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Product Highlights

Vented Fasteners / Screws — Provide an excellent path for trapped gases to escape the bottom of blind-tapped holes. Three standard types available for shipping the same day. Custom bolts and screws are available on request.

CF Flanges and Mounting Hardware — available with same day shipping.

ISO KF and LF Flanges and Mounting Hardware — are also available for the immediate needs of our clients.

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UHV Vented Fasteners

Vented Screws, Washers and Lock-Washers

All Materials are HV and UHV compatible

Socket Head Cap Screws

Phillips Pan head Screws

Phillips Flathead Screws

Features

- UHV compatible construction
- Multiple fastener head types
- Custom solutions on request

Specifications

Vacuum Range

UHV, Ultrahigh vacuum	1×10^{-10} Torr
HV, High vacuum	1×10^{-8} Torr

Temperature Range^{1,2}

18-8 Stainless Steel	450°C
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Notes

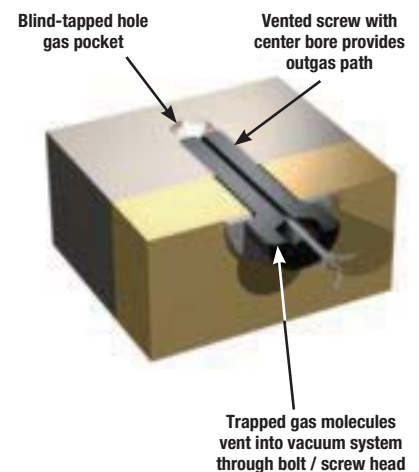
1. Overall assembly ratings must be adjusted to that of its lowest rated component.
2. Prolonged use at high temperatures may require the use of a vacuum compatible anti-seizing thread compound or coating such as silver-plating. Contact factory for custom vented screw solutions

§ Unless specified otherwise, dimensional units in all sections of this catalog are expressed in inches.

UHV Vented Fasteners

Accu-Glass Products, Inc., offers three types of vented screws: socket head cap screws, Phillips pan head and Phillips flat head screws. All screws are machined from vacuum compatible 18-8 stainless steel. These are available as standard off-the-shelf items. Custom screws and bolts can be quoted upon request.

The use of "vented" screws in vacuum environments is critical. Non-vented screws create gas pockets that are difficult to pump down. These gases show themselves as "virtual leaks" causing unwanted downtime.





The use of 'Vented' fasteners inside a vacuum environment is critical. A non-vented, blind-threaded hole creates a gas pocket that's difficult or impossible to evacuate (pump down) without an escape path. A trapped gas will manifest it self as a 'virtual leak', which is difficult to locate and causes unwanted downtime. Accu-Glass vented fasteners are manufactured from vacuum compatible 18-8 grade stainless steel.

Socket-Head Cap — Vented Screws / 450°C / UHV to 1x10⁻¹⁰ Torr

Screw Size, Length	Qty / Pack	Part Number
--------------------	------------	-------------

2-56 UNC — ANSI .086-56

1/8	10	210040
3/16	10	210041
1/4	10	210042
5/16	10	210043
3/8	10	210044
7/16	10	210045
1/2	5	210046
5/8	2	210047
3/4	2	210048

4-40 UNC — ANSI .112-40

1/8	10	210035
3/16	10	210011
1/4	10	210003
5/16	10	210036
3/8	10	210005
7/16	10	210037
1/2	10	210007
9/16	5	210008
5/8	5	210009
3/4	5	210010
7/8	2	210038
1	2	210039

5-40 UNC — ANSI .125-40

1/4	10	210049
5/16	10	210050
3/8	10	210051
1/2	10	210052
5/8	5	210053
3/4	2	210054
7/8	2	210055
1	2	210056

6-32 UNC — ANSI .138-32

1/8	10	210057
3/16	10	210016
1/4	10	210017
5/16	10	210625

Screw Size, Length	Qty / Pack	Part Number
--------------------	------------	-------------

6-32 Continued

3/8	10	210018
7/16	10	210058
1/2	10	210019
9/16	5	210059
5/8	5	210060
3/4	5	210020
7/8	2	210061
1	2	210062
1-1/8	2	210063
1-1/4	2	210064

8-32 UNC — ANSI .164-32

3/16	10	210065
1/4	10	210021
5/16	10	210066
3/8	10	210022
7/16	10	210067
1/2	10	210023
9/16	10	210068
5/8	5	210617
3/4	5	210024
7/8	5	210069
1	5	210618
1-1/8	2	210070
1-1/4	2	210071
1-1/2	2	210072
2	1	210073

10-24 UNC — ANSI .190-24

1/4	10	210074
3/8	10	210075
1/2	10	210076
5/8	10	210077
3/4	10	210078
7/8	5	210079
1	5	210080

10-32 UNF — ANSI .190-32

3/16	10	210081
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Screw Size, Length	Qty / Pack	Part Number
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10-32 Continued

1/4	10	210025
5/16	10	210620
3/8	10	210026
7/16	10	210082
1/2	10	210027
9/16	10	210083
5/8	10	210619
11/16	5	210084
3/4	10	210028
7/8	5	210085
1	5	210621
1-1/8	5	210086
1-1/4	5	210622
1-3/8	2	210087
1-1/2	2	210088
1-5/8	2	210089
1-3/4	2	210090
2	1	210091

1/4-20 UNC — ANSI .250-20

1/4	10	210092
5/16	10	210093
3/8	10	210031
1/2	10	210032
5/8	10	210094
3/4	10	210029
7/8	5	210095
1	5	210030
1-1/8	5	210096
1-1/4	5	210033
1-3/8	5	210034
1-1/2	2	210097
1-5/8	2	210098
1-3/4	2	210099
2	1	210100
2-1/2	1	210101



210027 / Socket Head Cap
#10-32 Vented Screws



The use of 'Vented' fasteners inside a vacuum environment is critical. A non-vented, blind-threaded hole creates a gas pocket that's difficult or impossible to evacuate (pump down) without an escape path. A trapped gas will manifest itself as a 'virtual leak', which is difficult to locate and causes unwanted downtime. Accu-Glass vented fasteners are manufactured from vacuum compatible 18-8 grade stainless steel.



210300 / Phillips Pan Head
#4-40 Vented Screw

Phillips Pan Head — Vented Screws / 450°C / UHV to 1×10^{-10} Torr

Screw Size / Length	Qty / Pack	Part Number
2-56 UNC — ANSI .086-56		
1/8	10	210317
1/4	10	210318
3/8	10	210319
1/2	5	210320
3/4	2	210321
4-40 UNC — ANSI .112-40		
1/8	10	210322
3/16	10	210323
1/4	10	210300
5/16	10	210324
3/8	10	210301
7/16	10	210325
1/2	10	210326
5/8	5	210327
3/4	2	210328

Screw Size / Length	Qty / Pack	Part Number
6-32 UNC — ANSI .138-32		
1/4	10	210302
5/16	10	210623
3/8	10	210303
1/2	10	210329
5/8	10	210330
3/4	10	210331
1	2	210332
8-32 UNC — ANSI .164-32		
1/4	10	210304
3/8	10	210305
1/2	10	210624
3/4	10	210333
1	2	210334
1-1/4	2	210335

Screw Size / Length	Qty / Pack	Part Number
10-32 UNF — ANSI .190-32		
1/4	10	210336
3/8	10	210337
1/2	10	210338
3/4	10	210339
1	10	210340
1/4-20 UNC — ANSI .250-20		
1/4	10	210341
3/8	10	210342
1/2	10	210343
5/8	10	210344
3/4	10	210345
1	10	210346



210306 / Phillips Flat Head
#4-40 Vented Screw

Phillips Flat Head — Vented Screws / 450°C / UHV to 1×10^{-10} Torr

Screw Size / Length	Qty / Pack	Part Number
2-56 UNC — ANSI .086-56		
1/8	10	210347
3/16	10	210626
1/4	10	210348
3/8	10	210349
1/2	10	210350
3/4	2	210351
4-40 UNC — ANSI .112-40		
1/8	10	210352
1/4	10	210306
3/8	10	210307
1/2	10	210353
3/4	2	210354

Screw Size / Length	Qty / Pack	Part Number
6-32 UNC — ANSI .138-32		
1/4	10	210308
3/8	10	210309
1/2	10	210355
5/8	10	210356
3/4	10	210357
1	2	210358
8-32 UNC — ANSI .164-32		
1/4	10	210310
3/8	10	210311
1/2	10	210316
3/4	10	210359
1	2	210360

Screw Size / Length	Qty / Pack	Part Number
10-32 UNF — ANSI .190-32		
1/4	10	210361
3/8	10	210312
1/2	10	210313
3/4	10	210362
1	5	210363
1-1/4	2	210364
1/4-20 UNC — ANSI .250-20		
1/2	10	210314
3/4	10	210315
1	10	210365
1-1/4	2	210366



The use of 'Vented' fasteners inside a vacuum environment is critical. A non-vented, blind-threaded hole creates a gas pocket that's difficult or impossible to evacuate (pump down) without an escape path. A trapped gas will manifest itself as a 'virtual leak', which is difficult to locate and causes unwanted downtime. Accu-Glass vented fasteners are manufactured from vacuum compatible 18-8 grade stainless steel.

