Section 1

Flanges and Fittings

CF Flanges

General information – 316LN steel type and quality

Description

Steel is cast into ingots in the conventional way (airmelted). Individual ingots are then remelted in an EFR unit as shown in the diagram. This significantly increases the final steel quality attainable.

Rapid heat extraction by the controllable melt rate permits the elimination of the gross macro segregation and inhomogeniety inherent in all conventionally cast ingots and gives excellent uniformity of structure.

Strict control of remelting parameters allows a substantial reduction in total inclusion content. The EFR process virtually eliminates all harmful brittle oxide stringers (B types in ASTM E45 cleanness assessment) and any remaining oxides are small round 'D' types. Because the steel has had impurities removed and has a superior homogeniety, its mechanical properties are improved (e.g. ductility and impact resistance in the transverse direction) and are remarkably consistent.

The austenitic grade 316LN, which Caburn-MDC uses, has a nominally nil content of ferrite and very low magnetic permeability making it suitable for the most demanding UHV applications.

All Caburn-MDC 316LN Euro Conflat® CF series flanges are Electroflux refined.

316LN Stainless steel specifications

Electroflux refined solution treated

Chemical composition

Percentages	Cr	16 – 18.5
	Ni	12 – 14
	C	0.030 maximum
	Si	1 maximum
	Mn	2 maximum
	Mo	2 – 3
	N	0.14 – 0.20
	P	0.045 maximum
	S	0.015 maximum
	Co	0.22 maximum
	Fe	Balance

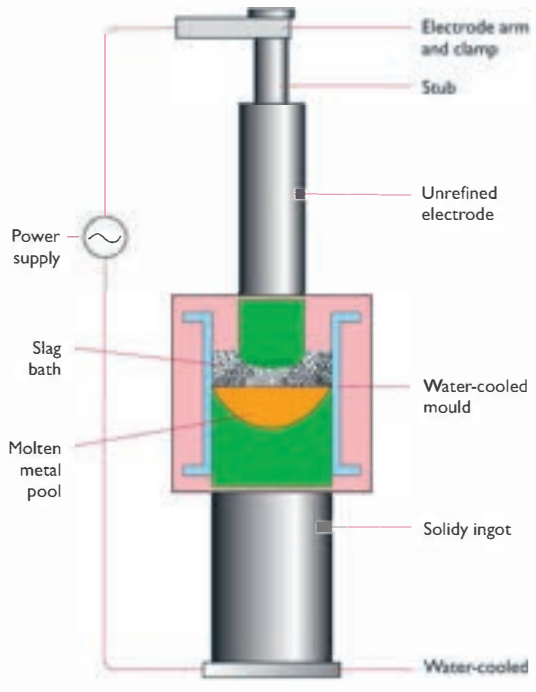
Mechanical properties

Tensile strength	600 N/mm² minimum
Yield stress	300 N/mm² minimum
Elongation	35% minimum
Brinell hardness	150/190

Inclusions

ASTM	E45 – 84 Method D
A, B and C	1 maximum
D	1.5 maximum
Magnetic permeability	1.005 maximum

Electroflux refined EFR



All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

General information

CF Flange and tube sizes

Standard series CF flanges are fully compatible with, and can be sealed to, Varian Conflat® (CF) types and similar flanges made by Balzers, VG and others. They are designed to accept standard 'inch outside diameter' stainless steel tubes which are detailed in the adjacent chart.

Caburn follows the widely used convention of categorising different sizes of UHV flange by using a 'DN' specification. 'DN' is the acronym of the French term 'Diamètre nominal' which translates as 'Nominal bore'. The bore referred to is that of the tube that fits inside the designated flange. The bore is 'nominal' because of the variation in tube wall thickness.

Euro CF series

Euro CF fittings use the 'oversize' tubes which allow greater internal diameters than conventional fittings.

Caburn-MDC reference for CF flanges

a bored flange is described as CF(X)-(Y) where

a blank flange is described as CFB(X)

a tapped flange has suffix 'T'

a spigotted flange has suffix -S

Rotatable flanges are described: CFR(X)-(Y)
CFBR(X)

316LN flanges are described: CFL

X outside diameter in mm

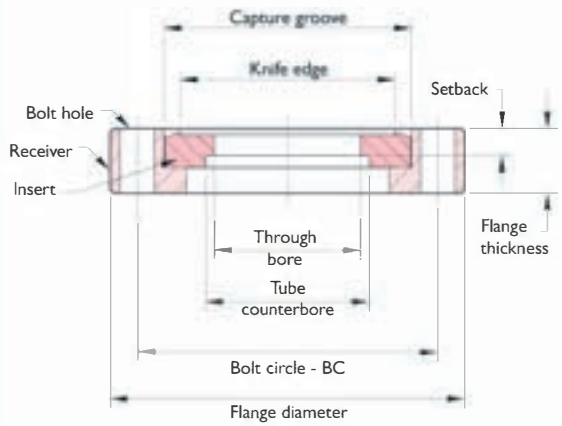
and

Y outside diameter of the matching tube in mm

DN nominal inside diameter of tube

CF Flange parts nomenclature

Rotatable flange example



Size ISO description	Outside diameter	Nominal ID	OD	Matching tube sizes Nominal bore
DN16CF	34 (1 1/3")	NW16CF	6.35 (1/4")	6
		9.52 (3/8")	8	
		18.0*	16	
		19.0 (3/4")	16	
Caburn-MDC Euro default size			**19.1**	**17.2**
DN40CF	70 (2 3/4")	NW38CF	25.4 (1")	22
		38.1 (1 1/2")	35	
		41.3 (1 5/8")	38	
		44.5 (1 3/4")	41.3	
Caburn-MDC Euro default size			**41.2**	**38.0**
DN63CF	114 (4 1/2")	NW63CF	50.8 (2")	50
		63.5 (2 1/2")	60	
		69.9 (2 3/4")	65	
Caburn-MDC Euro default size			**70.0**	**66.0**
DN100CF	152 (6")	NW100CF	101.6 (4")	97
		108.0 (4 1/4")	100	
Caburn-MDC Euro default size			**108.0**	**102.0**
DN160CF	203 (8")	NW150CF	152.4 (6")	146
		156*	150	
Caburn-MDC Euro default size			**156.0***	**150.0**
DN200CF	254 (10")	NW200CF	203.2 (8")	197
		209.5 (8 1/4")	203	
Caburn-MDC Euro default size			**209.5**	**203.0**
DN250CF	304 (12")	NW250CF	254.0 (10")	248.0
Caburn-MDC Euro default size			**254.0**	**248.0**

US Size large flanges

Size ISO description	Outside diameter	Nominal ID	OD	Matching tube sizes Nominal bore
N/A	336 (13 1/4")		254.0 (10")	248
N/A			273.0 (10 3/4")	266
N/A	355 (14")		304.8 (12")	298
N/A	419 (16 1/2")		355 (14")	3490

* No imperial equivalent

The following CF US sizes are also available

Flange OD	Matching Tube OD	Page Number
54.0 (2 1/8")	25.4 (1")	24-25
85.7 (3 3/8")	50.8 (2")	26-27
117.5 (4 5/8")	76.2 (3")	28-29
171.5 (6 3/4")	127.0 (5")	30-31

- The CF flange range is identical to the range available in the United States, except that CF flanges have metric tapped holes
- Caburn-MDC 12" flanges are compatible with Varian and Balzers flanges, they have 32 bolt holes with either M8 thread or 8.4mm diameter clearance holes equally spaced on a 284 bolt circle diameter

CF Flanges

General information

CF Flanges

Features

- Suitable for UHV or high vacuum
- Seal made by stainless steel knife edge into copper or Viton® gasket
- Complies with ISO 3669
- Compatible with other manufacturers' Conflat® knife-edge flanges
- Stainless steel grade 304 (1.4301) or 316LN EFR (1.4429 ESU)

Specifications

Material	
Flanges	304ss or 316LN
Gaskets	OFE Copper or Viton® elastomer
Bolts	300ss and silver-plated
Fastening	
Bolt head type	Hexagonal socket, hexagon head
Nut type	Hexagonal or two-hole plate nuts
Bolt size	**Torque**
M4	9 Nm
M6	16 Nm
M8	20 Nm
M8	35 Nm
M8	45 Nm
M8	45 Nm
Elastomer seal, all sizes	9 – 14 Nm
Vacuum range	
CF or wire seal	1×10^{-13} mbar
Elastomer seal	1×10^{-8} mbar
Temperature range	
CF or wire seal	-200°C to 450°C
Elastomer seal	Sustained: -20°C to 150°C, Intermittent: 200°C

Standard specifications are for OFE copper metal seals; optional elastomer sealing specifications are stated for gaskets made of DuPont Dow® elastomers Viton®

General specifications

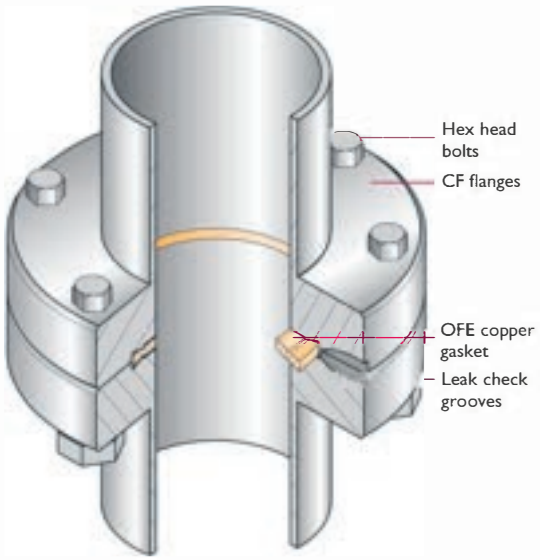
Caburn-MDC offers two types of CF flange in either 304 or 316LN for applications where very low magnetic permeability is required.

The OFE copper metal seal

The reliable sealing performance of CF flanges is a result of the geometry of the design which 'captures' the gasket material. When the conical sealing edge of the flange is pressed into the OFE (oxygen-free electronic grade) copper gasket, a lateral cold flow of the gasket material occurs. This cold flow is limited by the vertical flange wall. Further material flows away from the seal area is severely limited and high interface pressures are developed. These pressures cause gasket material to fill surface imperfections and produce a highly reliable seal.

Typical CF metal seal flange

Mated cross section



Intermediate hardware may be required for joining components, these have been omitted for clarity

Standard 304 series CF

Caburn-MDC standard 304 series CF flanges

Specifications

Stainless steel	304 (1.4301)
Vacuum range	to below 10^{-11} mbar
Temperature operating range	-196°C – 450°C
Magnetic permeability	<1.05
Hardness	150 Brinell

Euro CF series

Caburn-MDC Euro CF series 316LN flanges are clearly distinguishable from the 304 series

Specifications

Conforms to CERN specification

Stainless steel	316LN EFR (1.4429 ESU)
Fittings	304 or 316L
Vacuum range	to below 10^{-11} mbar
Temperature operating operating range	-200°C to 450°C
Magnetic permeability	<1.005
Hardness	170 Brinell

Flange installation

Using clean lint free gloves, place an OFE copper gasket against the knife edge seal of one of two standard CF flanges, preferably the flange most likely to hold and support the gasket from falling. With the gasket in place arrange the mating flange with the desired bolt hole orientation. Leak test grooves should be aligned, insert bolts and hand tighten. Washers are typically used on the nut side of the fastener assembly.

Anti-seize thread lubricants are recommended for the fastening of all stainless steel hardware. This is especially true with tapped hole or blind-tapped holes.

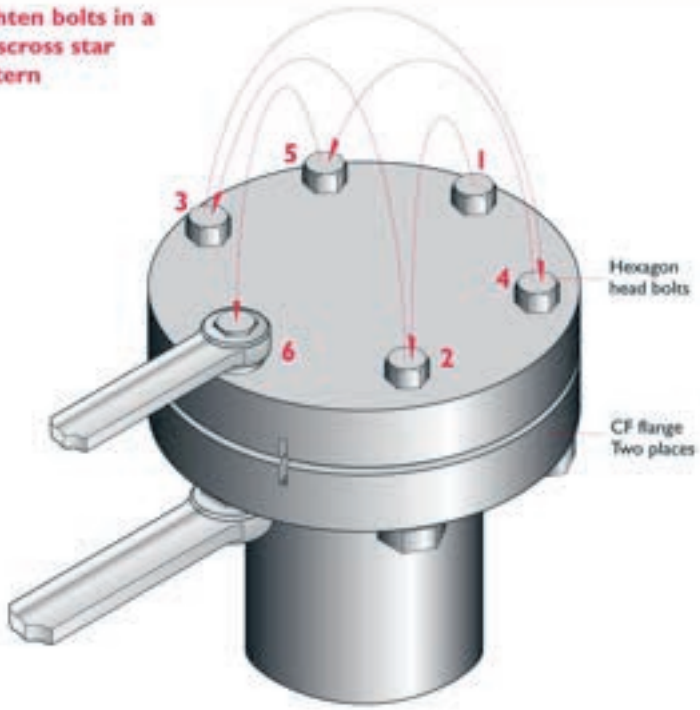
After hand tightening all bolts, support bolt and turn nut. The tightening process must be done gradually in quarter to half turn increments, in an alternating crisscross pattern. Continue until the desired torque ratings have been achieved. Tightening bolts in this fashion will ensure a reliable seal with even gasket compression and deformation.

Rotatable flanges

Non-rotatable and rotatable flanges are typically used in combination for bolt alignment purposes. A rotatable flange is constructed of two concentric components, these are referred to as the receiver and the insert. The receiver, or outer ring, contains the fastening bolt holes while the insert is the blank or bored centre piece that contains the sealing knife edge and to which a mating tube is typically welded. The term "rotatable" pertains to the flange's outer ring or receiver prior to the insertion of fasteners. Once the holes have been aligned and fasteners inserted, the flange is no longer rotatable.

CF metal seal flanges are fitted with either clearance or threaded fastening bolt holes. Tapped holes provide threads through the entire thickness of a flange. Exceptions to this include reducer flanges and cubes which are fitted with blind tapped holes. Blind tapped holes are drilled only part way through a flange and do not break through.

Tighten bolts in a crisscross star pattern



All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

DN16CF 34mm Mini 1⅓" OD

Non-rotatable

Rotatable

Features

- Complies with ISO 3669
- UHV rated to 1×10^{-13} mbar
- High temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Compatible with other manufacturers' Conflat® knife-edge flanges

Specifications

Material	
Flanges	304 (1.4301) or 316EFR (1.4429 ESU)
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal or socket head screws
Nut type	Hexagonal or two hole plate nuts
Size	M4
Torque	9 Nm
Vacuum range	to below 10^{-11} mbar
Temperature range	-200°C to 450°C
Weight	0.1 kg
Dimensions	33.8 OD x 15.9 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

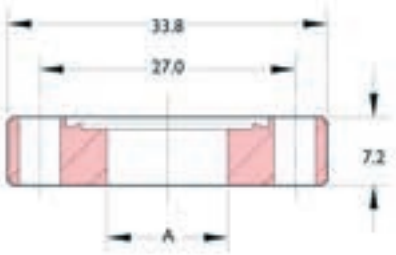


Figure 2

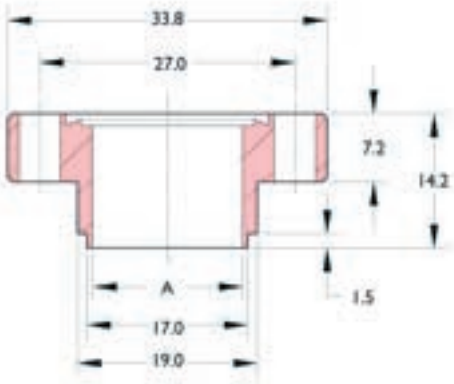


Figure 3

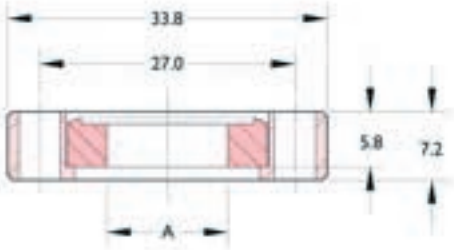
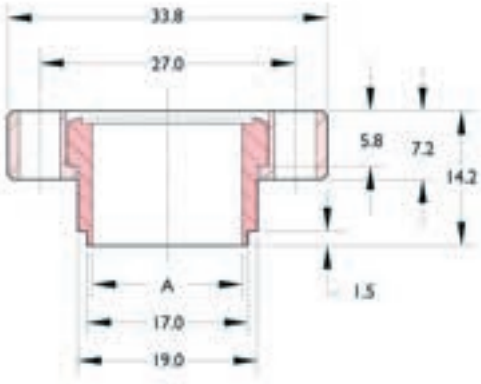


Figure 4



- Through-hole flanges have 6 bolt holes drilled 4.4 diameter
- Tapped flanges have 6 bolt holes threaded M4
- Weld preps shown for small diameter, thin wall tube sizes

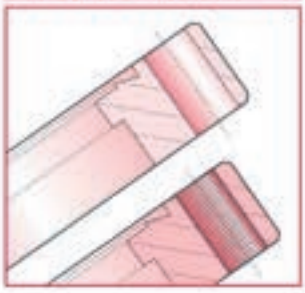
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Section 1.1

CF Flanges

DN16CF 34mm Mini 1⅛" OD

Non-rotatable

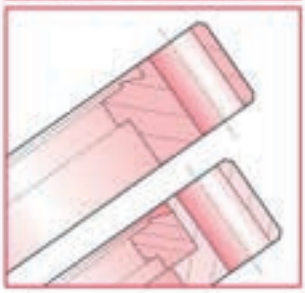


Nominal matching tube OD	Bolt hole	Figure	A	Wt kg	Reference	Part number
304 Stainless steel						
Blank	Clearance	1	–	0.1	CFB34	110000
19.1	Clearance	1	15.9	0.1	CF34-19	110057
19.1	Clearance	2	15.9	0.1	CF34-19-S	110004
Blank	Tapped	1	–	0.1	CFB34T	130043
19.1[1]	Tapped	2	15.9	0.1	CF34-19T-S	130047

Rotatable

Nominal matching tube OD	Bolt hole	Figure	A	Wt kg	Reference	Part number
304 Stainless steel						
Blank	Clearance	3	–	0.1	CFBR34	100000
19.1	Clearance	3	15.9	0.1	CFR34-19	1116036
19.1	Clearance	4	15.9	0.1	CFR34-19-S	100004
Blank	Tapped	3	–	0.1	CFBR34T	120043
19.1[1]	Tapped	4	15.9	0.1	CFR34-19T-S	120047

Euro CF Series



Nominal matching tube OD	Bolt hole	Figure	A	Wt kg	Reference	Part number
Non-rotatable: 316LN EFR 1.4429 ESU						
Blank	Clearance	1	–	0.1	CFBL34	1112010
19.1[1]	Clearance	1	16	0.1	CFL34-19	1112012
Blank	Tapped	1	–	0.1	CFBL34T	1112025
19.1[1]	Tapped	1	16	0.1	CFL34-19T	1112027
Rotatable: 316LN EFR 1.4429 ESU						
Blank	Clearance	3	–	0.1	CFBRL34	1112040
19.1[1]	Clearance	3	16	0.1	CFRL34-19	1112042

Note Rotatable outers are standard material

Hardware

- Bolt sets for clearance hole flanges include screws and nuts
- Bolt sets for tapped flanges include screws only
- Gold plated gaskets available on request

Description	Bolt[2] hole	Bolt length	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 16 ID	–	–	10	0.1	CCG16	1113240
Gasket, Viton®, 16 ID	–	–	5	0.1	VG16	191001
Gasket, OFE copper annealed, 16 ID	–	–	1	0.1	CGA16	1113220
Gasket, silver plated copper, 16 ID	–	–	1	0.1	CGAG16	1113230
Gasket, nickel	–	–	1	0.1	NG16	191060
Socket head screw M4[1]	C	20	25	0.1	M4-20	1113014
Socket head screw M4[4]	T	16	25	0.1	M4-16	1113000
Socket head screw M4[5]	T	30	25	0.2	M4-30	1113015
12 Plate nuts/24 screws and washers	C	20	12/24	0.1	PN16-8SET	1113100
Plate nuts, M4	C	–	24	0.04	PN16	1113112
High-temperature thread lubricant (28gm)	–	–	1	0.1	FEL-PRO C-102	1260200
Flange cover, plastic	–	–	1	0.1	FC133	192000

[1] Caburn-MDC Euro default size
[2] C = Clearance holes, T = Tapped holes
[3] For use with standard flanges
[4] For use with tapped flanges
[5] For use with double sided flanges

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

DN40CF 70mm 2¾" OD

Non-rotatable

Rotatable

Features

- Complies with ISO 3669
- UHV rated to $1x10^{-13}$ mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Compatible with other manufacturers' Conflat® knife-edge flanges

Specifications

Material	
Flanges	304 (1.4301) or 316EFR (1.4429 ESU)
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal
Nut type	Hexagonal or two-hole plate nuts
Size	M6
Torque	16 Nm
Vacuum range	to below 10^{-13} mbar
Temperature range	-200°C to 450°C
Weight	0.5 kg
Dimensions	69.3 OD x 41.3 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

Figure 2

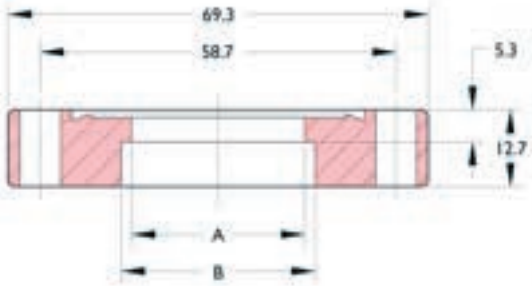


Figure 3

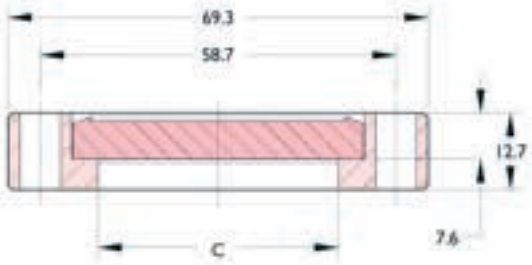
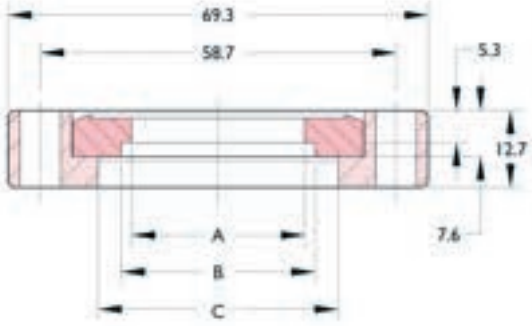


Figure 4



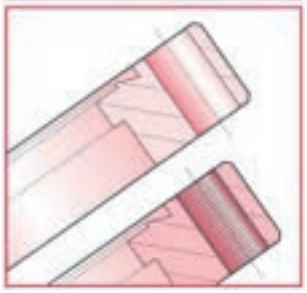
- Through hole flanges have 6 bolt holes drilled 6.7 diameter
- Tapped flanges have 6 bolt holes threaded M6

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

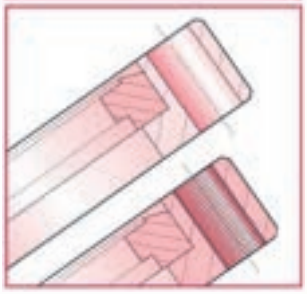
DN40CF 70mm 2¾" OD

Non-rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	C	Wt kg	Reference	Part number
304 Stainless steel								
Blank	Clearance	1	–	–	–	0.45	CFB70	110008
25.4	Clearance	2	22.2	25.7	–	0.34	CF70-25	110012
38.1	Clearance	2	34.9	38.3	–	0.34	CF70-38	110014
41.3[1]	Clearance	2	38.0	41.5	–	0.34	CF70-41	110051
44.5	Clearance	2	41.3	44.6	–	0.34	CF70-44	110052
Blank	Tapped	1	–	–	–	0.45	CFB70T	130051
38.1	Tapped	2	34.9	38.3	–	0.34	CF70-38T	130057
41.3	Tapped	2	38.0	41.5	–	0.34	CF70-41T	130085

Rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	C	Wt kg	Reference	Part number
304 Stainless steel								
Blank	Clearance	3	–	–	39.6	0.45	CFBR70	100008
38.1	Clearance	4	34.9	38.3	39.6	0.34	CFR70-38	100014
41.3[1]	Clearance	4	38.0	41.5	42.1	0.34	CFR70-41	100051
44.5	Clearance	4	41.3	44.6	46.0	0.34	CFR70-44	100043
Blank	Tapped	3	–	–	39.6	0.45	CFBR70T	120051
38.1	Tapped	4	34.9	38.3	39.6	0.34	CFR70-38T	120057
41.3[1]	Tapped	4	38.0	41.5	42.1	0.34	CFR70-41T	120085

Euro CF Series

Nominal matching tube OD	Bolt hole	Figure	A	B	C	Wt kg	Reference	Part number
Non-rotatable: 316LN EFR 1.4429 ESU								
Blank	Clearance	1	–	–	–	0.45	CFBL70	1112110
38.1	Clearance	2	34.9	38.3	–	0.34	CFL70-38	1112111
41.3[1]	Clearance	2	38.0	41.5	–	0.34	CFL70-41	1112112
Blank	Tapped	1	–	–	–	0.45	CFBL70T	1112125
38.1	Tapped	2	34.9	38.3	–	0.34	CFL70-38T	1112126
41.3[1]	Tapped	2	38.0	41.5	–	0.34	CFL70-41T	1112127
Rotatable: 316LN EFR 1.4429 ESU								
Blank	Clearance	3	–	–	39.6	0.45	CFBRL70	1112140
38.1	Clearance	4	34.9	38.3	39.6	0.34	CFRL70-38	1112141
41.3[1]	Clearance	4	38.0	41.5	42.1	0.34	CFRL70-41	1112142

Note Rotatable outers are standard material

Hardware

Description	Bolt[2] hole	Bolt length	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 37 ID	–	–	10	0.3	CCG40	1113241
Gasket, Viton®, 43 ID	–	–	5	0.1	VG40	191005
Gasket, OFE copper annealed, 37 ID	–	–	1	0.1	CGA40	1113221
Gasket, silver-plated copper, 37 ID	–	–	1	0.1	CGAG40	1113231
Gasket, nickel	–	–	1	0.1	NG40	191061
Hex-head bolts M6[3]	C	35	25	0.4	M6-35	1113021
Hex-head bolts M6[4]	T	25	25	0.4	M6-25	1113006
Hex-head bolts M6[5]	T	55	25	0.4	M6-55	1113022
12 Plate nuts/24 bolts and washers	C	35	12/24	0.4	PN40-BSET	1113101
Plate nuts, M6	C	–	24	0.1	PN-40	1113113
High-temperature thread lubricant (28gm)	–	–	1	0.1	FEL-PRO C-102	1260200
Flange cover, plastic	–	–	1	0.1	FC275	192002

- Bolt sets for clearance hole flanges include bolts, flat washers and nuts
- Bolt sets for tapped flanges include bolts and flat washers
- Gold-plated gaskets available on request

[1] Caburn-MDC Euro default size

[2] C = Clearance holes, T = Tapped holes

[3] For use with standard flanges

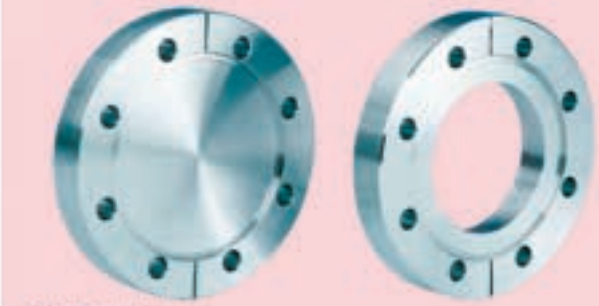
[4] For use with tapped flanges

[5] For use with double-sided flanges

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

DN63CF 114mm 4½" OD



Non-rotatable

Rotatable

Features

- Complies with ISO 3669
- UHV rated to 1×10^{-11} mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Compatible with other manufacturers' Conflat® knife-edge flanges

Specifications

Material	
Flanges	304 (1.4301) or 316EFR (1.4429 ESU)
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal
Nut type	Hexagonal or two-hole plate nuts
Size	M8
Torque	20 Nm
Vacuum range	to below 10^{-11} mbar
Temperature range	-200°C to 450°C
Weight	1.4 kg maximum
Dimensions	113.5 OD x 66.0 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

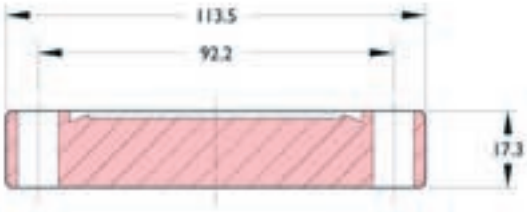


Figure 2

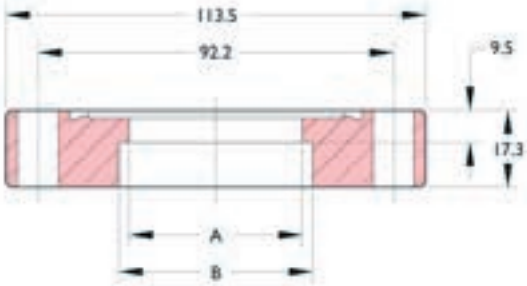


Figure 3

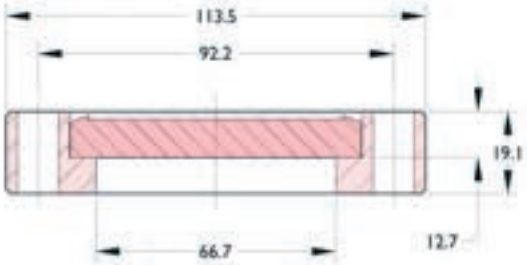
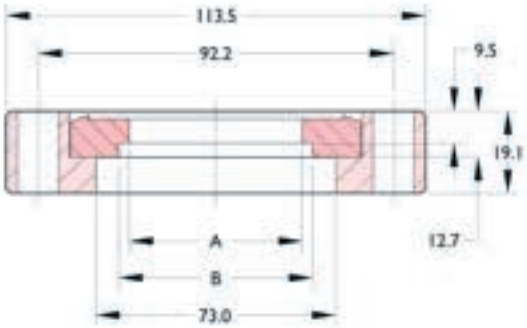


Figure 4



- Through hole flanges have 8 bolt holes drilled 8.4 diameter
- Tapped flanges have 8 bolt holes threaded M8

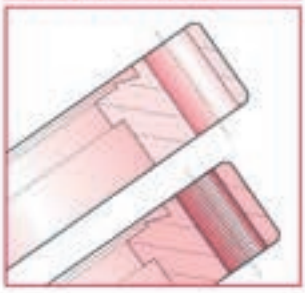
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Section 1.1

CF Flanges

DN63CF 114mm 4½" OD

Non-rotatable

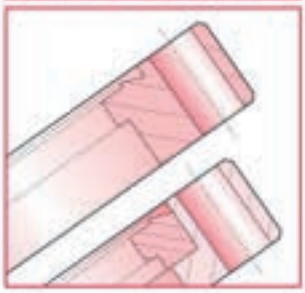


Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	1.4	CFB114	110018
63.5	Clearance	2	60.3	63.8	1.0	CF114-63	110021
70.0[1]	Clearance	2	66.7	70.2	1.0	CF114-70	110053
Blank	Tapped	1	–	–	1.4	CFB114T	130061
63.5	Tapped	2	60.3	63.8	1.0	CF114-63T	130064
70.0[1]	Tapped	2	66.7	70.2	1.0	CF114-70T	130087

Rotatable

Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	1.4	CFBR114	100018
63.5	Clearance	4	60.3	63.8	1.0	CFR114-63	100021
70.0[1]	Clearance	4	65.0	70.2	1.0	CFR114-70	100052
Blank	Tapped	3	–	–	1.4	CFBR114T	120061
63.5	Tapped	4	60.3	63.8	1.0	CFR114-63T	120064
70.0[1]	Tapped	4	65.0	70.2	1.0	CFR114-70T	120086

Euro CF Series



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
Non-rotatable: 316LN EFR 1.4429 ESU							
Blank	Clearance	1	–	–	1.4	CFBL114	1112210
63.5	Clearance	2	60.3	63.8	1.0	CFL114-63	1112211
70.0[1]	Clearance	2	66.7	70.2	1.0	CFL114-70	1112212
Blank	Tapped	1	–	–	1.4	CFBL114T	1112225
63.5	Tapped	2	60.3	63.8	1.0	CFL114-63T	1112226
70.0[1]	Tapped	2	66.7	70.2	1.0	CFL114-70T	1112227
Rotatable: 316LN EFR 1.4429 ESU							
Blank	Clearance	3	–	–	1.4	CFBRL114	1112240
63.5	Clearance	4	60.3	63.8	1.0	CFRL114-63	1112241
70.0[1]	Clearance	4	66.7	70.2	1.0	CFRL114-70	1112242

Note Rotatable outers are standard material

Hardware

- Bolt sets for clearance hole flanges include bolts, flat washers and nuts
- Bolt sets for tapped flanges include bolts and flat washers
- Gold-plated gaskets available on request

Description	Bolt[3] hole	Bolt length	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 63 ID	–	–	10	0.3	CCG63	1113242
Gasket, Viton®, 77 ID	–	–	1	0.1	VG63	191010
Gasket, OFE copper annealed, 63 ID	–	–	1	0.1	CGA63	1113222
Gasket, silver-plated copper, 63 ID	–	–	1	0.1	CGAG63	1113232
Gasket, nickel	–	–	1	0.1	NG63	191063
Hex-head bolt M8[4]	T	30	25	1.0	M8-30	1113007
Hex-head bolt M8[4]	C	50	25	1.0	M8-50	1113026
Hex-head bolt M8[4]	C	65	25	1.0	M8-65	1113028
Hex-head bolt/plate nut	C	50	12/24	1.0	PN63-8SET	1113102
Plate nuts, M8	C	–	24	0.3	PN63	1113114
High-temperature thread lubricant (28gm)	–	–	1	0.1	FEL-PRO C-102	1260200
Flange cover, plastic	–	–	1	0.1	FC450	7192004

[1] Caburn-MDC Euro default size
[2] For use with double-sided flanges
[3] C = Clearance holes, T = Tapped holes
[4] For use with standard flanges
[5] For use with tapped flanges

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

DN100CF 152mm 6" OD

Non-rotatable

Rotatable

Features

- Complies with ISO 3669
- UHV rated to 1×10^{-11} mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Compatible with other manufacturers' Conflat® knife-edge flanges

Specifications

Material	
Flanges	304 (1.4301) or 316EFR (1.4429 ESU)
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal
Nut type	Hexagonal or two-hole plate nuts
Size	M8
Torque	20 Nm
Vacuum range	to below 10^{-11} mbar
Temperature range	-200°C to 450°C
Weight	2.5 kg maximum
Dimensions	152 OD x 104 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

Figure 2

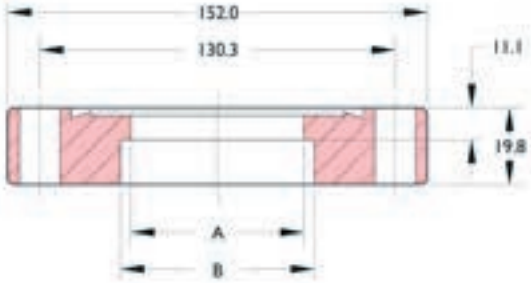


Figure 3

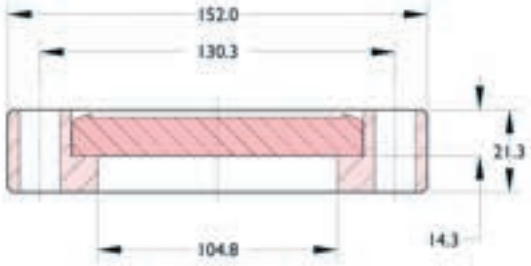
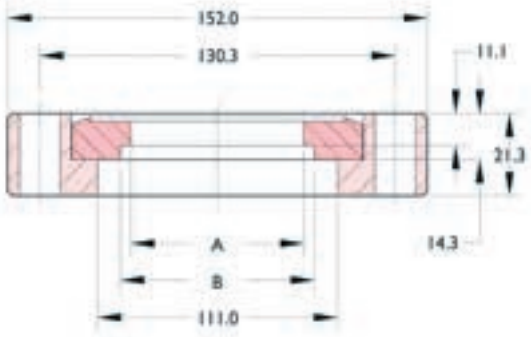


Figure 4



- Through hole flanges have 16 bolt holes drilled 8.4 diameter
- Tapped flanges have 16 bolt holes threaded M8

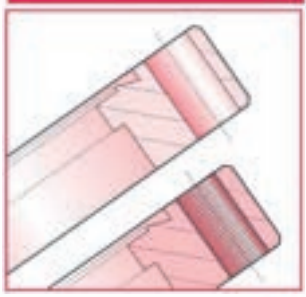
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Section 1.1

CF Flanges

DN100CF 152mm 6" OD

Non-rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	2.5	CFBI50	110025
101.6	Clearance	2	96.8	101.9	1.6	CFI50-100	110026
108.0[1]	Clearance	2	102.0	108.3	1.6	CFI50-108	110054
Blank	Tapped	1	–	–	2.5	CFBI50T	130068
101.6	Tapped	2	96.8	101.9	1.6	CFI50-100T	130069
108.0[1]	Tapped	2	102.0	108.3	1.6	CFI50-108T	130088

Rotatable

Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	2.5	CFBR150	100025
101.6	Clearance	4	96.8	101.9	1.6	CFR150-100	100026
108.0[1]	Clearance	4	101.0	108.3*	1.6	CFR150-108	100053
Blank	Tapped	3	–	–	2.5	CFBR150T	120068
101.6	Tapped	4	96.8	101.9	1.6	CFR150-100T	120069
108.0[1]	Tapped	4	101.0	108.3*	1.6	CFR150-108T	120087

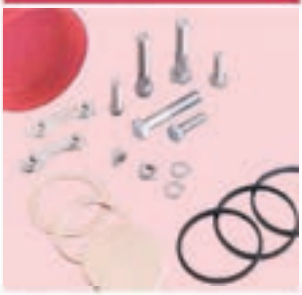
Euro CF Series

Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
Non-rotatable: 316LN EFR 1.4429 ESU							
Blank	Clearance	1	–	–	2.5	CFBL150	1112310
101.6	Clearance	2	96.8	101.9	1.6	CFL150-100	1112311
108.0[1]	Clearance	2	101.0	108.3	1.6	CFL150-108	1112312
Blank	Tapped	1	–	–	2.5	CFBL150T	1112325
101.6	Tapped	2	96.8	101.9	1.6	CFL150-100T	1112326
108.0[1]	Tapped	2	101.0	108.3	1.6	CFL150-108T	1112327
Rotatable: 316LN EFR 1.4429 ESU							
Blank	Clearance	3	–	–	2.5	CFBRL150	1112340
101.6	Clearance	4	96.8	101.9	1.6	CFRL150-100	1112341
108.0[1]	Clearance	4	101.0	108.3*	1.6	CFRL150-108	1112342

Note Rotatable outers are standard material

* ID of rotatable outer is 110.0mm (not 108.3mm as shown)

Hardware



- Bolt sets for clearance hole flanges include bolts, flat washers and nuts
- Bolt sets for tapped flanges include bolts and flat washers
- Gold-plated gaskets available on request

Description	Bolt[2] hole	Bolt length	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 101 ID	–	–	10	0.7	CCG100	1113243
Gasket, Viton®, 115 ID	–	–	1	0.1	VG100	191014
Gasket, OFE copper annealed, 101 ID	–	–	1	0.1	CGA100	1113223
Gasket, silver-plated copper, 101 ID	–	–	1	0.1	CGAG100	1113233
Gasket, nickel	–	–	1	0.1	NG100	191065
Hex-head bolt, M8[3]	T	35	25	1.0	M8-35	1113008
Hex-head bolt, M8[4]	C	50	25	1.0	M8-50	1113026
Hex-head bolt, M8[5]	C	70	25	2.0	M8-70	1113029
Hex-head bolt, M8	C	50	12/24	1.0	PN100-BSET	1113103
Plate nuts, M8	C	–	24	0.2	PN100	1113115
High-temperature thread lubricant (28gm)	–	–	1	0.1	FEL-PRO C-102	1260200
Flange cover, plastic	–	–	1	0.1	FC600	7192006

