is achieved in a compact design to minimize the physical "footprint" of the assembly that is easily adaptable within an existing vacuum system.

Operation method: First, the small **BYPASS VALVE** is opened permitting a reduced precise flow rate between the two sides of the valve body. Once the system reaches a user determined vacuum level, the parent valve is opened to allow full speed pumping. The orifice of the bypass valve is easily removed to allow the user to select an exact match for their application.

This valve series is intended to control a pump down cycle that is virtually turbulence-free for sensitive production vacuum systems. When combining the **SPV SERIES** valves with **DF SERIES DIFFUSERS** for venting, allows equipment to meet stringent requirements for two historically difficult issues.

SPV valves have been successfully installed and used for many applications including (but not limited to) optical and semiconductor fields and allows the user to have precision control over the roughing process.



Features:

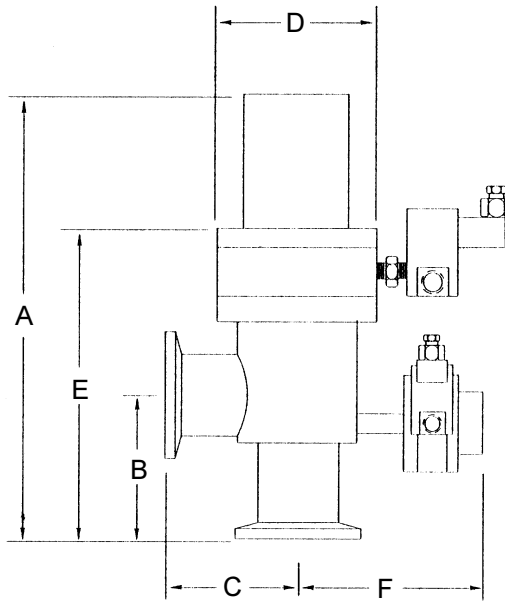
- Compact footprint
- Bellows sealed, high cycle life
- Available in 1", 1-1/2", 2", 2-1/2", 3" and 4" tube sizes
- Standard flanges include ISO-KF, MET-SEAL, and tube end
- Viton® seals standard
- 304L-valve body. All TIG welds are internal or 100% penetration and are performed on a computerized welding station for unequaled quality.
- Easily interchangeable fixed orifices. Standard sizes included with valve are .187, .125., .093
- All bypass valves are spring-loaded (normally closed, fail-safe)
- 120 volt solenoids are included, 65 to 100 psi operation
- Din connectors with LED displays are also standard issue on the SPV series. This allows the user to visually confirm the open position of the valves.

Slow Pump Pneumatic Stainless Steel Valves

1

SPV Pneumatic Angle Valve

Part Number	Tube OD	Port Style	A	B	C	D	E	F
SPV-100-N	1"	Tube End	7.05	2.12	2.12	2.00	5.06	3.65
SPV-100-K-N	1"	NW-25	7.17	2.25	2.25	2.00	5.75	3.65
SPV-100-N-MS	1"	2-1/8" OD MET-SEAL	7.22	2.42	2.42	2.00	5.22	3.65
SPV-150-N	1-1/2"	Tube End	8.03	2.25	2.25	2.75	5.46	3.90
SPV-150-K-N	1-1/2"	NW-40	8.16	2.46	2.46	2.75	7.41	3.90
SPV-150-N-MS	1-1/2"	2-3/4" OD MET-SEAL	8.24	2.46	2.46	2.75	7.41	3.90
SPV-200-N	2"	Tube End	10.77	3.25	3.25	3.50	7.40	4.12
SPV-200-K-N	2"	NW-50	10.93	3.50	3.50	3.50	7.55	4.12
SPV-200-N-MS	2"	3-3/8" OD Tube End	10.99	3.47	3.47	3.50	7.62	4.12
SPV-250-N	2-1/2"	Tube End	10.88	3.25	3.25	4.00	7.87	4.40
SPV-250-K-N	2-1/2"	NW-63 Clamp Style	11.68	3.50	3.50	4.00	8.62	4.40
SPV-250-N-MS	2-1/2"	4-1/2" OD MET-SEAL	11.26	3.47	3.47	4.00	8.25	4.40
SPV-300-N	3"	Tube End	11.87	3.50	3.50	4.50	8.37	4.65
SPV-300-K-N	3"	NW-80 Clamp Style	12.58	3.75	3.75	4.50	9.75	4.65
SPV-300-N-MS	3"	4-5/8" OD MET-SEAL	12.16	3.78	3.78	4.50	8.65	4.65
SPV-400-N	4"	Tube End	13.69	4.25	4.25	6.00	9.45	5.40
SPV-400-K-N	4"	NW-100 Clamp Style	13.94	4.50	4.50	6.00	9.71	5.40
SPV-400-N-MS	4"	6" OD MET-SEAL	14.07	4.69	4.69	6.00	9.89	5.40



Optional Accessories / Ordering Info

Optional solenoid voltages:

24vdc - Ordering code - 1

24vac - Ordering code - 2

240 vac - Ordering code - 3

Example: SPV-200-K-N-1 (2" angle, NW-50, pneumatic, 24vdc)

Additional cost - \$30.00

**No solenoids - deduct \$20

Kalrez®, Chemrez®, Parafleur® O-rings are available, contact factory for pricing schedule

Custom bypass orifice sizes are available for most applications, contact factory.



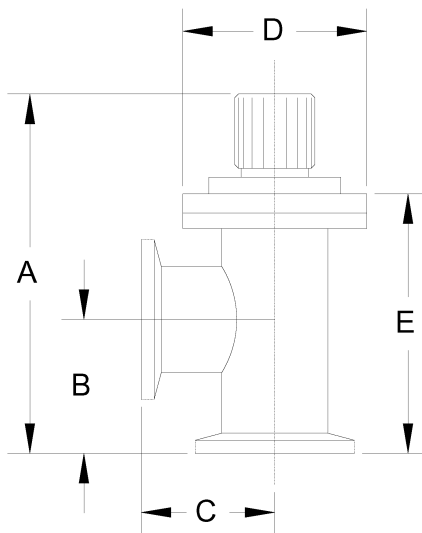


KEY's MIGHTY MINI SERIES VALVES are designed for today's equipment as enclosure space is at an all time premium and the ultra small footprint of the **MIGHTY MINI** specifically addresses this concern, making it the foremost choice when considering space limitations. **KEY MIGHTY MINI** series valves are available with three distinct port configuration standards: tube ends, NW-ISO flanges, and MET-SEAL flanges.

- All stainless steel construction, bellows stem seal
- Visual position indicator for the open position



KMM-40

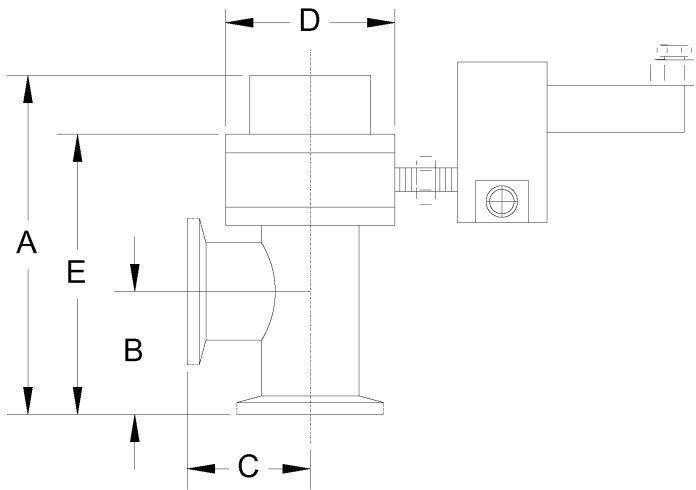


KMM-25

Mighty Mini Valves, Manually Operated, Viton® Bonnet and Poppet

Part Number	Tube OD	Description	A	B	C	D	E
KMM-75	3/4"	3/4" Tube Ends	3.80	1.21	1.21	2.00	2.69
KMM-16	3/4"	NW 16	3.96	1.37	1.37	2.00	2.85
KMM-133	3/4"	Mini MET-SEAL	4.30	1.87	1.87	2.00	3.19
KMM-100	1"	1" Tube Ends	3.80	1.21	1.21	2.00	2.69
KMM-25	1"	NW 25	3.96	1.37	1.37	2.00	2.85
KMM-212	1"	2-1/8" OD MET-SEAL	4.17	1.53	1.53	2.00	2.86
KMM-150	1-1/2"	1-1/2" Tube Ends	4.87	1.59	1.59	2.50	3.56
KMM-40	1-1/2"	NW 40	5.00	1.75	1.75	2.50	3.72
KMM-275	1-1/2"	2-3/4" OD MET-SEAL	5.25	2.00	2.00	2.50	3.97





KMM-275-P

Mighty Mini Valves, Electropneumatic Operation, Viton® Bonnet and Poppet

Part Number	Tube OD	Description	A	B	C	D	E
KMM-75-P	3/4"	Tube ends	3.84	1.21	1.21	2.00	2.96
KMM-16-P	3/4"	NW 16	4.00	1.37	1.37	2.00	3.12
KMM-133-P	3/4"	Mini MET-SEAL	4.50	1.87	1.87	2.00	3.46
KMM-100-P	1"	1" Tube ends	3.84	1.21	1.21	2.00	2.95
KMM-25-P	1"	NW 25	4.00	1.37	1.37	2.00	3.12
KMM-212-P	1"	2-1/8" OD MET-SEAL	4.17	1.53	1.53	2.00	3.12
KMM-150-P	1-1/2"	1-1/2" Tube ends	5.92	1.59	1.59	2.50	4.00
KMM-40-P	1-1/2"	NW 40	6.08	1.75	1.75	2.50	4.17
KMM-275-P	1-1/2"	2-3/4" OD MET-SEAL	6.28	2.00	2.00	2.50	4.25

Note: Pneumatic valves include 120/60 solenoid standard. All pneumatic valves are spring-loaded fail safe

Pneumatic Valve Options: add option code to suffix of part number

Description	Option Code
24 Volt DC solenoid	-24VDC
24 Volt AC solenoid	-24VAC
220 Volt AC solenoid	-220VAC
No Solenoid	-NS

Conductance at molecular flow

3/4" OD tube = 4 liters per second 1" OD tube = 8 liters per second 1-1/2" OD tube = 20 liters per second



Safety Relief Valve

Key High Vacuum Products, Inc.'s Safety Relief Valves are spring loaded, low pressure, direct acting, permanent safety devices.

Key's Safety Relief Valves will virtually eliminate the possibility of dangerous overpressure situations in unstable systems, or in systems, which can experience overpressure issues during gas backfill cycles.

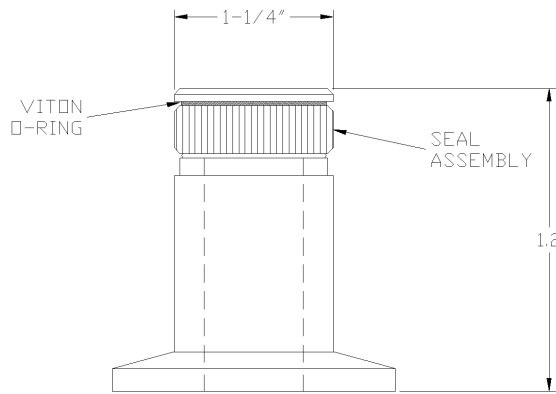
SRV Series are designed as a protection device, which will vent excess (positive) pressure from vacuum systems and chambers. These valves feature highly accurate cracking and reseal pressures.



Construction is from high vacuum grade materials: Stainless steel body, stainless steel spring, with viton seat

Every valve is 100% tested prior to shipment. These relief valves will protect gauges, view ports, etc., in the event of a "reasonable" overpressure situation.

Key High Vacuum Products, Inc., offers the **SRV Series** with two different opening (cracking) pressures to choose from, 0.2 psig or 2.0 psig. **SRV Valves** are mounted on NW25 or NW40 flanges standard.



Part Number	Flange Mount	Cracking Pressure
SRV-25★★	NW25	0.2 PSIG
SRV-40★★	NW40	0.2 PSIG
SRV-25-125★	NW25	2.0 PSIG
SRV-40-125★	NW40	2.0 PSIG

★= New Product

★★=Note: The 0.2 psig "cracking pressure" valves must be installed with the poppet in the vertical position. Other flange mountings are available upon request.



Key High Vacuum Products, Inc. ECV series valves are an Exhaust "Check" type valve, which were developed to safely isolate the vacuum process chamber from down stream materials by isolating the backing pump from the process chamber, eliminating reverse flow situations. The **ECV** series "Check" valves operate simply on the backing pumps exhaust flow; No outside utilities are required for operation such as an external compressed gas source.

Mounting

The **ECV** "Check" valve must be installed vertical orientation on the exhaust port of the backing pump, as the **ECV** "Check" valves are designed for directional flow.

Features / Benefits

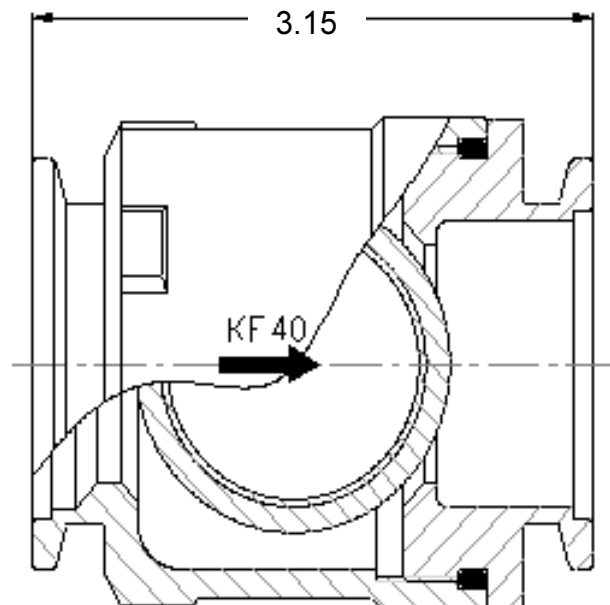
- Simple construction, inline, compact mounting, small envelope, virtually maintenance free.
- Standard NW 40 terminations
- Bakeable to 150 degrees centigrade

Materials of Construction

- Body = 316 stainless steel
- Viton® Bonnet Seal
- Poppet "Check Ball" is Viton®

Pneumatic Bellow Assemblies

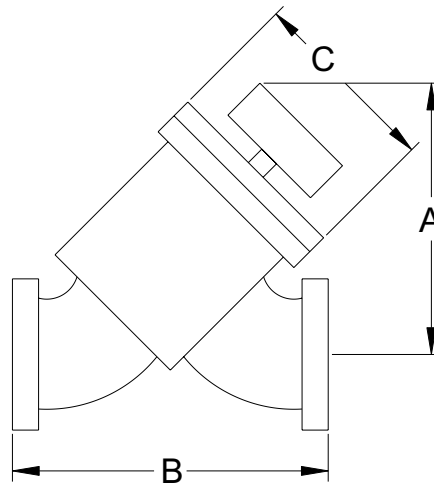
Part Number	Port Style	Length
ECV-40	NW 40	3.15



Stainless Steel Valves

Combination Valves, Stainless Steel, Viton® Bonnet and Poppet

Part Number	Tube OD	Port Style	A	B	C
CSAL-75	3/4"	Tube End	3.15	3.70	2.00
CSAL-75-K	3/4"	NW 16	3.15	4.70	2.00
CSAL-75-MS	3/4"	Mini MET-SEAL	3.15	4.01	2.00
CSAL-100	1"	Tube End	3.25	3.90	2.00
CSAL-100-K	1"	NW 25	3.25	4.23	2.00
CSAL-100-MS	1"	2-1/8" MET-SEAL	3.25	4.20	2.00
CSAL-150	1-1/2"	Tube End	4.29	4.82	2.75
CSAL-150-K	1-1/2"	NW 40	4.29	5.24	2.75
CSAL-150-MS	1-1/2"	2-3/4" MET-SEAL	4.29	5.12	2.75
CSAL-200	2"	Tube End	5.45	6.70	3.50
CSAL-200-K	2"	NW 50	5.45	7.15	3.50
CSAL-200-MS	2"	3-3/8" MET-SEAL	5.45	7.00	3.50



Combination Valves, Stainless Steel, OFHC® Bonnet and Viton® Poppet

Part Number	Tube OD	Port Style	A	B	C
CSAL-75-C	3/4"	Tube End	3.15	3.70	2.00
CSAL-75-MS-C	3/4"	Mini MET-SEAL	3.15	4.01	2.00
CSAL-100-C	1"	Tube End	3.25	3.90	2.00
CSAL-100-MS-C	1"	2-1/8" MET-SEAL	3.25	4.20	2.00
CSAL-150-C	1-1/2"	Tube End	4.29	4.82	2.75
CSAL-150-MS-C	1-1/2"	2-3/4" MET-SEAL	4.29	5.12	2.75
CSAL-200-C	2"	Tube End	5.45	6.70	3.50
CSAL-200-MS-C	2"	3-3/8" MET-SEAL	5.45	7.00	3.50

Gasket Kits for CSAL Valves

Viton® Gasket Kits

Part Number	Fits Valve Series	Price
OR-SA-100-N	75,100	\$ 13.00
OR-SA-150-N	150	\$ 13.00
OR-SA-200-N	200	\$ 18.00

Gasket Kits OFHC® Bonnet, Viton® Poppet

Part Number	Fits Valve Series
OR-SA-100-N-C	75,100
OR-SA-150-N-C	150
OR-SA-200-N-C	200

Manual Bellow Assemblies

Part Number	Fits Valve Series
RS-B-100-N	75,100
RS-B-150-N	150
RS-B-200-N	200

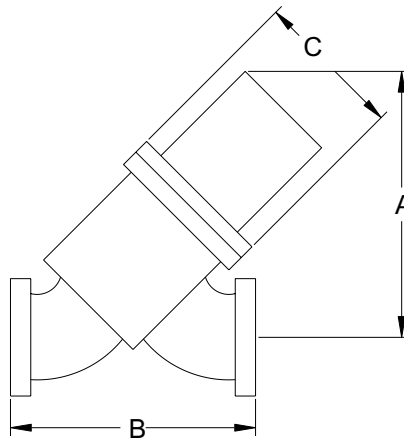


Stainless Steel Valves

1

Combination Valves, Stainless Steel, Electropneumatic, Viton® Bonnet and Poppet

Part Number	Tube OD	Port Style	A	B	C
CSAL-75-P	3/4"	Tube End	5.01	3.70	2.00
CSAL-75-P-K	3/4"	NW 16	5.01	4.70	2.00
CSAL-75-P-MS	3/4"	Mini MET-SEAL	5.01	4.01	2.00
CSAL-100-P	1"	Tube End	5.02	3.90	2.00
CSAL-100-P-K	1"	NW 25	5.02	4.23	2.00
CSAL-100-P-MS	1"	2-1/8" MET-SEAL	5.02	4.20	2.00
CSAL-150-P	1-1/2"	Tube End	5.40	4.82	2.75
CSAL-150-P-K	1-1/2"	NW 40	5.40	5.12	2.75
CSAL-150-P-MS	1-1/2"	2-3/4" MET-SEAL	5.40	5.24	2.75
CSAL-200-P	2"	Tube End	7.40	6.70	3.50
CSAL-200-P-K	2"	NW 50	7.40	7.15	3.50
CSAL-200-P-MS	2"	3-3/8" MET-SEAL	7.40	7.00	3.50



Combination Valves, Stainless Steel, Electropneumatic, OFHC® Bonnet and Viton® Poppet

Part Number	Tube OD	Port Style	A	B	C
CSAL-75-P-C	3/4"	Tube End	5.01	3.70	2.00
CSAL-75-P-MS-C	3/4"	Mini MET-SEAL	5.01	4.01	2.00
CSAL-100-P-C	1"	Tube End	5.02	3.90	2.00
CSAL-100-P-MS-C	1"	2-1/8" MET-SEAL	5.02	4.20	2.00
CSAL-150-P-C	1-1/2"	Tube End	5.40	4.82	2.75
CSAL-150-P-MS-C	1-1/2"	2-3/4" MET-SEAL	5.40	5.12	2.75
CSAL-200-P-C	2"	Tube End	7.40	6.70	3.50
CSAL-200-P-MS-C	2"	3-3/8" MET-SEAL	7.40	7.00	3.50

Gasket Kits for CSAL Valves

Viton® Gasket Kits

Gasket Kits OFHC® Bonnet, Viton® Poppet

Part Number	Fits Valve Series	Price	Part Number	Fits Valve Series
OR-PSA-100-N	75,100	\$ 13.00	OR-PSA-100-N-C	75,100
OR-PSA-150-N	150	\$ 13.00	OR-PSA-150-N-C	150
OR-PSA-200-N	200	\$ 18.00	OR-PSA-200-N-C	200

Options: add code to suffix of part number

Pneumatic Bellows Assemblies

Description	Option Code	Price	Part Number	Fits Valve Series
24 Volt DC solenoid	-24VDC	Add \$ 20.00	PRS-B-100-N	75,100
24 Volt AC solenoid	-24VAC	Add \$ 20.00	PRS-B-150-N	150
220 Volt AC solenoid	-220VAC	Add \$ 20.00	PRS-B-200-N	200
Mechanical limit switches	-LS	Add \$ 300.00		
No solenoid	-NS	Deduct \$ 10.00		



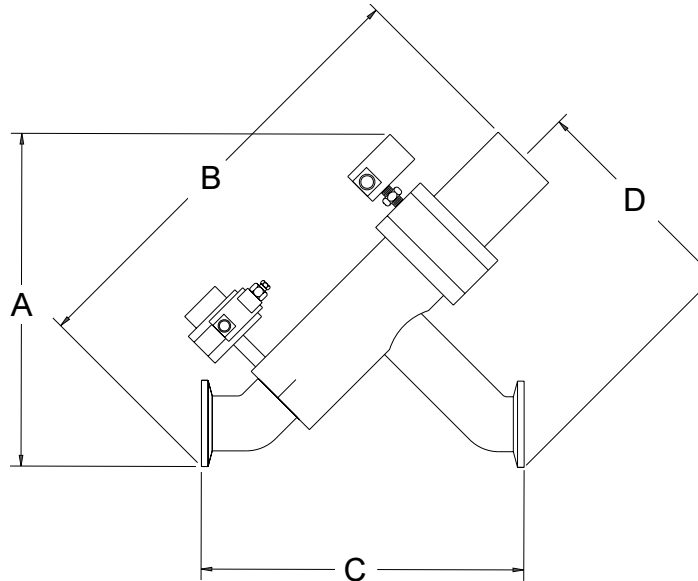
Slow Pump Pneumatic Combination Valves

SPVCSAL Combination Valves, Electropneumatic Operation, Viton® O-Ring on bonnet and poppet seal

Part Number	Tube OD	Port Size	A	B	C	D
SPVCSAL-75-P★	3/4"	Tube End	7.31	7.59	4.93	3.52
SPVCSAL-75-P-K★	3/4"	NW 16	7.50	7.78	5.25	3.75
SPVCSAL-75-P-MS★	3/4"	Mini MET-SEAL	7.42	7.70	5.36	3.82
SPVCSAL-100-P★	1"	Tube End	7.75	8.13	5.08	4.00
SPVCSAL-100-P-K★	1"	NW 25	7.75	8.13	5.40	4.00
SPVCSAL-100-P-MS★	1"	2-1/8" MET-SEAL	7.75	8.13	5.52	4.00
SPVCSAL-150-P★	1-1/2"	Tube End	8.50	10.00	5.70	4.00
SPVCSAL-150-P-K★	1-1/2"	NW 40	8.82	10.20	6.00	4.37
SPVCSAL-150-P-MS★	1-1/2"	2-3/4" MET-SEAL	9.12	10.20	6.00	4.42
SPVCSAL-200-P★	2"	Tube End	11.00	12.52	7.46	5.12
SPVCSAL-200-P-K★	2"	NW 50	11.47	13.00	7.78	5.60
SPVCSAL-200-P-MS★	2"	3-3/8" MET-SEAL	11.69	13.68	8.37	5.80

Note: All Valves are spring loaded, fail safe. Published price includes 120/60 solenoids standard.

★= New Product



Optional Accessories / Ordering Info

Optional solenoid Voltages; add code to suffix of part number

24vdc - Ordering code - 1

24vac - Ordering code - 2

240vac - Ordering code - 3

Example: SPVCSAL-150-P-K-1 (Slow Pump-Combo Valve, 1-1/2", Pneumatic, NW 40, 24vdc)

Additional Cost = \$ 30.00

Kalrez®, Chemrez®, Paraflo® Seals are available upon request, contact factory for price schedule.

Custom bypass orifices sizes are available, contact factory

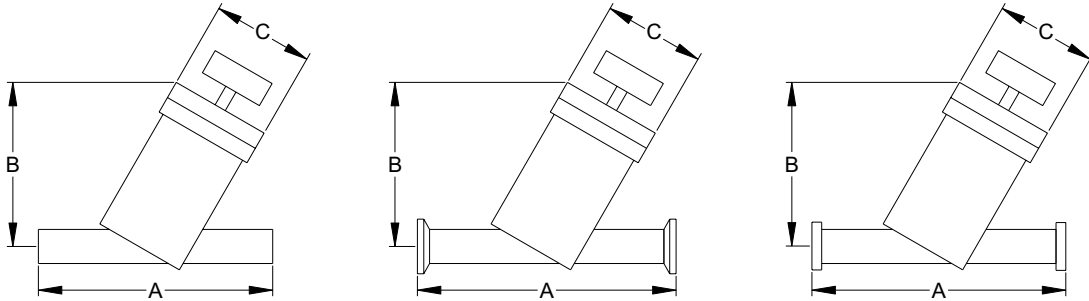


Stainless Steel Valves

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Straight Thru Valves, Stainless Steel, Manual, Viton® Bonnet and Poppet

Part Number	Tube OD	Port Style	A	B	C
ILV-75	3/4"	Tube End	5.00	4.00	3.50
ILV-75-K	3/4"	NW 16	5.32	4.00	3.50
ILV-75-MS	3/4"	Mini MET-SEAL	6.00	4.00	3.50
ILV-100	1"	Tube End	5.50	4.12	3.50
ILV-100-K	1"	NW 25	5.82	4.12	3.50
ILV-100-MS	1"	2-1/8" MET-SEAL	5.92	4.12	3.50
ILV-150	1-1/2"	Tube End	7.01	4.37	3.50
ILV-150-K	1-1/2"	NW 40	7.37	4.37	3.50
ILV-150-MS	1-1/2"	2-3/4" MET-SEAL	7.43	4.37	3.50



Viton® Gasket Kits

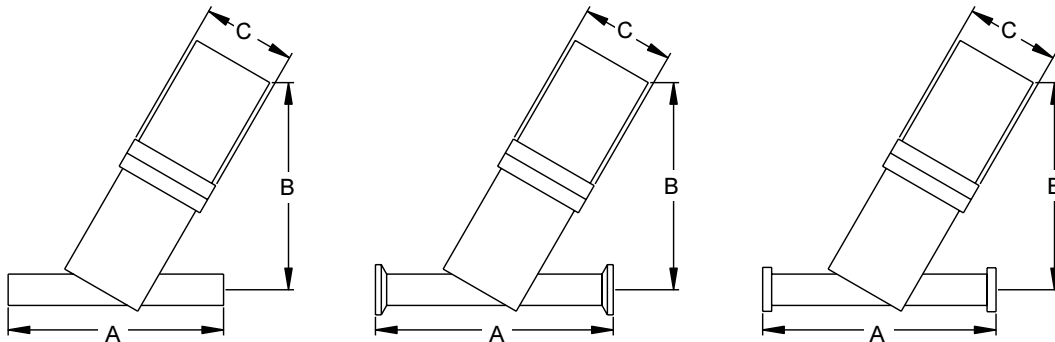
Part Number	Fits Valve Series
OR-SA-200-N	75,100,150

Manual Bellows Assembly

Part Number	Fits Valve Series
RS-B-200-N	75,100,150

Straight Thru Valves, Stainless Steel, Electropneumatic, Viton® Bonnet and Poppet

Part Number	Tube OD	Port Style	A	B	C
ILV-75-P	3/4"	Tube End	5.00	5.75	3.50
ILV-75-P-K	3/4"	NW 16	5.32	5.75	3.50
ILV-75-P-MS	3/4"	Mini MET-SEAL	6.00	5.75	3.50
ILV-100-P	1"	Tube End	5.50	5.87	3.50
ILV-100-P-K	1"	NW 25	5.82	5.87	3.50
ILV-100-P-MS	1"	2-1/8" MET-SEAL	5.92	5.87	3.50
ILV-150-P	1-1/2"	Tube End	7.01	6.12	3.50
ILV-150-P-K	1-1/2"	NW 40	7.37	6.12	3.50
ILV-150-P-MS	1-1/2"	2-3/4" OD MET-SEAL	7.43	6.12	3.50



Viton® Gasket Kit

Part Number	Fits Valve Series
OR-PSA-200-N	75, 100,150

Pneumatic Bellows Assembly

Part Number	Fits Valve Series
PRS-B-200-N	75,100,150

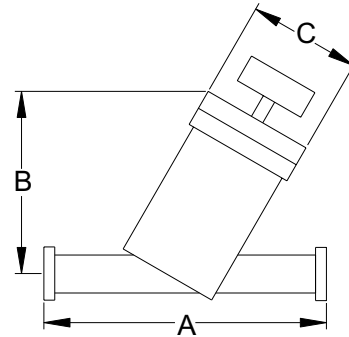
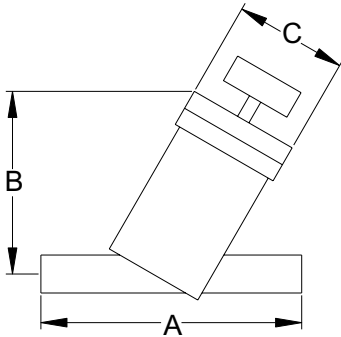


Stainless Steel Valves



Straight Thru Valves, Stainless Steel, Manual, OFHC® Bonnet and Viton® Poppet

Part Number	Tube OD	Port Style	A	B	C
ILV-75-C	3/4"	Tube End	5.00	4.00	3.50
ILV-75-MS-C	3/4"	Mini MET-SEAL	6.00	4.00	3.50
ILV-100-C	1"	Tube End	5.50	4.12	3.50
ILV-100-C-MS	1"	2-1/8" MET-SEAL	5.92	4.12	3.50
ILV-150-C	1-1/2"	Tube End	7.01	4.37	3.50
ILV-150-MS-C	1-1/2"	2-3/4" MET-SEAL	7.43	4.37	3.50



Gasket Kit, OFHC® Bonnet, Viton® Poppet

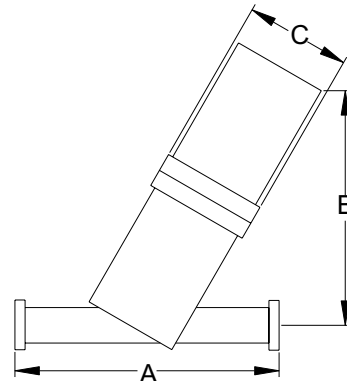
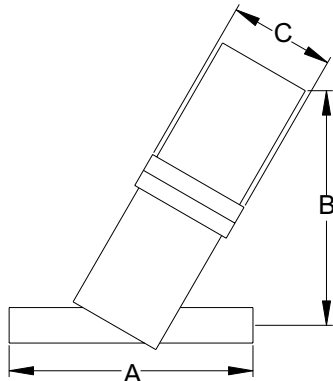
Part Number	Fits Valve Series
OR-SA-200-N-C	75,100,150

Manual Bellows Assembly

Part Number	Fits Valve Series
RS-B-200-N	75,100,150

Straight Thru Valves, Stainless Steel, Electropneumatic, OFHC® Bonnet and Viton® Poppet

Part Number	Tube OD	Port Style	A	B	C
ILV-75-P-C	3/4"	Tube End	5.00	5.75	3.50
ILV-75-P-MS-C	3/4"	Mini MET-SEAL	6.00	5.75	3.50
ILV-100-P-C	1"	Tube End	5.50	5.87	3.50
ILV-100-P-MS-C	1"	2-1/8" MET-SEAL	5.92	5.87	3.50
ILV-150-P-C	1-1/2"	Tube End	7.01	6.12	3.50
ILV-150-P-MS-C	1-1/2"	2-3/4" OD MET-SEAL	7.43	6.12	3.50



Gasket Kit OFHC® Bonnet, Viton® Poppet

Part Number	Fits Valve Series
OR-PSA-200-N-C	75, 100,150

Pneumatic Bellows Assembly

Part Number	Fits Valve Series
PRS-B-200-N	75,100,150

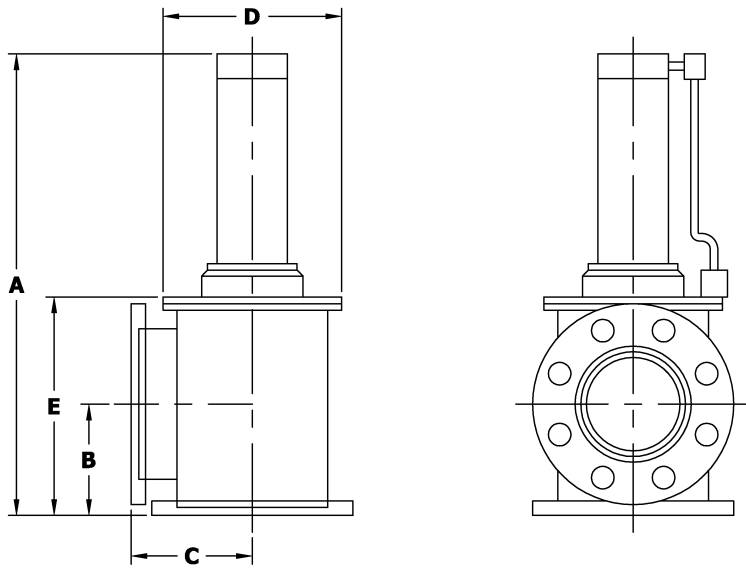
Optional Pneumatic Accessories (Solenoids are optional on ILV series; see chart)

Part Number	Description	Fits Valve Series
35A-AAA-DAAJ1KA	120/60 solenoid	All
35A-AAA-DABA1BA	230 volt solenoid	All
35A-AAA-DDAJ1KA	24 volt DC solenoid	All
35A-AAA-DACJ1KA	24 volt AC solenoid	All
-LS (add to suffix of part number)	Mechanical limit switches	All



Stainless Steel Valves

2



Right Angle Valve O-Ring Shaft Seal

Features:

- Electropolished, 304 stainless steel body
- Viton® O-ring seals
- Normally closed, spring loaded (fail safe) air cylinder
- 120/60 solenoid included
- Rugged, simple proved industrial design intended for large differential pressures and/or high partial environments

Part Number	Tube OD	Port Style	A	B	C	D	E
RAV-37-K★	3/8"	NW 10	5.70	1.65	1.65	2.00	3.80
RAV-50-K★	1/2"	NW 16	5.70	1.65	1.65	2.00	3.80
RAV-75-K★	3/4"	NW 16	6.25	2.12	2.12	2.00	4.37
RAV-100-K★	1"	NW 25	6.37	2.25	2.25	2.00	4.95
RAV-150-K★	1-1/2"	NW 40	7.50	2.46	2.46	2.75	4.95
RAV-200-K★	2"	NW 50	10.30	3.50	3.50	3.50	6.93
RAV-400	4"	Tube End	18.00	4.87	4.87	6.0	9.62
RAV-400-ISO	4"	NW 100	18.50	5.12	5.12	6.0	9.87
RAV-400-ASA	4"	ASA 9	18.62	5.25	5.25	6.0	10.00
RAV-600	6"	Tube End	25.12	6.00	6.00	10.0	12.12
RAV-600-ISO	6"	NW 160	25.37	6.250	6.25	10.0	12.50
RAV-600-ASA	6"	ASA 11	25.50	6.375	6.375	10.0	12.62
RAV-800★	8"	Tube End	29.18	8.00	8.00	12.00	15.01
RAV-800-ISO★	8"	NW 200	29.43	8.25	8.25	12.00	15.26
RAV-800-ASA★	8"	ASA 13	29.56	8.37	8.37	12.00	15.39
RAV-1000-ISO★	10"	NW 250	36	10.50	10.50	14.00	18.50
RAV-1000-ASA★	10"	ASA 13	36.50	10.62	10.62	14.00	18.62

★ = New Product, Note: * Valve shown with optional o-ring groove in mounting flange.

Options for RAV SERIES valves: Add code to suffix of part number

Description	Option Code	
24 Volt DC solenoid	-24VDC	Add
24 Volt AC solenoid	-24VAC	Add
220 Volt AC solenoid	-220VAC	Add
Reed Switches	-LS	Add
No solenoid	-NS	Deduct

Note: Additional options such as roughing ports, gauge ports, sealing materials, etc. are available. Contact factory direct for price schedules.



Heater Blankets

For METAL ETCH and CVD process equipment



In an ETCH/CVD environment one of the major areas of concern is the solidification of process gases that cool as they exit from the heated process chamber to the cooler temperatures found downstream. These gases then sublime on the surfaces of the foreline. Result; solidification of hazardous byproducts in the line causing a loss in conductance, particle migration issues and fouling of the valve seals. By using **KEY HIGH HEATER BLANKETS**, significant enhancements have been proven in reducing or eliminating these vital concerns. By incorporating **HEATER BLANKETS** to heat the foreline to an elevated temperature of 100°C, assures the gases will not condense and solidify on their way to the scrubber. Clean up your downstream concerns with **HEATER BLANKETS** from **KEY HIGH VACUUM PRODUCTS, INC.**

Features:

All **KEY HIGH HEATER BLANKETS** feature a standard internal thermostat to control the high temperature set point, eliminating high temperature run away. Many **HEATER BLANKETS** feature a visual red light alerting personnel of proper operation of the blanket. All **HEATER BLANKETS** have two Hubbell twist plugs (one male, one female) for easy daisy chain installation. The typical ramp up cycle of a **HEATER BLANKET** to the thermal set point, is less than 30 minutes from a cold start. Most **HEATER**

BLANKETS combine ceramic snap action thermostat and fuse to control the high set point and all blankets are manufactured from UL recognized materials and are cleanroom compliant (silicone foam insulation of the blanket and kevlar laces.) All blankets are installed to conserve on radiant heat loss and control excessive particle contamination with a snug intimate fit. The external temperature of the blanket is approximately 75°C and personnel should exercise proper precaution accordingly.

KEY HIGH VACUUM PRODUCTS, INC.'s power cables are specifically designed and engineered for the **HEATER BLANKETS**. All power cables are grounded and fused for safety and must be purchased separately.

BENEFIT OF HEATER BLANKETS:

These silicone rubber heaters are designed and engineered to be simple to use, rugged in construction and are economical. By applying a uniform thermal load to down stream forelines, improves the consistence of process yields as well as adding predictability to the preventive maintenance cycle. By using **KEY HIGH HEATER BLANKETS** results in faster pump down cycles, less water vapor, reduction of particles, elimination of solid buildup, combining to increase machine uptime and thruput of product.



Heater Blankets

HOW TO INSTALL COMPONENTS AND HEATER BLANKETS:

Always position valves as close as feasible to the process chamber. Attach if possible. This reduces the chance of particle buildup upstream of the valve, which will migrate into the valve enclosure adversely affecting the performance of the valve. Always install valves in front of traps, as traps by their inherent nature will cool the gas stream generating particles which may condense on the valve surface.

Upon request **HEATER BLANKETS** are available in a wide variety of shapes, sizes and voltages, which can be designed, engineered and fabricated per customer request. Consult factory for details.

Inline Valve Heater Blankets

Part Number	Description	Volts	Watts
HJ-SL-75	3/4" inline valve heater jacket	120ac	30
HJ-SL-100*	1" inline valve heater jacket	120ac	35
HJ-SL-150*	1-1/2" inline valve heater jacket	120ac	80
HJ-SL-200	2" inline valve heater jacket	120ac	100

* = Due to size limits not available with indicator light of thermal cutoff switch

Note: For 220 volt AC heater jackets, add 220 to end of part number, example: HJ-SL75220

Angle Valve Heater Blankets

Part Number	Description	Volts	Watts
HJ-SA-75*	3/4" angle valve heater jacket	120ac	40
HJ-SA-100*	1" angle valve heater jacket	120ac	50
HJ-SA-150*	1-1/2" angle valve heater jacket	120ac	80
HJ-SA-200	2" angle valve heater jacket	120ac	100

* = Due to size limits not available with indicator light or thermal cutoff switch

Note: For 220 volt AC heater jackets, add 220 to end of part number, example: HJ-SA200220

NW Flanged Full Nipple Heater Blankets

Part Number	Description	Volts	Watts
HJ-KSS3940*	1-1/2" OD tube 5.12 OAL NW 40's	120ac	40
HJ-KSS3940-1	1-1/2" OD tube 12.6 OAL NW 40's	120ac	110
HJ-KSS3950	2" OD tube 5.51 OAL NW 50's	120ac	60
HJ-KSS3950-1	2" OD tube 12.6 OAL NW 50's	120ac	160
HJ-KSN7763	2-1/2" OD tube 6.92 OAL NW 63's	120ac	110
HJ-KSN7780	3" OD tube 7.72 OAL NW 80's	120ac	125
HJ-KSN77100	4" OD tube 8.5 OAL NW 100's	120ac	190

* = Due to size limits not available with indicator light or thermal cutoff switch

Note: for 220 volt AC heater jackets, add 220 to end of part number, example: HJ-KSS3940220



Heater Blankets



NW Flanged 45° Radius Elbow Heater Blankets

Part Number	Description	Volts	Watts
HJ-KSE4440*	1-1/2" OD tube NW 40's	120ac	30
HJ-KSE4450	2" OD tube NW 50's	120ac	55
HJ-KSE7463	2-1/2" OD tube NW 63's	120ac	80
HJ-KSE7480	3" OD tube NW 80's	120ac	90
HJ-KSE74100	4" OD tube NW 100's	120ac	100

* = Due to size limits not available with indicator light or thermal cutoff switch

Note: for 220 volt AC heater jackets, add 220 to end of part number, example: HJ-KSE4450220

NW Flanged 90° Radius Elbow Heater Blankets

Part Number	Description	Volts	Watts
HJ-KSE4140*	1-1/2" OD tube NW 40's	120ac	35
HJ-KSE4150	2" OD tube NW 50's	120ac	65
HJ-KSE7363R	2-1/2" OD tube NW 63's	120ac	100
HJ-KSE7280R	3" OD tube NW 80's	120ac	120
HJ-KSE73100R	4" OD tube NW 100's	120ac	200

* = Due to size limits not available with indicator light or thermal cutoff switch

Note: For 220 volt AC heater jackets, add 220 to end of part number, example: HJ-KSE4150220

NW Flanged Tee Heater Blankets

Part Number	Description	Volts	Watts
HJ-KST4540*	1-1/2" OD tube NW 40's	120ac	50
HJ-KST4550	2" OD tube NW 50's	120ac	120
HJ-KST7563	2-1/2" OD tube NW 63's	120ac	130
HJ-KST7580	3" OD tube NW 80's	120ac	135
HJ-KST75100	4" OD tube NW 100's	120ac	200

* = Due to size limits not available with indicator light or thermal cutoff switch

Note: for 220 volt heater jackets, add 220 to end of part number, example: HJ-KST4550220

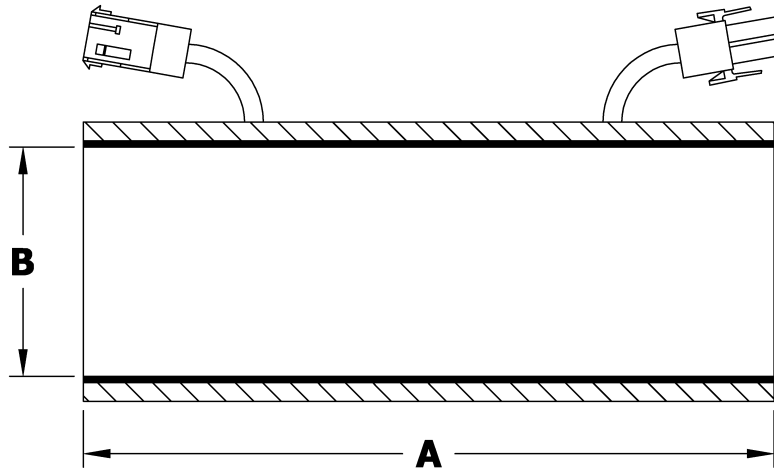
NW Flange Joint Heater Blankets

Part Number	Description	Volts	Watts
HJ-KSCA2740**	NW 40 clamp assembly	120ac	15
HJ-KSCA2750**	NW 50 clamp assembly	120ac	35
HJ-KSCA9463**	ISO-MF NW 63 clamp assembly	120ac	50
HJ-KSCA9480**	ISO-MF NW 80 clamp assembly	120ac	65
HJ-KSCA94100**	ISO-MF NW 100 clamp assembly	120ac	75
HJ-KSF7063**	ISO bolted NW 63 assembly	120ac	50
HJ-KSF7080**	ISO bolted NW 80 assembly	120ac	65
HJ-KSF70100**	ISO bolted NW 100 assembly	120ac	75

** = Due to size limits not available with indicator light, thermal cutoff switch or thermostat

Note: for 220 volt heater jackets, add 220 to end of part number, example: HJ-KSCA2750220



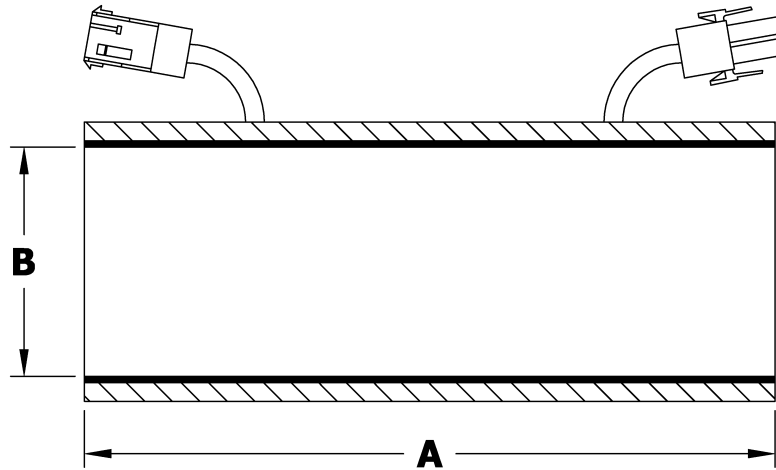


Straight Section Tube Heater Blankets for 1/4" OD tube

- 1/4" I.D. orange extruded silicone sponge with orange jacket, 1/4" wall thickness, snap closures
- 3" leads extend past each end of heater, 2 pin amp connectors
- 2.5 watts per square inch
- Thermocouple leads are Teflon insulated
- Snap closures

Part Number	A	B	Description	Volts	Watts
HJ-SST025-6	6"	1/4"		120 ac	12
HJ-SST025-6TC	6"	1/4"	Type J thermocouple	120 ac	12
HJ-SST025-9	9"	1/4"		120 ac	18
HJ-SST025-9TC	9"	1/4"	Type J thermocouple	120 ac	18
HJ-SST025-12	12"	1/4"		120 ac	24
HJ-SST025-12TC	12"	1/4"	Type J thermocouple	120 ac	24
HJ-SST025-18	18"	1/4"		120 ac	36
HJ-SST025-18TC	18"	1/4"	Type J thermocouple	120 ac	36
HJ-SST025-24	24"	1/4"		120 ac	48
HJ-SST025-24TC	24"	1/4"	Type J thermocouple	120 ac	48
HJ-SST025-36	36"	1/4"		120 ac	72
HJ-SST025-36TC	36"	1/4"	Type J thermocouple	120 ac	72





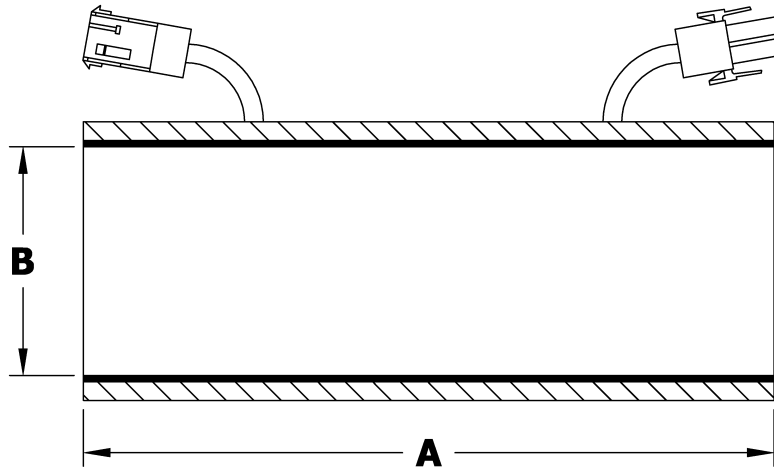
Straight Section Tube Heater Blankets for 1-1/2" OD tube

- 1/4" gray silicone sponge with gray jacket
- 3" leads extend past each end of heater, 2 pin amp connectors
- 1.5 watts per square inch
- Thermocouple pockets on all heaters 3" wide and over
- 1" trimable section on specified heaters
- Snap type closures

Part Number	A	B	Trimable Ends	Volts	Watts
HJ-SST150-2	2"	1-1/2"	No	120 ac	14
HJ-SST150-2T	2"	1-1/2"	Yes	120 ac	7
HJ-SST150-3	3"	1-1/2"	No	120 ac	22
HJ-SST150-3T	3"	1-1/2"	Yes	120 ac	14
HJ-SST150-4	4"	1-1/2"	No	120 ac	29
HJ-SST150-4T	4"	1-1/2"	Yes	120 ac	22
HJ-SST150-5	5"	1-1/2"	No	120 ac	36
HJ-SST150-5T	5"	1-1/2"	Yes	120 ac	29
HJ-SST150-6	6"	1-1/2"	No	120 ac	43
HJ-SST150-6T	6"	1-1/2"	Yes	120 ac	36
HJ-SST150-12	12"	1-1/2"	No	120 ac	85
HJ-SST150-12T	12"	1-1/2"	Yes	120 ac	78
HJ-SST150-18	18"	1-1/2"	No	120 ac	128
HJ-SST150-18T	18"	1-1/2"	Yes	120 ac	115
HJ-SST150-24	24"	1-1/2"	No	120 ac	170
HJ-SST150-24T	24"	1-1/2"	Yes	120 ac	160
HJ-SST150-30	30"	1-1/2"	No	120 ac	213
HJ-SST150-30T	30"	1-1/2"	Yes	120 ac	198
HJ-SST150-36	36"	1-1/2"	No	120 ac	255
HJ-SST150-36T	36"	1-1/2"	Yes	120 ac	240

Heater Blankets

1

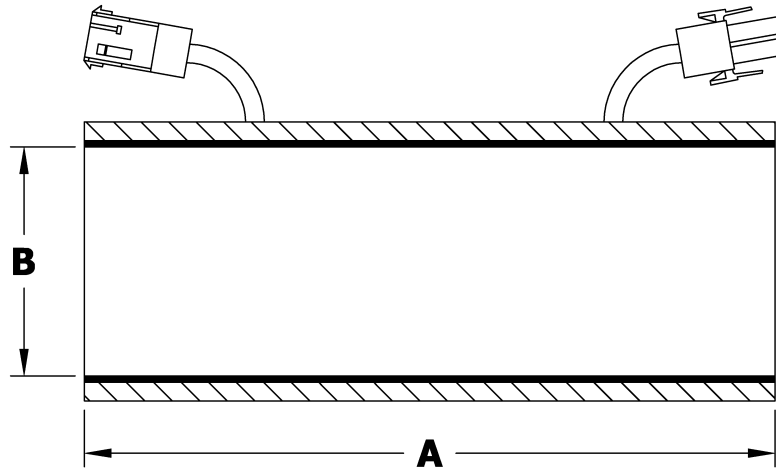


Straight Section Tube Heater Blankets for 2" OD Tube

- 1/4" gray silicone sponge with gray jacket
- 3" leads extend past each end of heater, 2 pin amp connectors
- 1.5 watts per square inch
- Thermocouple pockets on all heaters 3" wide and over
- 1" trimable section on specified heaters
- Snap type closures

Part Number	A	B	Trimable Ends	Volts	Watts
HJ-SST200-3	3"	2"	No	120 ac	19
HJ-SST200-3T	3"	2"	Yes	120 ac	10
HJ-SST200-4	4"	2"	No	120 ac	38
HJ-SST200-4T	4"	2"	Yes	120 ac	29
HJ-SST200-5	5"	2"	No	120 ac	48
HJ-SST200-5T	5"	2"	Yes	120 ac	38
HJ-SST200-6	6"	2"	No	120 ac	57
HJ-SST200-6T	6"	2"	Yes	120 ac	47
HJ-SST200-12	12"	2"	No	120 ac	114
HJ-SST200-12T	12"	2"	Yes	120 ac	104
HJ-SST200-18	18"	2"	No	120 ac	170
HJ-SST200-18T	18"	2"	Yes	120 ac	160
HJ-SST200-24	24"	2"	No	120 ac	225
HJ-SST200-24T	24"	2"	Yes	120 ac	215
HJ-SST200-30	30"	2"	No	120 ac	280
HJ-SST200-30T	30"	2"	Yes	120 ac	270
HJ-SST200-36	36"	2"	No	120 ac	340
HJ-SST200-36T	36"	2"	Yes	120 ac	330





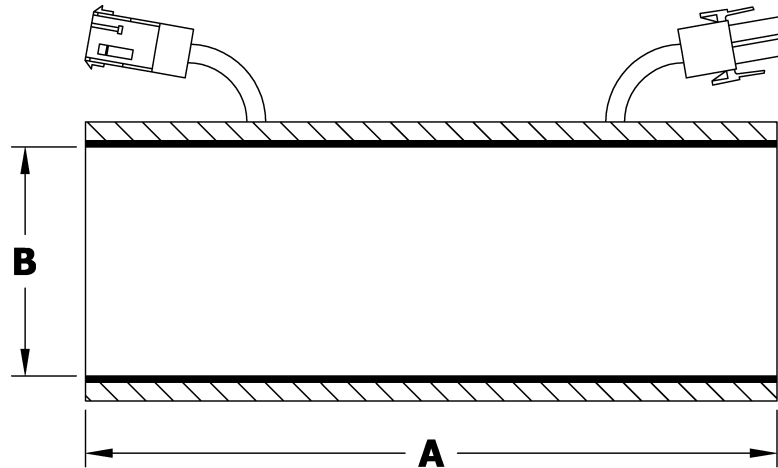
Straight Section Tube Heater Blankets for 3" OD Tube

- 1/4" gray silicone sponge with gray jacket
- 3" leads extend past each end of heater, 2 pin amp connectors
- 1.5 watts per square inch
- Thermocouple pockets on all heaters 3" wide and over
- 1" trimable section on specified heaters
- Snap type closures

Part Number	A	B	Trimable Ends	Volts	Watts
HJ-SST300-2	2"	3"	No	120 ac	24
HJ-SST300-2T	2"	3"	Yes	120 ac	12
HJ-SST300-3	3"	3"	No	120 ac	36
HJ-SST300-3T	3"	3"	Yes	120 ac	24
HJ-SST300-4	4"	3"	No	120 ac	48
HJ-SST300-4T	4"	3"	Yes	120 ac	36
HJ-SST300-5	5"	3"	No	120 ac	59
HJ-SST300-5T	5"	3"	Yes	120 ac	48
HJ-SST300-6	6"	3"	No	120 ac	71
HJ-SST300-6T	6"	3"	Yes	120 ac	59
HJ-SST300-12	12"	3"	No	120 ac	140
HJ-SST300-12T	12"	3"	Yes	120 ac	125
HJ-SST300-18	18"	3"	No	120 ac	213
HJ-SST300-18T	18"	3"	No	120 ac	213
HJ-SST300-24	24"	3"	No	120 ac	283
HJ-SST300-24T	24"	3"	Yes	120 ac	268

Heater Blankets

1



Straight Section Tube Heater Blankets for 4" OD Tube

- 1/4" gray silicone sponge with gray jacket
- 3" leads extend past each end of heater, 2 pin amp connectors
- 1.5 watts per square inch
- Thermocouple pockets on all heaters 3" wide and over
- 1" trimable section on specified heaters
- Snap type closures

Part Number	A	B	Trimable Ends	Volts	Watts
HJ-SST400-2	2"	4"	No	120 ac	32
HJ-SST400-2T	2"	4"	Yes	120 ac	16
HJ-SST400-3	3"	4"	No	120 ac	48
HJ-SST400-3T	3"	4"	Yes	120 ac	32
HJ-SST400-4	4"	4"	No	120 ac	63
HJ-SST400-4T	4"	4"	Yes	120 ac	48
HJ-SST400-5	5"	4"	No	120 ac	79
HJ-SST400-5T	5"	4"	Yes	120 ac	63
HJ-SST400-6	6"	4"	No	120 ac	95
HJ-SST400-6T	6"	4"	Yes	120 ac	79
HJ-SST400-8	8"	4"	No	120 ac	131
HJ-SST400-8T	8"	4"	Yes	120 ac	115
HJ-SST400-10	10"	4"	No	120 ac	158
HJ-SST400-10T	10"	4"	Yes	120 ac	146
HJ-SST400-12	12"	4"	No	120 ac	190
HJ-SST400-12T	12"	4"	Yes	120 ac	178
HJ-SST400-18	18"	4"	No	120 ac	285
HJ-SST400-18T	18"	4"	Yes	120 ac	270
HJ-SST400-24	24"	4"	No	120 ac	375
HJ-SST400-24T	24"	4"	Yes	120 ac	360
HJ-SST400-30	30"	4"	No	120 ac	470
HJ-SST400-30T	30"	4"	Yes	120 ac	455
HJ-SST400-36	36"	4"	No	120 ac	565
HJ-SST400-36T	36"	4"	Yes	120 ac	550



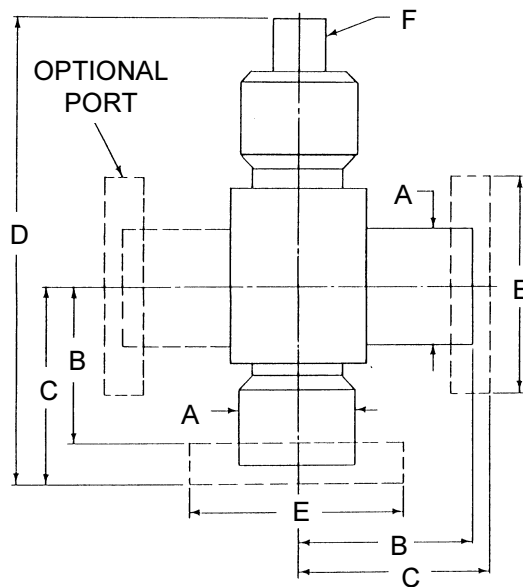
Bakeable All Metal Valves



KEY's All Metal Bakeable Valves, are designed for ultra high vacuum where high temperatures are encountered and the ultimate in low pressure is required. **KEY's** reliable design offers many leak-free cycles without gasket replacement.

Applications range from applied research studies, physics experiments, vacuum furnaces, to semiconductor processing.

- Bakeable to 450° C open or closed
- Replaceable OFHC® copper seal
- High conductance
- Right angle or Tee styles



Part Number	A	B	C	D		E	F
	Tube OD			Open	Closed		
BAV-75	3/4"	1.75	2-1/4	7-1/2"	6-3/4"	1.33"	3/8"
BAV-75-F	3/4"	2.25	2-1/4	8"	7-1/4"	1.33"	3/8"
BAV-75-F-T	3/4"	2.25	2-1/4	8"	7-1/4"	1.33"	3/8"
BAV-75-T	3/4"	1.75	2-1/4	7-1/2"	6-3/4"	1.33"	3/8"
BAV-100	1"	2.04	2-1/4	5-3/4"	4-7/8"	2-3/4"	1/2"
BAV-100-F	1"	2.04	2-1/4	5-3/4"	4-7/8"	2-3/4"	1/2"
BAV-100-F-T	1"	2.04	2-1/4	5-3/4"	4-7/8"	2-3/4"	1/2"
BAV-100-T	1"	2.04	2-1/4	5-3/4"	4-7/8"	2-3/4"	1/2"
BAV-150	1-1/2"	2.26	2-15/32	7"	5-7/8"	2-3/4"	11/16"
BAV-150-F	1-1/2"	2.26	2-15/32	7"	5-7/8"	2-3/4"	11/16"
BAV-150-F-T	1-1/2"	2.26	2-15/32	7"	5-7/8"	2-3/4"	11/16"
BAV-150-T	1-1/2"	2.26	2-15/32	7"	5-7/8"	2-3/4"	11/16"



KES Series 200 and 300 Straight Thru Solenoid Valve

Features:

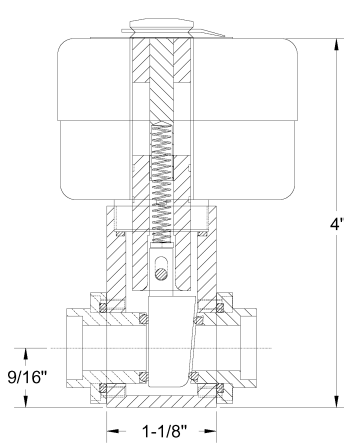
- Available in brass and stainless steel type 304
- High conductance straight thru construction
- Continuous duty rated solenoid
- 115 VAC operation

Description:

KES 200 and 300 Series straight thru solenoid valves are direct acting electromagnetic in operation; they require no compressed air. These valves feature a reliable design and are spring loaded "Fail Safe" (valves will close) for system protection in the event of a loss of power. Do not install **KES** Series more than 45° from vertical position for best results. All valves are leak tested at 3×10^{-9} torr on a helium leak detector with a one-atmosphere differential.



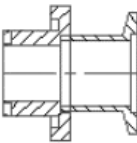
KES 200



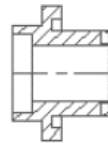
Pipe Tape Flange



Flanged

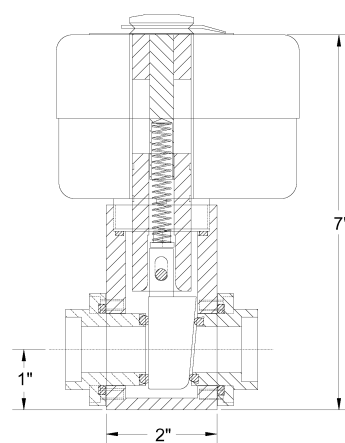


NW Flange



Socket Weld Flange

KES 300



Stainless Steel Construction:

Part Number	Mounting Flanges
KES-200-F-SS	3/8" Flanged Counterbore
KES-201-F-SS	1/2" Flanged Counterbore
KES-200-PT-SS	1/8" Female NPT
KES-201-PT-SS	1/4" Female NPT
KES-200-SW-SS	3/8" Socket Weld
KES-201-SW-SS	1/2" Socket Weld
KES-200-KF-SS	NW 10
KES-201-KF-SS	NW 16
KES-300-F-SS	3/4" Flanged Counterbore
KES-301-F-SS	1" Flanged Counterbore
KES-300-PT-SS	3/8" Female NPT
KES-301-PT-SS	1" Female NPT
KES-300-SW-SS	3/4" Socket Weld
KES-301-SW-SS	1" Socket Weld
KES-300-KF-SS	NW 25
KES-301-KF-SS	NW 40

Brass Construction:

Part Number	Mounting Flanges
KES-200-F-BR	3/8" Flanged Counterbore
KES-201-F-BR	1/2" Flanged Counterbore
KES-200-PT-BR	1/8" Female NPT
KES-201-PT-BR	1/4" Female NPT
KES-200-SW-BR	3/8" Socket Weld
KES-201-SW-BR	1/2" Socket Weld
KES-200-KF-BR	NW 10
KES-201-KF-BR	NW 16
KES-300-F-BR	3/4" Flanged Counterbore
KES-301-F-BR	1" Flanged Counterbore
KES-300-PT-BR	3/8" Female NPT
KES-301-PT-BR	1" Female NPT
KES-300-SW-BR	3/4" Socket Weld
KES-301-SW-BR	1" Socket Weld
KES-300-KF-BR	NW 25
KES-301-KF-BR	NW 40



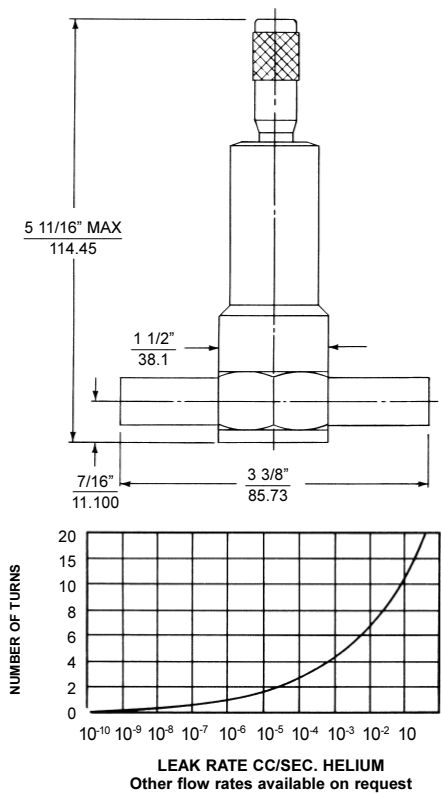
Series 100 Accu-flow Metering Valve

Features:

- Manually operated
- Precise linear flow rates
- Bellows sealed
- Available in 304 stainless steel construction and chrome plated brass

Description:

A micrometer drive that allows predictable and linear flow patterns with a wide control range as well as a positive shut off. The micrometer drive is ideal for precise control of gas accurately at any desired level. All valves are leak tested at 3×10^{-9} torr on a helium leak detector with a one-atmosphere differential.



END FITTINGS

1/8" FEMALE NPT		STYLE-P
1/4" QUICK CONNECT FITTING		STYLE-Q
1 1/3" O.D MIN. CONFLAT		STYLE-C
1 3/8" O.D. O-RING FLANGE		STYLE-O
1/8" - 1/4" SWAGELOK		STYLE-S
1/4" SOCKET WELD		STYLE-SW

Inlet and outlet fittings other than standard available on special request.

Stainless Steel Construction:

Part Number	Mounting Flanges
AF-100-PS	1/8" Female NPT
AF-100-QS	1/4" Quick Connect Fitting
AF-100-CS	1-1/3" OD Mini MET-SEAL
AF-100-SS-1/8	1/8" Swagelok®
AF-100-SS-1/4	1/4" Swagelok®
AF-100-SW-S	1/4" Socket Weld
AF-100-VCR	1/4" Male VCR®
AF-100-VCR-25F	1/4" Female VCR®
AF-100-KF16-SS	NW 16

Chrome Plated Brass Construction:

Part Number	Mounting Flanges
AF-100-PB	1/8" Female NPT
AF-100-PB-1/4	1/4" Female NPT
AF-100-QB	1/4" Quick Connect Fitting
AF-100-CB	1-1/3" OD Mini MET-SEAL
AF-100-SB-1/8	1/8" Swagelok®
AF-100-SB-1/4	1/4" Swagelok®
AF-100-SW-B	1/4" Socket Weld
AF-100-BR-KF16	NW 16



PEV Series Piezoelectric Gas Flow Valve

Features:

- Stainless steel construction
- 0 to 525 sccm
- Precise linear control flow rate
- Suitable for all dry non-corrosive gases compatible with materials

Description:

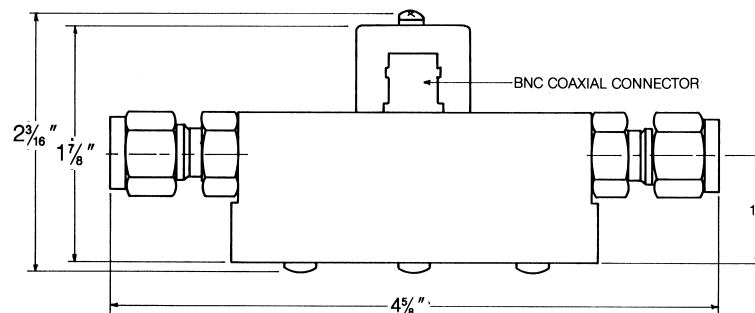
The **Piezoelectric Gas Flow Valve Model PEV-1** is a high precision gas leak valve which uses a piezoelectric bender element that responds directly to a voltage signal, which causes the opening and closing of the valve. The piezoelectric bender element responds within milliseconds to a voltage signal of 0 to 100-Volt DC. All **PEV-1** valves have a two micron filter on the inlet, viton® seals and a coaxial BNC connector(Kings KC-79-117). The threshold voltage of the valve is 20 to 30 volts, maximum voltage is 100 Volt DC and inlet pressure should not exceed 50 PSI.

The **PEV-1** Series valves are designed to be fail-safe. In the event of a power loss, the **PEV-1** will close and remain closed until power is restored to valve. All valves manufactured by **KEY HIGH VACUUM PRODUCTS, INC.** are leak tested on a helium mass spectrometer at 3×10^{-9} torr with a one-atmosphere differential on the inlet and exhibit no leakage.



PEV-1 Ordering Information

Part Number	Description
PEV-1	Piezoelectric Valve 1/4" Swagelok® Fittings
PEV-1-VCR®	Piezoelectric Valve 1/4" Male VCR's®
PEV-1-001	Replacement Viton® Seals
PEV-1-002	Inlet Filter 2 Micron
PEV-1-003	RG-188 Cable 10 Foot With One Mating Connector Only
PEV-1-004	1/4" FNPT Inlet Fitting & 1/2" OD Tube Outlet Fitting

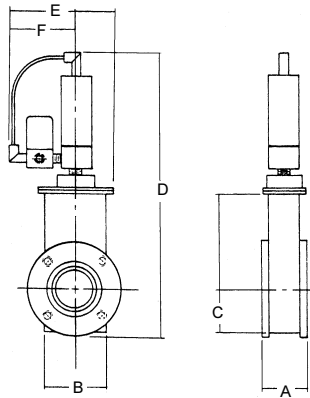


Gate Valves, Stainless Steel

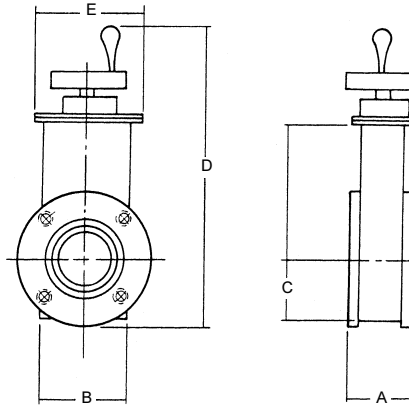
Features:

- 2" - 2-1/2"
- Bellows sealed
- Available pneumatic and manual configurations
- ASA, ISO-KF and Metal Seal flanges

Pneumatic Gate Valve



Manual Gate Valve



Pneumatic Gate Valve

Flange Data								Valve Dimensions						
Part No	Type	Nominal	ID	OD	BC	# of Holes	Thread	A	B	C	D	E	F	G
GV-2-AP	ASA	2	2.00	6.00	4.750	4	3/8-16	2.125	3.875	3.00	15.00	7.00	4.00	5.50
GV-2-CP	Conflat	2	2.00	4.50	3.628	8	5/16-24	2.750	3.875	2.312	15.00	7.00	4.00	5.50
GV-2-ISP	KF	2	2.00	2.95	-	-	-	3.375	3.875	1.500	15.00	7.00	4.00	5.50
GV-25-AP	ASA	2-1/2	2.50	6.00	4.750	4	3/8-16	2.125	3.875	3.00	15.00	7.00	4.00	5.50
GV-25-CP	Conflat	2-1/2	2.50	4.50	3.628	8	5/16-24	2.750	3.875	2.312	15.00	7.00	4.00	5.50

Manual Gate Valve

Flange Data								Valve Dimensions						
Part No	Type	Nominal	ID	OD	BC	# of Holes	Thread	A	B	C	D	E	F	G
GV-2-AM	ASA	2	2.00	6.00	4.750	4	3/8-16	2.125	3.875	3.00	15.00	5.50	-	-
GV-2-CM	Conflat	2	2.00	4.50	3.628	8	5/16-24	2.750	3.875	2.312	14.25	5.50	-	-
GV-2-ISM	KF	2	2.00	2.95	-	-	-	3.375	3.875	1.500	13.50	5.50	-	-
GV-25-AM	ASA	2-1/2	2.50	6.00	4.750	4	3/8-16	2.125	3.875	3.00	15.00	5.50	-	-
GV-25-CM	Conflat	2-1/2	2.50	4.50	3.628	8	5/16-24	2.750	3.875	2.312	14.25	5.50	-	-

Specifications: Air Pressure 65-125 psig
 Electrical 115 Volts, 50/60 Hz
 Vacuum Seals Viton®
 Shaft Seal Bellows

Options: Optional Solenoid Voltages; Add - \$20.00
 12, 14VDC, or 220 VAC

Roughing and ION gauge ports; Contact Factory

Special ports and flanges available upon request

Replacement O-Ring Kits

Part No	Description
OR-GV-2	2" Manual & Pneumatic Valves
OR-GV-25	2-1/2" Manual & Pneumatic Valves

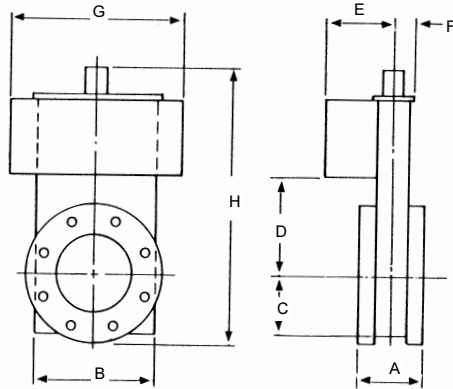


Gate Valves, Stainless Steel

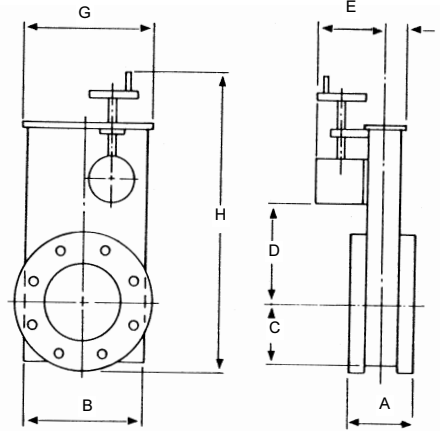
Features:

- 4", 6" & 8"
- Available in pneumatic and manual configurations
- Available with MET-SEAL and ASA flanges

Pneumatic Gate Valve



Manual Gate Valve



Pneumatic Gate Valve

Flange Data								Valve Dimensions							
Part No	Type	Nominal	ID	OD	BC	Holes	Thread	A	B	C	D	E	F	G	H
GV-4AP	ASA	4	4.00	9.00	7.500	8	5/8-18	2.625	7.00	3.44	4.75	5.19	1.44	11.0	17.12
GV-4CP	Conflat	4	4.00	5.97	5.128	16	5/16-24	2.375	7.00	3.44	4.75	5.19	1.44	11.0	15.62
GV-6AP	ASA	6	6.00	11.00	9.500	8	3/4-10	4.00	9.88	4.69	7.75	5.75	2.00	14.0	21.75
GV-6CP	Conflat	6	6.00	7.97	7.128	20	5/16-24	4.38	9.88	4.69	7.75	5.75	2.00	14.0	20.25
GV-8AP	ASA	8	7.75	11.00	9.500	8	3/4-10	4.00	9.88	4.69	7.75	5.75	2.00	14.0	21.75
GV-8CP	Conflat	8	7.75	9.97	9.128	24	5/16-24	4.44	9.88	4.69	7.75	5.75	2.00	14.0	21.25

Manual Gate Valve

Flange Data								Valve Dimensions							
Part No	Type	Nominal	ID	OD	BC	Holes	Thread	A	B	C	D	E	F	G	H
GV-4AM	ASA	4	4.00	9.00	7.500	8	5/8-18	2.625	7.00	3.44	4.75	5.19	1.44	8.50	18.12
GV-4CM	Conflat	4	4.00	5.97	5.128	16	5/16-24	2.375	7.00	3.44	4.75	5.19	1.44	8.50	16.62
GV-6AM	ASA	6	6.00	11.00	9.500	8	3/4-10	4.00	9.88	4.69	7.75	5.75	2.00	11.12	22.88
GV-6CM	Conflat	6	6.00	7.97	7.128	20	5/16-24	4.38	9.88	4.69	7.75	5.75	2.00	11.12	21.37
GV-8AM	ASA	8	7.75	11.00	9.500	8	3/4-10	4.00	9.88	4.69	7.75	5.75	2.00	14.0	21.75
GV-8CM	Conflat	8	7.75	9.97	9.128	24	5/16-24	4.44	9.88	4.69	7.75	5.75	2.00	14.0	21.25

Specifications: Air Pressure 65-125 psig
 Electrical 115 Volts, 50/60 Hz
 Vacuum Seals Viton®
 Shaft Seal With Double "O" Rings

Options: Position Indicators; Add \$120.00
 Optional Solenoid Voltages; Add \$ 20.00
 12V, 24 VDC, & 12V, 24V, 230VAC
 ISO flange Add \$200.00 per valve to ASA prices
 Metal Seal or ISO roughing port; Add \$200.00
 Special ports and flanges available upon request.

Replacement O-Ring Kits

Part No	Description
OR-GV-4	4" Manual & Pneumatic Valves
OR-GV-6	6" Manual & Pneumatic Valves
OR-GV-8	8" Manual & Pneumatic Valves





BA/BL Series brass valves are bellows sealed valves that feature a high density forged valve body eliminating porosity issues, virtual leaks, and are a reliable low cost high vacuum valve. The rugged time proven design and simple construction assures both an extensive life cycle as well as ease of maintenance. The **BA/BL** valve series feature high conductance short flow paths which make them perfect for use as foreline valves in nearly all general purpose environments with inert gases such as pumping stations, glove boxes, etc..

BA/BL Series valves are offered in right angle and inline versions, with three distinct port styles; NW flanges for mounting to standard ISO components; Female NPT ports 1/8" to 1-1/2" and tube socket weld (3/8" to 2-1/8" tube OD). Socket weld valves can be silver soldered (hard soldered) or soft soldered into place. When installing socket weld valves always remove the complete actuator/bellows assembly; the heat from the soldering operation will damage or destroy the elastometer seals and actuator. Upon completion of soldering, the valve body should be completely glass beaded, polished and cleaned to remove all flux and oxides generated while soldering. Great care should be taken while soldering valves to avoid damaging or destroying the valve seat. Experienced personnel should perform soldering where applicable. In order to minimize outgassing issues, no grease or lubricates should be used on any surface within the vacuum envelope when reinstalling the bellows assembly.

The **BA/BL Series** valves are offered with two different standard poppet seals for both the manual and pneumatic versions. The disk seal valves feature a viton® washer on the poppet. The benefits of this

design are higher dirt carrying ability, larger sealing area and the seal can be "flipped over" to effectively double the life of the seal. The o-ring seal valves feature a viton® o-ring that is incorporated into the poppet itself. The benefit of this design is a minimum of elastometer located within the vacuum envelope; there is a small additional charge for the brass o-ring style poppet valves. Both styles (disk and o-ring) are considered stock items.

Manual valves employ an Acme Thread stem for quick opening and closing of the valve.

Pneumatic valves have double acting air cylinders and 120/60-solenoid standard and require compressed air supply of 50 to 90 psig. Pneumatic **BA/BL Series** valves will close in the incident of a power failure. Other solenoid voltages are obtainable as options. Upon request spring loaded normally closed air cylinders are available (fail safe). Reed switches are also available for pneumatic valves as an option on double acting air cylinders only. Reed switches are commonly utilized for remote position indication of the valve position. When ordering the Reed switch option, voltage requirement must be specified at the time of order as AC and DC switches are not interchangeable.

BA/BL Series valves are designed to operate in high vacuum systems at pressures as low as 5×10^{-8} torr. All **BA/BL Series** valves are leak tested on a helium mass spectrometer having minimum sensitivity of 5×10^{-9} torr prior to shipment.

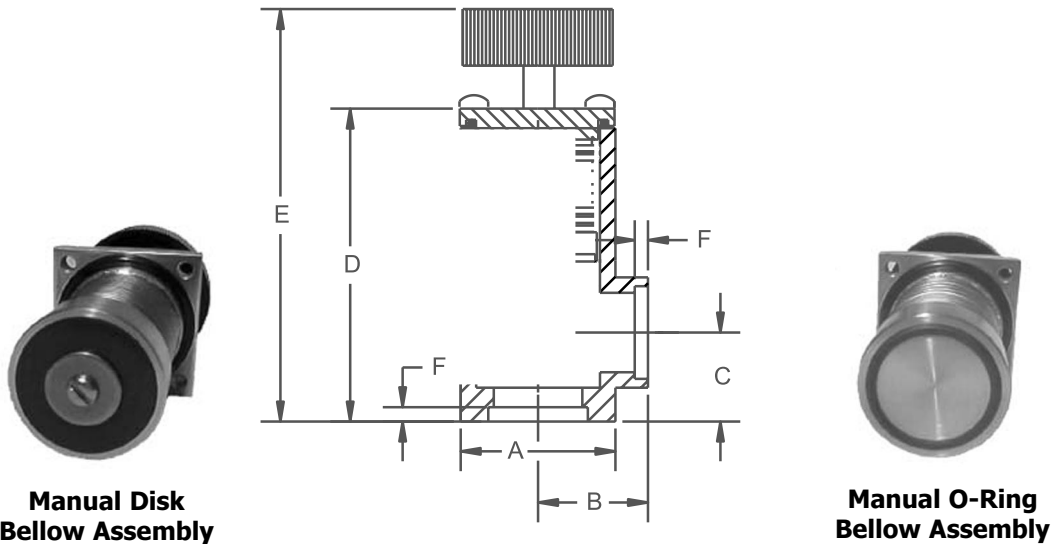
Options include but are not limited to roughing ports, Swagelok® ports, VCR® ports, Gauge ports, etc.. Contact factory for assistance.



