

Vacuum Components

KF Components



ISO Components



CF Components



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General technical information

Introduction

Vacuum components are important parts of vacuum technology. These are all components of vacuum equipment which are necessary for the assembly of vacuum lines, e. g. flanges, seals and tube components (elbows, tees, crosses etc.). Applications in vacuum technology make high demands on the selection of material as well as the fabrication of these components.

Varied fields of application require different connection standards which are based on different flange systems. Therefore, we offer vacuum components of all important standards. Our product range covers a vast selection of standard vacuum components.

We are also specialised in the manufacture of vacuum components to your precise requirements.

Flange systems (KF, ISO, CF)

Three different flange systems or standards are basically used in vacuum technology. The selection of the most suitable system depends on the respective application. Please find further technical details in the introductions of the subsections. Our flanges comply with the following standards:

Flange system	Small flange	Clamping flange	ConFlat® compatible
Short term	KF (ISO-KF)	ISO (ISO-K, ISO-F)	CF
Nominal diameter	DN10 to DN50	DN63 to DN630	DN10 to DN250
Standard	DIN28403 ISO2861	DIN 28404 ISO1609	ISO3669
Vacuum range	up to HV	up to HV	up to UHV
Standard seal	elastomer O-ring	elastomer O-ring	Cu gasket
Leak rate	< 1.0E-9 mbar l / s	< 1.0E-9 mbar l / s	< 1.0E-11 mbar l / s

Materials

Our vacuum components are made of materials which meet the high demands of vacuum technology. Only stainless steels are processed for flanges and tubes. In addition we offer KF components of aluminium.

We manufacture flanges of forged stainless steel 316LN ESR for demanding applications, especially in ultra high vacuum. This electroslag remelted material is characterised by highest purity and homogeneous structure, high durability and low permeability. The stainless steel 316LN ESR processed by us originates from especially produced material. The specifications respective composition and purity are clearly closer defined by us than determined by the standard.

Applied stainless steels

Material no.	AISI	ESR
1.4301	304	-
1.4305	303	-
1.4307	304L	-
1.4404 / 1.4435	316L	-
1.4429	316LN	yes
1.4541	321	-
1.4571	316Ti	-

Vacuum Components

General technical informationen

Sealing materials

Different sealing materials are used in vacuum applications. The selection of the appropriate material depends on the required characteristics, especially with respect to:

- Ultimate pressure
- Temperature
- Chemical resistance
- Radiation resistance

O-rings of NBR or FKM are commonly used for KF and ISO components. Flat seals of copper are standard for CF components. Other materials are also used for special applications.

Elastomer seals

Material	NBR (nitrile butadiene rubber)	FKM (fluor rubber)	PFPM (perfluor rubber)	PTFE (polytetrafluorethylene)
Flange system	KF, ISO	KF, ISO, CF	KF, ISO	KF
Design	O-ring	O-ring or flat seal	O-ring	edge seal
Applicaton	non corrosive	moderate corrosive	highly corrosive	highly corrosive
Comment	standard material for KF and ISO	standard material for KF and ISO	application mainly in semiconductor technology	high pressing forces, clamp chains or special clamps

Metal seals

Material	Aluminium	Copper (OFHC)
Flange system	KF, ISO	CF
Design	edge seal	flat gasket
Application	up to ultimate pressure 1.0E-7 mbar	up to ultimate pressure, radiation resistant
Comment	high pressing forces, for KF with clamp chains or special clamps usable	standard material for CF, for special applications silver coated or annealed

Quality, cleaning and packing

Vacuum components by us are subject to demanding quality requirements. The most important data are listed in the following table:

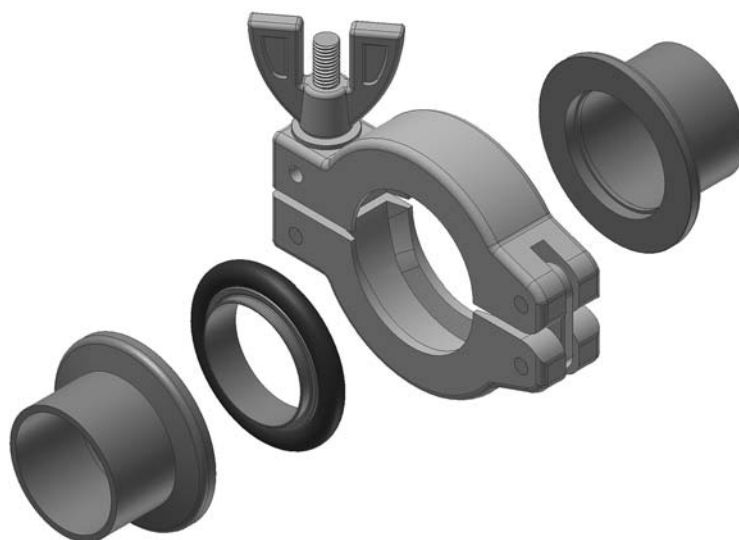
Leak rate	< 1.0 E-9 mbar l / s, - welded part separately tested - inspection certificate on request
Weld seams	inside or from outside through welded
Surface quality	turning workpieces: - blank - roughness: Ra 3.2 (sealing surface: Ra 1.6 or. 0.8) welded parts: - KF and ISO: glass bead blasted inside and outside - CF: inside blank, outside polished or glass bead blasted - roughness: Ra 3.2 or better - electropolished on request
Cleaning	- oil- and grease-free - hydrocarbon-free - ultrasonic cleaning with deionized water
Packing	- dust-proof packed in bags or foils - protected against damage - cleanroom packing on request

Dimensions

All dimensions in mm unless specified.

Introduction

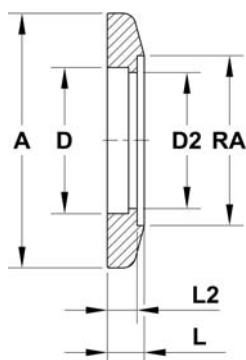
The Small flange or KF standard (DIN 28403, ISO 2961) is the standard connection for vacuum pipes up to the nominal diameter of DN50 used in low, fine and high vacuum. The connection between two flanges is shown in the following figure:



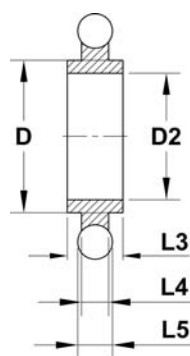
Functional principle

A seal is positioned between the flanges. The seal consists of a centering ring and the O-ring stretched upon. The flanges are held together by a clamp. The clamp has an inclined interior surface adequate to the conical outer surface of the flanges.

Usually centering rings and standard clamps are used with wing nuts. They enable a quick and easy assembly without any tools. Trapped centering rings and special clamps or clamp chains are offered for special applications. Claw clamps or so-called bulkhead clamps are available for wall mounting.



KF flange



KF centering ring

Dimensions of KF flanges / KF centering rings

Dimension	DN10	DN16	DN25	DN40	DN50
A	30.0	30.0	40.0	55.0	75.0
D	12.2	17.2	26.2	41.2	52.2
D2	10.0	16.0	25.0	40.0	50.0
RA	14.0	19.0	28.0	41.0	53.0
L	5.1	4.5	4.6	4.4	5.4
L2	3.5	3.5	3.5	3.5	4.5

KF Components

Introduction

Materials

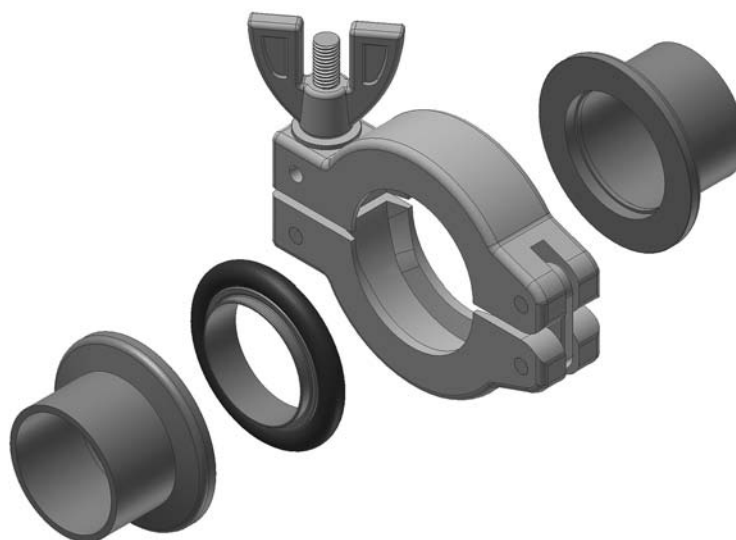
Seals	Flanges	Components
NBR (O-ring) FKM (O-ring) PTFE (edge seal) PTFE (centering ring / trapped centering ring) aluminium (edge seal) aluminium (centering ring / trapped centering ring) stainless steel 1.4301 (centering ring) stainless steel 1.4404 (centering ring)	aluminium stainless steel 1.4301 stainless steel 1.4305 stainless steel 1.4404	aluminium stainless steel 1.4301 stainless steel 1.4305 stainless steel 1.4404 stainless steel 1.4435 stainless steel 1.4541 stainless steel 1.4571

Fields of application

Materials components and seals	Pressure range (mbar - bar)	Leak rate (mbar l / s)	Recommended centering ring	Recommended connecting element
aluminium with elastomer seal	1.0E-7 to 1.5 1.0E-7 to 1.5	1.0E-8	inside outside	standard clamp clamp chain
stainless steel with elastomer seal	1.0E-8 to 1.5 1.0E-8 to 1.5	1.0E-9	inside outside	standard clamp clamp chain
stainless steel with metal seal	1.0E-9 to 1.5	< 1.0E-9	outside	clamp chain or special clamp

Introduction

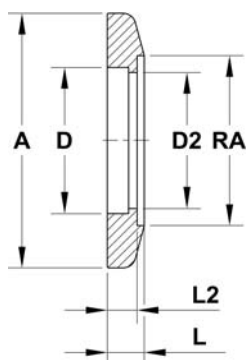
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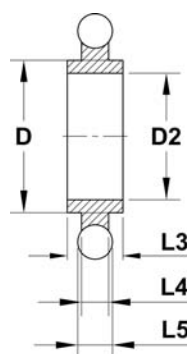
Functional principle

A seal is positioned between the flanges. The seal consists of a centering ring and the O-ring stretched upon. The flanges are held together by a clamp. The clamp has an inclined interior surface adequate to the conical outer surface of the flanges.

Usually centering rings and standard clamps are used with wing nuts. They enable a quick and easy assembly without any tools. Trapped centering rings and special clamps or clamp chains are offered for special applications. Claw clamps or so-called bulkhead clamps are available for wall mounting.



KF flange



KF centering ring

Dimensions of KF flanges / KF centering rings

Dimension	DN10	DN16	DN25	DN40	DN50
A	30.0	30.0	40.0	55.0	75.0
D	12.2	17.2	26.2	41.2	52.2
D2	10.0	16.0	25.0	40.0	50.0
RA	14.0	19.0	28.0	41.0	53.0
L	5.1	4.5	4.6	4.4	5.4
L2	3.5	3.5	3.5	3.5	4.5

KF Components

Introduction

Materials

Seals	Flanges	Components
NBR (O-ring) FKM (O-ring) PTFE (edge seal) PTFE (centering ring / trapped centering ring) aluminium (edge seal) aluminium (centering ring / trapped centering ring) stainless steel 1.4301 (centering ring) stainless steel 1.4404 (centering ring)	aluminium stainless steel 1.4301 stainless steel 1.4305 stainless steel 1.4404	aluminium stainless steel 1.4301 stainless steel 1.4305 stainless steel 1.4404 stainless steel 1.4435 stainless steel 1.4541 stainless steel 1.4571

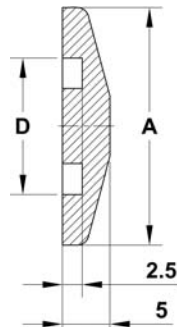
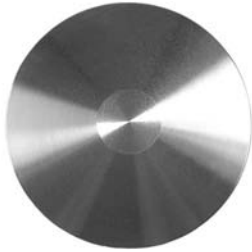
Fields of application

Materials components and seals	Pressure range (mbar - bar)	Leak rate (mbar l / s)	Recommended centering ring	Recommended connecting element
aluminium with elastomer seal	1.0E-7 to 1.5 1.0E-7 to 1.5	1.0E-8	inside outside	standard clamp clamp chain
stainless steel with elastomer seal	1.0E-8 to 1.5 1.0E-8 to 1.5	1.0E-9	inside outside	standard clamp clamp chain
stainless steel with metal seal	1.0E-9 to 1.5	< 1.0E-9	outside	clamp chain or special clamp

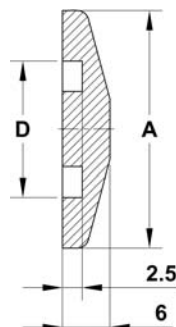
KF Components

KF Flanges

KF Blank flanges



aluminium

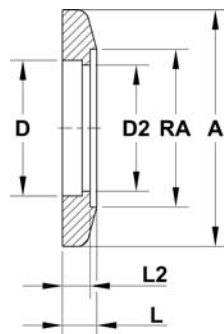


stainless steel

Order code			DN	A	D
Aluminium	Stainless steel 304*	Stainless steel 316L*			
KF16BA	KF16BS-304	KF16BS-316	16	30	17.2
KF25BA	KF25BS-304	KF25BS-316	25	40	26.2
KF40BA	KF40BS-304	KF40BS-316	40	55	41.2
KF50BA	KF50BS-304	KF50BS-316	50	75	52.2

* For clean room compatible packaging please add "-CRP" to the order code

KF Bored flanges, stainless steel



Order code		DN	A	D	L	RA	L2	D2
Stainless steel 304	Stainless steel 316L							
KF16B19-304	KF16B19-316	16	30	17.2	4.5	19	3.5	16
-	KF16B20-316	16	30	17.2	4.3	20	3.5	16
KF25B28-304	KF25B28-316	25	40	26.2	4.6	28	3.5	25
KF40B41-304	KF40B41-316	40	55	41.2	4.9	41	3.5	40
KF50B53-304	KF50B53-316	50	75	52.2	5.9	53	4.5	50
KF40B44-304	KF40B44-316	40	55	41.2	4.4	44.5	3.5	40
KF50B57-304	KF50B57-316	50	75	52.2	5.4	57	4.5	52

• For clean room compatible packaging please add "-CRP" to the order code

KF Components

KF Flanges

KF Flange caps, plastics

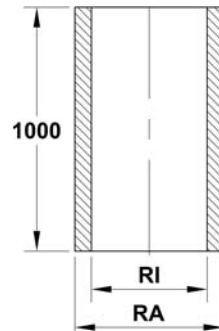


Order code	DN
KF16CAP	16
KF25CAP	25
KF40CAP	40
KF50CAP	50

- Packing unit 10 pieces

KF Fittings

KF Tube, 1 m length, stainless steel



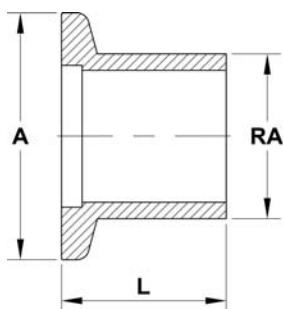
Technical data

- Lengthwise welded
- Outside and inside etched
- DIN 11850
- Ra < 0.8 µm
- Ra (welding seam area) < 1.6 µm

Order code		DN	RA	RI
St. steel 304	St. steel 316L			
R304-19x1.5-1	R316-19x1.5-1	16	19	16
R304-28x1.5-1	R316-28x1.5-1	25	28	25
R304-41x1.5-1	R316-41x1.5-1	40	41	38
R304-53x1.5-1	R316-53x1.5-1	50	53	50

KF Fittings

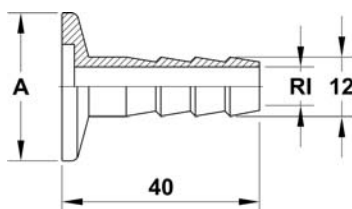
KF Tubulations (half nipples), stainless steel



Order code		DN	A	L	RA
St. steel 304	St. steel 316L				
TU16K13-19-304	-	16	30	13	19
TU16K20-20-304	TU16K20-20-316	16	30	20	20
TU16K30-20-304	TU16K30-20-316	16	30	30	20
-	TU16K40-20-316	16	30	40	20
TU16K70-20-304	TU16K70-20-316	16	30	70	20
TU25K13-25-304	-	25	40	13	25
TU25K20-28-304	TU25K20-28-316	25	40	20	28
TU25K30-28-304	TU25K30-28-316	25	40	30	28
-	TU16K40-28-316	25	40	40	28
TU25K70-28-304	TU25K70-28-316	25	40	70	28
TU40K19-38-304	-	40	55	19	38
TU40K20-44.5-304	TU40K20-44.5-316	40	55	20	44.5
TU40K30-44.5-304	TU40K30-44.5-316	40	55	30	44.5
-	TU25K40-44.5-316	40	55	40	44.5
TU40K70-44.5-304	TU40K70-44.5-316	40	55	70	44.5
TU50K19-51-304	-	50	75	19	51
TU50K20-57-304	TU50K20-57-316	50	75	20	57
TU50K30-57-304	TU50K30-57-316	50	75	30	57
-	TU25K70-57-316	50	75	40	57
TU50K70-57-304	TU50K70-57-316	50	75	70	57

- For clean room compatible packaging please add "-CRP" to the order code

KF Hose nozzles, aluminium

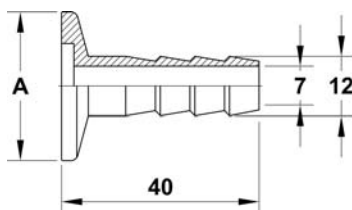


Technical data

■ Hose ID 10 mm

Order code	DN	A	RI
KF16HNA	16	30	7
KF25HNA	25	40	7
KF40HNA	40	55	7
KF50HNA	50	75	8

KF Hose nozzles, stainless steel



Technical data

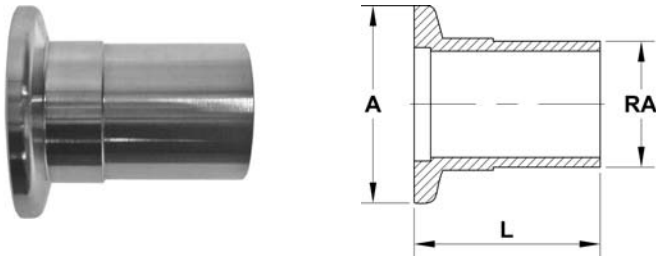
■ Hose ID 10 mm

Order code	DN	A
KF16HNS-316	16	30
KF25HNS-316	25	40
KF40HNS-316	40	55
KF50HNS-316	50	75

KF Components

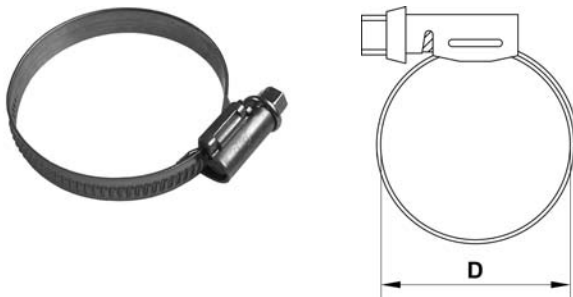
KF Fittings

KF Tubulations for PVC hose, stainless steel



Order code	DN	A	RA	L
KF16TUH-316	16	30	19	32
KF25TUH-316	25	40	25	38
KF40TUH-316	40	55	38	50
KF50TUH-316	50	75	51	55

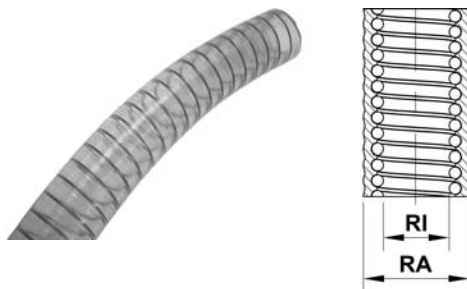
KF Hose clamps for PVC hose



Order code	DN	D
KF16HC	16	25
KF25HC	25	36
KF40HC	40	50
KF50HC	50	60

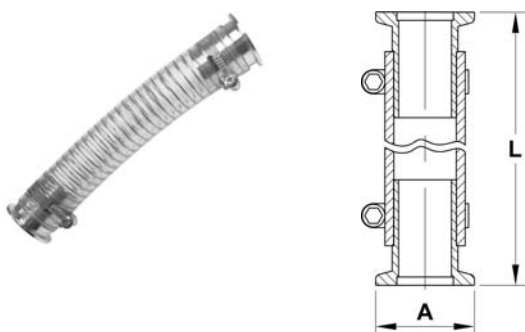
- D = max. hose diameter

KF Hoses, wire reinforced PVC, per metre



Order code	DN	RA	RI
PVC16	16	26	19
PVC25	25	33	25
PVC40	40	47	38
PVC50	50	60	50

KF Hose connectors, PVC, stainless steel

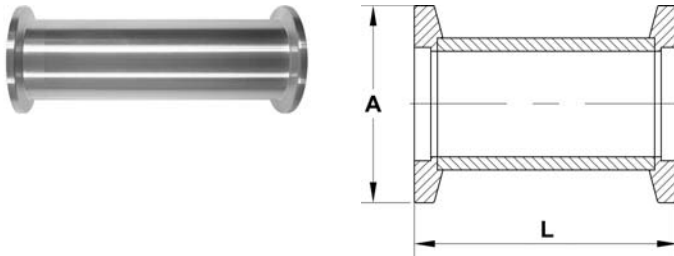


Order code	DN	A	L
KF16PVC25	16	30	250
KF16PVC50	16	30	500
KF16PVC100	16	30	1000
KF25PVC25	25	40	250
KF25PVC50	25	40	500
KF25PVC100	25	40	1000
KF40PVC25	40	55	250
KF40PVC50	40	55	500
KF40PVC100	40	55	1000
KF50PVC25	50	75	250
KF50PVC50	50	75	500
KF50PVC100	50	75	1000