[1] Caburn-MDC Euro default size

[2] For use with standard flanges

[3] C = Clearance holes, T = Tapped holes

[4] For use with tapped flanges

[5] For use with double-sided flanges

MDC PRECISION

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

DN160CF 203mm 8" OD

Non-rotatable

Rotatable

Features

- Complies with ISO 3669
- UHV rated to 1×10^{-11} mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Compatible with other manufacturers' Conflat® knife-edge flanges

Specifications

Material	
Flanges	304 (1.4301) or 316EFR (1.4429 ESU)
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal
Nut type	Hexagonal or two-hole plate nuts
Size	M8
Torque	20 Nm
Vacuum range	to below 10^{-11} mbar
Temperature range	-200°C to 450°C
Weight	5.5 kg maximum
Dimensions	202.4 OD x 156.0 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

Figure 2

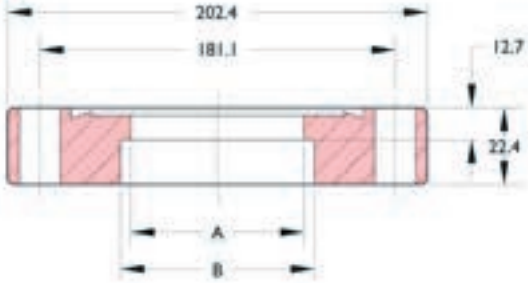


Figure 3

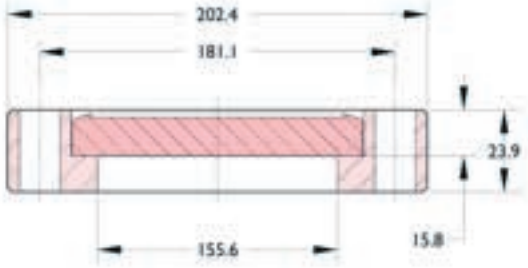
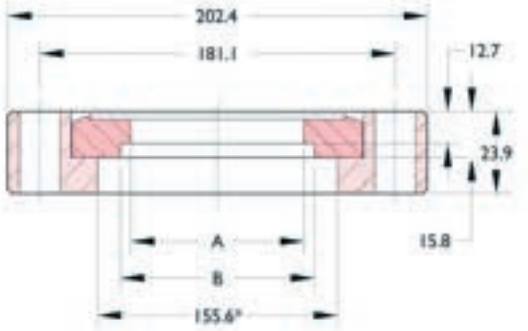


Figure 4



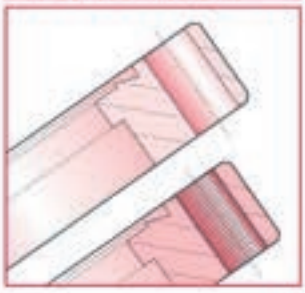
- Through hole flanges have 20 bolt holes drilled 8.4 diameter
- Tapped flanges have 20 bolt holes threaded M8

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

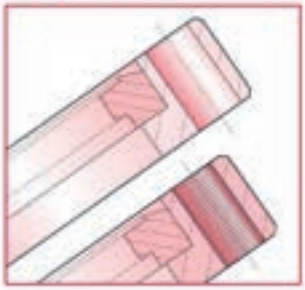
DN160CF 203mm 8" OD

Non-rotatable



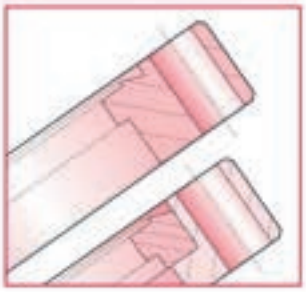
Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	5.5	CFB200	110030
152.4	Clearance	2	147.6	152.9	2.5	CF200-150	110031
156.0[1]	Clearance	2	150.0	156.5	2.5	CF200-156	110055
Blank	Tapped	1	–	–	5.5	CFB200T	130073
152.4	Tapped	2	147.6	152.9	2.5	CF200-150T	130074
156.0[1]	Tapped	2	150.0	156.5	2.5	CF200-156T	130089

Rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	5.5	CFBR200	100030
152.4	Clearance	4	147.6	152.9	2.5	CFR200-150	100031
156.0[1]	Clearance	4	150.0	156.5*	2.5	CFR200-156	100054
Blank	Tapped	3	–	–	5.5	CFBR200T	120073
152.4	Tapped	4	147.6	152.9	2.5	CFR200-150T	120074
156.0[1]	Tapped	4	150.0	156.5*	2.5	CFR200-156T	120088

Euro CF Series



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
Non-rotatable: 316LN EFR 1.4429 ESU							
Blank	Clearance	1	–	–	5.5	CFBL200	1112410
152.4	Clearance	2	147.6	152.9	2.5	CFL200-150	1112411
156.0[1]	Clearance	2	150.0	156.5	2.5	CFL200-156	1112412
Blank	Tapped	1	–	–	5.5	CFBL200T	1112425
152.4	Tapped	2	147.6	152.9	2.5	CFL200-150T	1112426
156.0[1]	Tapped	2	150.0	156.5	2.5	CFL200-156T	1112427
Rotatable: 316LN EFR 1.4429 ESU							
Blank	Clearance	3	–	–	5.5	CFBRL200	1112440
152.4	Clearance	4	147.6	152.9	2.5	CFRL200-150	1112441
156.0[1]	Clearance	4	150.0	156.5*	2.5	CFRL200-156	1112442

Note Rotatable outers are standard material

* ID of rotatable outer is 159.0mm (not 156.5mm as shown)

Hardware

- Bolt sets for clearance hole flanges include bolts, flat washers and nuts
- Bolt sets for tapped flanges include bolts and flat washers
- Gold-plated gaskets available on request

Description	Bolt[3] hole	Bolt length	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 152 ID	–	–	10	1.0	CCG160	1113244
Gasket, Viton®, 153 ID	–	–	1	0.1	VG160	191018
Gasket, OFE copper annealed, 152 ID	–	–	1	0.1	CGA160	1113224
Gasket, silver-plated copper, 152 ID	–	–	1	0.1	CGAG160	1113234
Gasket, nickel	–	–	1	0.1	NG160	191067
Hex-head bolt, M8[2]	T	35	25	1.0	M8-35	1113008
Hex-head bolt, M8[4]	C	60	25	1.0	M8-60	1113027
Hex-head bolt, M8[5]	C	80	25	1.0	M8-80	1113030
Hex-head bolt/plate nut, M8	C	60	12/24	0.9	PN160-BSET	1113104
Plate nuts, M8	C	–	24	0.1	PN160	1113116
High-temperature thread lubricant (28gm)	–	–	1	0.1	FEL-PRO C-102	1260200
Flange cover, plastic	–	–	1	0.1	FC800	7192007

[1] Caburn-MDC Euro default size

[2] For use with standard flanges

[3] C = Clearance holes, T = Tapped holes

[4] For use with tapped flanges

[5] For use with double-sided flanges

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

DN200CF 254mm 10" OD

Non-rotatable

Rotatable

Features

- Complies with ISO 3669
- UHV rated to $1x10^{-11}$ mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Compatible with other manufacturers' Conflat® knife-edge flanges

Specifications

Material	
Flanges	304 (1.4301) or 316EFR (1.4429 ESU)
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal
Nut type	Hexagonal
Size	M8
Torque	20 Nm
Vacuum range	to below 10^{-11} mbar
Temperature range	-200°C to 450°C
Weight	9 kg maximum
Dimensions	253.3 OD x 204.7 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

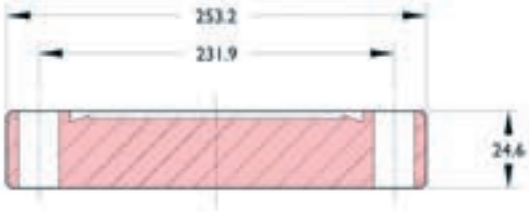


Figure 2

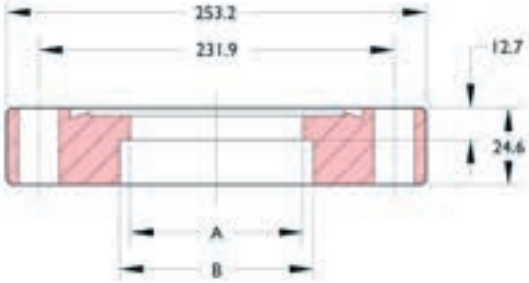


Figure 3

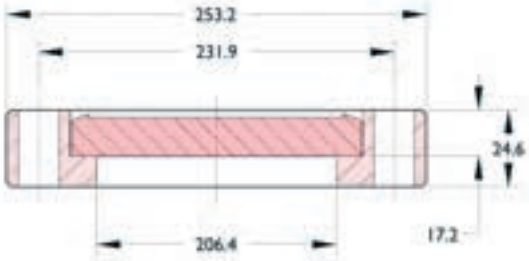
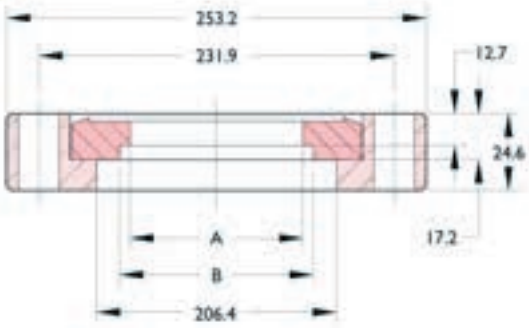


Figure 4



- Through hole flanges have 24 bolt holes drilled 8.4 diameter
- Tapped flanges have 24 bolt holes threaded M8

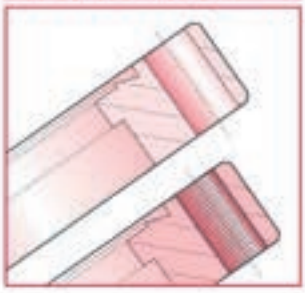
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Section 1.1

CF Flanges

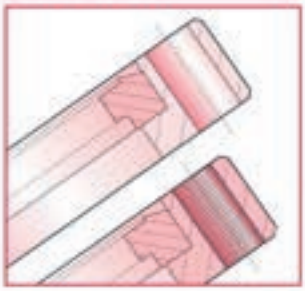
DN200CF 254mm 10" OD

Non-rotatable



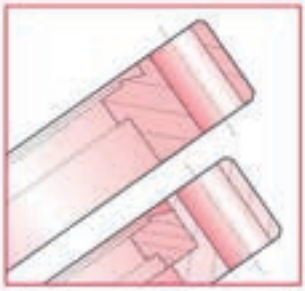
Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	9.0	CFB250	110032
203.2	Clearance	2	198.4	203.7	3.5	CF250-200	110033
209.6[1]	Clearance	2	204.7	210.0	3.5	CF250-210	110056
Blank	Tapped	1	–	–	9.0	CFB250T	130075
203.2	Tapped	2	198.4	203.7	3.5	CF250-200T	130076
209.6[1]	Tapped	2	204.7	210.0	3.5	CF250-210T	130090

Rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	9.0	CFBR250	100032
203.2	Clearance	4	198.4	203.7	3.5	CFR250-200	100033
209.6[1]	Clearance	4	204.7	210.0*	3.5	CFR250-210	100055
Blank	Tapped	3	–	–	9.0	CFBR250T	120075
203.2	Tapped	4	198.4	203.7	3.5	CFR250-200T	120076
209.6[1]	Tapped	4	204.7	210.0*	3.5	CFR250-210T	120089

Euro CF Series



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
Non-rotatable: 316LN EFR 1.4429 ESU							
Blank	Clearance	1	–	–	9.0	CFBL250	1112510
209.6[1]	Clearance	2	204.7	210.0	3.5	CFL250-205	1112512
Blank	Tapped	1	–	–	9.0	CFBL250T	1112525
209.6[1]	Tapped	2	204.7	210.0	3.5	CFL250-205T	1112527
Rotatable: 316LN EFR 1.4429 ESU							
Blank	Clearance	3	–	–	9.0	CFBRL250	1112540
209.6[1]	Clearance	4	204.7	210.0*	3.5	CFRL250-205	1112542

Note Rotatable outers are standard material

* ID of rotatable outer is 212.0mm (not 210.0mm as shown)

Hardware

- Bolt sets for clearance hole flanges include bolts, flat washers and nuts
- Bolt sets for tapped flanges include bolts and flat washers
- Gold-plated gaskets available on request

Description	Bolt [1] hole	Bolt length	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 203 ID	–	–	10	1.4	CCG200	1113245
Gasket, Viton®, 203 ID	–	–	1	0.1	VG200	191020
Gasket, OFE copper annealed, 203 ID	–	–	1	0.1	CGA200	1113225
Gasket, silver-plated copper, 203 ID	–	–	1	0.1	CGAG200	1113235
Gasket, nickel	–	–	1	0.1	NG200	7191068
Hex-head bolt, M8[2]	T	50	25	0.8	M8-50	1113026
Hex-head bolt, M8[2]	C	60	25	0.8	M8-60	1113027
Hex-head bolt, M8[2]	C	90	25	1.0	M8-90	1113031
High-temperature thread lubricant (28gm)	–	–	1	0.1	FEL-PRO C-102	1260200
Flange cover, plastic	–	–	1	0.2	FC1000	7192008

[1] Caburn-MDC Euro default size

[2] For use with standard flanges

[3] C = Clearance holes, T = Tapped holes

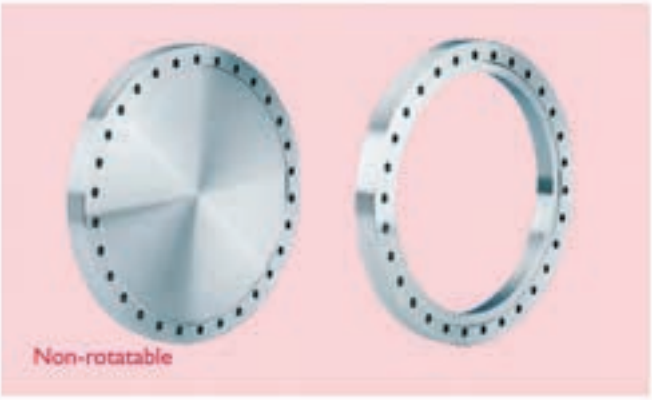
[4] For use with tapped flanges

[5] For use with double-sided flanges

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

DN250CF 304mm 12" OD



Non-rotatable

Rotatable

Features

- UHV rated to $1x10^{-13}$ mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- There is widespread incompatibility between different manufacturers' larger sizes of the CF flange – No DN International Standard notation exists for CF flange sizes 304mm (12") OD and above.

Specifications

Material	
Flanges	304 (1.4301) or 316EFR (1.4429 ESU)
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal
Nut type	Hexagonal
Size	M8
Torque	20 Nm
Vacuum range	to below 10^{-13} mbar
Temperature range	-200°C to 450°C
Weight	15.5 kg maximum
Dimensions	305.0 OD x 247.7 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

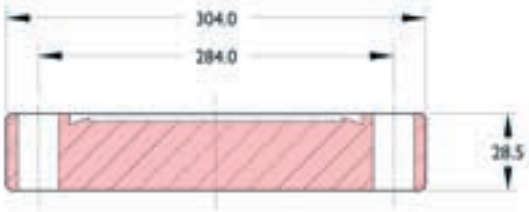


Figure 2

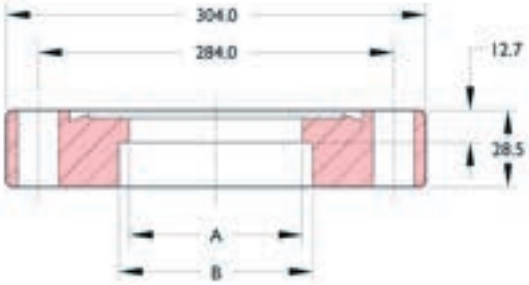


Figure 3

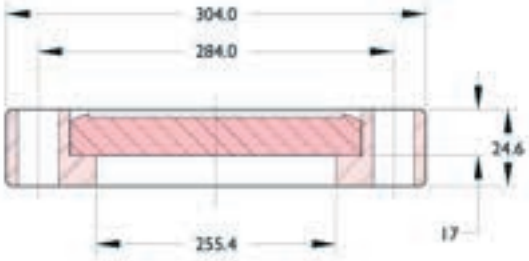
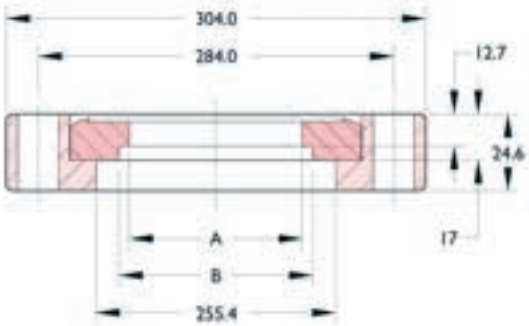


Figure 4



- Through hole flanges have 32 bolt holes drilled 8.4 diameter
- Tapped flanges have 32 bolt holes threaded M8
- Check bolt holes with compatible mating flange

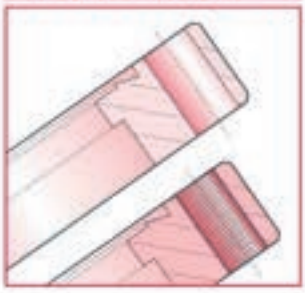
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Section 1.1

CF Flanges

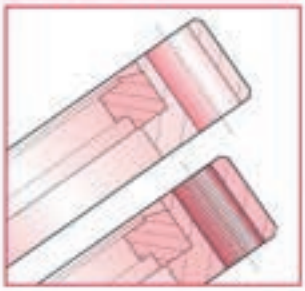
DN250CF 304mm 12" OD

Non-rotatable



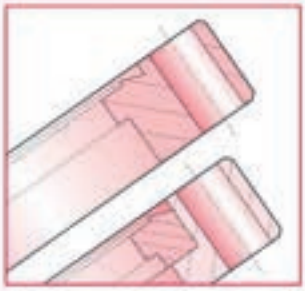
Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	15.5	CFB304	110058
254.0	Clearance	2	247.7	254.5	4.5	CF304-254	110059
Blank	Tapped	1	–	–	15.5	CFB304T	130058
254.0	Tapped	2	247.7	254.5	4.5	CF304-254T	130059

Rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	15.5	CFBR304	100058
254.0	Clearance	4	247.7	254.5	4.5	CFR304-254	100059
Blank	Tapped	3	–	–	15.5	CFBR304T	120058
254.0	Tapped	4	247.7	254.5	4.5	CFR304-254T	120059

Euro CF Series



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
Non-rotatable: 316LN EFR 1.4429 ESU							
Blank	Clearance	1	–	–	15.5	CFBL304	1112610
254.0	Clearance	2	247.7	254.5	4.5	CFL304-254	1112611
Blank	Tapped	1	–	–	15.5	CFBL304T	1112625
254.0	Tapped	2	247.7	254.5	4.5	CFL304-254T	1112626
Rotatable: 316LN EFR 1.4429 ESU							
Blank	Clearance	3	–	–	15.5	CFBRL304	1112640
254.0	Clearance	4	247.7	254.5	4.5	CFRL304-254	1112641

Note Rotatable outers are standard material

Hardware

Description	Bolt[1] Hole	Bolt Length	Qty per Pack	Wt kg	Reference	Part number
Gasket, copper	–	–	1	0.1	CCG250 – 2700D	1113248
Gasket, copper	–	–	1	0.1	CCG250 – 2730D	1113247
Gasket, Viton®	–	–	1	0.1	VG250B	1113306
Hex-head bolt, M8[2]	C	60	32	0.7	M8-60(32)	1113033
Hex-head bolt, M8[2]	T	50	32	0.7	M8-50(32)	1113010
High-temperature thread lubricant (28gm)	–	–	1	0.1	FEL-PRO C-102	1260200

[1] Caburn-MDC Euro default size

[2] C = Clearance holes, T = Tapped holes

[3] For use with standard flanges

[4] For use with tapped flanges

- Bolt sets for clearance hole flanges include bolts, flat washers and nuts
- Bolt sets for tapped flanges include bolts and flat washers

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

US Sizes introduction

Non-rotatable

Features

- These flanges are only available with unified tapped holes
- These flanges are offered with US-style gaskets, nuts and bolts
- US-style flanges, sizes 2 1/8" OD to 16 1/2" OD
- US-size CF flanges are only available in 304 stainless steel

This table states sizes of flanges which are in use in the United States but which are not defined by ISO 3669.

US Size flange OD	Flange OD mm	DN Equivalent	Bolts metric	Bolts unified
1 1/3"	34	DN16	M4	8-32 UNC
2 1/8"	54	DN25	–	1/4"-28 UNF
2 3/4"	70	DN40	M6	1/4"-28 UNF
3 1/8"	86	DN50	–	5/16"-24 UNF
4 1/2"	114	DN63	M8	5/16"-24 UNF
4 5/8"	143	DN80	–	5/16"-24 UNF
6"	152	DN100	M8	5/16"-24 UNF
6 3/4"	171	DN125	–	5/16"-24 UNF
8"	203	DN160	M8	5/16"-24 UNF
10"	254	DN200	M8	5/16"-24 UNF
12"	305	DN250*	M8	5/16"-24 UNF
12 1/4"	336	–	–	3/8"-24 UNF
14"	355	–	–	3/8"-24 UNF
16 1/2"	419	–	–	3/8"-24 UNF

* DN250 is not defined by ISO 3669 – the Caburn-MDC DN250CF follows the Balzers' pattern

The customer is advised to check all bolt hole orientations on fabrications when using these flanges

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Section 1.1

Del-Seal™ CF flanges

UNF Bolt sets

12-point dodecagon head

Socket cap head

Hexagonal head

Features

- UNF bolt sets are offered for use with US-style CF and equipment
- Bolt sets are socket head type or high strength 12 point dodecagon head sets
- Hexagon heads are offered for larger sizes

Bolt sets for through hole flanges

- Each set includes stainless steel bolts, nuts and washers
- All bolt sets are available silver-plated on request

Type	No. per pack	Reference	Part number
8-32 UNC x ¾" socket	25	BA-075	190001
Box wrench 8-32	1	Ballwrench	540000
¼"-28 UNF x 1¼" 12 pt	25	BA-150-12	190040
¼" Box wrench 12 pt	1	Boxwrench	540001
9/16"-24 UNF x 1¾" 12 pt	25	BA-180-12	190043
9/16"-24 UNF x 2" 12 pt	25	BA-200-12	190045
9/16"-24 UNF x 2¼" 12 pt	25	BA-300-12	190046
9/16"-24 UNF x 2½" 12 pt	25	BA-800-12	190048
9/16" Box wrench 12 pt	1	Boxwrench	540001
⅜"-24 UNF x 3" HEX	30	BA-1000	190012
⅜"-24 UNF x 3" HEX	36	BA-1650	190015
⅜"-24 Wrench	1	UNF38	1113170

Bolt sets for tapped flanges

- Each set includes stainless steel bolts, nuts and washers
- All bolt sets are available silver-plated on request

Type	No. per pack	Reference	Part number
8-32 UNC x ½" Socket	25	BA-050	190000
Box wrench 8-32	1	Ballwrench	540000
¼"-28 UNF x 7/8" 12 pt	25	BA-085-12	190041
¼" Box wrench 12 pt	1	Boxwrench	540001
9/16"-24 UNFx 1¼" 12 pt	25	BA-125-12	190044
9/16"-24 UNF x 1¾" 12 pt	25	BA-600-12	190047
9/16" Box wrench 12 pt	1	Boxwrench	540001
⅜"-24 UNF x 2" HEX	30	BA-1001	190013
⅜"-24 UNF x 2" HEX	36	BA-1002	190014
⅜"-24 Wrench	1	UNF38	1113170

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

2⅛" OD US sizes 54mm

Non-rotatable

Rotatable

Features

- UHV rated to $1x10^{-11}$ mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Conflat®-compatible design

Specifications

Material	
Flanges	304ss
Gaskets, metal / elastomer	OFE copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal or 12-point head
Nut type	Hexagonal
Size	¼"-28 UNF
Torque	16 Nm
Vacuum range	to below 10^{-11} mbar
Temperature range	-200°C to 450°C
Weight	0.2 kg
Dimensions	53.6 OD x 22.2 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

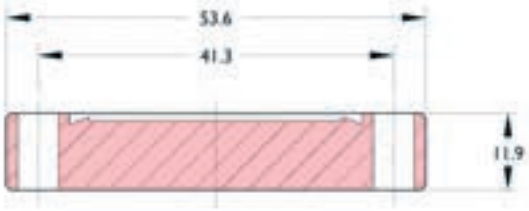


Figure 2

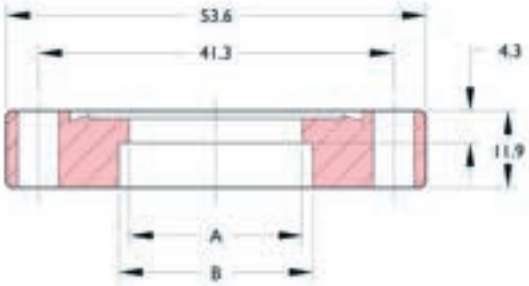


Figure 3

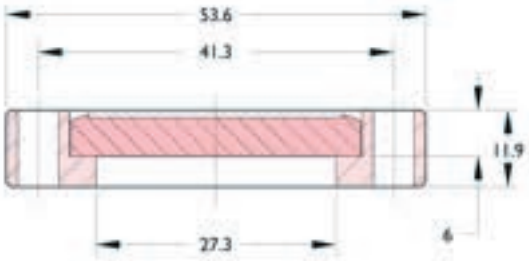
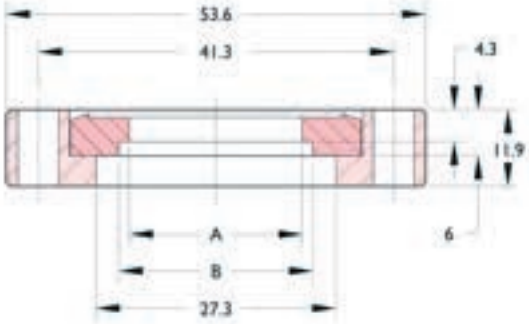


Figure 4



- Through hole flanges have 4 bolt holes drilled 6.7 diameter
- Tapped flanges have 4 bolt holes threaded ¼"-28 UNF

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

2⅛" OD US sizes 54mm

Non-rotatable

Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	0.2	F218000	110005
1" (25.4)	Clearance	2	22.2	26.6	0.2	F218100	110007
Blank	Tapped	1	–	–	0.2	F218000T	130005
1" (25.4)	Tapped	2	22.2	26.6	0.2	F218100T	130007

Rotatable

Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	0.2	F218000R	100005
1" (25.4)	Clearance	4	22.2	26.6	0.2	F218100R	100007
Blank	Tapped	3	–	–	0.2	F218000RT	120005
1" (25.4)	Tapped	4	22.2	26.6	0.2	F218100RT	120007

Hardware

Description	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 1.00" (25.4) ID	10	0.05	GK-100	191002
Gasket, Viton®, 1.02" (25.9) ID	5	0.05	GK-100V	191003
High-temperature thread lubricant (28gm)	1	0.4	FEL-PRO C-102	1260200
Flange cover, plastic	1	0.05	FC218	192001

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

3⅜" OD US sizes 85mm

Non-rotatable

Rotatable

Features

- UHV rated to 1×10^{-13} mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Conflat®-compatible design

Specifications

Material	
Flanges	304ss
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal or 12-point head
Nut type	Hexagonal or two-hole plate nuts
Size	1/4"-24 UNF
Torque	20 Nm
Vacuum range	to below 10^{-13} mbar
Temperature range	-200°C to 450°C
Weight	0.7 kg maximum
Dimensions	85.6 OD x 47.6 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

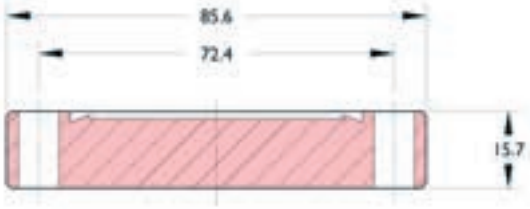


Figure 2

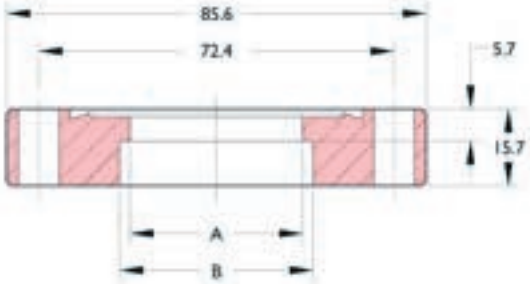


Figure 3

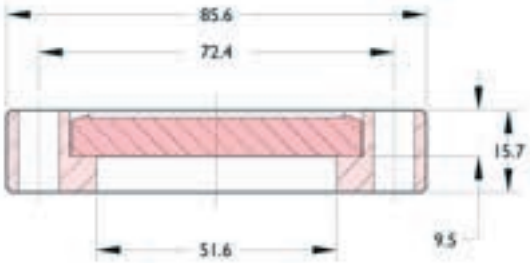
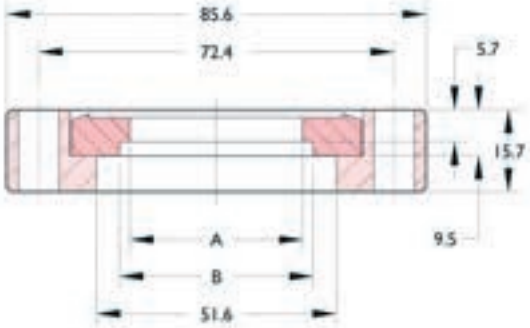


Figure 4



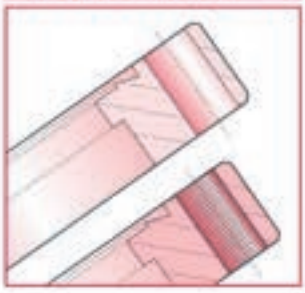
- Through hole flanges have 8 bolt holes drilled 8.4 diameter
- Tapped flanges have 8 bolt holes threaded 1/4"-24 UNF

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

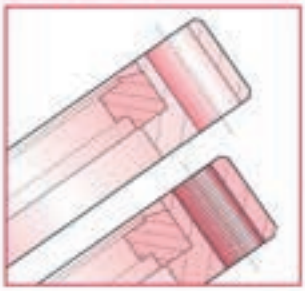
3⅜" OD US sizes 85mm

Non-rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	0.7	F338000	110015
2" (50.8)	Clearance	2	47.6	51.0	0.5	F338200	110017
Blank	Tapped	1	–	–	0.7	F338000T	130015
2" (50.8)	Tapped	2	47.6	51.0	0.5	F338200T	130017

Rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	0.7	F338000R	100015
2" (50.8)	Clearance	4	47.6	51.0	0.5	F338200R	100017
Blank	Tapped	3	–	–	0.7	F338000RT	120015
2" (50.8)	Tapped	4	47.6	51.0	0.5	F338200RT	120017

Hardware

Description	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 2.01" (51.0) ID	10	0.2	GK-200	191007
Gasket, Viton®, 2.19" (55.6) ID	1	0.1	GK-200V	191008
High-temperature thread lubricant (28gm)	1	0.1	FEL-PRO C-102	1260200
Flange cover, plastic	1	0.1	FC338	192003

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

4½" OD US sizes 117mm

Non-rotatable

Rotatable

Features

- UHV rated to 1×10^{-11} mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Conflat®-compatible design

Specifications

Material	
Flanges	304ss
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal or 12-point head
Nut type	Hexagonal
Size	7/16"-24 UNF
Torque	20 Nm
Vacuum range	to below 10^{-11} mbar
Temperature range	-200°C to 450°C
Weight	1.6 kg maximum
Dimensions	117.3 OD x 73 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

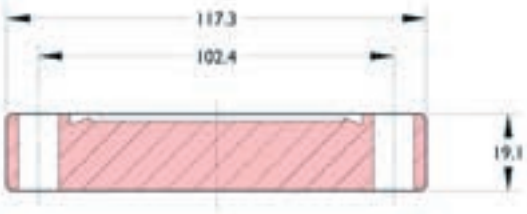


Figure 2

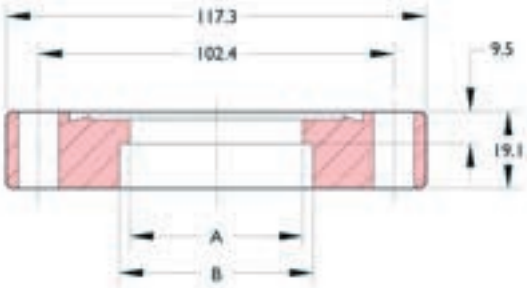


Figure 3

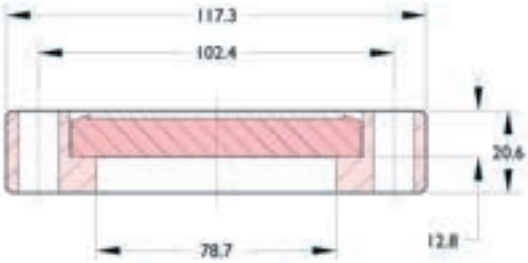
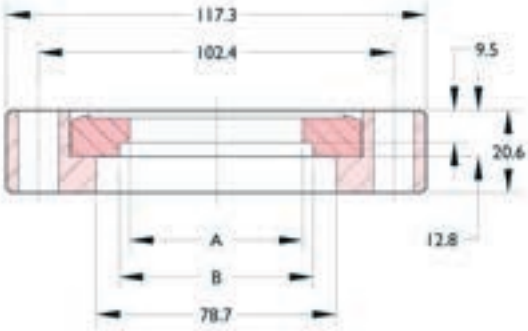


Figure 4



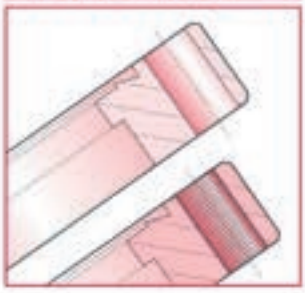
- Through hole flanges have 10 bolt holes drilled 8.4 diameter
- Tapped flanges have 10 bolt holes threaded 7/16"-24 UNF

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

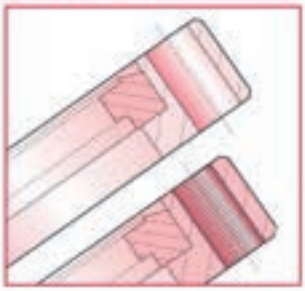
4⅝" OD US sizes 117mm

Non-rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	1.6	F458000	110022
3" (75)	Clearance	2	73.0	76.5	1.0	F458300	110024
Blank	Tapped	1	–	–	1.6	F458000T	130022
3" (75)	Tapped	2	73.0	76.5	1.0	F458300T	130024

Rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	1.6	F458000R	100022
3" (75)	Clearance	4	73.0	76.5	1.0	F458300R	100024
Blank	Tapped	3	–	–	1.6	F458000RT	120022
3" (75)	Tapped	4	73.0	76.5	1.0	F458300RT	120024

Hardware

Description	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 3.01" (76.5) ID	10	0.5	GK-300	191011
Gasket, Viton®, 3.36" (85.0) ID	1	0.1	GK-300V	191012
High-temperature thread lubricant (28gm)	1	0.1	FEL-PRO C-102	1260200
Flange cover, plastic	1	0.1	FC458	192005

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

6¾" OD US sizes 171mm

Non-rotatable

Rotatable

Features

- UHV rated to 1×10^{-13} mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Conflat®-compatible design

Specifications

Material	
Flanges	304ss
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal or 12-point head
Nut type	Hexagonal
Size	5/16"-24 UNF
Torque	20 Nm
Vacuum range	to below 10^{-13} mbar
Temperature range	-200°C to 450°C
Weight	3.6 kg maximum
Dimensions	171.5 OD x 123.7 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

Figure 2

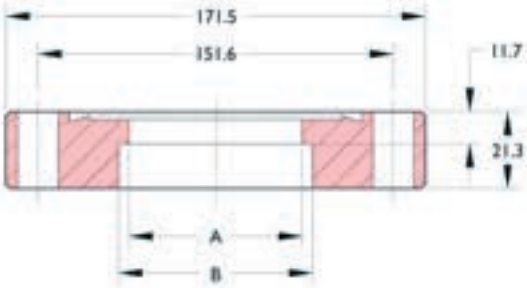


Figure 3

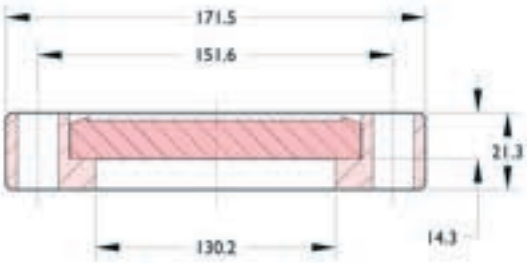
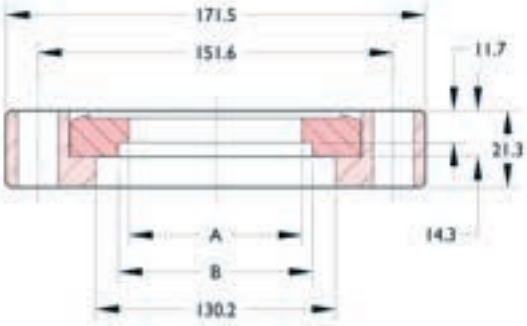


Figure 4



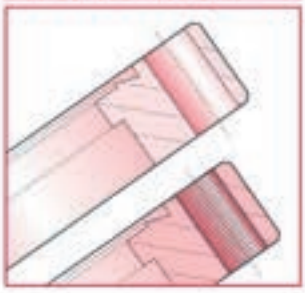
- Through hole flanges have 18 bolt holes drilled 8.4 diameter
- Tapped flanges have 18 bolt holes threaded 5/16"-24 UNF

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

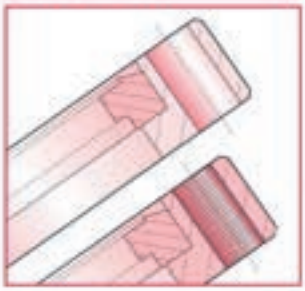
6¾" OD US sizes 171mm

Non-rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	3.6	F675000	110027
5" (127)	Clearance	2	123.7	127.3	1.6	F675500	110029
Blank	Tapped	1	–	–	3.6	F675000T	130027
5" (127)	Tapped	2	123.7	127.3	1.6	F675500T	130029

Rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	3.6	F675000R	100027
5" (127)	Clearance	4	123.7	127.3	1.6	F675500R	100029
Blank	Tapped	3	–	–	3.6	F675000RT	120027
5" (127)	Tapped	4	123.7	127.3	1.6	F675500RT	120029

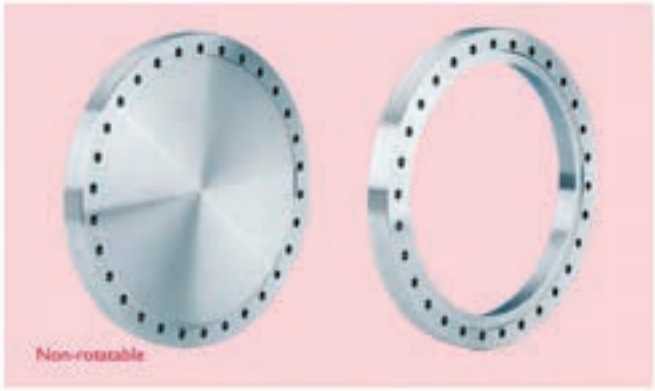
Hardware

Description	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 5.01" (127.3) ID	10	0.7	GK-500	191015
Gasket, Viton®, 5.34" (135.6) ID	1	0.1	GK-500V	191016
High-temperature thread lubricant (28gm)	1	0.11	FEL-PRO C-102	1260200

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

13¼" OD US sizes 336mm



Non-rotatable

Rotatable

Features

- UHV rated to $1x10^{-11}$ mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Conflat®-compatible design

Specifications

Material	
Flanges	304ss
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal
Nut type	Hexagonal
Size	½"-24 UNF
Torque	35 Nm
Vacuum range	to below 10^{-11} mbar
Temperature range	-200°C to 450°C
Weight	19 kg maximum
Dimensions	336.5 OD x 266.7 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

