

 Chambers and components

Part **3.3**



# Chambers and components

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**2 Know-how book**

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# Vacuum chambers

Vacuum chambers meeting the greatest of demands





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# Vacuum chambers

## Vacuum chambers meeting the greatest of demands

At the heart of a vacuum system is the vacuum chamber that has been customized for the application. Pfeiffer Vacuum's vacuum chambers meet the highest quality and engineering standards providing vacuum solutions precisely designed to meet our customers' needs. They are used for medium vacuum to ultra-high vacuum applications and can also be designed, produced and tested as pressure chambers for overpressure of more than 500 hPa in accordance with the Pressure Equipment Directive (97/23/EC).

The range of vacuum chambers extends from small recipients for lab applications to large-sized space simulation and coating chambers.

Pfeiffer Vacuum offers full service from a single source: Application consultation, design, production, quality assurance, assembly and on-site service. From the design to project management and finishing, we will provide you a perfect vacuum solution: high quality vacuum chambers in single item and serial production.





## Features at a glance

	Nominal size							Pressure range			Temperature range		Page
	DN 250	DN 300	DN 320	DN 400	DN 500	DN 600	DN 750	1 · 10 <sup>-7</sup> hPa up to ambient pressure	1 · 10 <sup>-7</sup> hPa to 500 hPa overpressure	1 · 10 <sup>-5</sup> hPa up to ambient pressure	-15 to 150°C	0 to 40°C	
<b>TrinosLine standard vacuum chambers</b>													
High vacuum chambers, cubical with stainless steel door		■			■		■	■			■		18
High vacuum chambers, cubical with acrylic glass door		■			■		■			■		■	18
High vacuum chambers, horizontal			■	■	■	■		■			■		19
High vacuum chambers, vertical			■	■	■	■		■			■		20
Medium vacuum chambers, vertical with acrylic glass cover	■		■	■						■		■	21
Modular vacuum chambers			■	■	■				■		■		22



#### Customer benefits

- Full service from a single source
- Vacuum solutions designed precisely for your application
- Versatile applications
- Safe and reliable



# Standard vacuum chambers

Standardized chambers for your vacuum applications



## Standard vacuum chambers

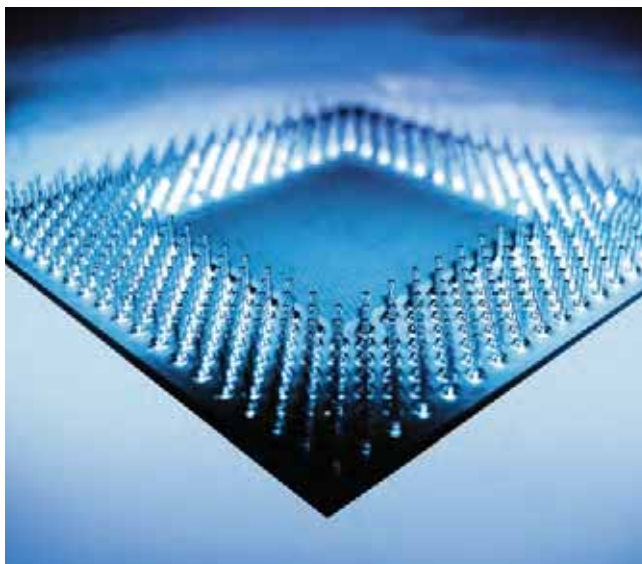
Standard vacuum chambers are standardized shapes where you can select the port types and locations. They can be configured to the vacuum solution you need.

### Customer benefits

- Pre-configured shapes
- Customized ports
- Proven robust design

### Typical applications

- Research & development
- Semiconductor
- Coating
- Analytics
- Industry



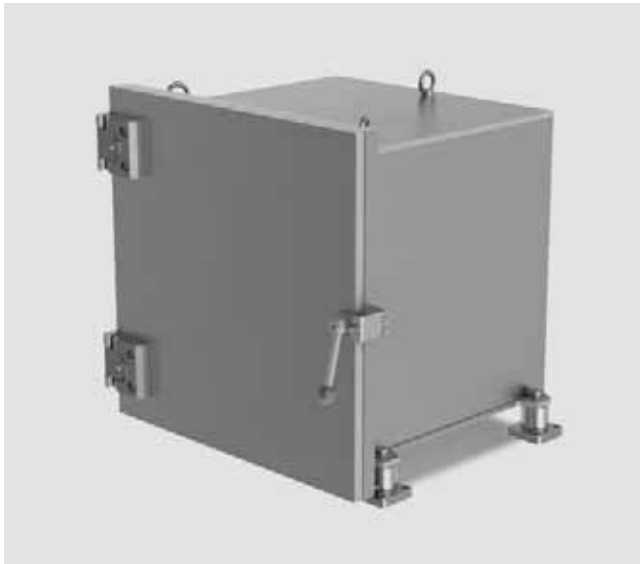
Semiconductor



Coating



Analytics



High vacuum chamber



Medium vacuum chamber



Modular chamber components

## Series

### High vacuum chambers

High vacuum chambers are designed for a pressure range from ambient pressure up to  $1 \cdot 10^{-7}$  hPa. Standardized base bodies are available in three versions. Cubical, cylindrical-horizontal and cylindrical vertical. The nominal sizes range from 300 mm to 800 mm.

### Medium vacuum chambers

Designed for a pressure range from  $1 \cdot 10^{-5}$  hPa to ambient pressure, the medium vacuum chambers are equipped with a transparent acrylic glass cover. Basic bodies are available in the nominal sizes of 320 mm to 500 mm.

### Modular chamber components

Modular chambers offer a wide range of possible combinations and a great degree of flexibility at all times. Starting from a base plate, the chamber can be designed with a bell-shaped top and an extension. A cover is available for the extension, thus making it possible to flexibly expand the chamber. All the modules are ideally adapted to each other and designed for a pressure range of  $10^{-7}$  hPa to 500 hPa. The modules are based on ISO-K base flanges in accordance with DIN 28404 and ISO 1609. Accessories include centering rings, claws clamps and double claw clamps from our ISO-K product range. The nominal diameter of the base bodies range from DN 320 to DN 500 ISO-K.



## General information

The lowest possible final pressure in the overall system depends on a number of factors, in particular the pump system, the outgassing rate of the interior surfaces and the pump-down time. The minimum pressures in the product description are based on experience of what can be attained with a well designed vacuum system. The values may be exceeded or may not be achieved in individual cases. The gas permeability needs to be taken into consideration when using elastomer seals. This depends on the materials, temperature and gas type.

## Important information relating to the technical data

The permissible upper and lower temperature limits for the overall system are based on the lowest upper value and the highest lower value for the system components involved.

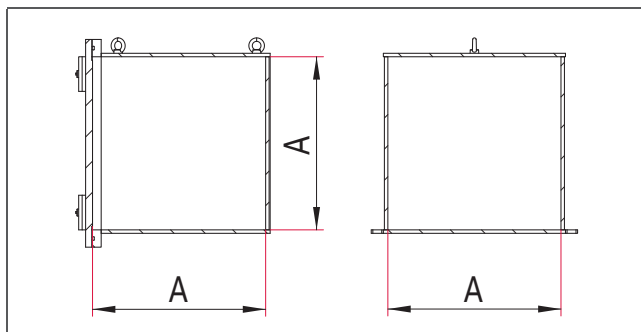
Flange connections and components have been developed to provide vacuum-sealed connections. They are able to bear only limited mechanical loads. Therefore, it is necessary to examine whether structural or dynamic loads need to be borne by additional elements (e.g. brackets) when designing a vacuum system.

## TrinosLine High Vacuum Chamber, Cubical, KBH



- Cubical chamber body
- Hinged door and FKM seal
- Surface: inside and outside glass bead blasted
- Chamber with foot-plates and ring bolts
- Feet available separately (accessories)
- Chamber ports available (accessories)
- Tightness:  $< 1 \cdot 10^{-9}$  Pa m<sup>3</sup>/s

### Dimensions



### Note

Accessories: chamber feet, chamber ports, mounting table

When you place an order, we will prepare a technical drawing of the chamber with your ports and any other options selected.

Once you have approved the drawing, we will begin manufacturing your chamber.

Optional support bracket inside

Optional inside surface finish: electropolished or pickled and passivated

Wide range of uses through our extensive selection of pumping and measuring technology and other vacuum accessories.

### Stainless Steel Door

- Pressure range:  $1 \cdot 10^{-7}$  hPa to ambient pressure
- Materials: Chamber body made from stainless steel 304 (1.4301); stainless steel door
- Temperature range: -15 to 150 °C

Nominal diameter	A [mm]	Order number
DN 300	300	820KBH0300-S
DN 500	500	820KBH0500-S
DN 750	750	820KBH0750-S

### Acrylic Glass Door

- Pressure range:  $1 \cdot 10^{-5}$  hPa to ambient pressure
- Materials: Chamber body made from stainless steel 304 (1.4301); acrylic glass door (PMMA)
- Temperature range: 0 to 40 °C

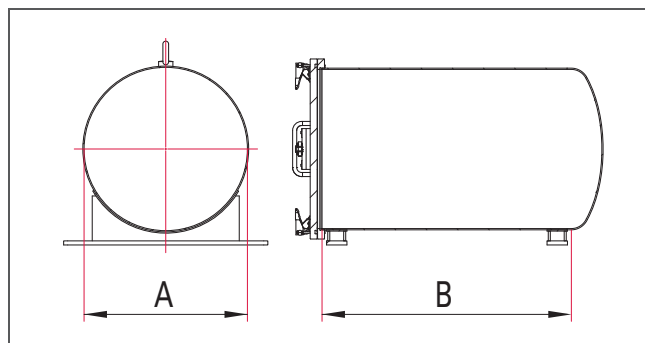
Nominal diameter	A [mm]	Order number
DN 300	300	820KBH0300-G
DN 500	500	820KBH0500-G
DN 750	750	820KBH0750-G

## TrinosLine High Vacuum Chamber, Horizontal, KHH



- Cylindrical, horizontal body, one side welded dished end
- Stainless steel door with hinges and quick clamps to prestress the FKM-door seal
- Surface: inside and outside glass bead blasted
- Chamber with feet and ring bolts
- Chamber ports available (accessories)
- Tightness:  $< 1 \cdot 10^{-9}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-7}$  hPa to ambient pressure
- Materials: Chamber body and door made from stainless steel 304 (1.4301)
- Temperature range: -15 to 150 °C

### Dimensions



### Note

Accessories: chamber ports

When you place an order, we will prepare a technical drawing of the chamber with your ports and any other options selected.

Once you have approved the drawing, we will begin manufacturing your chamber.

Options: additional chamber lengths, support bracket inside

Optional inside surface finish: electropolished or pickled and passivated

Wide range of uses through our extensive selection of pumping and measuring technology and other vacuum accessories.

### KHH

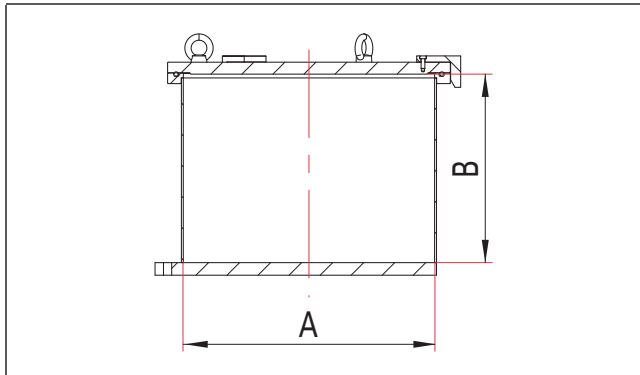
Nominal diameter	A [mm]	B [mm]	Order number
DN 320	320	500	820KHH0320-500
DN 400	400	600	820KHH0400-600
DN 500	500	750	820KHH0500-750
DN 600	600	900	820KHH0600-900

## TrinosLine High Vacuum Chamber, Vertical, KVH



- Cylindrical, vertical body with a welded flat bottom and top flange with FKM seal
- Cover with ring bolts and external guides for easy installation and protection of the sealing surface
- Surface: inside and outside glass bead blasted
- Chamber with foot-plates
- Chamber ports available (accessories)
- Tightness:  $< 1 \cdot 10^{-9}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-7}$  hPa to ambient pressure
- Materials: Chamber body and cover made from stainless steel 304 (1.4301)
- Temperature range: -15 to 150 °C

### Dimensions



### Note

Accessories: chamber ports, mounting table

When you place an order, we will prepare a technical drawing of the chamber with your ports and any other options selected.

Once you have approved the drawing, we will begin manufacturing your chamber.

Options: additional chamber heights

Wide range of uses through our extensive selection of pumping and measuring technology and other vacuum accessories.

### KVH

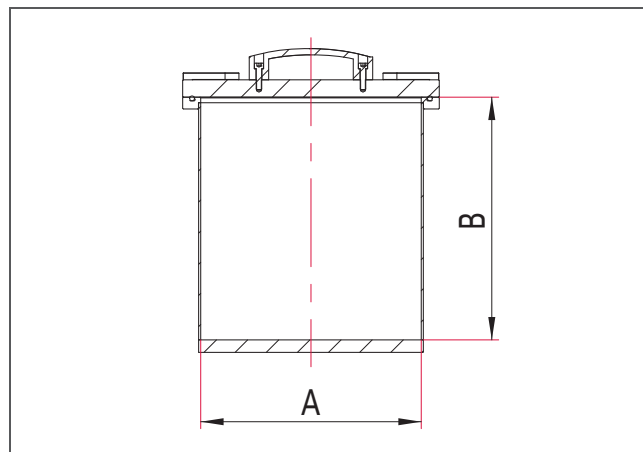
Nominal diameter	A [mm]	B [mm]	Order number
DN 320	318	250	820KVH0320-250
DN 400	400	300	820KVH0400-300
DN 500	500	350	820KVH0500-350
DN 600	600	400	820KVH0600-400

## TrinosLine Medium Vacuum Chamber, Vertical, KVG



- Cylindrical, vertical body with a welded flat bottom and top flange with FKM seal
- Acrylic glass cover (PMMA) with handles and external guides for easy installation and protection of the sealing surface
- Surface inside and outside glass bead blasted
- Chamber with foot-plates
- Chamber ports available (accessories)
- Tightness:  $< 1 \cdot 10^{-9}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-5}$  hPa to ambient pressure
- Materials: Chamber body made from stainless steel 304 (1.4301), acrylic glass cover (PMMA)
- Temperature range: 0 to 40 °C

### Dimensions



### Note

Accessories: chamber ports, mounting table

When you place an order, we will prepare a technical drawing of the chamber with your ports and any other options selected.

Once you have approved the drawing, we will begin manufacturing your chamber.

Options: additional chamber heights

Wide range of uses through our extensive selection of pumping and measuring technology and other vacuum accessories.

### KVG

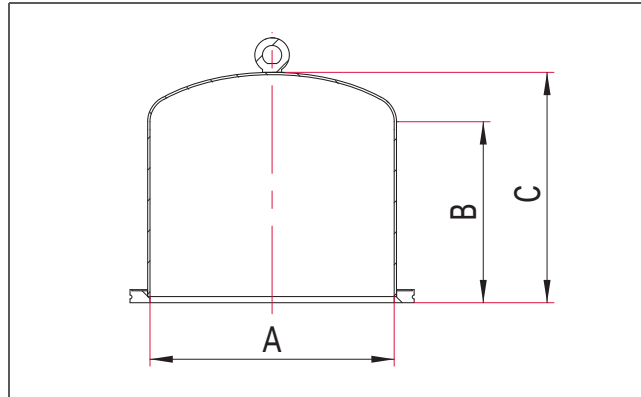
Nominal diameter	A [mm]	B [mm]	Order number
DN 250	250	300	820KVG250-300
DN 320	318	350	820KVG320-350
DN 400	400	400	820KVG400-400

## TrinosLine Modular Vacuum Chamber, Bell



- Modular design layout for maximum flexibility at any time
- Cylindrical, vertical body welded with dished end and ISO-K base flange
- Ring bolt
- Surface: inside and outside glass bead blasted
- Chamber ports available (accessories)
- Tightness:  $< 1 \cdot 10^{-9}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-7}$  hPa to 500 hPa over pressure
- Materials: Stainless steel 304 (1.4301)
- Temperature range: -15 to 150 °C

### Dimensions



### Note

Accessories: chamber ports, ISO-K centering ring, ISO-K claw clamps or double claw clamps  
 Combinable with the base plate (mounting with claw clamps) and the extension (mounting with double claw clamps)

When you place an order, we will prepare a technical drawing of the chamber with your ports.  
 Once you have approved the drawing, we will begin manufacturing your chamber.

Options: additional chamber heights

Wide range of uses through our extensive selection of pumping and measuring technology and other vacuum accessories.

### Stainless Steel 304/1.4301

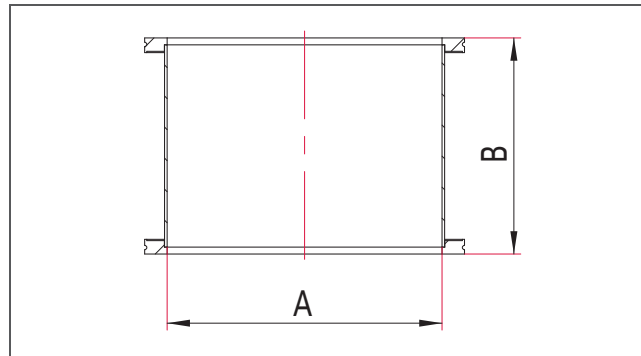
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 320 ISO-K	318	235	300	820KMG320-300
DN 400 ISO-K	400	320	400	820KMG400-400
DN 500 ISO-K	500	400	500	820KMG500-500

## TrinosLine Modular Vacuum Chamber, Extension



- Modular design layout for maximum flexibility at any time
- Cylindrical, vertical body, both sides are welded to ISO-K base flange
- Surface: inside and outside glass bead blasted
- Chamber ports available (accessories)
- Tightness:  $< 1 \cdot 10^{-9}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-7}$  hPa to 500 hPa over pressure
- Materials: Stainless steel 304 (1.4301)
- Temperature range: -15 to 150 °C

### Dimensions



### Note

Accessories: chamber ports, ISO-K centering ring, ISO-K claw clamps or double claw clamps  
 Combinable with the base plate (mounting with claw clamps) and the bell (mounting with double claw clamps).

When you place an order, we will prepare a technical drawing of the chamber with your ports.

Once you have approved the drawing, we will begin manufacturing your chamber.

Options: additional chamber heights

Wide range of uses through our extensive selection of pumping and measuring technology and other vacuum accessories.

### Stainless Steel 304/1.4301

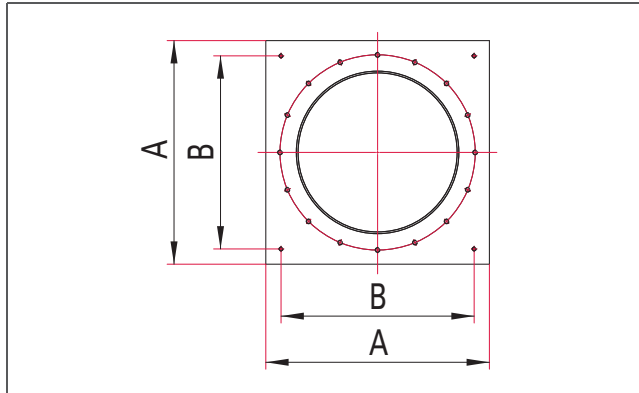
Nominal diameter	A [mm]	B [mm]	Order number
DN 320 ISO-K	318	250	820KMV320-250
DN 400 ISO-K	400	300	820KMV400-300
DN 500 ISO-K	500	400	820KMV500-400

## TrinosLine Modular Vacuum Chamber, Base Plate



- Modular design layout for maximum flexibility at any time
- Square base plate with centering groove and sealing surface for an ISO-K centering ring and bolt circle with threaded holes for ISO-K claw clamps
- Fixing holes for mounting
- Ground surface
- Tightness:  $< 1 \cdot 10^{-9}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-7}$  hPa to 500 hPa over pressure
- Materials: Stainless steel 304 (1.4301)
- Temperature range: -15 bis 150 °C

### Dimensions



### Note

Accessories: chamber ports, ISO-K centering ring, ISO-K claw clamps, mounting tables

Combinable with the bell and the extension (fixing each with claw clamps)

When you place an order, we will prepare a technical drawing of the chamber with your ports.

Once you have approved the drawing, we will begin manufacturing your chamber.

Wide range of uses through our extensive selection of pumping and measuring technology and other vacuum accessories.

### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	Order number
DN 320 ISO-K	430	390	820KMB320
DN 400 ISO-K	520	480	820KMB400
DN 500 ISO-K	620	580	820KMB500

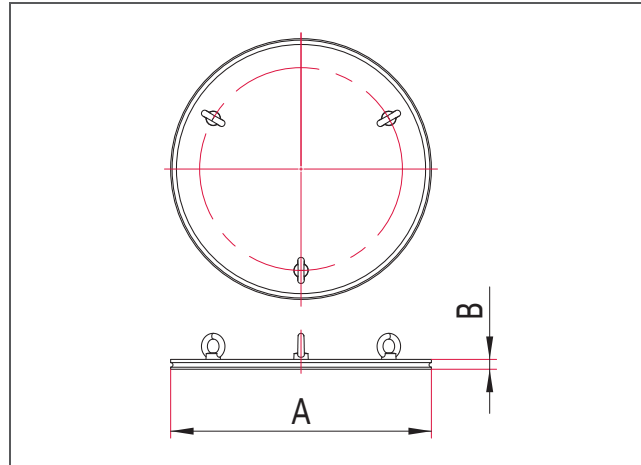


## TrinosLine Modular Vacuum Chamber, Cover



- Modular design layout for maximum flexibility at any time
- ISO-K blind flange with handles (DN320) or ring bolts (DN400/500)
- Smoothed surface
- Tightness:  $< 1 \cdot 10^{-9}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-7}$  hPa to 500 hPa over pressure
- Materials: Stainless steel 304 (1.4301)
- Temperature range: -15 bis 150 °C

### Dimensions



### Note

Accessories: chamber ports, ISO-K centering ring, ISO-K double claw clamps

Combinable with the bell and the extension (fixing with double claw clamps)

When you place an order, we will prepare a technical drawing of the chamber with your ports.

Once you have approved the drawing, we will begin manufacturing your chamber.

Wide range of uses through our extensive selection of pumping and measuring technology and other vacuum accessories.