Hex Head — Vented Screws / 450°C / UHV to 1x10⁻¹⁰ Torr

Screw Size / Length	Qty / Pack	Part Number
4-40 UNC — ANSI .112-40		
1/4	10	210367
3/8	10	210368
1/2	10	210369
3/4	2	210370
6-32 UNC — ANSI .138-32		
1/4	10	210371
3/8	10	210372
1/2	10	210373
3/4	5	210374
1	2	210375

Screw Size / Length	Qty / Pack	Part Number
8-32 UNC — ANSI .164-32		
1/4	10	210376
3/8	10	210377
1/2	10	210378
3/4	10	210379
1	2	210380
10-32 UNF — ANSI .190-32		
1/4	10	210381
3/8	10	210382
1/2	10	210383
3/4	10	210384
1	5	210385
1-1/4	2	210386

Screw Size / Length	Qty / Pack	Part Number
1/4-20 UNC — ANSI .250-20		
3/8	10	210387
1/2	10	210388
5/8	10	210389
3/4	10	210390
1	5	210391
1-1/4	2	210392
5/16-24 UNF — ANSI .312-24		
1/2	10	210393
5/8	10	210394
3/4	5	210395
1	2	210396
1-1/4	2	210397
1-1/2	2	210398



210388 / Hex Head
1/4-20 Vented Screw

Socket Set Screw — Vented Screws / 450°C / UHV to 1x10⁻¹⁰ Torr

Screw Size / Length	Qty / Pack	Part Number
2-56 UNC — ANSI .086-56		
1/8	10	210418
1/4	10	210419
3/8	10	210420
1/2	5	210421
3/4	2	210422
4-40 UNC — ANSI .112-40		
1/8	10	210423
1/4	10	210424
3/8	10	210425
1/2	10	210426
3/4	2	210427

Screw Size / Length	Qty / Pack	Part Number
6-32 UNC — ANSI .138-32		
1/4	10	210428
3/8	10	210429
1/2	10	210430
3/4	10	210431
1	2	210432
8-32 UNC — ANSI .164-32		
1/4	10	210433
3/8	10	210434
1/2	10	210435
3/4	10	210436
1	2	210437

Screw Size / Length	Qty / Pack	Part Number
10-32 UNF — ANSI .190-32		
1/4	10	210438
3/8	10	210439
1/2	10	210440
3/4	10	210441
1	5	210442
1-1/4	2	210443
1/4-20 UNC — ANSI .250-20		
1/4	10	210444
3/8	10	210445
1/2	10	210446
5/8	10	210447
3/4	10	210448



210446 / Socket Set Screw
1/4-20 Vented Set Screw



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210405 / Flat Washer
1/4 Inch Vented



210414 / Lock Washer
1/4 Inch Vented

Washers — Vented, Flat and Split Lock Washers / 450°C / UHV to 1×10^{-10} Torr

Fastener Size	Qty / Pack	Part Number
Flat Washer — with Face Groove		
#2	10	210399
#4	10	210400
#5	10	210401
#6	10	210402
#8	10	210403
#10	10	210404
1/4	10	210405
5/16	10	210406
3/8	10	210407
1/2	10	210408

Fastener Size	Qty / Pack	Part Number
Split Lock Washer — with Wide Gap		
#2 ¹	20	210409
#4 ¹	20	210410
#6 ¹	20	210411
#8 ¹	20	210412
#10 ¹	20	210413
1/4 ¹	20	210414
5/16	20	210415
3/8	20	210416
1/2	20	210417

1. Type 316 Stainless Steel





CF Components

Conflat® Compatible Flanges and Fittings

Conical Reducer CF Flanges

Blank CF Flanges

Zero Length Reducer CF Flanges

Gaskets and Mounting
Hardware

Nipples, Elbows,
and Couplings

Features

- 304 Stainless Steel
- UHV Compatible to 1×10^{-13} Torr
- Bakeable to 450°C

Specifications

Vacuum Range

UHV, Ultrahigh vacuum

1×10^{-13} Torr

Temperature Range^{1,2}

304 Stainless Steel

450°C

Notes

1. Overall assembly ratings must be adjusted to that of its lowest rated component.
 2. Anti-seizing thread lubricants or compounds are recommended when fastening stainless steel components. Silver-plated bolts are an ideal solution for in-vacuum use, while various paint-on thread lubricating solutions for air-service applications are commercially available. Contact factory for more information on thread lubricating solutions.
- § Unless specified otherwise, dimensional units in all sections of this catalog are expressed in inches.

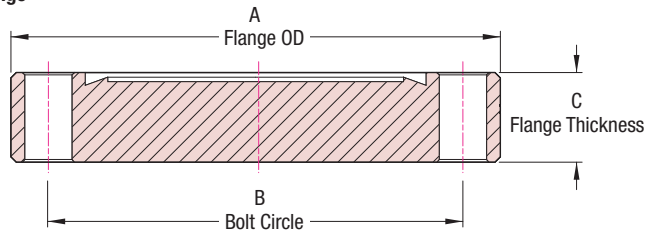
CF Components

Accu-Glass Products' line of Conflat® compatible CF style blank flanges, fittings and hardware are designed to incorporate the industry standard "captured copper gasket" sealing principle. This is the standard ultrahigh vacuum, UHV sealing method used throughout the industrial and scientific vacuum communities.

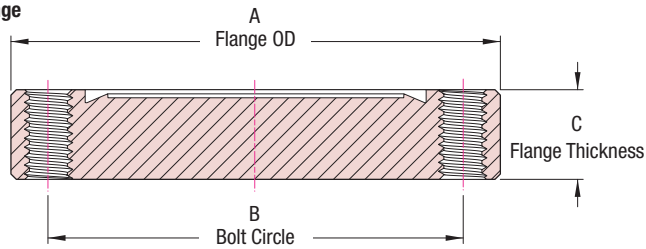
Our range of products include numerous CF flanged parts from conical reducers, zero length reducers, nipples, elbows and couplings to all supporting mounting hardware including copper and Viton® gaskets.



CF, Clearance Hole Flange



CF, Threaded Hole Flange

Non-Rotatable¹ — Blank CF Flange / 450°C / UHV to 1x10⁻¹⁰ Torr

Flange	A Flange OD	B Bolt Circle	Bolt Holes		C Flange Thickness	Model Number	Part Number
			Quantity	Diameter			

Clearance — Bolt Hole

133 CF	1.33	1.062	6	0.17	0.30	CF133-000-N	200000
212 CF	2.12	1.625	4	0.26	0.47	CF212-000-N	200040
275 CF	2.73	2.312	6	0.26	0.50	CF275-000-N	200060
338 CF	3.36	2.850	8	0.33	0.69	CF338-000-N	200110
450 CF	4.50	3.628	8	0.33	0.69	CF450-000-N	200122
462 CF	4.62	4.030	10	0.33	0.81	CF462-000-N	200138
600 CF	6.00	5.128	16	0.33	0.78	CF600-000-N	200150
675 CF	6.75	5.969	18	0.33	0.84	CF675-000-N	200158
800 CF	8.00	7.128	20	0.33	0.87	CF800-000-N	200170
1000 CF	10.00	9.128	24	0.33	0.97	CF1000-000-N	200178
1200 CF	12.00	11.180	32	0.33	1.12	CF1200-000-N	200186
1325 CF	13.25	12.060	30	0.39	1.12	CF1325-000-N	200194
1400 CF	14.00	12.809	30	0.39	1.12	CF1400-000-N	200206
1450 CF	14.50	13.311	32	0.39	1.12	CF1450-000-N	200214
1650 CF	16.50	15.310	36	0.39	1.12	CF1650-000-N	200222

Threaded — Bolt Hole

133 CF	1.33	1.062	6	8-32	0.30	CF133-000-NT	200009
212 CF	2.12	1.625	4	1/4-28	0.47	CF212-000-NT	200045
275 CF	2.73	2.312	6	1/4-28	0.50	CF275-000-NT	200070
450 CF	4.50	3.628	8	5/16-24	0.69	CF450-000-NT	200126
600 CF	6.00	5.128	16	5/16-24	0.78	CF600-000-NT	200152
675 CF	6.75	5.969	18	5/16-24	0.84	CF675-000-NT	200161

1. Gaskets and mounting hardware see pages 230 and 231.

**200000** / 1.33 CF Flange
Clearance Holes**200122** / 4.50 CF Flange
Clearance Holes**200009** / 1.33 CF Flange
Threaded Holes**200126** / 4.50 CF Flange
Threaded Holes



200018 / CF Flange
Clearance Holes



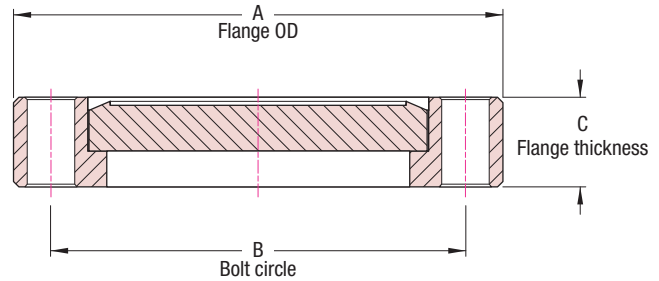
200130 / CF Flange
Clearance Holes



200026 / CF Flange
Threaded Holes



200134 / CF Flange
Threaded Holes



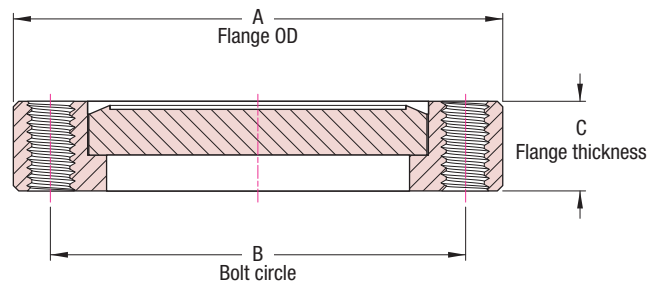
Rotatable¹ — Blank CF Flange / Clearance / 450°C / UHV to 1×10^{-10} Torr

Flange	A Flange OD	B Bolt Circle	Bolt Holes		C Flange Thickness	Model Number	Part Number
			Quantity	Diameter			

Clearance — Bolt Hole

133 CF	1.33	1.062	6	0.17	0.30	CF133-000-R	200018
275 CF	2.73	2.312	6	0.26	0.50	CF275-000-R	200080
450 CF	4.50	3.628	8	0.33	0.75	CF450-000-R	200130

1. Gaskets and mounting hardware see pages 230 and 231.



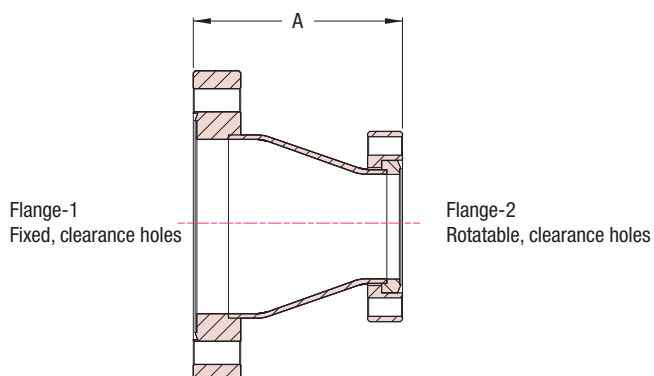
Rotatable¹ — Blank CF Flange / Threaded / 450°C / UHV to 1×10^{-10} Torr

Flange	A Flange OD	B Bolt Circle	Bolt Holes		C Flange Thickness	Model Number	Part Number
			Quantity	Thread			

Threaded — Bolt Hole

133 CF	1.33	1.062	6	8-32	0.30	CF133-000-RT	200026
275 CF	2.73	2.312	6	1/4-28	0.50	CF275-000-RT	200100
450 CF	4.50	3.628	8	5/16-24	0.75	CF450-000-RT	200134

1. Gaskets and mounting hardware see pages 230 and 231.



Conical Reducers¹ — CF Flange / 450°C / UHV to 1x10⁻¹⁰ Torr

CF Flange		Tube OD (ID)			Model Number	Part Number
Flange-1	Flange-2	Flange-1	Flange-2	A		

Clearance — Bolt Holes

275 CF	133 CF	1.50 (1.37)	0.75 (0.68)	3.18	CR275-133	200558
450 CF	275 CF	2.50 (2.37)	1.50 (1.37)	3.00	CR450-275	200561
600 CF	450 CF	4.00 (3.87)	2.50 (2.37)	4.40	CR600-450	200567
800 CF	600 CF	6.00 (5.76)	4.00 (3.87)	6.44	CR800-600	200569

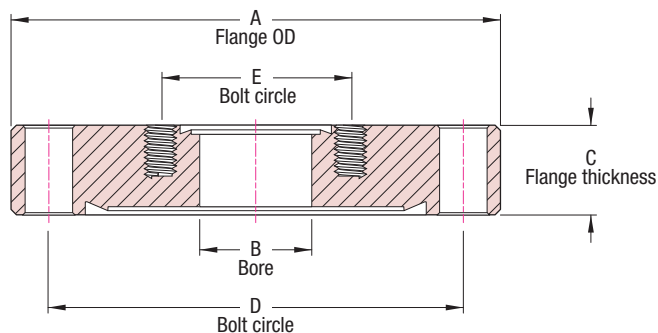
1. Gaskets and mounting hardware located on pages 230 and 231. Please call factory for larger flange sizes.



