

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.

Please call Key High at 631-360-3970 or email us at info@KeyHigh.com for the most up-to-date listing of products and for pricing information.



MET-SEAL Flanges



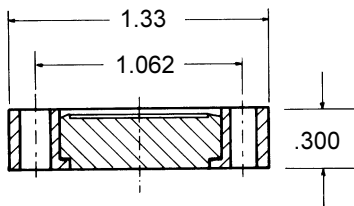
MET-SEAL Mini Flanges

Rotatable Mini Flanges

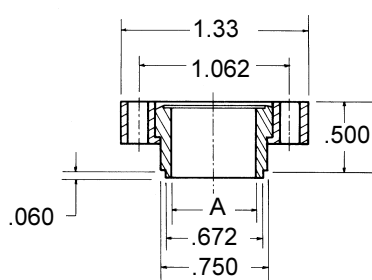
Part Number	Nominal OD	A ID	Bolt Holes No.	Bolt Dia	Price	Tapped Part No.	Thread Size
MS133-000R	1-1/3"	Blank	6	.172	\$ 16.00	MS133-000RT	8-32
MS133-025R	1-1/3"	.255	6	.172	\$ 16.00	MS133-025RT	8-32
MS133-038R	1-1/3"	.380	6	.172	\$ 16.00	MS133-038RT	8-32
MS133-050R	1-1/3"	.505	6	.172	\$ 16.00	MS133-050RT	8-32
MS133-075RW	1-1/3"	.630	6	.172	\$ 16.00	MS133-075RTW	8-32

R = Rotatable / W = Weld Neck / T = Tapped

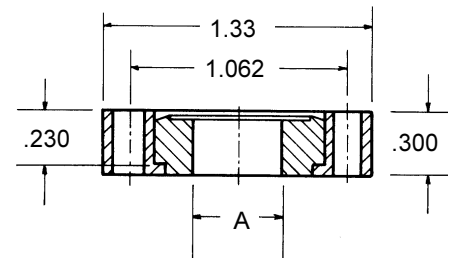
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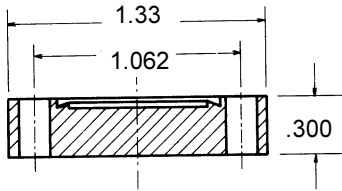
MET-SEAL Flanges, Plastic Covers

Non-Rotatable Mini Flanges

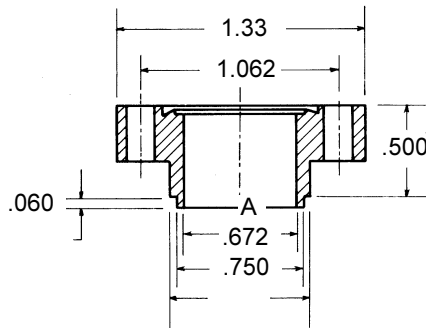
Part Number	Nominal OD	A ID	Bolt Holes No.	Bolt Dia	Price	Tapped Part No.	Thread Size
MS133-000N	1-1/3"	Blank	6	.172	\$ 15.00	MS133-000NT	8-32
MS133-025N	1-1/3"	.255	6	.172	\$ 15.00	MS133-025NT	8-32
MS133-038N	1-1/3"	.380	6	.172	\$ 15.00	MS133-038NT	8-32
MS133-050N	1-1/3"	.505	6	.172	\$ 15.00	MS133-050NT	8-32
MS133-075NW	1-1/3"	.630	6	.172	\$ 15.00	MS133-075NTW	8-32

N = Non-rotatable / W = Weld Neck / T = Tapped

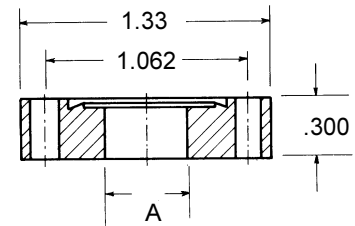
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MET-SEAL Mini Flange Hardware

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

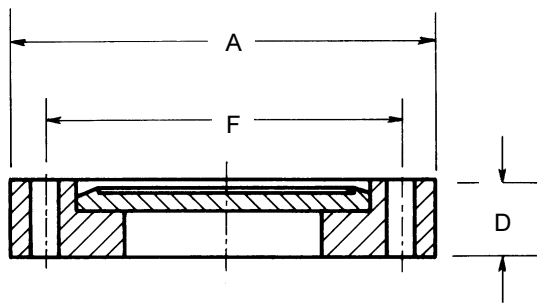
Rotatable Flanges

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

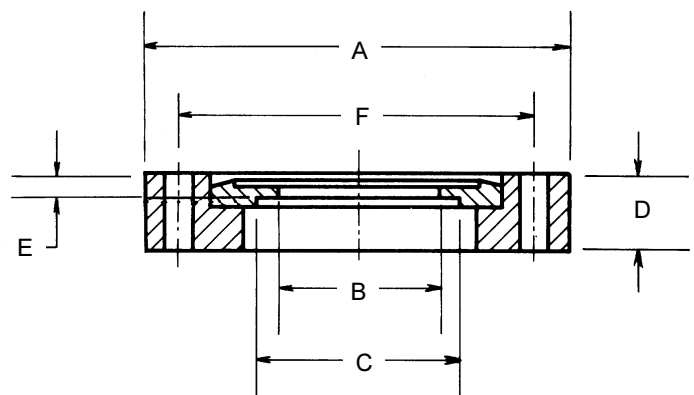
R = Rotatable / T = Tapped

Dimensions in inches

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MET-SEAL Ultra High Vacuum Flanges

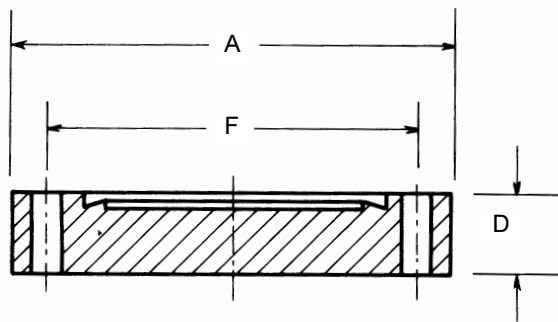
Non-Rotatable Flanges

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

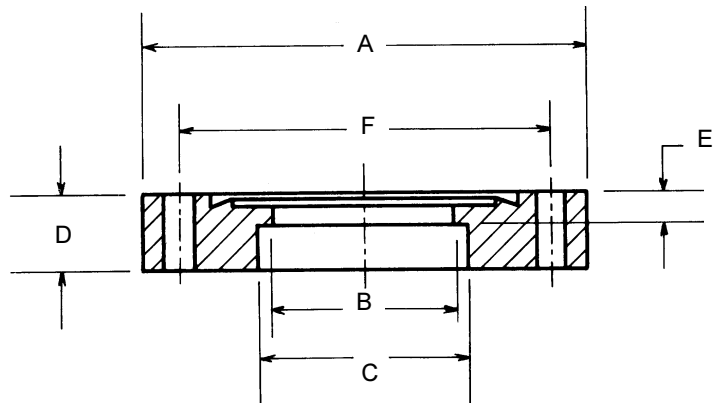
N= Non-Rotatable / T = Tapped

Dimensions in inches

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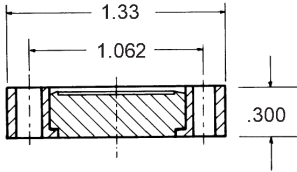
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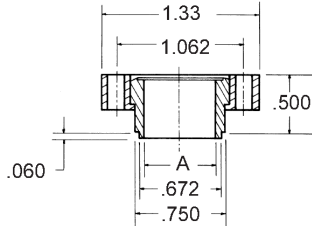
MET-SEAL Ultra High Vacuum Flanges 316

