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

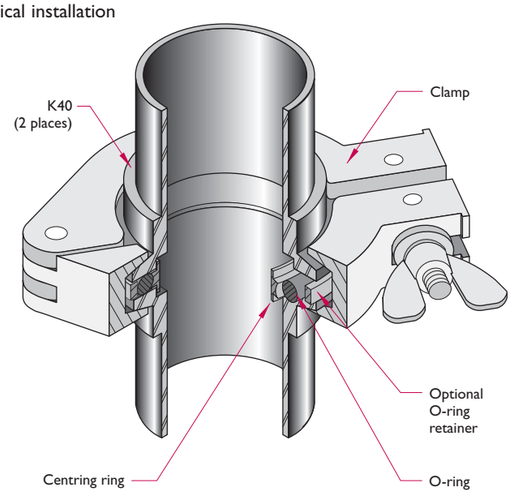
Fittings	304 Stainless steel, TIG welded
Clamps	Aluminium
Standard O-rings	Du Pont Viton® fluoroelastomer
Vacuum	O-ring compression by uniform pressure application around the 15° outer flange surfaces
Flanges	ISO standard dimensions 360° rotatable Four standard flange sizes for use with four tube sizes
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] MDC Vacuum reserves the right to substitute a larger-bore tube according to availability

UHV Series

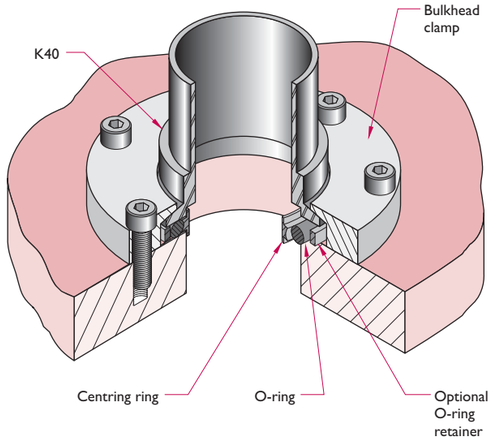
ISO KF

Typical installation



Bulkhead clamp

Typical installation



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

Flanges and fittings

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. MDC Vacuum 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.

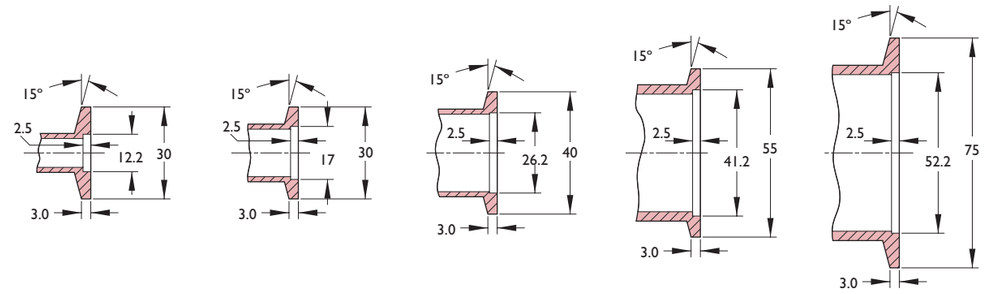
Each vacuum seal is made by compression of an O-ring on a centring ring between mating flanges. The seal is made in seconds by finger-closure of a wing nut on the all-metal hinged aluminium clamp.

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	MDC Vacuum 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



DN10KF DN16KF DN25KF DN40KF DN50KF

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

All dimensions are nominal in millimetres unless specified

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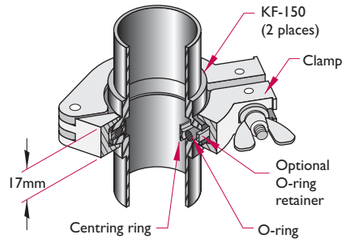
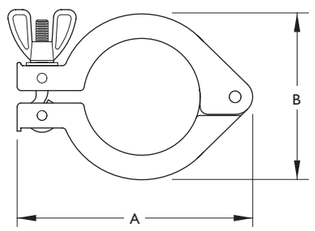
ISO KF Flanges and fittings

Clamps

Hinged clamp





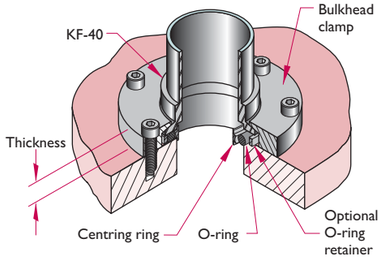
Features

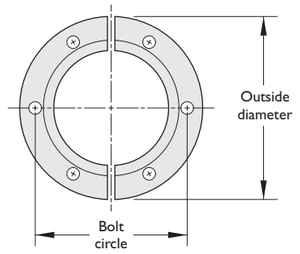
- Fastens ISO KF of comparable size
- Quick make and break
- Stainless steel wing nut and bolt
- Aluminium construction
- Requires centring ring with elastomer gasket

Flange size	Tube size	A	B	Wt kg	Reference	Part number	£	€
DN10/16KF	12.7-19.0	71	45	0.2	K16-C	**7701000**	2	3
DN20/25KF	25.4	80	55	0.2	K25-C	**7701001**	2	3
DN32/40KF	38.1	96	70	0.3	K40-C	**7701002**	3	5
DN50KF	50.8	123	95	0.5	K50-C	**7701003**	4	6

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	K75-BC	**716000**	15	22
DN25KF	6	10	48.0	60	0.2	K100-BC	**716001**	17	26
DN40KF	6	10	62.0	75	0.2	K150-BC	**716002**	20	30
DN50KF	8	10	82.5	95	0.2	K200-BC	**716003**	23	35

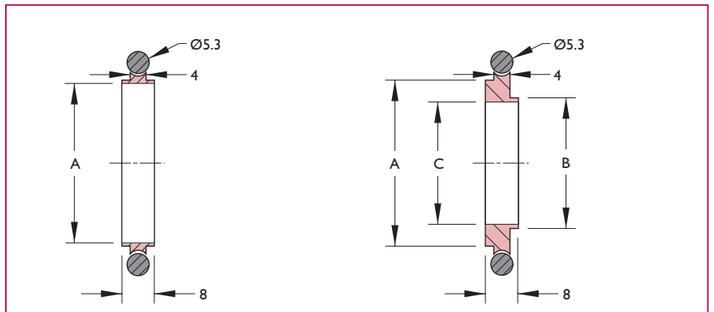
Bolted bulkhead clamps are commonly used to fasten ISO KF components to flat chamber walls or baseplates. Use of this product requires customer machining of six or eight M5 threaded bolt holes on the mounting surface. Once a clamp has been positioned and aligned with the mating bolt holes, a vacuum seal 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**	2	3
DN25KF	25	K25-CRA	**7710014**	2	3
DN40KF	40	K40-CRA	**7710015**	3	5
DN50KF	50	K50-CRA	**7710016**	5	8

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**	1	2
DN25KF	25	K25-CRAB	**7710018**	2	3
DN40KF	40	K40-CRAB	**7710019**	2	3
DN50KF	50	K50-CRAB	**7710020**	2	3

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**	2	3
DN25KF	25	K25-CR	**7710001**	3	5
DN40KF	40	K40-CR	**7710002**	3	5
DN50KF	50	K50-CR	**7710003**	5	8

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**	4	6
DN25KF	25	K25-CRS	**7710022**	6	9
DN40KF	40	K40-CRS	**7710023**	8	12
DN50KF	50	K50-CRS	**7710024**	10	15

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**	4	6
DN25KF-20KF	26	22	20	K25-20-CR	**7710011**	6	8
DN40KF-32KF	41	34	32	K40-32-CR	**7710012**	7	11

All dimensions are nominal in millimetres unless specified

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

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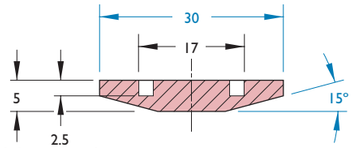


Figure 2 Unbored stub

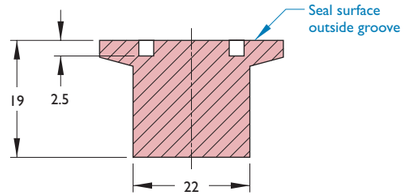


Figure 3 Weld flange – small tube

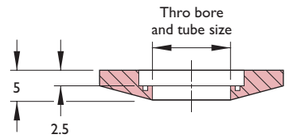


Figure 4 Weld flange

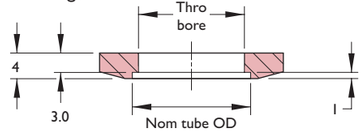
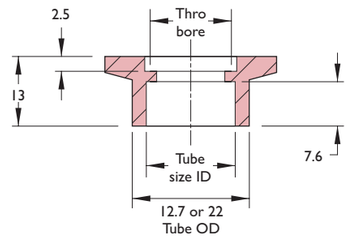