### Stainless Steel 304/1.4301

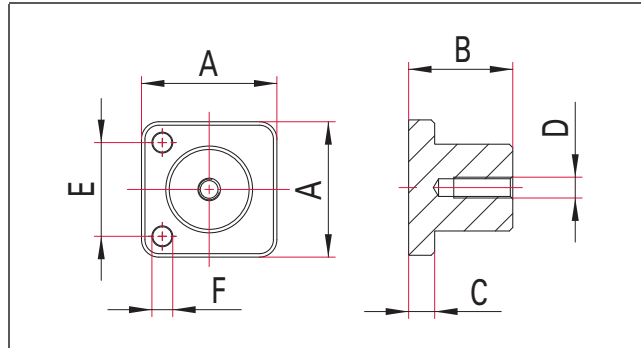
Nominal diameter	A [mm]	B [mm]	Order number
DN 320 ISO-K	370	17	820KMD320
DN 400 ISO-K	450	17	820KMD400
DN 500 ISO-K	550	17	820KMD500

## Chamber feet for Standard Vacuum Chamber, Cubical (KBH)



- For deploying the cubical chamber (KBH) on a level surface
- Assemble to the foot-plates of the cubical chamber (KBH)
- Sturdy mounting which can take great loads
- Number per set: Consisting of 4 feet with screws
- Materials: Aluminum, surface: red anodized

### Dimensions



### Chamber Feet KBH

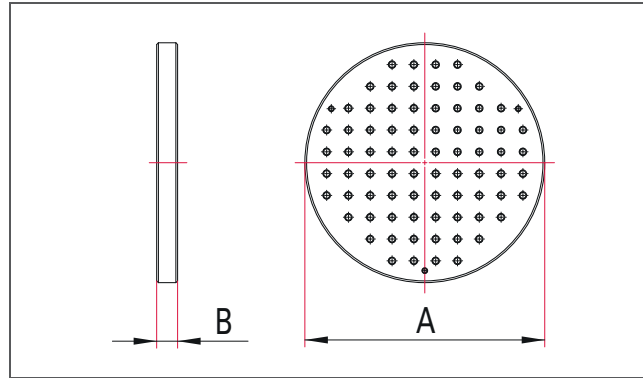
Nominal diameter	A [mm]	B [mm]	C [mm]	D	E [mm]	F [mm]	Order number
DN 300	68	50	15	M10	44	9	820KBH0300-F
DN 500	78	60	15	M12	54	11	820KBH0500-F
DN 750	118	65	20	M16	88	13.5	820KBH0750-F

## Mounting Tables

- Square and round tables available
- Hole pattern: 25 x 25 mm
- Thread: M6
- Surfaces: Precision milled or polished

### Aluminum: Round

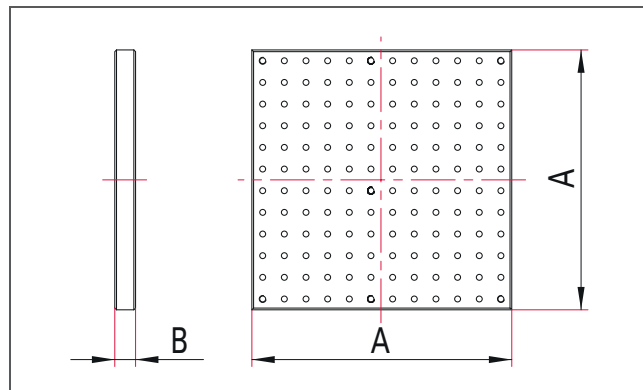
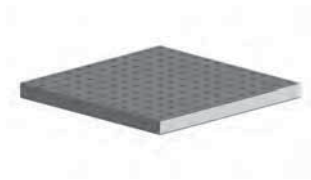
#### Dimensions



Nominal diameter	A [mm]	B [mm]	Order number
DN 320	275	15	810KTO320-R
DN 400	350	15	810KTO400-R
DN 500	425	20	810KTO500-R
DN 600	525	25	810KTO600-R

### Aluminum: Square

#### Dimensions



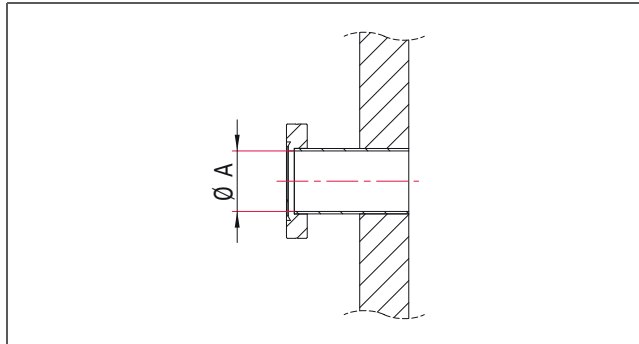
Nominal diameter	A [mm]	B [mm]	Order number
DN 300	250	15	810KTO300-E
DN 500	425	20	810KTO500-E
DN 750	650	25	810KTO750-E

## CF Ports



- Other flange materials available upon request
- Pressure range:  $< 1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Note

The minimum inner diameter is determined by the combination of flange, tube and seal. The open diameter may be locally reduced by welding seams and manufacturing-related deviations of the tubes.

### CF, Fixed Port: 304L Stainless Steel

Nominal diameter	A [mm]	Order number
DN 16	16	820KPC016
DN 25	24	820KPC025
DN 40	37	820KPC040
DN 50	47.5	820KPC050
DN 63	66	820KPC063
DN 75	72.1	820KPC075
DN 100	104	820KPC100
DN 130	123.7	820KPC130
DN 160	155	820KPC160
DN 200	200	820KPC200
DN 250	250	820KPC250

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF, Fixed Port with Thread: 304L Stainless Steel

Nominal diameter	A [mm]	Order number
DN 16	16	820KPC016-G
DN 40	37	820KPC040-G
DN 63	66	820KPC063-G
DN 100	104	820KPC100-G
DN 160	155	820KPC160-G
DN 200	200	820KPC200-G
DN 250	250	820KPC250-G

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**CF, Rotatable: 304L Stainless Steel**

Nominal diameter	A [mm]	Order number
DN 16	16	820KPD016
DN 25	24	820KPD025
DN 40	37	820KPD040
DN 50	47.5	820KPD050
DN 63	66	820KPD063
DN 75	72.1	820KPD075
DN 100	104	820KPD100
DN 130	123.7	820KPD130
DN 160	155	820KPD160
DN 200	200	820KPD200
DN 250	250	820KPD250

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**CF, Rotatable with Metric Thread: 304L Stainless Steel**

Nominal diameter	A [mm]	Order number
DN 16	16	820KPD016-G
DN 40	37	820KPD040-G
DN 63	66	820KPD063-G
DN 100	104	820KPD100-G
DN 160	155	820KPD160-G
DN 200	200	820KPD200-G
DN 250	250	820KPD250-G

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**CF, Blank Flange for Ports: 304L Stainless Steel**

Nominal diameter	A [mm]	Order number
DN 16	-	820KBC016
DN 25	-	820KBC025
DN 40	-	820KBC040
DN 50	-	820KBC050
DN 63	-	820KBC063
DN 75	-	820KBC075
DN 100	-	820KBC100
DN 130	-	820KBC130
DN 160	-	820KBC160
DN 200	-	820KBC200
DN 250	-	820KBC250

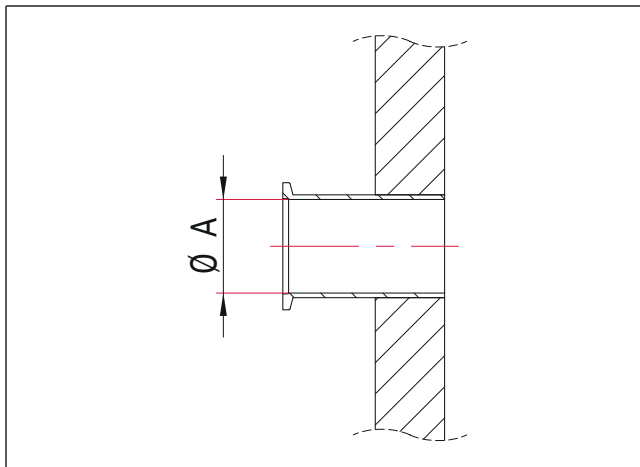
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## ISO-KF Ports



- Other flange materials available on request
- Pressure range:  $< 1 \cdot 10^{-7}$  hPa to 500 hPa over pressure (elastomer seal);  
 $< 1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Note

The minimum inner diameter is determined by the combination of flange, tube and seal. The open diameter may be locally reduced by welding seams and manufacturing-related deviations of the tubes.

### ISO-KF Ports: 304/1.4301 Stainless Steel

Nominal diameter	A [mm]	Order number
DN 16	16	820KPI016
DN 25	24	820KPI025
DN 40	40.5	820KPI040
DN 50	51	820KPI050

Flanges according to ISO 2861

### ISO-KF Blind Flange for Ports: 304/1.4301 Stainless Steel, with FKM Centering Ring and Clamping Ring

Nominal diameter	A [mm]	Order number
DN 16	-	820KBI016
DN 25	-	820KBI025
DN 40	-	820KBI040
DN 50	-	820KBI050

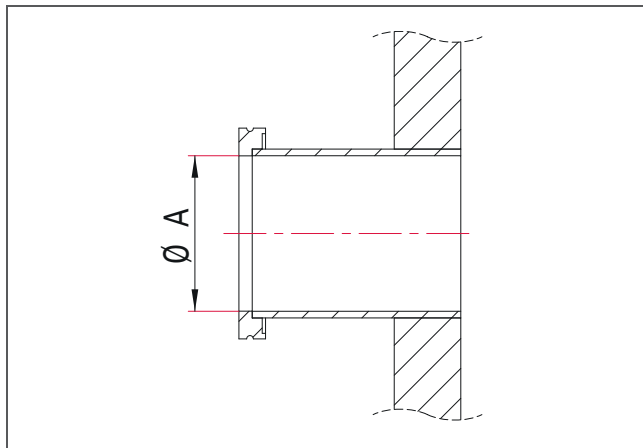
Flanges according to ISO 2861

## ISO-K Ports



- Other flange materials available upon request
- Pressure range:  $< 1 \cdot 10^{-7}$  hPa to 500 hPa over pressure (elastomer seal);  $< 1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Note

The minimum inner diameter is determined by the combination of flange, tube and seal. The open diameter may be locally reduced by welding seams and manufacturing-related deviations of the tubes.

### ISO-K Ports: 304/1.4301 Stainless Steel

Nominal diameter	A [mm]	Order number
DN 63	70	820KPI063
DN 80	83	820KPI080
DN 100	102	820KPI100
DN 160	153	820KPI160
DN 200	213	820KPI200
DN 250	261	820KPI250

Flanges according to ISO 1609

### ISO-K Blank Flanges for Ports: 304/1.4301 Stainless Steel, with FPM Centering Ring and Double Claw Clamps

Nominal diameter	A [mm]	Order number
DN 63	-	820KBI063
DN 80	-	820KBI080
DN 100	-	820KBI100
DN 160	-	820KBI160
DN 200	-	820KBI200
DN 250	-	820KBI250

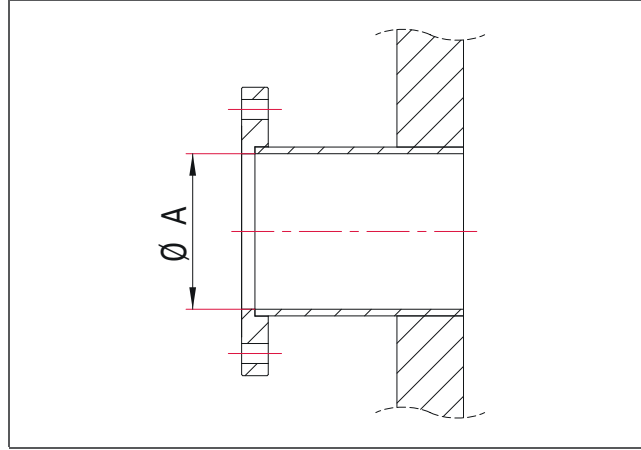
Flanges according to ISO 1609

## ISO-F Ports



- Other flange materials available upon request
- Pressure range:  $< 1 \cdot 10^{-7}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Note

The minimum inner diameter is determined by the combination of flange, tube and seal. The open diameter may be locally reduced by welding seams and manufacturing-related deviations of the tubes.

### ISO-F Ports: 304/1.4301 Stainless Steel

Nominal diameter	A [mm]	Order number
DN 63	70	820KPF063
DN 100	102	820KPF100
DN 160	153	820KPF160
DN 200	213	820KPF200
DN 250	261	820KPF250

Flanges according to ISO 1609

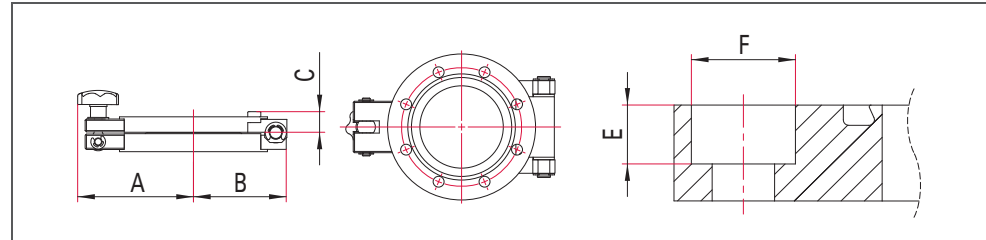


## CF Quick-Access-Door

- Screw holes: Through-holes with counter-bore for cylinder head
- Can be installed using hexagon socket screws
- Bakeout temperature: up to 200 °C
- Seal: FKM
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Temperature range: -15 to 150 °C

### Stainless Steel, without Sight Glass

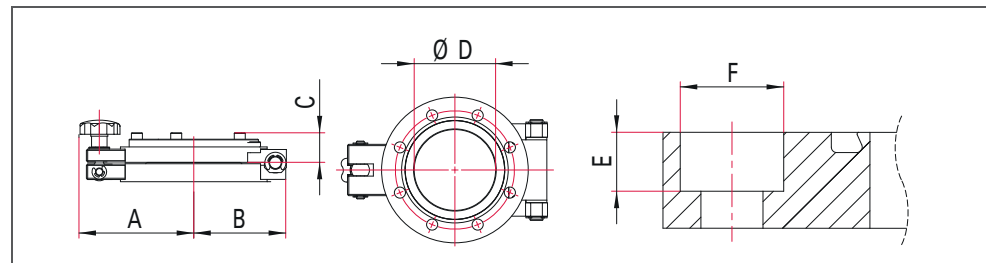
#### Dimensions



Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 CF	88	72	16	-	10	16	420KTU063
DN 100 CF	108	93	16	-	10	16	420KTU100
DN 160 CF	134	119	20	-	10	16	420KTU160
DN 200 CF	160	145	20	-	10	16	420KTU200
DN 250 CF	186	171	20	-	10	16	420KTU250

### Stainless Steel, with Sight Glass

#### Dimensions



- Order no. suffix -G: with sight glass
- Sight glass: Borosilicate glass

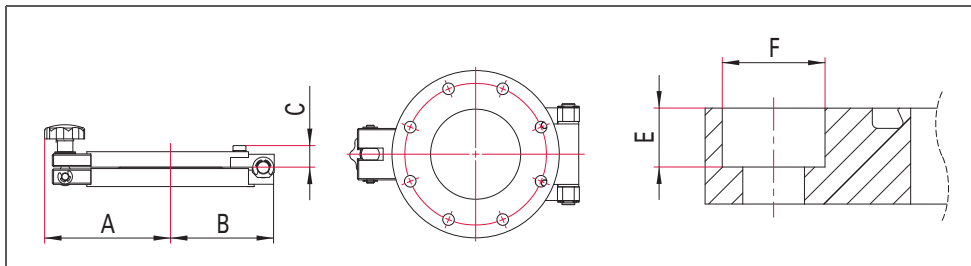
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 CF	88	72	23	63	10	16	420KTU063-G
DN 100 CF	108	93	27	95	10	16	420KTU100-G
DN 160 CF	134	119	31	145	10	16	420KTU160-G
DN 200 CF	160	145	31	145	10	16	420KTU200-G
DN 250 CF	186	171	31	145	10	16	420KTU250-G

## ISO-F Quick-Access-Door

- Screw holes: Through-holes with counter-bore for cylinder head
- Can be installed using hexagon socket screws
- Bakeout temperature: up to 200 °C
- Seal: FKM
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Temperature range: -15 to 150 °C

### Stainless Steel 304/1.4301, without Sight Glass

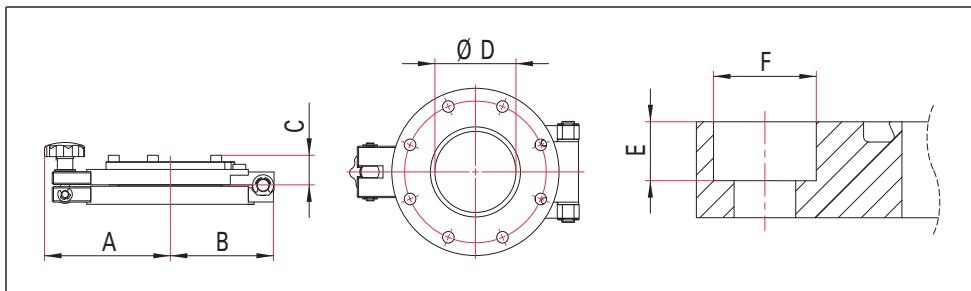
#### Dimensions



Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 ISO-F	98	80	16	-	10	16	520KTU063
DN 100 ISO-F	116	99	16	-	10	16	520KTU100
DN 160 ISO-F	147	130	20	-	12.5	20	520KTU160
DN 200 ISO-F	177	160	20	-	12.5	20	520KTU200

### Stainless Steel 304/1.4301, with Sight Glass

#### Dimensions



- Order no. suffix -G: with sight glass
- Sight glass: Borosilicate glass

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 ISO-F	98	80	23	63	10	16	520KTU063-G
DN 100 ISO-F	116	99	27	95	10	16	520KTU100-G
DN 160 ISO-F	147	130	31	145	12.5	20	520KTU160-G
DN 200 ISO-F	177	160	31	145	12.5	20	520KTU200-G





# Custom vacuum chambers

Individually designed chambers for your vacuum applications



## Custom vacuum chambers

With many years of experience we have the know-how of virtually all requirements and can provide professional guidance for system specifications, design and engineering.

Our physicists, designers, project managers and production specialists have extensive experience of a wide range of uses in all market segments. The tasks are based on your requirements: our starting point on the path to a finished product can range from a rough sketch to a complete set of blueprints.

Our customers include a great number of renowned large research facilities and universities, who we supply with UHV vacuum chambers, cryostats and accelerator components as well as reputable customers from industry, whose development and production areas we equip with vacuum chambers.

### Customer benefits

- Individual design
- Proven, robust design
- Optimal process adaption
- Extensive systems guidance

### Typical applications

- For all areas of vacuum technology



Space simulation



Leak detection



Air conditioning / refrigeration technology

## Technical design

Vacuum chambers are produced using high-quality materials. Special cleaning procedures guarantee contamination-free, vacuum-stable surfaces, to meet the highest of standards and are ready for immediate installation. All production phases are documented and quality tested in each production phase. You will receive a quality report containing the leak test log and other test results.

All vacuum chambers

- can be adapted to meet technical requirements
- can be equipped with the necessary accessories
- are tested for leaks

## Standards

We use 1.4301 (304) stainless steel for pipes, chamber walls and ISO flanges and 1.4307 (304 L) for CF flanges. Premium stainless steel 1.4429 ESU (316 LN ESR) is available to provide minimum outgassing rate and high strength even after vacuum annealing above 950°C. Our standard interior and exterior treatment is glass bead blasted. Surfaces can be sanded, sanded and electro-polished, chemically pickled and passivated, as well as vacuum annealed.

## Options

Your vacuum chamber can be expanded in numerous ways. We offer an extensive selection of accessories, fittings and attachments. We can also supply the following services upon request:

- Chamber materials: additional stainless steels and aluminum alloys
- Material certification
- Water cooling: as C-channel, pillow plate cooling or double walled.
- Chamber frames
- Chamber heating
- Cleaning and demagnetization annealing under vacuum
- Design and production of a pressure chamber
- FEM (Finite Element Method) calculations
- Assembly under cleanroom conditions

## Product testing

In addition to the standard leak test other tests can be carried out:

- Integral helium leak testing
- Baking-out and final vacuum residual gas analysis
- Pressure testing
- 3D check
- Permeability testing
- Electrical insulation testing
- Dye penetrant inspection
- X-ray inspection of welding seams





# Components

The connection in your vacuum system





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# Components

## The connection in your vacuum system

A vacuum system consists of several individual parts, which have to be joined together to form a single unit. Detachable, vacuum-sealed flange connections allow components to be connected directly or with vacuum components such as pipes or hoses.

Pfeiffer Vacuum offers components with various flange systems that meet the connection standards for many applications and flange sizes. The selection of proper materials and the use of high-quality production and cleaning technologies meet the high standards of vacuum technology and lead to a high degree of tightness and low outgassing rates (desorption). The broad range of standard components in stock guarantee rapid availability.

Pfeiffer Vacuum also offers more than standard solutions. Components can be modified to meet your requirements or a customized solution can be produced to perfectly fit your needs. We are a one-stop supplier for all stages of the process: assistance in finding the right solution for your application, design, manufacture, quality assurance, installation and on-site service.



### Overview of series and applications

	Analytics				Semiconductors				Coating				Industry				R & D																										
	Electron microscopy	Leak detection	Mass spectrometry	Surface analysis	Plasma monitoring	Residual gas analysis	Lithography	PVD (Physical Vapor Deposition)	CVD (Chemical Vapor Deposition)	Plasma etching	Implantation – source	Implantation – beamline	Inspection	Bonding	MBE (Molecular Beam Epitaxy)	Load locks, transfer chambers, handling systems	Flat panel displays (FPD)	LED / OLED	Hard disk coating	Photovoltaics	Glass coating (PVD)	CD, DVD, Blu-ray production (PVD)	Optical coating (PVD)	Wear protection (PVD, CVD)	Hard coating	Medical technology	Industrial leak detection	Electron beam welding	Insulation vacuums	Bulb and tube manufacturing	Heat treatment	Vacuum drying	Vacuum furnaces	Nuclear research	Fusionstechnik	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	Page
<b>■</b> = recom- mended																																											
<b>Components</b>																																											
ISO-KF	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	52					
ISO-K / ISO-F	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	106					
CF	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	144					
COF			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	194					
Viewports	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	200					

## Features at a glance

	Nominal diameter																Page							
	DN 10	DN 16	DN 25	DN 40	DN 50	DN 63	DN 75	DN 80	DN 100	DN 130	DN 160	DN 200	DN 250	DN 300	DN 320	DN 350		DN 400	DN 450	DN 500	DN 600	DN 630	DN 800	
<b>ISO-KF</b>																								
Sealing elements	■	■	■	■	■																			52
Fastening elements	■	■	■	■	■																			60
Flanges	■	■	■	■	■																			66
Pipe components	■	■	■	■	■																			70
Adapter	■	■	■	■	■																			83
Hoses and flexible connectors	■	■	■	■	■																			94
<b>ISO-K / ISO-F</b>																								
Fastening elements						■		■	■		■	■	■		■		■		■		■			106
Sealing elements						■		■	■		■	■	■		■		■		■		■			110
Flanges						■		■	■		■	■	■		■		■		■		■			114
Pipe components						■			■		■	■	■											123
Adapters						■			■		■													133
Hoses and flexible connectors						■		■	■		■	■	■		■									138
<b>CF</b>																								
Sealing elements		■	■	■	■	■	■		■	■	■	■	■	■	■	■	■							144
Fastening elements		■	■	■	■	■	■		■	■	■	■	■	■	■	■	■							149
Flanges		■	■	■	■	■	■		■	■	■	■	■	■	■	■	■							153
Adapter		■		■		■			■		■				■									178
Pipe components		■		■		■			■		■	■												182
Hoses and flexible connectors		■		■		■			■		■													192
<b>COF</b>																								
Fastening elements																		■	■	■	■		■	194
Sealing elements																		■	■	■	■		■	195
Flanges																		■	■	■	■		■	196
<b>Viewports</b>																								
ISO-KF, ISO-K, ISO-F, CF viewports		■	■	■	■	■			■		■	■												200
CF shutters				■		■			■		■													206
ISO-KF, ISO-K, CF retainers				■		■																		208
Glasses for retainers			■		■																			209

**Customer benefits**

- High availability
- Compatibility
- Easy assembly
- Suitable for a wide variety of applications



ISO-KF small flange components



ISO-K clamping flange and ISO-F fixed flange components



CF flange components for UHV applications

## Series

**ISO-KF small flange components** are produced in accordance with DIN 28403 and ISO 2861 in the nominal range DN 10 to DN 50 from the stainless steel materials 1.4301 (304) and 1.4404 (316L) and aluminum alloys. ISO-KF connections are suitable for pressures up to  $10^{-8}$  hPa and may also be used with overpressure up to 1,500 hPa. The pressure range may be expanded to  $< 10^{-9}$  hPa with metal seals.