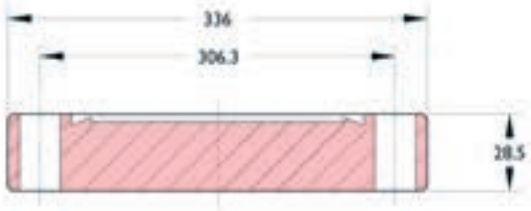


Figure 2

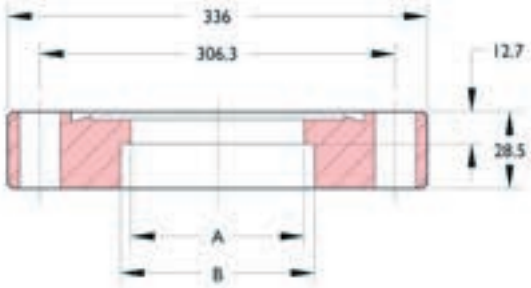


Figure 3

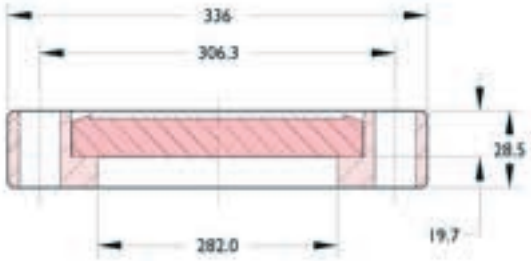
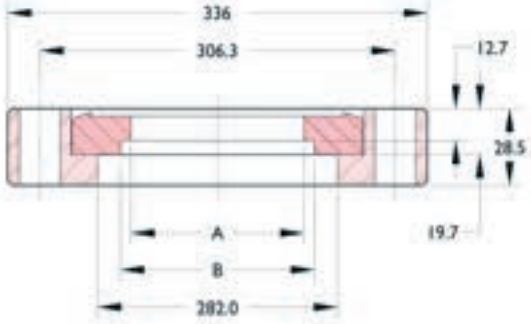


Figure 4



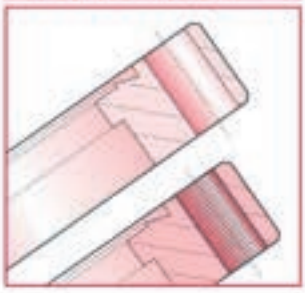
- Through hole flanges have 30 bolt holes drilled 9.9 diameter
- Tapped flanges have 30 bolt holes threaded ½"-24 UNF

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

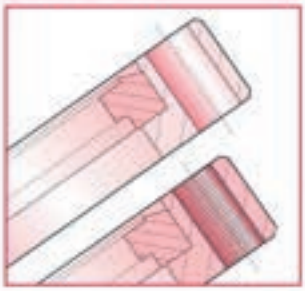
13¼" OD US sizes 336mm

Non-rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	18.6	CFB336	**110034**
10" (254)	Clearance	2	247.7	254.5	8.2	CF336-254	**110035**
10¾" (273)	Clearance	2	266.7	273.4	8.2	CF336-273	**110036**
Blank	Tapped	1	–	–	18.6	CFB336T	**130034**
10" (254)	Tapped	2	247.7	254.5	8.2	CF336-254T	**130035**
10¾" (273)	Tapped	2	266.7	273.4	8.2	CF336-273T	**130036**

Rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	18.6	CFBR336	**100034**
10" (254)	Clearance	4	247.7	254.5	8.2	CFR336-254	**100035**
10¾" (273)	Clearance	4	266.7	273.4	8.2	CFR336-273	**100036**
Blank	Tapped	3	–	–	18.6	CFBR336T	**120034**
10" (254)	Tapped	4	247.7	254.5	8.2	CFR336-254T	**120035**
10¾" (273)	Tapped	4	266.7	273.4	8.2	CFR336-273T	**120036**

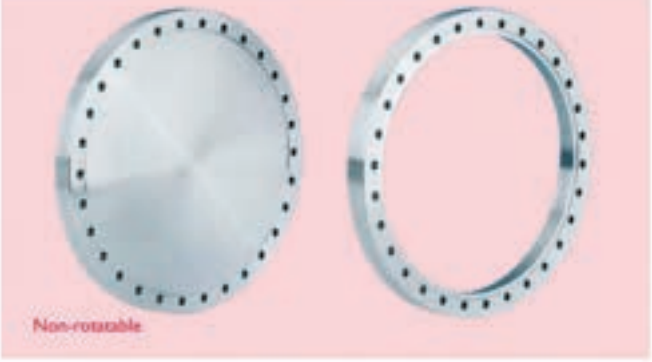
Hardware

Description	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 10.87" (276.0) ID	1	0.1	GK-1000I	**191022**
Gasket, Viton®, 11.36" (288.5) ID	1	0.1	GK-1000V	**191023**
High-temperature thread lubricant (28gm)	1	0.1	FEL-PRO C-102	**1260200**

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

14" OD US sizes 356mm



Non-rotatable

Rotatable

Features

- UHV rated to $1x10^{-13}$ mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Conflat®-compatible design

Specifications

Material	
Flanges	304ss
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal
Nut type	Hexagonal
Size	5/16"-24 UNF
Torque	35 Nm
Vacuum range	to below 10^{-13} mbar
Temperature range	-200°C to 450°C
Weight	21 kg maximum
Dimensions	355.6 OD x 298.5 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

Figure 2

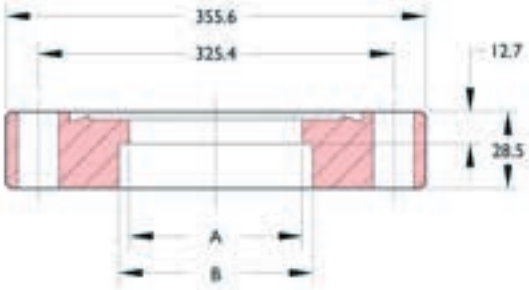


Figure 3

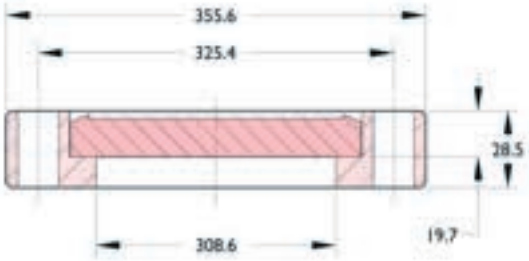
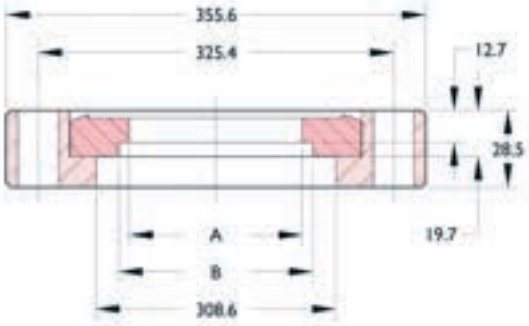


Figure 4



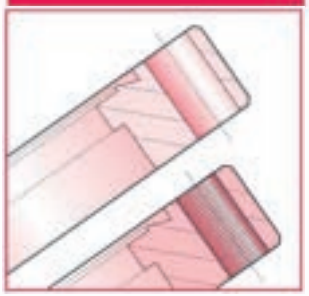
- Through hole flanges have 30 bolt holes drilled 9.9 diameter
- Tapped flanges have 30 bolt holes threaded 5/16"-24 UNF

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

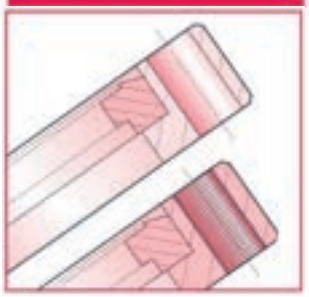
14" OD US sizes 356mm

Non-rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	21.0	CFB355	**110037**
12" (304.8)	Clearance	2	298.5	305.3	9.0	CF355-304	**110038**
Blank	Tapped	1	–	–	21.0	CFB355T	**130037**
12" (304.8)	Tapped	2	298.5	305.3	9.0	CF355-304T	**130038**

Rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	21.0	CFBR355	**100037**
12" (304.8)	Clearance	4	298.5	305.3	9.0	CFR355-304	**100038**
Blank	Tapped	3	–	–	21.0	CFBR355T	**120037**
12" (304.8)	Tapped	4	298.5	305.3	9.0	CFR355-304T	**120038**

Hardware

Description	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 11.52" (292.7) ID	1	0.5	GK-1400I	**191025**
Gasket, Viton®, 12.11" (307.6) ID	1	0.1	GK-1400V	**191026**
High-temperature thread lubricant (28gm)	1	0.1	FEL-PRO C-102	**1260200**

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

16½" OD US sizes 419mm

Non-rotatable

Rotatable

Features

- UHV rated to 1×10^{-13} mbar
- High-temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Tapped or clearance bolt holes
- Conflat®-compatible design

Specifications

Material	
Flanges	304ss
Gaskets, metal / elastomer	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal
Nut type	Hexagonal
Size	⅜"-24 UNF
Torque	35 Nm
Vacuum range	to below 10^{-13} mbar
Temperature range	-200°C to 450°C
Weight	29 kg maximum
Dimensions	420 OD x 349.3 ID maximum

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

UHV Series

Figure 1

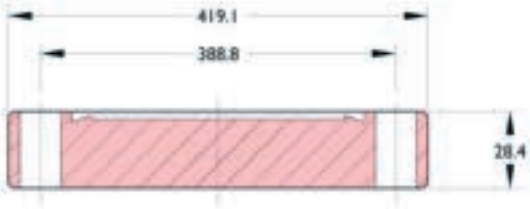


Figure 2

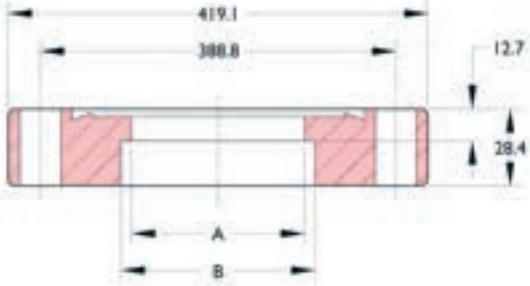


Figure 3

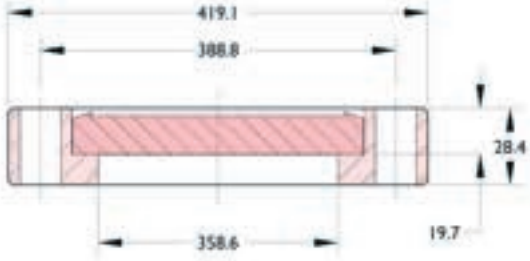
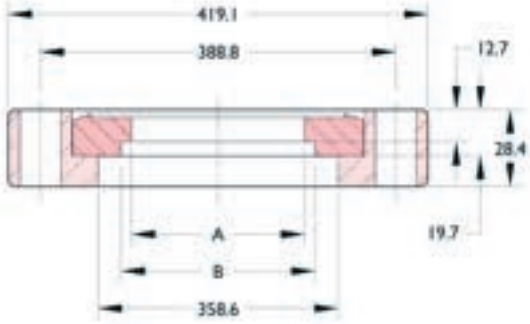


Figure 4



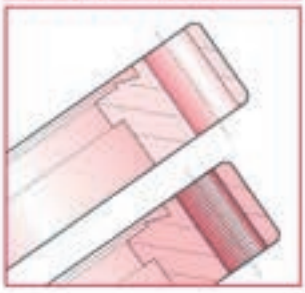
- Through hole flanges have 36 bolt holes drilled 9.9 diameter
- Tapped flanges have 36 bolt holes threaded ⅜"-24 UNF

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Del-Seal™ CF flanges

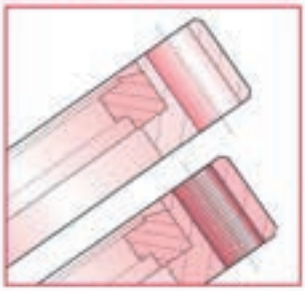
16½" OD US sizes 419mm

Non-rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	1	–	–	29.0	CFB419	110039
14" (355)	Clearance	2	349.3	356.1	12.0	CF419-355	110040
Blank	Tapped	1	–	–	29.0	CFB419T	130039
14" (355)	Tapped	2	349.3	356.1	12.0	CF419-355T	130040

Rotatable



Nominal matching tube OD	Bolt hole	Figure	A	B	Wt kg	Reference	Part number
304 Stainless steel							
Blank	Clearance	3	–	–	29.0	CFBR419	100039
14" (355)	Clearance	4	349.3	356.1	12.0	CFR419-355	100040
Blank	Tapped	3	–	–	29.0	CFBR419T	120039
14" (355)	Tapped	4	349.3	356.1	12.0	CFR419-355T	120040

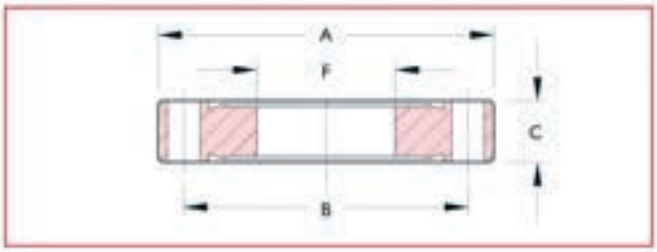
Hardware

Description	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 14.11" (358.4) ID	1	0.05	GK-1650I	191028
Gasket, Viton®, 14.60" (370.8) ID	1	0.05	GK-1650V	191029
High-temperature thread lubricant (28gm)	1	0.4	FEL-PRO C-102	1260200

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

Double sided



UHV Series

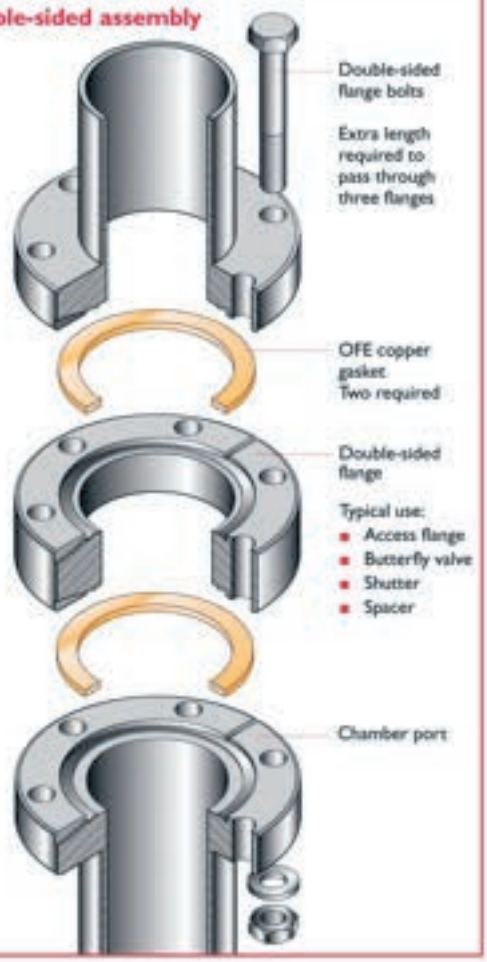
Description

CF double-sided flanges are designed to be inserted between two flanges of the same size. This provides a simple method for adding thermocouple gauge tubes or up-to-air valves to a system with virtually no change in conductance or pumping speed.

All CF double-sided flanges are made of 304ss material. Each assembly requires two gaskets and longer-length bolts.

Caburn-MDC does not recommend stacking more than one double-sided flange in a single assembly.

Typical double-sided assembly



Features

- UHV rated to 1×10^{-11} mbar
- High-temperature rated to 450°C
- Non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Clearance bolt holes on most flanges
- Conflat®-compatible design complies with ISO 3669

Specifications

Material	
Flanges	304ss
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal or socket head
Nut type	Hexagonal
Size / torque	M4/9 Nm, M6/16 Nm, M8/20 Nm, M8/35 Nm
Vacuum range	to below 10^{-11} mbar
Temperature range	-200°C to 450°C
Weight and dimensions	See table

Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C

DN63CF to DN100CF

Nominal size	A	B	C	F	No. of holes	Hole size	Wt kg	Reference	Part number
DN63CF									
63	114	92.2	17.3	Blank	8	8.4	1.4	CFD8114	140018
63	114	92.2	17.3	38	8	8.4	1.1	CFD114-38	140019
63	114	92.2	17.3	51	8	8.4	1.0	CFD114-51	140020
63	114	92.2	17.3	63	8	8.4	1.0	CFD114-63	140021
DN100CF									
100	152	130.3	19.8	Blank	16	8.4	2.5	CFD8150	140025
100	152	130.3	19.8	102	16	8.4	1.6	CFD150-100	140026

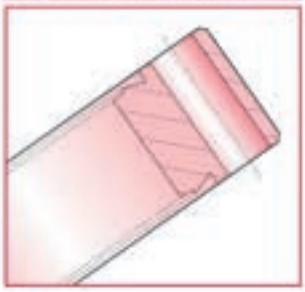
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Section 1.1

CF Flanges

Double sided

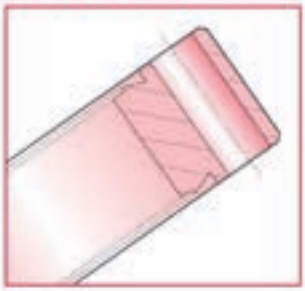
DN16CF to DN40CF



- 316LN available upon request, but may be subject to longer lead-times

Nominal size	A	B	C	F	No. of holes	Hole size	Wt kg	Reference	Part number
DN16CF									
16	34	27.0	7.2	Blank	6	4.4	0.2	CFDB34	140000
16	34	27.0	7.2	9.7	6	4.4	0.2	CFD34-09	140002
16	34	27.0	7.2	12.7	6	4.4	0.2	CFD34-13	140003
DN40CF									
40	70	58.7	19.1	Blank	6	6.7	0.3	CFDB70	140007
40	70	58.7	25.4	Blank	6	6.7	0.3	CFDB70-1	140043
40	70	58.7	19.1	7	6	6.7	0.3	CFD70-06	140008
40	70	58.7	19.1	12	6	6.7	0.3	CFD70-12	140009
40	70	58.7	19.1	19	6	6.7	0.3	CFD70-19	140010
40	70	58.7	19.1	25	6	6.7	0.3	CFD70-25	140011
40	70	58.7	19.1	32	6	6.7	0.3	CFD70-32	140012
40	70	58.7	19.1	38	6	6.7	0.3	CFD70-38	140013
40	70	58.7	25.4	38	6	6.7	0.3	CFD70-38/25	140014

DN160CF to DN200CF



- 316LN available upon request, but may be subject to longer lead-times

Nominal size	A	B	C	F	No. of holes	Hole size	Wt kg	Reference	Part number
DN160CF									
160	203	181	22.0	Blank	20	8.4	5.5	CFDB200	140030
160	203	181	22.0	150	20	8.4	2.5	CFD200-150	140031
DN200CF									
200	254	232	24.6	Blank	24	8.4	4.0	CFDB250	140032
200	254	232	24.6	203	24	8.4	3.4	CFD250-200	140033

Hardware

- Bolt sets for clearance hole flanges include screws and nuts
- Bolt sets for tapped flanges include screws only
- Gold plated gaskets available on request

Description	Bolt[1] hole	Bolt length	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 16 ID	–	–	10	0.1	CCG16	1113240
Gasket, Viton®, 16 ID	–	–	5	0.1	VG16	191001
Socket head screw M4[1]	T	30	25	0.2	M4-30	1113015
Gasket, copper, 37 ID	–	–	10	0.3	CCG40	1113241
Gasket, Viton®, 43 ID	–	–	5	0.1	VG40	191005
Hex-head bolts M6[1]	T	55	25	0.4	M6-55	1113022
Gasket, copper, 63 ID	–	–	10	0.3	CCG63	1113242
Gasket, Viton®, 77 ID	–	–	1	0.1	VG63	191010
Hex-head bolt M8[1]	C	65	25	1.0	M8-65	1113028
Gasket, copper, 101 ID	–	–	10	0.7	CCG100	1113243
Gasket, Viton®, 115 ID	–	–	1	0.1	VG100	191014
Hex-head bolt, M8[1]	C	70	25	2.0	M8-70	1113029
Gasket, copper, 152 ID	–	–	10	1.0	CCG160	1113244
Gasket, Viton®, 153 ID	–	–	1	0.1	VG160	191018
Hex-head bolt, M8[1]	C	80	25	1.0	M8-80	1113030
Gasket, copper, 203 ID	–	–	10	1.4	CCG200	1113245
Gasket, Viton®, 203 ID	–	–	1	0.1	VG200	191020
Hex-head bolt, M8[1]	C	90	25	1.0	M8-90	1113031

[1] For use with standard flanges

[1] For use with double sided flanges

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges

Zero-length reducers

UHV Series

Description

Zero length reducers are used for a change in size of flanges within the CF family. "Zero length" means the total thickness of a unit is the thickness of one flange only.

Features

- UHV rated to $1x10^{-13}$ mbar
- High-temperature rated to 450°C
- Non-rotatable geometry
- OFE Copper or optional Viton® elastomer gaskets
- Clearance and blind-tapped bolt holes
- Conflat®-compatible with other manufacturers' knife edge flanges and complies with ISO 3669

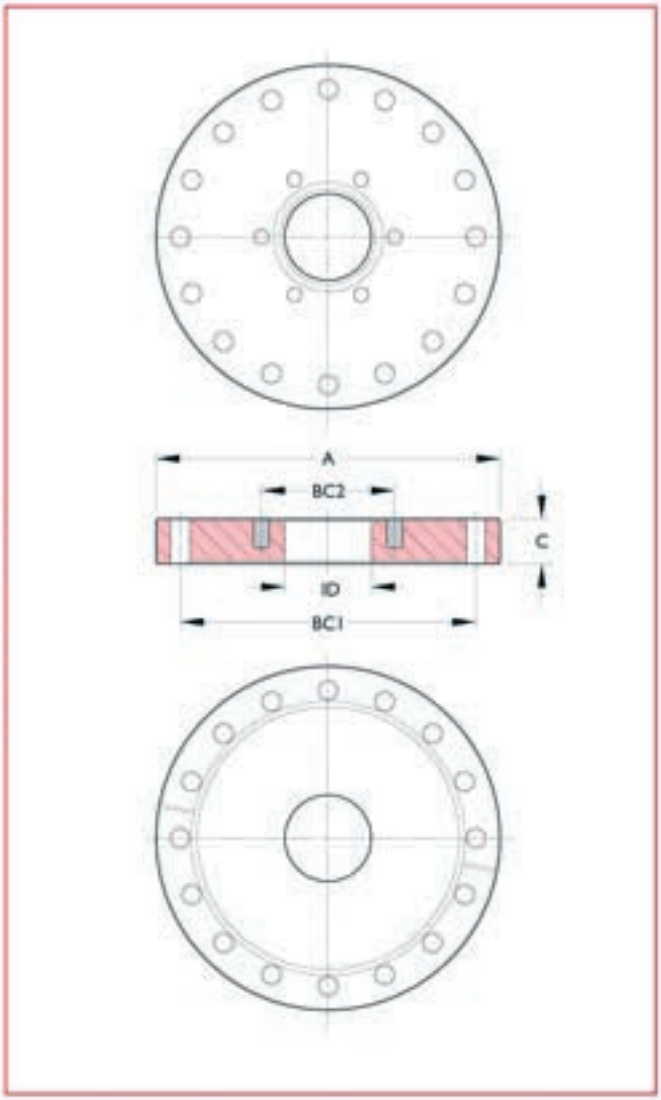
Specifications

Material	
Flanges	304ss
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal or socket head
Nut type	Hexagonal
Size/torque	M4/9 Nm, M6/16 Nm, M8/20 Nm
Vacuum range	to below 10^{-13} mbar
Temperature range	-200°C to 450°C
Weight and dimensions	See table

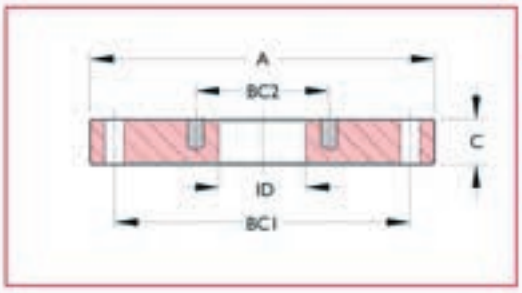
Elastomer seal temperature range

Sustained: -20°C to 150°C

Intermittent: 200°C



All dimensions are nominal in millimetres unless specified - Weights given are approximate



CF to CF Zero-length reducers

Information

- Custom designs available on request
- 316LN material available on request, a longer lead time may apply

	Mating flange side		Smaller flange side							
Connects flanges	Nominal OD-A	BC1	Nominal OD	ID	BC2	Thread BC2	C	Wt kg	Reference	Part number
304 Stainless steel										
DN40CF-16CF	70	58.7	34	15.7	26.9	M4	12.7	0.2	CFZ40-16	150055
DN63CF-16CF	114	92.2	34	15.7	26.9	M4	17.3	1.4	CFZ63-16	150060
DN63CF-40CF	114	92.2	70	38.1	58.7	M6	17.3	1.1	CFZ63-40	150062
DN100CF-16CF	150	130.3	34	15.7	26.9	M4	19.8	2.7	CFZ100-16	150068
DN100CF-40CF	150	130.3	70	38.1	58.7	M6	19.8	2.5	CFZ100-40	150070
DN100CF-63CF	150	130.3	114	63.5	92.2	M8	19.8	2.0	CFZ100-63	150072
DN160CF-40CF	200	181.1	70	38.1	58.7	M6	22.4	5.4	CFZ160-40	150083
DN160CF-63CF	200	181.1	114	63.5	92.2	M8	22.4	4.8	CFZ160-63	150085
DN160CF-100CF	200	181.1	150	101.6	130.3	M8	22.4	3.9	CFZ160-100	150087
DN200CF-40CF	250	231.9	70	38.1	58.7	M6	24.6	9.0	CFZ200-40	150091
DN200CF-63CF	250	231.9	114	63.5	92.2	M8	24.6	9.0	CFZ200-63	150093
DN200CF-100CF	250	231.9	150	101.6	130.3	M8	24.6	8.4	CFZ200-100	150095
DN200CF-160CF	250	231.9	200	152.4	181.1	M8	24.6	7.7	CFZ200-160	150097
DN250CF-63CF	304	284	114	63.5	92.2	M8	28.5	18.0	CFZ250-63	1114020
DN250CF-100CF	304	284	150	101.6	130.3	M8	28.5	17.3	CFZ250-100	1114023
DN250CF-160CF	304	284	200	152.4	181.1	M8	28.5	16.8	CFZ250-160	1114024
DN250CF-200CF	304	284	254	204.7	231.9	M8	28.5	15.5	CFZ250-200	1114025

Hardware

- Bolt sets for clearance hole flanges include screws and nuts
- Bolt sets for tapped flanges include screws only
- Gold plated gaskets available on request

Description	Bolt[1] hole	Bolt length	Qty per pack	Wt kg	Reference	Part number
Gasket, copper, 16 ID	–	–	10	0.1	CCG16	1113240
Gasket, Viton®, 16 ID	–	–	5	0.1	VG16	191001
Socket head screw M4[1]	T	30	25	0.2	M4-30	1113015
Gasket, copper, 37 ID	–	–	10	0.3	CCG40	1113241
Gasket, Viton®, 43 ID	–	–	5	0.1	VG40	191005
Hex-head bolts M6[2]	T	55	25	0.4	M6-55	1113022
Gasket, copper, 63 ID	–	–	10	0.3	CCG63	1113242
Gasket, Viton®, 77 ID	–	–	1	0.1	VG63	191010
Hex-head bolt M8[2]	C	65	25	1.0	M8-65	1113023
Gasket, copper, 101 ID	–	–	10	0.7	CCG100	1113243
Gasket, Viton®, 115 ID	–	–	1	0.1	VG100	191014
Hex-head bolt, M8[2]	C	70	25	2.0	M8-70	1113029
Gasket, copper, 152 ID	–	–	10	1.0	CCG160	1113244
Gasket, Viton®, 153 ID	–	–	1	0.1	VG160	191018
Hex-head bolt, M8[2]	C	80	25	1.0	M8-80	1113030
Gasket, copper, 203 ID	–	–	10	1.4	CCG200	1113245
Gasket, Viton®, 203 ID	–	–	1	0.1	VG200	191020
Hex-head bolt, M8[2]	C	90	25	1.0	M8-90	1113031

[1] For use with standard flanges
[2] For use with double sided flanges

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges and fittings

Introduction

Features

- UHV rated to $1x10^{-13}$ mbar
- High temperature rated to 450°C
- Rotatable and non-rotatable geometries
- OFE Copper or optional Viton® elastomer gaskets
- Conflat® compatible design to ISO 3669

Specifications

Material	
Flanges	304 (1.4301) or 316EFR (1.4429 ESU)
Tube	304ss or 316Ss
Gaskets	OFE Copper
Bolts	Stainless steel
Fastening	
Bolt type	Hexagonal
Nut type	Hexagonal or two-hole plate nuts
Size / torque	See individual flange specs
Vacuum	
Range	to below 10^{-13} mbar
Leak test	$2x10^{-10}$ l/sec of He
Temperature range	-200°C to 450°C
Weight and dimensions	See table

UHV Series

Description

Caburn-MDC CF tube fittings are convenient building-block components. They offer great flexibility in the design and construction of high and ultra-high vacuum systems. All fittings are fabricated from stainless steel drawn and welded vacuum tubing.

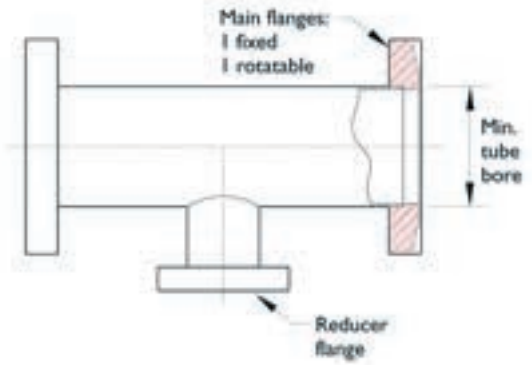
To facilitate assembly alignment, a rotatable flange is supplied opposite a non-rotatable flange on each axis. Elbows are supplied with two rotatable flanges.

In general, reducers are used for a change in size of flanges within a single method of sealing, such as CF to CF. Reducers may be either zero-length or include a section of tubing between flanges.

Non-zero-length reducers are also called nipple reducers and have either a straight tube or a conical section between flanges.

In general, hybrid adaptors provide a transition between two different methods of creating a vacuum seal, such as metal seal CF to elastomer seal ISO.

Reducing tees and crosses have a single main tube with main flanges and a smaller diameter reducer tube with a reducer flange or flanges.



- Main flanges are on the larger tube
- Reducer flange is on the smaller tube
- In general, each axis includes one rotatable and one non-rotatable flange
- Tubes are specified by minimum bore

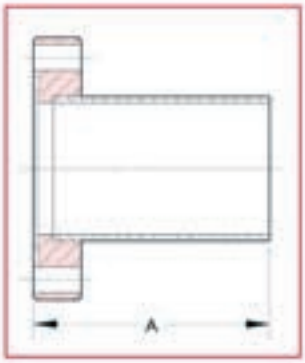
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges and fittings

Tubulated CF flanges

Tubulated CF flanges Half nipple



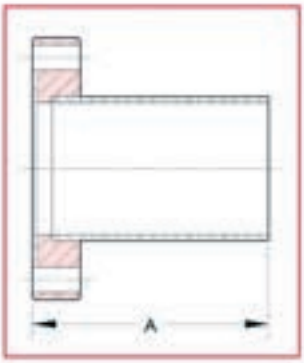
Features

- Weldable fitting
- Fixed or rotatable CF flanges
- Custom lengths available on request

Nominal flange	Flange OD	Flange config'	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel							
DN16CF	34	F	15.8	38	0.2	CST16-T	401000
DN16CF	34	R	15.8	38	0.2	CRST16-T	401020
DN40CF	70	F	34.8	63	0.5	CST40-T	401002
DN40CF	70	F	38.0	63	0.6	E-CST40-T	1115061
DN40CF	70	R	34.8	63	0.5	CRST40-T	401022
DN63CF	114	F	60.3	105	1.4	CST63-T	401004
DN63CF	114	R	60.3	105	1.4	CRST63-T	401024
DN100CF	152	F	97.8	135	1.8	CST100-T	401006
DN100CF	152	R	97.8	135	1.8	CRST100-T	401026
DN160CF	203	F	147.0	167	3.4	CST160-T	401008
DN160CF	203	R	147.0	167	3.4	CRST160-T	401045
DN200CF	254	F	197.0	203	5.0	CST200-T	401009

[1] R = Rotatable
F = Fixed

Tubulated CF flanges Half nipple



Features

- 316LN flanges
- Use for low-magnetic-field environments
- Increased conductance over standard fittings
- Custom lengths available on request

Nominal flange	Flange OD	Flange config'	Min. tube bore	A	Wt kg	Reference	Part number
EURO-CF Series 316LN Larger-bore tube							
DN16CF	34	F	17.2	38	0.2	EST16-T	1116000
DN40CF	70	F	38.0	63	0.5	EST40-T	1116001
DN63CF	114	F	66.0	105	1.4	EST63-T	1116002
DN100CF	152	F	102.0	135	1.8	EST100-T	1116003
DN160CF	203	F	150.0	167	3.4	EST160-T	1116004
DN200CF	254	F	203.0	203	5.0	EST200-T	1116005
DN250CF	304	F	248.0	254	12.7	EST250-T	1116006

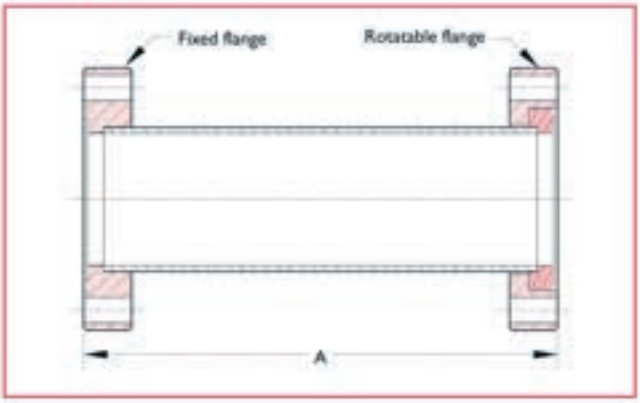
[1] F = Fixed

Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

CF Flanges and fittings

Straight connectors

Straight connectors Full nipple

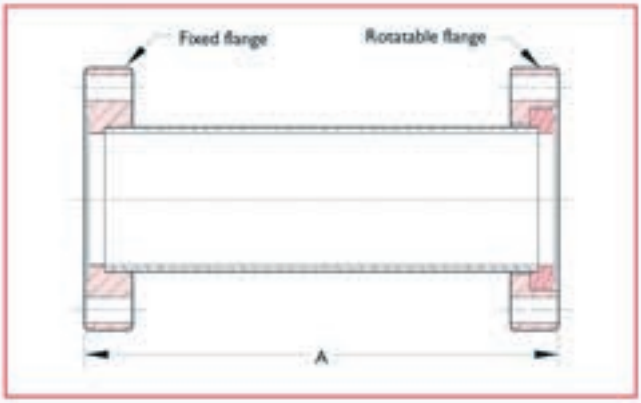


Features

- Coupling to mate two identical size CF flanges
- Includes one rotatable and one non-rotatable CF flanges
- Custom lengths available on request

Nominal flange	Flange OD	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel						
DN16CF	34	15.8	76	0.2	CST16	402000
DN40CF	70	34.8	125	0.7	CST40	402002
DN40CF	70	38.0	125	0.8	E-CST40	1115011
DN63CF	114	60.3	210	1.4	CST63	402004
DN100CF	152	97.8	270	4.3	CST100	402006
DN160CF	203	147.0	333	7.3	CST160	402008
DN200CF	254	197.0	406	12.5	CST200	402009

Straight connectors Full nipple



Features

- 316LN flanges
- Use for low magnetic field environments
- Increased conductance over standard fittings
- Custom lengths available on request

Nominal flange	Flange OD	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel						
DN16CF	34	17.2	76	0.2	EST16	1116010
DN40CF	70	38.0	125	0.7	EST40	1116011
DN63CF	114	66.0	210	1.4	EST63	1116012
DN100CF	152	102.0	270	4.3	EST100	1116013
DN160CF	203	150.0	333	7.3	EST160	1116014
DN200CF	254	203.0	406	12.5	EST200	1116015

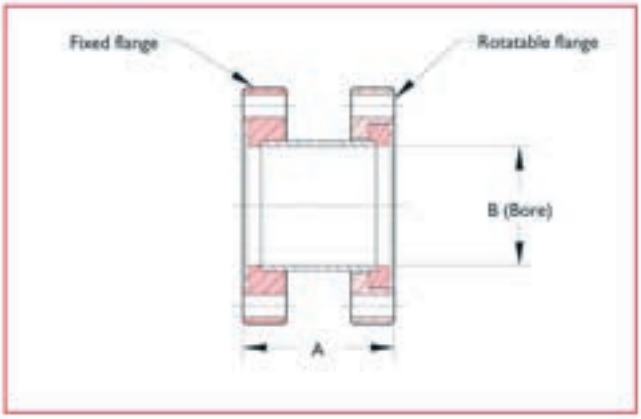
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges and fittings

Straight connectors and flexible couplings

Minimum length



Features

- Special nipple to mate two tapped flanges
- CF-flanged nipple mounts between two tapped flanges with minimum spacing
- Includes metric threaded studs,nuts and washers

The tapped flange adaptor is a nipple with a minimum length for mating two tapped flanges. Studs must be screwed into each tapped flange prior to installing the adaptor. The tapped flange adaptor has clearance holes on each flange which slip over the studs. Nuts are then fixed to the studs to complete installation. Studs, nuts and washers are provided with the adaptor.