Figure 5 Socket weld



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**	2	3
Blank	2	Blank	0.03	K16-US	**7715000**	8	12
9.5	3	Weld	0.03	K16-10-W	**7713005**	11	16
12.7	3	Weld	0.03	K16-12-W	**7713006**	11	16
12.7	5	Socket weld	0.03	K16-12-SW	**7713000**	9	14
19.1	4	Weld	0.02	K16-W	**7713007**	4	6
19.1	5	Socket weld	0.02	K16-SW	**7713001**	4	6
Aluminium							
Blank	1	Blank	0.05	K16-ALB	**1120151**	2	3

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

Flanges and fittings

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

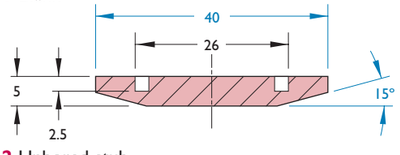


Figure 2 Unbored stub

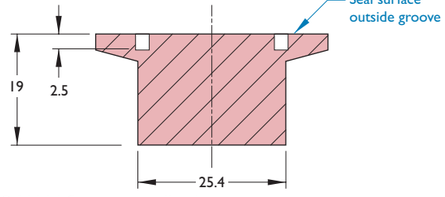


Figure 3 Weld flange – small tube

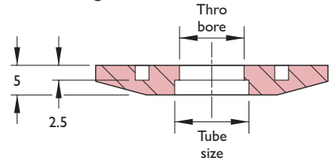


Figure 4 Weld flange

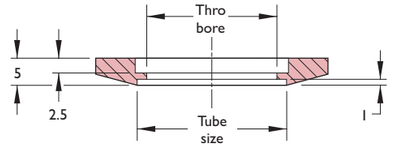
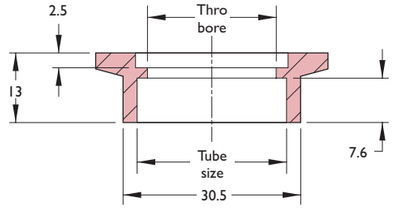


Figure 5 Socket weld



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**	3	5
Blank	2	Blank	0.05	K25-US	**7715001**	13	19
9.5	3	Weld	0.05	K25-10-W	**7713008**	11	16
12.7	3	Weld	0.04	K25-12-W	**7713009**	11	16
19.1	4	Weld	0.04	K25-19-W	**7713010**	10	15
25.4	4	Weld	0.04	K25-W	**7713011**	6	9
19.1	5	Socket weld	0.04	K25-SW	**7713002**	7	11
Aluminium							
Blank	1	Blank	0.05	K25-ALB	**1120152**	2	3

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

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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

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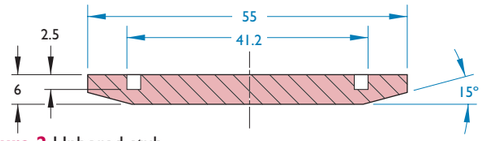


Figure 2 Unbored stub

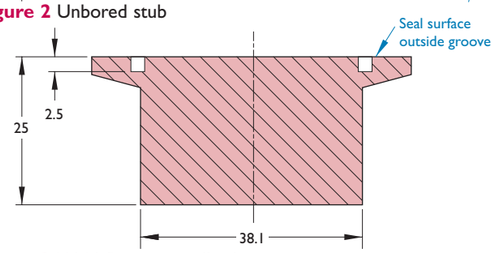


Figure 3 Weld flange – small tube

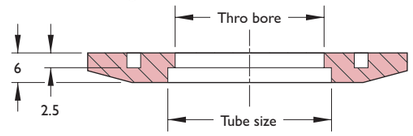


Figure 4 Weld flange

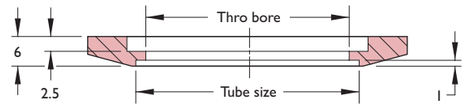
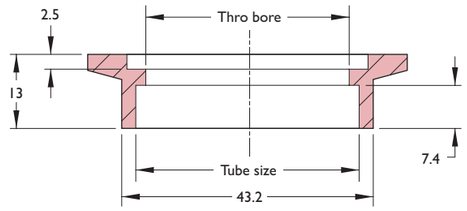


Figure 5 Socket weld



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**	4	6
Blank	2	Blank	0.2	K40-US	**715002**	15	23
9.5	3	Weld	0.1	K40-10-W	**713012**	14	21
12.7	3	Weld	0.1	K40-12-W	**713013**	14	21
19.1	3	Weld	0.06	K40-19-W	**713014**	14	21
25.4	3	Weld	0.06	K40-25-W	**713015**	14	21
44.5	4	Weld	0.04	K40-W	**713016**	8	12
38.6	5	Socket weld	0.08	K40-SW	**713003**	9	14
Aluminium							
Blank	1	Blank	0.05	K40-ALB	**1120153**	3	4

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

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

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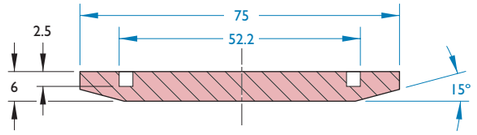


Figure 2 Unbored stub

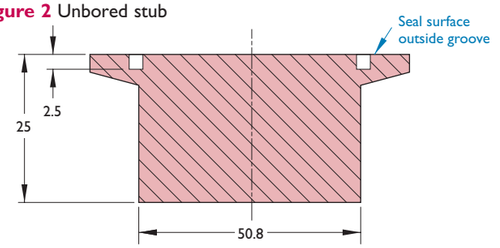


Figure 3 Weld flange – small tube

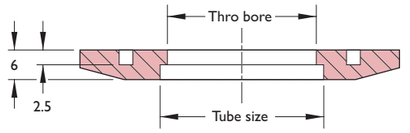


Figure 4 Weld flange

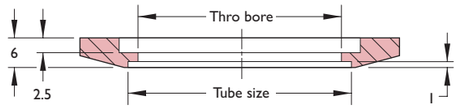
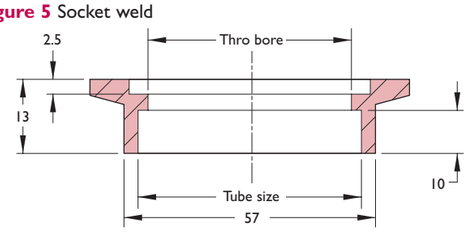


Figure 5 Socket weld



Dimensions in blue are common to all flanges

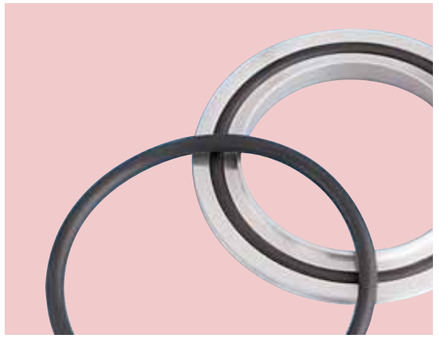
Tube OD nominal	Figure	Flange reference	Wt kg	Reference	Part number	£	€
Stainless steel							
Blank	1	Blank	0.18	K50-B	**712003**	7	11
Blank	2	Blank	0.18	K50-US	**715003**	26	39
9.5	3	Weld	0.18	K50-10-W	**713017**	20	30
12.7	3	Weld	0.18	K50-12-W	**713018**	20	30
19.1	3	Weld	0.18	K50-19-W	**713019**	20	30
25.4	3	Weld	0.18	K50-25-W	**713020**	20	30
38.1	3	Weld	0.18	K50-38-W	**713021**	20	30
51.0	4	Weld	0.13	K50-W	**713022**	9	13
51.3	5	Socket weld	0.13	K50-SW	**713004**	10	15
Aluminium							
Blank	1	Blank	0.05	K50-ALB	**1120154**	8	12

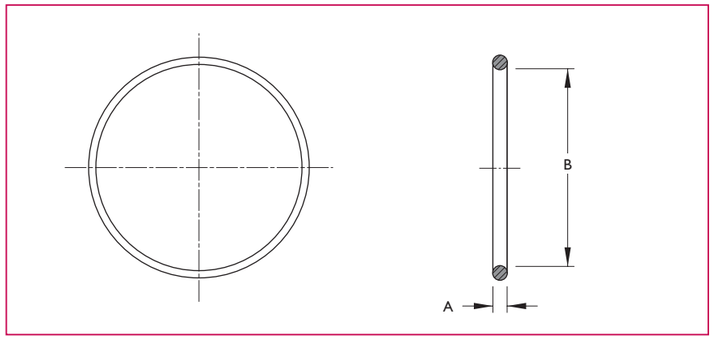
All dimensions are nominal in millimetres unless specified Weights given are approximate

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**	2	3
DN16KF	5	18	K16-O	**711000**	2	3
DN25KF	5	28	K25-O	**711001**	2	3
DN40KF	5	41	K40-O	**711002**	2	3
DN50KF	5	55	K50-O	**711003**	2	3

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**	1	1
DN25KF	5	28	K25-OB	**711022**	1	1
DN40KF	5	41	K40-OB	**711024**	2	2
DN50KF	5	55	K50-OB	**711025**	2	2