**ISO-K clamping flange components and ISO-F fixed flange components** are produced in accordance with DIN 28404 and ISO 1609 in the nominal range DN 63 to DN 630 from the stainless steel materials 1.4301 (304) and 1.4404 (316L). ISO-K/ ISO-F connections are suitable for pressures up to  $10^{-8}$  hPa and may also be used with overpressure up to 1,500 hPa. The pressure range may be expanded to  $< 10^{-9}$  hPa with metal seals.

**CF flange components for ultra high vacuum applications** are produced for the lowest ultimate pressure in the nominal range DN 16 to DN 350 from the stainless steel materials 1.4307 (304L) and 1.4429 ESU (316LN ESR). The components meet the specification under the ISO 3669 standard and are in the nominal range DN 16 to DN 250 compatible with the ISO/TS 3669-2 standard. CF connections are sealed with flat metal gaskets and are bakeable up to 450 °C. Flanges made from 1.4429 ESU (316LN ESR) are also suitable for cleaning or demagnetization vacuum heat treatment at 1,050 °C due to their extremely high strength.

**COF flanges** are used in the large nominal range DN 400 to DN 800 for ultra high vacuum applications and are made from stainless steel materials 1.4307 (304L). The pressure range comprises  $10^{-12}$  hPa to ambient pressure. COF connections are sealed with metal wires and are bakeable up to 300 °C. They are not symmetrical and are composed of a male and female flange. COF flange dimensions are not standardized. Should there be any questions about compatibility with existing COF equipment, please contact us.

**Viewports** are primarily for visual monitoring of processes. They may also be used for the targeted transfer of electromagnetic waves. In doing so the transmission and the optical quality of the glasses need to be taken into account. We will provide you with the appropriate glass type in combination with various vacuum flange types in the nominal range DN 16 to DN 200 for your requirements.

## General information

All vacuum components from Pfeiffer Vacuum meet the high quality requirements placed on vacuum components. The vacuum components are helium leak-tested and show leakage rates better than  $10^{-10}$  Pa m<sup>3</sup>/s for ISO-KF, ISO-K/ISO-F flanges and  $10^{-11}$  Pa m<sup>3</sup>/s for CF and COF flanges. All flange components are welded from inside for an ideal vacuum. Should the geometry not permit this process, the flange will be welded entirely to avoid virtual leaks such as gaps and blind holes. Welded components are finely glass bead blasted with glass beads or pickled. Alternative surface treatments such as surface grinding, electro-polishing or annealing are available upon request.

## Important information relating to the technical data

The minimum attainable ultimate pressure in the overall system depends on a number of factors, in particular the pump system, the desorption rates, the interior surfaces and the pump down time. Minimum pressures listed in the product description are empirical values that can be achieved with a well designed vacuum system. In individual cases they can be both exceeded or not met. When using elastomer seals, their permeation also needs to be taken into account. It is dependent on the material, temperature and gas type.

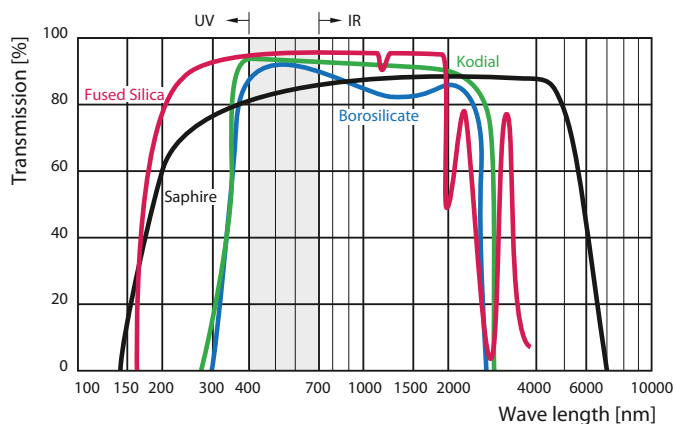
The permitted maximum and minimum temperature for the overall system is based on the lowest maximum temperature and the highest minimum temperature of the components used. The flange connections and components were developed to implement vacuum proof connections. They can only bear limited mechanical loads. Therefore it is necessary to test whether static or dynamic loads need to be absorbed by additional elements (e.g. brackets) when designing a vacuum system.



COF flange components

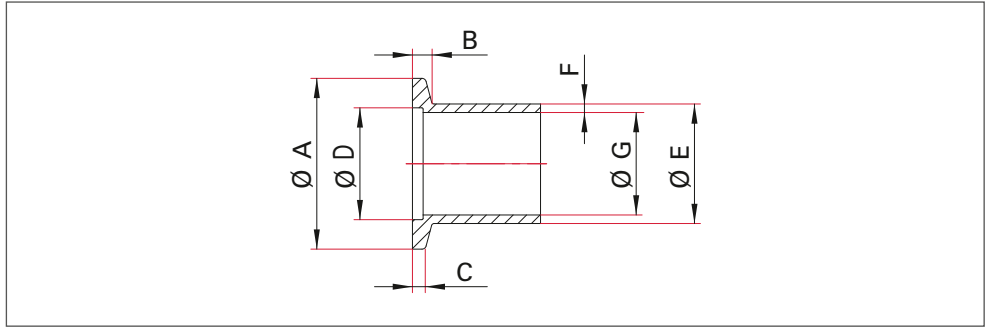


Viewports



Transmission curve for viewports

## Dimensions



## Primary dimensions of ISO-KF flanges

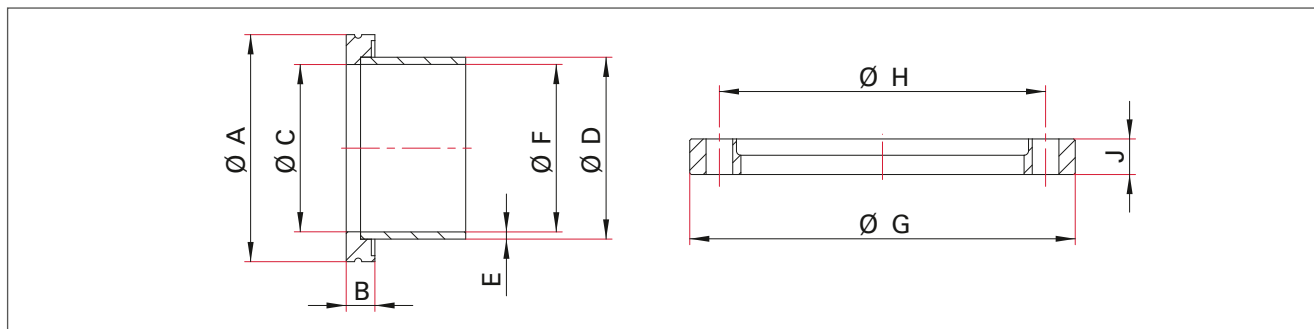
Nominal diameter	DN 10 KF	DN 16 KF	DN 25 KF	DN 40 KF	DN 50 KF
A – External diameter [mm]	30	30	40	55	75
A – External diameter [inch]	1.18	1.18	1.57	2.17	2.95
B – Flange height [mm]	5	5	5	5	5
C – [mm]	3	3	3	3	3
D – Centering ring set [mm]	12.2	17.2	26.2	41.2	52.4
E · F – Typical pipe dimension <sup>1)</sup> [mm]	14 · 2	20 · 2	28 · 2	44.5 · 2	57 · 3.2
G – Typical internal diameter <sup>2)</sup> [mm]	10	16	24	40.5	51

<sup>1)</sup> Additional pipe dimensions can be found particularly in the products “weld ring flange” and “flange with half nipple”.

<sup>2)</sup> The minimum inner diameter is determined by the combination of flange, pipe and centering ring. In addition, welding seams and manufacturing tolerances of the pipes can locally reduce the free diameter.



## Dimensions



## Primary dimensions for ISO-K and ISO-F flanges

Nominal diameter	DN 63 ISO-K	DN 80 ISO-K	DN 100 ISO-K	DN 160 ISO-K	DN 200 ISO-K	DN 250 ISO-K	DN 320 ISO-K	DN 400 ISO-K	DN 500 ISO-K	DN 630 ISO-K
A - External diameter [mm]	95	110	130	180	240	290	370	450	550	690
A - External diameter [inch]	3.74	4.33	5.12	7.09	9.45	11.42	14.57	17.72	21.65	27.17
B - Flange height [mm]	12	12	12	12	12	12	17	17	17	22
C - Centering ring set [mm]	70	83	102	153	213	261	318	400	501	651
D · E - Typical pipe dimension <sup>1)</sup> [mm]	76.1 · 3	88.9 · 3	108 · 3	159 · 3	219 · 3	273 · 3	324 · 3	406 · 3	508 · 4	660 · 5
F - Typical internal diameter <sup>2)</sup> [mm]	70	83	102	153	213	261	318	400	500	650
G - External diameter [mm] ISO-F flange and FLU <sup>3)</sup>	130	145	165	225	285	335	425	510	610	750
H - Bolt holes [mm] ISO-F flange and FLU <sup>3)</sup>	110	125	145	200	260	310	395	480	580	720
J - Height [mm] ISO-F flange and FLU	12	12	12	16	16	16	20	20	20	24
Number of bore holes · diameter [mm] ISO-F flange and FLU <sup>3)</sup>	4 · 9	8 · 9	8 · 9	8 · 11	12 · 11	12 · 11	12 · 13.5	16 · 13.5	16 · 13.5	20 · 13.5
Recommended number of bracket screws for elastomer seals <sup>4)</sup>	4	4	4	4	6	6	8	8	12	12
Minimal number of bracket screws for aluminum edged seal <sup>4)</sup>	4	6	6	8	10	12	-	-	-	-
Number of claws / screws	4 · M8	8 · M8	8 · M8	8 · M10	12 · M10	12 · M10	12 · M12	16 · M12	16 · M12	20 · M12

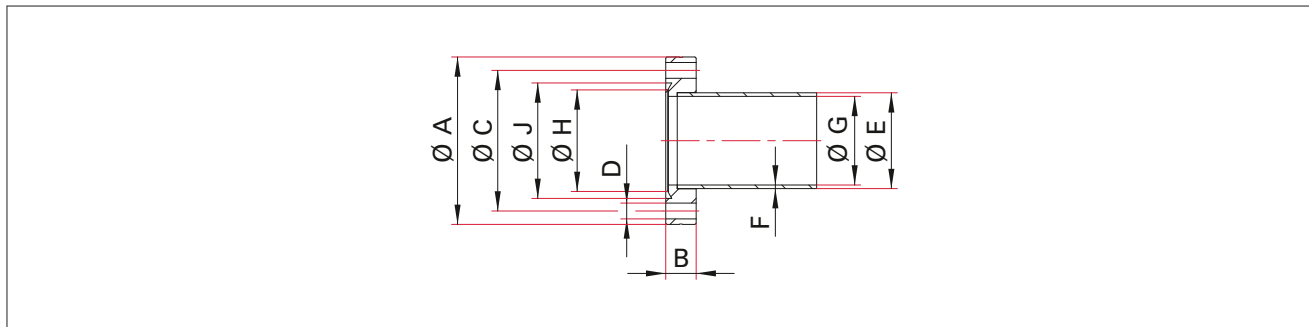
<sup>1)</sup> Additional pipe dimensions can be found particularly in the products "weld ring flange" and "flange with half nipple".

<sup>2)</sup> The minimum inner diameter is determined by the combination of flange, pipe and centering ring. In addition, welding seams and manufacturing tolerances of the pipes can locally reduce the free diameter.

<sup>3)</sup> FLU = Rotatable bolt ring

<sup>4)</sup> Note the installation instructions for the component!

## Dimensions for CF flange



## Primary dimensions of CF flanges

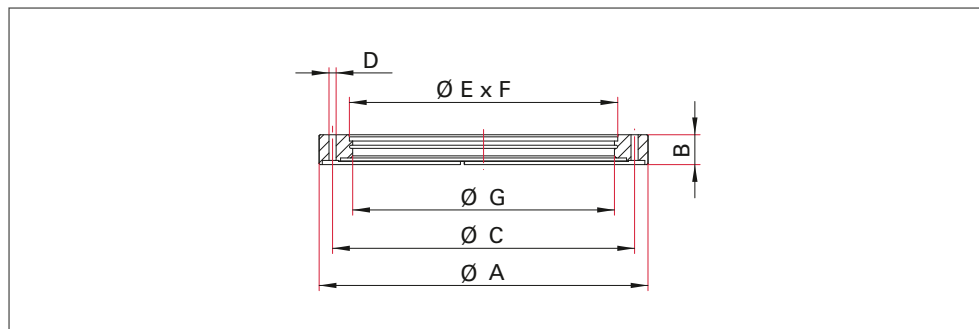
Nominal diameter	DN 16 CF	DN 25 CF	DN 40 CF	DN 50 CF	DN 63 CF	DN 75 CF	DN 100 CF
A – External diameter [mm]	34.0	54.0	69.9	85.7	113.5	117.4	152.0
A – External diameter [inch]	1-1/3	2-1/8	2-3/4	3-3/8	4-1/2	4-5/8	6
B – Flange height [mm]	7.75	12.0	12.7	17.3	17.5	17.5	19.8
C – Bolt hole diameter for screws [mm]	27.0	41.3	58.7	72.4	92.2	102.3	130.3
D – Number · Diameter Screw bore holes [mm]	6 · 4.4	4 · 6.6	6 · 6.6	8 · 8.4	8 · 8.4	10 · 8.4	16 · 8.4
E · F – Typical outside pipe diameter <sup>1)</sup> [mm]	18 · 1	28 · 2	40 · 1.5	50.8 · 1.65	70 · 2	76.1 · 2	108 · 2
G – Typical internal diameter <sup>2)</sup> [mm]	16	24	37	47.5	66	72.1	104
H – Diameter cutting edge [mm]	18.3	27.7	41.9	55.9	77	86.2	115.3
J – Diameter groove for flange seal [mm]	21.4	33.0	48.25	61.8	82.5	91.6	120.6

Nominal diameter	DN 130 CF	DN 160 CF	DN 200 CF	DN 250 CF	DN 300 CF	DN 350 CF
A – External diameter [mm]	171.4	202.4	253.2	304.8	355.6	419.1
A – External diameter [inch]	6-3/4	8	10	12	14	16.5
B – Flange height [mm]	21.4	22.2	24.5	26.0	28.5	28.5
C – Bolt hole diameter screws [mm]	151.6	181.0	231.8	284.0	325.4	388.9
D – Number · Cross section Screw bore holes [mm]	18 · 8.4	20 · 8.4	24 · 8.4	32 · 8.4	30 · 10.5	36 · 10.5
E · F – Typical outside pipe diameter <sup>1)</sup> [mm]	127 · 1.65	159 · 2	205 · 2.5	256 · 3	306 · 3	356 · 3
G – Typical internal diameter <sup>2)</sup> [mm]	123.7	154.5	200	250	300	350
H – Diameter cutting edge [mm]	136.3	166.1	216.9	267	308.9	370.7
J – Diameter groove for flange seal [mm]	141.8	171.4	222.2	273.1	313.5	376.8

<sup>1)</sup> Additional pipe dimensions can be found particularly in the products “weld ring flange” and “flange with half nipple”..

<sup>2)</sup> The minimum internal diameter is determined by the combination of flange, pipe and seal. In addition, welding seams and manufacturing tolerances of the pipes can locally reduce the free diameter.

## Dimensions for COF flange



## Primary dimensions of COF flanges

Nominal diameter	DN 400 COF	DN 450 COF	DN 500 COF	DN 600 COF	DN 800 COF
A – External diameter [mm]	497	562	595	690	890
B – Flange height [mm]	33	38	43	43	43
C – Bolt hole diameter screws [mm]	454	513	559	661	859
D – Number · Diameter Screw bore holes [mm]	36 · 13	36 · 17	36 · 17	40 · 17	52 · 17
E · F – Pipe dimension [mm]	406 · 3	458 · 4	508 · 4	610 · 5	812 · 6
G – Internal diameter <sup>1)</sup> [mm]	400	450	500	600	800

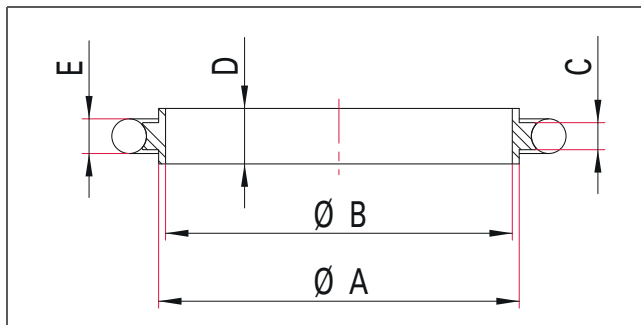
<sup>1)</sup> The minimum internal diameter is determined by the combination of flange and pipe. In addition, welding seams and manufacturing tolerances of the pipes can locally reduce the free diameter.

## ISO-KF Centering Ring



- Material: O-ring in various materials
- Temperature range: FKM: -15 to 150 °C (shortly up to 200 °C); NBR: -25 to 120 °C; CR: -5 to 120 °C; EPDM: -50 to 130 °C

### Dimensions



### Aluminum EN AW-6061

Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 KF	CR	12	10	3.9	8	5	116ZRG010
DN 16 KF	CR	17	16	3.9	8	5	116ZRG016
DN 25 KF	CR	26	25	3.9	8	5	116ZRG025
DN 40 KF	CR	41	40	3.9	8	5	116ZRG040
DN 50 KF	CR	52	50	3.9	8	5.33	116ZRG050
DN 10 KF	FKM	12	10	3.9	8	5	112ZRG010
DN 16 KF	FKM	17	16	3.9	8	5	112ZRG016
DN 25 KF	FKM	26	25	3.9	8	5	112ZRG025
DN 40 KF	FKM	41	40	3.9	8	5	112ZRG040
DN 50 KF	FKM	52	50	3.9	8	5.33	112ZRG050
DN 10 KF	NBR	12	10	3.9	8	5	111ZRG010
DN 16 KF	NBR	17	16	3.9	8	5	111ZRG016
DN 25 KF	NBR	26	25	3.9	8	5	111ZRG025
DN 40 KF	NBR	41	40	3.9	8	5	111ZRG040
DN 50 KF	NBR	52	50	3.9	8	5.33	111ZRG050

According to ISO 2861

### Stainless Steel 304/1.4301

Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 KF	FKM	12	10	3.9	8	5	122ZRG010
DN 16 KF	FKM	17	16	3.9	8	5	122ZRG016
DN 25 KF	FKM	26	25	3.9	8	5	122ZRG025
DN 40 KF	FKM	41	40	3.9	8	5	122ZRG040
DN 50 KF	FKM	52	50	3.9	8	5.33	122ZRG050
DN 16 KF	EPDM	17	16	3.9	8	5	124ZRG016
DN 25 KF	EPDM	26	25	3.9	8	5	124ZRG025
DN 40 KF	EPDM	41	40	3.9	8	5	124ZRG040
DN 50 KF	EPDM	52	50	3.9	8	5.33	124ZRG050

According to ISO 2861

## Stainless Steel 316L/1.4404

Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 KF	FKM	12	10	3.9	8	5	172ZRG010
DN 16 KF	FKM	17	16	3.9	8	5	172ZRG016
DN 25 KF	FKM	26	25	3.9	8	5	172ZRG025
DN 40 KF	FKM	41	40	3.9	8	5	172ZRG040
DN 50 KF	FKM	52	50	3.9	8	5.33	172ZRG050

According to ISO 2861

## ISO-KF Centering Ring, Plastic

- Material: Plastic
- Temperature range: -15 to 150 °C (shortly up to 200 °C)



## PTFE

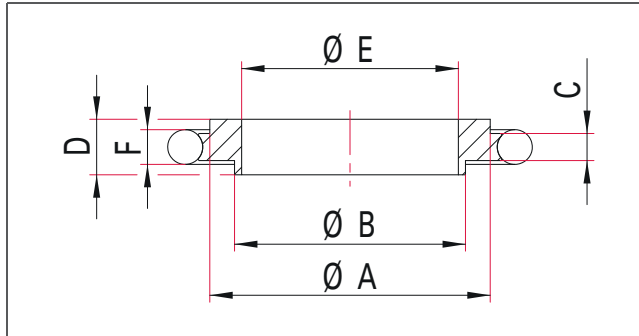
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 KF	FKM	12	10	3.9	8	5	132ZRG010
DN 16 KF	FKM	17	16	3.9	8	5	132ZRG016
DN 25 KF	FKM	26	25	3.9	8	5	132ZRG025
DN 40 KF	FKM	41	40	3.9	8	5	132ZRG040
DN 50 KF	FKM	52	50	3.9	8	5.33	132ZRG050

## ISO-KF Reducer Centering Ring



- Material: O-ring in various materials
- Temperature range: FKM: -15 to 150 °C (shortly up to 200 °C);  
NBR: -25 to 120 °C; CR: -5 to 120 °C

### Dimensions



### Aluminum EN AW-6061

Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Nominal diameter reduced	Order number
DN 16 KF	FKM	17	12	3.9	8	10	5	DN 10 KF	112ZRR016
DN 25 KF	FKM	26	22	3.9	8	21	5	DN 20 KF	112ZRR025
DN 40 KF	FKM	41	34	3.9	8	32	5	DN 32 KF	112ZRR040
DN 16 KF	NBR	17	12	3.9	8	10	5	DN 10 KF	111ZRR016
DN 25 KF	NBR	26	22	3.9	8	21	5	DN 20 KF	111ZRR025
DN 40 KF	NBR	41	34	3.9	8	32	5	DN 32 KF	111ZRR040
DN 16 KF	CR	17	12	3.9	8	10	5	DN 10 KF	116ZRR016
DN 25 KF	CR	26	22	3.9	8	21	5	DN 20 KF	116ZRR025
DN 40 KF	CR	41	34	3.9	8	32	5	DN 32 KF	116ZRR040

According to ISO 2861

### Stainless Steel 304/1.4301

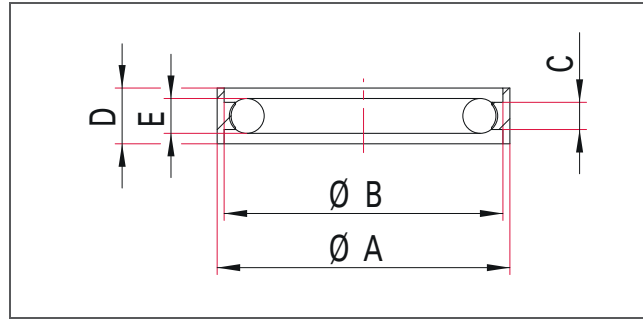
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Nominal diameter reduced	Order number
DN 16 KF	FKM	17	12	3.9	8	10	5	DN 10 KF	122ZRR016
DN 25 KF	FKM	26	22	3.9	8	21	5	DN 20 KF	122ZRR025
DN 40 KF	FKM	41	34	3.9	8	32	5	DN 32 KF	122ZRR040

According to ISO 2861

## ISO-KF Outer Centering Ring

- Available in aluminum, stainless steel or plastic

### Dimensions



### Aluminum EN AW-6061

- Temperature range: FKM: -15 to 150 °C (shortly up to 200 °C); EPDM: -50 to 130 °C

Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 16 KF	EPDM	32.5	30	3.9	8	5	114ZAR016
DN 25 KF	EPDM	42	40	3.9	8	5	114ZAR025
DN 40 KF	EPDM	57.5	55	3.9	8	5	114ZAR040
DN 50 KF	EPDM	77.5	75	3.9	8	5.33	114ZAR050
DN 16 KF	FKM	32.5	30	3.9	8	5	112ZAR016
DN 25 KF	FKM	42	40	3.9	8	5	112ZAR025
DN 40 KF	FKM	57.5	55	3.9	8	5	112ZAR040
DN 50 KF	FKM	77.5	75	3.9	8	5.33	112ZAR050