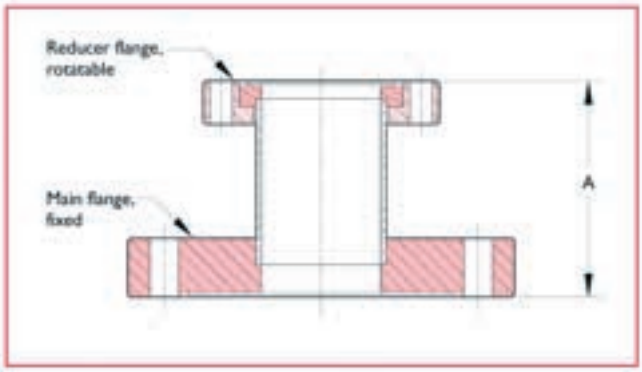
Main flange nominal	A	Min. B	Wt kg	Reference	Part number
DN16CF	44.5	16	0.2	TFA-16	1115149
DN40CF	58.5	38	1.0	TFA-40	1115150
DN63CF	67.2	66	2.0	TFA-63	1115151
DN100CF	76.5	102	3.8	TFA-100	1115152

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges and fittings

Nipple reducers

Straight tube

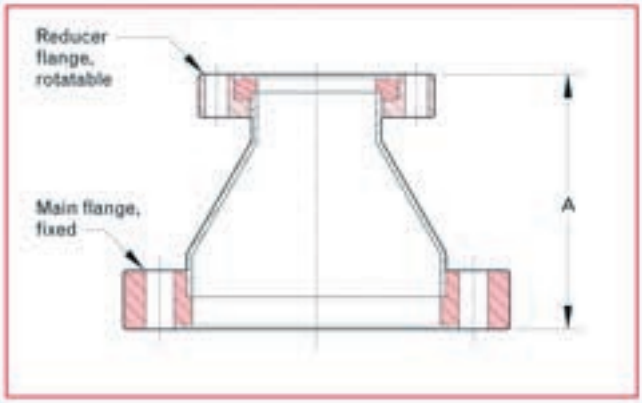


Features

- For CF-to-CF connections of different size flanges
- Smaller flange is rotatable
- Custom lengths available on request
- Also available in Euro-CF Series 316LN on request

Main flange nominal	OD	Reducer nominal	Flange OD	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel								
DN40CF	70	DN16CF	34	17.2	50	0.5	E-CST40-16	1115035
DN63CF	114	DN40CF	70	38.0	60	1.6	E-CST63-40	1115036
DN100CF	152	DN40CF	70	38.0	75	2.0	E-CST100-40	1115037
DN100CF	152	DN63CF	114	66.0	95	2.5	E-CST100-63	1115038
DN160CF	203	DN40CF	70	38.0	75	3.0	E-CST160-40	1115039
DN160CF	203	DN63CF	114	66.0	95	3.5	E-CST160-63	1115040
DN160CF	203	DN100CF	152	102.0	120	4.0	E-CST160-100	1115041
DN200CF	254	DN40CF	70	38.0	120	4.3	E-CST200-40	1115042
DN200CF	254	DN63CF	114	66.0	120	4.5	E-CST200-63	1115043
DN200CF	254	DN100CF	152	102.0	160	5.0	E-CST200-100	1115044
DN200CF	254	DN160CF	203	150.0	160	7.2	E-CST200-160	1115045
DN250CF	304	DN63CF	114	66.0	160	10.0	E-CST250-63	1115046
DN250CF	304	DN100CF	152	102.0	160	12.0	E-CST250-100	1115047
DN250CF	304	DN200CF	254	203.0	160	15.0	E-CST250-200	1115048

Conical



Features

- For CF-to-CF connections of different size flanges
- Smaller flange is rotatable

Main flange nominal	OD	Reducer nominal	Flange OD	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel								
DN40CF	70	DN16CF	34	34.8 - 17.2	78	0.7	FCR275133	402030
DN63CF	114	DN40CF	70	60.3 - 34.8	75	1.8	FCR450275	402032
DN100CF	152	DN63CF	114	97.8 - 60.3	113	2.5	FCR600450	402038
DN160CF	203	DN100CF	152	149.2 - 98.4	252	6.8	FCR800600	402040

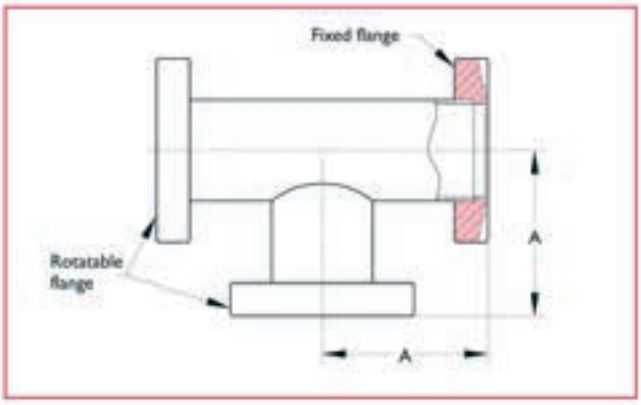
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges and fittings

Tees

Tee

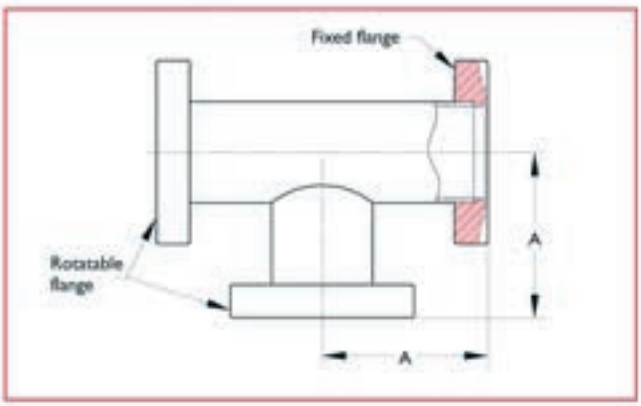


Features

- Each axis has one rotatable flange
- Custom lengths available on request

Nominal flange	Flange OD	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel						
DN16CF	34	15.8	38	0.4	CFT16	404000
DN40CF	70	38.0	63	1.2	CFT40	404002
DN63CF	114	60.3	86	3.6	CFT63-X	404038
DN63CF	114	60.3	105	3.6	CFT63	7404038
DN100CF	152	97.8	135	6.8	CFT100-X	404040
DN160CF	203	147.0	167	11.4	CFT160-X	404041
DN200CF	254	197.0	203	23.3	CFT200-X	404042

Tee



Features

- 316LN flanges
- Use for low magnetic field environments
- Large tube bores
- Custom lengths available on request

Nominal flange	Flange OD	Min. tube bore	A	Wt kg	Reference	Part number
Euro-CF Series 316LN Larger-bore tube						
DN16CF	34	17.2	38	0.4	ET16	1116060
DN40CF	70	38.0	63	1.2	ET40	1116061
DN63CF	114	66.0	105	3.6	ET63	1116062
DN100CF	152	102.0	135	6.8	ET100	1116063
DN160CF	203	150.0	167	11.4	ET160	1116064
DN200CF	254	203.0	203	23.3	ET200	1116065

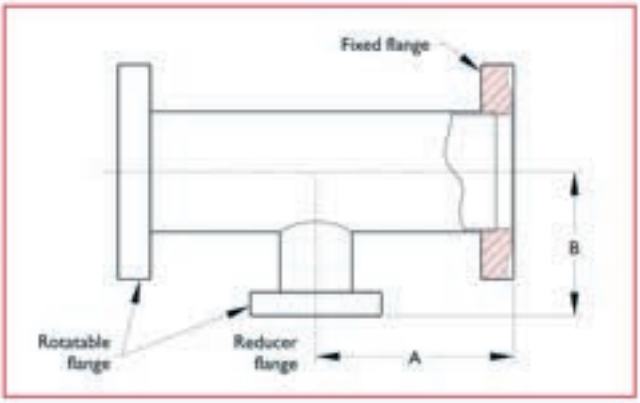
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges and fittings

Reducing tees

Reducing tees



Features

- CF-to-CF connections of different size flanges
- Each axis has one rotatable flange
- Custom lengths available on request
- Also available in Euro-CF Series 316LN on request

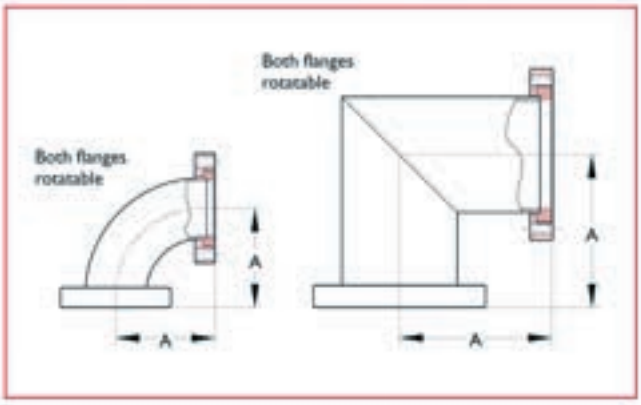
Main flanges nominal	Min. tube bore	A	Reducer flange nominal	Min. tube bore	B	Wt kg	Reference	Part number
304 Stainless steel								
DN40CF	38.0	63	DN16CF	17.2	60	1.0	E-CRT40-16	1115070
DN63CF	66.0	105	DN40CF	38.0	77	1.6	E-CRT63-40	1115071
DN100CF	102.0	135	DN40CF	38.0	95	4.0	E-CRT100-40	1115072
DN100CF	102.0	135	DN63CF	66.0	95	5.0	E-CRT100-63	1115073
DN160CF	150.0	167	DN63CF	66.0	120	8.0	E-CRT160-63	1115074
DN160CF	150.0	167	DN100CF	102.0	120	9.0	E-CRT160-100	1115075
DN200CF	202.5	203	DN100CF	102.0	145	12.7	E-CRT200-100	1115076
DN200CF	202.5	203	DN160CF	150.0	145	14.2	E-CRT200-160	1115077

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges and fittings

Elbows

90°

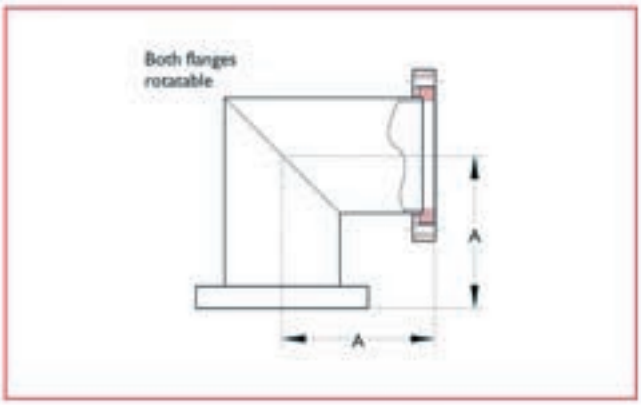


Features

- Radial or mitred tube

Nominal flange	Flange OD	Bend type	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel							
DN16CF	34	Radius	15.8	38.1	0.2	CFL16	403000
DN40CF	70	Radius	34.8	62.5	0.7	CFL40	403002
DN63CF	114	Radius	60.3	105	2.3	CFL63	403004
DN100CF	152	Radius	97.8	163	5.0	CFL100-X	403038
DN160CF	203	Mitre	147.0	167	8.8	CFL160-X	403039
DN200CF	254	Mitre	197.0	203	12.3	CFL200	403009

90°



Features

- 316LN flanges
- Use for low magnetic field environments
- Increased conductance over standard fittings

Nominal flange	Flange OD	Bend type	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel							
DN16CF	34	Mitre	15.8	38	0.2	EL16	1116050
DN40CF	70	Mitre	38.0	63	0.7	EL40	1116051
DN63CF	114	Mitre	66.0	105	2.3	EL63	1116052
DN100CF	152	Mitre	102.0	135	4.0	EL100	1116053
DN160CF	203	Mitre	150.0	167	8.8	EL160	1116054
DN200CF	254	Mitre	203.0	203	12.3	EL200	1116055

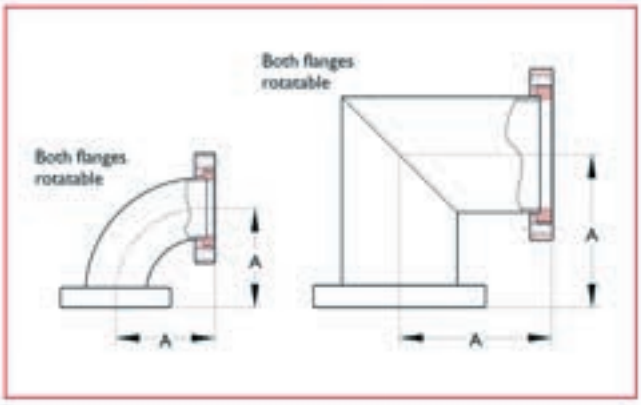
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges and fittings

Elbows

90°

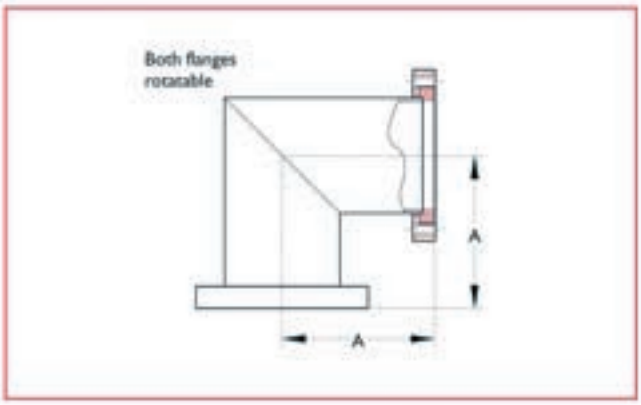


Features

- Radial or mitred tube

Nominal flange	Flange OD	Bend type	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel							
DN16CF	34	Radius	15.8	38.1	0.2	CFL16	403000
DN40CF	70	Radius	34.8	62.5	0.7	CFL40	403002
DN63CF	114	Radius	60.3	105	2.3	CFL63	403004
DN100CF	152	Radius	97.8	163	5.0	CFL100-X	403038
DN160CF	203	Radius	147.0	241	8.8	CFL160-X	403039
DN160CF	203	Mitre	147.0	167	8.8	CFL160	403008
DN200CF	254	Mitre	197.0	203	12.3	CFL200	403009

90°



Features

- 316LN flanges
- Use for low magnetic field environments
- Increased conductance over standard fittings

Nominal flange	Flange OD	Bend type	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel							
DN16CF	34	Mitre	15.8	38	0.2	EL16	1116050
DN40CF	70	Mitre	38.0	63	0.7	EL40	1116051
DN63CF	114	Mitre	66.0	105	2.3	EL63	1116052
DN100CF	152	Mitre	102.0	135	4.0	EL100	1116053
DN160CF	203	Mitre	150.0	167	8.8	EL160	1116054
DN200CF	254	Mitre	203.0	203	12.3	EL200	1116055

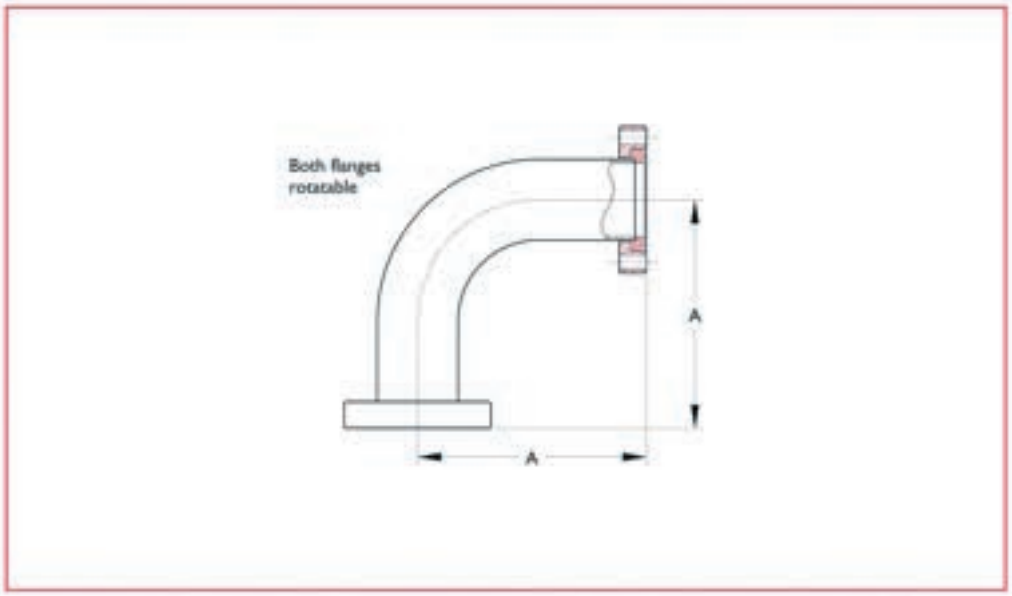
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges and fittings

Elbows

90° with tangents



Features

- Radial tube

Description	Flange OD	Min. tube bore	A	Wt kg	Reference	Part number
304 Stainless steel						
DN16CF	34	17.2	49	0.3	CFLL16	403040
DN40CF	70	34.8	80	1.1	CFLL40	403042
DN63CF	114	60.2	141	2.3	CFLL63	403044
DN100CF	152	97.3	222	5.5	CFLL100	403046

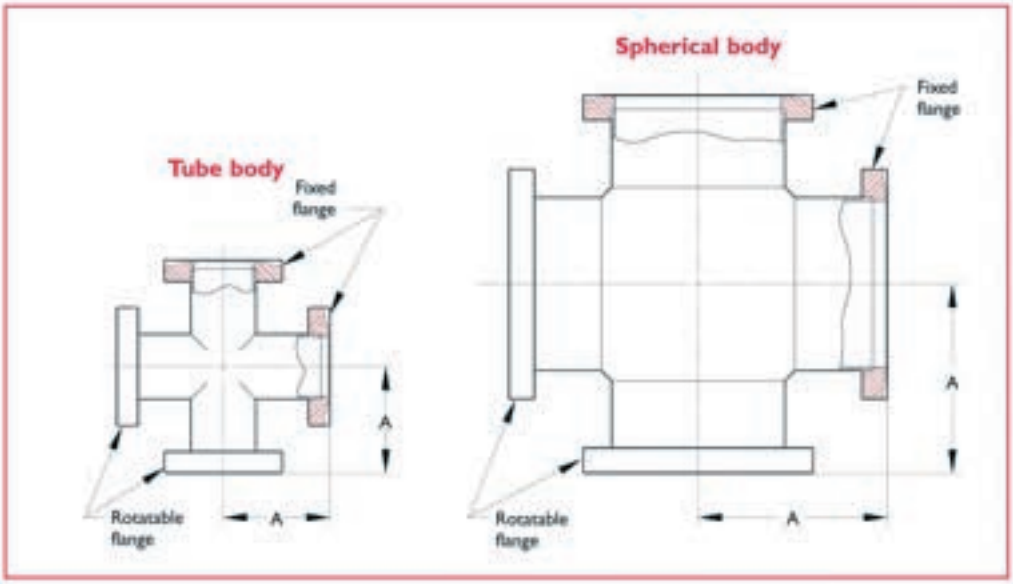
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Four-way crosses

Features

- Each axis has one rotatable flange
- Body type dependent on tube size
- Custom lengths available with larger, Euro-size tubes on request



Nominal flange	Flange OD	Tube min. ID	Body type	Sphere min. ID	A	Wt kg	Reference	Part number
304 Stainless steel								
DN16CF	34	17.3	Tube	–	38.1	0.1	CX4-16	405000
DN40CF	70	34.9	Tube	–	63.0	0.3	CX4-40	405002
DN63CF	114	60.3	Tube	–	105	1.4	CX4-63T	405031
DN100CF	152	97.6	Sphere	165	135.0	2.7	CX4-100S	405006
DN160CF	203	146.4	Tube	–	155.4	4.8	CX4-160T	405034
DN160CF	203	146.4	Sphere	229	167.0	4.8	CX4-160S	405008
DN200CF	254	197.2	Tube	–	190.5	7.6	CX4-200T	405035
DN200CF	254	197.2	Sphere	305	203.2	7.6	CX4-200S	405009

Four-way crosses

Nominal flange	Flange OD	Tube min. ID	Body type	Sphere min. ID	A	Wt kg	Reference	Part number
Euro-CF Series 316LN Larger-bore tube								
DN16CF	34	17.3	Tube	–	38.1	0.1	EX4-16	1116090
DN40CF	70	38.0	Tube	–	63.0	0.3	EX4-40	1116091
DN63CF	114	66.0	Tube	–	105.0	1.4	EX4-63	1116092
DN100CF	152	102.0	Sphere	165	135.0	2.7	EX4-100S	1116093
DN160CF	203	150.0	Sphere	229	167.0	4.8	EX4-160S	1116094
DN200CF	254	203.5	Sphere	305	203.2	7.6	EX4-200S	1116095

Caburn reserves the right to substitute a larger-bore tube according to availability

Features

- 316LN flanges with larger Euro size tube
- Use for low magnetic field environments
- Increased conductance over standard fittings

All dimensions are nominal in millimetres unless specified - Weights given are approximate

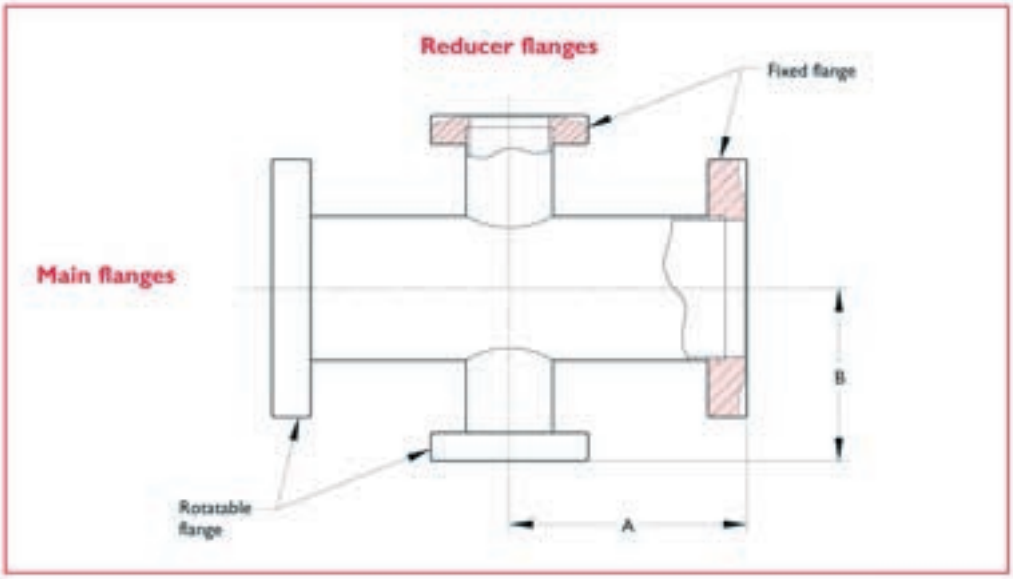
CF Flanges and fittings

Reducing crosses

Reducing crosses

Features

- CF-to-CF connections of different size flanges
- Each axis has one rotatable flange
- Custom lengths available on request
- Also available in Euro CF Series 316LN on request



Long axis flanges	Short axis flanges	Min. main bore	A	B	Min. reducer bore	Wt kg	Reference	Part number
304 Stainless steel								
DN40CF	DN16CF	38	63	60	15.8	1.4	E-CRX40-16	1115100
DN63CF	DN40CF	66	105	77	38	3.5	E-CRX63-40	1115101
DN100CF	DN40CF	102	135	95	38	6.1	E-CRX100-40	1115102
DN100CF	DN63CF	102	135	95	66	7.7	E-CRX100-63	1115103
DN160CF	DN40CF	150	167	120	38	9.7	E-CRX160-40	1115104
DN160CF	DN63CF	150	167	120	66	10.8	E-CRX160-63	1115105
DN160CF	DN100CF	150	167	120	102	10.9	E-CRX160-100	1115106
DN200CF	DN63CF	203	203	145	66	17.4	E-CRX200-63	1115107
DN200CF	DN100CF	203	203	145	102	15.2	E-CRX200-100	1115108
DN200CF	DN160CF	203	203	145	150	21.4	E-CRX200-160	1115109
DN250CF	DN160CF	248	250	230	150	26.1	E-CRX250-160	1115110
DN250CF	DN200CF	248	250	230	203	29.9	E-CRX250-200	1115111

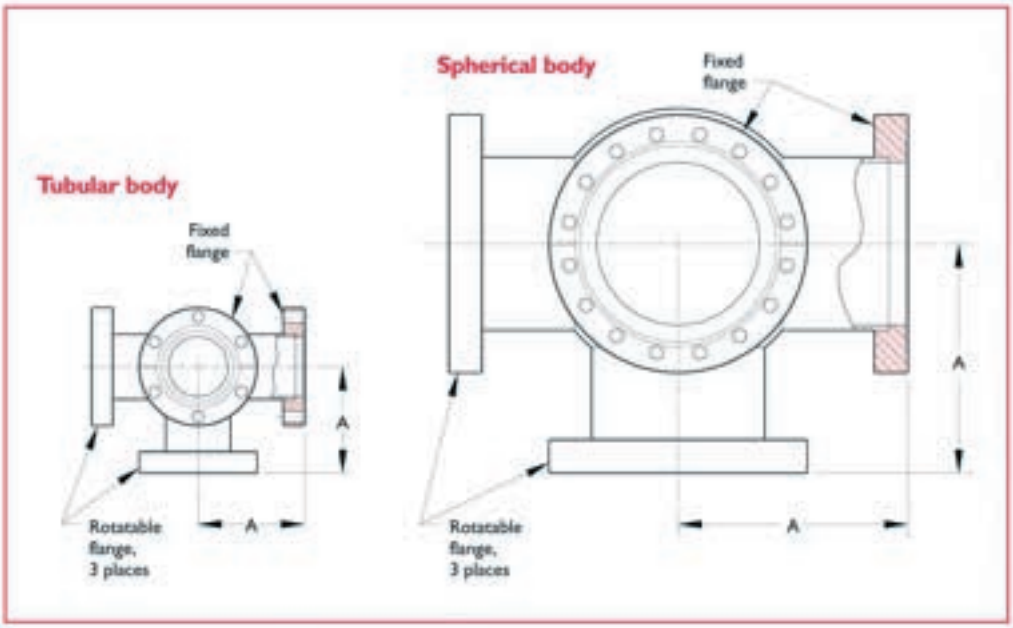
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Five-way crosses

Features

- Each axis has one rotatable flange
- Body type dependent on tube size
- Custom lengths available with larger, Euro-size tubes on request
- Also available in CF Series 316LN on request



Flange nominal	Flange OD	Min. tube ID	Body type	Body dimen. min. ID	Wall	A	Wt kg	Reference	Part number
304 Stainless steel									
DN16CF	34	15.8	Cube	25	–	38.0	0.2	CXS-16	406000
DN40CF	70	34.8	Tube	–	–	62.5	1.6	CXS-40	406002
DN63CF	114	57.5	Tube	–	–	104.6	6.0	CXS-63	406004
DN100CF	152	95.6	Sphere	153	3	135.0	10.0	CXS-100S	406006
DN160CF	203	146.4	Sphere	223	3	166.6	17.3	CXS-160S	406008
DN200CF	254	197.0	Sphere	299	3	203.0	27.2	CXS-200S	406009

Cube body

Five-way crosses with 19mm tubes have one-piece cubes for the main body.

The outer dimension is given in the table.

Caburn-MDC reserves the right to substitute a larger bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

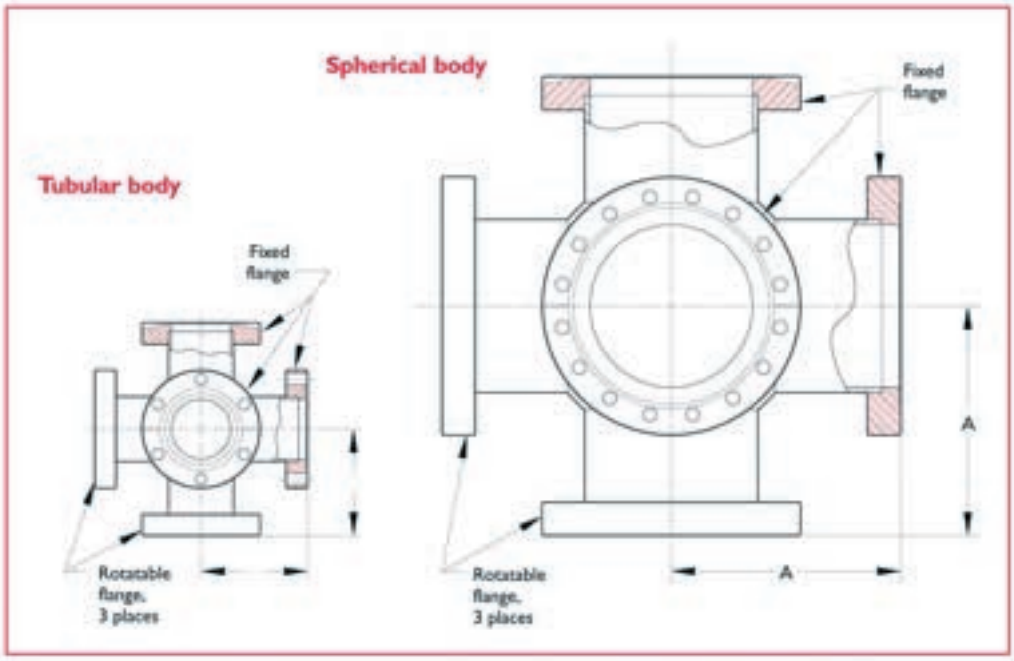
CF Flanges and fittings

Six-way crosses

Six-way crosses

Features

- Each axis has one rotatable flange
- Body type dependent on tube size
- Custom lengths available with larger, Euro-size tubes on request



Flange nominal	Flange OD	Min. tube ID	Body type	Body dimen. min. ID	A	Wt kg	Reference	Part number
304 Stainless steel								
DN16CF	34	15.8	Tube	–	38	0.3	CX6-16	407000
DN40CF	70	34.9	Tube	–	63	1.6	CX6-40	407002
DN63CF	114	57.5	Tube	–	105	8.0	CX6-63	407004
DN100CF	152	96.0	Sphere	153	135	12.0	CX6-100S	407006
DN160CF	203	146.0	Sphere	223	167	20.0	CX6-160S	407008
DN200CF	250	197.0	Sphere	299	203	33.0	CX6-200S	407009

Six-way crosses

Flange nominal	Flange OD	Min. tube ID	Body type	Body dimen. min. ID	A	Wt kg	Reference	Part number
Euro-CF Series 316LN Larger-bore tube								
DN16CF	34	17.2	Tube	–	38	0.3	EX6-16	116130
DN40CF	70	38.0	Tube	–	63	1.6	EX6-40	116131
DN63CF	114	66.0	Tube	–	105	8.0	EX6-63	116132
DN100CF	152	102	Sphere	153	135	12.0	EX6-100S	116133
DN160CF	203	150	Sphere	273	167	20.0	EX6-160S	116134
DN200CF	250	200	Sphere	299	203	33.0	EX6-200S	116135

Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

Features

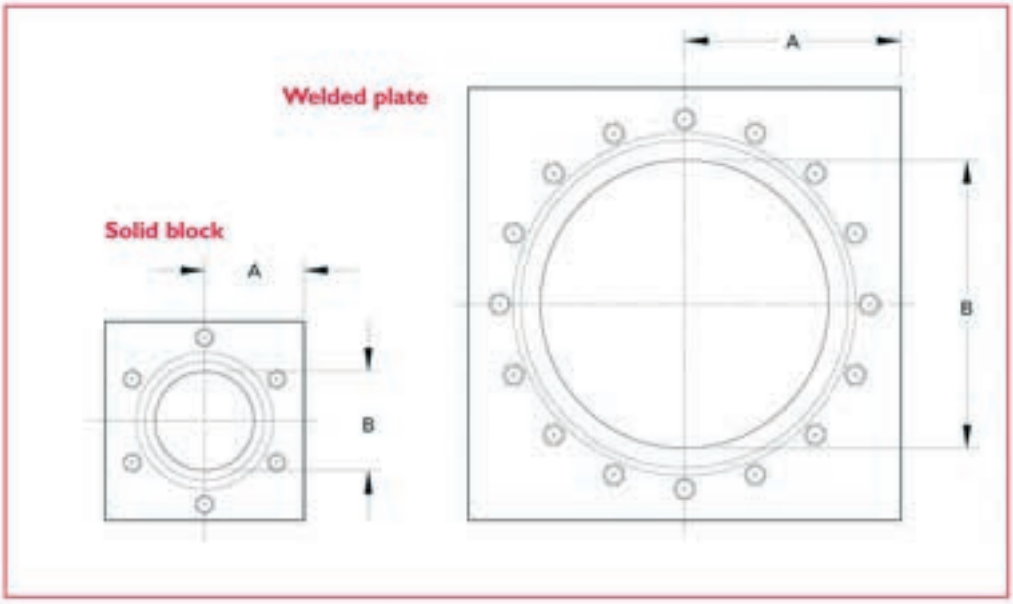
- 316LN flanges with larger, Euro-size tube
- Use for low magnetic field environments
- Increased conductance over standard fittings

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Cubes

Features

- Requires special length bolts – refer to hardware listing for each individual flange size
- Solid block or welded plate fabrication



Nominal flange	A	B	Thread	Bolt length	Wt kg	Reference	Part number
304 Stainless steel							
DN16CF	17.3	15.8	M4	6.4	2	E-CU075-6	408007
DN40CF	35.1	38.0	M6	6.4	3	E-CU150-6	408008
DN63CF	57.2	63.5	M8	12.7	8	E-CU250-6	408010

Hardware

- Bolt sets for clearance hole flanges include screws and nuts
- Bolt sets for tapped flanges include screws only
- Gold plated gaskets available on request

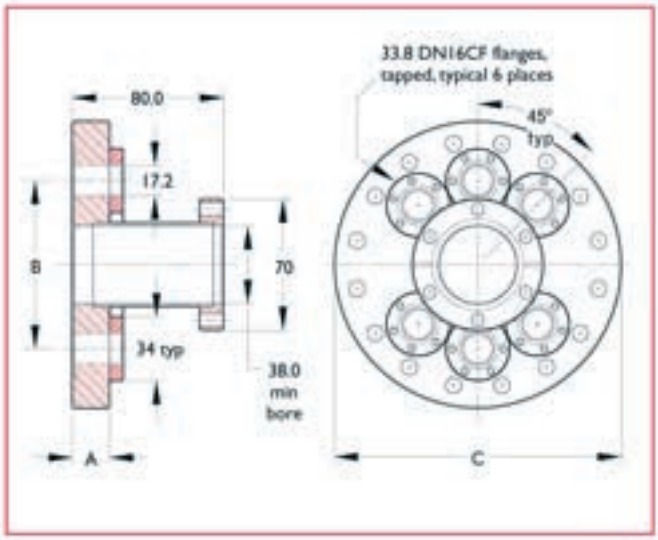
Description	Bolt[1] hole	Bolt length	Quantity per pack	Wt kg	Reference	Part number
Gasket, copper, 16 ID	–	–	10	0.1	CCG16	1113240
Socket head screw M4[1]	T	16	25	0.1	PN16-BSET	1113100
Gasket, copper, 37 ID	–	–	10	0.3	CCG40	1113241
Hex-head bolts M6[2]	T	25	25	0.4	M6-25	1113006
Gasket, copper, 63 ID	–	–	10	0.3	CCG63	1113242
Hex-head bolt M8[3]	T	30	25	1.0	M8-30	1113007

[1] C = Clearance holes, T = Tapped holes
[2] For use with tapped flanges
[3] For use with tapped flanges

CF Flanges and fittings

Multiport

Straight



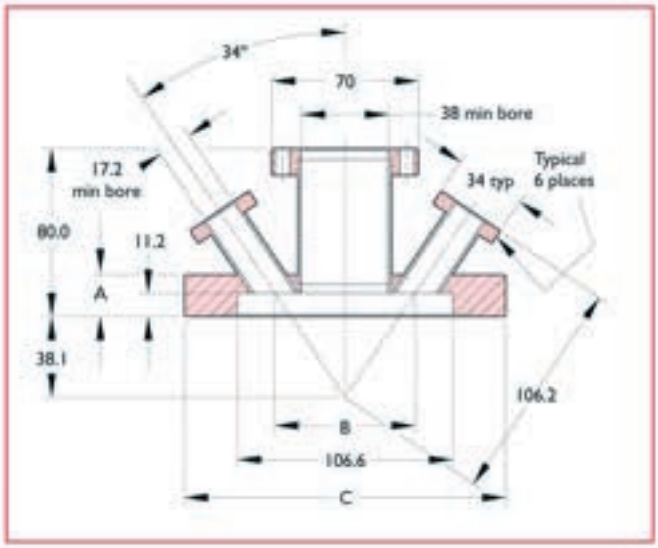
Features

- Includes six straight-intapped mini flanges around a DN40CF port
- Custom configurations available on request

Description	A	B	C	Wt kg	Reference	Part number
304 Stainless steel						
DN100CF[1]	19.8	88.9	152	3.2	MPFT100-16	**1601100**
DN160CF	22.4	108.0	203	5.5	MPFT160-16	**1601101**

[1] Must be used with gasket MCG100 **Part No. 1113237** and bolt set M8-50 cap **Part No. 1113025**

Angled



Features

- Includes six angled clearance hole mini flanges equally spaced around a DN40CF port
- Use for electrical or liquid nitrogen feedthroughs
- Ideal for use with Z-only, X-Y or X-Y-Z manipulators
- Custom configurations available on request

Description	A	B	C	Wt kg	Reference	Part number
304 Stainless steel						
DN100CF	19.8	66	152	3.2	MAF600-6-133A	**7409005**
DN160CF	22.4	66	203	5.5	MAF800-6-133A	**7409011**

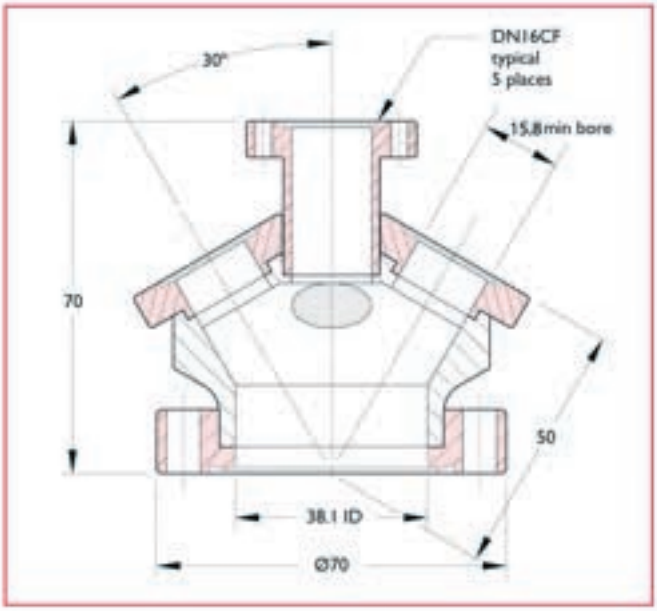
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

CF Flanges and fittings

Multi-mini and cluster flanges

Multi-mini flange

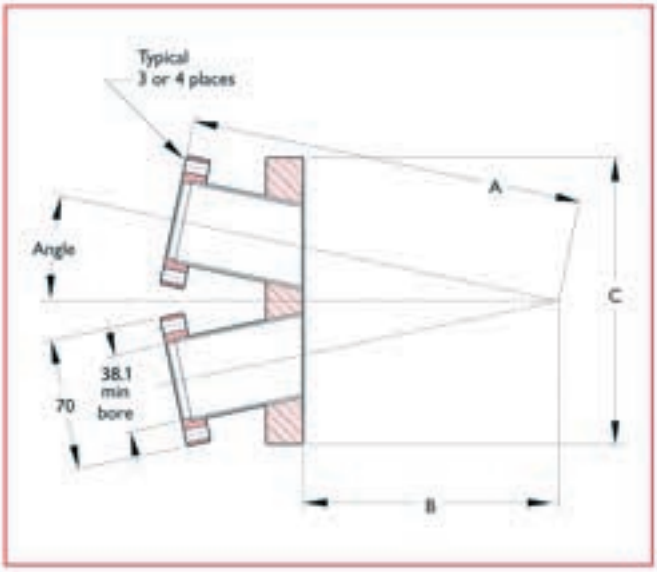


Features

- Provides five tapped mini flanges mounted on a DN40CF port
- Requires use of studs on main flange

Description	Wt kg	Reference	Part number
304 Stainless steel			
DN40CF Flange with five tapped mini flanges	0.6	E-MMF275-5-133	**409014**
M6-35 Stud kit	0.3	M6-STUD35	**1113064**

Cluster flange



Features

- Angled ports are configured to focus three or four DN40CF ports at a specified flange-to-sample distance
- Ports are directed towards the centre of a standard flanged CF six-way cross

Description	No. of ports	Angle	A	B	C	Wt kg	Reference	Part number
304 Stainless steel								
DN100CF Flange	3	12.5°	208	135	152	12	CF100-40-3	**1115160**
DN160CF Flange	3	13.0°	250	167	202	12	CF160-40-3	**1115161**
DN160CF Flange	4	13.0°	250	167	202	13	CF160-40-4	**1115162**

Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF Flanges and fittings

Introduction

ISO KF Assembly

Features

- Fast connect and disconnect
- 316L (1.4301) Stainless steel fittings
- All-metal aluminium clamps
- Viton® O-ring bakeable to 150°C
- Single wing nut closure
- ISO compatible

Specifications

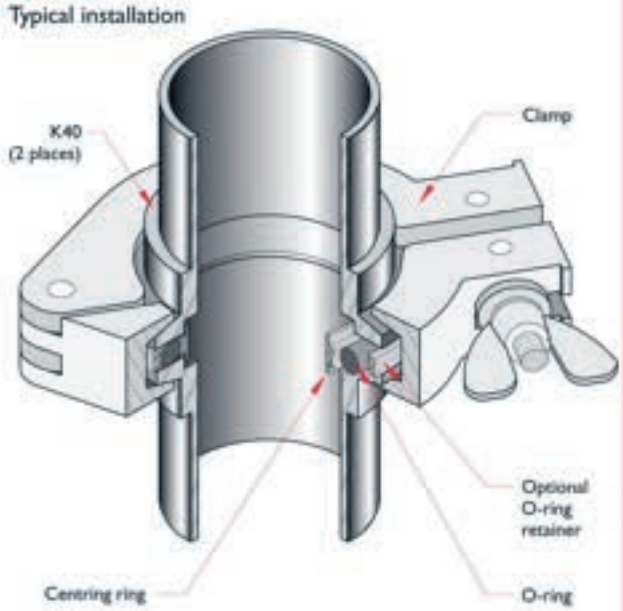
Material	
Fittings	304 Stainless steel, TIG welded
Clamps	Aluminium
Standard O-rings	Du Pont Viton® fluoroelastomer
Vacuum	O-ring compression by uniform pressure application around the 15° outer flange surfaces
Flanges	ISO standard dimensions 360° rotatable Four standard flange sizes for use with four tube sizes
Tube bore sizes[1]	12.7, 15.8, 22.1, 38.1 and 50mm
Maximum temperature	150°C
Components	Reusable and interchangeable with other ISO dimension components of the same size

[1] Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

UHV Series

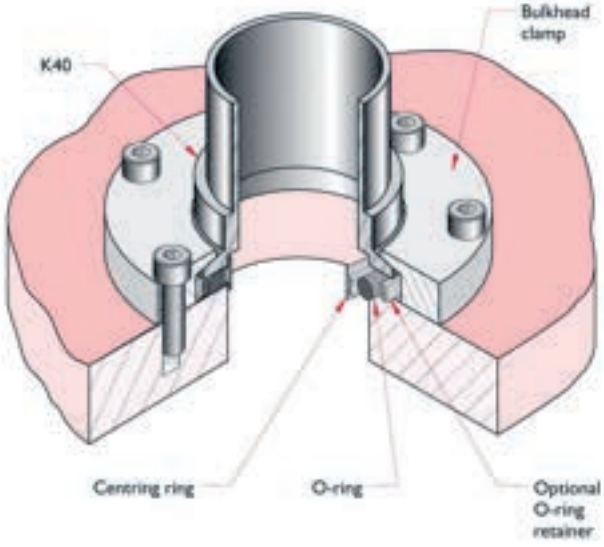
ISO KF

Typical installation



Bulkhead clamp

Typical installation



All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF Flanges and fittings

Introduction

ISO KF vacuum systems employ components with metric interface dimensions which have been defined by the International Standards Organisation (ISO). This ensures a high degree of compatibility between components obtained from different sources. Caburn-MDC ISO KF are compatible with Klein Flange (KF) types.