KF Components

KF Fittings

KF Straight connectors (full nipples)

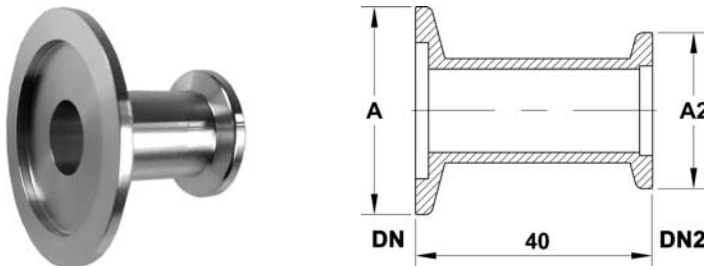


Order code			DN	A	L
Aluminium	Stainless steel 304*	Stainless steel 316L*			
SC16KA	SC16K-304	SC16K-316	16	30	80
SC25KA	SC25K-304	SC25K-316	25	40	100
SC40KA	SC40K-304	SC40K-316	40	55	130
-	SC50K-304	SC50K-316	50	75	130

* For clean room compatible packaging please add "-CRP" to the order code

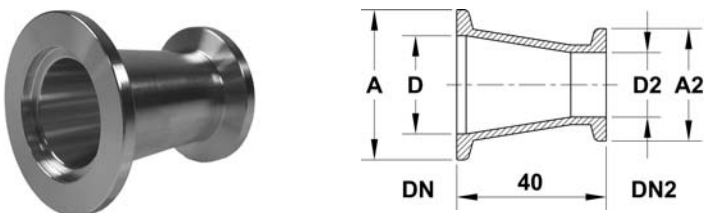
- Special lengths on request

KF Tubulated reducing adapters, aluminium



Order code	DN	DN2	A	A2
KF25R16A-40	25	16	40	30
KF40R16A-40	40	16	55	30
KF40R25A-40	40	25	55	40
KF50R40A-40	50	40	75	55

KF Tubulated reducing adapters, conical, stainless steel



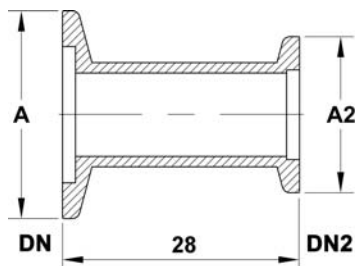
Order code		DN	DN2	A	A2	D	D2
Stainless steel 304	Stainless steel 316L						
KF25R16/CO-304	KF25R16/CO-316	25	16	40	30	26	17
KF40R16/CO-304	KF40R16/CO-316	40	16	55	30	41	17
KF40R25/CO-304	KF40R25/CO-316	40	25	55	40	41	26
KF50R25/CO-304	KF50R25/CO-316	50	25	75	40	52	26
KF50R40/CO-304	KF50R40/CO-316	50	40	75	55	52	41

- For clean room compatible packaging please add "-CRP" to the order code

KF Components

KF Fittings

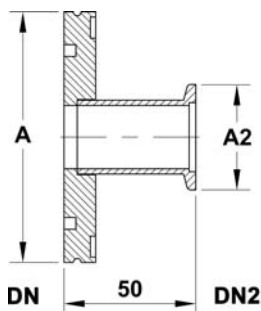
KF Tubulated reducing adapters, stainless steel



Order code		DN	DN2	A	A2
St. steel 304	St. steel 316L				
KF25R16-304	KF25R16-316	25	16	40	30
KF40R16-304	KF40R16-316	40	16	55	30
KF40R25-304	KF40R25-316	40	25	55	40
KF50R25-304	KF50R25-316	50	25	75	40
KF50R40-304	KF50R40-316	50	40	75	55

- For clean room compatible packaging please add "-CRP" to the order code

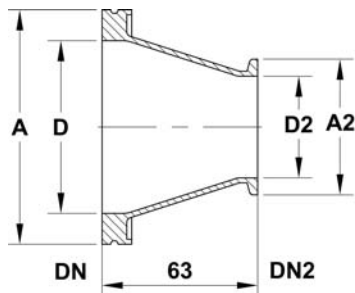
KF to ISO-K Adapters, stainless steel



Order code		DN	DN2	A	A2
St. steel 304	St. steel 316L				
SK063025-304	SK063025-316	63	25	95	40
SK063040-304	SK063040-316	63	40	95	55
SK063050-304	SK063050-316	63	50	95	75
SK100040-304	SK100040-316	100	40	130	55

- Other adapters on request
- For clean room compatible packaging please add "-CRP" to the order code

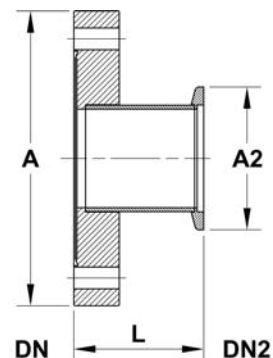
KF to ISO-K Adapters, conical, stainless steel



Order code	DN	DN2	A	A2	D	D2
SK63040/CO-304	63	40	95	55	70	41
SK63050/CO-304	63	50	95	75	70	52
SK80040/CO-304	80	40	110	55	83	41
SK80050/CO-304	80	50	110	75	83	52
SK100040/CO-304	100	40	130	55	102	41
SK100050/CO-304	100	50	130	75	102	52

- For clean room compatible packaging please add "-CRP" to the order code

KF to CF Adapters, stainless steel

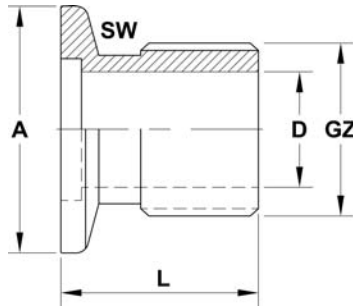


Order code	DN	DN2	A	A2	L
KA016016-316	16	16	34	30	36
KA040016-316	35	16	70	30	36
KA040025-316	35	25	70	40	36
KA040040-316	35	40	70	55	50
KA063025-316	63	25	114	40	50
KA063040-316	63	40	114	55	50

- Other adapters on request
- For clean room compatible packaging please add "-CRP" to the order code

KF Fittings

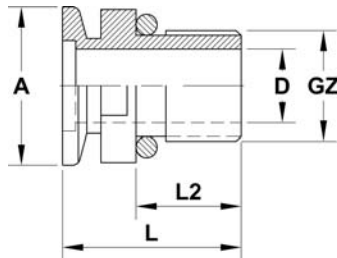
KF-G Adapter, G outside thread, stainless steel 316L



Order code	DN	A	GZ	D	L	SW
KF16GA12-316	16	30	1/2"	14	24	16
KF16GA14-316	16	30	1/4"	7	20	10
KF16GA34-316	16	30	3/4"	16	26	18
KF16GA38-316	16	30	3/8"	10	24	13
KF25GA1-316	25	40	1"	25	29	27
KF25GA12-316	25	40	1/2"	14	24	16
KF25GA34-316	25	40	3/4"	16	26	18
KF25GA114-316	25	40	1 1/4"	25	35	27
KF40GA114-316	40	55	1 1/4"	34	35	36
KF40GA112-316	40	55	1 1/2"	34	32	36
KF50GA2-316	50	75	2"	49	40	-

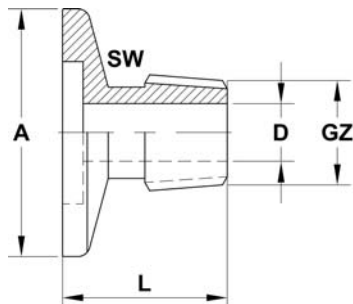
- For clean room compatible packaging please add "-CRP" to the order code

KF-G Adapter, G outside thread, stainless steel with FKM seal



Order code	DN	A	GZ	D	L	L2
KF16EF-316	16	30	1/2"	16	35	15
KF25EF-316	25	40	1"	25	45	25
KF40EF-316	40	55	1 1/2"	41	50	30

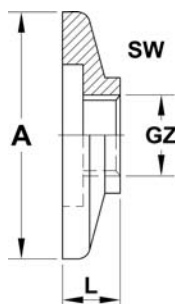
KF-R Adapter, R outside thread, stainless steel, 316L



Order code	DN	A	GZ	D	L	SW
KF16RA12-316	16	30	1/2"	14	27	19
KF25RA1-316	25	40	1"	25	32	27
KF40RA112-316	40	55	1 1/2"	38	40	41
KF50RA2-316	50	75	2"	51	43	-

- For clean room compatible packaging please add "-CRP" to the order code

KF-G Adapter, G inside thread, stainless steel, 316L



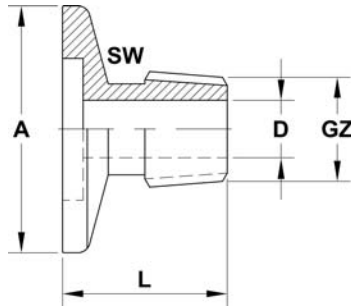
Order code	DN	A	GZ	L	SW
KF16GI18-316	16	30	1/8"	7	-
KF25GI14-316	25	40	1/4"	10	19
KF25GI12-316	25	40	1/2"	15	27
KF25GI34-316	25	40	3/4"	20	-
KF40GI12-316	40	55	1/2"	15	27
KF40GI1-316	40	55	1"	20	41
KF40GI114-316	40	55	1 1/4"	22	-

- For clean room compatible packaging please add "-CRP" to the order code

KF Components

KF Fittings

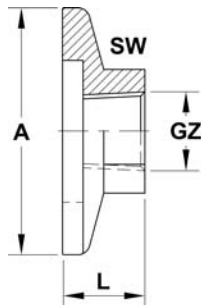
KF to NPT Adapters, NTP outside thread, stainless steel, 316L



Order code	DN	A	GZ	D	L	SW
KF16NPT14-316	16	30	1/4"	7.4	25	-
KF16NPT12-316	16	30	1/2"	14.9	32	19
KF16NPT34-316	16	30	3/4"	16	34	19
KF25NPT14-316	25	40	1/4"	7.4	25	-
KF25NPT34-316	25	40	3/4"	16	34	19
KF40NPT12-316	40	55	1/2"	14.9	32	19

- For clean room compatible packaging please add "-CRP" to the order code

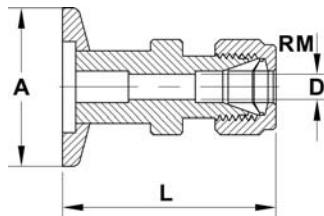
KF to NPT Adapters, NTP inside thread, stainless steel, 316L



Order code	DN	A	GZ	L	SW
KF16NPT18F-316	16	30	1/8"	10	13
KF16NPT14F-316	16	30	1/4"	13	19
KF25NPT14F-316	25	40	1/4"	13	19
KF25NPT18F-316	25	40	1/8"	10	13

- For clean room compatible packaging please add "-CRP" to the order code

KF to Swagelok Adapters, metric, stainless steel, 316L



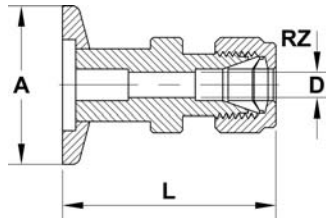
Order code	DN	A	D	L	RM
KSWA166-316	16	30	4.8	35	6
KSWA168-316	16	30	6.4	38	8
KSWA1610-316	16	30	7.9	44	10
KSWA256-316	25	40	4.8	33	6
KSWA258-316	25	40	6.4	38	8
KSWA2510-316	25	40	7.9	44	10
KSWA406-316	40	55	4.8	33	6
KSWA408-316	40	55	6.4	38	8
KSWA4010-316	40	55	7.9	44	10

- Swagelok compatible
- For clean room compatible packaging please add "-CRP" to the order code

KF Components

KF Fittings

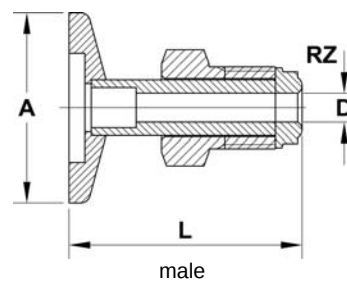
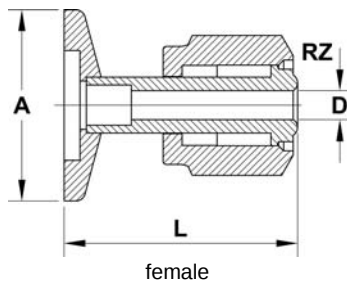
KF to Swagelok Adapters, imperial, stainless steel, 316L



Order code	DN	A	D	L	RZ
KSWA167-316	16	30	4.8	35	1/4"
KSWA169-316	16	30	7.1	44	3/8"
KSWA1613-316	16	30	10.4	53	1/2"
KSWA257-316	25	40	4.8	33	1/4"
KSWA259-316	25	40	7.1	44	3/8"
KSWA2513-316	25	40	10.4	53	1/2"
KSWA407-316	40	55	4.8	33	1/4"
KSWA409-316	40	55	7.1	44	3/8"
KSWA4013-316	40	55	10.4	53	1/2"

- Swagelok compatible
- For clean room compatible packaging please add "-CRP" to the order code

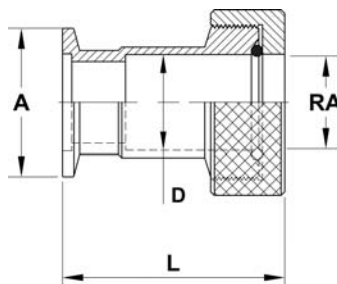
KF to VCR Adapters, female or male, stainless steel, 316L



Order code		DN	A	D	L	RZ
Female	Male					
KVCR166F-316	KVCR166M-316	16	30	4.8	36	1/4"
KVCR1613F-316	KVCR1613M-316	16	30	10.4	41	1/2"
KVCR256F-316	KVCR256M-316	25	40	4.8	36	1/4"
KVCR2513F-316	KVCR2513M-316	25	40	10.4	41	1/2"
KVCR406F-316	KVCR406M-316	40	55	4.8	36	1/4"
KVCR4013F-316	KVCR4013M-316	40	55	10.4	41	1/2"

- VCR compatible
- For clean room compatible packaging please add "-CRP" to the order code

KF Pinch screw connection, stainless steel, FKM seal

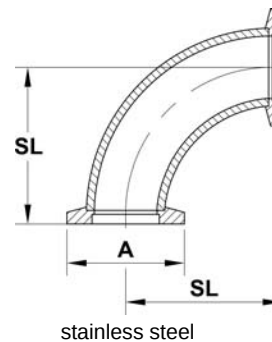
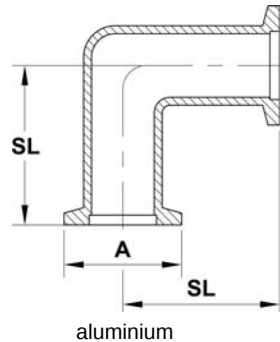


Order code	DN	A	D	L	RA
KF16TA12-316	16	30	13.1	50	12.7
KF25TA12-316	25	40	13.1	50	12.7
KF25TA25-316	25	40	25.8	60	25.4
KF40TA25-316	40	55	25.8	60	25.4

KF Components

KF Fittings

KF Elbows, 90°



Order code			DN	A	SL
Aluminium	Stainless steel 304*	Stainless steel 316L			
EL16KA	EL16K-304	EL16K-316	16	30	40
EL25KA	EL25K-304	EL25K-316	25	40	50
EL40KA	EL40K-304	EL40K-316	40	55	65
-	EL50K-304	EL50K-316	50	75	70

* For clean room compatible packaging please add "-CRP" to the order code

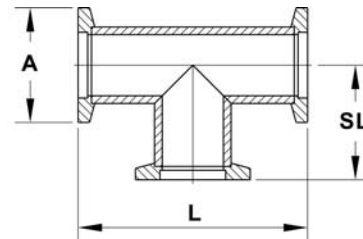
KF Tees



aluminium



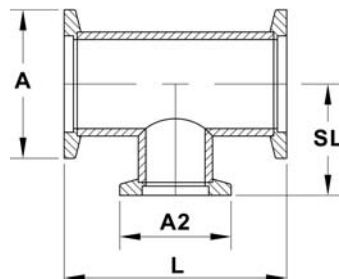
stainless steel



Order code			DN	A	L	SL
Aluminium	Stainless steel 304	Stainless steel 316L*				
TE16KA	TE16K-304	TE16K-316	16	30	80	40
TE25KA	TE25K-304	TE25K-316	25	40	100	50
TE40KA	TE40K-304	TE40K-316	40	55	130	65
-	TE50K-304	TE50K-316	50	75	140	70

* For clean room compatible packaging please add "-CRP" to the order code

KF Unequal tees, stainless steel



Order code	DN	DN2	A	A2	L	SL
UTE2516K-316	25	16	40	30	100	40
UTE4016K-316	40	16	55	30	130	40
UTE4025K-316	40	25	55	40	130	50
UTE5016K-316	50	16	75	30	140	50
UTE5025K-316	50	25	75	40	140	65
UTE5040K-316	50	40	75	55	140	65

- For clean room compatible packaging please add "-CRP" to the order code

KF Components

KF Fittings

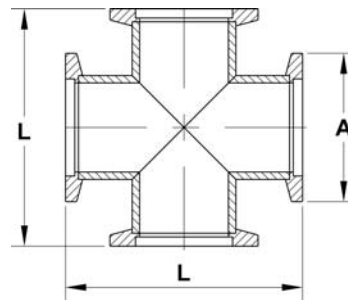
KF 4-way crosses, aluminium



aluminium



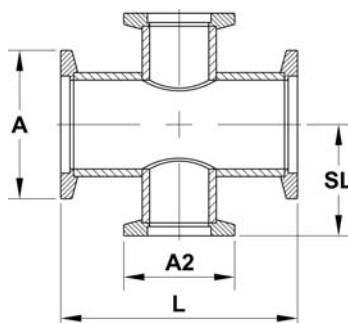
stainless steel



Order code			DN	A	L
Aluminium	Stainless steel 304*	Stainless steel 316L*			
X16KA	X16K-304	X16K-316	16	30	80
X25KA	X25K-304	X25K-316	25	40	100
X40KA	X40K-304	X40K-316	40	55	130
-	X50K-304	X50K-316	50	75	140

* For clean room compatible packaging please add "-CRP" to the order code

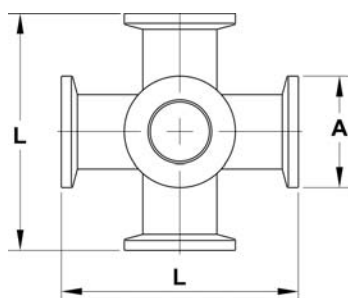
KF Reducing 4-way crosses, stainless steel



Order code	DN	DN2	A	A2	L	SL
X25K16-316	25	16	40	30	100	80
X40K16-316	40	16	55	30	130	80
X40K25-316	40	25	55	40	130	100
X50K25-316	50	25	75	40	140	100
X50K40-316	50	40	75	55	140	130

- For clean room compatible packaging please add "-CRP" to the order code

KF 6-way crosses, stainless steel

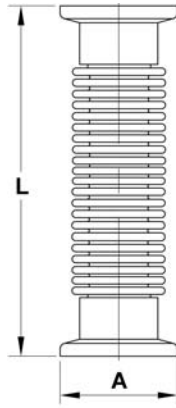


Order code	DN	A	L
XX16K-316	16	30	80
XX25K-316	25	40	100
XX40K-316	40	40	130
XX50K-316	50	75	140