200558 / Conical Reducer
Clearance Holes



200561 / Conical Reducer
Clearance Holes



Zero Length Reducers¹ — CF Flange / 450°C / UHV to 1x10⁻¹⁰ Torr

CF Flange		Bore B	Thickness C	Threaded Holes Side	Large Bolt Circle D	Small Bolt Circle E	Model Number	Part Number
A-Large	E-Small							

Clearance / Threaded — Bolt Holes

275 CF	133 CF	0.62	0.500	E	2.312	1.062	CF275-133-063-ST	200301
450 CF	133 CF	0.62	0.687	E	3.628	1.062	CF450-133-075-ST	200307
450 CF	275 CF	1.50	0.687	E	3.628	2.312	CF450-275-150-ST	200309
600 CF	275 CF	1.50	0.781	E	5.128	2.312	CF600-275-150-ST	200317
600 CF	450 CF	2.50	0.781	E	5.128	3.628	CF600-450-250-ST	200319
600 CF	450 CF	2.50	0.781	A / E	5.128	3.628	CF600-450-250-BT	200320
1000 CF	800 CF	6.00	0.960	E	9.128	7.128	CF1000-800-600-ST	200347

1. Gaskets and mounting hardware located on pages 230 and 231. Note that reducer side blind threaded holes require shorter bolts. Please call factory for larger flange sizes.



200309 / Zero Length Reducer CF Flange
Clearance/Threaded



200320 / Zero Length Reducer CF Flange
Clearance/Threaded



200500 / Half Nipple
Clearance Holes



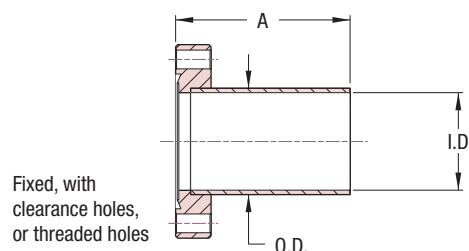
200509 / Half Nipple
Threaded Holes



200538 / Full Nipple
Clearance Holes



200542 / Full Nipple
Clearance Holes



Half Nipples¹ — CF Flange / 450°C / UHV to 1×10^{-10} Torr

Flange		Tube		A Length	Model Number	Part Number
Size	Dia.	OD	ID			

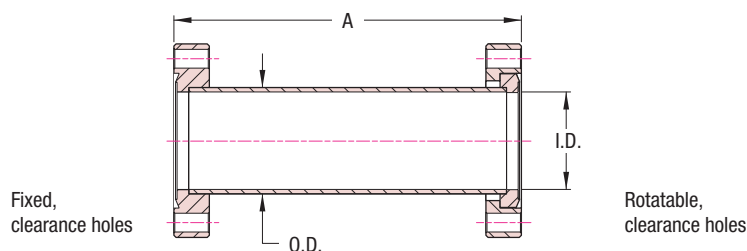
Clearance — Bolt Holes

133 CF	1.33	0.75	0.68	1.50	HN133-075-N	200500
212 CF	2.12	1.00	0.87	2.04	HN212-100-N	200504
275 CF	2.73	1.50	1.37	2.46	HN275-150-N	200508
450 CF	4.50	2.50	2.37	4.12	HN450-250-N	200516

Threaded — Bolt Holes

133 CF	1.33	0.75	0.68	1.50	HN133-075-NT	200501
212 CF	2.12	1.00	0.87	2.04	HN212-100-NT	200505
275 CF	2.73	1.50	1.37	2.46	HN275-150-NT	200509
450 CF	4.50	2.50	2.37	4.12	HN450-250-NT	200517

1. Gaskets and mounting hardware located on pages 230 and 231. Note that reducer side blind threaded holes require shorter bolts. Please call factory for larger flange sizes.



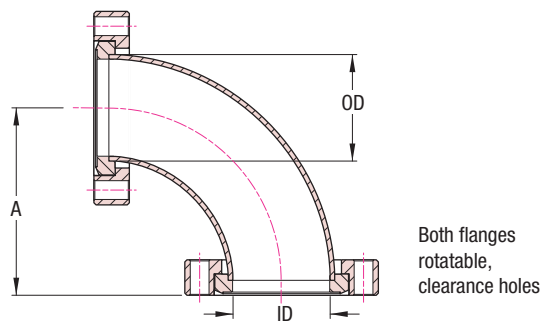
Full Nipples¹ — CF Flange / 450°C / UHV to 1×10^{-10} Torr

Flange		Tube		A Length	Model Number	Part Number
Size	Dia.	OD	ID			

Clearance — Bolt Holes

133 CF	1.33	0.75	0.68	3.00	FN133-075	200538
212 CF	2.12	1.00	0.87	4.08	FN212-100	200539
275 CF	2.73	1.50	1.37	4.93	FN275-150	200540
338 CF	3.38	2.00	1.87	6.45	FN338-200	200541
450 CF	4.50	2.50	2.37	8.25	FN450-250	200542

1. Gaskets and mounting hardware located on pages 230 and 231. Note that reducer side blind threaded holes require shorter bolts. Please call factory for larger flange sizes.



90° Radius Elbows¹ — CF Flange / 450°C / UHV to 1x10⁻¹⁰ Torr

Flange		Tube OD	ID	A Length	Model Number	Part Number
Size	Dia.					

Clearance — Bolt Holes

133 CF	1.33	0.75	0.68	1.6	RL90-133-075	200577
212 CF	2.12	1.00	0.87	1.7	RL90-212-100	200578
275 CF	2.73	1.50	1.37	2.5	RL90-275-150	200579
338 CF	3.38	2.00	1.87	3.2	RL90-338-200	200580
450 CF	4.50	2.50	2.37	4.1	RL90-450-250	200581

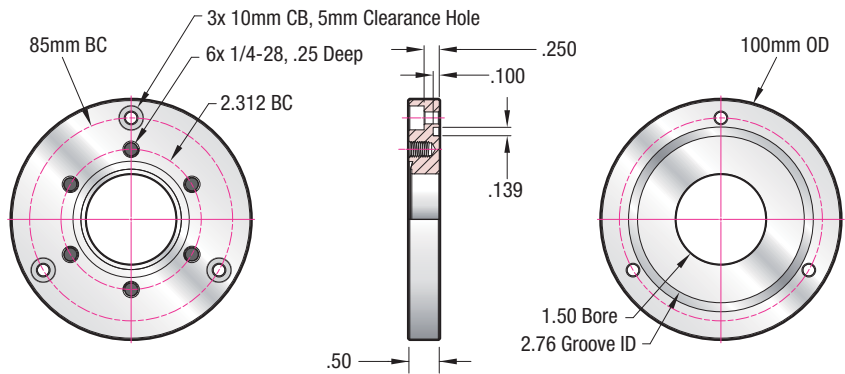
1. Please contact factory for larger sizes and threaded hole flanges. Gaskets and mounting hardware located on pages 230 and 231



200577 / 90° Elbow
Clearance Holes



200581 / 90° Elbow
Clearance Holes



Adapter Flange — CF 2.75 to FEI 100mm Flange / 450°C / UHV to 1x10⁻¹⁰ Torr

Flange Type Side-1	Flange Type Side-2	Model Number	Part Number
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Adapter Flange — 2.75 CF to FEI-100 / 6x Blind-Threaded Holes / 3x Clearance Holes

275 CF	FEI-100	FEI-275-ADT	200660
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200660 / CF Adapter Flange
2.75 CF — FEI Elastomer Seal



200606 / Tee
Clearance Holes



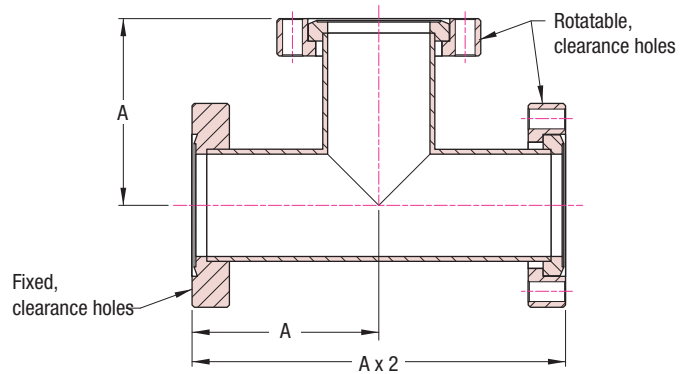
200608 / Tee
Clearance Holes



200618 / Reducer Tee
Clearance Holes



200623 / Reducer Tee
Clearance Holes



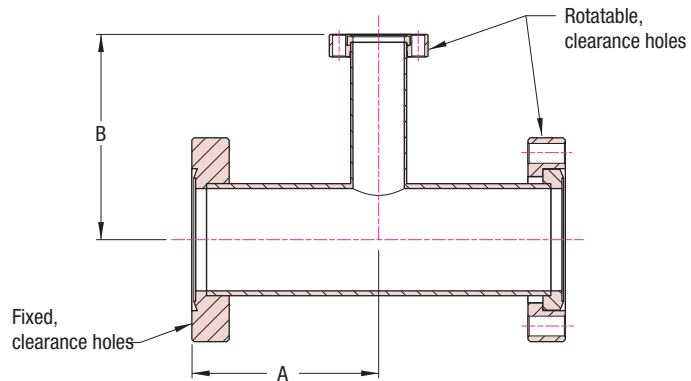
Tees¹ — CF Flange / 450°C / UHV to 1×10^{-10} Torr

Flange		Tube		A Length	Model Number	Part Number
Size	Dia.	OD	ID			

Clearance — Bolt Holes

133 CF	1.33	0.75	0.68	1.5	T133-075	200606
212 CF	2.12	1.00	0.87	2	T212-100	200607
275 CF	2.73	1.50	1.37	2.5	T275-150	200608
338 CF	3.38	2.00	1.87	3.2	T338-200	200609
450 CF	4.50	2.50	2.37	3.4	T450-250	200610

1. Gaskets and mounting hardware located on pages 230 and 231. Note that reducer side blind threaded holes require shorter bolts. Please call factory for larger flange sizes.