Use ISO KF for tube sizes DN16 to DN50.

Our standard range of KF flanges and fittings are manufactured from 304 (1.4301) stainless steel.

ISO KF constitutes an economical system of reusable interfacing stainless steel vacuum fittings and components for 19.1, 25.4, 38.1 and 50.8mm OD tubing. Assemblies are usable to 10^{-8} mbar. Maximum temperature for sustained use is 150°C. They are ideal for vacuum systems requiring regular assembly and disassembly.

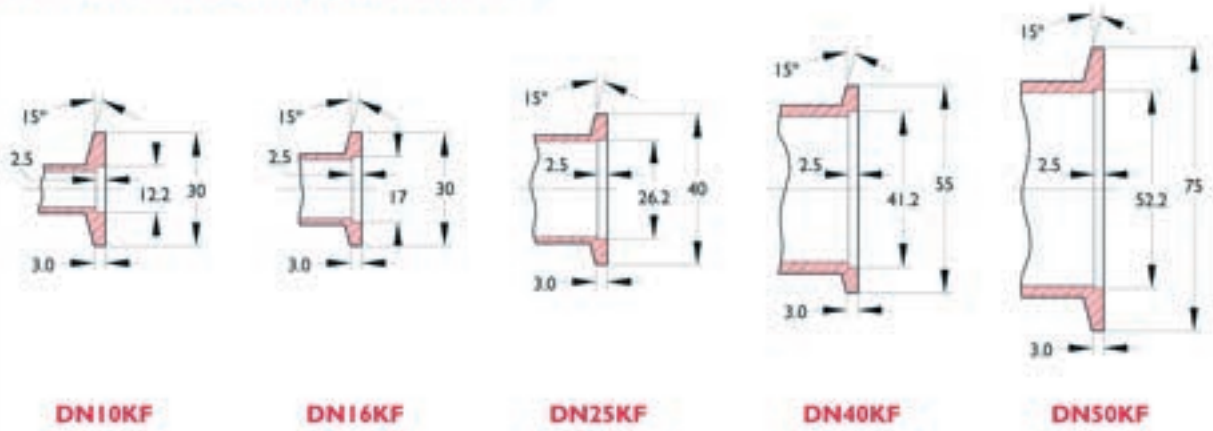
Each vacuum seal is made by compression of an O-ring on a centring ring between mating flanges. The seal is made in seconds by finger-closure of a wing nut on the all-metal hinged aluminium clamp.

The ISO KF family of modular building block components includes all commonly used standard fittings, feedthroughs and accessories. Reducing flanges are available to connect different size components. Mating flanges are offered to interface with pipe and other flange systems including LF and CF.

Inch-metric ISO comparison

Tube OD inches	Caburn-MDC reference	ISO	Nominal tube ID mm
0.75	K16	DN16KF	16
1.00	K25	DN25KF	25
1.50	K40	DN40KF	40
2.00	K50	DN50KF	50
2.50	L63	DN63LF	63.5
4.00	L100	DN100LF	102
6.00	L160	DN160LF	153
8.00	L200	DN200LF	212
10.00	L250	DN250LF	254
12.75	L320	DN320LF	316
16.00	L400	DN400LF	400
20.00	L500	DN500LF	500

Dimensions with ISO industry cross-references



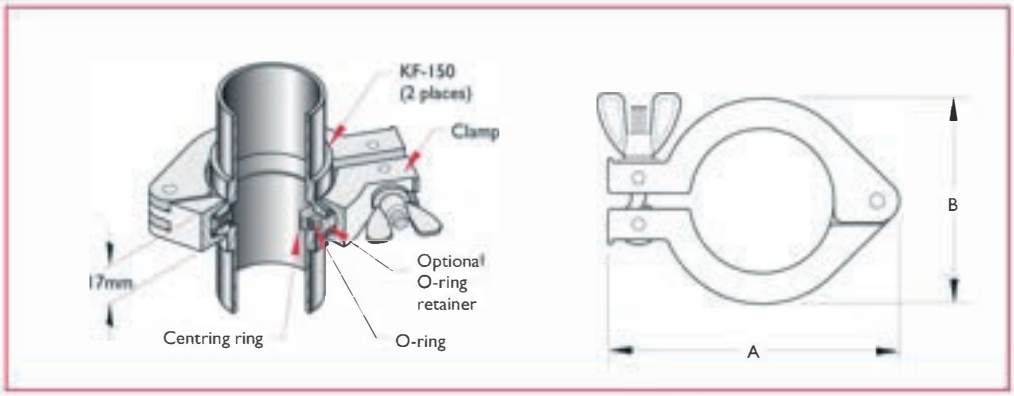
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF Flanges and fittings

Clamps

Hinged clamp



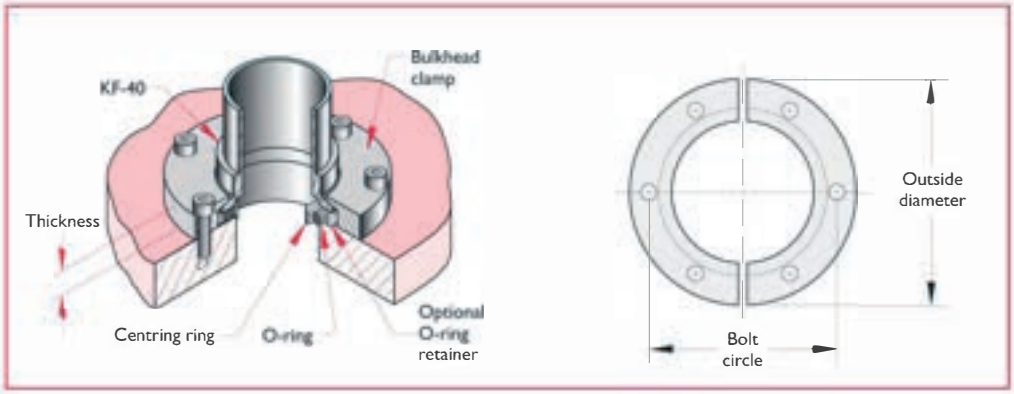
Features

- Fastens ISO KF of comparable size
- Quick make and break
- Stainless steel wing nut and bolt
- Aluminium construction
- Requires centring ring with elastomer gasket

Flange size	Tube size	A	B	Wt kg	Reference	Part number
DN10/16KF	12.7-19.0	71	45	0.2	K075-C	**701000**
DN20/25KF	25.4	80	55	0.2	K100-C	**701001**
DN32/40KF	38.1	96	70	0.3	K150-C	**701002**
DN50KF	50.8	123	95	0.5	K200-C	**701003**

Hinged clamp assemblies are the most commonly used method for making ISO KF vacuum seal connections. Prior to clamping, flanges can be rotated 360° and accept self-centring centring ring seals. Pressure is applied uniformly around the 15° outer surface of both flanges by finger-tightening the single wing nut until the first metal-to-metal contact is made between the spacing lips of the centring ring and the inner surface of the mating flanges. This compresses the O-ring between the flanges and makes the vacuum seal.

Bulkhead clamp



Features

- Fastens ISO KF directly to flat plates
- Bolt fastening
- Split-ring geometry
- Aluminium construction
- Requires centring ring with elastomer gasket

Flange size	No. of bolts	Thickness	BCD	OD	Wt kg	Reference	Part number
Aluminium							
DN16KF	6	9	38.0	51	0.2	K16-BC	**716000**
DN25KF	6	10	48.0	60	0.2	K25-BC	**716001**
DN40KF	6	10	62.0	75	0.2	K40-BC	**716002**
DN50KF	8	10	82.5	95	0.2	K50-BC	**716003**

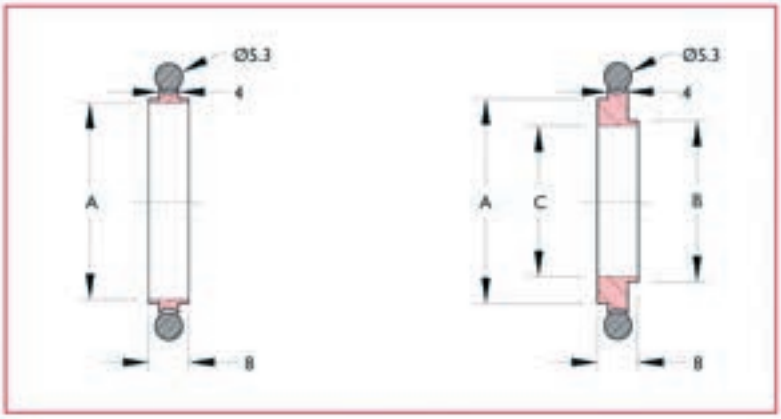
Bolted bulkhead clamps are commonly used to fasten ISO KF components to flat chamber walls or baseplates. Use of this product requires customer machining of six or eight M5 threaded bolt holes on the mounting surface. Once a clamp has been positioned and aligned with the mating bolt holes, a vacuum seal is made by alternately wrench-tightening opposing pairs of bolts. A complete bulkhead clamp assembly consists of two semicircular clamps, six or eight M5 x 16mm long stainless steel bolts and washers.

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF Flanges and fittings

Centring rings

Centring rings



Features

- Standard ring mates ISO KF of equal size
- Adaptor ring mates ISO KF of unequal size
- Includes elastomer O-ring
- Stainless steel or aluminium construction

Centring ring assemblies are placed between two ISO flanges with matching outer diameters. The widest portion of the centring ring rests inside a capture groove on the flange and the O-ring rests on the flat polished surface outside the capture groove. On a blank flange, the groove seen on the face of a flange is the capture groove, with the O-ring making contact with this flange face just outside the groove.

Aluminium Viton® O-ring

- Maximum bakeout temperature 200°C
- Sustained use to 150°C
- Aluminium

KF Flange	A	Reference	Part number
DN16KF	16	K16-CRA	7710013
DN25KF	25	K25-CRA	7710014
DN40KF	40	K40-CRA	7710015
DN50KF	50	K50-CRA	7710016

Aluminium Buna-N® O-ring

- Maximum bakeout temperature 100°C
- Sustained use to 80°C
- Aluminium

KF Flange	A	Reference	Part number
DN16KF	16	K16-CRAB	7710017
DN25KF	25	K25-CRAB	7710018
DN40KF	40	K40-CRAB	7710019
DN50KF	50	K50-CRAB	7710020

Stainless steel Viton® O-ring

- Maximum bakeout temperature 200°C
- Sustained use to 150°C
- Stainless steel

KF Flange	A	Reference	Part number
DN16KF	16	K16-CR	7710000
DN25KF	25	K25-CR	7710001
DN40KF	40	K40-CR	7710002
DN50KF	50	K50-CR	7710003

Stainless steel silicone O-ring

- For use in corrosive environments where silicone is acceptable
- Maximum bakeout temperature 200°C
- Sustained use to 150°C
- Stainless steel

KF Flange	A	Reference	Part number
DN16KF	16	K16-CRS	7710021
DN25KF	25	K25-CRS	7710022
DN40KF	40	K40-CRS	7710023
DN50KF	50	K50-CRS	7710024

Adaptor rings

- Viton® O-ring
- Maximum bakeout temperature 200°C
- Sustained use to 150°C
- Stainless steel

KF Flange	A	B	C	Reference	Part number
DN16KF-10KF	17	12	10	K16-10-CR	7710010
DN25KF-20KF	26	22	20	K25-20-CR	7710011
DN40KF-32KF	41	34	32	K40-32-CR	7710012

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF Flanges and fittings

DN16 KF

Features

- HV rated to 1x10⁻⁸ mbar
- High-temperature rated to 200°C
- Symmetric, non-rotatable geometry
- Elastomer O-ring seal
- Clamp-style fastening
- ISO-compatible design

Specifications

Material			
Flanges			304ss
O-rings			Viton®, Buna-N® or silicone elastomer
Clamps, hinged and bulkhead			Aluminium
Fastening			
Clamp type			Hinged with metric thread
Bulkhead type			Hexagonal head bolts, M5 thread
Nut type			Hexagonal
Torque			Clamp: Finger tight Bolts: 9 to 14 Nm
Vacuum range			1x10⁻⁸ mbar
Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Silicone	-20°C	200°C	150°C
Weight			0.1 kg maximum
Dimensions			30.0 OD x 17.3 ID maximum

HV Series

Figure 1 Blank

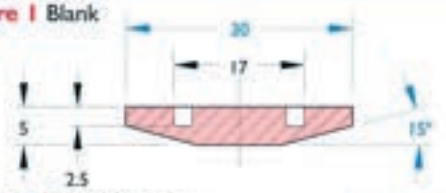


Figure 2 Unbored stub

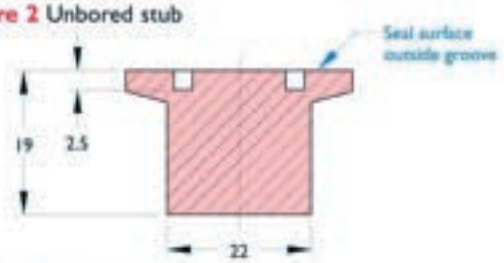


Figure 3 Weld flange – small tube

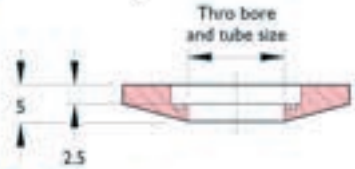


Figure 4 Weld flange

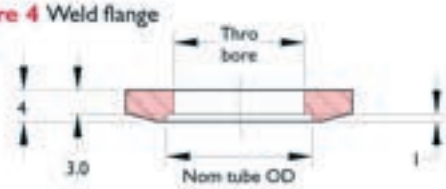
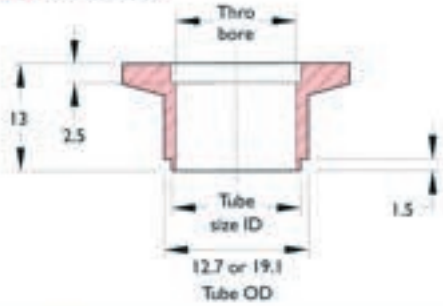


Figure 5 Socket weld



Dimensions in blue are common to all flanges

Tube OD nominal	Figure	Flange reference	Wt kg	Reference	Part number
Stainless steel					
Blank	1	Blank	0.03	K16-B	7712000
Blank	2	Blank	0.03	K16-US	7715000
9.5	3	Weld	0.03	K16-10-W	7713005
12.7	3	Weld	0.03	K16-12-W	7713006
12.7	5	Socket weld	0.03	K16-12-SW	7713000
19.1	4	Weld	0.02	K16-W	7713007
19.1	5	Socket weld	0.02	K16-SW	7713001
Aluminium					
Blank	1	Blank	0.05	K16-ALB	1120151

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF Flanges and fittings

DN25 KF

Features

- HV rated to 1x10⁻⁸ mbar
- High-temperature rated to 200°C
- Symmetric, non-rotatable geometry
- Elastomer O-ring seal
- Clamp-style fastening
- ISO-compatible design

Specifications

Material

Flanges	304ss
O-rings	Viton®, Buna-N® or silicone elastomer
Clamps, hinged and bulkhead	Aluminium

Fastening

Clamp type	Hinged with metric thread
Bulkhead type	Hexagonal head bolts, M5 thread
Nut type	Hexagonal
Torque	Clamp: Finger tight Bolts: 9 to 14 Nm

Vacuum range	1x10⁻⁸ mbar

Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Silicone	-20°C	200°C	150°C

Weight	0.1 kg maximum
Dimensions	39.9 OD x 22.2 ID maximum

HV Series

Figure 1 Blank

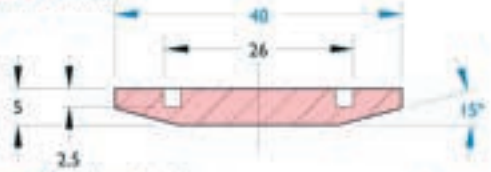


Figure 2 Unbored stub

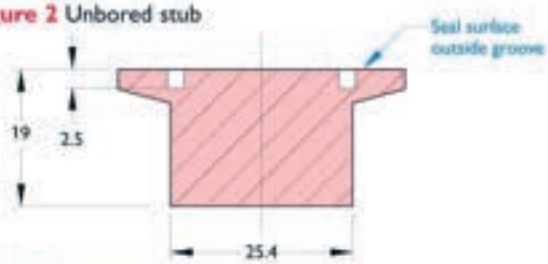


Figure 3 Weld flange – small tube

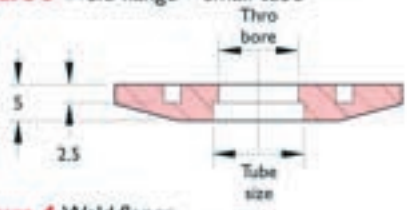


Figure 4 Weld flange

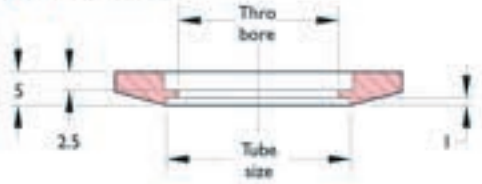
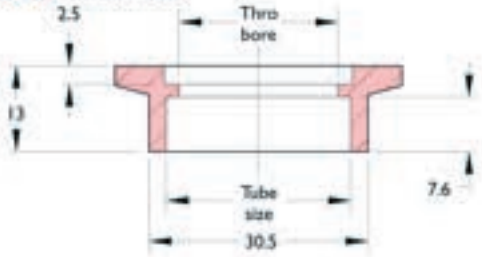


Figure 5 Socket weld



Dimensions in blue are common to all flanges

Tube OD nominal	Figure	Flange reference	Wt kg	Reference	Part number
Stainless steel					
Blank	1	Blank	0.05	K25-B	7712001
Blank	2	Blank	0.05	K25-US	7715001
9.5	3	Weld	0.05	K25-10-W	7713008
12.7	3	Weld	0.04	K25-12-W	7713009
19.1	4	Weld	0.04	K25-19-W	7713010
25.4	4	Weld	0.04	K25-W	7713011
19.1	5	Socket weld	0.04	K25-SW	7713002
Aluminium					
Blank	1	Blank	0.05	K25-ALB	1120152

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF Flanges and fittings

DN40 KF

Features

- HV rated to 1x10⁻⁸ mbar
- High-temperature rated to 200°C
- Symmetric, non-rotatable geometry
- Elastomer O-ring seal
- Clamp-style fastening
- ISO-compatible design

Specifications

Material

Flanges	304ss
O-rings	Viton®, Buna-N® or silicone elastomer
Clamps, hinged and bulkhead	Aluminium

Fastening

Clamp type	Hinged with metric thread
Bulkhead type	Hexagonal head bolts, 10-32 UNC thread
Nut type	Hexagonal
Torque	Clamp: Finger tight Bolts: 9 to 14 Nm

Vacuum range	1x10⁻⁸ mbar

Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Silicone	-20°C	200°C	150°C

Weight	0.2 kg maximum
Dimensions	54.9 OD x 34.9 ID maximum

HV Series

Figure 1 Blank

Figure 2 Unbored stub

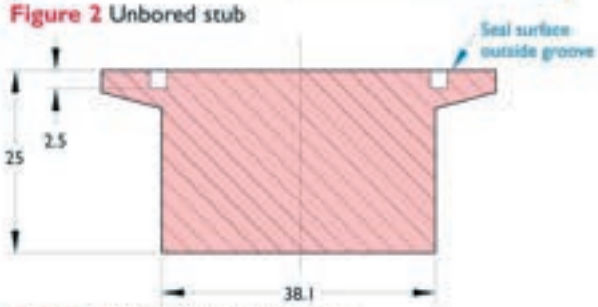


Figure 3 Weld flange – small tube

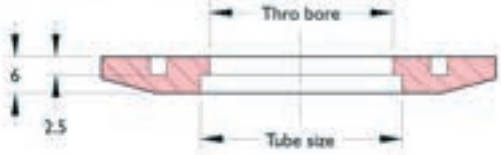


Figure 4 Weld flange

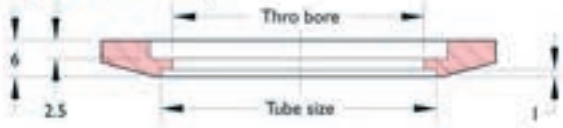
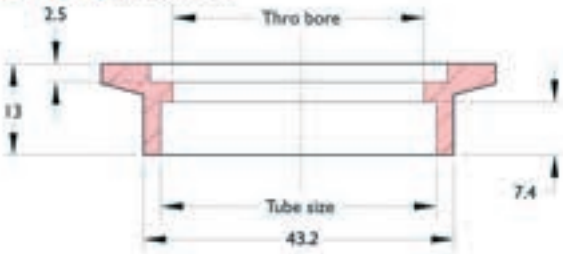


Figure 5 Socket weld



Dimensions in blue are common to all flanges

Tube OD nominal	Figure	Flange reference	Wt kg	Reference	Part number
Stainless steel					
Blank	1	Blank	0.09	K40-B	712002
Blank	2	Blank	0.2	K40-U5	715002
9.5	3	Weld	0.1	K40-10-W	713012
12.7	3	Weld	0.1	K40-12-W	713013
19.1	3	Weld	0.06	K40-19-W	713014
25.4	3	Weld	0.06	K40-25-W	713015
44.5	4	Weld	0.04	K40-W	713016
38.6	5	Socket weld	0.08	K40-SW	713003
Aluminium					
Blank	1	Blank	0.05	K40-ALB	1120153

ISO KF Flanges and fittings

DN50 KF

Features

- HV rated to 1x10⁻⁸ mbar
- High-temperature rated to 200°C
- Symmetric and non-rotatable geometry
- Elastomer O-ring seal
- Clamp-style fastening
- ISO-compatible design

Specifications

Material

Flanges	304ss
O-rings	Viton®, Buna-N® or silicone elastomer
Clamps, hinged and bulkhead	Aluminium

Fastening

Clamp type	Hinged with metric thread
Bulkhead type	Hexagonal head bolts, M5 thread
Nut type	Hexagonal
Torque	Clamp: Finger tight
	Bolts: 9 to 14 Nm

Vacuum range	1x10⁻⁸ mbar

Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Silicone	-20°C	200°C	150°C

Weight	0.2 kg maximum
Dimensions	75 OD x 52.5 ID maximum

HV Series

Figure 1 Blank

Figure 2 Unbored stub

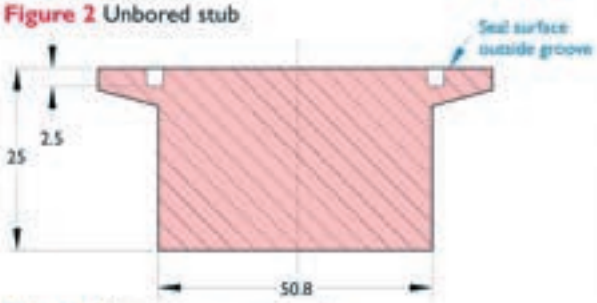


Figure 3 Weld flange – small tube

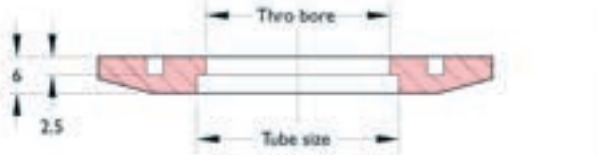


Figure 4 Weld flange

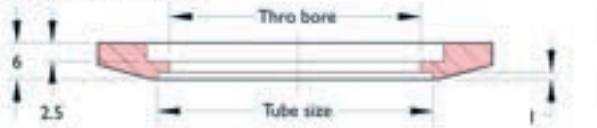
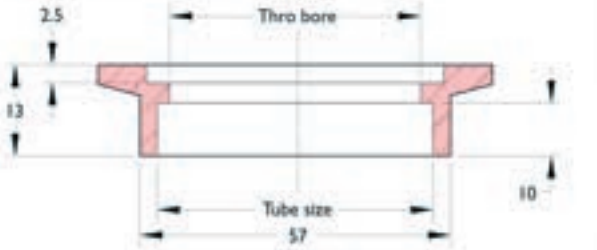


Figure 5 Socket weld



Dimensions in blue are common to all flanges

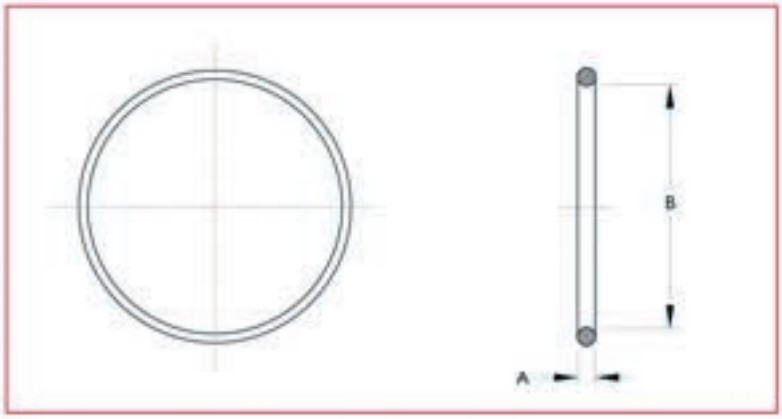
Tube OD nominal	Figure	Flange reference	Wt kg	Reference	Part number
Stainless steel					
Blank	1	Blank	0.18	K50-B	712003
Blank	2	Blank	0.18	K50-US	715003
9.5	3	Weld	0.18	K50-10-W	713017
12.7	3	Weld	0.18	K50-12-W	713018
19.1	3	Weld	0.18	K50-19-W	713019
25.4	3	Weld	0.18	K50-25-W	713020
38.1	3	Weld	0.18	K50-38-W	713021
51.0	4	Weld	0.13	K50-W	713022
51.3	5	Socket weld	0.13	K50-SW	713004
Aluminium					
Blank	1	Blank	0.05	K50-ALB	1120154

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF Flanges and fittings

Replacement O-rings and flange caps

Replacement O-rings



Viton® O-ring

- Maximum bakeout temperature 200°C
- Sustained use to 150°C

KF Flange	A	B	Reference	Part number
DN10KF	5	15	K10-O	711004
DN16KF	5	18	K16-O	711000
DN25KF	5	28	K25-O	711001
DN40KF	5	41	K40-O	711002
DN50KF	5	55	K50-O	711003

Buna-N® O-ring

- Maximum bakeout temperature 100°C
- Sustained use to 80°C

KF Flange	A	B	Reference	Part number
DN10KF	5	15	K10-OB	711020
DN25KF	5	28	K25-OB	711022
DN40KF	5	41	K40-OB	711024
DN50KF	5	55	K50-OB	711025

Silicone O-ring

- Maximum bakeout temperature 200°C
- Sustained use to 150°C

KF Flange	A	B	Reference	Part number
DN10KF	5	15	K10-OS	711005
DN16KF	5	18	K16-OS	711006
DN25KF	5	28	K25-OS	711007
DN40KF	5	42	K40-OS	711008
DN50KF	5	55	K50-OS	711009

Flange caps

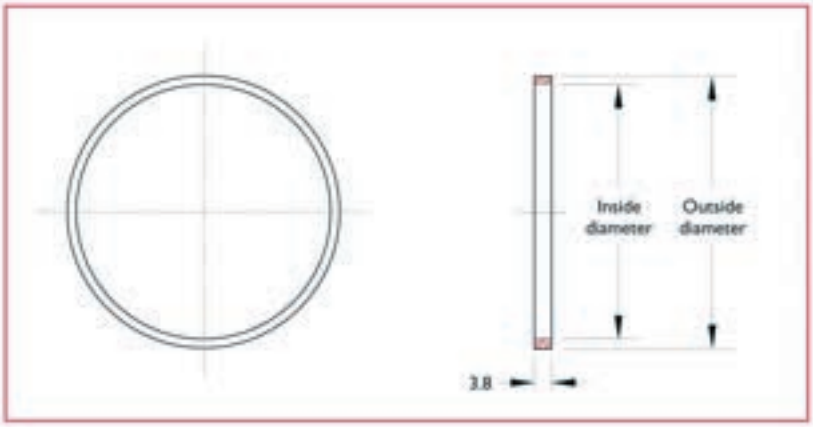
To fit flange	Quantity per pack	Reference	Part number
KF16	2	KFC16	192009
KF25	2	KFC25	192010
KF40	2	KFC40	192011
KF50	2	KFC50	192012

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF Flanges and fittings

O-ring retainers

O-ring retainer



Features

- Supports O-ring outside diameter during pressure burst
- Not for sustained pressures above one atmosphere
- Stainless steel construction

KF Flange	OD	ID	Wt kg	Reference	Part number
DN16	33.3	29.5	0.1	K16-ORR	**7710025**
DN25	43.2	36.6	0.1	K25-ORR	**7710026**
DN40	58.7	54.9	0.1	K40-ORR	**7710027**
DN50	69.9	67.8	0.1	K50-ORR	**7710028**

Place an O-ring retainer over a centring ring assembly which is already centred on a single flange face. Place the second flange over the centring ring and O-ring retainer and secure with a hinged clamp.

ISO LF Flanges and fittings

Introduction

ISO LF Flange assembly

Features

- Vacuum rated to $1x10^{-8}$ mbar
- Bakeable to 200°C
- Fast connect and disconnect
- Economical reusable fittings
- Genderless geometry
- Rotatable bolt ring adaptor
- Elastomer gasket seal
- Varied fastening methods
- ISO LF compatible
- 304 stainless steel construction

Specifications

Material	
Flanges	304 (1.4301)
Centring rings and claws	300ss and aluminium
Bolts	Steel
Flange	ISO standard dimensions 360° sexless rotatable Eight standard sizes
Maximum bakeout temperature	150°C
Number of clamps required	See table

Components Reusable and interchangeable with other ISO dimension components of the same size

Caburn-MDC's ISO LF components are an economical system of reusable and interfacing stainless steel vacuum fittings for tube sizes ranging from 63.5mm through to 500mm diameters. ISO LF flanges pick up where the ISO KF system leaves off. These flanges can operate in high vacuum environments to pressures in the $1x10^{-8}$ mbar range. The ISO LF flange system is ideally suited for applications requiring rapid and frequent assembly and disassembly. Caburn-MDC ISO LF flanges comply with all ISO specifications for vacuum mounting hardware and are compatible with most third party ISO LF flanges and components.

The primary method of fastening and sealing is achieved by using multiple double claw-clamp assemblies to provide uniform compression of an elastomer gasket trapped between two mating flanges. The elastomer gasket is mounted on an aluminium centring ring that has tubular rims or extensions that protrude on either side of the gasket. These rims or extensions fit into grooves on the corresponding mating flanges and conveniently centre the gasket between the flanges prior to sealing. A reliable seal is then made by tightening bolts in an alternating, criss-cross pattern and thus applying uniform pressure around the entire flange sealing surface.

Single claw-clamps are ideally suited for applications where one of the mating flanges is flush mounted and fitted with threaded bolt holes. Both the double and single claw-clamp fasteners provide unlimited rotation or positioning of mating flanges prior to final tightening of bolts.

Bolted rotatable adaptor rings provide a convenient way of fastening claw style flanges to threaded ISO LF flanges, without the use of individual claw-clamps. Rotatable bolt rings are ideally suited for use in applications where low profile geometry is required.

Bolted non-rotatable ISO LF flanges use bolts for fastening and are typically used where single claw fasteners are not desirable. They too, are ideally suited for use in applications where low profile geometry is required, but do not offer rotatable construction.

The Caburn-MDC ISO LF family of modular building-block components includes all of the commonly used standard hardware and fittings. Reducer flanges are available to connect different size ISO components. Hybrid adaptors are available to connect ISO LF components to non ISO vacuum fittings and mounts.

In general, Caburn-MDC components compare with international components using an inch-to-millimetre ratio. US sizes refer to a tube's outside diameter, whereas international sizes refer to a tube's inside diameter.

Flange size and tubing	
Flange size	**Tube OD**
DN63LF	76 (3")
DN100LF	108 (4¼")
DN160LF	159 (6¼")
DN200LF	219 (8⅝")
DN250LF	267 (10½")
DN320LF	323 (12¾")
DN400LF	406 (16")
DN500LF	508 (20")

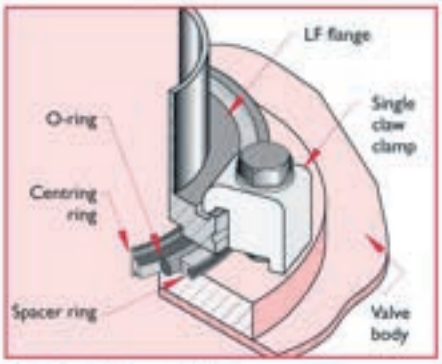
Claw-clamp flange		
OD	**Thickness**	**Number**
95	12	3 to 4
130	12	4 to 8
180	12	4 to 8
240	12	6 to 12
290	12	6 to 12
370	17	8 to 12
450	17	8 to 16
550	17	12 to 16

Bolt flanges				
OD	**Thickness**	**Bolt circle diameter**	**Holes**	**Bolt holes**
130	12	110	8.9	4 x M8
165	12	145	8.9	8 x M8
225	16	200	10.9	8 x M10
285	16	260	10.9	12 x M10
335	16	310	10.9	12 x M10
425	20	395	14.0	12 x M12
510	20	480	14.0	16 x M12
610	20	580	14.0	16 x M12

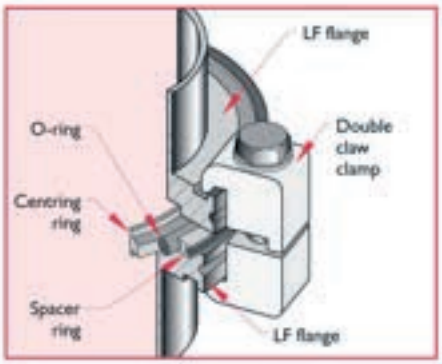
All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO LF Flanges and fittings

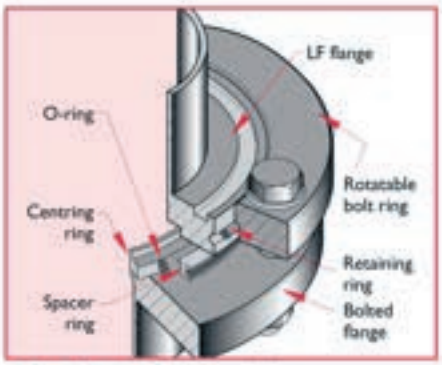
Introduction



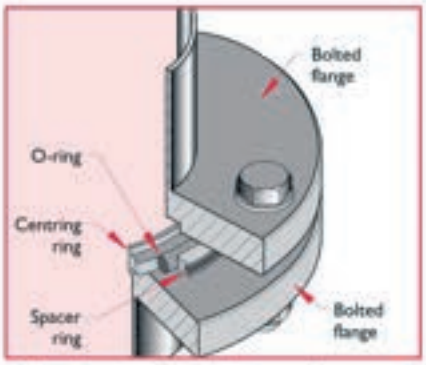
Single claw assembly



Double claw assembly



Bolted rotatable assembly



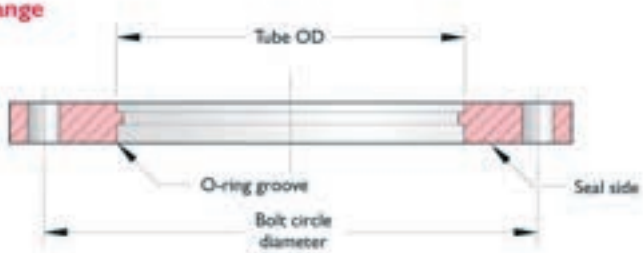
Bolted non-rotatable assembly

Rotatable bolt ring assembly

Claw-clamp flange

Centring ring assembly

Bolted flange



Intermediate hardware may be required for joining components, these have been omitted for clarity.

Inch-metric ISO comparison

Caburn-MDC	OD inches	ISO	Euro equivalent OD mm
K16	0.75	DN16KF	16.0
K25	1.00	DN25KF	25.0
K40	1.50	DN40KF	40.0
K50	2.00	DN50KF	50.0
L63	2.50	DN63LF	63.5
L100	4.00	DN100LF	102
L160	6.00	DN160LF	153
L200	8.00	DN200LF	203
L250	10.00	DN250LF	254
L320	12.75	DN320LF	316
L400	16.00	DN400LF	400
L500	20.00	DN500LF	500

Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

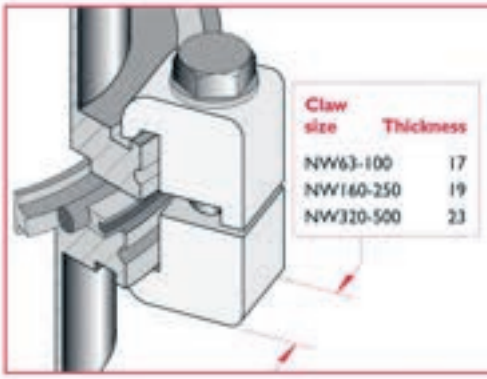
ISO LF Flanges

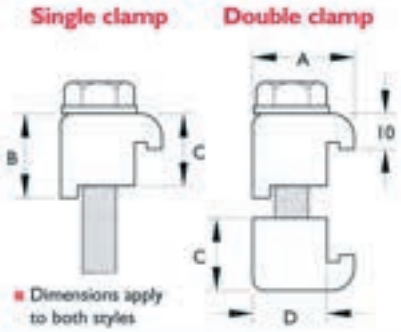
Claw-clamps and bolt rings

Claw-clamp

Features

- Fastens ISO LF flange of comparable size
- Quick make and break
- Zinc-plated steel bolt
- Aluminium claw construction
- Requires centring ring with elastomer gasket
- Other types of clamp available on request





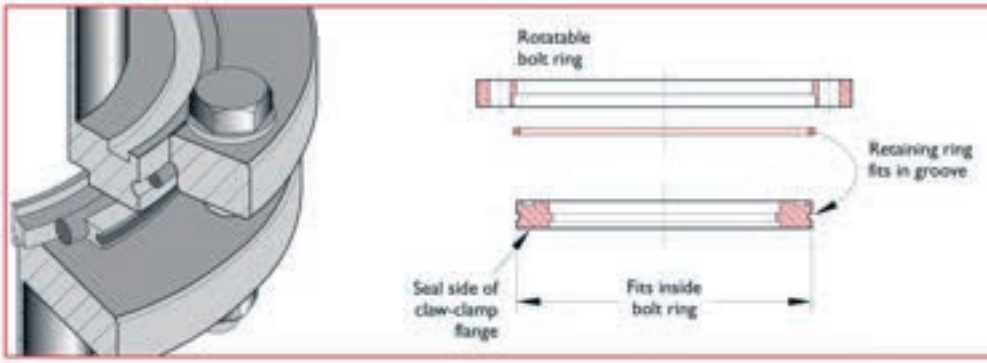
Flange size	A	B	C	D	Thread	Reference	Part number
Single claw							
DN63-100LF	24	24	20	16.3	M8	SCC63/100	1130000
DN160-250LF	28	24	20	20.3	M10	SCC160/250	1130001
DN320-500LF	34	30	25	26.3	M12	SCC320/500	1130002
Double claw							
DN63-100LF	34	24	20	16.3	M8	DCC63/100	1130008
DN160-250LF	28	24	20	20.3	M10	DCC160/250	1130009
DN320-500LF	34	30	25	26.3	M12	DCC320/500	1130010

Double claw-clamp assemblies are commonly used for making vacuum seal connections. Assembly is simplified by the 360° rotatable flanges and the self-centring feature of the centring ring. Single claw-clamp assemblies are used to mate a clamp-style to a threaded bolt-style such as on a gate valve. The vacuum seal is made by compressing the O-ring between the mating flanges. This is done by alternately spanner-tightening opposing pairs of clamps until the first metal-to-metal contact is made between the inner surfaces of the flanges and the spacing lip of the centring ring.