- For clean room compatible packaging please add "-CRP" to the order code

KF Flexible hoses

KF Flexible hoses, stainless steel



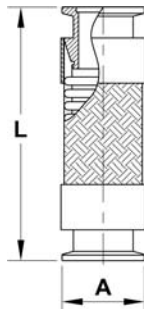
Technical data

■ Flange material	1.4301
■ Hose material	1.4404

Order code			DN	A	L	Bending radius
Stainless steel 304	Stainless steel 316L	Stainless steel 304 annealed				
FX16K25-304	FX16K25-316	FX16K25AN-304	16	30	250	-
FX16K50-304	FX16K50-316	FX16K50AN-304	16	30	500	-
FX16K75-304	FX16K75-316	FX16K75AN-304	16	30	750	50
FX16K100-304	FX16K100-316	FX16K100AN-304	16	30	1000	50
FX25K25-304	FX25K25-316	FX25K25AN-304	25	40	250	103
FX25K50-304	FX25K50-316	FX25K50AN-304	25	40	500	103
FX25K75-304	FX25K75-316	FX25K75AN-304	25	40	750	103
FX25K100-304	FX25K100-316	FX25K100AN-304	25	40	1000	103
FX40K25-304	FX40K25-316	FX40K25AN-304	40	55	250	90
FX40K50-304	FX40K50-316	FX40K50AN-304	40	55	500	90
FX40K75-304	FX40K75-316	FX40K75AN-304	40	55	750	90
FX40K100-304	FX40K100-316	FX40K100AN-304	40	55	1000	90
FX50K25-304	FX50K25-316	FX50K25AN-304	50	75	250	120
FX50K50-304	FX50K50-316	FX50K50AN-304	50	75	500	120
FX50K75-304	FX50K75-316	FX50K75AN-304	50	75	750	120
FX50K100-304	FX50K100-316	FX50K100AN-304	50	75	1000	120

- For clean room compatible packaging please add "-CRP" to the order code

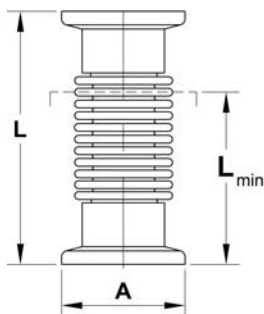
KF Braided flexible hoses, stainless steel



Order code	DN	A	L
BFX25K13	25	40	135
BFX25K25	25	40	250
BFX40K13	40	55	135
BFX40K25	40	55	250
BFX50K13	50	75	135
BFX50K25	50	75	250

KF Flexible hoses

KF Hydroformed bellows connectors, stainless steel



Technical data

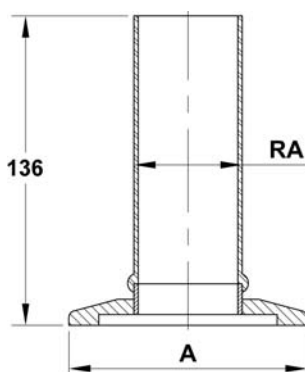
■ Flange material	1.4301
■ Bellows material	1.4404
■ Tolerances	L ±2 mm

Order code	DN	A	Lmin	L
KF16FXB-304	16	30	64	70
KF25FXB-304	25	40	63	80
KF40FXB-304	40	55	84	100
KF50FXB-304	50	75	84	100

- For clean room compatible packaging please add "-CRP" to the order code

KF Glass-to-metal Connections

KF Glass-to-metal connections, Kodial / Pyrex®



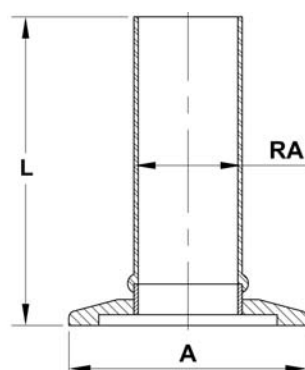
Technical data

■ Flange material	1.4301
■ Tolerances	RA ±1 mm, L ±3 mm
■ Bakeout temperature	max. 200 °C
■ Bakeout rate	2 - 3 °C/min

Order code		DN	A	RA
Kodial	Pyrex®			
KF16T13	KF16T13P-L137	16	30	13
KF25T19	KF25T19P-L137	25	40	19
KF25T25	KF25T25P-L137	25	40	25
KF40T25	KF40T25P	40	55	25
KF40T38	KF40T38P	40	55	38

- For detailed information see chapter viewports.

KF Glass-to-metal connections, quartz



Technical data

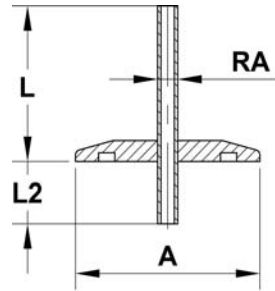
■ Flange material	1.4301
■ Tolerances	RA ±1 mm, L ±3 mm
■ Bakeout temperature	max. 200 °C
■ Bakeout rate	2 - 3 °C/min
■ Construction	metal-to-quartz transition using intermediate glass layers

Order code	DN	A	RA	L
KF16T13Q	16	30	13	143
KF25T19Q	25	40	19	155
KF25T25Q	25	40	25	165
KF40T25Q	40	55	25	165
KF40T38Q	40	50	38	175

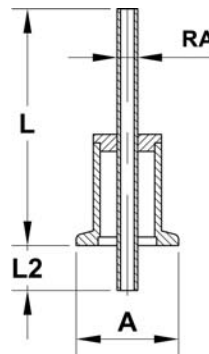
- For detailed information see chapter viewports.

KF Liquid Feedthroughs

KF 1-way liquid feedthroughs, stainless steel, 316L



for liquid

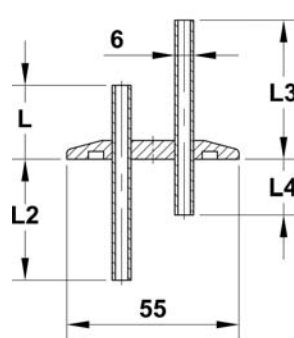
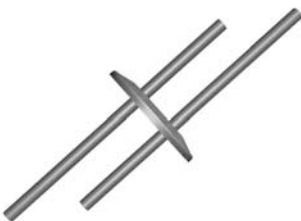


for liquid nitrogen

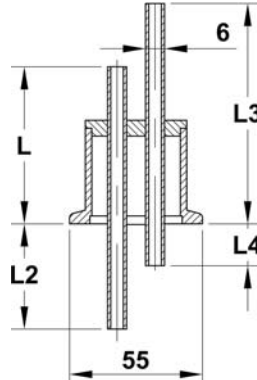
Order code		DN	A	RA	L	L2	Vacuum side	Atmosphere side
Liquid	Liquid nitrogen							
LFKF16PP-316	LNFKF16PP-316	16	30	6	75	45	tube	tube
LFKF40PP-316	LNFKF40PP-316	40	55	6	75	45	tube	tube
LFKF40PPL-316	LNFKF40PPL-316	40	55	12	75	45	tube	tube
LFKF40PSL-316	LNFKF40PSL-316	40	55	12	114	45	tube	Swagelok 12 mm
LFKF40SSL-316	LNFKF40SSL-316	40	55	12	114	84	Swagelok 12 mm	Swagelok 12 mm

- For clean room compatible packaging please add "-CRP" to the order code
- Other lengths and connections on request
- Swagelok compatible

KF 2-way liquid feedthroughs, stainless steel, 316L



for liquid



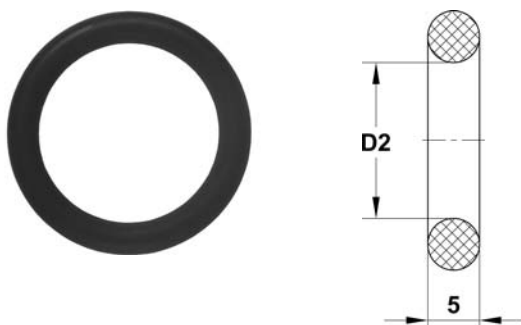
for liquid nitrogen

Order code		DN	L	L2	L3	L4	Vacuum side	Atmosphere side
Liquid	Liquid nitrogen							
LFKF402PP-316	LNFKF402PP-316	40	45	75	75	45	tube	tube
LFKF402PS-316	LNFKF402PS-316	40	45	103	75	73	tube	Swagelok 6 mm
LFKF402SP-316	LNFKF402SP-316	40	73	75	103	45	Swagelok 6 mm	tube

- For clean room compatible packaging please add "-CRP" to the order code
- Other lengths and connections on request
- Swagelok compatible

KF Seals

KF O-rings, elastomer



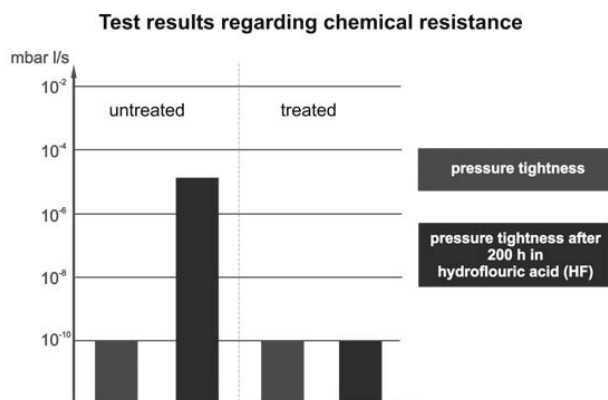
Technical data

- Temperature range -10 °C to 150 °C (intermittent to 200 °C)

Order code		DN	D2
FKM treated	FKM vacuum baked*		
KF10VR-BEH	KF10VR-VB	10	15
KF16VR-BEH	KF16VR-VB	16	18
KF25VR-BEH	KF25VR-VB	25	28
KF40VR-BEH	KF40VR-VB	40	42
KF50VR-BEH	KF50VR-VB	50	55

* For clean room compatible packaging please add "-CRP" to the order code

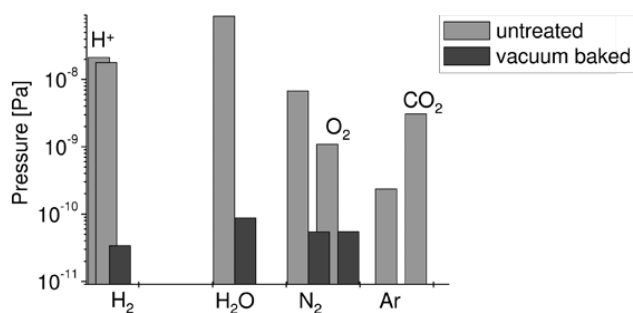
Chemically resistant KF O-rings, treated FKM



The commonly used elastomer seals suffer irreversible damage in corrosive environments and have a short life cycle. Therefore a procedure was developed which considerably raises the durability of FKM O-rings used in aggressive processes. The procedure involves the pores of FKM so that corrosive liquids and gases cannot directly penetrate the O-ring structure.

The significant reduction in contact surface enables a considerable increase in resistance to reactive substances. Fields of application: Fore vacuum, exhaust pipes and all kinds of processes involving aggressive gases and liquids.

Vacuum baked KF O-rings

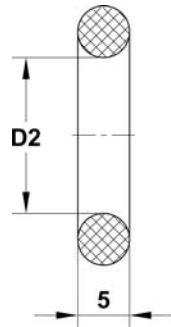


The rate between the residual gas contamination and the pumping speed has to be considered in order to provide an ultrapure vacuum. The desorption of water molecules from the O-ring contaminates the vacuum and causes higher pumping speeds. O-ring particles can disturb delicate vacuum processes.

A considerable particle reduction and low outgassing rates can be achieved by our special treatment of the O-rings. The spectrum inspection shows that our treatment of the O-rings enables a significant reduction in water content and volatile elements.

KF Seals

KF O-rings, elastomer

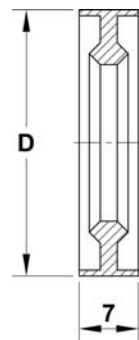


Technical data

- Temperature range NBR -10 °C to 100 °C
- Temperature range FKM -10 °C to 150 °C (intermittent 200 °C)

Order code		DN	D2
NBR	FKM		
KF10NR	KF10VR	10	15
KF16NR	KF16VR	16	18
KF25NR	KF25VR	25	28
KF40NR	KF40VR	40	42
KF50NR	KF50VR	50	55

KF Edge seals, aluminium, PTFE

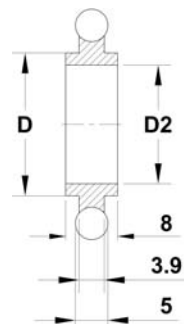


Technical data

- Temperature range aluminium to 150 °C
- Temperature range PTFE to 120 °C
- Connecting elements KF clamp chains

Order code		DN	D
Aluminium	PTFE		
KF10/16MS	KF10/16TS	16	32
KF20/25MS	KF20/25TS	25	42
KF32/40MS	KF32/40TS	40	57
KF50MS	KF50TS	50	77

KF Centering rings, NBR



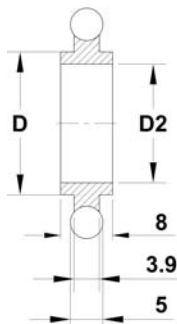
Technical data

- Temperature range -10 °C to 100 °C

Order code		DN	D	D2
Aluminium	Stainless steel			
KF10ANCR	KF10SNCR-304	10	12	10
KF16ANCR	KF16SNCR-304	16	17	16
KF25ANCR	KF25SNCR-304	25	26	25
KF40ANCR	KF40SNCR-304	40	41	40
KF50ANCR	KF50SNCR-304	50	52	50

KF Seals

KF Centering rings, FKM

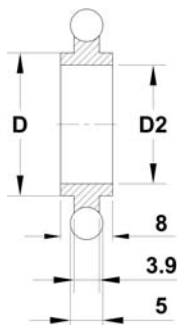


Technical data

- Temperature range -10 °C to 150 °C (intermittent 200 °C)

Order code		DN	D	D2
Aluminium	Stainless steel 304			
KF10AVCR	KF10SVCR-304	10	12	10
KF16AVCR	KF16SVCR-304	16	17	16
KF25AVCR	KF25SVCR-304	25	26	25
KF40AVCR	KF40SVCR-304	40	41	40
KF50AVCR	KF50SVCR-304	50	52	50

KF Centering rings, FKM, stainless steel 316L



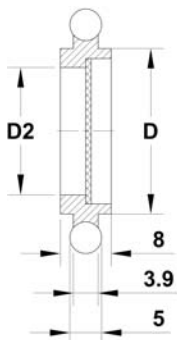
Technical data

- Temperature range -10 °C to 150 °C (intermittent 200 °C)
- Option vacuum baked or with improved chemical resistance (see page 1-21)

Order code			DN	D	D2
FKM*	FKM treated	FKM vacuum baked			
KF10SVCR-316	KF10SVCR-BEH-316	KF10SVCR-VB-316	10	12	10
KF16SVCR-316	KF16SVCR-BEH-316	KF16SVCR-VB-316	16	17	16
KF25SVCR-316	KF25SVCR-BEH-316	KF25SVCR-VB-316	25	26	25
KF40SVCR-316	KF40SVCR-BEH-316	KF40SVCR-VB-316	40	41	40
KF50SVCR-316	KF50SVCR-BEH-316	KF50SVCR-VB-316	50	52	50

* For clean room compatible packaging please add "-CRP" to the order code

KF Mesh centering rings, stainless steel



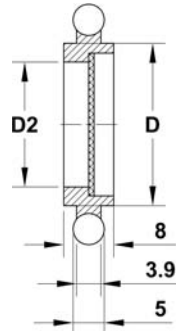
Technical data

- Temperature range NBR -10 °C to 100 °C
- Temperature range FKM -10 °C to 150 °C (intermittent 200 °C)
- Mesh size 1 mm
- Wire size 0.3 mm

Order code		DN	D	D2
NBR	FKM			
KF16MCR1N-304	KF16MCR1V-304	16	17	14
KF25MCR1N-304	KF25MCR1V-304	25	26	23
KF40MCR1N-304	KF40MCR1V-304	40	41	38
KF50MCR1N-304	KF50MCR1V-304	50	52	48

KF Seals

KF Centering rings with sintered metal screen, stainless steel - FKM

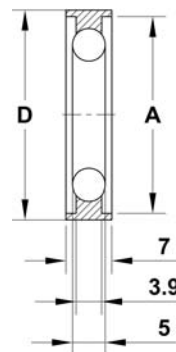


Technical data

Temperature range	10 °C to 40 °C
Filter material	stainless steel
Pores width	20 µm

Order code	DN	D	D2
KF16FMCRV-303	16	17	15
KF25FMCRV-303	25	26	24
KF40FMCRV-303	40	41	39
KF50FMCRV-303	50	52	49

KF Outer centering rings, aluminium

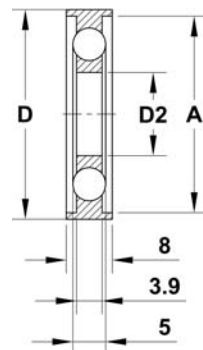


Technical data

Temperature range NBR	-10 °C to 100 °C
Temperature range FKM	-10 °C to 150 °C (intermittent 200 °C)

Order code		DN	D	A
NBR	FKM			
KF16AZRN	KF16AZRV	16	32	30
KF25AZRN	KF25AZRV	25	42	40
KF40AZRN	KF40AZRV	40	57	55
KF50AZRN	KF50AZRV	50	77	75

KF Trapped centering rings with support ring, stainless steel, NBR, aluminium



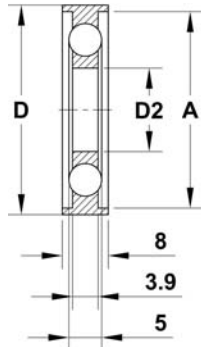
Technical data

Temperature range	-10 °C to 100 °C
Outer ring material	aluminium
Centering ring material	stainless steel

Order code	DN	D	A	D2
KF16TCRN-304	16	32	30	16
KF25TCRN-304	25	42	40	25
KF40TCRN-304	40	57	55	40
KF50TCRN-304	50	77	75	50

KF Seals

KF Trapped centering rings, FKM

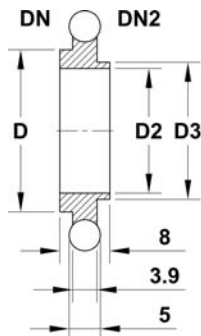


Technical data

- Temperature range -10 °C to 150 °C (intermittent 200 °C)
- Outer ring material aluminium
- Centering ring material stainless steel

Order code			DN	D	A	D2
Alu/Stainless steel 304	Alu/Stainless steel 316L	PTFE/PTFE				
KF16TCRV-304	KF16TCRV-316	KF16TVCR	16	32	30	16
KF25TCRV-304	KF25TCRV-316	KF25TVCR	25	42	40	25
KF40TCRV-304	KF40TCRV-316	KF40TVCR	40	57	55	40
KF50TCRV-304	KF50TCRV-316	KF50TVCR	50	77	75	50

KF Reducing centering rings, aluminium



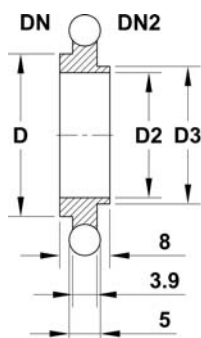
Technical data

- Temperature range NBR -10 °C to 100 °C
- Temperature range FKM -10 °C to 150 °C (intermittent 200 °C)

Order code		DN	DN2	D	D2	D3
NBR	FKM					
KF10/16ANRCR	KF10/16AVRCR	16	10	17	10	12
KF20/25ANRCR	KF20/25AVRCR	25	20	26	20	22
KF32/40ANRCR	KF32/40AVRCR	40	32	41	32	34

KF Seals

KF Adapter centering rings, stainless steel



Technical data

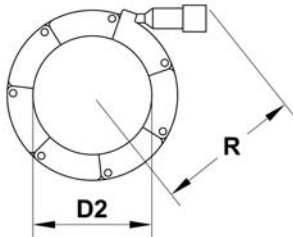
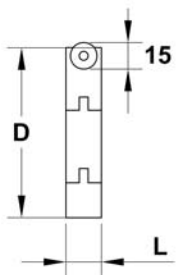
- Temperature range NBR -10 °C to 100 °C
- Temperature range FKM -10 °C to 150 °C (intermittent 200 °C)

Order code		DN	DN2	D	D2	D3
NBR	FKM					
KF10/16SNRCR-304	KF10/16SVRCR-304	16	10	17	10	12
KF20/25SNRCR-304	KF20/25SVRCR-304	25	20	26	20	22
KF32/40SNRCR-304	KF32/40SVRCR-304	40	32	41	32	34

* For clean room compatible packaging please add "-CRP" to the order code

KF Connecting elements

KF Clamp chains, polyamide



Technical data

	Type W	Type WH
Temperatures (short-term)	to 60 °C (70 °C)	to 100 °C (120 °C)
Colour	black	gray
Spec. resistance	10E12 Ohm · cm	10E15 Ohm · cm
Dielectr. strength	26 kV/mm	32 kV/mm
Link material	polyamide 6 (30 % glass fibre)	polyamide (35 % glass fibre)
Lock material	stainless steel and aluminium	stainless steel and aluminium
Bolt material	stainless steel	stainless steel
Suitable seals	elastomer	elastomer

Order code		DN	D	D2	L	R	Max. internal pressure (bar)
to 60 °C	to 100 °C						
W16	WH16	16	51	22	18	48	5
W25	WH25	25	61	32	18	55	4
W40	WH40	40	76	47	18	59	3
W50	WH50	50	96	67	20	68	3

KF Components

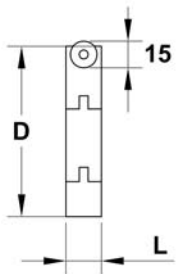
KF Connecting elements

KF Clamp chains, aluminium



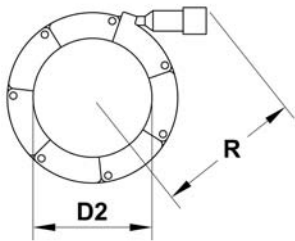
Technical data

■ Temperature	to 150 °C
■ Link material	AlMgSi 1
■ Lock material	stainless steel
■ Bolt material	stainless steel
■ Suitable seals	elastomer, aluminium, copper

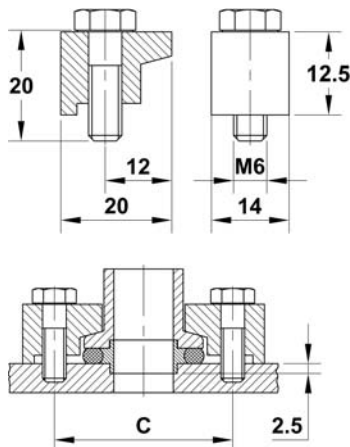


Order code	DN	D	D2	L	R	Max. internal pressure (bar)	Closing moment (Nm)
XA16	16	51	22	18	45	10	2.5
XA25	25	61	32	18	50	8	3.5
XA40	40	76	47	18	61	6	5.0
XA50	50	96	67	20	73	6	6.0

- Please mention the closing moments during over pressure application.