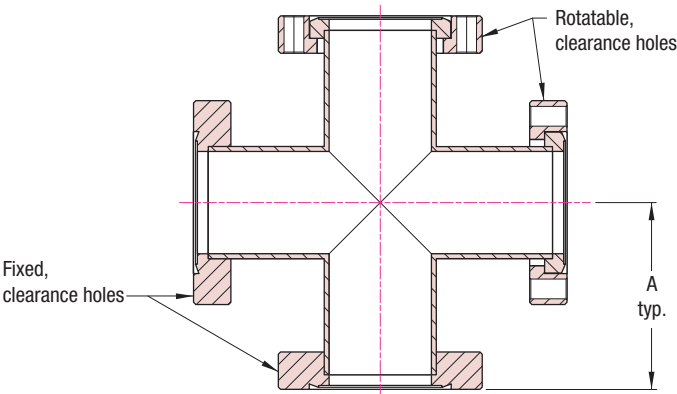
Reducer Tees¹ — CF Flange / 450°C / UHV to 1×10^{-10} Torr

Flange Size		Bolt Holes		A	B	Model Number	Part Number
#1	#2	#1	#2				

Clearance — Bolt Holes

275 CF	133 CF	1.50 (1.37)	0.75 (0.68)	2.5	2.75	RDT275-133	200618
450 CF	275 CF	2.50 (2.37)	1.50 (1.37)	3.4	2.50	RDT450-275	200623

1. Gaskets and mounting hardware located on pages 230 and 231. Please call factory for larger flange sizes.



4-Way Crosses¹ — CF Flange / 450°C / UHV to 1x10⁻¹⁰ Torr

Flange		Tube		A Length	Model Number	Part Number
Size	Dia.	OD	ID			
133 CF	1.33	0.75	0.68	1.5	X4-133-075	200654
275 CF	2.73	1.50	1.37	2.5	X4-275-150	200655
450 CF	4.50	2.50	2.37	3.4	X4-450-250	200658

Clearance — Bolt Holes

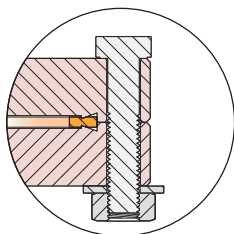
1. Gaskets and mounting hardware located on pages 230 and 231. Please contact factory for prices and lead time on larger 4-way crosses as well as 5- and 6-way crosses and cubes..



200654 / 4-way Cross
Clearance Holes



200658 / 4-way Cross
Clearance Holes



200850 / Copper Gasket



Copper Gaskets¹ — CF Flange / 450°C / UHV to 1x10⁻¹⁰ Torr

CF Flange	Gasket ID	Gasket OD	Package Quantity	Model Number	Part Number
Copper Gaskets					
133 CF	0.64	0.84	10	CG-064-133	200730
212 CF	1.00	1.29	10	CG-100-212	200740
275 CF	1.53 ²	1.90	10	CG-153-275	200761
275 CF	1.45	1.90	10	CG-145-275	200760
338 CF	2.01	2.43	10	CG-201-338	200780
450 CF	2.51	3.24	10	CG-251-450	200810
450 CF	2.80 ²	3.24	10	CG-280-450	200820
462 CF	3.01	3.60	10	CG-301-462	200830
600 CF	4.01	4.74	10	CG-401-600	200850
600 CF	4.12 ²	4.74	10	CG-4125-600	200851
675 CF	5.01	5.57	10	CG-501-675	200870
800 CF	6.01	6.74	10	CG-601-800	200880
1000 CF	8.00	8.74	10	CG-800-1000	200900
1200 CF	10.00	10.74	10	CG-1000-1200	200920
1200 CF	10.00	10.74	1	CG-1000-1200-1	200921
1325 CF	10.87	11.56	10	CG-1087-1325	200910
1325 CF	10.87	11.56	1	CG-1087-1325-1	200911
1400 CF	11.56	12.33	10	CG-1156-1400	200930
1400 CF	11.56	12.33	1	CG-1156-1400-1	200931
1650 CF	14.11	14.82	10	CG-1411-1650	200940
1650 CF	14.11	14.82	1	CG-1411-1650-1	200941

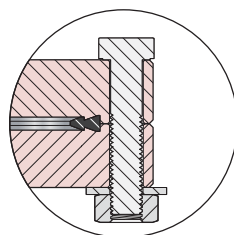
1. Call factory for larger size gaskets. 2. Recommended for flanges with multiple feedthroughs



Viton® Gaskets¹ — CF Flange / 150°C / HV to 1x10⁻⁸ Torr

CF Flange	Gasket ID	Gasket OD	Thickness	Package Quantity	Model Number	Part Number
Viton® Gaskets						
133 CF	0.62	0.84	0.08	5	VG-062-133	200731
212 CF	1.02	1.29	0.12	5	VG-102-212	200741
275 CF	1.68	1.90	0.12	5	VG-168-275	200763
338 CF	2.19	2.43	0.12	1	VG-219-338	200782
450 CF	3.02	3.24	0.12	1	VG-302-450	200812
462 CF	3.36	3.60	0.12	1	VG-336-462	200832
600 CF	4.51	4.74	0.12	1	VG-451-600	200852

1. Call factory for larger size gaskets.



200763 / Viton® Gasket



CF Gasket Clip Set — 2x Clips Included in Set

Accu-Glass stainless steel gasket clip set is a simple and convenient way of supporting 2.75 CF gaskets in place during difficult or unusual Conflat® CF flange installations. Ideal for vertical or inverted installations, and when working against gravity.

Gasket Clips — CF Flange / 20°C / Air Service

CF Flange	Description	Model Number	Part Number
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Gasket Clips — Gasket Installation Tool

275 CF	Set includes 2x Stainless Steel Clips	GC-275-2	113290
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113290 / Gasket Clips for use with 2.75 CF Flange

CF Fastener Kits — Includes Bolts, Nuts, and Washers

CF Fastener Kits are supplied with 18-8 stainless steel hardware to closely match the linear expansion of standard CF flanges. Listed bolt lengths are for clearance hole CF flanges only.

Caution: Threaded bolt hole flanges require shorter bolt lengths. A small amount of anti-seize lubricant should be applied before assembly.

Kits include bolts, nuts and washers. With exception of 1.33 CF kits, all bolts have hexagonal heads, 133 CF bolts have socket cap heads. Each package includes enough hardware to mount the number of flanges listed in the table below.

Fastener Kits¹ — CF Flange / 450°C / UHV to 1x10⁻¹⁰ Torr

CF Flange	Bolt / Nut Threads	Bolt Length	Package Quantity Each	Mounts number of flanges	Model Number	Part Number
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Clearance — Hole CF Flanges / Kit includes bolts, nuts and washers

133 CF ²	8-32	0.75	24	4	CFH-133	200735
212 CF	1/4-28	1.25	16	4	CFH-212	200742
275 CF	1/4-28	1.25	24	4	CFH-275	200764
338 CF	5/16-24	1.75	32	4	CFH-338	200783
450 CF	5/16-24	2.00	32	4	CFH-450	200813
462 CF ³	5/16-24	2.00	40	4	CFH-462	200833
600 CF ³	5/16-24	2.00	32	2	CFH-600	200853
675 CF	5/16-24	2.25	36	2	CFH-675	200873
800 CF	5/16-24	2.25	40	2	CFH-800	200883
1000 CF	5/16-24	2.50	48	2	CFH-1000	200903
1200 CF	5/16-24	3.00	32	1	CFH-1200	200923
1325 CF	3/8-24	3.00	30	1	CFH-1325	200933
1400 CF	3/8-24	3.00	30	1	CFH-1400	200943
1450 CF	3/8-24	3.00	32	1	CFH-1450	200953
1650 CF	3/8-24	3.00	36	1	CFH-1650	200963

1. Anti-seize thread lubricants or compounds are recommended when fastening stainless steel components. Silver-plated bolts are an ideal solution for in-vacuum use, while various paint-on thread lubricating solutions for air-service applications are commercially available. Contact factory for more information on thread lubricating solutions. 2. Supplied with socket head cap screws. 3. For rotatable clearance hole flanges of this size, use part number 200873, as they require slightly longer bolts, 2.25 inch length.



200735 / 133 CF Mounting Hardware



200813 / 450 CF Mounting Hardware



ISO Components

KF and LF Clamp Style Flanges and Fittings

Conical Reducer ISO Flanges

Blank ISO Flanges

Nipples, Elbows,
and Couplings

Centering Ring Assemblies
and Mounting Hardware

ISO KF
Clamp Style

ISO LF
Claw Style

Features

- 304 Stainless Steel
- HV Compatible to 1×10^{-8} Torr
- Bakeable to 200°C, 250°C intermittently

Specifications

Material

Flange	304 Stainless Steel
Centering Ring	304 Stainless Steel
O-Ring	Viton® elastomer
Clamps	Aluminum

Vacuum Range

HV, Ultrahigh vacuum	1×10^{-8} Torr
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Temperature Range¹

304 Stainless Steel	450°C
Elastomer Gasket	200°C
Intermittently up to	250°C

Notes

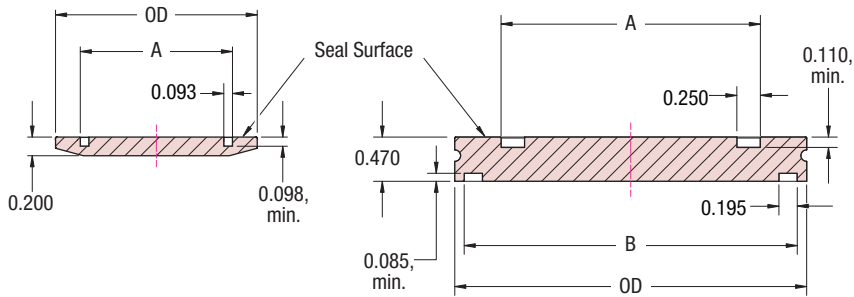
1. Overall assembly ratings must be adjusted to that of its lowest rated component.
2. Anti-seizing thread lubricants or compounds are recommended when fastening stainless steel components. Silver-plated bolts are an ideal solution for in-vacuum use, while various paint-on thread lubricating solutions for air-service applications are commercially available. Contact factory for more information on thread lubricating solutions.