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**	3	4
DN16KF	5	18	K16-OS	**711006**	3	4
DN25KF	5	28	K25-OS	**711007**	3	4
DN40KF	5	42	K40-OS	**711008**	4	5
DN50KF	5	55	K50-OS	**711009**	5	6

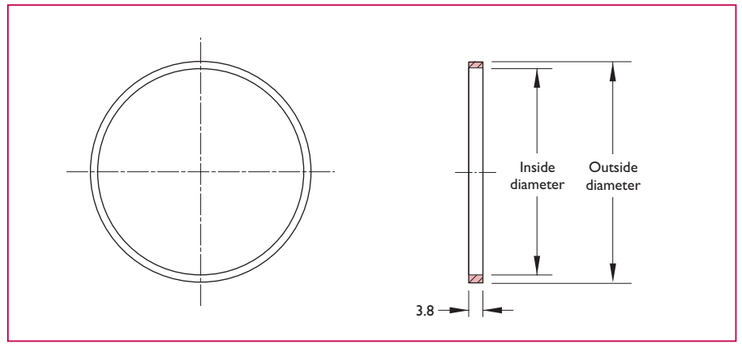
Flange caps

To fit flange	Quantity per pack	Reference	Part number	£	€
KF16	2	KFC16	**192009**	1	1
KF25	2	KFC25	**192010**	1	1
KF40	2	KFC40	**192011**	1	1
KF50	2	KFC50	**192012**	1	1

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**	8	12
DN25	43.2	36.6	0.1	K25-ORR	**7710026**	8	12
DN40	58.7	54.9	0.1	K40-ORR	**7710027**	9	14
DN50	69.9	67.8	0.1	K50-ORR	**7710028**	10	15

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

MDC Vacuum Limited'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. MDC Vacuum 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 MDC Vacuum 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, MDC Vacuum 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

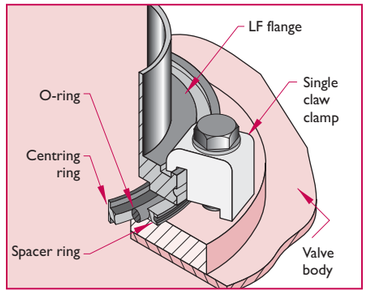
OD	Thickness	Number
95	12	3 to 4
130	12	4 to 8
180	12	4 to 8
240	12	6 to 12
290	12	6 to 12
370	17	8 to 12
450	17	8 to 16
550	17	12 to 16

Bolt flanges

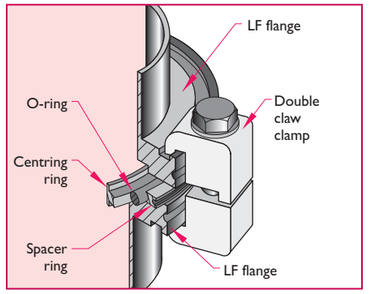
OD	Thickness	Bolt circle diameter	Holes	Bolt holes
130	12	110	8.9	4 x M8
165	12	145	8.9	8 x M8
225	16	200	10.9	8 x M10
285	16	260	10.9	12 x M10
335	16	310	10.9	12 x M10
425	20	395	14.0	12 x M12
510	20	480	14.0	16 x M12
610	20	580	14.0	16 x M12

All dimensions are nominal in millimetres unless specified

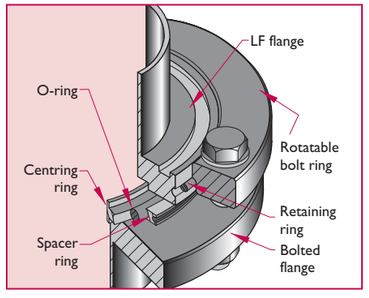
Flanges and fittings



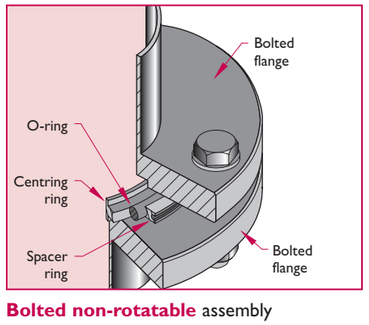
Single claw assembly



Double claw assembly



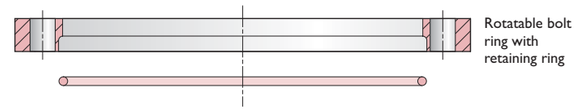
Bolted rotatable assembly



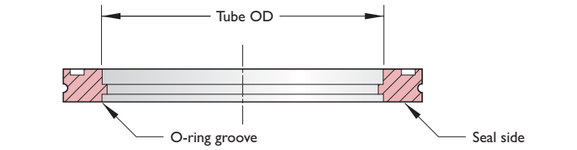
Bolted non-rotatable assembly

Section 1.2
ISO LF Flanges and fittings
Introduction

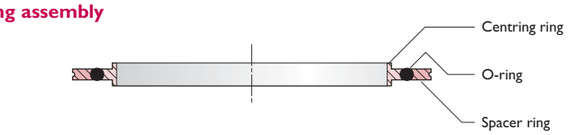
Rotatable bolt ring assembly



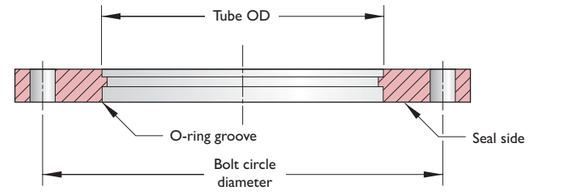
Claw-clamp flange



Centring ring assembly



Bolted flange



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

Inch-metric ISO comparison

MDC Vacuum	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

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

All dimensions are nominal in millimetres unless specified

MDC Vacuum Limited Telephone +44 (0)1825 280 450 www.mdcvacuum.co.uk

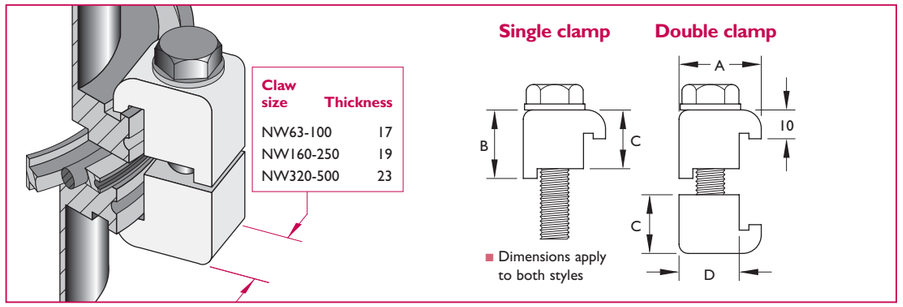
ISO LF Flanges

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



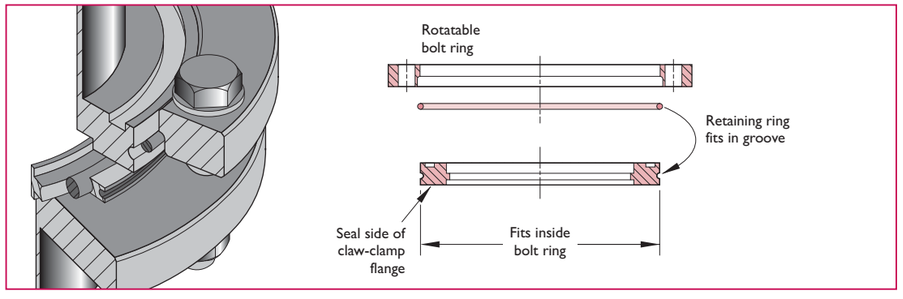
Flange size	A	B	C	D	Thread	Reference	Part number	£	€
Single claw									
DN63-100LF	24	24	20	16.3	M8	SCC63/100	**1130000**	2	3
DN160-250LF	28	24	20	20.3	M10	SCC160/250	**1130001**	2	3
DN320-500LF	34	30	25	26.3	M12	SCC320/500	**1130002**	3	5
Double claw									
DN63-100LF	34	24	20	16.3	M8	DCC63/100	**1130008**	2	3
DN160-250LF	28	24	20	20.3	M10	DCC160/250	**1130009**	2	3
DN320-500LF	34	30	25	26.3	M12	DCC320/500	**1130010**	3	5

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



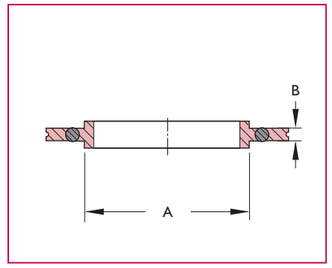
Flange size	Ring OD	Bolt holes	Hole size	Bolt circle	Thickness	Reference	Part number	£	€
DN63LF	130	4	9	110	12	L63-RBF	**853000**	26	39
DN100LF	165	8	9	145	12	L100-RBF	**853001**	32	47
DN160LF	225	8	9	200	16	L160-RBF	**853002**	60	91
DN200LF	285	12	11	260	16	L200-RBF	**853003**	88	132
DN250LF	335	12	11	310	16	L250-RBF	**853004**	94	141