Brass Valves

Right Angle Valves, Brass, Manual, Socket Weld, Viton® Bonnet and Poppet

Part Number	Poppet	Port Style	A	B	C	D	E	F
BA-37	Disk	3/8" Socket	1.00	.94	.75	2.81	4.25	.18
BA-37-O	O-Ring	3/8" Socket	1.00	.94	.75	2.81	4.25	.18
BA-50	Disk	1/2" Socket	1.00	.94	.75	2.81	4.25	.18
BA-50-O	O-Ring	1/2" Socket	1.00	.94	.75	2.81	4.25	.18
BA-75	Disk	3/4" Socket	1.37	1.31	.87	3.37	5.00	.37
BA-75-O	O-Ring	3/4" Socket	1.37	1.31	.87	3.37	5.00	.37
BA-112	Disk	1-1/8" Socket	2.00	1.68	1.18	4.12	6.10	.37
BA-112-O	O-Ring	1-1/8" Socket	2.00	1.68	1.18	4.12	6.10	.37
BA-162	Disk	1-5/8" Socket	2.50	1.87	1.62	4.62	6.50	.37
BA-162-O	O-Ring	1-5/8" Socket	2.50	1.87	1.62	4.62	6.50	.37
BA-200	Disk	2" Socket	3.00	2.25	2.00	5.25	8.00	.50
BA-200-O	O-Ring	2" Socket	3.00	2.25	2.00	5.25	8.00	.50
BA-212	Disk	2-1/8" Socket	3.00	2.25	2.00	5.25	8.00	.50
BA-212-O	O-Ring	2-1/8" Socket	3.00	2.25	2.00	5.25	8.00	.50



Manual Disk Bellow Assembly

Manual O-Ring Bellow Assembly

Manual Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-50	37,50
DB-75	75
DB-112	112
DB-162	162
DB-200	200,212

Manual O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-50	37,50
OB-75	75
OB-112	112
OB-162	162
OB-200	200,212

Manual Disk Replacement Seal Kits

Part Number	Fits Valve Series
DK-50	37,50
DK-75	75
DK-112	112
DK-162	162
DK-200	200,212

Manual O-Ring Replacement Seal Kits

Part Number	Fits Valve Series
OK-50	37,50
OK-75	75
OK-112	112
OK-162	162
OK-200	200,212

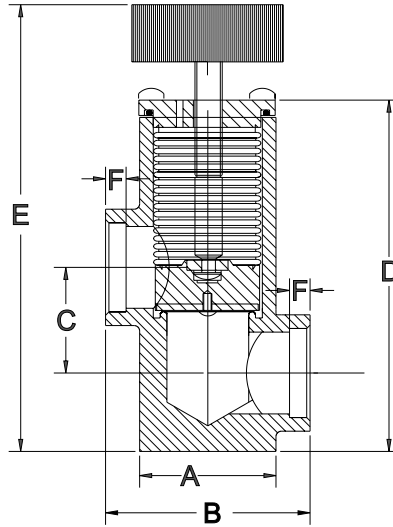
Brass Valves

Inline Valves, Brass, Manual, Socket Weld, Viton® Bonnet and Poppet

Part Number	Poppet	Port Style	A	B	C	D	E	F
BL-37	Disk	3/8" Socket	1.00	1.81	.62	3.12	4.50	.18
BL-37-O	O-Ring	3/8" Socket	1.00	1.81	.62	3.12	4.50	.18
BL-50	Disk	1/2" Socket	1.00	1.81	.62	3.12	4.50	.18
BL-50-O	O-Ring	1/2" Socket	1.00	1.81	.62	3.12	4.50	.18
BL-75	Disk	3/4" Socket	1.37	2.62	.84	4.00	5.62	.37
BL-75-O	O-Ring	3/4" Socket	1.37	2.62	.84	4.00	5.62	.37
BL-112	Disk	1-1/8" Socket	2.00	3.37	1.28	5.00	7.20	.37
BL-112-O	O-Ring	1-1/8" Socket	2.00	3.37	1.28	5.00	7.20	.37
BL-162	Disk	1-5/8" Socket	2.50	3.75	1.93	6.37	8.56	.37
BL-162-O	O-Ring	1-5/8" Socket	2.50	3.75	1.93	6.37	8.56	.37
BL-200	Disk	2" Socket	3.00	4.62	2.00	6.87	9.43	.50
BL-200-O	O-Ring	2" Socket	3.00	4.62	2.00	6.87	9.43	.50
BL-212	Disk	2-1/8" Socket	3.00	4.62	2.00	6.87	9.43	.50
BL-212-O	O-Ring	2-1/8" Socket	3.00	4.62	2.00	6.87	9.43	.50



Manual Disk Bellow Assembly



Manual O-Ring Bellow Assembly

Manual Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-50	37,50
DB-75	75
DB-112	112
DB-162	162
DB-200	200,212

Manual O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-50	37,50
OB-75	75
OB-112	112
OB-162	162
OB-200	200,212

Manual Disk Replacement Seal Kits

Part Number	Fits Valve Series
DK-50	37,50
DK-75	75
DK-112	112
DK-162	162
DK-200	200,212

Manual O-Ring Replacement Seal Kits

Part Number	Fits Valve Series
OK-50	37,50
OK-75	75
OK-112	112
OK-162	162
OK-200	200,212



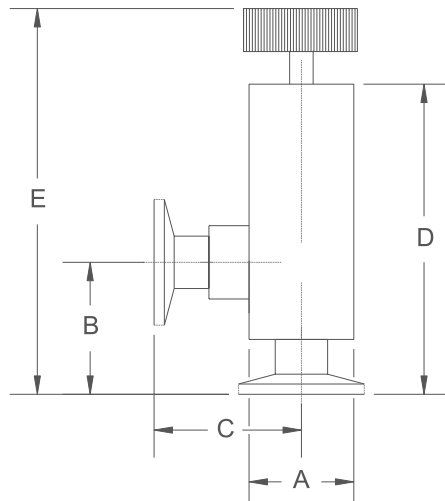
Brass Valves

Right Angle Valves, Brass, Manual, NW Flanges, Viton® Bonnet and Poppet

Part Number	Poppet	Port Style	A	B	C	D	E
BA-37-K	Disk	NW 10	1.00	1.37	1.37	2.81	4.25
BA-37-K-O	O-Ring	NW 10	1.00	1.37	1.37	2.81	4.25
BA-50-K	Disk	NW 16	1.00	1.37	1.37	2.81	4.25
BA-50-K-O	O-Ring	NW 16	1.00	1.37	1.37	2.81	4.25
BA-75-K	Disk	NW 16	1.37	1.56	1.56	4.00	5.50
BA-75-K-O	O-Ring	NW 16	1.37	1.56	1.56	4.00	5.50
BA-112-K	Disk	NW 25	2.00	1.87	1.87	4.67	7.00
BA-112-K-O	O-Ring	NW 25	2.00	1.87	1.87	4.67	7.00
BA-162-K	Disk	NW 40	2.50	2.37	2.37	5.37	7.12
BA-162-K-O	O-Ring	NW 40	2.50	2.37	2.37	5.37	7.12
BA-200-K	Disk	NW 50	3.00	2.37	2.37	5.25	8.10
BA-200-K-O	O-Ring	NW 50	3.00	2.37	2.37	5.25	8.10



Manual Disk Bellow Assembly



Manual O-Ring Bellow Assembly

Manual Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-50	37,50
DB-75	75
DB-112	112
DB-162	162
DB-200	200,212

Manual O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-50	37,50
OB-75	75
OB-112	112
OB-162	162
OB-200	200,212

Manual Disk Replacement Seal Kits

Part Number	Fits Valve Series
DK-50	37,50
DK-75	75
DK-112	112
DK-162	162
DK-200	200,212

Manual O-Ring Replacement Seal Kits

Part Number	Fits Valve Series
OK-50	37,50
OK-75	75
OK-112	112
OK-162	162
OK-200	200,212

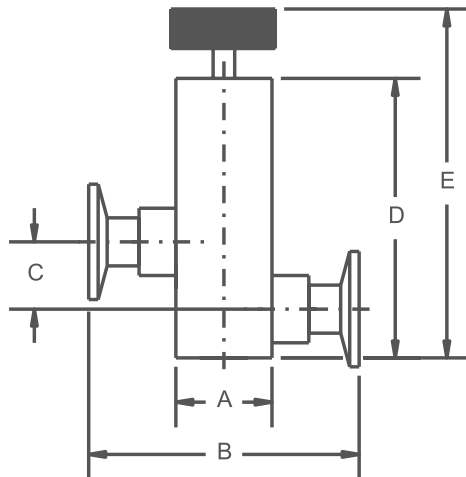
Brass Valves

Inline Valves, Brass, Manual, NW Flanges, Viton® Bonnet and Poppet

Part Number	Poppet	Port Style	A	B	C	D	E
BL-37-K	Disk	NW 10	1.00	2.56	.62	3.12	4.50
BL-37-K-O	O-Ring	NW 10	1.00	2.25	.62	3.12	4.50
BL-50-K	Disk	NW 16	1.00	3.12	.62	3.12	4.50
BL-50-K-O	O-Ring	NW 16	1.00	3.12	.62	3.12	4.50
BL-75-K	Disk	NW 16	1.37	3.87	.84	4.00	5.62
BL-75-K-O	O-Ring	NW 16	1.37	3.87	.84	4.00	5.62
BL-112-K	Disk	NW 25	2.00	4.56	1.28	5.00	7.20
BL-112-K-O	O-Ring	NW 25	2.00	4.56	1.28	5.00	7.20
BL-162-K	Disk	NW 40	2.50	5.25	1.93	6.37	8.56
BL-162-K-O	O-Ring	NW 40	2.50	5.25	1.93	6.37	8.56
BL-200-K	Disk	NW 50	3.00	5.37	2.00	6.87	9.43
BL-200-K-O	O-Ring	NW 50	3.00	5.37	2.00	6.87	9.43



Manual Disk Bellow Assembly



Manual O-Ring Bellow Assembly

Manual Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-50	37,50
DB-75	75
DB-112	112
DB-162	162
DB-200	200,212

Manual O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-50	37,50
OB-75	75
OB-112	112
OB-162	162
OB-200	200,212

Manual Disk Replacement Seal Kits

Part Number	Fits Valve Series
DK-50	37,50
DK-75	75
DK-112	112
DK-162	162
DK-200	200,212

Manual O-Ring Replacement Seal Kits

Part Number	Fits Valve Series
OK-50	37,50
OK-75	75
OK-112	112
OK-162	162
OK-200	200,212



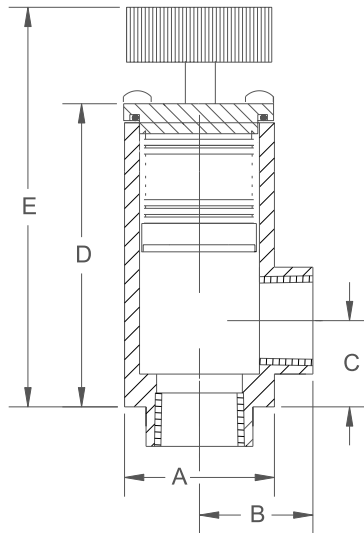
Brass Valves

Right Angle Valves, Brass, Manual, Female Pipe Thread, Viton® Bonnet and Seal

Part Number	Poppet	Port Style	A	B	C	D	E
BAP-12	Disk	1/8" Female NPT	1.00	.94	.75	2.81	4.25
BAP-12-O	O-Ring	1/8" Female NPT	1.00	.94	.75	2.81	4.25
BAP-25	Disk	1/4" Female NPT	1.00	.94	.75	2.81	4.25
BAP-25-O	O-ring	1/4" Female NPT	1.00	.94	.75	2.81	4.25
BAP-37	Disk	3/8" Female NPT	1.37	1.31	.87	2.81	4.25
BAP-37-O	O-Ring	3/8" Female NPT	1.00	.94	.75	2.81	4.25
BAP-50	Disk	1/2" Female NPT	1.37	1.31	.87	3.37	5.00
BAP-50-O	O-Ring	1/2" Female NPT	1.37	1.31	.87	3.37	5.00
BAP-75	Disk	3/4" Female NPT	2.00	1.68	1.18	4.95	7.00
BAP-75-O	O-Ring	3/4" Female NPT	2.00	1.68	1.18	4.95	7.00
BAP-100	Disk	1" Female NPT	2.00	1.68	1.18	4.95	7.00
BAP-100-O	O-Ring	1" Female NPT	2.00	1.68	1.62	4.62	6.50
BAP-150	Disk	1-1/2" Female NPT	2.50	2.62	2.37	5.55	7.31
BAP-150-O	O-Ring	1-1/2" Female NPT	2.50	2.62	2.37	5.55	7.31



**Manual Disk
Bellow Assembly**



**Manual O-Ring
Bellow Assembly**

Manual Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-50	12,25
DB-75	37,50
DB-112	75,100
DB-162	150

Manual O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-50	12,25
OB-75	37,50
OB-112	75,100
OB-162	150

Manual Disk Replacement Seal Kits

Part Number	Fits Valve Series
DK-50	12,25
DK-75	37,50
DK-112	75,100
DK-162	150

Manual O-Ring Replacement Seal Kits

Part Number	Fits Valve Series
OK-50	12,25
OK-75	37,50
OK-112	75,100
OK-162	150

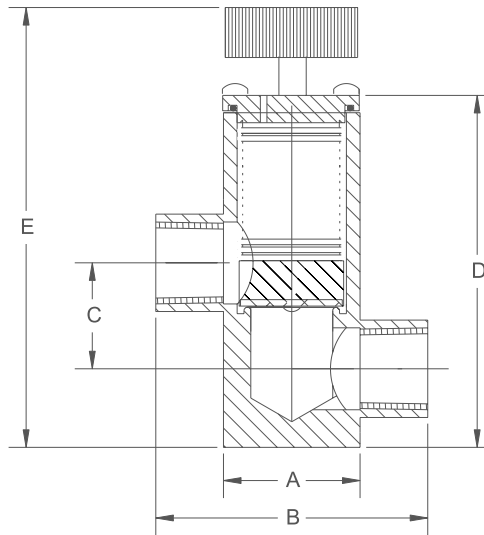
Brass Valves

Inline Valves, Brass, Manual, Female Pipe Thread, Viton® Bonnet and Seal

Part Number	Poppet	Port Style	A	B	C	D	E
BLP-12	Disk	1/8" Female NPT	1.00	1.81	.62	3.12	4.50
BLP-12-O	O-Ring	1/8" Female NPT	1.00	1.81	.62	3.12	4.50
BLP-25	Disk	1/4" Female NPT	1.00	1.81	.62	3.12	4.50
BLP-25-O	O-Ring	1/4" Female NPT	1.00	1.81	.62	3.12	4.50
BLP-37	Disk	3/8" Female NPT	1.37	2.62	.84	4.00	5.62
BLP-37-O	O-Ring	3/8" Female NPT	1.37	2.62	.84	4.00	5.62
BLP-50	Disk	1/2" Female NPT	1.37	2.62	.84	4.00	5.62
BLP-50-O	O-Ring	1/2" Female NPT	1.37	2.62	.84	4.00	5.62
BLP-75	Disk	3/4" Female NPT	2.00	3.37	1.28	5.00	7.20
BLP-75-O	O-Ring	3/4" Female NPT	2.00	3.37	1.28	5.00	7.20
BLP-100	Disk	1" Female NPT	2.00	3.37	1.28	5.00	7.20
BLP-100-O	O-Ring	1" Female NPT	2.00	3.37	1.28	5.00	7.20
BLP-150	Disk	1-1/2" Female NPT	2.50	3.75	1.93	6.37	8.56
BLP-150-O	O-Ring	1-1/2" Female NPT	2.50	3.75	1.93	6.37	8.56



Manual Disk Bellow Assembly



Manual O-Ring Bellow Assembly

Manual Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-50	12,25
DB-75	37,50
DB-112	75,100
DB-162	150

Manual O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-50	12,25
OB-75	37,50
OB-112	75,100
OB-162	150

Manual Disk Replacement Seal Kits

Part Number	Fits Valve Series
DK-50	12,25
DK-75	37,50
DK-112	75,100
DK-162	150

Manual O-Ring Replacement Seal Kits

Part Number	Fits Valve Series
OK-50	12,25
OK-75	37,50
OK-112	75,100
OK-162	150



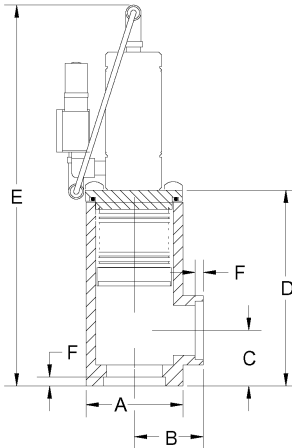
Brass Valves

Right Angle Valves, Brass, Electropneumatic, Socket Weld, Viton® Seals

Part Number	Poppet	Port Style	A	B	C	D	E	F
BA-37-P	Disk	3/8" socket	1.00	.94	.75	3.18	7.25	.18
BA-37-P-O	O-Ring	3/8" socket	1.00	.94	.75	3.18	7.25	.18
BA-50-P	Disk	1/2" socket	1.00	.94	.75	3.18	7.25	.18
BA-50-P-O	O-Ring	1/2" socket	1.00	.94	.75	3.18	7.25	.18
BA-75-P	Disk	3/4" socket	1.37	1.31	.87	3.75	8.00	.37
BA-75-P-O	O-Ring	3/4" socket	1.37	1.31	.87	3.75	8.00	.37
BA-112-P	Disk	1-1/8" socket	2.00	1.68	1.18	4.25	9.62	.37
BA-112-P-O	O-Ring	1-1/8" socket	2.00	1.68	1.18	4.25	9.62	.37
BA-162-P	Disk	1-5/8" socket	2.50	1.87	1.62	4.86	9.25	.37
BA-162-P-O	O-Ring	1-5/8" socket	2.50	1.87	1.62	4.86	9.25	.37
BA-200-P	Disk	2" socket	3.00	2.25	2.00	5.50	10.00	.50
BA-200-P-O	O-Ring	2" socket	3.00	2.25	2.00	5.50	10.00	.50
BA-212-P	Disk	2-1/8" socket	3.00	2.25	2.00	5.50	10.00	.50
BA-212-P-O	O-Ring	2-1/8" socket	3.00	2.25	2.00	5.50	10.00	.50



Pneumatic Disk Bellow Assembly



Pneumatic O-Ring Bellow Assembly

Electropneumatic Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-2-50	37,50
DB-2-75	75
DB-2-112	112
DB-2-162	162
DB-2-200	200,212

Electropneumatic Disk Replacement Seal Kits

Part Number	Fits Valve Series
OR-DB-2-50	37,50
OR-DB-2-75	75
OR-DB-2-112	112
OR-DB-2-162	162
OR-DB-2-200	200,212

Electropneumatic O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-2-50	37,50
OB-2-75	75
OB-2-112	112
OB-2-162	162
OB-2-200	200,212

Electropneumatic O-Ring Replacement Kits

Part Number	Fits Valve Series
OR-OB-2-50	37,75
OR-OB-2-75	75
OR-OB-2-112	112
OR-OB-2-162	162
OR-OB-2-200	200,212

Valve Options

Description	Option Code
Reed Switches	-LS
Spring loaded air cylinder	-S
24 Volt DC solenoid	-24VDC
24 Volt AC solenoid	-24VAC
220 Volt AC solenoid	-220VAC
No solenoid	-NS

* = Add option code to suffix of valve part number



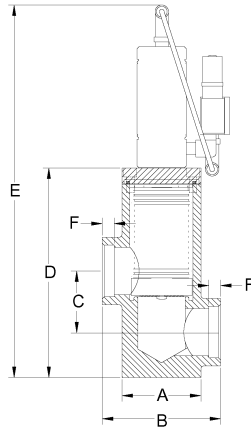
Brass Valves

Inline Valves, Brass, Electropneumatic, Socket Weld, Viton® Seals

Part Number	Poppet	Port Style	A	B	C	D	E	F
BL-37-P	Disk	3/8" Socket	1.00	1.81	.62	3.50	7.62	.18
BL-37-P-O	O-Ring	3/8" Socket	1.00	1.81	.62	3.50	7.62	.18
BL-50-P	Disk	1/2" Socket	1.00	1.81	.62	3.50	7.62	.18
BL-50-P-O	O-Ring	1/2" Socket	1.00	1.81	.62	3.50	7.62	.18
BL-75-P	Disk	3/4" Socket	1.37	2.62	.84	4.43	8.62	.37
BL-75-P-O	O-Ring	3/4" Socket	1.37	2.62	.84	4.43	8.62	.37
BL-112-P	Disk	1-1/8" Socket	2.00	3.37	1.28	5.25	9.62	.37
BL-112-P-O	O-Ring	1-1/8" Socket	2.00	3.37	1.28	5.25	9.62	.37
BL-162-P	Disk	1-5/8" Socket	2.50	3.75	1.93	7.05	11.00	.37
BL-162-P-O	O-Ring	1-5/8" Socket	2.50	3.75	1.93	7.05	11.00	.37
BL-200-P	Disk	2" Socket	3.00	4.62	2.00	7.05	11.37	.50
BL-200-P-O	O-Ring	2" Socket	3.00	4.62	2.00	7.05	11.37	.50
BL-212-P	Disk	2-1/8" Socket	3.00	4.62	2.00	7.05	11.37	.50
BL-212-P-O	O-Ring	2-1/8" Socket	3.00	4.62	2.00	7.05	11.37	.50



Electropneumatic Disk Bellow Assembly



Electropneumatic O-Ring Bellow Assembly

Electropneumatic Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-2-50	37,50
DB-2-75	75
DB-2-112	112
DB-2-162	162
DB-2-200	200,212

Electropneumatic O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-2-50	37,50
OB-2-75	75
OB-2-112	112
OB-2-162	162
OB-2-200	200,212

Electropneumatic Disk Replacement Seal Kits

Part Number	Fits Valve Series
OR-DB-2-50	37,50
OR-DB-2-75	75
OR-DB-2-112	112
OR-DB-2-162	162
OR-DB-2-200	200,212

Electropneumatic O-Ring Replacement Kits

Part Number	Fits Valve Series
OR-OB-2-50	37,75
OR-OB-2-75	75
OR-OB-2-112	112
OR-OB-2-162	162
OR-OB-2-200	200,212

Valve Options

Description	Option Code
Reed Switches	-LS
Spring loaded air cylinder	-S
24 Volt DC solenoid	-24VDC
24 Volt AC solenoid	-24VAC
220 Volt AC solenoid	-220VAC
No solenoid	-NS

* = Add option code to suffix of valve part number



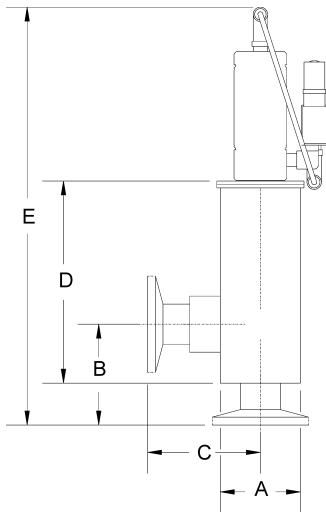
Brass Valves

Right Angle Valves, Brass, Electropneumatic, NW Flanges, Viton® Seals

Part Number	Poppet Seal	Port Style	A	B	C	D	E
BA-37-P-K	Disk	NW 10	1.00	1.37	1.37	3.91	8.00
BA-37-P-K-O	O-Ring	NW 10	1.00	1.37	1.37	3.91	8.00
BA-50-P-K	Disk	NW 16	1.00	1.37	1.37	3.91	8.00
BA-50-P-K-O	O-Ring	NW 16	1.00	1.37	1.37	3.91	8.00
BA-75-P-K	Disk	NW 16	1.37	1.56	1.56	4.41	8.62
BA-75-P-K-O	O-Ring	NW 16	1.37	1.56	1.56	4.41	8.62
BA-112-P-K	Disk	NW 25	2.00	1.87	1.87	4.87	9.37
BA-112-P-K-O	O-Ring	NW 25	2.00	1.87	1.87	4.87	9.37
BA-162-P-K	Disk	NW 40	2.50	2.37	2.37	5.56	9.87
BA-162-P-K-O	O-Ring	NW 40	2.50	2.37	2.37	5.56	9.87
BA-200-P-K	Disk	NW 50	3.00	2.37	2.37	5.82	10.25
BA-200-P-K-O	O-Ring	NW 50	3.00	2.37	2.37	5.82	10.25



Electropneumatic Disk Bellow Assembly



Electropneumatic O-Ring Bellow Assembly

Electropneumatic Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-2-50	37,50
DB-2-75	75
DB-2-112	112
DB-2-162	162
DB-2-200	200,212

Electropneumatic O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-2-50	37,50
OB-2-75	75
OB-2-112	112
OB-2-162	162
OB-2-200	200,212

Electropneumatic Disk Replacement Seal Kits

Part Number	Fits Valve Series
OR-DB-2-50	37,50
OR-DB-2-75	75
OR-DB-2-112	112
OR-DB-2-162	162
OR-DB-2-200	200,212

Electropneumatic O-Ring Replacement Kits

Part Number	Fits Valve Series
OR-OB-2-50	37,75
OR-OB-2-75	75
OR-OB-2-112	112
OR-OB-2-162	162
OR-OB-2-200	200,212

Valve Options

Description	Option Code
Reed Switches	-LS
Spring loaded air cylinder	-S
24 Volt DC solenoid	-24VDC
24 Volt AC solenoid	-24VAC
220 Volt AC solenoid	-220VAC
No solenoid	-NS

* = Add option code to suffix of valve part number



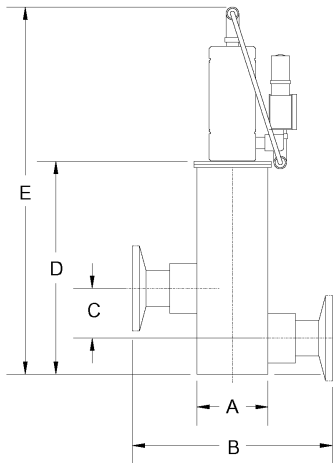
Brass Valves

Inline Valves, Brass, Electropneumatic, NW Flanges, Viton® Seals

Part Number	Poppet	Port Style	A	B	C	D	E
BL-37-P-K	Disk	NW 10	1.00	2.56	.62	3.50	7.62
BL-37-P-K-O	O-Ring	NW 10	1.00	2.56	.62	3.50	7.62
BL-50-P-K	Disk	NW 16	1.00	2.56	.62	3.50	7.62
BL-50-P-K-O	O-Ring	NW 16	1.00	2.56	.62	3.50	7.62
BL-75-P-K	Disk	NW 16	1.37	3.87	.84	4.43	8.62
BL-75-P-K-O	O-Ring	NW 16	1.37	3.87	.84	4.43	8.62
BL-112-P-K	Disk	NW 25	2.00	4.56	1.28	5.25	9.62
BL-112-P-K-O	O-Ring	NW 25	2.00	4.56	1.28	5.25	9.62
BL-162-P-K	Disk	NW 40	2.50	5.25	1.93	7.05	11.00
BL-162-P-K-O	O-Ring	NW 40	2.50	5.25	1.93	7.05	11.00
BL-200-P-K	Disk	NW 50	3.00	5.37	2.00	7.05	11.37
BL-200-P-K-O	O-Ring	NW 50	3.00	5.37	2.00	7.05	11.37



Electropneumatic Disk Bellow Assembly



Electropneumatic O-Ring Bellow Assembly

Electropneumatic Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-2-50	37,50
DB-2-75	75
DB-2-112	112
DB-2-162	162
DB-2-200	200,212

Electropneumatic O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-2-50	37,50
OB-2-75	75
OB-2-112	112
OB-2-162	162
OB-2-200	200,212

Electropneumatic Disk Replacement Seal Kits

Part Number	Fits Valve Series
OR-DB-2-50	37,50
OR-DB-2-75	75
OR-DB-2-112	112
OR-DB-2-162	162
OR-DB-2-200	200,212

Electropneumatic O-Ring Replacement Kits

Part Number	Fits Valve Series
OR-OB-2-50	37,75
OR-OB-2-75	75
OR-OB-2-112	112
OR-OB-2-162	162
OR-OB-2-200	200,212

Valve Options

Description	Option Code
Reed Switches	-LS
Spring loaded air cylinder	-S
24 Volt DC solenoid	-24VDC
24 Volt AC solenoid	-24VAC
220 Volt AC solenoid	-220VAC
No solenoid	-NS

* = Add option code to suffix of valve part number



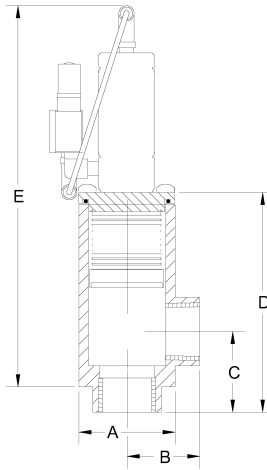
Brass Valves

Right Angle Valves, Brass, Electropneumatic, Female Pipe Thread, Viton® Seals

Part Number	Poppet Seal	Port Style	A	B	C	D	E
BAP-12-P	Disk	1/8" Female NPT	1.00	.94	.75	3.18	7.25
BAP-12-P-O	O-Ring	1/8" Female NPT	1.00	.94	.75	3.18	7.25
BAP-25-P	Disk	1/4" Female NPT	1.00	.94	.75	3.18	7.25
BAP-25-P-O	O-Ring	1/4" Female NPT	1.00	.94	.75	3.18	7.25
BAP-37-P	Disk	3/8" Female NPT	1.37	1.31	.87	4.41	8.62
BAP-37-P-O	O-Ring	3/8" Female NPT	1.37	1.31	.87	4.41	8.62
BAP-50-P	Disk	1/2" Female NPT	1.37	1.31	.87	4.41	8.62
BAP-50-P-O	O-Ring	1/2" Female NPT	1.37	1.31	.87	4.41	8.62
BAP-75-P	Disk	3/4" Female NPT	2.00	1.68	1.18	5.12	9.50
BAP-75-P-O	O-Ring	3/4" Female NPT	2.00	1.68	1.18	5.12	9.50
BAP-100-P	Disk	1" Female NPT	2.00	1.68	1.18	5.12	9.50
BAP-100-P-O	O-Ring	1" Female NPT	2.00	1.68	1.18	5.12	9.50
BAP-150-P	Disk	1-1/2" Female NPT	2-1/2"	2.62	2.37	5.75	10.25
BAP-150-P-O	O-Ring	1-1/2" Female NPT	2-1/2"	2.62	2.37	5.75	10.25



Electropneumatic Disk Bellow Assembly



Electropneumatic O-Ring Bellow Assembly

Electropneumatic Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-2-50	37,50
DB-2-75	75
DB-2-112	112
DB-2-162	162
DB-2-200	200,212

Electropneumatic Disk Replacement Seal Kits

Part Number	Fits Valve Series
OR-DB-2-50	37,50
OR-DB-2-75	75
OR-DB-2-112	112
OR-DB-2-162	162
OR-DB-2-200	200,212

Electropneumatic O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-2-50	37,50
OB-2-75	75
OB-2-112	112
OB-2-162	162
OB-2-200	200,212

Electropneumatic O-Ring Replacement Kits

Part Number	Fits Valve Series
OR-OB-2-50	37,75
OR-OB-2-75	75
OR-OB-2-112	112
OR-OB-2-162	162
OR-OB-2-200	200,212

Valve Options

Description	Option Code
Reed Switches	-LS
Spring loaded air cylinder	-S
24 Volt DC solenoid	-24VDC
24 Volt AC solenoid	-24VAC
220 Volt AC solenoid	-220VAC
No solenoid	-NS

* = Add option code to suffix of valve part number



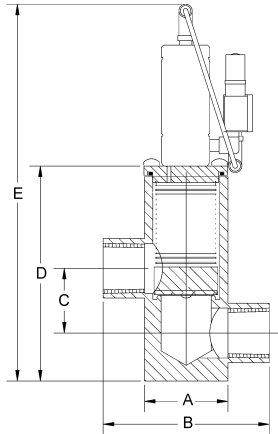
Brass Valves

Inline Valves, Brass, Electropneumatic, Female Pipe Thread, Viton® Seals

Part Number	Poppet	Port Style	A	B	C	D	E
BLP-12-P	Disk	1/8" Female NPT	1.00	1.81	.62	3.50	7.62
BLP-12-P-O	O-Ring	1/8" Female NPT	1.00	1.81	.62	3.50	7.62
BLP-25-P	Disk	1/4" Female NPT	1.00	1.81	.62	3.50	7.62
BLP-25-P-O	O-Ring	1/4" Female NPT	1.00	1.81	.62	3.50	7.62
BLP-37-P	Disk	3/8" Female NPT	1.37	3.87	.84	4.43	8.62
BLP-37-P-O	O-Ring	3/8" Female NPT	1.37	3.87	.84	4.43	8.62
BLP-50-P	Disk	1/2" Female NPT	1.37	4.56	1.28	5.25	9.62
BLP-50-P-O	O-Ring	1/2" Female NPT	1.37	4.56	1.28	5.25	9.62
BLP-75-P	Disk	3/4" Female NPT	2.00	3.37	1.93	5.25	9.62
BLP-75-P-O	O-Ring	3/4" Female NPT	2.00	3.37	1.93	5.25	9.62
BLP-100-P	Disk	1" Female NPT	2.00	3.37	1.93	5.25	9.62
BLP-100-P-O	O-Ring	1" Female NPT	2.00	3.37	1.93	5.25	9.62
BLP-150-P	Disk	1-1/2" Female NPT	2.00	3.75	1.93	7.05	11.00
BLP-150-P-O	O-Ring	1-1/2" Female NPT	2.00	3.75	1.93	7.05	11.00



Electropneumatic Disk Bellow Assembly



Electropneumatic O-Ring Bellow Assembly

Electropneumatic Disk Bellow Assemblies

Part Number	Fits Valve Series
DB-2-50	37,50
DB-2-75	75
DB-2-112	112
DB-2-162	162
DB-2-200	200,212

Electropneumatic Disk Replacement Seal Kits

Part Number	Fits Valve Series
OR-DB-2-50	37,50
OR-DB-2-75	75
OR-DB-2-112	112
OR-DB-2-162	162
OR-DB-2-200	200,212

Electropneumatic O-Ring Bellow Assemblies

Part Number	Fits Valve Series
OB-2-50	37,50
OB-2-75	75
OB-2-112	112
OB-2-162	162
OB-2-200	200,212

Electropneumatic O-Ring Replacement Kits

Part Number	Fits Valve Series
OR-OB-2-50	37,75
OR-OB-2-75	75
OR-OB-2-112	112
OR-OB-2-162	162
OR-OB-2-200	200,212

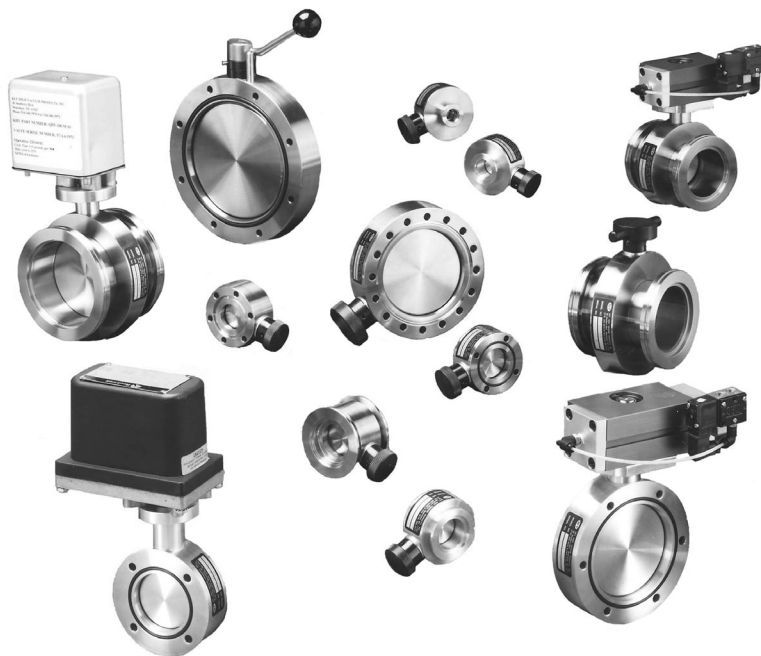
Valve Options

Description	Option Code
Reed Switches	-LS
Spring loaded air cylinder	-S
24 Volt DC solenoid	-24VDC
24 Volt AC solenoid	-24VAC
220 Volt AC solenoid	-220VAC
No solenoid	-NS

* = Add option code to suffix of valve part number



QBV SERIES Butterfly Valves



3

KEY HIGH VACUUM PRODUCTS, INC.'s QBV Series butterfly valves are designed and manufactured to offer reliable performance, be versatile and offer an economic benefit. These valves have a narrow compact straight through design with a minimal internal surface area to maximize available pumping speed. **KEY HIGH QBV Series** butterfly valves possess a quick quarter turn 90° actuation from the fully open to the closed position. Valve bodies are fabricated from 304L SS or 6061T6 Aluminum (dependent on customer choice) for corrosion resistance and a low out gassing rates. **KEY HIGH QBV Series** valves feature four different flange interface styles: bolted, MET-SEAL, ISO-NW and ISO-MF. Our wide range of flange interface styles allows the user to pick the exact flanging system for their particular requirement and saves on expensive enclosure space by eliminating adapter flanges. Benefits of these flanging systems is rapid, convenient system assembly/disassembly and excellent flexibility. **QBV Series** butterfly valves are ideally suited for the isolation of pumps, chambers, roughing lines and exhaust lines. Valves are mountable in any position. However, the correct or preferred method is to install the **QBV** valves with the narrow side of the taper towards the vacuum pump. In this arrangement the pump will "pull" the flapper into the narrower side of the taper while the valve is in closed position effecting a better seal. **KEY HIGH** offers the **QBV Series** valves in three distinct actuating styles; manual, electropneumatic and motorized operation. All **QBV** valves have small physical "footprints" and are high conductance shut off valves due to the straight through design and offer a significant cost advantage over a gate valve, as well as a much smaller physical foot print.

QBV Series valves from **KEY HIGH VACUUM PRODUCTS, INC.** have been approved for use in some of the world's largest semiconductor equipment builders and IC manufactures. New in this catalog is the locking handle option for the manually operated valves. A locking handle is of a direct benefit in the exhaust line, as once set in the correct position will help eliminate under/over shoot issues from the throttle valve.

KEY HIGH QBV Series valves include these standard features:

- All small cross section Viton® seals bakeable to 150°C with valve in open position
- Dual Viton® shaft seal
- 3/4" ID through 6" ID bores
- Mountable in any position or flow direction
- Each valve is helium leak tested at 3 x 10⁻⁹ torr prior to shipment



Butterfly Valves ISO Bolted Interface

Features: Standard typical **ISO** bolted interface dimensions saves on enclosure space and allows the use of standard hardware for rapid convenient system assembly and excellent flexibility. The **QBV ISO-BT SERIES** valves are offered in four (4) standard sizes NW 63 through NW 160 (2-1/2" through 6" ID) and are constructed of 304 stainless steel.

Manual Butterfly Valves: ISO Bolted Interface

Part Number	Line Size	A	B	C	D	E	Flange Size
QBV-63-SS-BT	2-1/2"	2-3/8"	5.12	1.50	3.50	4 holes .35 dia. located on 4.33 bolt circle	NW 63
QBV-80-SS-BT	3"	2-7/8"	5.72	1.50	4.19	4 holes .35 dia. located on 4.92 bolt circle	NW 80
QBV-100-SS-BT	4"	3-7/8"	6.50	1.50	4.69	8 holes .35 dia. located on 5.71 bolt circle	NW 100
QBV-160-SS-BT	6"	5-5/8"	8.86	1.50	7.30	8 holes .43 dia. located on 5.71 bolt circle	NW 160

Options: Locking handle for Damper applications - Add **-HH** to suffix of part number for locking handle, and \$35.00 to base price.

Motorized Butterfly Valves: ISO Bolted Interface

Part Number	A	B	C	D	E	F	Flange Size
QBV-63-SS-BTM	2.37	5.12	1.50	8.43	4-1/2"	4 holes .35 dia. located on 4.33 bolt circle	NW 63
QBV-80-SS-BTM	2.85	5.72	1.50	8.73	4-1/2"	4 holes .35 dia, located on 4.92 bolt circle	NW 80
QBV-100-SS-BTM	3.87	6.50	1.50	9.12	4-1/2"	8 holes .35 dia. located on 5.71 bolt circle	NW 100
QBV-160-SS-BTM	5.75	8.86	1.50	10.30	4-1/2"	8 holes .43 dia, located on 5.71 bolt circle	NW 160

Standard actuators are 120/60 ac, cycle time 3.5 seconds per 90 degrees of rotation, duty cycle is 25%, Nema 4 enclosure

Options:

- 12 VDC, 24 VDC voltages - Add - \$100.00 to base price and **-12VDC** or **-24VDC** suffix to part number. DC motors are continuous duty.
- Two additional switches for use as limit switches - Add - \$300.00 to base price and **-LS** suffix to part number
- Potentiometer: For measuring resistance output for feedback of actual position. Add - \$250.00 to base price and **-P** to suffix of part number. Potentiometers offered in 0-135 ohm, 0-1000 ohm, and 0-5000 ohm, must be specified at time of order.

Electropneumatic Butterfly Valves: ISO Bolted Interface

Part Number	A	B	C	D	E	F	G	Flange Size
QBV-63-SS-BTP	2.37	5.12	1.50	5.56	7.06	3.56	4 holes .35 dia. located on 4.33 bolt circle	NW 63
QBV-80-SS-BTP	2.85	5.72	1.50	6.06	7.06	3.56	4 holes .35 dia. located on 4.92 bolt circle	NW 80
QBV-100-SS-BTP	3.87	6.50	1.50	6.58	8.20	4.37	8 holes .35 dia. located on 5.71 bolt circle	NW 100
QBV-160-SS-BTP	5.75	8.86	1.50	7.75	8.20	4.37	8 holes .43 dia located on 5.71 bolt circle	NW 160

All pneumatic air cylinders feature a factory set "AIR CUSHIONS" which dampen vibration at the opening and closing of the valve cycle for smooth, essentially shock free performance. Operating air pressure is 60 to 100 psi. Standard air cylinders are double acting, normally closed and all **QBV** valves close in an electrical utility failure and remain closed. All **QBV** valves are shipped with a 120/60-air solenoid standard.

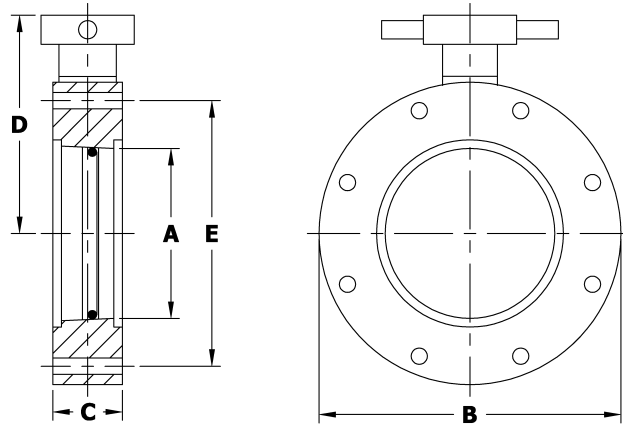
Options:

- Solenoid valve voltages available: 12VDC, 24VDC, 24VAC, and 230VAC; - Add - \$20.00 to base price and voltage requirement to suffix of part number.
- Magnetic reed switches for position indication. Reed switches feature an LED indicator for visual confirmation of valve position and have a two-meter cable; - Add - \$150.00 and **-RS** to suffix of part number. Switches are 110 to 120 VAC or 4.5 to 24VDC and must be specified at time of order.

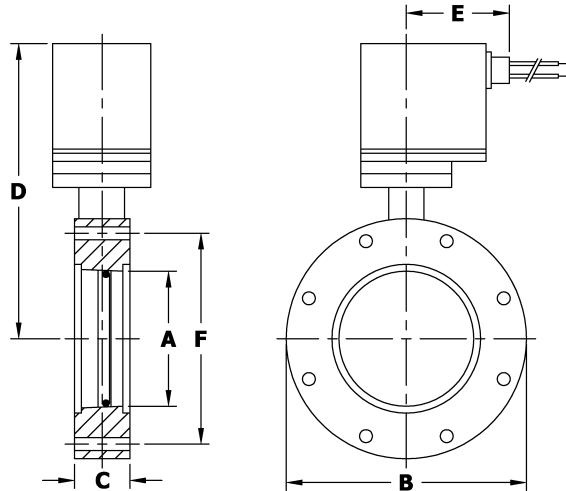


Butterfly Valves ISO Bolted Interface

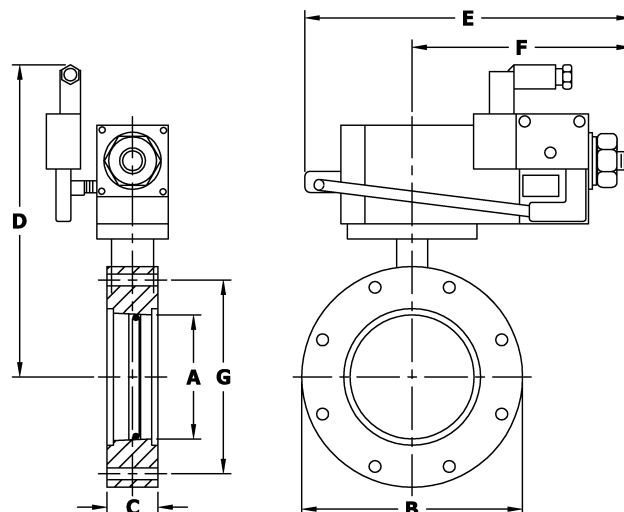
Manual Butterfly Valves: ISO Bolted Interface



Motorized Butterfly Valves: ISO Bolted Interface



Electropneumatic Butterfly Valves: ISO Bolted Interface



Butterfly Valves ISO-MF Interface

Features: Standard typical **ISO-MF** interface dimensions saves on enclosure space and allows the use of standard hardware for rapid convenient system assembly and excellent flexibility. The **QBV ISO-MF series** valves are offered four standard sizes NW 63 through NW 160 (2-1/2" through 6" ID) and are constructed of 304 stainless steel.

Manual Butterfly Valves; ISO-MF Interface

Part Number	Line Size	A	B	C	D	Flange size
QBV-63-SS	2-1/2"	2.37	4-1/2"	4.18	3.56	NW 63
QBV-80-SS	3"	2.85	5-1/2"	4.18	4.08	NW 80
QBV-100-SS	4"	3.87	5-3/4"	4.18	4.31	NW 100
QBV-160-SS	6"	5.75	8"	4.18	6.87	NW 160

Options: Locking handle for Damper applications; - Add **-HH** to suffix of part number for locking handle- Add - \$35.00 to base price.

Motorized Butterfly Valves; ISO-MF Interface

Part Number	Line Size	A	B	C	D	E	Flange size
QBV-63-M-SS	2-1/2"	2.37	4-1/2"	4.18	8.12	4-1/2"	NW 63
QBV-80-M-SS	3"	2.85	5-1/2"	4.18	8.62	4-1/2"	NW 80
QBV-100-M-SS	4"	3.87	5-3/4"	4.18	8.75	4-1/2"	NW 100
QBV-160-M-SS	6"	5.75	8"	4.18	9.87	4-1/2"	NW 160

Standard actuators are 120/60 ac, cycle time 3.5 seconds per 90 degrees, duty cycle is 25%, NEMA 4 enclosure

Options:

- 12VDC, 24VDC voltages- Add - \$100.00 to base price & **-12VDC** or **-24VDC** suffix to part number; DC motors are continuous duty.
- Two additional switches for use as limit switch -Add - \$300.00 to base price and **-LS** suffix to part number.
- Potentiometer: For measuring resistance output for feedback of actual position. Add - \$250.00 to base price and **-P** to suffix of part number. Potentiometers offered in 0-135 ohm, 0-1000 ohm, and 0-5000 ohm; must be specified at time of order.

Electropneumatic Butterfly Valves; ISO-MF Interface

Part Number	Line Size	A	B	C	D	E	F	Flange Size
QBV-63-P-SS	2-1/2"	2.37	4-1/2"	4.18	5.25	7.06	3.56	NW 63
QBV-80-P-SS	3"	2.85	5-1/2"	4.18	5.75	7.06	3.56	NW 80
QBV-100-P-SS	4"	3.87	5-3/4"	4.18	6.20	8.20	4.37	NW 100
QBV-160-P-SS	6"	5.75	8"	4.18	7.32	8.20	4.37	NW 160

All pneumatic air cylinders feature factory set "AIR CUSHIONS" which dampen vibration at the opening and closing of the valve cycle for smooth, essentially shock free performance. Operating air pressure is 60 to 100 psi. Standard air cylinders are double acting, normally closed and will close in an electrical failure and remain closed. All valves include 120/60 air solenoid standard.

Options:

- Solenoid valve voltages: 12VDC, 24VDC, 24VAC, and 230VAC. Add - \$20.00 to base price and voltage requirement to suffix of part number.
- Magnetic Reed switches position indicators; Reed switches feature an LED indicator for visual conformation of valve position and have a two-meter cable. Add - \$150.00 and **-RS** to suffix of part number. Switches are 110 to 120 VAC or 4.5 to 24 VDC and must be specified at time of order.

General options available: / contact factory

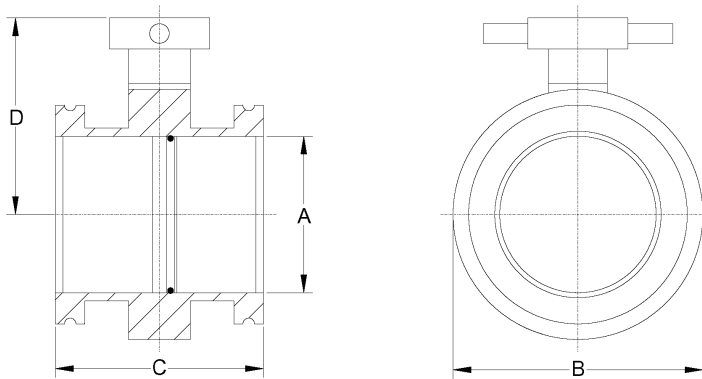
Kalrez®, Parafluro®, or other suitable sealing materials

Roughing ports / Gauge ports consisting of KF, MET-SEAL and VCR® flanges are available; contact factory



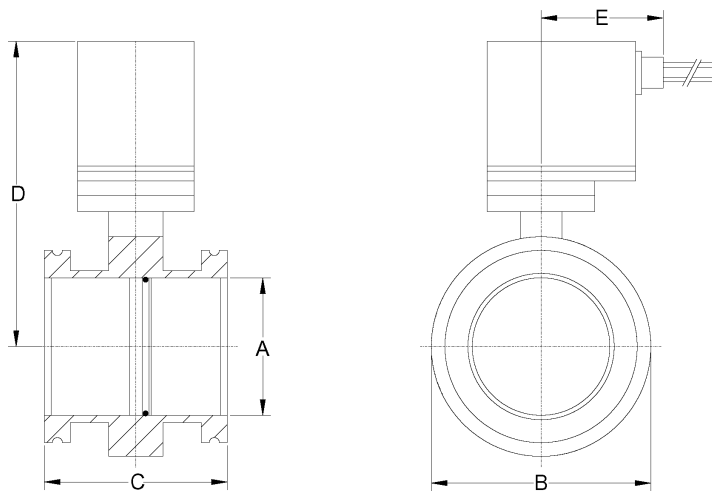
Butterfly Valves ISO-MF Interface

Manual Butterfly Valves; ISO-MF Interface

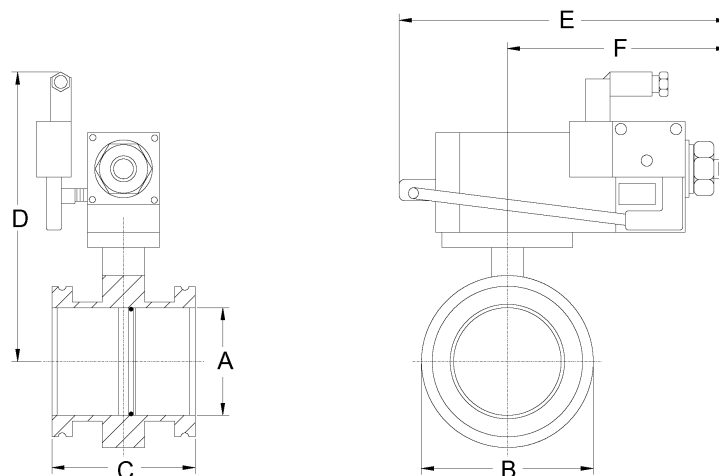


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Motorized Butterfly Valves; ISO-MF Interface



Electropneumatic Butterfly Valves; ISO-MF Interface



Butterfly Valves ISO-KF Interface

Features: Standard ISO-KF interface dimensions allowing the use of standard hardware for rapid convenient system assembly and excellent flexibility. The QBV-KF series valves are offered in four sizes NW 16 through NW 50 (3/4" through 2"ID). These valves are offered in 6061T6-body construction and 304L-body construction.

Key Speedy Manual Butterfly Valves; ISO-KF Interface

Part Number	Material	A	B	C	D	Flange size
QBV-75-AL-16	Aluminum	.65	2.75	2.250	2.33	NW 16
QBV-75-SS-16	Stainless Steel	.65	2.75	2.250	2.33	NW 16
QBV-100-AL-25	Aluminum	.86	2.75	1.85	2.33	NW 25
QBV-100-SS-25	Stainless Steel	.86	2.75	1.85	2.33	NW 25
QBV-150-AL-40	Aluminum	1.27	2.75	1.85	2.33	NW 40
QBV-150-SS-40	Stainless Steel	1.27	2.75	1.85	2.33	NW 40
QBV-200-AL-50	Aluminum	1.46	2.95	2.05	2.42	NW 50
QBV-200-SS-50	Stainless Steel	1.46	2.95	2.05	2.42	NW 50

Options: Locking handle for exhaust damper applications add **-HH** to suffix of part number- Add - \$35.00 to base price.

Key Speedy Motorized Butterfly Valves; ISO-KF Interface

Part Number	Material	A	B	C	D	E	Flange size
QBV-75-M-AL-16	Aluminum	.65	2.75	2.250	8.00	4.50	NW 16
QBV-75-M-SS-16	Stainless Steel	.65	2.75	2.250	8.00	4.50	NW 16
QBV-100-M-AL-25	Aluminum	.86	2.75	1.85	8.00	4.50	NW 25
QBV-100-M-SS-25	Stainless Steel	.86	2.75	1.85	8.00	4.50	NW 25
QBV-150-M-AL-40	Aluminum	1.27	2.75	1.85	8.00	4.50	NW 40
QBV-150-M-SS-40	Stainless Steel	1.27	2.75	1.85	8.00	4.50	NW 40
QBV-200-M-AL-50	Aluminum	1.46	2.95	2.05	8.12	4.50	NW 50
QBV-200-M-SS-50	Stainless Steel	1.46	2.95	2.05	8.12	4.50	NW 50

Standard actuators are 120/60 AC, cycle time 3.5 seconds per 90°, duty cycle is 25%, NEMA 4 enclosure

Options:

- 12VDC, 24VDC voltages -Add - \$100.00 to base price & **-12VDC** or **-24VDC** suffix of part number; DC motors are continuous duty.
- Two additional switches for use as limit switches; - Add - \$300.00 to base price and **-LS** suffix to part number.
- Potentiometer for measuring resistance feedback of actual position. - Add - \$250.00 to base price and **-P** to suffix of part number. Potentiometers offered in 0-135 ohm, 0-1000 ohm, and 0-5000 ohm and must be specified at time of order.

Key Speedy Electropneumatic Butterfly Valves; ISO-KF Interface

Part Number	Material	A	B	C	D	E	Flange Size
QBV-75-P-AL-16	Aluminum	.65	2.75	2.250	4.37	6.87	NW 16
QBV-75-P-SS-16	Stainless Steel	.65	2.75	2.250	4.37	6.87	NW 16
QBV-100-P-AL-25	Aluminum	.86	2.75	1.85	4.37	6.87	NW 25
QBV-100-P-SS-25	Stainless Steel	.86	2.75	1.85	4.37	6.87	NW 25
QBV-150-P-AL-40	Aluminum	1.27	2.75	1.85	4.37	6.87	NW 40
QBV-150-P-SS-40	Stainless Steel	1.27	2.75	1.85	4.37	6.87	NW 40
QBV-200-P-AL-50	Aluminum	1.46	2.95	2.05	4.50	6.87	NW 50
QBV-200-P-SS-50	Stainless Steel	1.46	2.95	2.05	4.50	6.87	NW 50

All pneumatic valves feature double acting air cylinders, 120/60 air solenoid and require a 60 to 100 psig compressed air supply. All pneumatic valves are normally closed and in the event of an electrical failure will close and remain closed until power is restored.

Options:

- Solenoid valve voltages: 12VDC, 24VDC, 24VAC, and 230VAC. - Add - \$20.00 to base price and voltage requirement to suffix of part number.
- Magnetic Reed Switch position indicators: Reed switches feature a LED indicator for visual conformation of valve position and have a two-meter cable. Add - \$150.00 and **-RS** to suffix of part number. Switches are 110 to 120 VAC or 4.5 to 24 VDC and must be specified at time of order.

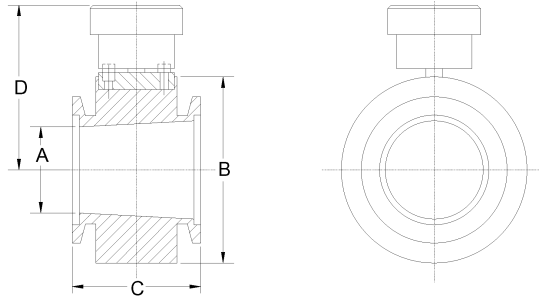
General Options Available: / Contact Factory

- Kalrez®, Parafluro®, Chemraz®, or other suitable materials.
- Roughing ports / Gauge ports consisting of KF, MET-SEAL, and VCR® flanges are available; contact factory.



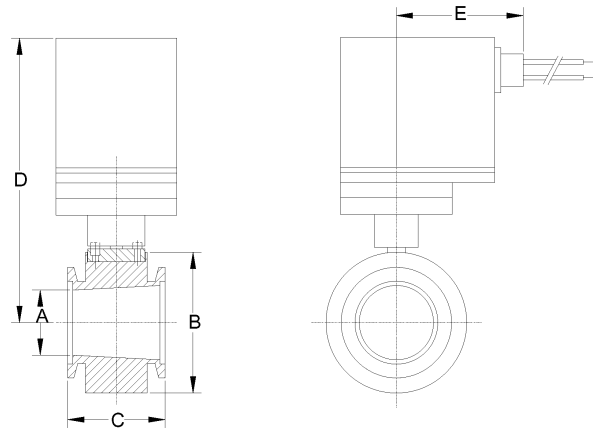
Butterfly Valves ISO-KF Interface

Key Speedy Manual Butterfly Valves; ISO-KF Interface

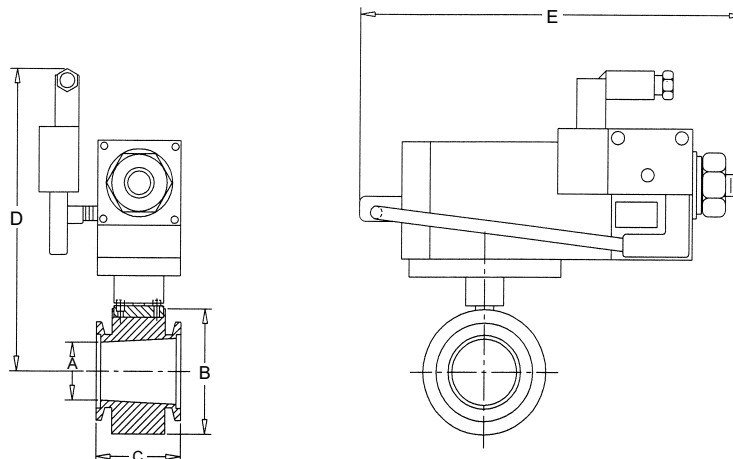


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Key Speedy Motorized Butterfly Valves; ISO-KF Interface



Key Speedy Electropneumatic Butterfly Valves; ISO-KF Interface



Butterfly Valves MET-SEAL Interface

Manual Operation

Part Number	Tubing Line Size	A	B	C	D	E
QBV-15-MS	3/4" to 1-1/2"	1.13	2.74	1.38	2.37	6 holes .265 dia. located on a 2.312 bolt circle
QBV-25-MS	2" to 2-1/2"	2.38	4.47	1.50	3.50	8 holes .332 dia. located on a 3.625 bolt circle
QBV-40-MS	3" to 4"	3.87	5.97	1.50	6.75	16 holes .332 dia. located on a 5.125 bolt circle
QBV-60-MS	5" to 6"	5.62	7.97	1.50	8.00	20 holes .332 dia. located on a 7.128 bolt circle

Options:

- Locking handle for exhaust damper applications; - Add **-HH** to suffix of part number; - Add - \$35.00 to base price.
- Note* = QBV-15-MS and QBV-25-MS are rotary knob operation (not shown), QBV-40-MS and QBV-60-MS are lever operation.

Electropneumatic Operation

Part Number	Tubing Line Size	A	B	C	D	E	F
QBV-15-P-MS	3/4" to 1-1/2"	1.13	2.74	1.38	4.25	5.50	6 holes .265 dia. located on a 2.312 bolt circle
QBV-25-P-MS	2" to 2-1/2"	2.38	4.47	1.50	6.12	7.38	8 holes .332 dia. Located on a 3.625 bolt circle
QBV-40-P-MS	3" to 4"	3.87	5.97	1.50	6.87	7.38	16 holes .332 dia. Located on a 5.125 bolt circle
QBV-60-P-MS	5" to 6"	5.62	7.97	1.50	8.00	7.38	20 holes .332 dia. Located on a 7.128 bolt circle

Operating pressure is 60 to 100 psi. Standard air cylinders are double acting normally closed and will close in an electrical failure and remain closed. All valves include 120/60 air solenoid standard.

Options:

- Solenoid valve voltages: 12VDC, 24VDC, 24VAC, and 230VAC. Add - \$ 20.00 to base price and voltage requirement to suffix of part number. Example: **(QBV-40-P-MS-24VDC)**
- Magnetic Reed switch position indicators: Reed switches feature an LED indicator for visual confirmation of valve position and have a two-meter cable. Add - \$ 150.00 and **-RS** to suffix of part number. Switches are 110 to 120 VAC or 4.5 to 24VDC and must be specified at time of order.

Motorized Operation

Part Number	Tubing Line Size	A	B	C	D	E	F	G
QBV-15-M-MS	3/4" to 2-1/2"	1.13	2.74	1.38	7.38	4-3/4"	3"	6 holes .265 dia. located on a 2.312 bolt circle
QBV-25-M-MS	2 to 2-1/2"	2.38	4.47	1.50	8.38	4-3/4"	3"	8 holes .332 dia. located on a 3.625 bolt circle
QBV-40-M-MS	3" to 4"	3.87	5.97	1.50	9.12	4-3/4"	3"	16 holes .332 dia. located on a 5.125 bolt circle
QBV-60-M-MS	5" to 6"	5.62	7.97	1.50	9.75	4-3/4"	3"	20 holes .332 dia. located on a 7.128 bolt circle

Options:

- 12VDC, 24VDC voltages are available, Add - \$100.00 to base price & -12VDC or 24VDC to suffix of part number. Example: **(QBV-40-M-MS-12VDC)** DC motors are continuous duty, 3.5 seconds per 90-degree rotation, and have NEMA 4 enclosures.
- Two additional switches for use as limit switches Add - \$300.00 to base price and **-LS** suffix to part number. Example: **(QBV-25-M-MS-LS)**
- Potentiometer: For measuring resistance output for feedback of actual position. Add - \$250.00 to base price and **-P** to suffix of part number. Example **(QBV-40-M-MS-P)** Potentiometers are offered in 0-135 ohm, 0-1000 ohm, and 0-5000 ohm; and must be specified at the time of order.

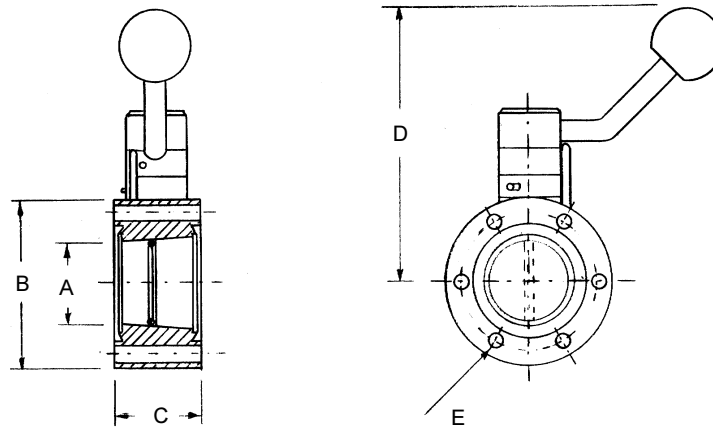
General Options Available: / Contact Factory

- Kalrez®, Parafiuoro®, Chemraz®, or other suitable sealing materials.
- Roughing ports / Gauge ports consisting of KF, MET-SEAL, and VCR® flanges are available; contact factory.



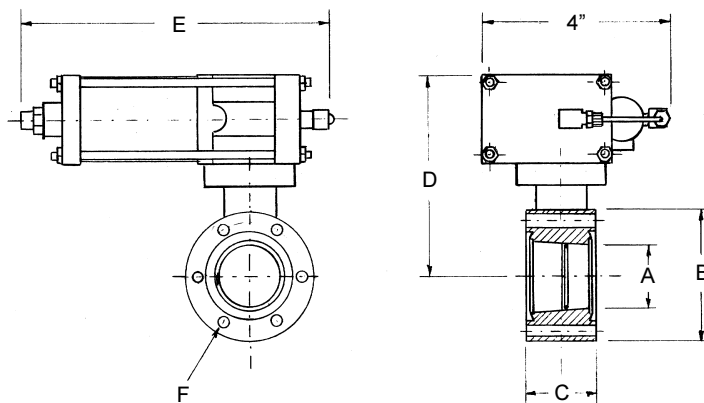
Butterfly Valves MET-SEAL Interface

Manual Quarter Swing: MET-SEAL Interface

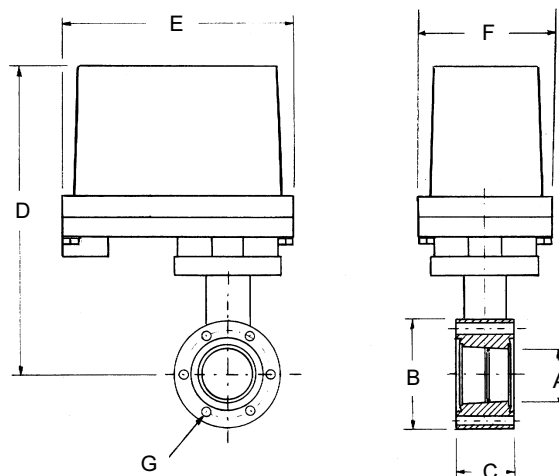


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Electropneumatic Operation: MET-SEAL Interface



Motorized Operation: MET-SEAL Interface



Key Bolted Manual and Motorized Butterfly Valves

Key Bolted Manual Butterfly Valve

Part No	Line Size	A	B	C	D	Bolt Circle Dimensional Data
QBV-15-AL	3/4 to 1-1/2	1-3/8	2-3/4	1-3/8	3-3/4	4 holes 17/64 Dia. Equally Spaced on 2.312 B.C.
QBV-15-SS	3/4 to 1-1/2	1-3/8	2-3/4	1-3/8	3-3/4	4 holes 17/64 Dia. Equally Spaced on 2.312 B.C.
QBV-20-AL	1-1/2 to 2	1-7/8	4-1/2	1-1/2	5-1/4	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-20-SS	1-1/2 to 2	1-7/8	4-1/2	1-1/2	5-1/4	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-25-AL	2 to 2-1/2	2-3/8	4-1/2	1-1/2	5-1/4	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-25-SS	2 to 2-1/2	2-3/8	4-1/2	1-1/2	5-1/4	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-30-AL	2-1/2 to 3	2-7/8	5-1/2	1-1/2	5-3/4	4 holes 21/64 Dia. Equally Spaced on 4.625 B.C.
QBV-30-SS	2-1/2 to 3	2-7/8	5-1/2	1-1/2	5-3/4	4 holes 21/64 Dia. Equally Spaced on 4.625 B.C.
QBV-40-AL	3 to 4	3-7/8	6	1-1/2	6-3/4	6 holes 21/64 Dia. Equally Spaced on 5.125 B.C.
QBV-40-SS	3 to 4	3-7/8	6	1-1/2	6-3/4	6 holes 21/64 Dia. Equally Spaced on 5.125 B.C.
QBV-50-AL	4 to 5	4-7/8	7	1-1/2	7-1/4	6 holes 21/64 Dia. Equally Spaced on 6.125 B.C.
QBV-50-SS	4 to 5	4-7/8	7	1-1/2	7-1/4	6 holes 21/64 Dia. Equally Spaced on 6.125 B.C.
QBV-60-AL	5 to 6	5-5/8	8	1-1/2	8	8 holes 21/64 Dia. Equally Spaced on 7.125 B.C.
QBV-60-SS	5 to 6	5-5/8	8	1-1/2	8	8 holes 21/64 Dia. Equally Spaced on 7.125 B.C.

Options: Locking handle for exhaust damper applications; - Add **-HH** to suffix of part number - Add - \$35.00 to base price. These valves are offered in 6061T6-body construction (Add **-AL** to suffix of part number), and 304L-body construction (Add **-SS** to suffix of part number).

Key Bolted Motorized Butterfly Valve

Part Number	Line Size	A	B	C	D	E	F
QBV-15-M-AL	3/4 to 1-1/2	1-3/8	2-3/4	1-3/8	7-3/4	3"	4 holes 17/64 Dia. Equally Spaced on 2.312 B.C.
QBV-15-M-SS	3/4 to 1-1/2	1-3/8	2-3/4	1-3/8	7-3/4	3"	4 holes 17/64 Dia. Equally Spaced on 2.312 B.C.
QBV-20-M-AL	1-1/2 to 2	1-7/8	4-1/2	1-1/2	8-1/4	3"	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-20-M-SS	1-1/2 to 2	1-7/8	4-1/2	1-1/2	8-1/4	3"	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-25-M-AL	2 to 2-1/2	2-3/8	4-1/2	1-1/2	8-1/4	3"	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-25-M-SS	2 to 2-1/2	2-3/8	4-1/2	1-1/2	8-1/4	3"	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-30-M-AL	2-1/2 to 3	2-7/8	5-1/2	1-1/2	8-3/4	3"	4 holes 21/64 Dia. Equally Spaced on 4.625 B.C.
QBV-30-M-SS	2-1/2 to 3	2-7/8	5-1/2	1-1/2	8-3/4	3"	4 holes 21/64 Dia. Equally Spaced on 4.625 B.C.
QBV-40-M-AL	3 to 4	3-7/8	6	1-1/2	9-1/4	3"	6 holes 21/64 Dia. Equally Spaced on 5.125 B.C.
QBV-40-M-SS	3 to 4	3-7/8	6	1-1/2	9-1/4	3"	6 holes 21/64 Dia. Equally Spaced on 5.125 B.C.
QBV-50-M-AL	4 to 5	4-7/8	7	1-1/2	9-3/4	3"	6 holes 21/64 Dia. Equally Spaced on 6.125 B.C.
QBV-50-M-SS	4 to 5	4-7/8	7	1-1/2	9-3/4	3"	6 holes 21/64 Dia. Equally Spaced on 6.125 B.C.
QBV-60-M-AL	5 to 6	5-5/8	8	1-1/2	10-1/4	3"	8 holes 21/64 Dia. Equally Spaced on 7.125 B.C.
QBV-60-M-SS	5 to 6	5-5/8	8	1-1/2	10-1/4	3"	8 holes 21/64 Dia. Equally Spaced on 7.125 B.C.

Standard actuators are 120/60 ac, cycle time 3.5 seconds per 90° rotation, duty cycle is 25%, NEMA 4 enclosure. These valves are offered in 6061T6-body construction (Add **-AL** to suffix of part number), and 304L-body construction (Add **-SS** to suffix of part number).

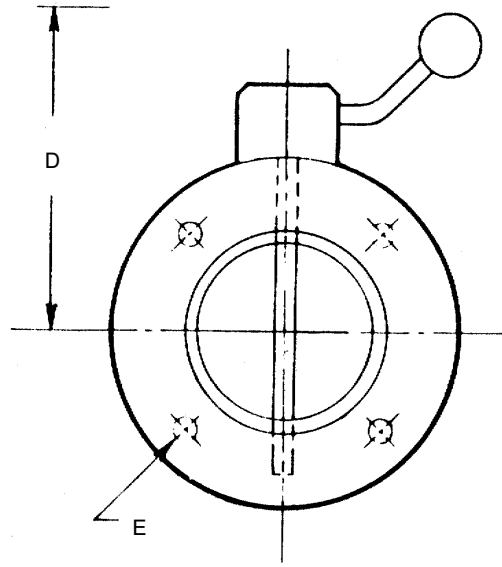
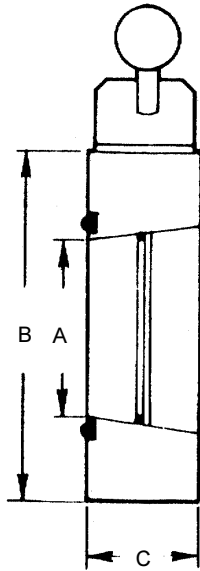
Options:

- 12VDC, 24VDC voltages- Add - \$100.00 to base price & **-12VDC** or **-24VDC** suffix to part number; DC motors are continuous duty.
- Two additional switches for use as limit switch - Add - \$300.00 to base price and **-LS** suffix to part number.
- Potentiometer for measuring resistance feedback of actual position. Add - \$250.00 to base price and **-P** to suffix of part number. Potentiometers offered in 0-135 ohm, 0-1000 ohm, 0-5000 ohm; Must be specified at time of order.



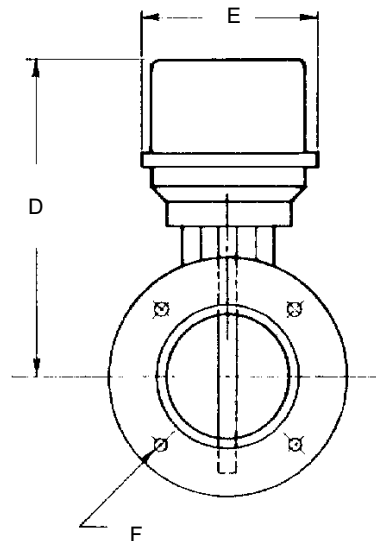
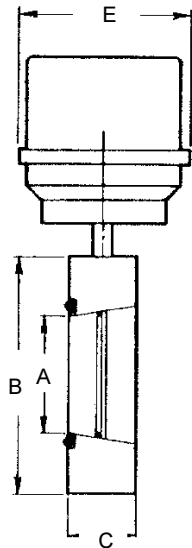
Key Bolted Manual and Motorized Butterfly Valves

Key Bolted Manual Butterfly Valve



3

Key Bolted Motorized Butterfly Valve



Key Bolted Pneumatic Butterfly Valves

Key Bolted Pneumatic Butterfly Valves

Part Number	Line size	A	B	C	D	E	F
QBV-15-P-AL	3/4" to 1-1/2"	1-3/8"	2-3/4"	1-3/8"	4-1/4"	5-1/2"	4 holes 17/64 Dia. Equally Spaced on 2.312 B.C.
QBV-15-P-SS	3/4 to 1-1/2"	1-3/8"	2-3/4"	1-3/8"	4-1/4"	5-1/2"	4 holes 17/64 Dia. Equally Spaced on 2.312 B.C.
QBV-20-P-AL	1-1/2" to 2"	1-7/8"	4-1/2"	1-1/2"	6"	8-1/2"	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-20-P-SS	1-1/2" to 2"	1-7/8"	4-1/2"	1-1/2"	6"	8-1/2"	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-25-P-AL	2" to 2-1/2"	2-3/8"	4-1/2"	1-1/2"	6"	8-1/2"	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-25-P-SS	2" to 2-1/2"	2-3/8"	4-1/2"	1-1/2"	6"	8-1/2"	4 holes 21/64 Dia. Equally Spaced on 3.625 B.C.
QBV-30-P-AL	2-1/2" to 3"	2-7/8"	5-1/2"	1-1/2"	6-1/2"	8-1/2"	4 holes 21/64 Dia. Equally Spaced on 4.625 B.C.
QBV-30-P-SS	2-1/2" to 3"	2-7/8"	5-1/2"	1-1/2"	6-1/2"	8-1/2"	4 holes 21/64 Dia. Equally Spaced on 4.625 B.C.
QBV-40-P-AL	3" to 4"	3-7/8"	6"	1-1/2"	7"	8-1/2"	6 holes 21/64 Dia. Equally Spaced on 5.125 B.C.
QBV-40-P-SS	3" to 4"	3-7/8"	6"	1-1/2"	7"	8-1/2"	6 holes 21/64 Dia. Equally Spaced on 5.125 B.C.
QBV-50-P-AL	4" to 5"	4-7/8"	7"	1-1/2"	7-1/2"	8-1/2"	6 holes 21/64 Dia. Equally Spaced on 6.125 B.C.
QBV-50-P-SS	4" to 5"	4-7/8"	7"	1-1/2"	7-1/2"	8-1/2"	6 holes 21/64 Dia. Equally Spaced on 6.125 B.C.
QBV-60-P-AL	5" to 6"	5-5/8"	8"	1-1/2"	8"	8-1/2"	8 holes 21/64 Dia. Equally Spaced on 7.125 B.C.
QBV-60-P-SS	5" to 6"	5-5/8"	8"	1-1/2"	8"	8-1/2"	8 holes 21/64 Dia. Equally Spaced on 7.125 B.C.

All pneumatic valves feature double acting air cylinder, 120/60 air solenoid and require a 60 to 100 psig compressed air supply. All pneumatic valves are normally closed and in the event of an electrical failure, will close and remain closed until power is restored. These valves are offered in 6061T6-body construction (Add **-AL** to suffix of part number), and 304L-body construction(Add **-SS** to suffix of part number).

Options:

- Solenoid valve voltages: 12vdc, 24vdc, 24vac, and 230vac. Add - \$20.00 to base price and voltage requirement to suffix of part number.
- Magnetic Reed Switch position indicators; Reed switches feature an LED indicator for visual conformation of valve position and have a two-meter cable.
Add - \$150.00 and **-RS** to suffix of part number. Switches are 110 to 120 VAC or 4.5 to 24 VDC and must be specified at time of order.

General options available: / contact factory

Kalrez®, Paraflo®, or other suitable sealing materials

Mating Flange Sets for Key Bolted Butterfly Valves; Brass and Stainless

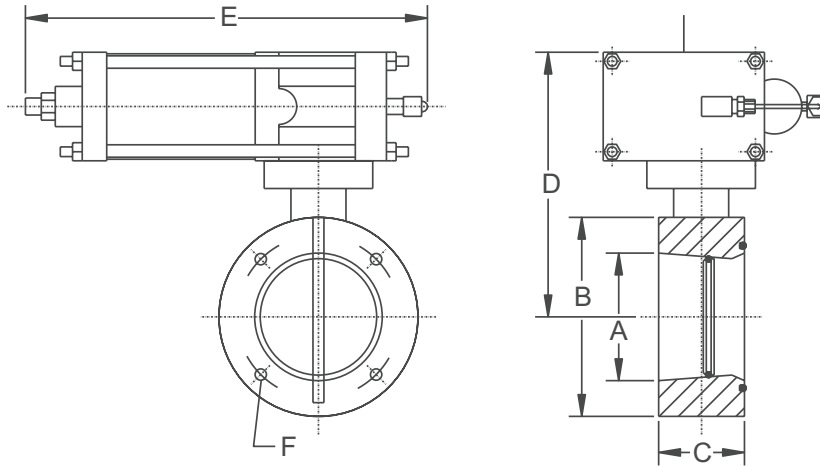
Part Number	A	B	C	D	E	F
QBF-75-BR	3/4"	2.312	2-3/4"	1/8"	5/16"	4 holes 17/64" dia. Located on a 2.312" B.C.
QBF-75-SS	3/4"	2.312	2-3/4"	1/8"	5/16"	4 holes 17/64" dia. Located on a 2.312" B.C.
QBF-100-BR	1"	2.312	2-3/4"	1/8"	5/16"	4 holes 17/64" dia. Located on a 2.312" B.C.
QBF-100-SS	1"	2.312	2-3/4"	1/8"	5/16"	4 holes 17/64" dia. Located on a 2.312" B.C.
QBF-150-BR	1-1/2"	2.312	2-3/4"	1/8"	5/16"	4 holes 17/64" dia. Located on a 2.312" B.C.
QBF-150-SS	1-1/2"	2.312	2-3/4"	1/8"	5/16"	4 holes 17/64" dia. Located on a 2.312" B.C.
QBF-200-BR	2"	3.625	4-1/2"	5/32"	3/8"	4 holes 21/64" dia. Located on a 3.625" B.C.
QBF-200-SS	2"	3.625	4-1/2"	5/32"	3/8"	4 holes 21/64" dia. Located on a 3.625" B.C.
QBF-250-BR	2-1/2"	3.625	4-1/2"	5/32"	3/8"	4 holes 21/64" dia. Located on a 3.625" B.C.
QBF-250-SS	2-1/2"	3.625	4-1/2"	5/32"	3/8"	4 holes 21/64" dia. Located on a 3.625" B.C.
QBF-300-BR	3"	4.625	5-1/2"	3/16"	7/16"	4 holes 21/64" dia. Located on a 4.625" B.C.
QBF-300-SS	3"	4.625	5-1/2"	3/16"	7/16"	4 holes 21/64" dia. Located on a 4.625" B.C.
QBF-400-BR	4"	5.125	6"	1/4"	1/2"	6 holes 21/64" dia. Located on a 5.125" B.C.
QBF-400-SS	4"	5.125	6"	1/4"	1/2"	6 holes 21/64" dia. Located on a 5.125" B.C.
QBF-500-BR	5"	6.125	7"	1/4"	1/2"	6 holes 21/64" dia. Located on a 6.125" B.C.
QBF-500-SS	5"	6.125	7"	1/4"	1/2"	6 holes 21/64" dia. Located on a 6.125" B.C.
QBF-600-BR	6"	7.125	8"	1/4"	1/2"	8 holes 21/64" dia. Located on a 7.125" B.C.
QBF-600-SS	6"	7.125	8"	1/4"	1/2"	8 holes 21/64" dia. Located on a 7.125" B.C.

These flanges are offered in brass (Add **-BR** to suffix of part number) or 304L (Add **-SS** to suffix of part number).



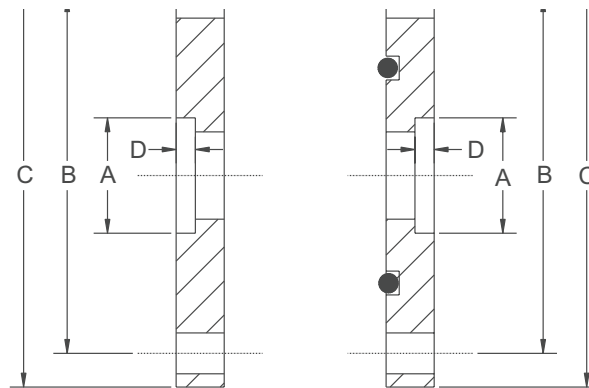
Key Bolted Pneumatic Butterfly Valves

Key Bolted Pneumatic Butterfly Valves



3

Mating Flange Sets for Key Bolted Butterfly Valves; Brass and Stainless Steel

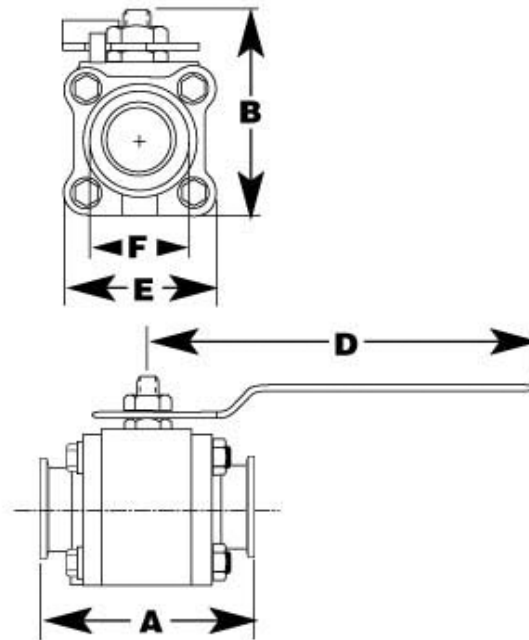


Stainless Steel Ball Valves

Straight Thru, 1/4" Turn, Manual Ball Valves

- Straight thru design
- Viton® sealed feedthrough
- Standard NW flanges

3



Manual Ball Valves

Part Number	Port Style	Orifice	A	B	D	E	F
SSBV-16★	NW 16	.51	3.6	2.6	3.94	1.89	1.18
SSBV-25★	NW 25	.83	4.21	3.29	5.90	2.32	1.57
SSBV-40★	NW 40	1.30	5.12	4.25	8.27	3.23	2.17
SSBV-50★	NW 50	1.65	5.95	4.84	8.27	3.74	2.95

★ = New Product



ISO Components

KEY HIGH VACUUM PRODUCTS, INC., is a major manufacturer of ISO flanges and components. These flanges and components are a comprehensive family of high vacuum building block components. All **"KEY SPEEDY"** components are manufactured to exact ISO specifications. The International Standards Organization has defined the standard metric interface dimensions, which allows interchangeability of ISO compliant components. The tube diameters of the **"KEY SPEEDY"** ISO flanges have been adjusted slightly by **KEY HIGH VACUUM PRODUCTS, INC.** to meet the closest standard domestic tubing found in the US (inch sizes).

"KEY SPEEDY" ISO components are standardized modular construction system components for today's high vacuum systems. The **"KEY SPEEDY"** ISO system offers flanges, elbows, tees, crosses, reducers, valves, traps, adapters, etc., which allow extensive versatility. The ISO interface system on this extensive array of components permit complete systems to be designed and produced rapidly by equipment builders using standard "off the shelf" components.

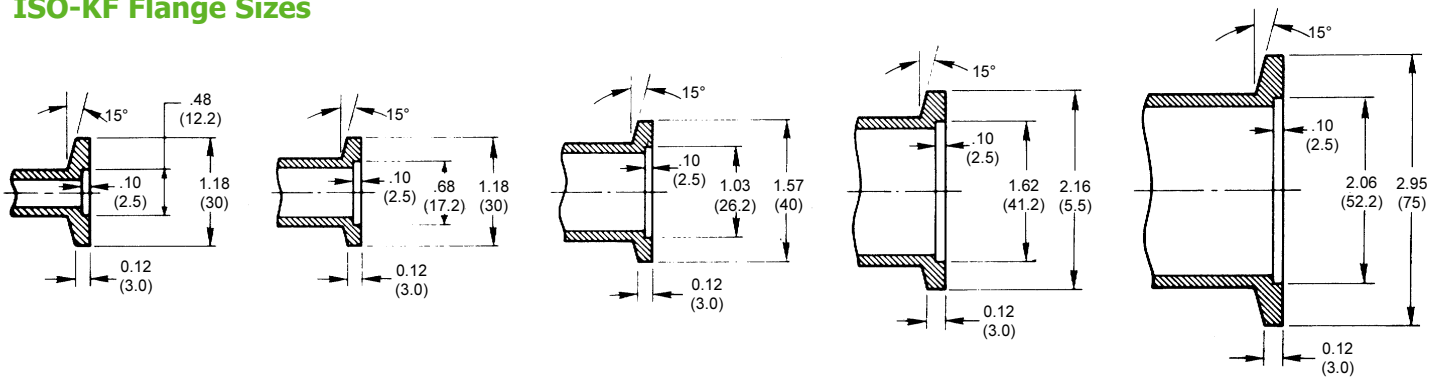
A complete ISO clamp assembly consists of two identical flanges, clamp or clamps, centering ring, which aligns the flanges and prevents the o-ring from collapsing while being subjected to high vacuum. **"KEY SPEEDY"** ISO flanges themselves are infinitely rotatable solving alignment issues. Furthermore the ISO flange system offers the most cost-effective technique available for leak tight manifolds for today's systems.

NW 10 through NW 50 **"KEY SPEEDY"** ISO components use a single hinged aluminum clamp with a single wing nut permitting quick easy one-hand assembly. Simply tighten the wing nut, which in turn applies a downward pressure on the flanges to generate a leak tight seal. Hinged clamps should be finger tightened only until both flanges are firmly in contact with the o-ring seal.

"KEY SPEEDY" ISO flanges and components with viton® o-rings can bake to 205°C intermittently while under vacuum. However, sustained baking about 160°C will cause typical viton® o-rings to deteriorate rapidly. Buna o-rings are bakeable for short periods to 100°C intermediately; sustained baking should not be performed above 80°C. In clean baked systems with viton® seals pressures of 10⁻⁹ torr can be attained and in clean baked systems with buna seals pressures of 10⁻⁷ torr can be attained.

KEY HIGH VACUUM PRODUCTS, INC. manufactures an extensive range of ISO hardware offerings that leads to virtually one stop shopping capability. The ease of use of the **"KEY SPEEDY"** ISO system make this flange system the most prevalent format when building a high vacuum system. Simple o-ring compression seal, speedy assembly and disassembly, coupled with reusable components and an enormous selection of components, make it the easiest method yet to "plumb" a system.

ISO-KF Flange Sizes



NW 10 ISO-KF

NW 16 ISO-KF

NW 25 ISO-KF

NW 40 ISO-KF

NW 50 ISO-KF

Flange dimensions shown are the International Standard Flange dimensions. Rather than repeat them throughout the catalog, they are shown once in this diagram.



KEY SPEEDY Series 316L ISO Components

At **KEY HIGH VACUUM PRODUCTS, INC.**, we are always looking for new additional products to bring you innovative problem solving components that benefit you, the customer. **KEY HIGH VACUUM PRODUCTS, INC.** is now pleased to offer "**SERIES 316L KEY SPEEDY**" ISO components. As the name implies, these components are manufactured from select grades of certified **316L** stainless steel.

"**SERIES 316L KEY SPEEDY**" stainless steel ISO vacuum fittings and components from **KEY HIGH VACUUM PRODUCTS, INC.** are ideal if greater corrosion resistance is required than is available from the standard grade of 304 ISO components. **316L** stainless steel is the "next step up" from 304 as 316L stainless steel has virtually the same mechanical, physical and fabrication characteristics as 304 with the added benefit of superior corrosion resistance.

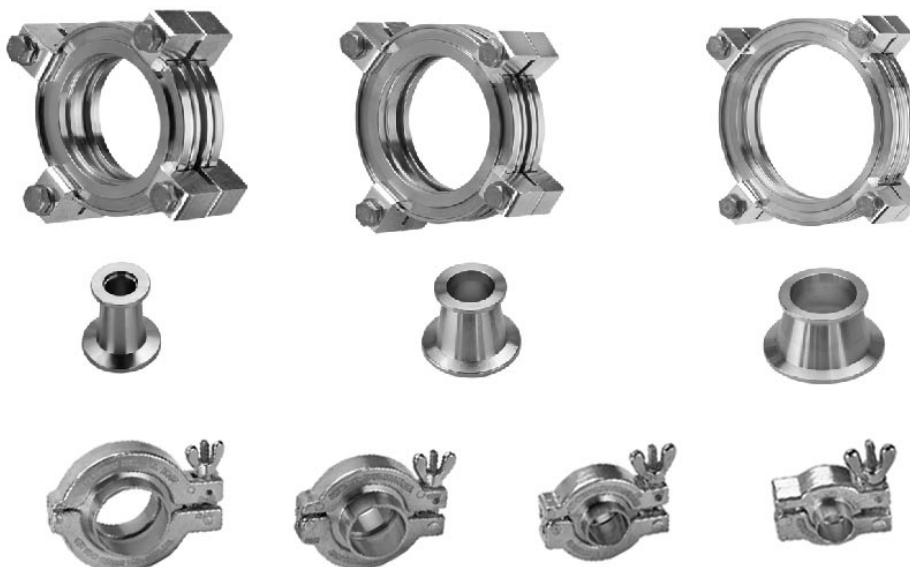
Corrosion resistance

Grade **316L** has excellent corrosion resistance in a wide range of media. The corrosion resistance of austenitic stainless steel alloys varies from good to excellent, depending on alloy content. The most common austenitic stainless steel is type 304, which contains approximately 18% chromium and 8% nickel. In addition to the alloying variation of standard 304 stainless steel; **316L** stainless steel has higher chromium, and nickel levels, and has the added benefit of molybdenum to improve the aspect of corrosion resistance.

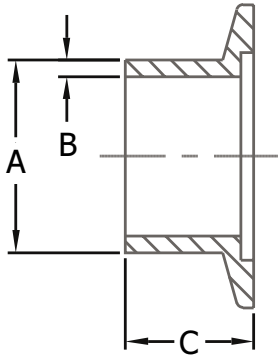
Typical Applications

"**SERIES 316L KEY SPEEDY**" components are suggested for high temperature or corrosive applications commonly found in the semiconductor industries. Type **316L** stainless steel is also well suited for high temperature applications that require relatively high strengths up to 1500° F. Like other austenitic stainless steel, **316L** has excellent toughness down to the temperatures of liquefied gases and has application at these temperatures, however lower cost grades such as 304 are usually selected for cryogenic vessels. Another benefit like other austenitic grades, **316L** in the annealed condition is virtually non-magnetic. This alone may be a reason for selecting grade **316L** in some applications. Another benefit of "**SERIES 316L KEY SPEEDY**" components is that it has outstanding weldability and all standard TIG welding techniques can be used for joining components together.

This additional new family of high vacuum components from **KEY HIGH VACUUM PRODUCTS, INC.**, is intended for use in today's demanding production tools, which make more extensive use of volatile and aggressive chlorine and fluorine chemistries than ever before. In today's tools superior materials and components are needed from start to finish in the plumbing of the vacuum system. All our "**SERIES 316L KEY SPEEDY**" components are manufactured from the finest quality materials and should be considered for critical applications involving corrosive fluids and gases found in many systems.