§ Unless specified otherwise, dimensional units in all sections of this catalog are expressed in inches.

ISO Components

Accu-Glass Products' line of ISO KF and LF style blank flanges, fittings and hardware are designed to incorporate the industry standard "hinged or claw" clamp with centering ring sealing principle. This is the standard high vacuum sealing method used throughout the industrial and scientific vacuum communities.

Our range of products include numerous KF and LF flanged parts from conical reducers, nipples, elbows and couplings to all supporting mounting hardware including hinged clamps, claw clamps and centering rings.

**KF — Hinged Clamp Style****LF — Claw Clamp Style****ISO Flanges¹ — Blank / 150°C / HV to 1x10⁻⁸ Torr**

Flange Size	Flange OD	A	B	Clamping Method	Model Number	Part Number
KF Type — Blank Flange / Hinge Style Clamping						
NW16 KF	1.18	0.68	—	Hinged	K16-000	202000
NW25 KF	1.57	1.03	—	Hinged	K25-000	202020
NW40 KF	2.16	1.62	—	Hinged	K40-000	202030
NW50 KF	2.95	2.06	—	Hinged	K50-000	202040
LF Type — Blank Flange / Claw Style Clamping						
NW63 LF	3.74	2.76	3.54	Claw	L63-000-C	202050
NW80 LF	4.33	3.27	4.13	Claw	L80-000-C	202060
NW100 LF	5.12	4.02	4.92	Claw	L100-000-C	202070
NW160 LF	7.09	6.02	6.89	Claw	L160-000-C	202080
NW200 LF	9.45	8.39	9.25	Claw	L200-000-C	202090

1. Centering ring assemblies and mounting hardware located on pages 236 and 237.

**202000** / ISO KF Flange**202040** / ISO KF Flange**202050** / ISO LF Flange**202070** / ISO LF Flange



210500 / Conical Reducer



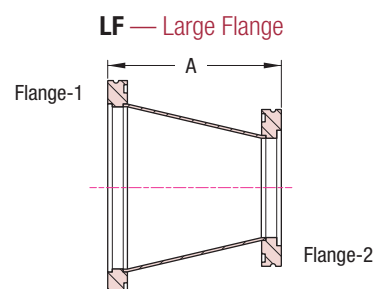
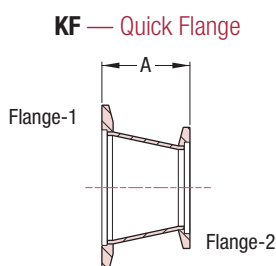
210502 / Conical Reducer



210600 / Half Nipple



210602 / Half Nipple



Conical Reducers¹ — ISO KF and LF Flanges / 150°C / HV to 1x10⁻⁸ Torr

ISO Flange		Tube OD		Length A	Model Number	Part Number
Flange-1	Flange-2	Flange-1	Flange-2			

KF to KF — Conical Reducers

NW40 KF	NW16	1.50 (1.37)	0.75 (0.68)	1.57	CR-K40-K16	210500
NW50 KF	NW40	2.00 (1.87)	1.50 (1.37)	1.57	CR-K50-K40	210501

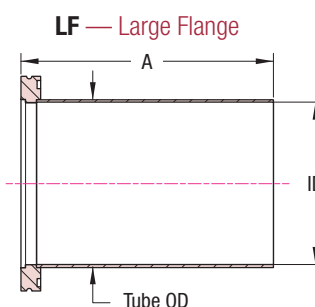
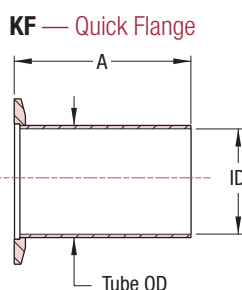
LF to KF — Conical Reducers

NW63 LF	NW40	2.50 (2.37)	1.50 (1.37)	2.83	CR-L63-K40	210502
NW63 LF	NW50	2.50 (2.37)	2.00 (1.87)	2.85	CR-L63-K50	210503

LF to LF — Conical Reducers

NW100 LF	NW63	4.00 (3.87)	2.50 (2.37)	4.14	CR-L100-L63	210504
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1. Centering ring assemblies and mounting hardware located on pages 236 and 237. Please call factory for larger flange sizes.



Half Nipple¹ — ISO KF and LF Flanges / 150°C / HV to 1x10⁻⁸ Torr

ISO Flange		Tube OD	ID	Length A	Model Number	Part Number
Size	Dia.					

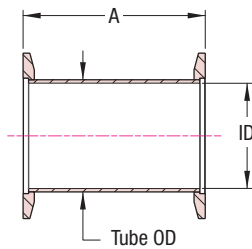
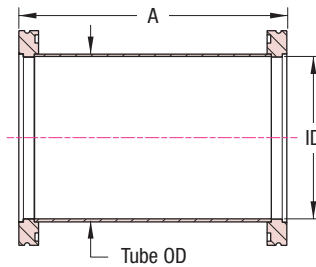
KF — Half Nipples

NW40 KF	2.16	1.50	1.37	2.40	HN-150-K40	210600
NW50 KF	2.95	2.00	1.87	3.15	HN-200-K50	210601

LF — Half Nipples

NW63 LF	3.74	2.50	2.37	3.25	HN-250-L63	210602
NW100 LF	5.12	4.00	3.87	3.94	HN-400-L100	210603
NW160 LF	7.09	6.00	5.76	3.94	HN-600-L160	210604

1. Centering ring assemblies and mounting hardware located on pages 236 and 237.

**KF — Quick Flange****LF — Large Flange**

Full Nipples¹ — ISO KF and LF Flanges / 150°C / HV to 1x10⁻⁸ Torr

Flange Size		Tube OD	ID	A Length	Model Number	Part Number
Size	Dia.					

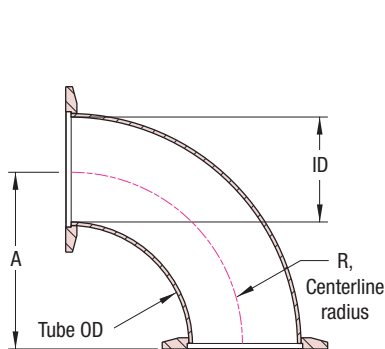
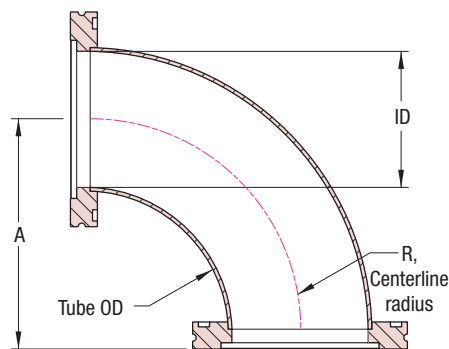
KF — Full Nipples

NW40 KF	2.16	1.50	1.37	4.80	FN-150-K40	210605
NW50 KF	2.95	2.00	1.87	6.30	FN-200-K50	210606

LF — Full Nipples

NW63 LF	3.74	2.50	2.37	6.50	FN-250-L63	210607
NW100 LF	5.12	4.00	3.87	8.26	FN-400-L100	210608

1. Centering ring assemblies and mounting hardware located on pages 236 and 237.

**210605** / Full Nipple**210607** / Full Nipple**KF — Quick Flange****LF — Large Flange**

90° Radius Elbows¹ — ISO KF and LF Flanges / 150°C / HV to 1x10⁻⁸ Torr

Flange Size		Tube OD	ID	A	R	Model Number	Part Number
Size	Dia.						

KF — 90° Radius Elbows

NW40 KF	2.16	1.50	1.37	2.40	2.25	RL90-K40	210609
NW50 KF	2.95	2.00	1.87	3.15	3.00	RL90-K50	210610

LF — 90° Radius Elbows

NW63 LF	3.74	2.50	2.37	4.00	3.75	RL90-L63	210611
NW100 LF	5.12	4.00	3.87	6.25	6.00	RL90-L100	210612

1. Centering ring assemblies and mounting hardware located on pages 236 and 237.

**210609** / 90° Elbow**210611** / 90° Elbow

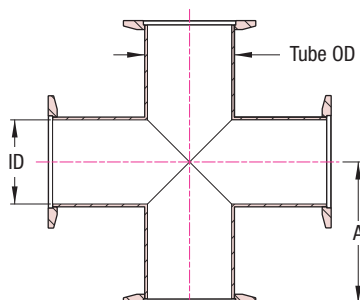


210613 / 4-Way Cross

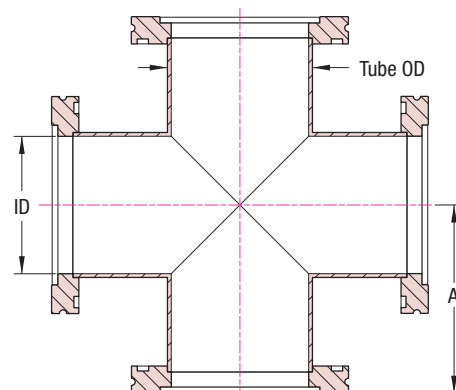


210615 / 4-Way Cross

KF — Quick Flange



LF — Large Flange



4-Way Crosses¹ — ISO KF and LF Flanges / 150°C / HV to 1x10⁻⁸ Torr

Flange Size		Tube OD	ID	A Length	Model Number	Part Number
Size	Dia.					