- Higher corrosion resistance
- Reach lower base pressures
- Less susceptible to magnetic fields, virtually ferrite free

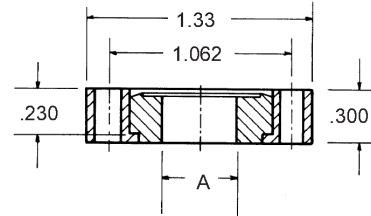
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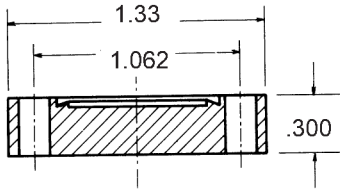


Rotatable Mini Met-Seal Flanges

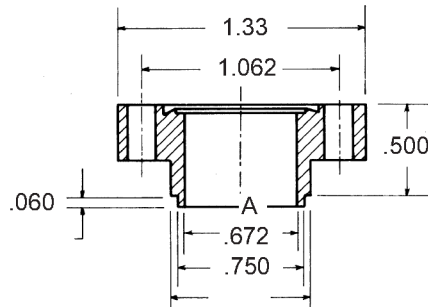
Part Number	Nominal OD	A (ID)	Bolt Holes	Diameter
MS133-000R316★	1-1/3"	Blank	6	.172
MS133-025RW316★	1-1/3"	.180	6	.172
MS133-050RW316★	1-1/3"	.375	6	.172
MS133-075RW316★	1-1/3"	.625	6	.172

★ = New Product

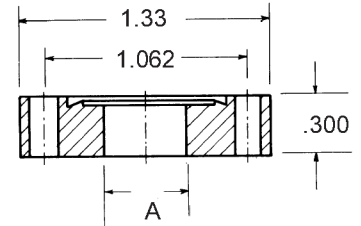
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Non-Rotatable Mini Met-Seal Flanges

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

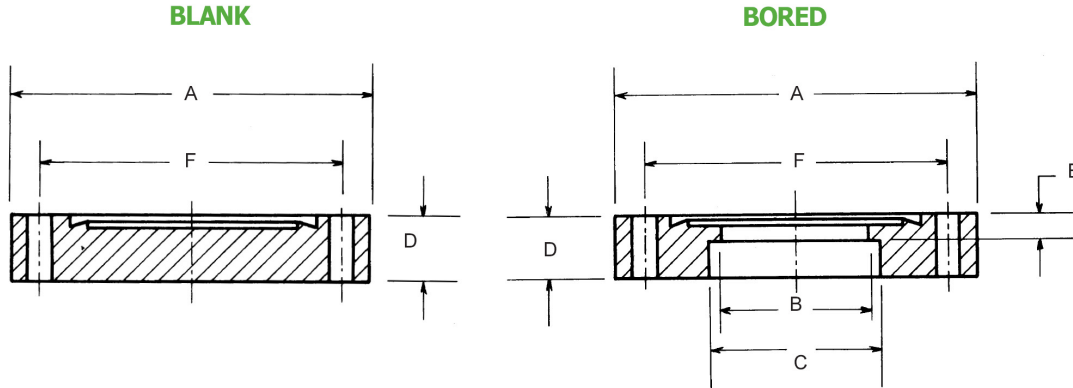
G-133-NI★

★ = 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

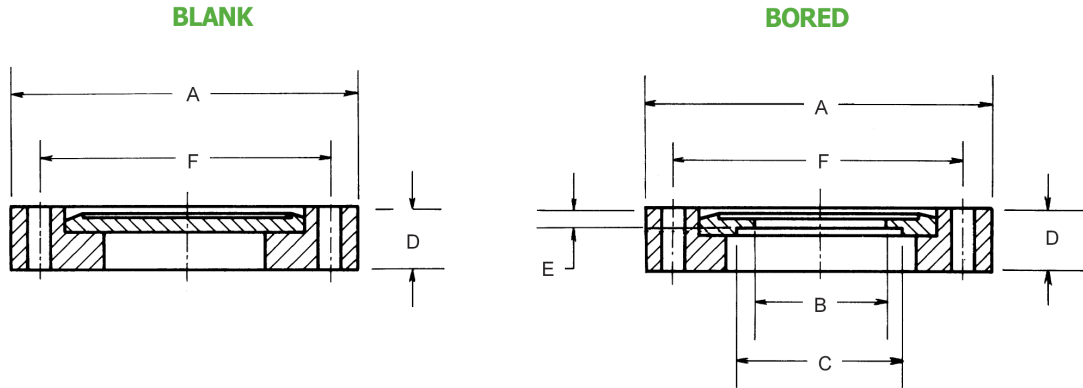
Solid Nickel Gasket for Mini Met-Seal (Sold Individually)

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

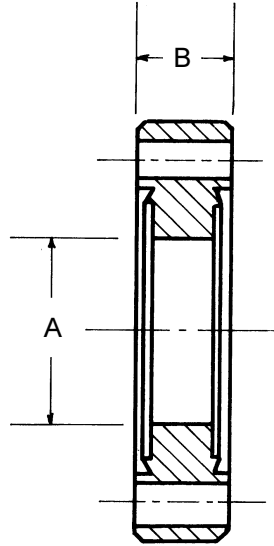
★ = New Product

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

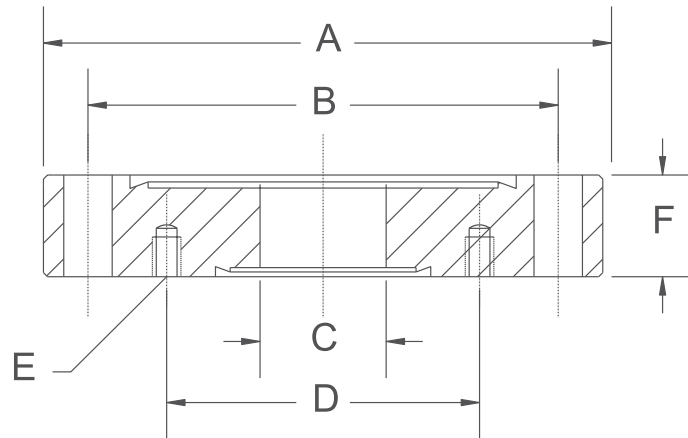


Double Sided Flanges

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

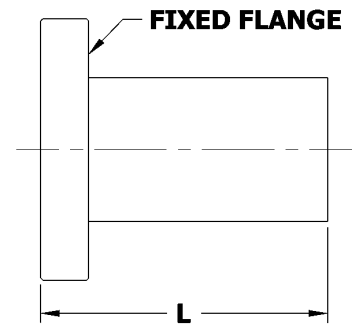


MET-SEAL Nipples

MET-SEAL Half Nipples

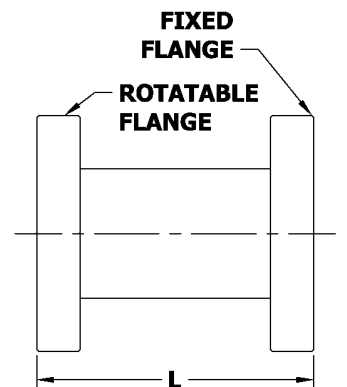
Part Number	Flange OD	Tube OD	Flange Code	L
HN133-1	1.33	.75	N	1.50
HN133-1-R	1.33	.75	R	1.50
HN133-1-T	1.33	.75	T	1.50
HN133-1-RT	1.33	.75	RT	1.50
HN212-1	2.12	1.00	N	2.04
HN212-1-R	2.12	1.00	R	2.04
HN212-1-T	2.12	1.00	T	2.04
HN212-1-RT	2.12	1.00	RT	2.04
HN275-1	2.74	1.50	N	2.46
HN275-1-R	2.74	1.50	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