KF Claw clamps, aluminium

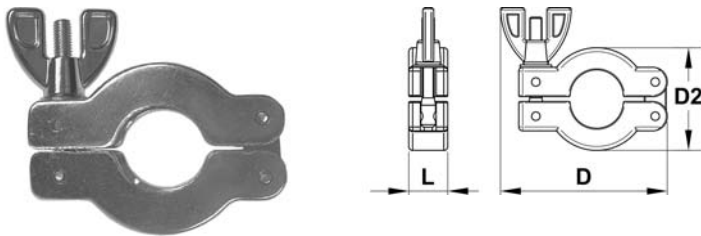


Order code	DN
KFC	16 - 50

DN	C	Number of required clamps
10	45	2
16	45	2
20	55	3
25	55	3
32	71	3
40	71	3
50	91	3

KF Connecting elements

KF Clamp rings, aluminium

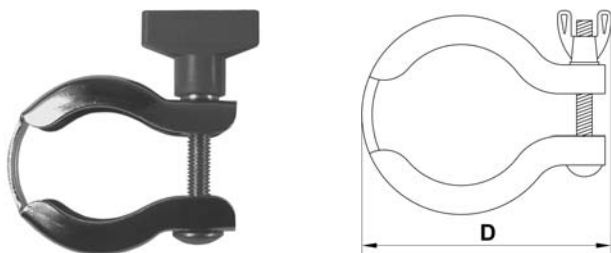


Technical data

■ Temperature range -10 °C to 200 °C

Order code	DN	D	D2	L
KF16C	16	62	42	16
KF25C	25	72	52	16
KF40C	40	90	70	16
KF50C	50	113	90	20

KF Clamp rings, stainless steel

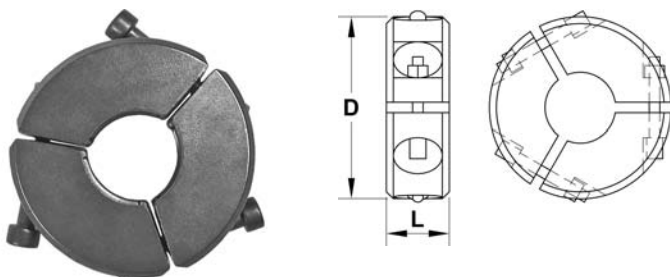


Technical data

■ Temperature range -10 °C to 125 °C

Order code	DN	D
KF16CLR	16	50
KF25CLR	25	63
KF40CLR	40	76
KF50CLR	50	100

KF Clamp rings for metal seals, aluminium

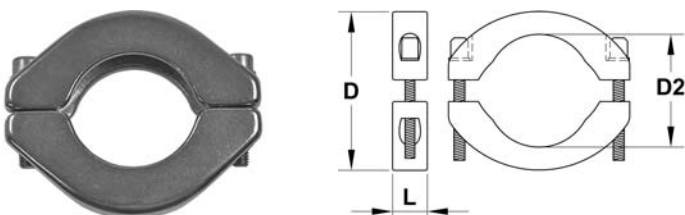


Technical data

■ Temperature range to 200 °C

Order code	DN	D	L
KF10/16MSCA-304	16	52	18
KF20/25MSCA-304	25	75	20
KF32/40MSCA-304	40	90	23
KF50MSCA-304	50	115	28

KF Clamp rings for metal seals, stainless steel



Technical data

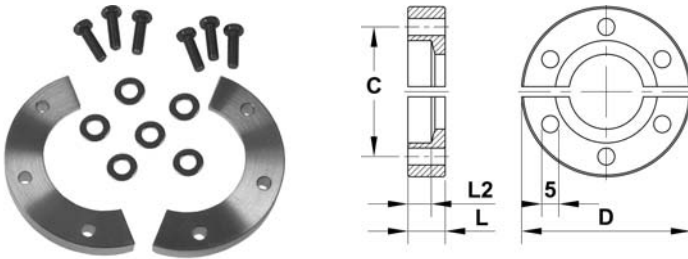
■ Temperature range to 450 °C

Order code	DN	D	D2	L
KF10/16MSC-304	16	54	22	17
KF20/25MSC-304	25	64	32	18
KF32/40MSC-304	40	82	47	18
KF50MSC-304	50	112	62	20

- For clean room compatible packaging please add "-CRP" to the order code

KF Connecting elements

KF Bulkhead clamps, aluminium

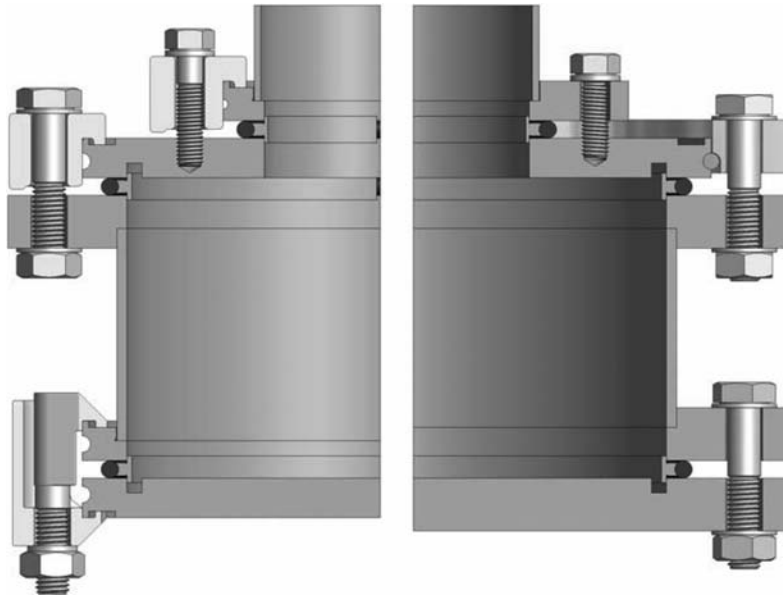


Order code	DN	D	C	L	L2	Incl. screws
BHC16	16	50	38	9	5	yes
BHC25	25	60	48	10	5	yes
BHC40	40	75	62	9	5	yes
BHC50	50	95	83	10	5	yes
BHC16K	16	50	38	11	7	no
BHC25K	25	60	48	11	7	no
BHC40K	40	75	63	11	7	no
BHC50K	50	95	83	12	7	no

- Suitable screws 10-32 UNF x 5/8"

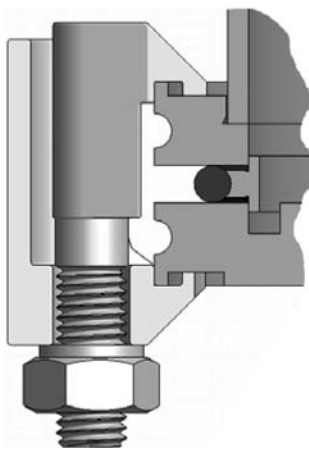
Introduction

The ISO-KF standard for clamp connections (DIN 28404, ISO 1609) is the standard connection for vacuum pipes starting from the nominal diameter DN63 and larger used in fine and high vacuum. The various possibilities of connection between two flanges are shown in the following figures:



Functional principle

Figure 1: Connection with claw clamps

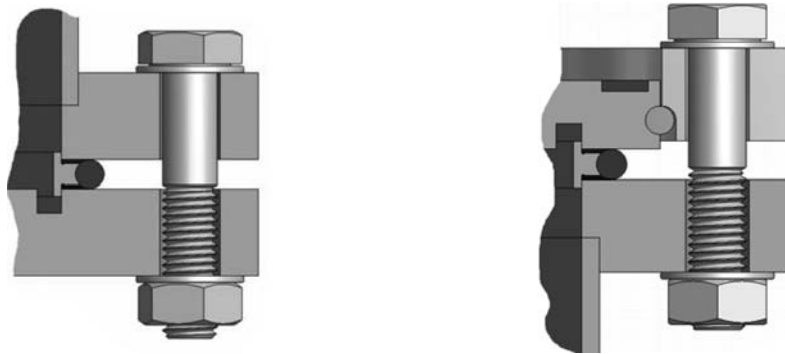


ISO-K: Two single flanges are connected with the help of claw clamps. The flanges have a groove on the back in which the claw clamps are hooked which press the flanges together.

Such as KF connections there is a sealing with centering ring and O-ring between the flanges. Mostly an additional trapped centering ring is used which produces an assembly with constant distance.

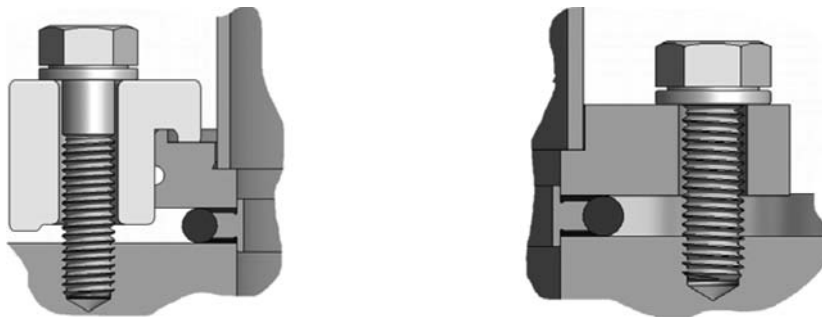
Introduction

Figure 2: Connection with screws



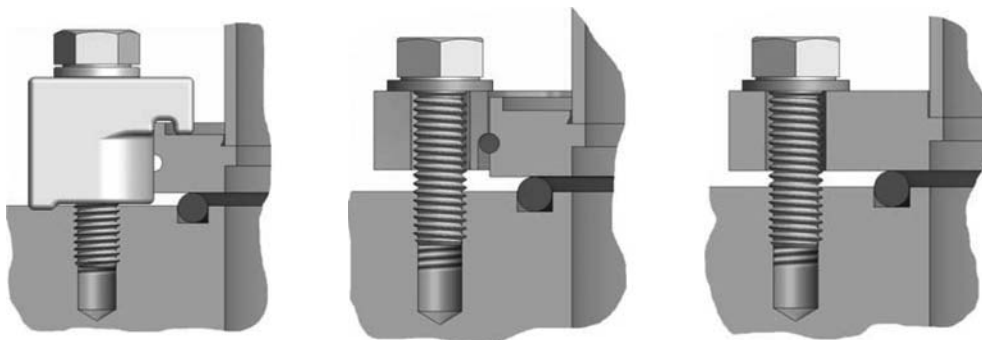
ISO-K flanges with holes are called ISO-F flanges and the sealing is the same as for ISO-K flanges. Both flanges can be easily combined with each other. An ISO-K flange can be transformed into a rotatable ISO-F flange by means of a rotatable bolt ring with retaining ring. Screws hold the flanges together.

Figure 3: Combination ISO-K / ISO-F



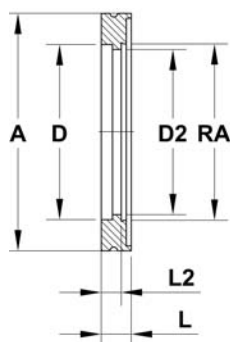
ISO-F flanges are commonly used for wall mounting or with gate valves. An ISO-K flange can be fastened thereon with the help of claw clamps. Claw clamps are available for tapped blind holes as well as for through bolt holes.

Further combination possibilities:

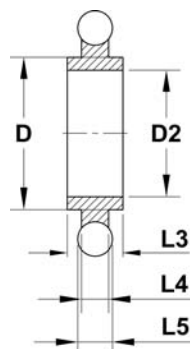


It is possible to dispense with the screws, if the O-ring lies in a groove on the flange. But claw clamps with mated length have to be used in this case.

Introduction



ISO Flange



ISO Centering ring

Dimensions of ISO-K flanges and centering rings

Nominal diameter	63	80	100	160	200	250	320	400	500	630
A	95	110	130	180	240	290	370	450	550	690
D	70	83	102	153	213	261	318	400	501	651
D2	66 / 70	81 / 83	100 / 102	150 / 153	200 / 213	250 / 261	318	400	501	651
RA	70 / 76	85 / 89	104 / 108	154 / 159	204 / 219	254 / 267	324	406	508	660
L	12	12	12	12	12	12	17	17	17	22
L2	8 / 6	8 / 6	8 / 6	8 / 6	8 / 6	8 / 6	10	10	10	15
L3	8	8	8	8	8	8	14	14	14	14
L4	3.9	3.9	3.9	3.9	3.9	3.9	5.6	5.6	5.6	5.6
L5	5.3	5.3	5.3	5.3	5.3	5.3	7	7	7	7
Number of clamps	4	4	4	4	6	6	8	8	12	12
Number of claw clamps	4	8	8	8	12	12	12	16	16	20
Claw clamp size	M8 x 35	M8 x 35	M8 x 35	M10 x 40	M10 x 40	M10 x 40	M12 x 50	M12 x 50	M12 x 50	M12 x 55
Number of screws	4	8	8	8	12	12	12	16	16	20
Screw size	M8 x 40	M8 x 40	M8 x 40	M10 x 50	M10 x 50	M10 x 50	M12 x 60	M12 x 60	M12 x 60	M12 x 70

Materials

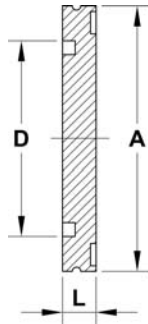
Sealing	Flange	Components
NBR (O-ring)	stainless steel 304	stainless steel 304
FKM (O-ring)	stainless steel 316L	stainless steel 304L
aluminium (edge sealing)		stainless steel 316L
aluminium (centering ring / trapped centering ring)		stainless steel 321
stainless steel 304 (centering ring)		stainless steel 316Ti

Fields of application

Materials Components and sealings	Pressure range (mbar - bar)	Leak rate (mbar l / s)	Recommended connecting element
Stainless steel with elastomer sealing	1.0E-7 - 1.5	1.0E-9	with claw clamp or wall clamp
Stainless steel with metal sealing	1.0E-9 - 1.5	< 1.0E-9	with chain clamp or ISO-F with nuts

ISO Flanges

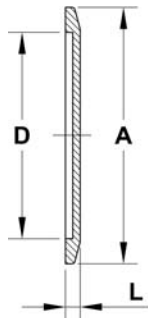
ISO-K Claw clamp blank flanges, stainless steel



Order code		DN	A	D	L
St. steel 304	St. steel 316L*				
ISO63BK-304	ISO63BK-316	63	95	70	12
ISO80BK-304	ISO80BK-316	80	110	83	12
ISO100BK-304	ISO100BK-316	100	130	102	12
ISO160BK-304	ISO160BK-316	160	180	153	12
ISO200BK-304	ISO200BK-316	200	240	213	12
ISO250BK-304	ISO250BK-316	250	290	261	12
ISO320BK-304	ISO320BK-316	320	370	318	17

* For clean room compatible packaging please add "-CRP" to the order code

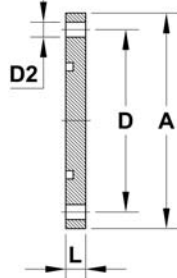
ISO Blank flanges, conical, stainless steel



Order code	DN	A	D	L
KF63BS-304	63	87	70	5
KF80BS-304	80	114	83	12
KF100BS-304	100	134	102	12

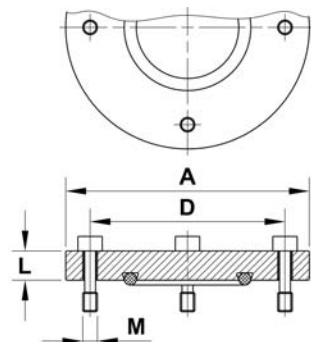
- Mountable with ISO clamp chains

ISO-F Blank flanges, stainless steel



Order code	DN	A	D	D2	L
ISO63FBK-304	63	130	110	9	12
ISO80FBK-304	80	145	125	9	12
ISO100FBK-304	100	165	145	9	12
ISO160FBK-304	160	225	200	11	16
ISO200FBK-304	200	285	260	11	16
ISO250FBK-304	250	335	310	11	16
ISO320FBK-304	320	425	395	14	20

ISO-F Chamber flanges, stainless steel



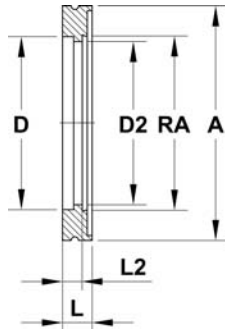
Technical data

■ Flange	stainless steel 1.4404
■ O-ring	FKM
■ Bolts	DIN 7964KE, A2
■ Temperature range	-10 °C to 150 °C
■ Application	wall mounting

Order code	DN	A	D	L	M
ISO40KAM-316	40	100	80	12	M6
ISO63KAM-316	63	130	110	12	M8
ISO100KAM-316	100	165	145	12	M8
ISO160KAM-316	160	225	200	12	M10

ISO Flanges

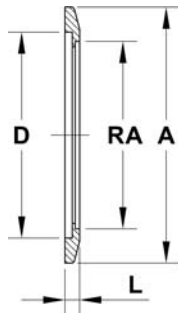
ISO-K Claw clamp bored flanges, stainless steel



Order code		DN	A	D	D2	RA	L	L2
Stainless steel 304	Stainless steel 316L							
ISO63B70-304	ISO63B70-316	63	95	70	66	70	12	8
ISO63B76-304	ISO63B76-316	63	95	70	70	76	12	6
ISO80B85-304	ISO80B85-316	80	110	83	81	85	12	8
ISO80B89-304	ISO80B89-316	80	110	83	83	89	12	6
ISO100B104-304	ISO100B104-316	100	130	102	100	104	12	8
ISO100B108-304	ISO100B108-316	100	130	102	102	108	12	6
ISO160B154-304	ISO160B154-316	160	180	153	151	154	12	8
ISO160B159-304	ISO160B159-316	160	180	153	153	159	12	6
ISO200B204-304	ISO200B204-316	200	240	213	200	204	12	8
ISO200B219-304	ISO200B219-316	200	240	213	213	219	12	6
ISO250B254-304	ISO250B254-316	250	290	261	250	254	12	8
ISO250B267-304	ISO250B267-316	250	290	261	261	267	12	6
ISO320B324-304	ISO320B324-316	320	370	318	318	324	17	10

* For clean room compatible packaging please add "-CRP" to the order code

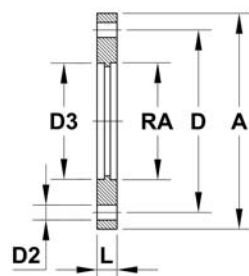
ISO Bored flanges, conical, stainless steel



Order code	DN	A	D	RA	L
KF63B63-304	63	87	70	63	5
KF80B76-304	80	114	83	76	12
KF100B102-304	100	134	102	102	12