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

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**	13	20
DN100LF	102	4	L100-CR	**810001**	17	26
DN160LF	153	4	L160-CR	**810002**	22	33
DN200LF	213	4	L200-CR	**810003**	32	48
DN250LF	261	4	L250-CR	**810004**	41	60
DN320LF	318	5.5	L320-CR	**810005**	74	109
DN400LF	400	5.5	L400-CR	**810006**	90	132
DN500LF	501	5.5	L500-CR	**810007**	115	169

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

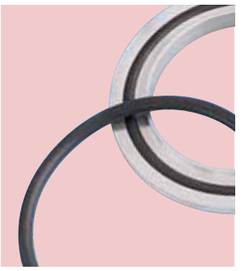
- Maximum bakeout temperature 100°C
- Sustained use to 80°C

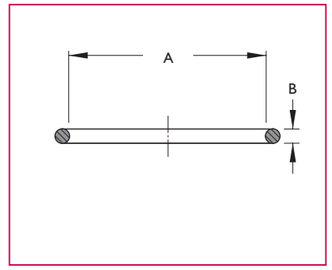
ISO LF flange	A	B	Reference	Part number	£	€
DN63LF	70	4	L63-CRB	**810020**	21	32
DN100LF	102	4	L100-CRB	**810021**	26	38
DN160LF	153	4	L160-CRB	**810022**	32	47
DN200LF	213	4	L200-CRB	**810023**	41	61
DN250LF	261	4	L250-CRB	**810024**	60	89
DN320LF	318	5.5	L320-CRB	**810025**	89	130
DN400LF	400	5.5	L400-CRB	**810026**	93	137
DN500LF	501	5.5	L500-CRB	**810027**	93	137

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**	38	57
DN100LF	102	4	L100-CRSS	**810011**	58	87
DN160LF	153	4	L160-CRSS	**810012**	65	98
DN200LF	213	4	L200-CRSS	**810013**	85	128
DN250LF	261	4	L250-CRSS	**810014**	100	150
DN320LF	318	5.5	L320-CRSS	**810015**	POA	POA
DN400LF	400	5.5	L400-CRSS	**810016**	POA	POA
DN500LF	501	5.5	L500-CRSS	**810017**	POA	POA





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**	6	9
DN100LF	107	5.3	L100-O	**811001**	10	15
DN160LF	158	5.3	L160-O	**811002**	17	26
DN200LF	221	5.3	L200-O	**811003**	21	32
DN250LF	253	5.3	L250-O	**811004**	24	36
DN320LF	330	7.0	L320-O	**811005**	32	47
DN400LF	405	7.0	L400-O	**811006**	36	54
DN500LF	507	7.0	L500-O	**811007**	48	71

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**	1	2
DN100LF	107	5.3	L100-OB	**811021**	2	3
DN160LF	158	5.3	L160-OB	**811022**	3	5
DN200LF	221	5.3	L200-OB	**811023**	4	6
DN250LF	253	5.3	L250-OB	**811024**	5	8
DN320LF	317	7.0	L320-OB	**811025**	10	15
DN400LF	405	7.0	L400-OB	**811026**	15	23
DN500LF	507	7.0	L500-OB	**811027**	20	30

All dimensions are nominal in millimetres unless specified

ISO LF Flanges

DN63LF

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
- Two methods of fastening
- ISO-compatible and modified ISO design

Specifications

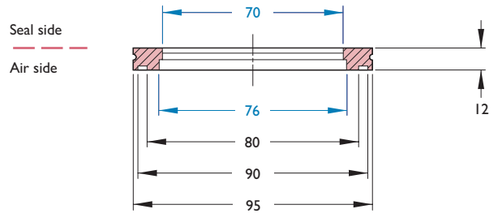
Material	
Flanges	304ss
Rotatable bolt ring	Aluminium
O-rings	Viton® or Buna-N® elastomer
Claw-clamps	Aluminium
Fastening	
Claw-clamp	M8, (4 required)
Bolt type	Hexagonal head, M8
Nut type	Hexagonal
Torque	Bolts: 9-14 Nm
Vacuum range	$1x10^{-8}$ mbar

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

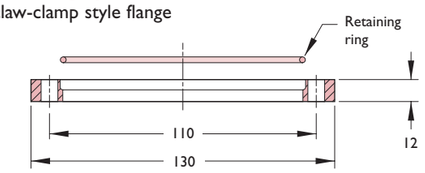


Figure 2 Bolt style

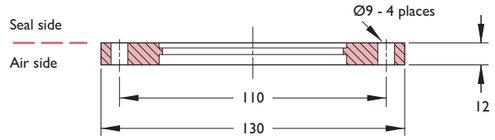
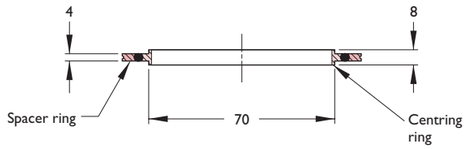


Figure 3 Centring ring assembly



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**	33	49
–	2	Blank	Bolt	1.3	L63-BB	**852000**	48	72
76	2	Weld	Bolt	1.3	L63-BW	**850009**	46	68
76	1	Weld	Claw-clamp	0.3	L63-W	**813023**	45	68

Optional flange converter	Wt kg	Reference	Part number	£	€
Rotatable bolt ring assembly	0.9	L63-RBF	**853000**	26	39
Retaining ring	0.1	L63-RR	**853020**	6	9

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

Flanges and fittings

ISO LF Flanges

DN100LF

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
- Two methods of fastening
- ISO-compatible and modified ISO design

Specifications

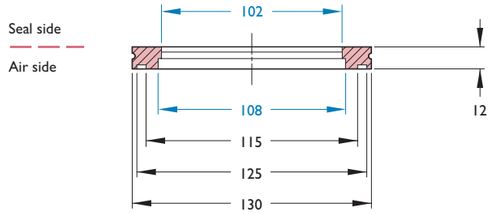
Material	
Flanges	304ss
Rotatable bolt ring	Aluminium
O-rings	Viton® or Buna-N® elastomer
Claw-clamps	Aluminium
Fastening	
Claw-clamp	M8, (8 required)
Bolt type	Hexagonal head, M8
Nut type	Hexagonal
Torque	Bolts: 9-14 Nm
Vacuum range	$1x10^{-8}$ mbar

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

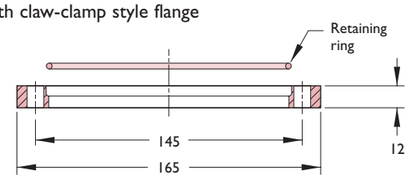


Figure 2 Bolt style

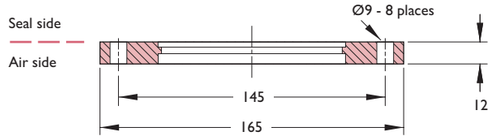
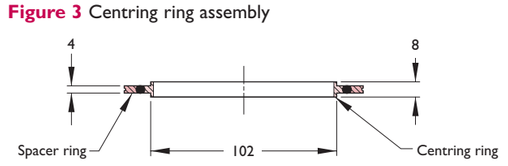


Figure 3 Centring ring assembly



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**	50	75
–	2	Blank	Bolt	2.0	L100-BB	**852001**	79	119
108	2	Weld	Bolt	2.0	L100-BW	**850010**	71	106
108	1	Weld	Claw-clamp	0.3	L100-W	**813024**	35	53

Optional flange converter	Wt kg	Reference	Part number	£	€
Rotatable bolt ring assembly	0.9	L100-RBF	**853001**	32	47
Retaining ring	0.1	L100-RR	**853021**	8	12

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

ISO LF Flanges

DN160LF

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
- 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

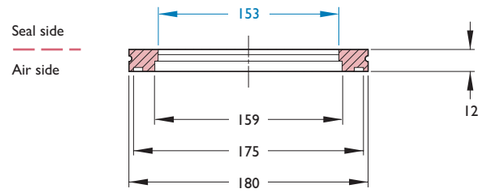
5 kg maximum

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

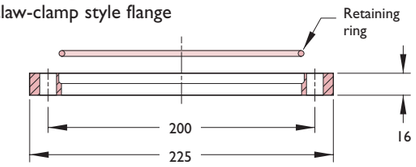


Figure 2 Bolt style

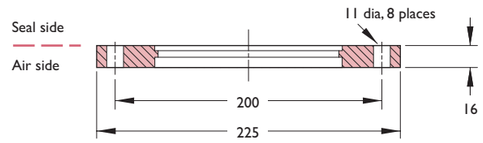
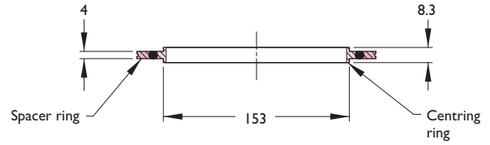


Figure 3 Centring ring assembly



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**	61	92
–	2	Blank	Bolt	2.0	L160-BB	**7852002**	96	144
159	2	Weld	Bolt	2.0	L160-BW	**7850011**	98	146
159	1	Weld	Claw-clamp	0.8	L160-W	**7813025**	61	92