### Stainless Steel 304/1.4301

- Temperature range: -15 to 150 °C (shortly up to 200 °C)

Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 16 KF	FKM	32.5	30	3.9	8	5	122ZAR016
DN 25 KF	FKM	42	40	3.9	8	5	122ZAR025
DN 40 KF	FKM	57.5	55	3.9	8	5	122ZAR040
DN 50 KF	FKM	77.5	75	3.9	8	5.33	122ZAR050

### Plastic PTFE

- Temperature range: -15 to 150 °C (shortly up to 200 °C)

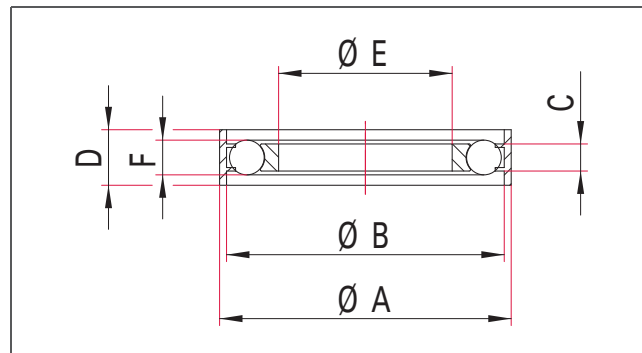
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 16 KF	FKM	32.5	30	3.9	8	5	132ZAR016
DN 25 KF	FKM	42	40	3.9	8	5	132ZAR025
DN 40 KF	FKM	57.5	55	3.9	8	5	132ZAR040
DN 50 KF	FKM	77.5	75	3.9	8	5.33	132ZAR050

## ISO-KF Outer Centering Ring with Inner Support Ring



- Inner ring material: Stainless steel
- Temperature range: -15 to 150 °C (shortly up to 200 °C)

### Dimensions



### Aluminum EN AW-6061

Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 16 KF	FKM	32.5	30	3.9	8	16	5	112ZAI016
DN 25 KF	FKM	42	40	3.9	8	25	5	112ZAI025
DN 40 KF	FKM	57.5	55	3.9	8	40	5	112ZAI040
DN 50 KF	FKM	77.5	75	3.9	8	50	5.33	112ZAI050

### Stainless Steel 304/1.4301

Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 16 KF	FKM	32.5	30	3.9	8	16	5	122ZAI016
DN 25 KF	FKM	42	40	3.9	8	25	5	122ZAI025
DN 40 KF	FKM	57.5	55	3.9	8	40	5	122ZAI040
DN 50 KF	FKM	75.5	75	3.9	8	50	5.33	122ZAI050

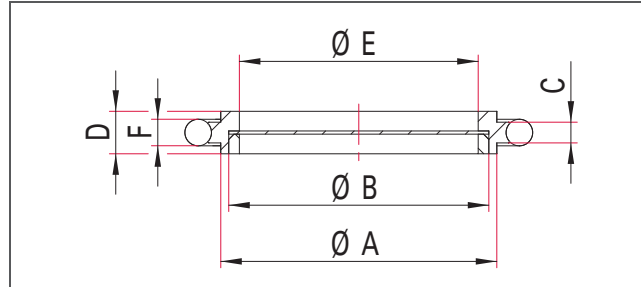


## ISO-KF Centering Ring with Screen



- Material: Stainless Steel
- Wire thickness: Approximately 0.3 mm
- Mesh: Approximately 1 mm
- Temperature range: -15 to 150 °C (shortly up to 200 °C)

### Dimensions



Stainless Steel 304/1.4301

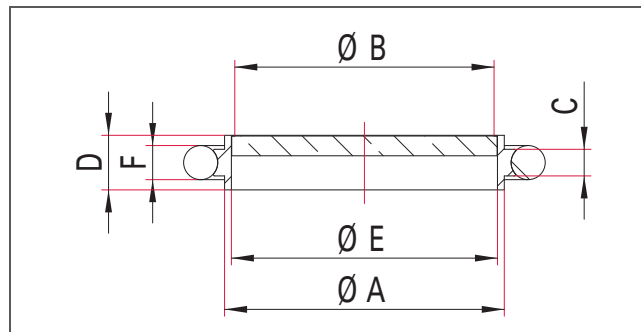
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 10 KF	FKM	12	10	3.9	8	7	5	122ZRD010
DN 16 KF	FKM	17	16	3.9	8	13	5	122ZRD016
DN 25 KF	FKM	26	25	3.9	8	19	5	122ZRD025
DN 40 KF	FKM	41	40	3.9	8	34	5	122ZRD040
DN 50 KF	FKM	52	50	3.9	8	45	5.33	122ZRD050

## ISO-KF Centering Ring with Sintered Metal Filter



- Material: Sintered bronze
- Mesh: Average pore diameter: Approximately 0.02 mm
- Temperature range: -15 to 150 °C (shortly up to 200 °C)

### Dimensions



Stainless Steel 304/1.4301

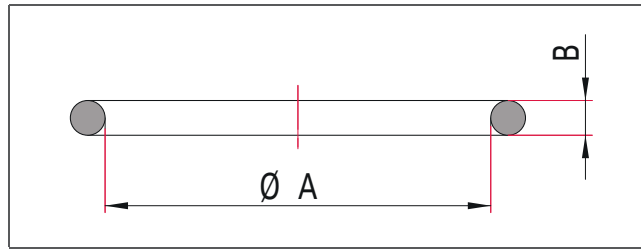
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 10 KF	FKM	12	9	3.9	8	10	5	122ZRS010
DN 16 KF	FKM	17	13	3.9	8	14	5	122ZRS016
DN 25 KF	FKM	26	23	3.9	8	24	5	122ZRS025
DN 40 KF	FKM	41	38	3.9	8	39	5	122ZRS040
DN 50 KF	FKM	52	48	3.9	8	49	5.33	122ZRS050

## ISO-KF O-Ring

- Quantities: Item no. suffix -S10 = 10 pieces



### Dimensions



### FKM

- Temperature range: -15 to 150 °C (shortly up to 200 °C)

Nominal diameter	A [mm]	B [mm]	Order number
DN 10 KF	15	5	102DOR010-S10
DN 16 KF	18	5	102DOR016-S10
DN 25 KF	28	5	102DOR025-S10
DN 40 KF	42	5	102DOR040-S10
DN 50 KF	53.34	5.33	102DOR050-S10

According to ISO 2861

### NBR

- Temperature range: -25 to 120 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 10 KF	15	5	101DOR010-S10
DN 16 KF	18	5	101DOR016-S10
DN 25 KF	28	5	101DOR025-S10
DN 40 KF	42	5	101DOR040-S10
DN 50 KF	53.34	5.33	101DOR050-S10

According to ISO 2861

### Silicone (VMQ)

- Temperature range: -55 to 200 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 10 KF	15	5	103DOR010-S10
DN 16 KF	18	5	103DOR016-S10
DN 25 KF	28	5	103DOR025-S10
DN 40 KF	42	5	103DOR040-S10
DN 50 KF	53.34	5.33	103DOR050-S10

According to ISO 2861

### EPDM

- Temperature range: -50 to 130 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 10 KF	15	5	104DOR010-S10
DN 16 KF	18	5	104DOR016-S10
DN 25 KF	28	5	104DOR025-S10
DN 40 KF	42	5	104DOR040-S10
DN 50 KF	53.34	5.33	104DOR050-S10

According to ISO 2861

**CR**

- Temperature range: -5 to 120 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 10 KF	15	5	106DOR010-S10
DN 16 KF	18	5	106DOR016-S10
DN 25 KF	28	5	106DOR025-S10
DN 40 KF	42	5	106DOR040-S10
DN 50 KF	53.34	5.33	106DOR050-S10

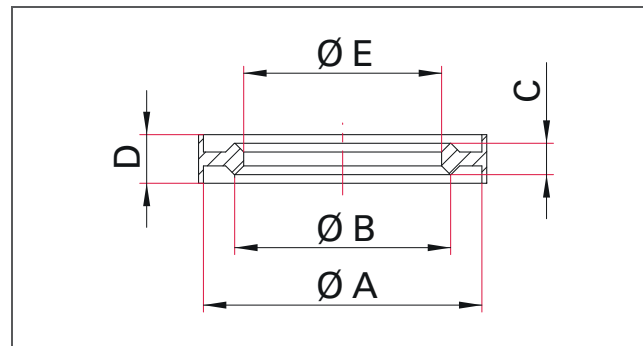
According to ISO 2861

## ISO-KF Aluminum Edged Seal

- For stainless steel flanges
- No gas permeation
- Fastener: ISO-KF Clamp for Metal Seals
- For single use only
- Temperature range: -196 to 150 °C



### Dimensions



### Aluminum EN AW-6082/3.2315, Soft-annealed

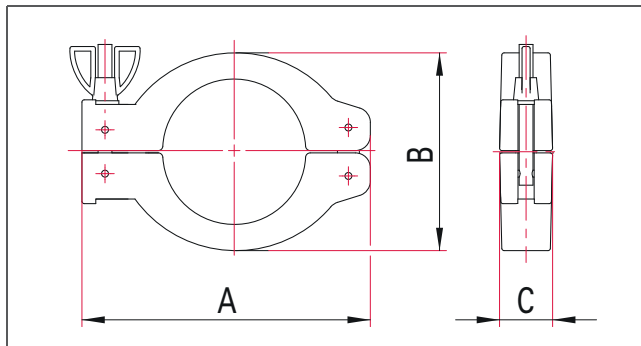
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 / 16 KF	30	21	4.5	7	18.5	110ZSK016
DN 20 / 25 KF	40	31	4.5	7	28.5	110ZSK025
DN 32 / 40 KF	55	46	4.5	7	43.5	110ZSK040
DN 50 KF	75	66	4.5	7	63.5	110ZSK050

## ISO-KF Clamp for Elastomer Seal



- Suitable for use with elastomer seals
- Torque: max. 2 Nm on wingnut
- Temperature range: -196 to 200 °C
- Over pressure max.: 1500 hPa

### Dimensions



### Aluminum ADC 12

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 / 16 KF	63	43	16	110BSR016
DN 20 / 25 KF	72	54	16	110BSR025
DN 32 / 40 KF	90	70	16	110BSR040
DN 50 KF	113	92	22	110BSR050

According to ISO 2861

### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 / 16 KF	62	45	17	120BSR016
DN 20 / 25 KF	73	53	17	120BSR025
DN 32 / 40 KF	90	68	17	120BSR040
DN 50 KF	115	90	19	120BSR050

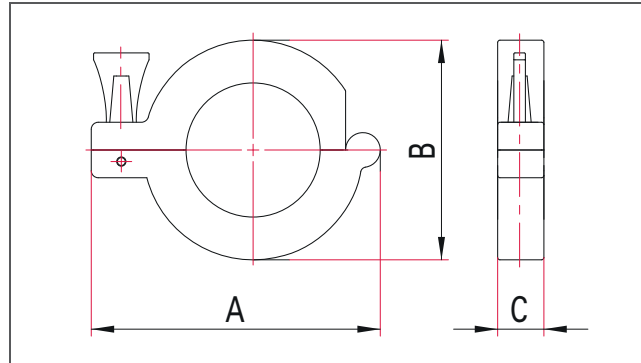
According to ISO 2861

## ISO-KF Clamping Ring for Elastomer Seal, Plastic



- Particularly well suited for glass flanges
- Suitable for use with elastomer seals
- Torque: max. 2 Nm on wingnut
- Temperature range: -10 to 80 °C
- Over pressure max.: 500 hPa

### Dimensions



### Plastic

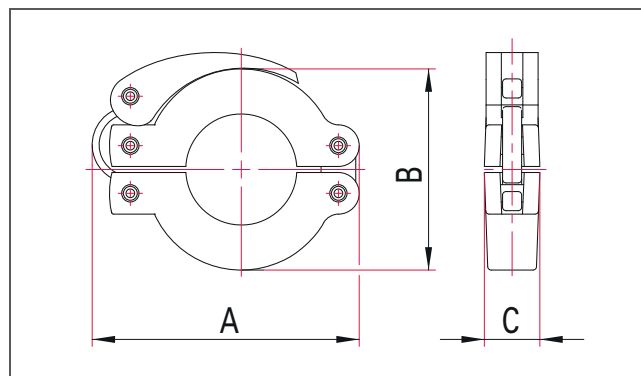
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 / 16 KF	65	47	20	130BSR016
DN 20 / 25 KF	79	59	20	130BSR025
DN 32 / 40 KF	92	74	20	130BSR040
DN 50 KF	123	95	23	130BSR050

## ISO-KF Quick-Release Clamp



- Suitable for use with elastomer seals
- Temperature range: -10 to 80 °C
- Over pressure max.: 500 hPa

### Dimensions



### Aluminum/Plastic

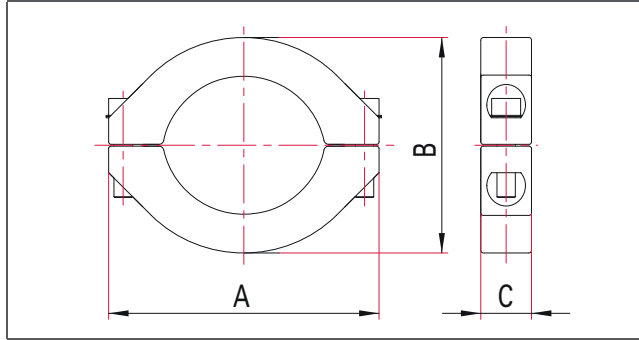
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 / 16 KF	68	45	16	110BSS016
DN 20 / 25 KF	80	55	16	110BSS025
DN 32 / 40 KF	98	70	18	110BSS040

## ISO-KF Clamp for Metal Seals



- Suitable for use with elastomer and metal seals
- Bolts: Hexagon socket, A2-70 steel
- We recommend using a screw thread lubricant
- Temperature range: -196 to 300 °C
- Over pressure max.: 500 hPa

### Dimensions



### Stainless Steel 304/1.4301

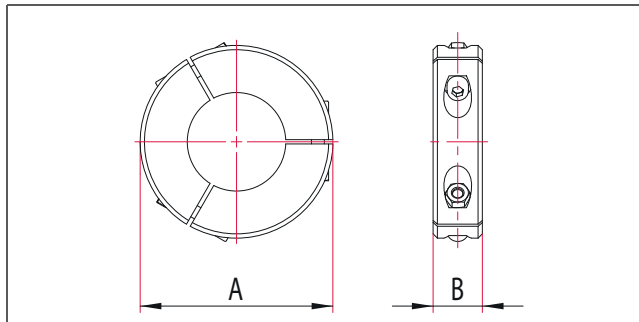
Nominal diameter	A [mm]	B [mm]	C [mm]	Bolt	Order number
DN 10 / 16 KF	55	47	18	M5 x 25	120BSM016
DN 20 / 25 KF	66.5	57	18	M5 x 25	120BSM025
DN 32 / 40 KF	82.5	72	18	M5 x 25	120BSM040
DN 50 KF	122	96	21	M8 x 35	120BSM050

## ISO-KF Bolt Clamp (3-Part) for Metal Seals



- Suitable for use with metal and elastomer seals
- Bolts: Hexagon socket, A2-70 steel
- Temperature range: -196 to 200 °C
- Over pressure max.: 500 hPa

### Dimensions



### Aluminum

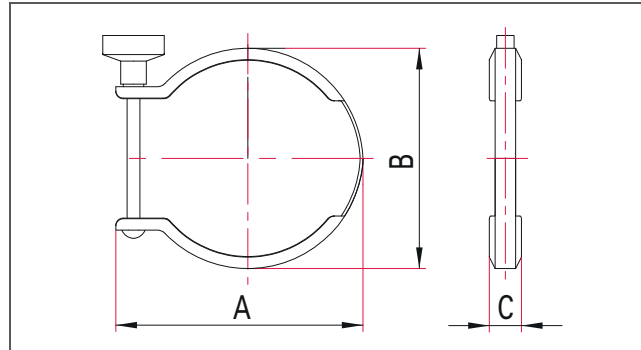
Nominal diameter	A [mm]	B [mm]	Bolt	Order number
DN 10 / 16 KF	48	18	M4 x 30	110BSD016
DN 20 / 25 KF	70	19	M6 x 30	110BSD025
DN 32 / 40 KF	85	23	M8 x 35	110BSD040
DN 50 KF	112	28	M8 x 35	110BSD050

## ISO-KF Hingeless Clamp



- Suitable for use with elastomer seals
- Compact design
- Torque: max. 2 Nm on wingnut
- Temperature range: -10 to 125 °C
- Over pressure max.: 500 hPa

### Dimensions



### Stainless Steel 304/1.4301

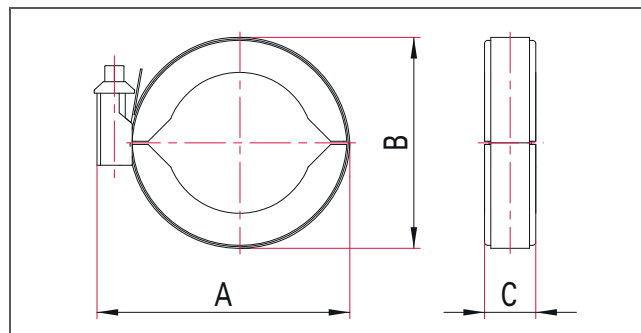
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 / 16 KF	47	38	16	120BSG016
DN 20 / 25 KF	54	49	16	120BSG025
DN 32 / 40 KF	70	62	16	120BSG040
DN 50 KF	90	84	16	120BSG050

## ISO-KF Clamping Ring for Elastomer Seals



- Suitable for use with elastomer seals
- Compact design
- Screw: Hexagon head; wrench width 7 mm
- Temperature range: 0 to 100 °C
- Over pressure max.: 500 hPa

### Dimensions



### Aluminum ADC 12/Steel

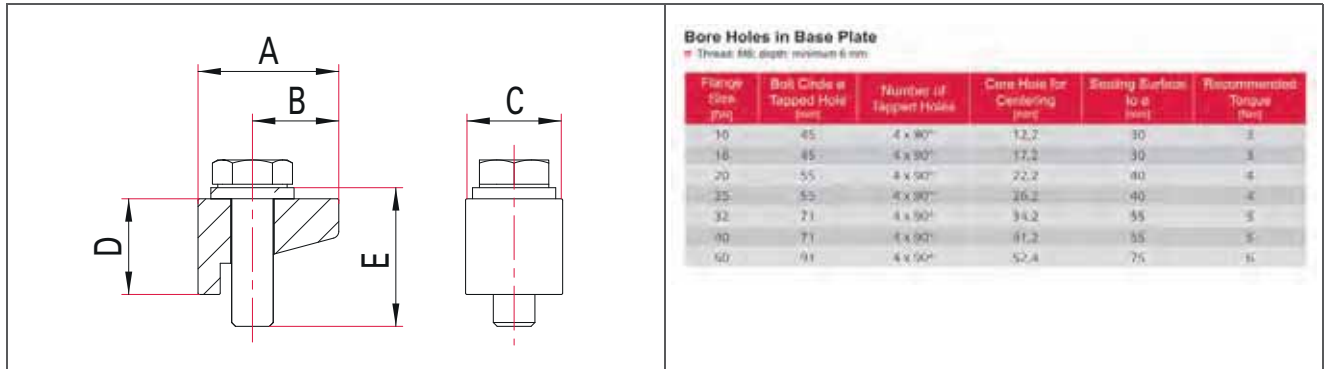
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 / 16 KF	54	39	16	110BSB016
DN 20 / 25 KF	63	48	16	110BSB025
DN 32 / 40 KF	80	64	16	110BSB040

## ISO-KF Claw Clamp



- Suitable for use with elastomer seals
- For installing on a base plate with KF centering ring
- Holes: Needed number of tapped holes in base plate: 4x90°  
(Thread: M6, depth: min. 6 mm)
- Torque: Max. 8 Nm
- Bolt: Hexagon head, A2-70 steel, M6 x 20 mm
- Temperature range: -196 to 200 °C
- Over pressure max.: 500 hPa

### Dimensions



### Aluminum EN AW-6061

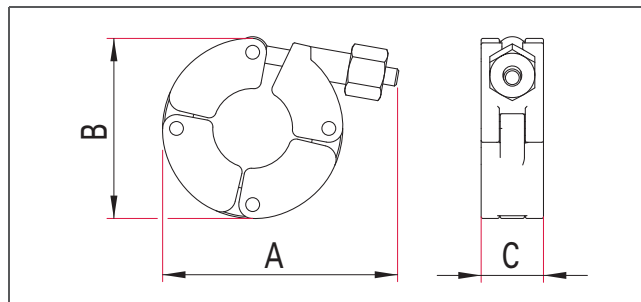
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 - 50 KF	20.5	12.5	14	14	20	110BPR050-2

## ISO-KF Chain Clamp, Aluminum



- Suitable for use with elastomer and metallic seals
- Hand grip: Stainless steel
- Temperature range: -196 to 200 °C
- Over pressure max.: 500 hPa

### Dimensions



### Aluminum/stainless steel

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10-16 ISO-KF	71	52.5	18	PF 106 016-T
DN 20-25 ISO-KF	82	65	18	PF 106 025-T
DN 32-40 ISO-KF	98	79	18	PF 106 040-T
DN 50 ISO-KF	117	97.5	20	PF 106 050-T

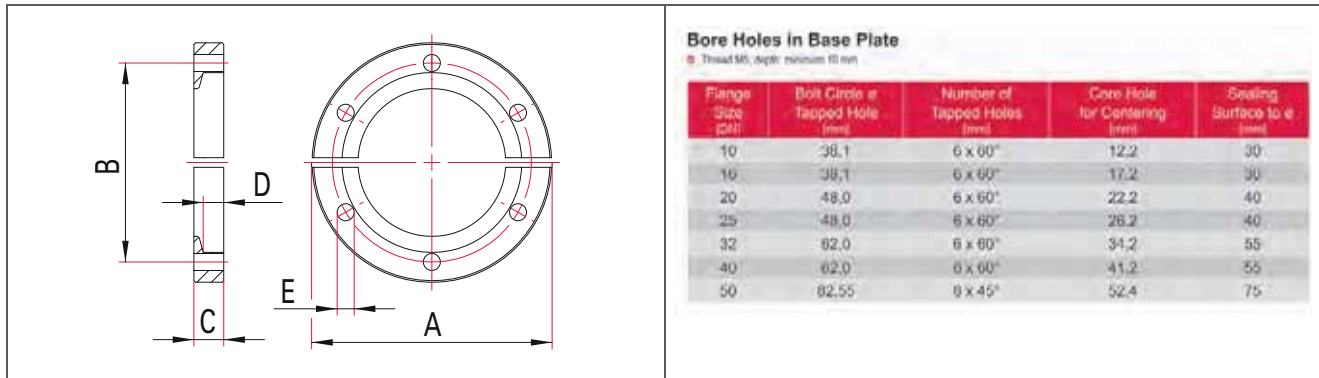


## ISO-KF Bulkhead Clamp



- Suitable for use with elastomer seals
- For mounting on a base plate with KF centering ring
- Holes: Number of tapped holes in base plate: DN 10-40: 6x60°; DN 50: 8x45°  
(Thread M5, depth: min. 10 mm)
- Kind of screw: Hexagon head, A2-70 steel, M5x20
- Temperature range: -196 to 200 °C
- Over pressure max.: 500 hPa