KF — 4-Way Crosses

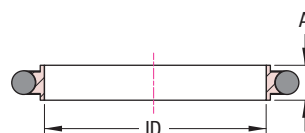
NW40 KF	2.16	1.50	1.37	2.40	X4-150-K40	210613
NW50 KF	2.95	2.00	1.87	3.15	X4-200-K50	210614

LF — 4-Way Crosses

NW63 LF	3.74	2.50	2.37	3.25	X4-250-L63	210615
NW100 LF	5.12	4.00	3.87	4.13	X4-400-L100	210616

1. Centering ring assemblies and mounting hardware located on pages 236 and 237.

KF / LF — Centering Rings



Centering Rings — ISO KF and LF Flanges / 150°C / HV to 1x10⁻⁸ Torr

Flange Model	Pkg Qty	Ring Material	O-Ring Material	ID	A	Model Number	Part Number
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KF — Centering Rings

NW16 KF	1	SS	Viton	0.63	0.315	CRV-SS-K16	202200
NW25 KF	1	SS	Viton	0.97	0.315	CRV-SS-K25	202210
NW40 KF	1	SS	Viton	1.55	0.315	CRV-SS-K40	202220
NW50 KF	1	SS	Viton	1.97	0.315	CRV-SS-K50	202230

LF — Centering Rings

NW63 LF	1	SS	Viton	2.61	0.327	CRV-SS-L63	202240
NW80 LF	1	SS	Viton	3.14	0.327	CRV-SS-L80	202251
NW100 LF	1	SS	Viton	3.86	0.327	CRV-SS-L100	202262
NW160 LF	1	SS	Viton	5.87	0.327	CRV-SS-L160	202273
NW200 LF	1	SS	Viton	8.23	0.327	CRV-SS-L200	202284



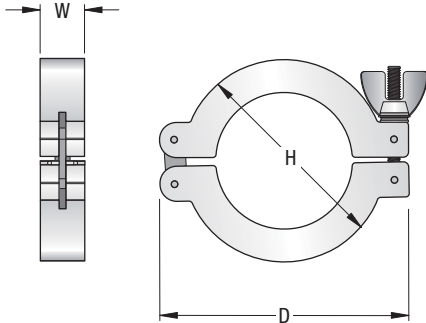
202200 / ISO KF Centering Ring Assembly



202240 / ISO LF Centering Ring Assembly

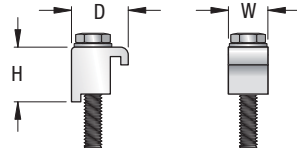


ISO KF — Hinged Clamp



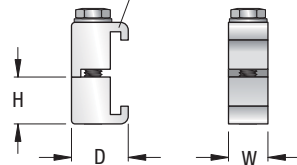
Stainless steel bolts and washers, all styles

ISO LF — Clamp, Single Claw



ISO LF — Clamp, Double Claw

Same as Single Claw



202225 / ISO KF Hinged Clamp

ISO Clamps — Mounting Hardware / 150°C / HV to 1x10⁻⁸ Torr

ISO Flange	Bolt Size	Pkg Qty	W x D x H ¹	Model Number	Part Number
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Hinged — Clamp / Aluminum / for use with ISO KF 'Quick Flange'

NW16 KF	Captive	1	0.75 x 2.47 x 1.63	HC-AL-K16	202205
NW25 KF	Captive	1	0.75 x 2.85 x 2.06	HC-AL-K25	202215
NW40 KF	Captive	1	0.75 x 3.53 x 2.70	HC-AL-K40	202225
NW50 KF	Captive	1	0.80 x 4.45 x 3.60	HC-AL-K50	202235

Single Claw — Clamp / Aluminum / for use with ISO LF 'Large Flange'

NW63 LF					
NW80 LF	M8 x 35	1	0.65 x 0.95 x 0.94	LF-SCC-1	210553
NW100 LF					
NW160 LF					
NW200 LF	M10 x 35	1	0.75 x 1.10 x 0.94	LF-SCC-2	210554
NW250 LF					
NW320 LF					
NW400LF	M12 x 50	1	0.90 x 1.33 x 1.18	LF-SCC-3	210555
NW500 LF					

Double Claw — Clamp / Aluminum / for use with ISO LF 'Large Flange'

NW63 LF					
NW80 LF	M8 x 45	1	0.65 x 0.95 x 0.80	LF-DCC-1	210550
NW100 LF					
NW160 LF					
NW200 LF	M10 x 45	1	0.75 x 1.10 x 0.80	LF-DCC-2	210551
NW250 LF					
NW320 LF					
NW400LF	M12 x 55	1	0.90 x 1.33 x 1.00	LF-DCC-3	210552
NW500 LF					

1. Dimensions are for reference only, actual dimensions may vary slightly.



210553 / ISO LF Single Claw Clamp



210550 / ISO LF Double Claw Clamp



Fitting to Flange Adapters

Swagelok®, VCR®, Ultra-Torr®, NPT and more...

Swagelok® Compression Fitting to CF Flange

Male VCR® Metal Gasket Sealed Fittings to CF Flange

Female VCR® to CF Flange Metal Gasket Sealed Fittings

Female NPT to CF Flange

Ultra-Torr® Quick Disconnect Fitting to CF Flange

Fitting to Flange Adapters

Accu-Glass Products' line of Fitting-to-Flange Adapters provide a simple and economical means of mating between dissimilar flange/fitting interfaces.

For UHV and high vacuum applications, we offer both Conflat® compatible CF and ISO NW KF/LF flanges that are fitted with industry standard fittings including Swagelok® and VCR® metal-to-metal tube fittings (both male and female for VCR® fittings).

For high vacuum applications, Ultra-Torr® quick disconnect tube fittings, male and female NPT pipe threads, and various rubber hose fittings are also available. Custom solution inquiries are always welcome, just contact one of our sales engineers with your detailed requirements.

Features

- Swagelok® Fittings
- VCR® Fittings
- Ultra-Torr® Fittings
- NPT Pipe Thread Fittings
- Hose Fittings
- Baseplate Fittings
- 304 / 316 Stainless Steel
- UHV Compatible to 1×10^{-13} Torr
- Bakeable to 450°C

Specifications

Vacuum Range

UHV, Ultrahigh Vacuum	1×10^{-13} Torr
HV, High Vacuum	1×10^{-8} Torr

Temperature Range^{1,2}

304, 316 Stainless Steel	450°C
Metal Seals	450°C
Elastomer Seals	200°C

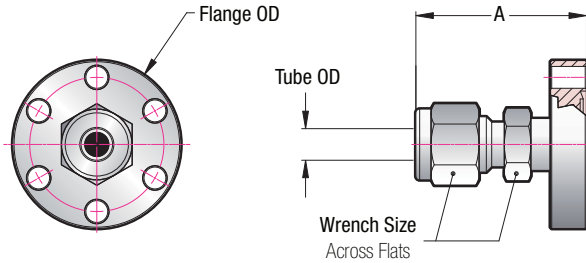
Notes

1. Overall assembly ratings must be adjusted to that of its lowest rated component.
 2. Anti-seizing thread lubricants or compounds are recommended when fastening stainless steel components. Silver-plated bolts are an ideal solution for in-vacuum use, while various paint-on thread lubricating solutions for air-service applications are commercially available. Contact factory for more information on thread lubricating solutions.
- § Unless specified otherwise, dimensional units in all sections of this catalog are expressed in inches.



Swagelok® — Swaged Metal Seal Compression Fitting

Type 304 Flange, and 316 Swagelok® compression fitting stainless steel materials.



CF Flange Adapter — 450°C / UHV to 1x10⁻¹⁰ Torr

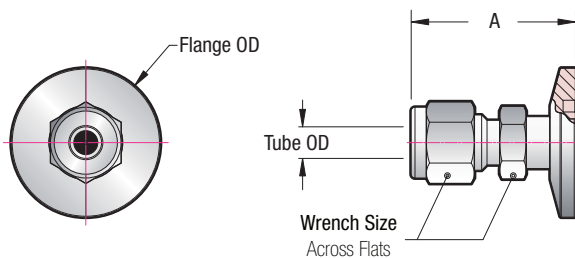
Fitting Size	Tube OD	Flange Type	Flange OD	A Nominal Length	Wrench Size	Model Number	Part Number
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Swagelok® — Compression Fitting

1/4	0.250	1.33 CF	1.33	1.38	.56 / .50	SWG1/4-133	210800
1/4	0.250	2.75 CF	2.73	1.51	.56 / .50	SWG1/4-275	210801
1/2	0.500	1.33 CF	1.33	1.68	.87 / .62	SWG1/2-133	210802
1/2	0.500	2.75 CF	2.73	1.68	.87 / .87	SWG1/2-275	210803
3/4	0.750	2.75 CF	2.73	1.77	1.12 / 1.06	SWG3/4-275	210804
1	1.000	2.75 CF	2.73	2.13	1.50 / 1.37	SWG1-275	210805



210800 / 1/4 Inch Tube
Swagelok® Fitting to 1.33 CF Flange



ISO KF Flange Adapter — 150°C / HV to 1x10⁻⁸ Torr

Fitting Size	Tube OD	Flange Type	Flange OD	A Nominal Length	Wrench Size	Model Number	Part Number
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Swagelok® — Compression Fitting

1/4	0.250	NW16 KF	1.18	1.43	.56 / .50	SWG1/4-K16	210806
1/4	0.250	NW40 KF	2.16	1.33	.56 / .50	SWG1/4-K40	210807
1/4	0.250	NW50 KF	2.95	1.33	.56 / .50	SWG1/4-K50	210808
1/2	0.500	NW40 KF	2.16	1.63	.87 / .87	SWG1/2-K40	210809
1/2	0.500	NW50 KF	2.95	1.63	.87 / .87	SWG1/2-K50	210810
3/4	0.750	NW40 KF	2.16	1.72	1.12 / 1.06	SWG3/4-K40	210811
3/4	0.750	NW50 KF	2.95	1.72	1.12 / 1.06	SWG3/4-K50	210812
1	1.000	NW40 KF	2.16	2.08	1.50 / 1.37	SWG1-K40	210813
1	1.000	NW50 KF	2.95	2.08	1.50 / 1.37	SWG1-K50	210814



210806 / 1/4 Inch Tube
Swagelok® Fitting to ISO NW16 KF Flange

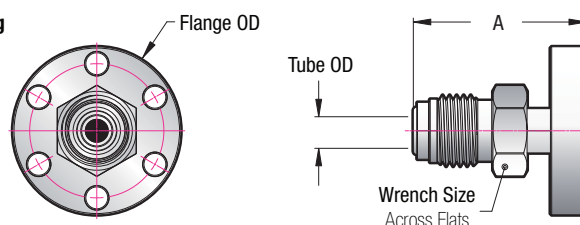


210815 / 1/4 Inch Tube
Male VCR® Fitting to 1.33 CF Flange

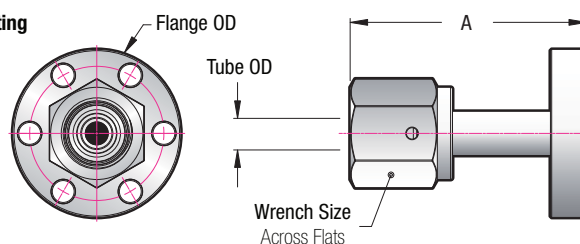
VCR® — Metal Gasket Seal Fitting

Type 304 Flange, and 316 VCR® metal gasket seal fitting stainless steel materials.