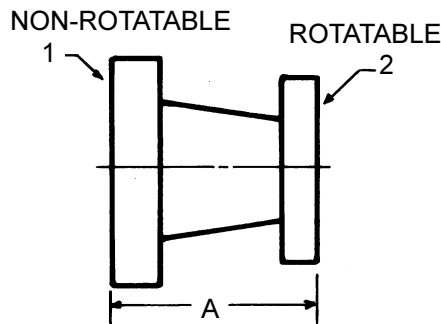


MET-SEAL Full Nipples

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

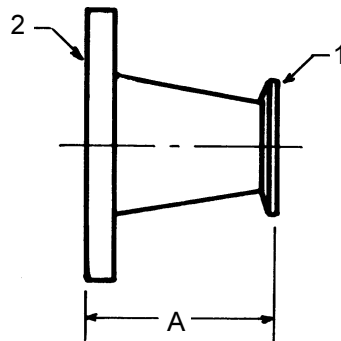


MET-SEAL Fittings



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

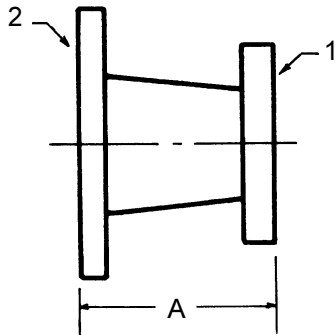


Conical Reducer Nipples MS to NW

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

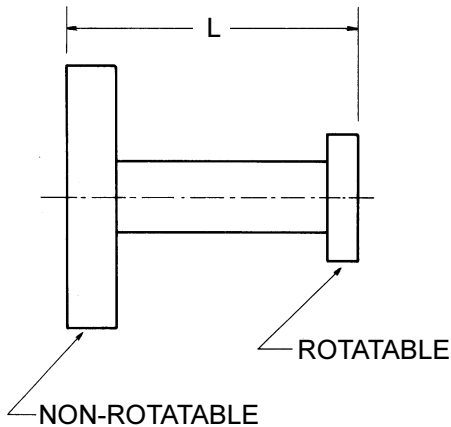
Conical Reducer Nipple MS to ASA



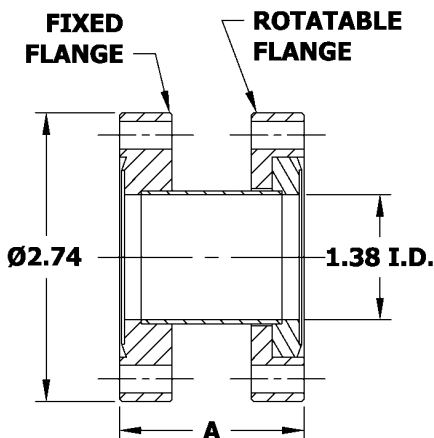
Part No.	MS Flange OD	Tube OD	ASA Flange OD	Tube OD	A
CRN212-ASA5	2.12	1.00	ASA-5	2.00	2.79
CRN275-ASA5	2.74	1.50	ASA-5	2.00	2.83
CRN275-ASA6	2.74	1.50	ASA-6	3.00	4.08
CRN338-ASA5	3.36	2.00	ASA-5	2.50	2.85
CRN338-ASA6	3.36	2.00	ASA-6	3.00	4.10
CRN338-ASA7.5	3.36	2.00	ASA-7.5	4.00	4.10
CRN450-ASA5	4.47	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