- Mountable with ISO clamp chains

ISO-F Bored flanges, stainless steel

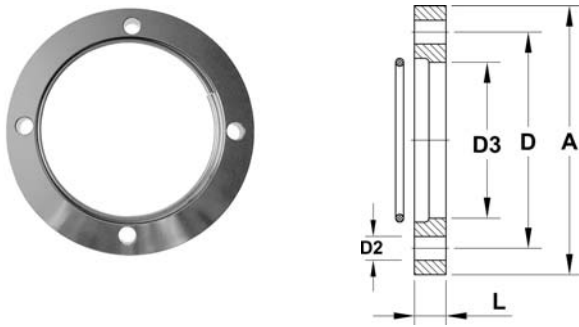


Order code	DN	A	D	D2	D3	L	RA
ISO63F70-304	63	130	110	9	70	12	70
ISO80F85-304	80	145	125	9	83	12	85
ISO100F104-304	100	165	145	9	102	12	104
ISO160F154-304	160	225	200	11	153	16	154
ISO200F204-304	200	285	260	11	213	16	204
ISO250F254-304	250	335	310	11	261	16	254
ISO320F324-304	320	425	395	14	318	20	324

ISO Components

ISO Flanges

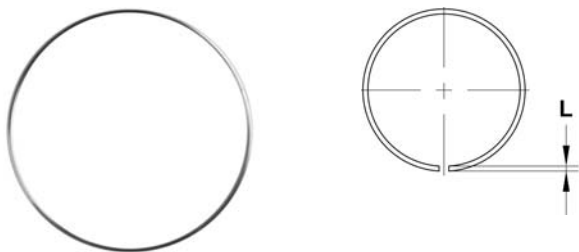
ISO Rotatable bolt rings with retaining ring, steel, nickel plated



Order code	DN	A	D	D2	D3	L	Number of holes
ISO63R-304	63	130	110	9	95	12	4
ISO80R-304	80	145	125	9	110	12	8
ISO100R-304	100	165	145	9	130	12	8
ISO160R-304	160	225	200	11	180	16	8
ISO200R-304	200	285	260	11	240	16	12
ISO250R-304	250	335	310	11	290	16	12
ISO320R-304	320	425	395	14	371	20	12

- For clean room compatible packaging please add "-CRP" to the order code

ISO Replacement retaining rings for rotatable bolt rings



Order code	L	Accessories for
ISO63RR-304	3	ISO63R
ISO80RR-304	3	ISO80R
ISO100RR-304	3	ISO100R
ISO160RR-304	5	ISO160R
ISO200RR-304	5	ISO200R
ISO250RR-304	5	ISO250R
ISO320RR-304	5	ISO320R

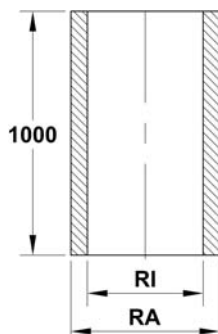
ISO Flange caps, plastics



Order code	DN	Pack size
ISO63CAP	63	10
ISO100CAP	100	10
ISO160CAP	160	10
ISO200CAP	200	1
ISO250CAP	250	1

ISO Fittings

ISO Tube, 1 m length, stainless steel

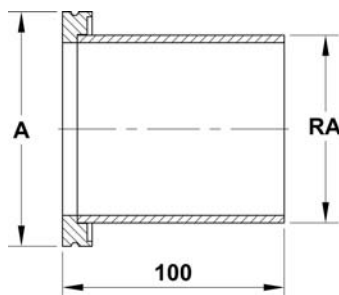


Technical data

- Lengthwise welded
- Outside and inside etched
- DIN 11850
- Ra < 0.8 µm
- Ra (welding seam area) < 1.6 µm

Order code		DN	RI	RA
St. steel 304	St. steel 316L			
R304-70x2.0-1	R316-70x2.0-1	63	66	70
R304-85x2.0-1	R316-85x2.0-1	80	81	85
R304-104x2.0-1	R316-104x2.0-1	100	100	104
R304-154x2.0-1	R316-154x2.0-1	160	150	154
R304-204x2.0-1	R316-204x2.0-1	200	200	204

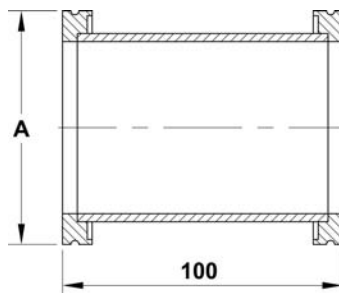
ISO-K Claw clamp tubulations (half nipples), stainless steel



Order code	DN	A	RA
ISO63TU-100-76-316	63	95	76
ISO63TU-100-70-316	63	95	70
ISO80TU-100-89-316	80	110	89
ISO80TU-100-85-316	80	110	85
ISO100TU-100-108-316	100	130	108
ISO100TU-100-104-316	100	130	104
ISO160TU-100-159-316	160	180	159
ISO160TU-100-154-316	160	180	154
ISO200TU-100-219-316	200	240	219
ISO200TU-100-204-316	200	240	204
ISO250TU-100-254-316	250	290	254
ISO320TU-100-324-316	320	370	324

- For clean room compatible packaging please add "-CRP" to the order code

ISO-K Straight connectors (full nipples), stainless steel

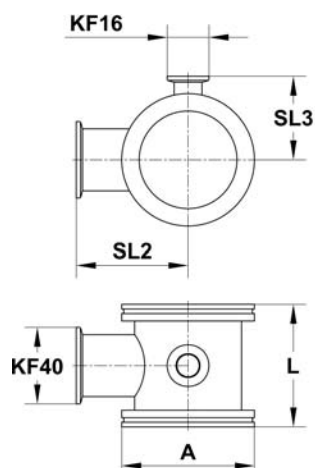


Order code	DN	A
ISO63SC-316	63	95
ISO80SC-316	80	110
ISO100SC-316	100	130
ISO160SC-316	160	180
ISO200SC-316	200	240
ISO250SC-316	250	290

- For clean room compatible packaging please add "-CRP" to the order code

ISO Fittings

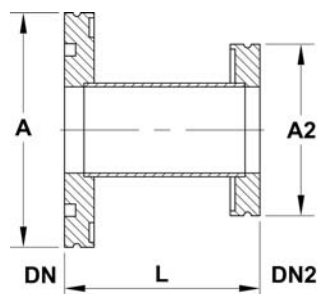
ISO-K Straight connectors with lateral KF ports, stainless steel



Order code	DN	A	SL2	SL3	L
ISO63SC4016K-316	63	95	80	60	88
ISO100SC4016K-316	100	130	75	75	108
ISO160SC4016K-316	160	180	100	100	138

- For clean room compatible packaging please add "-CRP" to the order code

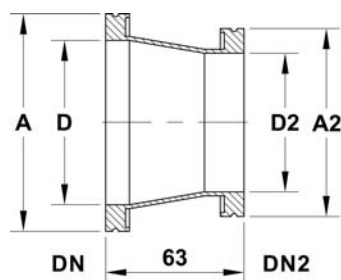
ISO-K Tubulated reducing adapters, stainless steel



Order code		DN	DN2	A	A2	L
Stainless steel 304	Stainless steel 316L*					
ISO100R63-304	ISO100R63-316	100	63	130	95	50
ISO160R63-304	ISO160R63-316	160	63	180	95	50
ISO160R100-304	ISO160R100-316	160	100	180	130	50
ISO200R100-304	ISO200R100-316	200	100	240	130	90
ISO250R100-304	ISO250R100-316	250	100	290	130	90

* For clean room compatible packaging please add "-CRP" to the order code

ISO-K Tubulated reducing adapters, conical, stainless steel

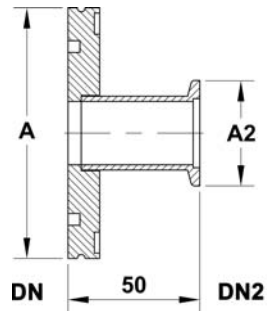


Order code	DN	DN2	A	A2	D	D2
ISO80R63/CO-304	80	63	110	95	83	70
ISO100R63/CO-304	100	63	130	95	102	70
ISO100R80/CO-304	100	80	130	110	102	83
ISO160R63/CO-304	160	63	180	95	153	70
ISO160R100/CO-304	160	100	180	130	153	102

- For clean room compatible packaging please add "-CRP" to the order code

ISO Fittings

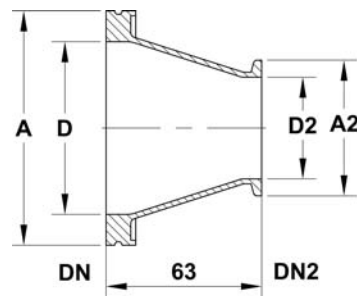
ISO-K to KF Adapters, stainless steel



Order code		DN	DN2	A	A2
St. steel 304	St. steel 316L*				
SK063025-304	SK063025-316	63	25	95	40
SK063040-304	SK063040-316	63	40	95	55
SK063050-304	SK063050-316	63	50	95	75
SK100040-304	SK100040-316	100	40	130	55

* For clean room compatible packaging please add "-CRP" to the order code

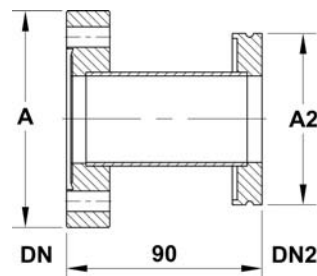
ISO-K to KF Adapters, conical, stainless steel



Order code	DN	DN2	A	A2	D	D2
SK063040/CO-304	63	40	95	55	70	41
SK063050/CO-304	63	50	95	75	70	52
SK080040/CO-304	80	40	95	55	83	41
SK080050/CO-304	80	50	95	75	83	52
SK100040/CO-304	100	40	130	55	102	41
SK100050/CO-304	100	50	130	75	102	52

• For clean room compatible packaging please add "-CRP" to the order code

ISO-K to CF Adapters, stainless steel



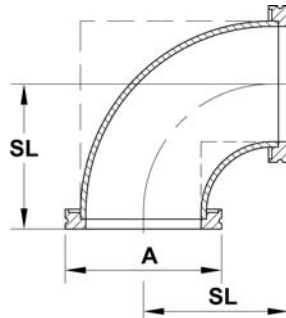
Order code	DN	DN2	A	A2
SA063063-304	63	63	114	95
SA100063-304	100	63	152	95
SA100100-304	100	100	152	130
SA160100-304	150	100	203	130
SA160160-304	150	160	203	180

• For clean room compatible packaging please add "-CRP" to the order code

ISO Components

ISO Fittings

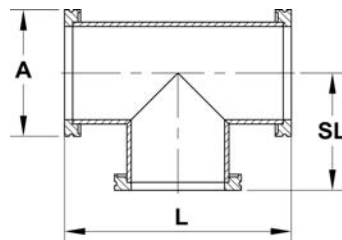
ISO-K Elbows 90°, stainless steel



Order code		DN	A	SL	Form
Stainless steel 304	Stainless steel 316L*				
ISO63E-304	ISO63E-316	63	95	88	swept
ISO80E-304	ISO80E-316	80	110	98	swept
ISO100E-304	ISO100E-316	100	130	108	swept
ISO160E-304	ISO160E-316	160	180	138	mitred
ISO200E-304	ISO200E-316	200	240	178	mitred

* For clean room compatible packaging please add "-CRP" to the order code

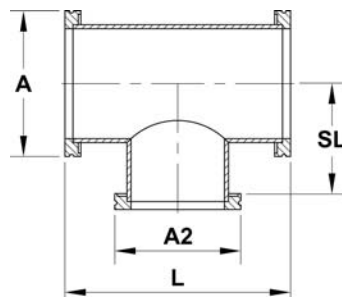
ISO-K Tees, stainless steel



Order code		DN	A	L	SL
St. steel 304	St. steel 316L*				
ISO63TE-304	ISO63TE-316	63	95	176	88
ISO80TE-304	ISO80TE-316	80	110	196	98
ISO100TE-304	ISO100TE-316	100	130	216	108
ISO160TE-304	ISO160TE-316	160	180	276	138
ISO200TE-304	ISO200TE-316	200	240	356	178

* For clean room compatible packaging please add "-CRP" to the order code

ISO-K Unequal tees, stainless steel



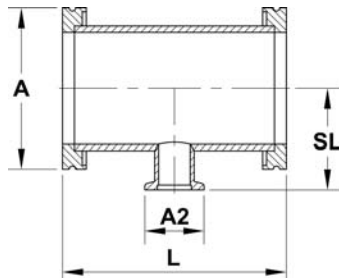
Order code		DN	DN2	A	A2	L	SL
Stainless steel 304	Stainless steel 316L*						
ISO100TE63-304	ISO100TE63-316	100	63	130	95	216	107
ISO160TE63-304	ISO160TE63-316	160	63	180	95	276	130
ISO160TE100-304	ISO160TE100-316	160	100	180	130	276	131

* For clean room compatible packaging please add "-CRP" to the order code

ISO Components

ISO Fittings

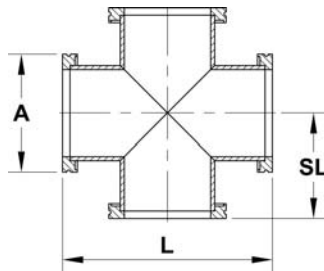
ISO-K to KF Reducing tees, stainless steel



Order code		DN	DN2	A	A2	L	SL
Stainless steel 304	Stainless steel 316L*						
ISO63TE25-304	ISO63TE25-316	63	25	95	40	204	79
ISO63TE40-304	ISO63TE40-316	63	40	95	55	204	76
ISO100TE40-304	ISO100TE40-316	100	40	130	75	260	111

* For clean room compatible packaging please add "-CRP" to the order code

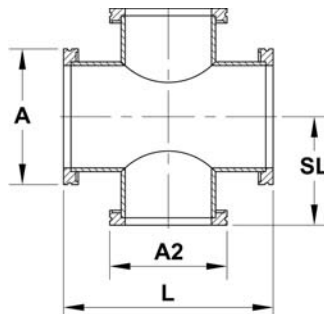
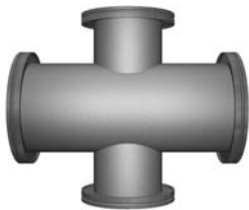
ISO-K 4-way crosses, stainless steel



Order code		DN	A	L	SL
St. steel 304	St. steel 316L*				
ISO63X-304	ISO63X-316	63	95	176	88
ISO80X-304	ISO80X-316	80	110	196	98
ISO100X-304	ISO100X-316	100	130	216	108
ISO160X-304	ISO160X-316	160	180	276	138
ISO200X-304	ISO200X-316	200	240	356	178

* For clean room compatible packaging please add "-CRP" to the order code

ISO-K Unequal 4-way crosses, stainless steel



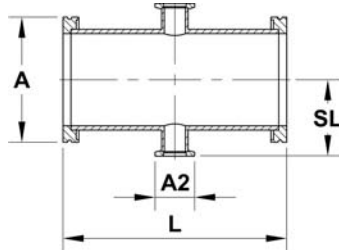
Order code		DN	DN2	A	A2	L	SL
Stainless steel 304	Stainless steel 316L*						
ISO100X63-304	ISO100X63-316	100	63	130	95	114	108
ISO160X63-304	ISO160X63-316	160	63	180	95	260	138
ISO160X100-304	ISO160X100-316	160	100	180	130	262	138

* For clean room compatible packaging please add "-CRP" to the order code

ISO Components

ISO Fittings

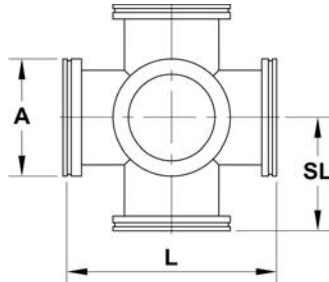
ISO-K to KF Reducing crosses, stainless steel



Order code		DN	DN2	A	A2	L	SL
Stainless steel 304	Stainless steel 316L*						
ISO63X25-304	ISO63X25-316	63	25	95	40	204	58
ISO63X40-304	ISO63X40-316	63	40	95	55	204	76
ISO100X40-304	ISO100X40-316	100	40	130	55	260	95

* For clean room compatible packaging please add "-CRP" to the order code

ISO-K 6-way crosses, stainless steel

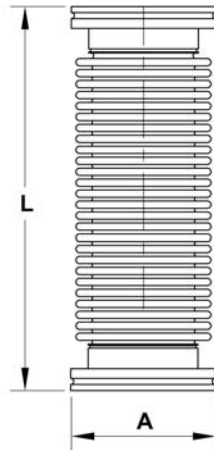


Order code	DN	A	L	SL
ISO63XX	63	95	176	88
ISO80XX	80	110	196	98
ISO100XX	100	130	216	108
ISO160XX	160	180	276	138
ISO200XX	200	240	356	178

- For clean room compatible packaging please add "-CRP" to the order code

ISO Flexible Hoses

ISO-K Flexible hoses, stainless steel



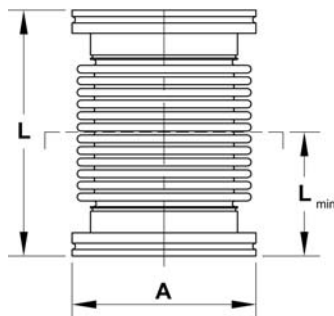
Technical data

■ Flange material	1.4301
■ Bellows material	1.4404

Order code	DN	A	L
ISO63FX25-304	63	95	250
ISO63FX50-304	63	95	500
ISO63FX75-304	63	95	750
ISO63FX100-304	63	95	1000
ISO80FX25-304	80	110	250
ISO80FX50-304	80	110	500
ISO80FX75-304	80	110	750
ISO80FX100-304	80	110	1000
ISO100FX25-304	100	130	250
ISO100FX50-304	100	130	500
ISO100FX75-304	100	130	750
ISO100FX100-304	100	130	1000
ISO160FX25-304	160	180	250
ISO160FX50-304	160	180	500
ISO160FX75-304	160	180	750
ISO160FX100-304	160	180	1000

- For clean room compatible packaging please add "-CRP" to the order code

ISO-K Hydroformed bellows connectors, stainless steel



Technical data

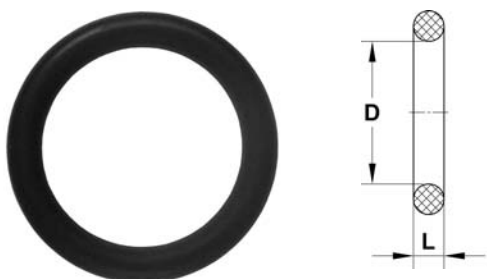
■ Flange material	1.4301
■ Bellows material	1.4404
■ Tolerances	L ±3 mm

Order code	DN	A	Lmin	L
ISO63FXB-304	63	95	112	130
ISO80FXB-304	80	110	112	130
ISO100FXB-304	100	130	112	130
ISO160FXB-304	160	180	192	220
ISO200FXB-304	200	240	180	200
ISO250FXB-304	250	290	180	200

- For clean room compatible packaging please add "-CRP" to the order code

ISO Seals

ISO O-rings, elastomer



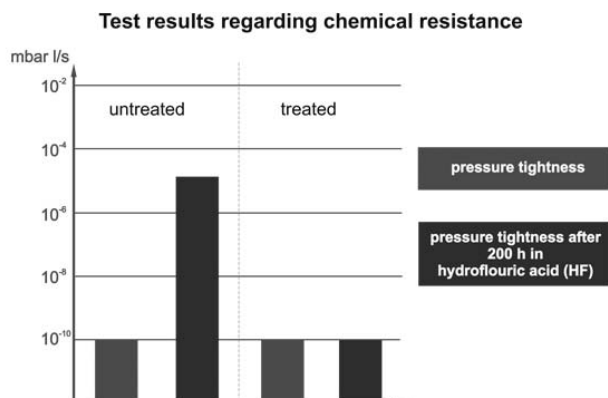
Technical data

- Temperature range: -10 °C to 150 °C (intermittent to 200 °C)

Order code		DN	D	L
FKM treated	FKM vacuum baked*			
ISO63VR-BEH	ISO63VR-VB	63	76	5.3
ISO80VR-BEH	ISO80VR-VB	80	88	5.3
ISO100VR-BEH	ISO100VR-VB	100	107	5.3
ISO160VR-BEH	ISO160VR-VB	160	158	5.3
ISO200VR-BEH	ISO200VR-VB	200	209	5.3
ISO250VR-BEH	ISO250VR-VB	250	253	5.3
ISO320VR-BEH	ISO320VR-VB	320	330	7

* For clean room compatible packaging please add "-CRP" to the order code

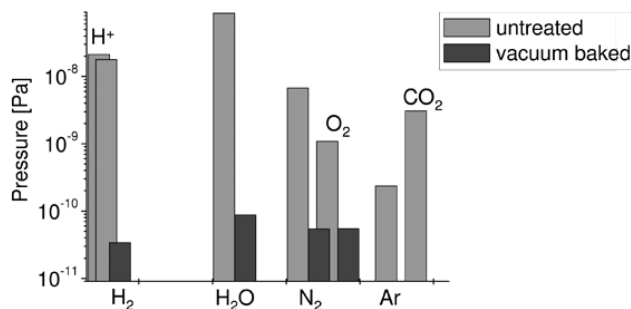
Chemically resistant ISO O-rings, treated FKM



The commonly used elastomer seals suffer irreversible damage in corrosive environments and have a short life cycle. Therefore a procedure was developed which considerably raises the durability of FKM O-rings used in aggressive processes. The procedure involves the pores of FKM so that corrosive liquids and gases cannot directly penetrate the O-ring structure.