Male Fitting



Female Fitting



210817 / 1/2 Inch Tube
Male VCR® Fitting to 1.33 CF Flange

CF Flange Adapter — 450°C / UHV to 1x10⁻¹⁰ Torr

Fitting Size	Tube OD	Flange Type	Flange OD	A Nominal Length	Wrench Size	Model Number	Part Number
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VCR® — Male Fitting

1/4	0.250	1.33 CF	1.33	1.37	.62	VCRM1/4-133	210815
1/4	0.250	2.75 CF	2.73	1.50	.62	VCRM1/4-275	210816
1/2	0.500	1.33 CF	1.33	1.56	1.08	VCRM1/2-133	210817
1/2	0.500	2.75 CF	2.73	1.56	1.08	VCRM1/2-275	210818
3/4	0.750	2.75 CF	2.73	2.06	1.31	VCRM3/4-275	210819
1	1.000	2.75 CF	2.73	2.28	1.62	VCRM1-275	210820

VCR® — Female Fitting

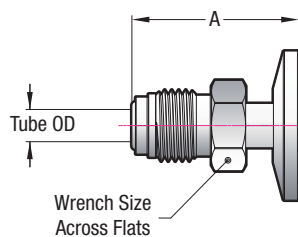
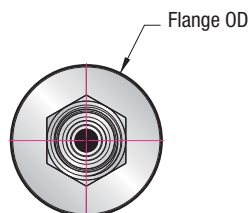
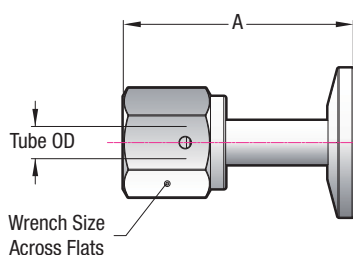
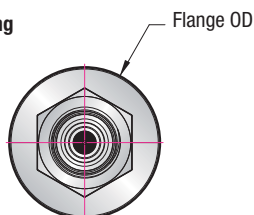
1/4	0.250	1.33 CF	1.33	1.87	.75	VCRF1/4-133	211091
1/4	0.250	2.75 CF	2.73	2.00	.75	VCRF1/4-275	211092
1/2	0.500	1.33 CF	1.33	2.13	1.06	VCRF1/2-133	211093
1/2	0.500	2.75 CF	2.73	2.13	1.06	VCRF1/2-275	211094
3/4	0.750	2.75 CF	2.73	2.81	1.50	VCRF3/4-275	211095
1	1.000	2.75 CF	2.73	3.20	1.75	VCRF1-275	211096



211091 / 1/4 Inch Tube
Female VCR® Fitting to 1.33 CF Flange

**VCR® — Metal Gasket Seal Fitting**

Type 304 Flange, and 316 VCR® metal gasket seal fitting stainless steel materials.

Male Fitting**Female Fitting**

210821 / 1/4 Inch Tube
Male VCR® Fitting to ISO NW16 KF Flange

ISO KF Flange Adapter — 150°C / HV to 1x10⁻⁸ Torr

Fitting Size	Tube OD	Flange Type	Flange OD	A Nominal Length	Wrench Size	Model Number	Part Number
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VCR® — Male Fitting

1/4	0.250	NW16 KF	1.18	1.32	.62	VCRM1/4-K16	210821
1/4	0.250	NW40 KF	2.16	1.32	.62	VCRM1/4-K40	210822
1/4	0.250	NW50 KF	2.95	1.32	.62	VCRM1/4-K50	210823
1/2	0.500	NW40 KF	2.16	1.51	.94	VCRM1/2-K40	210824
1/2	0.500	NW50 KF	2.95	1.51	.94	VCRM1/2-K50	210825
3/4	0.750	NW40 KF	2.16	2.01	1.31	VCRM3/4-K40	210826
3/4	0.750	NW50 KF	2.95	2.01	1.31	VCRM3/4-K50	210827
1	1.000	NW40 KF	2.16	2.23	1.62	VCRM1-K40	210828
1	1.000	NW50 KF	2.95	2.23	1.62	VCRM1-K50	210829

VCR® — Female Fitting

1/4	0.250	NW16 KF	1.18	1.82	.75	VCRF1/4-K16	210855
1/4	0.250	NW40 KF	2.16	1.82	.75	VCRF1/4-K40	210857
1/4	0.250	NW50 KF	2.95	1.82	.75	VCRF1/4-K50	210858
1/2	0.500	NW40 KF	2.16	2.08	1.06	VCRF1/2-K40	210861
1/2	0.500	NW50 KF	2.95	2.08	1.06	VCRF1/2-K50	210862
3/4	0.750	NW40 KF	2.16	2.76	1.50	VCRF3/4-K40	210864
3/4	0.750	NW50 KF	2.95	2.76	1.50	VCRF3/4-K50	210865
1	1.000	NW40 KF	2.16	3.15	1.75	VCRF1-K40	210867
1	1.000	NW50 KF	2.95	3.15	1.75	VCRF1-K50	210868



210855 / 1/4 Inch Tube
Shown With Nut Resting on Flange

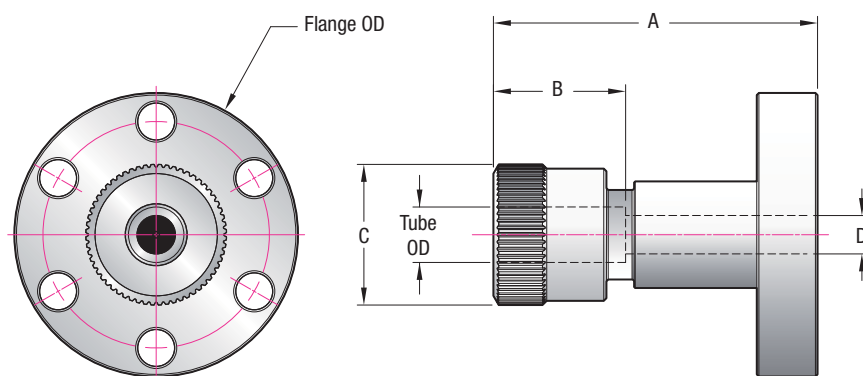


210855 / 1/4 Inch Tube
Female VCR® Fitting to ISO NW16 KF Flange



Ultra-Torr® — Quick Disconnect Fitting

Type 304 Flange, and 316 Ultra-Torr® fitting stainless steel materials.



210833 / 1/4 Inch Tube
Ultra Torr® Fitting to 1.33 CF Flange

CF Flange Adapter — 150°C / HV to 1x10⁻⁸ Torr

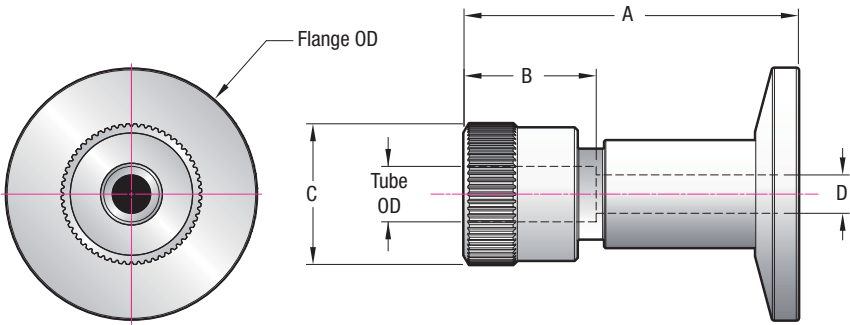
Tube Size	Flange Type	Flange OD	A Nominal Length	B	C	D	Model Number	Part Number
1/4	1.33 CF	1.33	1.53	.62	.69	.18	QD1/4-133	210833
1/4	2.75 CF	2.73	1.66	.62	.69	.18	QD1/4-275	210841
3/8	1.33 CF	1.33	1.64	.66	.81	.28	QD3/8-133	210835
3/8	2.75 CF	2.73	1.77	.66	.81	.28	QD3/8-275	210843
1/2	1.33 CF	1.33	1.80	.80	.94	.40	QD1/2-133	210836
1/2	2.75 CF	2.73	1.75	.80	.94	.40	QD1/2-275	210844
3/4	2.75 CF	2.73	1.84	.94	1.25	.62	QD3/4-275	210846
1	2.75 CF	2.73	1.86	.94	1.56	.87	QD1-275	210848

Ultra-Torr® — Quick Disconnect Fitting



Ultra-Torr® — Quick Disconnect Fitting

Type 304 Flange, and 316 Ultra-Torr® fitting stainless steel materials.



ISO KF Flange Adapter — 150°C / UHV to 1x10⁻⁸ Torr

Tube Size	Flange Type	Flange OD	A Nominal Length	B	C	D	Model Number	Part Number
1/4	NW16 KF	1.18	1.58	.62	.69	.18	QD1/4-K16	210903
1/4	NW40 KF	2.16	1.48	.62	.69	.18	QD1/4-K40	210911
1/4	NW50 KF	2.95	1.48	.62	.69	.18	QD1/4-K50	210926
3/8	NW16 KF	1.18	1.69	.66	.81	.28	QD3/8-K16	210905
3/8	NW40 KF	2.16	1.59	.66	.81	.28	QD3/8-K40	210913
3/8	NW50 KF	2.95	1.59	.66	.81	.28	QD3/8-K50	210928
1/2	NW16 KF	1.18	1.80	.80	.94	.40	QD1/2-K16	210906
1/2	NW40 KF	2.16	1.70	.80	.94	.40	QD1/2-K40	210914
1/2	NW50 KF	2.95	1.70	.80	.94	.40	QD1/2-K50	210929
3/4	NW40 KF	2.16	1.79	.94	1.25	.62	QD3/4-K40	210916
3/4	NW50 KF	2.95	1.79	.94	1.25	.62	QD3/4-K50	210931
1	NW40 KF	2.16	1.81	.94	1.56	.87	QD1-K40	210918
1	NW50 KF	2.95	1.81	.94	1.56	.87	QD1-K50	210933

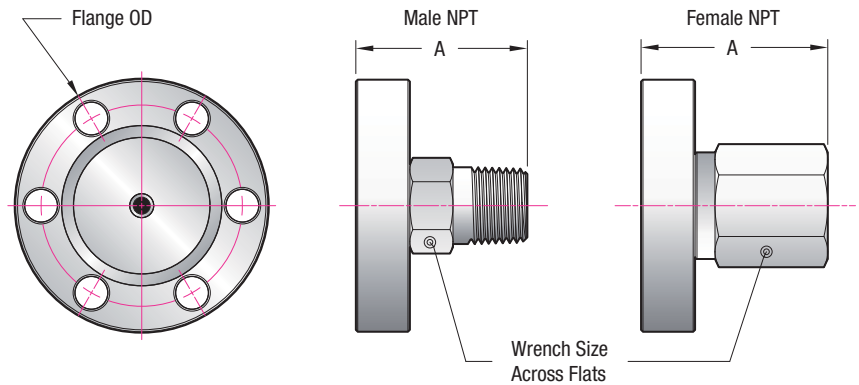


210903 / 1/4 Inch Tube
Ultra Torr® Fitting to ISO NW16 KF Flange



NPT — Tapered Pipe Thread Fitting

Type 304 Flange, and 316 NPT fitting stainless steel materials.