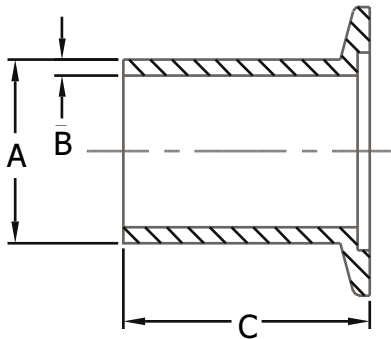
KEY SPEEDY Series 316L ISO Components



Flange Short Weld Stub

- Stainless steel type 316L
- Butt weld

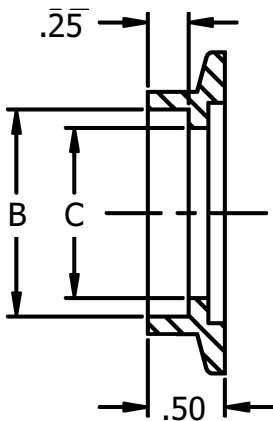
Part Number	Tube OD	ISO	A	B	C
KSF-0316-1-316	3/4"	NW 16	0.75	0.065	0.50
KSF-0325-316	1"	NW 25	1.00	0.065	0.75
KSF-0340-316	1-1/2"	NW 40	1.50	0.083	0.75
KSF-0350-316	2"	NW 50	2.00	0.083	0.75



Flange Long Weld Stub

- Stainless steel type 316L
- Butt Weld

Part Number	Tube OD	ISO	A	B	C
KSF-0416-1-316	3/4"	NW 16	0.75	0.065	1.575
KSF-0425-316	1"	NW 25	1.00	0.065	1.575
KSF-0440-316	1-1/2"	NW 40	1.50	0.083	1.575
KSF-0450-316	2"	NW 50	2.00	0.083	1.575

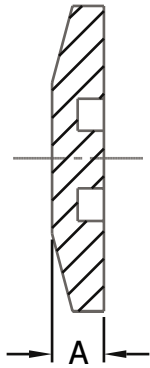


Flange Weld Socket

- Stainless steel type 316L
- Self Aligning

Part Number	Tube OD	ISO	B	C
KSF-0616-316	3/4"	NW 16	0.760	0.625
KSF-0625-316	1"	NW 25	1.010	0.87
KSF-0640-316	1-1/2"	NW 40	1.510	1.37
KSF-0650-316	2"	NW 50	2.010	1.87

KEY SPEEDY Series 316L ISO components

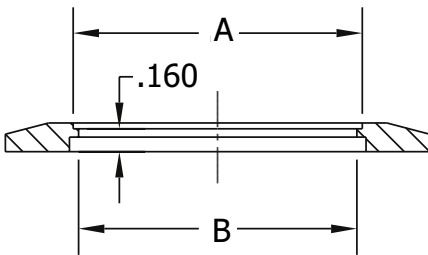


Flange Blank-Off

- Stainless steel type 316L
- To close off unused ports

Part Number	ISO	A
KSF-1210-316	NW 10	.2
KSF-1216-316	NW 16	.2
KSF-1225-316	NW 25	.2
KSF-1240-316	NW 40	.2
KSF-1250-316	NW 50	.2

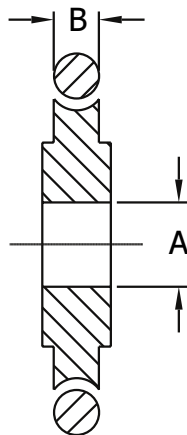
4



Flange Weld Ring

- Stainless steel type 316L
- Low Profile

Part Number	Tube OD	ISO	A	B
KSF-9816-2-316	3/4"	NW 16	0.76	0.625
KSF-9825-3-316	1"	NW 25	1.01	0.938
KSF-9840-4-316	1-1/2"	NW 40	1.51	1.438
KSF-9850-5-316	2"	NW 50	2.01	1.938



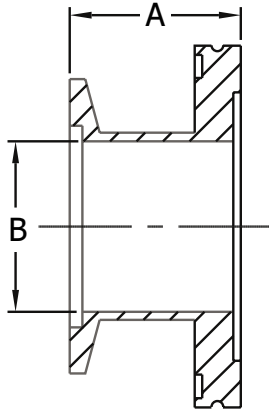
Seal Centering Ring Assembly

- Stainless steel type 316L
- Replaceable Viton® O-ring / Other Sealing materials available
- 200° C maximum bake out

Part Number	Tube OD	ISO	A	B
KSCR-1810-316	1/2"	NW 10	0.394	0.210
KSCR-1816-316	3/4"	NW 16	0.630	0.210
KSCR-1825-316	1"	NW 25	0.984	0.210
KSCR-1840-316	1-1/2"	NW 40	1.575	0.210
KSCR-1850-316	2"	NW 50	1.969	0.210



KEY SPEEDY Series 316L ISO Components



Adapter ISO-KF to ISO-MF

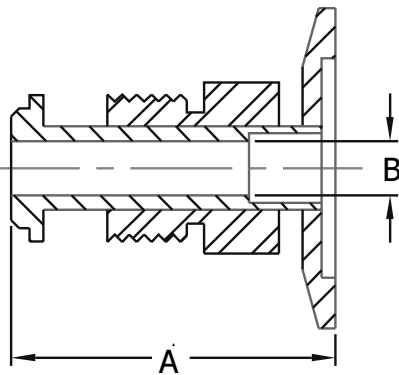
• *Stainless steel type 316L*

Part Number	ISO-MF to ISO-KF	A	B
KSA-3616-316	NW 63 to NW 16	1.77	0.62
KSA-3625-316	NW 63 to NW 25	1.77	0.87
KSA-3640-316	NW 63 to NW 40	1.77	1.33
KSA-3650-316	NW 63 to NW 50	1.77	1.83
KSA-3650-1-316	NW 80 to NW 50	1.77	1.83
KSA-3650-3-316	NW 100 to NW 40	1.77	1.33
KSA-3650-2-316	NW 100 to NW 50	1.77	1.83

4

Adapter ISO-KF to VCR® Male

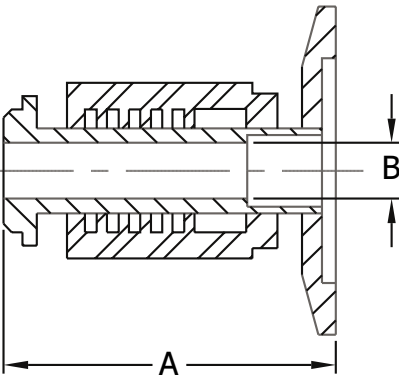
• *Stainless steel type 316L*



Part Number	Flange Size	A	B
KSA-3716-316	NW 16 to 1/4" VCR®	1.40	0.19
KSA-3716-1-316	NW 16 to 1/2" VCR®	1.63	0.41
KSA-3725-316	NW 25 to 1/4" VCR®	1.40	0.62
KSA-3725-1-316	NW 25 to 1/2" VCR®	1.60	0.41
KSA-3725-2-316	NW 25 to 3/4" VCR®	2.14	0.62
KSA-3740-316	NW 40 to 1/4" VCR®	1.40	0.19
KSA-3740-1-316	NW 40 to 1/2" VCR®	1.60	0.41
KSA-3740-2-316	NW 40 to 3/4" VCR®	2.10	0.62
KSA-3750-316	NW 50 to 1/4" VCR®	1.40	0.19
KSA-3750-1-316	NW 50 to 1/2" VCR®	1.60	0.41
KSA-3750-2-316	NW 50 to 3/4" VCR®	2.10	0.62

Adapter ISO-KF to VCR® Female

• *Stainless steel type 316L*

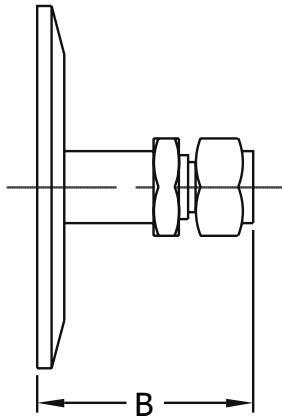


Part Number	Flange Size	A	B
KSA-3816-316	NW 16 to 1/4" VCR®	1.40	0.19
KSA-3816-1-316	NW 16 to 1/2" VCR®	1.63	0.41
KSA-3825-316	NW 25 to 1/4" VCR®	1.40	0.19
KSA-3825-1-316	NW 25 to 1/2" VCR®	1.60	0.41
KSA-3825-2-316	NW 25 to 3/4" VCR®	2.14	0.62
KSA-3840-316	NW 40 to 1/4" VCR®	1.40	0.19
KSA-3840-1-316	NW 40 to 1/2" VCR®	1.60	0.41
KSA-3840-2-316	NW 40 to 3/4" VCR®	2.10	0.62
KSA-3850-316	NW 50 to 1/4" VCR®	1.40	0.19
KSA-3850-1-316	NW 50 to 1/2" VCR®	1.60	0.41
KSA-3850-2-316	NW 50 to 3/4" VCR®	2.10	0.62



KEY SPEEDY Series 316L ISO Components

4



Adapter ISO-KF to Swagelok®

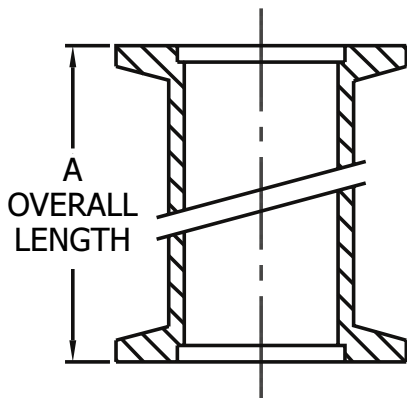
• *Stainless steel type 316L*

Part Number	Flange Size	For tubing size OD	B
KSA-9816-316	NW 16	1/4"	1.32
KSA-9825-316	NW 25	1/4"	1.32
KSA-9825-1-316	NW 25	1/2"	1.62
KSA-9840-316	NW 40	1/4"	1.32
KSA-9840-1-316	NW 40	1/2"	1.62
KSA-9840-2-316	NW 40	3/4"	1.71
KSA-9840-3-316	NW 40	1"	2.07
KSA-9850-316	NW 50	1/4"	1.32
KSA-9850-1-316	NW 50	1/2"	1.62
KSA-9850-2-316	NW 50	3/4"	1.71
KSA-9850-3-316	NW 50	1"	2.07

Straight Section

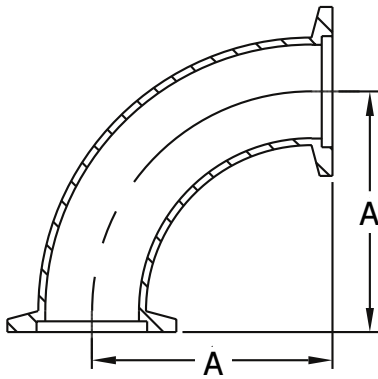
• *Stainless steel type 316L*

• *Other lengths available upon request*



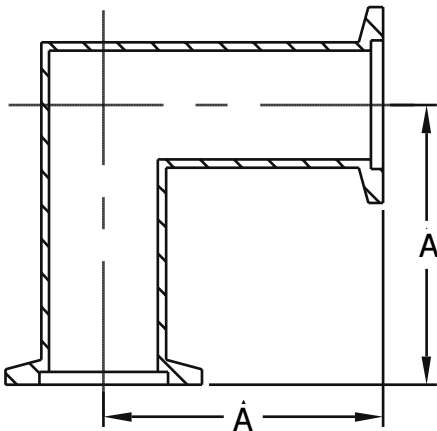
Part Number	Flange Size	A
KSS-3916-2-316	NW 16	2.30
KSS-3916-316	NW 16	3.15
KSS-3916-3-316	NW 16	6.45
KSS-3916-1-316	NW 16	12.60
KSS-3925-316	NW 25	3.94
KSS-3925-2-316	NW 25	4.06
KSS-3925-3-316	NW 25	4.08
KSS-3925-4-316	NW 25	8.03
KSS-3925-1-316	NW 25	12.60
KSS-3940-2-316	NW 40	4.80
KSS-3940-3-316	NW 40	4.93
KSS-3940-316	NW 40	5.12
KSS-3940-4-316	NW 40	10.39
KSS-3940-1-316	NW 40	12.60
KSS-3950-316	NW 50	5.51
KSS-3950-2-316	NW 50	6.30
KSS-3950-3-316	NW 50	6.43
KSS-3950-4-316	NW 50	11.18
KSS-3950-1-316	NW 50	12.60





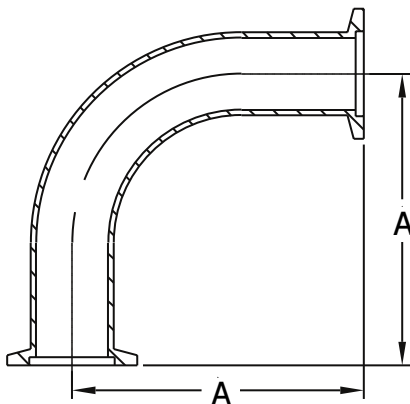
Elbows 90° Radius Bend
 • Stainless steel type 316L

Part Number	Flange Size	A
KSE-4110-316	NW 10	1.25
KSE-4116-316	NW 16	1.57
KSE-4125-316	NW 25	2.04
KSE-4140-316	NW 40	2.46
KSE-4150-316	NW 50	3.21



Elbows 90° Miter
 • Stainless steel type 316L

Part Number	Flange Size	A
KSE-4216-316	NW 16	1.15
KSE-4225-316	NW 25	2.04
KSE-4240-316	NW 40	2.56
KSE-4250-316	NW 50	2.76

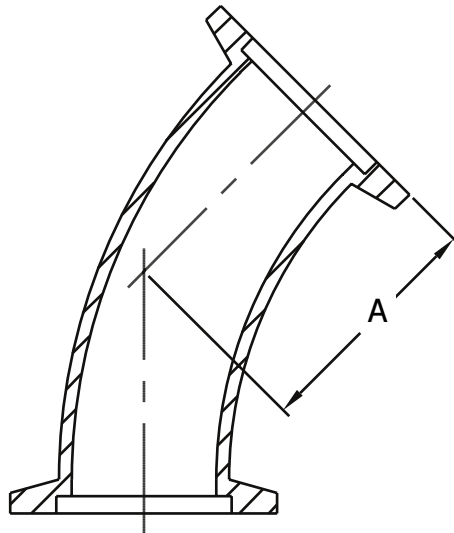


Elbows Long Radius 90° Bend
 • Stainless steel type 316L

Part Number	Flange Size	A
KSE-4340-316	NW 40	5.12
KSE-4350-316	NW 50	5.51



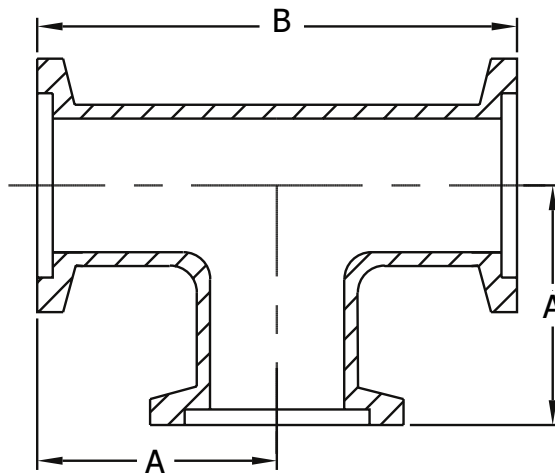
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Elbows 135° Radius Bend

• **Stainless steel type 316L**

Part Number	Flange Size	A
KSE-4416-316	NW 16	0.91
KSE-4425-316	NW 25	1.12
KSE-4440-316	NW 40	1.68
KSE-4450-316	NW 50	1.99

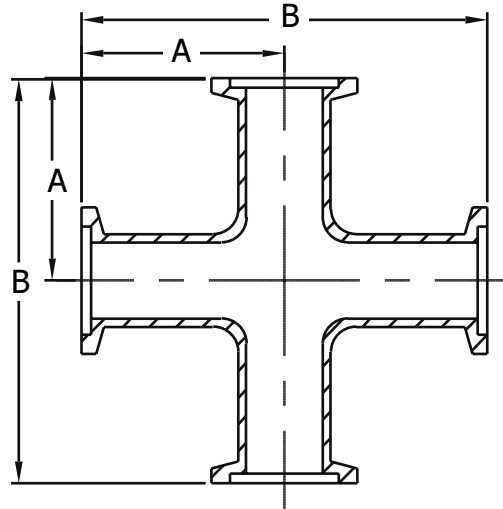


Tees

• **Stainless steel type 316L**

Part Number	Flange Size	A	B
KST-4510-316	NW 10	1.25	2.50
KST-4516-316	NW 16	1.57	3.15
KST-4525-316	NW 25	2.04	4.08
KST-4540-316	NW 40	2.56	5.12
KST-4550-316	NW 50	3.21	5.51

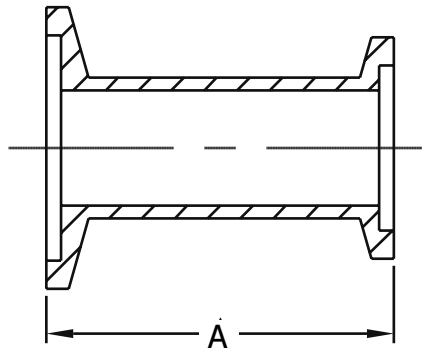




Crosses

- ISO-KF Flanges, same size all ports
- Stainless steel type 316L

Part Number	Flange Size	A	B
KSCRS-4716-316	NW 16	1.57	3.15
KSCRS-4725-316	NW 25	1.97	3.94
KSCRS-4740-316	NW 40	2.56	5.12
KSCRS-4750-316	NW 50	2.76	5.51

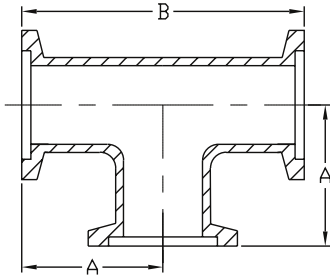


Reducer

- Mates differing, ISO-KF sizes
- Stainless steel type 316L

Part Number	Flange Size	A
KSR-4816-316	NW 16 to NW 25	1.57
KSR-4816-1-316	NW 16 to NW 40	1.57
KSR-4816-2-316	NW 16 to NW 50	1.57
KSR-4825-316	NW 25 to NW 40	1.57
KSR-4825-1-316	NW 25 to NW 50	1.57
KSR-4840-316	NW 40 to NW 50	1.57

KEY SPEEDY ISO-KF Aluminum Elbows, Tees, Crosses

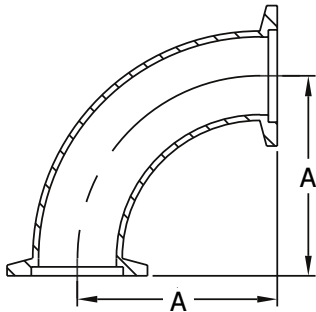


Aluminum Tees

• 6082 Aluminum

Part Number	ISO	A	B
KST-4510-AL★	NW 10	1.18	2.36
KST-4516-AL★	NW 16	1.57	3.14
KST-4525-AL★	NW 25	1.96	3.94
KST-4540-AL★	NW 40	2.75	5.51

★= New Product

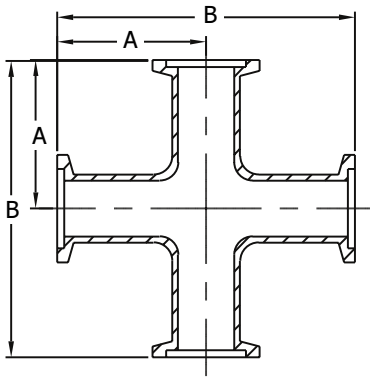


Aluminum 90° Elbows

• 6082 Aluminum

Part Number	ISO	A
KSE-4116-AL★	NW 16	1.57
KSE-4125-AL★	NW 25	1.97
KSE-4140-AL★	NW 40	2.56

★= New Product

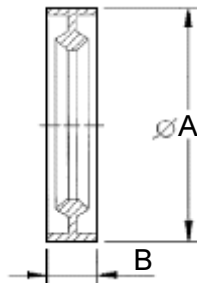


Aluminum Crosses

• 6082 Aluminum

Part Number	ISO	A	B
KSCRS-4716-AL★	NW 16	1.57	3.15
KSCRS-4725-AL★	NW 25	1.97	3.94
KSCRS-4740-AL★	NW 40	2.56	5.12

★= New Product



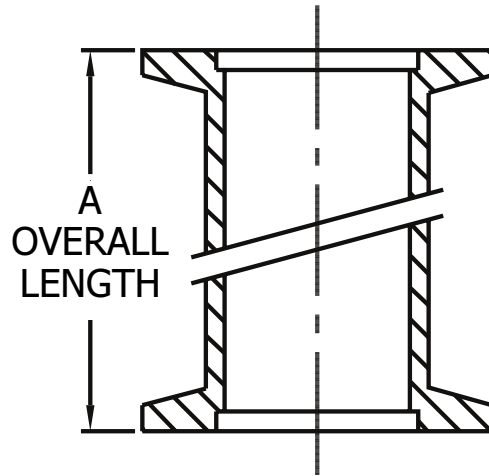
Aluminum Metal Edge Seals

• 6082 Aluminum

Part Number	ISO	A	B
KSCR-1516-AMES★	NW 16	1.26	.275
KSCR-1525-AMES★	NW 25	1.65	.275
KSCR-1540-AMES★	NW 40	2.44	.275
KSCR-1550-AMES★	NW 50	3.03	.275

★= New Product





Straight Sections

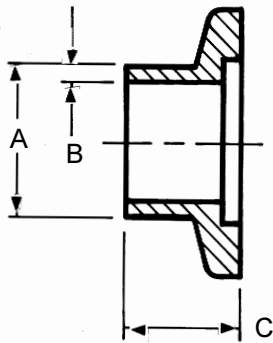
- ***Aluminum 6061T6***
- ***Other lengths available upon request***

Part Number	Flange Size	A
KSS-3916-2.30AL★	NW 16	2.30
KSS-3916-AL★	NW 16	3.15
KSS-3916-6.45-AL★	NW 16	6.45
KSS-3925-AL★	NW 25	3.94
KSS-3925-4.08-AL★	NW 25	4.08
KSS-3925-8.03-AL★	NW 25	8.03
KSS-3925-1-AL★	NW 25	12.60
KSS-3940-4.80-AL★	NW 40	4.80
KSS-3940-4.93-AL★	NW 40	4.93
KSS-3940-AL★	NW 40	5.12
KSS-3940-10.39-AL★	NW 40	10.39
KSS-3950-AL★	NW 50	5.51
KSS-3950-6.30-AL★	NW 50	6.30
KSS-3950-6.43-AL★	NW 50	6.43
KSS-3950-11.18-AL★	NW 50	11.18
KSS-3950-1-AL★	NW 50	12.60

★= New Product



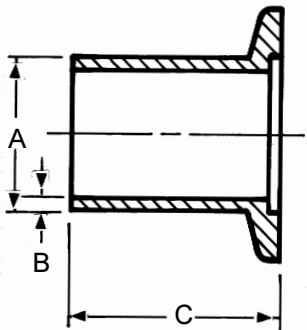
KEY SPEEDY ISO-NW Flanges



Flange Short Weld Stub
 • Stainless steel type 304
 • Butt weld

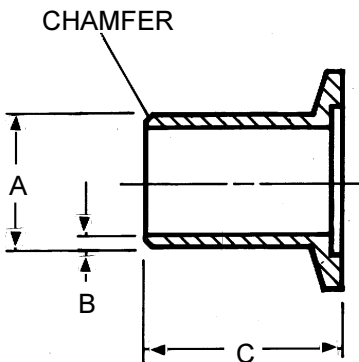
Part Number	Tube OD	ISO	A	B	C
KSF-0310	3/8"	NW 10	0.50	0.065	0.50
KSF-0316	1/2"	NW 16	0.75	0.065	0.50
KSF-0316-1	3/4"	NW 16	0.75	0.065	0.50
KSF-0325	1"	NW 25	1.00	0.065	0.50
KSF-0340	1-1/2"	NW 40	1.50	0.083	0.75
KSF-0350	2"	NW 50	2.00	0.083	0.75

4



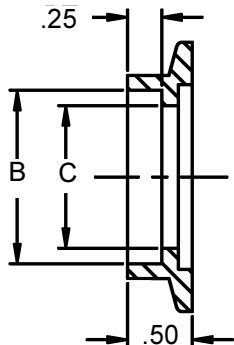
Flange Long Weld Stub
 • Stainless steel type 304
 • Butt weld

Part Number	Tube OD	ISO	A	B	C
KSF-0410	1/2"	NW 10	0.50	0.065	1.575
KSF-0416	1/2"	NW 16	0.50	0.065	1.575
KSF-0416-1	3/4"	NW 16	0.75	0.065	1.575
KSF-0425	1"	NW 25	1.00	0.065	1.575
KSF-0440	1-1/2"	NW 40	1.50	0.083	1.575
KSF-0450	2"	NW 50	2.00	0.083	1.575



Flange Long Weld Stub
 • Aluminum type 6061T6
 • Butt weld

Part Number	Tube OD	ISO	A	B	C
KSF-0516	1/2"	NW 16	0.50	0.065	1.575
KSF-0516-1	3/4"	NW 16	0.75	0.065	1.575
KSF-0525	1"	NW 25	1.00	0.065	1.575
KSF-0540	1-1/2"	NW 40	1.50	0.083	1.575
KSF-0550	2"	NW 50	2.00	0.083	1.575

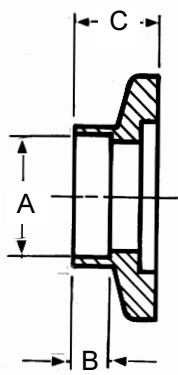


Flange Weld Socket
 • Stainless steel type 304
 • Self aligning

Part Number	Tube OD	ISO	B	C
KSF-0616-1	1/2"	NW 16	0.510	0.437
KSF-0616	3/4"	NW 16	0.760	0.625
KSF-0625	1"	NW 25	1.010	0.87
KSF-0640	1-1/2"	NW 40	1.510	1.37
KSF-0650	2"	NW 50	2.010	1.87



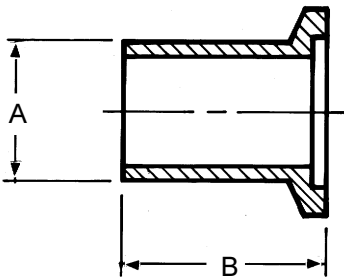
KEY SPEEDY ISO-NW Flanges



Flange Braze Socket

• Brass

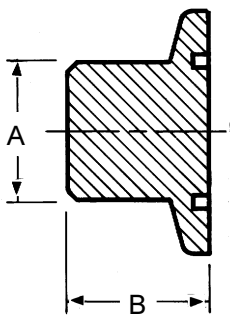
Part Number	Tube OD	ISO	A	B	C
KSF-0710	1/2"	NW 10	0.51	0.25	0.50
KSF-0716	1/2"	NW 16	0.51	0.25	0.50
KSF-0716-1	5/8"	NW 16	0.63	0.25	0.50
KSF-0716-2	3/4"	NW 16	0.76	0.25	0.62
KSF-0725	1"	NW 25	1.01	0.25	0.50
KSF-0725-1	1-1/8"	NW 25	1.13	0.50	0.62
KSF-0740	1-5/8"	NW 40	1.63	0.50	1.00
KSF-0750	2"	NW 50	2.01	0.50	1.00
KSF-0750-1	2-1/8"	NW 50	2.13	0.50	1.00



Flange Braze Stub

• Brass

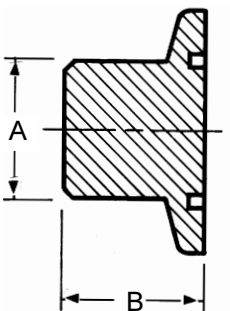
Part Number	Tube OD	ISO	A	B
KSF-0816	1/2"	NW 16	0.50	1.00
KSF-0816-1	5/8"	NW 16	0.62	1.00
KSF-0816-2	3/4"	NW 16	0.75	1.00
KSF-0825	1"	NW 25	1.00	1.38
KSF-0825-1	1-1/8"	NW 25	1.12	1.38
KSF-0840	1-5/8"	NW 40	1.62	1.575
KSF-0850	2"	NW 50	2.00	1.575
KSF-0850-1	2-1/8"	NW 50	2.12	1.575



Flange Unbored Stub

• Stainless steel type 304

Part Number	ISO	A	B
KSF-0910	NW 10	0.75	0.75
KSF-0916	NW 16	0.75	0.75
KSF-0925	NW 25	1.00	0.75
KSF-0940	NW 40	1.50	1.00
KSF-0950	NW 50	2.00	1.00

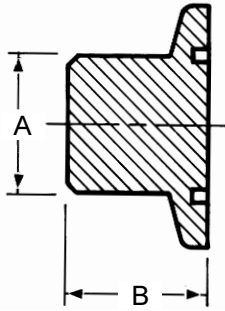


Flange Unbored Stub

• Aluminum type 6061T6

Part Number	ISO	A	B
KSF-1010	NW 10	0.75	0.75
KSF-1016	NW 16	0.75	0.75
KSF-1025	NW 25	1.00	0.75
KSF-1040	NW 40	1.50	1.00
KSF-1050	NW 50	2.00	1.00

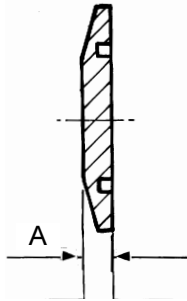
KEY SPEEDY ISO-NW Flanges



Flange Unbored Stub

- Brass

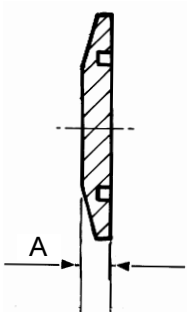
Part Number	ISO	A	B
KSF-1116	NW 16	0.75	0.75
KSF-1125	NW 25	1.00	0.75
KSF-1140	NW 40	1.50	1.00
KSF-1150	NW 50	2.00	1.00



Flange Blank-Off

- Stainless steel type 304
- To close off unused ports

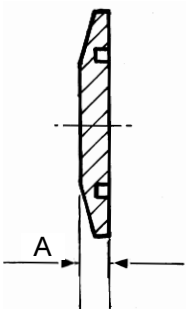
Part Number	ISO	A
KSF-1210	NW 10	.2
KSF-1216	NW 16	.2
KSF-1225	NW 25	.2
KSF-1240	NW 40	.2
KSF-1250	NW 50	.2



Flange Blank-Off

- Aluminum type 6061-T6
- To close off unused ports

Part Number	ISO	A
KSF-1310	NW 10	.2
KSF-1316	NW 16	.2
KSF-1325	NW 25	.2
KSF-1340	NW 40	.2
KSF-1350	NW 50	.2



Flange Blank-Off

- Brass
- To close off unused ports

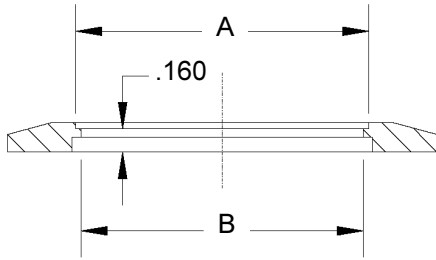
Part Number	ISO	A
KSF-1416	NW 16	.2
KSF-1425	NW 25	.2
KSF-1440	NW 40	.2
KSF-1450	NW 50	.2



KEY SPEEDY ISO-NW Flanges

Flange Weld Ring

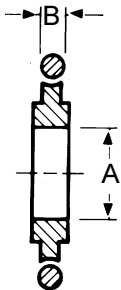
- Stainless steel type 304
- Low profile



Part Number	Tube OD	ISO	A	B
KSF-9810	3/8"	NW 10	0.380	0.250
KSF-9816	3/8"	NW 16	0.380	0.343
KSF-9816-1	1/2"	NW 16	0.510	0.461
KSF-9816-2	3/4"	NW 16	0.760	0.625
KSF-9825	3/8"	NW 25	0.380	0.343
KSF-9825-1	1/2"	NW 25	0.510	0.461
KSF-9825-2	3/4"	NW 25	0.760	0.625
KSF-9825-3	1"	NW 25	1.010	0.938
KSF-9840	3/8"	NW 40	0.380	0.343
KSF-9840-1	1/2"	NW 40	0.510	0.461
KSF-9840-2	3/4"	NW 40	0.760	0.725
KSF-9840-3	1"	NW 40	1.010	0.938
KSF-9840-4	1-1/2"	NW 40	1.510	1.438
KSF-9850	3/8"	NW 50	0.380	0.343
KSF-9850-1	1/2"	NW 50	0.510	0.461
KSF-9850-2	3/4"	NW 50	0.760	0.725
KSF-9850-3	1"	NW 50	1.010	0.938
KSF-9850-4	1-1/2"	NW 50	1.510	1.438
KSF-9850-5	2"	NW 50	2.010	1.938

Seal Centering Ring Assembly

- Aluminum centering ring
- Replaceable Buna-N O-ring
- 100° C maximum bake out



Part Number	Tube OD	ISO	A	B
KSCR-1510	1/2"	NW 10	0.394	0.210
KSCR-1516	3/4"	NW 16	0.630	0.210
KSCR-1525	1"	NW 25	0.984	0.210
KSCR-1540	1-1/2"	NW 40	1.575	0.210
KSCR-1550	2"	NW 50	1.969	0.210

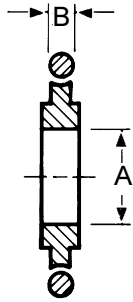
Seal Centering Ring Assembly

- Aluminum centering ring
- Replaceable Viton® O-ring
- 200° C maximum bake out



Part Number	Tube OD	ISO	A	B
KSCR-1610	1/2"	NW 10	.394	0.210
KSCR-1616	3/4"	NW 16	.630	0.210
KSCR-1625	1"	NW 25	.984	0.210
KSCR-1640	1-1/2"	NW 40	1.575	0.210
KSCR-1650	2"	NW 50	1.969	0.210

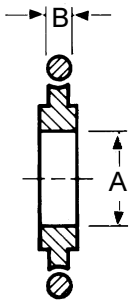
KEY SPEEDY ISO-NW Centering Rings



Seal Centering Ring Assembly

- Stainless steel centering ring
- Replaceable Buna-N O-ring
- 100° C maximum bake out

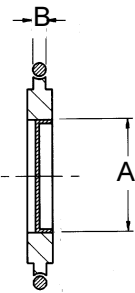
Part Number	Tube OD	ISO	A	B
KSCR-1710	1/2"	NW 10	0.394	0.210
KSCR-1716	3/4"	NW 16	0.630	0.210
KSCR-1725	1"	NW 25	0.934	0.210
KSCR-1740	1-1/2"	NW 40	1.575	0.210
KSCR-1750	2"	NW 50	1.969	0.210



Seal Centering Ring Assembly

- Stainless steel centering ring
- Replaceable Viton® O-ring
- 200° C maximum bake out

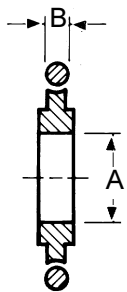
Part Number	Tube OD	ISO	A	B
KSCR-1810	1/2"	NW 10	0.394	0.210
KSCR-1816	3/4"	NW 16	0.630	0.210
KSCR-1825	1"	NW 25	0.984	0.210
KSCR-1840	1-1/2"	NW 40	1.575	0.210
KSCR-1850	2"	NW 50	1.969	0.210



Seal Centering Ring Assembly with Screen

- Stainless steel centering
- Replaceable Viton® O-ring
- # 72 Stainless steel screen

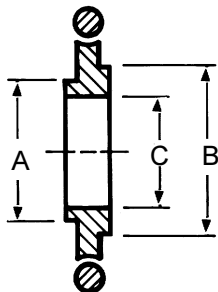
Part Number	Tube OD	ISO	A	B
KSCR-1816-72	3/4"	NW 16	0.490	0.21
KSCR-1825-72	1"	NW 25	0.840	0.21
KSCR-1840-72	1-1/2"	NW 40	1.470	0.21
KSCR-1850-72	2"	NW 50	1.830	0.21



Seal Centering Ring Assembly

- Stainless steel centering
- Replaceable Silicone O-ring

Part Number	Tube OD	ISO	A	B
KSCR-1910	1/2"	NW 10	0.394	0.21
KSCR-1916	3/4"	NW 16	0.630	0.21
KSCR-1925	1"	NW 25	0.984	0.21
KSCR-1940	1-1/2"	NW 40	1.575	0.21
KSCR-1950	2"	NW 50	1.969	0.21



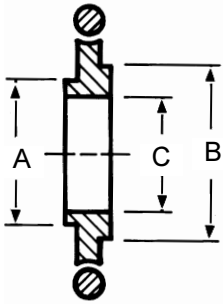
Seal Adaptive Centering Ring Assembly

- Aluminum centering ring
- Replaceable Buna-N O-ring
- Connects outdated bore sizes

Part Number	Tube OD	ISO	A	B	C
KSCR-2016A	1/ 2"	NW 10 to NW 16	0.67	0.47	0.39
KSCR-2025A	1"	NW 20 to NW 25	1.02	0.87	0.83
KSCR-2040A	1-1/2"	NW 32 to NW 40	1.61	1.34	1.26



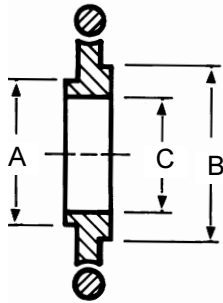
KEY SPEEDY ISO-NW Centering Rings; O-Rings



Seal Adaptive Centering Ring Assembly

- Stainless steel type 304 centering ring
- Replaceable Viton® O-ring

Part Number	Tube OD	ISO	A	B	C
KSCR-2116A	1/2"	NW10 to 16	0.67	0.47	0.39
KSCR-2125A	1"	NW20 to 25	1.02	0.87	0.83
KSCR-2140A	1-1/2"	NW32 to 40	1.61	1.34	1.26

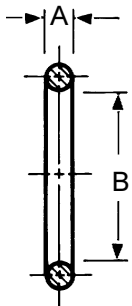


Seal Adaptive Centering Ring Assembly

- Aluminum centering ring
- Replaceable Viton® O-ring

Part Number	Tube OD	ISO	A	B	C
KSCR-2216A	1/2"	NW10 to 16	0.67	0.47	0.39
KSCR-2225A	1"	NW20 to 25	1.02	0.87	0.87
KSCR-2240A	1-1/2"	NW32 to 40	1.61	1.34	1.26

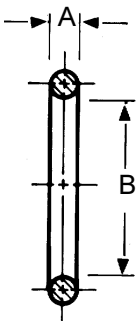
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Seal O-Ring

- Replaceable seal for centering ring
- Buna-N O-ring

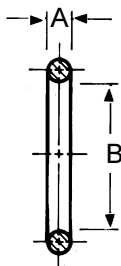
Part Number	O-Ring Size	A	B
KSO-2310	312	0.210	0.600
KSO-2316	314	0.210	0.725
KSO-2325	320	0.210	1.10
KSO-2340	326	0.210	1.60
KSO-2350	330	0.210	2.10



Seal O-Ring

- Replaceable seal for centering ring
- Viton® O-ring

Part Number	O-Ring Size	A	B
KSO-2410	312	0.210	0.600
KSO-2416	314	0.210	0.725
KSO-2425	320	0.210	1.10
KSO-2440	326	0.210	1.60
KSO-2450	330	0.210	2.10



Seal O-Ring

- Replaceable seal for centering ring
- Silicone O-ring

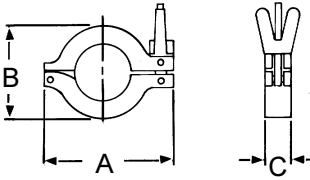
Part Number	O-Ring Size	A	B
KSO-2510	312	0.210	0.600
KSO-2516	314	0.210	0.725
KSO-2525	320	0.210	1.10
KSO-2540	326	0.210	1.60
KSO-2550	330	0.210	2.10



KEY SPEEDY ISO-NW Clamps and Adapters

Clamps

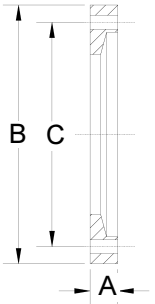
- Aluminum 6061-T6
- Wing nut and screw closure



Part Number	ISO	A	B
KSC-2616	NW 16	2.24	1.69
KSC-2625	NW 25	2.76	2.17
KSC-2640	NW 40	3.39	2.76
KSC-2650	NW 50	4.33	3.70

Clamps, Bulkhead

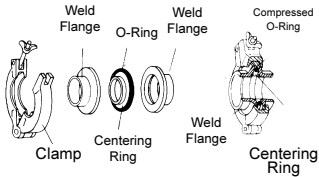
- Aluminum 6061-T6
- Used to connect to baseplate, chambers or fixed flanges
- Includes 10-32 x 5/8" stainless steel bolts and washers



Part Number	ISO	A	B	C
KSC-2616-BC	NW 16	0.36	2.00	1.50
KSC-2625-BC	NW 25	0.38	2.38	1.89
KSC-2640-BC	NW 40	0.36	2.94	2.44
KSC-2650-BC	NW 50	0.40	3.75	3.25

Complete Clamp Assemblies

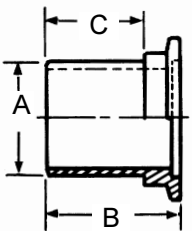
- Includes two weld flanges, clamp, centering ring & Viton®



Part Number	Tube OD	Clamp	Flanges	Centering
KSCA-2716	3/4"	KSC-2616	KSF-0316-1	KSCR-1816
KSCA-2725	1"	KSC-2625	KSF-0325	KSCR-1825
KSCA-2740	1-1/2"	KSC-2640	KSF-0340	KSCR-1840
KSCA-2750	2"	KSC-2650	KSF-0350	KSCR-1850

Adapter Hose

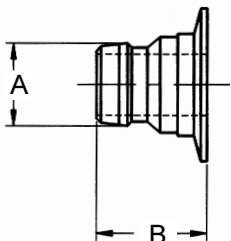
- ISO-KF to PVC hose
- Stainless steel type 304



Part Number	ISO	A	B	C
KSA-2816	NW 16	0.75	1.25	0.75
KSA-2825	NW 25	1.00	1.50	1.00
KSA-2840	NW 40	1.50	2.00	1.50
KSA-2850	NW 50	2.00	2.50	2.00

Adapter Hose

- ISO-KF to gum rubber hose
- Aluminum 6061-T6



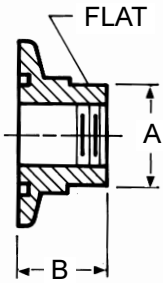
Part Number	Hose Size	ISO	A	B
KSA-10016	1/2" or 5/8"	NW 16	0.62	1.65
KSA-10016-1	5/8" or 3/4"	NW 16	0.75	1.65
KSA-10025	3/4" or 7/8"	NW 25	0.87	1.73
KSA-10040	1-1/2" or 1-5/8"	NW 40	1.63	2.17
KSA-10050	2"	NW 50	1.63	2.17



KEY SPEEDY ISO-NW Adapters

Adapter Pipe

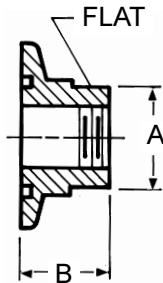
- Stub tapped 1/8" female NPT
- Aluminum 6061-T6



Part Number	ISO	A	B
KSA-2905	NW 10	0.62	0.50
KSA-2910	NW 10	0.62	0.75
KSA-2916	NW 16	0.62	0.75
KSA-2925	NW 25	0.88	0.75
KSA-2940	NW 40	1.25	1.00
KSA-2950	NW 50	1.75	1.00

Adapter Pipe

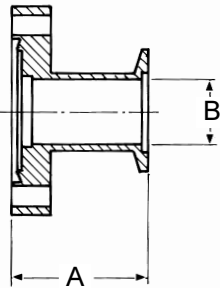
- Stub tapped 1/4" female NPT
- Aluminum 6061-T6



Part Number	ISO	A	B
KSA-3010	NW 10	0.62	0.75
KSA-3016	NW 16	0.62	0.75
KSA-3025	NW 25	0.88	0.75
KSA-3040	NW 40	1.25	1.00
KSA-3050	NW 50	1.75	1.00

Adapter MET-SEAL to ISO-KF

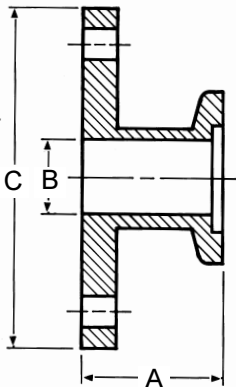
- Stainless steel 304



Part Number	Tube OD	ISO	A	B
KSA-3210	1/2"	NW 10 to Mini	1.57	0.40
KSA-3216	3/4"	NW 16 to Mini	2.07	0.62
KSA-3216-1	3/4"	NW 16 to 2-3/4"	1.78	0.62
KSA-3225	1"	NW 25 to 2-3/4"	1.78	0.87
KSA-3240	1-1/2"	NW 40 to 2-3/4"	1.78	1.33
KSA-3250	2"	NW 50 to 4-1/2"	1.95	1.83

Adapter ASA flange to ISO-KF

- Stainless steel type 304
- Without O-ring groove



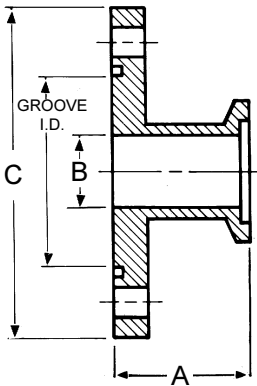
Part Number	ISO to ASA flange OD	A	B	C
KSA-3316-1	NW 16 to 4-1/4" OD ASA	1.81	.62	4.25
KSA-3325-3	NW 25 to 4-1/4" OD ASA	1.81	.87	4.25
KSA-3340-4	NW 40 to 4-1/4" OD ASA	1.81	1.33	4.25
KSA-3316-2	NW 16 to 5" OD ASA	1.81	.62	5.0
KSA-3325-1	NW 25 to 5" OD ASA	1.81	.87	5.0
KSA-3340	NW 40 to 5" OD ASA	1.81	1.33	5.0
KSA-3350	NW 50 to 5" OD ASA	1.81	1.84	5.0
KSA-3316-3	NW 16 to 6" OD ASA	1.81	.62	6.0
KSA-3325-4	NW 25 to 6" OD ASA	1.81	.87	6.0
KSA-3340-1	NW 40 to 6" OD ASA	1.81	1.33	6.0
KSA-3350-1	NW 50 to 6" OD ASA	1.81	1.84	6.0
KSA-3316-4	NW 16 to 7-1/2" OD ASA	1.81	.62	7.5
KSA-3325-2	NW 25 to 7-1/2" OD ASA	1.81	.87	7.5
KSA-3340-2	NW 40 to 7-1/2" OD ASA	1.81	1.33	7.5
KSA-3350-2	NW 50 to 7-1/2" OD ASA	1.81	1.84	7.5
KSA-3316-5	NW 16 to 9" OD ASA	1.81	.62	9.0
KSA-3325-5	NW 25 to 9" OD ASA	1.81	.87	9.0
KSA-3340-3	NW 40 to 9" OD ASA	1.81	1.33	9.0
KSA-3350-3	NW 50 to 9" OD ASA	1.81	1.84	9.0



KEY SPEEDY ISO-NW Adapter Flanges

Adapter ASA flange to ISO-KF

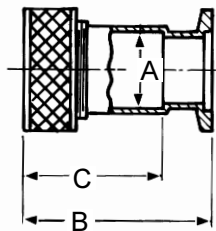
- Stainless steel type 304
- With O-ring groove and Viton® O-ring



Part Number	ISO to ASA flange OD	A	B	C
KSA-3416-1	NW 16 to 4-1/4" OD ASA	1.81	.62	4.25
KSA-3425-3	NW 25 to 4-1/4" OD ASA	1.81	.87	4.25
KSA-3440-4	NW 40 to 4-1/4" OD ASA	1.81	1.33	4.25
KSA-3416-2	NW 16 to 5" OD ASA	1.81	.62	5.0
KSA-3425-1	NW 25 to 5" OD ASA	1.81	.87	5.0
KSA-3440	NW 40 to 5" OD ASA	1.81	1.33	5.0
KSA-3450	NW 50 to 5" OD ASA	1.81	1.84	5.0
KSA-3416-3	NW 16 to 6" OD ASA	1.81	.62	6.0
KSA-3425-4	NW 25 to 6" OD ASA	1.81	.87	6.0
KSA-3440-1	NW 40 to 6" OD ASA	1.81	1.33	6.0
KSA-3450-1	NW 50 to 6" OD ASA	1.81	1.84	6.0
KSA-3416-4	NW 16 to 7-1/2" OD ASA	1.81	.62	7.5
KSA-3425-2	NW 25 to 7-1/2" OD ASA	1.81	.87	7.5
KSA-3440-2	NW 40 to 7-1/2" OD ASA	1.81	1.33	7.5
KSA-3450-2	NW 50 to 7-1/2" OD ASA	1.81	1.84	7.5
KSA-3416-5	NW 16 to 9" OD ASA	1.81	.62	9.0
KSA-3425-5	NW 25 to 9" OD ASA	1.81	.87	9.0
KSA-3440-3	NW 40 to 9" OD ASA	1.81	1.33	9.0
KSA-3450-3	NW 50 to 9" OD ASA	1.81	1.84	9.0

Adapter Tubing

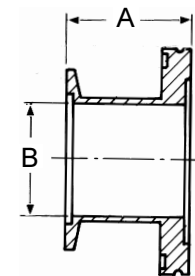
- Compression type to ISO-KF
- Stainless steel type 304 body, Viton® O-ring



Part Number	ISO	For Tube OD	A	B	C
KSA-3510	NW 10	1/2"	0.515	2.0	1.3
KSA-3516	NW 16	1/4"	0.265	1.3	THRU
KSA-3516-1	NW 16	1/2"	0.515	2.0	1.3
KSA-3516-2	NW 16	3/4"	0.765	2.2	1.6
KSA-3525	NW 25	1/2"	0.515	2.0	1.3
KSA-3525-1	NW 25	3/4"	0.765	2.3	1.6
KSA-3525-2	NW 25	1"	1.015	2.4	1.8
KSA-3540	NW 40	1/2"	0.515	2.3	1.3
KSA-3540-1	NW 40	3/4"	0.765	2.5	1.6
KSA-3540-2	NW 40	1"	1.015	2.8	1.8
KSA-3540-3	NW 40	1-1/8"	1.140	2.9	1.9
KSA-3540-4	NW 40	1-1/2"	1.510	3.3	2.5
KSA-3550	NW 50	3/4"	0.765	2.5	1.6
KSA-3550-1	NW 50	1"	1.015	2.8	1.8
KSA-3550-2	NW 50	1-1/8"	1.140	2.9	1.9
KSA-3550-3	NW 50	1-1/2"	1.510	3.4	2.5
KSA-3550-4	NW 50	2"	2.010	3.4	2.6

Adapter ISO-KF to ISO-MF

- Stainless steel type 304



Part Number	ISO-MF to ISO-KF	A	B
KSA-3616	NW 63 to NW 16	1.77	.62
KSA-3625	NW 63 to NW 25	1.77	.87
KSA-3640	NW 63 to NW 40	1.77	1.33
KSA-3650	NW 63 to NW 50	1.77	1.83
KSA-8580-3★	NW 80 to NW 16	1.77	.62
KSA-8580-4★	NW 80 to NW 25	1.77	.87
KSA-8580	NW 80 to NW 40	1.77	1.33
KSA-3650-1	NW 80 to NW 50	1.77	1.83
KSA-8516★	NW 100 to NW 16	1.77	.62
KSA-3625-1★	NW 100 to NW 25	1.77	.87
KSA-3650-3	NW 100 to NW 40	1.77	1.33
KSA-3650-2	NW 100 to NW 50	1.77	1.83

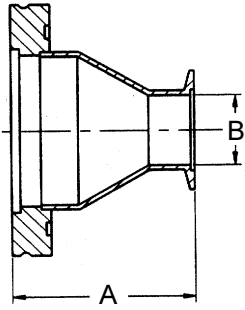
★ = New Product



KEY SPEEDY ISO-KF Adapters

Adapter ISO-KF to ISO-MF Conical Reducer

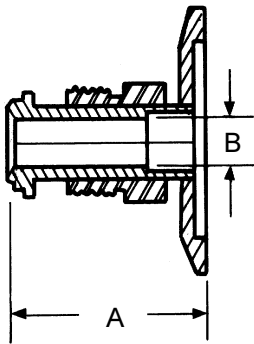
- Stainless steel type 304
- Other combinations available upon request



Part Number	Flange sizes	A	B
KSA-3640-CR	NW 40 to NW 63	2.87	1.37
KSA-3650-CR	NW 50 to NW 63	2.87	1.87
KSA-8580-CR	NW 40 to NW 80	4.12	1.37
KSA-3650-1-CR	NW 50 to NW 80	2.87	1.87
KSA-3650-2-CR	NW 50 to NW 100	4.12	1.87

Adapter ISO-KF to VCR® Male

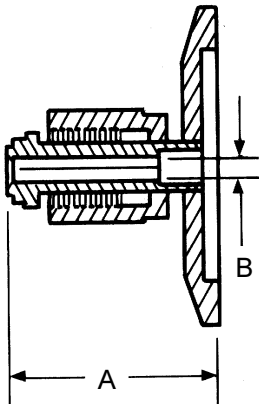
- Stainless steel type 304



Part Number	Flange Size	A	B
KSA-3716	NW 16 to 1/4" VCR®	1.40	0.19
KSA-3716-1	NW 16 to 1/2" VCR®	1.63	0.41
KSA-3725	NW 25 to 1/4" VCR®	1.40	0.62
KSA-3725-1	NW 25 to 1/2" VCR®	1.60	0.41
KSA-3725-2	NW 25 to 3/4" VCR®	2.14	0.62
KSA-3740	NW 40 to 1/4" VCR®	1.40	0.19
KSA-3740-1	NW 40 to 1/2" VCR®	1.60	0.41
KSA-3740-2	NW 40 to 3/4" VCR®	2.10	0.62
KSA-3750	NW 50 to 1/4" VCR®	1.40	0.19
KSA-3750-1	NW 50 to 1/2" VCR®	1.60	0.41
KSA-3750-2	NW 50 to 3/4" VCR®	2.10	0.62

Adapter ISO-KF to VCR® Female

- Stainless steel type 304



Part Number	Flange Size	A	B
KSA-3816	NW 16 to 1/4" VCR®	1.40	0.19
KSA-3816-1	NW 16 to 1/2" VCR®	1.63	0.41
KSA-3825	NW 25 to 1/4" VCR®	1.40	0.62
KSA-3825-1	NW 25 to 1/2" VCR®	1.60	0.41
KSA-3825-2	NW 25 to 3/4" VCR®	2.14	0.62
KSA-3840	NW 40 to 1/4" VCR®	1.40	0.19
KSA-3840-1	NW 40 to 1/2" VCR®	1.60	0.41
KSA-3840-2	NW 40 to 3/4" VCR®	2.10	0.62
KSA-3850	NW 50 to 1/4" VCR®	1.40	0.19
KSA-3850-1	NW 50 to 1/2" VCR®	1.60	0.41
KSA-3850-2	NW 50 to 3/4" VCR®	2.10	0.62

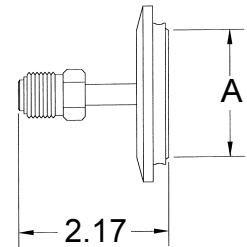
DF Series Diffusers

KEY HIGH VACUUM PRODUCTS, INC., DF Series DIFFUSERS are an award winning product, that are designed and manufactured to introduce large quantities of gas quickly into a vacuum chamber or load lock during the venting of a process. **DF Series DIFFUSERS** break up the incoming gas stream evenly and uniformly and will dramatically reduce cycle time by diffusing the incoming gas stream into a large uniform flow.

DF Series DIFFUSERS feature standard ISO interface allowing the use of bulkhead clamps to a chamber, as well as a 1/4" VCR® fitting for rapid installation into your system. Construction of **DF Series DIFFUSERS** is 304L and 316L stainless steel.

By incorporating **DF Series DIFFUSERS** in your system, you can dramatically cut cycle time as opposed to conventional venting procedures and have less particle issues to address.

- Maximum inlet pressure = 30 psi
- Maximum operating temperature = 120 ° C
- Standard Viton® elastomer



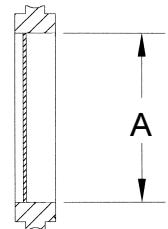
Part Number	ISO	VCR® fitting	Pressure drop at 20 CFM / ft2	SCCM flow rate	A
DF-KSA-3710MVCR	NW 10	1/4" Male	1.0 PSI	450	.37
DF-KSA-3810FVCR	NW 10	1/4" Female	1.0 PSI	450	.37
DF-KSA-3716MVCR	NW 16	1/4" Male	1.0 PSI	1,000	.62
DF-KSA-3816FVCR	NW 16	1/4" Female	1.0 PSI	1,000	.62
DF-KSA-3725MVCR	NW 25	1/4" Male	0.5 PSI	1,900	.75
DF-KSA-3825FVCR	NW 25	1/4" Female	0.5 PSI	1,900	.75
DF-KSA-3740MVCR	NW 40	1/4" Male	0.1 PSI	4,500	1.25
DF-KSA-3840FVCR	NW 40	1/4" Female	0.1 PSI	4,500	1.25
DF-KSA-3750MVCR	NW 50	1/4" Male	0.05 PSI	9,000	1.87
DF-KSA-3850FVCR	NW 50	1/4" Female	0.05 PSI	9,000	1.87



DF-KSA-3740MVCR

DG Series DIFFUSERS are based on the same proven design as the DF Series and incorporate a diffuser built directly into a standard ISO centering ring, allowing the diffuser to be used with no additional hardware. The construction DG Series is 304L and 316L stainless steel.

- Maximum inlet pressure = 30 psi
- Maximum operating temperature = 120 ° C
- Standard Viton® elastometer



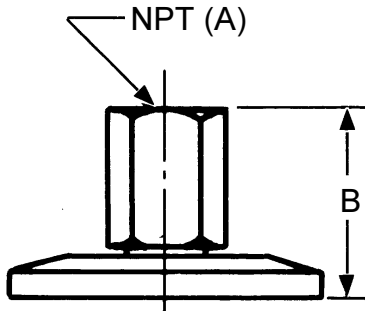
Part Number	ISO	Pressure drop at 20 CFM / ft2	SCCM Flow Rate	A
DG-KSCR-1810	NW 10	1.0 PSI	450	.37
DG-KSCR-1816	NW 16	1.0 PSI	1,000	.62
DG-KSCR-1825	NW 25	0.1 PSI	1,900	.75
DG-KSCR-1840	NW 40	0.05 PSI	4,500	1.25
DG-KSCR-1850	NW 50	0.05 PSI	9,000	1.87



KEY SPEEDY ISO-NW Adapters

Adapter Female Pipe

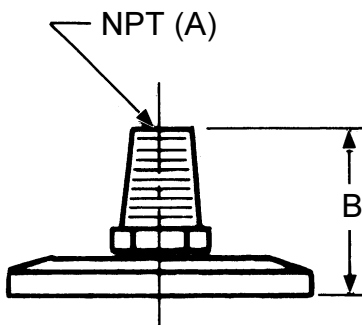
- Stainless steel type 304
- Female NPT



Part Number	Flange Size	NPT Size	B
KSA-9510	NW 10	1/8"	0.95
KSA-9510-1	NW 10	1/4"	1.06
KSA-9516	NW 16	1/8"	0.95
KSA-9516-1	NW 16	1/4"	1.06
KSA-9525	NW 25	1/8"	0.95
KSA-9525-1	NW 25	1/4"	1.06
KSA-9525-2	NW 25	1/2"	1.19
KSA-9525-3	NW 25	3/4"	1.47
KSA-9540	NW 40	1/8"	0.95
KSA-9540-1	NW 40	1/4"	1.06
KSA-9540-2	NW 40	1/2"	1.19
KSA-9540-3	NW 40	3/4"	1.47
KSA-9550	NW 50	1/8"	0.95
KSA-9550-1	NW 50	1/4"	1.06
KSA-9550-2	NW 50	1/2"	1.19
KSA-9550-3	NW 50	3/4"	1.47

Adapter Male Pipe

- Stainless steel type 304
- Male NPT

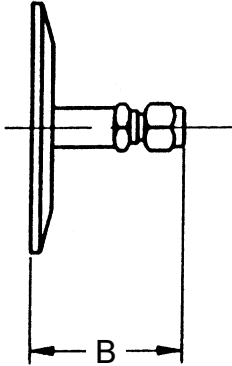


Part Number	Flange Size	NPT Size	B
KSA-9610	NW 10	1/8"	0.88
KSA-9610-1	NW 10	1/4"	1.06
KSA-9616	NW 16	1/8"	0.88
KSA-9616-1	NW 16	1/4"	1.06
KSA-9616-2	NW 16	1/2"	1.28
KSA-9625	NW 25	1/8"	0.88
KSA-9625-1	NW 25	1/4"	1.06
KSA-9625-2	NW 25	1/2"	1.28
KSA-9625-3	NW 25	3/4"	1.31
KSA-9625-4	NW 25	1"	1.59
KSA-9640	NW 40	1/8"	0.88
KSA-9640-1	NW 40	1/4"	1.06
KSA-9640-2	NW 40	1/2"	1.28
KSA-9640-3	NW 40	3/4"	1.31
KSA-9640-4	NW 40	1"	1.59
KSA-9650	NW 50	1/8"	0.88
KSA-9650-1	NW 50	1/4"	1.06
KSA-9650-2	NW 50	1/2"	1.28
KSA-9650-3	NW 50	3/4"	1.31
KSA-9650-4	NW 50	1"	1.59

KEY SPEEDY ISO-KF; Adapters, Straight Section and Elbows

Adapter ISO-KF to Swagelok®

• *Stainless steel type 304*



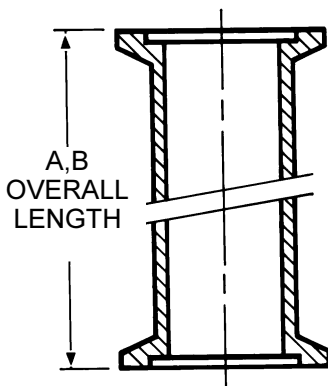
Part Number	Flange Size	For tubing size OD	B
KSA-9816	NW 16	1/4"	1.32
KSA-9825	NW 25	1/4"	1.32
KSA-9825-1	NW 25	1/2"	1.62
KSA-9840	NW 40	1/4"	1.32
KSA-9840-1	NW 40	1/2"	1.62
KSA-9840-2	NW 40	3/4"	1.71
KSA-9840-3	NW 40	1"	2.07
KSA-9850	NW 50	1/4"	1.32
KSA-9850-1	NW 50	1/2"	1.62
KSA-9850-2	NW 50	3/4"	1.71
KSA-9850-3	NW 50	1"	2.07

4

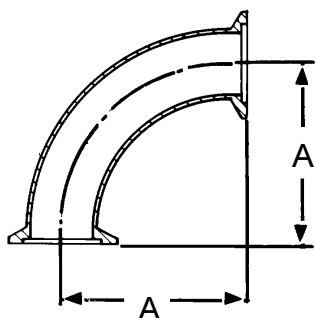
Straight Section

• *Stainless steel type 304*

• *Other lengths available upon request*



Part Number	Flange Size	A
KSS-3916-2.30	NW 16	2.30
KSS-3916	NW 16	3.15
KSS-3916-6.45	NW 16	6.45
KSS-3916-1	NW 16	12.60
KSS-3925	NW 25	3.94
KSS-3925-4.06	NW 25	4.06
KSS-3925-4.08	NW 25	4.08
KSS-3925-8.03	NW 25	8.03
KSS-3925-1	NW 25	12.60
KSS-3940-4.80	NW 40	4.80
KSS-3940-4.93	NW 40	4.93
KSS-3940	NW 40	5.12
KSS-3940-10.39	NW 40	10.39
KSS-3940-1	NW 40	12.60
KSS-3950	NW 50	5.51
KSS-3950-6.30	NW 50	6.30
KSS-3950-6.43	NW 50	6.43
KSS-3950-11.18	NW 50	11.18
KSS-3950-1	NW 50	12.60



Elbows 90° Bend

• *Stainless steel type 304*

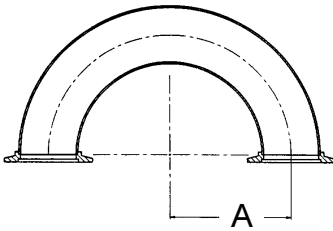
Part Number	Flange Size	A
KSE-4110	NW 10	1.25
KSE-4116	NW 16	1.57
KSE-4125	NW 25	2.04
KSE-4140	NW 40	2.46
KSE-4150-M	NW 50	2.76
KSE-4150	NW 50	3.21



KEY SPEEDY Stainless Steel Elbows

Elbows 180° Bend

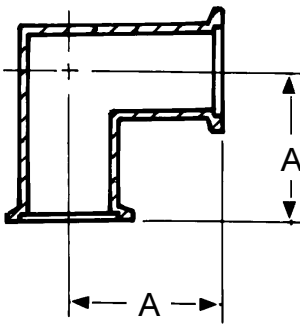
• Stainless steel type 304



Part Number	Flange Size	A
KSE-4116-180	NW 16	1.12
KSE-4125-180	NW 25	1.50
KSE-4140-180	NW 40	2.25
KSE-4150-180	NW 50	3.00

Elbows 90° Miter

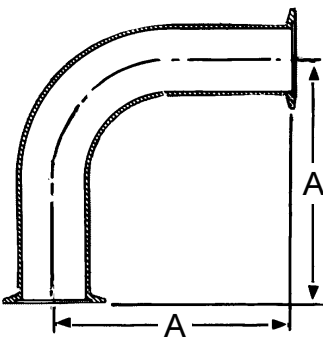
• Stainless steel type 304



Part Number	Flange Size	A
KSE-4216	NW 16	1.15
KSE-4225	NW 25	2.04
KSE-4240	NW 40	2.56
KSE-4250	NW 50	2.76

Elbows Long Radius 90° Bend

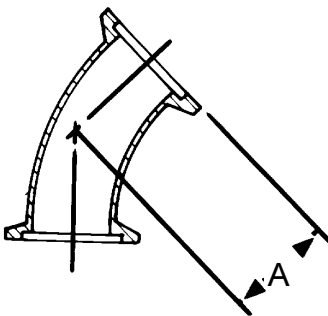
• Stainless steel type 304



Part Number	Flange Size	A
KSE-4340	NW 40	5.12
KSE-4350	NW 50	5.51

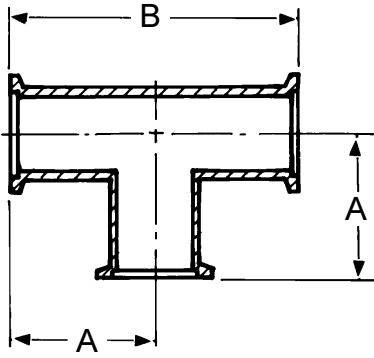
Elbows 135° Bend

• Stainless steel type 304



Part Number	Flange Size	A
KSE-4416	NW 16	0.914
KSE-4425	NW 25	1.121
KSE-4440	NW 40	1.682
KSE-4450	NW 50	1.992

KEY SPEEDY ISO-KF Adapter Tees

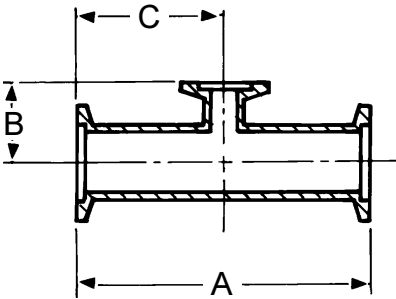


Tees

• Stainless steel type 304

Part Number	Flange Size	A	B
KST-4510	NW 10	1.25	2.50
KST-4516	NW 16	1.57	3.15
KST-4525	NW 25	2.04	4.08
KST-4540	NW 40	2.56	5.12
KST-4550	NW 50	3.21	5.51
KST-4550-M	NW 50	2.76	5.51

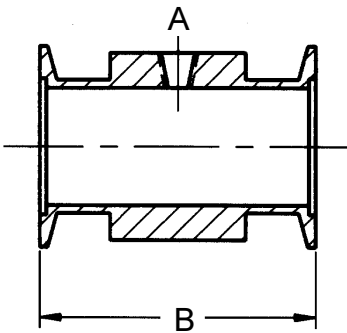
4



Tees Reducing

• Stainless steel type 304

Part Number	Flange Size	A	B	C
KST-4625	NW 25 to 16	3.94	1.08	1.97
KST-4640	NW 40 to 16	5.12	1.32	2.56
KST-4650	NW 50 to 16	5.51	1.58	2.76
KST-4640-25	NW 40 to 25	4.92	2.40	2.46
KST-4650-25	NW 50 to 25	6.42	2.84	3.21
KST-4650-40	NW 50 to 40	6.42	2.74	3.21

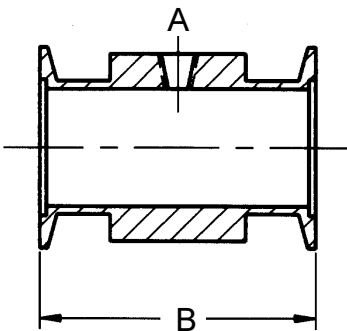


Adapter Tee

• Stainless steel type 304

• ISO-KF flanges, same on thru ports, female NPT or

Part Number	Flange Size	(A) Female NPT Size	B
KST-9916	NW 16	1/8	1.57
KST-9916-1	NW 16	1/4	1.57
KST-9925	NW 25	1/8	1.57
KST-9925-1	NW 25	1/4	1.57
KST-9940	NW 40	1/8	1.57
KST-9940-1	NW 40	1/4	1.57
KST-9950	NW 50	1/8	1.57
KST-9950-1	NW 50	1/4	1.57



Adapter Tee

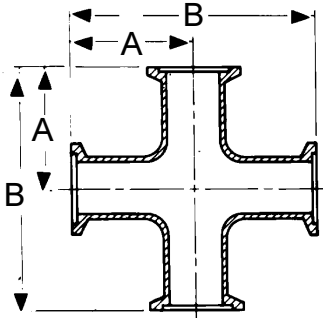
• 6061T6 Aluminum

• ISO-KF flanges, same on thru ports, female NPT or

Part Number	Flange Size	(A) Female NPT Size	B
KST-10016	NW 16	1/8	1.57
KST-10016-1	NW 16	1/4	1.57
KST-10025	NW 25	1/8	1.57
KST-10025-1	NW 25	1/4	1.57
KST-10040	NW 40	1/8	1.57
KST-10040-1	NW 40	1/4	1.57
KST-10050	NW 50	1/8	1.57
KST-10050-1	NW 50	1/4	1.57



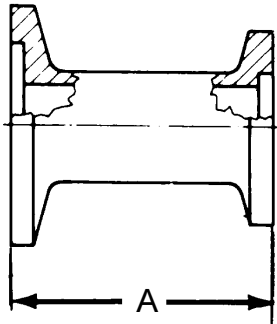
KEY SPEEDY ISO-KF; Crosses, Reducer, Conical Reducer



Crosses

- ISO-KF flanges, same size all ports
- Stainless steel type 304

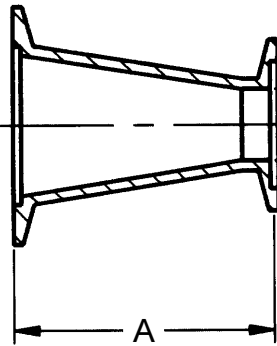
Part Number	Flange Size	A	B
KSCRS-4716	NW 16	1.57	3.15
KSCRS-4725	NW 25	1.97	3.94
KSCRS-4740	NW 40	2.56	5.12
KSCRS-4750	NW 50	2.76	5.51



Reducer

- Mates differing, ISO-KF sizes
- Stainless steel type 304

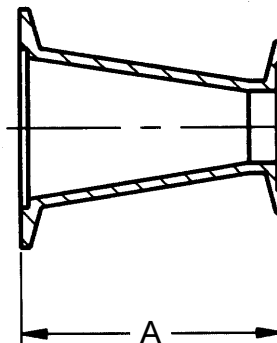
Part Number	Flange Size	A
KSR-4816	NW 16 to 25	1.57
KSR-4816-1	NW 16 to 40	1.57
KSR-4816-2	NW 16 to 50	1.57
KSR-4825	NW 25 to 40	1.57
KSR-4825-1	NW 25 to 50	1.57
KSR-4840	NW 40 to 50	1.57



Reducer Conical

- Mates differing ISO-KF sizes
- Stainless steel type 304

Part Number	Flange Size	A
KSR-4816-CR	NW 16 to 25	1.57
KSR-4816-1-CR	NW 16 to 40	1.57
KSR-4816-2-CR	NW 16 to 50	1.57
KSR-4825-CR	NW 25 to 40	1.57
KSR-4825-1-CR	NW 25 to 50	1.57
KSR-4840-CR	NW 40 to 50	1.57

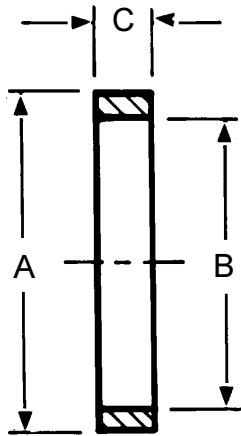


Reducer Conical

- Mates differing ISO-KF sizes
- 6061T6 Aluminum

Part Number	Flange Size	A
KSR-4816-CR-AL	NW 16 to 25	1.57
KSR-4816-1-CR-AL	NW 16 to 40	1.57
KSR-4816-2-CR-AL	NW 16 to 50	1.57
KSR-4825-CR-AL	NW 25 to 40	1.57
KSR-4825-1-CR-AL	NW 25 to 50	1.57
KSR-4840-CR-AL	NW 40 to 50	1.57

KEY SPEEDY Feedthroughs

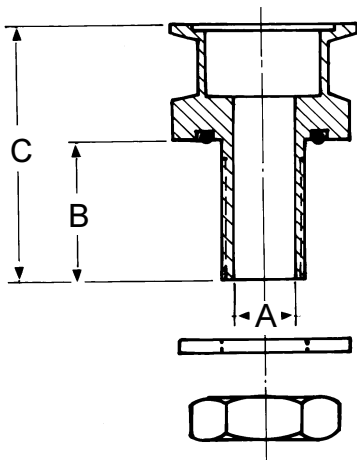


Over Pressure Rings

- Retains O-ring in overpressure situations
- Fits over OD of O-ring
- Stainless steel type 304

Part Number	ISO	Maximum Pressure PSIG	A	B	C
KSR-5610	NW 10	100	1.25	1.09	.141
KSR-5616	NW 16	100	1.25	1.18	.346
KSR-5625	NW 25	100	1.66	1.58	.346
KSR-5640	NW 40	75	2.25	2.17	.346
KSR-5650	NW 50	50	2.75	2.62	.146

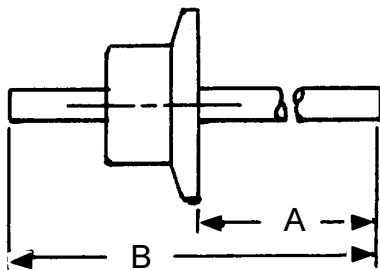
4



Feedthrough Baseplate

- Fits through 1" diameter hole
- Suitable for baseplates up to 1" thick
- Stainless steel type 304

Part Number	ISO	A	B	C
KSFT-5725	NW 25	.75	1.62	2.88
KSFT-5740	NW 40	.75	1.62	3.12



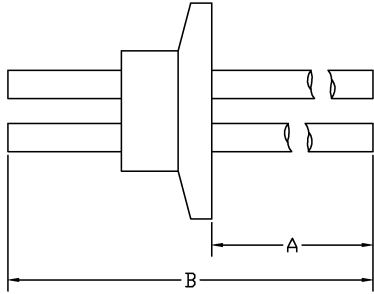
Feedthrough Liquid/Gas Single Tube

- Tubing 1/4" OD x .035 wall
- Stainless steel type 304

Part Number	ISO	A	B
KSFT-5816	NW 16	9.1	15.7
KSFT-5825	NW 25	9.1	15.7
KSFT-5840	NW 40	9.1	15.7
KSFT-5850	NW 50	9.1	15.7



KEY SPEEDY ISO-NW Liquid/Gas Feedthroughs



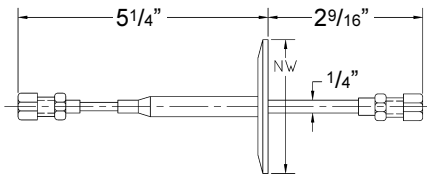
Feedthrough Liquid/Gas Double Tube

- Tubing 1/4" OD x .035 wall
- Stainless steel type 304

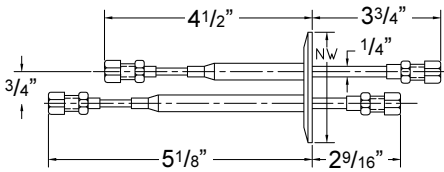
Part Number	ISO	A	B
KSFT-5916	NW 16	9.1	15.7
KSFT-5925	NW 25	9.1	15.7
KSFT-5940	NW 40	9.1	15.7
KSFT-5950	NW 50	9.1	15.7

Feedthrough Liquid Nitrogen

- Tubing 1/4" OD, stainless steel 304
- 1/4" Swagelok® stainless steel 316
- Maximum temperature 150° C



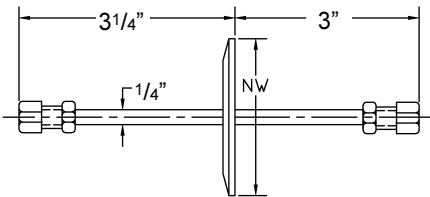
Part Number	ISO	Single Tube
KSLN-6000-16	NW 16	
KSLN-6000-25	NW 25	
KSLN-6000-40	NW 40	
KSLN-6000-50	NW 50	



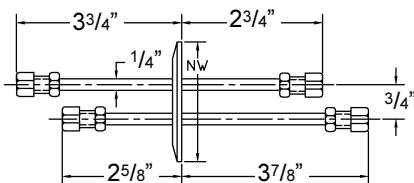
Part Number	ISO	Double Tube
KSLN-6000-40-2	NW 40	
KSLN-6000-50-2	NW 50	

Liquid/Gas Feedthroughs

- Tubing 1/4" OD, stainless steel type 304
- 1/4" Swagelok® stainless steel 316
- Maximum temperature 150°C



Part Number	ISO	Single Tube
KSL-6100-16	NW 16	
KSL-6100-25	NW 25	
KSL-6100-40	NW 40	
KSL-6100-50	NW 50	



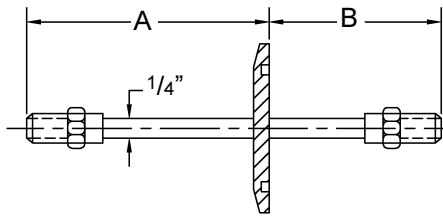
Part Number	ISO	Double Tube
KSL-6100-40-2	NW 40	
KSL-6100-50-2	NW 50	



KEY SPEEDY Feedthrough; Single/Double tube

Feedthrough Liquid/Gas Single Tube

- Tubing 1/4" OD x .035 wall stainless steel 304
- 1/4" Male VCR® stainless steel 316

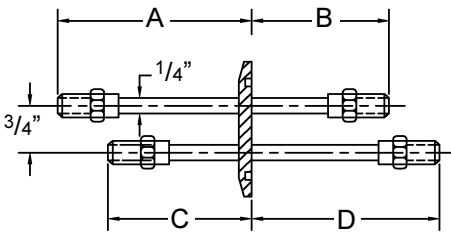


Part Number	ISO	A	B
KSL-6725MVCR	NW 25	3.7	2.8
KSL-6740MVCR	NW 40	3.4	3.1
KSL-6750MVCR	NW 50	3.4	3.1

4

Feedthrough Liquid/Gas Double Tube

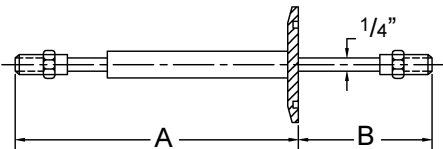
- Tubing 1/4" OD x .035 wall stainless steel 304
- 1/4" Male VCR® stainless steel 316



Part Number	ISO	A	B	C	D
KSL-6840MVCR	NW 40	3.7	2.7	2.4	4.0
KSL-6850MVCR	NW 50	3.7	2.7	2.4	4.0

Feedthrough Liquid Nitrogen Single Tube

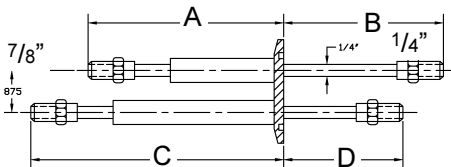
- Tubing 1/4" OD x .035 wall stainless steel 304
- 1/4" Male VCR® stainless steel 316



Part Number	ISO	A	B
KSLN-6916MVCR	NW 16	5.3	2.5
KSLN-6925MVCR	NW 25	5.3	2.5
KSLN-6940MVCR	NW 40	5.3	2.5
KSLN-6950MVCR	NW 50	5.3	2.5

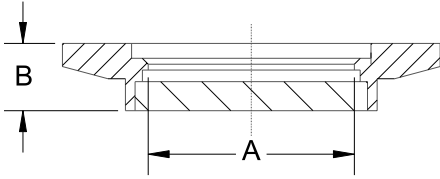
Feedthrough Liquid Nitrogen Double Tube

- Tubing 1/4" OD x .035 wall stainless steel 304
- 1/4" Male VCR® stainless steel 316



Part Number	ISO	A	B	C	D
KSLN-7040MVCR	NW 40	4.1	3.6	5.3	2.5
KSLN-7050MVCR	NW 50	4.1	3.6	5.3	2.5

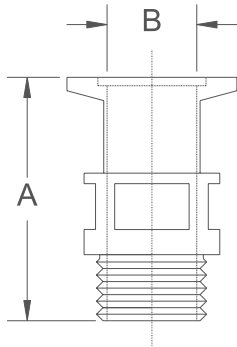




Viewports Zero length

- Zero length 7056 glass
- Standard ISO flange interface

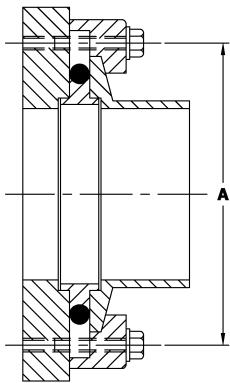
Part Number	ISO	A	B
VP-75-NW16	NW 16	.62	.38
VP-100-NW25	NW 25	.62	.38
VP-150-NW40	NW 40	1.40	.55
VP-200-NW50	NW 50	1.40	.55



Adapter Welch Pump

- Includes aluminum gasket
- Stainless steel type 304

Part Number	ISO	Welch Pump	A	B
KSFT-1399	NW 16	1399, 1400, 1410	1.77	.46
KSFT-1405	NW 16	1405	2.56	.56
KSFT-1402	NW 25	1380, 8806, 1402, 8811, 1403, 8816, 8821	2.76	.75
KSFT-1376	NW 40	1373, 8831, 1376	2.56	1.12
KSFT-1397	NW 40	1374, 8851, 1397	2.56	1.43



Nail Clamps

- Clamp material = Aluminum
- Used to attach standard NW flanges directly to cha

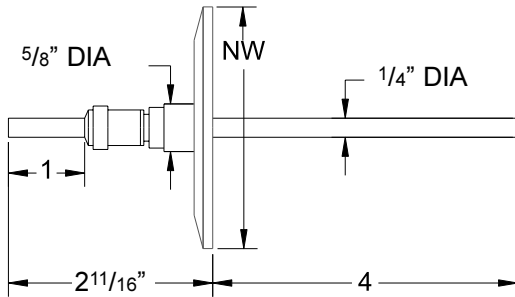
Part Number	ISO	Bolt Size	A	Quantity
NC-10	NW 10	M6 x 20	1.693	3
NC-16	NW 16	M6 x 20	1.693	3
NC-25	NW 25	M6 x 20	2.086	4
NC-40	NW 40	M6 x 20	2.677	4
NC-50	NW 50	M6 x 20	3.465	6

Electrical Feedthroughs

Medium current, solid OFHC® conductor

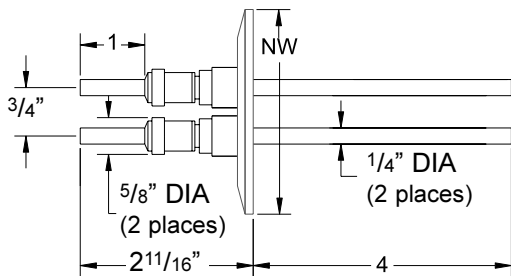
- Maximum current 150 amps
- Maximum voltage 5 kV peak
- Maximum temperature 150° C
- Maximum temperature change 25° C per minute

4



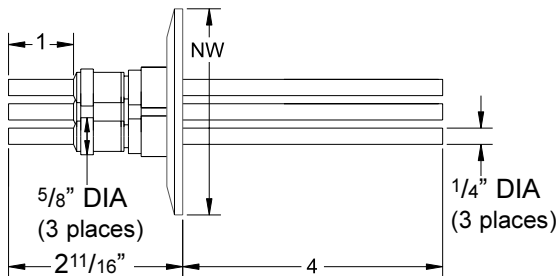
One Conductor

Part Number	ISO
KSE-6200-16	NW 16
KSE-6200-25	NW 25
KSE-6200-40	NW 40
KSE-6200-50	NW 50



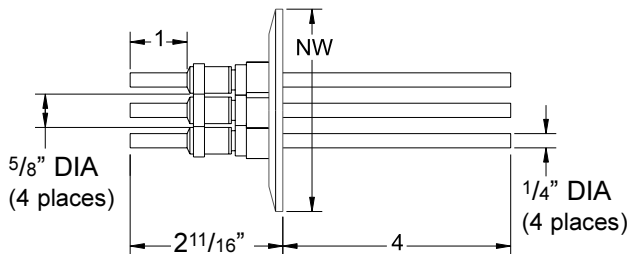
Two Conductor

Part Number	ISO
KSE-6200-40-2	NW 40
KSE-6200-50-2	NW 50



Three Conductor

Part Number	ISO
KSE-6200-40-3	NW 40
KSE-6200-50-3	NW 50



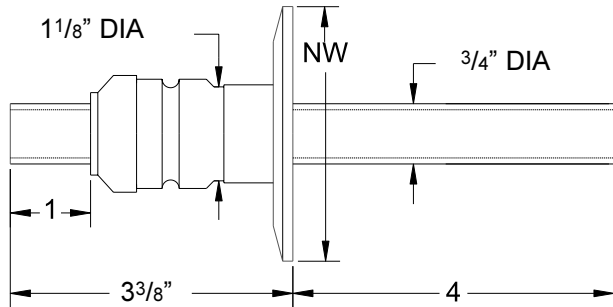
Four Conductor

Part Number	ISO
KSE-6200-50-4	NW 50



Electrical Feedthroughs High current, solid OFHC® conductor

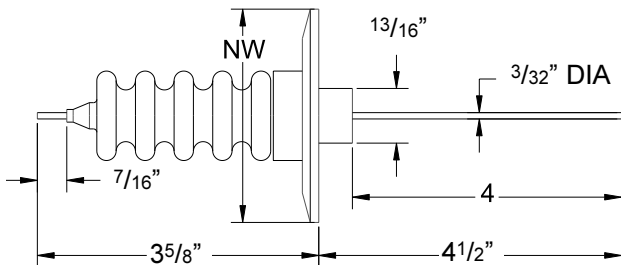
- Maximum current 600 amps
- Maximum temperature 150° C
- Maximum voltage 3 kV peak
- Maximum temperature change 25° C per minute



Part Number	ISO
KSHE-6300-40	NW 40
KSHE-6300-50	NW 50

High Voltage, Solid Stainless Steel

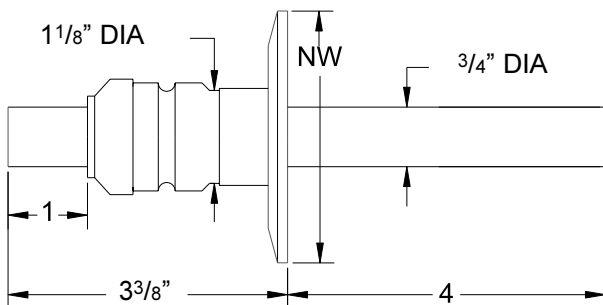
- Maximum current 1 amp
- Maximum temperature 150° C
- Maximum voltage 28 kV (below 1 x 10⁻⁴ Torr)
- Maximum temperature change 25° C per minute



Part Number	ISO
KSEV-6400-40	NW 40
KSEV-6400-50	NW 50

Electrical Feedthroughs Water Cooled

- Copper tube, .032" wall
- Maximum voltage 3 kV peak
- Maximum temperature 150° C
- Maximum temperature change 25° C per minute

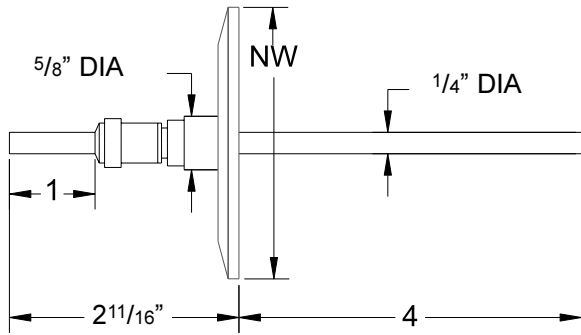


Part Number	ISO
KSHVE-6600-40	NW 40
KSHVE-6600-50	NW 50

Electrical Feedthroughs Water Cooled

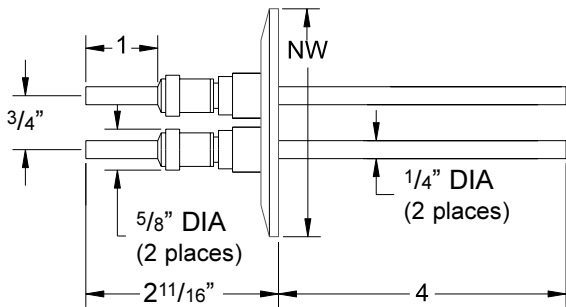
- Copper tube, .032 wall
- Maximum voltage 5 kV peak
- Maximum temperature 150° C
- Maximum temperature change 25° C per minute

4



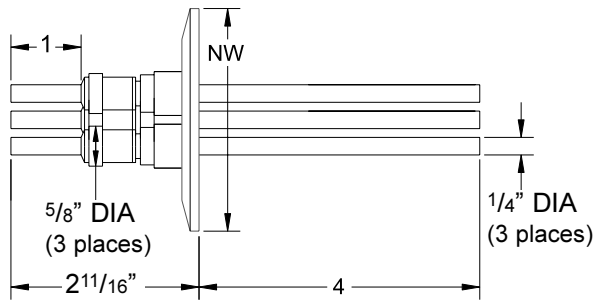
One Conductor

Part Number	ISO
KSHV-6500-16	NW 16
KSHV-6500-25	NW 25
KSHV-6500-40	NW 40
KSHV-6500-50	NW 50



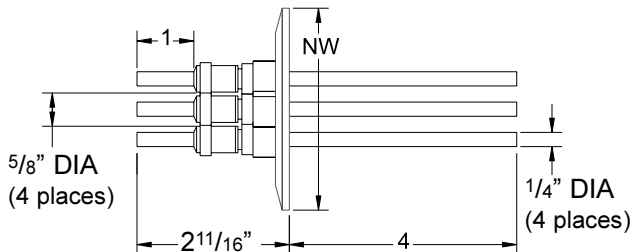
Two Conductor

Part Number	ISO
KSHV-6500-40-2	NW 40
KSHV-6500-50-2	NW 50



Three Conductor

Part Number	ISO
KSHV-6500-40-3	NW 40
KSHV-6500-50-3	NW 50



Four Conductor

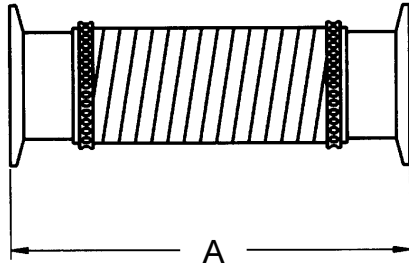
Part Number	ISO
KSHV-6500-50-4	NW 50



Tubing; PVC & Wire Reinforced

Tubing PVC

- 304 stainless steel ISO-KF flanges
- Wire reinforced PVC hose
- Special lengths to order



Part Number	ISO SIZE	A
PVC-50-12	NW 10	12.0
PVC-50-24	NW 10	24.0
PVC-50-36	NW 10	36.0
PVC-50-48	NW 10	48.0
PVC-75-12	NW 16	12.0
PVC-75-24	NW 16	24.0
PVC-75-36	NW 16	36.0
PVC-75-48	NW 16	48.0
PVC-100-12	NW 25	12.0
PVC-100-24	NW 25	24.0
PVC-100-36	NW 25	36.0
PVC-100-48	NW 25	48.0
PVC-150-12	NW 40	12.0
PVC-150-24	NW 40	24.0
PVC-150-36	NW 40	36.0
PVC-150-48	NW 40	48.0
PVC-200-12	NW 50	12.0
PVC-200-24	NW 50	24.0
PVC-200-36	NW 50	36.0
PVC-200-48	NW 50	48.0

Wire reinforced PVC tubing

- Sold by the foot



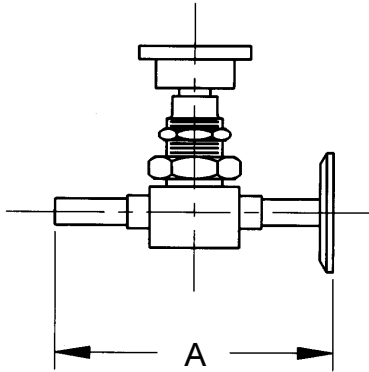
Part Number	Tube ID	Tube OD
PVC-1	1/4"	1/2"
PVC-2	3/8"	5/8"
PVC-3	1/2"	13/16"
PVC-4	5/8"	1"
PVC-5	3/4"	1-1/8"
PVC-6	1"	1-3/8"
PVC-7	1-1/4"	1-3/4"
PVC-8	1-1/2"	2"
PVC-9	2"	2-1/2"



Hose Clamps

Part Number	For Tube OD
HC-1	1/2" to 5/8"
HC-2	3/4" to 1-1/4"
HC-3	1-3/8" to 1-3/4"
HC-4	2" to 2-1/2"

Vent/Backfill Valves, Gauges

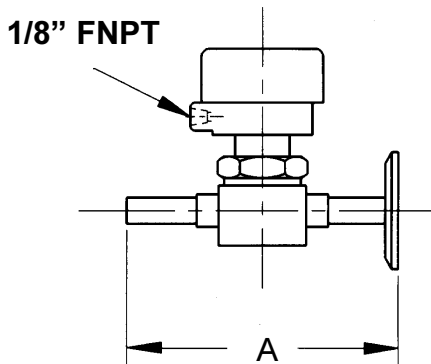


Vent/Backfill Valves Manual

- Stainless steel bellows sealed valve
- 1/4" OD tube on valve, other fittings available upon request

Part Number	ISO	A
MVV-10816	NW 16	7.5
MVV-10825	NW 25	7.5
MVV-10840	NW 40	7.5
MVV-10850	NW 50	7.5

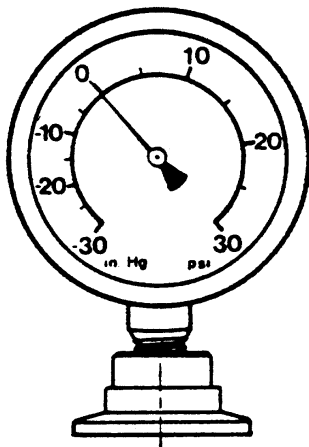
4



Vent/Backfill Valves Pneumatic

- Stainless steel bellows sealed, fail safe, (spring loaded) normally closed
- Solenoid not included, available as option; 12, 24 VDC, 120, 240 VAC contact factory
- 1/4" OD tube on valve, other fittings available upon request

Part Number	ISO	A
PVV-10816	NW 16	3.25
PVV-10825	NW 25	3.25
PVV-10840	NW 40	3.25
PVV-10850	NW 50	3.25



Gauge Compound Vacuum/Pressure

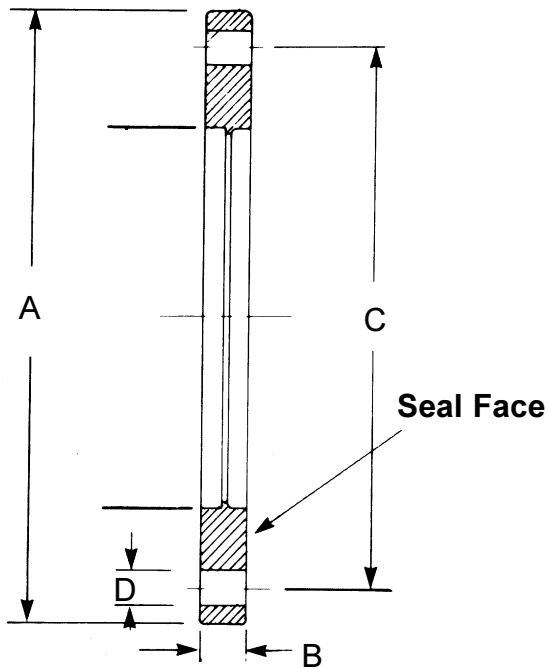
- 30" Hg-30 psig
- Stainless steel bourdon tube & connections

Part Number	Flange Size
KSG-9710	NW 10
KSG-9716	NW 16
KSG-9725	NW 25
KSG-9740	NW 40
KSG-9750	NW 50

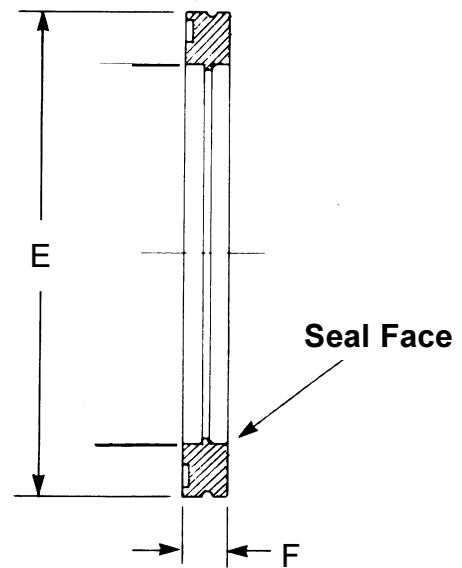


ISO-MF Flange Sizes

ISO Bolted Flange



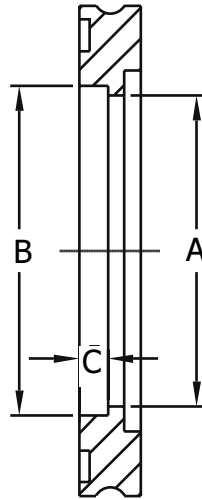
ISO Multi-Fastener Flange



ISO Bolted Style Flange

ISO-MF Clamp

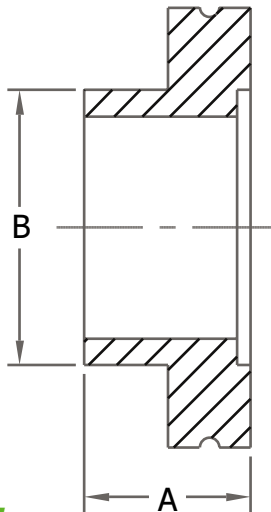
Flange	Tube OD X ID	A	B	C	D	Bolts Needed	E	F	Clamps Needed
NW 63	2.5 X .065	5.12	.47	4.33	.35	4	3.74	.47	4
NW 80	3.0 X .065	5.72	.47	4.92	.35	8	4.33	.47	4
NW 100	4.0 X .065	6.50	.47	5.71	.35	8	5.12	.47	4
NW 160	6.0 X .083	8.86	.63	7.87	.43	8	7.09	.47	4
NW 200	8.0 X .120	11.22	.63	10.24	.43	12	9.45	.47	6
NW 250	10.0 X .125	13.19	.63	12.20	.43	12	11.42	.47	6
NW 320	12.0 X .125	16.73	.79	15.55	.55	12	14.57	.67	8