Optional flange converter	Wt kg	Reference	Part number	£	€
Rotatable bolt ring assembly	1.4	L160-RBF	**7853002**	60	91
Retaining ring	0.2	L160-RR	**7853022**	11	17

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

ISO LF Flanges

DN200LF

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
- 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

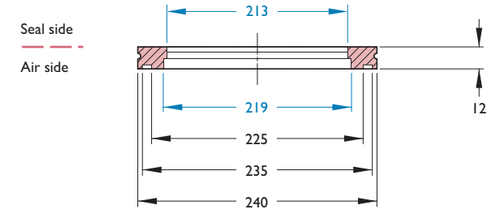
1.4 kg maximum

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

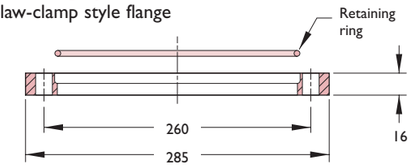


Figure 2 Bolt style

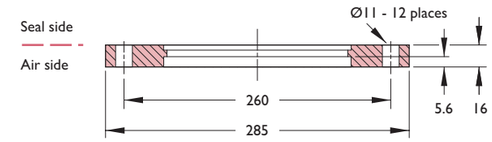
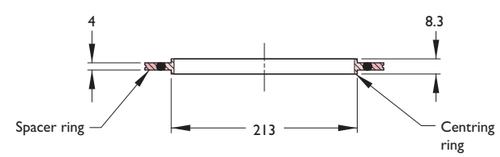


Figure 3 Centring ring assembly



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.

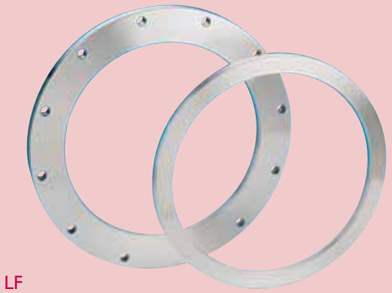
Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number	£	€
–	1	Blank	Claw-clamp	2.0	L200-B	**7812003**	101	152
–	2	Blank	Bolt	8.0	L200-BB	**7852003**	165	241
219	1	Weld	Claw-clamp	1.0	L200-W	**7813026**	88	132
219	2	Weld	Bolt	4.0	L200-BW	**850012**		

Optional flange converter	Wt kg	Reference	Part number	£	€
Rotatable bolt ring assembly	2.7	L200-RBF	**7853003**	88	132
Retaining ring	0.2	L200-RR	**7853023**	12	18

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

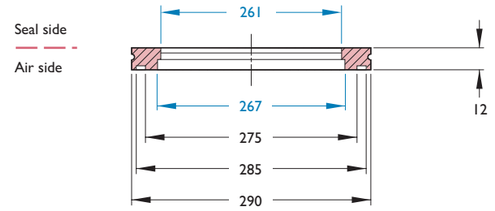
34 kg maximum

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

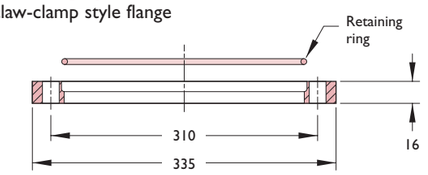


Figure 2 Bolt style

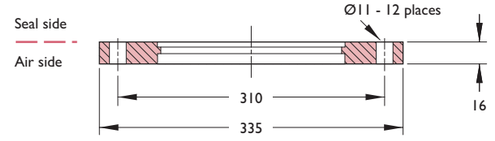
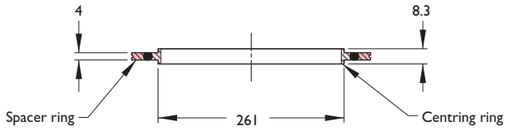


Figure 3 Centring ring assembly



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**	142	213
267	1	Weld	Claw-clamp	1.4	L250-W	**7813027**	102	153
–	2	Blank	Bolt	2.0	L250-BB	**7852004**	246	360
267	2	Weld	Bolt	4.3	L250-BW	**7850013**	285	428

Optional flange converter	Wt kg	Reference	Part number	£	€
Rotatable bolt ring assembly	4.5	L250-RBF	**7853004**	94	141
Retaining ring	0.2	L250-RR	**7853024**	13	20

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

ISO LF Flanges

DN320LF

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	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

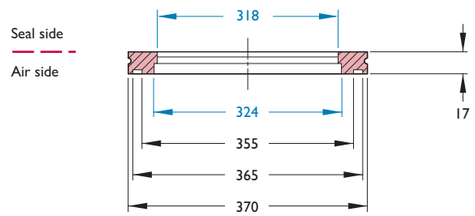
23 kg maximum

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

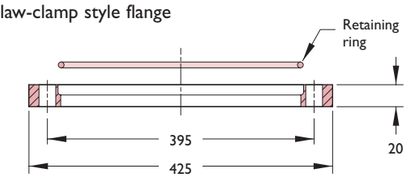


Figure 2 Bolt style

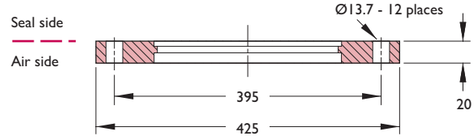
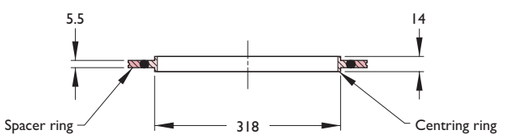


Figure 3 Centring ring assembly



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.

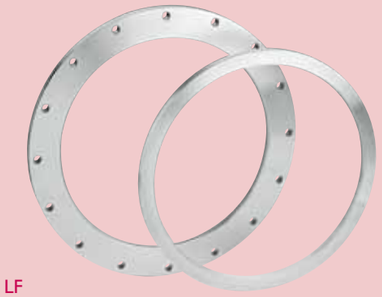
Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number	£	€
–	1	Blank	Claw-clamp	14.5	L320-B	**7812005**	247	371
324	1	Weld	Claw-clamp	3.6	L320-W	**7813005**	214	320
–	2	Blank	Bolt	23.0	L320-BB	**7852005**	364	532
324	2	Weld	Bolt	11.4	L320-BW	**7850005**	513	750

Optional flange converter	Wt kg	Reference	Part number	£	€
Rotatable bolt ring assembly	5.4	L320-RBF	**7853005**	205	308
Retaining ring	0.2	L320-RR	**7853025**	21	32

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

ISO LF Flanges

DN400LF



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

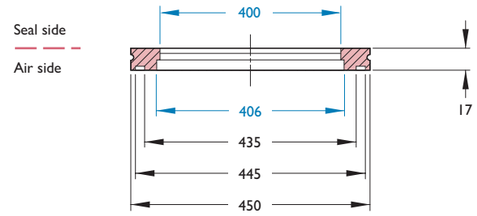
Material	
Flanges	304ss
Rotatable bolt ring	Aluminium
O-rings	Viton® or Buna-N® elastomer
Claw-clamps	Aluminium
Fastening	
Claw-clamp	M12, (8-16 required)
Bolt type	Hexagonal head, M12
Nut type	Hexagonal
Torque	Bolts: 9-14 Nm
Vacuum range	1x10^{-8} mbar

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

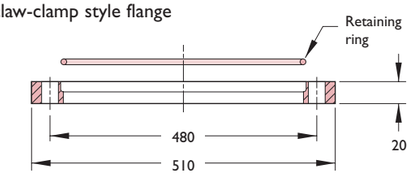


Figure 2 Bolt style

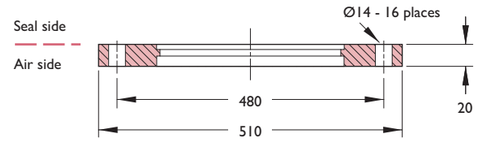
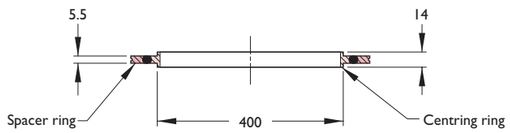


Figure 3 Centring ring assembly



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**	313	470
406	1	Weld	Claw-clamp	4.5	L400-W	**7813006**	320	468
–	2	Blank	Bolt	34.0	L400-BB	**7852006**	506	740
406	2	Weld	Bolt	11.4	L400-BW	**7850006**	508	742

Optional flange converter	Wt kg	Reference	Part number	£	€
Rotatable bolt ring assembly	13.6	L400-RBF	**7853006**	288	432
Retaining ring	0.2	L400-RR	**7853026**	21	32

Flanges and fittings

ISO LF Flanges

DN500LF

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

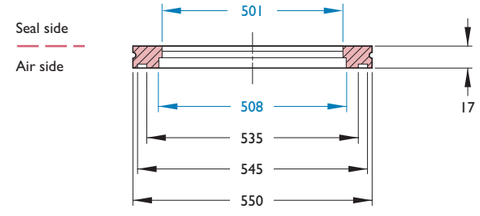
Material	
Flanges	304ss
Rotatable bolt ring	Aluminium
O-rings	Viton® or Buna-N® elastomer
Claw-clamps	Aluminium
Fastening	
Claw-clamp	M12, (12-16 required)
Bolt type	Hexagonal head, M12
Nut type	Hexagonal
Torque	Bolts: 9-14 Nm
Vacuum range	1x10^{-8} mbar

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

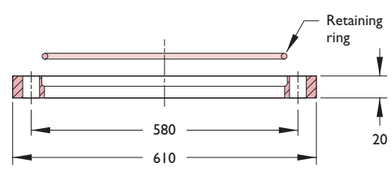


Figure 2 Bolt style

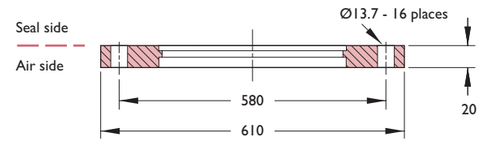
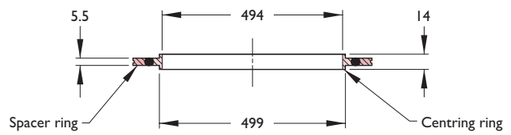


Figure 3 Centring ring assembly



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.