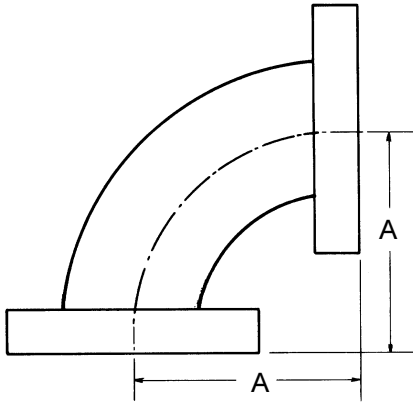
Short Length Full MET-SEAL Nipple Kit

- 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



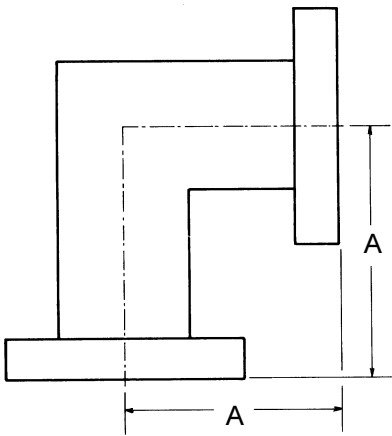
MET-SEAL Fittings



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

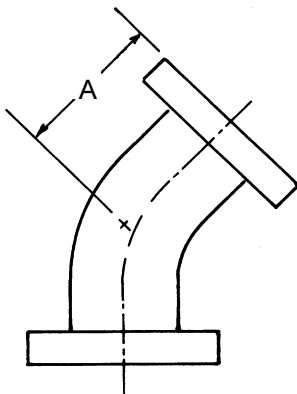
Note = * Both Flanges Rotatable



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

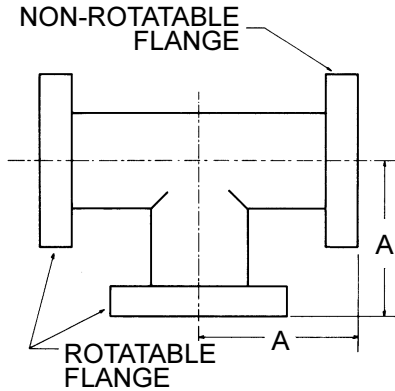


45° Radius Elbow

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

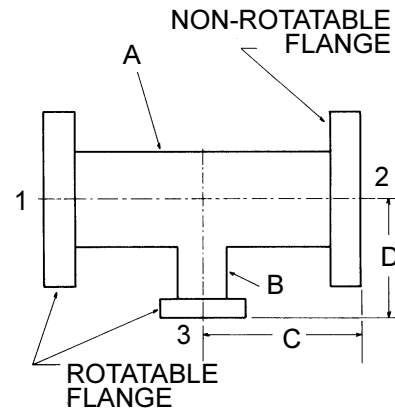
Note = * Both Flanges Rotatable

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

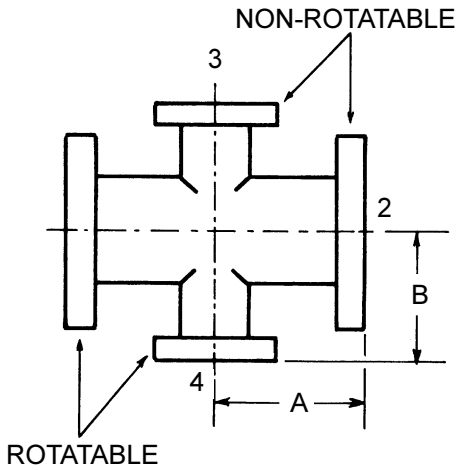


Reducer Tees

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

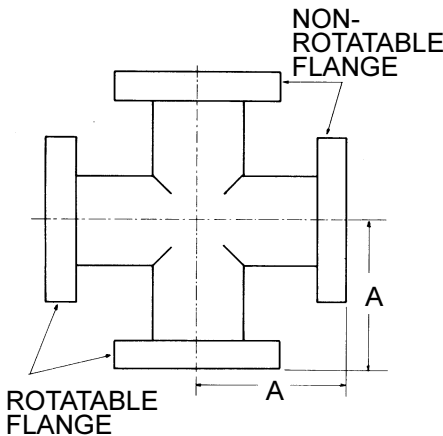


Part No.	FIG. 1 & 2		FIG. 3 & 4		A	B
	Fig. OD	Tube OD	Fig. OD	Tube OD		
4RC-275	2.74	1.50	1.33	.75	2.46	1.87
4RC-275-1	2.74	1.50	2.12	1.00	2.46	2.29
4RC-338	3.36	2.00	1.33	.75	3.22	2.13
4RC-338-1	3.36	2.00	2.74	1.50	3.22	2.71
4RC-450	4.47	2.50	2.74	1.50	3.38	2.96
4RC-450-1	4.47	2.50	3.36	2.00	3.38	3.48
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

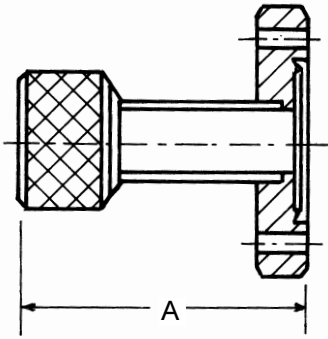


Part No.	Tube OD	Nominal Flange OD	A
4C-133	.75	1.33	1.50
4C-212	1.00	2.12	2.04
4C-275	1.50	2.74	2.46
4C-338	2.00	3.36	3.21
4C-450	2.50	4.47	4.12
4C-462	3.00	4.61	3.53
4C-600	4.00	5.97	5.31
4C-675	5.00	6.73	4.93
4C-800	6.00	7.97	6.56
4C-1000	8.00	9.97	8.00

MET-SEAL Adapter Fittings

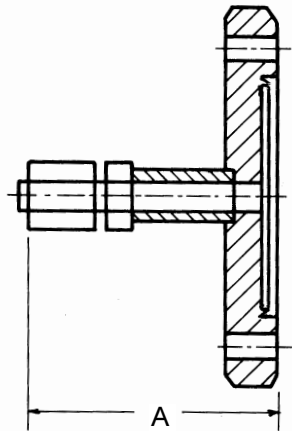
MET-SEAL Flange to Quick Seal Adapter

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



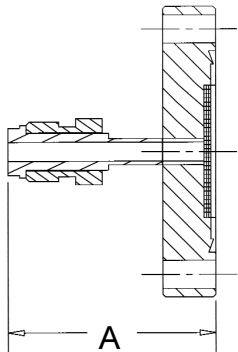
MET-SEAL DIFFUSERS/Adapter Fittings

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.

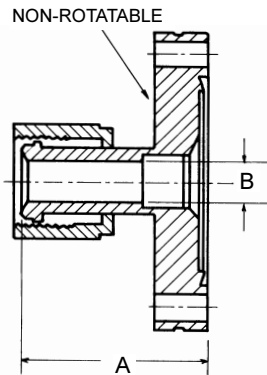
- Maximum inlet pressure = 30 psig
- Maximum operating temperature = 120 ° C



DF Series Diffusers

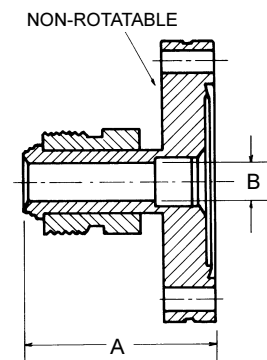
Part No.	Base Flange	VCR fitting	Pressure drop at 20 CFM/ft2	SCCM flow rate	A
DF-MSA133-FV25★	1-1/3" OD	1/4" Female	0.5 PSI	1,000	1.46
DF-MSA133-MV25★	1-1/3" OD	1/4" Male	0.5 PSI	1,000	1.46
DF-MSA275-FV25★	2-3/4" OD	1/4" Female	0.1 PSI	4,500	1.46
DF-MSA275-MV25★	2-3/4" OD	1/4" Male	0.1 PSI	4,500	1.46

★ = 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

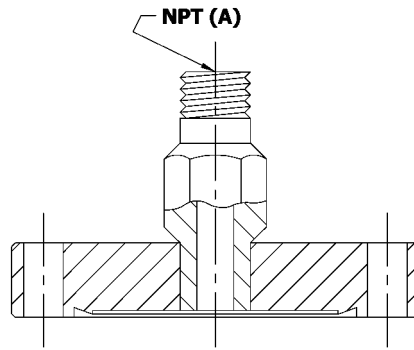


MET-SEAL Flange to Male VCR® Adapter

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

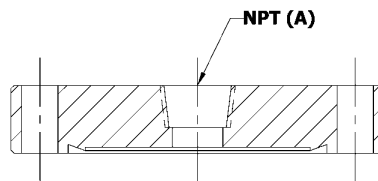


MET-SEAL Fittings



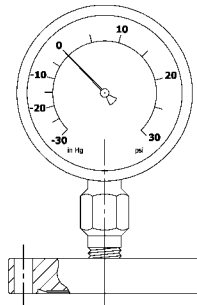
MET-SEAL Flange to Male NPT

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

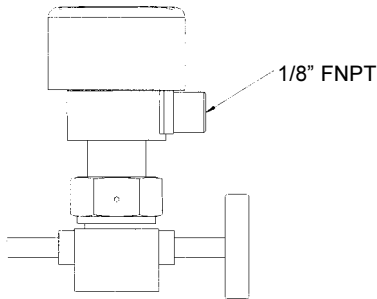
Part Number	Flange OD
MSG-133	1.33
MSG-212	2.12
MSG-275	2.73