### Dimensions



### Aluminum EN AW-6082/3.2315

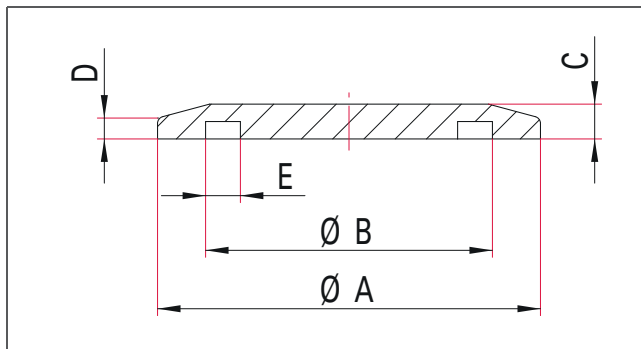
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 / 16 KF	50.8	38.1	9.2	6.5	5.3	110BUH016
DN 20 / 25 KF	60.3	48	9.9	6.6	5.3	110BUH025
DN 32 / 40 KF	74.6	62	9.3	6.6	5.3	110BUH040
DN 50 KF	95.2	82.55	10.3	6.5	5.3	110BUH050

## ISO-KF Blank Flange

- Available in stainless steel or aluminum



### Dimensions



### Aluminum EN AW-6082/3.2315

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure
- Temperature range: -196 to 200 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 KF	30	12.2	5	3	-	110FBL010
DN 16 KF	30	17.2	5	3	-	110FBL016
DN 25 KF	40	26.2	5	3	3.5	110FBL025
DN 40 KF	55	41.2	5	3	5	110FBL040
DN 50 KF	75	52.4	5	3	5	110FBL050

Flanges according to ISO 2861

### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 KF	30	12.2	5	3	-	120FBL010
DN 16 KF	30	17.2	5	3	-	120FBL016
DN 25 KF	40	26.2	5	3	3.5	120FBL025
DN 40 KF	55	41.2	5	3	5	120FBL040
DN 50 KF	75	52.4	5	3	5	120FBL050

Flanges according to ISO 2861

### Stainless Steel 316L/1.4404

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 350 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 KF	30	12.2	5	3	-	170FBL010
DN 16 KF	30	17.2	5	3	-	170FBL016
DN 25 KF	40	26.2	5	3	3.5	170FBL025
DN 40 KF	55	41.2	5	3	5	170FBL040
DN 50 KF	75	52.4	5	3	5	170FBL050

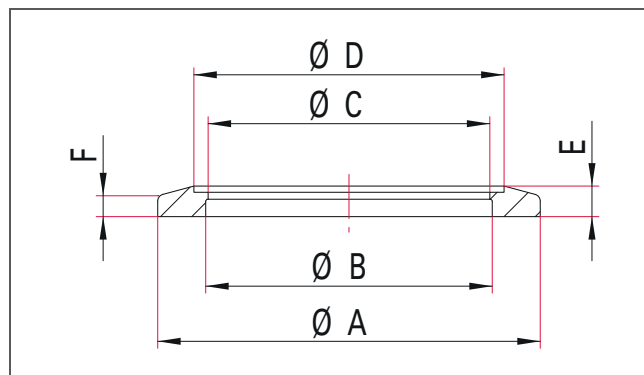
Flanges according to ISO 2861

## ISO-KF Weld Ring Flange

- Various stainless steel grades available



### Dimensions



#### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 10 KF	12.7 x 1.24	30	12.2	10.2	12.8	5	3	120FAN010-12
DN 10 KF	14 x 2	30	12.2	10	14.15	5	3	120FAN010-14
DN 16 KF	19.05 x 1.65	30	17.2	15.75	19.2	5	3	120FAN016-19
DN 16 KF	20 x 2	30	17.2	16	20.2	5	3	120FAN016-20
DN 25 KF	25.4 x 1.65	40	26.2	22.1	25.6	5	3	120FAN025-25
DN 25 KF	28 x 2	40	26.2	24	28.2	5	3	120FAN025-28
DN 40 KF	38 x 1.5	55	41.2	34.8	38.4	5	3	120FAN040-38
DN 40 KF	44.5 x 2	55	41.2	40.5	44.7	5	3	120FAN040-44
DN 50 KF	50.8 x 1.65	75	52.4	47.5	51	5	3	120FAN050-51
DN 50 KF	57 x 3.2	75	52.4	50.6	57.2	5	3	120FAN050-57

Flanges according to ISO 2861

#### Stainless Steel 316L/1.4404

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 350 °C

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 10 KF	14 x 2	30	12.2	10	14.15	5	3	170FAN010-14
DN 16 KF	20 x 2	30	17.2	16	20.2	5	3	170FAN016-20
DN 25 KF	28 x 2	40	26.2	24	28.2	5	3	170FAN025-28
DN 40 KF	44.5 x 2	55	41.2	40.5	44.7	5	3	170FAN040-44
DN 50 KF	57 x 3.2	75	52.4	50.6	57.2	5	3	170FAN050-57

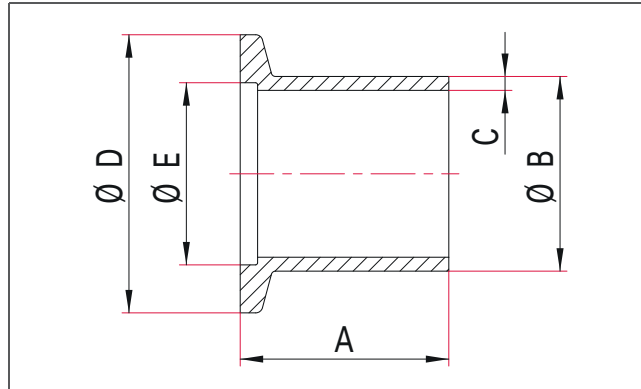
Flanges according to ISO 2861

## ISO-KF Half Nipple



- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)

### Dimensions



### Stainless Steel 304/1.4301

- Temperature range: -196 to 300 °C

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 KF	14 x 2	30	14	2	30	12.2	120FRA010-14-30
DN 10 KF	14 x 2	52	14	2	30	12.2	120FRA010-14-52
DN 10 KF	14 x 2	70	14	2	30	12.2	120FRA010-14-70
DN 16 KF	19.05 x 1.65	40	19.05	1.65	30	17.2	120FRA016-19-40
DN 16 KF	20 x 2	30	20	2	30	17.2	120FRA016-20-30
DN 16 KF	20 x 2	52	20	2	30	17.2	120FRA016-20-52
DN 16 KF	20 x 2	70	20	2	30	17.2	120FRA016-20-70
DN 25 KF	25.4 x 1.65	40	25.4	1.65	40	26.2	120FRA025-25-40
DN 25 KF	28 x 2	30	28	2	40	26.2	120FRA025-28-30
DN 25 KF	28 x 2	55	28	2	40	26.2	120FRA025-28-55
DN 25 KF	28 x 2	70	28	2	40	26.2	120FRA025-28-70
DN 40 KF	38 x 1.5	40	38	1.5	55	41.2	120FRA040-38-40
DN 40 KF	42.4 x 2	26	42.4	2	55	41.2	120FRA040-42-26
DN 40 KF	44.5 x 2	30	44.5	2	55	41.2	120FRA040-44-30
DN 40 KF	44.5 x 2	58	44.5	2	55	41.2	120FRA040-44-58
DN 40 KF	44.5 x 2	70	44.5	2	55	41.2	120FRA040-44-70
DN 50 KF	50.8 x 1.65	40	50.8	1.65	75	52.4	120FRA050-50-40
DN 50 KF	54 x 2	26	54	2	75	52.4	120FRA050-54-26
DN 50 KF	57 x 3.2	30	57	3.2	75	52.4	120FRA050-57-30
DN 50 KF	57 x 3.2	58	57	3.2	75	52.4	120FRA050-57-58
DN 50 KF	57 x 3.2	70	57	3.2	75	52.4	120FRA050-57-70

Flanges according to ISO 2861

**Stainless Steel 316L/1.4404**

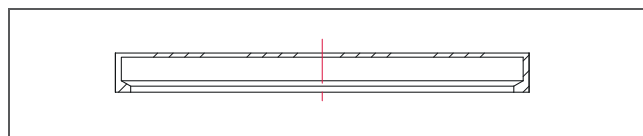
■ Temperature range: -196 to 350 °C

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 KF	14 x 2	30	14	2	30	12.2	170FRA010-14-30
DN 10 KF	14 x 2	70	14	2	30	12.2	170FRA010-14-70
DN 16 KF	19.05 x 1.65	40	19.05	1.65	30	17.2	170FRA016-19-40
DN 16 KF	20 x 2	30	20	2	30	17.2	170FRA016-20-30
DN 16 KF	20 x 2	70	20	2	30	17.2	170FRA016-20-70
DN 25 KF	25.4 x 1.65	40	25.4	1.65	40	26.2	170FRA025-25-40
DN 25 KF	28 x 2	30	28	2	40	26.2	170FRA025-28-30
DN 25 KF	28 x 2	70	28	2	40	26.2	170FRA025-28-70
DN 40 KF	42.4 x 2	26	42.4	2	55	41.2	170FRA040-42-26
DN 40 KF	44.5 x 2	30	44.5	2	55	41.2	170FRA040-44-30
DN 40 KF	44.5 x 2	70	44.5	2	55	41.2	170FRA040-44-70
DN 50 KF	54 x 2	26	54	2	75	52.4	170FRA050-54-26
DN 50 KF	57 x 3.2	30	57	3.2	75	52.4	170FRA050-57-30
DN 50 KF	57 x 3.2	70	57	3.2	75	52.4	170FRA050-57-70

Flanges according to ISO 2861

**ISO-KF Flange Cap**

■ Made from plastic

**Dimensions****Polyethylene (PE)**

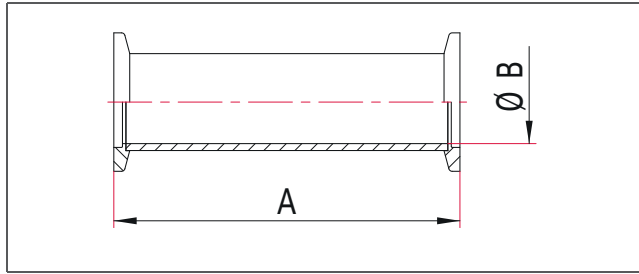
Nominal diameter	Quantity per package	Order number
DN 16 KF	10	130FSK016-S10
DN 25 KF	10	130FSK025-S10
DN 40 KF	10	130FSK040-S10
DN 50 KF	10	130FSK050-S10

## ISO-KF Full Nipple

- Custom lengths on request



### Dimensions



### Aluminium EN AW-6082/3.2315

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 KF	80	16	110RZS016
DN 25 KF	100	24	110RZS025
DN 40 KF	130	40	110RZS040

Flanges according to ISO 2861

### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 KF	80	16	120RZS016
DN 25 KF	100	24	120RZS025
DN 40 KF	130	40	120RZS040
DN 50 KF	140	50	120RZS050

Flanges according to ISO 2861

### Stainless Steel 316L/1.4404

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 350 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 KF	80	16	170RZS016
DN 25 KF	100	24	170RZS025
DN 40 KF	130	40	170RZS040
DN 50 KF	140	50	170RZS050

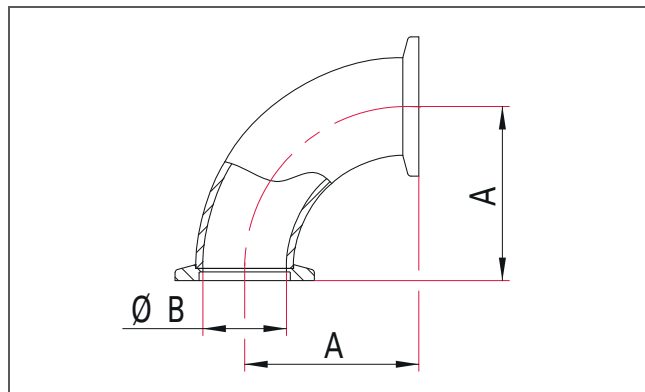
Flanges according to ISO 2861

## ISO-KF Elbow, Radius, 90°

- Various stainless steel grades available



### Dimensions



#### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 10 KF	30	10	120RRB010-90
DN 16 KF	40	16	120RRB016-90
DN 25 KF	50	24	120RRB025-90
DN 40 KF	65	40	120RRB040-90
DN 50 KF	70	51	120RRB050-90

Flanges according to ISO 2861

#### Stainless Steel 316L/1.4404

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 350 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 KF	40	16	170RRB016-90
DN 25 KF	50	24	170RRB025-90
DN 40 KF	65	40	170RRB040-90
DN 50 KF	70	51	170RRB050-90

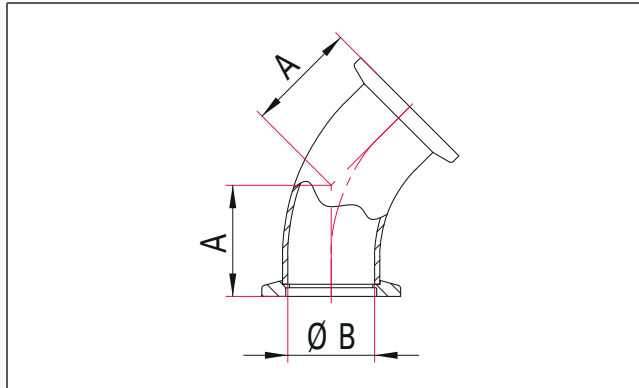
Flanges according to ISO 2861

## ISO-KF Elbow, Radius, 45°

- Various stainless steel grades available



### Dimensions



#### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 10 KF	30	10	120RRB010-45
DN 16 KF	25	16	120RRB016-45
DN 25 KF	32	24	120RRB025-45
DN 40 KF	40	40	120RRB040-45
DN 50 KF	51	51	120RRB050-45

Flanges according to ISO 2861

#### Stainless Steel 316L/1.4404

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 350 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 KF	26	16	170RRB016-45
DN 25 KF	32	24	170RRB025-45
DN 40 KF	40	40	170RRB040-45
DN 50 KF	51	51	170RRB050-45

Flanges according to ISO 2861

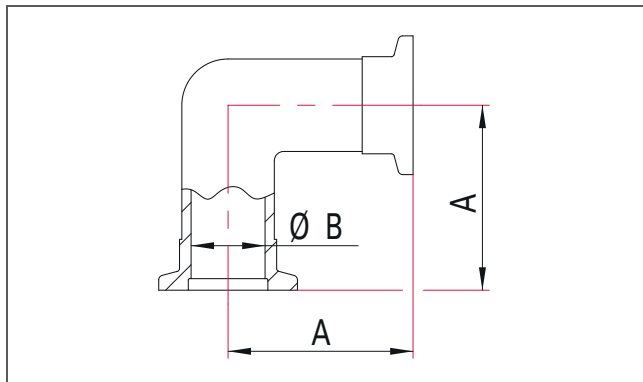


## ISO-KF Elbow, 90°

- Aluminum
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

### Aluminum EN AW-6082/3.2315

#### Dimensions

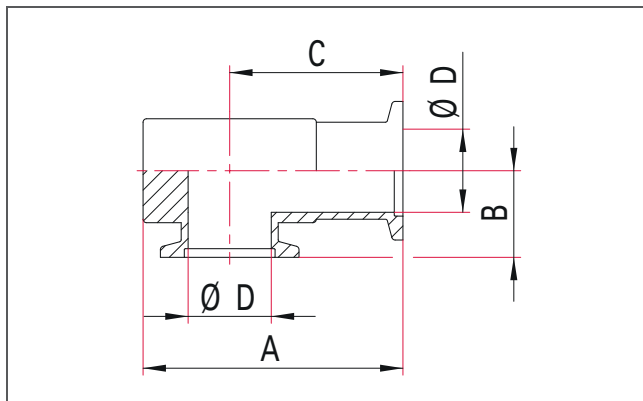


Nominal diameter	A [mm]	B [mm]	Order number
DN 10 KF	30	10	110RRB010-90
DN 16 KF	40	16	110RRB016-90
DN 25 KF	50	25	110RRB025-90
DN 40 KF	65	39	110RRB040-90

Flanges according to ISO 2861

### Aluminum EN AW-2007/3.1645

#### Dimensions



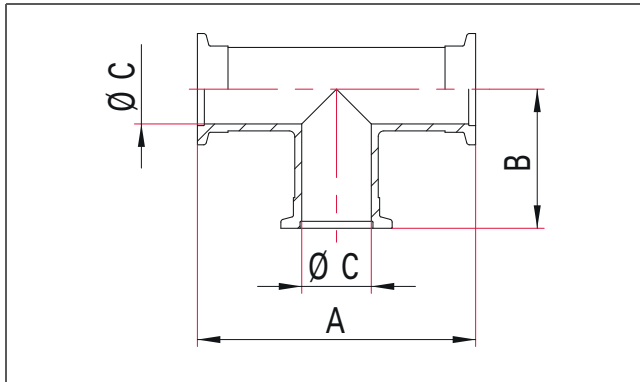
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 KF	58	20	40	16	110RWS016-V
DN 25 KF	73	25	50	25	110RWS025-V
DN 40 KF	95	35	65	40	110RWS040-V

Flanges according to ISO 2861

## ISO-KF Tee

Aluminum EN AW-6082/3.2315

### Dimensions



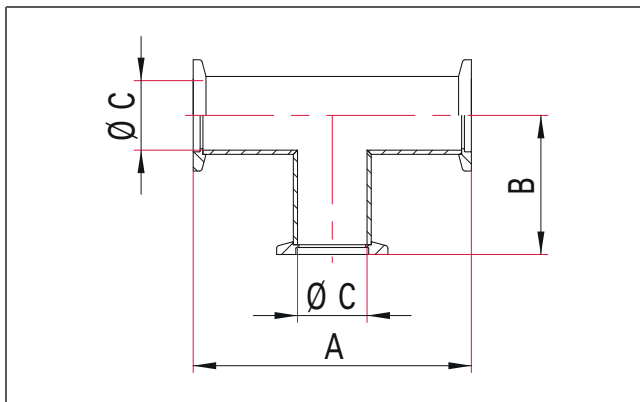
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 KF	60	30	10	110RTS010
DN 16 KF	80	40	16	110RTS016
DN 25 KF	100	50	25	110RTS025
DN 40 KF	130	65	40	110RTS040

Flanges according to ISO 2861

### Stainless Steel 304/1.4301

### Dimensions



- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 KF	60	30	10	120RTS010
DN 16 KF	80	40	16	120RTS016
DN 25 KF	100	50	24	120RTS025
DN 40 KF	130	65	40	120RTS040
DN 50 KF	140	70	51	120RTS050

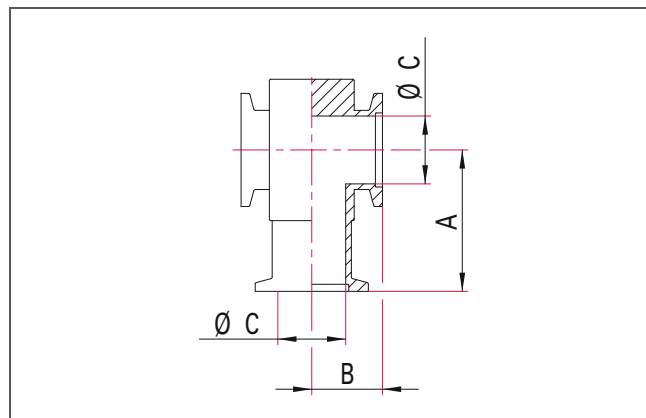
Flanges according to ISO 2861

**Stainless Steel 316L/1.4404**

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 350 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	80	40	16	170RTS016
DN 25 KF	100	50	24	170RTS025
DN 40 KF	130	65	40	170RTS040
DN 50 KF	140	70	50	170RTS050

Flanges according to ISO 2861

**Aluminum EN AW-2007/3.1645****Dimensions**

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

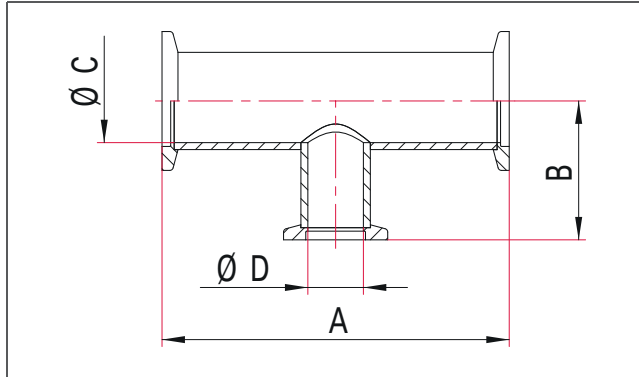
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	40	20	16	110RTS016-V
DN 25 KF	50	25	25	110RTS025-V
DN 40 KF	65	35	40	110RTS040-V

Flanges according to ISO 2861

## ISO-KF Reducer Tee

Stainless Steel 304/1.4301

### Dimensions



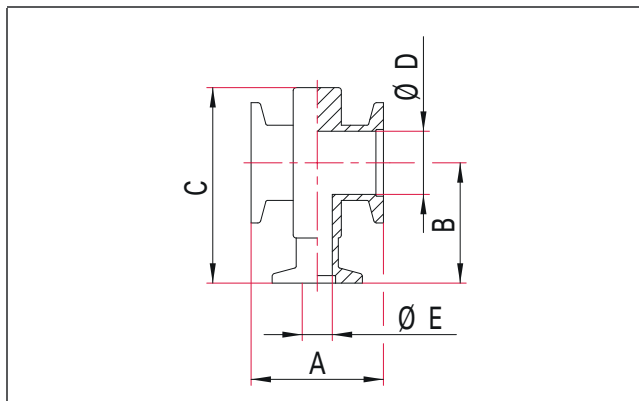
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Nominal diameter reduced	Order number
DN 25 KF	100	40	24	16	DN 16 KF	120RTR025-016
DN 40 KF	130	40	40	16	DN 16 KF	120RTR040-016
DN 40 KF	130	50	40	24	DN 25 KF	120RTR040-025
DN 50 KF	140	50	50	16	DN 16 KF	120RTR050-016
DN 50 KF	140	65	50	24	DN 25 KF	120RTR050-025
DN 50 KF	140	65	50	40	DN 40 KF	120RTR050-040

Flanges according to ISO 2861

Aluminum EN AW-2007/3.1645

### Dimensions



- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

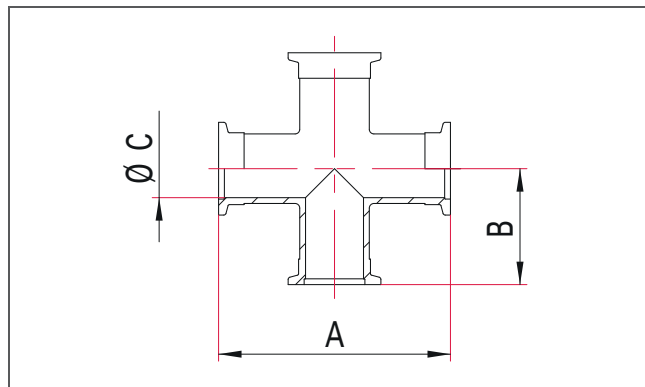
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Nominal diameter reduced	Order number
DN 25 KF	44	40	62.5	25	DN 16 KF	110RTR025-016-V
DN 40 KF	59	50	80	40	DN 16 KF	110RTR040-016-V
DN 40 KF	59	50	80	40	DN 25 KF	110RTR040-025-V