Flange MF, Bored

- Use with claw clamps
- Stainless steel type 316L

Part Number	Flange Size	Bore	A	B	C
KSF-6763-316	NW 63	2.5"	2.37	2.51	.22
KSF-6780-316	NW 80	3"	2.87	3.01	.22
KSF-67100-316	NW 100	4"	3.87	4.01	.22
KSF-67160-316	NW 160	6"	5.83	6.01	.22



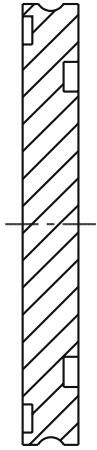
Flange MF Long Weld Stub

- Use with claw clamps
- Stainless steel type 316L

Part Number	Flange Size	Bore	A	B
KSF-6863-3.25-316	NW 63	2.5"	3.25	2.50
KSF-6863-316	NW 63	2.5"	3.94	2.50
KSF-6863-4.0-316	NW 63	2.5"	4.00	2.50
KSF-6880-3.5-316	NW 80	3"	3.50	3.00
KSF-6880-316	NW 80	3"	3.94	3.00
KSF-68100-316	NW 100	4"	3.94	4.00
KSF-68100-4.13-316	NW 100	4"	4.13	4.00
KSF-68100-5.12-316	NW 100	4"	5.12	4.00
KSF-68160-316	NW 160	6"	3.94	6.00
KSF-68160-5.38-316	NW 160	6"	5.38	6.00
KSF-68160-6.44-316	NW 160	6"	6.44	6.00



KEY SPEEDY Series 316L ISO Components

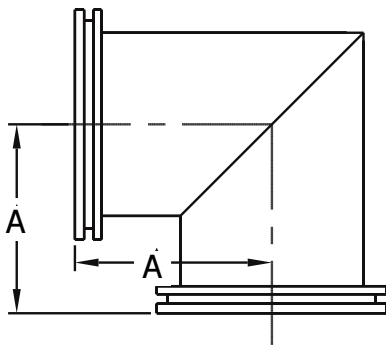


Flange MF, Blank

- Stainless steel type 316L
- Use with claw clamps

Part Number	Flange size
KSF-6963-316	NW 63
KSF-6980-316	NW 80
KSF-69100-316	NW 100
KSF-69160-316	NW 160

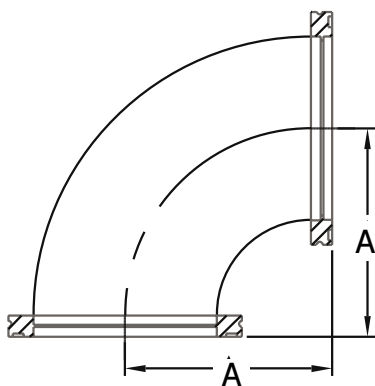
4



Elbows 90° Miter

- Stainless steel 316L

Part Number	Flange size	A
KSE-7363-316	NW 63	3.46
KSE-7380-316	NW 80	3.86
KSE-73100-316	NW 100	4.25
KSE-73160-316	NW 160	5.43



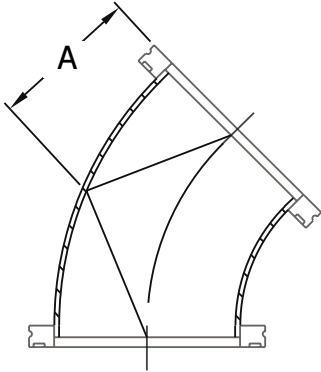
Elbows Radius 90° Bend

- Stainless steel 316L

Part Number	Flange size	A
KSE-7363-R-316	NW 63	4.00
KSE-7380-R-316	NW 80	4.74
KSE-73100-R-316	NW 100	6.24
KSE-73160-R-316	NW 160	9.24



KEY SPEEDY Series 316L ISO Components

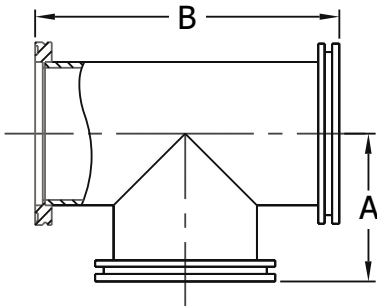


Elbows 45° Radius Bend

• *Stainless steel type 316L*

Part Number	Flange Size	A
KSE-7463-316	NW 63	3.24
KSE-7480-316	NW 80	3.93
KSE-74100-316	NW 100	5.03
KSE-74160-316	NW 160	9.71

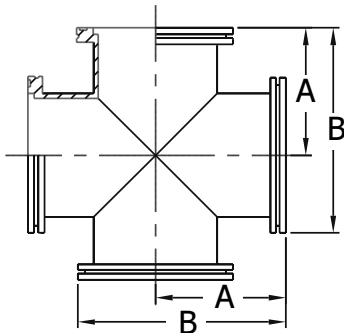
4



Tee

• *Stainless steel type 316L*

Part Number	Flange Size	A	B
KST-7563-316	NW 63	3.46	6.92
KST-7580-316	NW 80	3.86	7.72
KST-75100-316	NW 100	4.25	8.50
KST-75160-316	NW 160	5.43	10.86



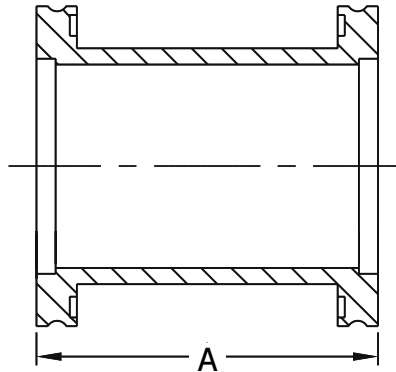
Cross

• *Stainless steel type 316L*

• *ISO-MF Flanges, same size all ports*

Part Number	Flange Size	A	B
KSCRS-7663-316	NW 63	3.46	6.92
KSCRS-7680-316	NW 80	3.86	7.72
KSCRS-76100-316	NW 100	4.25	8.50
KSCRS-76160-316	NW 160	5.43	10.86

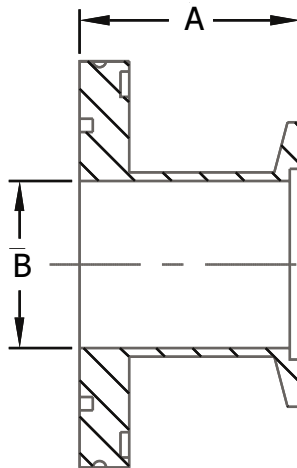




Full Nipples

• Stainless steel type 316L

Part Number	Flange Size	A
KSN-7763-1-316	NW 63	6.50
KSN-7763-316	NW 63	6.92
KSN-7763-2-316	NW 63	8.00
KSN-7780-1-316	NW 80	4.18
KSN-7780-2-316	NW 80	7.00
KSN-7780-316	NW 80	7.72
KSN-77100-1-316	NW 100	4.18
KSN-77100-316	NW 100	8.50
KSN-77100-2-316	NW 100	10.24
KSN-77160-1-316	NW 160	4.18
KSN-77160-316	NW 160	10.86
KSN-77160-2-316	NW 160	12.88



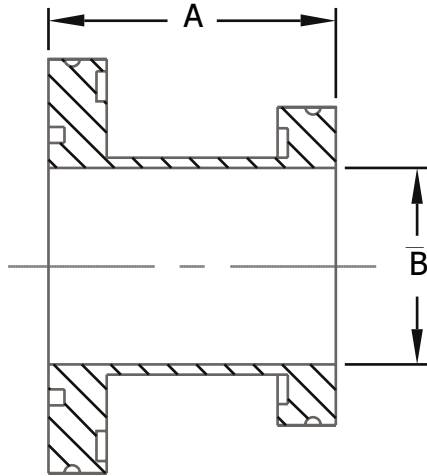
Adapter

• ISO-MF Flange to ISO-KF Flange

• Stainless steel type 316L

Part Number	Flange Size	A	B
KSA-8563-316	NW 63 to NW 40	1.77	1.33
KSA-8563-1-316	NW 63 to NW 50	1.77	1.83
KSA-8580-316	NW 80 to NW 40	1.77	1.33
KSA-8580-1-316	NW 80 to NW 50	1.77	1.83
KSA-85100-316	NW 100 to NW 50	1.77	1.83

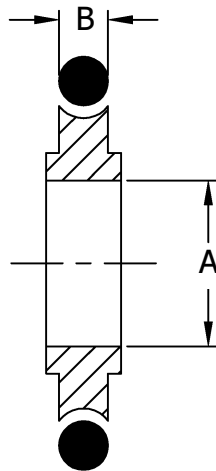
4



Reducer

- ISO-MF Flange to ISO-MF Flange
- Stainless steel type 316L

Part Number	Flange Size	A	B
KSR-8663-316	NW 63 to NW 80	2.95	2.37
KSR-8663-1-316	NW 63 to NW 100	2.95	2.37
KSR-8663-2-316	NW 63 to NW 160	2.95	2.37
KSR-8680-316	NW 80 to NW 100	2.95	2.87
KSR-8680160-316	NW 80 to NW 160	2.95	2.87
KSR-86100-316	NW 100 to NW 160	2.95	3.87



Seal

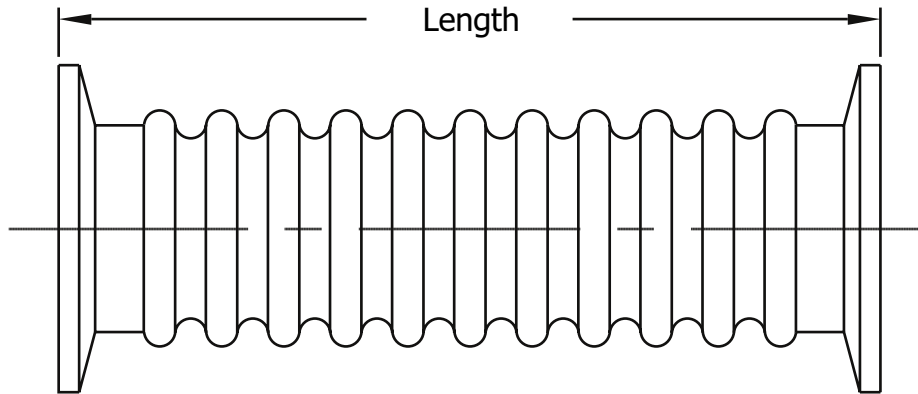
Centering Ring/Seal Assembly

- Replaceable Viton® O-ring/Other materials available
- Stainless steel type 316L

Part Number	Flange Size	A	B
KSCR-8763-316	NW 63	2.63	0.15
KSCR-8780-316	NW 80	3.14	0.15
KSCR-87100-316	NW 100	3.89	0.15
KSCR-87160-316	NW 160	5.90	0.15



KEY SPEEDY Series 316L ISO Components



4

Stainless Steel Type 316L Hose Assemblies

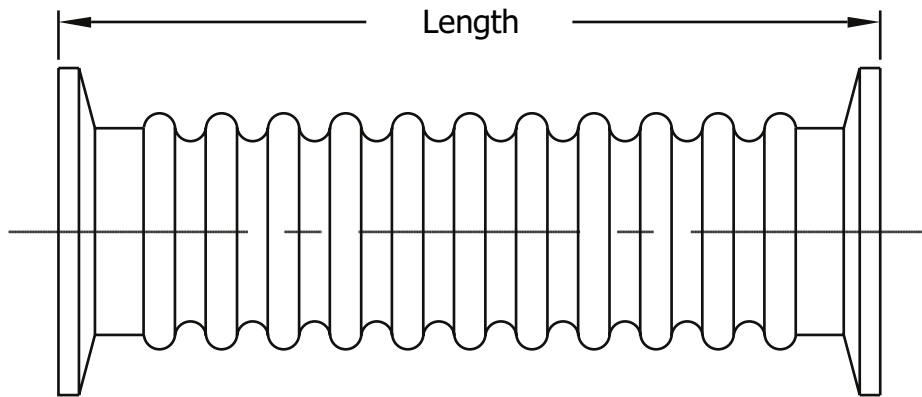
Part Number	Hose I.D.	Length	Description
KH-025-MVCR1316	1/4"	3.5"	1/4" Male VCR®
KH-025-FVCR1316	1/4"	3.5"	1/4" Female VCR®
KH-025-MVCR2316	1/4"	6"	1/4" Male VCR®
KH-025-FVCR2316	1/4"	6"	1/4" Female VCR®
KH-025-MVCR3316	1/4"	12"	1/4" Male VCR®
KH-025-FVCR3316	1/4"	12"	1/4" Female VCR®
BK-75-3.94-316	3/4"	3.94"	NW 16 Flanges
BK-75-6-316	3/4"	6"	NW 16 Flanges
BK-75-12-316	3/4"	12"	NW 16 Flanges
BK-75-24-316	3/4"	24"	NW 16 Flanges
BK-75-36-316	3/4"	36"	NW 16 Flanges
BK-100-3.94-316	1"	3.94"	NW 25 Flanges
BK-100-6-316	1"	6"	NW 25 Flanges
BK-100-12-316	1"	12"	NW 25 Flanges
BK-100-24-316	1"	24"	NW 25 Flanges
BK-100-36-316	1"	36"	NW 25 Flanges
BK-150-3.94-316	1-1/2"	3.94"	NW 40 Flanges
BK-150-6-316	1-1/2"	6"	NW 40 Flanges
BK-150-12-316	1-1/2"	12"	NW 40 Flanges
BK-150-24-316	1-1/2"	24"	NW 40 Flanges
BK-150-36-316	1-1/2"	36"	NW 40 Flanges
BK-200-3.94-316	2"	3.94"	NW 50 Flanges
BK-200-6-316	2"	6"	NW 50 Flanges
BK-200-12-316	2"	12"	NW 50 Flanges
BK-200-24-316	2"	24"	NW 50 Flanges
BK-200-36-316	2"	36"	NW 50 Flanges

Note: When ordering flexible hose connectors with metal braid sheathing; - Add - letter "S" to prefix of part number. **(Example SBK-200-36-316)**

Note: For lengths other than listed, contact the factory.



4



Stainless steel type 316L Hose Assemblies

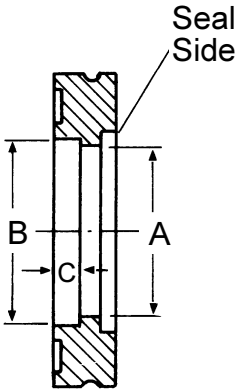
Part Number	Hose I.D.	Length	Description
BI-250-6-316	2-1/2"	6"	NW 63 ISO MF Flanges
KSH-7863-1-316	2-1/2"	9.8"	NW 63 ISO MF Flanges
BI-250-12-316	2-1/2"	12"	NW 63 ISO MF Flanges
KSH-7863-2-316	2-1/2"	19.7"	NW 63 ISO MF Flanges
BI-250-24-316	2-1/2"	24"	NW 63 ISO MF Flanges
BI-250-36-316	2-1/2"	36"	NW 63 ISO MF Flanges
BI-300-6-316	3"	6"	NW 80 ISO MF Flanges
KSH-7880-1-316	3"	9.8"	NW 80 ISO MF Flanges
BI-300-12-316	3"	12"	NW 80 ISO MF Flanges
BI-300-18-316	3"	18"	NW 80 ISO MF Flanges
KSH-7880-2-316	3"	19.7"	NW 80 ISO MF Flanges
BI-300-24-316	3"	24"	NW 80 ISO MF Flanges
BI-300-36-316	3"	36"	NW 80 ISO MF Flanges
BI-400-6-316	4"	6"	NW 100 ISO MF Flanges
KSH-78100-1-316	4"	9.8"	NW 100 ISO MF Flanges
BI-400-12-316	4"	12"	NW 100 ISO MF Flanges
KSH-78100-2-316	4"	19.7"	NW 100 ISO MF Flanges
BI-400-24-316	4"	24"	NW 100 ISO MF Flanges
BI-400-36-316	4"	36"	NW 100 ISO MF Flanges
KSFC-78160-316	6"	7.9"	NW 160 ISO MF Flanges
KSFC-78160-1316	6"	10"	NW 160 ISO MF Flanges
KSFC-78160-2316	6"	12"	NW 160 ISO MF Flanges

Note: When ordering flexible hose connectors with metal braid sheathing; - Add - letter "S" to prefix of part number. (Example **SBI-400-12-316**)

Note: For lengths other than listed, contact the factory.



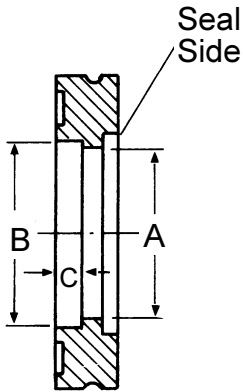
KEY SPEEDY Flanges; bored, blank, weld stub



Flange MF, Bored

- Stainless steel type 304
- Use with claw clamps

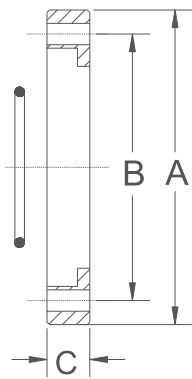
Part Number	Flange size	Bore	A	B	C
KSF-6763	NW 63	2.5"	2.37	2.50	.22
KSF-6780	NW 80	3"	2.87	3.00	.22
KSF-67100	NW 100	4"	3.87	4.00	.22
KSF-67160	NW 160	6"	5.83	6.00	.22
KSF-67200	NW 200	8"	7.76	8.00	.22
KSF-67250	NW 250	10"	9.75	10.00	.22
KSF-67320	NW 320	12"	12.42	12.75	.30



Flange MF, Bored

- 6061-T6 Aluminum
- Use with claw clamps

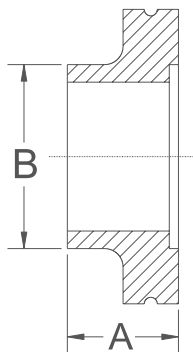
Part Number	Flange size	Bore	A	B	C
KSF-6763-AL	NW 63	2.5"	2.37	2.50	.22
KSF-6780-AL	NW 80	3"	2.87	3.00	.22
KSF-67100-AL	NW 100	4"	3.87	4.00	.22
KSF-67160-AL	NW 160	6"	5.83	6.00	.22
KSF-67200-AL	NW 200	8"	7.76	8.00	.22
KSF-67250-AL	NW 250	10"	9.75	10.00	.22
KSF-67320-AL	NW 320	12"	12.42	12.75	.30



Rotatable Bolt Ring Assemblies

- Aluminum construction
- Retaining ring included
- Standard bolt pattern

Part Number	ISO size	Tube Size	A	B	C
RBR-6763-AL	NW 63	2.50	5.12	4.33	.47
RBR-6780-AL	NW 80	3.00	5.71	4.92	.47
RBR-67100-AL	NW 100	4.00	6.50	5.71	.47
RBR-67160-AL	NW 160	6.00	8.86	7.87	.63
RBR-67200-AL	NW 200	8.00	11.22	10.24	.63
RBR-67250-AL	NW 250	10.00	13.19	12.20	.63
RBR-67320-AL	NW 320	12.75	16.73	15.55	.79



Flange MF Short Weld Stub

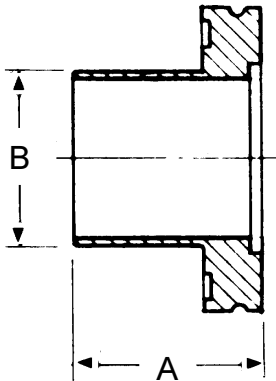
- Aluminum 6061-T6
- Use with claw clamps

Part Number	Flange size	Bore	A	B
KSF-6863-AL	NW 63	2.5"	1.51	2.50
KSF-6880-AL	NW 80	3"	1.51	3.00
KSF-68100-AL	NW 100	4"	1.51	4.00
KSF-68160-AL	NW 160	6"	1.51	6.00
KSF-68200-AL	NW 200	8"	1.51	8.00
KSF-68250-AL	NW 250	10"	1.56	10.00
KSF-68320-AL	NW 320	12"	1.56	12.00

KEY SPEEDY Flanges; bored, blank, weld stub

Flange MF Long Weld Stub

- Stainless steel 304
- Use with claw clamps

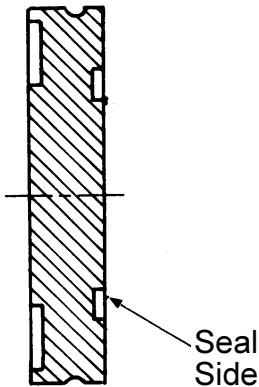


Part Number	Flange size	Bore	A	B
KSF-6863-3.25	NW 63	2.5"	3.25	2.50
KSF-6863	NW 63	2.5"	3.94	2.50
KSF-6863-4.0	NW 63	2.5"	4.00	2.50
KSF-6880-3.5	NW 80	3"	3.50	3.00
KSF-6880	NW 80	3"	3.94	3.00
KSF-68100	NW 100	4"	3.94	4.00
KSF-68100-4.13	NW 100	4"	4.13	4.00
KSF-68100-5.12	NW 100	4"	5.12	4.00
KSF-68160	NW 160	6"	3.94	6.00
KSF-68160-5.38	NW 160	6"	5.38	6.00
KSF-68160-6.44	NW 160	6"	6.44	6.00
KSF-68200	NW 200	8"	3.94	8.00
KSF-68200-7.38	NW 200	8"	7.38	8.00
KSF-68250	NW 250	10"	3.94	10.00
KSF-68250-9.88	NW 250	10"	9.88	10.00
KSF-68320	NW 320	12"	3.94	12.00
KSF-68320-9.88	NW 320	12"	9.88	12.00

4

Flange MF, Blank

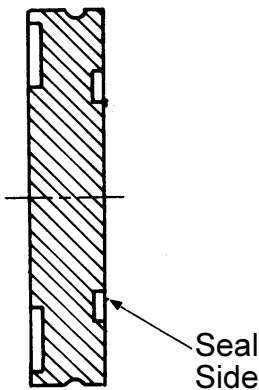
- Stainless steel 304
- Use with claw clamps



Part Number	Flange size
KSF-6963	NW 63
KSF-6980	NW 80
KSF-69100	NW 100
KSF-69160	NW 160
KSF-69200	NW 200
KSF-69250	NW 250
KSF-69320	NW 320

Flange MF, Blank

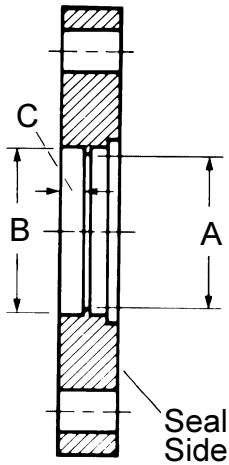
- Aluminum 6061-T6
- Use with claw clamps



Part Number	Flange size
KSF-6963-AL	NW 63
KSF-6980-AL	NW 80
KSF-69100-AL	NW 100
KSF-69160-AL	NW 160
KSF-69200-AL	NW 200
KSF-69250-AL	NW 250
KSF-69320-AL	NW 320



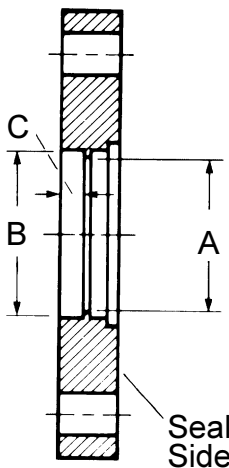
KEY SPEEDY Flanges Bolted



Flange Bolted, Bored

- Stainless steel 304
- For use with bolts only

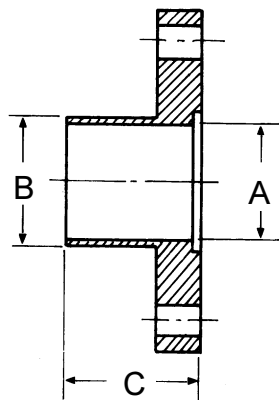
Part Number	Flange size	Bore	A	B	C
KSF-7063	NW 63	2.5"	2.37	2.50	.22
KSF-7080	NW 80	3"	2.87	3.00	.22
KSF-70100	NW 100	4"	3.87	4.00	.22
KSF-70160	NW 160	6"	5.83	6.00	.22
KSF-70200	NW 200	8"	7.76	8.00	.30
KSF-70250	NW 250	10"	9.75	10.00	.30
KSF-70320	NW 320	12"	12.42	12.75	.30



Flange Bolted, Bored

- Aluminum 6061-T6
- For use with bolts only

Part Number	Flange size	Bore	A	B	C
KSF-7063-AL	NW 63	2.5"	2.37	2.50	.22
KSF-7080-AL	NW 80	3"	2.87	3.00	.22
KSF-70100-AL	NW 100	4"	3.87	4.00	.22
KSF-70160-AL	NW 160	6"	5.83	6.00	.22
KSF-70200-AL	NW 200	8"	7.76	8.00	.30
KSF-70250-AL	NW 250	10"	9.75	10.00	.30
KSF-70320-AL	NW 320	12"	12.42	12.75	.30

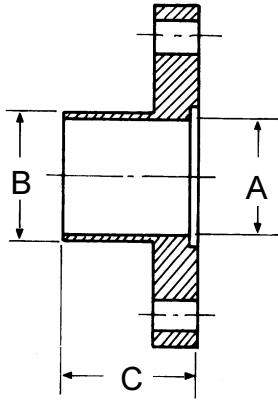


Flange Bolted, Weld Stub

- Stainless steel 304
- For use with bolts only

Part Number	Flange size	Bore	A	B	C
KSF-7163	NW 63	2.5"	2.37	2.50	3.94
KSF-7180	NW 80	3"	2.87	3.00	3.94
KSF-71100	NW 100	4"	3.87	4.00	3.94
KSF-71160	NW 160	6"	5.83	6.00	3.94
KSF-71200	NW 200	8"	7.76	8.00	3.94
KSF-71250	NW 250	10"	9.75	10.00	3.94
KSF-71320	NW 320	12"	12.42	12.75	3.94

KEY SPEEDY Flanges Bolted

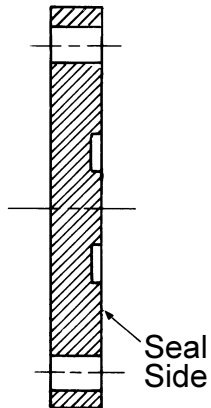


Flange Bolted, Weld Stub

- Aluminum 6061-T6
- For use with bolts only

Part Number	Flange size	Bore	A	B	C
KSF-7163-AL	NW 63	2.5"	2.37	2.50	1.50
KSF-7180-AL	NW 80	3"	2.87	3.00	1.50
KSF-71100-AL	NW 100	4"	3.87	4.00	1.50
KSF-71160-AL	NW 160	6"	5.83	6.00	1.50
KSF-71200-AL	NW 200	8"	7.76	8.00	1.50
KSF-71250-AL	NW 250	10"	9.75	10.00	1.51
KSF-71320-AL	NW 320	12"	12.42	12.75	1.51

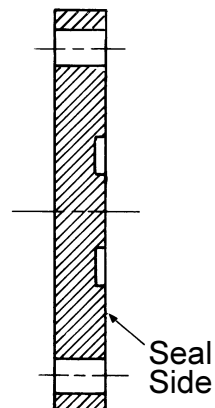
4



Flange Bolted, Blank

- Stainless steel 304
- For use with bolts only

Part Number	Flange size
KSF-7263	NW 63
KSF-7280	NW 80
KSF-72100	NW 100
KSF-72160	NW 160
KSF-72200	NW 200
KSF-72250	NW 250
KSF-72320	NW 320



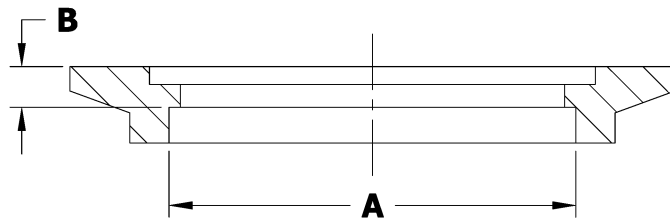
Flange Bolted, Blank

- Aluminum 6061-T6
- For use with bolts only

Part Number	Flange size
KSF-7263-AL	NW 63
KSF-7280-AL	NW 80
KSF-72100-AL	NW 100
KSF-72160-AL	NW 160
KSF-72200-AL	NW 200
KSF-72250-AL	NW 250
KSF-72320-AL	NW 320

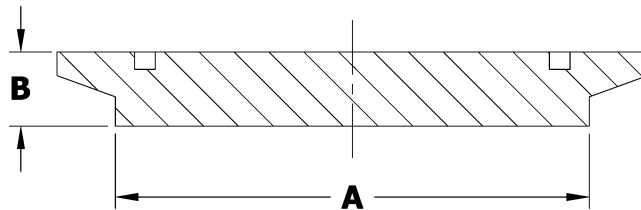


KEY SPEEDY ISO-MF Band Clamp



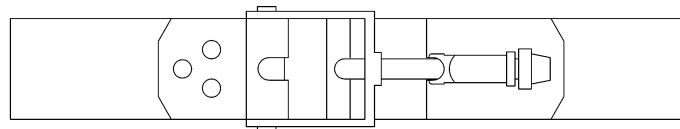
Band Clamp Flanges Bored

Part Number	Tube OD	ISO	A	B
KSF-6763-BC	2-1/2"	NW 63	2.51	.25
KSF-6780-BC	3"	NW 80	3.10	.25
KSF-67100-BC	4"	NW 100	4.10	.25
KSF-67160-BC	6"	NW 160	6.10	.25
KSF-67200-BC	8"	NW 200	8.10	.25



Band Clamp Flanges Blank

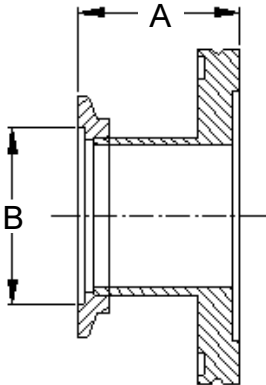
Part Number	ISO	A	B
KSF-6963-BL	NW 63	3.00	.47
KSF-6980-BL	NW 80	3.50	.47
KSF-69100-BL	NW 100	4.50	.47
KSF-69160-BL	NW 160	6.50	.47
KSF-69200-BL	NW 200	8.50	.47



Clamps for Band Clamp Assemblies

Part Number	ISO
CLF-63	NW 63
CLF-80	NW 80
CLF-100	NW 100
CLF-160	NW 160
CLF-200	NW 200

KEY SPEEDY Band Clamp Components

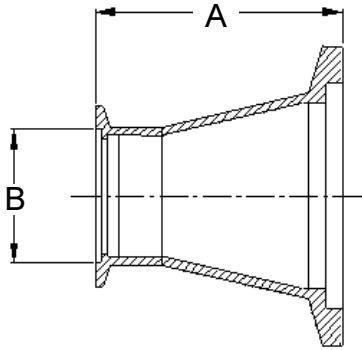


Adapter ISO Band Clamp to ISO-KF

• Stainless steel type 304

Part Number	ISO Band Clamp to ISO-KF	A	B
KSA-11716★	NW 63 to NW 16	1.77	.62
KSA-11725★	NW 63 to NW 25	1.77	.87
KSA-11740★	NW 63 to NW 40	1.77	1.33
KSA-11750★	NW 63 to NW 50	1.77	1.83
KSA-11780★	NW 80 to NW 40	1.77	1.33
KSA-11750-1★	NW 80 to NW 50	1.77	1.83
KSA-11750-2★	NW 100 to NW 40	1.77	1.33
KSA-11750-3★	NW 100 to NW 50	1.77	1.83

★ = New Product

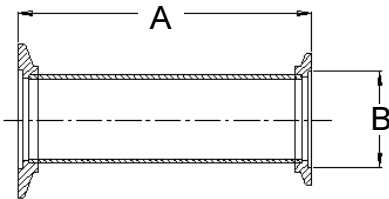


Adapter Conical ISO Band Clamp to ISO-KF

• Stainless steel type 304

Part Number	ISO Band Clamp to ISO-KF	A	B
KSA-11840★	NW 40 to NW 63	2.87	1.37
KSA-11850★	NW 50 to NW 63	2.87	1.87
KSA-11880★	NW 40 to NW 80	4.12	1.37
KSA-11850-1★	NW 50 to NW 80	2.87	1.87
KSA-11850-2★	NW 50 to NW 100	4.12	1.87

★ = New Product



Adapter Reducer, Band Clamp to Band Clamp

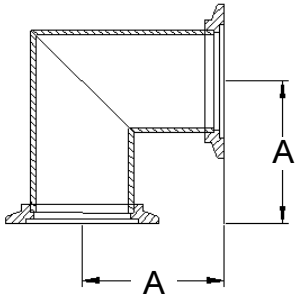
• Stainless steel type 304

Part Number	ISO Sizes	A	B
KSA-11963★	NW 63 to NW 80	2.95	2.37
KSA-11963-1★	NW 63 to NW 100	2.95	2.37
KSA-11963-2★	NW 63 to NW 160	2.95	2.37
KSA-11963-3★	NW 63 to NW 200	2.95	2.37
KSA-11980★	NW 80 to NW 100	2.95	2.87
KSA-11980-1★	NW 80 to NW 160	2.95	2.87
KSA-11980-2★	NW 80 to NW 200	2.95	3.87
KSA-119100★	NW 100 to NW 160	2.95	3.87
KSA-119100-1★	NW 100 to NW 200	2.95	5.78
KSA-119160★	NW 160 to NW 200	2.95	7.75

★ = New Product



KEY SPEEDY Band Clamp Components

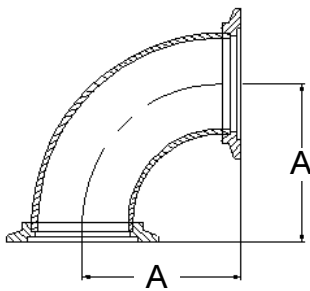


Band Clamp, Elbows 90° Miter

• Stainless steel type 304

Part Number	ISO	A
KSE-10963★	NW 63	3.46
KSE-10980★	NW 80	3.86
KSE-109100★	NW 100	4.25
KSE-109160★	NW 160	5.43
KSE-109200★	NW 200	6.61

★ = New Product

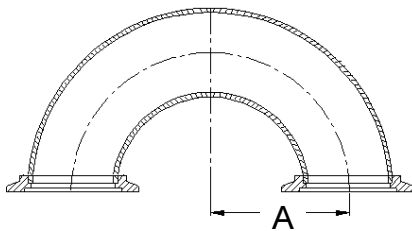


Band Clamp, Elbows Radius 90° Bend

• Stainless steel type 304

Part Number	ISO	A
KSE-11063★	NW 63	4.00
KSE-11080★	NW 80	4.74
KSE-110100★	NW 100	6.24
KSE-110160★	NW 160	9.24
KSE-110200★	NW 200	6.61

★ = New Product

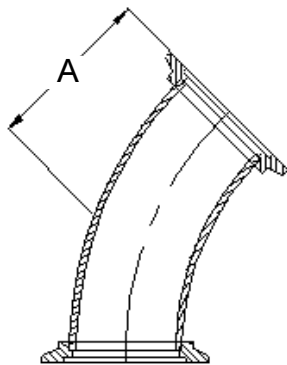


Band Clamp, Elbows 180° Bend

• Stainless steel type 304

Part Number	ISO	A
KSE-11163★	NW 63	7.50
KSE-11180★	NW 80	9.00
KSE-111100★	NW 100	12.00
KSE-111160★	NW 160	18.00

★ = New Product



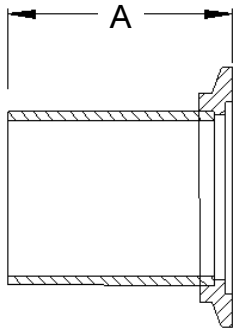
Band Clamp, Elbows 45°

• Stainless steel type 304

Part Number	ISO	A
KSE-11263★	NW 63	3.24
KSE-11280★	NW 80	3.93
KSE-112100★	NW 100	5.03
KSE-112160★	NW 160	9.71

★ = New Product

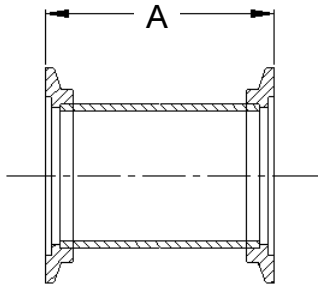
KEY SPEEDY Band Clamp Components



Band Clamp, Long Weld Stub
 • Stainless steel type 304

Part Number	ISO	Tube Size	A
KSN-11363★	NW 63	2-1/2"	3.94
KSN-11380★	NW 80	3"	3.94
KSN-113100★	NW 100	4"	3.94
KSN-113160★	NW 160	6"	3.94
KSN-113200★	NW 200	8"	3.94

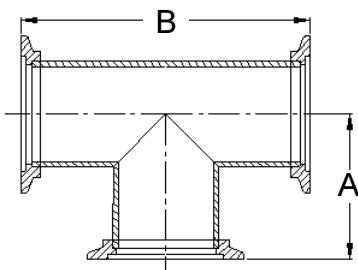
★ = New Product



Band Clamp, Full Nipple
 • Stainless steel type 304

Part Number	ISO	Tube Size	A
KSN-11463★	NW 63	2-1/2"	6.92
KSN-11480★	NW 80	3"	7.72
KSN-114100★	NW 100	4"	8.50
KSN-114160★	NW 160	6"	10.86
KSN-114200★	NW 200	8"	13.22

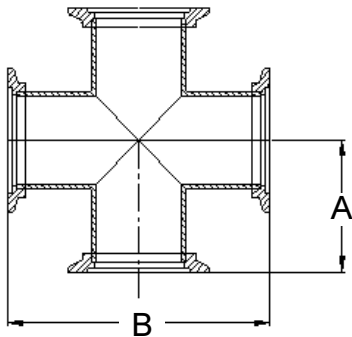
★ = New Product



Band Clamp, Tee
 • Stainless steel type 304
 • Standard centerline dimensions

Part Number	ISO	A	B
KST-11563★	NW 63	3.46	6.92
KST-11580★	NW 80	3.86	7.72
KST-115100★	NW 100	4.25	8.50
KST-115160★	NW 160	5.43	10.86
KST-115200★	NW 200	6.61	13.22

★ = New Product



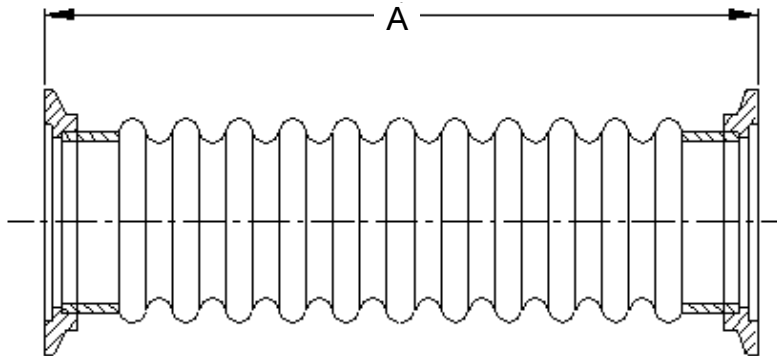
Band Clamp, Cross
 • Stainless steel type 304
 • Standard centerline dimensions

Part Number	ISO	A	B
KSCRS-11663★	NW 63	3.46	6.92
KSCRS-11680★	NW 80	3.86	7.72
KSCRS-116100★	NW 100	4.25	8.50
KSCRS-116160★	NW 160	5.43	10.86
KSCRS-116200★	NW 200	6.61	13.22

★ = New Product



KEY SPEEDY Band Clamp Components



Band Clamp Flex Hoses

- Thin wall flexible hose connectors
- Stainless steel TIG welded construction

Part Number	Hose I.D.	Length	Description
ISOBC-63★	2-1/2"	6.00	NW 63 flanges
ISOBC-63-1★	2-1/2"	12.00	NW 63 flanges
ISOBC-80★	3"	6.00	NW 80 flanges
ISOBC-80-1★	3"	12.00	NW 80 flanges
ISOBC-100★	4"	6.00	NW 100 flanges
ISOBC-100-1★	4"	12.00	NW 100 flanges
ISOBC-160★	6"	6.00	NW 160 flanges
ISOBC-160-1★	6"	12.00	NW 160 flanges
ISOBC-200★	8"	6.00	NW 200 flanges
ISOBC-200-1★	8"	12.00	NW 200 flanges

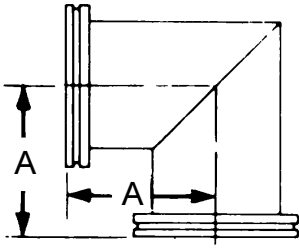
★ = New Product



KEY SPEEDY Stainless Steel Elbows

Elbows 90° Miter

• Stainless steel type 304

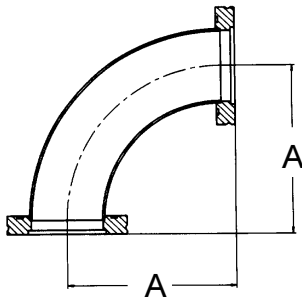


Part Number	Flange size	A
KSE-7363	NW 63	3.46
KSE-7380	NW 80	3.86
KSE-73100	NW 100	4.25
KSE-73160	NW 160	5.43
KSE-73200	NW 200	6.61
KSE-73250	NW 250	8.19

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Elbows Radius 90° Bend

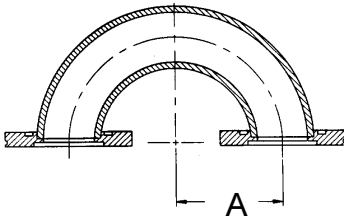
• Stainless steel type 304



Part Number	Flange size	A
KSE-7363-R	NW 63	4.00
KSE-7380-R	NW 80	4.74
KSE-73100-R	NW 100	6.24
KSE-73160-R	NW 160	9.24
KSE-73200-R	NW 200	12.25
KSE-73250-R	NW 250	15.25

Elbows 180° Bend

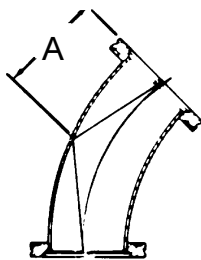
• Stainless steel type 304



Part Number	Flange size	A
KSE-7363-180	NW 63	7.5
KSE-7380-180	NW 80	9.0
KSE-73100-180	NW 100	12.0
KSE-73160-180	NW 160	18.0

Elbows 45°

• Stainless steel type 304



Part Number	Flange size	A
KSE-7463	NW 63	3.24
KSE-7480	NW 80	3.93
KSE-74100	NW 100	5.03
KSE-74160	NW 160	9.71

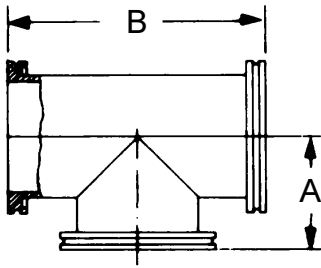


KEY SPEEDY ISO-NW Tees and Reducers

Tee

- **Stainless steel type 304**

- **Standard flange face to centerline dimensions**

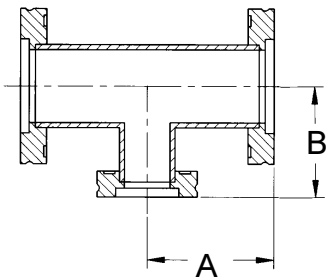


Part Number	Flange size	A	B
KST-7563	NW 63	3.46	6.92
KST-7580	NW 80	3.86	7.72
KST-75100	NW 100	4.25	8.50
KST-75160	NW 160	5.43	10.86
KST-75200	NW 200	6.61	13.22
KST-75250	NW 250	8.19	16.38

Tees Reducing

- **ISO-MF flanges**

- **Stainless steel type 304**



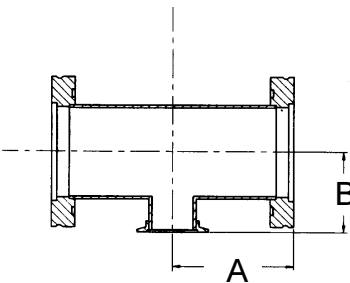
Part Number	Flange size	A	B
KST-1078063	NW 80 TO NW63	3.22	3.27
KST-10710063	NW 100 TO NW 63	5.12	4.47
KST-10710080	NW 100 TO NW 80	5.12	4.47
KST-10716063	NW 160 TO NW 63	6.31	5.62
KST-10716080	NW 160 TO NW 80	6.31	5.82
KST-107160100	NW 160 TO NW 100	6.31	5.59
KST-10720063	NW 200 TO NW 63	7.75	6.62
KST-10720080	NW 200 TO NW 80	7.75	7.00
KST-107200100	NW 200 TO NW 100	7.75	6.96
KST-107200160	NW 200 TO NW 160	7.75	6.87

Tees Reducing

- **ISO-MF flanges, same on thru ports**

- **ISO-KF on side ports**

- **Stainless steel type 304**

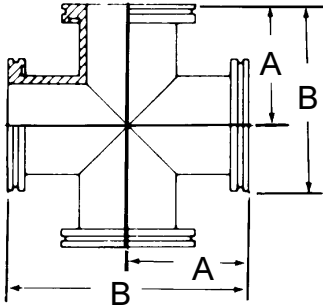


Part Number	Flange size	A	B
KST-1046316	NW 63 TO NW 16	4.00	2.22
KST-1046325	NW 63 TO NW 25	4.00	3.09
KST-1046340	NW 63 TO NW 40	4.00	3.00
KST-1046350	NW 63 TO NW 50	4.00	3.61
KST-1048025	NW 80 TO NW 25	3.22	3.34
KST-1048040	NW 80 TO NW 40	3.22	3.24
KST-1048050	NW 80 TO NW 50	3.22	3.36
KST-10410025	NW 100 TO NW 25	5.12	3.84
KST-10410040	NW 100 TO NW 40	5.12	3.74
KST-10410050	NW 100 TO NW 50	5.12	4.36
KST-10416040	NW 160 TO NW 40	6.31	4.74
KST-10416050	NW 160 TO NW 50	6.31	5.36

KEY SPEEDY ISO-NW Crosses and Nipples

Cross

- **Stainless steel type 304**
- **ISO-MF flanges, same size all ports**
- **Standard flange face to centerline dimensions**

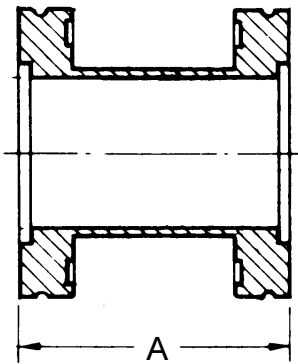


Part Number	Flange size	A	B
KSCRS-7663	NW 63	3.46	6.92
KSCRS-7680	NW 80	3.86	7.72
KSCRS-76100	NW 100	4.25	8.50
KSCRS-76160	NW 160	5.43	10.86
KSCRS-76200	NW 200	6.61	13.22
KSCRS-76250	NW 250	8.19	16.38

4

Nipple

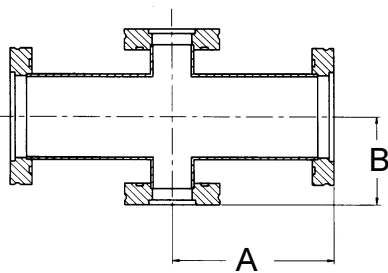
- **Stainless steel type 304**



Part Number	Flange size	A
KSN-7763-6.50	NW 63	6.50
KSN-7763	NW 63	6.92
KSN-7763-8.00	NW 63	8.00
KSN-7780-4.18	NW 80	4.18
KSN-7780-7.00	NW 80	7.00
KSN-7780	NW 80	7.72
KSN-77100-4.18	NW 100	4.18
KSN-77100	NW 100	8.50
KSN-77100-10.24	NW 100	10.24
KSN-77160-4.18	NW 160	4.18
KSN-77160	NW 160	10.86
KSN-77160-12.88	NW 160	12.88
KSN-77200	NW 200	13.22
KSN-77250	NW 250	16.38

Cross Reducing

- **ISO-MF to ISO-MF**
- **Mates differing ISO-MF sizes**
- **Stainless steel type 304**



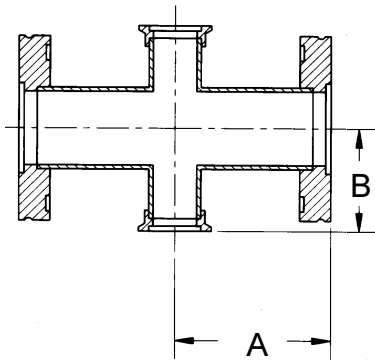
Part Number	Flange size	A	B
KSCRS-1068063	NW 80 TO NW 63	3.22	3.27
KSCRS-10610063	NW 100 TO NW 63	5.12	4.74
KSCRS-10610080	NW 100 TO NW 80	5.12	4.74
KSCRS-10616063	NW 160 TO NW 63	6.31	5.62
KSCRS-10616080	NW 160 TO NW 80	6.31	5.82
KSCRS-10616100	NW 160 TO NW 100	6.31	5.59
KSCRS-10620063	NW 200 TO NW 63	7.75	6.62
KSCRS-10620080	NW 200 TO NW 80	7.75	7.00
KSCRS-106200100	NW 200 TO NW 100	8.00	4.00
KSCRS-106200160	NW 200 TO NW 160	8.00	6.00



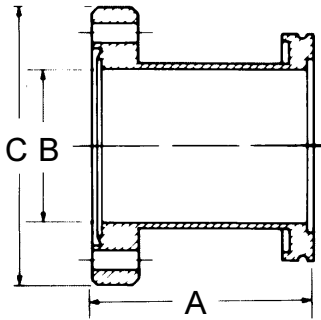
KEY SPEEDY Adapter ISO-MF Flange, Cross Reducing

Cross Reducing

- ISO-MF Flanges, same on thru ports
- ISO-KF on side ports
- Stainless steel type 304



Part Number	Flange size	A	B
KSCRS-1056316	NW 63 TO NW 16	4.00	2.22
KSCRS-1056325	NW 63 TO NW 25	4.00	3.09
KSCRS-1056340	NW 63 TO NW 40	4.00	3.00
KSCRS-1056350	NW 63 TO NW 50	4.00	3.61
KSCRS-1058025	NW 80 TO NW 25	3.22	3.34
KSCRS-1058040	NW 80 TO NW 40	3.22	3.24
KSCRS-1058050	NW 80 TO NW 50	3.22	3.36
KSCRS-10510025	NW 100 TO NW 25	5.12	3.84
KSCRS-10510040	NW 100 TO NW 40	5.12	3.74
KSCRS-10510050	NW 100 TO NW 50	5.12	4.36
KSCRS-10516040	NW 160 TO NW 40	6.31	4.74
KSCRS-10516050	NW 160 TO NW 50	6.31	5.36



Adapter

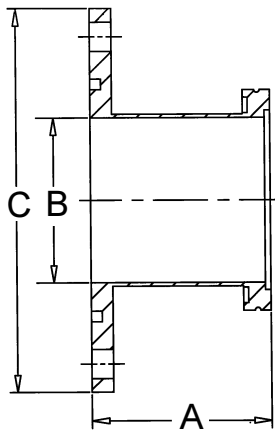
- ISO-MF Flange to MET-SEAL Flange
- Stainless steel type 304

Part Number	Flange size	A	B	C
KSA-8363	NW 63 TO 4-1/2"	4.33	2.37	4.5
KSA-8380-1★	NW 80 TO 6"	4.33	2.87	6
KSA-83100	NW 100 TO 6"	4.37	3.83	6
KSA-83160	NW 160 TO 8"	4.45	5.78	8
KSA-83200	NW 200 TO 10"	4.45	7.78	10

★ = New Product

Adapter

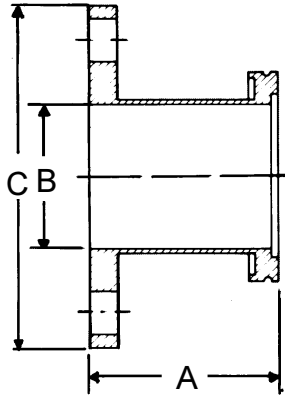
- ISO-MF Flange to ASA Flange
- With O-ring groove
- Stainless steel type 304



Part Number	Flange size	A	B	C
KSA-8463-0	NW 63 TO 2" ASA	4.18	2.37	6.0
KSA-8480-0	NW 80 TO 2" ASA	4.18	2.87	6.0
KSA-84100-0	NW 100 TO 2" ASA	4.18	3.12	6.0
KSA-8463-1-0	NW 63 TO 3" ASA	4.18	2.37	7.5
KSA-8480-1-0	NW 80 TO 3" ASA	4.18	2.87	7.5
KSA-84100-1-0	NW 100 TO 3" ASA	4.18	3.87	7.5
KSA-84100-2-0	NW 100 TO 4" ASA	4.18	3.87	9.0
KSA-84160-0	NW 160 TO 4" ASA	4.18	5.34	9.0
KSA-84160-1-0	NW 160 TO 6" ASA	4.42	5.83	11.0
KSA-84200-0	NW 200 TO 6" ASA	4.42	7.76	11.0

KEY SPEEDY Adapter ISO-MF Flange, Reducer

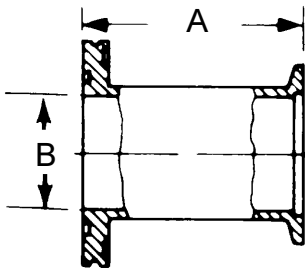
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Adapter

- ISO-MF Flange to ASA Flange
- Without O-ring groove
- Stainless steel type 304

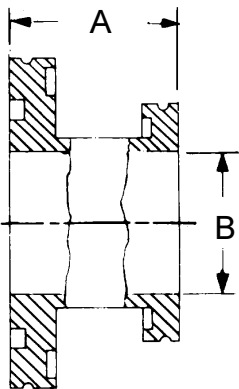
Part Number	Flange size	A	B	C
KSA-8463	NW 63 TO 2" ASA	4.18	2.37	6.0
KSA-8480	NW 80 TO 2" ASA	4.18	2.87	6.0
KSA-84100	NW 100 TO 2" ASA	4.18	3.12	6.0
KSA-8463-1	NW 63 TO 3" ASA	4.18	2.37	7.5
KSA-8480-1	NW 80 TO 3" ASA	4.18	2.87	7.5
KSA-84100-1	NW 100 TO 3" ASA	4.18	3.87	7.5
KSA-84100-2	NW 100 TO 4" ASA	4.18	3.87	9.0
KSA-84160	NW 160 TO 4" ASA	4.18	5.34	9.0
KSA-84160-1	NW 160 TO 6" ASA	4.42	5.83	11.0
KSA-84200	NW 200 TO 6" ASA	4.42	7.76	11.0



Adapter

- ISO-MF Flange to ISO-KF Flange
- Stainless steel type 304

Part Number	Flange size	A	B
KSA-8563	NW 63 TO NW 40	1.77	1.33
KSA-8563-1	NW 63 TO NW 50	1.77	1.83
KSA-8580	NW 80 TO NW 40	1.77	1.33
KSA-8580-1	NW 80 TO NW 50	1.77	1.83
KSA-85100	NW 100 TO NW 50	1.77	1.83



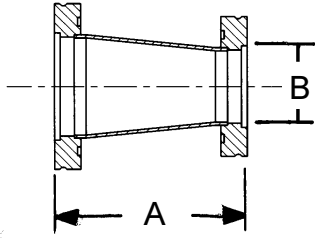
Reducer

- ISO-MF Flange to ISO-MF Flange
- Stainless steel type 304

Part Number	Flange size	A	B
KSR-8663	NW 63 TO NW 80	2.95	2.37
KSR-8663-1	NW 63 TO NW 100	2.95	2.37
KSR-8663-2	NW 63 TO NW 160	2.95	2.37
KSR-8663200	NW 63 TO NW 200	2.95	2.37
KSR-8680	NW 80 TO NW 100	2.95	2.87
KSR-8680160	NW 80 TO NW 160	2.95	2.87
KSR-8680200	NW 80 TO NW 200	2.95	2.87
KSR-86100	NW 100 TO NW 160	2.95	3.87
KSR-86100200	NW 100 TO NW 200	2.95	3.87
KSR-86160200	NW 160 TO NW 200	2.95	5.78
KSR-86200250	NW 200 TO NW 250	2.95	7.75



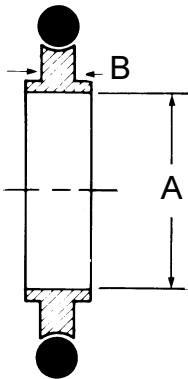
KEY SPEEDY ISO Centering Seals and Components



Reducer

- ISO-MF to ISO-MF flange conical reducers
- Stainless steel type 304

Part Number	Flange size	A	B
KSA-8663-CR	NW 63 TO NW 80	4.12	2.37
KSA-8663-1-CR	NW 63 TO NW 100	4.12	2.37
KSA-8680-CR	NW 80 TO NW 100	4.12	2.87
KSA-86100-CR	NW 80 TO NW 160	9.50	2.87
KSA-86160-CR	NW 100 TO NW 160	9.50	3.83

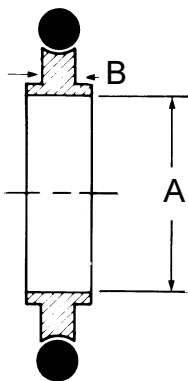


Seal

Centering/seal Assembly

- Replaceable Viton® O-ring
- Rated 150° C max
- Stainless steel type 304

Part Number	Flange size	A	B
KSCR-8763	NW 63	2.63	.15
KSCR-8780	NW 80	3.14	.15
KSCR-87100	NW 100	3.89	.15
KSCR-87160	NW 160	5.90	.15
KSCR-87200	NW 200	8.26	.15
KSCR-87250	NW 250	10.14	.15
KSCR-87320	NW 320	12.30	.22



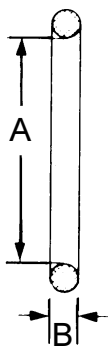
Seal

Centering ring assembly

- 6061-T6 material
- Viton® O-ring
- Rated 150° C max.

Part Number	ISO size	A	B
KSCR-8763-AL	NW 63	2.63	.15
KSCR-8780-AL	NW 80	3.14	.15
KSCR-87100-AL	NW 100	3.89	.15
KSCR-87160-AL	NW 160	5.90	.15
KSCR-87200-AL	NW 200	8.26	.15
KSCR-87250-AL	NW 250	10.14	.15
KSCR-87320-AL	NW 320	12.30	.22

KEY SPEEDY ISO Centering Seals and Components

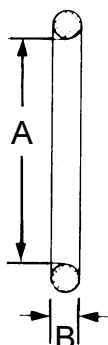


Seal O-Ring

- Buna-N
- Replaceable seal for centering assembly
- Standard O-ring sizes
- Bakeable to 80°C

Part Number	Flange size	A	B
KSO-8863	NW 63	2.85	.210
KSO-8880	NW 80	3.35	.210
KSO-88100	NW 100	4.10	.210
KSO-88160	NW 160	5.98	.210
KSO-88200	NW 200	8.48	.210
KSO-88250	NW 250	10.48	.210
KSO-88320	NW 320	12.48	.275

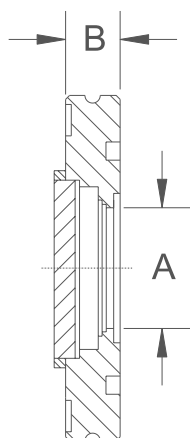
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Seal O-Ring

- Viton®
- Replaceable seal for centering ring assembly
- Standard O-ring sizes
- Bakeable to 150°C

Part Number	Flange size	A	B
KSO-8963	NW 63	2.85	.210
KSO-8980	NW 80	3.35	.210
KSO-89100	NW 100	4.10	.210
KSO-89160	NW 160	5.98	.210
KSO-89200	NW 200	8.48	.210
KSO-89250	NW 250	10.48	.210
KSO-89320	NW 320	12.48	.275

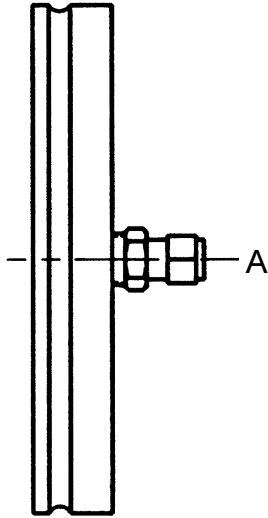


- Viewports zero length
- Zero length 7056 glass
- Standard ISO flange interface

Part Number	ISO size	A	B
VP-ISO-NW63	NW 63	1.40	.47
VP-ISO-NW80	NW 80	1.40	.47
VP-ISO-NW100	NW 100	2.62	.47
VP-ISO-NW160	NW 160	3.88	.47
VP-ISO-NW200	NW 200	5.37	.47



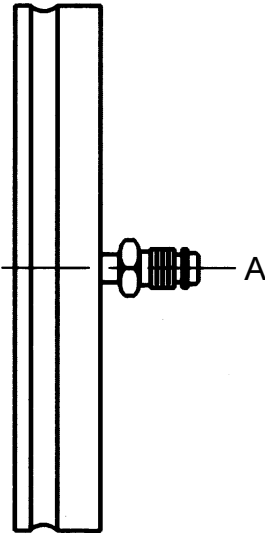
KEY SPEEDY ISO-MF Adapters, Plastic Covers



Adapter

- ISO-MF to Swagelok®
- Stainless steel type 304

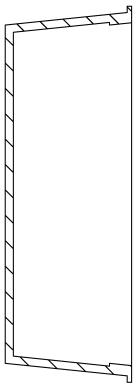
Part Number	Flange size	A
KSA-10263	NW 63	1/4"
KSA-10263-1	NW 63	1/2"
KSA-10263-2	NW 63	3/4"
KSA-10263-3	NW 63	1"
KSA-10280	NW 80	1/4"
KSA-10280-1	NW 80	1/2"
KSA-10280-2	NW 80	3/4"
KSA-10280-3	NW 80	1"
KSA-102100	NW 100	1/4"
KSA-102100-1	NW 100	1/2"
KSA-102100-2	NW 100	3/4"
KSA-102100-3	NW 100	1"
KSA-102160	NW 160	1/4"
KSA-102160-1	NW 160	1/2"
KSA-102160-2	NW 160	3/4"
KSA-102160-3	NW 160	1"



Adapter

- ISO-MF to VCR® male
- Stainless steel type 304

Part Number	Flange size	A
KSA-10163	NW 63	1/4"
KSA-10163-1	NW 63	1/2"
KSA-10163-2	NW 63	3/4"
KSA-10163-3	NW 63	1"
KSA-10180	NW 80	1/4"
KSA-10180-1	NW 80	1/2"
KSA-10180-2	NW 80	3/4"
KSA-10180-3	NW 80	1"
KSA-101100	NW 100	1/4"
KSA-101100-1	NW 100	1/2"
KSA-101100-2	NW 100	3/4"

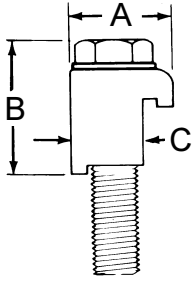


KEY SPEEDY Plastic Covers

- Protect exposed flange sealing surfaces

Part Number	For NW
PC-16	10 / 16
PC-25	20 / 25
PC-40	32 / 40
PC-50	50
PC-63	63 clamp style
PC-80	80 clamp style
PC-100	100 clamp style
PC-160	160 clamp style

KEY SPEEDY Clamps; Single and Double Claw

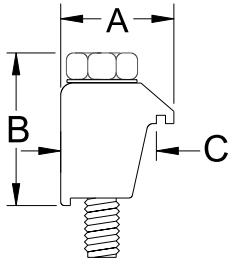


Clamp

Single Claw

- Aluminum clamp
- Stainless steel bolt and washer
- To join MF flange to tapped bolted flange

Part Number	Flange size	Bolt size	A	B	C
KSC-90100	NW63, NW80, NW100	M8	.95	1.2	.62
KSC-90160	NW160, NW200, NW250	M10	1.10	1.25	.80
KSC-90320	NW320, NW400, NW500	M12	1.34	1.57	1.04

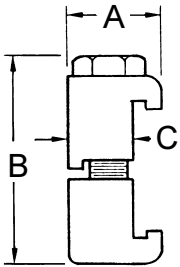


Clamp

Single Claw

- Nickel plated carbon steel
- Stainless steel bolt and washer
- Increased strength, insurance for expensive pumps

Part Number	For Flange Sizes	A	B	C
KSC-90100-NI	NW 63, NW 80, NW 100	.93	1.20	.66
KSC-90160-NI	NW 160, NW 200, NW 250	1.15	1.20	.87
KSC-90320-NI	NW 320, NW 400, NW 500	1.35	1.46	.96

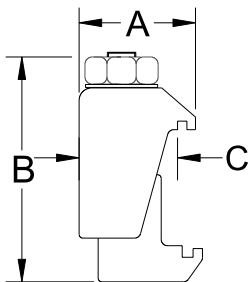


Clamp

Double Claw

- Aluminum clamp
- Stainless steel bolt and washer

Part Number	For Flange Sizes	A	B	C
KSC-9163	NW63, NW80, NW100	.95	1.98	.62
KSC-91160	NW160, NW200, NW250	1.10	2.05	.80
KSC-91320	NW320, NW400, NW500	1.34	2.56	1.04



Clamp

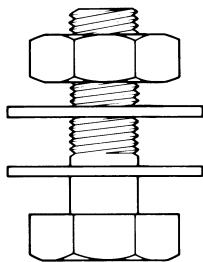
Double Claw

- Nickel plated carbon steel
- Stainless steel bolt and washer
- Increased strength, insurance for expensive pumps

Part Number	For Flange sizes	A	B	C
KSC-91100-NI	NW 63, NW 80, NW 100	.93	1.98	.66
KSC-91160-NI	NW 160, NW 200, NW 250	1.10	2.35	.71
KSC-91320-NI	NW 320, NW 400, NW 500	1.20	3.04	.85

Bolts

- For 2 bolted flanges
- Stainless steel
- Priced per set
- Nuts and washers included



Part Number	Flange size	Bolt size	No. in set	Pitch
KSB-9263	NW63	M8x40	4	1.25
KSB-92100	NW80, NW100	M8x40	8	1.25
KSB-92160	NW160	M10x50	8	1.50
KSB-92200	NW200, NW250	M10x50	12	1.50
KSB-92320	NW320	M12x60	12	1.75

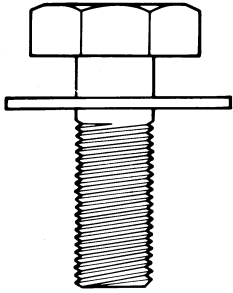


KEY SPEEDY Bolts and Clamp Assemblies

Bolts

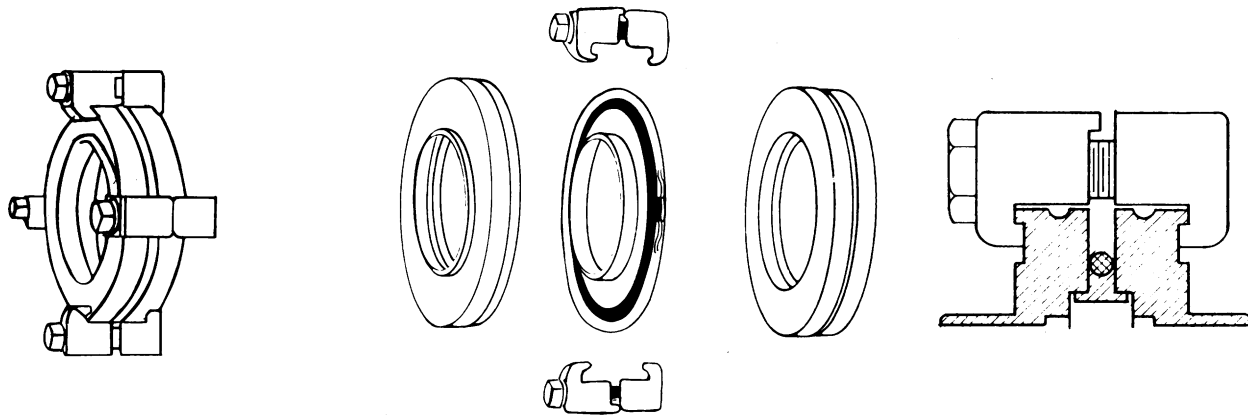
For joining bolted flange to tapped flange

- Stainless steel
- Priced per set
- Includes washer



Part Number	Flange size	Bolt size	No. in set	Pitch
KSB-9363	NW 63	M8x30	4	1.25
KSB-9380	NW 80, NW 100	M8x30	8	1.25
KSB-93160	NW 160	M10x35	8	1.50
KSB-93200	NW 200, NW 250	M10x35	12	1.50
KSB-93320	NW 320	M12x45	12	1.75

4



Complete Clamp Assembly- ISO-MF

- Stainless steel
- Viton® O-ring
- Two weld flanges

Part Number	Flange size	Nom. Bore	Claw clamps	Centering ring	Weld flanges
KSCA-9463	NW 63	2-1/2"	KSC-9163 /4 PER	KSCR-8763	KSF-6763
KSCA-9480	NW 80	3"	KSC-9180 /4 PER	KSCR-8780	KSF-6780
KSCA-94100	NW 100	4"	KSC-91100 /4 PER	KSCR-87100	KSF-67100
KSCA-94160	NW 160	6"	KSC-91160 /4 PER	KSCR-87160	KSF-67160
KSCA-94200	NW 200	8"	KSC-91200 /6 PER	KSCR-87200	KSF-67200
KSCA-94250	NW 250	10"	KSC-91250 /6 PER	KSCR-87250	KSF-67250
KSCA-94320	NW 320	12"	KSC-91320 /8 PER	KSCR-87320	KSF-67320



Foreline Traps, Dry-Ice Cooled

- **304 ss construction / Viton® Bonnet**
- **Easily removable, 3 quart cold bucket**
- **Visible trapping surface, refrigerant level**



Description:

DIFT Series foreline traps are a tabletop condensation style trap, which use a mixture of Alcohol and Dry-Ice achieving operating temperatures of - 100°F. At this temperature the **DIFT** trap effectively eliminates oil back streaming from mechanical pumps. Most condensable vapors (water/solvents) are removed before they can be ingested into the vacuum pump. The benefits being; the mechanical pump is protected and lower operating pressures are reached within the vacuum system.

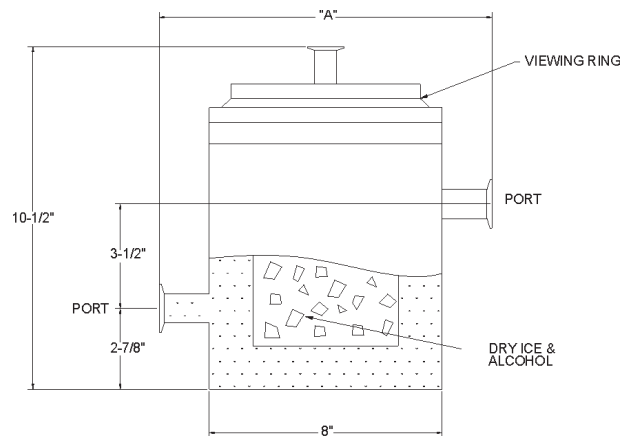
Construction:

The **DIFT** trap ports are offset, in an inline configuration. This port arrangement exposes the incoming gas stream to the largest amount of refrigerated surface area possible.

The Polycarbonate "Bucket" cover allows viewing of the alcohol/dry ice level. The cold bucket itself holds three quarts of alcohol/dry ice mix, and should be between 1/2 and 3/4 full for satisfactory trapping efficiency. The Polycarbonate "Bonnet" flange allows viewing of the trapped (frozen) gas on the cold bucket itself. "Typical" holding times are (about) 12 hours. The cold bucket and the body of the **DIFT** trap itself, are 304 stainless steel, which is electro polished. The electro polishing process, decreases the surface area, and enhances the corrosion resistance of the stainless steel itself. Additionally the electro polished surfaces are very easy to clean.

As with any refrigerated trap, safety issues must be addressed.

- 1) Prolonged contact with skin can and will cause freezer burn/frost bite.
- 2) Dry ice will admit carbon dioxide, which is colorless, heavier than air and can cause suffocation. Use only in well ventilated area's.
- 3) Never clamp polycarbonate (bucket) cover. As the dry ice evaporates, it expands significantly.
- 4) Alcohol is flammable. Keep away from sparks, heat sources, and flames.
- 5) Do not use acetone as it will damage the polycarbonate components.



Part Number	Port Style	A
DIFT-050★	1/2" OD tube	10-3/4"
DIFT-075★	3/4" OD tube	10-3/4"
DIFT-16★	NW 16	11-1/16"
DIFT-25★	NW 25	11-1/16"
DIFT-40★	NW 40	11-1/16"

★ = New Product



Foreline Traps

Foreline traps are an essential component that are often overlooked when building a vacuum system and should be incorporated into all well designed vacuum systems.

In a properly designed high vacuum system foreline traps are located between the roughing pump and the work chamber. This method eliminates an oil path to the work chamber and also protects the mechanical pump from condensable vapors. **KEY HIGH VACUUM PRODUCTS, INC.** manufactures a complete selection of high conductance traps which are of a compact design with high trapping abilities. All traps feature 304 stainless steel housings and are available in right angle and inline mounting configurations with four standard port terminations to fit most applications.

Foreline traps fall into two (2) different and distinct categories.

1) KEY Series CFT, SAT and MT Series TRAPS are specifically designed to capture oil vapor which backstreams from an oil sealed roughing pump, before it can enter the work chamber. **CFT** and **SAT Series TRAPS** are filled with an OFHC® Copper Wool that is retained by stainless steel screens. The **SAT TRAPS** feature two piece clamped design and have replaceable cartridge trapping elements, while the **CFT Series** traps are factory sealed units. The OFHC® copper elements trap oil vapors but allows water vapor through the element, which is pumped away by the foreline pump. Under normal operating conditions years of service can be expected from both the **SAT & CFT** traps. The **MT Series TRAPS** in addition to capturing oil vapor, possess the additional benefit of being extremely efficient at capturing water vapor. This is accomplished by employing a synthetic zeolite as the trapping media, which is rechargeable through a simple bakeout.

When installing the **CFT, SAT** and **MT Series TRAPS**, the correct or preferred procedure is to install the trap as far away as practicable from an oil sealed mechanical pump. In addition, it should be mounted vertically, if space allows. This technique will greatly lengthen the service, as it minimizes the quantity of oil vapor that can be introduced into the trap during molecular flow. By installing the trap in this fashion also helps prevent premature saturation of the capturing media.

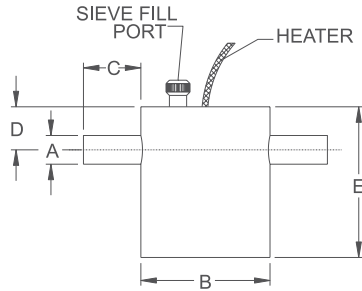
2) KEY LNT and WCT Series foreline traps are capture type traps that collect condensable gas vapors such as water, solvents, etc. as they are being pumped from the vacuum chamber, but before they can intrude into the mechanical pump. These traps collect vapors by utilizing a refrigerant such as liquid nitrogen (**LNT Series**) or refrigerated water (**WCT Series**) and should be the foremost choice in high moisture, condensable effluent applications. Without appropriate trapping, condensable vapors can intrude into the mechanical pump, limiting the ultimate base pressure of the pump to unacceptably high levels. These foreline traps extend the life of the pump; the fluid, and minimize maintenance issues. Isolation valves should always be placed between any capture trap and the work chamber. Isolation valves should always be closed to prevent trapped gases from escaping into the work chamber when warming up the trap, during bakeouts, maintenance cycles, etc..

The benefits of putting in service the correct foreline traps are lower ultimate base pressures, cleaner chambers and extended periods of operation. Each trap offers simple reliable operation, along with high efficiency ratings of better than 99% and when correctly employed practically eliminate hydrocarbon backstreaming issues and are valuable additions to any high vacuum system.



Molecular Sieve Foreline Traps

- All stainless steel construction
- Lower foreline pressures



The use of **KEY** foreline traps offers an effective method of preventing backstreaming of "wet" mechanical pump vapors. The **MT Series** contain a synthetic zeolite, which also traps water vapor and operates at room temperature. The synthetic zeolite is recharged by baking out in place under a vacuum with the gas ballast valve open on the mechanical pump. An isolation valve should be located in front of the **MT** trap on the chamber side and the isolation valve should be closed during the bakeout cycle. Bakeouts can be scheduled during non-production time and regeneration of the synthetic zeolite will be dependent upon the amount of gas and water vapor introduced to the synthetic zeolite. Normal regeneration should be achieved in one to two hours.

Part Number	Port Style	A	B	C	D	E
MT-75	3/4" OD tube	3/4"	4-1/2"	2"	1-5/8"	5-1/4"
MT-75-2-K	NW 16	3/4"	4-1/2"	2-3/16"	1-5/8"	5-1/4"
MT-75-2-MS	1-1/3" OD MET-SEAL	3/4"	4-1/2"	2-1/2"	1-5/8"	5-1/4"
MT-100	1" OD tube	1"	4-1/2"	2"	1-5/8"	5-1/4"
MT-100-2-K	NW 25	1"	4-1/2"	2-3/16"	1-5/8"	5-1/4"
MT-100-2-MS	2-1/8" OD MET-SEAL	1"	4-1/2"	2-3/16"	1-5/8"	5-1/4"
MT-150	1-1/2" OD tube	1-1/2"	4-1/2"	2"	2"	7-7/8"
MT-150-2-K	NW 40	1-1/2"	4-1/2"	2-3/16"	2"	7-7/8"
MT-150-2-MS	2-3/4" OD MET-SEAL	1-1/2"	4-1/2"	2-1/4"	2"	7-7/8"
MT-200	2" OD tube	2"	4-1/2"	2"	2"	7-7/8"
MT-200-2-K	NW 50	2"	4-1/2"	2-3/16"	2"	7-7/8"
MT-200-2-MS	3-3/8" OD MET-SEAL	2"	4-1/2"	2-1/4"	2"	7-7/8"
MT-250	2-1/2" OD tube	2-1/2"	4-1/2"	2"	2"	7-7/8"
MT-250-2-K	NW 63	2-1/2"	4-1/2"	2-1/4"	2"	7-7/8"
MT-250-2-MS	4-1/2" OD MET-SEAL	2-1/2"	4-1/2"	2-3/8"	2"	7-7/8"
MT-300	3" OD tube	3"	6"	2-1/2"	3"	10"
MT-300-2-K	NW 80	3"	6"	2-3/4"	3"	10"
MT-300-2-MS	4-5/8" OD MET-SEAL	3"	6"	2-3/4"	3"	10"
MT-400	4" OD tube	4"	8"	1-1/2"	4"	13"
MT-400-2-K	NW 100	4"	8"	1-3/4"	4"	13"
MT-400-2-MS	6" OD MET-SEAL	4"	8"	1-15/16"	4"	13"

Replacement Molecular Sieve Charges

Part Number	Use for
MT-100-MSC	MT-75 / MT-100
MT-150-MSC	MT-150 / MT-200 / MT-250
MT-300-MSC	MT-300
MT-400-MSC	MT-400

Replacement Cartridge Heaters

Part Number	Use for
J5A74	MT-75 / MT-100
J8A111	MT-150 / MT-200 / MT-250
J10A62	MT-300 / MT-400 (2 per)

MT Sizing Chart

Part Number	Use with CFM Pump	Heater 120v watts	Sieve charge
MT-75	2 to 8	75	.7 lbs
MT-100	2 to 8	75	.7 lbs
MT-150	8 to 20	120	1.1 lbs
MT-200	15 to 25	120	1.1 lbs
MT-250	20 to 30	120	1.1 lbs
MT-300	30 to 45	375	3.3 lbs
MT-400	50 to 75	375	4.7 lbs



Inline Assimilation Foreline Traps

Features:

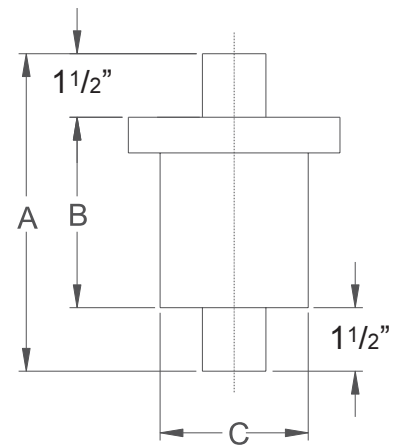
- Rapid removal and installation of media
- Viton® O-ring and quick change clamp
- Eliminates hydrocarbon backstreaming
- Stainless steel type 304 body



Description:

The **SAT Series traps** offer a highly effective method of preventing mechanical pump vapors from backstreaming into the vacuum chamber. **SAT traps** are a two piece design that makes maintenance a quick operation. **SAT traps** use activated bronze wool media, which is held in place by a cartridge stainless steel screen that is recessed to allow maximum conductance while achieving high trapping efficiency. **SAT traps** are shipped complete with an activated bronze cartridge. **SAT traps** require no bakeout and are maintenance free. Stainless steel media can be provided by adding "-SS" to the suffix of the part number at no additional cost.

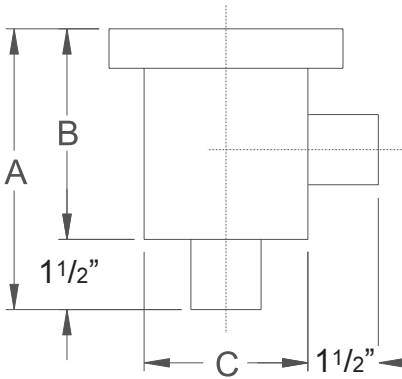
Part Number	Port Style	A	B	C
SAT-75	3/4" OD tube	6-1/2"	4-5/8"	3"
SAT-16	NW 16	6-3/4"	4-5/8"	3"
SAT-75-CF	1-1/3" OD MET-SEAL	7-1/2"	4-5/8"	3"
SAT-100	1" OD tube	6-1/2"	4-5/8"	3"
SAT-25	NW 25	6-3/4"	4-5/8"	3"
SAT-100-CF	2-3/4" OD MET-SEAL	7"	4-5/8"	3"
SAT-150	1-1/2" OD tube	6-7/8"	4-5/8"	4"
SAT-40	NW 40	7-1/8"	4-5/8"	4"
SAT-150-CF	2-3/4" OD MET-SEAL	6-5/16"	4-5/8"	4"
SAT-200	2" OD tube	9-3/4"	6-5/8"	6"
SAT-50	NW 50	10"	6-5/8"	6"
SAT-200-CF	3-3/8" OD MET-SEAL	10-1/2"	6-5/8"	6"
SAT-250	2-1/2" OD tube	13"	6-5/8"	6"
SAT-63	NW 63	13-1/2"	6-5/8"	6"
SAT-250-CF	4-1/2" OD MET-SEAL	13-3/4"	6-5/8"	6"
SAT-300	3" OD tube	13"	6-5/8"	6"
SAT-80	NW 80	13-1/2"	6-5/8"	6"
SAT-300-CF	4-5/8" OD MET-SEAL	13-3/4"	6-5/8"	6"
SAT-400	4" OD tube	13"	6-5/8"	6"
SAT-NW100	NW 100	13-1/2"	6-5/8"	6"
SAT-400-CF	6" OD MET-SEAL	13-3/4"	6-5/8"	6"
SAT-258	2-1/2" OD tube	13"	9-1/2"	8"
SAT-638	NW 80	13-1/2"	9-1/2"	8"
SAT-258-CF	4-1/2" OD MET-SEAL	13-3/4"	9-1/2"	8"
SAT-308	3" OD tube	13"	9-1/2"	8"
SAT-808	NW 80	13-1/2"	9-1/2"	8"
SAT-308-CF	4-5/8" OD MET-SEAL	13-3/4"	9-1/2"	8"
SAT-408	4" OD tube	13"	9-1/2"	8"
SAT-NW108	NW 100	13-1/2"	9-1/2"	8"
SAT-408-CF	6" OD MET-SEAL	13-3/4"	9-1/2"	8"
SAT-608	6" OD tube	13"	9-1/2"	8"
SAT-160	NW 160	13-1/2"	9-1/2"	8"
SAT-600-CF	8" OD MET-SEAL	13-3/4"	9-1/2"	8"



Assimilation Foreline Traps

Assimilation Traps Right Angle

Part Number	Port Style	A	B	C
SAT-75-A	3/4" OD tube	5-1/2"	4-5/8"	3"
SAT-16-A	NW 16	5-3/4"	4-5/8"	3"
SAT-75-A-CF	1-1/3" OD MET-SEAL	6-1/8"	4-5/8"	3"
SAT-100-A	1" OD tube	5-1/2"	4-5/8"	3"
SAT-25-A	NW 25	5-3/4"	4-5/8"	3"
SAT-100-A-CF	2-3/4" OD MET-SEAL	5-3/4"	4-5/8"	3"
SAT-150-A	1-1/2" OD tube	5-3/4"	4-5/8"	4"
SAT-40-A	NW 40	6"	4-5/8"	4"
SAT-150-A-CF	2-3/4" OD MET-SEAL	6"	4-5/8"	4"
SAT-200-A	2" OD tube	8-1/8"	6-5/8"	6"
SAT-50-A	NW 50	8-1/2"	6-5/8"	6"
SAT-200-A-CF	3-3/8" OD MET-SEAL	8-1/2"	6-5/8"	6"
SAT-250-A	2-1/2" OD tube	8-1/2"	7"	6"
SAT-63-A	NW 63	8-1/2"	7"	6"
SAT-250-A-CF	4-1/2" OD MET-SEAL	8-1/2"	7"	6"
SAT-300-A	3" OD tube	8-1/2"	7"	6"
SAT-80-A	NW 80	8-1/2"	7"	6"
SAT-300-A-CF	4-5/8" OD MET-SEAL	8-1/2"	7"	6"
SAT-400-A	4" OD tube	8-1/2"	7"	6"
SAT-NW100-A	NW 100	8-1/2"	7"	6"
SAT-400-A-CF	6" OD MET-SEAL	8-1/2"	7"	6"
SAT-258-A	2-1/2" OD tube	11-1/2"	10"	8"
SAT-638-A	NW 80	11-1/2"	10"	8"
SAT-258-A-CF	4-1/2" OD MET-SEAL	11-1/2"	10"	8"
SAT-308-A	3" OD tube	11-1/2"	10"	8"
SAT-808-A	NW 80	11-1/2"	10"	8"
SAT-308-A-CF	4-5/8" OD MET-SEAL	11-1/2"	10"	8"
SAT-408-A	4" OD tube	11-1/2"	10"	8"
SAT-NW108-A	NW 100	11-1/2"	10"	8"
SAT-408-A-CF	6" OD MET-SEAL	11-1/2"	10"	8"
SAT-608-A	6" OD tube	11-1/2"	10"	8"
SAT-160-A	NW 160	11-1/2"	10"	8"
SAT-600-A-CF	8" OD MET-SEAL	11-1/2"	10"	8"



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Assimilation Traps Replacement Filter Elements

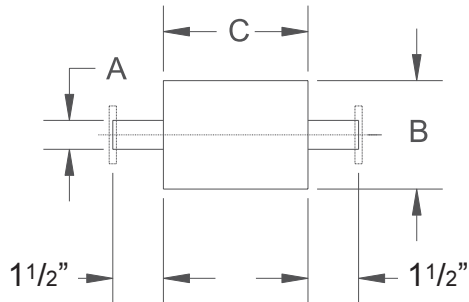
Part Number	Trap Bodies	Media
RE-SAT-16	3" OD	Copper
RE-SAT-16-SS	3" OD	Stainless Steel
RE-SAT-150	4" OD	Copper
RE-SAT-150-SS	4" OD	Stainless Steel
RE-SAT-200	6" OD	Copper
RE-SAT-200-SS	6" OD	Stainless Steel
RE-SAT-800	8" OD	Copper
RE-SAT-800-SS	8" OD	Stainless Steel



Coaxial Foreline Traps

Features:

- Eliminates hydrocarbon backstreaming
- Stainless steel type 304 body
- Operates in position, no bakeout required
- Activated OFHC® copper media



Description:

The **CFT Series traps** are an effective design, which reduces mechanical pump backstreaming to the vacuum chamber. The activated OFHC® copper media is held in place by stainless steel screens which are recessed to allow maximum conductance while accomplishing high trapping effectiveness. Using **CFT Series traps** will result in a cleaner system that will endure longer operation cycles before service is necessary. **CFT traps** need no bakeouts or cooling and are maintenance free. Stainless steel media can be provided by adding "**-SS**" to the suffix of the part number at no additional cost.

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Part Number	Port Style	A	B	C
CFT-75	3/4" OD tube	.75	4.00	4.50
CFT-75-2-K	NW 16	.75	4.00	4.50
CFT-75-2-MS	1-1/3" OD MET-SEAL	.75	4.00	4.50
CFT-100	1" OD tube	1.00	4.00	4.50
CFT-100-2-K	NW 25	1.00	4.00	4.50
CFT-100-2-MS	2-1/8" OD MET-SEAL	1.00	4.00	4.50
CFT-150	1-1/2" OD tube	1.50	4.00	4.50
CFT-150-2-K	NW 40	1.50	4.00	4.50
CFT-150-2-MS	2-3/4" OD MET-SEAL	1.50	4.00	4.50
CFT-200	2" OD tube	2.00	4.00	4.50
CFT-200-2-K	NW 50	2.00	4.00	4.50
CFT-200-2-MS	3-3/8" OD MET-SEAL	2.00	4.00	4.50
CFT-250	2-1/2" OD tube	2.50	4.00	4.50
CFT-250-2-K	NW 63	2.50	4.00	4.50
CFT-250-2-MS	4-1/2" OD MET-SEAL	2.50	4.00	4.50
CFT-300	3" OD tube	3.00	4.00	4.50
CFT-300-2-K	NW 80	3.00	4.00	4.50
CFT-300-2-MS	4-5/8" OD MET-SEAL	3.00	4.00	4.50
CFT-400	4" OD tube	4.00	6.00	4.50
CFT-400-2-K	NW 100	4.00	6.00	4.50
CFT-400-2-MS	6" OD MET-SEAL	4.00	6.00	4.50



Foreline Traps; Liquid Nitrogen

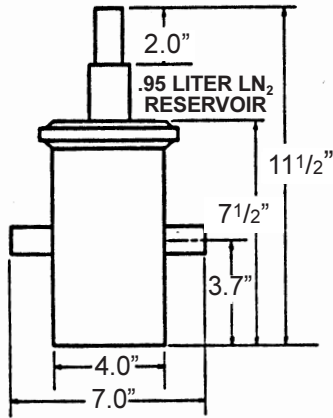
- Two piece clamped body design
- Removable liquid nitrogen reservoir
- Traps all condensable vapors
- Stainless steel type 304 construction, viton® o-ring



Description:

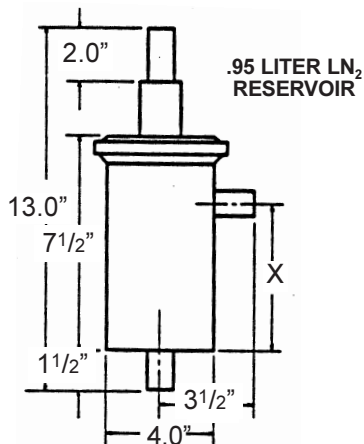
LNT Series liquid nitrogen refrigerant traps offer an extremely effective method for trapping all condensable vapors, which results in no backstreaming and a removal of corrosive gases before they can enter the mechanical pump. **LNT traps** are extremely effective at water vapor capture. The nitrogen reservoir acts as a pump itself, which results in a quicker pump down of the vacuum vessel. The quick clamp design allows for quick cleaning of the reservoir without removing the trap itself from the vacuum system.