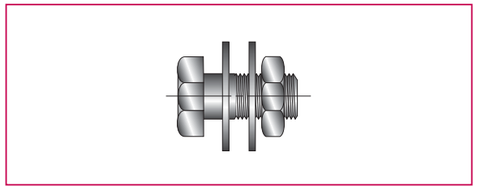
Tube OD nominal	Figure	Flange reference	Fastening method	Wt kg	Reference	Part number	£	€
–	1	Blank	Claw-clamp	31.4	L500-B	**7812007**	615	923
508	1	Weld	Claw-clamp	5.4	L500-W	**7813007**	595	893
–	2	Blank	Bolt	43.0	L500-BB	**7852007**	784	1145
508	2	Weld	Bolt	25.0	L500-BW	**7850007**	774	1130

Optional flange converter	Wt kg	Reference	Part number	£	€
Rotatable bolt ring assembly	16.0	L500-RBF	**7853007**	490	735
Retaining ring	0.2	L500-RR	**7853027**	30	45

ISO LF Fittings

Bolt sets and replacement retaining rings

Bolt sets for two bolted flanges

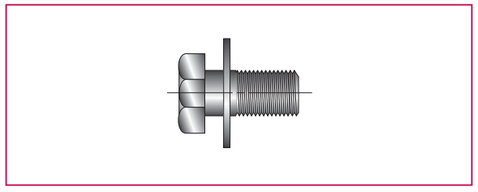


Features

- 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**	21	31
DN100LF	M8 X 40	25	M8-40	**1113025**	21	31
DN160LF	M10 X 50	12	M10-50 (12)	**1113040**	17	26
DN200LF	M10 X 50	12	M10-50 (12)	**1113040**	17	26
DN250LF	M10 X 50	12	M10-50 (12)	**1113040**	17	26
DN300LF	M12 X 60	16	M12-60 (16)	**1113050**	42	62
DN400LF	M12 X 60	16	M12-60 (16)	**1113050**	42	62
DN500LF	M12 X 60	16	M12-60 (16)	**1113050**	42	62

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**	16	24
DN100LF	M8 x 20	25	M8-20	**1113009**	16	24
DN160LF	M10 x 30	12	M10-30 (12)	**1113011**	12	18
DN200LF	M10 x 30	12	M10-30 (12)	**1113011**	12	18
DN250LF	M10 x 30	12	M10-30 (12)	**1113011**	12	18
DN320LF	M12 x 40	16	M12-40 (16)	**1113012**	32	48
DN400LF	M12 x 40	16	M12-40 (16)	**1113012**	32	48
DN500LF	M12 x 40	16	M12-40 (16)	**1113012**	32	48

Replacement retaining rings

ISO LF Flange	Reference	Part number	£	€
Steel For rotatable bolt rings				
DN63LF	L63-RR	**7853020**	6	9
DN100LF	L100-RR	**7853021**	8	12
DN160LF	L160-RR	**7853022**	11	17
DN200LF	L200-RR	**7853023**	12	18
DN250LF	L250-RR	**7853024**	13	20
DN320LF	L320-RR	**7853025**	21	32
DN400LF	L400-RR	**7853026**	21	32
DN500LF	L500-RR	**7853027**	30	45

All dimensions are nominal in millimetres unless specified

ISO KF and LF fittings

Introduction

Features

- High vacuum rated to 1×10^{-8} 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	1×10^{-8} mbar
Fittings leak test	2×10^{-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] MDC Vacuum reserves the right to use matt or polished tube at their discretion

UHV Series

Description

MDC Vacuum 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

MDC Vacuum	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

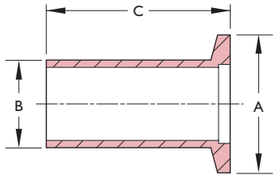
Sizes given above are nominal

All dimensions are nominal in millimetres unless specified

ISO KF and LF fittings

Half nipples

KF Clamp style

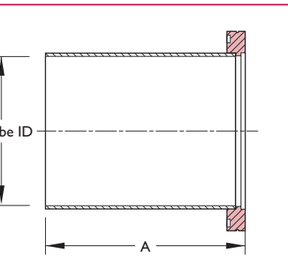


Features

- 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**	4	6
K25-SWS	40	28	30	K25-SWS	**7715102**	5	8
K40-SWS	55	44.5	30	K40-SWS	**7715103**	7	11
K50-SWS	75	57	30	K50-SWS	**7715104**	12	18
Long							
K16-LWS	30	20	70	K16-LWS	**7715106**	7	11
K25-LWS	40	28	70	K25-LWS	**7715107**	6	9
K40-LWS	55	44.5	70	K40-LWS	**7715108**	7	11
K50-LWS	75	57	70	K50-LWS	**7715109**	14	21

LF Clamp style



Features

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

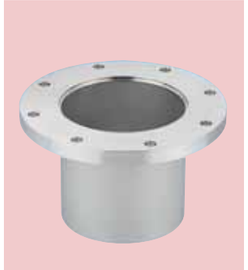
Flange ISO ref.	Min. tube ID	Min. A	Wt kg	Reference	Part number	£	€
Stainless steel							
DN63LF	60	100	0.5	LST-63-T	**7820009**	49	74
DN100LF	97	100	0.9	LST-100-T	**7820010**	60	90
DN160LF	145	100	1.5	LST-160-T	**7820011**	87	130
DN200LF	197	100	2.0	LST-200-T	**7820012**	137	205
DN250LF	248	100	4.0	LST-250-T	**7820013**	160	240
DN320LF	314	100	5.5	LST320-T	**7820005**	316	474
DN400LF	397	100	6.0	LST400-T	**7820006**	491	717
DN500LF	497	100	8.0	LST500-T	**7820007**	609	890

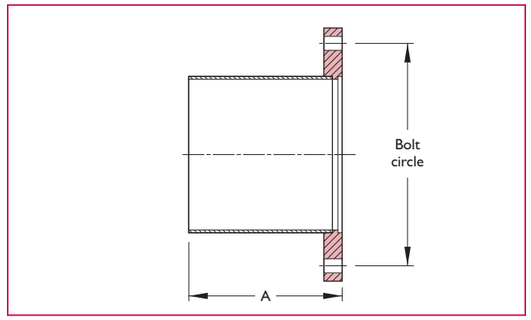
MDC Vacuum reserves the right to substitute a larger-bore tube according to availability

ISO KF and LF fittings

Half nipples and nipples

LF Bolt style



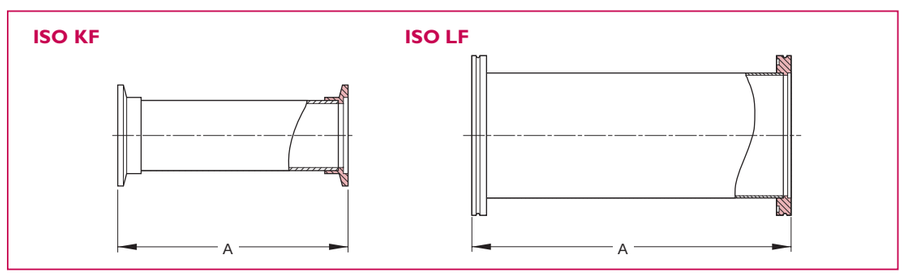


Features

- 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**	59	88
DN100LF	8	M8	145	97	100	2.3	L100-BL	**7851010**	93	140
DN160LF	8	M10	200	145	100	3.2	L160-BL	**7851011**	139	209
DN200LF	12	M10	260	197	100	5.5	L200-BL	**7851012**	220	330
DN250LF	12	M10	310	248	100	6.8	L250-BL	**7851013**	300	450
DN320LF	12	M12	395	314	100	15.5	L320-BL	**7851005**	625	938
DN400LF	16	M12	480	397	100	18.0	L400-BL	**7851006**	804	1205
DN500LF	16	M12	580	498	100	32.5	L500-BL	**7851007**	988	1482