Flanges according to ISO 2861

## ISO-KF 4-Way Cross

Aluminum EN AW-6082/3.2315

### Dimensions



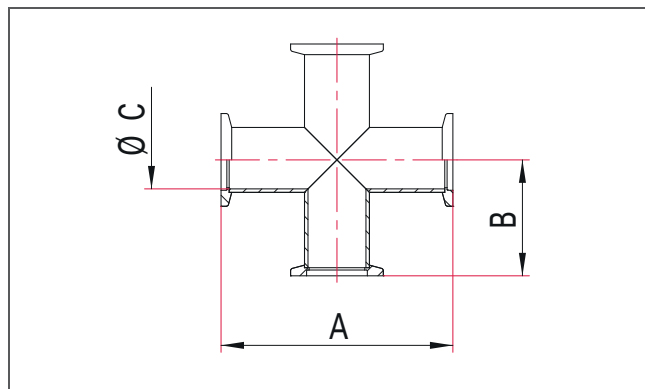
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	80	40	16	110RKS016
DN 25 KF	100	50	24	110RKS025
DN 40 KF	130	65	40	110RKS040

Flanges according to ISO 2861

Stainless Steel 304/1.4301

### Dimensions



- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 KF	60	30	10	120RKS010
DN 16 KF	80	40	16	120RKS016
DN 25 KF	100	50	24	120RKS025
DN 40 KF	130	65	40	120RKS040
DN 50 KF	140	70	51	120RKS050

Flanges according to ISO 2861

**Stainless Steel 316L/1.4404**

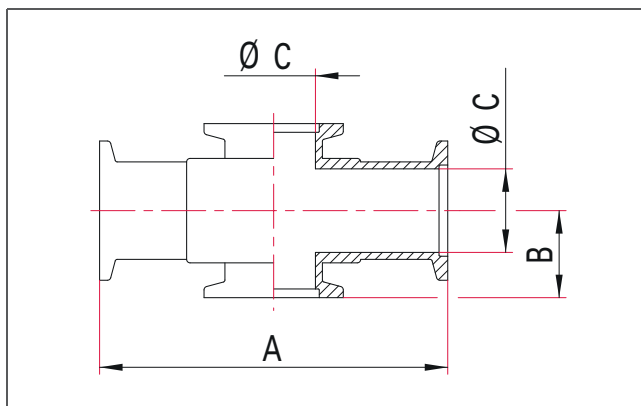
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 350 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 KF	60	30	10	170RKS010
DN 16 KF	80	40	16	170RKS016
DN 25 KF	100	50	24	170RKS025
DN 40 KF	130	65	40	170RKS040
DN 50 KF	140	70	51	170RKS050

Flanges according to ISO 2861

**Aluminum EN AW-2007/3.1645**

**Dimensions**



- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

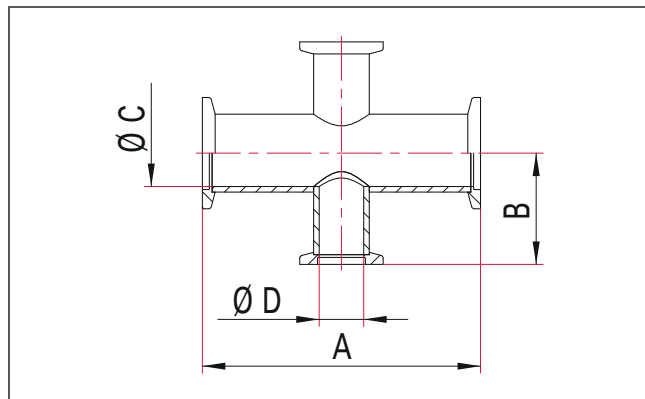
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	80	20	16	110RKS016-V
DN 25 KF	100	25	25	110RKS025-V
DN 40 KF	130	35	40	110RKS040-V

Flanges according to ISO 2861

## ISO-KF Reducer Cross

Stainless Steel 304/1.4301

### Dimensions



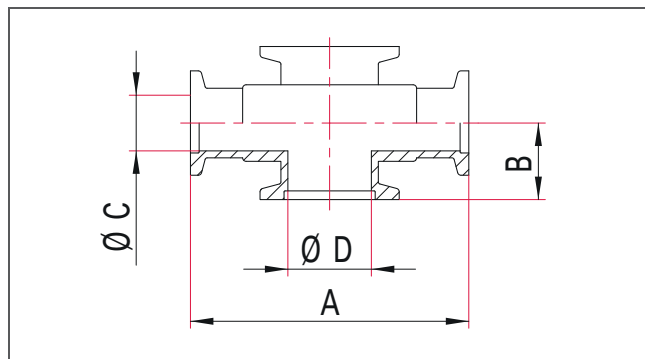
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Nominal diameter reduced	Order number
DN 25 KF	100	40	24	16	DN 16 KF	120RKR025-016
DN 40 KF	130	40	40	16	DN 16 KF	120RKR040-016
DN 40 KF	130	50	40	24	DN 25 KF	120RKR040-025
DN 50 KF	140	40	50	16	DN 16 KF	120RKR050-016
DN 50 KF	140	50	50	24	DN 25 KF	120RKR050-025
DN 50 KF	140	65	50	40	DN 40 KF	120RKR050-040

Flanges according to ISO 2861

Aluminum EN AW-2007/3.1645

### Dimensions



- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Nominal diameter reduced	Order number
DN 25 KF	80	22	16	25	DN 16 KF	110RKR025-016-V
DN 40 KF	100	30	16	40	DN 16 KF	110RKR040-016-V
DN 40 KF	100	30	25	40	DN 25 KF	110RKR040-025-V

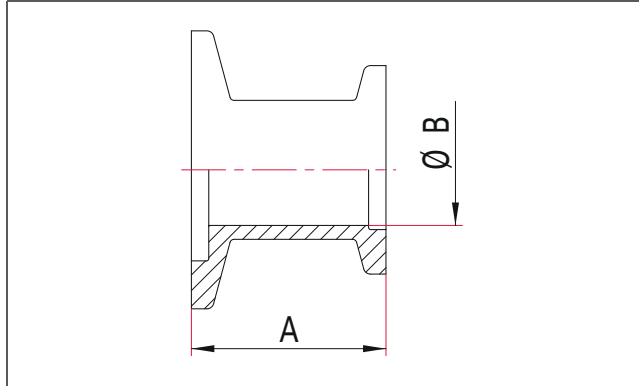
Flanges according to ISO 2861

## ISO-KF Straight Reducer

- Available in stainless steel or aluminum



### Dimensions



### Aluminum EN AW-6082/3.2315

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 25 KF	40	10	DN 10 KF	110RRG025-010-40
DN 25 KF	28	16	DN 16 KF	110RRG025-016-28
DN 25 KF	40	16	DN 16 KF	110RRG025-016-40
DN 40 KF	28	16	DN 16 KF	110RRG040-016-28
DN 40 KF	40	16	DN 16 KF	110RRG040-016-40
DN 40 KF	28	24	DN 25 KF	110RRG040-025-28
DN 40 KF	40	25	DN 25 KF	110RRG040-025-40
DN 50 KF	40	24	DN 25 KF	110RRG050-025-40
DN 50 KF	40	40	DN 40 KF	110RRG050-040-40

Flanges according to ISO 2861

### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 25 KF	28	16	DN 16 IKF	120RRG025-016-28
DN 25 KF	40	16	DN 16 KF	120RRG025-016-40
DN 40 KF	28	16	DN 16 KF	120RRG040-016-28
DN 40 KF	40	16	DN 16 KF	120RRG040-016-40
DN 40 KF	28	24	DN 25 KF	120RRG040-025-28
DN 40 KF	40	24	DN 25 KF	120RRG040-025-40
DN 50 KF	40	16	DN 16 KF	120RRG050-016-40
DN 50 KF	28	24	DN 25 KF	120RRG050-025-28
DN 50 KF	40	24	DN 25 KF	120RRG050-025-40
DN 50 KF	28	40	DN 40 KF	120RRG050-040-28
DN 50 KF	40	40	DN 40 KF	120RRG050-040-40

Flanges according to ISO 2861

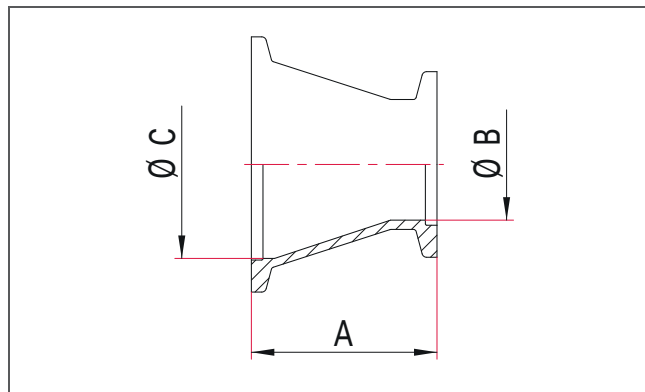


## ISO-KF Conical Reducer

- Available in stainless steel or aluminum



### Dimensions



#### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Nominal diameter reduced	Order number
DN 25 KF	40	16	24	DN 16 KF	12ORRK025-016-40
DN 40 KF	40	16	40	DN 16 KF	12ORRK040-016-40
DN 40 KF	40	24	40	DN 25 KF	12ORRK040-025-40
DN 50 KF	40	16	50	DN 16 KF	12ORRK050-016-40
DN 50 KF	40	24	50	DN 25 KF	12ORRK050-025-40
DN 50 KF	40	40	50	DN 40 KF	12ORRK050-040-40

Flanges according to ISO 2861

#### Stainless Steel 316L/1.4404

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 350 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Nominal diameter reduced	Order number
DN 25 KF	40	16	24	DN 16 KF	17ORRK025-016-40
DN 40 KF	40	16	40	DN 16 KF	17ORRK040-016-40
DN 40 KF	40	24	40	DN 25 KF	17ORRK040-025-40
DN 50 KF	40	24	50	DN 25 KF	17ORRK050-025-40
DN 50 KF	40	40	50	DN 40 KF	17ORRK050-040-40

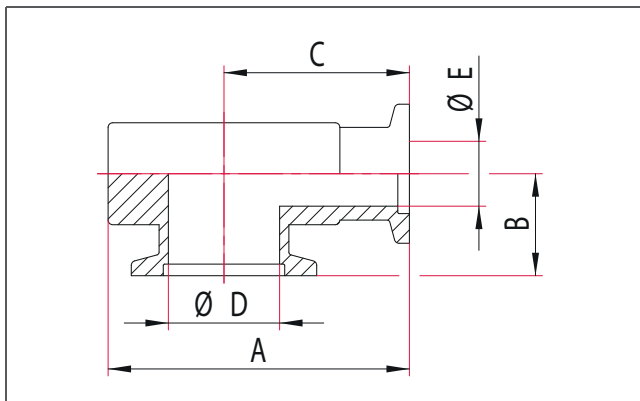
Flanges according to ISO 2861

## ISO-KF Reducer Elbow



- Aluminum
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

### Dimensions



Aluminum EN AW-2007/3.1645

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Nominal diameter reduced	Order number
DN 25 KF	62	22	40	25	16	DN 16 KF	110RWR025-016-V
DN 40 KF	72	30	50	40	16	DN 16 KF	110RWR040-016-V
DN 40 KF	80	30	50	40	25	DN 25 KF	110RWR040-025-V

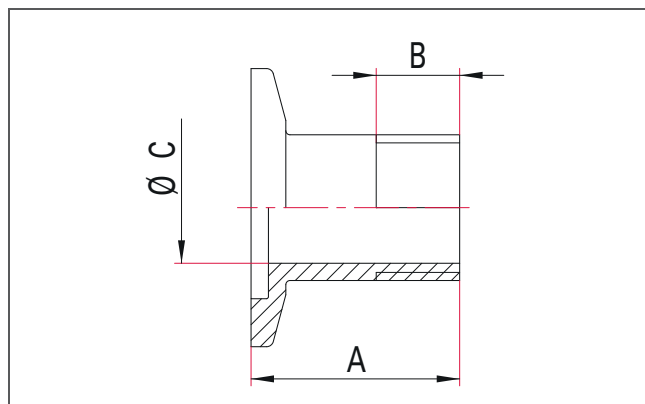
Flanges according to ISO 2861

## ISO-KF Flange with Pipe Thread, w/o Seal, Male



- Materials: Stainless steel
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Thread	Order number
DN 10 KF	30	12	10	G3/8"	120AEI010-0375
DN 16 KF	30	9	9	G1/4"	120AEI016-0250
DN 16 KF	30	12	16	G1/2"	120AEI016-0500
DN 25 KF	30	12	16	G1/2"	120AEI025-0500
DN 25 KF	30	12	20	G3/4"	120AEI025-0750
DN 25 KF	30	12	24	G1"	120AEI025-1000
DN 40 KF	30	14	35	G1.25"	120AEI040-1250
DN 40 KF	30	12	41	G1.5"	120AEI040-1500
DN 50 KF	35	16	51	G2"	120AEI050-2000

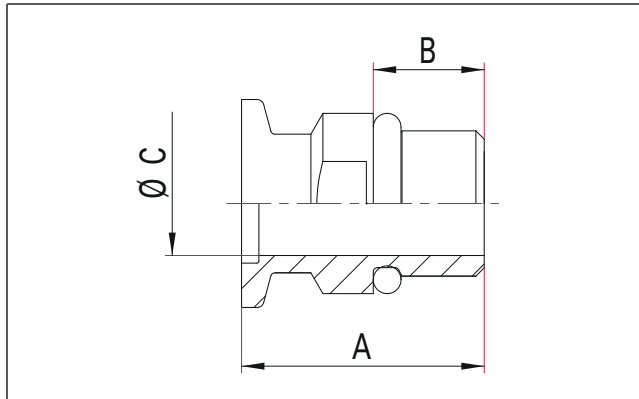
Flanges according to ISO 2861

## ISO-KF Flange with Pipe Thread and FKM Seal, Male



- Material: Stainless steel
- Seal: FKM
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -15 to 150 °C (shortly up to 200 °C)

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Wrench size [mm]	Thread	Order number
DN 10 KF	35	16	10	19	G3/8"	122AED010-0375
DN 16 KF	35	16	15	23	G1/2"	122AED016-0500
DN 25 KF	45	24	21	32	G3/4"	122AED025-0750
DN 25 KF	45	24	24	34	G1"	122AED025-1000
DN 40 KF	50	28	40	50	G1.5"	122AED040-1500

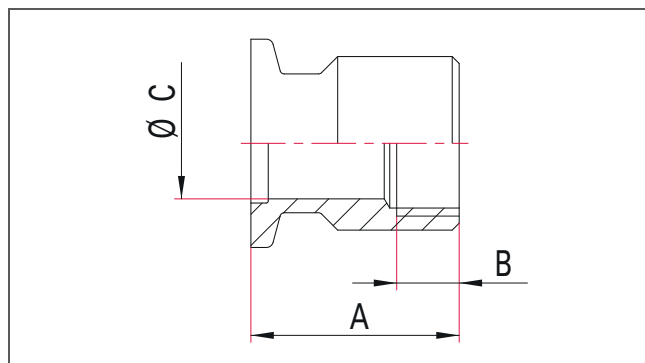
Flanges according to ISO 2861

## ISO-KF Flange with Pipe Thread, w/o Seal, Female



- Material: Stainless steel
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Thread	Order number
DN 10 KF	30	15	10	G3/8"	120AAU010-0375
DN 16 KF	30	9	16	G1/2"	120AAU016-0500
DN 25 KF	30	12	24	G3/4"	120AAU025-0750
DN 40 KF	30	16	28	G1"	120AAU040-1000

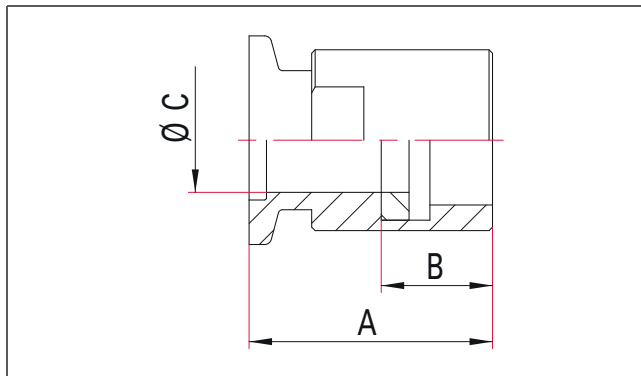
Flanges according to ISO 2861

## ISO-KF Flange with Pipe Thread and FKM Seal, Female



- Material: Stainless steel
- Seal: FKM
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -15 to 150 °C (shortly up to 200 °C)

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Wrench size [mm]	Thread	Order number
DN 10 KF	35	15	10	17	G3/8"	122AAD010-0375
DN 16 KF	35	16	15	21	G1/2"	122AAD016-0500
DN 25 KF	45	25	24	35	G1"	122AAD025-1000
DN 40 KF	50	26	40	46	G1.5"	122AAD040-1500

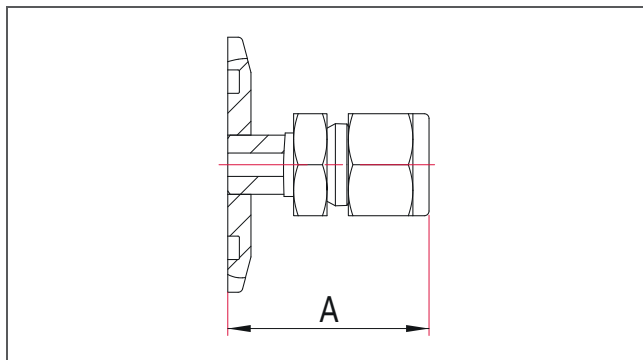
Flanges according to ISO 2861

## ISO-KF Swagelok® Adapter



- Original Swagelok® fitting
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Materials: Stainless steel 304/1.4301
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301, Metric Sizes

Nominal diameter	A [mm]	Tube external diameter	Order number
DN 16 KF	40	6 mm	120ASW016-6
DN 16 KF	41	8 mm	120ASW016-8
DN 25 KF	38	6 mm	120ASW025-6
DN 25 KF	39	8 mm	120ASW025-8
DN 25 KF	41	10 mm	120ASW025-10
DN 25 KF	43	12 mm	120ASW025-12
DN 40 KF	38	6 mm	120ASW040-6

Flanges according to ISO 2861

### Stainless Steel 304/1.4301, Imperial Sizes

Nominal diameter	A [mm]	Tube external diameter	Order number
DN 16 KF	40	1/4"	120ASW016-0250
DN 16 KF	53	1/2"	120ASW016-0500
DN 25 KF	38	1/4"	120ASW025-0250
DN 25 KF	53	1/2"	120ASW025-0500
DN 40 KF	38	1/4"	120ASW040-0250

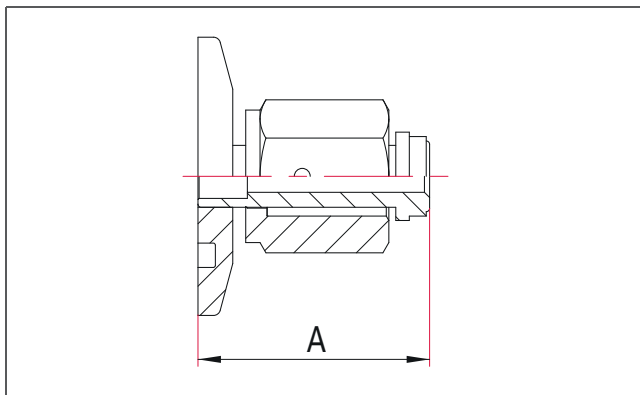
Flanges according to ISO 2861

## ISO-KF VCR Adapter, Female



- Original Swagelok® VCR adapter
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Materials: Stainless steel 304/1.4301
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	VCR connection	Order number
DN 16 KF	36	1/4"	120AVF016-0250
DN 16 KF	41	1/2"	120AVF016-0500
DN 25 KF	33	1/4"	120AVF025-0250
DN 25 KF	37	1/2"	120AVF025-0500

Flanges according to ISO 2861

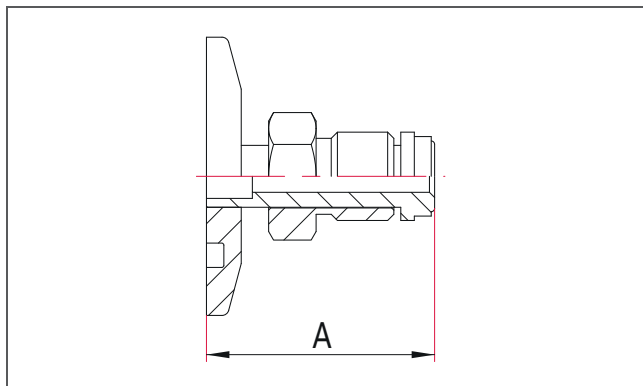


## ISO-KF VCR Adapter, Male



- Original Swagelok® VCR Adapter
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Materials: Stainless steel 304/1.4301
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	VCR connection	Order number
DN 16 KF	36	1/4"	120AVM016-0250
DN 16 KF	41	1/2"	120AVM016-0500
DN 25 KF	33	1/4"	120AVM025-0250
DN 25 KF	37	1/2"	120AVM025-0500
DN 40 KF	33	1/4"	120AVM040-0250
DN 40 KF	37	1/2"	120AVM040-0500

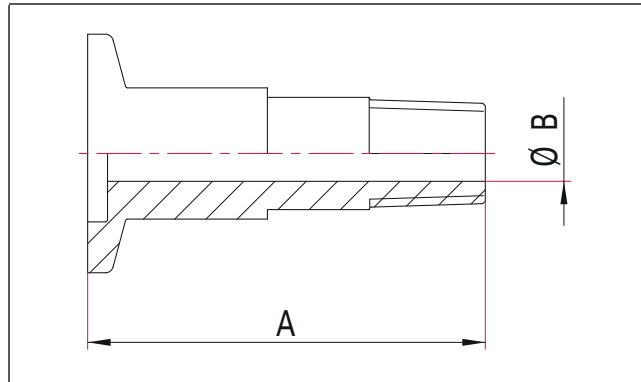
Flanges according to ISO 2861

### ISO-KF Flange with NPT Thread, Male



- Material: Stainless steel
- Temperature range: -196 to 300 °C

#### Dimensions



#### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	Thread	Order number
DN 16 KF	50	7.1	NPT 1/4"	120ANM016-0250
DN 25 KF	50	7.1	NPT 1/4"	120ANM025-0250
DN 25 KF	75	11.9	NPT 1/2"	120ANM025-0500

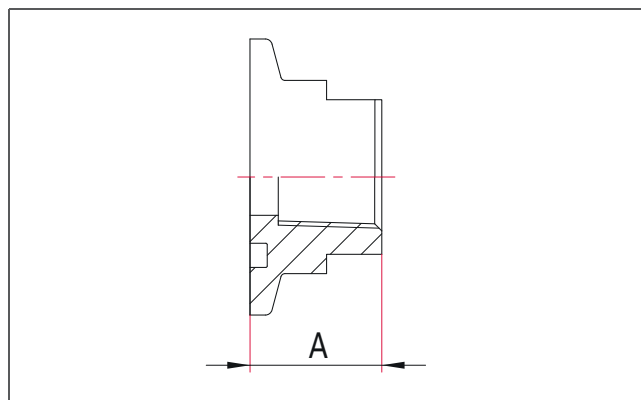
Flanges according to ISO 2861

### ISO-KF Flange with NPT Thread, Female



- Material: Stainless steel
- Temperature range: -196 to 300 °C

#### Dimensions



#### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	Thread	Order number
DN 16 KF	19	NPT 1/8"	120ANF016-0125
DN 16 KF	19	NPT 1/4"	120ANF016-0250
DN 25 KF	19	NPT 1/8"	120ANF025-0125
DN 25 KF	19	NPT 1/4"	120ANF025-0250