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4" Inline LN2 Refrigerant Traps

Part Number	Port Style
LNT-4-75	3/4" OD tube
LNT-4-75-K	NW 16
LNT-4-75-CF	1-1/3" OD MET-SEAL
LNT-4-100	1" OD tube
LNT-4-100-K	NW 25
LNT-4-100-CF	2-3/4" OD MET-SEAL
LNT-4-150	1-1/2" OD tube
LNT-4-150-K	NW 40
LNT-4-150-CF	2-3/4" OD MET-SEAL



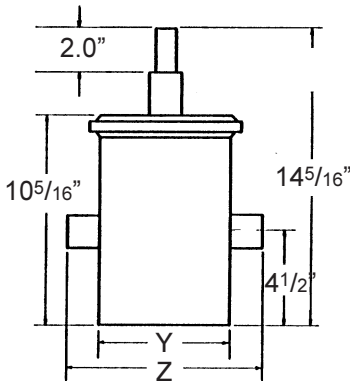
4" Right Angle LN2 Refrigerant Traps

Part Number	Port Style	X
LNTA-4-75	3/4" OD tube	5.50
LNTA-4-75-K	NW 16	5.50
LNTA-4-75-CF	1-1/3" OD MET-SEAL	5.50
LNTA-4-100	1" OD tube	5.40
LNTA-4-100-K	NW 25	5.40
LNTA-4-100-CF	2-3/4" OD MET-SEAL	5.40
LNTA-4-150	1-1/2" OD tube	5.40
LNTA-4-150-K	NW 40	5.40
LNTA-4-150-CF	2-3/4" OD MET-SEAL	5.40



Foreline Traps; Liquid Nitrogen

6" & 8" Inline LN2 Refrigerant Traps

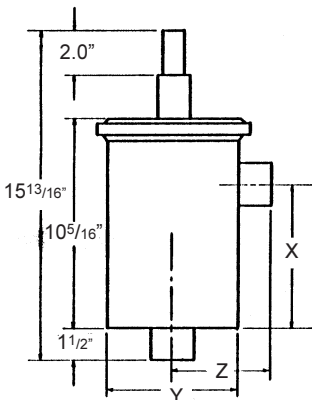


Part Number	Port Style	Y	Z
LNT-6-150	1-1/2" OD tube	6"	9.00
LNT-6-150-K	NW 40	6"	9.50
LNT-6-150-CF	2-3/4" OD MET-SEAL	6"	9.50
LNT-6-200	2" OD tube	6"	9.00
LNT-6-200-K	NW 50	6"	9.50
LNT-6-200-CF	3-3/8" OD MET-SEAL	6"	9.50
LNT-6-200-ASA	5" OD ASA flange	6"	9.50
LNT-6-250	2-1/2" OD tube	6"	9.00
LNT-6-250-ISO	NW 63	6"	9.50
LNT-6-250-CF	4-1/2" OD MET-SEAL	6"	9.75
LNT-6-250-ASA	5" OD ASA flange	6"	9.75
LNT-6-300	3" OD tube	6"	9.00
LNT-6-300-ISO	NW 80	6"	9.50
LNT-6-300-CF	4-5/8" OD MET-SEAL	6"	9.75
LNT-6-300-ASA	6" OD ASA flange	6"	9.75
LNT-8-400	4" OD tube	8"	11.00
LNT-8-400-ISO	NW 100	8"	9.50
LNT-8-400-CF	6" OD MET-SEAL	8"	10.00
LNT-8-400-ASA	7-1/2" OD ASA flange	8"	10.00

LNT-6 Reservoir is 1.51 Liters, LNT-8 Reservoir is 3.31 Liters

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6" & 8" Right Angle LN2 Refrigerant Traps



Part Number	Port Style	X	Y	Z
LNTA-6-150	1-1/2" OD tube	6.75	6.00	4.50
LNTA-6-150-K	NW 40	6.75	6.00	5.00
LNTA-6-150-CF	2-3/4" OD MET-SEAL	6.75	6.00	5.00
LNTA-6-200	2" OD tube	6.50	6.00	4.50
LNTA-6-200-K	NW 50	6.50	6.00	5.00
LNTA-6-200-CF	3-3/8" OD MET-SEAL	6.50	6.00	5.00
LNTA-6-200-ASA	5" OD ASA flange	6.50	6.00	5.00
LNTA-6-250	2-1/2" OD tube	6.25	6.00	4.50
LNTA-6-250-ISO	NW 63	6.25	6.00	5.00
LNTA-6-250-CF	4-1/2" OD MET-SEAL	6.25	6.00	5.25
LNTA-6-250-ASA	5" OD ASA flange	6.25	6.00	5.25
LNTA-6-300	3" OD tube	6.00	6.00	4.50
LNTA-6-300-ISO	NW 80	6.00	6.00	5.00
LNTA-6-300-CF	4-5/8" OD MET-SEAL	6.00	6.00	5.25
LNTA-6-300-ASA	6" OD ASA flange	6.00	6.00	5.25
LNTA-8-400	4" OD tube	6.00	8.00	5.50
LNTA-8-400-ISO	NW 100	6.00	8.00	6.00
LNTA-8-400-CF	6" OD MET-SEAL	6.00	8.00	7.00
LNTA-8-400-ASA	7-1/2" OD ASA flange	6.00	8.00	7.00

Approximate Liquid Nitrogen Reservoir holding times before refilling; individual results may vary.

LNT / LNTA-4 = 12 hours, LNT / LNTA-6 = 16 hours, LNT / LNTA-8 = 24 hours

LNTA-6 Reservoir is 1.51 Liters, LNTA-8 Reservoir is 3.31 Liters



Water Cooled Foreline Traps

- Two piece clamped body design
- Angle and Inline port configurations
- High conductance
- Stainless steel type 304 construction

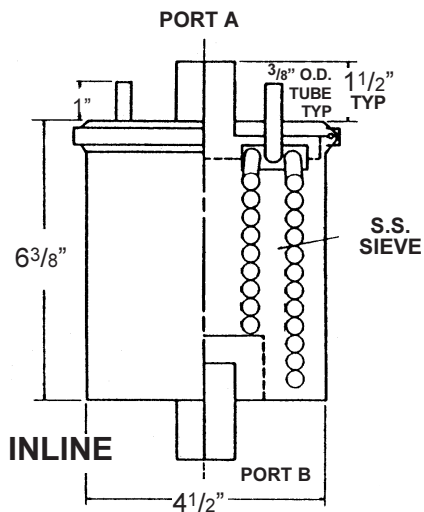


Description:

WCT Series water-cooled traps offer an extremely effective high capacity method for trapping condensable gas vapors in the foreline using refrigerated water. This method will reduce condensable effluent and increase the process tool uptime.

The **WCT / WCTA Series** traps draw in condensable gas vapors and solidifies them before these gases can backstream, or damage the mechanical pump. **KEY'S** water-cooled traps have a stainless steel sieve material, which is put into contact with the cooling coils for an even higher surface area. This design gives **KEY** traps an approximate 10X greater performance rating.

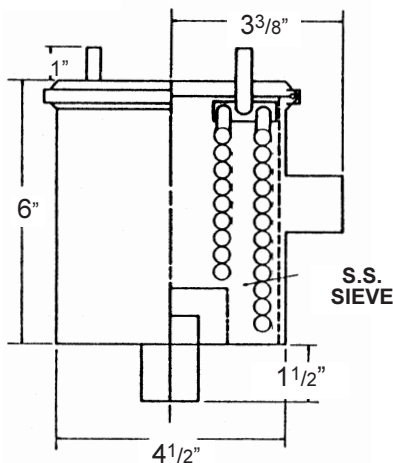
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4-1/2" Inline Water-Cooled Traps

Part Number	Port Style
WCT-4.5-150	1-1/2" OD tube
WCT-4.5-150-K	NW 40
WCT-4.5-150-CF	2-3/4" OD MET-SEAL
WCT-4.5-200	2" OD tube
WCT-4.5-200-K	NW 50
WCT-4.5-200-CF	3-3/8" OD MET-SEAL
WCT-4.5-200-ASA	5" OD ASA flange

ANGLE



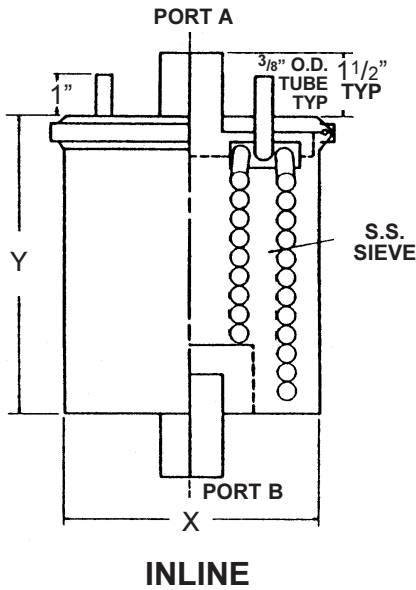
4-1/2" Right Angle Water-Cooled Traps

Part Number	Port Style
WCTA-4.5-150	1-1/2" OD tube
WCTA-4.5-150-K	NW 40
WCTA-4.5-150-CF	2-3/4" OD MET-SEAL
WCTA-4.5-200	2" OD tube
WCTA-4.5-200-K	NW 50
WCTA-4.5-200-CF	3-3/8" OD MET-SEAL
WCTA-4.5-200-ASA	5" OD ASA flange



Water Cooled Foreline Traps

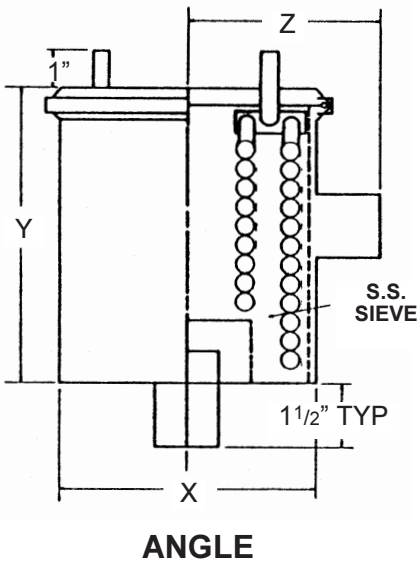
6" & 8" Inline Water-Cooled Traps



Part Number	Port Style	X	Y
WCT-6-150	1-1/2" OD tube	6"	7.00
WCT-6-150-K	NW 40	6"	7.00
WCT-6-150-CF	2-3/4" OD MET-SEAL	6"	7.00
WCT-6-200	2" OD tube	6"	7.00
WCT-6-200-K	NW 50	6"	7.00
WCT-6-200-CF	3-3/8" OD MET-SEAL	6"	7.00
WCT-6-200-ASA	5" OD ASA flange	6"	7.00
WCT-6-250	2-1/2" OD tube	6"	7.00
WCT-6-250-ISO	NW 63	6"	7.00
WCT-6-250-CF	4-1/2" OD MET-SEAL	6"	7.00
WCT-6-250-ASA	5" OD ASA flange	6"	7.00
WCT-6-300	3" OD tube	6"	7.00
WCT-6-300-ISO	NW 80	6"	7.00
WCT-6-300-CF	4-5/8" OD MET-SEAL	6"	7.00
WCT-6-300-ASA	6" OD ASA flange	6"	7.00
WCT-8-400	4" OD tube	8"	10.00
WCT-8-400-ISO	NW 100	8"	10.00
WCT-8-400-CF	6" OD MET-SEAL	8"	10.00
WCT-8-400-ASA	7-1/2" OD ASA flange	8"	10.00

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6" & 8" Right Angle Water-Cooled Traps



Part Number	Port Style	X	Y	Z
WCTA-6-150	1-1/2" OD tube	6.00	7.00	4.50
WCTA-6-150-K	NW 40	6.00	7.00	4.50
WCTA-6-150-CF	2-3/4" OD MET-SEAL	6.00	7.00	4.50
WCTA-6-200	2" OD tube	6.00	7.00	4.50
WCTA-6-200-K	NW 50	6.00	7.00	4.50
WCTA-6-200-CF	3-3/8" OD MET-SEAL	6.00	7.00	4.50
WCTA-6-200-ASA	5" OD ASA flange	6.00	7.00	4.50
WCTA-6-250	2-1/2" OD tube	6.00	7.00	4.50
WCTA-6-250-ISO	NW 63	6.00	7.00	4.50
WCTA-6-250-CF	4-1/2" OD MET-SEAL	6.00	7.00	4.50
WCTA-6-250-ASA	5" OD ASA flange	6.00	7.00	4.50
WCTA-6-300	3" OD tube	6.00	7.00	4.50
WCTA-6-300-ISO	NW 80	6.00	7.00	4.50
WCTA-6-300-CF	4-5/8" OD MET-SEAL	6.00	7.00	4.50
WCTA-6-300-ASA	6" OD ASA flange	6.00	7.00	4.50
WCTA-8-400	4" OD tube	8.00	10.00	6.50
WCTA-8-400-ISO	NW 100	8.00	10.00	6.50
WCTA-8-400-CF	6" OD MET-SEAL	8.00	10.00	6.50
WCTA-8-400-ASA	7-1/2" OD ASA flange	8.00	10.00	6.50



Replacement Foreline Trap Clamps and Seals

3" OD trap body hardware

Part Number	Description
540-4	Body Clamp
VOR150	Viton O-ring

4" OD trap body hardware

Part Number	Description
13MHHM-4	Body Clamp
VOR244	Viton O-ring

4-1/2" OD trap body hardware

Part Number	Description
89510K	Body Clamp
VOR245	Viton O-ring

6" OD trap body hardware

Part Number	Description
13MHHM-6	Body Clamp
VOR163	Viton O-ring

8" OD trap body hardware

Part Number	Description
540-8	Body Clamp
VOR266	Viton O-ring



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Note:

All foreline traps manufactured by **KEY HIGH VACUUM PRODUCTS, INC.** are available with the option of a 1/8" female NPT port. Typically the port is located on the bottom of the trap and is used to install thermocouple gauges, drain cocks, etc.. Add **-1/8FNPT** to suffix of trap part number and fax or e-mail a sketch showing the required location. There is a nominal \$ 65.00 charge for each requested port and all ports are "plugged" with a stainless steel male NPT plug before shipment.



Foreline (Inlet) Filters

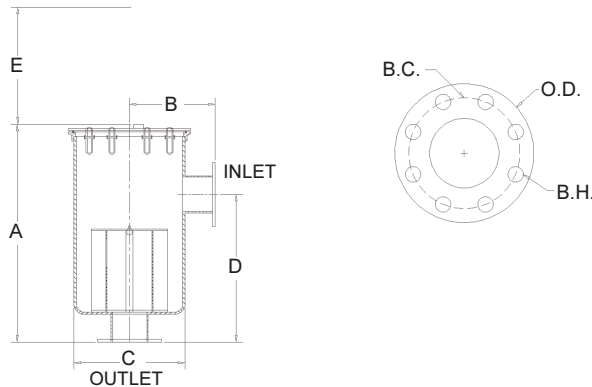
- **High Flow Design**
- **Low Pressure Drop**
- **Large Dirt Holding Capacity**
- **ASA Flanged Inlet / Outlet**

Description:

LPTA Series Inlet Traps are large-scale particle traps that are rugged, and intended for use in industrial environments. **LPTA Traps** will extend the service intervals of vacuum pumps, by preventing contaminants from being ingested by the pump. Common applications for **LPTA Traps** are processes that produce significant amounts of dusts, powders, resins, etc. The polyester filter cartridge has an efficiency rating greater than 99%, and the filter cartridge is moisture resistant.

Construction:

LPTA Inlet Traps feature right angle mounting arrangement, with ASA flanges for straightforward mounting, using ordinary hardware. Units are of steel construction, with a baked enamel finish, and are capable of withstanding hot air and oil mists. The filter itself incorporates a foam polyurethane "pre-filter" prior to the actual pleated, five (5) micron, polyester cartridge. This arrangement allows higher dirt carrying capacity (50%), thereby extending service intervals, as well as increasing uptime. Heavy duty "T" bolts allowing quick access for maintenance cycles, and 1/4" female NPT ports are located on the inlet / outlet ports, allowing the use of gauges should the need arise.



Part Number	ASA Port	A	B	C	D	E	SCFM Rating
LPTA-4★	9" OD	27-1/8"	9"	14"	18-1/2"	15"	520
LPTA-6★	11" OD	29-1/8"	12"	18-2"	20-1/2"	15"	1100
LPTA-8★	13-1/2" OD	38"	14"	22-1/2"	25-1/2"	20"	1800

★ = New Product

Replacement Polyester Cartridges

Part Number	Use With
RF-4★	LPTA-4
RF-6★	LPTA-6
RF-8★	LPTA-8

★ = New Product



Foreline (Inlet) Filters

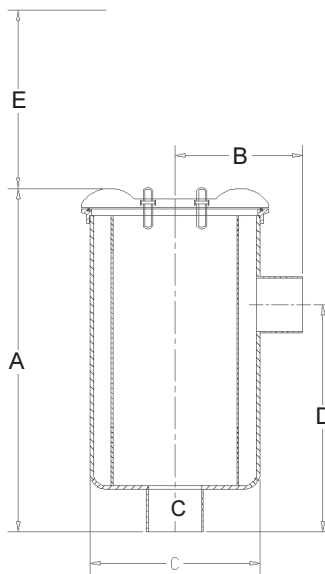
- **High Flow Design**
- **Low Pressure Drop**
- **Large Dirt Holding Capacity**
- **ASA Flanged Inlet / Outlet**

Description:

SPTA Series Foreline Traps are compact industrial style inlet filters. **SPTA Traps** are designed to extend the life of vacuum pumps by preventing solid contaminants from being ingested by the pump. Common applications for the **SPTA Traps** are processes that generate dusts, powders, resins, etc. The high efficiency polyester cartridge has an efficiency rating greater than 99% and cartridges are moisture resistant.

Construction:

SPTA Inlet Filter Traps feature right angle mounting configuration, with female NPT Inlet / Outlet ports for easy mounting. Units are of steel construction, with a baked enamel finish. The filter itself is a heavy duty, pleated, five (5) micron, polyester cartridge. Polyester filters have a high dirty carrying capacity, is washable with warm water and mild detergents, thereby extending service life of the cartridge. Additionally, the cartridge incorporates a foam polyurethane "pre-filter" which allows a much higher dirt carrying capacity (typically 50%). Stainless steel torsion clips hold the bonnet assembly firmly in place and allow quick access for maintenance cycles. All **SPTA Series Inlet Filters** feature 1/4" female NPT ports which are located on the inlet and outlet ports allowing the use of gauges, should the need arise.



Part Number	ASA Port	A	B	C	D	E	SCFM Rating
SPTA-1-FNPT★	1/2" FNPT	4-3/8"	2-1/4"	5-7/8"	1-7/8"	3"	18
SPTA-2-FNPT★	3/4" FNPT	3-3/4"	2-1/4"	5-7/8"	2-1/2"	3-1/4"	25
SPTA-3-FNPT★	1" FNPT	6-3/4"	4-1/8"	7-5/16"	4-1/2"	5-1/4"	40
SPTA-4-FNPT★	1-1/2" FNPT	6-3/4"	4-1/8"	7-5/16"	4-1/2"	5-1/4"	80

★ = New Product

Replacement Polyester Cartridges

Part Number	Use With
RF-SPTA-1/2★	SPTA-1-FNPT
RF-SPTA-1/2★	SPTA-2-FNPT
RF-SPTA-3/4★	SPTA-3-FNPT
RF-SPTA-3/4★	SPTA-4-FNPT

★ = New Product



Oil Mist Eliminators

- **Large Holding Capacity**
- **Easy Field Maintained**
- **99% Efficiency**
- **Low Back Pressure Elements**

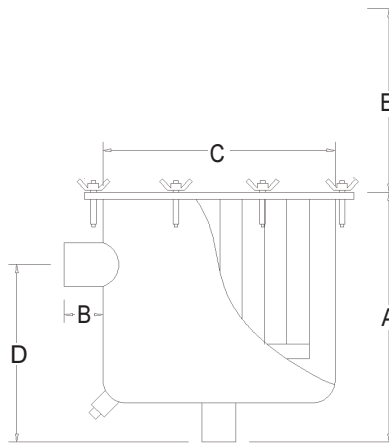
Description: **HDME OIL MIST ELIMINATORS** are a necessary piece component, which should be used on every rotary vane pumps exhaust port. Rotary vane pumps are a major source of air pollution when mist eliminators are not used. A fine oil mist / vapor will be exhausted from the pump into the surrounding air, whenever the pump is operating between atmosphere and 1 millibar; the higher the pressure, the more oil will be expelled. This oil will create a messy, dangerous situation, which will factor in respiratory distress; and generate environmental issues. **KEY HIGH VACUUM PRODUCTS, INC.**'s mist eliminators are designed to specifically trap this plume of exhausted oil. Return the oil to the pump, resulting in a cleaner, healthier, safer, working environment.

KEY HIGH VACUUM PRODUCTS, INC.'s oil mist eliminators are a valuable solution for trapping oil mist. The oil is separated from the air through use of a rugged, pleated, and multi-layer fiberglass element, which uses the coalescing principal. The design of the element allows it to have a high efficiency value (greater than 99%), while maintaining a very high flow rate. **KEY HIGH VACUUM PRODUCTS, INC.** offers four different mist eliminators, allowing users a lot of flexibility. Upon request we can provide alternative trapping medias for use with aggressive gases, as well as volatile organic compounds. Contact factory direct.

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HDME Series:

Construction: KHV's heavy duty oil mist eliminators feature right angle mounting configuration, and are constructed from steel which has a baked enamel finish. **HDME Oil Mist Eliminators** have female NPT inlet / outlet ports (standard) and come with a 1/4" drain plug.



Part Number	FNPT	A	B	C	D	E	CFM
HDME-1★	1"	6-3/4"	1/2"	7-5/16"	4-5/8"	5-1/4"	40
HDME-2★	1-1/2"	6-3/4"	1/2"	7-5/16"	4-5/8"	5-1/4"	50

★ = New Product

Part Number	Use With
RF-HDME-1★	HDME-1/HDME-2

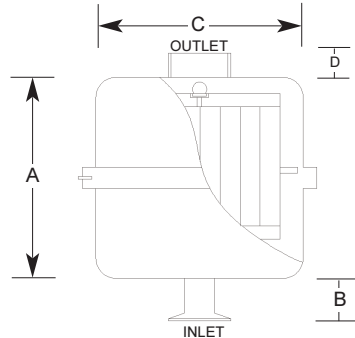
★ = New Product



Oil Mist Eliminators

ILME Series:

Construction: **ILME Series Oil Mist Eliminators** feature inline mounting, standard NW mounting flanges, constructed from steel that has a baked enamel finish. **ILME Oil Mist Eliminators** have a built in safety valve, which in the event of an over pressure situation (1/2 bar or more) the safety valve releases, protecting the pump. All **ILME Series** are two-piece designs and have 1/8" female NPT drain plugs.



Part Number	Port Style	A	B	C	D	CFM
ILME-16★	NW 16	4-5/15"	7/8"	3-1/4"	7/8"	10
ILME-25★	NW 25	7-3/8"	7/8"	5-1/4"	7/8"	20

★ = New Product

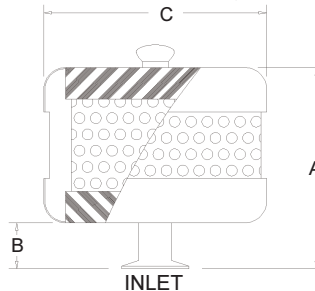
Replacement Fiberglass Cartridges for ILME

Part Number	Use With
RF-ILME-16★	ILME-16
RF-ILME-25★	ILME-25

★ = New Product

SAME Series:

Construction: **SAME Series Oil Mist Eliminators** are a standoff type mount that is intended for inert gas applications where no volatile organic compounds are used. **SAME Series** filters feature NW style or Welch style mounts, minimizing hardware usage and stand off heights. Units are constructed from steel that has been nickel-plated. Filter replacement is a simple thumbscrew arrangement.



Part Number	Port Style	A	B	C	CFM
SAME-1★	3/4"-20 thread	3-1/4"	1"	2-1/2"	4
SAME-2★	1"-20 thread	5"	7/8"	2-1/2"	7
SAME-3★	1-3/4"-20 thread	8-7/8"	1-3/4"	5-1/8"	24
SAME-NW16★	NW 16	4-1/2"	7/8"	2-1/2"	4.5
SAME-NW25★	NW 25	9-1/4"	2-1/8"	5-1/8"	24
SAME-NW40★	NW 40	9-1/4"	2-1/8"	10-1/4"	55

★ = New Product

Replacement Fiberglass Cartridges for SAME

Part Number	Use With
RF-SAME-1★	SAME-1
RF-SAME-2★	SAME-2
RF-SAME-3★	SAME-3
RF-SAME-NW16★	SAME-NW16
RF-SAME-NW25★	SAME-NW25
RF-SAME-NW40★	SAME-NW40

★ = New Product



Stainless Steel Thin Wall Flexible Hose Connectors

KEY HIGH VACUUM PRODUCTS, INC.'s stainless steel flexible hose connectors are ideal for solving alignment issues when straight ridged tubing is unpractical. Thin wall hoses are used for installing roughing pumps, gas lines and are extremely well suited for use with foreline applications. Flanges on these hose assemblies are fabricated from 304L stainless steel with the exception of the VCR® fittings which are produced from 316L stainless steel. The hose material itself is 321 stainless steel and all assemblies are TIG welded without exception and leak tested on a helium mass spectrometer.

Hoses are available standard with five distinct terminations suitable to a majority of existing applications; Standard flanges encompass; **KEY SPEEDY NW & ISO flanges, female or male VCR® fittings, MET-SEAL flanges, QS quick connect fittings and tube end fittings.** **KEY HIGH VACUUM PRODUCTS, INC.,** has selected the most common lengths and flanges requested in this catalog; however upon request nearly any length can be constructed to fit a particular requirement.

General installation guidelines are; extension of 20% and a compression of 30% of the free length for unbraided hose assemblies. Braided assemblies by their nature can not be extended nor compressed due to the braid itself; and hoses with braid will lose some lateral flexibility (approximately 25% dependent on the length) due to the braid. The main function of a braided assembly is to protect the hose from "squirming" during over pressure situations.



Stainless Steel Thin Wall Flexible Hose Connectors

Part Number	Hose I.D.	Length	Description
KH-025-MVC-3.5	1/4"	3-1/2"	1/4" Male VCR®
KH-025-FVC-3.5	1/4"	3-1/2"	1/4" Female VCR®
KH-025-MVC-6	1/4"	6"	1/4" Male VCR®
KH-025-FVC-6	1/4"	6"	1/4" Female VCR®
KH-025-MVC-12	1/4"	12"	1/4" Male VCR®
KH-025-FVC-12	1/4"	12"	1/4" Female VCR®
KH-025-MVC-24	1/4"	24"	1/4" Male VCR®
KH-025-FVC-24	1/4"	24"	1/4" Female VCR®
KH-025-MVC-36	1/4"	36"	1/4" Male VCR®
KH-025-FVC-36	1/4"	36"	1/4" Female VCR®
BK-75-3.94	3/4"	3.94"	NW 16 flange
BK-75-6	3/4"	6"	NW 16 flange
BC-75-6	3/4"	6"	Mini MET-SEAL
BQ-75-6	3/4"	6"	Quick connect
BT-75-6	3/4"	6"	3/4" OD tube
KSH-5316	3/4"	9.84"	NW 16 flange
BK-75-10.23	3/4"	10.23"	NW 16 flange
BK-75-12	3/4"	12"	NW 16 flange
BC-75-12	3/4"	12"	Mini MET-SEAL
BQ-75-12	3/4"	12"	Quick connect
BT-75-12	3/4"	12"	3/4" OD tube
BC-75-18	3/4"	18"	Mini MET-SEAL
KSH-5416	3/4"	19.69"	NW 16 flange
BK-75-20.23	3/4"	20.23"	NW 16 flange
BK-75-24	3/4"	24"	NW 16 flange
BC-75-24	3/4"	24"	Mini MET-SEAL
BQ-75-24	3/4"	24"	Quick connect
BT-75-24	3/4"	24"	3/4" OD tube
BK-75-36	3/4"	36"	NW 16 flange
BC-75-36	3/4"	36"	Mini MET-SEAL
BQ-75-36	3/4"	36"	Quick connect
BT-75-36	3/4"	36"	3/4" OD tube
KSH-5516	3/4"	39.4"	NW 16 flange
BK-75-40.23	3/4"	40.23"	NW 16 flange
BK-75-48	3/4"	48"	NW 16 flange
BC-75-48	3/4"	48"	Mini MET-SEAL
BQ-75-48	3/4"	48"	Quick connect
BT-75-48	3/4"	48"	3/4" OD tube
BK-75-60	3/4"	60"	NW 16 flange
BC-75-60	3/4"	60"	Mini MET-SEAL
BQ-75-60	3/4"	60"	Quick connect
BT-75-60	3/4"	60"	3/4" OD tube
BC-75-72	3/4"	72"	Mini MET-SEAL

Note: When ordering flexible hose connectors with the metal braid sheathing be sure to add the letter "S" to the prefix of the part number (**Example SBK-75-6**).



Stainless Steel Thin Wall Flexible Hose Connectors

Part Number	Hose I.D.	Length	Description
BK-100-3.94	1"	3.94"	NW 25 flange
BK-100-6	1"	6"	NW 25 flange
BC-100-6	1"	6"	2-1/8" MET-SEAL
BQ-100-6	1"	6"	Quick connect
BT-100-6	1"	6"	1" OD tube
KSH-5325	1"	9.84"	NW 25 flange
BK-100-12	1"	12"	NW 25 flange
BC-100-12	1"	12"	2-1/8" MET-SEAL
BQ-100-12	1"	12"	Quick connect
BT-100-12	1"	12"	1" OD tube
BK-100-18	1"	18"	NW 25 flange
KSH-5425	1"	19.69"	NW 25 flange
BK-100-20.27	1"	20.27"	NW 25 flange
BK-100-24	1"	24"	NW 25 flange
BC-100-24	1"	24"	2-1/8" MET-SEAL
BQ-100-24	1"	24"	Quick connect
BT-100-24	1"	24"	1" OD tube
BK-100-36	1"	36"	NW 25 flange
BC-100-36	1"	36"	2-1/8" MET-SEAL
BQ-100-36	1"	36"	Quick connect
BT-100-36	1"	36"	1" OD tube
KSH-5525	1"	39.4"	NW 25 flange
BK-100-40.27	1"	40.27"	NW 25 flange
BK-100-48	1"	48"	NW 25 flange
BC-100-48	1"	48"	2-1/8" MET-SEAL
BQ-100-48	1"	48"	Quick connect
BT-100-48	1"	48"	1" OD tube
BK-100-60	1"	60"	NW 25 flange
BC-100-60	1"	60"	2-1/8" MET-SEAL
BQ-100-60	1"	60"	Quick connect
BT-100-60	1"	60"	1" OD tube
BK-150-3.94	1-1/2"	3.94"	NW 40 flange
BK-150-6	1-1/2"	6"	NW 40 flange
BC-150-6	1-1/2"	6"	2-3/4" MET-SEAL
BQ-150-6	1-1/2"	6"	Quick connect
BT-150-6	1-1/2"	6"	1-1/2" OD tube
KSH-5340	1-1/2"	9.84"	NW 40 flange
BK-150-10.28	1-1/2"	10.28"	NW 40 flange
BK-150-12	1-1/2"	12"	NW 40 flange
BC-150-12	1-1/2"	12"	2-3/4" MET-SEAL
BQ-150-12	1-1/2"	12"	Quick connect
BT-150-12	1-1/2"	12"	1-1/2" OD tube
BK-150-18	1-1/2"	18"	NW 40 flange
KSH-5440	1-1/2"	19.69"	NW 40 flange
BK-150-20.28	1-1/2"	20.28"	NW 40 flange

Note: When ordering flexible hose connectors with metal braid sheathing add letter "S" to prefix of part number (**Example SBK-150-6**).



Stainless Steel Thin Wall Flexible Hose Connectors

Part Number	Hose I.D.	Length	Description
BK-150-24	1-1/2"	24"	NW 40 flange
BC-150-24	1-1/2"	24"	2-3/4" MET-SEAL
BQ-150-24	1-1/2"	24"	Quick connect
BT-150-24	1-1/2"	24"	1-1/2" OD tube
BK-150-36	1-1/2"	36"	NW 40 flange
BC-150-36	1-1/2"	36"	2-3/4" MET-SEAL
BQ-150-36	1-1/2"	36"	Quick connect
BT-150-36	1-1/2"	36"	1-1/2" OD tube
KSH-5540	1-1/2"	40"	NW 40 flange
BK-150-40.28	1-1/2"	40.28"	NW 40 flange
BK-150-48	1-1/2"	48"	NW 40 flange
BC-150-48	1-1/2"	48"	2-3/4" MET-SEAL
BQ-150-48	1-1/2"	48"	Quick connect
BT-150-48	1-1/2"	48"	1-1/2" OD tube
BK-150-60	1-1/2"	60"	NW 40 flange
BC-150-60	1-1/2"	60"	2-3/4" MET-SEAL
BQ-150-60	1-1/2"	60"	Quick connect
BT-150-60	1-1/2"	60"	1-1/2" OD tube
BK-200-3.94	2"	3.94"	NW 50 flange
BK-200-6	2"	6"	NW 50 flange
BC-200-6	2"	6"	3-3/8" MET-SEAL
BQ-200-6	2"	6"	Quick connect
BT-200-6	2"	6"	2" OD tube
KSH-5350	2"	9.84"	NW 50 flange
BK-200-10.53	2"	10.53"	NW 50 flange
BK-200-12	2"	12"	NW 50 flange
BC-200-12	2"	12"	3-3/8" MET-SEAL
BQ-200-12	2"	12"	Quick connect
BT-200-12	2"	12"	2" OD tube
KSH-5450	2"	19.69"	NW 50 flange
BK-200-20.53	2"	20.53"	NW 50 flange
BK-200-24	2"	24"	NW 50 flange
BC-200-24	2"	24"	3-3/8" MET-SEAL
BQ-200-24	2"	24"	Quick connect
BT-200-24	2"	24"	2" OD tube
BK-200-36	2"	36"	NW 50 flange
BC-200-36	2"	36"	3-3/8" MET-SEAL
BQ-200-36	2"	36"	Quick connect
BT-200-36	2"	36"	2" OD tube
KSH-5550	2"	39.4"	NW 50 flange
BK-200-40.53	2"	40.53"	NW 50 flange
BK-200-48	2"	48"	NW 50 flange
BC-200-48	2"	48"	3-3/8" MET-SEAL
BQ-200-48	2"	48"	Quick connect
BT-200-48	2"	48"	2" OD tube
BK-200-60	2"	60"	NW 50 flange
BC-200-60	2"	60"	3-3/8" MET-SEAL
BQ-200-60	2"	60"	Quick connect
BT-200-60	2"	60"	2" OD tube

Note: When ordering flexible hose connectors with metal braid sheathing add letter "S" to prefix of part number (**Example SBK-150-24**).



Stainless Steel Thin Wall Flexible Hose Connectors

Part Number	Hose I.D.	Length	Description
BC-250-6	2-1/2"	6"	4-1/2" MET-SEAL
BI-250-6	2-1/2"	6"	NW 63 ISO flange
BT-250-6	2-1/2"	6"	2-1/2" OD tube
KSH-7863-9.8	2-1/2"	9.8"	NW 63 ISO flange
BC-250-12	2-1/2"	12"	4-1/2" MET-SEAL
BI-250-12	2-1/2"	12"	NW 63 ISO flange
BT-250-12	2-1/2"	12"	2-1/2" OD tube
KSH-7863-19.7	2-1/2"	19.7"	NW 63 ISO flange
BC-250-24	2-1/2"	24"	4-1/2" MET-SEAL
BI-250-24	2-1/2"	24"	NW 63 ISO flange
BT-250-24	2-1/2"	24"	2-1/2" OD tube
BC-250-36	2-1/2"	36"	4-1/2" OD MET-SEAL
BI-250-36	2-1/2"	36"	NW 63 ISO-MF flange
BT-250-36	2-1/2"	36"	2-1/2" OD tube
BC-250-48	2-1/2"	48"	4-1/2" OD MET-SEAL
BI-250-48	2-1/2"	48"	NW 63 ISO-MF flange
BT-250-48	2-1/2"	48"	2-1/2" OD tube
BC-250-60	2-1/2"	60"	4-1/2" OD MET-SEAL
BI-250-60	2-1/2"	60"	NW 63 ISO-MF flange
BT-250-60	2-1/2"	60"	2-1/2" OD tube
BC-300-6	3"	6"	4-5/8" OD MET-SEAL
BI-300-6	3"	6"	NW 80 ISO-MF flange
BT-300-6	3"	6"	3" OD tube
KSH-7880-9.8	3"	9.8"	NW 80 ISO-MF flange
BC-300-12	3"	12"	4-5/8" OD MET-SEAL
BI-300-12	3"	12"	NW 80 ISO-MF flange
BT-300-12	3"	12"	3" OD tube
BI-300-18	3"	18"	NW 80 ISO-MF flange
KSH-7880-19.7	3"	19.7"	NW 80 ISO-MF flange
BC-300-24	3"	24"	4-5/8" OD MET-SEAL
BI-300-24	3"	24"	NW 80 ISO-MF flange
BT-300-24	3"	24"	3" OD tube
BC-300-36	3"	36"	4-5/8" OD MET-SEAL
BI-300-36	3"	36"	NW 80 ISO-MF flange
BT-300-36	3"	36"	3" OD tube
BC-300-48	3"	48"	4-5/8" OD MET-SEAL
BI-300-48	3"	48"	NW 80 ISO-MF flange
BT-300-48	3"	48"	3" OD tube
BC-300-60	3"	60"	4-5/8" OD MET-SEAL
BI-300-60	3"	60"	NW 80 ISO-MF flange
BT-300-60	3"	60"	3" OD tube

Note: When ordering flexible hose connectors with metal braid sheathing add letter "S" to prefix of part number (**Example SBC-300-12**).



Stainless Steel Thin Wall Flexible Hose Connectors

Part Number	Hose I.D.	Length	Description
BC-400-6	4"	6"	6" OD MET-SEAL
BI-400-6	4"	6"	NW 100 ISO-MF flange
BT-400-6	4"	6"	4" OD tube
KSH-78100-9.8	4"	9.8"	NW 100 ISO-MF flange
BC-400-12	4"	12"	6" OD MET-SEAL
BI-400-12	4"	12"	NW 100 ISO-MF flange
BT-400-12	4"	12"	4" OD tube
KSH-78100-19.7	4"	19.7"	NW 100 ISO-MF flange
BC-400-24	4"	24"	6" OD MET-SEAL
BI-400-24	4"	24"	NW 100 ISO-MF flange
BT-400-24	4"	24"	4" OD tube
BC-400-36	4"	36"	6" OD MET-SEAL
BI-400-36	4"	36"	NW 100 ISO-MF flange
BT-400-36	4"	36"	4" OD tube
KSH-78100-39.4	4"	39.4"	NW 100 ISO-MF flange
BC-400-48	4"	48"	6" OD MET-SEAL
BI-400-48	4"	48"	NW 100 ISO-MF flange
BT-400-48	4"	48"	4" OD tube
BC-400-60	4"	60"	6" OD MET-SEAL
BI-400-60	4"	60"	NW 100 ISO-MF flange
BT-400-60	4"	60"	4" OD tube
KSFC-78160	6"	7.9"	NW 160 ISO-MF flange
KSFC-78160-10	6"	10"	NW 160 ISO-MF flange
KSFC-78160-12	6"	12"	NW 160 ISO-MF flange
KSFC-78160-39.4	6"	39.4"	NW 160 ISO-MF flange
KSFC-78200	6"	9.8"	NW 200 ISO-MF flange
KSFC-78250	6"	11.8"	NW 250 ISO-MF flange

Note: When ordering flexible hose connectors with metal braid sheathing add letter "S" to prefix of part number (**Example SBC-400-12**).



Stainless Steel Thick Wall Hose Connectors

Description:

Thick wall hoses are constructed of the same materials as our thin wall hoses with the exception of the wall thickness of the hose itself. The walls of these thick wall hoses are double the thickness of the thin wall hoses, which reduces the overall flexibility of the units. The main advantage of the thick wall units is the fact that in most cases external supports are not required to support the hoses from collapsing while under a vacuum. Special lengths, flanges and configurations are available upon request.

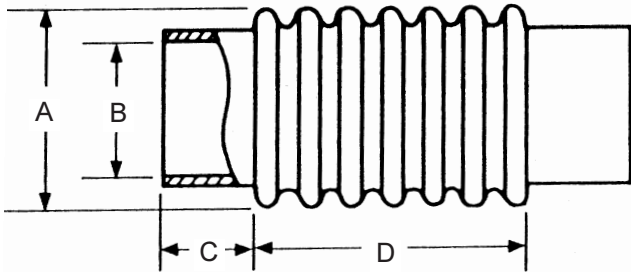


Part Number	Hose I.D.	Length	Description
KSH-4916	3/4"	9.84"	NW 16 flange
KSH-5016	3/4"	19.69"	NW 16 flange
KSH-5116	3/4"	39.4"	NW 16 flange
KSH-4925	1"	9.84"	NW 25 flange
KSH-5025	1"	19.69"	NW 25 flange
KSH-5125	1"	39.4"	NW 25 flange
KSH-4940	1-1/2"	9.84"	NW 40 flange
KSH-5040	1-1/2"	19.69"	NW 40 flange
KSH-5140	1-1/2"	39.4"	NW 40 flange
KSH-4950	2"	9.84"	NW 50 flange
KSH-5050	2"	19.69"	NW 50 flange
KSH-5150	2"	39.4"	NW 50 flange
KSH-7963-20	2-1/2"	20"	NW 63 ISO flange
KSH-7963	2-1/2"	24"	NW 63 ISO flange
KSH-8063	2-1/2"	36"	NW 63 ISO flange
KSH-7963-40	2-1/2"	40"	NW 63 ISO flange
KSH-7980-20	3"	20"	NW 80 ISO flange
KSH-7980	3"	24"	NW 80 ISO flange
KSH-8080	3"	36"	NW 80 ISO flange
KSH-7980-40	3"	40"	NW 80 ISO flange
KSH-79100-10	4"	10"	NW 100 ISO flange
KSH-80100-15	4"	15"	NW 100 ISO flange
KSH-79100-20	4"	20"	NW 100 ISO flange
KSH-79100	4"	24"	NW 100 ISO flange
KSH-80100	4"	36"	NW 100 ISO flange
KSH-79100-40	4"	40"	NW 100 ISO flange
KSH-79160-20	6"	20"	NW 160 ISO flange
KSH-79160	6"	24"	NW 160 ISO flange
KSH-80160	6"	36"	NW 160 ISO flange
KSH-79160-40	6"	40"	NW 160 ISO flange
KSH-79200-20	8"	20"	NW 200 ISO flange
KSH-79200	8"	24"	NW 200 ISO flange
KSH-80200	8"	36"	NW 200 ISO flange
KSH-79200-40	8"	40"	NW 200 ISO flange
KSH-79250-20	10"	20"	NW 250 ISO flange
KSH-79250	10"	24"	NW 250 ISO flange
KSH-80250	10"	36"	NW 250 ISO flange
KSH-79250-40	10"	40"	NW 250 ISO flange

Formed Stainless Steel Bellows

Description:

HFB Series bellows are manufactured from 321 stainless steel and are highly flexible. Typical applications include: expansion joints, vibration dampening, cryogenic applications and alignment issues. Upon request, **HFB** bellows can be manufactured with standard tube end fittings, as well as different cuff lengths and convoluted lengths.

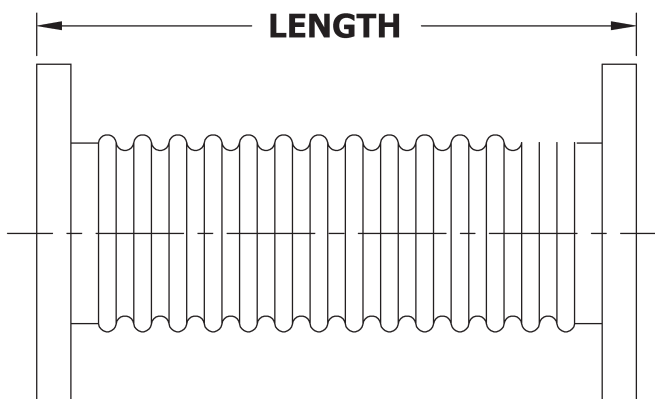


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Part Number	Wall Thickness	A	B	C	D	DEFLECTION + OR -
HFB-200	.004	.375	.250	.50	1.00	1/4"
HFB-201	.004	.450	.312	.50	1.00	1/4"
HFB-203	.004	.540	.375	.50	1.50	3/8"
HFB-204	.005	.740	.500	.50	1.50	3/8"
HFB-205	.006	.875	.625	.50	1.50	3/8"
HFB-206	.006	1.030	.750	.50	1.50	1/2"
HFB-207	.006	1.225	.875	.50	2.00	1/2"
HFB-208	.006	1.36	1.00	.75	2.00	1/2"
HFB-209	.006	1.46	1.125	.75	2.00	1/2"
HFB-210	.006	1.60	1.250	.75	2.00	1/2"
HFB-211	.006	1.78	1.375	.75	2.00	1/2"
HFB-212	.006	1.91	1.500	.75	2.00	1/2"
HFB-213	.006	2.12	1.625	.75	2.00	1/2"
HFB-214	.006	2.22	1.750	.75	2.00	1/2"
HFB-215	.006	2.47	2.00	.75	2.47	3/4"
HFB-216	.007	2.90	2.25	.75	2.50	3/4"
HFB-217	.007	3.00	2.50	.75	2.50	3/4"
HFB-218	.007	3.75	3.00	1.00	3.00	3/4"
HFB-219	.007	4.12	3.50	1.00	3.50	3/4"
HFB-220	.008	4.75	4.00	1.00	4.00	1-1/4"
HFB-221	.008	5.30	4.50	1.00	4.00	1-1/4"
HFB-222	.008	5.85	5.00	1.00	5.00	1-1/2"
HFB-223	.008	6.40	5.50	1.25	5.00	1-1/2"
HFB-224	.010	7.00	6.00	1.25	5.00	1-1/2"
HFB-225	.012	9.25	8.00	1.25	6.00	2"
HFB-226	.012	11.87	10.00	1.25	6.00	2"



ASA Stainless Steel Thin Wall Flexible Hose Connectors



ASA Stainless Steel Thin Wall Flexible Hose Connectors

- One flange rotatable, one flange non rotatable
- Stainless steel TIG welded construction

Part Number	Hose I.D.	Length	Description
HFB-ASA4-6	1"	6.00	4-1/4" OD ASA flanges
HFB-ASA4-1.5	1-1/2"	6.00	4-1/4" OD ASA flanges
HFB-ASA5	2"	6.00	5" OD ASA flanges
HFB-ASA5-2.5	2-1/2"	6.00	5" OD ASA flanges
HFB-ASA6	3"	7.00	6" OD ASA flanges
HFB-ASA7	4"	7.00	7-1/2" OD ASA flanges
HFB-ASA9	4"	7.00	9" OD ASA flanges
HFB-ASA9-6	6"	7.00	9" OD ASA flanges
HFB-ASA11	6"	7.00	11" OD ASA flanges
HFB-ASA-11-8	8"	7.00	11" OD ASA flanges



Welded Stainless Steel Bellows

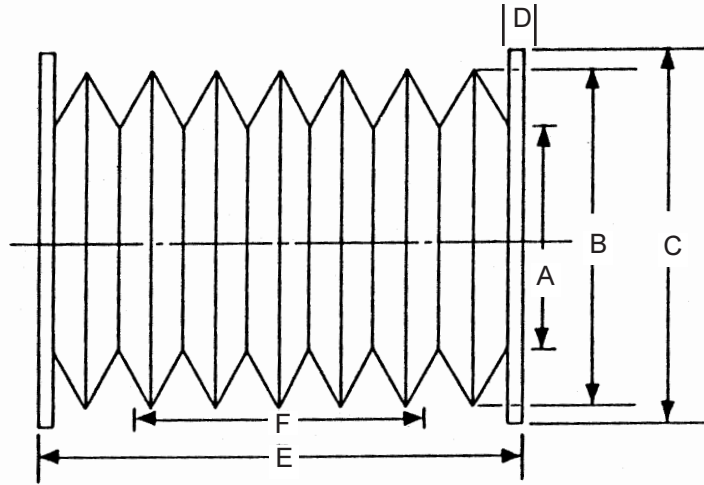
Introduction: The bellows material itself is fabricated for AM-350 stainless steel which allows for a wide spectrum of temperature, a more flexible diaphragm, greater stroke length and a lower compressed height. The bellows, diaphragm and attached flanges are TIG welded and all units are leak tested on a helium mass spectrometer at 5 x 10⁻¹⁰ torr.



Part Number	Bellows I.D. "A"	Bellows O.D. "B"	Flange O.D. "C"	Flange Thickness "D"	Extended Length "E"	Compressed Length "F"	Spring Rate
SSWB-100	.260	.595	.687	.010	.750	.210	10.2
SSWB-101	.260	.595	.687	.010	1.500	.42	4.9
SSWB-110	.250	.750	.900	.010	.930	.26	19.3
SSWB-111	.250	.750	.900	.010	3.00	.74	5.9
SSWB-120	.550	1.030	1.155	.015	1.38	.38	10.3
SSWB-121	.550	1.030	1.155	.015	3.38	.87	4.1
SSWB-130	.750	1.250	1.50	.015	.600	.20	33.0
SSWB-131	.750	1.250	1.50	.015	23.00	5.33	.8
SSWB-140	.540	1.350	1.350	.015	1.46	.360	8.8
SSWB-141	.540	1.350	1.350	.015	3.20	.55	3.8
SSWB-150	.937	1.437	1.437	.015	.750	.26	13.1
SSWB-151	.937	1.437	1.437	.015	2.25	.60	4.2
SSWB-160	.750	1.500	1.562	.015	1.25	3.7	N/A
SSWB-161	.750	1.500	1.562	.015	3.50	.63	N/A
SSWB-170	.970	1.500	1.562	.015	2.50	.63	6.9
SSWB-171	.970	1.500	1.562	.015	6.00	1.39	2.9
SSWB-180	.750	1.625	2.100	.015	2.25	.39	6.2
SSWB-181	.750	1.625	2.100	.015	4.50	.68	3.1
SSWB-190	.750	1.750	2.100	.015	8.50	1.58	2.9
SSWB-191	.750	1.750	2.100	.015	2.00	.41	12.2
SSWB-200	1.00	1.750	2.100	.015	4.25	.95	6.8
SSWB-201	1.00	1.750	2.100	.015	5.50	1.21	5.2
SSWB-210	1.070	2.000	2.100	.015	.75	.20	31.9
SSWB-211	1.070	2.000	2.100	.015	.350	.13	74.5
SSWB-220	1.250	2.000	2.100	.015	1.25	.34	17.7
SSWB-221	1.250	2.000	2.100	.015	3.50	.81	6.1
SSWB-230	1.500	2.250	2.375	.015	5.50	1.21	4.5
SSWB-231	1.500	2.250	2.375	.015	12.37	2.60	2.0



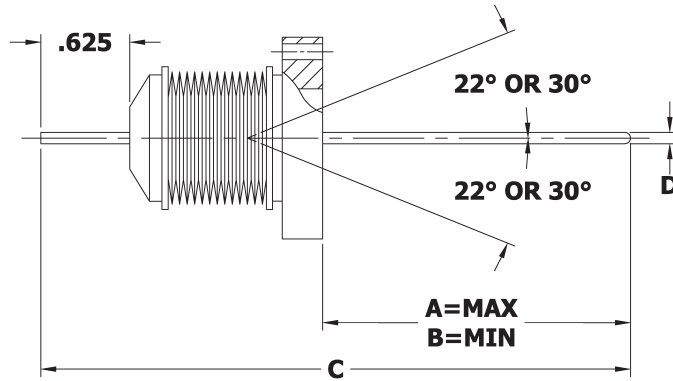
Welded Stainless Steel Bellows



Part Number	Bellows I.D. "A"	Bellows O.D. "B"	Flange O.D. "C"	Flange Thickness "D"	Extended Length "E"	Compressed Length "F"	Spring Rate
SSWB-250	1.875	2.625	2.750	.015	.87	.32	45.3
SSWB-251	1.875	2.625	2.750	.015	3.50	.98	10.6
SSWB-260	2.000	3.000	3.250	.015	2.2	.52	10.1
SSWB-261	2.000	3.000	3.250	.015	4.75	1.02	4.5
SSWB-270	2.150	3.000	3.125	.015	1.75	.39	6.2
SSWB-271	2.150	3.000	3.125	.015	3.25	.60	3.4
SSWB-280	2.250	3.250	3.375	.015	1.46	.36	14.9
SSWB-281	2.250	3.250	3.375	.015	3.20	.67	6.5
SSWB-290	2.500	3.500	3.625	.015	3.50	.79	6.3
SSWB-291	2.500	3.500	3.625	.015	7.00	1.58	3.2
SSWB-300	3.000	4.000	4.125	.015	4.12	1.00	7.3
SSWB-301	3.000	4.000	4.125	.015	7.37	1.70	4.1
SSWB-310	3.750	4.750	4.875	.015	3.00	.83	6.6
SSWB-311	3.750	4.750	4.875	.015	5.75	1.48	3.5
SSWB-320	4.200	5.250	5.375	.020	3.25	.87	19.0
SSWB-321	4.200	5.250	5.375	.020	9.00	2.12	6.7
SSWB-330	4.500	6.000	6.125	.020	4.00	.88	12.3
SSWB-331	4.500	6.000	6.125	.020	10.25	1.97	4.8
SSWB-340	5.400	6.440	6.565	.030	3.00	1.09	34.9
SSWB-341	5.400	6.440	6.565	.030	6.50	2.21	15.7
SSWB-350	6.000	7.500	7.625	.030	8.25	1.58	3.1
SSWB-351	6.000	7.500	7.625	.030	10.00	1.88	2.6
SSWB-360	6.300	8.00	8.125	.030	8.40	1.63	5.9
SSWB-361	6.300	8.00	8.125	.030	12.00	2.29	4.1
SSWB-370	9.500	11.00	11.250	.040	8.00	12.60	12.6
SSWB-371	9.500	11.00	11.250	.040	12.37	2.95	8.2



Welded Stainless Steel Bellows Assemblies



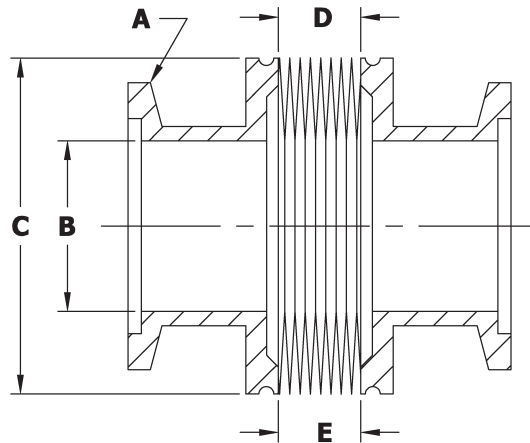
Wobble Stick Manipulator

Features:

KEY SPEEDY or MET-SEAL flange mounts standard

- AM 350 welded bellows
- Simple means of positioning samples
- Bakeable design

Part Number	Flange Mount	A	B	C	D	Angle
WSM-133	1-1/3" OD Mini	3.5	3.0	6.0	.12	44 degrees
WSM-16	NW 16	3.5	3.0	6.0	.12	44 degrees
WSM-275	2-3/4" OD MET-SEAL	6.0	3.7	10.0	.25	60 degrees
WSM-40	NW 40	6.0	3.7	10.0	.25	60 degrees



Welded Bellows Volume Compensators

- AM-350 bellows
- TIG welded construction
- Other strokes, flanges available upon request

Part Number	A	B	C	D = Ext	E = Comp	Stroke
SSWB-NW16	NW 16	.63	1.24	1.65	1.26	.394
SSWB-NW40	NW 40	1.54	2.32	1.77	1.30	.472
SSWB-NW63	NW 63	2.95	3.94	3.35	2.87	.472
SSWB-NW100	NW 100	4.02	5.20	3.74	3.27	.472
SSWB-NW160	NW 160	5.91	7.28	4.17	3.70	.472
SSWB-MS275	2-3/4" OD MET-SEAL	1.54	2.32	2.95	2.48	.472
SSWB-MS600	6" OD MET-SEAL	4.02	5.20	3.74	3.27	.472
SSWB-MS800	8" OD MET-SEAL	5.91	7.28	4.17	3.70	.472



Stainless Steel Thin Wall "Gas Flex" Hose Connectors

KEY HIGH VACUUM PRODUCTS, INC.'s "GAS FLEX" hose assemblies are flexible (corrugated) metal stainless steel hose, which can be used in both vacuum and positive pressure service. **KHVP** offers this hose series in 1/4", 3/8" and 1/2" ID. Hoses are produced from fully annealed type 321 stainless steel sheet stock, which is rolled into a tube, and seam welded.



Braided hoses can be used both in vacuum and positive pressure service. **"SGF"** Series (braided) **"GAS FLEX"** hoses are an ideal solution for gas box delivery applications (positive pressure). Often the delivery lines are not straight, and require some flexibility. **"GAS FLEX"** hoses allow the user to form the hose to their individual requirements; and still allow for "clean arrangements" of the delivery lines.

Standard end connections include 304 stainless steel tube end, NW flanges, and Met-Seal flanges, Swagelok and VCR fittings. **"GAS FLEX"** hoses are offered in standard and custom lengths, available upon request.

All **"GAS FLEX"** hoses are leak tested after assembly assuring they are leak tight, and defect free. As always, all assemblies are thoroughly cleaned at all stages of the manufacturing process, not just at final inspection. Each hose is individually bagged after final leak test.

Technical Data

STATIC

Nominal Hose ID	Minimum Bend Radius	Maximum Working Pressure 70°F PSIG	Minimum Bend Radius	Dynamic Max. Working Pressure 70° (PSIG)	Burst Pressure 70° (PSIG)
1/4"	0.35	390	N/A	N/A	N/A
1/4" w/Braid	0.75	4800	5.5	2030	11165
3/8"	0.55	170	N/A	N/A	N/A
3/8" w/Braid	1.14	3700	6	1450	8000
1/2"	0.83	130	N/A	N/A	N/A
1/2" w/Braid	1.34	2900	4.88	1160	6100

"GAS FLEX" hoses will render maximum service life when properly installed.

The following precautions should be observed when installing:

- 1) Do not subject any metal hose to gas surges greater than 50% of the rated working pressure (this will shorten the service life of the hose).
- 2) Avoid torque: Torque (twisting) is harmful to hose and substantially reduces service life. Always install a hose so that flexing takes place in one plane.
- 3) Avoid over bending: If metal hose is bent below the minimum recommended bend radius, fatigue occurs, and premature failure can result. This bending typically occurs near the end connections, and should be avoided.



Stainless Steel Thin Wall "Gas Flex" Hose Connectors



Part Number	Hose ID	Length	Description
GF-025-MS-4★	1/4"	4"	Mini MET-SEAL
GF-025-MS-8★	1/4"	8"	Mini MET-SEAL
GF-025-MS-12★	1/4"	12"	Mini MET-SEAL
GF-025-MS-18★	1/4"	18"	Mini MET-SEAL
GF-025-MS-24★	1/4"	24"	Mini MET-SEAL
GF-025-MS-36★	1/4"	36"	Mini MET-SEAL
GF-037-MS-4★	3/8"	4"	Mini MET-SEAL
GF-037-MS-8★	3/8"	8"	Mini MET-SEAL
GF-037-MS-12★	3/8"	12"	Mini MET-SEAL
GF-037-MS-18★	3/8"	18"	Mini MET-SEAL
GF-037-MS-24★	3/8"	24"	Mini MET-SEAL
GF-037-MS-36★	3/8"	36"	Mini MET-SEAL
GF-050-MS-4★	1/2"	4"	Mini MET-SEAL
GF-050-MS-8★	1/2"	8"	Mini MET-SEAL
GF-050-MS-12★	1/2"	12"	Mini MET-SEAL
GF-050-MS-18★	1/2"	18"	Mini MET-SEAL
GF-050-MS-24★	1/2"	24"	Mini MET-SEAL
GF-050-MS-36★	1/2"	36"	Mini MET-SEAL
GF-025-4★	1/4"	4"	NW 16
GF-025-8★	1/4"	8"	NW 16
GF-025-12★	1/4"	12"	NW 16
GF-025-18★	1/4"	18"	NW 16
GF-025-24★	1/4"	24"	NW 16
GF-025-36★	1/4"	36"	NW 16
GF-037-4★	3/8"	4"	NW 16
GF-037-8★	3/8"	8"	NW 16
GF-037-12★	3/8"	12"	NW 16
GF-037-18★	3/8"	18"	NW 16
GF-037-24★	3/8"	24"	NW 16
GF-037-36★	3/8"	36"	NW 16
GF-050-4★	1/2"	4"	NW 16
GF-050-8★	1/2"	8"	NW 16
GF-050-12★	1/2"	12"	NW 16
GF-050-18★	1/2"	18"	NW 16
GF-050-24★	1/2"	24"	NW 16
GF-050-36★	1/2"	36"	NW 16

★= New Product

Note: When ordering "Gas Flex" hose connectors with braid; Add "S" to prefix of part number (Example **SGF-025-4**).



Stainless Steel Thin Wall "Gas Flex" Hose Connectors



Part Number	Hose ID	Length	Description
GF-025-MVC-4★	1/4"	4"	Male VCR's
GF-025-MVC-8★	1/4"	8"	Male VCR's
GF-025-MVC-12★	1/4"	12"	Male VCR's
GF-025-MVC-18★	1/4"	18"	Male VCR's
GF-025-MVC-24★	1/4"	24"	Male VCR's
GF-025-MVC-36★	1/4"	36"	Male VCR's
GF-025-FVC-4★	1/4"	4"	Female VCR's
GF-025-FVC-8★	1/4"	8"	Female VCR's
GF-025-FVC-12★	1/4"	12"	Female VCR's
GF-025-FVC-18★	1/4"	18"	Female VCR's
GF-025-FVC-24★	1/4"	24"	Female VCR's
GF-025-FVC-36★	1/4"	36"	Female VCR's
GF-037-MVC-4★	3/8"	4"	Male VCR's
GF-037-MVC-8★	3/8"	8"	Male VCR's
GF-037-MVC-12★	3/8"	12"	Male VCR's
GF-037-MVC-18★	3/8"	18"	Male VCR's
GF-037-MVC-24★	3/8"	24"	Male VCR's
GF-037-MVC-36★	3/8"	36"	Male VCR's
GF-037-FVC-4★	3/8"	4"	Female VCR's
GF-037-FVC-8★	3/8"	8"	Female VCR's
GF-037-FVC-12★	3/8"	12"	Female VCR's
GF-037-FVC-18★	3/8"	18"	Female VCR's
GF-037-FVC-24★	3/8"	24"	Female VCR's
GF-037-FVC-36★	3/8"	36"	Female VCR's
GF-050-MVC-4★	1/2"	4"	Male VCR's
GF-050-MVC-8★	1/2"	8"	Male VCR's
GF-050-MVC-12★	1/2"	12"	Male VCR's
GF-050-MVC-18★	1/2"	18"	Male VCR's
GF-050-MVC-24★	1/2"	24"	Male VCR's
GF-050-MVC-36★	1/2"	36"	Male VCR's
GF-050-FVC-4★	1/2"	4"	Female VCR's
GF-050-FVC-8★	1/2"	8"	Female VCR's
GF-050-FVC-12★	1/2"	12"	Female VCR's
GF-050-FVC-18★	1/2"	18"	Female VCR's
GF-050-FVC-24★	1/2"	24"	Female VCR's
GF-050-FVC-36★	1/2"	36"	Female VCR's

★= New Product

Note: When ordering "Gas Flex" hose connectors with braid; Add "S" to prefix of part number (Example **SGF-025-MVC-4**).



Stainless Steel Thin Wall "Gas Flex" Hose Connectors



Part Number	Hose ID	Length	Description
GF-025-MFVC-4★	1/4"	4"	Male to Female VCR
GF-025-MFVC-8★	1/4"	8"	Male to Female VCR
GF-025-MFVC-12★	1/4"	12"	Male to Female VCR
GF-025-MFVC-18★	1/4"	18"	Male to Female VCR
GF-025-MFVC-24★	1/4"	24"	Male to Female VCR
GF-025-MFVC-36★	1/4"	36"	Male to Female VCR
GF-037-MFVC-4★	3/8"	4"	Male to Female VCR
GF-037-MFVC-8★	3/8"	8"	Male to Female VCR
GF-037-MFVC-12★	3/8"	12"	Male to Female VCR
GF-037-MFVC-18★	3/8"	18"	Male to Female VCR
GF-037-MFVC-24★	3/8"	24"	Male to Female VCR
GF-037-MFVC-36★	3/8"	36"	Male to Female VCR
GF-050-MFVC-4★	1/2"	4"	Male to Female VCR
GF-050-MFVC-8★	1/2"	8"	Male to Female VCR
GF-050-MFVC-12★	1/2"	12"	Male to Female VCR
GF-050-MFVC-18★	1/2"	18"	Male to Female VCR
GF-050-MFVC-24★	1/2"	24"	Male to Female VCR
GF-050-MFVC-36★	1/2"	36"	Male to Female VCR
GF-025-SW-4★	1/4"	4"	Swagelok
GF-025-SW-8★	1/4"	8"	Swagelok
GF-025-SW-12★	1/4"	12"	Swagelok
GF-025-SW-18★	1/4"	18"	Swagelok
GF-025-SW-24★	1/4"	24"	Swagelok
GF-025-SW-36★	1/4"	36"	Swagelok
GF-037-SW-4★	3/8"	4"	Swagelok
GF-037-SW-8★	3/8"	8"	Swagelok
GF-037-SW-12★	3/8"	12"	Swagelok
GF-037-SW-18★	3/8"	18"	Swagelok
GF-037-SW-24★	3/8"	24"	Swagelok
GF-037-SW-36★	3/8"	36"	Swagelok
GF-050-SW-4★	1/2"	4"	Swagelok
GF-050-SW-8★	1/2"	8"	Swagelok
GF-050-SW-12★	1/2"	12"	Swagelok
GF-050-SW-18★	1/2"	18"	Swagelok
GF-050-SW-24★	1/2"	24"	Swagelok
GF-050-SW-36★	1/2"	36"	Swagelok

★= New Product

Note: When ordering "Gas Flex" hose connectors with braid; Add "S" to prefix of part number (Example **SGF-025-MVC-4**).



Stainless Steel Thin Wall "Gas Flex" Hose Connectors

Part Number	Hose ID	Length	Description
BT-025-4★	1/4"	4"	1/4" OD X .035 wall tube end
BT-025-8★	1/4"	8"	1/4" OD X .035 wall tube end
BT-025-12★	1/4"	12"	1/4" OD X .035 wall tube end
BT-025-18★	1/4"	18"	1/4" OD X .035 wall tube end
BT-025-24★	1/4"	24"	1/4" OD X .035 wall tube end
BT-025-36★	1/4"	36"	1/4" OD X .035 wall tube end
BT-037-4★	3/8"	4"	3/8" OD X .035 wall tube end
BT-037-8★	3/8"	8"	3/8" OD X .035 wall tube end
BT-037-12★	3/8"	12"	3/8" OD X .035 wall tube end
BT-037-18★	3/8"	18"	3/8" OD X .035 wall tube end
BT-037-24★	3/8"	24"	3/8" OD X .035 wall tube end
BT-037-36★	3/8"	36"	3/8" OD X .035 wall tube end
BT-050-4★	1/2"	4"	1/2" OD X .035 wall tube end
BT-050-8★	1/2"	8"	1/2" OD X .035 wall tube end
BT-050-12★	1/2"	12"	1/2" OD X .035 wall tube end
BT-050-18★	1/2"	18"	1/2" OD X .035 wall tube end
BT-050-24★	1/2"	24"	1/2" OD X .035 wall tube end
BT-050x-36★	1/2"	36"	1/2" OD X .035 wall tube end

★= New Product

Note: When ordering "Gas Flex" hose connectors with braid; Add "S" to prefix of part number (Example **SBT-025-4**).



Compression Fittings

Introduction:

KEY HIGH VACUUM PRODUCTS, INC.'s compression fittings are manufactured entirely from solid rod and offer a simple effective method for creating a reusable, reliable high vacuum seal that feature raised knurled nuts for finger tightening of the assemblies. All compression assemblies listed here include a viton® o-ring which has a temperature rating of + 200° centigrade.

Materials:

Quick Seals, Line Seals and Cap Seals are offered in three different materials, standard size range of 1/16" to 2-1/8" ID

- Brass units are entirely constructed of brass
- Aluminum units are entirely constructed grade 6061T6
- Stainless steel units feature 304-L bodies and washers with nickel chrome plated nuts

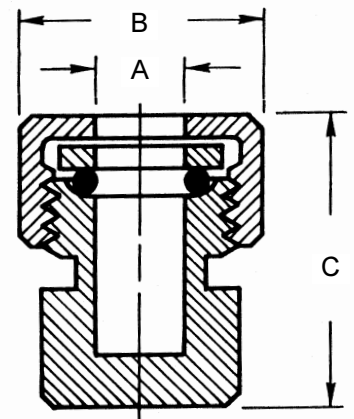
Application:

These compression fittings offer a highly effective quick and positive sealing method of joining vacuum lines, glass ionization gauges tubes, feedthroughs, and also are offered mounted on our MET-SEAL and NW flanges as adapters. All compression fittings are cleaned, packaged and ready for immediate use upon receipt.



Cap Seal Fittings

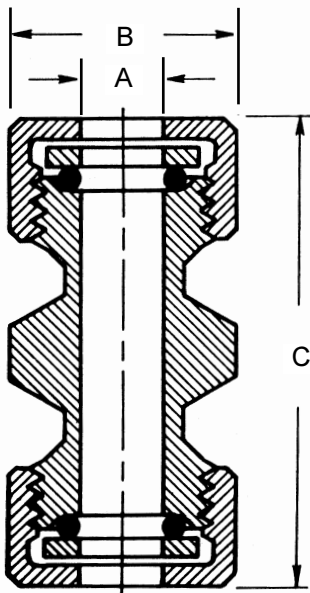
Part No.	Body material	Tube OD	A	B	C
CS-06-AL	6061 T6	1/16"	.072	5/8"	1-1/8"
CS-06-BR	Brass	1/16"	.072	5/8"	1-1/8"
CS-06-SS	304 SS	1/16"	.072	5/8"	1-1/8"
CS-09-AL	6061 T6	3/32"	.103	5/8"	1-1/8"
CS-09-BR	Brass	3/32"	.103	5/8"	1-1/8"
CS-09-SS	304 SS	3/32"	.103	5/8"	1-1/8"
CS-12-AL	6061 T6	1/8"	.135	5/8"	1-1/8"
CS-12-BR	Brass	1/8"	.135	5/8"	1-1/8"
CS-12-SS	304 SS	1/8"	.135	5/8"	1-1/8"
CS-18-AL	6061 T6	3/16"	.197	5/8"	1-1/8"
CS-18-BR	Brass	3/16"	.197	5/8"	1-1/8"
CS-18-SS	304 SS	3/16"	.197	5/8"	1-1/8"
CS-25-AL	6061 T6	1/4"	.260	5/8"	1-1/8"
CS-25-BR	Brass	1/4"	.260	5/8"	1-1/8"
CS-25-SS	304 SS	1/4"	.260	5/8"	1-1/8"
CS-31-AL	6061 T6	5/16"	.325	1"	1-1/8"
CS-31-BR	Brass	5/16"	.325	1"	1-1/8"
CS-31-SS	304 SS	5/16"	.325	1"	1-1/8"
CS-37-AL	6061 T6	3/8"	.385	1"	1-1/8"
CS-37-BR	Brass	3/8"	.385	1"	1-1/8"
CS-37-SS	304 SS	3/8"	.385	1"	1-1/8"
CS-50-AL	6061 T6	1/2"	.515	1-1/4"	1-3/8"
CS-50-BR	Brass	1/2"	.515	1-1/4"	1-3/8"
CS-50-SS	304 SS	1/2"	.515	1-1/4"	1-3/8"
CS-62-AL	6061 T6	5/8"	.640	1-1/4"	1-3/8"
CS-62-BR	Brass	5/8"	.640	1-1/4"	1-3/8"
CS-62-SS	304 SS	5/8"	.640	1-1/4"	1-3/8"
CS-75-AL	6061 T6	3/4"	.765	1-1/2"	1-3/8"
CS-75-BR	Brass	3/4"	.765	1-1/2"	1-3/8"
CS-75-SS	304 SS	3/4"	.765	1-1/2"	1-3/8"
CS-87-AL	6061 T6	7/8"	.890	1-3/4"	1-1/2"
CS-87-BR	Brass	7/8"	.890	1-3/4"	1-1/2"
CS-87-SS	304 SS	7/8"	.890	1-3/4"	1-1/2"
CS-100-AL	6061 T6	1"	1.015	1-3/4"	1-1/2"
CS-100-BR	Brass	1"	1.015	1-3/4"	1-1/2"
CS-100-SS	304 SS	1"	1.015	1-3/4"	1-1/2"
CS-112-AL	6061 T6	1-1/8"	1.140	1-7/8"	1-1/2"
CS-112-BR	Brass	1-1/8"	1.140	1-7/8"	1-1/2"
CS-112-SS	304 SS	1-1/8"	1.140	1-7/8"	1-1/2"
CS-125-AL	6061 T6	1-1/4"	1.265	2"	1-3/4"
CS-125-BR	Brass	1-1/4"	1.265	2"	1-3/4"
CS-125-SS	304 SS	1-1/4"	1.265	2"	1-3/4"
CS-137-AL	6061 T6	1-3/8"	1.390	2-1/8"	1-7/8"
CS-137-BR	Brass	1-3/8"	1.390	2-1/8"	1-7/8"
CS-137-SS	304 SS	1-3/8"	1.390	2-1/8"	1-7/8"
CS-150-AL	6061 T6	1-1/2"	1.515	2-1/4"	2"
CS-150-BR	Brass	1-1/2"	1.515	2-1/4"	2"
CS-150-SS	304 SS	1-1/2"	1.515	2-1/4"	2"
CS-162-AL	6061 T6	1-5/8"	1.640	2-3/8"	2-1/8"
CS-162-BR	Brass	1-5/8"	1.640	2-3/8"	2-1/8"
CS-162-SS	304 SS	1-5/8"	1.640	2-3/8"	2-1/8"
CS-175-AL	6061 T6	1-3/4"	1.765	2-1/2"	2-1/4"
CS-175-BR	Brass	1-3/4"	1.765	2-1/2"	2-1/4"
CS-175-SS	304 SS	1-3/4"	1.765	2-1/2"	2-1/4"
CS-200-AL	6061 T6	2"	2.015	2-3/4"	2-1/2"
CS-200-BR	Brass	2"	2.015	2-3/4"	2-1/2"
CS-200-SS	304 SS	2"	2.015	2-3/4"	2-1/2"
CS-212-AL	6061 T6	2-1/8"	2.140	2-7/8"	2-1/2"
CS-212-BR	Brass	2-1/8"	2.140	2-7/8"	2-1/2"
CS-212-SS	304 SS	2-1/8"	2.140	2-7/8"	2-1/2"



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Line Seal Straight thru Connectors

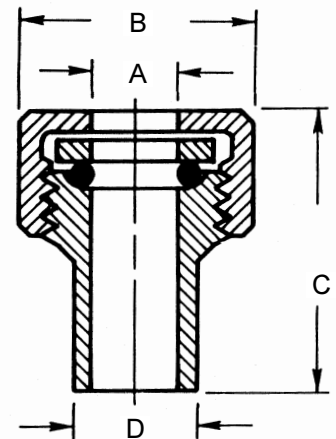


Part Number	Body material	Tube OD	A	B	C
LS-06-AL	6061T6	1/16"	.072	5/8"	1-5/8"
LS-06-BR	Brass	1/16"	.072	5/8"	1-5/8"
LS-06-SS	304 SS	1/16"	.072	5/8"	1-5/8"
LS-09-AL	6061T6	3/32"	.103	5/8"	1-5/8"
LS-09-BR	Brass	3/32"	.103	5/8"	1-5/8"
LS-09-SS	304 SS	3/32"	.103	5/8"	1-5/8"
LS-12-AL	6061T6	1/8"	.135	5/8"	1-5/8"
LS-12-BR	Brass	1/8"	.135	5/8"	1-5/8"
LS-12-SS	304 SS	1/8"	.135	5/8"	1-5/8"
LS-18-AL	6061T6	3/16"	.197	5/8"	1-5/8"
LS-18-BR	Brass	3/16"	.197	5/8"	1-5/8"
LS-18-SS	304 SS	3/16"	.197	5/8"	1-5/8"
LS-25-AL	6061T6	1/4"	.260	5/8"	1-5/8"
LS-25-BR	Brass	1/4"	.260	5/8"	1-5/8"
LS-25-SS	304 SS	1/4"	.260	5/8"	1-5/8"
LS-31-AL	6061T6	5/16"	.325	1"	1-1/2"
LS-31-BR	Brass	5/16"	.325	1"	1-1/2"
LS-31-SS	304 SS	5/16"	.325	1"	1-1/2"
LS-37-AL	6061T6	3/8"	.385	1"	1-1/2"
LS-37-BR	Brass	3/8"	.385	1"	1-1/2"
LS-37-SS	304 SS	3/8"	.385	1"	1-1/2"
LS-50-AL	6061T6	1/2"	.515	1-1/4"	1-1/2"
LS-50-BR	Brass	1/2"	.515	1-1/4"	1-1/2"
LS-50-SS	304 SS	1/2"	.515	1-1/4"	1-1/2"
LS-62-AL	6061T6	5/8"	.640	1-1/4"	1-1/2"
LS-62-BR	Brass	5/8"	.640	1-1/4"	1-1/2"
LS-62-SS	304 SS	5/8"	.640	1-1/4"	1-1/2"
LS-75-AL	6061T6	3/4"	.765	1-1/2"	1-1/2"
LS-75-BR	Brass	3/4"	.765	1-1/2"	1-1/2"
LS-75-SS	304 SS	3/4"	.765	1-1/2"	1-1/2"
LS-87-AL	6061T6	7/8"	.890	1-3/4"	1-1/2"
LS-87-BR	Brass	7/8"	.890	1-3/4"	1-1/2"
LS-87-SS	304 SS	7/8"	.890	1-3/4"	1-1/2"
LS-100-AL	6061T6	1"	1.015	1-3/4"	1-1/2"
LS-100-BR	Brass	1"	1.015	1-3/4"	1-1/2"
LS-100-SS	304 SS	1"	1.015	1-3/4"	1-1/2"
LS-112-AL	6061T6	1-1/8"	1.140	1-7/8"	1-1/2"
LS-112-BR	Brass	1-1/8"	1.140	1-7/8"	1-1/2"
LS-112-SS	304 SS	1-1/8"	1.140	1-7/8"	1-1/2"
LS-125-AL	6061T6	1-1/4"	1.265	2"	1-3/4"
LS-125-BR	Brass	1-1/4"	1.265	2"	1-3/4"
LS-125-SS	304 SS	1-1/4"	1.265	2"	1-3/4"
LS-137-AL	6061T6	1-3/8"	1.390	2-1/8"	1-3/4"
LS-137-BR	Brass	1-3/8"	1.390	2-1/8"	1-3/4"
LS-137-SS	304 SS	1-3/8"	1.390	2-1/8"	1-3/4"
LS-150-AL	6061T6	1-1/2"	1.515	2-1/4"	1-3/4"
LS-150-BR	Brass	1-1/2"	1.515	2-1/4"	1-3/4"
LS-150-SS	304 SS	1-1/2"	1.515	2-1/4"	1-3/4"
LS-162-AL	6061T6	1-5/8"	1.640	2-3/8"	1-3/4"
LS-162-BR	Brass	1-5/8"	1.640	2-3/8"	1-3/4"
LS-162-SS	304 SS	1-5/8"	1.640	2-3/8"	1-3/4"
LS-175-AL	6061T6	1-3/4"	1.765	2-1/2"	1-3/4"
LS-175-BR	Brass	1-3/4"	1.765	2-1/2"	1-3/4"
LS-175-SS	304 SS	1-3/4"	1.765	2-1/2"	1-3/4"
LS-200-AL	6061T6	2"	2.015	2-3/4"	2"
LS-200-BR	Brass	2"	2.015	2-3/4"	2"
LS-200-SS	304 SS	2"	2.015	2-3/4"	2"
LS-212-AL	6061T6	2-1/8"	2.140	2-7/8"	2"
LS-212-BR	Brass	2-1/8"	2.140	2-7/8"	2"
LS-212-SS	304 SS	2-1/8"	2.140	2-7/8"	2"



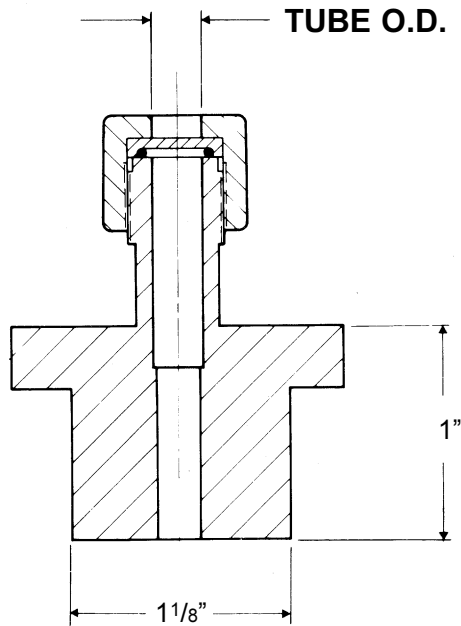
Quick Connect Fittings

Part No.	Body material	Tube OD	A	B	C	D
QS-06-AL	6061T6	1/16"	.072	5/8"	1-1/8"	3/8"
QS-06-BR	Brass	1/16"	.072	5/8"	1-1/8"	3/8"
QS-06-SS	304 SS	1/16"	.072	5/8"	1-1/8"	3/8"
QS-09-AL	6061T6	3/32"	.103	5/8"	1-1/8"	3/8"
QS-09-BR	Brass	3/32"	.103	5/8"	1-1/8"	3/8"
QS-09-SS	304 SS	3/32"	.103	5/8"	1-1/8"	3/8"
QS-12-AL	6061T6	1/8"	.135	5/8"	1-1/8"	3/8"
QS-12-BR	Brass	1/8"	.135	5/8"	1-1/8"	3/8"
QS-12-SS	304 SS	1/8"	.135	5/8"	1-1/8"	3/8"
QS-18-AL	6061T6	3/16"	.197	5/8"	1-1/8"	3/8"
QS-18-BR	Brass	3/16"	.197	5/8"	1-1/8"	3/8"
QS-18-SS	304 SS	3/16"	.197	5/8"	1-1/8"	3/8"
QS-25-AL	6061T6	1/4"	.260	5/8"	1-1/8"	3/8"
QS-25-BR	Brass	1/4"	.260	5/8"	1-1/8"	3/8"
QS-25-SS	304 SS	1/4"	.260	5/8"	1-1/8"	3/8"
QS-31-AL	6061T6	5/16"	.325	1"	1-1/8"	5/8"
QS-31-BR	Brass	5/16"	.325	1"	1-1/8"	5/8"
QS-31-SS	304 SS	5/16"	.325	1"	1-1/8"	5/8"
QS-37-AL	6061T6	3/8"	.385	1"	1-1/8"	5/8"
QS-37-BR	Brass	3/8"	.385	1"	1-1/8"	5/8"
QS-37-SS	304 SS	3/8"	.385	1"	1-1/8"	5/8"
QS-50-AL	6061T6	1/2"	.515	1-1/4"	1-3/8"	3/4"
QS-50-BR	Brass	1/2"	.515	1-1/4"	1-3/8"	3/4"
QS-50-SS	304 SS	1/2"	.515	1-1/4"	1-3/8"	3/4"
QS-62-AL	6061T6	5/8"	.640	1-1/4"	1-3/8"	3/4"
QS-62-BR	Brass	5/8"	.640	1-1/4"	1-3/8"	3/4"
QS-62-SS	304 SS	5/8"	.640	1-1/4"	1-3/8"	3/4"
QS-75-AL	6061T6	3/4"	.765	1-1/2"	1-3/8"	7/8"
QS-75-BR	Brass	3/4"	.765	1-1/2"	1-3/8"	7/8"
QS-75-SS	304 SS	3/4"	.765	1-1/2"	1-3/8"	7/8"
QS-87-AL	6061T6	7/8"	.890	1-3/4"	1-1/2"	1-1/8"
QS-87-BR	Brass	7/8"	.890	1-3/4"	1-1/2"	1-1/8"
QS-87-SS	304 SS	7/8"	.890	1-3/4"	1-1/2"	1-1/8"
QS-100-AL	6061T6	1"	1.015	1-3/4"	1-1/2"	1-1/8"
QS-100-BR	Brass	1"	1.015	1-3/4"	1-1/2"	1-1/8"
QS-100-SS	304 SS	1"	1.015	1-3/4"	1-1/2"	1-1/8"
QS-112-AL	6061T6	1-1/8"	1.140	1-7/8"	1-1/2"	1-3/8"
QS-112-BR	Brass	1-1/8"	1.140	1-7/8"	1-1/2"	1-3/8"
QS-112-SS	304 SS	1-1/8"	1.140	1-7/8"	1-1/2"	1-3/8"
QS-125-AL	6061T6	1-1/4"	1.265	2"	1-3/4"	1-1/2"
QS-125-BR	Brass	1-1/4"	1.265	2"	1-3/4"	1-1/2"
QS-125-SS	304 SS	1-1/4"	1.265	2"	1-3/4"	1-1/2"
QS-137-AL	6061T6	1-3/8"	1.390	2-1/8"	1-7/8"	1-5/8"
QS-137-BR	Brass	1-3/8"	1.390	2-1/8"	1-7/8"	1-5/8"
QS-137-SS	304 SS	1-3/8"	1.390	2-1/8"	1-7/8"	1-5/8"
QS-150-AL	6061T6	1-1/2"	1.515	2-1/4"	2"	1-3/4"
QS-150-BR	Brass	1-1/2"	1.515	2-1/4"	2"	1-3/4"
QS-150-SS	304 SS	1-1/2"	1.515	2-1/4"	2"	1-3/4"
QS-162-AL	6061T6	1-5/8"	1.640	2-3/8"	2-1/8"	1-7/8"
QS-162-BR	Brass	1-5/8"	1.640	2-3/8"	2-1/8"	1-7/8"
QS-162-SS	304 SS	1-5/8"	1.640	2-3/8"	2-1/8"	1-7/8"
QS-175-AL	6061T6	1-3/4"	1.765	2-1/2"	2-1/4"	2"
QS-175-BR	Brass	1-3/4"	1.765	2-1/2"	2-1/4"	2"
QS-175-SS	304 SS	1-3/4"	1.765	2-1/2"	2-1/4"	2"
QS-200-AL	6061T6	2"	2.015	2-3/4"	2-1/2"	2-1/4"
QS-200-BR	Brass	2"	2.015	2-3/4"	2-1/2"	2-1/4"
QS-200-SS	304 SS	2"	2.015	2-3/4"	2-1/2"	2-1/4"
QS-212-AL	6061T6	2-1/8"	2.140	2-7/8"	2-1/2"	2-1/4"
QS-212-BR	Brass	2-1/8"	2.140	2-7/8"	2-1/2"	2-1/4"
QS-212-SS	304 SS	2-1/8"	2.140	2-7/8"	2-1/2"	2-1/4"



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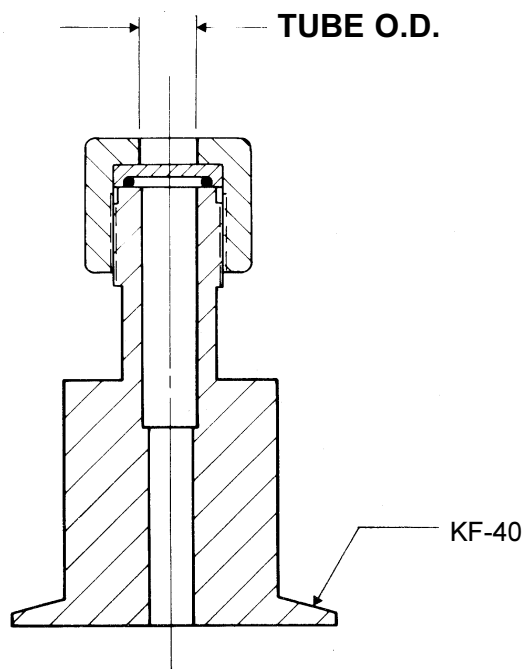




Leak Detector Adapter Fittings

- Brass construction
- 1-1/8" port to compressi
- Viton® O-ring

Part Number	Tube O.D.
LQ-06	1/16"
LQ-09	3/32"
LQ-12	1/8"
LQ-25	1/4"
LQ-31	5/16"
LQ-37	3/8"
LQ-50	1/2"
LQ-62	5/8"
LQ-75	3/4"
LQ-87	7/8"
LQ-100	1"
LQ-112	1-1/8"
LQ-125	1-1/4"
LQ-137	1-3/8"
LQ-150	1-1/2"
LQ-162	1-5/8"
LQ-175	1-3/4"
LQ-200	2"
LQ-212	2-1/8"



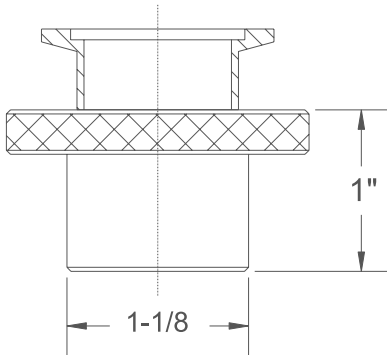
Leak Detector Adapter Fittings

- Brass Construction
- ISO-NW 40 to compression seal,
- Viton® O-ring

Part Number	Tube O.D.
LK-06	1/16"
LK-09	3/32"
LK-12	1/8"
LK-18	3/16"
LK-25	1/4"
LK-31	5/16"
LK-37	3/8"
LK-50	1/2"
LK-62	5/8"
LK-75	3/4"
LK-87	7/8"
LK-100	1"
LK-112	1-1/8"
LK-125	1-1/4"
LK-137	1-3/8"
LK-150	1-1/2"
LK-162	1-5/8"
LK-175	1-3/4"
LK-200	2"
LK-212	2-1/8"



Leak Detector Adapter Fittings, Plug Seals, Brass and Stainless Steel

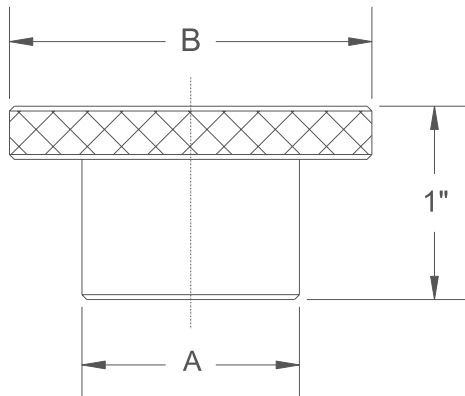


Leak Detector Adapter Fittings

- Stainless steel 304 construction
- 1-1/8" port to ISO-NW

Part Number	ISO-NW
LDF-16	NW 16
LDF-25	NW 25
LDF-40	NW 40
LDF-50	NW 50

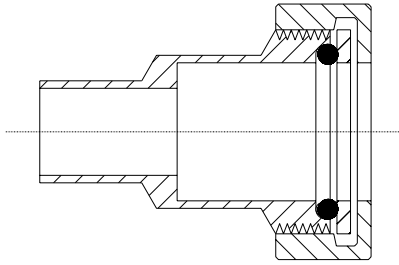
Plug Seals



Part Number	Material	A	B
PS-06	Brass	1/16"	5/8"
PS-06-SS	304 SS	1/16"	5/8"
PS-09	Brass	3/32"	5/8"
PS-09-SS	304 SS	3/32"	5/8"
PS-12	Brass	1/8"	5/8"
PS-12-SS	304 SS	1/8"	5/8"
PS-18	Brass	3/16"	5/8"
PS-18-SS	304 SS	3/16"	5/8"
PS-25	Brass	1/4"	5/8"
PS-25-SS	304 SS	1/4"	5/8"
PS-31	Brass	5/16"	1"
PS-31-SS	304 SS	5/16"	1"
PS-37	Brass	3/8"	1"
PS-37-SS	304 SS	3/8"	1"
PS-50	Brass	1/2"	1-1/4"
PS-50-SS	304 SS	1/2"	1-1/4"
PS-62	Brass	5/8"	1-1/4"
PS-62-SS	304 SS	5/8"	1-1/4"
PS-75	Brass	3/4"	1-1/2"
PS-75-SS	304 SS	3/4"	1-1/2"
PS-87	Brass	7/8"	1-3/4"
PS-87-SS	304 SS	7/8"	1-3/4"
PS-100	Brass	1"	1-3/4"
PS-100-SS	304 SS	1"	1-3/4"
PS-112	Brass	1-1/8"	1-7/8"
PS-112-SS	304 SS	1-1/8"	1-7/8"
PS-125	Brass	1-1/4"	2"
PS-125-SS	304 SS	1-1/4"	2"
PS-137	Brass	1-3/8"	2-1/8"
PS-137-SS	304 SS	1-3/8"	2-1/8"
PS-150	Brass	1-1/2"	2-1/4"
PS-150-SS	304 SS	1-1/2"	2-1/4"
PS-162	Brass	1-5/8"	2-3/8"
PS-162-SS	304 SS	1-5/8"	2-3/8"
PS-175	Brass	1-3/4"	2-1/2"
PS-175-SS	304 SS	1-3/4"	2-1/2"
PS-200	Brass	2"	2-3/4"
PS-200-SS	304 SS	2"	2-3/4"
PS-212	Brass	2-1/8"	2-7/8"
PS-212-SS	304 SS	2-1/8"	2-7/8"

Compression Fittings, Adapters

The **CPB / CPS SERIES** adapters for gauge tubes are intended to allow the user to use standard gauge tubes in existing equipment with non standard ports. These adapters are available in brass and stainless steel bodies and are complete with Viton® O-ring.