Straight tube



Features

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

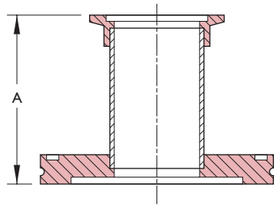
Flange ISO ref.	Min. tube ID	Min. A	Wt kg	Reference	Part number	£	€
Stainless steel							
DN16KF	16	80	0.2	KST-16	**7721000**	22	33
DN25KF	22	100	0.2	KST-25	**7721001**	25	38
DN40KF	34	130	0.2	KST-40	**7721002**	33	49
DN50KF	47	140	0.4	KST-50	**7721003**	43	64
Stainless steel							
DN63LF	60	100	0.9	LST63	**7821009**	69	103
DN100LF	97	100	1.8	LST100	**7821010**	132	198
DN160LF	145	100	4.5	LST160	**7821011**	174	260
DN200LF	197	100	5.5	LST200	**7821012**	246	369
DN250LF	248	100	7.3	LST250	**7821013**	311	467

ISO KF and LF fittings

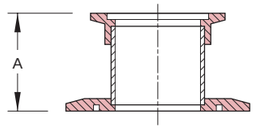
Nipple reducers

Straight tube

ISO LF to ISO KF



ISO KF to ISO KF



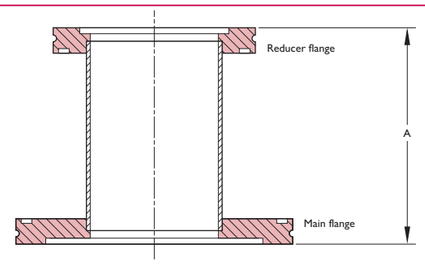
Features

- 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**	16	24
DN40KF	DN16KF	16	28	0.2	KST-40-16	**7732001**	18	27
DN40KF	DN25KF	24	28	0.2	KST-40-25	**7732003**	19	28
DN50KF	DN16KF	16	28	0.3	KST-50-16	**7732002**	19	28
DN50KF	DN25KF	24	28	0.3	KST-50-25	**7732004**	45	68
DN50KF	DN40KF	40	28	0.3	KST-50-40	**7732005**	48	72
Stainless steel								
DN63LF	DN40KF	34	50	0.7	LST63-K40	**1130285**	56	84
DN63LF	DN50KF	47	50	1.2	LST63-K50	**1130286**	67	100
DN100LF	DN50KF	47	50	1.2	LST100-K50	**1130287**	106	159

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**	88	132
DN160LF	DN63LF	60	50	2.7	LST160-63	**7832012**	120	180
DN160LF	DN100LF	97	50	4.8	LST160-100	**7832013**	127	191
DN200LF	DN160LF	145	90	6.0	LST200-160	**7832014**	257	386
DN250LF	DN200LF	197	90	8.0	LST250-200	**7832015**	363	545

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

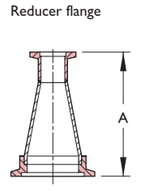
MDC Vacuum reserves the right to substitute a larger-bore tube according to availability

ISO KF and LF fittings

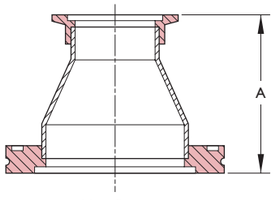
Nipple reducers and elbows

Conical

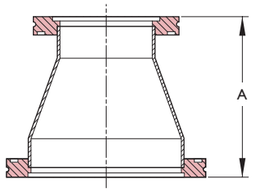
ISO KF to ISO KF



ISO LF to ISO KF



ISO LF to ISO LF



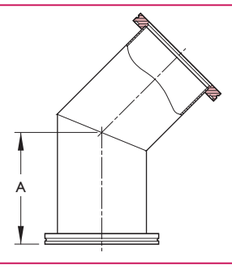
Features

- 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**	51	77
DN40KF	55	DN16KF	30	38 - 19	1.7	78	0.5	K150XK075FCR	**732007**	55	83
DN40KF	55	DN25KF	40	38 - 25	1.7	70	0.5	K150XK100FCR	**732010**	58	87
DN50KF	75	DN25KF	40	50 - 25	1.7	70	0.5	K200XK100FCR	**732008**	66	99
DN50KF	75	DN40KF	55	50 - 38	1.7	71	0.5	K200XK150FCR	**732009**	66	99
DN63LF	95	DN40KF	55	63 - 38	1.7	72	0.7	L250XK150FCR	**840016**	145	218
DN100LF	130	DN50KF	75	100 - 50	1.7	104	1.6	L400XK200FCR	**840020**	188	282
DN100LF	130	DN63LF	95	102 - 63	1.7	105	2.0	LCR100-63	**832007**	196	287
DN160LF	180	DN100LF	130	152 - 102	3.0	241	2.3	LCR160-100	**832010**	337	493

45° with tangents

ISO LF Mitred



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**	173	253
DN100LF	130	Mitre	97	128	2.7	LL45-100	**7823009**	257	376

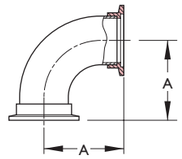
MDC Vacuum reserves the right to substitute a larger-bore tube according to availability

ISO KF and LF fittings

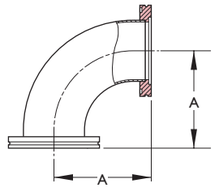
Elbows

90°

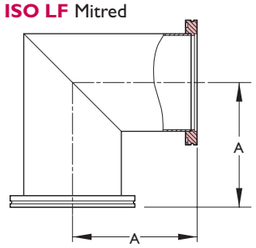
ISO KF Radial



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	Min. tube ID	A	Wt kg	Reference	Part number	£	€
Stainless steel									
DN16KF	30	Radial	16	40	0.2	KL-16	**7723000**	20	31
DN25KF	40	Radial	22	50	0.2	KL-25	**7723001**	21	32
DN40KF	55	Radial	34	65	0.2	KL-40	**7723002**	22	33
DN50KF	75	Radial	47	70	0.4	KL-50	**7723003**	45	68
Stainless steel									
DN63LF	95	Radial	60	88	1.0	LL63	**7823000**	82	123
DN100LF	130	Radial	97	159	2.7	LL100R	**7823018**	200	300
DN160LF	180	Mitred	145	138	4.5	LL160	**7823002**	299	449
DN200LF	240	Mitred	197	178	6.4	LL200	**7823003**	423	634
DN250LF	290	Mitred	248	208	8.6	LL250	**7823004**	595	892

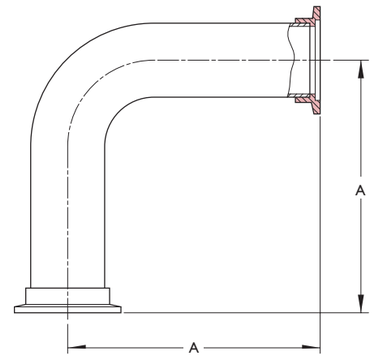
MDC Vacuum reserves the right to substitute a larger-bore tube according to availability

Flanges and fittings
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

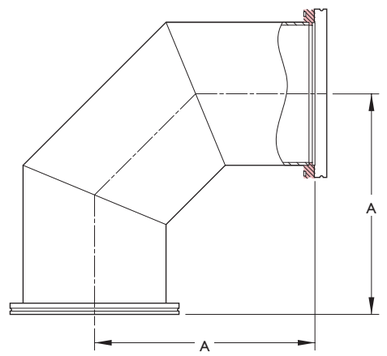


Flange ISO ref.	Flange OD	Nominal tube ID	A	Wt kg	Reference	Part number	£	€
Stainless steel								
DN16KF	30	16	49	0.2	KLL-16	**7723018**	41	62
DN25KF	40	22	57	0.8	KLL-25	**7723019**	50	75
DN40KF	55	34	80	1.0	KLL-40	**7723020**	56	84
DN50KF	75	48	108	1.0	KLL-50	**7723021**	66	99
Stainless steel								
DN63LF	95	60	138	1.4	L63-2LL	**823020**	70	105
DN100LF	130	97	217	2.3	L100-2LL	**823022**	280	420

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**	380	570

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

ISO KF and LF fittings

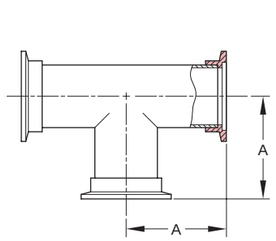
Tees and reducing tees

Tee

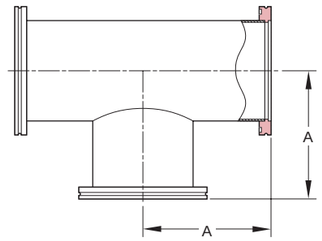
Features

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

ISO KF



ISO LF



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**	39	59
DN25KF	40	22	50	0.2	KT-25	**7724001**	39	59
DN40KF	55	34	65	0.2	KT-40	**7724002**	39	59
DN50KF	75	48	70	0.4	KT-50	**7724003**	54	81
Stainless steel								
DN63LF	95	60	88	1.4	LT63	**7824031**	127	191
DN100LF	130	97	108	3.6	LT100	**7824032**	178	267
DN160LF	180	145	138	6.0	LT160	**7824033**	368	552
DN200LF	240	197	178	8.2	LT200	**7824034**	388	581
DN250LF	290	248	208	10.8	LT250	**7824035**	587	880