The significant reduction in contact surface enables a considerable increase in resistance to reactive substances. Fields of application: Fore vacuum, exhaust pipes and all kinds of processes involving aggressive gases and liquids.

Vacuum baked ISO O-rings

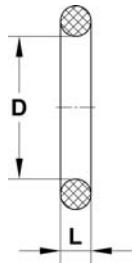


The rate between the residual gas contamination and the pumping speed has to be considered in order to provide an ultrapure vacuum. The desorption of water molecules from the O-ring contaminates the vacuum and causes higher pumping speeds. O-ring particles can disturb delicate vacuum processes.

A considerable particle reduction and low outgassing rates can be achieved by our special treatment of the O-rings. The spectrum inspection shows that our treatment of the O-rings enables a significant reduction in water content and volatile elements.

ISO Seals

ISO O-rings, elastomer



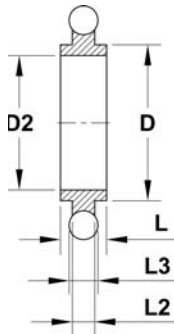
Technical data

- Temperature range NBR -10 °C to 100 °C
- Temperature range FKM -10 °C to 150 °C (intermittent 200 °C)

Order code		DN	D	L
NBR	FKM			
ISO63NR	ISO63VR	63	76	5.3
ISO80NR	ISO80VR	80	88	5.3
ISO100NR	ISO100VR	100	107	5.3
ISO160NR	ISO160VR	160	158	5.3
ISO200NR	ISO200VR	200	209	5.3
ISO250NR	ISO250VR	250	253	5.3
ISO320NR	ISO320VR	320	330	7

* For clean room compatible packaging please add "-CRP" to the order code

ISO Centering rings, NBR



Technical data

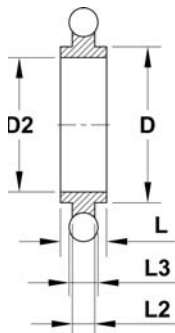
- Temperature range -10 °C to 100 °C

Order code		DN	D	D2	L	L2	L3
Aluminium	Stainless steel						
ISO63ANCR	ISO63SNCR-304	63	70	68	8	3.9	5.3
ISO80ANCR	ISO80SNCR-304	80	83	81	8	3.9	5.3
ISO100ANCR	ISO100SNCR-304	100	102	100	8	3.9	5.3
ISO160ANCR	ISO160SNCR-304	160	153	150	8	3.9	5.3
ISO200ANCR	ISO200SNCR-304	200	213	210	8	3.9	5.3
ISO250ANCR	ISO250SNCR-304	250	261	258	8	3.9	5.3
ISO320ANCR	ISO320SNCR-304	320	318	315	14	5.6	7

- Larger nominal widths on request

ISO Seals

ISO Centering rings, FKM



Technical data

■ Temperature range

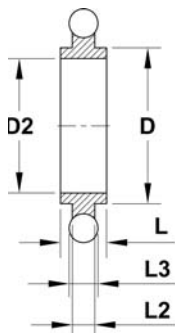
-10 °C to 150 °C
(intermittent 200 °C)
vacuum baked or
with improved
chemical resistance
(see page 1-44)

■ Option

Order code		DN	D	D2	L	L2	L3
Aluminium	Stainless steel 304						
ISO63AVCR	ISO63SVCR-304	63	70	68	8	3.9	5.3
ISO80AVCR	ISO80SVCR-304	80	83	81	8	3.9	5.3
ISO100AVCR	ISO100SVCR-304	100	102	100	8	3.9	5.3
ISO160AVCR	ISO160SVCR-304	160	153	150	8	3.9	5.3
ISO200AVCR	ISO200SVCR-304	200	213	210	8	3.9	5.3
ISO250AVCR	ISO250SVCR-304	250	261	258	8	3.9	5.3
ISO320AVCR	ISO320SVCR-304	320	318	315	14	5.6	7

- Larger nominal widths on request

ISO Centering rings, FKM, stainless steel 316L



Technical data

■ Temperature range

-10 °C to 150 °C
(intermittent 200 °C)
vacuum baked or
with improved
chemical resistance
(see page 1-44)

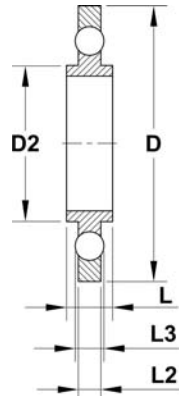
■ Option

Order code			DN	D	D2	L	L2	L3
FKM*	FKM treated	FKM vacuum baked*						
ISO63SVCR-316	ISO63SVCR-BEH-316	ISO63SVCR-VB-316	63	70	68	8	3.9	5.3
ISO80SVCR-316	ISO80SVCR-BEH-316	ISO80SVCR-VB-316	80	83	81	8	3.9	5.3
ISO100SVCR-316	ISO100SVCR-BEH-316	ISO100SVCR-VB-316	100	102	100	8	3.9	5.3
ISO160SVCR-316	ISO160SVCR-BEH-316	ISO160SVCR-VB-316	160	153	150	8	3.9	5.3
ISO200SVCR-316	ISO200SVCR-BEH-316	ISO200SVCR-VB-316	200	213	210	8	3.9	5.3
ISO250SVCR-316	ISO250SVCR-BEH-316	ISO250SVCR-VB-316	250	261	258	8	3.9	5.3
ISO320SVCR-316	ISO320SVCR-BEH-316	ISO320SVCR-VB-316	320	318	315	14	5.6	7

* For clean room compatible packaging please add "-CRP" to the order code

ISO Seals

ISO centering rings with outer ring, NBR



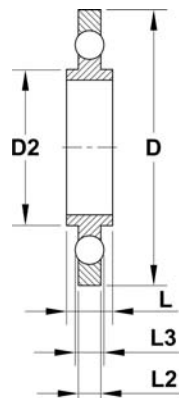
Technical data

- Temperature range -10 °C to 100 °C

Order code		DN	D	D2	L	L2	L3
Alu/Alu	Alu/Stainless steel 304						
ISO63ANCRT	ISO63SNCRT-304	63	94	70	8	3.9	5.3
ISO80ANCRT	ISO80SNCRT-304	80	109	83	8	3.9	5.3
ISO100ANCRT	ISO100SNCRT-304	100	128	102	8	3.9	5.3
ISO160ANCRT	ISO160SNCRT-304	160	179	153	8	3.9	5.3
ISO200ANCRT	ISO200SNCRT-304	200	239	213	8	3.9	5.3
ISO250ANCRT	ISO250SNCRT-304	250	287	261	8	3.9	5.3
ISO320ANCRT	ISO320SNCRT-304	320	358	318	14	5.6	7

- Larger nominal widths on request

ISO centering rings with outer ring, FKM



Technical data

- Temperature range -10 °C to 150 °C (intermittent 200 °C)
- Option vacuum baked or with improved chemical resistance (see page 1-44)

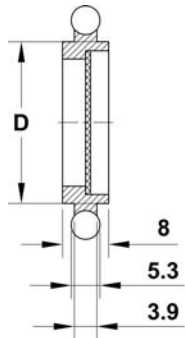
Order code			DN	D	D2	L	L2	L3
Alu/Alu	Alu/Stainless steel 304	Alu/Stainless steel 316L*						
ISO63AVCRT	ISO63SVCRT-304	ISO63SVCRT-316	63	94	70	8	3.9	5.3
ISO80AVCRT	ISO80SVCRT-304	ISO80SVCRT-316	80	109	83	8	3.9	5.3
ISO100AVCRT	ISO100SVCRT-304	ISO100SVCRT-316	100	128	102	8	3.9	5.3
ISO160AVCRT	ISO160SVCRT-304	ISO160SVCRT-316	160	179	153	8	3.9	5.3
ISO200AVCRT	ISO200SVCRT-304	ISO200SVCRT-316	200	239	213	8	3.9	5.3
ISO250AVCRT	ISO250SVCRT-304	ISO250SVCRT-316	250	287	261	8	3.9	5.3
ISO320AVCRT	ISO320SVCRT-304	ISO320SVCRT-316	320	358	318	14	5.6	7

* For clean room compatible packaging please add "-CRP" to the order code

- Larger nominal widths on request

ISO Seals

ISO Mesh centering rings, stainless steel, FKM



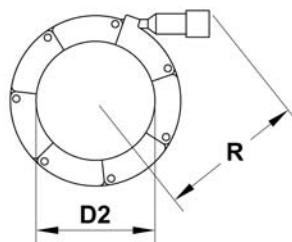
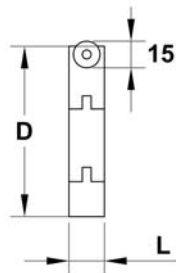
Technical data

■ Temperature range	-10 °C to 150 °C (intermittent 200 °C)
■ Mesh size MCRV	4 mm
■ Mesh size MCR1V	1 mm
■ Wire size MCRV	0.9 mm
■ Wire size MCR1V	0.3 mm

Order code		DN	D
4 mm, 0.9 mm	1 mm, 0.3 mm		
ISO63MCRV	ISO63MCR1V	63	70
ISO100MCRV	ISO100MCR1V	100	102
ISO160MCRV	ISO160MCR1V	160	153

ISO Connecting Elements

ISO Clamp chains, aluminium



Technical data

■ Temperature FKM gasket	150 °C
■ Temperature aluminium gasket	150 °C
■ Lock material	stainless steel
■ Bolt material	stainless steel
■ Flange type	conical ISO flanges

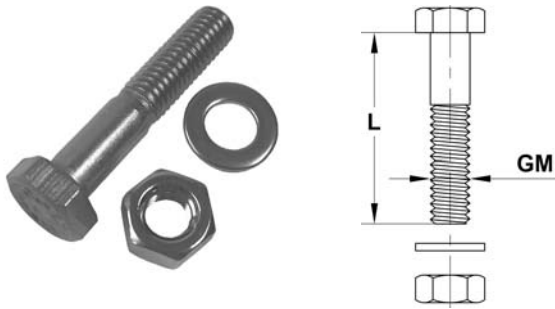
Order code	DN	D	D2	R	L
XA63	63	112	77	78	20
XA80	80	144	103	107	34
XA100	100	164	123	113	34

- Closing moment depends on sealing material, see data sheet.

ISO Components

ISO Connecting Elements

ISO Nut bolt and washer sets for two bolted flanges

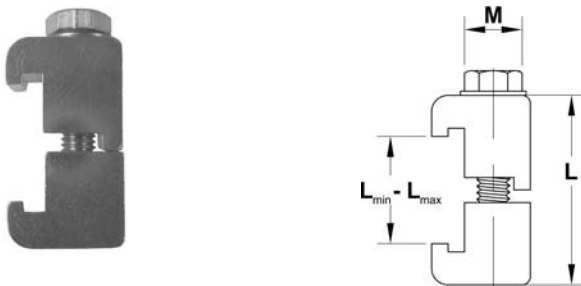


Technical data

■ Bolt	ISO 4014, 4017, A2
■ Nut	ISO 4032, A2
■ Washer	ISO 7089, A2

Order code	DN	GM	L	Pack size
ISO63NBW	63	M8	40	4
ISO80NBW	80	M8	40	8
ISO100NBW	100	M8	40	8
ISO160NBW	160	M10	50	8
ISO200NBW	200	M10	50	12
ISO250NBW	250	M10	50	12
ISO320NBW	320	M12	60	12

ISO Double claw clamps, aluminium

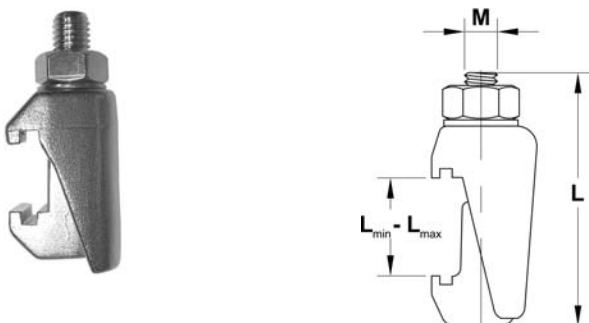


Technical data

■ Application	with centering ring
---------------	---------------------

Order code	DN	M	L	Lmax	Lmin
ISO63/100DCA	63 - 100	M8	50	28	22
ISO160/250DCA	160 - 250	M10	51	34	23
ISO320/500DCA	320 - 500	M12	67	50	36

ISO Double claw clamps



Technical data

■ Application	with centering ring
---------------	---------------------

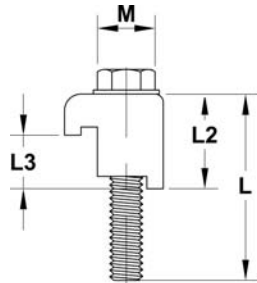
Order code		DN	M	L	Lmax	Lmin
Mild steel, zinc plated	Stainless steel					
ISO63/250DCMS	ISO63/250DCSS	63 - 250	M10	60	27	16
ISO320/500DCMS	ISO320/500DCSS	320 - 500	M12	76	37	27
ISO630DCMS	-	630	M12	86	46	36

* For clean room compatible packaging please add "-CRP" to the order code

ISO Components

ISO Connecting Elements

ISO Claw clamps



Technical data

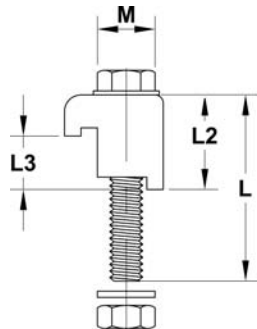
■ Application

for blind tapped holes
with centering rings

Order code			DN	M	L	L2	L3
Aluminium	Mild steel, zinc plated	Stainless steel*					
ISO63/100WCA	ISO63/100WCMS	ISO63/100WCSS	63 - 100	M8	34	23	14
ISO160/250WCA	ISO160/250WCMS	ISO160/250WCSS	160 - 250	M10	35	23	14
ISO320/500WCA	ISO320/500WCMS	ISO320/500WCSS	320 - 500	M12	48	30	21

* For clean room compatible packaging please add "-CRP" to the order code

ISO Claw clamps, steel nuts and washers



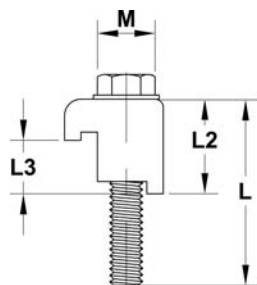
Technical data

■ Application

for through bolt holes
with centering rings

Order code			DN	M	L	L2	L3
Aluminium	Mild steel, zinc plated						
ISO63/100WCNA	ISO63/100WCN		63 - 100	M8	44	23	14
ISO160/250WCNA	ISO160/250WCN		160 - 250	M10	50	23	14
ISO320/500WCNA	ISO320/500WCN		320 - 500	M12	59	36	21

ISO Claw clamps, mild steel, zinc plated



Technical data

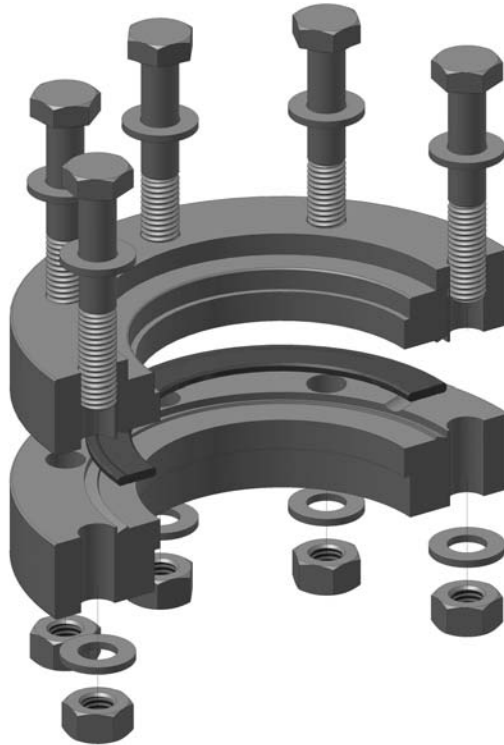
■ Application

with O-ring
without centering ring

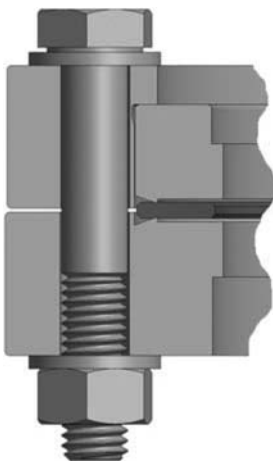
Order code	DN	M	L	L2	L3
ISO63/100WCO	63 - 100	M8	35	18	10
ISO160/250WCO	150 - 250	M10	41	19	10
ISO320/500WCO	320 - 500	M12	58	30	15

Introduction

The generation of ultra high vacuum (UHV) makes great demands on the material and connections. Therefore the CF standard was created in the UHV technology (ISO 3669; enhancement ISO/TS 3669-2). The following figure shows the principle construction:



Functional principle



CF flanges are manufactured from circular blanks of stainless steel on CNC machines. Rotatable flanges are bipartite and consist of an inner part with the seal face and an outer part with the bolt holes. CF flanges have an annular groove on the vacuum side for the reception of the gasket and a knife-edge.

Sealing is achieved by means of a flat gasket of oxygen-free (OFHC) copper because of the low leak rate and high bakeout temperature necessary for UHV technology. This gasket can be used generally only once due to the plastic deformation by the knife-edge.

Fastening is achieved by bolts which must be tightened uniformly crosswise in order to avoid any kind of distortion. Such flange connections have a leak rate of $< 1.0E-11$ mbar l/s and are bakeable up to 450 °C.

CF Components

Introduction

Dimensions

We provide CF flanges and components of the dimensions DN10 to DN250 according to the pre-norm ISO/TS 3669-2. These flanges are fully interchangeable with ConFlat® and CF flanges of other manufacturers.

Please consider that individual standards of institutions are also available in the market. Please add the auxiliary dimensions (DN25, DN50, DN75, DN125) in case of requests and offers of CF flanges and components. In addition please add the size and the number of required bolts and the necessary copper gasket for dimensions from DN250.