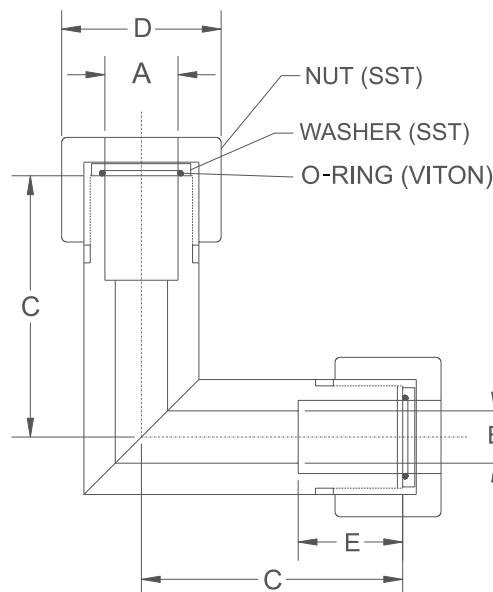


Specifications:

Part Number	Description
CPB-625-750-BR	Brass 5/8" OD male tube to 3/4" compression
CPB-709-750-BR	Brass .709 OD male tube to 3/4" compression
CPB-750-1000-BR	Brass 3/4" OD male tube to 1" compression
CPS-625-750-SS	Stainless steel 5/8" OD male tube to 3/4" compression
CPS-709-750-SS	Stainless steel .709 OD male tube to 3/4" compression
CPS-750-1000-SS	Stainless steel 3/4" OD male tube to 1" compression fitting

90° Union Elbow compression adapter

The **ELC SERIES** compression adapters are intended to connect fractional tubes and the bodies are manufactured from 304 stainless steel and are electropolished and are helium leak tested at 3×10^{-9} torr and are supplied with nut, washer and Viton® O-ring



Specifications:

Part Number	Description	A	B	C	D	E
ELC-25	For 1/4" OD tube	.265	.187	7/8"	1/2"	5/8"
ELC-37	For 3/8" OD tube	.385	.312	1-1/2"	1"	1"
ELC-50	For 1/2" OD tube	.515	.437	1-1/2"	1"	1-1/4"



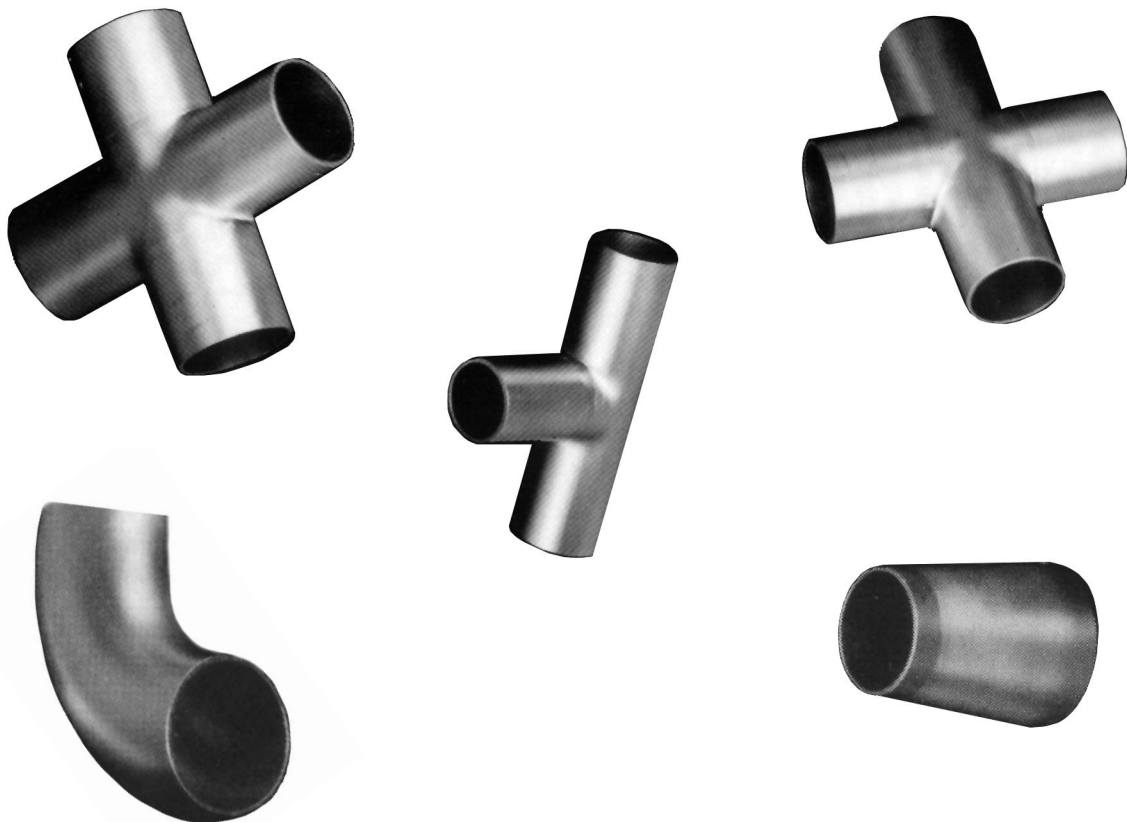
WELD FITTINGS

KEY HIGH VACUUM BUTT WELD FITTINGS are produced from high quality type 304 stainless steel tubing. All crosses and tees in this catalog are constructed with the pulled port technique, which features full penetration butt welds. This procedure is by far the most desirable method for high vacuum and ultra-high vacuum, as this eliminates entrapment areas that cause virtual leaks. This assures rapid pumpdown of your system and minimizes outgassing. The standard finish on these fittings is a glass bead type with all burrs removed. Upon request, electropolished fittings can be supplied, as well as fittings constructed of type 316 stainless steel.

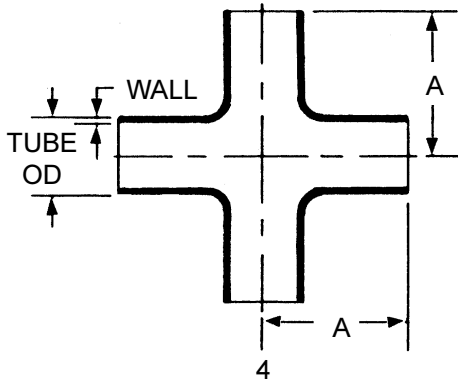
Resulting from numerous requests we have received, new in this catalog are concentric reducers for minimal conductance loss, and reducer crosses.

Designed to be used as (building-block) components with KF (rough vacuum), ISO and ASA (high vacuum) and Metal Sealing Flanges (ultra-high vacuum), all fittings are easily welded using TIG (tungsten inert gas) fusion weld process. This is the correct procedure for clean vacuum quality welds. Filler rod is not used.

All **KEY** Butt Weld Fittings are cleaned, packaged and ready for immediate use. All welds are leak tested on a helium mass spectrometer having a sensitivity of 5×10^{-10} std cc/sec and exhibit no leakage.



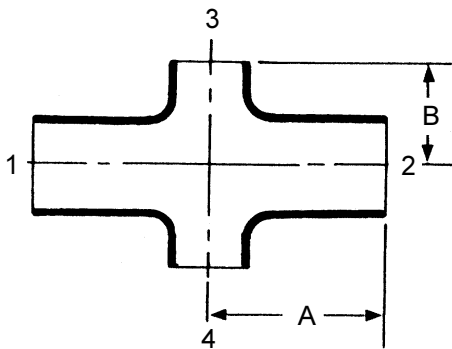
KEY Stainless Steel Weld Fittings



4-Way Cross

Part Number	Tube OD	Wall	A
CRS50-SS4	.50	.065	.75
CRS75-SS4	.75	.065	1.00
CRS100-SS4	1.00	.065	1.88
CRS150-SS4	1.50	.065	2.25
CRS200-SS4	2.00	.065	3.00
CRS250-SS4	2.50	.065	3.00
CRS300-SS4	3.00	.065	3.25
CRS400-SS4	4.00	.083	3.88
CRS500-SS4	5.00	.083	4.25
CRS600-SS4	6.00	.109	5.00

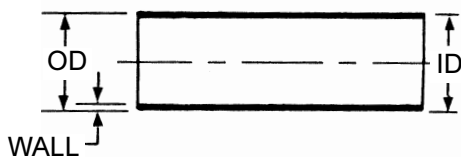
Reducer cross



Part Number	Arm OD	Leg OD	A	B
CRS100-50-SS4	1.00	.50	1.88	1.50
CRS100-75-SS4	1.00	.75	1.88	2.00
CRS150-50-SS4	1.50	.50	2.25	1.75
CRS150-75-SS4	1.50	.75	2.25	2.25
CRS150-100-SS4	1.50	1.00	2.25	2.13
CRS200-75-SS4	2.00	.75	3.00	2.50
CRS200-150-SS4	2.00	1.50	3.00	2.50
CRS250-150-SS4	2.50	1.50	3.00	2.75
CRS250-200-SS4	2.50	2.00	3.00	3.25
CRS300-150-SS4	3.00	1.50	3.25	3.00
CRS300-200-SS4	3.00	2.00	3.25	3.50
CRS300-250-SS4	3.00	2.50	3.25	3.25
CRS400-150-SS4	4.00	1.50	3.88	3.50
CRS400-200-SS4	4.00	2.00	3.88	4.00
CRS400-250-SS4	4.00	2.50	3.88	3.75
CRS400-300-SS4	4.00	3.00	3.88	3.75
CRS500-400-SS4	5.00	4.00	4.50	4.38
CRS600-250-SS4	6.00	2.50	5.00	4.75
CRS600-300-SS4	6.00	3.00	5.00	4.75
CRS600-400-SS4	6.00	4.00	5.00	4.88
CRS600-500-SS4	6.00	5.00	5.00	5.00
CRS800-600-SS4	8.00	6.00	6.00	6.00

Tubing

- Tube ends deburred
- Cut to length, sold per foot

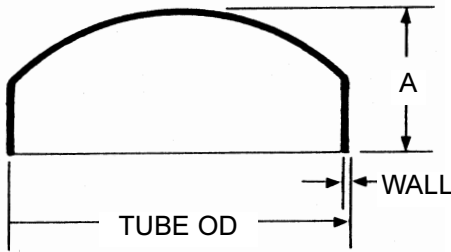


Part Number	OD	ID	Wall
SST50	.50	.402	.049
SST75	.75	.680	.065
SST100	1.00	.870	.065
SST150	1.50	1.370	.065
SST200	2.00	1.870	.065
SST250	2.50	2.370	.065
SST300	3.00	2.870	.083
SST400	4.00	3.834	.083
SST600	6.00	5.834	.083



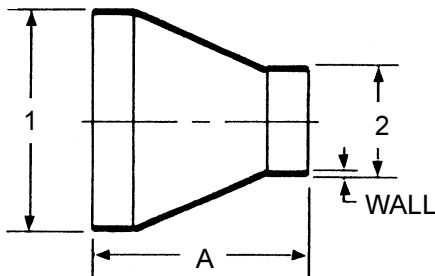
KEY Stainless Steel Weld Fittings

End Caps



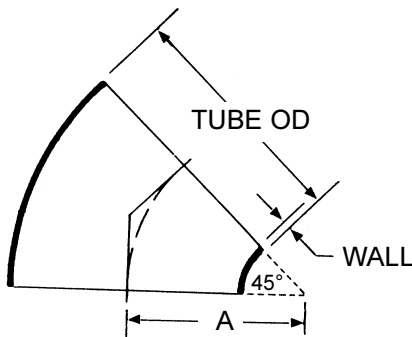
Part Number	Tube OD	Wall	A
EC50	.50	.065	.25
EC75	.75	.065	.31
EC100	1.00	.065	.37
EC150	1.50	.065	.56
EC200	2.00	.065	.75
EC250	2.50	.065	1.00
EC300	3.00	.065	1.25
EC400	4.00	.083	1.50
EC600	6.00	.109	2.00

Conical Reducers



Part Number	Tube OD 1	Tube OD 2	A	Wall
CR75-100	1.00	.75	2.375	.065
CR75-150	1.50	.75	2.375	.065
CR100-150	1.50	1.00	2.375	.065
CR100-200	2.00	1.00	2.375	.065
CR150-200	2.00	1.50	2.375	.065
CR150-250	2.50	1.50	2.375	.065
CR200-250	2.50	2.00	2.375	.065
CR150-300	3.00	1.50	3.625	.065
CR200-300	3.00	2.00	3.625	.065
CR250-300	3.00	2.50	3.625	.065
CR200-400	4.00	2.00	3.625	.065
CR250-400	4.00	2.50	3.625	.065
CR300-400	4.00	3.00	3.625	.065
CR300-600	6.00	3.00	9.000	.083
CR400-600	6.00	4.00	9.000	.083

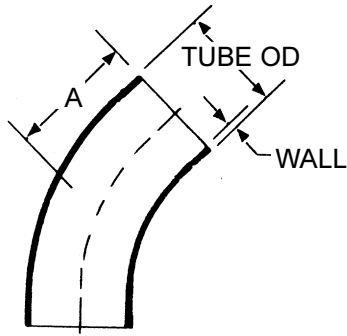
45° Radius Elbow



Part Number	Tube OD	Wall	A
EL050-45SS	.50	.065	.75
EL075-45SS	.75	.065	1.00
EL100-45SS	1.00	.065	1.50
EL150-45SS	1.50	.065	2.25
EL200-45SS	2.00	.065	3.00
EL250-45SS	2.50	.065	3.75
EL300-45SS	3.00	.065	4.50
EL400-45SS	4.00	.083	6.00
EL600-45SS	6.00	.109	9.00

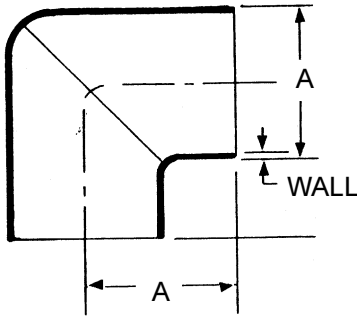


KEY Stainless Steel Weld Fittings



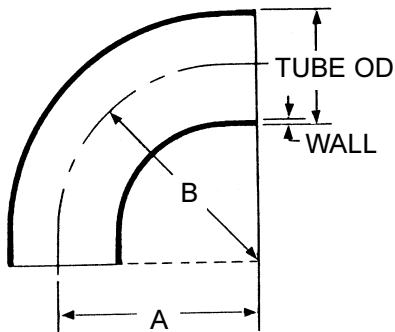
45° Radius Tangent Elbow

Part Number	Tube OD	Wall	A
EL075-45TSS	.75	.065	.764
EL100-45TSS	1.00	.065	1.187
EL150-45TSS	1.50	.065	1.625
EL200-45TSS	2.00	.065	2.312
EL250-45TSS	2.50	.065	2.995
EL300-45TSS	3.00	.083	3.683
EL400-45TSS	4.00	.083	4.812



90° Mitered Elbow

Part Number	Tube OD	Wall	A
EL075-90MSS	.75	.065	1.00
EL100-90MSS	1.00	.065	1.88
EL150-90MSS	1.50	.065	2.25
EL200-90MSS	2.00	.065	3.00
EL250-90MSS	2.50	.065	3.00
EL300-90MSS	3.00	.083	3.25
EL400-90MSS	4.00	.083	3.88
EL500-90MSS	5.00	.083	4.25
EL600-90MSS	6.00	.083	5.00



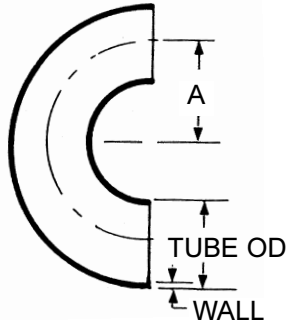
90° Radius Elbow

Part Number	Tube OD	Wall	A	B
EL50-90SS	.50	.065	.75	.75
EL75-90SS	.75	.065	1.12	1.12
EL100-90SS	1.00	.065	1.50	1.50
EL150-90SS	1.50	.065	2.25	2.25
EL200-90SS	2.00	.065	3.00	3.00
EL250-90SS	2.50	.065	3.75	3.75
EL300-90SS	3.00	.083	4.50	4.50
EL400-90SS	4.00	.083	6.00	6.00
EL600-90SS	6.00	.109	9.00	9.00

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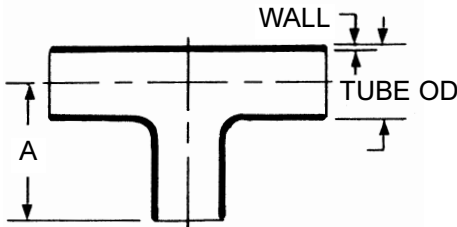


KEY Stainless Steel Weld Fittings



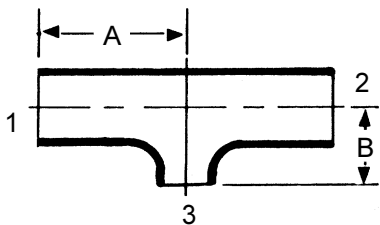
180° U-BEND Radius Elbow

Part Number	Tube OD	Wall	A
EL50-180SS	.50	.065	.75
EL75-180SS	.75	.065	1.12
EL100-180SS	1.00	.065	1.50
EL150-180SS	1.50	.065	2.25
EL200-180SS	2.00	.065	3.00
EL300-180SS	3.00	.065	4.50
EL400-180SS	4.00	.083	6.00



Tee

Part Number	Tube OD	Wall	A
T50-SS	.50	.065	.75
T75-SS	.75	.065	1.88
T100-SS	1.00	.065	1.88
T150-SS	1.50	.065	2.25
T200-SS	2.00	.065	3.00
T250-SS	2.50	.065	3.00
T300-SS	3.00	.065	3.25
T400-SS	4.00	.083	3.88
T500-SS	5.00	.083	4.25
T600-SS	6.00	.083	5.50



Reducer Tee

Part Number	Arm OD	Leg OD	A	B
T100-50-SS	1.00	.50	1.88	1.50
T100-75-SS	1.00	.75	1.88	2.00
T150-50-SS	1.50	.50	2.25	1.75
T150-75-SS	1.50	.75	2.25	2.25
T150-100-SS	1.50	1.00	2.25	2.13
T200-75-SS	2.00	.75	3.00	2.50
T200-100-SS	2.00	1.00	3.00	2.37
T200-150-SS	2.00	1.50	3.00	2.50
T250-150-SS	2.50	1.50	3.00	2.75
T250-200-SS	2.50	2.00	3.00	3.25
T300-150-SS	3.00	1.50	3.25	3.00
T300-200-SS	3.00	2.00	3.25	3.50
T300-250-SS	3.00	2.50	3.25	3.25
T400-150-SS	4.00	1.50	3.88	3.50
T400-200-SS	4.00	2.00	3.88	4.00
T400-250-SS	4.00	2.50	3.88	3.75
T400-300-SS	4.00	3.00	3.88	3.75
T500-400-SS	5.00	4.00	4.50	4.38
T600-250-SS	6.00	2.50	5.00	4.75
T600-400-SS	6.00	4.00	5.00	4.88
T600-500-SS	6.00	5.00	5.00	5.00
T800-600-SS	8.00	6.00	6.00	6.00



FS Series Vacuum Flange Sets

Features:

- Available in Brass and Type 304 stainless steel
- Set includes Viton® O-ring and bolts
- Available for 1/4" OD to 6" OD tube
- Available as individual units



Description:

These versatile flange sets are manufactured in a complete line to match most standard tube diameters. These flanges are machined to at least a #32 finish or better. **FS SERIES** flanges are designed to be effective to 5 x 10⁻⁸ torr and are bakeable to 200°C.

Ordering Information Suffix of -BR = Brass, Suffix of -SS = Stainless Steel

Part Number	C'bore dia.	C'bore Depth	Bore dia.	Flange Dia.	Bolt Circle	# of holes / Size	Flange Width
FS-25-BR	.258	1/16"	3/16"	1-1/8"	7/8"	3 holes 5/32"	3/16"
FS-25-SS	.258	1/16"	3/16"	1-1/8"	7/8"	3 holes 5/32"	3/16"
FS-37-BR	.388	1/16"	5/16"	1-1/8"	7/8"	3 holes 5/32"	1/4"
FS-37-SS	.388	1/16"	5/16"	1-1/8"	7/8"	3 holes 5/32"	1/4"
FS-50-BR	.508	3/32"	3/8"	1-3/8"	1-1/8"	3 holes 11/64"	1/4"
FS-50-SS	.508	3/32"	3/8"	1-3/8"	1-1/8"	3 holes 11/64"	1/4"
FS-62-BR	.633	3/32"	1/2"	1-3/8"	1-1/8"	3 holes 11/64"	1/4"
FS-62-SS	.633	3/32"	1/2"	1-3/8"	1-1/8"	3 holes 11/64"	1/4"
FS-75-BR	.765	3/32"	5/8"	1-3/4"	1-13/32"	3 holes 11/64"	1/4"
FS-75-SS	.765	3/32"	5/8"	1-3/4"	1-13/32"	3 holes 11/64"	1/4"
FS-100-BR	1.008	1/8"	7/8"	2-1/4"	1-3/4"	3 holes 7/32"	5/16"
FS-100-SS	1.008	1/8"	7/8"	2-1/4"	1-3/4"	3 holes 7/32"	5/16"
FS-112-BR	1.133	1/8"	1"	2-1/4"	1-3/4"	3 holes 7/32"	5/16"
FS-112-SS	1.133	1/8"	1"	2-1/4"	1-3/4"	3 holes 7/32"	5/16"
FS-150-BR	1.510	1/8"	1-1/4"	3"	2-9/16"	3 holes 7/32"	5/16"
FS-150-SS	1.510	1/8"	1-1/4"	3"	2-9/16"	4 holes 17/64"	5/16"
FS-162-BR	1.635	1/8"	1-3/8"	3"	2-9/16"	4 holes 17/64"	5/16"
FS-162-SS	1.635	1/8"	1-3/8"	3"	2-9/16"	4 holes 17/64"	5/16"
FS-200-BR	2.010	5/32"	1-3/4"	3-1/2"	3"	4 holes 17/64"	3/8"
FS-200-SS	2.010	5/32"	1-3/4"	3-1/2"	3"	4 holes 17/64"	3/8"
FS-212-BR	2.135	5/32"	1-7/8"	3-1/2"	3"	4 holes 17/64"	3/8"
FS-212-SS	2.135	5/32"	1-7/8"	3-1/2"	3"	4 holes 17/64"	3/8"
FS-250-BR	2.510	5/32"	2-1/4"	4"	3-1/2"	4 holes 17/64"	3/8"
FS-250-SS	2.510	5/32"	2-1/4"	4"	3-1/2"	4 holes 17/64"	3/8"
FS-300-BR	3.010	3/16"	2-3/4"	5"	4-1/4"	6 holes 17/64"	7/16"
FS-300-SS	3.010	3/16"	2-3/4"	5"	4-1/4"	6 holes 17/64"	7/16"
FS-312-BR	3.135	3/16"	2-7/8"	5"	4-1/4"	6 holes 17/64"	7/16"
FS-312-SS	3.135	3/16"	2-7/8"	5"	4-1/4"	6 holes 17/64"	7/16"
FS-400-BR	4.010	1/4"	3-3/4"	6"	5-1/4"	6 holes 21/64"	1/2"
FS-400-SS	4.010	1/4"	3-3/4"	6"	5-1/4"	6 holes 21/64"	1/2"
FS-412-BR	4.135	1/4"	3-7/8"	6"	5-1/4"	6 holes 21/64"	1/2"
FS-412-SS	4.135	1/4"	3-7/8"	6"	5-1/4"	6 holes 21/64"	1/2"
FS-500-BR	5.010	1/4"	4-3/4"	7"	6-1/4"	6 holes 21/64"	1/2"
FS-500-SS	5.010	1/4"	4-3/4"	7"	6-1/4"	6 holes 21/64"	1/2"
FS-600-BR	6.010	1/4"	5-3/4"	8"	7-1/8"	8 holes 21/64"	1/2"
FS-600-SS	6.010	1/4"	5-3/4"	8"	7-1/8"	8 holes 21/64"	1/2"

Note: Individual flanges may be ordered, see examples below.

FS-150-BR-1 (Bored flange 1.5", Brass)

FS-150-BR-O (Bored flange, 1.5", Brass, With O-ring Groove)

FS-150-BR-BL (Blank flange, Brass)

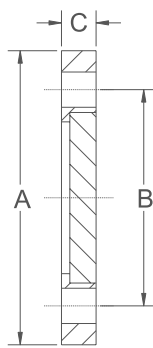
FS-150-BR-BL-O (Blank flange, Brass, With O-ring Groove)

Price structure is determined by taking the price of the set and dividing by two.

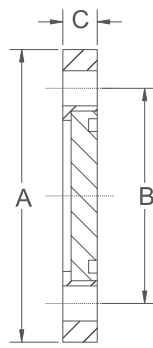
Examples: **FS-150-BR** = \$ 48.00 ÷ 2 = \$ 24.00



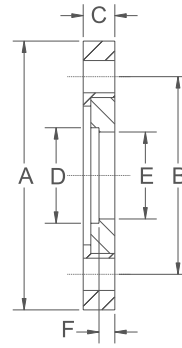
Rotatable ASA Flanges



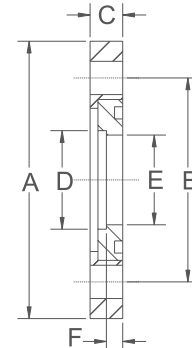
Plain



Plain with O-Ring



Bored



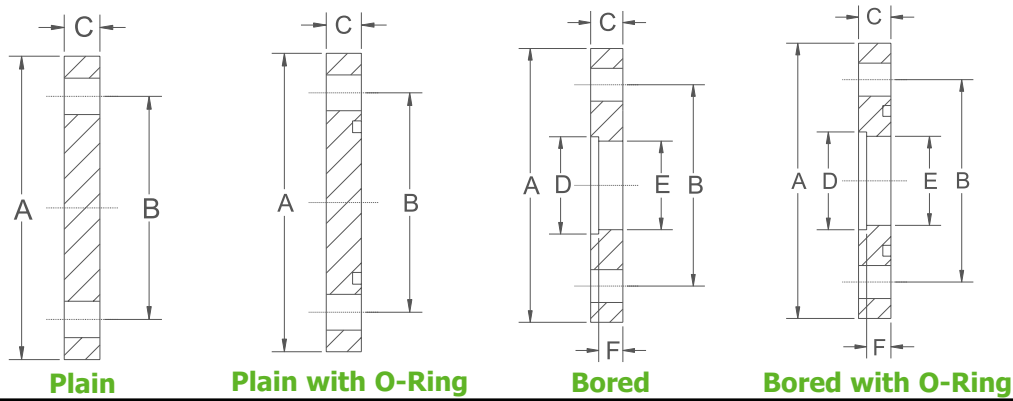
Bored with O-Ring

Part Number	A Flange Dia	B	C	D	E	F	Number of Holes	Hole Dia	O-Ring No.
R-ASA-4-P	4.250"	3.125"	.500"	-	-	-	4	.625"	-
R-ASA-4-P-O	4.250"	3.125"	.500"	-	-	-	4	.625"	2-226
R-ASA-4-B	4.250"	3.125"	.500"	1.510"	1.375"	.250"	4	.625"	-
R-ASA-4-B-O	4.250"	3.125"	.500"	1.510"	1.375"	.250"	4	.625"	2-226
R-ASA-5-P	5.000"	3.880"	.500"	-	-	-	4	.625"	-
R-ASA-5-P-O	5.000"	3.880"	.500"	-	-	-	4	.625"	2-231
R-ASA-5-B	5.000"	3.880"	.500"	2.010"	1.875"	.250"	4	.625"	-
R-ASA-5-B-O	5.000"	3.880"	.500"	2.010"	1.875"	.250"	4	.625"	2-231
R-ASA-5-B-25	5.000"	3.880"	.500"	2.510"	2.375"	.250"	4	.625"	-
R-ASA-5-B-25-O	5.000"	3.880"	.500"	2.510"	2.375"	.250"	4	.625"	2-231
R-ASA-6-P	6.000"	4.750"	.625"	-	-	-	4	.687"	-
R-ASA-6-P-O	6.000"	4.750"	.625"	-	-	-	4	.687"	2-238
R-ASA-6-B	6.000"	4.750"	.625"	3.010"	2.937"	.312"	4	.687"	-
R-ASA-6-B-O	6.000"	4.750"	.625"	3.010"	2.937"	.312"	4	.687"	2-238
R-ASA-6-B-35	6.000"	4.750"	.625"	3.510"	3.437"	.312"	4	.687"	-
R-ASA-6-B-35-O	6.000"	4.750"	.625"	3.510"	3.437"	.312"	4	.687"	2-239
R-ASA-7-P	7.500"	6.000"	.625"	-	-	-	4	.750"	-
R-ASA-7-P-O	7.500"	6.000"	.625"	-	-	-	4	.750"	2-243
R-ASA-7-B	7.500"	6.000"	.625"	4.015"	3.875"	.312"	4	.750"	-
R-ASA-7-B-O	7.500"	6.000"	.625"	4.015"	3.875"	.312"	4	.750"	2-243
R-ASA-9-P	9.000"	7.500"	.625"	-	-	-	8	.687"	-
R-ASA-9-P-O	9.000"	7.500"	.625"	-	-	-	8	.687"	2-258
R-ASA-9-B	9.000"	7.500"	.625"	4.015"	3.875"	.312"	8	.687"	-
R-ASA-9-B-O	9.000"	7.500"	.625"	4.015"	3.875"	.312"	8	.687"	2-258
R-ASA-9-B-6	9.000"	7.500"	.625"	6.025"	5.875"	.312"	8	.687"	-
R-ASA-9-B-6-O	9.000"	7.500"	.625"	6.025"	5.875"	.312"	8	.687"	2-258
R-ASA-11-P	11.000"	9.500"	.750"	-	-	-	8	.812"	-
R-ASA-11-P-O	11.000"	9.500"	.750"	-	-	-	8	.812"	2-266
R-ASA-11-B	11.000"	9.500"	.750"	6.025"	5.875"	.375"	8	.812"	-
R-ASA-11-B-O	11.000"	9.500"	.750"	6.025"	5.875"	.375"	8	.812"	2-266
R-ASA-11-B-8	11.000"	9.500"	.750"	8.025"	7.875"	.375"	8	.812"	-
R-ASA-11-B-8-O	11.000"	9.500"	.750"	8.025"	7.875"	.375"	8	.812"	2-266
R-ASA-13-P	13.500"	11.750"	.750"	-	-	-	8	.812"	-
R-ASA-13-P-O	13.500"	11.750"	.750"	-	-	-	8	.812"	2-274
R-ASA-13-B	13.500"	11.750"	.750"	8.025"	7.875"	.375"	8	.812"	-
R-ASA-13-B-O	13.500"	11.750"	.750"	8.025"	7.875"	.375"	8	.812"	2-274
R-ASA-13-B-10	13.500"	11.750"	.750"	10.025"	9.875"	.375"	8	.812"	-
R-ASA-13-B-10-O	13.500"	11.750"	.750"	10.025"	9.875"	.375"	8	.812"	2-274
R-ASA-16-P	16.000"	14.250"	.750"	-	-	-	12	.812"	-
R-ASA-16-P-O	16.000"	14.250"	.750"	-	-	-	12	.812"	2-278
R-ASA-16-B	16.000"	14.250"	.750"	10.025"	9.875"	.375"	12	.812"	-
R-ASA-16-B-O	16.000"	14.250"	.750"	10.025"	9.875"	.375"	12	.812"	2-278
R-ASA-16-B-12	16.000"	14.250"	.750"	12.025"	11.875"	.375"	12	.812"	-
R-ASA-16-B-12-O	16.000"	14.250"	.750"	12.025"	11.875"	.375"	12	.812"	2-278

* Price on request



Non-Rotatable ASA Flanges



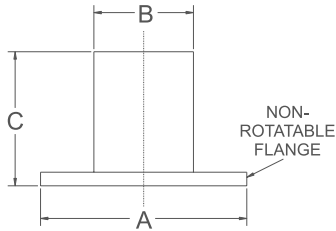
Part Number	A Flange Dia	B	C	D	E	F	Number of Holes	Hole Dia	O-Ring No.
ASA-4-P	4.250"	3.125"	.500"	-	-	-	4	.625"	-
ASA-4-P-O	4.250"	3.125"	.500"	-	-	-	4	.625"	2-226
ASA-4-B	4.250"	3.125"	.500"	1.510"	1.375"	.375"	4	.625"	-
ASA-4-B-O	4.250"	3.125"	.500"	1.510"	1.375"	.375"	4	.625"	2-226
ASA-5-P	5.000"	3.880"	.500"	-	-	-	4	.625"	-
ASA-5-P-O	5.000"	3.880"	.500"	-	-	-	4	.625"	2-231
ASA-5-B	5.000"	3.880"	.500"	2.010"	1.875"	.375"	4	.625"	-
ASA-5-B-O	5.000"	3.880"	.500"	2.010"	1.875"	.375"	4	.625"	2-231
ASA-5-B-25	5.000"	3.880"	.500"	2.510"	2.375"	.375"	4	.625"	-
ASA-5-B-25-O	5.000"	3.880"	.500"	2.510"	2.375"	.375"	4	.625"	2-231
ASA-6-P	6.000"	4.750"	.500"	-	-	-	4	.687"	-
ASA-6-P-O	6.000"	4.750"	.500"	-	-	-	4	.687"	2-238
ASA-6-B	6.000"	4.750"	.500"	3.010"	2.937"	.375"	4	.687"	-
ASA-6-B-O	6.000"	4.750"	.500"	3.010"	2.937"	.375"	4	.687"	2-238
ASA-6-B-35	6.000"	4.750"	.500"	3.510"	3.437"	.375"	4	.687"	-
ASA-6-B-35-O	6.000"	4.750"	.500"	3.510"	3.437"	.375"	4	.687"	2-239
ASA-7-P	7.500"	6.000"	.500"	-	-	-	4	.750"	-
ASA-7-P-O	7.500"	6.000"	.500"	-	-	-	4	.750"	2-243
ASA-7-B	7.500"	6.000"	.500"	4.015"	3.875"	.375"	4	.750"	-
ASA-7-B-O	7.500"	6.000"	.500"	4.015"	3.875"	.375"	4	.750"	2-243
ASA-9-P	9.000"	7.500"	.500"	-	-	-	8	.687"	-
ASA-9-P-O	9.000"	7.500"	.500"	-	-	-	8	.687"	2-259
ASA-9-B	9.000"	7.500"	.500"	4.015"	3.875"	.375"	8	.687"	-
ASA-9-B-O	9.000"	7.500"	.500"	4.015"	3.875"	.375"	8	.687"	2-259
ASA-9-B-6	9.000"	7.500"	.500"	6.025"	5.875"	.375"	8	.687"	-
ASA-9-B-6-O	9.000"	7.500"	.500"	6.025"	5.875"	.375"	8	.687"	2-259
ASA-11-P	11.000"	9.500"	.750"	-	-	-	8	.812"	-
ASA-11-P-O	11.000"	9.500"	.750"	-	-	-	8	.812"	2-266
ASA-11-B	11.000"	9.500"	.750"	6.025"	5.875"	.375"	8	.812"	-
ASA-11-B-O	11.000"	9.500"	.750"	6.025"	5.875"	.375"	8	.812"	2-266
ASA-11-B-8	11.000"	9.500"	.750"	8.025"	7.875"	.375"	8	.812"	-
ASA-11-B-8-O	11.000"	9.500"	.750"	8.025"	7.875"	.375"	8	.812"	2-266
ASA-13-P	13.500"	11.750"	.750"	-	-	-	8	.812"	-
ASA-13-P-O	13.500"	11.750"	.750"	-	-	-	8	.812"	2-274
ASA-13-B	13.500"	11.750"	.750"	8.025"	7.875"	.375"	8	.812"	-
ASA-13-B-O	13.500"	11.750"	.750"	8.025"	7.875"	.375"	8	.812"	2-274
ASA-13-B-10	13.500"	11.750"	.750"	10.025"	9.875"	.375"	8	.812"	-
ASA-13-B-10-O	13.500"	11.750"	.750"	10.025"	9.875"	.375"	8	.812"	2-274
ASA-16-P	16.000"	14.250"	.750"	-	-	-	12	.812"	-
ASA-16-P-O	16.000"	14.250"	.750"	-	-	-	12	.812"	2-278
ASA-16-B	16.000"	14.250"	.750"	10.025"	9.875"	.375"	12	.812"	-
ASA-16-B-O	16.000"	14.250"	.750"	10.025"	9.875"	.375"	12	.812"	2-278
ASA-16-B-12	16.000"	14.250"	.750"	12.025"	11.875"	.375"	12	.812"	-
ASA-16-B-12-O	16.000"	14.250"	.750"	12.025"	11.875"	.375"	12	.812"	2-278

* Price on request



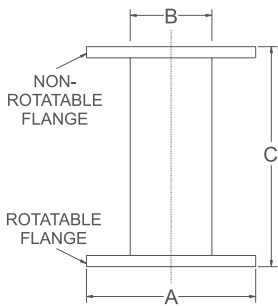
ASA Nipples

ASA Half Nipples



Part Number	A Flange Diameter	B	C
550100	5.00"	2.00"	3-1/4"
550101	5.00"	2.50"	3-1/4"
550102	5.00"	2.50"	4"
550103	6.00"	3.00"	3-1/2"
550104	7.50"	4.00"	4-1/8"
550105	7.50"	4.00"	5-1/8"
550106	9.00"	4.00"	4-1/8"
550107	9.00"	4.00"	5-1/8"
550108	9.00"	6.00"	5-1/4"
550109	9.00"	6.00"	6-5/16"
550110	11.00"	6.00"	5-3/8"
550111	11.00"	6.00"	6-7/16"
550112	11.00"	8.00"	7-3/8"
550113	13.50"	8.00"	7-3/4"
550114	13.50"	10.00"	9-7/8"
550115	16.00"	10.00"	9-7/8"
550116	16.00"	12.00"	9-7/8"

ASA Full Nipples



Part Number	A Flange Diameter	B	C
560100	5.00"	2.00"	6-1/2"
560101	5.00"	2.50"	6-1/2"
560102	5.00"	2.50"	8"
560103	6.00"	3.00"	7"
560104	7.50"	4.00"	8-1/4"
560105	7.50"	4.00"	10-1/4"
560106	9.00"	4.00"	8-1/4"
560107	9.00"	4.00"	10-1/4"
560108	9.00"	6.00"	10-1/2"
560109	9.00"	6.00"	12-5/8"
560110	11.00"	6.00"	10-3/4"
560111	11.00"	6.00"	12-7/8"
560112	11.00"	8.00"	14-3/4"
560113	13.50"	8.00"	15-1/2"
560114	13.50"	10.00"	19-3/4"
560115	16.00"	10.00"	19-3/4"
560116	16.00"	12.00"	19-3/4"

* Price on request

Ordering Information:

Add "-01" to part number if O-Ring required on non-rotatable flange.

Add "-02" to part number if O-Ring required on rotatable flange.

Add "-03" to part number if O-Ring required on both flanges.

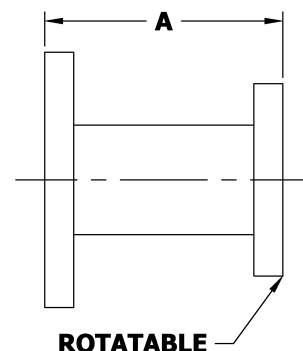
ASA Nipples

ASA Reducers

Part Number	Flange Sizes	A	Tube
RN-ASA-9-5	9" OD to 5" OD	4.50	2" OD
RN-ASA-9-6	9" OD x 6" OD	4.50	3" OD
RN-ASA-9-7.5	9" OD x 7-1/2" OD	4.50	4" OD
RN-ASA-11-5	11" OD x 5" OD	4.75	2" OD
RN-ASA-11-6	11" OD x 6" OD	4.75	3" OD
RN-ASA-11-7.5	11" OD x 7-1/2" OD	4.75	4" OD
RN-ASA-11-9	11" OD x 9" OD	4.75	6" OD
RN-ASA-13.5-9	13-1/2" OD x 9" OD	5.00	6" OD
RN-ASA-13.5-11	13-1/2" OD x 11" OD	5.00	8" OD
RN-ASA-16-11	16" OD x 11" OD	5.00	8" OD
RN-ASA-16-13.5	16" OD x 13-1/2" OD	5.00	10" OD

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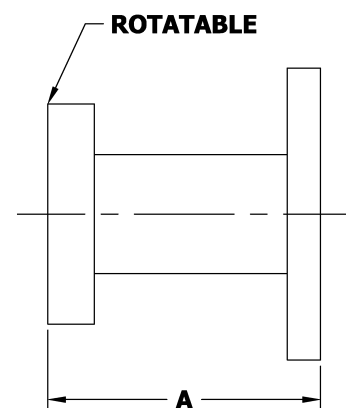
Note: O-ring grooves are available on ASA flanges. Designate which flange is required with O-ring groove; - Add -1OR to suffix of part number. If two o-ring grooves are required; - Add -2OR to suffix of part number. Additional charges will apply, use individual ASA flange sheet for charges.



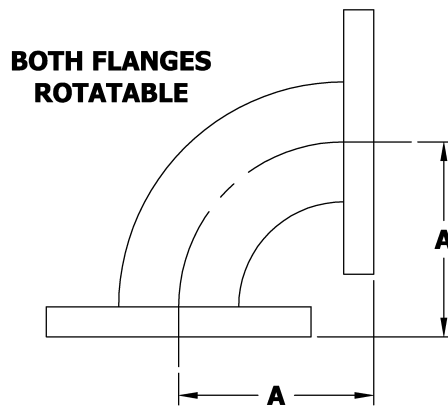
ASA to MET-SEAL Adapter Nipples

Part Number	MET-SEAL OD	ASA OD	A	Tube OD
FN133-ASA4	1-1/3"	4-1/4"	5.00	3/4"
FN133-ASA5	1-1/3"	5"	5.00	3/4"
FN275-ASA5	2-3/4"	5"	5.00	1-1/2"
FN275-ASA6	2-3/4"	6"	5.00	1-1/2"
FN275-ASA7.5	2-3/4"	7-1/2"	5.00	1-1/2"
FN275-ASA9	2-3/4"	9"	5.00	1-1/2"
FN275-ASA11	2-3/4"	11"	5.00	1-1/2"
FN338-ASA5	3-3/8"	5"	5.00	2"
FN338-ASA6	3-3/8"	6"	5.00	2"
FN338-ASA7.5	3-3/8"	7-1/2"	5.00	2"
FN338-ASA9	3-3/8"	9"	5.00	2"
FN338-ASA11	3-3/8"	11"	5.00	2"
FN450-ASA5	4-1/2"	5"	5.00	2-1/2"
FN450-ASA6	4-1/2"	6"	5.00	2-1/2"
FN450-ASA7.5	4-1/2"	7-1/2"	5.00	2-1/2"
FN450-ASA9	4-1/2"	9"	5.00	2-1/2"
FN450-ASA11	4-1/2"	11"	5.00	2-1/2"
FN600-ASA7.5	6"	7-1/2"	5.00	4"
FN600-ASA9	6"	9"	5.00	4"
FN600-ASA11	6"	11"	5.00	4"
FN800-ASA7.5	8"	7-1/2"	5.00	4"
FN800-ASA9	8"	9"	5.00	6"
FN800-ASA11	8"	11"	5.00	6"
FN1000-ASA7.5	10"	7-1/2"	5.00	4"
FN1000-ASA9	10"	9"	5.00	6"
FN1000-ASA11	10"	11"	5.00	8"

Note: O-ring grooves are available on all ASA flanges. Designate which flange is required with O-ring groove; - Add -1OR to suffix of part number. Additional charges will apply, use individual ASA flange sheet for appropriate additional charges.



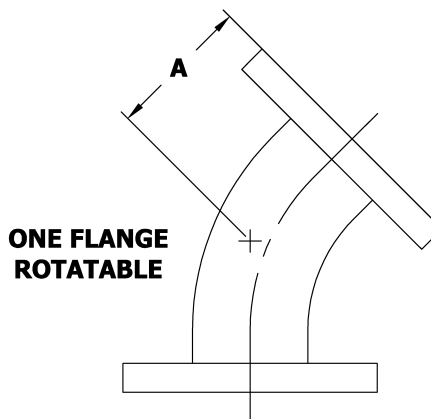
ASA Elbows



ASA 90° Radius Elbows

Part Number	Flange Size	A	Tube OD
EL-ASA-5	5" OD	3.25	2" OD
EL-ASA-6	6" OD	4.75	3" OD
EL-ASA-7.5	7-1/2" OD	6.25	4" OD
EL-ASA-9	9" OD	6.25	4" OD
EL-ASA-11	11" OD	9.37	6" OD
EL-ASA-13.5	13-1/2" OD	12.37	8" OD

Note: O-ring grooves are available on all ASA flanges; - Add **-1OR** to suffix of part number. If two o-ring grooves are required; - Add **-2OR** to suffix of part number. Additional charges will apply, use individual ASA flange sheet for appropriate additional charges.



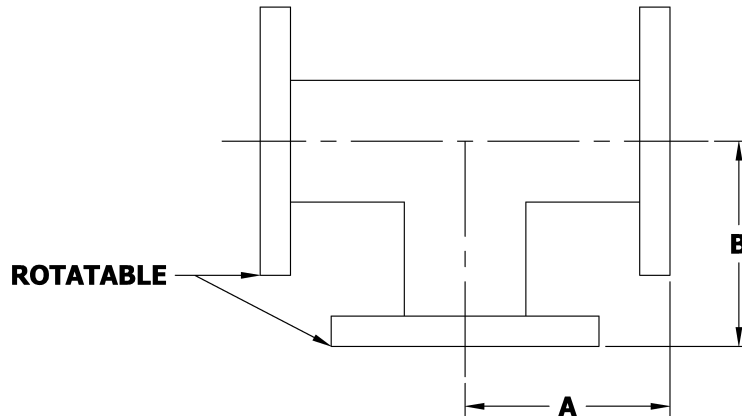
ASA 45° Radius Elbows

Part Number	Flange Size	A	Tube
EL45-ASA-5	5" OD	2.10	2" OD
EL45-ASA-6	6" OD	3.93	3" OD
EL45-ASA-7.5	7-1/2" OD	5.06	4" OD
EL45-ASA-9	9" OD	5.06	4" OD

Note: O-ring grooves are available on all ASA flanges; - Add **-1OR** to suffix of part number. If two o-ring grooves are required; - Add **-2OR** to suffix of part number. Additional charges will apply, use individual ASA flange sheet for appropriate additional charges.



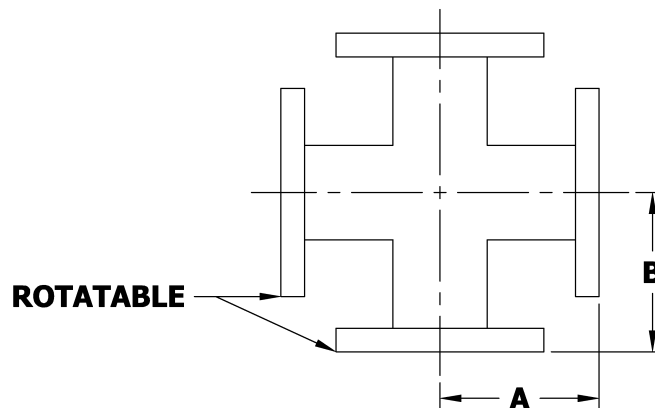
ASA Tees and Crosses



ASA Tees

Part Number	Flange Size	A	B	Tube OD
T-ASA-5	5" OD	3.25	3.25	2"
T-ASA-7.5	7-1/2" OD	5.12	5.12	4"
T-ASA-9-6	9" OD	5.12	5.12	4"
T-ASA-11	11" OD	6.37	6.37	6"
T-ASA-13.5	13-1/2" OD	7.75	7.75	8"

Note: O-ring grooves are available on all ASA flanges. Designate which flange is required with o-ring groove; - Add **-1OR** to suffix of part number. If two o-ring grooves are required; - Add **-2OR** to suffix of part number. Additional charges will apply, use individual ASA flange sheet for appropriate additional charges.



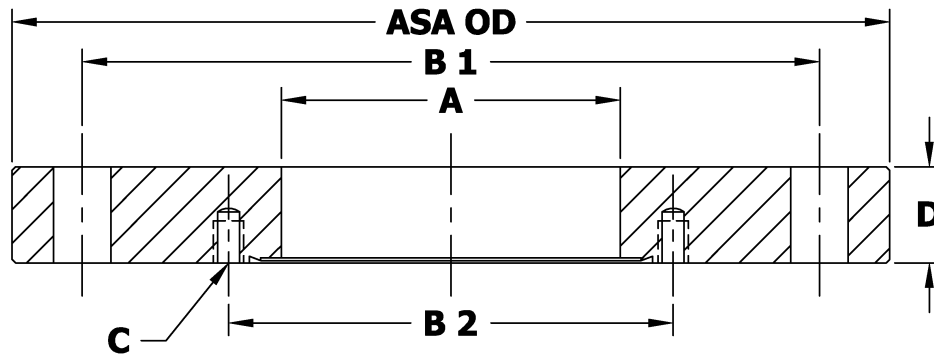
ASA 4 Way Crosses

Part Number	Flange Size	A	B	Tube OD
C-ASA-5	5" OD	3.25	3.25	2"
C-ASA-7.5	7-1/2" OD	5.12	5.12	4"
C-ASA-9-6	9" OD	5.25	5.25	6"
C-ASA-11	11" OD	6.37	6.37	6"
C-ASA-13.5	13-1/2" OD	7.75	7.75	8"

Note: O-ring grooves are available on all ASA flanges. Designate which flange is required with o-ring groove; Add **-1OR** to suffix of part number. If two o-ring grooves are required; - Add **-2OR** to suffix of part number. Additional charges will apply, use individual ASA flange sheet for appropriate additional charges.



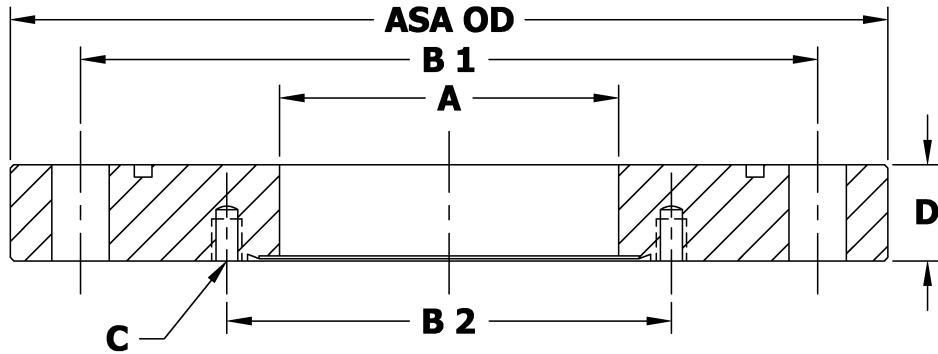
ASA to MET-SEAL Zero Length Reducers



ASA to MET-SEAL Zero Length Reducers Without O-ring Groove

Part Number	ASA OD	B 1	Bolt No.	B 2	A	C	D
ZLR-ASA4-133	4-1/4"	3.12	4	1.062	.62	8-32	.50
ZLR-ASA5-133	5"	3.87	4	1.062	.62	8-32	.50
ZLR-ASA5-275	5"	3.87	4	2.312	1.50	1/4-28	.50
ZLR-ASA6-133	6"	4.75	4	1.062	.62	8-32	.50
ZLR-ASA6-275	6"	4.75	4	2.312	1.50	1/4-28	.50
ZLR-ASA6-338	6"	4.75	4	2.85	2.00	5/16-24	.50
ZLR-ASA7-133	7-1/2"	6.00	4	1.062	.62	8-32	.50
ZLR-ASA7-275	7-1/2"	6.00	4	2.312	1.50	1/4-28	.50
ZLR-ASA7-338	7-1/2"	6.00	4	2.850	2.00	5/16-24	.50
ZLR-ASA9-133	9"	7.50	8	1.062	.62	8-32	.50
ZLR-ASA9-275	9"	7.50	8	2.312	1.50	1/4-28	.50
ZLR-ASA9-338	9"	7.50	8	2.850	2.00	5/16-24	.50
ZLR-ASA9-450	9"	7.50	8	3.625	2.50	5/16-24	.50
ZLR-ASA9-600	9"	7.50	8	5.128	4.00	5/16-24	.50
ZLR-ASA11-133	11"	9.50	8	1.062	.62	8-32	.75
ZLR-ASA11-275	11"	9.50	8	2.312	1.50	1/4-28	.75
ZLR-ASA11-338	11"	9.50	8	2.850	2.00	5/16-24	.75
ZLR-ASA11-450	11"	9.50	8	3.628	2.50	5/16-24	.75
ZLR-ASA11-600	11"	9.50	8	5.128	4.00	5/16-24	.75
ZLR-ASA11-800	11"	9.50	8	7.128	6.00	5/16-24	.75

ASA to MET-SEAL Zero Length Reducers



ASA to MET-SEAL Zero Length Reducer With O-ring Groove

Part Number	ASA OD	B 1	Bolt No.	B 2	A	C	D
ZLR-ASA4-133-O	4-1/4"	3.12	4	1.062	.62	8-32	.50
ZLR-ASA5-133-O	5"	3.87	4	1.062	.62	8-32	.50
ZLR-ASA5-275-O	5"	3.87	4	2.312	1.50	1/4-28	.50
ZLR-ASA6-133-O	6"	4.75	4	1.062	.62	8-32	.50
ZLR-ASA6-275-O	6"	4.75	4	2.312	1.50	1/4-28	.50
ZLR-ASA6-338-O	6"	4.75	4	2.850	2.00	5/16-24	.50
ZLR-ASA7-133-O	7-1/2"	6.00	4	1.062	.62	8-32	.50
ZLR-ASA7-275-O	7-1/2"	6.00	4	2.312	1.50	1/4-28	.50
ZLR-ASA7-338-O	7-1/2"	6.00	4	2.850	2.00	5/16-24	.50
ZLR-ASA9-133-O	9"	7.50	4	1.062	.62	8-32	.50
ZLR-ASA9-275-O	9"	7.50	4	2.312	1.50	1/4-28	.50
ZLR-ASA9-338-O	9"	7.50	4	2.850	2.00	5/16-24	.50
ZLR-ASA9-450-O	9"	7.50	4	3.625	2.50	5/16-24	.50
ZLR-ASA9-600-O	9"	7.50	4	5.128	4.00	5/16-24	.50
ZLR-ASA11-133-O	11"	9.50	8	1.062	.62	8-32	.75
ZLR-ASA11-275-O	11"	9.50	8	2.312	1.50	1/4-28	.75
ZLR-ASA11-338-O	11"	9.50	8	2.850	2.00	5/16-24	.75
ZLR-ASA11-450-O	11"	9.50	8	3.628	2.50	5/16-24	.75
ZLR-ASA11-600-O	11"	9.50	8	5.128	4.00	5/16-24	.75
ZLR-ASA11-800-O	11"	9.50	8	7.128	6.00	5/16-24	.75



Ultra High Vacuum Met-Seal Flanges

Description

KEY MET-SEAL Flanges are manufactured to standards compatible with other Conflat® style flanges to assure interchangeability and are available in sizes from 1-1/3" to 10" diameters. Flanges are offered in rotatable or non-rotatable versions with clearance holes or tapped bolt holes.

Rotatable **MET-SEAL Flanges** consist of a 304 stainless steel receiver and insert which provides for full range of circular motion. This design is appropriate for systems where various components are used interchangeably and for solving alignment problems.

Non-rotatable **MET-SEAL Flanges** are recommended for mating components of fixed locality within the system. Designed as one piece, this style offers a cost saving alternative to rotatable versions.

Material

Only the finest raw materials are used in the manufacturing process of these quality flanges. Sizes 3-3/8" OD and smaller are manufactured from select 304 stainless steel bar stock. Larger flanges are manufactured from specially chosen material fabricated under state-of-the-art melting and vacuum degassing. The cross rolling process of the material breaks up any remaining virtual leak paths.



Fabrication Processes

CNC machining processes are utilized to produce flanges with repeatedly invariable qualities. Efficient, low-cost production methods permit **KEY** to facilitate rapid shipment to your facility

Our manufacturing processes adopt industry standards that have won **KEY** many loyal customers from both the research and semiconductor communities. Standard practices include all internal TIG welded joints or full penetration butt weldments (when internal welds are not possible) and the use of sulphur-free, water-soluble oil for machining.

Specifications

Vacuum range10-13 Torr and below
Temperature operating range.....-196°C to +500°C
Material304 stainless steel
Sealing torque requirement:
Mini and 2-3/4" diameter16 ft/lb maximum
3-3/8" diameter and larger26 ft/lb maximum

Electropolishing

Electropolishing is available for all building block components. This provides for optimum pumpdown within the vacuum system.

Guaranteed Satisfaction

KEY MET-SEAL Flanges and components are warranted to be free of defects due to material and/or workmanship for a period of one year from the date of shipment. Liability of this warranty is limited to repair or replacement of said defective products at **KEY's** election.

Conflat® is a registered trademark of Varian Associates, Inc.



MET-SEAL Flanges



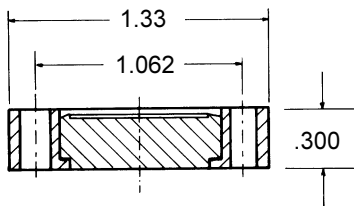
MET-SEAL Mini Flanges

Rotatable Mini Flanges

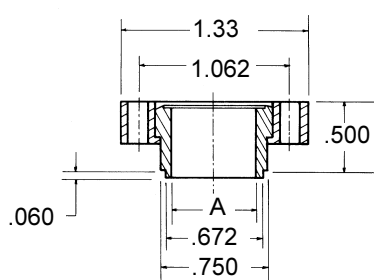
Part Number	Nominal OD	A ID	Bolt Holes No.	Bolt Dia	Price	Tapped Part No.	Thread Size
MS133-000R	1-1/3"	Blank	6	.172	\$ 16.00	MS133-000RT	8-32
MS133-025R	1-1/3"	.255	6	.172	\$ 16.00	MS133-025RT	8-32
MS133-038R	1-1/3"	.380	6	.172	\$ 16.00	MS133-038RT	8-32
MS133-050R	1-1/3"	.505	6	.172	\$ 16.00	MS133-050RT	8-32
MS133-075RW	1-1/3"	.630	6	.172	\$ 16.00	MS133-075RTW	8-32

R = Rotatable / W = Weld Neck / T = Tapped

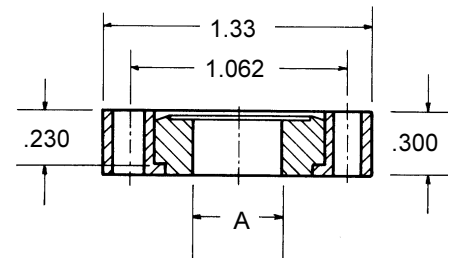
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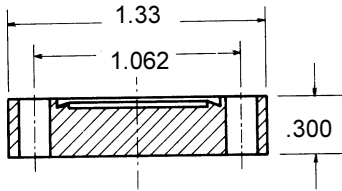
MET-SEAL Flanges, Plastic Covers

Non-Rotatable Mini Flanges

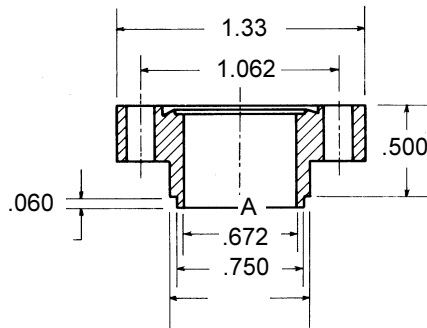
Part Number	Nominal OD	A ID	Bolt Holes No.	Bolt Dia	Price	Tapped Part No.	Thread Size
MS133-000N	1-1/3"	Blank	6	.172	\$ 15.00	MS133-000NT	8-32
MS133-025N	1-1/3"	.255	6	.172	\$ 15.00	MS133-025NT	8-32
MS133-038N	1-1/3"	.380	6	.172	\$ 15.00	MS133-038NT	8-32
MS133-050N	1-1/3"	.505	6	.172	\$ 15.00	MS133-050NT	8-32
MS133-075NW	1-1/3"	.630	6	.172	\$ 15.00	MS133-075NTW	8-32

N = Non-rotatable / W = Weld Neck / T = Tapped

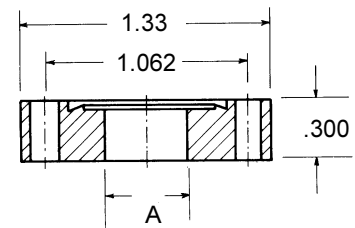
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MET-SEAL Mini Flange Hardware

Part Number	Description	QTY. in Set
G-133	OFHC® Copper Gasket	10
VG-133	Viton® Gasket	5
BS-133	S/S Bolt & Nut Set 8-32 x 3/4" long	25
BS-133T	S/S Bolt & Washer Set 8-32 x 9/16" long	25



MET-SEAL Plastic Covers

- Protect exposed knife-edges

Part Number	Flange OD
PC-133	1.33
PC-212	2.12
PC-275	2.74
PC-338	3.36
PC-450	4.47
PC-462	4.61
PC-600	5.97
PC-800	7.97
PC-1000	9.97

MET-SEAL Ultra High Vacuum Flanges

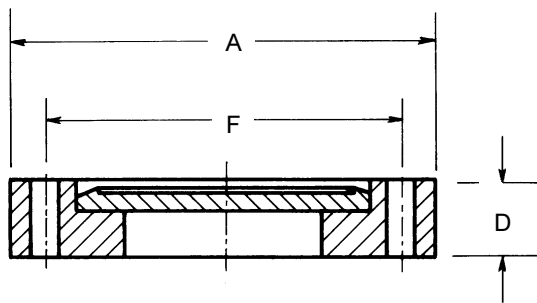
Rotatable Flanges

Part No.	Nominal OD	A OD	B ID	C	D	E	F	Bolt No.	Holes Dia.	Price	Tapped Part No.	Thread Size
MS212-000R	2-1/8"	2.12	Blank	—	.470	—	1.625	4	.265	\$ 21.00	MS212-000RT	1/4-28
MS212-025R	2-1/8"	2.12	.255	—	.470	—	1.625	4	.265	\$ 21.00	MS212-025RT	1/4-28
MS212-050R	2-1/8"	2.12	.505	—	.470	—	1.625	4	.265	\$ 21.00	MS212-050RT	1/4-28
MS212-075R	2-1/8"	2.12	.688	.760	.470	.167	1.625	4	.265	\$ 21.00	MS212-075RT	1/4-28
MS212-100R	2-1/8"	2.12	.938	1.010	.470	.167	1.625	4	.265	\$ 21.00	MS212-100RT	1/4-28
MS275-000R	2-3/4"	2.74	Blank	—	.500	—	2.312	6	.265	\$ 27.00	MS275-000RT	1/4-28
MS275-025R	2-3/4"	2.74	.255	—	.500	—	2.312	6	.265	\$ 27.00	MS275-025RT	1/4-28
MS275-050R	2-3/4"	2.74	.505	—	.500	—	2.312	6	.265	\$ 27.00	MS275-050RT	1/4-28
MS275-075R	2-3/4"	2.74	.688	.760	.500	.209	2.312	6	.265	\$ 27.00	MS275-075RT	1/4-28
MS275-100R	2-3/4"	2.74	.938	1.010	.500	.209	2.312	6	.265	\$ 27.00	MS275-100RT	1/4-28
MS275-125R	2-3/4"	2.74	1.188	1.260	.500	.209	2.312	6	.265	\$ 27.00	MS275-125RT	1/4-28
MS275-150R	2-3/4"	2.74	1.438	1.510	.500	.209	2.312	6	.265	\$ 27.00	MS275-150RT	1/4-28
MS338-000R	3-3/8"	3.36	Blank	—	.687	—	2.850	8	.332	\$ 51.00	MS338-000RT	5/16-24
MS338-150R	3-3/8"	3.36	1.438	1.510	.687	.225	2.850	8	.332	\$ 51.00	MS338-150RT	5/16-24
MS338-200R	3-3/8"	3.36	1.938	2.010	.687	.225	2.850	8	.332	\$ 51.00	MS338-200RT	5/16-24
MS450-000R	4-1/2"	4.47	Blank	—	.750	—	3.628	8	.332	\$ 77.00	MS450-000RT	5/16-24
MS450-150R	4-1/2"	4.47	1.438	1.510	.750	.375	3.628	8	.332	\$ 77.00	MS450-150RT	5/16-24
MS450-200R	4-1/2"	4.47	1.938	2.010	.750	.375	3.628	8	.332	\$ 77.00	MS450-200RT	5/16-24
MS450-250R	4-1/2"	4.47	2.438	2.510	.750	.375	3.628	8	.332	\$ 77.00	MS450-250RT	5/16-24
MS462-000R	4-5/8"	4.61	Blank	—	.812	—	4.030	10	.332	\$ 90.00	MS462-000RT	5/16-24
MS462-300R	4-5/8"	4.61	2.938	3.010	.812	.281	4.030	10	.332	\$ 90.00	MS462-300RT	5/16-24
MS600-000R	6"	5.97	Blank	—	.844	—	5.128	16	.332	\$ 110.00	MS600-000RT	5/16-24
MS600-400R	6"	5.97	3.910	4.010	.844	.438	5.128	16	.332	\$ 110.00	MS600-400RT	5/16-24
MS675-000R	6-3/4"	6.73	Blank	—	.844	—	5.969	18	.332	\$ 125.00	MS675-000RT	5/16-24
MS675-500R	6-3/4"	6.73	4.875	5.010	.844	.460	5.969	18	.332	\$ 125.00	MS675-500RT	5/16-24
MS800-000R	8"	7.97	Blank	—	.937	—	7.128	20	.332	\$175.00	MS800-000RT	5/16-24
MS800-600R	8"	7.97	5.875	6.020	.937	.500	7.128	20	.332	\$175.00	MS800-600RT	5/16-24
MS1000-000R	10"	9.97	Blank	—	.968	—	9.128	24	.332	\$340.00	MS1000-000RT	5/16-24
MS1000-800R	10"	9.97	7.875	8.020	.968	.500	9.128	24	.332	\$340.00	MS1000-800RT	5/16-24

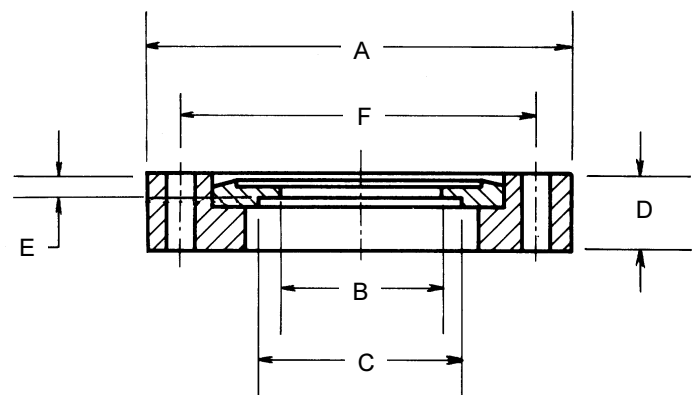
R = Rotatable / T = Tapped

Dimensions in inches

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MET-SEAL Ultra High Vacuum Flanges

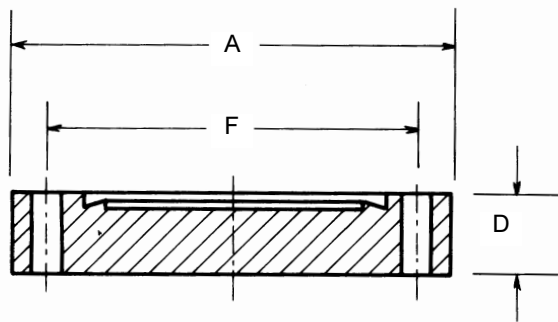
Non-Rotatable Flanges

Part No.	Nominal OD	A	B	C	D	E	F	Bolt No.	Holes Dia,	Price	Tapped Part No.	Thread Size
MS212-000N	2-1/8"	2.12	Blank	—	.470	—	1.625	4	.265	\$ 19.00	MS212-000NT	1/4-28
MS212-025N	2-1/8"	2.12	.255	—	.470	—	1.625	4	.265	\$ 19.00	MS212-025NT	1/4-28
MS212-050N	2-1/8"	2.12	.505	—	.470	—	1.625	4	.265	\$ 19.00	MS212-050NT	1/4-28
MS212-075N	2-1/8"	2.12	.688	.760	.470	.167	1.625	4	.265	\$ 19.00	MS212-075NT	1/4-28
MS212-100N	2-1/8"	2.12	.938	1.010	.470	.167	1.625	4	.265	\$ 19.00	MS212-100NT	1/4-28
MS275-000N	2-3/4"	2.74	Blank	—	.500	—	2.312	6	.265	\$ 23.00	MS275-000NT	1/4-28
MS275-025N	2-3/4"	2.74	.255	—	.500	—	2.312	6	.265	\$ 23.00	MS275-025NT	1/4-28
MS275-050N	2-3/4"	2.74	.505	—	.500	—	2.312	6	.265	\$ 23.00	MS275-050NT	1/4-28
MS275-075N	2-3/4"	2.74	.688	.760	.500	.209	2.312	6	.265	\$ 23.00	MS275-075NT	1/4-28
MS275-100N	2-3/4"	2.74	.938	1.010	.500	.209	2.312	6	.265	\$ 23.00	MS275-100NT	1/4-28
MS275-125N	2-3/4"	2.74	1.188	1.260	.500	.209	2.312	6	.265	\$ 23.00	MS275-125NT	1/4-28
MS275-150N	2-3/4"	2.74	1.438	1.510	.500	.209	2.312	6	.265	\$ 23.00	MS275-150NT	1/4-28
MS338-000N	3-3/8"	3.36	Blank	—	.687	—	2.850	8	.332	\$ 44.00	MS338-000NT	5/16-24
MS338-150N	3-3/8"	3.36	1.438	1.510	.687	.225	2.850	8	.332	\$ 44.00	MS338-150NT	5/16-24
MS338-200N	3-3/8"	3.36	1.938	2.010	.687	.225	2.850	8	.332	\$ 44.00	MS338-200NT	5/16-24
MS450-000N	4-1/2"	4.47	Blank	—	.687	—	3.628	8	.332	\$ 66.00	MS450-000NT	5/16-24
MS450-150N	4-1/2"	4.47	1.438	1.510	.687	.375	3.628	8	.332	\$ 66.00	MS450-150NT	5/16-24
MS450-200N	4-1/2"	4.47	1.938	2.010	.687	.375	3.628	8	.332	\$ 66.00	MS450-200NT	5/16-24
MS450-250N	4-1/2"	4.47	2.438	2.510	.687	.375	3.628	8	.332	\$ 66.00	MS450-250NT	5/16-24
MS462-000N	4-5/8"	4.61	Blank	—	.812	—	4.030	10	.332	\$ 77.00	MS462-000NT	5/16-24
MS462-300N	4-5/8"	4.61	2.938	3.010	.812	.281	4.030	10	.332	\$ 77.00	MS462-300NT	5/16-24
MS600-000N	6"	5.97	Blank	—	.781	—	5.128	16	.332	\$ 90.00	MS600-000NT	5/16-24
MS600-400N	6"	5.97	3.910	4.010	.781	.438	5.128	16	.332	\$ 90.00	MS600-400NT	5/16-24
MS675-000N	6-3/4"	6.73	Blank	—	.844	—	5.969	18	.332	\$105.00	MS675-000NT	5/16-24
MS675-500N	6-3/4"	6.73	4.875	5.010	.844	.460	5.969	18	.332	\$105.00	MS675-500NT	5/16-24
MS800-000N	8"	7.97	Blank	—	.875	—	7.128	20	.332	\$160.00	MS800-000NT	5/16-24
MS800-600N	8"	7.97	5.875	6.020	.875	.500	7.128	20	.332	\$160.00	MS800-600NT	5/16-24
MS1000-000N	10"	9.97	Blank	—	.968	—	9.128	24	.332	\$290.00	MS1000-000NT	5/16-24
MS1000-800N	10"	9.97	7.875	8.020	.968	.500	9.128	24	.332	\$290.00	MS1000-800NT	5/16-24

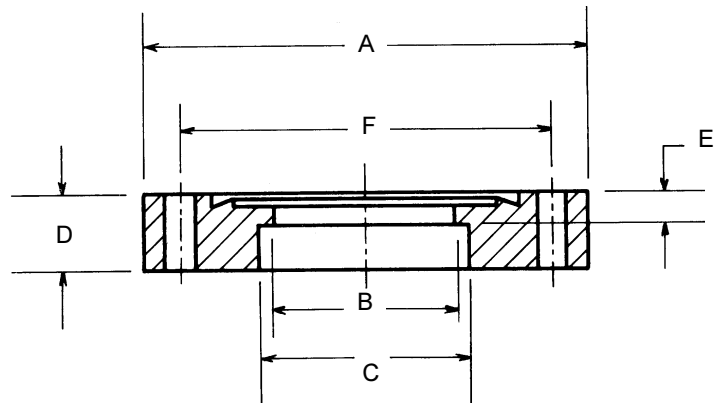
N= Non-Rotatable / T = Tapped

Dimensions in inches

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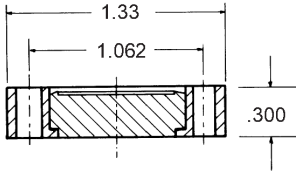
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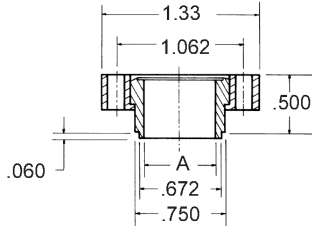
MET-SEAL Ultra High Vacuum Flanges 316

- Higher corrosion resistance
- Reach lower base pressures
- Less susceptible to magnetic fields, virtually ferrite free

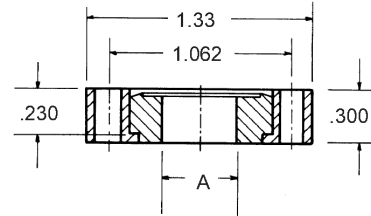
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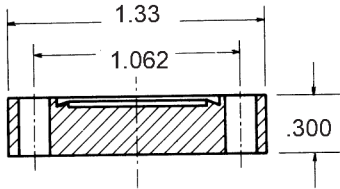


Rotatable Mini Met-Seal Flanges

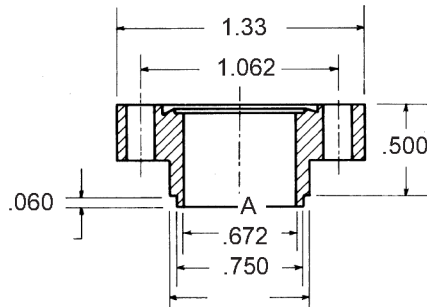
Part Number	Nominal OD	A (ID)	Bolt Holes	Diameter
MS133-000R316★	1-1/3"	Blank	6	.172
MS133-025RW316★	1-1/3"	.180	6	.172
MS133-050RW316★	1-1/3"	.375	6	.172
MS133-075RW316★	1-1/3"	.625	6	.172

★ = New Product

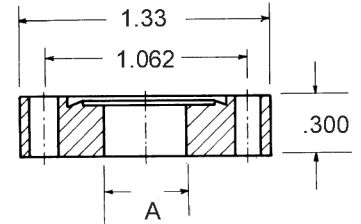
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Non-Rotatable Mini Met-Seal Flanges

Part Number	Nominal OD	A (ID)	Bolt Holes	Diameter
MS133-000N316★	1-1/3"	Blank	6	.172
MS133-025NW316★	1-1/3"	.180	6	.172
MS133-050NW316★	1-1/3"	.375	6	.172
MS133-075NW316★	1-1/3"	.625	6	.172

★ = New Product

Solid Nickel Gasket for Mini Met-Seal (Sold Individually)

Part Number

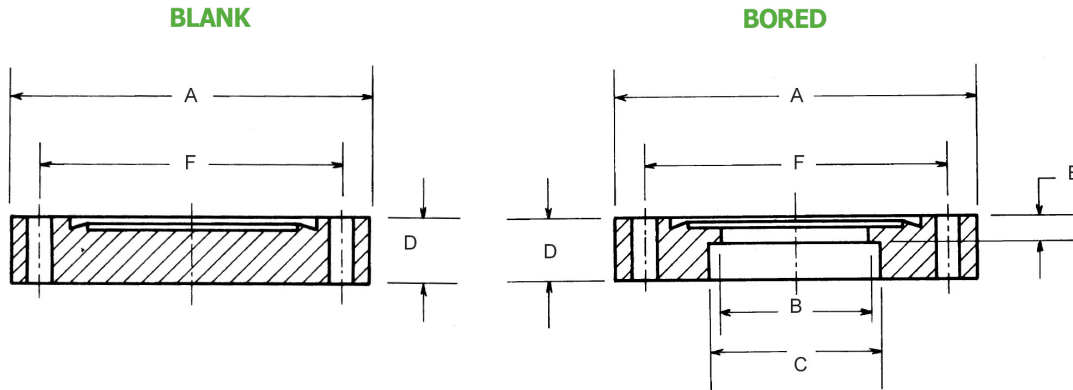
G-133-NI★

★ = New Product



MET-SEAL Ultra High Vacuum Flanges 316

- Higher corrosion resistance
- Reach lower base pressures
- Less susceptible to magnetic fields, virtually ferrite free



Non-Rotatable Flanges

Part Number	Nominal OD	A OD	B ID	C	D	E	F	Bolt Holes	Hole Dia
MS275-000N316★	2-3/4"	2.74	Blank	-	.500	-	2.312	6	.265
MS275-100N316★	2-3/4"	2.74	.938	1.010	.500	.209	2.312	6	.265
MS275-150N316★	2-3/4"	2.74	1.437	1.510	.500	.209	2.312	6	.265
MS450-000N316★	4-1/2"	4.47	Blank	-	.750	-	3.628	8	.332
MS450-200N316★	4-1/2"	4.47	1.938	2.010	.750	.375	3.628	8	.332
MS450-250N316★	4-1/2"	4.47	2.437	2.510	.750	.375	3.628	8	.332
MS600-000N316★	6"	5.97	Blank	-	.844	-	5.128	16	.332
MS600-400N316★	6"	5.97	3.910	4.010	.844	.437	5.128	16	.332
MS800-000N316★	8"	7.97	Blank	-	.937	-	7.128	20	.332
MS800-600N316★	8"	7.97	5.875	6.020	.937	.500	7.128	20	.332
MS1000-000N316★	10"	9.97	Blank	-	.968	-	9.128	24	.332
MS1000-800N316★	10"	9.97	7.875	8.020	.968	.500	9.128	24	.332

★ = New Product

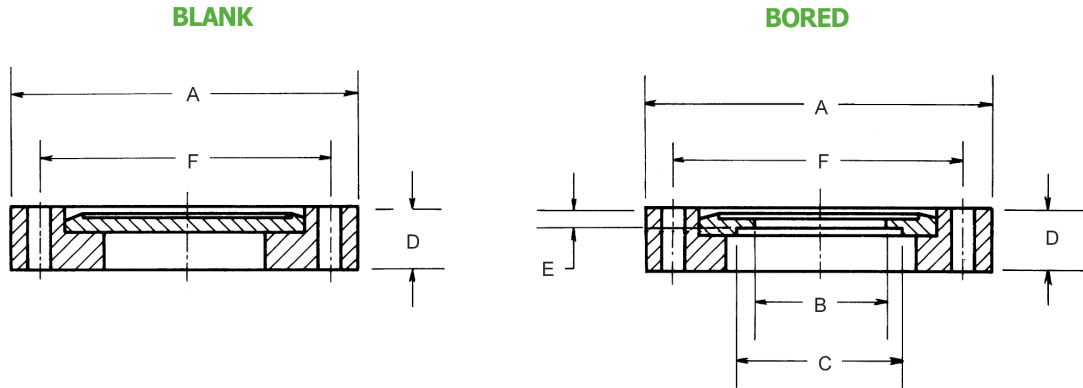
Solid Nickel Gasket for Mini Met-Seal (Sold Individually)

Part Number	Use with
G-275-NI	2-3/4" OD
G-338-NI	3-3/8" OD
G-450-NI	4-1/2" OD
G-600-NI	6" OD
G-800-NI	8" OD
G-1000-NI	10" OD



MET-SEAL Ultra High Vacuum Flanges 316

- Higher corrosion resistance
- Reach lower base pressures
- Less susceptible to magnetic fields, virtually ferrite free



Rotatable Flanges

Part Number	Nominal OD	A OD	B ID	C	D	E	F	Bolt Holes	Hole Dia
MS275-000R316★	2-3/4"	2.74	Blank	-	.500	-	2.312	6	.265
MS275-100R316★	2-3/4"	2.74	.938	1.010	.500	.209	2.312	6	.265
MS275-150R316★	2-3/4"	2.74	1.437	1.510	.500	.209	2.312	6	.265
MS450-000R316★	4-1/2"	4.47	Blank	-	.750	-	3.628	8	.332
MS450-200R316★	4-1/2"	4.47	1.938	2.010	.750	.375	3.628	8	.332
MS450-250R316★	4-1/2"	4.47	2.437	2.510	.750	.375	3.628	8	.332
MS600-000R316★	6"	5.97	Blank	-	.844	-	5.128	16	.332
MS600-400R316★	6"	5.97	3.910	4.010	.844	.437	5.128	16	.332
MS800-000R316★	8"	7.97	Blank	-	.937	-	7.128	20	.332
MS800-600R316★	8"	7.97	5.875	6.020	.937	.500	7.128	20	.332
MS1000-000R316★	10"	9.97	Blank	-	.968	-	9.128	24	.332
MS1000-800R316★	10"	9.97	7.875	8.020	.968	.500	9.128	24	.332

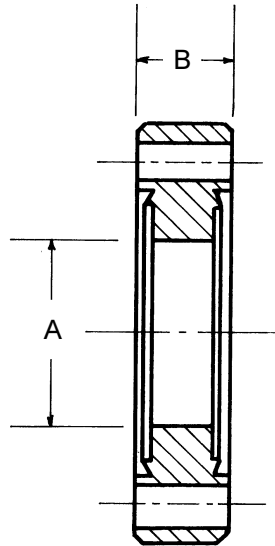
★ = New Product

Solid Nickel Gasket for Mini Met-Seal (Sold Individually)

Part Number	Use with
G-275-NI	2-3/4" OD
G-338-NI	3-3/8" OD
G-450-NI	4-1/2" OD
G-600-NI	6" OD
G-800-NI	8" OD
G-1000-NI	10" OD



MET-SEAL Ultra High Vacuum Flanges

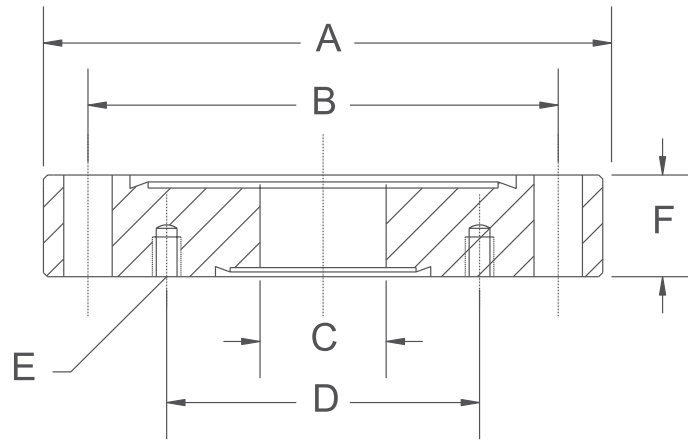


Double Sided Flanges

Part No.	Nominal OD	A	B
MS133-000D	1-1/3"	Blank	.300
MS133-037D	1-1/3"	.375	.300
MS133-050D	1-1/3"	.505	.300
MS133-075D	1-1/3"	.630	.300
MS212-000D	2-1/8"	Blank	.470
MS212-075D	2-1/8"	.760	.470
MS212-100D	2-1/8"	1.010	.470
MS275-000D	2-3/4"	Blank	.500
MS275-025D	2-3/4"	.255	.500
MS275-050D	2-3/4"	.505	.500
MS275-075D	2-3/4"	.760	.500
MS275-100D	2-3/4"	1.010	.500
MS275-125D	2-3/4"	1.260	.500
MS275-150D	2-3/4"	1.510	.500
MS338-000D	3-3/8"	Blank	.687
MS338-150D	3-3/8"	1.510	.687
MS338-200D	3-3/8"	2.010	.687
MS450-000D	4-1/2"	Blank	.687
MS450-150D	4-1/2"	1.510	.687
MS450-200D	4-1/2"	2.010	.687
MS450-250D	4-1/2"	2.510	.687
MS462-000D	4-5/8"	Blank	.812
MS462-250D	4-5/8"	2.510	.812
MS462-300D	4-5/8"	3.010	.812
MS600-000D	6"	Blank	.781
MS600-400D	6"	4.010	.781
MS675-000D	6-3/4"	Blank	.844
MS675-400D	6-3/4"	4.010	.844
MS675-500D	6-3/4"	5.010	.844
MS800-000D	8"	Blank	.875
MS800-600D	8"	6.020	.875
MS1000-000D	10"	Blank	.968
MS1000-800D	10"	8.020	.968



MET-SEAL Ultra High Vacuum Flanges



MET-SEAL zero length reducers

Part Number	A	B	C	D	E	F
ZLR-275-133	2-3/4"	2.312	0.62	1.062	8-32	.500
ZLR-275-212★★	2-3/4"	2.312	0.62	1.625	1/4-28	.500
ZLR-338-133	3-3/8"	2.850	0.62	1.062	8-32	.687
ZLR-338-212	3-3/8"	2.850	1.00	1.625	1/4-28	.687
ZLR-338-275★★	3-3/8"	2.850	1.50	2.312	1/4-28	.687
ZLR-450-133	4-1/2"	3.628	0.62	1.062	8-32	.687
ZLR-450-212	4-1/2"	3.628	1.00	1.625	1/4-28	.687
ZLR-450-275	4-1/2"	3.628	1.50	2.312	1/4-28	.687
ZLR-450-338★★	4-1/2"	3.628	2.00	2.850	5/16-24	.687
ZLR-462-133	4-5/8"	4.030	0.62	1.062	8-32	.812
ZLR-462-212	4-5/8"	4.030	1.00	1.625	1/4-28	.812
ZLR-462-275	4-5/8"	4.030	1.50	2.312	1/4-28	.812
ZLR-462-338	4-5/8"	4.030	2.00	2.850	5/16-24	.812
ZLR-600-133	6"	5.128	0.62	1.062	8-32	.781
ZLR-600-275	6"	5.128	1.50	2.312	1/4-28	.781
ZLR-600-338	6"	5.128	2.00	2.850	5/16-24	.781
ZLR-600-450	6"	5.128	2.50	3.628	5/16-24	.781
ZLR-600-462	6"	5.128	3.00	4.030	5/16-24	.781
ZLR-675-133	6-3/4"	5.969	0.62	1.062	8-32	.844
ZLR-675-212	6-3/4"	5.969	1.00	1.625	1/4-28	.844
ZLR-675-275	6-3/4"	5.969	1.50	2.312	1/4-28	.844
ZLR-675-338	6-3/4"	5.969	2.00	2.850	5/16-24	.844
ZLR-675-450	6-3/4"	5.969	2.50	3.628	5/16-24	.844
ZLR-675-462	6-3/4"	5.969	3.00	4.030	5/16-24	.844
ZLR-675-600★★	6-3/4"	5.969	4.00	5.128	5/16-24	.844
ZLR-800-133	8"	7.128	0.62	1.062	8-32	.875
ZLR-800-275	8"	7.128	1.50	2.312	1/4-28	.875
ZLR-800-338	8"	7.128	2.00	2.850	5/16-24	.875
ZLR-800-450	8"	7.128	2.50	3.628	5/16-24	.875
ZLR-800-462	8"	7.128	3.00	4.030	5/16-24	.875
ZLR-800-600	8"	7.128	4.00	5.128	5/16-24	.875
ZLR-800-675★★	8"	7.128	5.00	5.969	5/16-24	.875
ZLR-1000-133	10"	9.128	0.62	1.062	8-32	.968
ZLR-1000-212	10"	9.128	1.00	1.625	1/4-28	.968
ZLR-1000-275	10"	9.128	1.50	2.312	1/4-28	.968
ZLR-1000-338	10"	9.128	2.00	2.850	5/16-24	.968
ZLR-1000-450	10"	9.128	2.50	3.628	5/16-24	.968
ZLR-1000-462	10"	9.128	3.00	4.030	5/16-24	.968
ZLR-1000-600	10"	9.128	4.00	5.128	5/16-24	.968
ZLR-1000-675	10"	9.128	5.00	5.969	5/16-24	.968
ZLR-1000-800	10"	9.128	6.00	7.128	5/16-24	.968

★★Tapped base flange



MET-SEAL Flange Hardware

MET-SEAL Flange Hardware

Part No.	Nominal OD	Description	Qty. in Set
G-212	2-1/8"	OFHC® Copper Gasket	10
VG-212	2-1/8"	Viton® Gasket	5
BS-212	2-1/8"	S/S Bolt & Nut Set, 1/4-28 x 1-1/4" L	25
BS-212T	2-1/8"	S/S Bolt & Washer Set, 1/4-28 x 7/8" L	25
G-275	2-3/4"	OFHC® Copper Gasket	10
VG-275	2-3/4"	Viton® Gasket	5
BS-275	2-3/4"	S/S Bolt & Nut Set, 1/4-28 x 1-1/4" L	25
BS-275T	2-3/4"	S/S Bolt & Washer Set, 1/4-28 x 1" L	25
G-338	3-3/8"	OFHC® Copper Gasket	10
VG-338	3-3/8"	Viton® Gasket	1
BS-338	3-3/8"	S/S Bolt & Nut Set, 5/16-24 x 1-3/4" L	25
BS-338T	3-3/8"	S/S Bolt & Washer Set, 5/16-24 x 1-1/4" L	25
G-450	4-1/2"	OFHC® Copper Gasket	10
VG-450	4-1/2"	Viton® Gasket	1
BS-450	4-1/2"	S/S Bolt & Nut Set, 5/16-24 x 2" L	25
BS-450T	4-1/2"	S/S Bolt & Washer Set, 5/16-24 x 1-1/4" L	25
G-462	4-5/8"	OFHC® Copper Gasket	10
VG-462	4-5/8"	Viton® Gasket	1
BS-462	4-5/8"	S/S Bolt & Nut Set, 5/16-24 x 2-1/4" L	25
BS-462T	4-5/8"	S/S Bolt & Washer Set, 5/16-24 x 1-1/4" L	25