Bolt ring claw-clamp to bolt flange adaptor

Features

- Converts claw-clamp flange to bolt style LF flange
- Bolt fastening
- Aluminium construction
- Includes retainer ring
- Does not include claw-clamp flange
- Requires centring ring with elastomer gasket and bolts



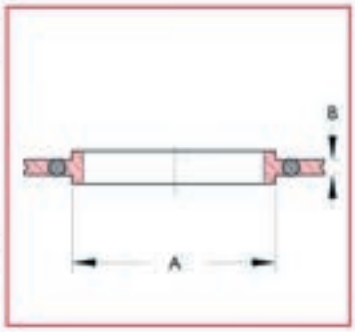
Flange size	Ring OD	Bolt holes	Hole size	Bolt circle	Thickness	Reference	Part number
DN63LF	130	4	9	110	12	L63-RBF	853000
DN100LF	165	8	9	145	12	L100-RBF	853001
DN160LF	225	8	9	200	16	L160-RBF	853002
DN200LF	285	12	11	260	16	L200-RBF	853003
DN250LF	335	12	11	310	16	L250-RBF	853004

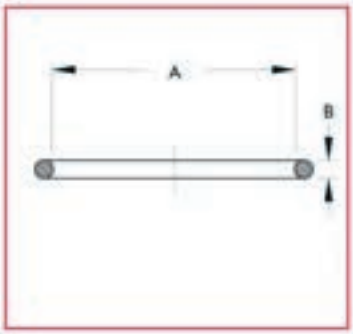
Slip the bolt ring over a standard claw-clamp style flange and install the retaining ring. After the bolt ring has been rotated to align the bolt holes, the vacuum seal is made by alternately spanner-tightening opposing pairs of bolts. One complete rotatable bolt ring assembly consists of one aluminium bolt ring and one retaining ring.

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO LF Flanges

Centring ring assemblies





Aluminium centring and spacer ring Viton® O-ring

- Maximum bakeout temperature 200°C
- Sustained use to 150°C

ISO LF flange	A	B	Reference	Part number
DN63LF	70	4	L63-CR	810000
DN100LF	102	4	L100-CR	810001
DN160LF	153	4	L160-CR	810002
DN200LF	213	4	L200-CR	810003
DN250LF	261	4	L250-CR	810004
DN320LF	318	5.5	L320-CR	810005
DN400LF	400	5.5	L400-CR	810006
DN500LF	501	5.5	L500-CR	810007

Replacement Viton® O-ring

- Maximum bakeout temperature 200°C
- Sustained use to 150°C

ISO LF flange	A	B	Reference	Part number
DN63LF	76	5.3	L63-O	811000
DN100LF	107	5.3	L100-O	811001
DN160LF	158	5.3	L160-O	811002
DN200LF	221	5.3	L200-O	811003
DN250LF	253	5.3	L250-O	811004
DN320LF	330	7.0	L320-O	811005
DN400LF	405	7.0	L400-O	811006
DN500LF	507	7.0	L500-O	811007

Aluminium centring and spacer ring Buna-N® O-ring

- Maximum bakeout temperature 100°C
- Sustained use to 80°C

ISO LF flange	A	B	Reference	Part number
DN63LF	70	4	L63-CRB	810020
DN100LF	102	4	L100-CRB	810021
DN160LF	153	4	L160-CRB	810022
DN200LF	213	4	L200-CRB	810023
DN250LF	261	4	L250-CRB	810024
DN320LF	318	5.5	L320-CRB	810025
DN400LF	400	5.5	L400-CRB	810026
DN500LF	501	5.5	L500-CRB	810027

Replacement Buna-N® O-ring

- Maximum bakeout temperature 100°C
- Sustained use to 80°C

ISO LF flange	A	B	Reference	Part number
DN63LF	76	5.3	L63-OB	811020
DN100LF	107	5.3	L100-OB	811021
DN160LF	158	5.3	L160-OB	811022
DN200LF	221	5.3	L200-OB	811023
DN250LF	253	5.3	L250-OB	811024
DN320LF	317	7.0	L320-OB	811025
DN400LF	405	7.0	L400-OB	811026
DN500LF	507	7.0	L500-OB	811027

Stainless steel centring with aluminium spacer ring Viton® O-ring

- Maximum bakeout temperature 200°C
- Sustained use to 150°C

ISO LF flange	A	B	Reference	Part number
DN63LF	70	4	L63-CRSS	810009
DN100LF	102	4	L100-CRSS	810011
DN160LF	153	4	L160-CRSS	810012
DN200LF	213	4	L200-CRSS	810013
DN250LF	261	4	L250-CRSS	810014
DN320LF	318	5.5	L320-CRSS	810015
DN400LF	400	5.5	L400-CRSS	810016
DN500LF	501	5.5	L500-CRSS	810017

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO LF Flanges

DN63LF

Features

- HV rated to $1x10^{-8}$ mbar
- High-temperature rated to 200°C
- Symmetric and non-rotatable geometry
- Rotatable bolt ring available
- Elastomer O-ring seal
- Two methods of fastening
- ISO-compatible and modified ISO design

Specifications

Material	
Flanges	304ss
Rotatable bolt ring	Aluminium
O-rings	Viton® or Buna-N® elastomer
Claw-clamps	Aluminium

Fastening	
Claw-clamp	M8, (4 required)
Bolt type	Hexagonal head, M8
Nut type	Hexagonal
Torque	Bolts: 9-14 Nm

Vacuum range	$1x10^{-9}$ mbar

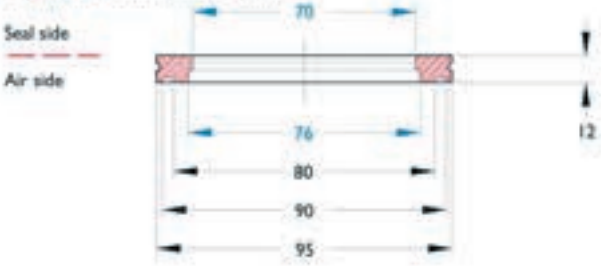
Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C

Weight	27 kg maximum

Dimensions	
Clamp style	95 OD x 76 ID maximum
Bolt style	130 OD x 76 ID maximum

HV Series

Figure 1 Claw-clamp style



Rotatable bolt ring option

Used with claw-clamp style flange

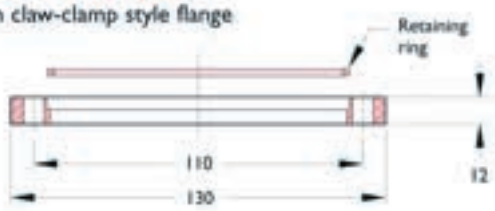


Figure 2 Bolt style

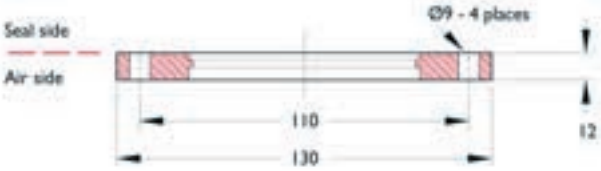


Figure 3 Centring ring assembly

Dimensions in blue are common to all flanges

Centring ring capture groove on blank flanges is 6.4 wide

A rotatable bolt ring assembly is used to add bolt holes to a standard claw-clamp style ISO LF flange. An assembly consists of one aluminium bolt ring and one retaining ring. The retaining ring fits into a groove on a claw-clamp style flange and holds the bolt ring onto the flange. Replacement retaining rings are also available separately.

Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number
–	1	Blank	Claw-clamp	0.5	L63-B	812000
–	2	Blank	Bolt	1.3	L63-BB	852000
76	2	Weld	Bolt	1.3	L63-BW	850009
76	1	Weld	Claw-clamp	0.3	L63-W	813023

Optional flange converter	Wt kg	Reference	Part number
Rotatable bolt ring assembly	0.9	L63-RBF	853000
Retaining ring	0.1	L63-RR	853020

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO LF Flanges

DN100LF

Features

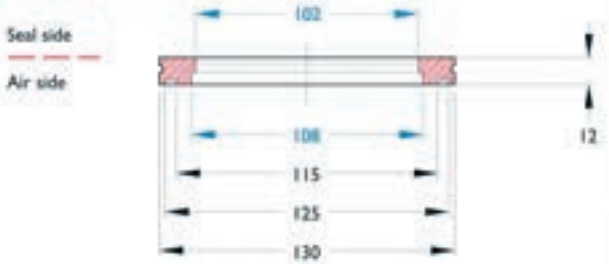
- HV rated to 1x10⁻⁹ mbar
- High-temperature rated to 200°C
- Symmetric and non-rotatable geometry
- Rotatable bolt ring available
- Elastomer O-ring seal
- Two methods of fastening
- ISO-compatible and modified ISO design

Specifications

Material			
Flanges			304ss
Rotatable bolt ring			Aluminium
O-rings			Viton® or Buna-N® elastomer
Claw-clamps			Aluminium
Fastening			
Claw-clamp			M8, (8 required)
Bolt type			Hexagonal head, M8
Nut type			Hexagonal
Torque			Bolts: 9-14 Nm
Vacuum range			1x10⁻⁹ mbar
Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Weight			27 kg maximum
Dimensions			
Clamp style			130.0 OD x 108 ID maximum
Bolt style			165.1 OD x 108 ID maximum

HV Series

Figure 1 Claw-clamp style



Rotatable bolt ring option

Used with claw-clamp style flange

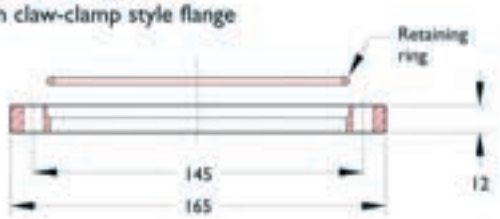


Figure 2 Bolt style

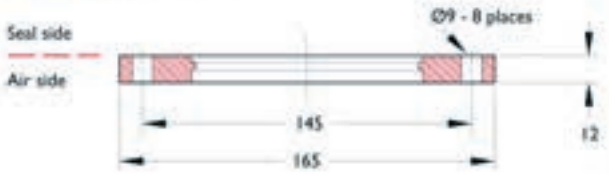
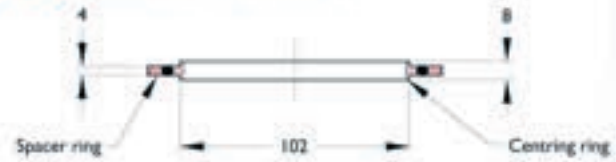


Figure 3 Centring ring assembly



Dimensions in blue are common to all flanges

Centring ring capture groove on blank flanges is 6.4 wide

A rotatable bolt ring assembly is used to add bolt holes to a standard claw-clamp style ISO LF flange. An assembly consists of one aluminium bolt ring and one retaining ring. The retaining ring fits into a groove on a claw-clamp style flange and holds the bolt ring onto the flange. Replacement retaining rings are also available separately.

Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number
–	1	Blank	Claw-clamp	0.4	L100-B	812001
–	2	Blank	Bolt	2.0	L100-BB	852001
108	2	Weld	Bolt	2.0	L100-BW	850010
108	1	Weld	Claw-clamp	0.3	L100-W	813024

Optional flange converter	Wt kg	Reference	Part number
Rotatable bolt ring assembly	0.9	L100-RBF	853001
Retaining ring	0.1	L100-RR	853021

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO LF Flanges

DN160LF

Features

- HV rated to $1x10^{-8}$ mbar
- High-temperature rated to 200°C
- Symmetric and non-rotatable geometry
- Rotatable bolt ring available
- Elastomer O-ring seal
- Two methods of fastening
- ISO-compatible and modified ISO design

Specifications

Material			
Flanges			304ss
Rotatable bolt ring			Aluminium
O-rings			Viton® or Buna-N® elastomer
Claw-clamps			Aluminium
Fastening			
Claw-clamp			M10, (8 required)
Bolt type			Hexagonal head, M10
Nut type			Hexagonal
Torque			Bolts: 9-14 Nm
Vacuum range			$1x10^{-8}$ mbar
Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Weight			5 kg maximum
Dimensions			
Clamp style			180.1 OD x 153 ID maximum
Bolt style			225.0 OD x 153 ID maximum

HV Series

Figure 1 Claw-clamp style

Rotatable bolt ring option

Used with claw-clamp style flange

Figure 2 Bolt style

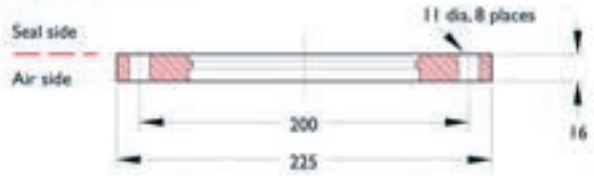
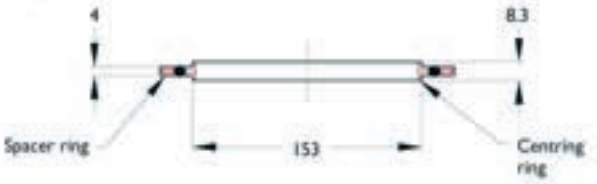


Figure 3 Centring ring assembly



Dimensions in blue are common to all flanges

Centring ring capture groove on blank flanges is 6.4 wide

A rotatable bolt ring assembly is used to add bolt holes to a standard claw-clamp style ISO LF flange. An assembly consists of one aluminium bolt ring and one retaining ring. The retaining ring fits into a groove on a claw-clamp style flange and holds the bolt ring onto the flange. Replacement retaining rings are also available separately.

Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number
–	1	Blank	Claw-clamp	2.3	L160-B	7812002
–	2	Blank	Bolt	2.0	L160-BB	7852002
159	2	Weld	Bolt	2.0	L160-BW	7850011
159	1	Weld	Claw-clamp	0.8	L160-W	7813025

Optional flange converter	Wt kg	Reference	Part number
Rotatable bolt ring assembly	1.4	L160-RBF	7853002
Retaining ring	0.2	L160-RR	7853022

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO LF Flanges

DN200LF

Features

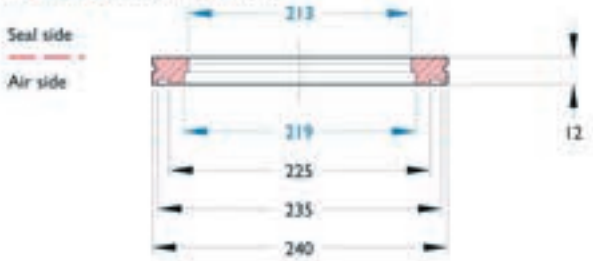
- HV rated to 1x10⁻⁸ mbar
- High-temperature rated to 200°C
- Symmetric and non-rotatable geometry
- Rotatable bolt ring available
- Elastomer O-ring seal
- Two methods of fastening
- ISO-compatible and modified ISO design

Specifications

Material			
Flanges			304ss
Rotatable bolt ring			Aluminium
O-rings			Viton® or Buna-N® elastomer
Claw-clamps			Aluminium
Fastening			
Claw-clamp			M10, (12 required)
Bolt type			Hexagonal head, M10
Nut type			Hexagonal
Torque			Bolts: 9-14 Nm
Vacuum range			1x10⁻⁸ mbar
Temperature range	**Minimum**	**Intermittent**	**Sustained**
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Weight			1.4 kg maximum
Dimensions			
Clamp style			240 OD x 213 ID maximum
Bolt style			285 OD x 213 ID maximum

HV Series

Figure 1 Claw-clamp style



Rotatable bolt ring option

Used with claw-clamp style flange

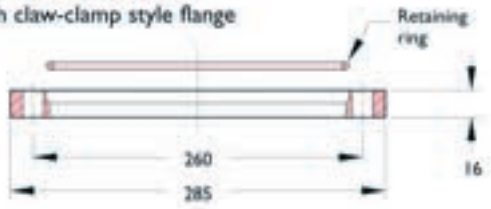


Figure 2 Bolt style

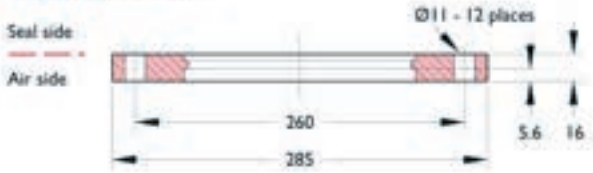


Figure 3 Centring ring assembly

Dimensions in blue are common to all flanges

Centring ring capture groove on blank flanges is 6.4 wide

A rotatable bolt ring assembly is used to add bolt holes to a standard claw-clamp style ISO LF flange. An assembly consists of one aluminium bolt ring and one retaining ring. The retaining ring fits into a groove on a claw-clamp style flange and holds the bolt ring onto the flange. Replacement retaining rings are also available separately.

Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number
–	1	Blank	Claw-clamp	2.0	L200-B	7812003
–	2	Blank	Bolt	8.0	L200-BB	7852003
219	1	Weld	Claw-clamp	1.0	L200-W	7813026
219	2	Weld	Bolt	1.0	L200-BW	850012

Optional flange converter	Wt kg	Reference	Part number
Rotatable bolt ring assembly	2.7	L200-RBF	7853003
Retaining ring	0.2	L200-RR	7853023

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO LF Flanges

DN250LF

ISO LF

Features

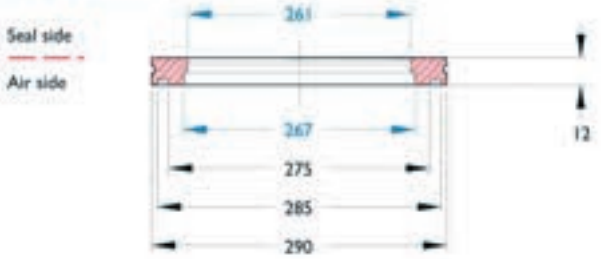
- HV rated to 1x10⁻⁸ mbar
- High-temperature rated to 200°C
- Symmetric and non-rotatable geometry
- Rotatable bolt ring available
- Elastomer O-ring seal
- Claw-clamp style or bolt style fastening
- ISO-compatible design

Specifications

Material			
Flanges			304ss
Rotatable bolt ring			Aluminium
O-rings			Viton® or Buna-N® elastomer
Claw-clamps			Aluminium
Fastening			
Claw-clamp			M10, (6-12 required)
Bolt type			Hexagonal head, M10
Nut type			Hexagonal
Torque			Bolts: 9-14 Nm
Vacuum range			1x10⁻⁸ mbar
Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Weight			34 kg maximum
Dimensions			
Clamp style			290 OD x 261 ID maximum
Bolt style			335 OD x 261 ID maximum

HV Series

Figure 1 Claw-clamp style



Rotatable bolt ring option

Used with claw-clamp style flange

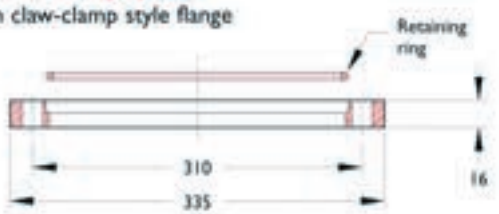


Figure 2 Bolt style

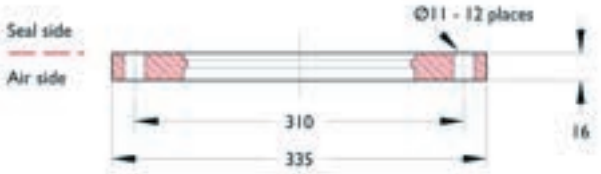


Figure 3 Centring ring assembly

Dimensions in blue are common to all flanges

Centring ring capture groove on blank flanges is 6.4 wide

A rotatable bolt ring assembly is used to add bolt holes to a standard claw-clamp style ISO LF flange. An assembly consists of one aluminium bolt ring and one retaining ring. The retaining ring fits into a groove on a claw-clamp style flange and holds the bolt ring onto the flange. Replacement retaining rings are also available separately.

Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number
–	1	Blank	Claw-clamp	6.0	L250-B	7812004
267	1	Weld	Claw-clamp	1.4	L250-W	7813027
–	2	Blank	Bolt	2.0	L250-BB	7852004
267	2	Weld	Bolt	4.3	L250-BW	7850013

Optional flange converter	Wt kg	Reference	Part number
Rotatable bolt ring assembly	4.5	L250-RBF	7853004
Retaining ring	0.2	L250-RR	7853024

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO LF Flanges

DN320LF

Features

- HV rated to 1x10⁻⁸ mbar
- High-temperature rated to 200°C
- Symmetric and non-rotatable geometry
- Rotatable bolt ring available
- Elastomer O-ring seal
- Claw-clamp style or bolt style fastening
- ISO-compatible design

Specifications

Material			
Flanges			304ss
Rotatable bolt ring			Aluminium
O-rings			Viton® or Buna-N® elastomer
Claw-clamps			Aluminium
Fastening			
Claw-clamp			M12, (8-12 required)
Bolt type			Hexagonal head, M12
Nut type			Hexagonal
Torque			Bolts: 9-14 Nm
Vacuum range			1x10⁻⁸ mbar
Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Weight			23 kg maximum
Dimensions			
Clamp style			370 OD x 318 ID maximum
Bolt style			425 OD x 318 ID maximum

HV Series

Figure 1 Claw-clamp style

Rotatable bolt ring option

Used with claw-clamp style flange

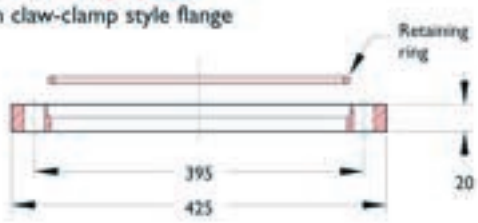


Figure 2 Bolt style

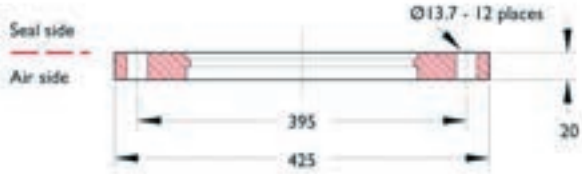


Figure 3 Centring ring assembly

Dimensions in blue are common to all flanges

Centring ring capture groove on blank flanges is 6.4 wide

A rotatable bolt ring assembly is used to add bolt holes to a standard claw-clamp style ISO LF flange. An assembly consists of one aluminium bolt ring and one retaining ring. The retaining ring fits into a groove on a claw-clamp style flange and holds the bolt ring onto the flange. Replacement retaining rings are also available separately.

Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number
–	1	Blank	Claw-clamp	14.5	L320-B	7812005
324	1	Weld	Claw-clamp	3.6	L320-W	7813005
–	2	Blank	Bolt	23.0	L320-BB	7852005
324	2	Weld	Bolt	11.4	L320-BW	7850005

Optional flange converter	Wt kg	Reference	Part number
Rotatable bolt ring assembly	5.4	L320-RBF	7853005
Retaining ring	0.2	L320-RR	7853025

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO LF Flanges

DN400LF

Features

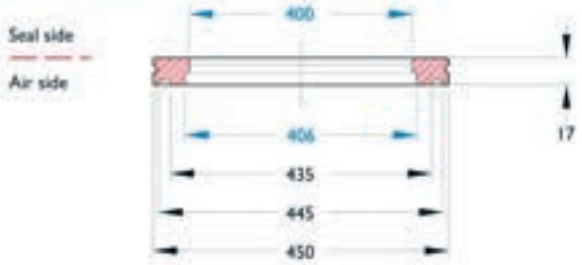
- HV rated to $1x10^{-8}$ mbar
- High-temperature rated to 200°C
- Symmetric and non-rotatable geometry
- Rotatable bolt ring available
- Elastomer O-ring seal
- Claw-clamp style or bolt style fastening
- ISO-compatible design

Specifications

Material			
Flanges			304ss
Rotatable bolt ring			Aluminium
O-rings			Viton® or Buna-N® elastomer
Claw-clamps			Aluminium
Fastening			
Claw-clamp			M12, (8-16 required)
Bolt type			Hexagonal head, M12
Nut type			Hexagonal
Torque			Bolts: 9-14 Nm
Vacuum range			$1x10^{-8}$ mbar
Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Weight			34 kg maximum
Dimensions			
Clamp style			450 OD x 400 ID maximum
Bolt style			510 OD x 400 ID maximum

HV Series

Figure 1 Claw-clamp style



Rotatable bolt ring option

Used with claw-clamp style flange

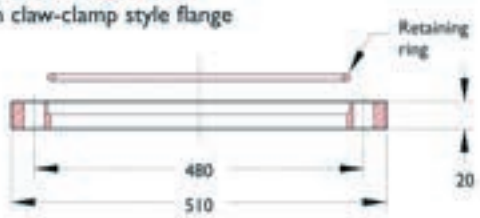


Figure 2 Bolt style

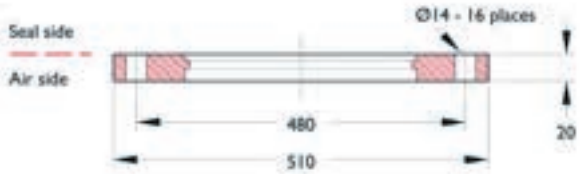


Figure 3 Centring ring assembly

Dimensions in blue are common to all flanges

Centring ring capture groove on blank flanges is 6.4 wide

A rotatable bolt ring assembly is used to add bolt holes to a standard claw-clamp style ISO LF flange. An assembly consists of one aluminium bolt ring and one retaining ring. The retaining ring fits into a groove on a claw-clamp style flange and holds the bolt ring onto the flange. Replacement retaining rings are also available separately.

Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number
–	1	Blank	Claw-clamp	20.5	L400-B	7812006
406	1	Weld	Claw-clamp	4.5	L400-W	7813006
–	2	Blank	Bolt	34.0	L400-BB	7852006
406	2	Weld	Bolt	11.4	L400-BW	7850006

Optional flange converter	Wt kg	Reference	Part number
Rotatable bolt ring assembly	13.6	L400-RBF	7853006
Retaining ring	0.2	L400-RR	7853026

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Section 1.2

ISO LF Flanges

DN500LF

Features

- HV rated to 1x10⁻⁸ mbar
- High-temperature rated to 200°C
- Symmetric and non-rotatable geometry
- Rotatable bolt ring available
- Elastomer O-ring seal
- Claw-clamp style or bolt style fastening
- ISO-compatible design

Specifications

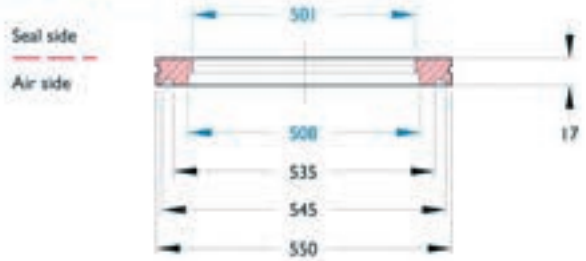
Material	
Flanges	304ss
Rotatable bolt ring	Aluminium
O-rings	Viton® or Buna-N® elastomer
Claw-clamps	Aluminium
Fastening	
Claw-clamp	M12, (12-16 required)
Bolt type	Hexagonal head, M12
Nut type	Hexagonal
Torque	Bolts: 9-14 Nm
Vacuum range	1x10⁻⁸ mbar

Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C

Weight	43 kg maximum
Dimensions	
Clamp style	550 OD x 501 ID maximum
Bolt style	610 OD x 501 ID maximum

HV Series

Figure 1 Claw-clamp style



Rotatable bolt ring option

Used with claw-clamp style flange

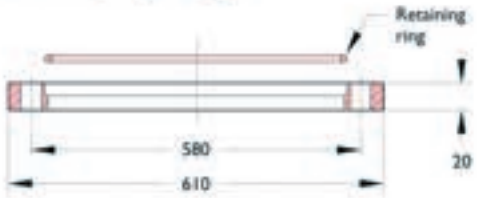


Figure 2 Bolt style

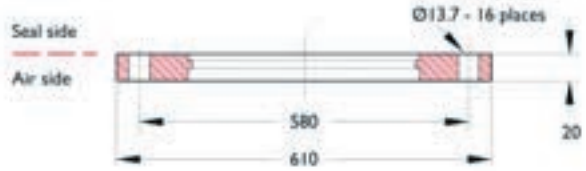


Figure 3 Centring ring assembly

Dimensions in blue are common to all flanges

Centring ring capture groove on blank flanges is 6.4 wide

A rotatable bolt ring assembly is used to add bolt holes to a standard claw-clamp style ISO LF flange. An assembly consists of one aluminium bolt ring and one retaining ring. The retaining ring fits into a groove on a claw-clamp style flange and holds the bolt ring onto the flange. Replacement retaining rings are also available separately.

Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number
–	1	Blank	Claw-clamp	31.4	LS00-B	7812007
508	1	Weld	Claw-clamp	5.4	LS00-W	7813007
–	2	Blank	Bolt	43.0	LS00-BB	7852007
508	2	Weld	Bolt	25.0	LS00-BW	7850007

Optional flange converter	Wt kg	Reference	Part number
Rotatable bolt ring assembly	16.0	LS00-RBF	7853007
Retaining ring	0.2	LS00-RR	7853027

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO LF Fittings

Bolt sets and replacement retaining rings

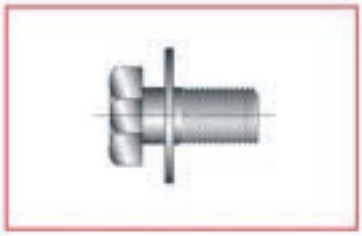
Bolt sets for two bolted flanges

Features

- Nuts and washers included

ISO LF Flange	Bolt size	Number in set	Reference	Part number
Stainless steel				
DN63LF	M8 X 40	25	M8-40	1113025
DN100LF	M8 X 40	25	M8-40	1113025
DN160LF	M10 X 50	12	M10-50 (12)	1113040
DN200LF	M10 X 50	12	M10-50 (12)	1113040
DN250LF	M10 X 50	12	M10-50 (12)	1113040
DN300LF	M12 X 60	16	M12-60 (16)	1113050
DN400LF	M12 X 60	16	M12-60 (16)	1113050
DN500LF	M12 X 60	16	M12-60 (16)	1113050

Bolt sets for joining bolted flanges to tapped flanges



Features

- Washer included

ISO LF Flange	Bolt size	Number in set	Reference	Part number
Stainless steel				
DN63LF	M8 x 20	25	M8-20	1113009
DN100LF	M8 x 20	25	M8-20	1113009
DN160LF	M10 x 30	12	M10-30 (12)	1113011
DN200LF	M10 x 30	12	M10-30 (12)	1113011
DN250LF	M10 x 30	12	M10-30 (12)	1113011
DN320LF	M12 x 40	16	M12-40 (16)	1113012
DN400LF	M12 x 40	16	M12-40 (16)	1113012
DN500LF	M12 x 40	16	M12-40 (16)	1113012

Replacement retaining rings

ISO LF Flange	Reference	Part number
Steel For rotatable bolt rings		
DN63LF	L63-RR	7853020
DN100LF	L100-RR	7853021
DN160LF	L160-RR	7853022
DN200LF	L200-RR	7853023
DN250LF	L250-RR	7853024
DN320LF	L320-RR	7853025
DN400LF	L400-RR	7853026
DN500LF	L500-RR	7853027

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF and LF fittings

Introduction

Features

- High vacuum rated to $1x10^{-9}$ mbar
- Temperature rated to 200°C maximum
- Symmetric, non-rotatable geometries
- Rotatable bolt rings available for LF sizes
- Viton® or Buna-N® O-rings
- Standard matt finish[1]
- ISO compatible design range of KF and LF sizes

Specifications

Material

Flanges	304ss
Finish[1]	Standard matt finish
Vacuum range	$1x10^{-9}$ mbar
Fittings leak test	$2x10^{-10}$ cc/sec of He

Temperature range	Minimum	Intermittent	Sustained
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Silicone	-50°C	200°C	150°C

Weight and dimensions See table

[1] Caburn-MDC reserves the right to use matt or polished tube at their discretion

UHV Series

Description

Caburn-MDC ISO KF and ISO LF tube fittings are convenient building-block components. They offer great flexibility in the design and construction of high vacuum systems. All fittings are fabricated from 304 stainless steel drawn and welded vacuum tubing. Flanges do not need to be rotatable since they are completely symmetric. If desired, rotatable bolt ring assemblies can be retrofitted to existing claw-clamp style flanges to add bolt holes to ISO LF fittings.

Reducers are used for a change in size of flanges within a single method of sealing, such as elastomer sealing of ISO KF and LF flanges.

Note Zero-length reducers are not possible with ISO style flanges.

Inch-metric ISO comparison

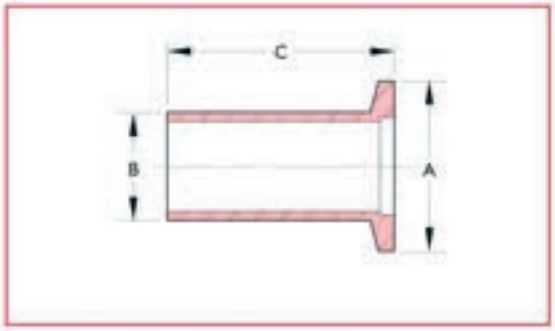
Caburn-MDC	OD inches	OD mm	ISO	OD mm
K16	0.75	19	NW16	20.0
K25	1.0	25	NW25	25.0
K40	1.5	38	NW40	40.0
K50	2.0	50	NW50	50.0
L63	2.9	76	NW63	63.5
L100	4.3	108	NW100	102
L160	6.3	159	NW160	153
L200	8.6	219	NW200	212
L250	10.5	267	NW250	254
L320	12.8	324	NW320	316
L400	16.0	406	NW400	400
L500	20.0	508	NW500	500

Sizes given above are nominal

ISO KF and LF fittings

Half nipples

KF Clamp style

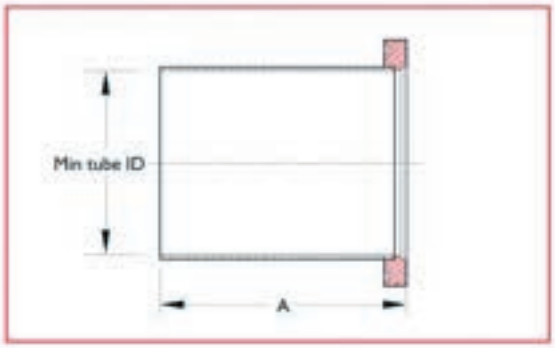


Features

- DN16KF through to DN50KF sizes
- Requires hinged clamp or bulkhead clamp
- Custom lengths available on request

Flange ISO ref.	Flange OD	Tube OD	Tube length	Reference	Part number
Short					
K16-SWS	30	20	30	K16-SWS	7715101
K25-SWS	40	28	30	K25-SWS	7715102
K40-SWS	55	44.5	30	K40-SWS	7715103
K50-SWS	75	57	30	K50-SWS	7715104
Long					
K16-LWS	30	20	70	K16-LWS	7715106
K25-LWS	40	28	70	K25-LWS	7715107
K40-LWS	55	44.5	70	K40-LWS	7715108
K50-LWS	75	57	70	K50-LWS	7715109

LF Clamp style



Features

- DN63LF through to DN500LF sizes
- Requires claw-clamps – see individual flange size
- Custom lengths available on request

Flange ISO ref.	Min. tube ID	Min. A	Wt kg	Reference	Part number
Stainless steel					
DN63LF	60	100	0.5	LST-63-T	7820009
DN100LF	97	100	0.9	LST-100-T	7820010
DN160LF	145	100	1.5	LST-160-T	7820011
DN200LF	197	100	2.0	LST-200-T	7820012
DN250LF	248	100	4.0	LST-250-T	7820013
DN320LF	314	100	5.5	LST320-T	7820005
DN400LF	397	100	6.0	LST400-T	7820006
DN500LF	497	100	8.0	LST500-T	7820007

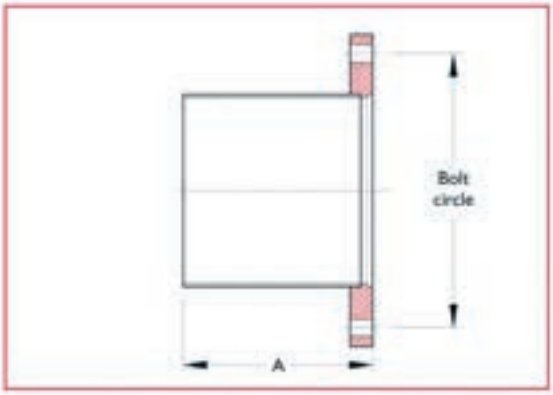
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF and LF fittings

Half nipples and nipples

LF Bolt style

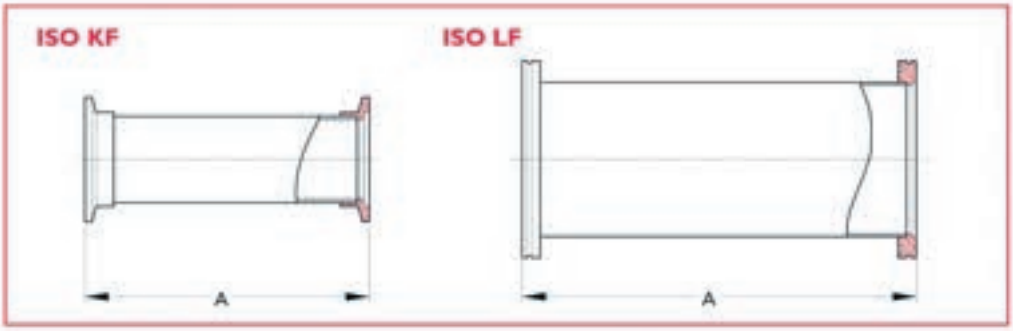


Features

- DN63LF through to DN500LF sizes
- Requires bolts – see individual flange size
- Custom lengths available on request

Flange ISO ref.	No. of bolt holes	Bolt holes size	BC	Tube/ cut and roll min. ID	Min. A	Wt kg	Reference	Part number
Stainless steel								
DN63LF	4	M8	110	60	100	1.8	L63-BL	7851009
DN100LF	8	M8	145	97	100	2.3	L100-BL	7851010
DN160LF	8	M10	200	145	100	3.2	L160-BL	7851011
DN200LF	12	M10	260	197	100	5.5	L200-BL	7851012
DN250LF	12	M10	310	248	100	6.8	L250-BL	7851013
DN320LF	12	M12	395	314	100	15.5	L320-BL	7851005
DN400LF	16	M12	480	397	100	18.0	L400-BL	7851006
DN500LF	16	M12	580	498	100	32.5	L500-BL	7851007

Straight tube



Features

- DN16KF through to DN250LF sizes
- Welded construction
- Custom lengths available on request

Flange ISO ref.	Min. tube ID	Min. A	Wt kg	Reference	Part number
Stainless steel					
DN16KF	16	80	0.2	KST-16	7721000
DN25KF	22	100	0.2	KST-25	7721001
DN40KF	34	130	0.2	KST-40	7721002
DN50KF	47	140	0.4	KST-50	7721003
Stainless steel					
DN63LF	60	100	0.9	LST63	7821009
DN100LF	97	100	1.8	LST100	7821010
DN160LF	145	100	4.5	LST160	7821011
DN200LF	197	100	5.5	LST200	7821012
DN250LF	248	100	7.3	LST250	7821013

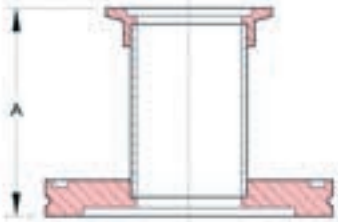
All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF and LF fittings

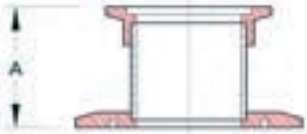
Nipple reducers

Straight tube

ISO LF to ISO KF



ISO KF to ISO KF



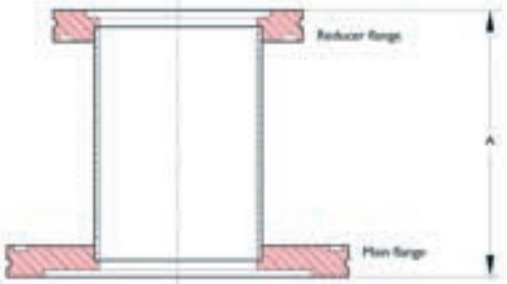
Features

- Main flange DN25KF to DN100LF
- Welded construction
- Custom lengths available on request

Flange ISO ref.	Nominal tube size	Nominal tube ID	A	Wt kg	Reference	Part number
Stainless steel						
DN25KF	DN16KF	16	28	0.2	KST-25-16	7732000
DN40KF	DN16KF	16	28	0.2	KST-40-16	7732001
DN40KF	DN25KF	24	28	0.2	KST-40-25	7732003
DN50KF	DN16KF	16	28	0.3	KST-50-16	7732002
DN50KF	DN25KF	24	28	0.3	KST-50-25	7732004
DN50KF	DN40KF	40	28	0.3	KST-50-40	7732005
Stainless steel						
DN63LF	DN40KF	34	50	0.7	LST63-K40	1130285
DN63LF	DN50KF	47	50	1.2	LST63-K50	1130286
DN100LF	DN50KF	47	50	1.2	LST100-K50	1130287