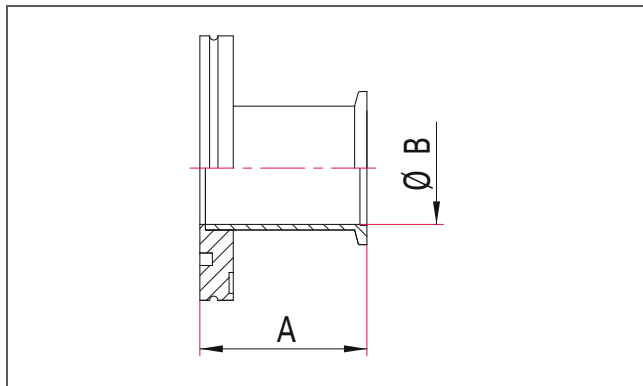
Flanges according to ISO 2861

## ISO-K/KF Straight Adapter



- Other combinations and lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 63 ISO-K	40	24	DN 25 ISO-KF	320RRG063-025-40
DN 63 ISO-K	40	40.5	DN 40 ISO-KF	320RRG063-040-40
DN 63 ISO-K	40	50.6	DN 50 ISO-KF	320RRG063-050-40
DN 100 ISO-K	40	24	DN 25 ISO-KF	320RRG100-025-40
DN 100 ISO-K	40	40.5	DN 40 ISO-KF	320RRG100-040-40
DN 100 ISO-K	40	50.6	DN 50 ISO-KF	320RRG100-050-40
DN 160 ISO-K	40	40.5	DN 40 ISO-KF	320RRG160-040-40

ISO-KF Flanges according to ISO 2861

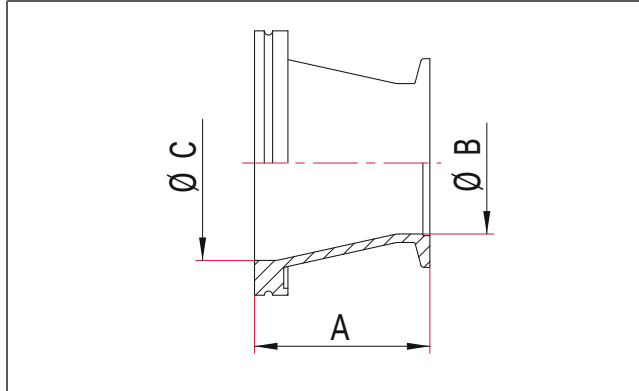
ISO-K Flanges according to ISO 1609

## ISO-K/KF Conical Adapter

- Available in stainless steel or aluminum



### Dimensions



#### Aluminum EN AW-6082

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Nominal diameter reduced	Order number
DN 63 ISO-K	40	40.5	70	DN 40 ISO-KF	310RRK063-040-40
DN 63 ISO-K	45	50	70	DN 50 ISO-KF	310RRK063-050-45

Flanges according to ISO 2861

ISO-K Flanges according to ISO 1609

#### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Nominal diameter reduced	Order number
DN 63 ISO-K	63	24	70	DN 25 ISO-KF	320RRK063-025-63
DN 63 ISO-K	63	40.5	70	DN 40 ISO-KF	320RRK063-040-63
DN 63 ISO-K	63	50	70	DN 50 ISO-KF	320RRK063-050-63
DN 100 ISO-K	63	40.5	102	DN 40 ISO-KF	320RRK100-040-63
DN 100 ISO-K	63	50	102	DN 50 ISO-KF	320RRK100-050-63

Flanges according to ISO 2861

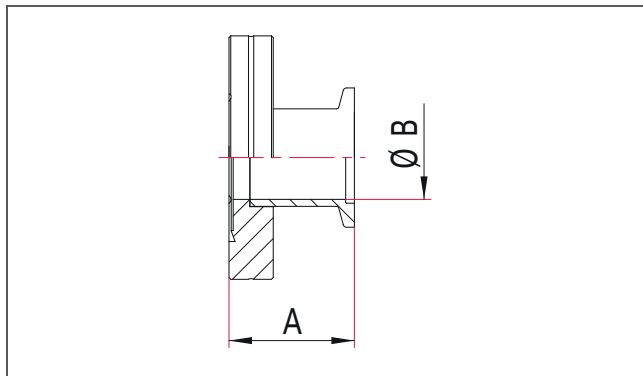
ISO-K Flanges according to ISO 1609

## ISO-KF/CF Adapter



- Other nominal diameters and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to ambient pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



Stainless Steel 304/1.4301; CF Flange 304L

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 16 CF	36	16	DN 16 ISO-KF	420RUG016-016-36
DN 16 CF	36	16	DN 25 ISO-KF	420RUG016-025-36
DN 16 CF	36	16	DN 40 ISO-KF	420RUG016-040-36
DN 40 CF	36	16	DN 16 ISO-KF	420RUG040-016-36
DN 40 CF	36	24	DN 25 ISO-KF	420RUG040-025-36
DN 40 CF	50	40.5	DN 40 ISO-KF	420RUG040-040-50
DN 63 CF	50	40.5	DN 40 ISO-KF	420RUG063-040-50
DN 100 CF	50	40.5	DN 40 ISO-KF	420RUG100-040-50

ISO-KF Flanges according to ISO 2861

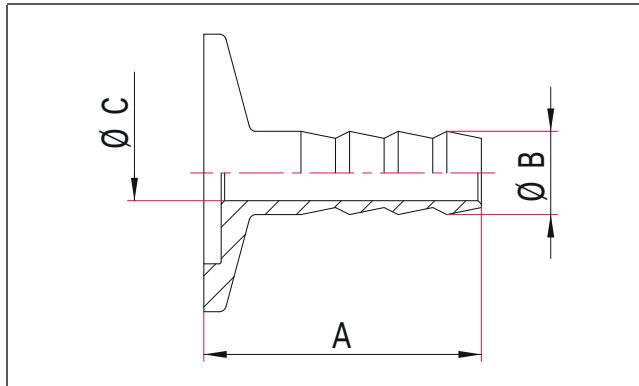
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## ISO-KF Hose Connector

- Fastener: Hose clamp (see accessories)
- Adapter for rubber hose



### Dimensions



### Aluminum EN AW-6082/3.2315

- Temperature range: -196 bis 150 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	40	8	4	110ASC016-8
DN 16 KF	40	12	7	110ASC016-12
DN 25 KF	40	8	4	110ASC025-8
DN 25 KF	40	12	7	110ASC025-12
DN 40 KF	40	12	7	110ASC040-12

Flanges according to ISO 2861

### Stainless Steel 304/1.4301

- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	40	8	4	120ASC016-8
DN 16 KF	40	12	7	120ASC016-12
DN 25 KF	40	12	7	120ASC025-12
DN 25 KF	40	16	12	120ASC025-16
DN 25 KF	40	20	16	120ASC025-20
DN 40 KF	40	12	7	120ASC040-12

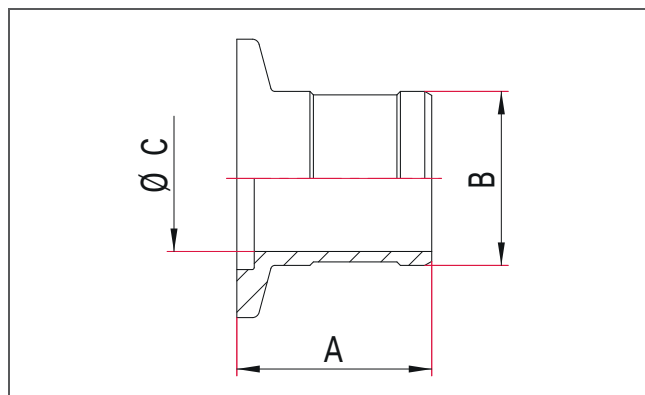
Flanges according to ISO 2861

## ISO-KF Adapter for PVC Hose



- For connecting a PVC hose with embedded spring or a CR sleeve
- Fastener: Hose clamp (see accessories)

### Dimensions



### Aluminum

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	28	16	12	110ASP016-16
DN 25 KF	28	16	12	110ASP025-16
DN 25 KF	40	25	21	110ASP025-25
DN 40 KF	32	45	40	110ASP040-45
DN 50 KF	60	50	45	110ASP050-50
DN 10 KF	40	14	9	PF 146 012
DN 16 KF	40	20	15	PF 146 024
DN 25 KF	40	20	16	PF 146 034
DN 40 KF	40	26	22	PF 146 047
DN 40 KF	40	41	37	PF 146 048

Please check the hose inner diameter before ordering  
Flanges according to ISO 2861

### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	28	16	12	120ASP016-16
DN 25 KF	28	25	21	120ASP025-25
DN 40 KF	32	45	40	120ASP040-45
DN 50 KF	60	50	45	120ASP050-50

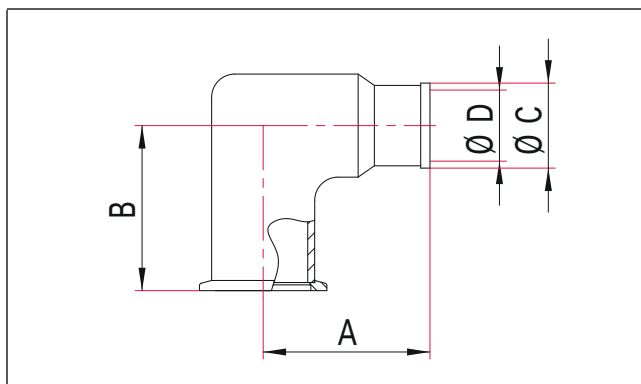
Please check the hose inner diameter before ordering  
Flanges according to ISO 2861

## ISO-KF 90° Elbow with Hose Adapter



- For connecting a PVC hose or a CR sleeve
- Fastener: Hose clamp (see accessories)

### Dimensions



### Aluminum EN AW-6061

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 KF	40	40	17	13	110ASR016
DN 25 KF	50	50	26	22	110ASR025
DN 40 KF	65	65	41	37	110ASR040

Please check the hose inner diameter before ordering  
Flanges according to ISO 2861

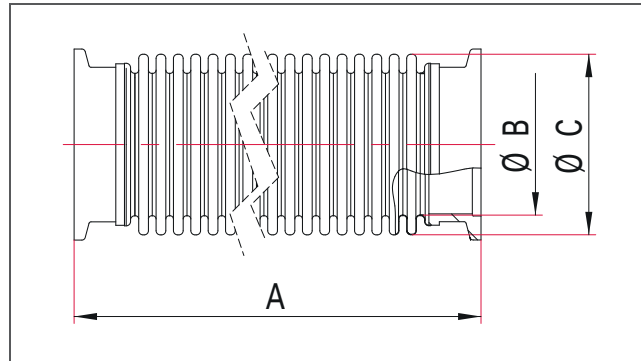


## ISO-KF Corrugated Hose, Flexible



- Flange connection length: 15 mm
- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 300 °C

### Dimensions



Stainless Steel: Flange 304/1.4301; Bellows 316L

Nominal diameter	A [mm]	B [mm]	C [mm]	Bend radius, unique movement [mm]	Bend radius, often movement [mm]	Order number
DN 10 KF	250	10	15.9	17	100	120SWN010-0250
DN 10 KF	500	10	15.9	17	100	120SWN010-0500
DN 10 KF	750	10	15.9	17	100	120SWN010-0750
DN 10 KF	1000	10	15.9	17	100	120SWN010-1000
DN 10 KF	1500	10	15.9	17	100	120SWN010-1500
DN 10 KF	2000	10	15.9	17	100	120SWN010-2000
DN 16 KF	250	16	23	26	140	120SWN016-0250
DN 16 KF	500	16	23	26	140	120SWN016-0500
DN 16 KF	750	16	23	26	140	120SWN016-0750
DN 16 KF	1000	16	23	26	140	120SWN016-1000
DN 16 KF	1500	16	23	26	140	120SWN016-1500
DN 16 KF	2000	16	23	26	140	120SWN016-2000
DN 25 KF	250	24	33	38	180	120SWN025-0250
DN 25 KF	500	24	33	38	180	120SWN025-0500
DN 25 KF	750	24	33	38	180	120SWN025-0750
DN 25 KF	1000	24	33	38	180	120SWN025-1000
DN 25 KF	1500	24	33	38	180	120SWN025-1500
DN 25 KF	2000	24	33	38	180	120SWN025-2000
DN 40 KF	250	40	52	59	240	120SWN040-0250
DN 40 KF	500	40	52	59	240	120SWN040-0500
DN 40 KF	750	40	52	59	240	120SWN040-0750
DN 40 KF	1000	40	52	59	240	120SWN040-1000
DN 40 KF	1500	40	52	59	240	120SWN040-1500
DN 40 KF	2000	40	52	59	240	120SWN040-2000
DN 50 KF	250	50	63	72	280	120SWN050-0250
DN 50 KF	500	50	63	72	280	120SWN050-0500
DN 50 KF	750	50	63	72	280	120SWN050-0750
DN 50 KF	1000	50	63	72	280	120SWN050-1000
DN 50 KF	1500	50	63	72	280	120SWN050-1500
DN 50 KF	2000	50	63	72	280	120SWN050-2000

Please note that the hose shrinks under vacuum.

The minimum bending radii are applicable for a temperature of 20 °C.

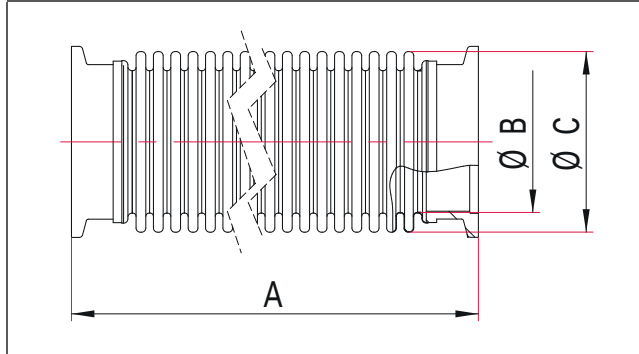
Flanges according to ISO 2861

## ISO-KF Corrugated Hose, Flexible, Annealed



- Flange connection length: 15 mm
- Stress relieved; low reset force when bent
- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 300 °C

### Dimensions



Stainless Steel: Flange 304/1.4301; Bellows 316L

Nominal diameter	A [mm]	B [mm]	C [mm]	Bend radius, unique movement [mm]	Order number
DN 10 KF	250	10	16	17	120SWG010-0250
DN 10 KF	500	10	16	17	120SWG010-0500
DN 10 KF	750	10	16	17	120SWG010-0750
DN 10 KF	1000	10	16	17	120SWG010-1000
DN 16 KF	250	16	23	26	120SWG016-0250
DN 16 KF	500	16	23	26	120SWG016-0500
DN 16 KF	750	16	23	26	120SWG016-0750
DN 16 KF	1000	16	23	26	120SWG016-1000
DN 25 KF	250	24	33	38	120SWG025-0250
DN 25 KF	500	24	33	38	120SWG025-0500
DN 25 KF	750	24	33	38	120SWG025-0750
DN 25 KF	1000	24	33	38	120SWG025-1000
DN 40 KF	250	40	52	59	120SWG040-0250
DN 40 KF	500	40	52	59	120SWG040-0500
DN 40 KF	750	40	52	59	120SWG040-0750
DN 40 KF	1000	40	52	59	120SWG040-1000
DN 50 KF	250	49.9	63	72	120SWG050-0250
DN 50 KF	500	49.9	63	72	120SWG050-0500
DN 50 KF	750	49.9	63	72	120SWG050-0750
DN 50 KF	1000	49.9	63	72	120SWG050-1000

Please note that the hose shrinks under vacuum.

The minimum bending radius is applicable for a temperature of 20 °C.

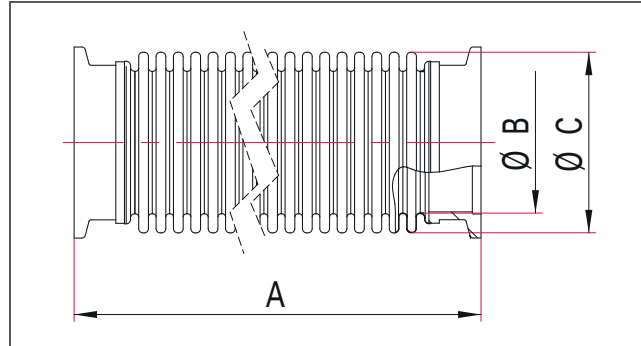
Flanges according to ISO 2861

## ISO-KF Corrugated Hose, Highly Flexible, Thin-wall



- Flange connection length: 15 mm
- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 300 °C

### Dimensions



Stainless Steel: Flange 304/1.4301; Bellows 316L

Nominal diameter	A [mm]	B [mm]	C [mm]	Bend radius, unique movement [mm]	Bend radius, often movement [mm]	Order number
DN 16 KF	250	16	26	26	105	120SWD016-0250
DN 16 KF	500	16	26	26	105	120SWD016-0500
DN 16 KF	750	16	26	26	105	120SWD016-0750
DN 16 KF	1000	16	26	26	105	120SWD016-1000
DN 16 KF	1500	16	26	26	105	120SWD016-1500
DN 16 KF	2000	16	26	26	105	120SWD016-2000
DN 25 KF	250	24	37	38	135	120SWD025-0250
DN 25 KF	500	24	37	38	135	120SWD025-0500
DN 25 KF	750	24	37	38	135	120SWD025-0750
DN 25 KF	1000	24	37	38	135	120SWD025-1000
DN 25 KF	1500	24	37	38	135	120SWD025-1500
DN 25 KF	2000	24	37	38	135	120SWD025-2000
DN 40 KF	250	40	56	59	180	120SWD040-0250
DN 40 KF	500	40	56	59	180	120SWD040-0500
DN 40 KF	750	40	56	59	180	120SWD040-0750
DN 40 KF	1000	40	56	59	180	120SWD040-1000
DN 40 KF	1500	40	56	59	180	120SWD040-1500
DN 40 KF	2000	40	56	59	180	120SWD040-2000
DN 50 KF	250	50	67	72	210	120SWD050-0250
DN 50 KF	500	50	67	72	210	120SWD050-0500
DN 50 KF	750	50	67	72	210	120SWD050-0750
DN 50 KF	1000	50	67	72	210	120SWD050-1000
DN 50 KF	1500	50	67	72	210	120SWD050-1500
DN 50 KF	2000	50	67	72	210	120SWD050-2000

Please note that the hose shrinks under vacuum.

The minimum bending radii are applicable for a temperature of 20 °C.

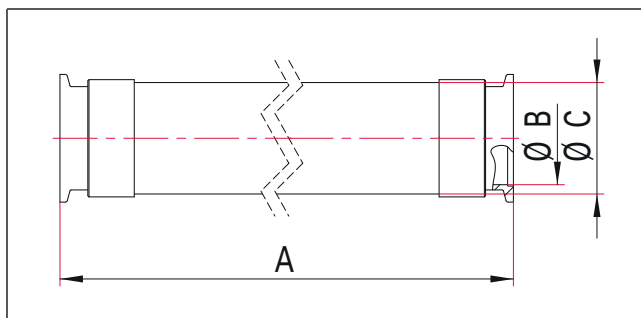
Flanges according to ISO 2861

## ISO-KF Corrugated Hose, Sheathed



- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 300 °C

### Dimensions



Stainless Steel: Flange and Braided Sheath 304/1.4301; Bellows 316L

Nominal diameter	A [mm]	B [mm]	C [mm]	Bend radius, unique movement [mm]	Bend radius, often movement [mm]	Order number
DN 16 KF	250	15.9	24.9	44	140	120SWU016-0250
DN 16 KF	500	15.9	24.9	44	140	120SWU016-0500
DN 16 KF	750	15.9	24.9	44	140	120SWU016-0750
DN 16 KF	1000	15.9	24.9	44	140	120SWU016-1000
DN 25 KF	250	24	35.1	64	180	120SWU025-0250
DN 25 KF	500	24	35.1	64	180	120SWU025-0500
DN 25 KF	750	24	35.1	64	180	120SWU025-0750
DN 25 KF	1000	24	35.1	64	180	120SWU025-1000
DN 40 KF	250	40	54.7	98	240	120SWU040-0250
DN 40 KF	500	40	54.7	98	240	120SWU040-0500
DN 40 KF	750	40	54.7	98	240	120SWU040-0750
DN 40 KF	1000	40	54.7	98	240	120SWU040-1000
DN 50 KF	250	49.9	65.7	120	280	120SWU050-0250
DN 50 KF	500	49.9	65.7	120	280	120SWU050-0500
DN 50 KF	750	49.9	65.7	120	280	120SWU050-0750
DN 50 KF	1000	49.9	65.7	120	280	120SWU050-1000

Please note that the hose shrinks under vacuum.

The minimum bending radii are applicable for a temperature of 20 °C.

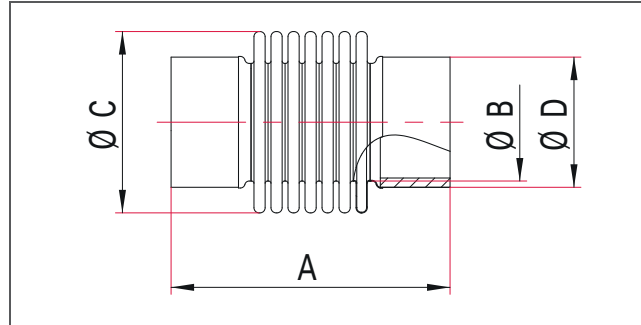
Flanges according to ISO 2861

## ISO-KF Spring Bellows with Weld Ends



- Flange connection length: 15 mm
- Weld end wall thickness: 2 mm
- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Materials: Stainless steel 316L
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 316L

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Axial stroke [mm]	Order number
DN 16 KF	90	16	26	20	±7	170SFA016-090
DN 25 KF	120	24	39	28	±16	170SFA025-120
DN 40 KF	120	40.5	58	44.5	±18	170SFA040-120
DN 50 KF	120	50	69	54	±19.5	170SFA050-120

Please note that the spring bellows shrinks under vacuum.

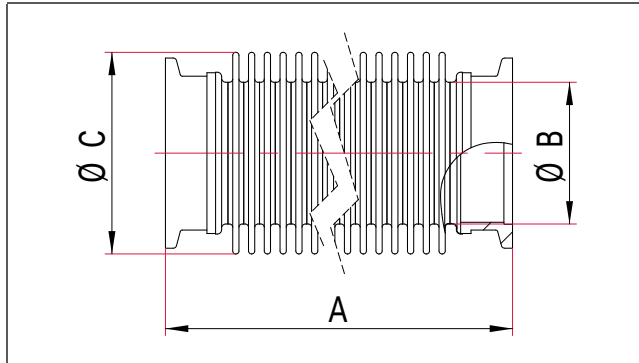
The axial stroke is applicable for a temperature of 20 °C and 10000 load cycles.

## ISO-KF Spring Bellows



- Flange connection length: 15 mm
- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Materials: Flange: stainless steel 1.4301/304; bellows: stainless steel 316L
- Temperature range: -196 to 300 °C

### Dimensions



**Stainless Steel: Flange 304/1.4301; Bellows 316L**

Nominal diameter	A [mm]	B [mm]	C [mm]	Axial stroke [mm]	Order number
DN 16 KF	60	16	26	±3.5	170SFK016-060
DN 16 KF	70	16	26	±5	170SFK016-070
DN 16 KF	100	16	26	±8.5	170SFK016-100
DN 16 KF	120	16	26	±11	170SFK016-120
DN 25 KF	60	24	39	±5	170SFK025-060
DN 25 KF	100	24	39	±12.5	170SFK025-100
DN 25 KF	120	24	39	±16	170SFK025-120
DN 40 KF	60	39	58	±5.5	170SFK040-060
DN 40 KF	100	39	58	±14	170SFK040-100
DN 40 KF	120	39	58	±18	170SFK040-120
DN 50 KF	60	50	69	±6.5	170SFK050-060
DN 50 KF	100	50	69	±15	170SFK050-100
DN 50 KF	120	50	69	±19.5	170SFK050-120

Please note that the spring bellows shrinks under vacuum.