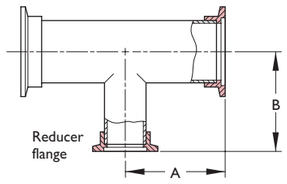
Reducing tees

Features

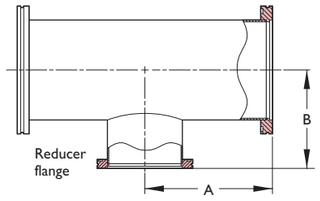
- Main flange DN25KF through DN160LF sizes
- Custom lengths available on request

ISO KF to ISO KF

Main flanges



ISO LF to ISO LF



Main flange ISO ref.	Nom. tube ID	A	Reducer flange ISO ref.	Nom. tube ID	B	Wt kg	Reference	Part number	£	€
Stainless steel										
DN25KF	22	50	DN16KF	16	40	0.5	KRT25-16	**724004**	24	36
DN40KF	34	65	DN16KF	16	40	0.5	KRT40-16	**724005**	38	57
DN40KF	34	65	DN25KF	22	50	0.5	KRT40-25	**724006**	38	57
DN50KF	48	70	DN16KF	16	50	1.0	KRT50-16	**724007**	38	57
DN50KF	48	70	DN25KF	22	65	1.0	KRT50-25	**724008**	38	57
DN50KF	48	70	DN40KF	34	65	1.0	KRT50-40	**724009**	50	75
Stainless steel										
DN100LF	97	108	DN63LF	60	107	3.2	LRT100-63	**7824047**	195	292
DN160LF	145	138	DN100LF	97	130	5.5	LRT160-100	**7824050**	364	546

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

ISO KF and LF fittings

Four-way crosses

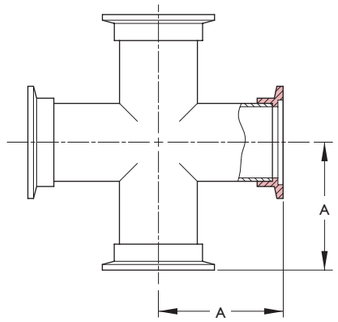
Four-way crosses

Note
Spherical main body on some units

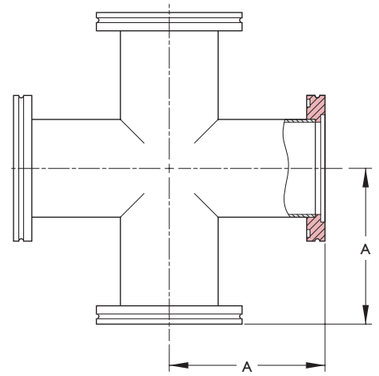
Features

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

ISO KF



ISO LF



Flange ISO ref.	Flange OD	Body type	Min. tube/ cut and roll[1] ID	Sphere ID	A	Wt kg	Reference	Part number	£	€
Stainless steel										
DN16KF	30	Tube	16	–	40	0.2	KX4-16	**7725000**	50	75
DN25KF	40	Tube	22	–	50	0.4	KX4-25	**7725001**	59	89
DN40KF	55	Tube	34	–	65	0.4	KX4-40	**7725002**	77	116
DN50KF	75	Tube	48	–	70	0.8	KX4-50	**7725003**	100	150
Stainless steel										
DN63LF	95	Tube	60	–	88	2.7	LX4-63	**7825031**	189	283
DN100LF	130	Sphere	97	152	130	4.5	LX4-100S	**7825032**	268	402
DN160LF	180	Sphere	145	222	160	6.8	LX4-160S	**7825033**	520	781
DN200LF	240	Sphere	197	299	197	9.5	LX4-200S	**7825034**	669	1003
DN250LF	290	Sphere	248	400	248	11.8	LX4-250S	**7825035**	852	1278

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

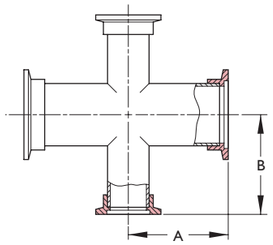
ISO KF and LF fittings

Reducing crosses

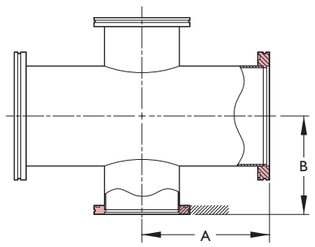
Features

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

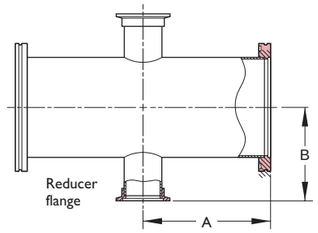
ISO KF to ISO KF



ISO LF to ISO LF



ISO LF to ISO KF



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**	67	100
DN40KF	34	65	DN16KF	16	40	0.4	KRX40-16	**7725011**	69	102
DN40KF	34	65	DN25KF	22	50	0.4	KRX40-25	**7725012**	86	129
DN50KF	48	70	DN25KF	22	50	1.0	KRX50-25	**7725013**	102	150
DN50KF	48	70	DN40KF	34	65	1.0	KRX50-40	**7725014**	107	157
Stainless steel										
DN63LF	60	102	DN40KF	34	76	1.0	L63-4-K40	**7825041**	250	375
DN63LF	60	102	DN50KF	48	92	1.0	L63-4-K50	**7825042**	272	408
DN100LF	97	130	DN50KF	48	111	2.3	L100-4-K50	**7825046**	400	600
Stainless steel										
DN100LF	97	108	DN63LF	60	107	4.0	L100-4-L63	**7825047**	472	708
DN160LF	145	138	DN100LF	97	131	6.8	L160-4-L100	**7825050**	844	1266

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

ISO KF and LF fittings

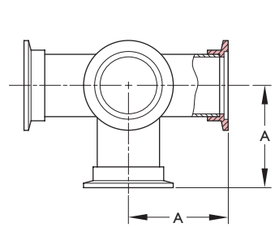
Five-way and six-way crosses

Five-way crosses

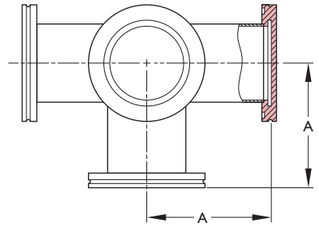
Features

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

ISO KF



ISO LF



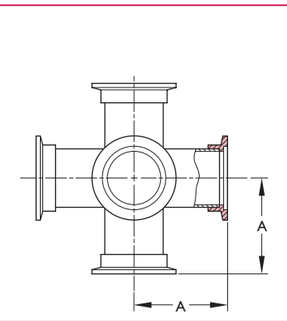
Flange ISO ref.	Flange OD	Minimum ID	Body type	A	Wt kg	Reference	Part number	£	€
Stainless steel									
DN16KF	30	16	Tube	40	0.2	KX5-16	**7726000**	61	91
DN25KF	40	22	Tube	50	0.4	KX5-25	**7726001**	71	106
DN40KF	55	38	Tube	65	0.4	KX5-40	**7726002**	113	170
Stainless steel									
DN63LF	95	60	Tube	88	3.6	LX5-63	**7826009**	371	557
DN100LF	130	97	Tube	108	5.5	LX5-100	**7826010**	515	773
DN160LF	180	145	Tube	138	8.2	LX5-160	**7826011**	831	1247

Six-way crosses

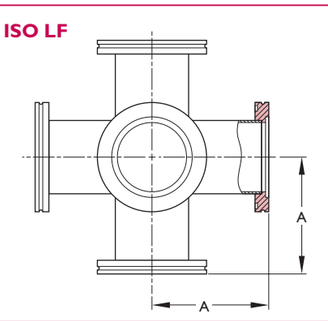
Features

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

ISO KF



ISO LF



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**	78	117
DN25KF	40	22	Tube	–	50	0.4	KX6-25	**7727001**	93	139
DN40KF	55	34	Tube	–	65	0.4	KX6-40	**7727002**	134	201
Stainless steel										
DN63LF	95	60	Tube	–	88	4.0	LX6-63	**7827009**	310	465
DN100LF	130	97	Tube	–	108	6.0	LX6-100	**7827010**	597	896
DN160LF	180	145	Sphere	222	138	8.6	LX6-160	**7827011**	1241	1861
DN200LF	240	197	Sphere	298	178	10.5	LX6-200	**7827012**	1483	2224
DN250LF	286	248	Sphere	400	208	15.0	LX6-250	**7827013**	1948	2921

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