Straight tube

ISO LF to ISO LF



Features

- Main flange DN100LF through to DN250LF
- Welded construction
- Custom lengths available on request

Main flange ISO ref.	Reducer flange ISO ref.	Minimum tube ID	A	Wt kg	Reference	Part number
Stainless steel						
DN100LF	DN63LF	60	50	2.0	LST100-63	7832011
DN160LF	DN63LF	60	50	2.7	LST160-63	7832012
DN160LF	DN100LF	97	50	4.8	LST160-100	7832013
DN200LF	DN160LF	145	90	6.0	LST200-160	7832014
DN250LF	DN200LF	197	90	8.0	LST250-200	7832015

Application note Zero-length reducers are not available with ISO style connection

Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

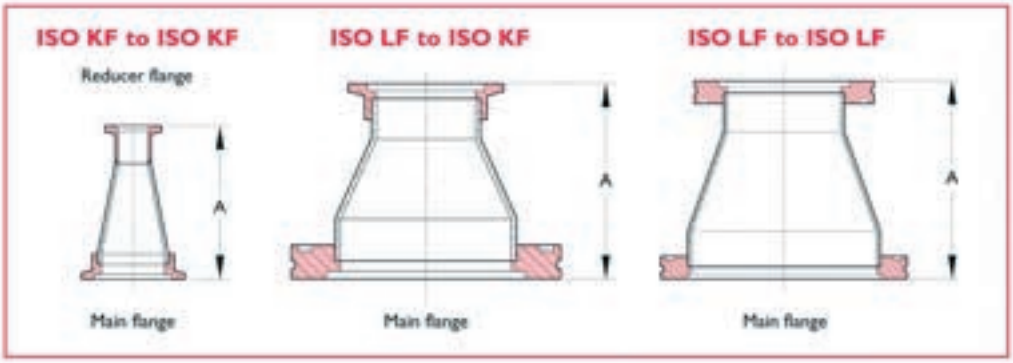
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Section 1.2

ISO KF and LF fittings

Nipple reducers and elbows

Conical

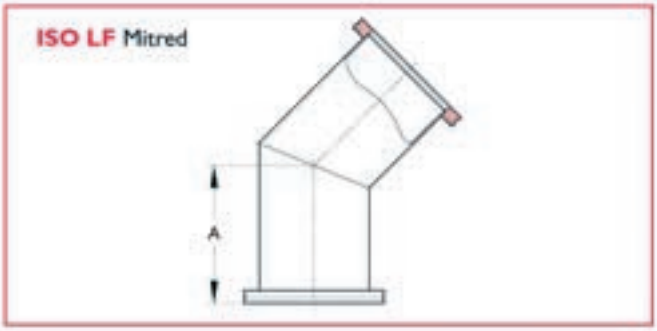


Features

- Main flange DN25KF through to DN160LF sizes

Main flange ISO ref.	Main flange OD	Tube ISO ref.	Reducer flange OD	OD	Wall	A	Wt kg	Reference	Part number
DN25KF	40	DN16KF	30	25 - 19	1.7	52	0.4	K100XK075FCR	732006
DN40KF	55	DN16KF	30	38 - 19	1.7	78	0.5	K150XK075FCR	732007
DN40KF	55	DN25KF	40	38 - 25	1.7	70	0.5	K150XK100FCR	732010
DN50KF	75	DN25KF	40	50 - 25	1.7	70	0.5	K200XK100FCR	732008
DN50KF	75	DN40KF	55	50 - 38	1.7	71	0.5	K200XK150FCR	732009
DN63LF	95	DN40KF	55	63 - 38	1.7	72	0.7	L250XK150FCR	840016
DN100LF	130	DN50KF	75	100 - 50	1.7	104	1.6	L400XK200FCR	840020
DN100LF	130	DN63LF	95	102 - 63	1.7	105	2.0	LCR100-63	832007
DN160LF	180	DN100LF	130	152 - 102	3.0	241	2.3	LCR160-100	832010

45° with tangents



Features

- Welded construction
- Custom lengths available on request

Flange ISO ref.	Flange OD	Bend type	Minimum tube ID	A	Wt kg	Reference	Part number
Stainless steel							
DN63LF	95	Mitre	60	82	0.9	LL45-63	7823008
DN100LF	130	Mitre	97	128	2.7	LL45-100	7823009

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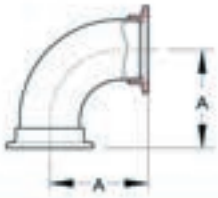
ISO KF and LF fittings

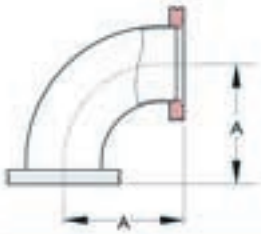
Elbows

90°

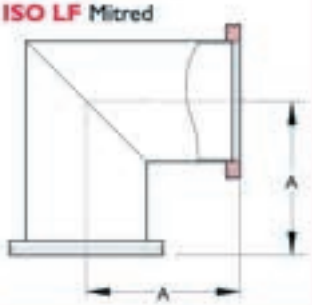
ISO KF Radial



ISO LF Radial



ISO LF Mitred



Features

- DN16KF through to DN250LF sizes
- Radial or mitred tube
- Welded construction
- Custom lengths available on request

Flange ISO ref.	Flange OD	Bend type	Minimum tube ID	A	Wt kg	Reference	Part number
Stainless steel							
DN16KF	30	Radial	16	40	0.2	KL-16	**7723000**
DN25KF	40	Radial	22	50	0.2	KL-25	**7723001**
DN40KF	55	Radial	34	65	0.2	KL-40	**7723002**
DN50KF	75	Radial	47	70	0.4	KL-50	**7723003**
Stainless steel							
DN63LF	95	Radial	60	88	1.0	LL63	**7823000**
DN100LF	130	Radial	97	159	2.7	LL100R	**7823018**
DN160LF	180	Mitred	145	138	4.5	LL160	**7823002**
DN200LF	240	Mitred	197	178	6.4	LL200	**7823003**
DN250LF	290	Mitred	248	208	8.6	LL250	**7823004**

Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Section 1.2

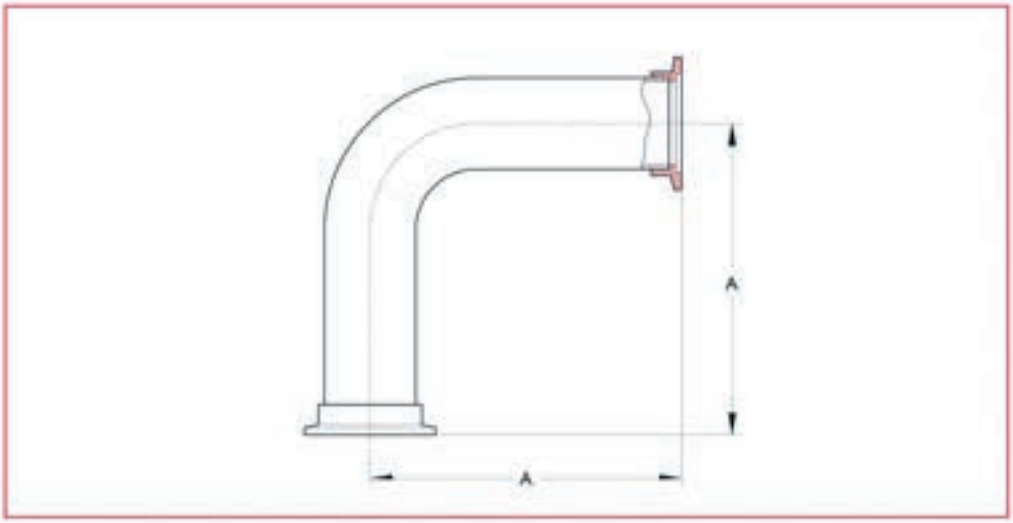
ISO KF and LF fittings

Elbows

90° with tangents

Features

- DN16KF through to DN100LF sizes
- Radial tube
- Welded construction
- Custom lengths available on request

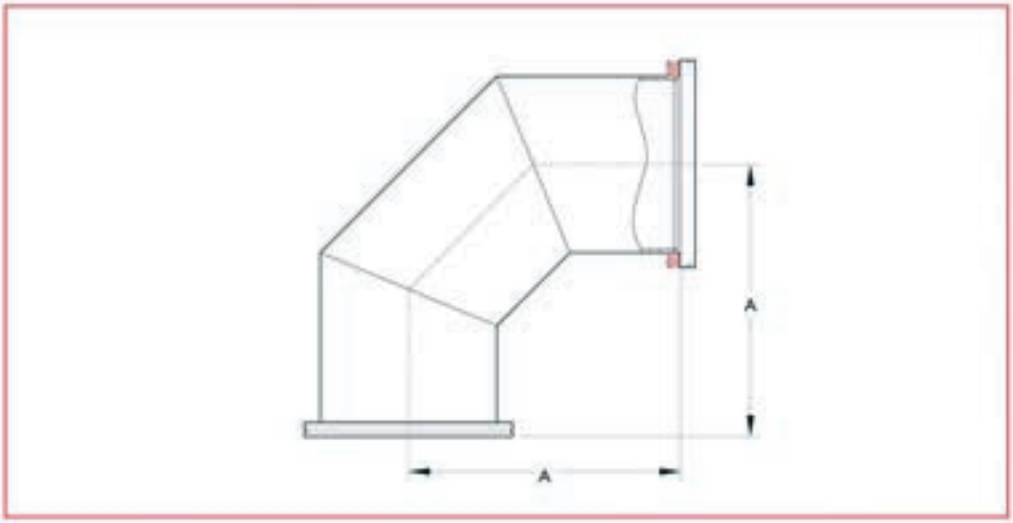


Flange ISO ref.	Flange OD	Nominal tube ID	A	Wt kg	Reference	Part number
Stainless steel						
DN16KF	30	16	49	0.2	KLL-16	7723018
DN25KF	40	22	57	0.8	KLL-25	7723019
DN40KF	55	34	80	1.0	KLL-40	7723020
DN50KF	75	48	108	1.0	KLL-50	7723021
Stainless steel						
DN63LF	95	60	138	1.4	L63-2LL	823020
DN100LF	130	97	217	2.3	L100-2LL	823022

High conductance

Features

- Mitred tube
- Welded construction
- Custom lengths available on request



Flange ISO ref.	Flange OD	Nominal tube ID	A	Wt kg	Reference	Part number
Stainless steel						
DN160LF	180	145	235	5.0	LL160-HC	823013

Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

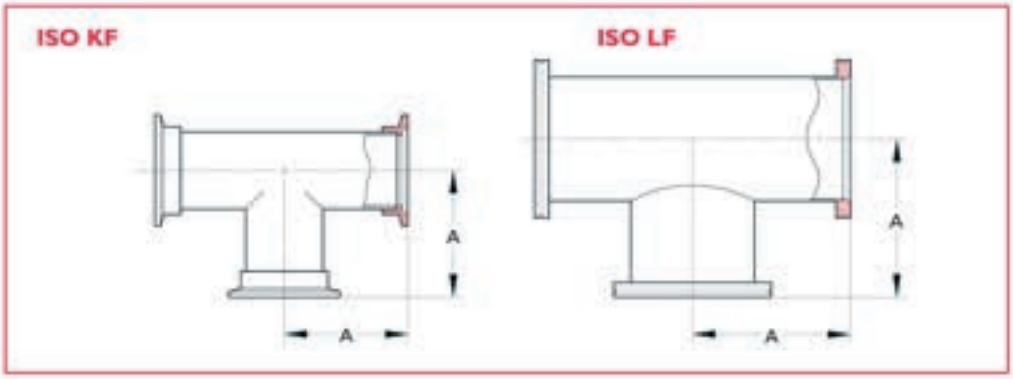
ISO KF and LF fittings

Tees and reducing tees

Tee

Features

- DN16KF through to DN250LF sizes
- Custom lengths available on request

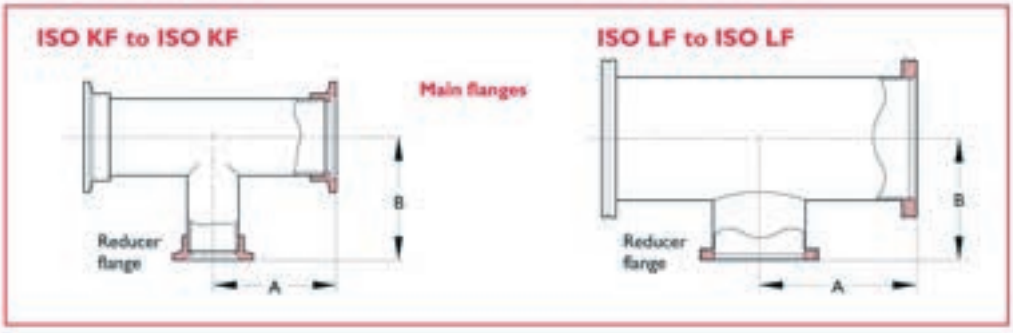


Flange ISO ref.	Flange OD	Nominal tube ID	A	Wt kg	Reference	Part number
Stainless steel						
DN16KF	30	16	40	0.2	KT-16	7724000
DN25KF	40	22	50	0.2	KT-25	7724001
DN40KF	55	34	65	0.2	KT-40	7724002
DN50KF	75	48	70	0.4	KT-50	7724003
Stainless steel						
DN63LF	95	60	88	1.4	LT63	7824031
DN100LF	130	97	108	3.6	LT100	7824032
DN160LF	180	145	138	6.0	LT160	7824033
DN200LF	240	197	178	8.2	LT200	7824034
DN250LF	290	248	208	10.8	LT250	7824035

Reducing tees

Features

- Main flange DN25KF through DN160LF sizes
- Custom lengths available on request



Main flange ISO ref.	Nominal tube ID	A	Reducer flange ISO ref.	Nominal tube ID	B	Wt kg	Reference	Part number
Stainless steel								
DN25KF	22	50	DN16KF	16	40	0.5	KRT25-16	724004
DN40KF	34	65	DN16KF	16	40	0.5	KRT40-16	724005
DN40KF	34	65	DN25KF	22	50	0.5	KRT40-25	724006
DN50KF	48	70	DN16KF	16	50	1.0	KRT50-16	724007
DN50KF	48	70	DN25KF	22	65	1.0	KRT50-25	724008
DN50KF	48	70	DN40KF	34	65	1.0	KRT50-40	724009
Stainless steel								
DN100LF	97	108	DN63LF	60	107	3.2	LRT100-63	7824047
DN160LF	145	138	DN100LF	97	130	5.5	LRT160-100	7824050

Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF and LF fittings

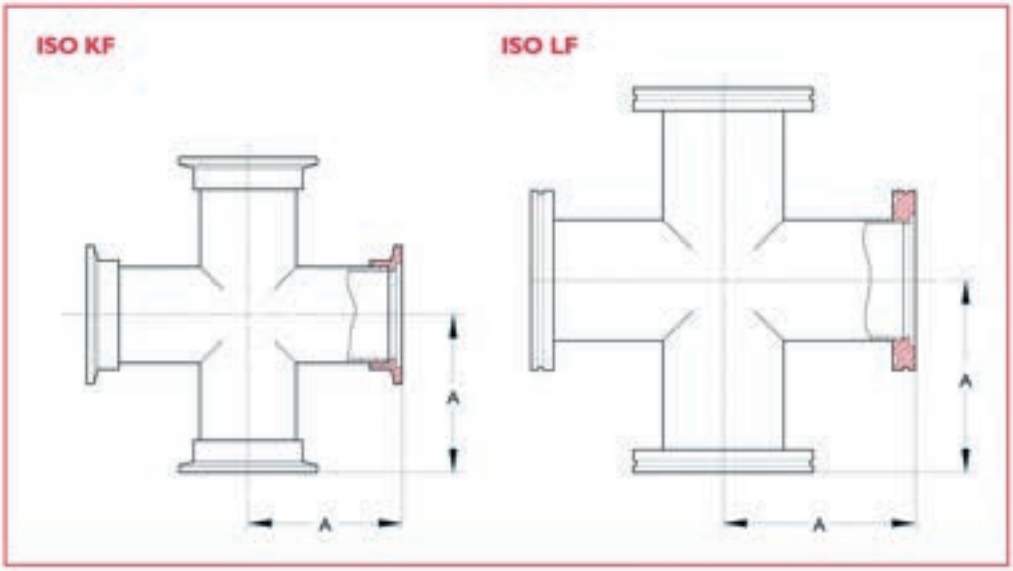
Four-way crosses

Four-way crosses

Note
Spherical main body on some units

Features

- DN16KF through to DN250LF sizes
- Body type dependent on tube size
- Custom lengths available on request



Flange ISO ref.	Flange OD	Body type	Min. tube/ cut and roll* ID	Sphere ID	A	Wt kg	Reference	Part number
Stainless steel								
DN16KF	30	Tube	16	–	40	0.2	KX4-16	**7725000**
DN25KF	40	Tube	22	–	50	0.4	KX4-25	**7725001**
DN40KF	55	Tube	34	–	65	0.4	KX4-40	**7725002**
DN50KF	75	Tube	48	–	70	0.8	KX4-50	**7725003**
Stainless steel								
DN63LF	95	Tube	60	–	88	2.7	LX4-63	**7825031**
DN100LF	130	Sphere	97	152	130	4.5	LX4-100S	**7825032**
DN160LF	180	Sphere	145	222	160	6.8	LX4-160S	**7825033**
DN200LF	240	Sphere	197	299	197	9.5	LX4-200S	**7825034**
DN250LF	290	Sphere	248	400	248	11.8	LX4-250S	**7825035**

* Cut and roll is a flat sheet of material cut to size and rolled to form a tube
The tube is finished with a continuous weld along the inside seam
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

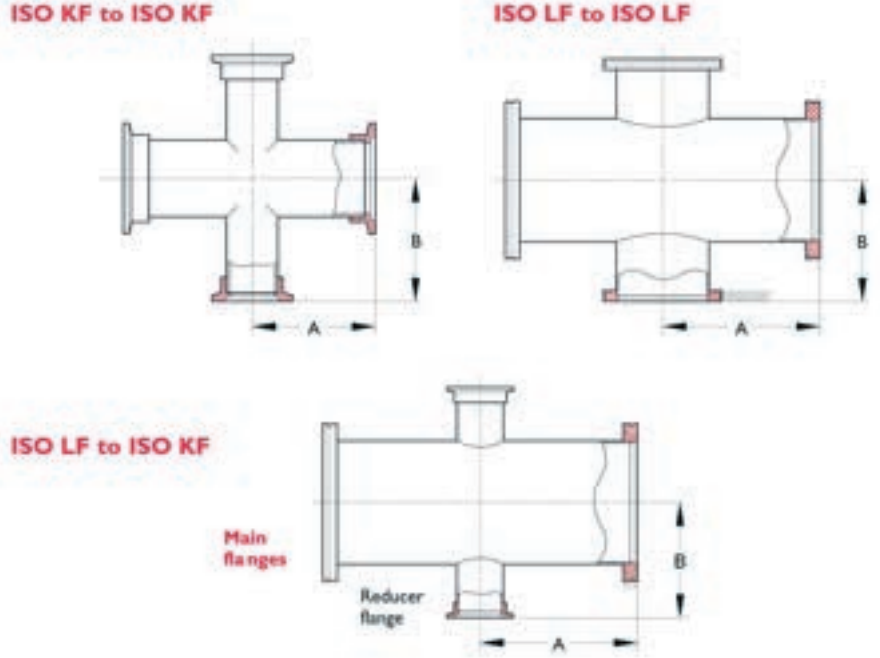
ISO KF and LF fittings

Reducing crosses

Reducing tees

Features

- Main flange DN25KF through to DN160LF sizes
- Custom lengths available on request



Main flange ISO ref.	Min. tube ID	A	Reducer flange ISO ref.	Min. tube ID	B	Wt kg	Reference	Part number
Stainless steel								
DN25KF	22	50	DN16KF	16	40	0.4	KRX25-16	7725010
DN40KF	34	65	DN16KF	16	40	0.4	KRX40-16	7725011
DN40KF	34	65	DN25KF	22	50	0.4	KRX40-25	7725012
DN50KF	48	70	DN25KF	22	50	1.0	KRX50-25	7725013
DN50KF	48	70	DN40KF	34	65	1.0	KRX50-40	7725014
Stainless steel								
DN63LF	60	102	DN40KF	34	76	1.0	L63-4-K40	7825041
DN63LF	60	102	DN50KF	48	92	1.0	L63-4-K50	7825042
DN100LF	97	130	DN50KF	48	111	2.3	L100-4-K50	7825046
Stainless steel								
DN100LF	97	108	DN63LF	60	107	4.0	L100-4-L63	7825047
DN160LF	145	138	DN100LF	97	131	6.8	L160-4-L100	7825050

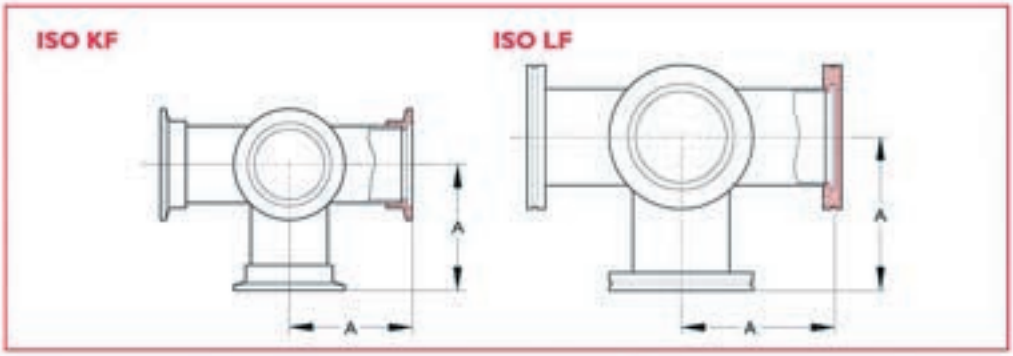
Caburn-MDC reserves the right to substitute a larger bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

ISO KF and LF fittings

Five-way and six-way crosses

Five-way crosses

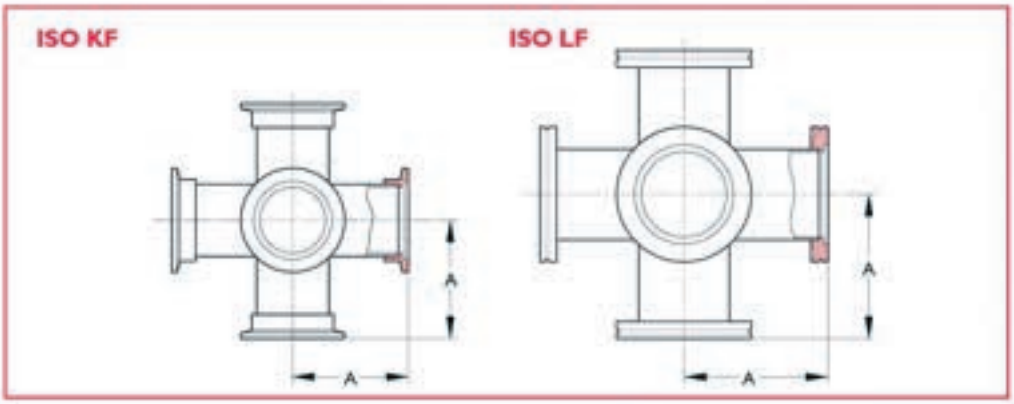


Features

- DN16KF through to DN160LF sizes
- Custom lengths available on request

Flange ISO ref.	Flange OD	Minimum ID	Body type	A	Wt kg	Reference	Part number
Stainless steel							
DN16KF	30	16	Tube	40	0.2	KX5-16	7726000
DN25KF	40	22	Tube	50	0.4	KX5-25	7726001
DN40KF	55	38	Tube	65	0.4	KX5-40	7726002
Stainless steel							
DN63LF	95	60	Tube	88	3.6	LX5-63	7826009
DN100LF	130	97	Tube	108	5.5	LX5-100	7826010
DN160LF	180	145	Tube	138	8.2	LX5-160	7826011

Six-way crosses



Features

- DN16KF through to DN250LF sizes
- Body type dependent on tube size
- Custom lengths available on request

Flange ISO ref.	Flange OD	Tube min. ID/ cut and roll[1]	Body type	Body dimen. ID	A	Wt kg	Reference	Part number
Stainless steel								
DN16KF	30	16	Tube	–	40	0.2	KX6-16	7727000
DN25KF	40	22	Tube	–	50	0.4	KX6-25	7727001
DN40KF	55	34	Tube	–	65	0.4	KX6-40	7727002
Stainless steel								
DN63LF	95	60	Tube	–	88	4.0	LX6-63	7827009
DN100LF	130	97	Tube	–	108	6.0	LX6-100	7827010
DN160LF	180	145	Sphere	222	138	8.6	LX6-160	7827011
DN200LF	240	197	Sphere	298	178	10.5	LX6-200	7827012
DN250LF	286	248	Sphere	400	208	15.0	LX6-250	7827013

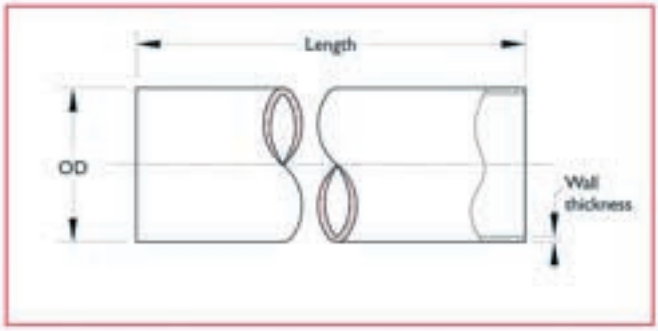
[1] Cut and roll is a flat sheet of material cut to size and rolled to form a tube
The tube is finished with a continuous weld along the inside seam
Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Weldable components

Vacuum tubing

Vacuum tubing



Features

- 304 (1.4301) stainless steel
- Cut to size as required (see cutting charge)
- Vacuum tight
- Suitable for high vacuum and UHV
- Maximum shipping length 2m

Description

Caburn-MDC 304 (1.4301) stainless steel tube is suitable for all high and ultrahigh vacuum applications. The material is priced per metre.

Nominal OD	Tube wall thickness	Tube ID	Wt kg/m	Reference	Part number
Stainless steel					
6.35 (1/4")	0.9 (20swg)	4.6	0.1	CT-06	1140001
9.52 (3/8")	0.9 (20swg)	7.7	0.2	CT-09	1140003
12.7 (1/2")	1.2 (18swg)	10.3	0.5	CT-12	1140008
19.1 (3/4")	1.2 (18swg)	16.7	0.6	CT-19	1140010
19.1 (3/4")	0.9 (20swg)	17.3	0.4	CT-19-09	1140011
38.1 (1 1/2")	1.6 (16swg)	34.9	1.5	CT-38	1140020
40.0	2.0 (14swg)	36.0	1.9	CT-40	1140024
41.2 (1 5/8")	1.6 (16swg)	38.0	1.6	CT-41	1140025
44.4 (1 3/4")	1.6 (16swg)	41.2	1.7	CT-44	1140026
50.8 (2")	1.6 (16swg)	47.6	2.0	CT-50	1140031
63.5 (2 1/2")	1.6 (16swg)	60.3	2.5	CT-63	1140036
70.0 (2 1/2")	2.0 (14swg)	66.0	2.6	CT-70	1140041
76.2 (3")	1.6 (16swg)	73.0	3.0	CT-76	1140042
101.6 (4")	1.6 (16swg)	98.4	4.1	CT-101	1140050
104.0	2.0 (14swg)	100.0	5.1	CT-104	1140052
108.0 (4 1/4")	2.0 (14swg)	104.0	5.3	CT-108	1140051
108.0 (4 1/4")	3.0 (10swg)	102.0	8.4	CT-108-32	1140066
152.4 (6")	3.0 (10swg)	146.4	12.1	CT-152	1140056
156.0 (6 1/8")	3.0 (10swg)	150.0	12.0	CT-156	1140057
159.0 (6 1/4")	3.0 (10swg)	153.0	11.8	CT-159	1140058
203.2 (8")	3.0 (10swg)	197.2	13.0	CT-203	1140063

Note

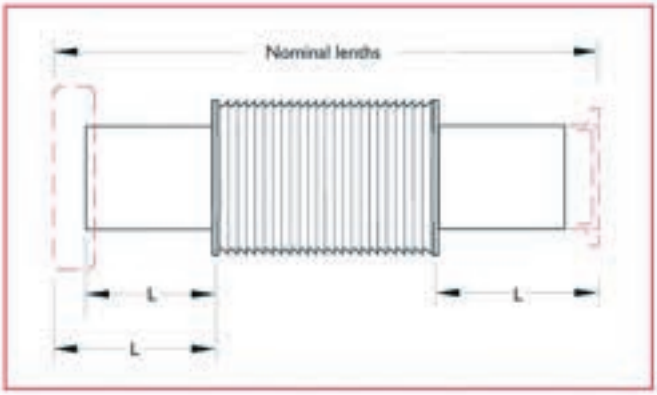
Tubes up to CT-41 have polished OD, all other sizes are not polished

All tubes are supplied UHV clean

All lengths subject to a -0 +5mm tolerance

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Edge-welded bellows



Features

- Long-life bellows
- 316LN flange option available on request

Description

Caburn-MDC is pleased to showcase this range of edge-welded bellows connectors for UHV. These allow lateral movement, off-axis movement and vibration isolation.

Offered with four standard fittings

Weldable CF or ISO KF and LF flanges, our bellows are manufactured to the highest standards of cleanliness for UHV applications. All bellows are constructed from stainless steel grade AM350 with connectors in SS304 material.

Special bellows assemblies and custom fabrications are also available on request.

For other sizes/combinations of flanges available

please contact your local sales office for a quotation.

Termination	Clear ID	Bellows max. OD	Nom. stroke	Nominal extended lengths[1]	Lengths compressed	L	Reference	Part number
DN16 AM350/304 Stainless steel								
DN16 weldable	16	32	12	95	83	39.5	EWM16-12-CT	1200100
DN16 weldable	16	32	25	113	88	40	EWM16-25-CT	1200101
DN16 weldable	16	32	38	131	93	40.5	EWM16-38-CT	1200102
DN16 weldable	16	32	76	182	106	41.5	EWM16-76-CT	1200103
DN16CF	16	32	25	125	97	44.5	EWM16-25-CF	1200105
DN16CF	16	32	38	145	102	45.0	EWM16-38-CF	1200106
DN40 AM350/304 Stainless steel								
DN40 weldable	38	62.5	12	132	120	58.5	EWM40-12-CT	1200113
DN40 weldable	38	62.5	25	147	122	57.5	EWM40-25-CT	1200114
DN40 weldable	38	62.5	38	167	129	59.5	EWM40-38-CT	1200115
DN40 weldable	38	62.5	76	216	140	60.0	EWM40-76-CT	1200116
DN40CF	38	62.5	25	159	133	63.0	EWM40-25-CF	1200118
DN40CF	38	62.5	38	178	140	65.0	EWM40-38-CF	1200119
DN40CF	38	62.5	76	228	151	65.5	EWM40-76-CF	1200120
DN40KF	38	62.5	25	156	130	61.5	EWM40-25-KF	1200122
DN40KF	38	62.5	38	175	137	63.5	EWM40-38-KF	1200123
DN40KF	38	62.5	76	225	148	64.0	EWM40-76-KF	1200124
DN63 AM350/304 Stainless steel								
DN63 weldable	66	95	25	185	160	77.0	EWM63-25-CT	1200127
DN63 weldable	66	95	38	206	168	79.0	EWM63-38-CT	1200128
DN63CF	66	95	25	204	179	96.0	EWM63-25-CF	1200131
DN63CF	66	95	38	225	187	96.0	EWM63-38-CF	1200132
DN100 AM350/304 Stainless steel								
DN100 weldable	100	132	12	175	163	80.5	EWM100-12-CT	1200139
DN100 weldable	100	132	25	191	166	81.0	EWM100-25-CT	1200140
DN100 weldable	100	132	38	210	172	82.5	EWM100-38-CT	1200141
DN100CF	100	132	38	232	194	93.5	EWM100-38-CF	1200145
DN160 AM350/304 Stainless steel								
DN160 weldable	150	195	25	214	189	92.5	EWM160-25-CT	1200153
DN160CF	150	195	25	239	214	105.0	EWM160-25-CF	1200157
DN160LF	150	195	25	226	201	98.5	EWM160-25-LF	1200161

[1] Nominal length is subject to a 10% variation

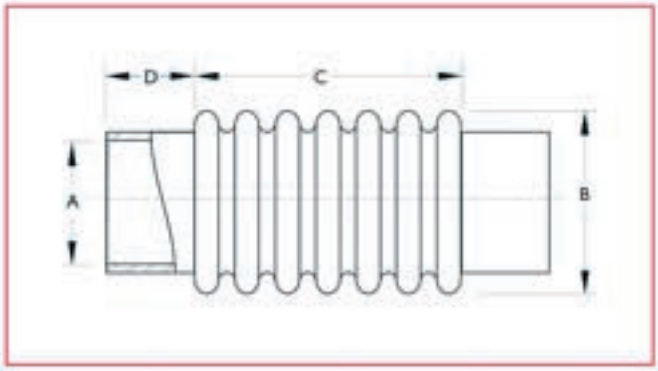
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Formed bellows

Weldable

Unflanged bellows

FB-6502



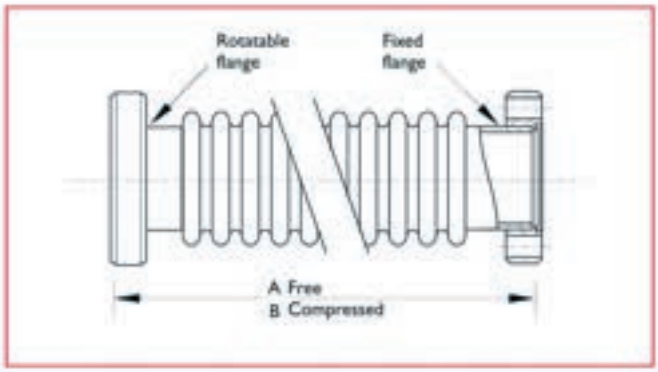
Features

- Type 321 stainless steel
- Highly-flexible, short-length bellows for alignment

Wall thickness	A	B	C	D	Deflection	Reference	Part number
0.13	6.4	9.4	25.4	12.7	±6.4	FB-6502	470000
0.13	7.9	11.7	25.4	12.7	±6.4	FB-6503	470001
0.13	9.4	14.5	38.1	12.7	±9.7	FB-6504	470002
0.13	12.7	19.1	38.1	12.7	±9.7	FB-6506	470003

Flexible couplings

150-X



Features

- CF Flange tabulated
- One flange rotatable

Flange	Bellows ID	A Maximum	B Minimum	Reference	Part number
DN16CF	12.7	76.2	66.5	075-X	400000
DN16CF	12.7	254.0	–	075-X-10	400001
DN40CF	31.8	88.9	78.7	150-X	400003
DN63CF	50.8	158.8	139.7	250-X	400005
DN100CF	88.9	193.5	168.1	400-X	400007
DN160CF	139.7	228.6	203.2	600-X	400009
DN200CF	190.5	254.0	228.6	800-X	400010
DN250CF	254.0	279.4	254.0	1000-XB	400012

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Vacuum hose and accessories

Introduction

Features

- Wire-reinforced PVC hose
- Stainless steel unbraided hose
- Stainless steel braided hose

Wire reinforced PVC hose

Caburn-MDC wire reinforced PVC hose is a flexible and economical solution for mechanical pump roughing lines. They are suitable for basic vacuum service. The wire reinforced wall prevents tube collapse while under vacuum loads, yet provides adequate flexibility for convoluted line paths.

Flexible PVC wire reinforced hose is available in diameters from 19 to 50mm, with or without end terminations. Available with stainless steel ISO KF flanges. The PVC hose is secured to the KF Flange terminations via stainless steel hose clamps.

Flexible stainless steel hose

Caburn-MDC flexible stainless steel hose is the perfect solution for applications where standard straight-line vacuum plumbing is not practical or where vibration isolation is required.

This type of hose consists of a relatively thin-wall-formed stainless steel bellows and is available with an optional, stainless steel braided sheath. The flexible stainless steel braiding protects the formed bellows from abrasion or impact produced by component movement or vacuum cycling and also protects the hose from excessive bending.

Both braided and unbraided configurations are offered with a choice of four end terminations including CF metal seal flanges, ISO KF and ISO LF flanges as well as tube end terminations. Limited only by the choice of flange, all stainless steel hoses can be baked to 450°C.

Custom lengths and terminations other than those listed are available on request. CF metal seal flanges provide a complete metal air-to-vacuum seal required for UHV applications.

Note The large and convoluted internal surface area will require lengthy pumping to achieve UHV pressures. Flexible hoses tend to contract when subjected to internal vacuum loads.

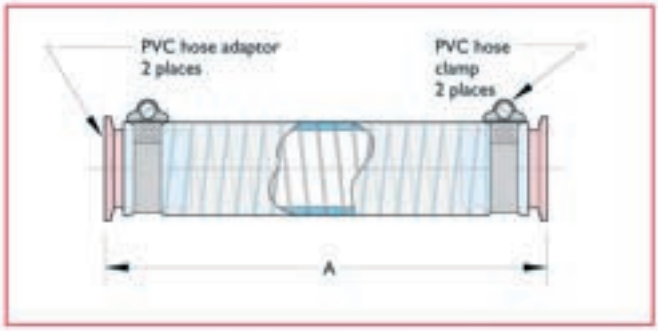
Components connected to either end of a hose must be securely anchored to prevent movement or possible damage. The total load exerted by atmospheric pressure is substantial and can move roughing pumps and other light, non-secured components.

The static bend radius specification for a formed bellows is the minimum radius the bellows can be curved without permanent deformation.

Vacuum hose

PVC Flexible vacuum hose and fittings

ISO KF



Features

- Mates with standard ISO KF fittings
- 35°C (95°F) maximum temperature
- Custom lengths available on request

Nominal hose bore	Flange	Static bend radius	A[1]	Wt kg	Reference	Part number
19 (¾")	DN16KF	500	600	0.5	KPVC16-600	1202000
19 (¾")	DN16KF	500	1200	1.0	KPVC16-1200	1202004
25 (1")	DN25KF	500	600	0.5	KPVC25-600	1202001
25 (1")	DN25KF	500	1200	3.0	KPVC25-1200	1202005
38 (1½")	DN40KF	500	600	0.6	KPVC40-600	1202002
38 (1½")	DN40KF	500	1200	3.0	KPVC40-1200	1202006
50 (2")	DN50KF	500	600	0.6	KPVC50-600	1202003
50 (2")	DN60KF	500	1200	3.4	KPVC50-1200	1202007

[1] Length is subject to tolerance of ±10mm.

PVC Hose per metre

Flange	Static bend radius	A[1]	Reference	Part number
DN16	500	1000	PVC16	1202020
DN25	500	1000	PVC25	1202021
DN40	500	1000	PVC40	1202022
DN50	500	1000	PVC50	1202023

[1] Length is subject to tolerance of ±10mm.

PVC Hose fitting

Flange	Reference	Part number
DN16KF	K16-HF	1120207
DN25KF	K25-HF	1120208
DN40KF	K40-HF	1120209
DN50KF	K50-HF	1120210

Hose clamps

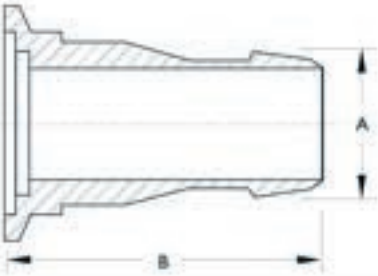
Flange	Reference	Part number
DN16KF	K16-HC	1120227
DN25KF	K25-HC	1120228
DN40KF	K40-HC	1120229
DN50KF	K50-HC	1120230

All dimensions are nominal in millimetres unless specified - Weights given are approximate

KF Tube fittings

KF to rubber hose adaptors

KF to rubber hose adaptor



KF Flange	Hose size	A	B	Reference	Part number
DN16KF	15.9 or 19.1	19.1	41.9	K16-RHA	735001
DN25KF	19.1 or 22.2	22.1	43.9	K25-RHA	735002
DN40KF	38.1 or 41.3	41.4	55.1	K40-RHA	735003
DN50KF	38.1 or 41.3	41.4	55.1	K50-RHA	735004

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Vacuum hose

Flexible stainless steel hose

UHV and HV series

Features

- Unbraided or braided configurations
- Highly flexible
- Allows for connection between misaligned pumps and chambers
- Provides vibration isolation from mechanical pumps
- All-metal flange hose bakeable to 450°C

Specifications

Material

Hose	304ss
Flanges	304ss
Gaskets	OFE Copper or Viton® elastomer
O-Rings	Viton®, Buna-N® or Silicone elastomer
Clamps, hinged and bulkhead	Aluminium

Fastening

Bolt, clamp, bulkhead	Refer to individual flange

Vacuum range

CF	1×10^{-10} mbar
ISO KF and LF	1×10^{-9} mbar

Temperature range	Minimum	Intermittent	Sustained
Copper gasket	-200°C	450°C	400°C
Viton®	-20°C	200°C	150°C
Buna-N®	-20°C	100°C	80°C
Silicone	-20°C	200°C	150°C

Description

Caburn-MDC flexible, stainless steel hose is useful in situations where standard straight-line plumbing is impractical or where vibration isolation is necessary.