CF Flange Adapter — 150°C / HV to 1x10⁻⁸ Torr

Fitting Size	Flange Type	Flange OD	A Nominal Length	Wrench Size	Model Number	Part Number
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NPT — Male Pipe Thread Fitting

1/4	1.33 CF	1.33	1.11	.56	NPTM1/4-133	210942
1/4	2.75 CF	2.73	1.32	.56	NPTM1/4-275	210943
1/2	2.75 CF	2.73	1.54	.87	NPTM1/2-275	210944
3/4	2.75 CF	2.73	1.54	1.06	NPTM3/4-275	210945
1	2.75 CF	2.73	1.80	1.37	NPTM1-275	210946

NPT — Female Pipe Thread Fitting

1/4	1.33 CF	1.33	1.11	.75	NPTF1/4-133	210962
1/4	2.75 CF	2.73	1.32	.75	NPTF1/4-275	210963
1/2	2.75 CF	2.73	1.59	1.06	NPTF1/2-275	210964
3/4	2.75 CF	2.73	1.64	1.31	NPTF3/4-275	210965
1	2.75 CF	2.73	1.73	1.62	NPTF1-275	210966



210942 / 1/4 Inch
Male NPT Fitting to 1.33 CF Flange

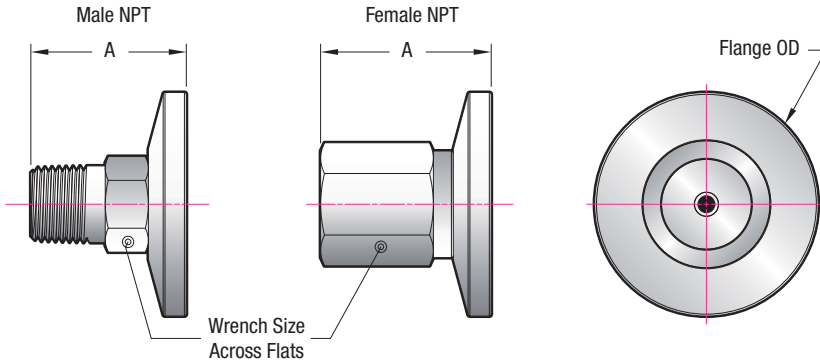


210962 / 1/4 Inch
Female NPT Fitting to 1.33 CF Flange



NPT — Tapered Pipe Thread Fitting

Type 304 Flange, and 316 NPT fitting stainless steel materials.



ISO KF Flange Adapter — 150°C / HV to 1x10⁻⁸ Torr

Fitting Size	Flange Type	Flange OD	A Nominal Length	Wrench Size	Model Number	Part Number
1/4	NW16 KF	1.18	1.02	.56	NPTM1/4-K16	210950
1/4	NW40 KF	2.16	1.02	.56	NPTM1/4-K40	210951
1/4	NW50 KF	2.95	1.02	.56	NPTM1/4-K50	210952
1/2	NW40 KF	2.16	1.24	.87	NPTM1/2-K40	210953
1/2	NW50 KF	2.95	1.24	.87	NPTM1/2-K50	210954
3/4	NW40 KF	2.16	1.24	1.06	NPTM3/4-K40	210955
3/4	NW50 KF	2.95	1.24	1.06	NPTM3/4-K50	210956
1	NW40 KF	2.16	1.50	1.37	NPTM1-K40	210957
1	NW50 KF	2.95	1.50	1.37	NPTM1-K50	210958

NPT — Female Pipe Thread Fitting

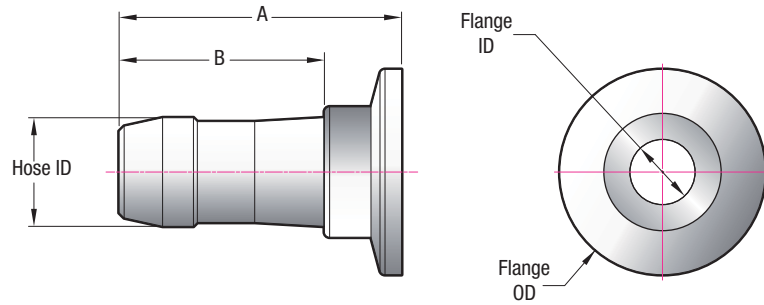
1/4	NW16 KF	1.18	1.02	.75	NPTF1/4-K16	210973
1/4	NW40 KF	2.16	1.02	.75	NPTF1/4-K40	210974
1/4	NW50 KF	2.95	1.02	.75	NPTF1/4-K50	210975
1/2	NW40 KF	2.16	1.22	1.06	NPTF1/2-K40	210976
1/2	NW50 KF	2.95	1.22	1.06	NPTF1/2-K50	210977
3/4	NW40 KF	2.16	1.34	1.31	NPTF3/4-K40	210978
3/4	NW50 KF	2.95	1.34	1.31	NPTF3/4-K50	210979
1	NW40 KF	2.16	1.43	1.62	NPTF1-K40	210980
1	NW50 KF	2.95	1.43	1.62	NPTF1-K50	210981



210950 / 1/4 Inch
Male NPT Fitting to NW16 KF Flange



210973 / 1/4 Inch
Female NPT Fitting to NW16 KF Flange



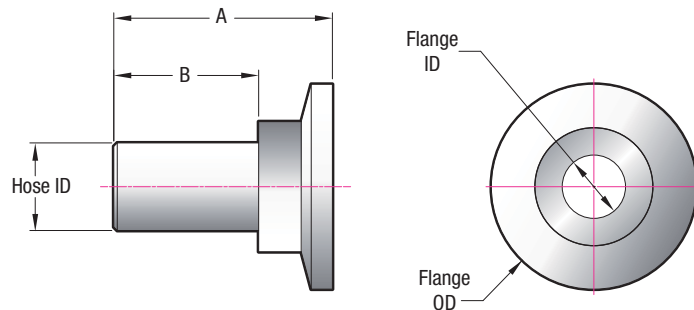
211100 / 1/2 or 5/8 Inch
Rubber Hose to NW16 KF Flange

ISO KF Flange Adapter — 150°C / UHV to 1x10⁻⁸ Torr

Hose ID		Flange Type	Flange OD	Flange ID	A Nominal Length	B	Model Number	Part Number
Min.	Max.							

Rubber Hose — Requires Hose Clamp

.50 - .63	NW16 KF	1.18	.38	1.65	1.18	RH63-K16	211100
.63 - .75	NW16 KF	1.18	.60	1.65	1.18	RH75-K16	211101
1.50 - 1.63	NW40 KF	2.16	1.36	2.17	1.72	RH1.63-K40	211103
1.50 - 1.63	NW50 KF	2.95	1.36	2.17	1.63	RH1.63-K50	211104



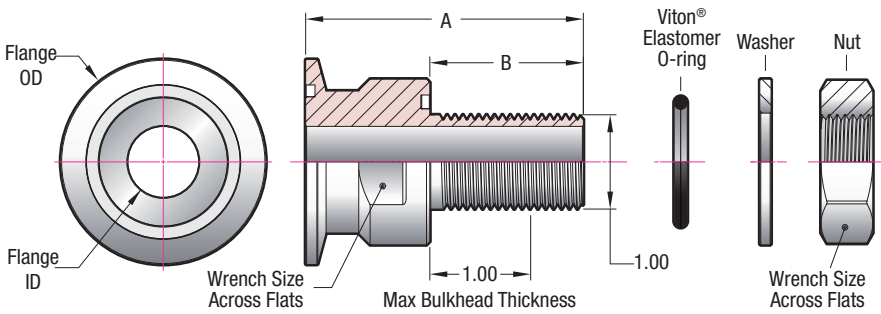
211110 / 1/2 inch PVC Hose
to NW16KF Flange

ISO KF Flange Adapter — 150°C / UHV to 1x10⁻⁸ Torr

Hose Size	Flange Type	Flange OD	Flange ID	Hose ID	A Nominal Length	B	Model Number	Part Number
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PVC Hose — Requires Hose Clamp

1/2	NW16 KF	1.18	.37	0.50	1.26	.84	PVC1/2-K16	211110
3/4	NW16 KF	1.18	.62	0.75	1.26	.84	PVC3/4-K16	211111
1-1/2	NW40 KF	2.16	1.37	1.50	2.00	1.58	PVC1-1/2-K40	211113
2	NW50 KF	2.95	1.87	2.00	2.00	1.58	PVC2-K50	211114



ISO KF Flange Adapter — 150°C / UHV to 1×10^{-8} Torr

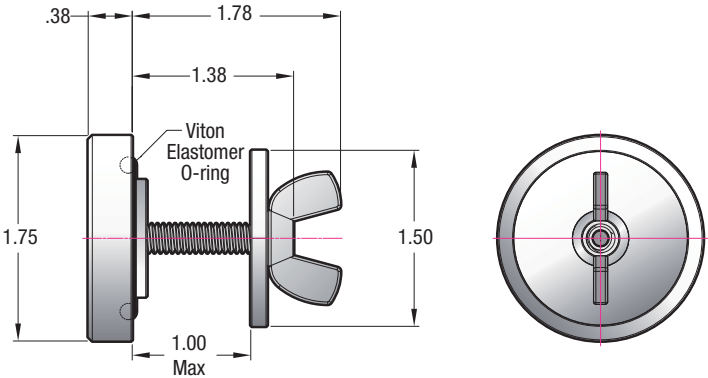
Flange Type	Flange OD	Flange ID	A	B	Wrench Size	Model Number	Part Number
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Baseplate — for 1 Inch Hole

NW40 KF	2.16	0.75	2.93	1.62	1.50	BPF-K40	211120
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211120 / Baseplate to NW40 KF Flange



Baseplate Plug — 150°C / HV to 1×10^{-8} Torr

Description	Model Number	Part Number
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Blank Plug — for 1 Inch Hole

Stainless Steel Blank Plug	BPP	211125
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211125 / Baseplate Plug