Dimensions of CF Flanges

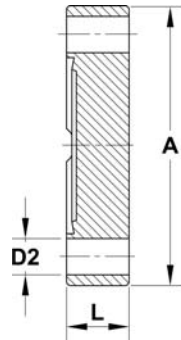
Nominal diameter	AD (mm (inch))	Thickness (mm)	AD CU gasket (mm)	Bolt circle (mm)	Number of holes
DN10	25.4 (1")	6	13.4	18	6 x M3
DN16	34 (1.33")	8	21	27	6 x M4
DN25	54 (2.12")	12	33	41	4 x M4
DN40	70 (2.75")	13	48	59	6 x M6
DN50	86 (3.38")	16	61	72	6 x M6
DN63	114 (4.5")	17	82	92	8 x M8
DN75	117 (4.62")	18	92	102	10 x M8
DN100	154 (6")	20	120	130	16 x M8
DN125	171 (6.75")	21	142	152	18 x M8
DN160	203 (8")	22	171	181	20 x M8
DN200	254 (10")	25	222	232	24 x M8
DN250	305 (12")	25	272.7	284	32 x M8
DN250 "imperial"	305 (12")	27	270	283	32 x M10

Materials

Seals	Flanges	Components
FKM	stainless steel 304	stainless steel 304
OFHC copper	stainless steel 304L	stainless steel 304L
OFHC copper silver coated	stainless steel 316L	stainless steel 316L
OFHC copper soft annealed	stainless steel 316LN ESR	stainless steel 316Ti

CF Flanges

CF Blank flanges, fixed, stainless steel



Technical data

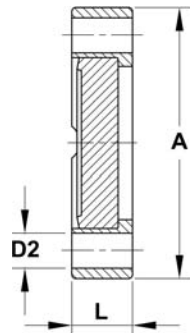
■ Option

with tapped holes

Order code			DN	A	D2	L
Stainless steel 304	Stainless steel 316L	Stainless steel 316LN ESR				
-	F10-316	-	10	25	3.2	6
F16-304	F16-316	F16-316LNS	16	34	4.3	7
F40-304	F40-316	F40-316LNS	40	70	6.7	13
F63-304	F63-316	F63-316LNS	63	114	8.3	17
F100-304	F100-316	F100-316LNS	100	152	8.3	20
F160-304	F160-316	F160-316LNS	160	203	8.3	22
F200-304	F200-316	F200-316LNS	200	254	8.3	24
F250-304	F250-316	F250-316LNS	250	304	8.3	25

- For clean room compatible packaging please add "-CRP" to the order code

CF Blank flanges, rotatable, stainless steel



Technical data

■ Options

with tapped holes

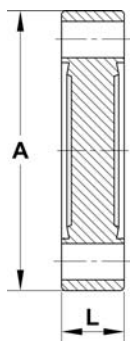
Order code			DN	A	D2	L
Stainless steel 304	Stainless steel 316L	Stainless steel 316LN ESR				
-	F16R-316	F16R-316LNS	16	34	4.3	7
F40R-304	F40R-316	F40R-316LNS	40	70	6.7	13
F63R-304	F63R-316	F63R-316LNS	63	114	8.3	17
F100R-304	F100R-316	F100R-316LNS	100	152	8.3	20
F160R-304	F160R-316	F160R-316LNS	160	203	8.3	22
F200R-304	F200R-316	F200R-316LNS	200	254	8.3	24
F250R-304	F250R-316	F250R-316LNS	250	304	8.3	25

- For clean room compatible packaging please add "-CRP" to the order code

CF Components

CF Flanges

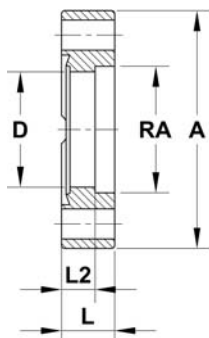
CF Double sided blank flanges, stainless steel



Order code		DN	A	L
St. steel 304	St. steel 316LN ESR			
F16DB-304	F16DB-316LNS	16	34	7
F40DB-304	F40DB-316LNS	40	70	13
F63DB-304	F63DB-316LNS	63	114	17
F100DB-304	F100DB-316LNS	100	152	20
F160DB-304	F160DB-316LNS	160	203	22

- For clean room compatible packaging please add "-CRP" to the order code

CF Bored flanges, fixed, stainless steel



Technical data

■ Option

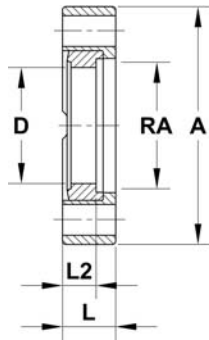
with tapped holes

Order code			DN	A	RA	D	L	L2
Stainless steel 304	Stainless steel 316L	Stainless steel 316LN ESR						
-	F10B10-316	-	10	25	10	9	6	3
F16B19-304	F16B19-316	F16B19-316LNS	16	34	19	16	7	4.8
F40B41-304	F40B41-316	F40B41-316LNS	40	70	41	38	13	4.8
F40B42-304	F40B42-316	F40B42-316LNS	40	70	42	38	13	4.8
F63B63-304	-	-	63	114	63	61	17	7.9
F63B70-304	F63B70-316	F63B70-316LNS	63	114	70	66	17	7.9
F100B101-304	-	-	100	152	101	98	20	9.5
F100B104-304	F100B104-316	F100B104-316LNS	100	152	104	100	20	9.5
F160B152-304	-	F160B152-316LNS	160	203	152	149	22	9.5
F160B154-304	F160B154-316	F160B154-316LNS	160	203	154	154	22	9.5
F200B204-304	F200B204-316	F200B204-316LNS	200	254	204	200	25	9.5
F250B254-304	F250B254-316	F250B254-316LNS	250	304	254	250	25	12.7

- For clean room compatible packaging please add "-CRP" to the order code

CF Flanges

CF Bored flanges, rotatable, stainless steel



Technical data

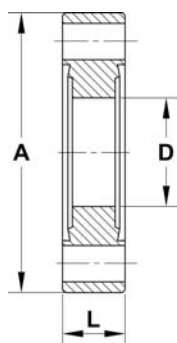
■ Option

with tapped holes

Order code			DN	A	RA	D	L	L2
Stainless steel 304	Stainless steel 316L	Stainless steel 316LN ESR						
F16RB19-304	F16RB19-316	F16RB19-316LNS	16	34	19	16	7	4.8
F40RB41-304	F40RB41-316	F40RB41-316LNS	40	70	41	38	13	4.8
F40RB42-304	F40RB42-316	F40RB42-316LNS	40	70	42	38	13	4.8
F63RB63-304	-	-	63	114	63	61	17	7.9
F63RB70-304	F63RB70-316	F63RB70-316LNS	63	114	70	66	17	7.9
F100RB101-304	-	-	100	152	101	98	20	9.5
F100RB104-304	F100RB104-316	F100RB104-316LNS	100	152	104	100	20	9.5
F160RB152-304	-	F160RB152-316LNS	160	203	152	149	22	9.5
F160RB154-304	F160RB154-316	F160RB154-316LNS	160	203	154	154	22	9.5
F200RB204-304	F200RB204-316	F200RB204-316LNS	200	253	204	200	25	9.5
F250RB254-304	F250RB254-316	F250RB254-316LNS	250	305	254	250	25	12.7

- For clean room compatible packaging please add "-CRP" to the order code

CF Double sided bored flanges, stainless steel



Technical data

■ Option

radial connections

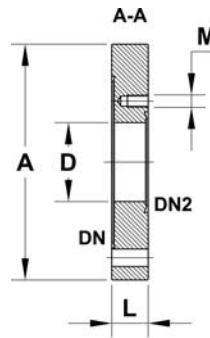
Order code		DN	A	D	L
St. steel 304	St. steel 316LN ESR				
F16D16-304	F16D16-316LNS	16	34	13	7
F40D38-304	F40D38-316LNS	40	70	38	13
F63D63-304	F63D66-316LNS	63	114	61	17
F100D100-304	F100D100-316LNS	100	152	100	20
F160D150-304	F160D150-316LNS	160	203	150	22

- For clean room compatible packaging please add "-CRP" to the order code

CF Components

CF Flanges

CF Reducer flanges, stainless steel



	Order code	DN	DN2	A	D	M	L
Stainless steel 304	Stainless steel 316LN ESR						
ZL016010-304	-	16	10	34	9	M3	10
ZL040010-304	-	40	10	70	9	M4	13
ZL040016-304	ZL040016-316LNS	40	16	70	16	M4	13
ZL063016-304	ZL063016-316LNS	63	16	114	16	M4	17
ZL063040-304	ZL063040-316LNS	63	40	114	38	M6	17
ZL100040-304	ZL100040-316LNS	100	40	152	38	M6	20
ZL100063-304	ZL100063-316LNS	100	63	152	66	M8	20
ZL160040-304	ZL160040-316LNS	160	40	203	38	M6	22
ZL160063-304	ZL160063-316LNS	160	63	203	66	M8	22
ZL160100-304	ZL160100-316LNS	160	100	203	100	M8	22
ZL200100-304	ZL200100-316LNS	200	100	253	100	M8	25
ZL200160-304	ZL200160-316LNS	200	160	253	150	M8	25

- For clean room compatible packaging please add "-CRP" to the order code

CF Flange caps, plastics



Technical data

■ Packing unit

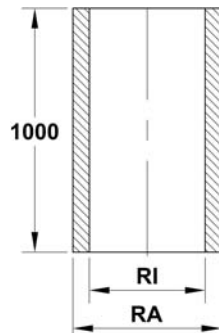
10 pieces

Order code	DN
CF16CAP	16
CF40CAP	40
CF63CAP	63
CF100CAP	100
CF160CAP	160

CF Components

CF Fittings

CF Tube, 1 m length, stainless steel

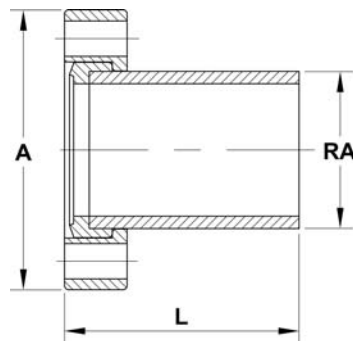


Technical data

- Lengthwise welded
- Outside and inside etched
- DIN 11850
- Ra < 0.8 µm
- Ra (welding seam area) < 1.6 µm

Order code		DN	RI	RA
St. steel 304	St. steel 316L			
R304-19x1.5-1	R316-19x1.5-1	16	16	19
R304-41x1.5-1	R316-41x1.5-1	40	38	41
R304-70x2.0-1	R316-70x2.0-1	63	66	70
R304-104x2.0-1	R316-104x2.0-1	100	100	104
R304-154x2.0-1	R316-154x2.0-1	160	150	154
R304-204x2.0-1	R316-204x2.0-1	200	200	204

CF Tubulations, rotatable, stainless steel



Technical data

- Option with tapped holes

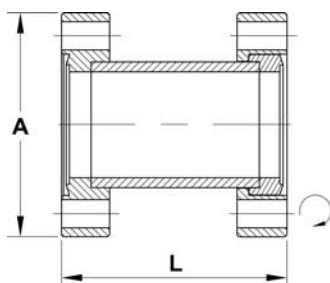
Order code		DN	A	L	RA
Stainless steel 304	Stainless steel 316LN ESR				
TU16R-38-19-304	TU16R-38-19-316LNS	16	34	38	19
TU40R-63-41-304	TU40R-63-41-316LNS	40	70	63	41
TU63R-105-63-304	-	63	114	105	63
TU63R-105-70-304	TU63R-105-70-316LNS	63	114	105	70
TU100R-135-101-304	-	100	152	135	101
TU100R-135-104-304	TU100R-135-104-316LNS	100	152	135	104
TU160R-167-152-304	-	160	203	167	152
TU160R-167-154-304	TU160R-167-154-316LNS	160	203	167	154
TU200R-167-204-304	TU200R-167-204-316LNS	200	254	167	204

- For clean room compatible packaging please add "-CRP" to the order code

CF Components

CF Fittings

CF Straight connectors, stainless steel, 1 flange rotatable



Technical data

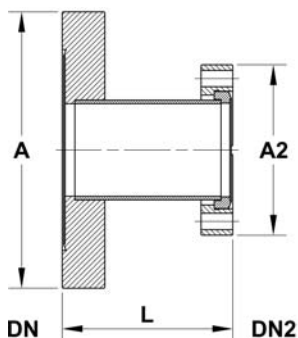
■ Option

with tapped holes
with fixed flanges
Material 1.4404
others lengths

Order code	DN	A	L
SC16R-316	16	34	76
SC40R-304	40	70	126
SC63R-304	63	114	210
SC100R-304	100	152	270
SC160R-304	160	203	334
SC200R-304	200	254	334

- For clean room compatible packaging please add "-CRP" to the order code

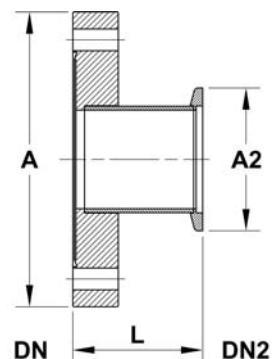
CF Tubulated reducing adapters, small flange rotatable, stainless steel



Order code	DN	DN2	A	A2	L
TA040016R-304	40	16	70	34	70
TA063016R-304	63	16	114	34	70
TA063040R-304	63	40	114	70	70
TA100040R-304	100	40	152	70	70
TA100063R-304	100	63	152	114	70
TA160063R-304	160	63	203	114	127
TA160100R-304	160	100	203	152	127

- For clean room compatible packaging please add "-CRP" to the order code

CF to KF adapters, stainless steel



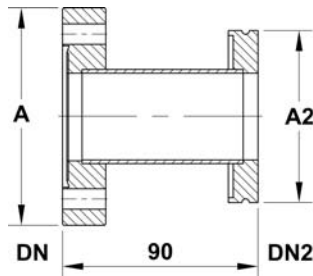
Order code	DN	DN2	A	A2	L
KA016016-316	16	16	34	30	36
KA040016-316	40	16	70	30	36
KA040025-316	40	25	70	40	36
KA040040-316	40	40	70	55	50
KA063025-316	63	25	114	40	50
KA063040-316	63	40	114	55	50

- For clean room compatible packaging please add "-CRP" to the order code

CF Components

CF Fittings

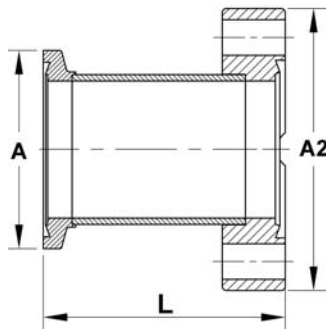
CF to ISO-K adapters, stainless steel



Order code	DN	DN2	A	A2
SA063063-304	63	63	114	95
SA100063-304	100	63	152	95
SA100100-304	100	100	152	130
SA160100-304	160	100	203	130
SA160160-304	160	160	203	180

- For clean room compatible packaging please add "-CRP" to the order code

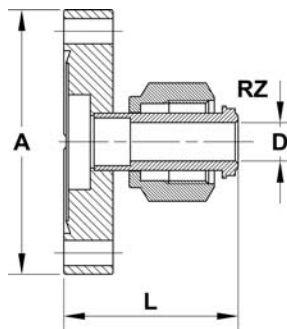
CF to Quick CF adapters, stainless steel



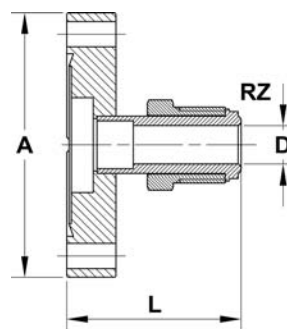
Order code	DN	A	A2	L
QCFA16-304	16	30	34	50
QCFA40-304	40	55	70	50
QCFA63-304	63	87	114	50
QCFA100-304	100	134	152	100

- For clean room compatible packaging please add "-CRP" to the order code

CF to VCR adapters, stainless steel



female



male

Technical data

- Flange material: stainless steel 304
- Adapter material: stainless steel 316L

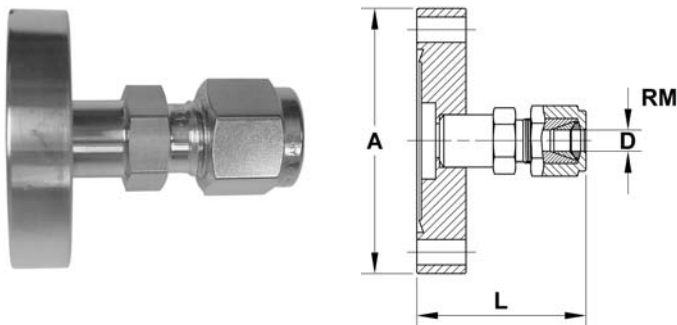
Order code		DN	A	D	L	RZ
Female	Male					
F16VCR6F-316	F16VCR6M-316	16	34	4.6	36	1/4"
F16VCR13F-316	F16VCR13M-316	16	34	10.1	41	1/2"
F40VCR6F-304	F40VCR6M-304	40	70	4.6	41	1/4"
F40VCR9F-304	F40VCR9M-304	40	70	7.1	46	3/8"
F40VCR13F-304	F40VCR13M-304	40	70	10.1	46	1/2"
F40VCR19F-304	F40VCR19M-304	40	70	15.7	53	3/4"
F40VCR25F-304	F40VCR25M-304	40	70	22	58	1"

- VCR compatible
- For clean room compatible packaging please add "-CRP" to the order code

CF Components

CF Fittings

CF to Swagelok adapters, metric, stainless steel



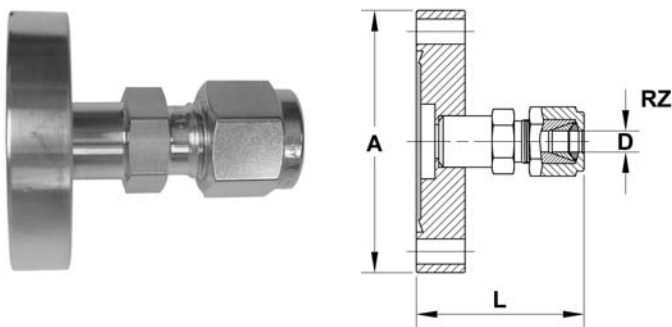
Technical data

■ Flange material	stainless steel 304
■ Adapter material	stainless steel 316L

Order code	DN	A	D	L	RM
F16SWA6M-316	16	34	4.8	38	6
F16SWA8M-316	16	34	7.9	44	8
F16SWA10M-316	16	34	7.9	44	10
F40SWA6M-304	40	70	4.8	43	6
F40SWA8M-304	40	70	6.4	47	8
F40SWA10M-304	40	70	7.9	49	10

- Swagelok compatible
- For clean room compatible packaging please add "-CRP" to the order code

CF to Swagelok adapters, imperial, stainless steel



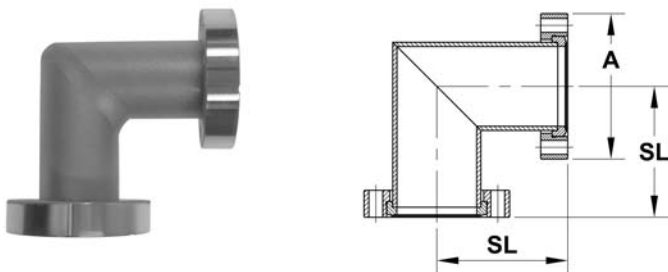
Technical data

■ Flange material	stainless steel 304
■ Adapter material	stainless steel 316L

Order code	DN	A	D	L	RZ
F16SWA7-316	16	34	4.8	38	1/4"
F40SWA7-304	40	70	4.8	43	1/4"
F40SWA9-304	40	70	7.1	48	3/8"
F40SWA13-304	40	70	10.4	52	1/2"

- Swagelok compatible
- For clean room compatible packaging please add "-CRP" to the order code

CF Elbows 90°, 2 flanges rotatable, stainless steel



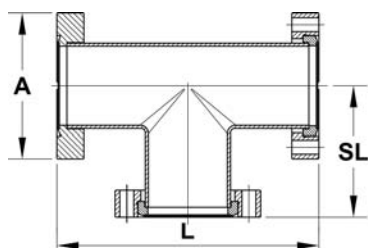
Order code		DN	A	SL
St. steel 304	St. steel 316LNS			
EL16R-304	EL16R-316LNS	16	34	38
EL40R-304	EL40R-316LNS	40	70	63
EL63R-304	EL63R-316LNS	63	114	105
EL100R-304	EL100R-316LNS	100	152	135
EL160R-304	EL160R-316LNS	160	203	167
EL200R-304	EL200R-316LNS	200	254	203

- For clean room compatible packaging please add "-CRP" to the order code

CF Components

CF Fittings

CF Tees, 2 flanges rotatable, stainless steel



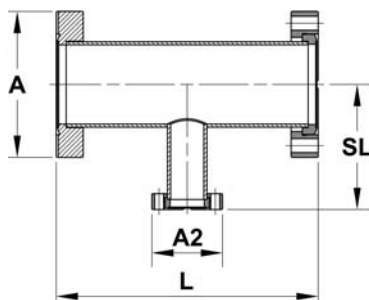
Technical data

■ Bolt hole orientation staggered

Order code		DN	A	L	SL
Stainless steel 304	Stainless steel 316LNS				
TE16RS-304	TE16RS-316LNS	16	34	76	38
TE40RS-304	TE40RS-316LNS	40	70	126	63
TE63RS-304	TE63RS-316LNS	63	114	210	105
TE100RS-304	TE100RS-316LNS	100	152	270	135
TE160RS-304	TE160RS-316LNS	160	203	334	167
TE200RS-304	TE200RS-316LNS	200	254	406	203

- For clean room compatible packaging please add "-CRP" to the order code

CF Unequal tees, 2 flanges rotatable, stainless steel



Technical data

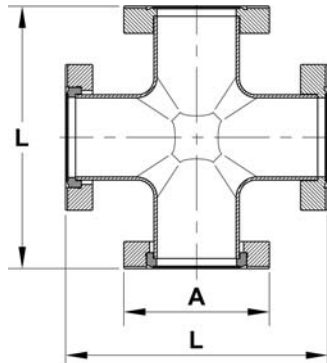
■ Bolt hole orientation staggered

Order code		DN	DN2	A	A2	L	SL
Stainless steel 304	Stainless steel 316LNS						
UTE040016RS-304	-	40	16	70	34	126	60
UTE063040RS-304	-	63	40	114	70	210	77
UTE100040RS-304	UTE100040R-316LNS	100	40	152	70	270	95
UTE100063RS-304	-	100	63	152	114	270	95
UTE160063RS-304	-	160	63	203	114	334	120
UTE160100RS-304	-	160	100	203	152	334	120

- For clean room compatible packaging please add "-CRP" to the order code

CF Fittings

CF 4-way crosses, 2 flanges rotatable, stainless steel



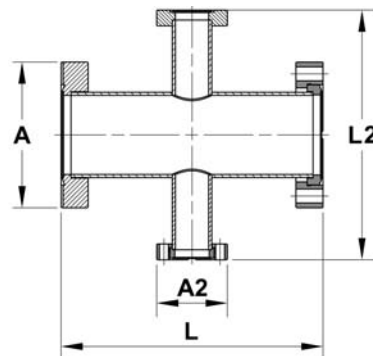
Technical data

■ Bolt hole orientation staggered

Order code		DN	A	L
Stainless steel 304	Stainless steel 316LNS			
X16RS-316	X19RS-316LNS	16	34	76
X40RS-304	X40RS-316LNS	40	70	126
X63RS-304	X63RS-316LNS	63	114	210
X100RS-304	X100RS-316LNS	100	152	270
X160RS-304	X160RS-316LNS	160	203	334
X200RS-304	X200RS-316LNS	200	254	406