The hose consists of stainless steel formed bellows covered with an optional tough metal braid of the same material. The flexible braid protects the bellows from abrasion or impact and provides external support to a component that tends to move under vacuum. The hose provides great flexibility, strength and durability, and is bakeable.

Hoses with CF flanges provide a complete metal air-to-vacuum seal required for UHV applications.

Note Large internal surface area requires lengthy pumping to achieve UHV pressures.

Care must be taken when installing to not exceed the specified bend radius. The static bend radius of a flex hose is the minimum radius a hose can be curved without encountering permanent deformation.

Because all flex hoses compress when subjected to internal vacuum pressures, equipment connected to either end of a flex hose must be securely anchored. Atmospheric pressure exerts a substantial force and can move roughing pumps or other light, non-secured components.

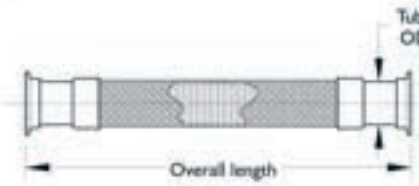
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Vacuum hose

Flexible stainless steel hose

Thin wall Braided

Braided



Features

- KF flanges
- Thin wall braided
- Other flanges, connectors and custom lengths available on request

Flange size	Overall length	Nominal tube OD	Flange connection both ends	Wt kg	Reference	Part number
304 Stainless steel						
DN25	135	25	DN25KF	0.5	BRBEL25-135	1202100
DN25	250	25	DN25KF	0.6	BRBEL25-250	1202101
DN25	500	25	DN25KF	0.9	BRBEL25-500	1202102
DN25	1000	25	DN25KF	1.7	BRBEL25-1000	1202103
DN40	135	38	DN40KF	0.9	BRBEL40-135	1202104
DN40	250	38	DN40KF	1.0	BRBEL40-250	1202105
DN40	500	38	DN40KF	1.2	BRBEL40-500	1202106
DN40	1000	38	DN40KF	2.0	BRBEL40-1000	1202107
DN50	135	51	DN50KF	1.0	BRBEL50-135	1202108
DN50	250	51	DN50KF	1.1	BRBEL50-250	1202109
DN50	500	51	DN50KF	1.4	BRBEL50-500	1202110
DN50	1000	51	DN50KF	2.3	BRBEL50-1000	1202111

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Vacuum hose

Flexible stainless steel hose

Thin wall Unbraided

Unbraided

Same size flange each end
KF + LF = non-rotatable
CF = one rotatable + one non-rotatable

Features

- CF, ISO KF and LF connections
- Thin wall unbraided
- Other flanges, connectors and custom lengths available on request

Flange size	Overall length	Bend radius	Flange connection both ends	Wt kg	Reference	Part number
304 Stainless steel						
DN16	500	60	DN16CF	0.3	FBEL16-500	1201000
DN16	750	60	DN16CF	0.4	FBEL16-750	1201001
DN16	1000	60	DN16CF	0.5	FBEL16-1000	1201002
DN16	500	60	DN16KF	0.3	KBEL16-500	1201005
DN16	750	60	DN16KF	0.4	KBEL16-750	1201006
DN16	1000	60	DN16KF	0.5	KBEL16-1000	1201007
DN25	500	68	DN25KF	0.4	KBEL25-500	1201010
DN25	750	68	DN25KF	0.6	KBEL25-750	1201011
DN25	1000	68	DN25KF	0.7	KBEL25-1000	1201012
DN40	500	115	DN40CF	1.2	FBEL40-500	1201015
DN40	750	115	DN40CF	1.3	FBEL40-750	1201016
DN40	1000	115	DN40CF	1.4	FBEL40-1000	1201017
DN40	500	115	DN40KF	0.7	KBEL40-500	1201020
DN40	750	115	DN40KF	1.0	KBEL40-750	1201021
DN40	1000	115	DN40KF	1.3	KBEL40-1000	1201022
DN50	500	125	DN50KF	0.9	KBEL50-500	1201025
DN50	750	125	DN50KF	1.1	KBEL50-750	1201026
DN50	1000	125	DN50KF	1.4	KBEL50-1000	1201027
DN63	500	150	DN63CF	2.6	FBEL63-500	1201030
DN63	750	150	DN63CF	3.8	FBEL63-750	1201031
DN63	1000	150	DN63CF	5.0	FBEL63-1000	1201032
DN63	500	150	DN63LF	1.6	LBEL63-500	1201035
DN63	750	150	DN63LF	2.6	LBEL63-750	1201036
DN63	1000	150	DN63LF	3.2	LBEL63-1000	1201037
DN100	500	275	DN100CF	2.9	FBEL100-500	1201041
DN100	750	275	DN100CF	3.9	FBEL100-750	1201042
DN100	1000	275	DN100CF	4.5	FBEL100-1000	1201043
DN100	500	275	DN100LF	2.0	LBEL100-500	1201046
DN100	750	275	DN100LF	3.0	LBEL100-750	1201047
DN100	1000	275	DN100LF	3.6	LBEL100-1000	1201048
DN160	500	275	DN160CF	3.0	FBEL160-500	1201052
DN160	750	275	DN160CF	4.0	FBEL160-750	1201053
DN160	1000	275	DN160CF	4.7	FBEL160-1000	1201054
DN160	500	275	DN160LF	2.2	LBEL160-500	1201057
DN160	750	275	DN160LF	3.2	LBEL160-750	1201058
DN160	1000	275	DN160LF	3.8	LBEL160-1000	1201059

Customer note

Custom lengths subject to a maximum length of 2m (due to shipping restrictions) for DN16, 25, 40 and 50 KF sizes – All other sizes, maximum length is 1m

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Vacuum hose

Quick-disconnect

Features

- High-vacuum rated to 1×10^{-9} mbar
- Temperature rated to 200°C maximum
- Symmetric, non-rotatable geometries
- Viton® O-rings
- Fast coupling
- Large range of tube sizes
- Weldable, Conflat® and ISO compatible designs
- Flanged versions available

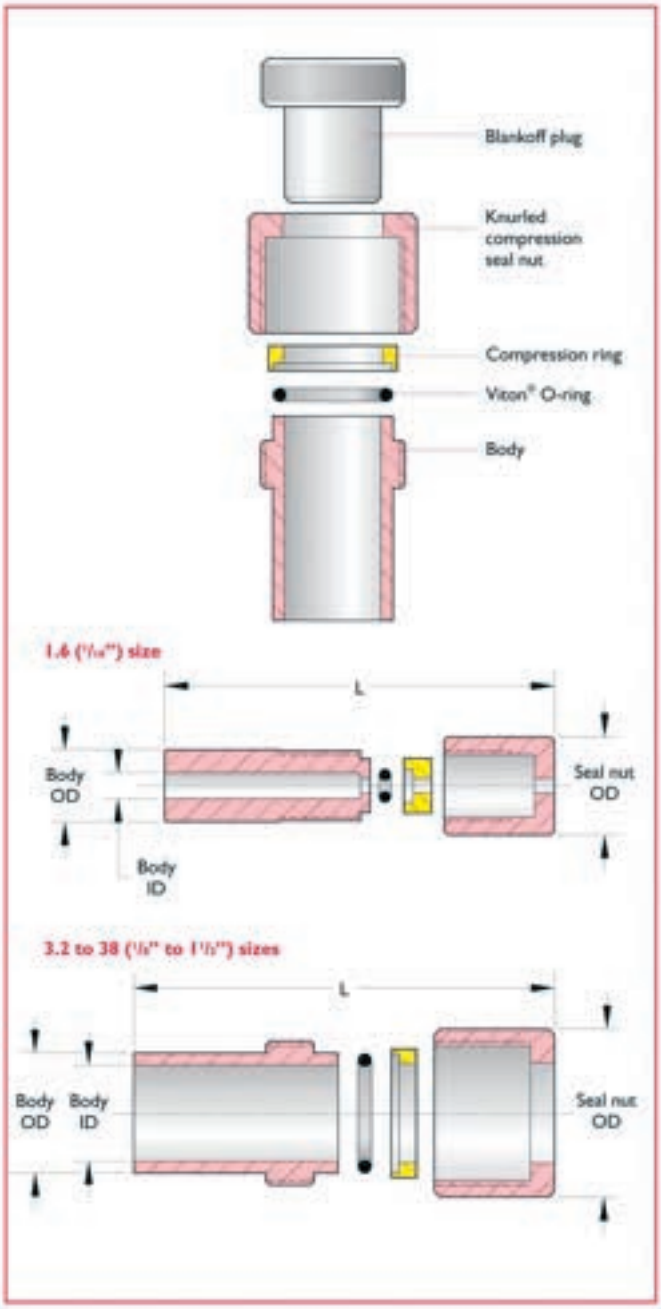
Description

Caburn-MDC quick-disconnects provide a fast and convenient method for coupling and uncoupling metal and glass tubing. They can be welded, brazed, or soldered to flanges, manifolds, chambers and other vacuum equipment. Quick-disconnects are ideal for mounting ion gauges, thermocouple gauges, special test ports and feedthroughs.

Components are fabricated from 304 stainless steel or brass. Assemblies are useable to 1×10^{-9} mbar and can be baked to 200°C. The maximum temperature for sustained use is 150°C.

Note Repeated bake-out to 200°C can cause deterioration of O-rings and require their periodic replacement.

The compression of a Viton® O-ring can accommodate variations in a tube up to 0.2mm. It is essential that all inserted tubes have accurate fractional inch diameters. Quick-disconnects have a bore clear through the body and do not restrict a tube from entering as far as desired into a chamber. Care must be taken when loosening the knurled compression seal nut for adjustment while the unit is under vacuum.



Specifications

Material	
Fittings	304ss or brass
O-rings	Viton®
Flanges	304ss
Fastening	
Torque	Finger-tight
Vacuum range	1×10^{-9} mbar
Temperature range	-20°C to 200°C
Weight and dimensions	See table

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Weldable components

Quick-disconnect

Stainless steel

Reference	Part number	Accepts tube size	Body ID	Body OD	Nut OD	Nominal L	Wt kg
DS-06	410000	1.6 (1/16")	1.8	10	13	33.3	0.05
DS-12	410001	3.2 (1/8")	3.3	10	13	33.3	0.07
DS-25	410003	6.4 (1/4")	6.4	10	16	33.3	0.10
DS-50	410006	12.7(1/2")	12.7	16	22	35.0	0.15
DS-75	410008	19.1 (3/4")	19.0	22	35	41.3	0.27
DS-87	410009	22.2 (7/8")	22.0	25	35	41.3	0.30
DS-100	410010	25.4 (1")	25.0	29	41	47.5	0.50
DS-112	410011	28.6 (1 1/8")	28.0	32	48	47.5	0.50
DS-125	410012	31.8 (1 1/4")	31.0	38	48	51.0	0.55
DS-138	410013	34.9 (1 3/8")	34.9	41	51	54.0	0.67
DS-150	410014	38.1 (1 1/2")	38.1	45	57	57.0	0.70

Brass

Reference	Part number
DB-06	411000
DB-12	411001
DB-25	411003
DB-50	411006
DB-75	411008
DB-87	411009
DB-100	411010
DB-112	411011
DB-125	411012
DB-138	411013
DB-150	411014

Dimensions given in the table above apply to both the stainless steel fittings on the left and the brass fittings on the right

Blankoff Stainless steel

Nominal size	Reference	Part number
1.6 (1/16")	S-06	410100
3.2 (1/8")	S-12	410101
6.4 (1/4")	S-25	410103
12.7 (1/2")	S-50	410106
19.1 (3/4")	S-75	410108
22.2 (7/8")	S-87	410109
25.4 (1")	S-100	410110
28.6 (1 1/8")	S-112	410111
31.8 (1 1/4")	S-125	410112
34.9 (1 3/8")	S-138	410113
38.1 (1 1/2")	S-150	410114

Blankoff Brass

Nominal size	Reference	Part number
1.6 (1/16")	B-06	411100
3.2 (1/8")	B-12	411101
6.4 (1/4")	B-25	411103
12.7 (1/2")	B-50	411106
19.1 (3/4")	B-75	411108
22.2 (7/8")	B-87	411109
25.4 (1")	B-100	411110
28.6 (1 1/8")	B-112	411111
31.8 (1 1/4")	B-125	411112
34.9 (1 3/8")	B-138	411113
38.1 (1 1/2")	B-150	411114

O-rings

Nominal size	Reference	Part number
1.6 (1/16")	VO-2-003	041003
3.2 (1/8")	VO-2-006	041006
6.4 (1/4")	VO-2-010	041010
12.7 (1/2")	VO-2-014	041014
22.2 (7/8")	VO-2-118	041118
25.4 (1")	VO-2-120	041120
28.6 (1 1/8")	VO-2-216	041216
31.8 (1 1/4")	VO-2-218	041218
34.9 (1 3/8")	VO-2-220	041220
38.1 (1 1/2")	VO-2-222	041222

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Hybrid adaptors

Introduction

Specifications

Material	
Fittings	304ss and 316ss
Flanges	304ss
Fastening	
Method and size	See individual flange specifications
Vacuum range	1×10^{-9} mbar
Fittings leak test	1×10^{-9} mbar l s^{-1}
Temperature range	-20°C to 200°C
Weight and dimensions	See table

UHV and HV series

Features

- High-vacuum rated to 1×10^{-9} mbar
- Temperature rated to 200°C maximum
- CF to Swagelok® or VCR® provides UHV, pressure, and temperature ranges
- Non-rotatable and symmetric geometries
- Viton® elastomer O-rings
- CF, ISO, KF and LF compatible flanges
- Custom adaptors available upon request

Description

Caburn-MDC hybrid adaptors provide a transition from one method of sealing to another. The hybrid feature of these adaptors is that the geometries at each end of any component are different. This is more than a change in size within a particular sealing method. They are available in most of the common interface transition pairs.

There are two major categories of adaptors: one combines pairs of standard vacuum flanges and the other combines standard fittings with flanges.

A frequent transition is from a metal seal flange to an O-ring sealed flange or fitting. Specifications are generally limited by the introduction of an O-ring seal. All hybrid adaptors, except the CF to Swagelok® or VCR® adaptors, include at least one non-metal seal and are therefore limited to high vacuum applications. Refer to individual component sections for specifications.

Reducers are a change in size within a particular flange sealing method, such as metal-seal to metal-seal. Reducers within a specific sealing method can be found in the fittings portion of each flange section.

Custom configurations available on request.

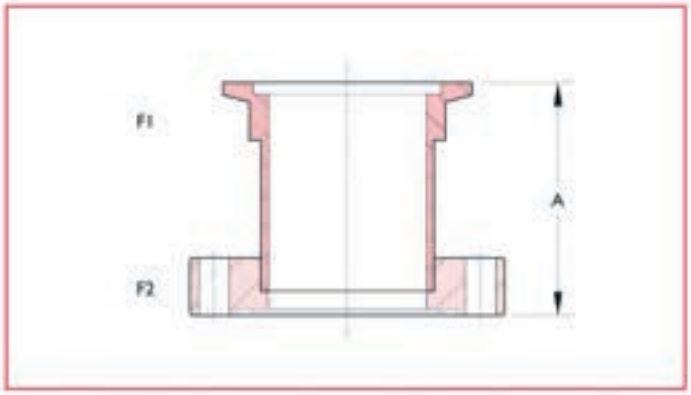
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Hybrid adaptors

Flange to flange

CF to ISO KF or ISO LF

ISO KF

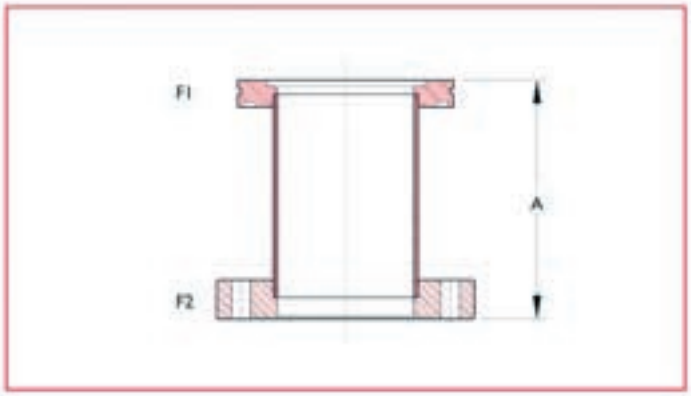


Features

- CF flange to ISO KF
- Custom lengths available on request

Flange F1	OD	Flange F2	OD	Tube min. ID	A	Wt kg	Reference	Part number
Stainless steel								
DN16KF	30	DN16CF	34	16	51	0.2	ST16-K16	7730000
DN16KF	30	DN40CF	70	16	51	0.2	ST40-K16	7730001
DN25KF	40	DN40CF	70	22	51	0.4	ST40-K25	7730002
DN40KF	55	DN40CF	70	34	51	0.4	ST40-K40	7730003
DN40KF	55	DN63CF	114	34	51	1.4	ST63-K40	7730006
DN50KF	75	DN63CF	114	47	51	1.4	ST63-K50	7730005

ISO LF



Features

- CF flange to ISO KF
- Custom lengths available on request

Flange F1	OD	Flange F2	OD	Tube min. ID	A	Wt kg	Reference	Part number
Stainless steel								
DN63LF	95	DN63CF	114	60	105	1.4	LST63-CF63	830000
DN100LF	130	DN100CF	152	97	106	2.3	LST100-CF100	830001
DN160LF	180	DN160CF	203	145	108	4.0	LST160-CF160	830002
DN200LF	240	DN200CF	254	197	108	7.3	LST200-CF200	830003

Caburn-MDC reserves the right to substitute a larger-bore tube according to availability

All dimensions are nominal in millimetres unless specified - Weights given are approximate

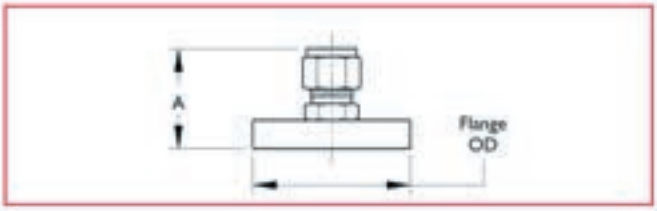
Hybrid adaptors

Flange to flange

Hamlet to CF or ISO KF

CF

450°C maximum



Features

- 304ss flange material
- 316ss Swagelok® material
- Two flange configurations

Hamlet Nominal Size	Tube OD	Flange Nominal	Flange OD	A Nominal	Wt kg	Reference	Part number
¼"	6.4	DN16CF	34	34	0.1	SWG25-C16	7414000
¼"	6.4	DN40CF	70	36	0.5	SWG25-C40	7414001
½"	12.7	DN16CF	34	43	0.1	SWG50-C16	7414002
½"	12.7	DN40CF	70	43	0.5	SWG50-C40	7414003
¾"	19.1	DN40CF	70	52	0.5	SWG75-C40	7414004
1"	25.4	DN40CF	70	60	0.5	SWG100-C40	7414005

KF

200°C maximum

Hamlet Nominal Size	Tube OD	Nominal Ref. ISO	Flange OD	A Nominal	Wt kg	Reference	Part number
¼"	6.4	DN16KF	30	46	0.1	K16-SWG25	7414012
¼"	6.4	DN25KF	40	46	0.1	K25-SWG25	7414013
¼"	6.4	DN40KF	55	46	0.1	K40-SWG25	7414014
¼"	6.4	DN50KF	75	46	0.1	K50-SWG25	7414015
½"	12.7	DN25KF	40	44	0.1	K25-SWG50	7414016
½"	12.7	DN40KF	55	42	0.1	K40-SWG50	7414017
½"	12.7	DN50KF	75	42	0.1	K50-SWG50	7414018
¾"	19.1	DN40KF	55	48	0.2	K40-SWG75	7414019
¾"	19.1	DN50KF	75	48	0.2	K50-SWG75	7414020
1"	25.4	DN40KF	55	59	0.2	K40-SWG100	7414021
1"	25.4	DN50KF	75	59	0.2	K50-SWG100	7414022

All dimensions are nominal in millimetres unless specified - Weights given are approximate

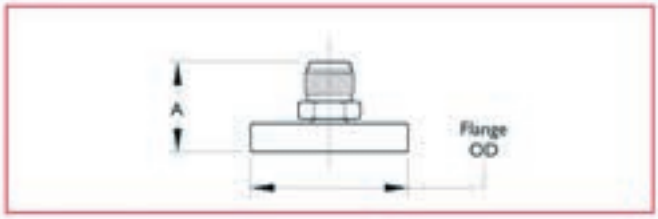
Hybrid adaptors

Fitting to flange

Male VCR® to CF or ISO KF

CF

450°C maximum



Features

- 304ss flange material
- 316ss VCR® material
- Two flange configurations

Male VCR® nominal size	Tube OD	Flange nominal	Flange OD	Approx. length	Wt kg	Reference	Part number
¼"	6.4	DN16CF	34	35	0.1	VCR25-C16	7414006
¼"	6.4	DN40CF	70	38	0.4	VCR25-C40	7414007
½"	12.7	DN16CF	34	39	0.1	VCR50-C16	7414008
½"	12.7	DN40CF	70	39	0.4	VCR50-C40	7414009
¾"	19.1	DN40CF	70	52	0.4	VCR40-C40	7414010
1"	25.4	DN40CF	70	58	0.4	VCR100-C40	7414011

KF

200°C maximum

Male VCR® nominal size	Tube OD	Flange nominal	Flange OD	Approx. length	Wt kg	Reference	Part number
¼"	6.4	DN16KF	30	33	0.1	K16-VCR25	414055
¼"	6.4	DN25KF	40	33	0.1	K25-VCR25	414056
¼"	6.4	DN40KF	55	33	0.1	K40-VCR25	414057
¼"	6.4	DN50KF	75	33	0.1	K50-VCR25	414058
½"	12.7	DN25KF	40	38	0.1	K25-VCR50	414059
½"	12.7	DN40KF	55	38	0.1	K40-VCR50	414060
½"	12.7	DN50KF	75	38	0.1	K50-VCR50	414061
¾"	19.1	DN40KF	55	51	0.2	K40-VCR75	414062
¾"	19.1	DN50KF	75	51	0.2	K50-VCR75	414063
1"	25.4	DN40KF	55	56	0.2	K40-VCR100	414064
1"	25.4	DN50KF	75	56	0.2	K50-VCR100	414065

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Hybrid adaptors

Fitting to flange

Quick-disconnect to CF or baseplate

Caburn-MDC flanged quick-disconnects provide rapid access into vacuum chambers through flanged ports. They offer all the convenience and flexibility of standard quick-disconnects when mated with CF baseplate or KF ports on a vacuum system. Quick-disconnects are a fast and convenient method for coupling and uncoupling metal and glass tubing. They permit the speedy interchange of feedthroughs, adaptors, thermocouple gauges and a variety of other special-purpose devices.

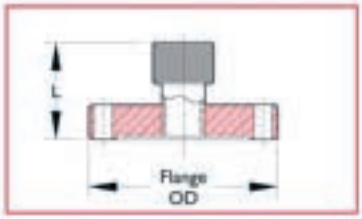
A positive seal is provided by O-ring compression. Fractional tubing OD must be circular within 0.2mm.

Note IDs are through and do not include a stop to restrict tubing insertion.

Material is 300 series stainless steel. Maximum bake-out temperature is 200°C. Quick-disconnects are easily sealed with blankoffs when not in use. Blankoffs are not included unless stated otherwise. Stainless steel and brass blankoffs are available.

CF

Tube D/A	Flange nominal	Flange OD	Nominal L	Wt kg	Reference	Part number
1.6 (1/16")	DN16CF	34	35	0.4	MFDS-06	413000
1.6 (1/16")	DN40CF	70	35	0.4	FDS-06	412000
3.2 (1/8")	DN16CF	34	35	0.4	MFDS-12	413001
3.2 (1/8")	DN40CF	70	35	0.4	FDS-12	412001
6.4 (1/4")	DN16CF	34	35	0.4	MFDS-25	413003
6.4 (1/4")	DN40CF	70	35	0.4	FDS-25	412003
12.7 (1/2")	DN16CF	34	36	0.8	MFDS-50	413006
12.7 (1/2")	DN40CF	70	36	0.8	FDS-50	412006
19.1 (3/4")	DN40CF	70	48	0.8	FDS-75	412008
22.3 (7/8")	DN40CF	70	44	0.8	FDS-87	412009
25.4 (1")	DN40CF	70	54	0.8	FDS-100	412010
28.6 (1 1/8")	DN40CF	70	54	0.8	FDS-112	412011
31.8 (1 1/4")	DN40CF	70	57	0.8	FDS-125	412012
34.9 (1 3/8")	DN40CF	70	60	0.8	FDS-138	412013
38.1 (1 1/2")	DN40CF	70	63	0.8	FDS-150	412014



Baseplate

Blankoff plug not included

Tube dia.	Figure	Body ID	Seal nut nom. ID	Wt kg	Reference	Part number
3.2 (1/8")	1	3.4	30	1.0	DBF-12	650000
6.4 (1/4")	1	6.7	30	1.0	DBF-25	650001
9.5 (3/8")	1	9.7	30	1.0	DBF-38	650002
12.7 (1/2")	1	13.2	30	1.0	DBF-50	650003
15.9 (5/8")	1	16.6	30	1.0	DBF-62	650004
19.1 (3/4")	1	19.5	30	1.0	DBF-75	650005
25.4 (1")	2	19.3	41	1.0	DBF-100	650006

Figure 1: (1/8" to 3/4") 3.2 to 19.1 sizes

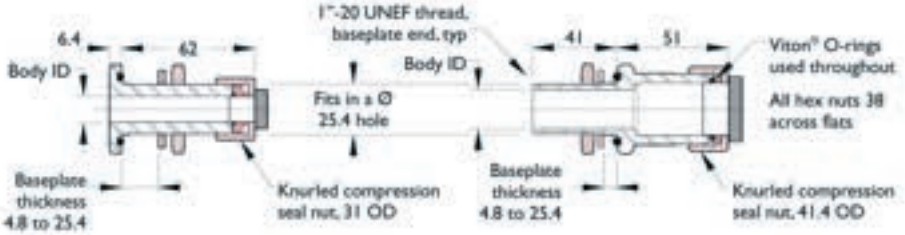


Figure 2: (1") 25.4 size only

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Hybrid adaptors

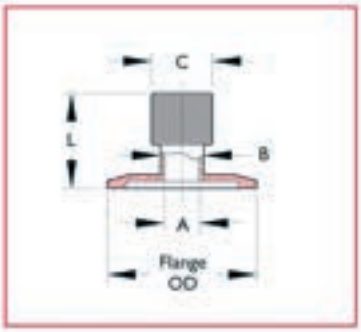
Fitting to flange

Quick-disconnect to KF

KF

Blankoff plug not included

Tube size	Nominal ref. ISO	Flange OD	A	B	C	Nom. L	Wt kg	Reference	Part number
1.6 (1/16")	DN16KF	30	1.7	9	13	33	0.2	K16XDS-06	734000
1.6 (1/16")	DN25KF	40	1.7	9	13	33	0.2	K25XDS-06	734008
1.6 (1/16")	DN40KF	55	1.7	9	13	33	0.2	K40XDS-06	734019
1.6 (1/16")	DN50KF	75	1.7	9	13	33	0.2	K50XDS-06	734034
3.2 (1/8")	DN16KF	30	3.0	9	13	33	0.2	K16XDS-12	734001
3.2 (1/8")	DN25KF	40	3.0	9	13	33	0.2	K25XDS-12	734009
3.2 (1/8")	DN40KF	55	3.0	9	13	33	0.2	K40XDS-12	734020
3.2 (1/8")	DN50KF	75	3.0	9	13	33	0.2	K50XDS-12	734035
6.4 (1/4")	DN16KF	30	6.6	9	16	33	0.2	K16XDS-25	734003
6.4 (1/4")	DN25KF	40	6.6	9	16	33	0.2	K25XDS-25	734011
6.4 (1/4")	DN40KF	55	6.6	9	16	33	0.2	K40XDS-25	734022
6.4 (1/4")	DN50KF	75	6.6	9	16	33	0.2	K50XDS-25	734037
12.7 (1/2")	DN16KF	30	12.9	16	22	38	0.2	K16XDS-50	734006
12.7 (1/2")	DN25KF	40	12.9	16	22	35	0.2	K25XDS-50	734014
12.7 (1/2")	DN40KF	55	12.9	16	22	35	0.2	K40XDS-50	734025
12.7 (1/2")	DN50KF	75	12.9	16	22	35	0.2	K50XDS-50	734040
19.1 (3/4")	DN25KF	30	19.3	22	25	44	0.2	K25XDS-75	734016
19.1 (3/4")	DN40KF	55	19.3	22	25	44	0.2	K40XDS-75	734027
19.1 (3/4")	DN50KF	75	19.3	22	25	44	0.2	K50XDS-75	734042
25.4 (1")	DN25KF	40	25.6	28	41	51	0.4	K25XDS-100	734018
25.4 (1")	DN40KF	55	25.6	28	41	51	0.4	K40XDS-100	734029
25.4 (1")	DN50KF	75	25.6	28	41	51	0.4	K50XDS-100	734044
31.7 (1 1/4")	DN40KF	55	32.0	38	48	54	0.4	K40XDS-125	734031
31.7 (1 1/4")	DN50KF	75	32.0	38	48	54	0.4	K50XDS-125	734046
38.1 (1 1/2")	DN40KF	55	38.3	44	57	60	0.4	K40XDS-150	734033
38.1 (1 1/2")	DN50KF	75	38.3	44	57	60	0.4	K50XDS-150	734048
50.8 (2")	DN50KF	75	51.1	57	70	63	0.4	K50XDS-200	734050



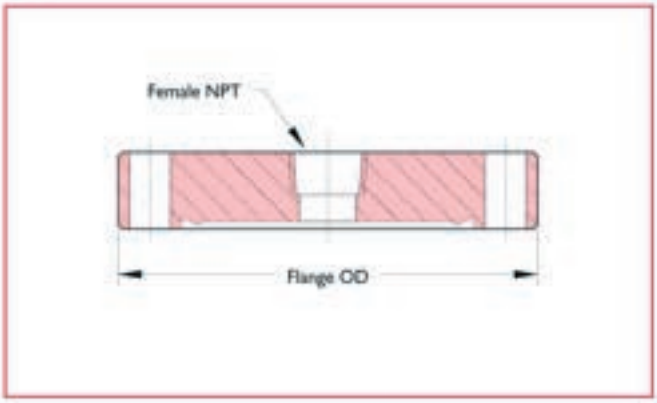
All dimensions are nominal in millimetres unless specified - Weights given are approximate

Hybrid adaptors

Fitting to flange

Female NPT to CF or KF

CF

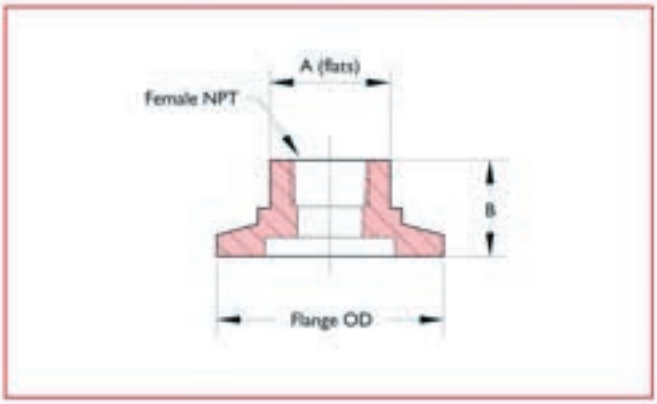


Features

- Use with Bourdon type pressure gauge, part number 432020
- Use with thermocouple gauge tubes
- Stainless steel
- Use Teflon® tape on threads (not supplied)

Female NPT size	Flange Nominal	Flange OD	Wt kg	Reference	Part number
3.2 (⅛")	DN16CF	34	0.1	1/8FPT-C16	7432041
3.2 (⅛")	DN40CF	70	0.4	1/8FPT-C40	7432043
6.4 (¼")	DN16CF	34	0.1	1/4FPT-C16	7432044
6.4 (¼")	DN40CF	70	0.4	1/4FPT-C40	7432046

KF



Features

- Use with Bourdon type pressure gauge, part number 432020
- Use with thermocouple gauge tubes
- Stainless steel
- Use Teflon® tape on threads (not supplied)

Female NPT size	Nominal ref. ISO	Flange OD	A	B	Wt kg	Reference	Part number
3.2 (⅛")	DN16KF	30	15.7	12.7	0.1	K16x1/8FPT	7731000
3.2 (⅛")	DN25KF	40	22.4	12.7	0.1	K25x1/8FPT	7731001
3.2 (⅛")	DN40KF	55	31.8	12.7	0.1	K40x1/8FPT	7731002
3.2 (⅛")	DN50KF	75	44.5	15.7	0.2	K50x1/8FPT	7731034
6.4 (¼")	DN16KF	30	15.7	12.7	0.1	K16x1/4FPT	7731004
6.4 (¼")	DN25KF	40	22.4	12.7	0.1	K25x1/4FPT	7731005
6.4 (¼")	DN40KF	55	31.8	12.7	0.1	K40x1/4FPT	7731008
6.4 (¼")	DN50KF	75	44.5	15.7	0.2	K50x1/4FPT	7731003
12.7 (½")	DN25KF	40	15.7	12.7	0.1	K25x1/2FPT	7731006
12.7 (½")	DN40KF	55	31.8	12.7	0.1	K40x1/2FPT	7731009
12.7 (½")	DN50KF	75	44.5	15.7	0.1	K50x1/2FPT	7731011
19.1 (¾")	DN40KF	55	31.8	12.7	0.1	K40x3/4FPT	7731010
19.1 (¾")	DN50KF	75	44.5	15.7	0.2	K50x3/4FPT	7731012

All dimensions are nominal in millimetres unless specified - Weights given are approximate

Hybrid adaptors

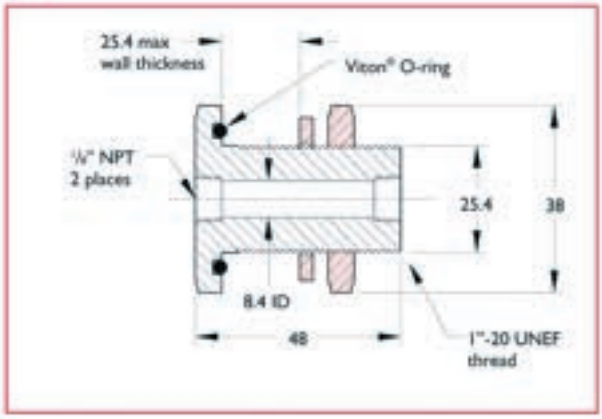
Fitting to flange

Female NTP to baseplate

Baseplate

O-ring, washer and nut included

Replacement O-ring MDC part number 041216



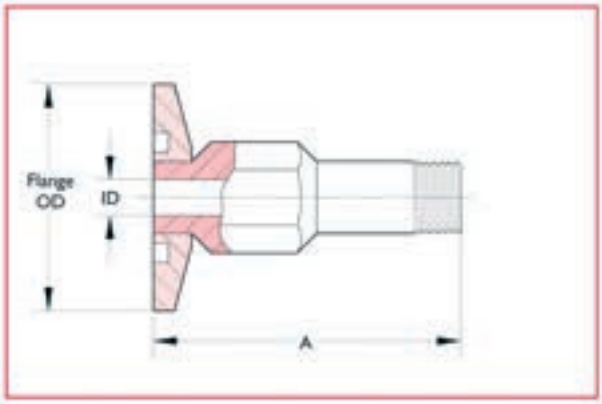
Features

- Use with thermocouple gauge or for gas backfilling
- ⅛" NPT accommodates gauges or tubing
- Fits standard 25.4 diameter mounting hole
- Seal is by Viton® O-ring
- Stainless steel
- Use Teflon® tape on threads (not supplied)

Description	Reference	Part number
Gas backfill feedthrough	FGT-1125	653000

Male NPT to KF

ISO KF



Features

- Stainless steel
- Use Teflon® tape on threads (not supplied)

Male NPT size	Nominal ref. ISO	Flange OD	ID	A	Wt kg	Reference	Part number
3.2 (⅛")	DN16KF	30	4.8	40.6	0.1	K16X1/8MPT	731020
6.4 (¼")	DN16KF	30	7.0	40.6	0.1	K16x1/4MPT	731021
6.4 (¼")	DN25KF	40	7.0	40.6	0.1	K25x1/4MPT	731023
6.4 (¼")	DN40KF	55	7.0	40.6	0.1	K40x1/4MPT	731027
6.4 (¼")	DN50KF	75	7.0	40.6	0.2	K50x1/4MPT	731030

All dimensions are nominal in millimetres unless specified - Weights given are approximate

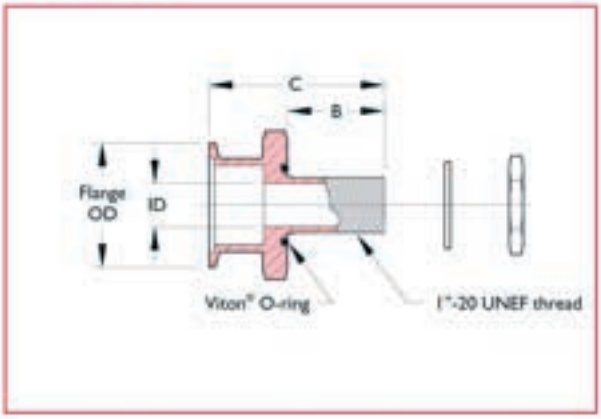
Hybrid adaptors

Fitting to flange

Baseplate to ISO KF or blank plug

ISO KF

O-ring, washer and nut included



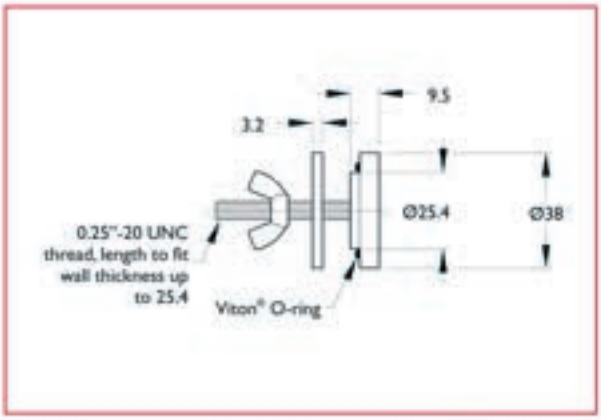
Features

- For use with plates up to 25.4 thick
- Fits through standard 25.4 diameter holes
- Seal is by Viton® O-ring
- Stainless steel body, washer and nut

Nominal ref. ISO	Flange OD	Required hole diameter	A ID	B	C	Wt kg	Reference	Part number
DN25KF	40	25.4	19.1	41.2	73	0.2	K25-BPFT	650007
DN40KF	55	25.4	19.1	41.2	82	0.4	K40-BPFT	650008

Blank plug

O-ring, washer and nut included



Features

- For sealing standard 25.4 diameter mounting holes when not in use
- Seal is by Viton® O-ring
- Stainless steel or brass plug

Description	Reference	Part number
Brass blank plug	FBB-101	654000
Stainless steel blank plug	FBS-101	654002

Baseplate mounts

Baseplate fittings mount through one-inch diameter ports and require a flat, scratch-free sealing surface of at least 44.5mm diameter. A vacuum seal is achieved by uniform compression of an elastomer gasket on the vacuum side of the chamber. A sealing nut and washer are typically fastened on the atmosphere side of the chamber. Hand tightening will usually provide adequate seal compression.

Elastomer seals limit the operating temperature range and bake-out temperature. For Viton® O-rings, the maximum intermittent bake-out temperature is 200°C with a sustained use to 150°C. Repeated bake-out cycling can result in the deterioration of the O-ring.