MET-SEAL Flange Hardware

Part No.	Nominal OD	Description	Qty. in Set
G-600	6"	OFHC® Copper Gasket	10
VG-600	6"	Viton® Gasket	1
BS-600	6"	S/S Bolt & Nut Set, 5/16-24 x 2-1/4" L	25
BS-600T	6"	S/S Bolt & Washer Set, 5/16-24 x 1-1/4" L	25
G-675	6-3/4"	OFHC® Copper Gasket	10
VG-675	6-3/4"	Viton® Gasket	1
BS-675	6-3/4"	S/S Bolt & Nut Set, 5/16-24 x 2-1/4" L	25
BS-675T	6-3/4"	S/S Bolt & Washer Set, 5/16-24 x 1-1/2" L	25
G-800	8"	OFHC® Copper Gasket	10
VG-800	8"	Viton® Gasket	1
BS-800	8"	S/S Bolt & Nut Set, 5/16-24 x 2-1/4" L	25
BS-800T	8"	S/S Bolt & Washer Set, 5/16-24 x 1-3/4" L	25
G-1000	10"	OFHC® Copper Gasket	10
VG-1000	10"	Viton® Gasket	1
BS-1000	10"	S/S Bolt & Nut Set, 5/16-24 x 2-1/2" L	25
BS-1000T	10"	S/S Bolt & Washer Set, 5/16-24 x 1-3/4" L	25

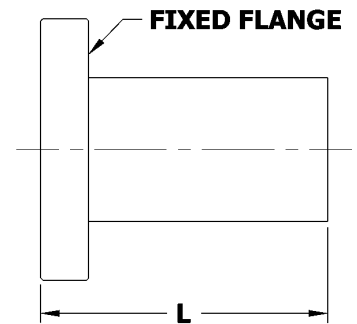


MET-SEAL Nipples

MET-SEAL Half Nipples

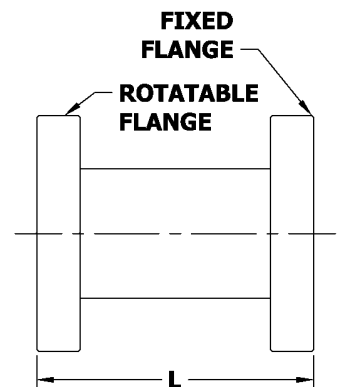
Part Number	Flange OD	Tube OD	Flange Code	L
HN133-1	1.33	.75	N	1.50
HN133-1-R	1.33	.75	R	1.50
HN133-1-T	1.33	.75	T	1.50
HN133-1-RT	1.33	.75	RT	1.50
HN212-1	2.12	1.00	N	2.04
HN212-1-R	2.12	1.00	R	2.04
HN212-1-T	2.12	1.00	T	2.04
HN212-1-RT	2.12	1.00	RT	2.04
HN275-1	2.74	1.50	N	2.46
HN275-1-R	2.74	1.50	R	2.46
HN275-1-T	2.74	1.50	T	2.46
HN275-1-RT	2.74	1.50	RT	2.46
HN338-1	3.36	2.00	N	3.21
HN338-1-R	3.36	2.00	R	3.21
HN338-1-T	3.36	2.00	T	3.21
HN338-1-RT	3.36	2.00	RT	3.21
HN450-1	4.47	2.50	N	4.21
HN450-1-R	4.47	2.50	R	4.21
HN450-1-T	4.47	2.50	T	4.21
HN450-1-RT	4.47	2.50	RT	4.21
HN462-1	4.61	3.00	N	3.53
HN462-1-R	4.61	3.00	R	3.53
HN462-1-T	4.61	3.00	T	3.53
HN462-1-RT	4.61	3.00	RT	3.53
HN600-1	5.97	4.00	N	5.31
HN600-1-R	5.97	4.00	R	5.31
HN600-1-T	5.97	4.00	T	5.31
HN600-1-RT	5.97	4.00	RT	5.31
HN675-1	6.73	5.00	N	4.93
HN675-1-R	6.73	5.00	R	4.93
HN675-1-T	6.73	5.00	T	4.93
HN675-1-RT	6.73	5.00	RT	4.93
HN800-1	7.97	6.00	N	6.56
HN800-1-R	7.97	6.00	R	6.56
HN800-1-T	7.97	6.00	T	6.56
HN800-1-RT	7.97	6.00	RT	6.56
HN1000-1	9.97	8.00	N	8.00
HN1000-1-R	9.97	8.00	R	8.00
HN1000-1-T	9.97	8.00	T	8.00
HN1000-1-RT	9.97	8.00	RT	8.00

Flange Codes: N = Non rotatable, R = Rotatable, T = Tapped, RT = Rotatable tapped

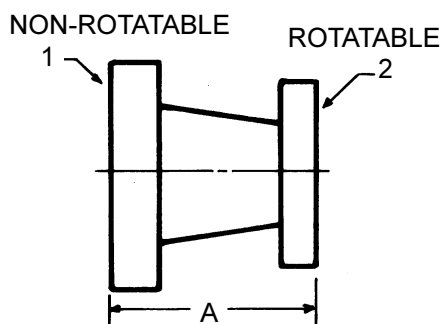


MET-SEAL Full Nipples

Part No.	Flange OD	Tube OD	L
FN133-1	1.33	.75	3.00
FN212-1	2.12	1.00	4.08
FN275-1	2.74	1.50	4.93
FN338-1	3.36	2.00	6.43
FN450-1	4.47	2.50	8.25
FN462-1	4.61	3.00	7.06
FN600-1	5.97	4.00	10.62
FN675-1	6.73	5.00	9.87
FN800-1	7.97	6.00	13.12
FN1000-1	10.00	8.00	16.00

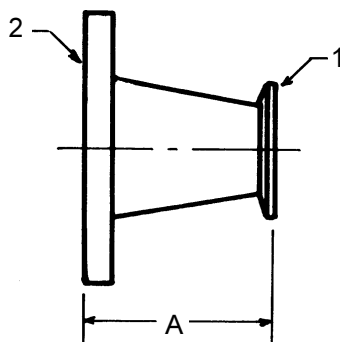


MET-SEAL Fittings



Conical Reducer Nipples

Part No.	Flange 1 OD	Tube OD	Flange 2 OD	Tube OD	A
CRN212-133	2.12	1.00	1.33	.75	2.04
CRN275-133	2.74	1.50	1.33	.75	3.08
CRN275-212	2.74	1.50	2.12	1.00	2.75
CRN338-212	3.36	2.00	2.12	1.00	2.76
CRN338-275	3.36	2.00	2.74	1.50	2.80
CRN450-275	4.47	2.50	2.74	1.50	2.95
CRN450-338	4.47	2.50	3.36	2.00	2.97
CRN462-275	4.61	3.00	2.74	1.50	4.11
CRN462-338	4.61	3.00	3.36	2.00	4.13
CRN462-450	4.61	3.00	4.47	2.50	4.28
CRN600-338	5.97	4.00	3.36	2.00	4.28
CRN600-450	5.97	4.00	4.47	2.50	4.43
CRN600-462	5.97	4.00	4.61	3.00	4.43

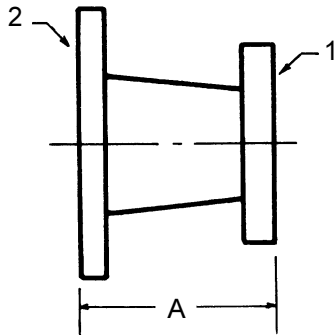


Conical Reducer Nipples MS to NW

Part No.	ISO-KF Flange OD	Tube OD	MS Flange OD	Tube OD	A
CRN16-212	NW-16	.75	2.12	1.00	2.74
CRN16-275	NW-16	.75	2.74	1.50	2.74
CRN25-133	NW-25	1.00	1.33	.75	3.03
CRN25-275	NW-25	1.00	2.74	1.50	2.74
CRN25-338	NW-25	1.00	3.36	2.00	2.76
CRN40-133	NW-40	1.00	1.33	.75	3.03
CRN40-212	NW-40	1.50	2.12	1.00	2.70
CRN40-338	NW-40	1.50	3.36	2.00	2.91
CRN40-450	NW-40	1.50	4.50	2.50	2.91
CRN40-462	NW-40	1.50	4.62	3.00	4.06
CRN50-212	NW-50	2.00	2.12	1.00	2.70
CRN50-275	NW-50	2.00	2.74	1.50	2.74
CRN50-450	NW-50	2.00	4.47	2.50	2.91
CRN50-462	NW-50	2.00	4.61	3.00	4.16
CRN50-600	NW-50	2.00	5.97	4.00	4.21

MET-SEAL Fittings

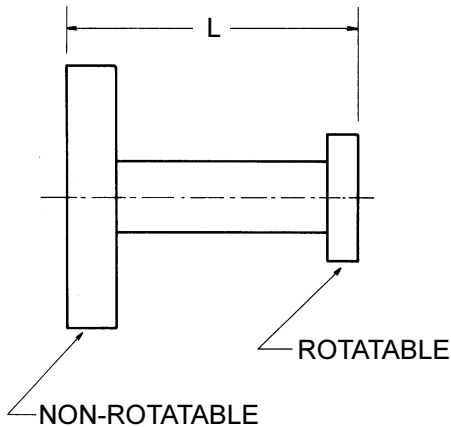
Conical Reducer Nipple MS to ASA



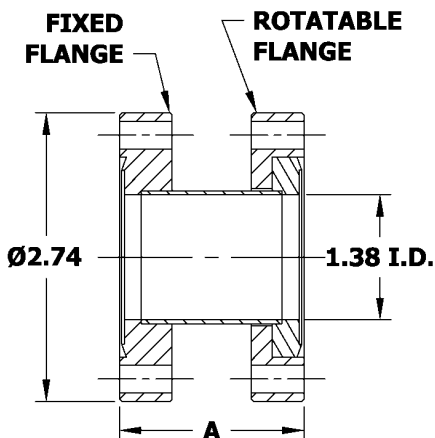
Part No.	MS Flange OD	Tube OD	ASA Flange OD	Tube OD	A
CRN212-ASA5	2.12	1.00	ASA-5	2.00	2.79
CRN275-ASA5	2.74	1.50	ASA-5	2.00	2.83
CRN275-ASA6	2.74	1.50	ASA-6	3.00	4.08
CRN338-ASA5	3.36	2.00	ASA-5	2.50	2.85
CRN338-ASA6	3.36	2.00	ASA-6	3.00	4.10
CRN338-ASA7.5	3.36	2.00	ASA-7.5	4.00	4.10
CRN450-ASA5	4.47	2.50	ASA-5	2.00	3.00
CRN450-ASA6	4.47	2.50	ASA-6	3.00	4.25
CRN450-ASA7.5	4.47	2.50	ASA-7.5	4.00	4.25
CRN462-ASA5	4.61	3.00	ASA-5	2.00	4.15
CRN462-ASA7.5	4.61	3.00	ASA-7.5	4.00	4.15
CRN600-ASA5	5.97	4.00	ASA-5	2.00	4.31
CRN600-ASA6	5.97	4.00	ASA-6	3.00	4.31

Add "-O" to part number if o-ring groove required

Reducer Nipple



Part No.	Nominal Dimensions		Tube OD	L
	Rotatable Flange OD	Non-Rotatable Flange OD		
RN133-212	1.33	2.12	.75	3.00
RN133-275	1.33	2.74	.75	3.00
RN212-275	2.12	2.74	1.00	3.00
RN275-338	2.74	3.36	1.50	3.00
RN275-450	2.74	4.47	1.50	3.00
RN275-600	2.74	5.97	1.50	3.00
RN450-600	4.47	5.97	2.50	5.00
RN275-800	2.74	7.97	1.50	5.00
RN450-800	4.47	7.97	2.50	5.00
RN600-800	5.97	7.97	4.00	5.00
RN275-1000	2.74	9.97	1.50	5.00
RN450-1000	4.47	9.97	2.50	5.00
RN600-1000	5.97	9.97	4.00	5.00
RN800-1000	7.97	9.97	6.00	5.00



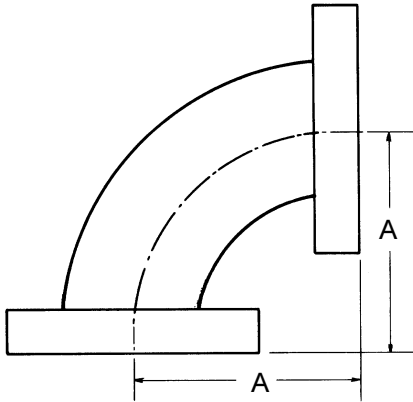
Short Length Full MET-SEAL Nipple Kit

- For mating 2 tapped flanges together
- Mounting kit includes stainless steel hardware:
12 each 1/4-28 x 1-1/4" studs, 24 each washers & nuts
- Studs must be installed into existing flanges before installing short length MET-SEAL nipple

Part Number	A
FN275-KIT	1.75



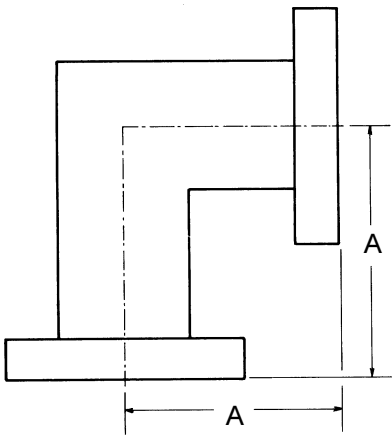
MET-SEAL Fittings



90° Radius Elbow

Part No.	Tube OD	Nominal Flange OD	A
E-075-MS	.75	1.33	1.50
E-100-MS	1.00	2.12	2.04
E-150-MS	1.50	2.74	2.46
E-200-MS	2.00	3.36	3.21
E-250-MS	2.50	4.47	4.03
E-300-MS	3.00	4.62	4.88
E-400-MS	4.00	5.97	6.44
E-600-MS	6.00	7.97	9.50

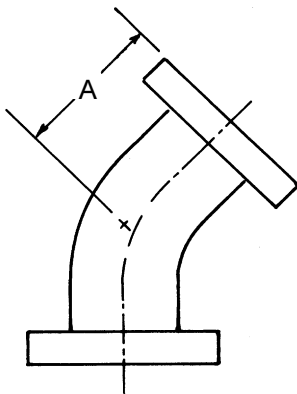
Note = * Both Flanges Rotatable



90° Mitered Elbow

Part No.	Tube OD	Nominal Flange OD	A
ME-075-MS	.75	1.33	1.50
ME-100-MS	1.00	2.12	2.05
ME-150-MS	1.50	2.74	2.46
ME-200-MS	2.00	3.36	3.22
ME-250-MS	2.50	4.47	3.38
ME-300-MS	3.00	4.62	3.53
ME-400-MS	4.00	5.97	4.32
ME-500-MS	5.00	6.73	4.71
ME-600-MS	6.00	7.97	5.50
ME-800-MS	8.00	9.97	7.50

Note = * Both Flanges Rotatable



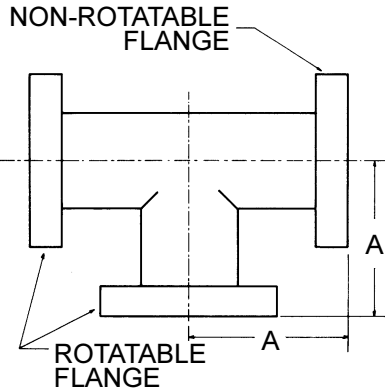
45° Radius Elbow

Part No.	Tube OD	Nominal Flange OD	A
E45-075-MS	.75	1.33	.93
E45-100-MS	1.00	2.12	1.13
E45-150-MS	1.50	2.74	1.74
E45-200-MS	2.00	3.36	2.06
E45-250-MS	2.50	4.47	3.37
E45-300-MS	3.00	4.61	3.96
E45-400-MS	4.00	5.97	5.21

Note = * Both Flanges Rotatable



MET-SEAL Tees and Crosses

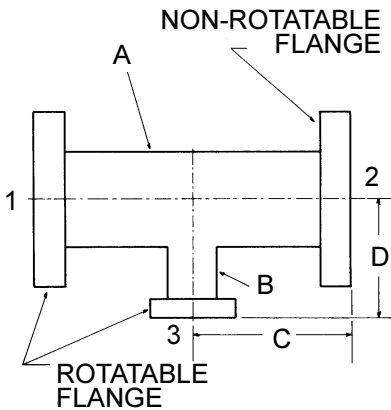


Tees

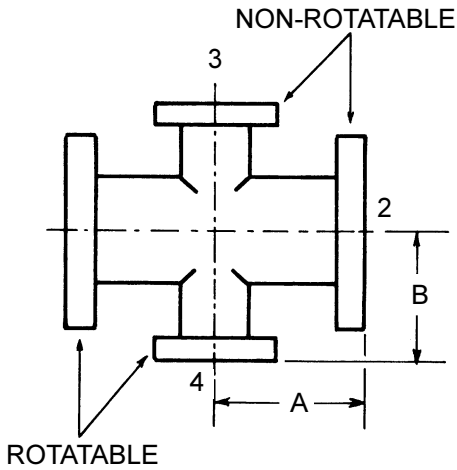
Part No.	Tube OD	Nominal Flange OD	A
T-075-MS	.75	1.33	1.50
T-100-MS	1.00	2.12	2.05
T-150-MS	1.50	2.74	2.46
T-200-MS	2.00	3.36	3.22
T-250-MS	2.50	4.47	3.38
T-300-MS	3.00	4.61	3.53
T-400-MS	4.00	5.97	4.32
T-500-MS	5.00	6.73	4.71
T-600-MS	6.00	7.97	5.50
T-800-MS	8.00	9.97	7.50

Reducer Tees

Part No.	A Tube OD	B Tube OD	Flange 1&2 Nominal OD	Flange 3 Nominal OD	C	D
RT-275-133	1.50	.75	2.74	1.33	2.46	1.87
RT-275-212	1.50	1.00	2.74	2.12	2.46	2.30
RT-338-133	2.00	.75	3.36	1.33	3.22	2.13
RT-338-275	2.00	1.50	3.36	2.74	3.22	2.71
RT-450-275	2.50	1.50	4.47	2.74	3.38	2.97
RT-450-338	2.50	2.00	4.47	3.36	3.38	3.48
RT-462-338	3.00	2.00	4.61	3.36	3.54	3.75
RT-462-450	3.00	2.50	4.61	4.47	3.54	3.64
RT-600-275	4.00	1.50	5.97	2.74	4.33	3.72
RT-600-338	4.00	2.00	5.97	3.36	4.33	4.24
RT-600-450	4.00	2.50	5.97	4.47	4.33	4.14
RT-600-462	4.00	3.00	5.97	4.61	4.33	4.04
RT-675-600	5.00	4.00	6.73	5.97	4.72	4.83
RT-800-275	6.00	1.50	7.97	2.74	5.50	4.71
RT-800-338	6.00	2.00	7.97	3.36	5.50	5.23
RT-800-450	6.00	2.50	7.97	4.47	5.50	5.12
RT-800-600	6.00	4.00	7.97	5.97	5.50	5.20
RT-1000-800	8.00	6.00	9.97	7.97	7.50	6.50



4-Way Reducer Cross

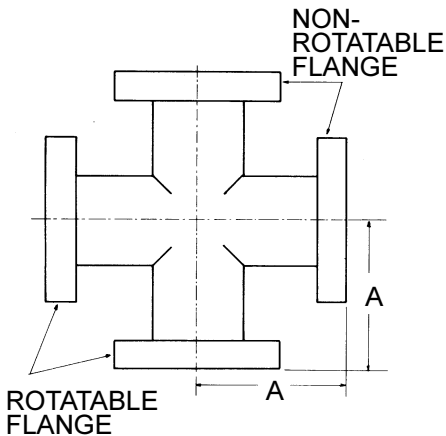


Part No.	FIG. 1 & 2		FIG. 3 & 4		A	B
	Fig. OD	Tube OD	Fig. OD	Tube OD		
4RC-275	2.74	1.50	1.33	.75	2.46	1.87
4RC-275-1	2.74	1.50	2.12	1.00	2.46	2.29
4RC-338	3.36	2.00	1.33	.75	3.22	2.13
4RC-338-1	3.36	2.00	2.74	1.50	3.22	2.71
4RC-450	4.47	2.50	2.74	1.50	3.38	2.96
4RC-450-1	4.47	2.50	3.36	2.00	3.38	3.48
4RC-462	4.61	3.00	3.36	2.00	3.53	3.73
4RC-462-1	4.61	3.00	4.47	2.50	3.53	3.63
4RC-600	5.97	4.00	2.74	1.50	4.32	3.71
4RC-600-1	5.97	4.00	3.36	2.00	4.32	4.23
4RC-600-2	5.97	4.00	4.47	2.50	4.32	4.13
4RC-600-3	5.97	4.00	4.61	3.00	4.32	4.03
4RC-675	6.73	5.00	5.97	4.00	4.71	4.82
4RC-800	7.97	6.00	2.74	1.50	5.50	4.71
4RC-800-1	7.97	6.00	3.36	2.00	5.50	5.23
4RC-800-2	7.97	6.00	4.47	2.50	5.50	5.13
4RC-800-3	7.97	6.00	5.97	4.00	5.50	5.19
4RC-1000	9.97	8.00	7.97	6.00	7.50	6.50

Other reducer combinations can be supplied upon request.

Dimension

4-Way Cross

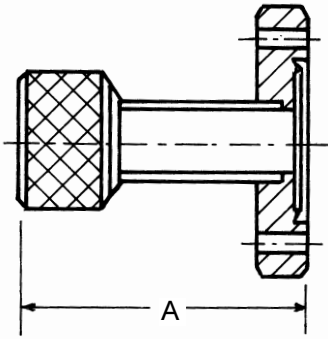


Part No.	Tube OD	Nominal Flange OD	A
4C-133	.75	1.33	1.50
4C-212	1.00	2.12	2.04
4C-275	1.50	2.74	2.46
4C-338	2.00	3.36	3.21
4C-450	2.50	4.47	4.12
4C-462	3.00	4.61	3.53
4C-600	4.00	5.97	5.31
4C-675	5.00	6.73	4.93
4C-800	6.00	7.97	6.56
4C-1000	8.00	9.97	8.00

MET-SEAL Adapter Fittings

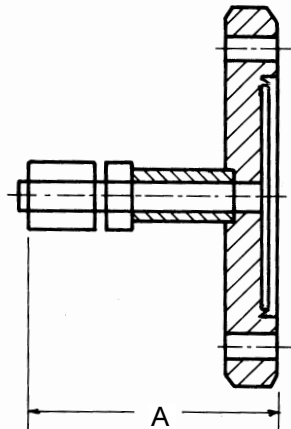
MET-SEAL Flange to Quick Seal Adapter

Part No.	Tube OD	Nominal Flange OD	A
MSA133-QS06	.06	1.33	1.31
MSA133-QS12	.12	1.33	1.31
MSA133-QS18	.18	1.33	1.31
MSA133-QS25	.25	1.33	1.31
MSA133-QS31	.31	1.33	1.31
MSA133-QS37	.37	1.33	1.31
MSA133-QS50	.50	1.33	1.37
MSA275-QS06	.06	2.74	1.31
MSA275-QS12	.12	2.74	1.31
MSA275-QS18	.18	2.74	1.31
MSA275-QS25	.25	2.74	1.31
MSA275-QS31	.31	2.74	1.31
MSA275-QS37	.37	2.74	1.31
MSA275-QS50	.50	2.74	1.37
MSA275-QS62	.62	2.74	1.50
MSA275-QS75	.75	2.74	1.62
MSA275-QS87	.87	2.74	1.75
MSA275-QS100	1.00	2.74	1.81
MSA275-QS112	1.12	2.74	2.00
MSA275-QS125	1.25	2.74	2.46
MSA275-QS137	1.37	2.74	2.58
MSA275-QS150	1.50	2.74	2.75



MET-SEAL Flange to Swagelok® Adapter

Part No.	Tube OD	Nominal Flange OD	A
MSA133-SW25	.25	1.33	1.64
MSA133-SW50	.50	1.33	1.87
MSA275-SW25	.25	2.74	1.86
MSA275-SW50	.50	2.74	2.09
MSA275-SW75	.75	2.74	2.74
MSA275-SW100	1.00	2.74	2.83



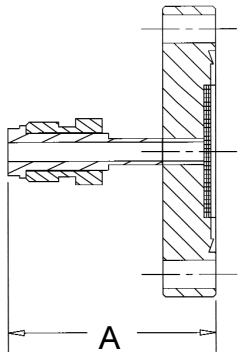
MET-SEAL DIFFUSERS/Adapter Fittings

KEY HIGH VACUUM PRODUCTS, INC. DF Series DIFFUSERS are an award winning product, that are designed and manufactured to introduce large quantities of gas quickly into a vacuum chamber or load lock during the venting of a process. **DF Series DIFFUSERS** break up the incoming gas stream evenly and uniformly and will dramatically reduce cycle time by diffusing the incoming gas stream into a large uniform flow.

The **DF-MSA Series DIFFUSERS** feature standard UHV Met-Seal flanges, allowing the use of standard hardware. The incoming gas line connection is a 1/4" VCR fitting. Construction of **DF-MSA Series DIFFUSERS** are 304L and 316L stainless steel.

By incorporating **DF-MSA Series Diffusers** in your system, you can dramatically cut cycle time as opposed to conventional venting procedures and have less particle issues to address.

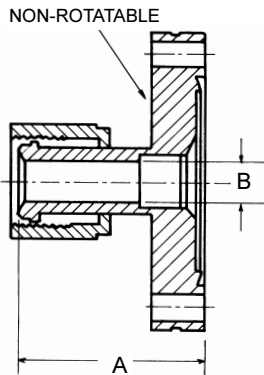
- Maximum inlet pressure = 30 psig
- Maximum operating temperature = 120 ° C



DF Series Diffusers

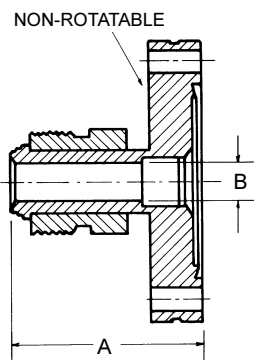
Part No.	Base Flange	VCR fitting	Pressure drop at 20 CFM/ft2	SCCM flow rate	A
DF-MSA133-FV25★	1-1/3" OD	1/4" Female	0.5 PSI	1,000	1.46
DF-MSA133-MV25★	1-1/3" OD	1/4" Male	0.5 PSI	1,000	1.46
DF-MSA275-FV25★	2-3/4" OD	1/4" Female	0.1 PSI	4,500	1.46
DF-MSA275-MV25★	2-3/4" OD	1/4" Male	0.1 PSI	4,500	1.46

★ = New Product



MET-SEAL Flange to Female VCR® Adapter

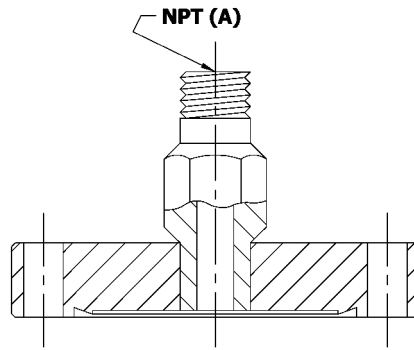
Part No.	Nominal Flange OD	VCR Size	A	B
MSA133-FV25	1.33	1/4	1.46	.19
MSA212-FV25	2.12	1/4	1.51	.19
MSA212-FV50	2.12	1/2	1.70	.41
MSA212-FV75	2.12	3/4	2.20	.62
MSA275-FV25	2.74	1/4	1.51	.19
MSA275-FV50	2.74	1/2	1.70	.41
MSA275-FV75	2.74	3/4	2.20	.62
MSA338-FV25	3.36	1/4	1.69	.19
MSA338-FV50	3.36	1/2	1.89	.41
MSA338-FV75	3.36	3/4	2.39	.62



MET-SEAL Flange to Male VCR® Adapter

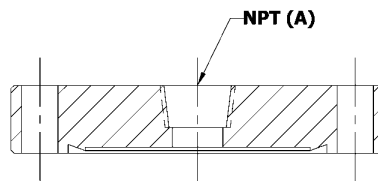
Part No.	Nominal Flange OD	VCR Size	A	B
MSA133-MV25	1.33	1/4	1.46	.19
MSA212-MV25	2.12	1/4	1.51	.19
MSA212-MV50	2.12	1/2	1.70	.41
MSA212-MV75	2.12	3/4	2.20	.62
MSA275-MV25	2.74	1/4	1.51	.19
MSA275-MV50	2.74	1/2	1.70	.41
MSA275-MV75	2.74	3/4	2.20	.62
MSA338-MV25	3.36	1/4	1.69	.19
MSA338-MV50	3.36	1/2	1.89	.41
MSA338-MV75	3.36	3/4	2.39	.62

MET-SEAL Fittings



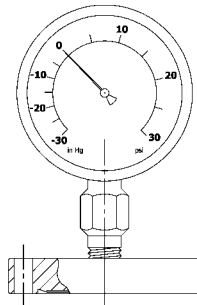
MET-SEAL Flange to Male NPT

Part Number	Nominal Flange OD	A= NPT Size
MSA133-1/8"MNPT	1.33	1/8"
MSA133-1/4"MNPT	1.33	1/4"
MSA212-1/8"MNPT	2.12	1/8"
MSA212-1/4"MNPT	2.12	1/4"
MSA275-1/8"MNPT	2.73	1/8"
MSA275-1/4"MNPT	2.73	1/4"
MSA275-1/2"MNPT	2.73	1/2"



MET-SEAL Flange to Female NPT

Part Number	Nominal Flange OD	A= NPT Size
MSA133-1/8"FNPT	1.33	1/8"
MSA133-1/4"FNPT	1.33	1/4"
MSA212-1/8"FNPT	2.12	1/8"
MSA212-1/4"FNPT	2.12	1/4"
MSA275-1/8"FNPT	2.73	1/8"
MSA275-1/4"FNPT	2.73	1/4"



MET-SEAL Gauge Compound Vacuum / Pressure

- 30" Hg - 30 psig
- Stainless steel bourdon tube & connection

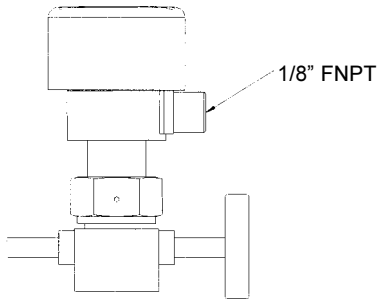
Part Number	Flange OD
MSG-133	1.33
MSG-212	2.12
MSG-275	2.73



MET-SEAL Vent / Backfill Valves, Gauges

Vent/Backfill Valves Manual

- Stainless steel bellows sealed valve
- Standard UHV flange mount

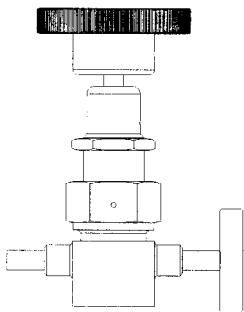


Part Number	Flange OD	A	ATM Port
MVMS-133★	1-1/3"	2.75"	1/4" OD tube
MVMS-133-MVCR★	1-1/3"	2.75"	1/4" MVCR
MVMS-133-FVCR★	1-1/3"	2.75"	1/4" FVCR
MVMS-275★	2-3/4"	2.75"	1/4" OD tube
MVMS-275-MVCR★	2-3/4"	2.75"	1/4" MVCR
MVMS-275-FVCR★	2-3/4"	2.75"	1/4" FVCR

★ = New Product

Vent/Backfill Valves Pneumatic

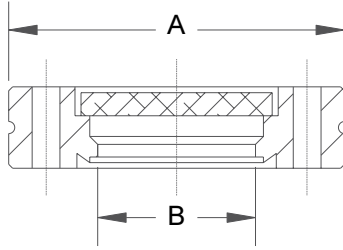
- Stainless steel bellows sealed, fail safe (spring loaded), normally closed
- Solenoid not included, available as option:
12, 24 VDC, 120, 240 VAC contact factory
- Standard UHV flange mount



Part Number	Flange OD	A	ATM Port
MVMS-133-P★	1-1/3"	2.75"	1/4" OD tube
MVMS-133-PMVCR★	1-1/3"	2.75"	1/4" MVCR
MVMS-133-PFVCR★	1-1/3"	2.75"	1/4" FVCR
MVMS-275-P★	2-3/4"	2.75"	1/4" OD tube
MVMS-275-PMVCR★	2-3/4"	2.75"	1/4" MVCR
MVMS-275-PFVCR★	2-3/4"	2.75"	1/4" FVCR

★ = New Product

MET-SEAL Viewports and Feedthroughs

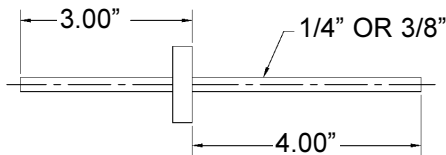


MET-SEAL Zero Length Viewports Pyrex 7056 Glass

Part Number	A	B
VP-1.33-G	1.33	5/8"
VP-2.75-G	2.74	1-3/8"
VP-4.50-G	4.47	2-5/8"
VP-6-G	5.97	3-7/8"
VP-8-G	7.97	5-3/8"

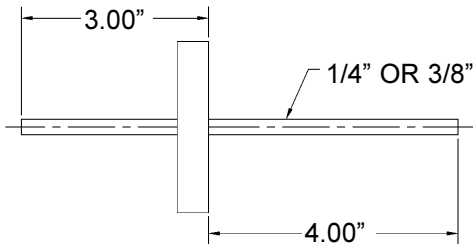
MET-SEAL Liquid Feedthroughs

- Maximum bake out temperature 450° C
- Tubing sizes 1/4" or 3/8"
- Material 304 S/S tubes and flanges
- 316 S/S Swageloks® and VCR's®



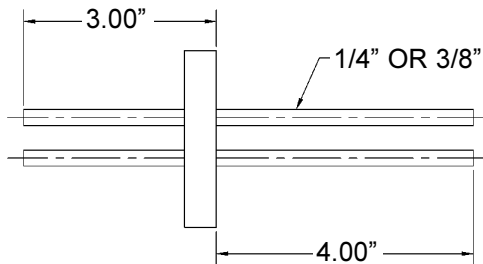
Liquid Feedthrough / Mini MET-SEAL Flange

Part Number	Description
FTL-133-25	1/4" OD x .035 wall tube
FTL-133-37	3/8" OD x .035 wall tube



Liquid Feedthrough / 2-3/4" OD MET-SEAL Flange

Part Number	Description
FTL-275-25	1/4" OD x .035 wall tube
FTL-275-37	3/8" OD x .035 wall tube



Dual Liquid Feedthroughs on 2-3/4" OD MET-SEAL Flange

Part Number	Description
FTL-275-25-2	1/4" OD x .035 wall tube
FTL-275-37-2	3/8" OD x .035 wall tube

Met-Seal Safety Covers

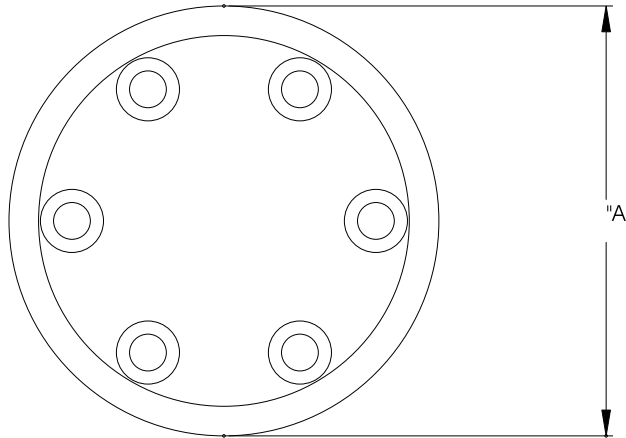
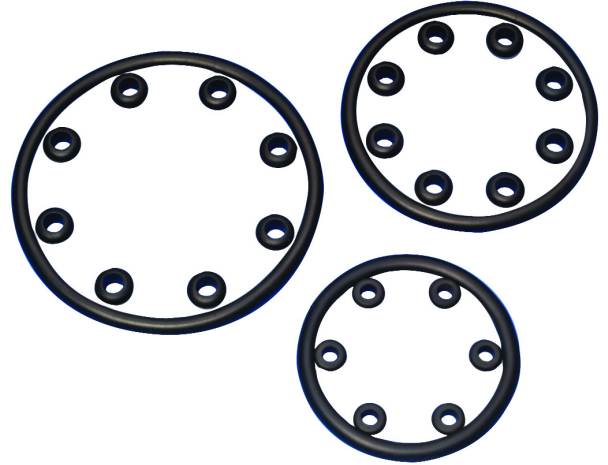
Innovative Protection for Exposed Viewports

KEY HIGH VACUUM PRODUCTS, INC.'s polycarbonate safety covers are an innovative solution for protecting personnel from exposed viewports from their inherent dangers. **MSSC (Met-Seal Safety Covers)** should be used as a continuation of good, safe laboratory practices. All glass used in vacuum work should be securely shielded to restrain flying glass in the event of an implosion.

MSSC's covers are secured by gently pushing the rubber gaskets over standard 12 point bolt heads. No tools required.

Installation is simple quick and easy. Simply line up the bolt holes and press the cover on. No need to break vacuum on existing equipment.

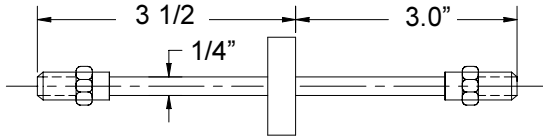
Temperature range -40°F to +180°F



Part Number	Use with Flange OD	A
MSSC-275	2-3/4" OD Flange	3-1/4"
MSSC-338	3-3/8" OD Flange	4"
MSSC-450	4-1/2" OD Flange	4-3/4"
MSSC-600	6" OD Flange	6-1/4"
MSSC-800	8" OD Flange	8-1/4"
MSSC-1000	10" OD Flange	10-1/4"

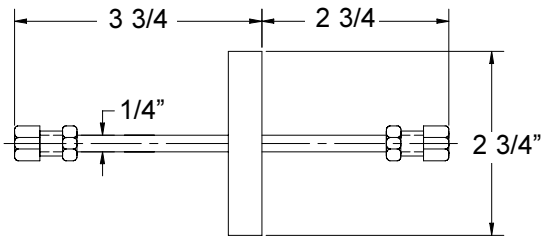


MET-SEAL Feedthroughs



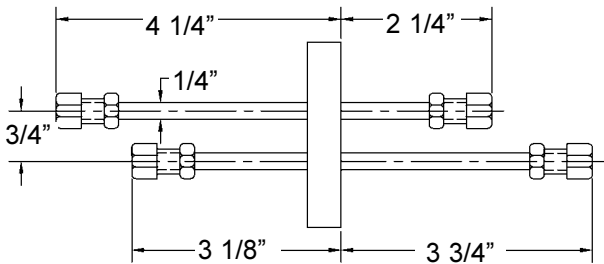
Liquid Feedthrough / Mini MET-SEAL with Swageloks®

Part Number	Description
FTL-133-25-SW	1/4" OD tube Swagelok® fittings



Liquid Feedthrough / 2-3/4" MET-SEAL with Swageloks®

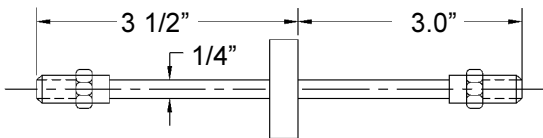
Part Number	Description
FTL-275-25-SW	1/4" OD tube Swagelok® fittings
FTL-275-37-SW	3/8" OD tube Swagelok® fittings



Dual Liquid Feedthroughs / 2-3/4" MET-SEAL with Swageloks®

Part Number	Description
FTL-275-25-2-SW	1/4" OD tube Swagelok® fittings
FTL-275-37-2-SW	3/8" OD tube Swagelok® fittings

9

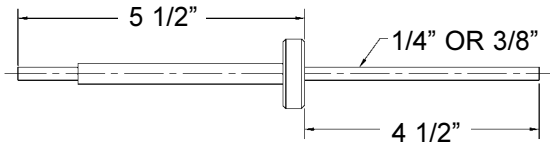


Liquid Feedthrough / MET-SEAL with 1/4" Male VCRs®

Part Number	Description
FTL-133-25-MVCR	1.33" OD flange, Single Tube 1/4" OD
FTL-275-25-MVCR	2.74" OD flange, Single Tube 1/4" OD
FTL-275-25-2-MVCR	2.74" OD flange, Dual Tubes 1/4" OD

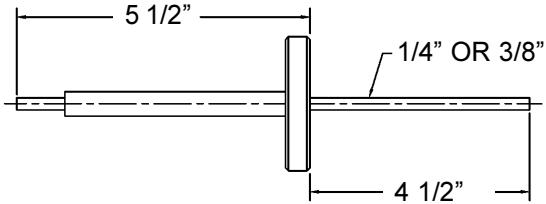


MET-SEAL Feedthroughs



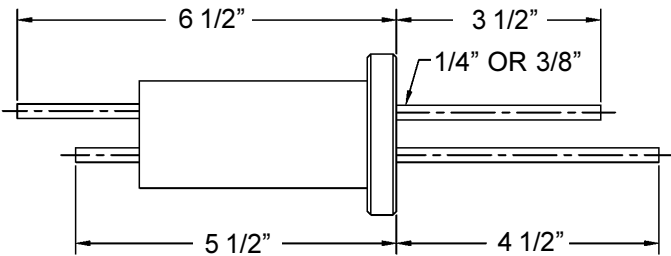
LN2 Feedthrough / Mini MET-SEAL Flange

Part Number	Description
FTLN-133-25	1/4" OD x .035 wall tube
FTLN-133-37	3/8" OD x .035 wall tube



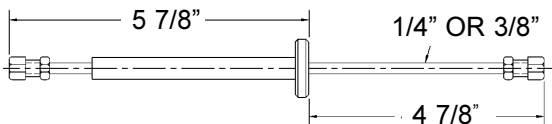
LN2 Feedthrough / 2-3/4" OD MET-SEAL Flange

Part Number	Description
FTLN-275-25	1/4" OD x .035 wall tube
FTLN-275-37	3/8" OD x .035 wall tube



Dual LN2 Feedthroughs / 2-3/4" OD MET-SEAL Flange

Part Number	Description
FTLN-275-25-2	1/4" OD x .035 wall tubes
FTLN-275-37-2	3/8" OD x .035 wall tubes

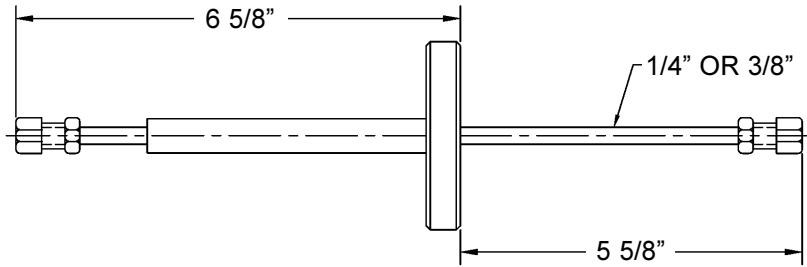


LN2 Feedthrough / Mini MET-SEAL Flange with Swageloks®

Part Number	Description
FTLN-133-25SW	1/4" OD tube Swagelok® fittings

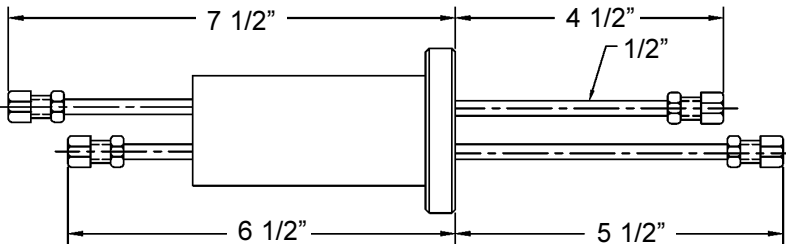


MET-SEAL Feedthroughs



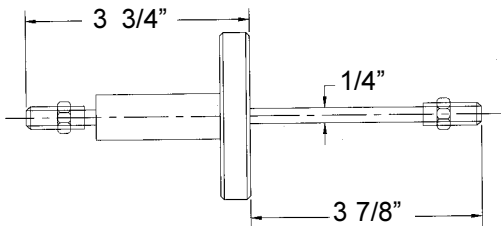
LN2 Feedthrough / 2-3/4" MET-SEAL with Swageloks®

Part Number	Description
FTLN-275-25-S	1/4" OD tube Swagelok® fittings
FTLN-275-37-S	3/8" OD tube Swagelok® fittings



Dual LN2 Feedthroughs / 2-3/4" MET-SEAL with Swageloks®

Part Number	Description
FTLN-275-25-2-S	1/4" OD tube Swagelok® fittings
FTLN-275-37-2-S	3/8" OD tube Swagelok® fittings

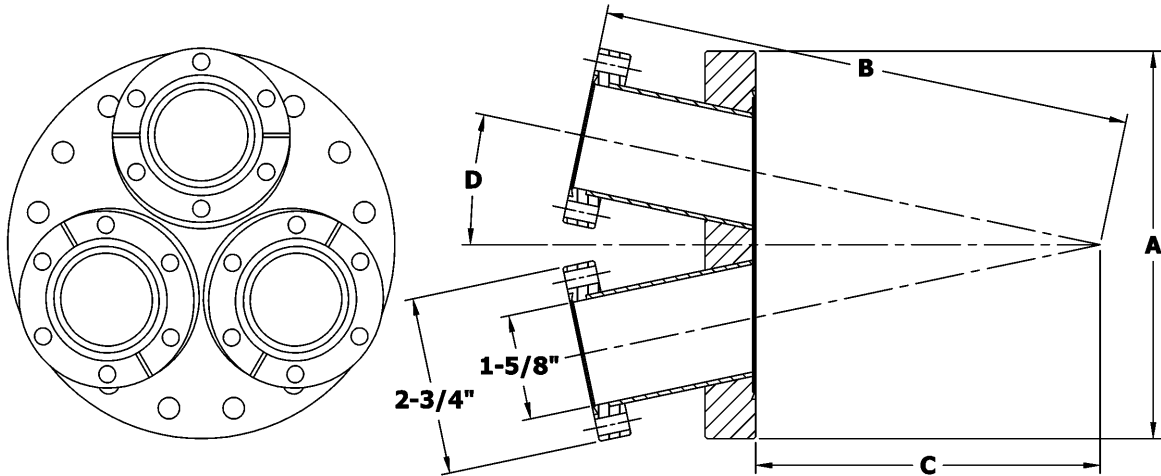


LN2 Feedthroughs / MET-SEAL Flange with VCRs®

Part Number	Description
FTLN-133-25-MVCR	1.33" OD flange 1/4" OD single tube, with 1/4" male VCR® fittings
FTLN-275-25-MVCR	2.74" OD flange 1/4" OD single tube, with 1/4" male VCR® fittings
FTLN-275-25-2-MVCR	2.74" OD flange 1/4" OD double tubes, with 1/4" male VCR® fittings



MET-SEAL Cluster Flanges

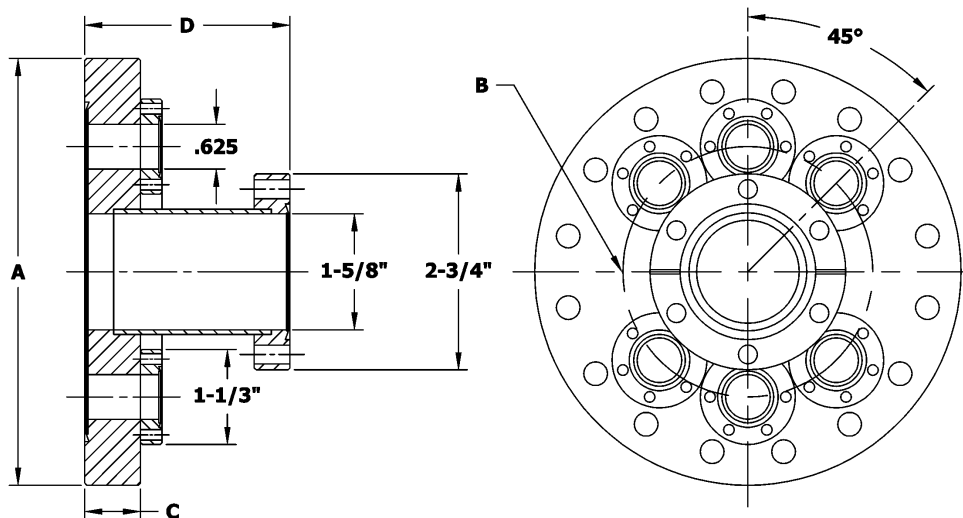


MET-SEAL Large Cluster Flanges, 3 or 4 Ports, Angled

Features:

- Oversized tubes on 2-3/4" OD MET-SEAL
- Angled ports converge to standard component centerlines
- Angled 2-3/4" OD MET-SEAL non rotatable

Part Number	Flange Mount	A	B	C	D	2-3/4" Ports
CF600-3LA	6" OD MET-SEAL	5.97	8.18	5.31	11.9 degrees	3
CF800-3LA	8" OD MET-SEAL	7.97	9.83	6.57	13 degrees	3
CF800-4LA	8" OD MET-SEAL	7.97	9.83	6.57	13 degrees	4



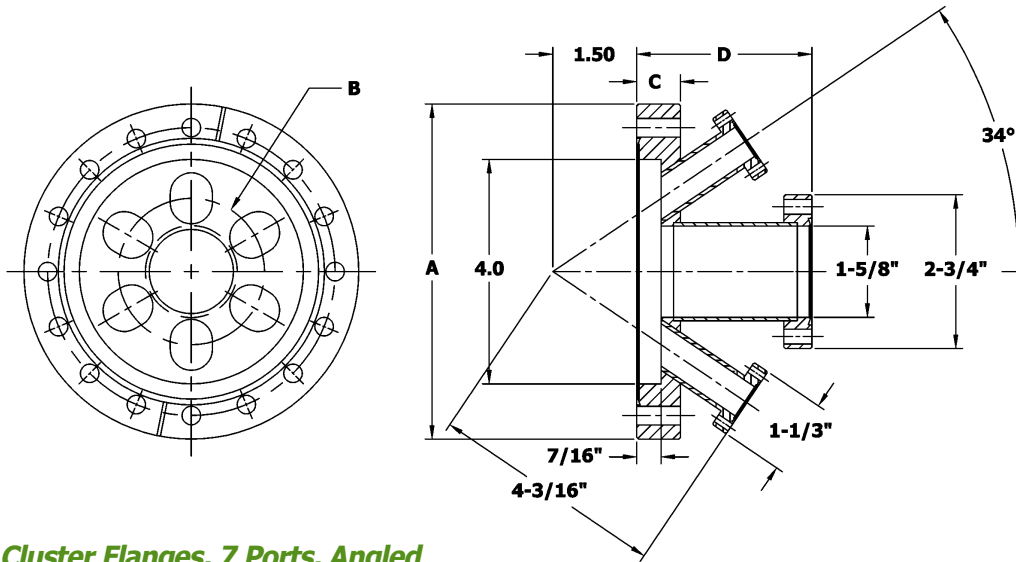
MET-SEAL Cluster Flanges, 7 Ports, Flush Mount

Features:

- Flush mounted tapped Mini MET-SEAL, 6 places
- Oversized tube on 2-3/4" OD MET-SEAL
- Electropolished assemblies

Part Number	Flange Mount	A	B	C	D
CF600-FM	6" OD MET-SEAL	5.97	3.5	.781	3.12
CF800-FM	8" OD MET-SEAL	7.97	4.25	.875	3.12

MET-SEAL Cluster Flanges

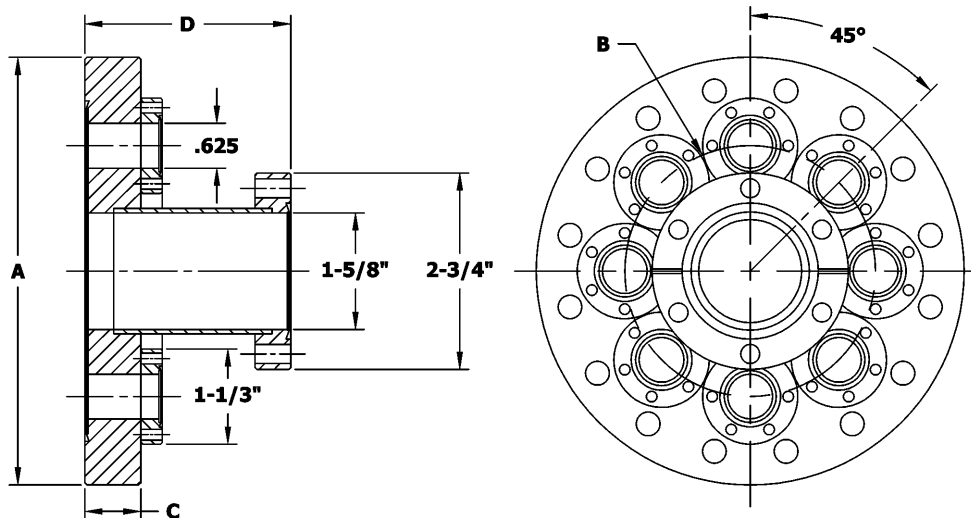


MET-SEAL Cluster Flanges, 7 Ports, Angled

Features:

- Angled Mini MET-SEAL non rotatable 6 places, thru holes
- Oversized tube on 2-3/4" OD MET-SEAL
- Electropolished assemblies

Part Number	Flange Mount	A	B	C	D
CF600-A	6" OD MET-SEAL	5.97	2.60	.781	3.12
CF800-A	8" OD MET-SEAL	7.97	2.60	.875	3.12



MET-SEAL Cluster Flanges, 9 Ports, Flush Mount

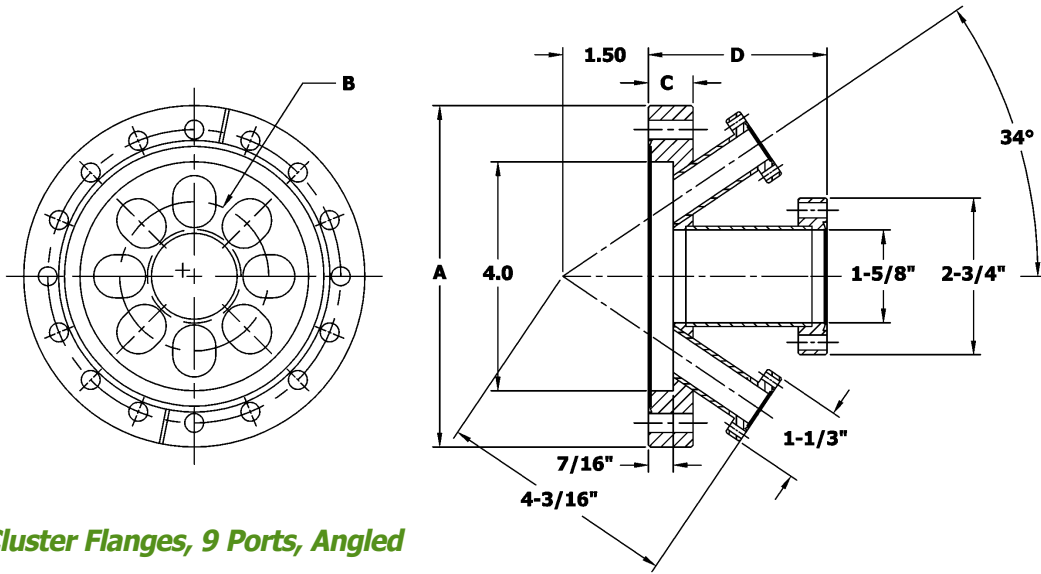
Features:

- Flush mounted tapped Mini MET-SEAL, 8 places
- Oversized central tube on 2-3/4" OD MET-SEAL
- Electropolished assemblies

Part Number	Base Flange	A	B	C	D
CF600-FM8	6" OD MET-SEAL	5.97	3.5	.781	3.12
CF800-FM8	8" OD MET-SEAL	7.97	4.25	.875	3.12



MET-SEAL Cluster Flanges

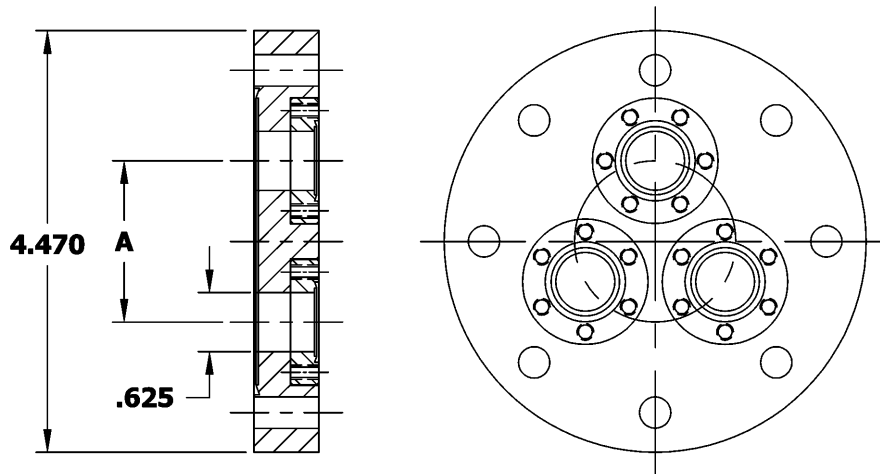


MET-SEAL Cluster Flanges, 9 Ports, Angled

Features:

- Angled Mini MET-SEAL 8 places, through holes
- Oversized tube on 2-3/4" OD MET-SEAL
- Electropolished assemblies

Part Number	Base Flange	A	B	C	D
CF600-A8	6" OD MET-SEAL	5.97	2.61	.781	3.12
CF800-A8	8" OD MET-SEAL	7.97	3.03	.875	3.12



Zero Length MET-SEAL Cluster Flanges

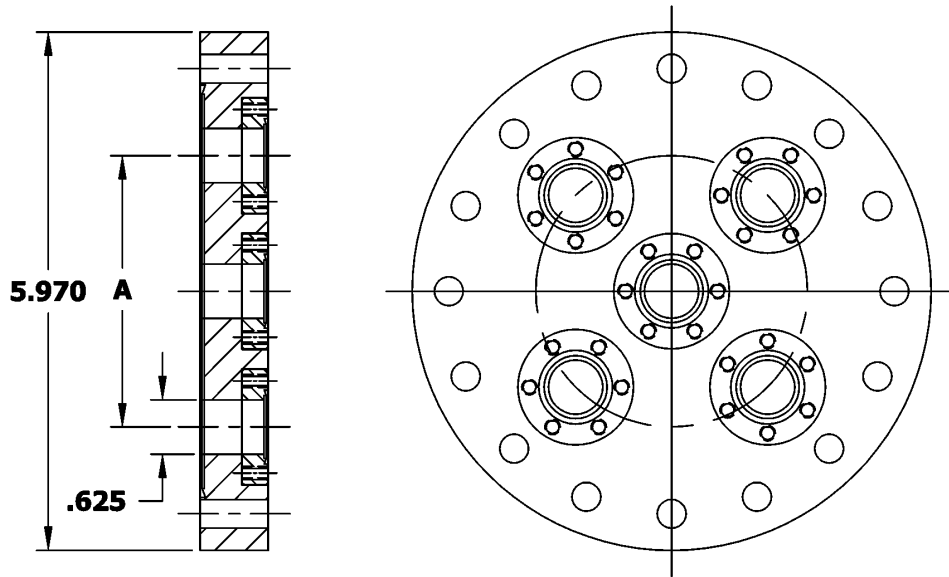
Features:

- Oversize bores on all flanges
- Attach accessories for electrical, cooling, feedthroughs, gauges, etc.
- Base flanges are through holes, insert flanges are tapped non-rotatable
- Electropolished assemblies

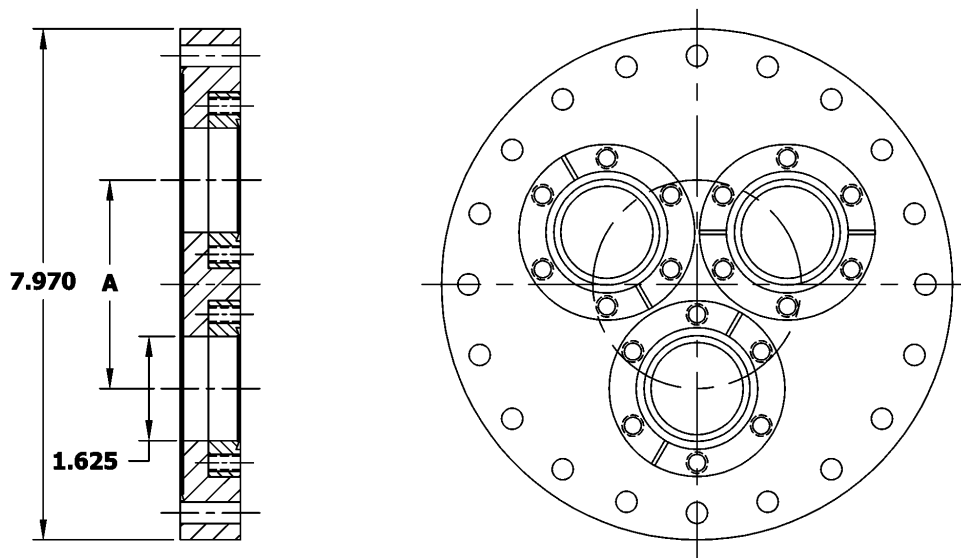
Part Number	Description	A
CLF450-133	4-1/2" OD base flange 3 each tapped Mini inserts	1.710



MET-SEAL Cluster Flanges



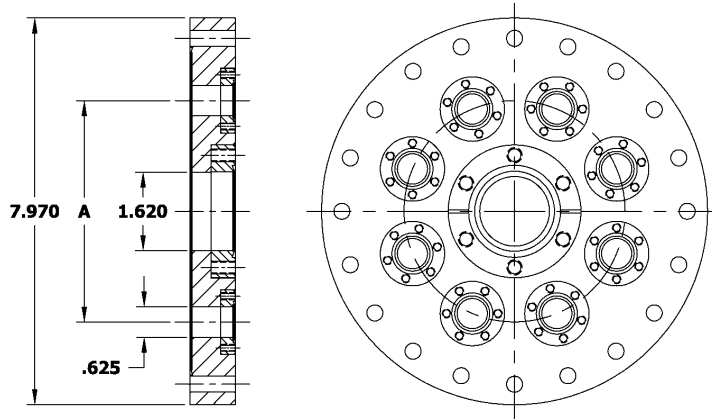
Part Number	Description	A
CLF600-133	6" OD base flange 5 each tapped Mini inserts	3.125



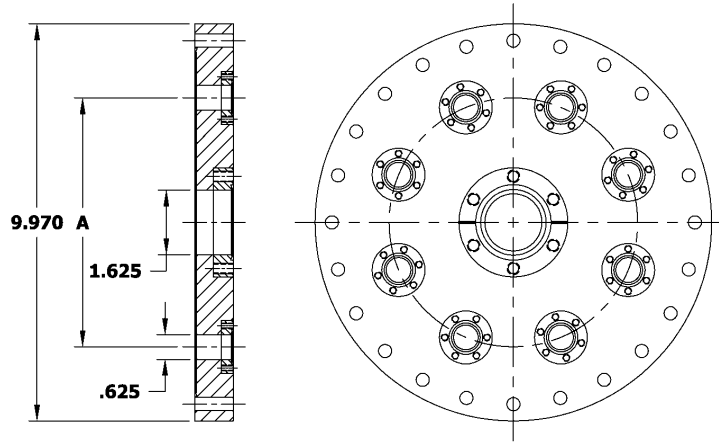
Part Number	Description	A
CLF800-275	8" OD base flange, 3 each tapped 2-3/4" inserts	3.250



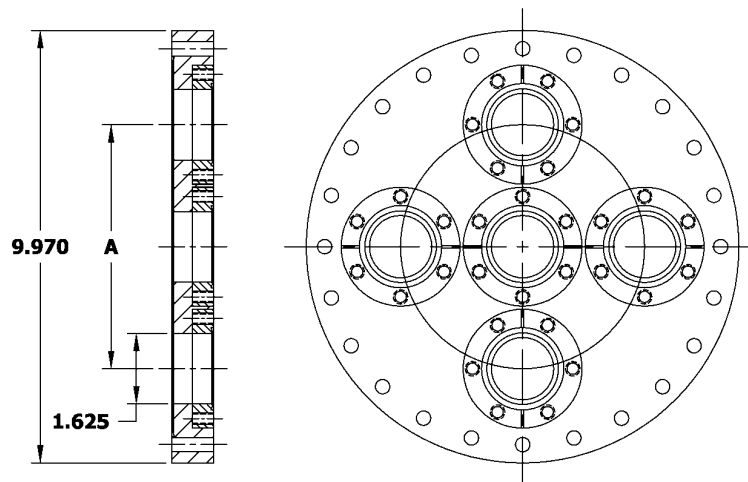
MET-SEAL Cluster Flanges



Part Number	Description	A
CLF800-275-133	8" OD base flange, 1 each 2-3/4" tapped insert 8 each tapped Mini inserts	4.562



Part Number	Description	A
CLF1000-275-133	10" OD base flange, 1 each 2-3/4" and 8 each Mini inserts	6.250



Part Number	Description	A
CLF1000-275	10" OD base flange, 5 each 2-3/4" tapped inserts	5.625



Custom Products Gallery

KEY HIGH VACUUM PRODUCTS, INC., willingly customizes its standard product line to meet individual customer specifications. Customized products include but are not limited to, valves, manifolds, half and full nipples, flanges, adapters, flexible couplings, spool or transition pieces, crosses, elbows, tees, feedthroughs, high vacuum systems as well as custom chambers.

KEY HIGH VACUUM PRODUCTS, INC., promptly quotes and fabricates these items with a fast response and a timely delivery. Frequently all that is required is a "rough print" and a description for this purpose.

Please feel free to contact us with your specific requirements.



Custom Manifolds



Custom Chambers



Custom Valves

Vacuum Systems

KEY HIGH VACUUM PRODUCTS, INC. designs and manufactures production, laboratory/research high vacuum systems.

Our **CP-401 / 501** sputtering systems and **KV-301** evaporation systems are bell jar type systems, which are used in deposition processes and provide excellent value for thin film research. These highly adaptable tools that can be used for a wide variety of thin film applications and are extremely versatile.

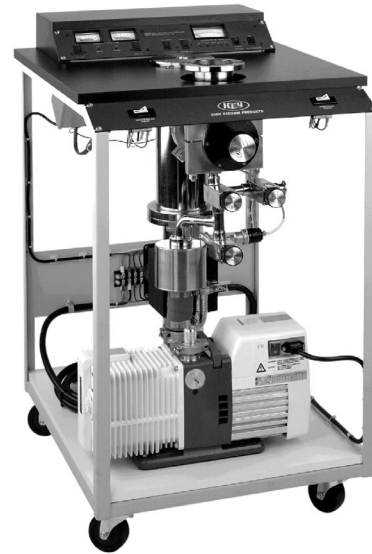
Our standard systems are offered with a variety of options such as turbo, cryo and diffusion pumped models, as well as a host of possible instrumentation and source packages.

The systems listed on the following pages are integrated units and are delivered turnkey ready for use.



Portable Diffusion Pumping Stations

- Compact accessible design
- 7 CFM dual stage mechanical pump
- Ionization gauge controller with dual thermocouples
- All bellows sealed valves
- Low loss 8 hour liquid nitrogen trap
- Easy operation and maintenance



Description:

The portable 2" and 3" pumping systems are fully equipped durable performance units which are designed to give the greatest value per dollar of any pumping system available. These portable systems are delivered as turnkey units. Completely tested at our factory for operation, quality and ultimate pressure. A truly portable unit that just wheels into position and plugs into any standard 110 VAC duplex outlet.

Portable pumping station operating characteristics

Specifications	2" System	3" System
Pumping Speed	185 liters / Second for Air	285 Liters / Second for Air
Ultimate Pressure	5 x 10 ⁻⁸ torr	5 x 10 ⁻⁸ torr
Backstreaming Rate	Less than 0.0009 mg/ cm ² /min	Less than 0.0009 mg/cm ² /min
Maximum Forepressure	.060 torr	.060 torr
Warm-Up Time	10 minutes normal	10 minutes normal
Power Requirements	110 VAC, 10 AMP	110 VAC, 10 AMP

Portable pumping station ordering information as per data sheet

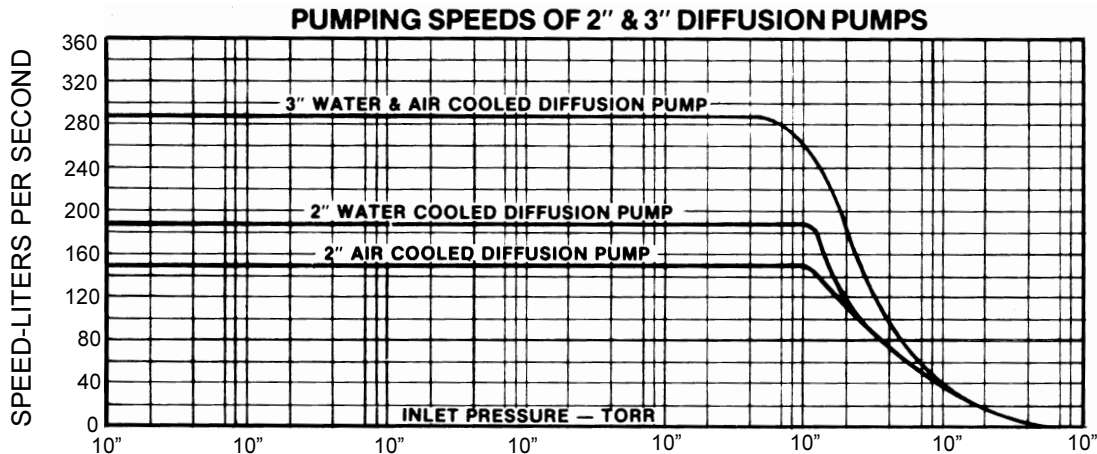
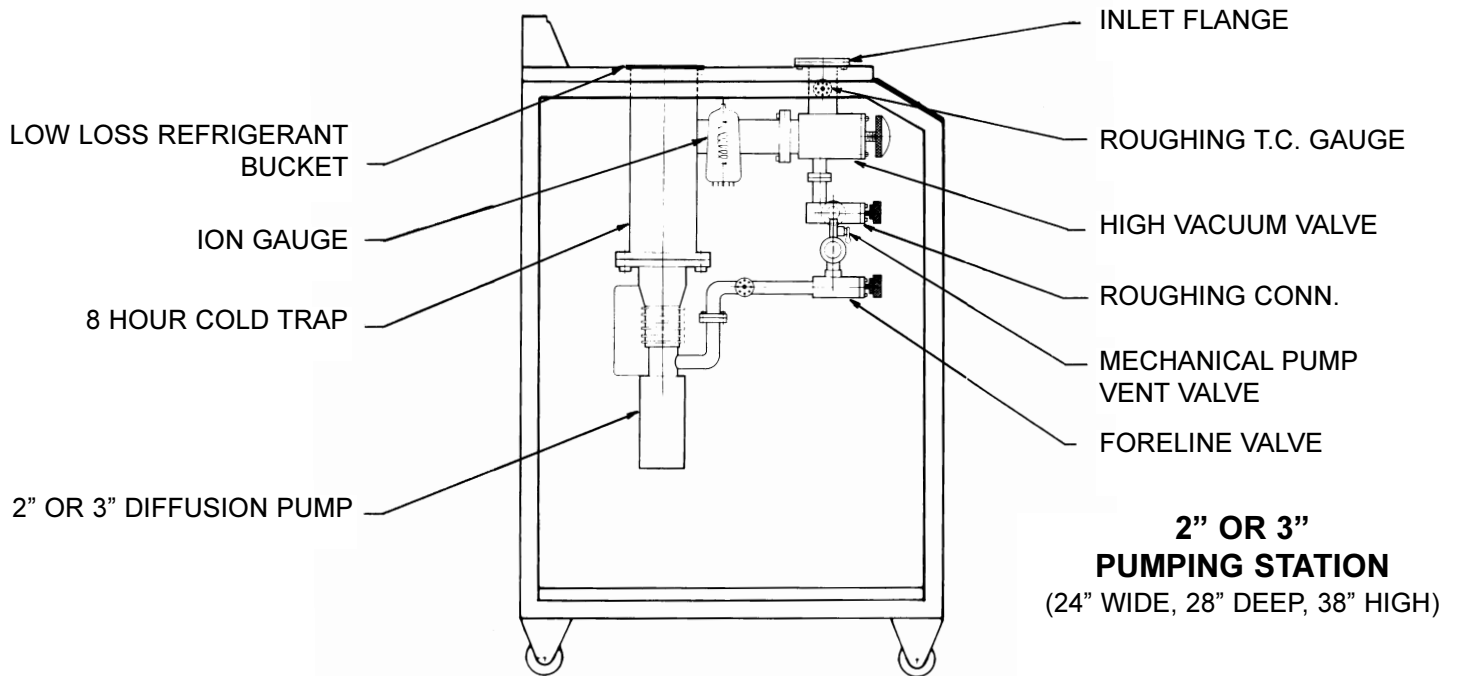
Part Number	Description
P2AC-BM	2" pumping system, chrome plated brass manifold
P2AC-SM	2" pumping system, high vacuum side stainless steel
P3AC-BM	3" pumping system, chrome plated brass manifold
P3AC-SM	3" pumping system, high vacuum side stainless steel



Portable Diffusion Pumping Stations

Options:

- Water cooled diffusion pump
- Baseplate
- Custom chamber or manifold
- Bell jar: Pyrex® or stainless steel
- Automatic valve and pump control
- Semi auto single lever control
- Contact factory directly for all available options



Diffusion Pumping Stacks

2" & 3" Diffusion Pumping Stacks

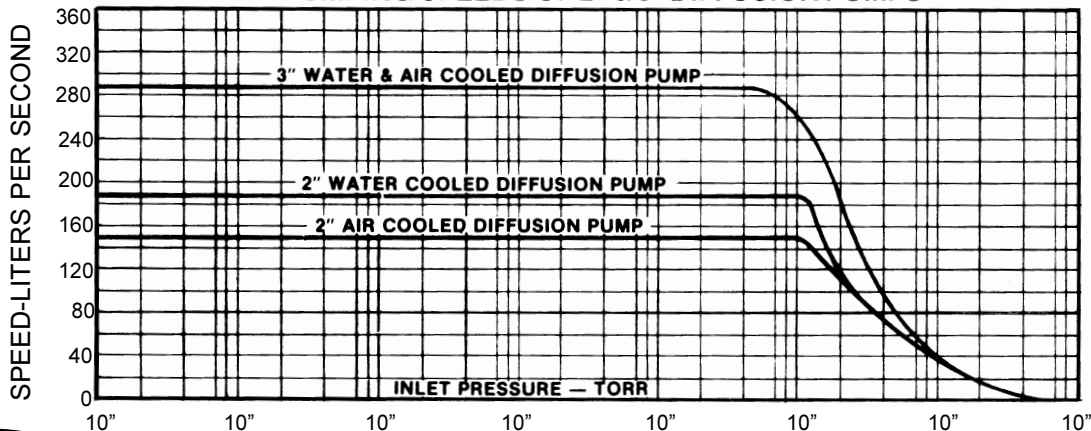
- Completely assembled and leak tested systems. Ready for mounting to your chamber
- Low - Loss 8-Hour liquid nitrogen trap
- Connections for foreline, roughing, thermocouple and Ionization gauge tubes
- All bellows sealed valves, manually operated

These stacks are complete and feature bellows sealed valves, low loss liquid nitrogen trap (to minimize backstreaming), foreline trap, and gauge ports. These stacks are reliable and easy to connect to a vacuum chamber. Each system will operate in the 10^{-7} to 10^{-8} torr range. Each stack is shipped "dry" with a separate charge of DC-704 diffusion pump fluid.

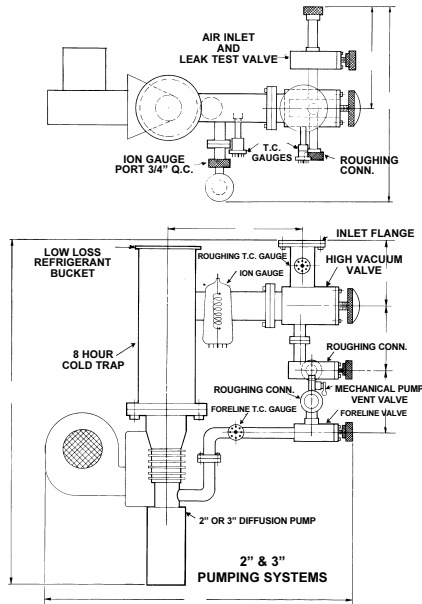


Specifications	2" System	3" System
Pumping Speed	185 Liters/Second for Air	285 Liters/Second for Air
Ultimate Pressure	5×10^{-8}	5×10^{-8}
Backstreaming Rate	Less than 0.0009 mg/cm ² /min	Less than 0.0009 mg/cm ² /min
Maximum Forepressure	.060 Torr	.060 Torr
Warm-up Time	10 minutes (Normal)	10 minutes (Normal)
Power	120 VAC	120 VAC
Recommended Forepump	2 CFM Throughput up to 0.400 Torr L/Sec	2 CFM Throughput up to 0.400 Torr L/Sec

PUMPING SPEEDS OF 2" & 3" DIFFUSION PUMPS



Diffusion Pumping Stacks



2" Air Cooled Diffusion Pump Stacks

Part Number	Description
2AC-BM	2" pumping stack, chrome plated brass high vacuum side, manual valves
2AC-BP	2" pumping stack, chrome plated brass high vacuum side, pneumatic valves
2AC-SM	2" pumping stack, stainless steel high vacuum side, manual valves
2AC-SP	2" pumping stack, stainless steel high vacuum side, pneumatic valves

2" Water Cooled Diffusion Pump Stacks

Part Number	Description
2WC-BM	2" pumping stack, chrome plated brass high vacuum side, manual valves
2WC-BP	2" pumping stack, chrome plated brass high vacuum side, pneumatic valves
2WC-SM	2" pumping stack, stainless steel high vacuum side, manual valves
2WC-SP	2" pumping stack, stainless steel high vacuum side, pneumatic valves

3" Air Cooled Diffusion Pump Stacks

Part Number	Description
3AC-BM	3" pumping stack, chrome plated brass high vacuum side, manual valves
3AC-BP	3" pumping stack, chrome plated brass high vacuum side, pneumatic valves
3AC-SM	3" pumping stack, stainless steel high vacuum side, manual valves
3AC-SP	3" pumping stack, stainless steel high vacuum side, pneumatic valves

3" Water Cooled Diffusion Pump Stacks

Part Number	Description
3WC-BM	3" pumping stack, chrome plated brass high vacuum side, manual valves
3WC-BP	3" pumping stack, chrome plated brass high vacuum side, pneumatic valves
3WC-SM	3" pumping stack, stainless steel high vacuum side, manual valves
3WC-SP	3" pumping stack, stainless steel high vacuum side, pneumatic valves

Options:

- Conduction-cooled baffle is available

High Vacuum Evaporator

MODEL KV-301

- 3" stainless steel pumping system operates at 2×10^{-7} Torr or better
- 8 hour low loss liquid nitrogen trap
- 14" diameter stainless steel base plate
- 12" diameter x 18" Pyrex® bell jar and implosion guard
- 7 CFM dual stage mechanical pump
- 3" air cooled diffusion pump, 285 l/s for air
- 1 KVA manually controlled evaporation power supply with two high current feedthrus

DESCRIPTION:

The **KEY MODEL KV-301** portable high vacuum evaporator is a complete turnkey high-speed diffusion pumping thermal evaporation system. Designed to give reliable performance with simplicity of operation and ease of maintenance.



Part Number	Description
KV-301	With all features listed on data sheet

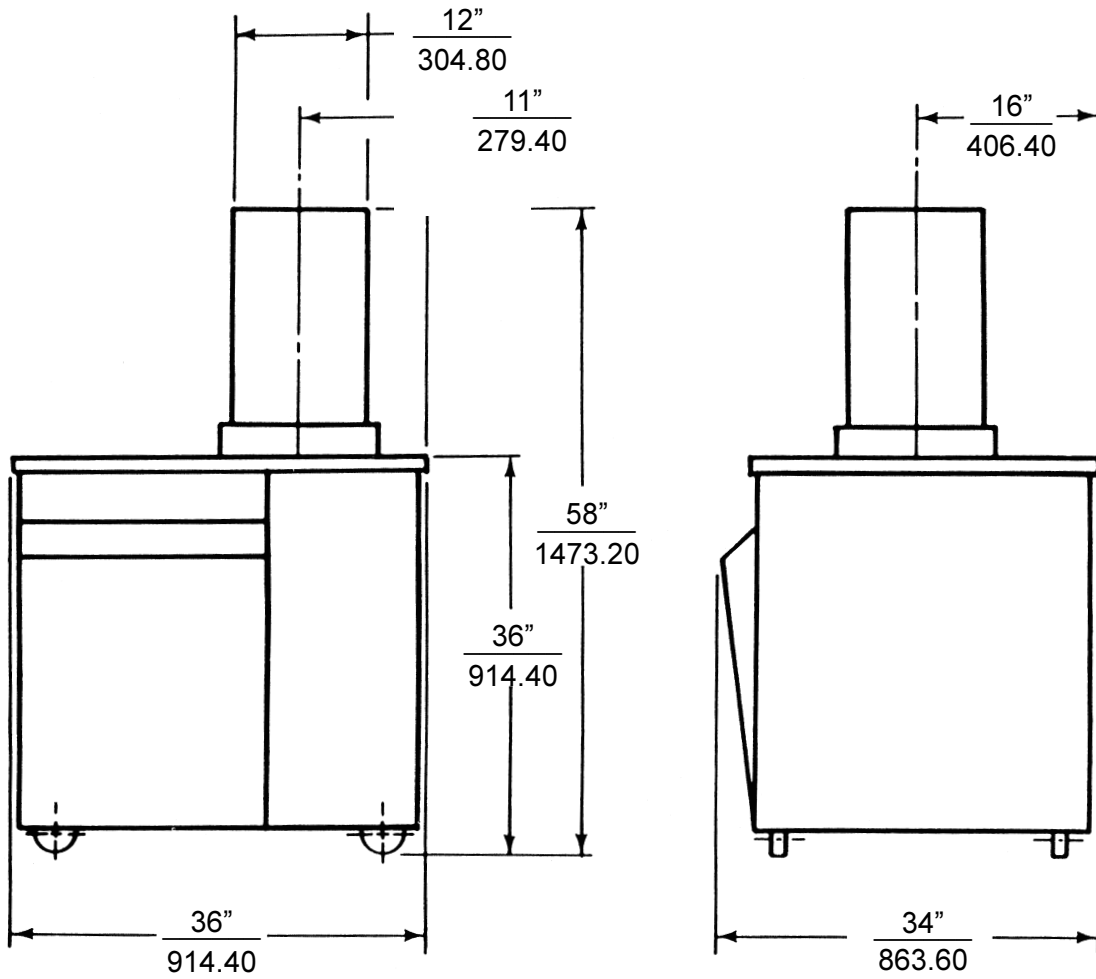
OPTIONS:

- ADP-3500 automatic valve and pump controller
- 11 CFM dual stage mechanical pump
- Selector switch to allow switching between multiple evaporation sources
- Base plate or bell jar as per requirement
- Custom chamber
- 2 KVA power supply
- Automated deposition control
- Source shutter
- Thin film deposition monitor and controllers
- Turbo pumping

Contact the factory for a complete range of options



High Vacuum Evaporator



DIMENSIONS:

- 36" Wide, 34" Deep, 36" High

MODELS KV-601-S, KV-601-E

Description:

The **KV-601 Series** are highly versatile systems, which are an effective production research and development tool and provide maximum flexibility to laboratory thin film deposition applications. The **KV-601 Series** are offered in a sputtering and electron beam configurations and are offered as a complete package. These systems are offered in manual and automated versions, with several baseplate and feedthru options. Applications include but not limited to optical coating, decorative coatings, metallurgical studies, etc...

Standard Common Features of the KV-601-S, KV-601-E

- Ionization and thermocouple gauge controller
- 6" diffusion pump with a pumping speed of 2400 l/s or a cryopump with a pumping of 1500 l/s
- Liquid nitrogen trap (diffusion pumped models only)
- Stainless steel gate valve for high vacuum pump isolation
- 11 CFM drive mechanical pump with mist eliminator
- 20" OD stainless steel baseplate with 12 each 1" diameter feedthrough holes
- 18" x 30" Pyrex® bell jar with an implosion guard
- Counterbalanced manual hoist



KV-601-S (Sputtering) Features:

- 3" magnetron sputtering source
- 3 kW RF power supply
- Auto tuning network
- Manual throttle valve
- Manual gas flow valve
- 3 kW DC power supply

KV-601-E (Evaporation) Features:

- 3 pocket E-Beam gun
- 3 kW power supply
- Stainless steel feedthrough collar

Sputtering and E-Beam Systems



Part Number	Description	Price
KV-601-E	E-Beam Gun System	\$ * POR
KV-601-S	Sputtering System	\$ * POR

* Price on request

Optional Equipment

- Single lever valve control
- Automatic valve sequencer
- Thickness film monitor/controller
- Quartz lamp substrate holder
- Substrate holder
- Automatic or manual shutter assembly
- Automatic throttle valve
- Gas flow instrumentation and control
- Stainless steel bell jar
- Motorized hoist
- 1 or 2 KVA evaporation power supply with 2 each high current feedthroughs
- Filament top switch allowing changes between sources
- Open frame cabinet
- 27 CFM mechanical roughing pump
- Stainless steel feedthrough collar
- Electrical feedthroughs

Cryopumped Systems

MODELS CP-401 AND 501

Description:

The **CP-401 and 501 Series** systems bring almost unlimited flexibility with a variety of standard options to the R & D lab environment. Rugged construction with the proven high-speed pumping design of the CT-8 cryopump. Cryopumps have the highest unmatched pumping speed available for water vapor, which typically is the largest gas load in a system. Direct benefits of a cryopumped system are; clean work environment, dependable performance and reduced utility rates. The **CP-401** features automated controls for all valves and the regeneration mode, while the **CP-501** has manual valves and controls. Both systems feature stainless steel base plates and typical pump-down to base pressure is less than 30 minutes in a clean nitrogen vented system. All systems are delivered turnkey and ready for use. Our systems are ideal for research, development and production applications. Applications include but are not limited to ion implantation, sputtering, optical coating, automotive metallization and industrial evaporation.

Price is dependent upon customer-defined configuration and options. Final price quotes are generated after customer provides all specifications. Contact factory directly for written price quotes.

Standard common features of the 401 and 501 series cryopump systems:

- CT-8 cryopump and compressor
- 8" gate valve
- 11 CFM direct drive mechanical pump
- GP 270 ionization and thermocouple gauge controller
- 18" x 30" Pyrex® bell jar with implosion guard
- 20" OD baseplate with 12 each 1" diameter feedthrough holes
- Foreline trap
- All bellows sealed foreline valves
- All stainless steel construction on high vacuum side
- Chrome plated brass construction on roughing side

8" Cryo Pump Pumping Speeds

Water	4000 liters/sec
Air	1500 liters/sec
Hydrogen	2500 liters/sec
Argon	1200 liters/sec
Argon throughput	700 scc/min

8" Cryo Pump Capacity

Argon	1000 standard liters
Hydrogen	12 standard liters at 5x10 ⁻⁶ torr
Cross over	150 torr liters
Cold to cold regeneration	2 hours 15 minutes typical

CP-401 Features

- Automatic valve controller (ACP-3000)
- Open frame construction with "skins"

CP-501 Features

- Manual valves and controls
- Open frame construction

Options:

- Roughing/foreline pumps: molecular drag, scroll, diaphragm, and other "dry" pumps upon request
- Stainless steel bell jar
- 20" OD feedthru collar 8 port
- Electron beam source
- Deposition controller; crystal monitor
- Cold cathode discharge gauges
- Magnetron sputtering source
- Manual deposition shutter
- DC power supplies, RF power supplies
- Custom high vacuum chambers as per request
- Other options are available; contact factory for price schedule
- CP-401 and CP-501 quoted per customer requirement



Cryopumped Systems

Model CP-401/CP-501 Systems



Chamber Accessories and Feedthroughs

For many years now **KEY HIGH VACUUM PRODUCTS, INC.** has fabricated "**custom**" vacuum chambers and components for our systems group, in addition to countless others for prominent public and private universities, government laboratories, etc.. A majority of the chambers **KEY HIGH** constructed for our customers, are per customer specification.

KEY HIGH is proud to announce we have expanded extensively on our product line, offering numerous new items including "**standard**" building block chamber components. These "**standard**" chambers and components allow the user to design and manufacture a system with flexibility in the project. This permits the procurement of only the components necessary when constructing a new system or updating an existing system.

In the subsequent pages are listed standard chamber components as well as **several hard to find items, such as valve controllers, hoists and other sub-assemblies.** These items permit the user to fabricate a complete vacuum system in a variety of configurations. By mixing together baseplates, collars and bell jars a variety of unique possibilities become open to the user.

At KEY, we sell solutions; different types of chamber accessories as well as an extensive assortment of high vacuum components; long life valves, traps and many other high vacuum accessories.

As with all of our products our custom products group can quote special order assemblies in most instances from simple sketches. This assures prompt quotes and dependable delivery dates.



Vacuum Chambers, Collars and Accessories

Pyrex® bell jars are supplied with rimless ground edge for use with flat baseplates and collars. The rimless edge accepts standard "L" shaped bell jar gaskets for a leak tight seal. Bakeouts higher than 150° C is not recommended and should only be done with infrared heat lamps, as they distribute heat evenly and minimize stress points. **Bell Jar Guards** are strongly recommended to protect personnel against an accidental implosion. **KHVP** guards are manufactured from perforated aluminum with aluminum spun top and tightening straps to conform to each individual bell jar.

Pyrex® Bell Jars

Part Number	Diameter / Height	
BJ-1	10"	X 12"
BJ-2	12"	X 18"
BJ-3	18"	X 18"
BJ-4	18"	x 30"



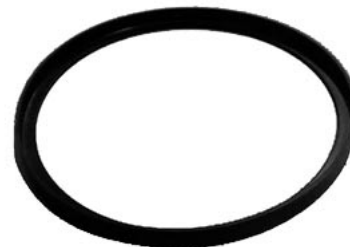
Bell Jar Guards

Part Number	Diameter / Height	
G-1	10"	X 12"
G-2	12"	X 18"
G-2A	14"	X 18"
G-2B	15"	X 18"
G-3	18"	X 18"
G-4	18"	X 30"



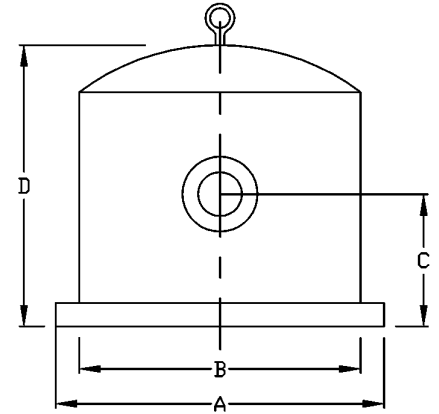
Bell Jar "L" Gaskets

Part Number	Material	Description
B-1	Buna N	For 10" diameter
V-1	Viton® A	For 10" diameter
B-2	Buna N	For 12" diameter
V-2	Viton® A	For 12" diameter
B-2A	Buna N	For 14" diameter
V-2A	Viton® A	For 14" diameter
B-3	Buna N	For 18" diameter
V-3	Viton® A	For 18" diameter



Stainless Steel Bell Jars, Collars

The **SSBJ Series** bell jars are manufactured from 304 stainless steel and are also intended for flat baseplates and collars. A dovetail groove is located in the base flange and viton® o-ring installed in all units. The **SSBJ Series** include a 4" Pyrex® viewport and a lifting eyelet. Standard finish is a satin type glass bead on all tubing and upon request electropolishing and other options are available.