MET-SEAL Vent / Backfill Valves, Gauges

Vent/Backfill Valves Manual

- Stainless steel bellows sealed valve
- Standard UHV flange mount

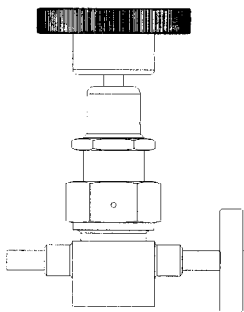


Part Number	Flange OD	A	ATM Port
MVMS-133★	1-1/3"	2.75"	1/4" OD tube
MVMS-133-MVCR★	1-1/3"	2.75"	1/4" MVCR
MVMS-133-FVCR★	1-1/3"	2.75"	1/4" FVCR
MVMS-275★	2-3/4"	2.75"	1/4" OD tube
MVMS-275-MVCR★	2-3/4"	2.75"	1/4" MVCR
MVMS-275-FVCR★	2-3/4"	2.75"	1/4" FVCR

★ = New Product

Vent/Backfill Valves Pneumatic

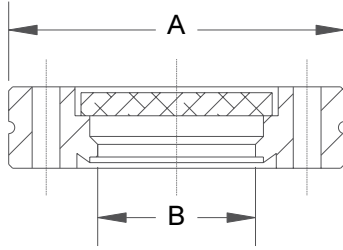
- Stainless steel bellows sealed, fail safe (spring loaded), normally closed
- Solenoid not included, available as option:
12, 24 VDC, 120, 240 VAC contact factory
- Standard UHV flange mount



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

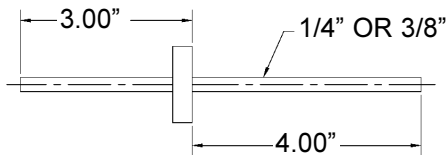


MET-SEAL Zero Length Viewports Pyrex 7056 Glass

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"

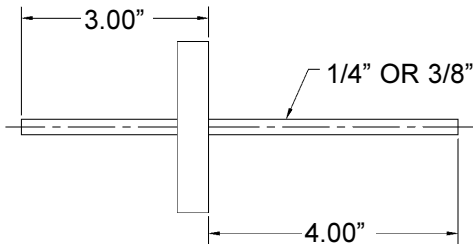
MET-SEAL Liquid Feedthroughs

- 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®



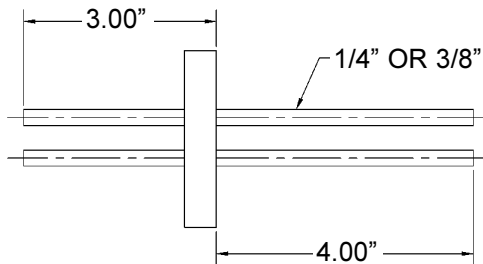
Liquid Feedthrough / Mini MET-SEAL Flange

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

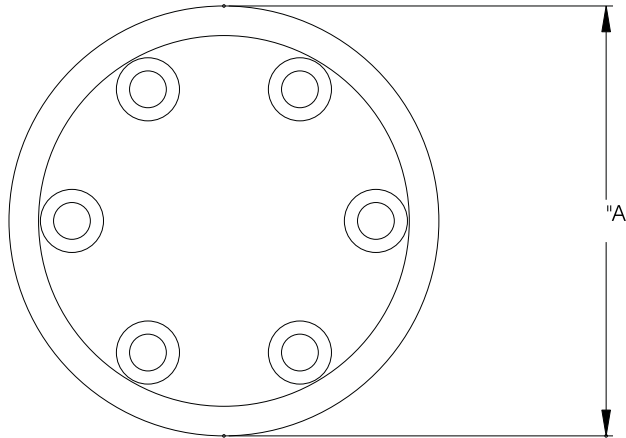
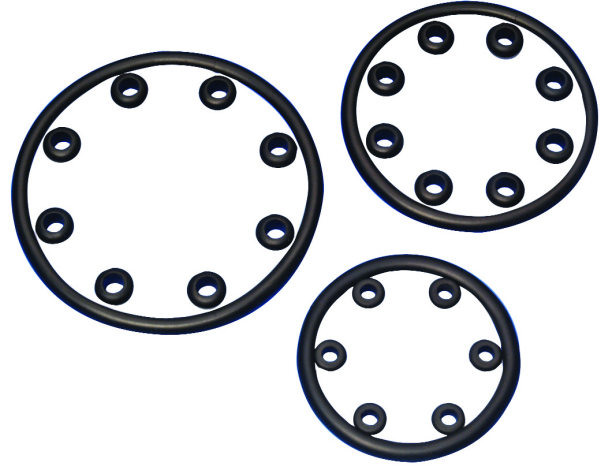
Innovative Protection for Exposed Viewports

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.

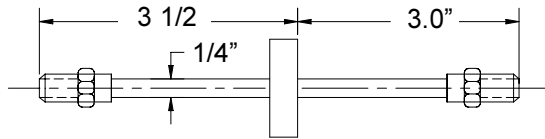
Installation is simple quick and easy. Simply line up the bolt holes and press the cover on. No need to break vacuum on existing equipment.

Temperature range -40°F to +180°F



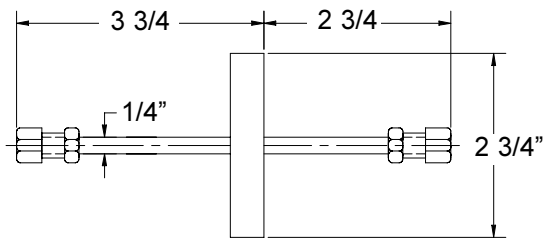
Part Number	Use with Flange OD	A
MSSC-275	2-3/4" OD Flange	3-1/4"
MSSC-338	3-3/8" OD Flange	4"
MSSC-450	4-1/2" OD Flange	4-3/4"
MSSC-600	6" OD Flange	6-1/4"
MSSC-800	8" OD Flange	8-1/4"
MSSC-1000	10" OD Flange	10-1/4"

MET-SEAL Feedthroughs



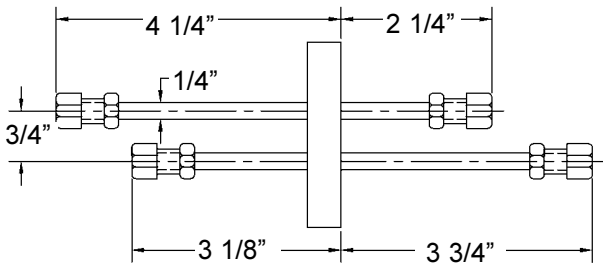
Liquid Feedthrough / Mini MET-SEAL with Swageloks®

Part Number	Description
FTL-133-25-SW	1/4" OD tube Swagelok® fittings



Liquid Feedthrough / 2-3/4" MET-SEAL with Swageloks®

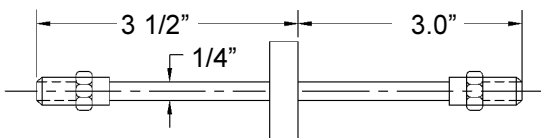
Part Number	Description
FTL-275-25-SW	1/4" OD tube Swagelok® fittings
FTL-275-37-SW	3/8" OD tube Swagelok® fittings



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

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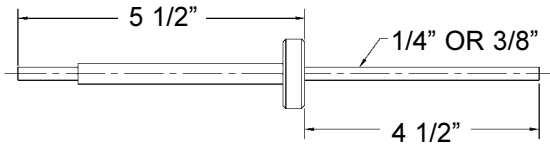