- For clean room compatible packaging please add "-CRP" to the order code

CF 4-way reducing crosses, 2 flanges rotatable, stainless steel



Technical data

■ Bolt hole orientation staggered

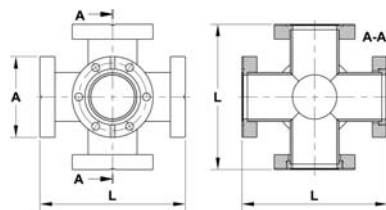
Order code		DN	DN2	A	A2	L	L2
Stainless steel 304	Stainless steel 316LNS						
UX040016RS-304	-	40	16	70	34	126	120
UX063040RS-304	-	63	40	114	70	210	154
UX100063RS-304	UX100063RS-316LNS	100	63	152	114	270	190
UX160063RS-304	-	160	63	203	114	334	240
UX200100RS-304	-	200	100	254	152	406	290

- For clean room compatible packaging please add "-CRP" to the order code

CF Components

CF Fittings

CF 6-way crosses, 3 flanges rotatable, stainless steel



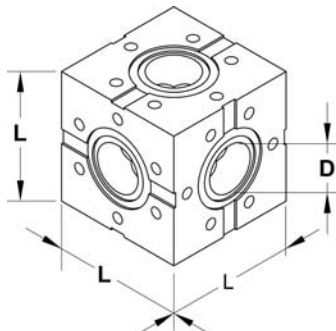
Technical data

■ Bolt hole orientation staggered

Order code		DN	A	L
Stainless steel 304	Stainless steel 316LNS			
XX16RS-316	-	16	34	76
XX40RS-304	XX40RS-316LNS	40	70	126
XX63RS-304	XX63RS-316LNS	63	114	210
XX100RS-304	XX100RS-316LNS	100	152	270
XX160RS-304	XX1600RS-316LNS	160	203	334
XX200RS-304	-	200	254	406

- For clean room compatible packaging please add "-CRP" to the order code

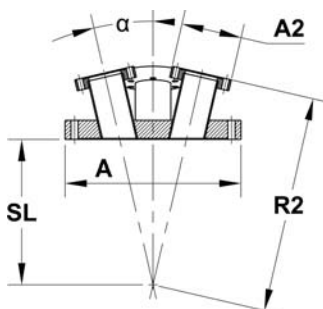
CF Cubes



Order code	DN	D	L
CUBE16-304	16	15	35
CUBE40-304	40	38	70
CUBE63-304	63	63	114
CUBE100-304	100	101	152
CUBE160-304	160	152	203
CUBE200-304	200	200	254

- For clean room compatible packaging please add "-CRP" to the order code

CF Cluster flanges, stainless steel

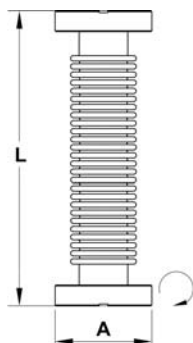


Order code	DN	DN2	No. of ports	A	A2	SL	R2	α
CF3P-304	100	40	3	152	70	135	208	11.9°
CF4P-304	160	40	4	203	70	167	250	13°

- Other versions on request
- For clean room compatible packaging please add "-CRP" to the order code

CF Flexible Hoses

CF Flexible hoses, 1 flange rotatable, stainless steel



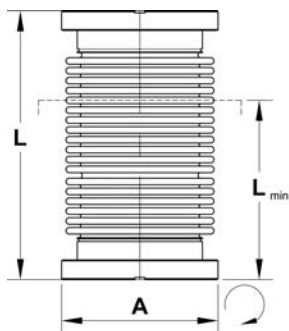
Technical data

■ Flange material	stainless steel 304
■ Hose material	stainless steel 316L

Order code	DN	A	L
FX16CF25R-304	16	34	250
FX16CF50R-304	16	34	500
FX16CF75R-304	16	34	750
FX16CF100R-304	16	34	1000
FX40CF25R-304	40	70	250
FX40CF50R-304	40	70	500
FX40CF75R-304	40	70	750
FX40CF100R-304	40	70	1000
FX63CF25R-304	63	114	250
FX63CF50R-304	63	114	500
FX63CF75R-304	63	114	750
FX63CF100R-304	63	114	1000
FX100CF25R-304	100	152	250
FX100CF50R-304	100	152	500
FX100CF75R-304	100	152	750
FX100CF100R-304	100	152	1000

- For clean room compatible packaging please add "-CRP" to the order code

CF Hydroformed bellows, 1 flange rotatable, stainless steel



Technical data

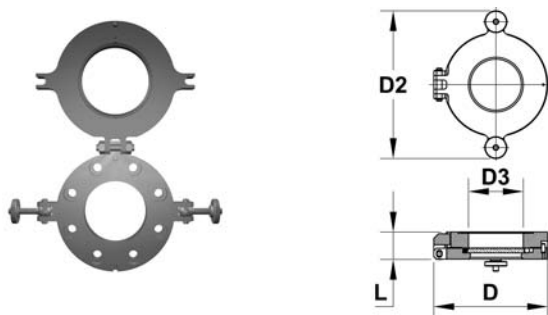
■ Flange material	stainless steel 304
■ Bellows material	stainless steel 316Ti

Order code	DN	A	L	Lmin
FXB16R-304	16	34	110	74
FXB40R-304	40	70	175	150
FXB63R-304	63	114	250	230
FXB100R-304	100	152	250	230
FXB160R-304	160	203	270	240

- For clean room compatible packaging please add "-CRP" to the order code

CF Glass-to-Metal Connections and Quick Access Doors

CF Quick access doors with exchangeable viewport, stainless steel / aluminium



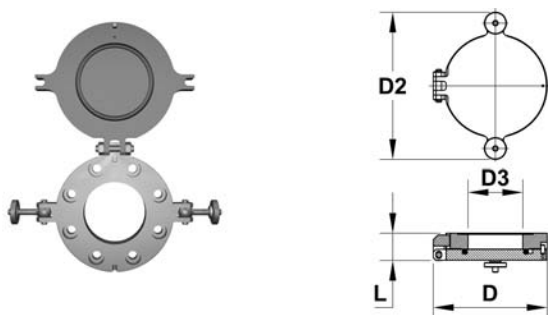
Technical data

■ Assembly	directly at the chamber, by hexagon socket screws
■ Bakeout temperature	up to 150 °C, up to 200 °C intermittent
■ Flange type	stainless steel 304
■ Door frame	aluminium, anodised
■ Door sealing	FKM
■ Viewport	Borofloat®
■ Leak rate	< 1.0E-8 mbar l/s

Order code	DN	D	D2	D3	L
QAD63VP-AL-304	63	152	125	63	30
QAD100VP-AL-304	100	194	164	100	33
QAD160VP-AL-304	160	211	238	150	35
QAD200VP-AL-304	200	274	297	200	43

- For clean room compatible packaging please add "-CRP" to the order code

CF Quick access doors without viewport, stainless steel / aluminium



Technical data

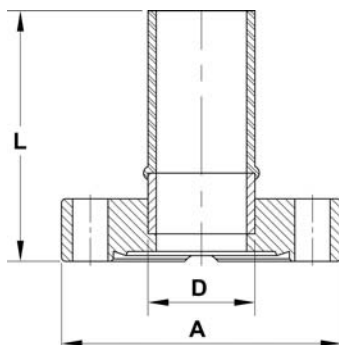
■ Assembly	directly at the chamber, by hexagon socket screws
■ Bakeout temperature	up to 150 °C, up to 200 °C intermittent
■ Flange type	stainless steel 304
■ Door frame	aluminium, anodised
■ Door sealing	FKM
■ Leak rate	< 1.0E-9 mbar l/s

Order code	DN	D	D2	D3	L
QAD40BK-AL-304	40	108	80	38	24
QAD63BK-AL-304	63	152	125	63	30
QAD100BK-AL-304	100	194	164	100	33
QAD160BK-AL-304	160	211	238	150	35
QAD200BK-AL-304	200	274	297	200	43

- For clean room compatible packaging please add "-CRP" to the order code

CF Glass-to-Metal Connections and Quick Access Doors

CF Glass-to-metal connections, Pyrex®

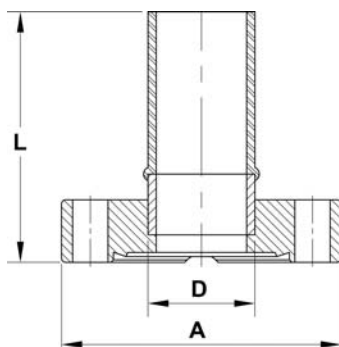


Technical data

■ Flange material	stainless steel 304
■ Tolerances	RA ± 1 mm, L ± 3 mm
■ Bakeout temperature	max. 200 °C
■ Bakeout rate	2 - 3 °C/min
■ Seal	OFHC copper, vacuum annealed

Order code	DN	A	D	L
T13P	16	34	13	104
T25P	40	70	25	104
T38P	40	70	38	104
T64P	63	114	64	190

CF Glass-to-metal connections, quartz



Technical data

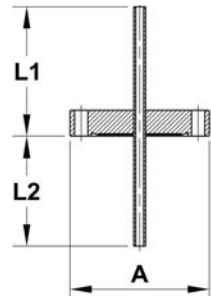
■ Flange material	stainless steel 304
■ Tolerances	RA ± 1 mm, L ± 3 mm
■ Bakeout temperature	max. 200 °C
■ Bakeout rate	2 - 3 °C/min
■ Seal	OFHC copper, vacuum annealed
■ Construction	metal-to-quartz transition using intermediate glass layers

Order code	DN	A	D	L
T13Q	16	34	13	143
T25Q	40	70	25	165
T38Q	40	70	38	165

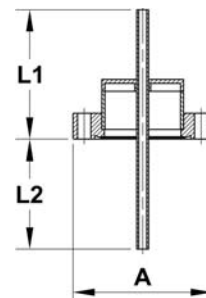
CF Components

CF Liquid Feedthroughs

CF 1-way liquid feedthroughs, stainless steel



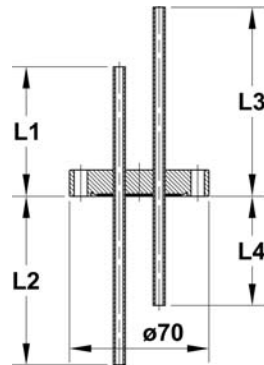
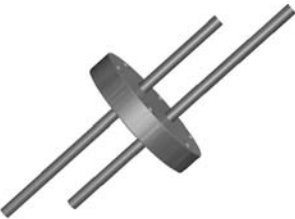
for liquid nitrogen



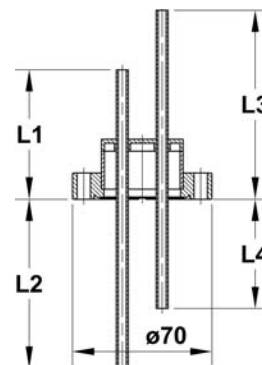
for liquid nitrogen

Order code		DN	A	L1	L2	Vacuum side	Atmosphere side
Liquid	Liquid nitrogen						
LF16PP-316	LNF16PP-316	16	34	60	55	tube 6 mm	tube 6 mm
LF16PS-316	LNF16PS-316	16	34	60	70	tube 6 mm	Swagelok 6 mm
LF40PP-304	LNF40PP-304	40	70	65	55	tube 6 mm	tube 6 mm
LF40PS-304	LNF40PS-304	40	70	65	70	tube 6 mm	Swagelok 6 mm
LF40PPL-304	LNF40PPL-304	40	70	75	65	tube 12 mm	tube 12 mm
LF40PSL-304	LNF40PSL-304	40	70	95	65	tube 12 mm	Swagelok 12 mm

CF 2-way liquid feedthroughs, stainless steel



for liquid nitrogen

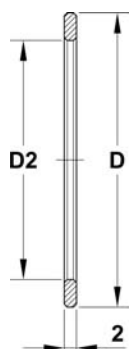


for liquid nitrogen

Order code		L1	L2	L3	L4	Vacuum side	Atmosphere side
Liquid	Liquid nitrogen						
LF402PP-304	LNF402PP-304	65	85	95	55	tube 6 mm	tube 6 mm
LF402PS-304	LNF402PS-304	65	100	95	70	tube 6 mm	Swagelok 6 mm
LF402SP-304	LNF402SP-304	80	85	110	55	Swagelok 6 mm	tube 6 mm
LF402SS-304	LNF402SS-304	80	100	110	70	Swagelok 6 mm	Swagelok 6 mm

CF Copper Gaskets

CF Copper gaskets



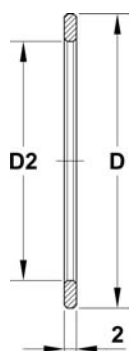
Technical data

Material	OFHC copper
Hardness	approx. 85 Brinell
Bakeout temperature	to 450 °C

Order code	DN	D	D2	Pack size
CU10	10	13.4	8.5	10
CU16	16	21	16	10
CU40	40	48	39	10
CU63	63	82	63	10
CU100	100	120	101	10
CU160	160	171	152	5
CU200	200	222	203	5
CU250	250	272.7	254	5

- For clean room compatible packaging please add "-CRP" to the order code

CF Copper gaskets, annealed



Technical data

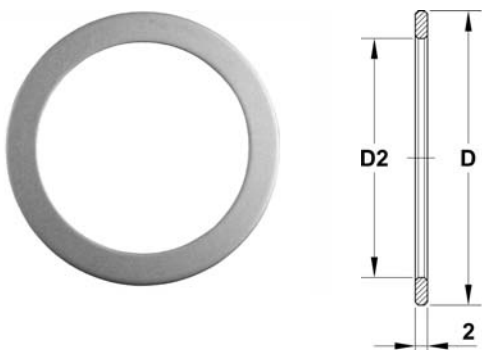
Material	OFHC copper
Hardness	approx. 45 Brinell
Bakeout temperature	to 450 °C
Application	feedthroughs, viewports, glass-to-metal connections
Packing unit	5 pieces

Order code	DN	D	D2
CUA16	16	21	16
CUA40	40	48	39
CUA63	63	82	63
CUA100	100	120	101
CUA160	160	171	152
CUA200	200	222	203
CUA250	250	272.7	254

- For clean room compatible packaging please add "-CRP" to the order code

CF Copper Gaskets

CF Copper gaskets, silver plated



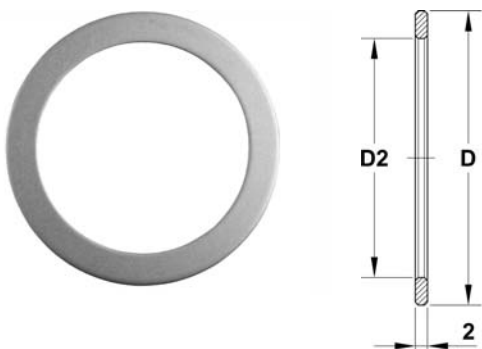
Technical data

■ Material	OFHC copper, silver plated
■ Hardness	approx. 85 Brinell
■ Bakeout temperature	to 450 °C
■ Packing unit	5 pieces

Order code	DN	D	D2
CU16SP	16	21	16
CU40SP	40	48	39
CU63SP	63	82	63
CU100SP	100	120	101
CU160SP	160	171	152
CU200SP	200	222	203
CU250SP	250	272.7	254

- For clean room compatible packaging please add "-CRP" to the order code

CF Copper gaskets, silver plated, annealed



Technical data

■ Material	OFHC copper
■ Hardness	approx. 85 Brinell
■ Bakeout temperature	to 450 °C
■ Packing unit	5 pieces

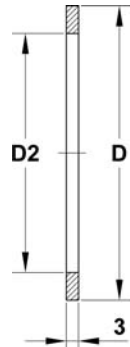
Order code	DN	D	D2
CUA16SP	16	21	16
CUA40SP	40	48	39
CUA63SP	63	82	63
CUA100SP	100	120	101
CUA160SP	160	171	152
CUA200SP	200	222	203
CUA250SP	250	272.7	254

- For clean room compatible packaging please add "-CRP" to the order code

CF Components

CF Copper Gaskets

CF Gaskets, FKM



Technical data

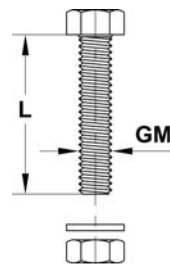
- Temperature range -10 °C to 150 °C
(intermittent 200 °C)
- Application multiple use possible

Order code	DN	D	D2
VGF10	10	13.4	7
VGF16	16	21	16
VGF40	40	48	37
VGF63	63	82	63
VGF100	100	120	101
VGF160	160	171	152
VGF200	200	222	202
VGF250	250	272.7	254

- For clean room compatible packaging please add "-CRP" to the order code

CF Connecting Elements

CF Hexagonal bolt sets, stainless steel



Technical data

- Bolt ISO 4014, 4017, A2
- Nut ISO 4032, A2
- Washer ISO 7089, A2
- Packing unit 25 pieces

Order code	DN	GM	L
NBW316	10	M3	16
NBW420	16	M4	20
NBW635	40	M6	35
NBW845	63	M8	45
NBW850	100	M8	50
NBW860	160 - 200	M8	60
NBW865	250	M8	65

CF Components

CF Connecting Elements

CF Hexagonal bolt sets for double sided flanges, stainless steel



Technical data

■ Bolt	ISO 4014, 4017, A2
■ Nut	ISO 4032, A2
■ Washer	ISO 7089, A2
■ Packing unit	25 pieces

Order code	DN	GM	L
NBW435	16	M4	35
NBW650	40	M6	50
NBW860D	63	M8	60
NBW870	100	M8	70
NBW880	160	M8	80
NBW890	200	M8	90

CF Hexagonal bolt sets for tapped flanges, stainless steel



Technical data

■ Bolt	ISO 4014, 4017, A2
■ Washer	ISO 7089, A2
■ Packing unit	25 pieces

Order code	DN	GM	L
BW312	10	M3	12
BW416	16	M4	16
BW625	40	M6	25
BW830	63	M8	30
BW835	100 - 160	M8	35
BW845	200	M8	45

CF Allen head bolt sets for tapped flanges, stainless steel



Technical data

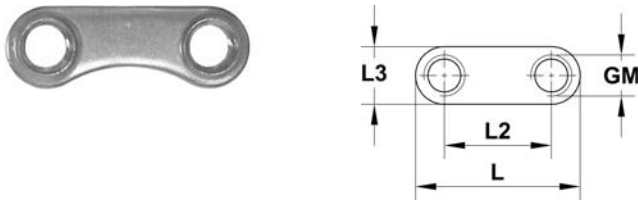
■ Bolt	ISO 4762, A2
■ Washer	ISO 7089, A2
■ Packing unit	25 pieces

Order code	DN	GM	L
CW416	16	M4	16
CW625	40	M6	25
CW830	63	M8	30
CW835	100 - 160	M8	35
CW845	200	M8	45

CF Components

CF Connecting Elements

CF Plate nuts, stainless steel 304



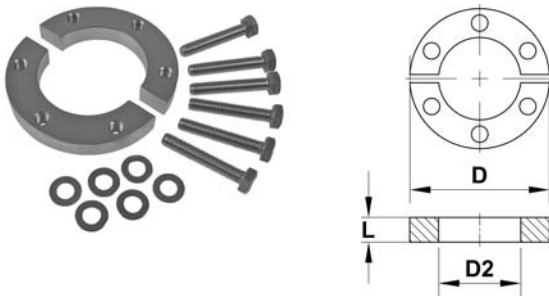
Technical data

■ Packing unit 25 pieces

Order code	DN	L	L2	L3	GM	Gravure
PN16-304	16	20	13	7	M4	M
PN40-304	40	41	29	11	M6	2.75
PN63-304	63	51	35	12	M8	114
PN100-304	100	44	25	12	M8	150
PN160-304	160	44	28	12	M8	200
PN200-304	200	45	30	13	M8	250

- For clean room compatible packaging please add "-CRP" to the order code

CF Horse shoe plate nuts, stainless steel 304



Technical data

■ Scope of delivery with screws and washers

Order code	DN	D	D2	L
PN16HS-304	16	34	20	6
PN40HS-304	40	70	43	9
PN63HS-304	63	113	65	12
PN100HS-304	100	151	103	12
PN160HS	160	202	154	12

- For clean room compatible packaging please add "-CRP" to the order code

CF Thread lubricant



Technical data

■ Application loosening of screws after bakeout

Order code	Material
TL100	MoS ₂