Stainless Steel Bell Jars

Part Number	A	B	C	D
SSBJ-1	14.00	12.00	6.00	12.00
SSBJ-2	20.00	18.00	12.00	30.00
SSBJ-3	26.00	24.00	12.00	30.00

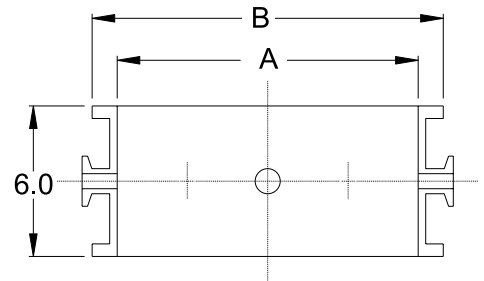
* Price on request

Feedthrough Collars

Part Number	A	B	Ports	Flanges
SSC-12-4	12.00	14.00	4	NW 40
SSC-12-4MS	12.00	14.00	4	MS275-150N
SSC-12-6	12.00	14.00	6	NW 40
SSC-12-6MS	12.00	14.00	6	MS275-150N
SSC-18-8	18.00	20.00	8	NW 40
SSC-18-8MS	18.00	20.00	8	MS275-150N
SSC-24-12	24.00	26.00	12	NW 40
SSC-24-12MS	24.00	26.00	12	MS275-150N

* Price on request

Note: All SSC collars include dovetail groove and Viton® o-ring on one side

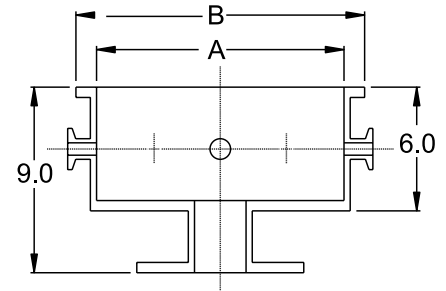


Stainless Steel Combination Baseplate / Collar

Part Number	A	B	ASA Flange	Ports	Flanges
SSCBC-12-4	12.00	14.00	ASA-9-B-6	4	NW 40
SSCBC-12-4MS	12.00	14.00	ASA-9-B-6	4	MS275-150N
SSCBC-12-6	12.00	14.00	ASA-9-B-6	6	NW 40
SSCBC-12-6MS	12.00	14.00	ASA-9-B-6	6	MS275-150N
SSCBC-18-8	18.00	20.00	ASA-11-B-8	8	NW 40
SSCBC-18-8MS	18.00	20.00	ASA-11-B-8	8	MS275-150N
SSCBC-24-12	24.00	26.00	ASA-11-B-8	12	NW 40
SSCBC-24-12MS	24.00	26.00	ASA-11-B-8	12	MS275-150N

* Price on request

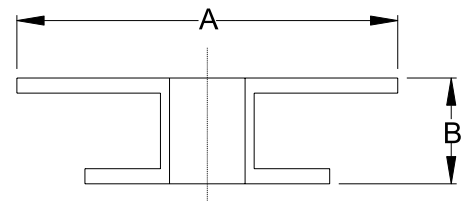
Note: Both the ASA flange and the top flange of the baseplate are smooth faced flanges as typically the bell jar and pump have o-ring grooves and or gaskets. Flanges with o-ring grooves are available upon special order.



Stainless Steel Baseplates

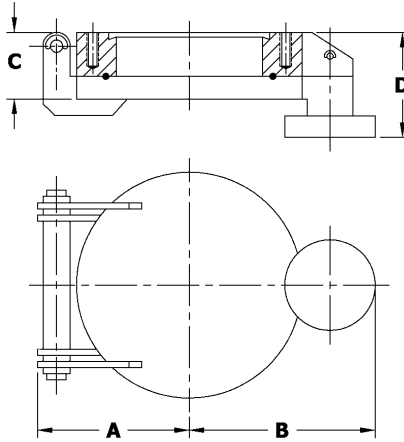
Part Number	A	B	ASA Flange
SSB-12	14.00	4.00	ASA-9-B-6
SSB-18	20.00	4.00	ASA-11-B-8
SSB-24	26.00	4.00	ASA-11-B-8

* Price on request



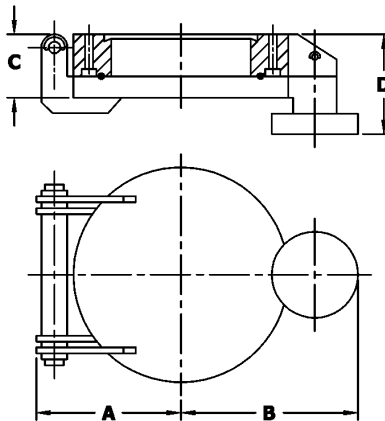
Access Doors

The **QAD Series** access doors that are a hinged design employ a viton® o-ring in the blank door itself and a standard MET-SEAL flange interface for bolting to the chamber itself. A rotary knob opens the door itself and the base flanges are offered with **tapped** holes and **clearance** holes. Clearance holes require the use of stainless steel socket head cap screw.



QADT Assemblies with Tapped Base Flange

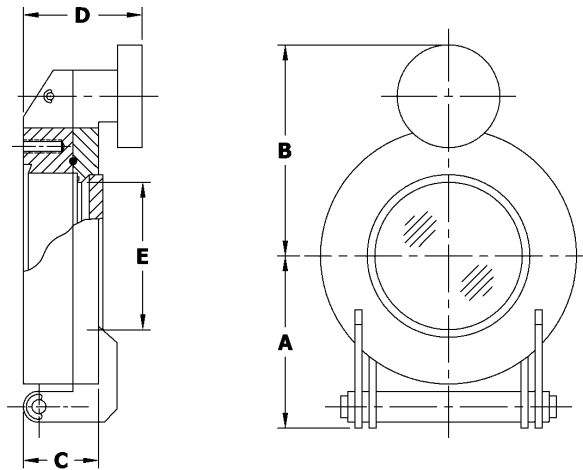
Part Number	MET-SEAL Flange	Base Flange Thread	MET-SEAL Bore	A	B	C	D
QADT-275	2-3/4" OD	1/4-28	1.33"	1.74	2.25	.87	1.46
QADT-450	4-1/2" OD	5/16-24	2.50"	2.75	3.75	1.06	1.85
QADT-600	6" OD	5/16-24	4.02"	3.43	4.68	1.28	2.63
QADT-800	8" OD	5/16-24	5.80"	4.61	5.68	1.38	2.75
QADT-1000	10" OD	5/16-24	8.01"	5.74	6.67	1.46	2.85



QAD Assemblies with Thru Holes on Base Flange

Part Number	MET-SEAL Flange	Base Flange Thru Hole	MET-SEAL Bore	A	B	C	D
QAD-275	2-3/4" OD	.265	1.33"	1.74	2.25	.87	1.46
QAD-450	4-1/2" OD	.332"	2.50"	2.75	3.75	1.06	1.85
QAD-600	6" OD	.332"	4.02"	3.43	4.68	1.28	2.63
QAD-800	8" OD	.332"	5.80"	4.61	5.68	1.38	2.75
QAD-1000	10" OD	.332"	8.01	5.74	6.67	1.46	2.85

Access Doors



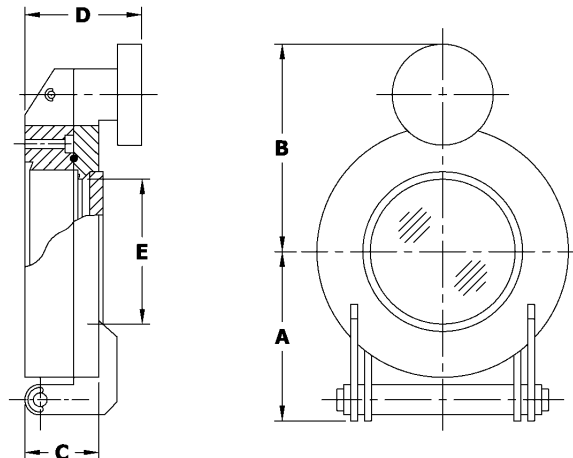
"VP" Series Quick Access Doors

Features:

- 7056 glass viewport directly in access door
- TIG welded construction

"VP" Series Quick Access Doors with Tapped Base Flange

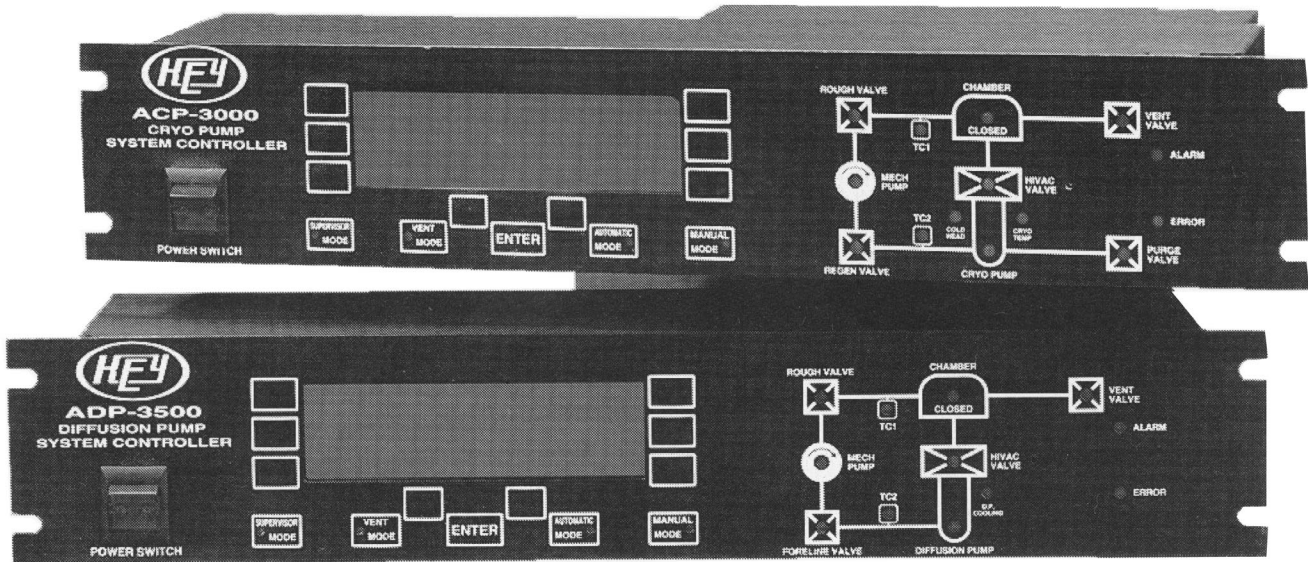
Part Number	MET-SEAL Flange	Base Flange Thread	MET-SEAL Bore	A	B	C	D	E
QADT-275-VP	2-3/4" OD	1/4-28	1.33	1.74	2.25	.87	1.46	1.4
QADT-450-VP	4-1/2" OD	5/16-24	2.50	2.75	3.75	1.06	1.85	2.7
QADT-600-VP	6" OD	5/16-24	4.02	4.68	4.68	1.28	2.63	3.87
QADT-800-VP	8" OD	5/16-24	5.80	5.68	5.68	1.38	2.75	5.38
QADT-1000-VP	10" OD	5/16-24	8.01	6.67	6.67	1.46	2.85	5.38



"VP" Series Quick Access Doors with Thru Holes on Base Flange

Part Number	MET-SEAL Flange	Base Flange Thread	MET-SEAL Bore	A	B	C	D	E
QAD-275-VP	2-3/4" OD	.265	1.33	1.74	2.25	.87	1.46	1.4
QAD-450-VP	4-1/2" OD	.332	2.50	2.75	3.75	1.06	1.85	2.7
QAD-600-VP	6" OD	.332	4.02	3.43	4.68	1.28	2.63	3.87
QAD-800-VP	8" OD	.332	5.80	4.61	5.68	1.38	2.75	5.38
QAD-1000-VP	10" OD	.332	8.01	5.74	6.67	1.46	2.85	5.38

Model ACP-3000 & ADP-3500 Cryo and Diffusion Vacuum System Controllers



KEY HIGH'S cryo valve controller is far and above superior to any other controller on the market today!

KEY HIGH VACUUM PRODUCTS INC. is proud to announce our **NEW ACP-3000** cryo pump system controller to meet your every need. Our controllers can be easily programmed to control and monitor vacuum systems and their processes.

Features:

- New modular design. Large display constantly keeps user informed of all system conditions
- Dual thermocouple displays are included
- Fully automatic vent and protected manual control, including password protected service mode
- Built in cryo pump temperature sensor
- All vacuum system data is data streamed from the controller
Information from process runs is preserved in host computer
- Three user defined process control setpoints are provided
- Monitors bell jar position. If the bell jar is not down, roughing valve will not open, protecting the mechanical pump from overheating
- Password protection for programmed parameters and setpoints
- Nonvolatile memory protects pre-set parameters against power failure and returns system safely to its original state
- Complete regeneration control of cyro pump

TECHNICAL SPECIFICATIONS:

- Standard output voltages 110 VAC and 24 VDC
- All voltages easily changed at factory or in field

INPUTS:

Bell jar down: contact closure N.O.

Cryo pump: diode sensor

Thermocouple:

Type DV-6M thermocouple gauge tubes

RS-232 serial port for computer interface

TC1 interlock: contact closure N.O.

TC2 interlock: contact closure N.O.

OUTPUTS:

Mechanical pump: line voltage, 2 AMP maximum.

Separate motor starter required.

Cryo pump compressor: line voltage, 2 AMP maximum.

Separate relay required

Valves: line voltage, 2 AMP maximum

PHYSICAL DIMENSIONS:

19" wide (standard rack mount)

3-1/2" height

9" depth

Weight: six pound

MODE OF OPERATION:

- Automatic mode:** In auto the ACP-3000 will cycle the vacuum system from ATM to high vacuum.
- Manual mode:** All pumps and valves can safely be operated from this mode.
- Vent mode:** The ACP-3000 incorporates adjustable timers to provide proper valve sequencing.
- Service mode:** This password-protected mode overrides all internal safety interlocks. This aids in system set-up and trouble shooting.

Liquid Nitrogen Level Controller

MODEL LN2-1000

- Fully automatic
- Dual sensor
- Splash guard on upper sensor
- Compact design
- Rack mountable



Description:

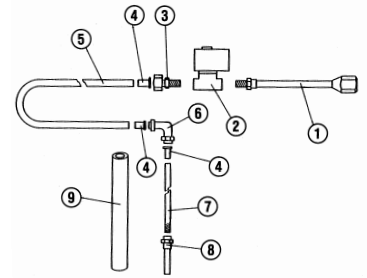
KEY HIGH VACUUM PRODUCTS INC.'s liquid nitrogen controller **Model LN2-1000** is a fully automatic dual sensor controller. Probes are placed at a high and low level. The lower sensor (fill level) activates the controller by applying power to the liquid nitrogen valve solenoid. The upper sensor (full level) deactivates the solenoid shutting off further liquid nitrogen.

Specifications:

Power:	115 VAC 60 Hz
Sensors:	Diode type 10ft sheathed cable
Dimensions:	2" high x 6" wide x 7" deep
Outlet:	115 VAC 60 Hz

Liquid Nitrogen Transfer Line Kit Accessories

Item No.	Part Number	Description
1	60001	Dewar adapter-6-1/2" long with 1/2" SAE flare nut & 1/4" MPT
2	60002	Solenoid valve -40 PSI 115V AC 60 Hz 9/32" orifice with 1/4" FPT
2	60003	Solenoid valve -100 PSI 115V AC 60 Hz 7/32" orifice with 1/4" FPT
3	60004	Adapter tube -1/4" MPT with 3/8" ferrule
4	60005	Insert
5	60006	Tubing flexible -1/4" ID, 43" long (Other lengths available)
6	60007	3/8" elbow
7	60008	Dewar nozzle -1/8" NPT one end, 10" long
8	60009	Splash arrestor
9	60011	Flexible foam plastic insulation 1/2" wall
	60010	3/8" ferrule coupling
	60014	Replacement splash guard

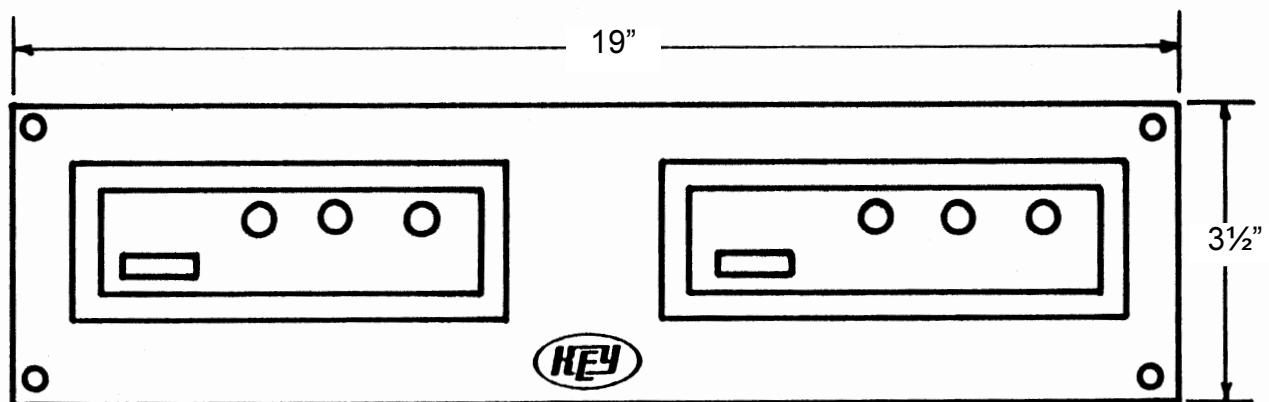


Liquid Nitrogen Transfer Line Kits

Part Number	Description
60012	Complete Kit-40 PSI with insulation
60013	Complete Kit-100 PSI with insulation

Rack Mount Option for one or two LN2-1000 Controllers

Part Number	Description
60015	Single Rack Mount
60015-1	Double Rack Mount



DFP High Vacuum Diffusion Pump

Model DFP-3000

- *Air cooled*
- *Compact design*
- *Low cost*

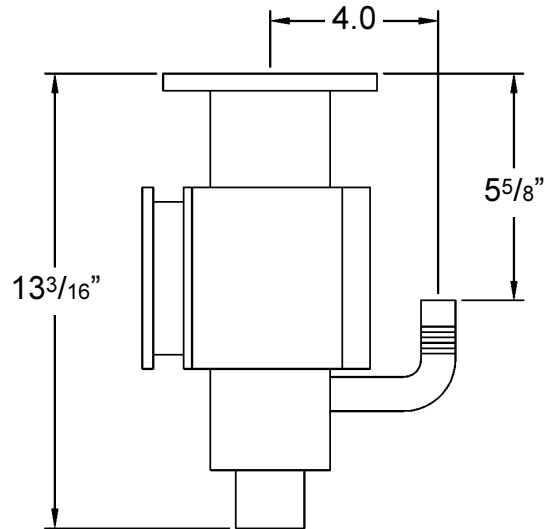


KEY HIGH VACUUM PRODUCTS, INC.'s model **DFP-3000** is a stainless steel body that is air cooled, fast warming and of compact design. The **DFP-3000** diffusion pump is suitable for any mobile or fixed pumping station. Applications include altitude simulation, evaporators and leak detectors allow it to be the ideal pump providing trouble free service for many years. The jet assembly features a full fractionating design to ensure constant fractionating of the fluid, providing long stable performance.

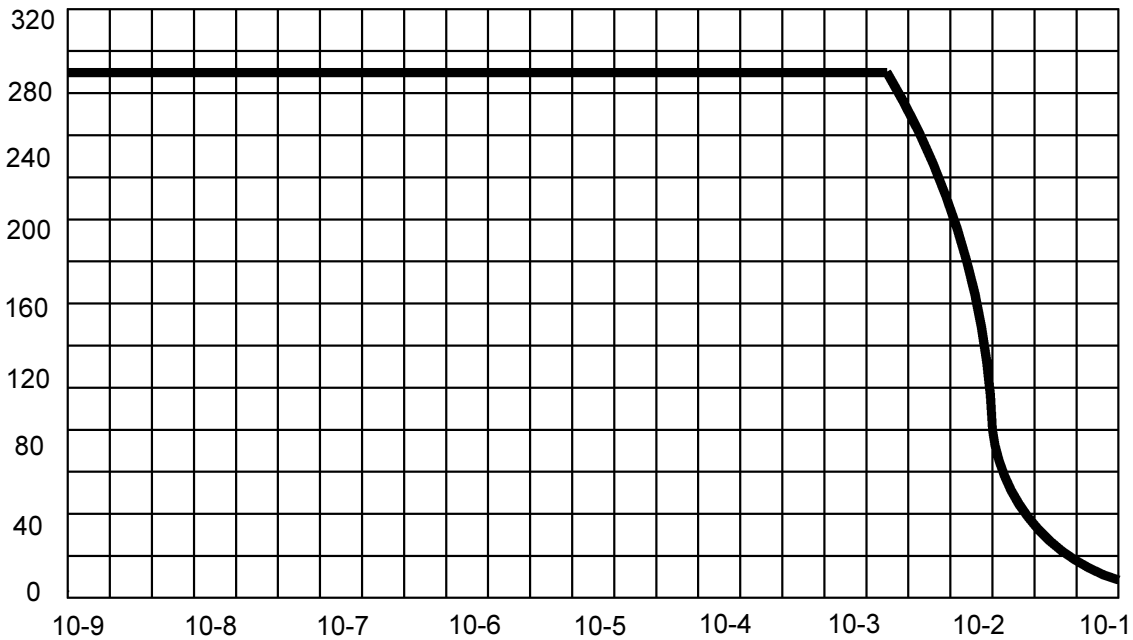
KEY HIGH VACUUM PRODUCTS, INC.'s **DFP-3000** is designed to achieve the best possible pumping speed with a minimum backstreaming.

DFP High Vacuum Diffusion Pump

Dimensional data



Performance Chart Air Speed L/S



Inlet Pressure - Torr

Pumping Speed:

Air	285 L/S
Helium	205 L/S
Max throughput	.3 Torr L/S
Recommending backing pump	3.2 CFM
Warm up time	8 minutes
Cool down time	10 minutes
Fluid quantity	150 CC
Foreline connection	1" OD
Backstreaming rate	< .001 mg/cm/min

Physical Data:

O.D.	6.0
I.D.	3.375
O ring	2-238
Four (4) holes .750 diameter on a 4.750 diameter bolt circle	
Jet material -	aluminum
Pump body material -	Stainless steel
Heater	110 volts 250 watts

Motorized Bell Jar Hoist

Model BJH-500

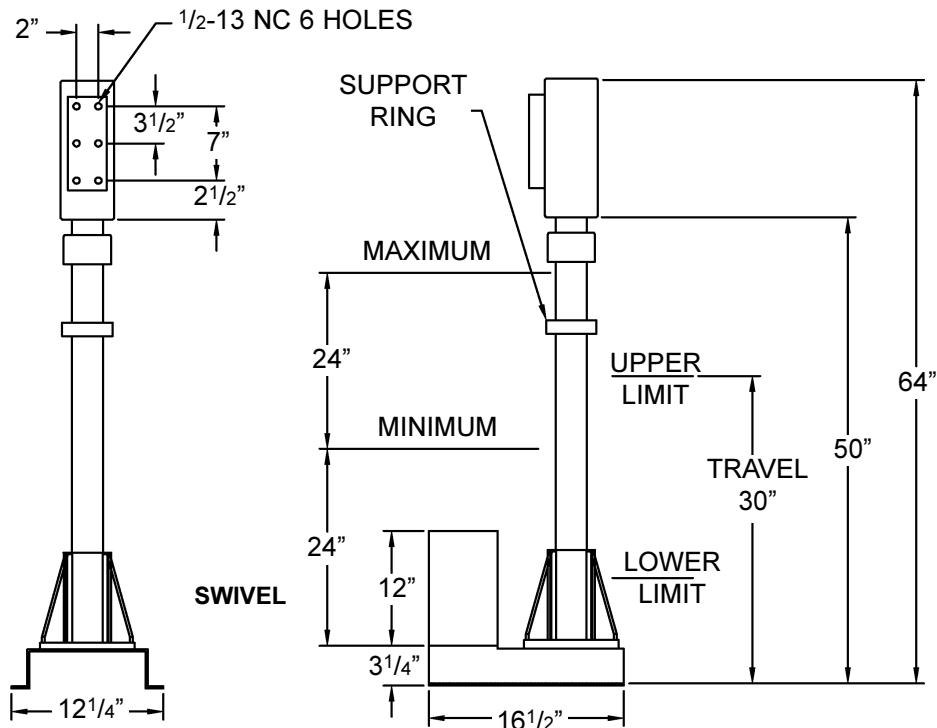
Features:

- Reliable, smooth, quiet operation
- Bell jars up to 400 pounds can be used
- This is a complete unit with a three-position switch
- No guide rods required
- Upper and lower limit switches
- Rotating swivel head for 360 degrees of rotation
- Operates on 110 VAC, 60 HZ

Price: \$4,195.00

Options:

- Other travel lengths
- Pressure vacuum switch that prevents hoist operation when bell jar is under vacuum
- Mounting bell jar plate per customer requirement

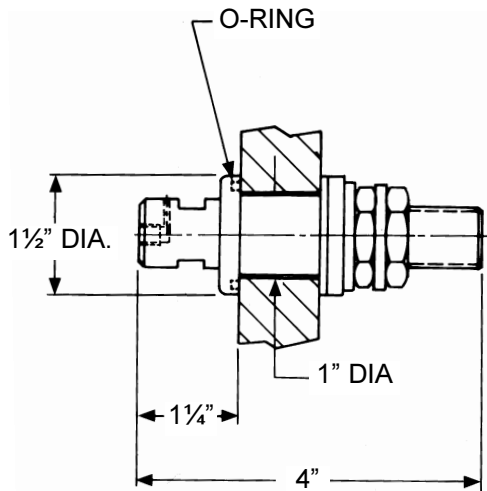


KEY Chamber Accessories; Feedthroughs

The following standard types of feedthroughs can be supplied with all collars. The standard **KHVP** feedthroughs fit 1-inch ports; **MET-SEAL** flanges or ISO quick-connect flanges are optional. Non-standard collar sizes for different numbers of feedthroughs as well as various collar heights can be provided on special order.

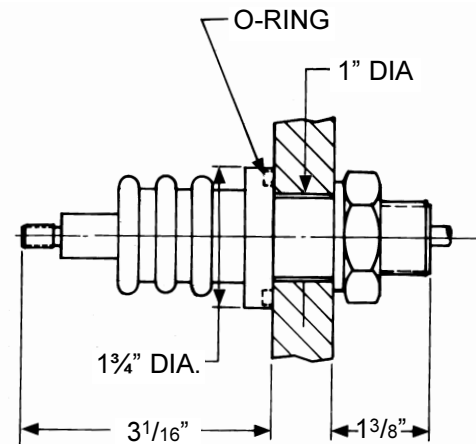
High-Current Feedthrough - Model FTO-101

Material: 3/4" OFHC® copper rod
Current Rating: 400 Amps
Voltage Rating: 50 V



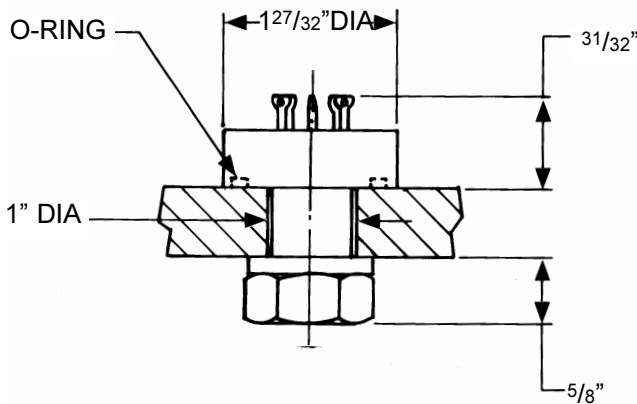
High-Voltage Feedthrough- Model FTO-102

Material: Break-resistant ceramic
Current Rating: 1 Amp
Voltage Rating: 20 KV



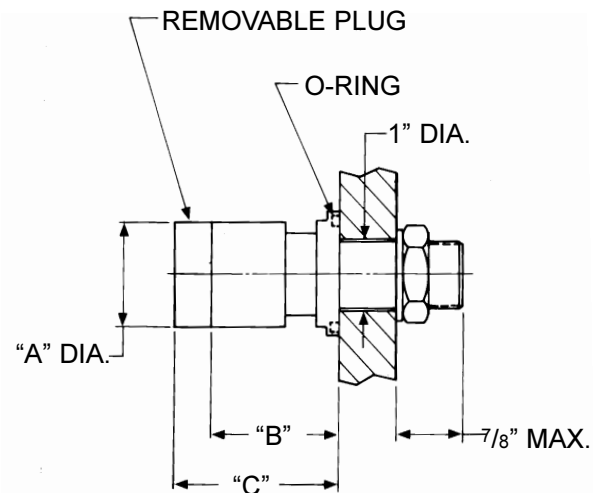
Octal Header Feedthrough-Model FTO-103

Material: Chrome plated brass
Pins: Nickel-plated copper
Current Rating: 5 Amps per pin
Voltage Rating: 220 V between pins



Quick-Coupling Feedthrough-Model FTO-104

Material: Chrome plated brass
Temperature Range: -120°C to + 90°C

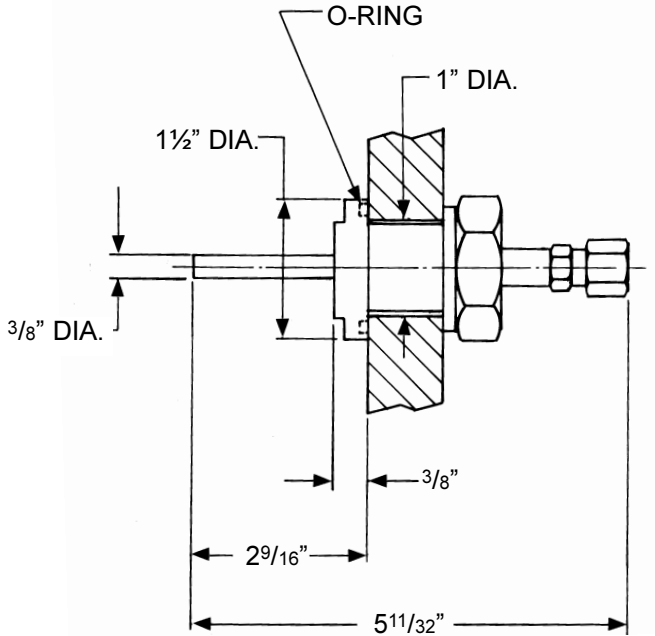


Part No.	Size	A	B	C
FTO-104-1	1/8"	5/8"	1-11/32"	1-15/32"
FTO-104-2	1/4"	3/4"	1-11/32"	1-15/32"
FTO-104-3	3/8"	15/16"	1-3/4"	2"
FTO-104-4	1/2"	1-1/4"	1-3/4"	2"

KEY Chamber Accessories; Feedthroughs

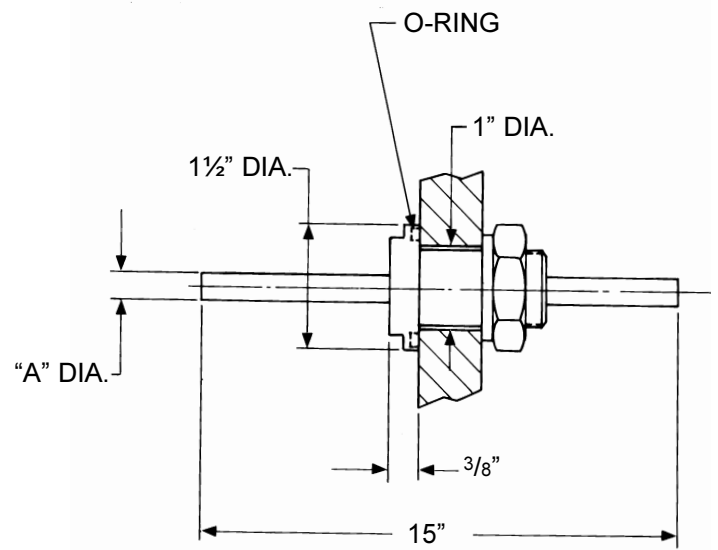
Liquid Nitrogen Feedthrough-Model FTO-105

Material: Chrome plated brass body; 3/8"OD x .035 wall tube
3/8" Swagelok® on atmosphere side



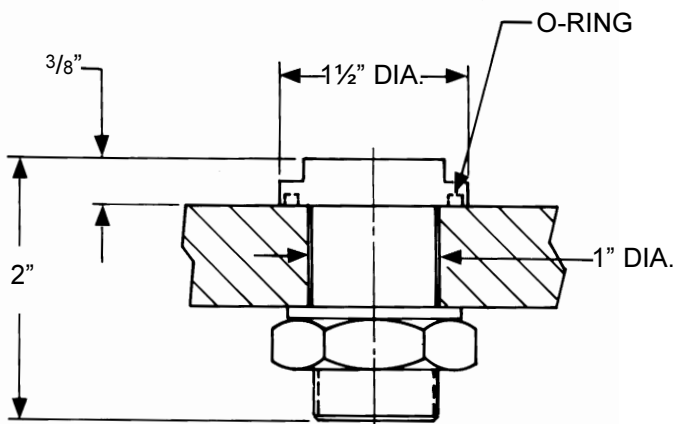
Water Feedthrough- Model FTO-106

Material: Chrome plated brass body; 304 stainless steel tube 1/4" OD x .035 wall



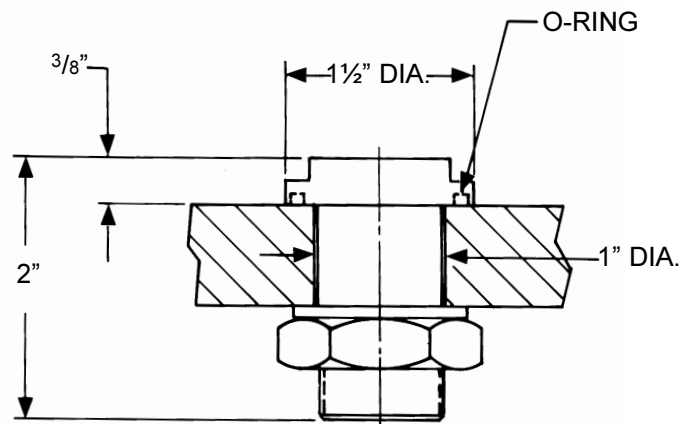
Blank Fixturing Support Feedthrough-Model FTO-107

Material: Brass



Blank Fixturing Support Feedthrough-Model FTO-107-SS

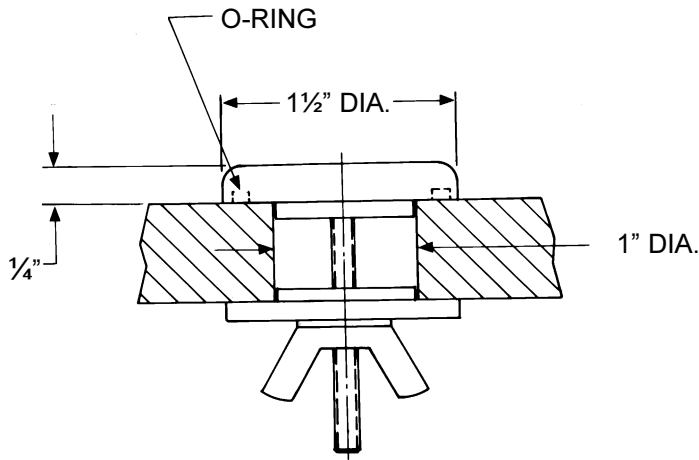
Material: Stainless steel body



KEY Chamber Accessories; Feedthroughs

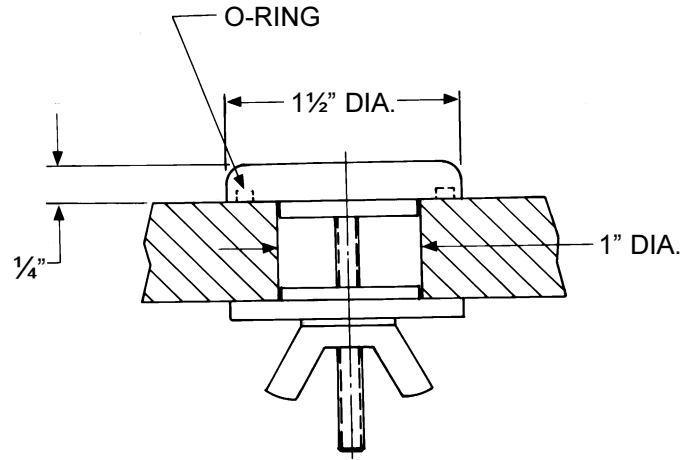
Blank Plug Feedthrough-Model FTO-108

Material: 6061-T6 aluminum
Plugs feedthrough hole not in use



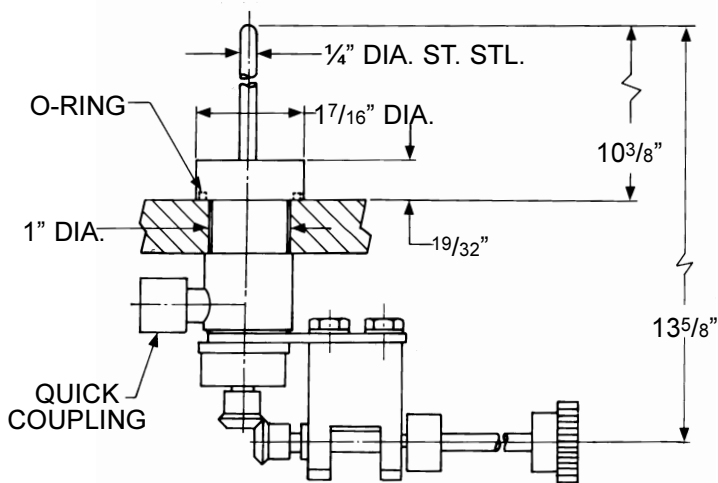
Blank Plug Feedthrough-Model FTO-108-SS

Material: Stainless steel
Plugs feedthrough hole not in use



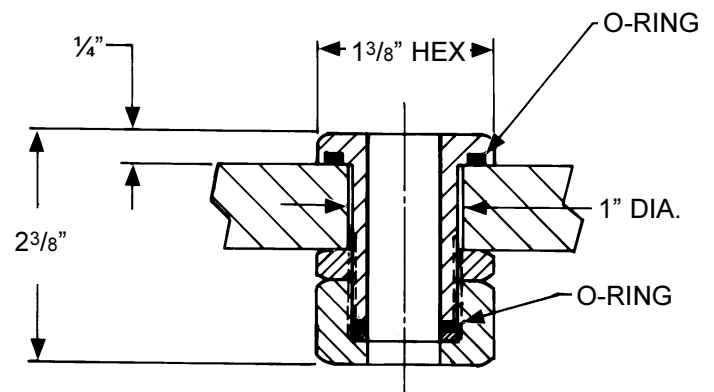
Direct Drive Rotary Feedthrough-Model FTO-109

Material: Chrome plated brass body
Provides rotary motion inside vacuum system



Quick Connect-Model FTO-110

Material: Chrome plated brass
For mounting 3/4" Ion gauge to baseplate

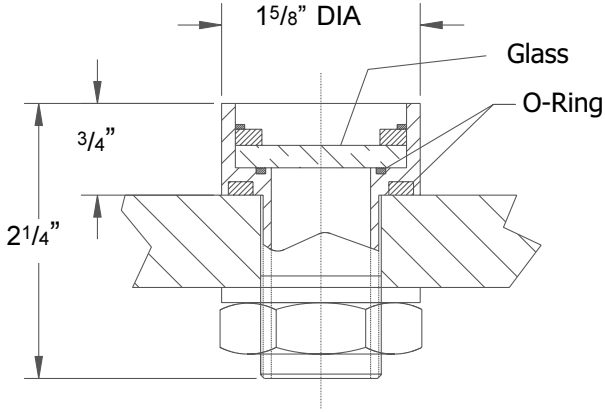


KEY Chamber Accessories; Feedthroughs

Sight Port- Model FTO-111

Material: Chrome plated brass

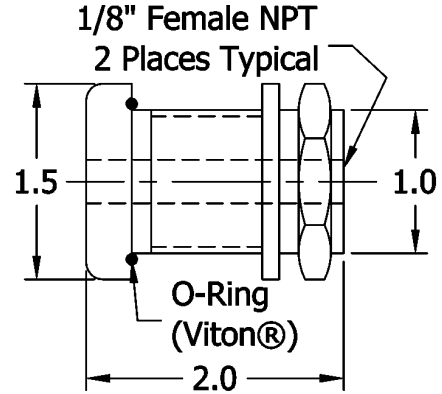
This port is standard supplied with a flat Pyrex® window.



Gas Back Fill/Thermocouple- Model FTO-119-SS

Material: Stainless steel

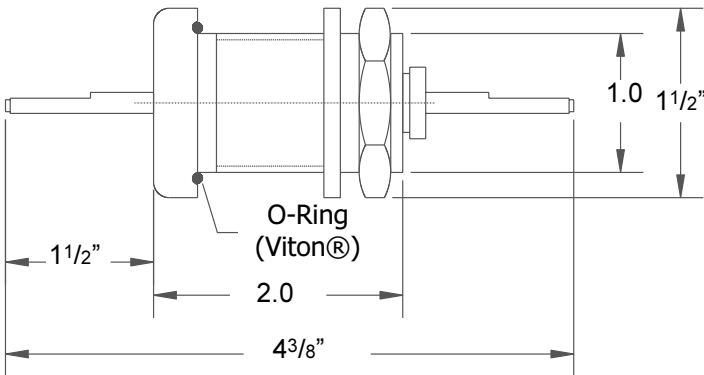
1/8" FNPT both sides



Direct Drive-Model FTO-120-SS

Material: Stainless steel

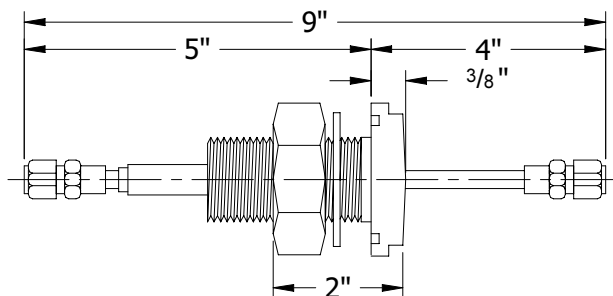
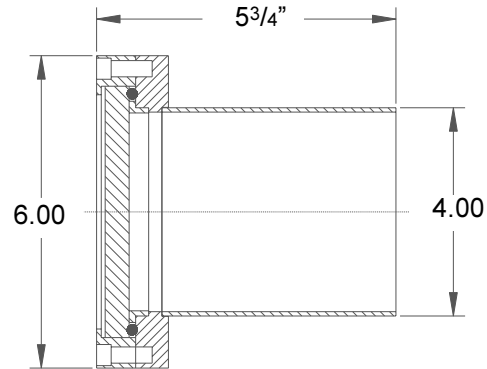
Viton® sealed shaft 500 RPM maximum



Viewport/Weld Stub-Model FTO-VP6

Material: Stainless steel half nipple

Pyrex® glass, Viton® sealed



Water Feedthroughs

Part Number	End Fittings
FTO-121	1/4" Swagelok®
FTO-122	1/4" Male VCR®

Electrical Feedthroughs

High Current Feedthrough - Model HCF-101

Ceramic insulated
2-3/4" O.D. MET-SEAL flange

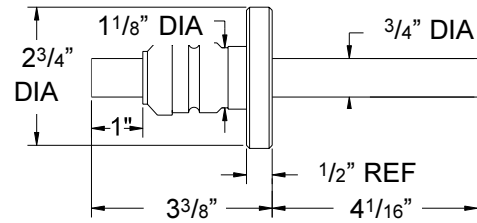
Specifications:

Conductor: 3/4" OFHC® copper rod

Current Rating: 600 Amps

Voltage Rating: 3 KV

Temperature Range: -150°C to 450°C



Model HCF-101

Medium Current Feedthroughs - Series CF-102

Ceramic insulated

1.33" and 2-3/4" MET-SEAL flanges

Available with one (Model CF-102-1), two (Model CF-102-2), three (Model CF-102-3) and four (Model CF-102-4) conductors
Single conductor is also available with 1.33" O.D., Mini-flange (Model CF-102-133)

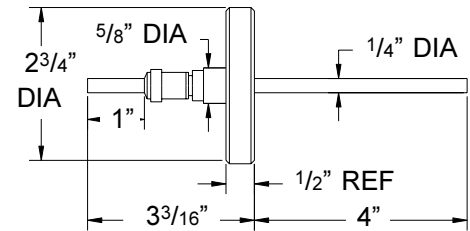
Specifications:

Conductor: 1/4" OFHC® copper rod

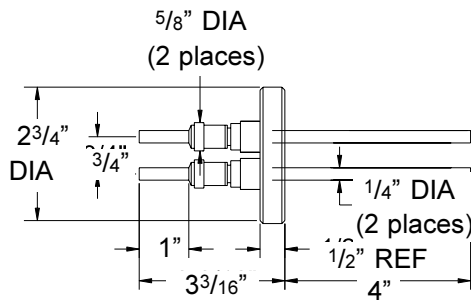
Current Rating: 150 AMPS

Voltage Rating: 5 KV

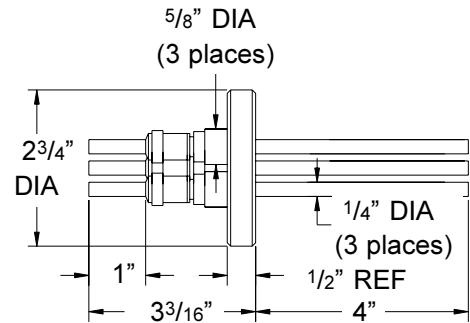
Temperature Range: - 150°C to 450°C



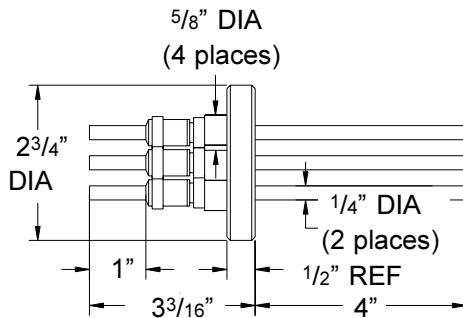
Model CF-102-1



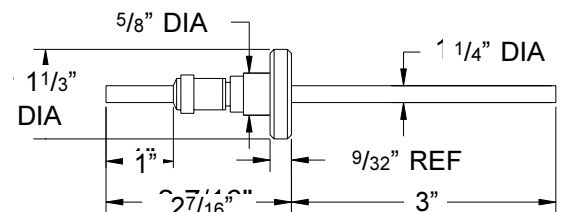
Model CF-102-2



Model CF-102-3



Model CF-102-4



Model CF-102-133

Electrical Feedthroughs

High Voltage Feedthrough - Model HVF-103

Ceramic insulated

2-3/4" O.D. **MET-SEAL** flange

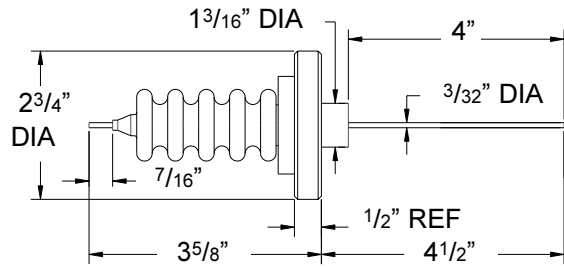
Specifications:

Conductor: 3/32" stainless steel rod

Current Rating: 1 Amp

Voltage Rating: 30 KV

Temperature Range: - 150°C to 450°C



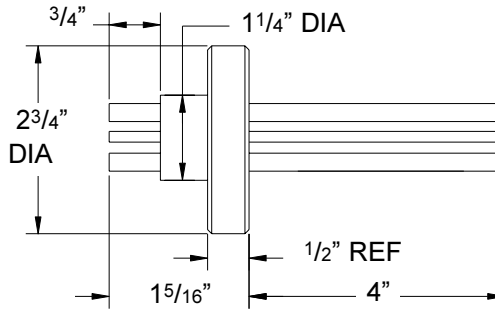
Model HVF-103

Eight-Pin Feedthroughs - Series EPF-104

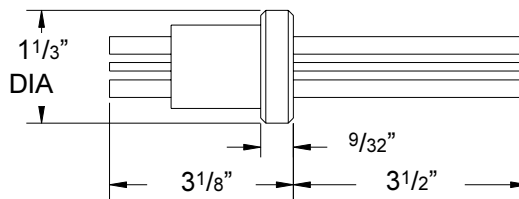
Kovar®/ceramic insulated

2-3/4" O.D. **MET-SEAL** flange

This eight-pin feedthrough is also available with 1.33" OD Mini-flange (Model EPF-104-133)



Model EPF-104-1



Model EPF-104-133

Electrical Feedthroughs

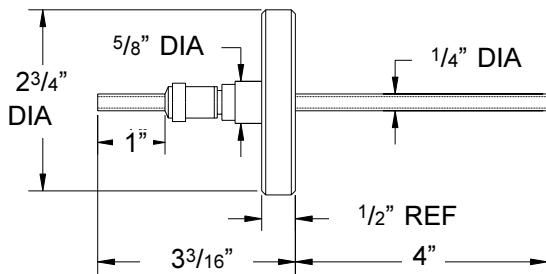
High Voltage Water Cooled Feedthroughs - Series WC-105

Ceramic insulated
2-3/4" O.D. **MET-SEAL** flange
Available with :

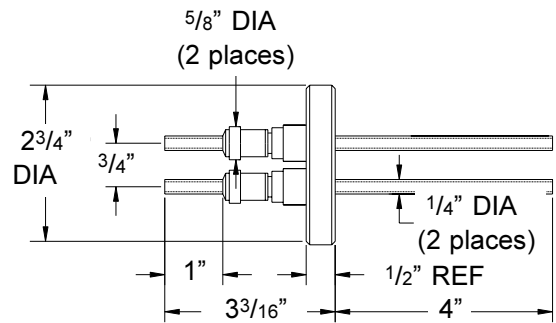
- One conductor:** Model: WC-105-1
- Two conductor:** Model: WC-105-2
- Three conductor:** Model: WC-105-3
- Four conductor:** Model: WC-105-4

Specifications:

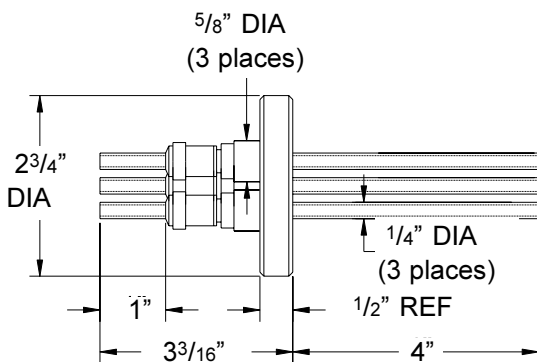
- Conductors:** 1/4" OFHC® copper rod
- Maximum Temperature Change:** 25°C/Minute
- Voltage Rating:** 5 KV
- Temperature Range:** - 150°C to 450°C



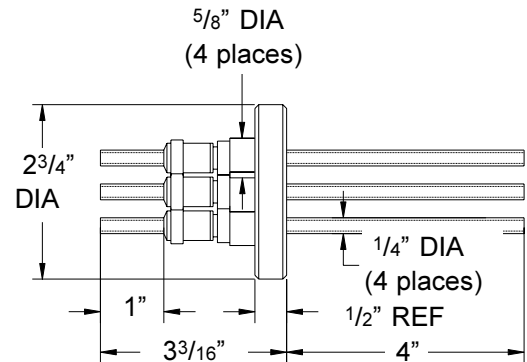
Model WC-105-1



Model WC-105-2

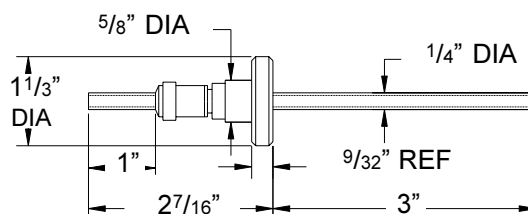


Model WC-105-3



Model WC-105-4

Single conductor is also available with a 1.33" O.D. Mini-flange - **Model WC-105-133**



High Voltage Shields

HVS SERIES (High Voltage Shields) are a safety device directly related to the safety of company personnel, and are intended to cover electrical high vacuum feedthroughs which are based on typical Mini 1-1/3" OD and 2-3/4" OD MET-SEAL style flanges.

Safety and convenience:

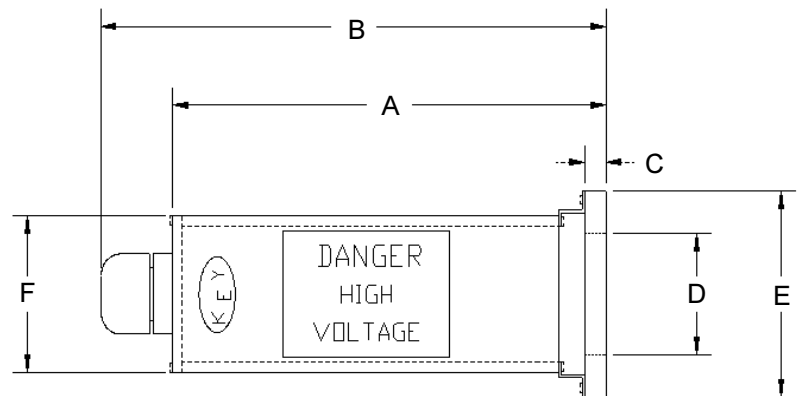
When properly installed, HVS shrouds can safeguard operators from possible accidental electrocution, as the acrylic material is an excellent electrical insulator. Alert people, develop safety practices, and help keep your workplace safe by alerting people to potential hazards with proper accident prevention. "Danger High Voltage" label located on the OD of the shroud clearly indicates an imminently hazardous situation, which if not avoided, can result in serious injury or death. Along with increasing machine safety, an additional benefit is gained by the protection of fragile components and instruments.

Features:

HVS SERIES simply are attached via 2 each socket head cap screws located on the aluminum split clamp, which secures directly to the electrical feed through flange OD.

The shroud itself is clear scratch resistant acrylic; the cord grips are standard liquid tight strain reliefs which are intended to seal cable entries and keep contaminants from entering the enclosure.

Maximum temperate ratings -40° to + 150° F



High Voltage Shields

Part Number	Flange OD	Cable Dia.	A	B	C	D	E	F
133-HVS★	1.33"	0.14 - 0.39	5-3/4"	6-7/8"	.30"	1-1/3"	2-5/16"	1-3/4"
133-HVS-1★	1.33"	0.20 - 0.47	3-3/4"	4-7/8"	.30"	1-1/3"	2-5/16"	1-3/4"
133-HVS-2★	1.33"	0.28 - 0.55	4-3/4"	5-7/8"	.30"	1-1/3"	2-5/16"	1-3/4"
133-HVS-3★	1.33"	0.35 - 0.71	6-3/4"	7-7/8"	.30"	1-1/3"	2-5/16"	1-3/4"
275-HVS★	2-3/4"	0.14 - 0.39	6"	7-1/8"	1/2"	2-3/4"	3-3/4"	2-3/4"
275-HVS-1★	2-3/4"	0.20 - 0.47	4"	5-1/8"	1/2"	2-3/4"	3-3/4"	2-3/4"
275-HVS-2★	2-3/4"	0.28 - 0.55	5"	6-1/8"	1/2"	2-3/4"	3-3/4"	2-3/4"
275-HVS-3★	2-3/4"	0.35 - 0.71	7"	8-1/8"	1/2"	2-3/4"	3-3/4"	2-3/4"

★ = New Product

Ionization Gauge Tubes

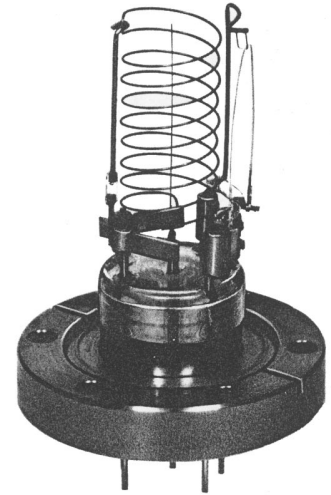
75 Series Nude Ionization Gauge Tubes

The **75 Series** nude gauge tubes are hot cathode Bayard-Alpert type with an operating range of 2×10^{-10} torr to 1×10^{-3} torr and are resistance heated. The **75 Series** is of rugged construction and will tolerate long outgassing cycles.

Specifications:

Grid: + 180 VDC to grid (Ground)
 Collector: 0 VDC (Collector)
 Filament: + 30 VDC to ground (filament)
 Sensitivity: 100 microamps per micron at 10 mA grid current (nitrogen)
 X-Ray Limit: 4×10^{-10} torr

Part Number	Mounting Flange / description
KN-75	2-3/4" OD MET-SEAL, Iridium Filament
KN-75-TT	2-3/4" OD MET-SEAL, Twin Tungsten Filaments
KN-75-NW40	NW 40, Iridium Filament
KN-75-NW40-TT	NW 40, Twin Tungsten Filaments



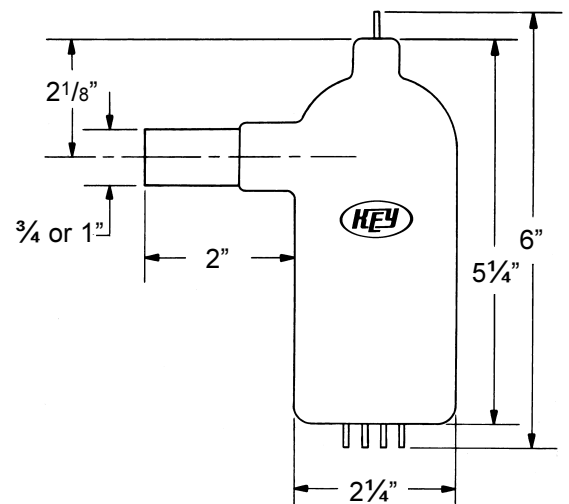
75 Series Iridium Filament Ionization Gauge Tubes

The **75 Series** glass gauge tubes are Bayard-Alpert type with an operating range of 2×10^{-10} to 1×10^{-3} torr. This gauge is a long life type with a rugged construction, that will tolerate accidental air inrushes and has an easy outgassing grid. The **75 Series** ionization gauge tubes are interchangeable with other manufacturers of the same construction.

Specifications:

Thoria coated iridium filament
 Grid: + 180 VDC to grid (Ground)
 Collector: 0 VDC (Collector)
 Filament: 3 to 5 volts at 4 to 6 Amps a.c. heating current; D.C. potential +30 volts
 Grid Degas: 6.3 to 7.5 volts at 10 amps
 Sensitivity: 100 microamps per micron at 10 mA grid current (nitrogen)
 X-ray limit: 2×10^{-10} torr

Part Number	Description
IG-75-NIR	3/4" Nonex® Tubulation
IG-75-PIR	3/4" Pyrex® Tubulation
IG-75-KIR	3/4" Kovar® Tubulation
IG-100-NIR	1" Nonex® Tubulation
IG-100-PIR	1" Pyrex® Tubulation
IG-100-KIR	1" Kovar® Tubulation
IG-100-KIRF	1" Tube to 2-3/4" OD MET-SEAL
IG-100-KIR-KF25	1" Tube to NW-25
IG-100-KIR-KF40	1" Tube to NW-40



Ionization Gauge Tubes

75 Series Twin Tungsten Filament Ionization Gauge Tubes

The **75 Series** glass gauge tubes are Bayard-Alpert type with an operating range of 2×10^{-10} torr to 1×10^{-3} torr. The **75 Series** is of rugged construction, will tolerate long outgassing cycles, and incorporates the twin tungsten filaments which can be switched without breaking vacuum, with most commercial controllers.

Specifications:

Twin tungsten filaments

Grid: + 180 VDC to grid (Ground)

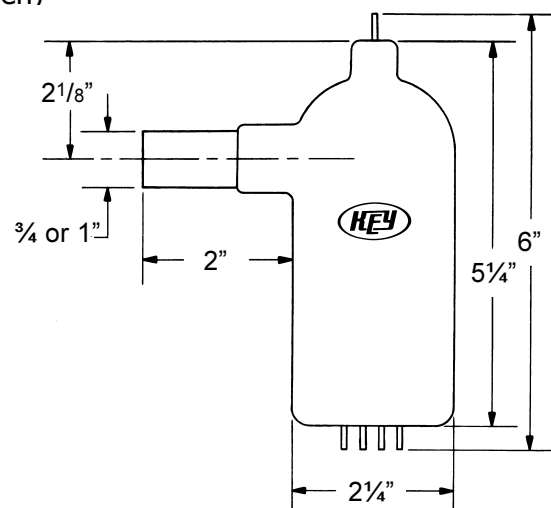
Collector: 0 VDC (Collector)

Filament: + 30 VDC to ground (filament)

Sensitivity: 100 microamps per micron at 10 mA grid current (nitrogen)

X-Ray Limit: 2×10^{-10} torr

Part Number	Description
IG-75-NTT	3/4" Nonex® Tubulation
IG-75-PTT	3/4" Pyrex® Tubulation
IG-709-NT	.709 Nonex® Tubulation
IG-75-KTT	3/4" Kovar® Tubulation
IG-100-NTT	1" Nonex® Tubulation
IG-100-PTT	1" Pyrex® Tubulation
IG-100-KTT	1" Kovar® Tubulation
IG-100-KTTF	1" Tube to 2-3/4" OD MET-SEAL
IG-100-KTT-KF25	1" Tube to NW-25
IG-100-KTT-KF40	1" Tube to NW-40



Note: All gauges are calibrated for nitrogen; for gases other than nitrogen, see chart below:

Gas	Multiply Reading By
Argon	0.72
Helium	6.06
Hydrogen	2.40
Krypton	0.52
Neon	3.36
Water Vapor	1.40
Xenon	0.35

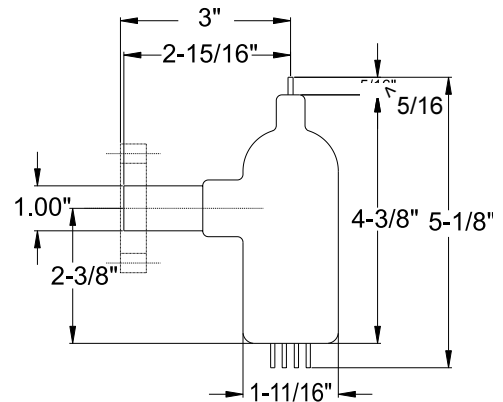
Ionization Gauge Tubes

99 Series Broad Range Ionization Gauge Tubes

The **99 Series** glass gauge tubes are platinum coated Bayard-Alpert gauges with an operating range of 1×10^{-1} (argon) to 4×10^{-10} torr. This gauge has a platinum coating for higher accuracy and the platinum coating is grounded to the 5th pin

Specifications:

- Thoria coated iridium filament
- Grid: + 180 VDC to grid (Ground)
- Collector: 0 VDC (Collector)
- Filament: 4 VAC
- Grid Degas: 6.3 to 7.5 volts at 10 amps
- Sensitivity: 100 microamps per micron at 10 mA grid current (nitrogen)
- X-ray Limit: 4×10^{-10} torr



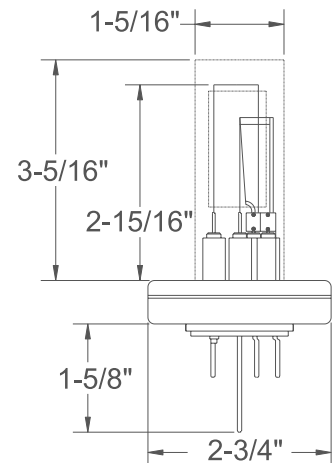
Part Number	Description
IG-100-NIRBR	1" Nonex® Tubulation
IG-100-KIRBR	1" Kovar® Tubulation
IG-100-KIRFBR	1" Tube to 2-3/4" OD MET-SEAL
IG-100-KIR-KF25BR	1" Tube to NW 25
IG-100-KIR-KF40BR	1" Tube to NW 40

76 Series UHV Nude Ionization Gauge Tube

The **76 Series** nude gauge tubes are electron beam type with an operating range of 5×10^{-12} to 1×10^{-3} torr and incorporate dual iridium filaments. These rugged constructed gauges have a long life filament that is easily field replaceable.

Specifications:

- Grid: + 180 VDC to grid (Ground)
- Collector: 0 VDC (Collector)
- Filament: + 30 VDC to ground (filament)
- Sensitivity: 25 torr
- X-Ray Limit: 2×10^{-11}



Part Number	Mounting flange / filament description
KN-76	2-3/4" OD MET-SEAL, Twin Iridium Filaments
KN-76-TT	2-3/4" OD MET-SEAL, Twin Tungsten Filaments
KN-76-NW40	NW 40 flange, Iridium Filaments
KN-76-NW40-TT	NW 40 flange, Twin Tungsten Filaments

Note: All gauges are calibrated for nitrogen; for gases other than nitrogen see chart below:

Gas	Multiply Reading By
Argon	0.72
Helium	6.06
Hydrogen	2.40
Krypton	0.52
Neon	3.36
Water Vapor	1.40
Xenon	0.35

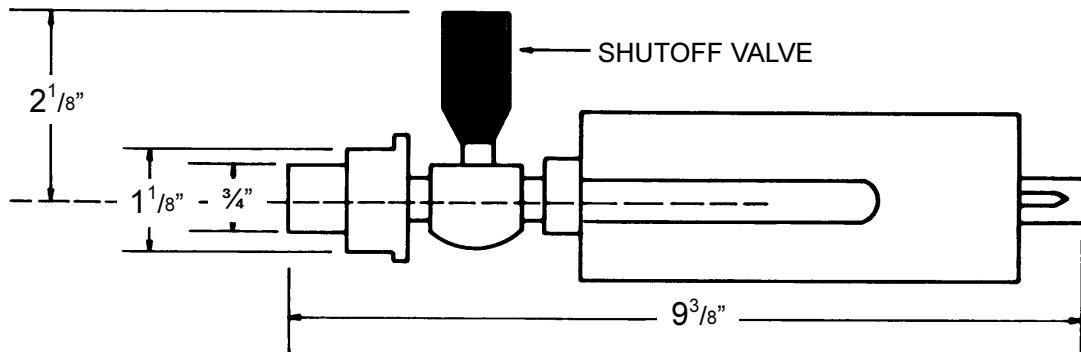


CLS Series Helium Permeation Calibrated Leaks



- **Chrome plated brass body**
- **Bellows sealed shutoff valve**
- **Used for helium leak detector calibration**

Part Number	Leak Ranges (Torr L/sec @ 25 ° C)
CLS-8	1 x 10 ⁻⁵ to 2 x 10 ⁻⁶
CLS-9	1 x 10 ⁻⁶ to 2 x 10 ⁻⁷
CLS-10	1 x 10 ⁻⁷ to 2 x 10 ⁻⁸
CLS-11	1 x 10 ⁻⁸ to 2 x 10 ⁻⁹
CLS-12	1 x 10 ⁻⁹ to 2 x 10 ⁻¹⁰



Note 1: Actual leak rates that exist within the ranges given above for each model is considered within specifications.

Note 2: KEY HIGH VACUUM PRODUCTS, INC. recommends storing all permeation leaks with the **Shut off valve open** to prevent saturation of the glass element.

Options:

- **KEY SPEEDY NW40 and NW50 fittings are available upon request**
- **Larger or smaller leak rates are available upon request**

Recalibration Service:

KEY HIGH VACUUM PRODUCTS, INC. provides a complete recalibration and refilling service traceable to the National Bureau of Standards. KEY also services and repairs other brand helium permeation gas leaks. **All calibrated gas leaks are shipped with certified calibration reports traceable to the NBS.**

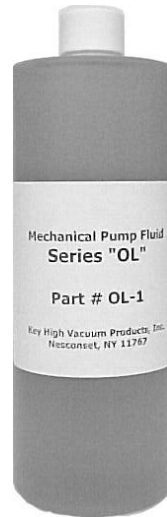
High Vacuum Lubricants

Mechanical Pump Fluid Series "OL"

Description: "OL" Series mechanical pump fluid is a distilled hydrocarbon fluid developed for all types of mechanical vacuum pumps. This fluid performs especially well in direct drive pumps. It has excellent resistance to oxidation and gum formation.

Specifications:

Vapor Pressure	8 x 10 ⁻⁵ Torr
Pour Point	4.5°F
Flash Point	450°F
Viscosity @ 100°F	47.7
Viscosity @ 130°F	23.6
Viscosity @ 210°F	6.5
Specific Gravity 25°C/25°C	.869



"OL" Ordering Information

Part Number	Description
OL-1	1 Quart
OL-2	1 Gallon
OL-3	5 Gallons
OL-4	55 Gallons

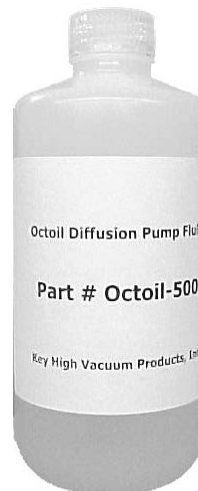
Octoil Diffusion Pump Fluid

Description: (Molecularly Distilled Synthetic Ester)

Octoil is a highly distilled synthetic ester fluid designed for use in diffusion pumps where pressures of 10⁻⁷ torr are required. It has become a standard fluid in diffusion pump leak detectors and mass spectrometers

Specifications:

Color	Clear
Viscosity @ 100°F	12.6cSt/68.2 SUS
Viscosity @ 130°F	7.9cSt/68.2 SUS
Specific Gravity	0.913
Flash Point (COC)	288°C / 550°F
Flash Point	209°C / 409°F
Fire Point	248°C / 248°F
Boiling Point °C @ .01 torr	141
Ultimate Vacuum, torr untrapped	3 x 10 ⁻⁷
Ultimate Vacuum, torr trapped	5 x 10 ⁻⁸



"OL" Ordering Information

Part Number	Description
OCTOIL-100	100 cc
OCTOIL-500	500 cc
OCTOIL-1	1 gallon



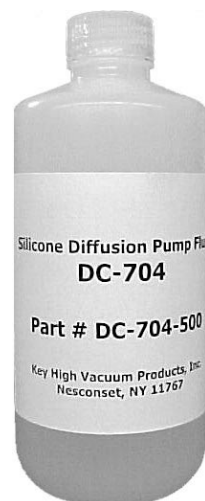
Silicone Diffusion Pump Fluid DC-704

Description: (Tetramethyltetraphenyltrisiloxane)

DC-704 Series diffusion pump fluid is recommended for systems operating in the 10-6 to 10-8 torr range. The thermal stability allows quick pump downs and keeps pump jet stack free of tars and carbon even after repeated exposure to atmosphere at operating temperatures.

Specifications:

Color	Light Straw
Viscosity @ 25°C (77°F), cs	39
Specific Gravity @ 25°C	1.07
Specific Gravity @ 70°C	1.03
Specific Gravity @ 100°C	1.00
Flash Point °C Open Cup	221
Boiling Point @ 0.5 torr, °C	215
Vapor Pressure @ 25°C	2.1 x 10 ⁻⁸ torr
Ultimate Vacuum Untrapped	10 ⁻⁷ to 10 ⁻⁸ torr
Ultimate Vacuum Trapped	10 ⁻¹¹ torr
Oxidation Resistance	Excellent
Backstreaming Rate	Low
Boiler Temperature, °C	220



DC-704 Ordering Information

Part Number	Description
DC-704-50	50 cc
DC-704-100	100 cc
DC-704-500	500 cc
DC-704-1	1 Gallon

Silicone Diffusion Pump Fluid DC-705

Description: (Penta Phenyltrimethyltrisiloxane)

DC-705 Series diffusion pump fluid is recommended for high vacuum systems operating in the 10⁻⁸ to 10⁻¹⁰ torr range. **DC-705** is the premier silicone diffusion pump fluid as it displays the same durable physical properties of the **704 Series** and the enhanced characteristics of little or no backstreaming and excellent vapor pumping capabilities.

Specifications:

Color	Light Straw
Viscosity @ 25°C (77°F), cs	1.09
Specific Gravity, @ 70°C	1.04
Specific Gravity, @ 100°C	1.02
Flash Point °C, open Cup	243
Boiling Point @ 0.5 torr, °C	245
Extrapolated Vapor Pressure @ 25°C (77°F) torr	3 x 10 ⁻¹⁰
Ultimate Vacuum, torr untrapped	10 ⁻⁹ to 10 ⁻¹⁰
Ultimate Vacuum, torr trapped	10 ⁻¹¹
Oxidation Resistance at Operating Temperature	Excellent
Backstreaming Rate	Very Low
Boiler Temperature, °C	250-270

DC-705 Ordering Information

Part Number	Description
DC-705-50	50 cc
DC-705-100	100 cc
DC-705-500	500 cc
DC-705-1	1 Gallon

High Vacuum Lubricants

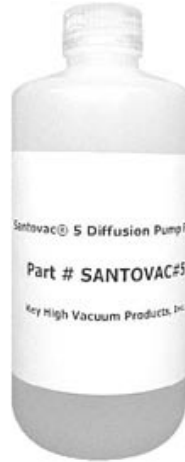
Santovac® 5 Diffusion Pump Fluid

Description (Synthetic Polyphenyl Ether)

Santovac® 5 is a diffusion pump fluid capable of producing ultra high vacuum levels in the 10-10 torr range. Its very low vapor pressure reduces backstreaming and can eliminate the need for baffles thereby maintaining system cleanliness and increasing pumping speeds. Its superior thermal and oxidation stability offers longer operating terms than most other fluids. Unlike silicone based fluids there is no danger of depositing electrically insulating films making it ideal for use in analytical vacuum equipment.

Specifications:

Color	Clear
Viscosity @ 35° C (100°F)	363cST/1860SUS
Viscosity @ 99° C (210°F)	13.1cSt/72SUS
Specific Gravity	1.198
Flash Point °C open Cup	288°C / 550°F
Boiling Point @ 0.5 torr	275°C
Vapor Pressure torr @ 25°C	4 x 10-10



Santovac® 5 Ordering Information

Part Number	Description	Price
SANTOVAC#5	500 cc	UPON REQUEST

Silicone High Vacuum Grease

Description:

The **HVL Series** silicone grease is a general-purpose grease and is equal to Dow Corning High Vacuum Grease.® **HVL Series** silicone grease is used in most general vacuum systems and only a thin layer of grease should be used. (Only enough where as the o-ring itself is "shiny". No grease itself should be visible) **HVL** silicone grease maintains its consistency for -30°F to 550°F and can be effectively used at pressures as low as 10-7 torr.

Specifications:

Color	Translucent White
Flash Point	> 625°F
Fire Point	> 625°F
Temperature Range	-45°F to 525°F

HVL Ordering Information

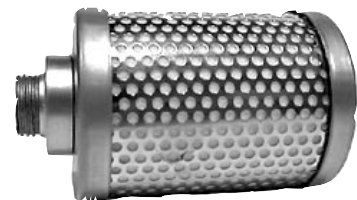
Part Number	Description
HVL-40Z	4 oz. container

Oil Mist Eliminators

KHVP-2000 Series throw away mist eliminators are designed to be used on any rotary vane pumps, eliminating the oil mist which is ejected through the exhaust port during the initial pump down to 1 mbar. Oil mist is harmful to the lungs and by incorporating the **KHVP-2000 Series** into a rotary vane pump eliminates this issue and will help maintain a cleaner working environment. The **KHVP-2000** disposable mist eliminators are of a general-purpose design capable of retaining oil mist as small as one micron and are not intended for aggressive gases. Other sizes and mounting arrangements are available upon request, contact factory.

Specifications:

Part Number	Use with CFM Pump	Mounting Thread
KHVP-2000	1 to 6 CFM	1/2" Male NPT
KHVP-2000-1	7 to 15 CFM	3/4" Male NPT
KHVP-2000-2	16 to 30 CFM	1" Male NPT



High Vacuum Lubricants

Oil Analysis Kit

The **OAK-2000** is an acidity test kit that allows the user to monitor the condition of the oil. By monitoring the vacuum pump oil maintenance costs are reduced and pump failure is averted. Each kit contains 10 vials of test solution, fill the vial with pump fluid and shake the vial and check the color. These kits give the user valuable information on the current condition of the pump fluid and assist in developing planned maintenance schedules as well as avoiding costly pump failure.

Part Number
OAK-2000



Rubber Vacuum Tubing

Hardness, Shore A +/-5	45
Specific gravity	1.08
Tensile Strength, PSI	3000
Average Elongation %	600
Brittle Temperature	-40° F
Maximum Operating Temperature	180° F



Vacuum Tubing Ordering Info:

Part Number	Description
VT1	3/8" Wall x 3/8" ID
VT2	3/8" Wall x 1/2" ID
VT3	3/8" Wall x 5/8" ID
VT4	1/2" Wall x 1" ID
VT5	1/2" Wall x 1-5/8" ID
VT6	1/2" Wall x 2" ID

Clamps for VT Series Hose

Part Number	Description
HC1	Fits VT1, VT2 & VT3
HC2	Fits VT4
HC3	Fits VT5
HC4	Fits VT6



O-Rings Viton® .070 Cross Section

Viton® (Fluorocarbon) O-Rings .070 cross section series

Part Number	I.D.	O.D.
VOR001★	.029	.109
VOR002★	.042	.142
VOR003★	.056	.176
VOR004★	.070	.210
VOR005★	.101	.241
VOR006★	.114	.254
VOR007★	.145	.285
VOR008★	.176	.316
VOR009★	.208	.347
VOR010★	.239	.379
VOR011★	.301	.441
VOR012★	.364	.504
VOR013★	.426	.566
VOR014★	.489	.629
VOR015★	.551	.691
VOR016★	.614	.754
VOR017★	.676	.816
VOR018★	.739	.879
VOR019★	.801	.941
VOR020★	.846	1.004
VOR021★	.926	1.066
VOR022★	.989	1.129
VOR023★	1.051	1.191
VOR024★	1.114	1.254
VOR025★	1.176	1.316
VOR026★	1.239	1.379
VOR027★	1.301	1.441
VOR028★	1.364	1.504
VOR029★	1.489	1.629
VOR030★	1.614	1.754
VOR031★	1.739	1.879
VOR032★	1.864	2.004
VOR033★	1.989	2.129
VOR034★	2.114	2.254
VOR035★	2.239	2.379
VOR036★	2.364	2.504
VOR037★	2.489	2.629
VOR038★	2.614	2.754
VOR039★	2.739	2.879
VOR040★	2.864	3.004
VOR041★	2.989	3.129
VOR042★	3.239	3.379
VOR043★	3.489	3.629
VOR044★	3.739	3.879
VOR045★	3.989	4.129
VOR046★	4.239	4.379
VOR047★	4.489	4.629
VOR048★	4.739	4.879
VOR049★	4.989	5.129
VOR050★	5.239	5.379

★ = New Product



O-Rings Viton® .103 Cross Section

Viton® (Fluorocarbon) O-Rings .103 cross section series

Part Number	I.D.	O.D.
VOR110★	.362	.568
VOR111★	.424	.630
VOR112★	.487	.693
VOR113★	.549	.755
VOR114★	.612	.818
VOR115★	.674	.880
VOR116★	.737	.943
VOR117★	.799	1.005
VOR118★	.862	1.068
VOR119★	.924	1.130
VOR120★	.987	1.193
VOR121★	1.049	1.255
VOR122★	1.112	1.318
VOR123★	1.174	1.380
VOR124★	1.237	1.443
VOR125★	1.299	1.505
VOR126★	1.362	1.568
VOR127★	1.424	1.630
VOR128★	1.487	1.693
VOR129★	1.549	1.755
VOR130★	1.612	1.818
VOR131★	1.674	1.880
VOR132★	1.734	1.943
VOR133★	1.799	2.005
VOR134★	1.862	2.068
VOR135★	1.925	2.131
VOR136★	1.987	2.193
VOR137★	2.050	2.256
VOR138★	2.112	2.318
VOR139★	2.175	2.381
VOR140★	2.237	2.443
VOR141★	2.300	2.506
VOR142★	2.362	2.568
VOR143★	2.425	2.631
VOR144★	2.487	2.693
VOR145★	2.550	2.756
VOR146★	2.612	2.818
VOR147★	2.675	2.881
VOR148★	2.737	2.943
VOR149★	2.800	3.006

★ = New Product



O-Rings Viton® .103 Cross Section

Viton® (Fluorocarbon) O-Rings .103 cross section series

Part Number	I.D.	O.D.
VOR150★	2.862	3.068
VOR151★	2.987	3.193
VOR152★	3.237	3.443
VOR153★	3.487	3.693
VOR154★	3.737	3.943
VOR155★	3.987	4.193
VOR156★	4.237	4.443
VOR157★	4.487	4.693
VOR158★	4.737	4.943
VOR159★	4.987	5.193
VOR160★	5.237	5.443
VOR161★	5.487	5.693
VOR162★	5.737	5.943
VOR163★	5.987	6.193
VOR164★	6.237	6.443
VOR165★	6.487	6.693
VOR166★	6.737	6.943
VOR167★	6.987	7.193
VOR168★	7.237	7.443
VOR169★	7.487	7.693
VOR170★	7.737	7.943
VOR171★	7.987	8.193
VOR172★	8.237	8.443
VOR173★	8.487	8.693
VOR174★	8.737	8.943
VOR175★	8.987	9.193
VOR176★	9.237	9.443
VOR177★	9.487	9.693
VOR178★	9.737	9.943

★ = New Product



O-Rings Viton® .139 Cross Section

Viton® (Fluorocarbon) O-Rings .139 cross section series

Part Number	I.D.	O.D.
VOR210★	.734	1.012
VOR211★	.796	1.074
VOR212★	.859	1.137
VOR213★	.921	1.199
VOR214★	.984	1.262
VOR215★	1.046	1.324
VOR216★	1.109	1.387
VOR217★	1.171	1.449
VOR218★	1.234	1.512
VOR219★	1.296	1.574
VOR220★	1.359	1.637
VOR221★	1.421	1.699
VOR222★	1.484	1.762
VOR223★	1.609	1.887
VOR224★	1.734	2.012
VOR225★	1.859	2.137
VOR226★	1.984	2.262
VOR227★	2.109	2.387
VOR228★	2.234	2.512
VOR229★	2.359	2.637
VOR230★	2.484	2.762
VOR231★	2.609	2.887
VOR232★	2.737	3.012
VOR233★	2.859	3.137
VOR234★	2.984	3.262
VOR235★	3.109	3.387
VOR236★	3.234	3.512
VOR237★	3.359	3.637
VOR238★	3.484	3.762
VOR239★	3.609	3.887
VOR240★	3.734	4.012
VOR241★	3.859	4.137
VOR242★	3.984	4.262
VOR243★	4.109	4.387
VOR244★	4.234	4.512
VOR245★	4.359	4.637
VOR246★	4.484	4.762
VOR247★	4.609	4.887
VOR248★	4.734	5.012
VOR249★	4.859	5.137
VOR250★	4.984	5.262
VOR251★	5.109	5.387
VOR252★	5.234	5.512

★ = New Product



O-Rings Viton® .139 Cross Section

Viton® (Fluorocarbon) O-Rings .139 cross section series

Part Number	I.D.	O.D.
VOR253★	5.359	5.637
VOR254★	5.484	5.762
VOR255★	5.609	5.887
VOR256★	5.734	6.012
VOR257★	5.859	6.137
VOR258★	5.984	6.262
VOR259★	6.234	6.512
VOR260★	6.484	6.762
VOR261★	6.734	7.012
VOR262★	6.984	7.262
VOR263★	7.234	7.512
VOR264★	7.484	7.762
VOR265★	7.734	8.012
VOR266★	7.984	8.262
VOR267★	8.234	8.512
VOR268★	8.484	8.762
VOR269★	8.734	9.012
VOR270★	8.984	9.262
VOR271★	9.234	9.512
VOR272★	9.484	9.762
VOR273★	9.734	10.012
VOR274★	9.984	10.262
VOR275★	10.484	10.762
VOR276★	10.984	11.262
VOR277★	11.484	11.762
VOR278★	11.984	12.262
VOR279★	12.984	13.262
VOR280★	13.984	14.262
VOR281★	14.984	15.262
VOR282★	15.955	16.223
VOR283★	16.955	17.233
VOR284★	17.955	18.233

★ = New Product



O-Rings Viton® .210 Cross Section

Viton® (Fluorocarbon) O-Rings .210 cross section series

Part Number	I.D.	O.D.
VOR325★	1.475	1.895
VOR326★	1.600	2.020
VOR327★	1.725	2.145
VOR328★	1.850	2.270
VOR329★	1.975	2.395
VOR330★	2.100	2.520
VOR331★	2.225	2.645
VOR332★	2.350	2.770
VOR333★	2.457	2.895
VOR334★	2.600	3.020
VOR335★	2.725	3.145
VOR336★	2.850	3.270
VOR337★	2.975	3.395
VOR338★	3.100	3.520
VOR339★	3.225	3.645
VOR340★	3.350	3.770
VOR341★	3.475	3.895
VOR342★	3.600	4.020
VOR343★	3.725	4.145
VOR344★	3.850	4.270
VOR345★	3.975	4.395
VOR346★	4.100	4.520
VOR347★	4.225	4.645
VOR348★	4.350	4.770
VOR349★	4.475	4.895
VOR350★	4.600	5.020
VOR351★	4.725	5.145
VOR352★	4.850	5.270
VOR353★	4.975	5.395
VOR354★	5.100	5.520
VOR355★	5.225	5.645
VOR356★	5.350	5.770
VOR357★	5.475	5.895
VOR358★	5.600	6.020
VOR359★	5.725	6.145
VOR360★	5.850	6.270
VOR361★	5.975	6.395
VOR362★	6.225	6.645
VOR363★	6.475	6.895
VOR364★	6.725	7.145
VOR365★	6.975	7.395
VOR366★	7.225	7.645
VOR367★	7.475	7.895
VOR368★	7.725	8.145
VOR369★	7.975	8.395
VOR370★	8.225	8.645
VOR371★	8.475	8.895
VOR372★	8.725	9.145
VOR373★	8.975	9.395
VOR374★	9.225	9.645

★ = New Product



O-Rings Viton® .210 Cross Section

Viton® (Fluorocarbon) O-Rings .210 cross section series

Part Number	I.D.	O.D.
VOR375★	9.475	9.895
VOR376★	9.725	10.145
VOR377★	9.975	10.395
VOR378★	10.475	10.895
VOR379★	10.975	11.395
VOR380★	11.475	11.895
VOR381★	11.975	12.395
VOR382★	12.975	13.395
VOR383★	13.975	14.395
VOR384★	14.975	15.395
VOR385★	15.955	16.375
VOR386★	16.955	17.375
VOR387★	17.955	18.375
VOR388★	18.953	19.373
VOR389★	19.953	20.373
VOR390★	20.953	21.373
VOR391★	21.953	22.373
VOR392★	22.940	23.360
VOR393★	23.940	24.360
VOR394★	24.940	25.360
VOR395★	25.940	26.360

★ = New Product



O-Rings Viton® .275 Cross Section

Viton® (Fluorocarbon) O-Rings .275 cross section series

Part Number	I.D.	O.D.
VOR425★	4.475	5.025
VOR426★	4.600	5.150
VOR427★	4.725	5.275
VOR428★	4.850	5.400
VOR429★	4.975	5.525
VOR430★	5.100	5.650
VOR431★	5.225	5.775
VOR432★	5.350	5.900
VOR433★	5.475	6.025
VOR434★	5.600	6.150
VOR435★	5.725	6.275
VOR436★	5.850	6.400
VOR437★	5.975	6.525
VOR438★	6.225	6.775
VOR439★	6.475	7.025
VOR440★	6.725	7.275
VOR441★	6.975	7.525
VOR442★	7.225	7.775
VOR443★	7.475	8.025
VOR444★	7.725	8.275
VOR445★	7.975	8.525
VOR446★	8.475	9.025
VOR447★	8.975	9.525
VOR448★	9.475	10.025
VOR449★	9.975	10.525
VOR450★	10.475	11.025
VOR451★	10.975	11.525
VOR452★	11.475	12.025
VOR453★	11.975	12.525
VOR454★	12.475	13.025
VOR455★	12.975	13.525
VOR456★	13.475	14.025
VOR457★	13.975	14.525
VOR458★	14.475	15.025
VOR459★	14.975	15.525
VOR460★	15.475	16.025
VOR461★	15.955	16.505
VOR462★	16.455	17.005
VOR463★	16.955	17.505
VOR464★	17.455	18.005
VOR465★	17.955	18.505
VOR466★	18.455	19.005
VOR467★	18.955	19.505
VOR468★	19.455	20.005
VOR469★	19.955	20.505
VOR470★	20.955	21.505
VOR471★	21.955	22.505
VOR472★	22.940	23.940
VOR473★	23.940	24.490
VOR474★	24.940	25.490
VOR475★	25.940	26.490

★ = New Product



TERMS AND CONDITIONS

Terms: Net 30 days, upon approval, MasterCard/Visa also available

All prices F.O.B. Nesconset, N.Y. Other terms quoted on request

Prices and specifications are subject to change without notice

OEM or quantity discounts available upon request

Prices listed are for United States domestic sales. For non-domestic shipments, contact the factory for pricing schedule.

WARRANTY

KEY HIGH VACUUM PRODUCTS INC. herein after referred to as **KHVP** warrants all products manufactured by **KHVP** to be free from defects in materials and workmanship for one (1) year from the date of shipment to the user.

Liability is limited to repair or replacement of unit as determined by **KHVP**.

Consumable items such as bellows, heaters and gauge tubes by their nature may have a service life of less than one (1) year in some environments, if unit fails to perform for a reasonable time frame as determined by **KHVP**, unit will be repaired or replaced at **KHVP's** election.

All returns must have a RA# issued by **KHVP** and shall be received prepaid.

ORDERING INFORMATION

When you are ready to place your order or require additional technical information call (631)360-3970, fax (631)360-3973 or visit our website at www.keyhigh.com for assistance. The sales office is open Monday-Friday 9:00am to 5:00pm EST.

KEY HIGH VACUUM PRODUCTS INC. carries an extensive inventory of completed components that are available for immediate shipment. Orders received before 1:00 PM local time, for standard stocked components, will be shipped the same day.

CUSTOM MANUFACTURING

KEY HIGH VACUUM PRODUCTS INC., routinely modifies its standard product line to suit a wide variety of our customers needs and goals. In the circumstance of a special length, shape, size, etc., please feel free to contact us and a product specialist will assist you.

NEW CUSTOMERS

In order to facilitate rapid shipment to your organization **KEY HIGH VACUUM PRODUCTS INC.** requires the subsequent information;

Bank reference

Three trade references

Dunn & Bradstreet reference number (if available)

Trademark Ownership

Cajon®

Swagelok®

VCR® ...Crawford Fitting Co.

Chemraze® ...Greene Tweed

Paroflour® ...Parker Hannifin Corp.

Nonex®

Pyrex® ...Corning Inc.

Viton®

Kalrez® ...E.I. du Pont de Nemours & Co.

Kovar® ...Carpenter Technology Inc.

Santovac® ...Monsanto Co.

Not responsible for typographical errors