Liquid Feedthrough / MET-SEAL with 1/4" Male VCRs®

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

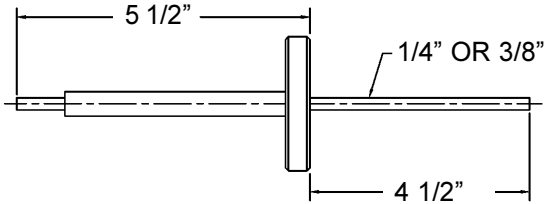


MET-SEAL Feedthroughs



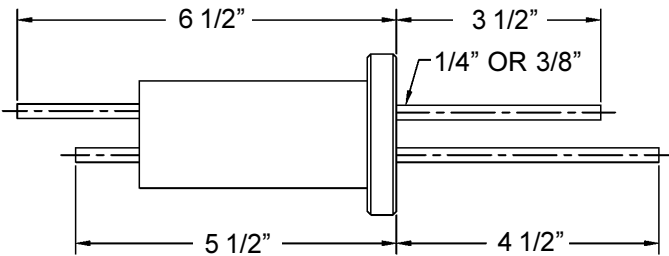
LN2 Feedthrough / Mini MET-SEAL Flange

Part Number	Description
FTLN-133-25	1/4" OD x .035 wall tube
FTLN-133-37	3/8" OD x .035 wall tube



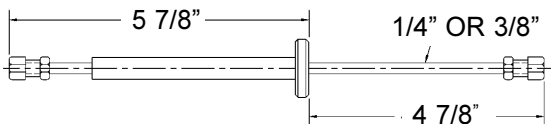
LN2 Feedthrough / 2-3/4" OD MET-SEAL Flange

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

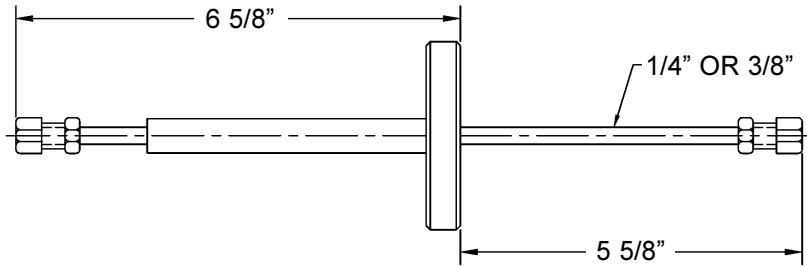


LN2 Feedthrough / Mini MET-SEAL Flange with Swageloks®

Part Number	Description
FTLN-133-25SW	1/4" OD tube Swagelok® fittings

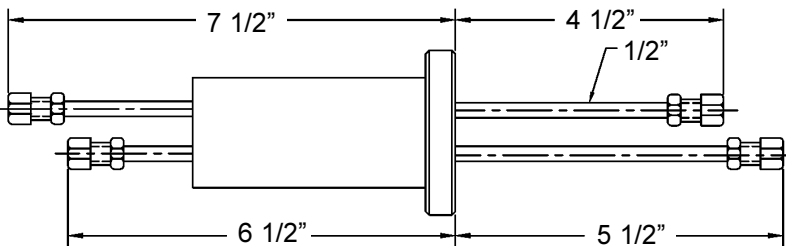


MET-SEAL Feedthroughs



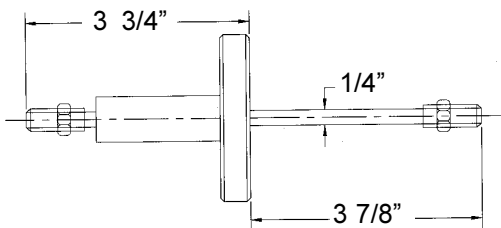
LN2 Feedthrough / 2-3/4" MET-SEAL with Swageloks®

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

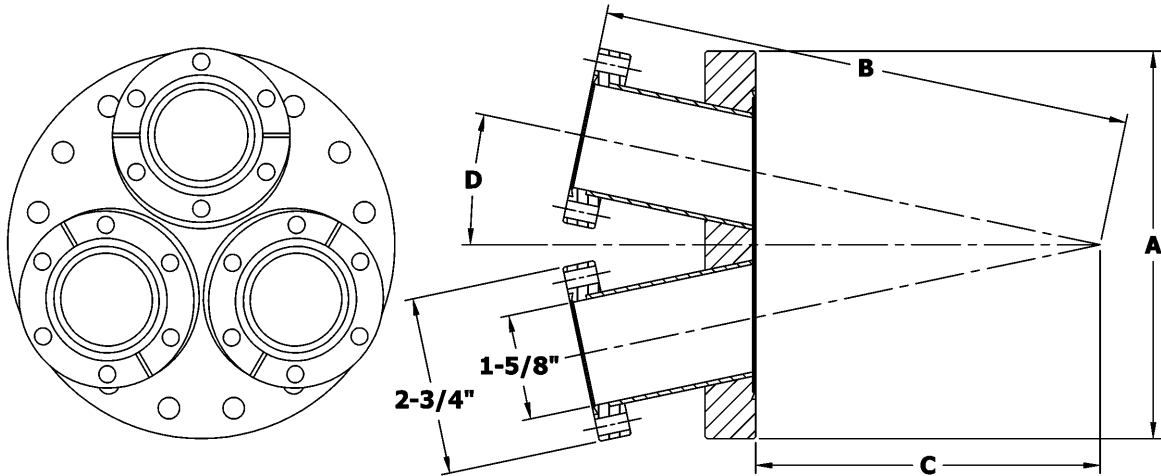


LN2 Feedthroughs / MET-SEAL Flange with VCRs®

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

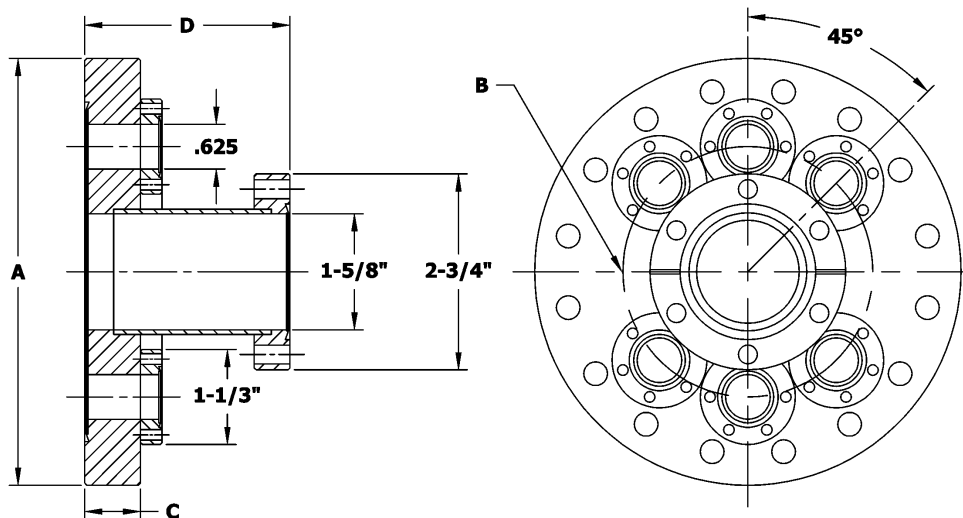


MET-SEAL Large Cluster Flanges, 3 or 4 Ports, Angled

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

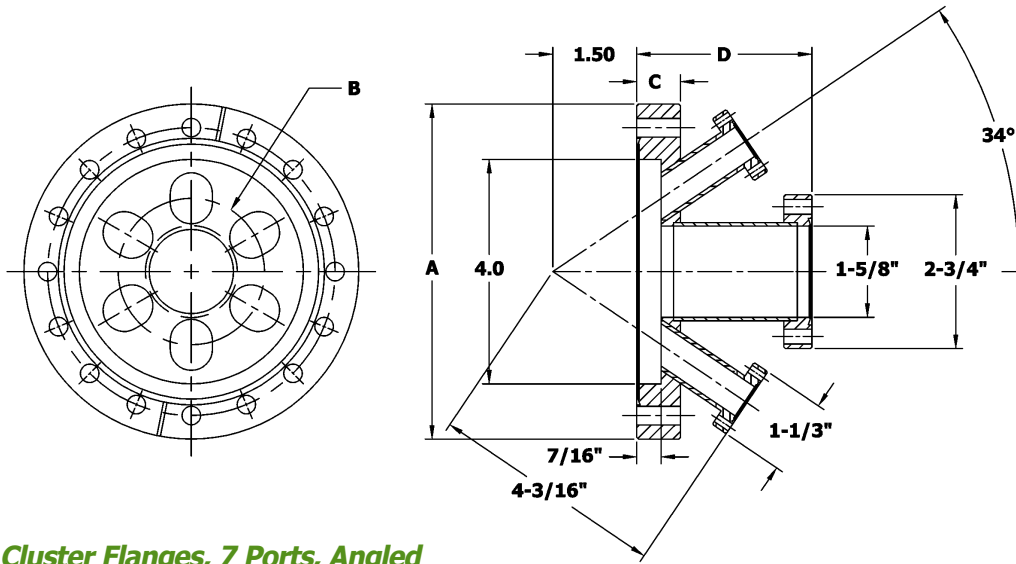
Features:

- 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



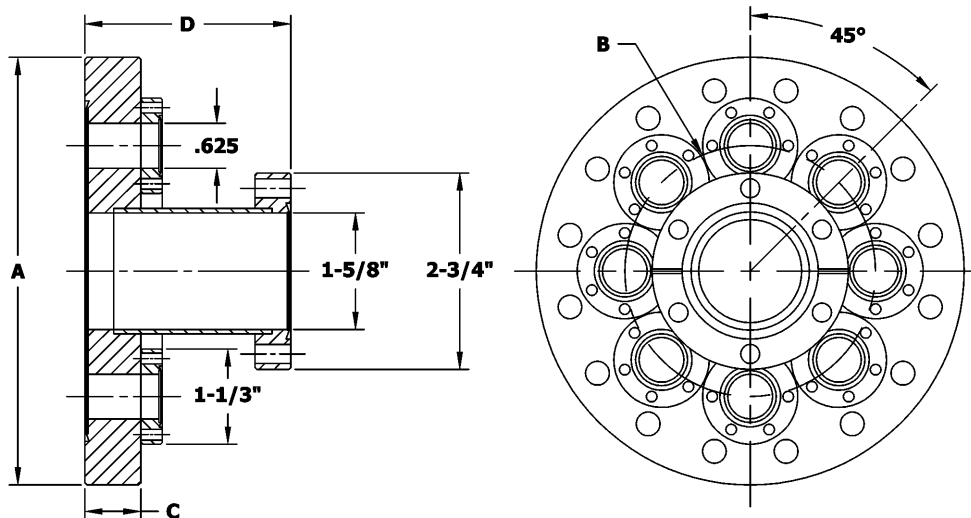
MET-SEAL Cluster Flanges



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



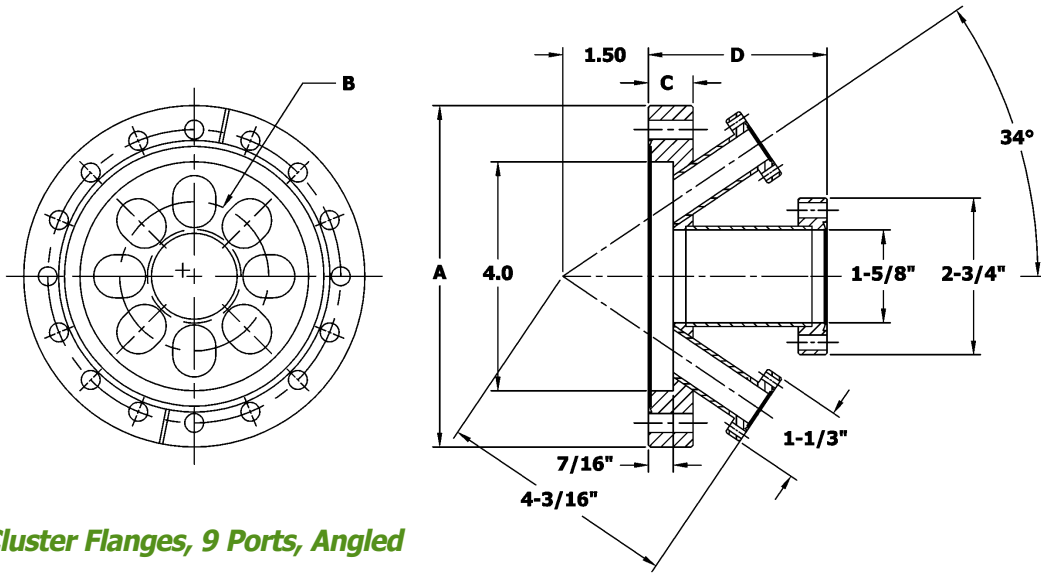
MET-SEAL Cluster Flanges, 9 Ports, Flush Mount Features:

- 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

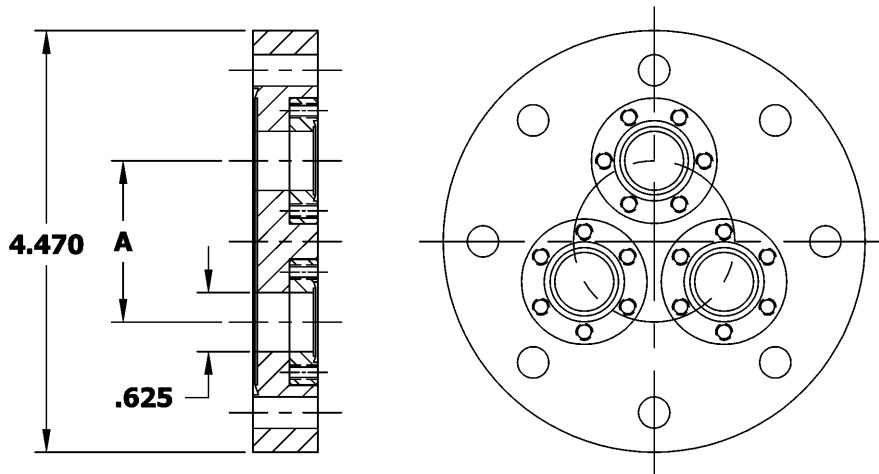


MET-SEAL Cluster Flanges, 9 Ports, Angled

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

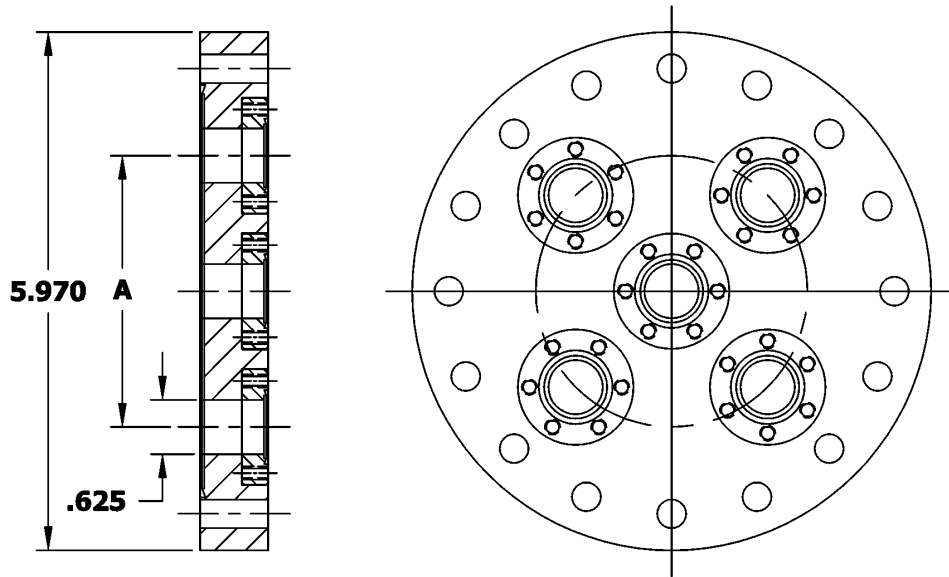
Features:

- 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

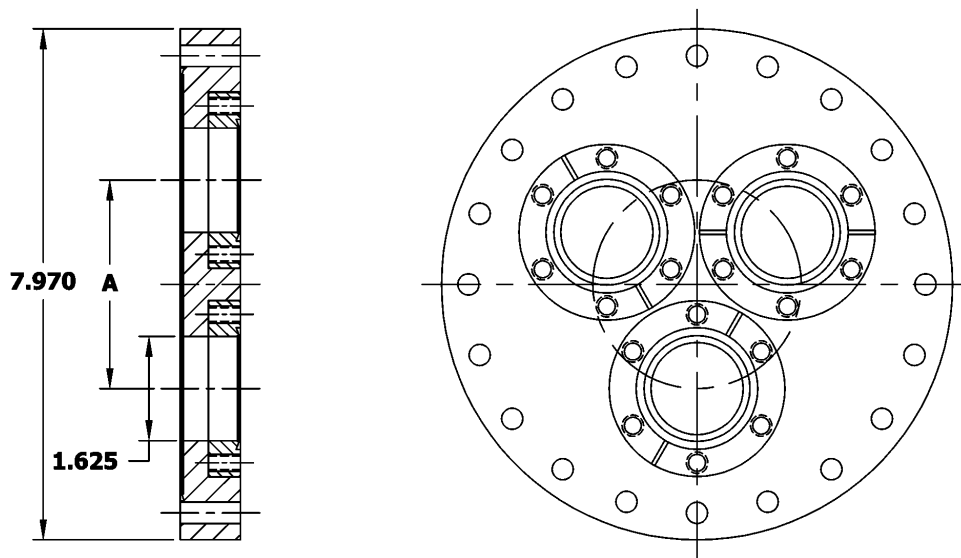
Part Number	Description	A
CLF450-133	4-1/2" OD base flange 3 each tapped Mini inserts	1.710



MET-SEAL Cluster Flanges



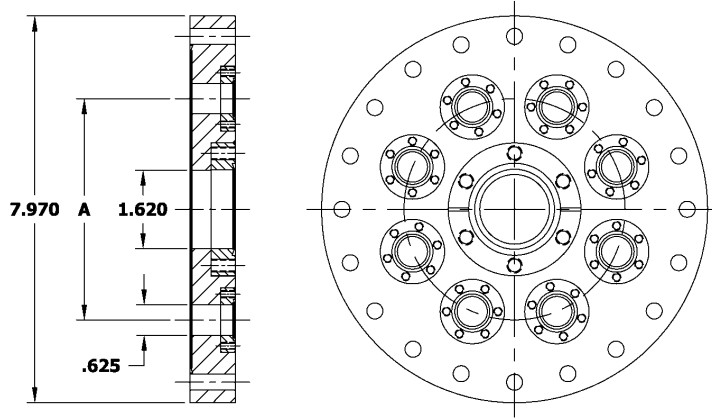
Part Number	Description	A
CLF600-133	6" OD base flange 5 each tapped Mini inserts	3.125



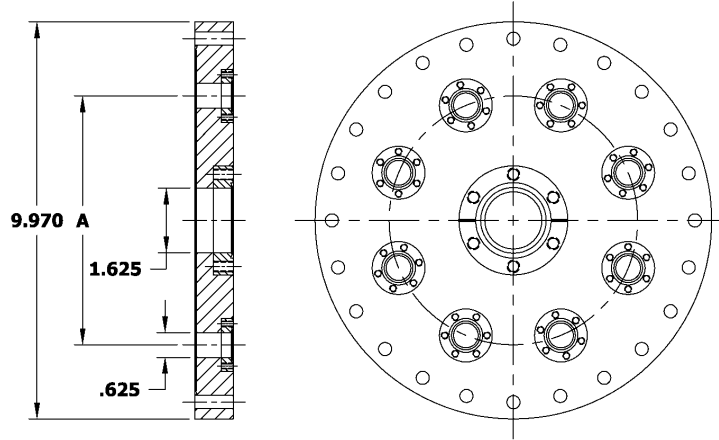
Part Number	Description	A
CLF800-275	8" OD base flange, 3 each tapped 2-3/4" inserts	3.250



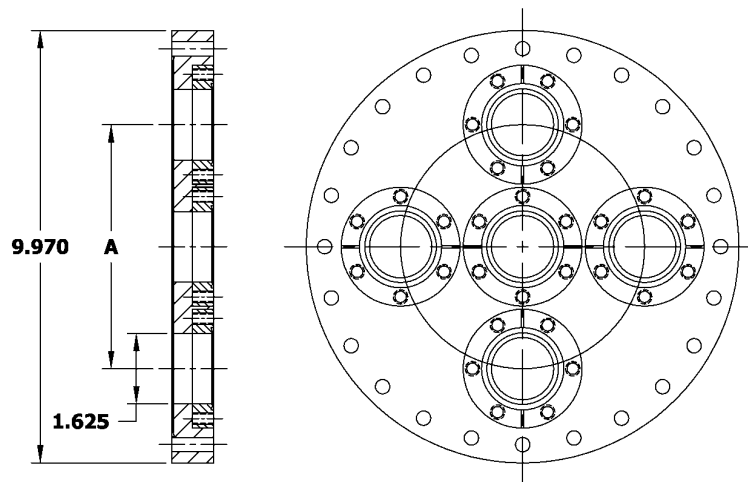
MET-SEAL Cluster Flanges



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