The axial stroke is applicable for a temperature of 20 °C and 10000 load cycles.

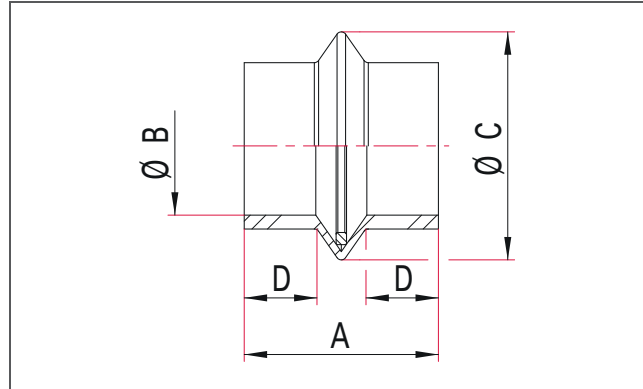
Flanges according to ISO 2861

## ISO-KF CR Sleeve



- Sleeve made from chloroprene rubber
- Connection: Adapter for PVC hose (see adapters) and hose clamp (see accessories)
- Pressure range:  $1 \cdot 10^{-5}$  hPa to ambient pressure
- Temperature range: -5 to 120 °C

### Dimensions



### Chloroprene Rubber (CR)

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 KF	44	17	44	12	130SMA020
DN 25 KF	50	25	50	15	130SMA028
DN 40 KF	56	41	68	18	130SMA045

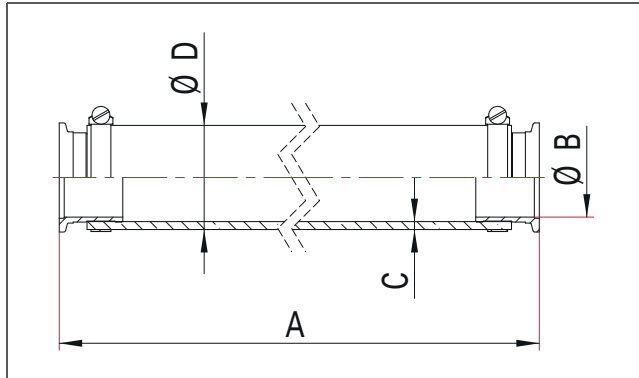
Please note that the sleeve shrinks under vacuum.

## ISO-KF PVC Hose with Embedded Spring and Flanges



- Inner tube: PVC, transparent
- Casing: Steel coil
- Hose cover: PVC, transparent
- Smooth inner and outer walls
- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-4}$  hPa to ambient pressure
- Temperature range: -10 to 60 °C

### Dimensions



### PVC with Stainless Steel Flange, 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Bend radius [mm]	Order number
DN 16 KF	500	12	3.1	22	30	100SPA016-0500
DN 16 KF	1000	12	3.1	22	30	100SPA016-1000
DN 25 KF	500	21	4	33	50	100SPA025-0500
DN 25 KF	1000	21	4	33	50	100SPA025-1000
DN 40 KF	500	40	4.9	55	90	100SPA040-0500
DN 40 KF	1000	40	4.9	55	90	100SPA040-1000
DN 50 KF	500	45	5.9	62	100	100SPA050-0500
DN 50 KF	1000	45	5.9	62	100	100SPA050-1000

The minimum bending radius is applicable for a temperature of 20 °C.  
Flanges according to ISO 2861

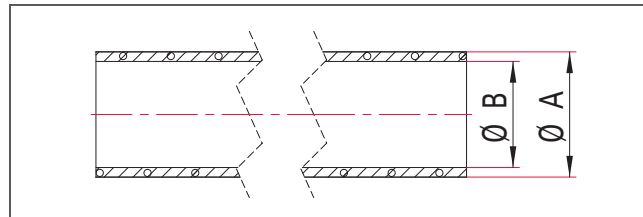


## ISO-KF PVC Hose with Embedded Spring



- Inner tube material: PVC, transparent
- Casing: steel coil
- Hose cover material: PVC, transparent
- Smooth inner and outer walls
- Length: up to 50 m; min. order: 1 m; orders > 1 m calculated pro rata
- Connection: hose adapter and hose clamp
- Pressure range:  $1 \cdot 10^{-4}$  hPa to 500 hPa over pressure
- Temperature range: -10 to 60 °C

### Dimensions



### PVC

Inner diameter [mm]	A [mm]	B [mm]	Bend radius [mm]	Order number
16	22	16	30	100SPM016
25	33	25	50	100SPM025
45	55	45	90	100SPM040
50	62	50	100	100SPM050
10	16	10	-	P 2358 262 SS
13	19	13	-	P 2359 314 NV
19	26	19	-	P 2359 455 NV
38	49	38	-	P 2359 810 NV

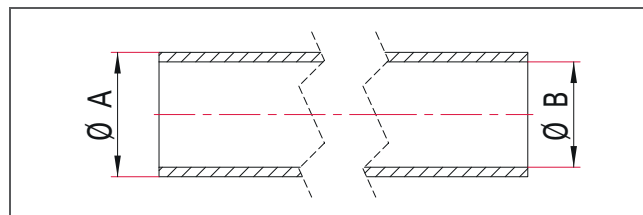
The minimum bending radius is applicable for a temperature of 20 °C.

## ISO-KF Rubber Hose



- For vacuum applications
- Custom lengths on request; minimum order: 1 m; orders > 1 m calculated pro rata
- Pressure range:  $1 \cdot 10^{-4}$  hPa to ambient pressure
- Temperature range: -30 to 85 °C

### Dimensions



### Rubber

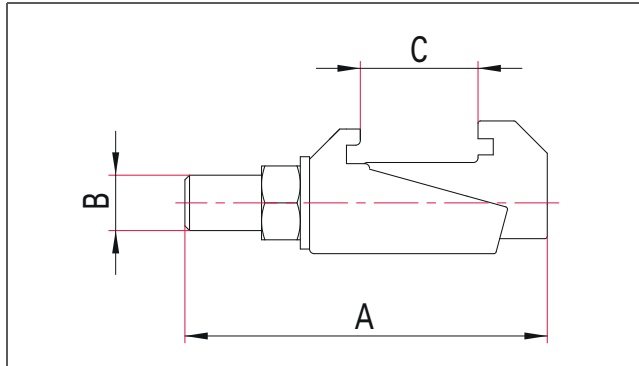
Inner diameter [mm]	A [mm]	B [mm]	Order number
7	17	7	130SPM010
10	25	10	130SPM016
16	32	16	130SPM020

## ISO-K Double Claw Clamp



- Suitable for use with metal and elastomer seals
- For stainless steel clamps we recommend using thread lubricant
- Torque: (for installation) DN 63-250: 12 to 16 Nm; DN 320-630: 20 to 26 Nm

### Dimensions



### Stainless Steel 316/1.4401

- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B	C [mm]	Order number
DN 63-250 ISO-K	61.5	M10	15 - 27	<b>320BKL250</b>
DN 320-500 ISO-K	75	M12	27 - 33	<b>320BKL500</b>
DN 630 ISO-K	85	M12	36 - 44	<b>320BKL630</b>

Not to be used for the assembly of turbo pumps!

Use the fastening elements given in the corresponding operating instructions.

### Zinc-plated Steel

- Temperature range: 0 to 200 °C

Nominal diameter	A [mm]	B	C [mm]	Order number
DN 63-250 ISO-K	61.5	M10	15 - 27	<b>350BKL250</b>
DN 320-500 ISO-K	77	M12	27 - 33	<b>350BKL500</b>
DN 630 ISO-K	86	M12	36 - 44	<b>350BKL630</b>

Not to be used for the assembly of turbo pumps!

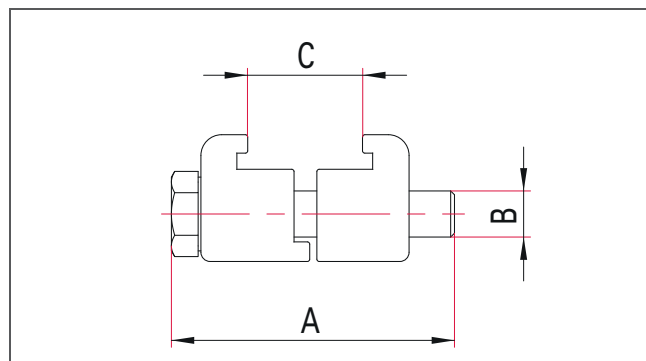
Use the fastening elements given in the corresponding operating instructions.

## ISO-K Double Claw Clamp, Aluminum

- Suitable for use with elastomer seals
- Temperature range: -196 to 200 °C



### Dimensions



Aluminum EN AW-6061; Screw: Stainless Steel A2-70

Nominal diameter	A [mm]	B	C [mm]	Order number
DN 63-100 ISO-K	50	M8	24 - 27	310BKL100
DN 160-250 ISO-K	52	M10	27 - 32	310BKL250
DN 320-500 ISO-K	65	M12	32 - 38	310BKL500

Not to be used for the assembly of turbo pumps!

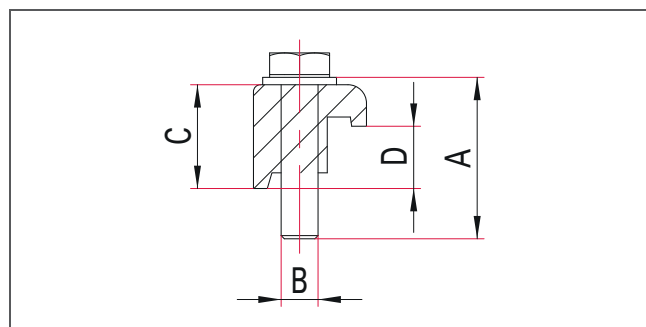
Use the fastening elements given in the corresponding operating instructions.

## ISO-K Claw Clamp

- Zinc-plated and stainless steel versions: Suitable for use with metal and elastomer seals
- Aluminum version: Suitable for use with elastomer seals
- For installing an ISO-K flange on a base plate without O-ring groove
- For a base plate with O-ring groove please use single claw clamp for base plate with sealing groove (BPD)

Aluminum EN AW-6061; Screw: Stainless Steel A2-70

### Dimensions



- Temperature range: -196 to 200 °C

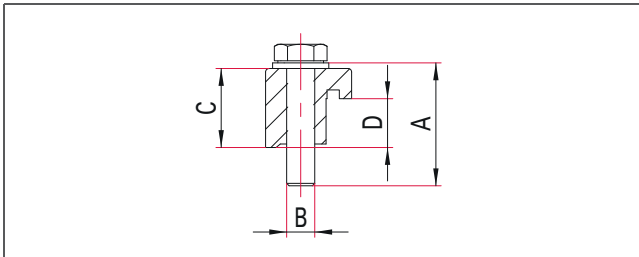
Nominal diameter	A [mm]	B	C [mm]	D [mm]	Order number
DN 63-100 ISO-K	35	M8	23	14	310BPR100
DN 160-250 ISO-K	35	M10	23	14	310BPR250
DN 320-500 ISO-K	50	M12	30	21	310BPR500

Not to be used for the assembly of turbo pumps!

Use the fastening elements given in the corresponding operating instructions.

**Stainless Steel 304/1.4301**

**Dimensions**



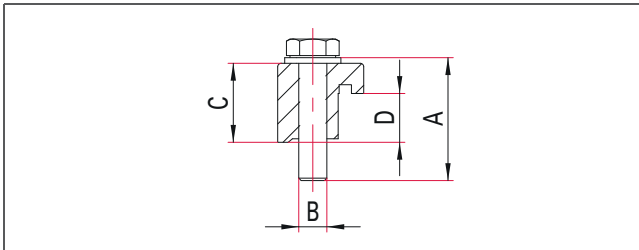
■ Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B	C [mm]	D [mm]	Order number
DN 63-100 ISO-K	35	M8	23	14	320BPR100
DN 160-250 ISO-K	35	M10	23	14	320BPR250
DN 320-500 ISO-K	50	M12	30	21	320BPR500

Not to be used for the assembly of turbo pumps!  
Use the fastening elements given in the corresponding operating instructions.

**Zinc-plated Steel**

**Dimensions**



■ Temperature range: 0 to 200 °C

Nominal diameter	A [mm]	B	C [mm]	D [mm]	Order number
DN 63-100 ISO-K	35	M8	23	14	350BPR100
DN 160-250 ISO-K	35	M10	23	14	350BPR250
DN 320-500 ISO-K	50	M12	30	20	350BPR500
DN 630 ISO-K	60	M12	41,5	26	350BPR630

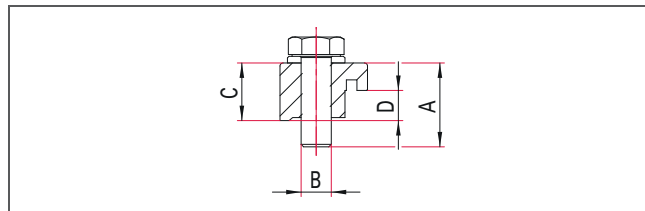
Not to be used for the assembly of turbo pumps!  
Use the fastening elements given in the corresponding operating instructions.

## ISO-K Single Claw Clamp for Base Plate with Sealing Groove



- Suitable for use with metal and elastomer seals
- For installing an ISO-K flange on a base plate with O-ring groove
- If there is no O-ring groove, please use the longer single claw clamps (BPR)
- Temperature range: 0 to 200 °C

### Dimensions



### Zinc-plated Steel

Nominal diameter	A [mm]	B	C [mm]	D [mm]	Order number
DN 63-100 ISO-K	30	M8	19	10.1	350BPD100
DN 160-250 ISO-K	35	M10	19	10.1	350BPD250
DN 320-500 ISO-K	45	M12	31	15.4	350BPD500
DN 630 ISO-K	55	M12	36	20.4	350BPD630

Not to be used for the assembly of turbo pumps!

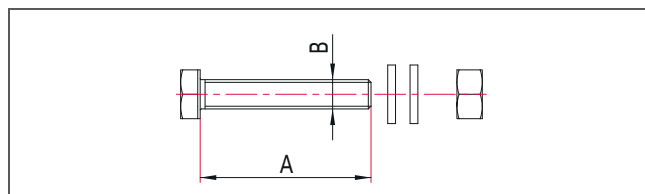
Use the fastening elements given in the corresponding operating instructions.

## ISO-F Screw Set



- For connecting two ISO-F flanges
- For connecting an ISO-F flange and an ISO-K/ISO-F bolt ring
- For connecting two ISO-K/ISO-F bolt rings
- Suitable for use with metal and elastomer seals
- Hexagon head screws, each with two washers and one nut

### Dimensions



### Zinc-plated Steel, property class 8.8

Nominal diameter	A [mm]	B	Package [Qty.]	Order number
DN 63-100 ISO-K/ISO-F	40	M8	8	550BSC100
DN 160-250 ISO-K/ISO-F	50	M10	12	550BSC250
DN 320-500 ISO-K/ISO-F	65	M12	16	550BSC500
DN 630 ISO-K/ISO-F	70	M12	20	550BSC630

### Stainless Steel A2-70

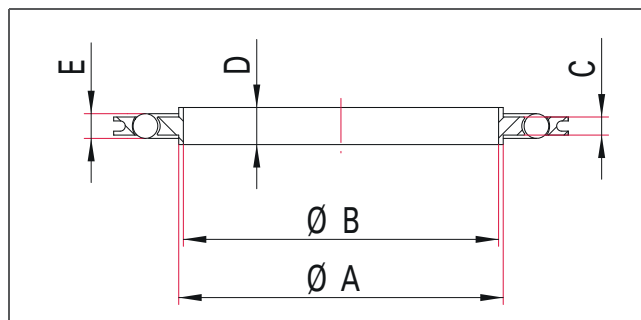
Nominal diameter	A [mm]	B	Package [Qty.]	Order number
DN 63-100 ISO-K/ISO-F	40	M8	8	520BSC100
DN 160-250 ISO-K/ISO-F	50	M10	12	520BSC250
DN 320-500 ISO-K/ISO-F	65	M12	16	520BSC500
DN 630 ISO-K/ISO-F	70	M12	20	520BSC630

## ISO-K Centering Ring with Outer Ring



- Aluminum outer ring
- Temperature range: FKM: -15 to 150 °C (shortly up to 200 °C);  
NBR: -25 to 120 °C; CR: -5 to 120 °C

### Dimensions



### Aluminum

Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 63 ISO-K	NBR	70	68	3.9	8	5.33	311ZRA063
DN 80 ISO-K	NBR	83	81	3.9	8	5.33	311ZRA080
DN 100 ISO-K	NBR	102	100	3.9	8	5.33	311ZRA100
DN 160 ISO-K	NBR	153	151	3.9	8	5.33	311ZRA160
DN 200 ISO-K	NBR	213	211	3.9	8	5.33	311ZRA200
DN 250 ISO-K	NBR	261	259	3.9	8	5.33	311ZRA250
DN 320 ISO-K	NBR	318	313	5.6	14	7	311ZRA320
DN 400 ISO-K	NBR	400	395	5.6	14	7	311ZRA400
DN 500 ISO-K	NBR	501	496	5.6	14	7	311ZRA500
DN 630 ISO-K	NBR	651	646	5.6	14	7	311ZRA630
DN 63 ISO-K	CR	70	68	3.9	8	5.33	316ZRA063
DN 80 ISO-K	CR	83	81	3.9	8	5.33	316ZRA080
DN 100 ISO-K	CR	102	100	3.9	8	5.33	316ZRA100
DN 160 ISO-K	CR	153	151	3.9	8	5.33	316ZRA160
DN 200 ISO-K	CR	213	211	3.9	8	5.33	316ZRA200
DN 250 ISO-K	CR	261	259	3.9	8	5.33	316ZRA250
DN 320 ISO-K	CR	318	313	5.6	14	7	316ZRA320
DN 400 ISO-K	CR	400	395	5.6	14	7	316ZRA400
DN 500 ISO-K	CR	501	496	5.6	14	7	316ZRA500
DN 630 ISO-K	CR	651	646	5.6	14	7	316ZRA630
DN 63 ISO-K	FKM	70	68	3.9	8	5.33	312ZRA063
DN 80 ISO-K	FKM	83	81	3.9	8	5.33	312ZRA080
DN 100 ISO-K	FKM	102	100	3.9	8	5.33	312ZRA100
DN 160 ISO-K	FKM	153	151	3.9	8	5.33	312ZRA160
DN 200 ISO-K	FKM	213	211	3.9	8	5.33	312ZRA200
DN 250 ISO-K	FKM	261	259	3.9	8	5.33	312ZRA250
DN 320 ISO-K	FKM	318	313	5.6	14	7	312ZRA320
DN 400 ISO-K	FKM	400	395	5.6	14	7	312ZRA400
DN 500 ISO-K	FKM	501	496	5.6	14	7	312ZRA500
DN 630 ISO-K	FKM	651	646	5.6	14	7	312ZRA630

## Stainless Steel 316Ti/1.4571 (DN 320: 304/1.4301) Outer Ring: Aluminum

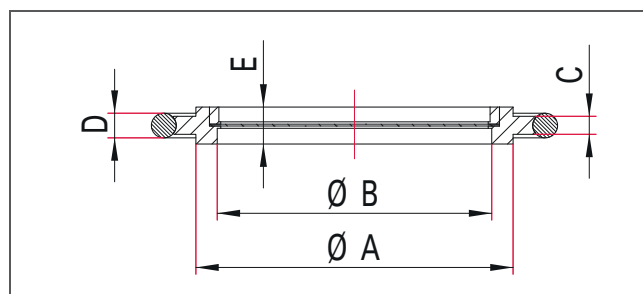
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 63 ISO-K	FKM	70	68	3.9	8	5.33	322ZRA063
DN 80 ISO-K	FKM	83	81	3.9	8	5.33	322ZRA080
DN 100 ISO-K	FKM	102	100	3.9	8	5.33	322ZRA100
DN 160 ISO-K	FKM	153	151	3.9	8	5.33	322ZRA160
DN 200 ISO-K	FKM	213	211	3.9	8	5.33	322ZRA200
DN 250 ISO-K	FKM	261	259	3.9	8	5.33	322ZRA250
DN 320 ISO-K	FKM	318	313	5.6	14	7	322ZRA320

## ISO-K Centering Ring with Screen



- Material: Stainless Steel
- Temperature range: -15 to 150 °C (shortly up to 200 °C)

## Dimensions



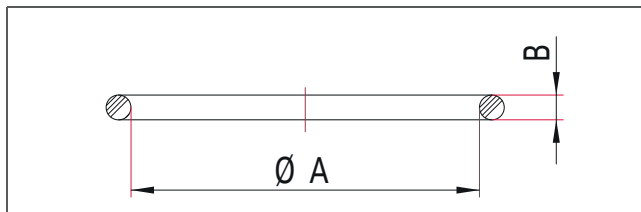
## Stainless Steel 304/1.4301

Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Mesh [mm]	Wire thickness [mm]	Order number
DN 63 ISO-K	FKM	70	60	3.9	5.33	8	0.5	0.2	322ZRD063
DN 80 ISO-K	FKM	83	73	3.9	5.33	8	0.6	0.2	322ZRD080
DN 100 ISO-K	FKM	102	92	3.9	5.33	8	0.8	0.2	322ZRD100
DN 160 ISO-K	FKM	153	143	3.9	5.33	8	1.2	0.2	322ZRD160

## ISO-K O-Rings

- Quantities: Item no. suffix -S1 = 1 piece; -S5 = 5 pieces

### Dimensions



### FKM

- Temperature range: -15 to 150 °C (shortly up to 200 °C)

Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 63 ISO-K	76	5.33	5	302DOR063-S5
DN 80 ISO-K	88.27	5.33	5	302DOR080-S5
DN 100 ISO-K	107	5.33	5	302DOR100-S5
DN 160 ISO-K	158	5.33	5	302DOR160-S5
DN 200 ISO-K	209	5.33	5	302DOR200-S5
DN 250 ISO-K	253	5.33	5	302DOR250-S5
DN 320 ISO-K	317	7	1	302DOR320-S1
DN 400 ISO-K	405	7	1	302DOR400-S1
DN 500 ISO-K	507	7	1	302DOR500-S1
DN 630 ISO-K	659	7	1	302DOR630-S1

### NBR

- Temperature range: -25 to 120 °C

Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 63 ISO-K	76	5.33	5	301DOR063-S5
DN 80 ISO-K	88.27	5.33	5	301DOR080-S5
DN 100 ISO-K	107	5.33	5	301DOR100-S5
DN 160 ISO-K	158	5.33	5	301DOR160-S5
DN 200 ISO-K	209	5.33	5	301DOR200-S5
DN 250 ISO-K	253	5.33	5	301DOR250-S5
DN 320 ISO-K	317	7	1	301DOR320-S1
DN 400 ISO-K	405	7	1	301DOR400-S1
DN 500 ISO-K	507	7	1	301DOR500-S1
DN 630 ISO-K	659	7	1	301DOR630-S1

### CR

- Temperature range: -5 to 120 °C

Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 63 ISO-K	76	5.33	5	306DOR063-S5
DN 80 ISO-K	88.27	5.33	5	306DOR080-S5
DN 100 ISO-K	107	5.33	5	306DOR100-S5
DN 160 ISO-K	158	5.33	5	306DOR160-S5
DN 200 ISO-K	209	5.33	5	306DOR200-S5
DN 250 ISO-K	253	5.33	5	306DOR250-S5
DN 320 ISO-K	317	7	1	306DOR320-S1
DN 400 ISO-K	405	7	1	306DOR400-S1
DN 500 ISO-K	507	7	1	306DOR500-S1
DN 630 ISO-K	659	7	1	306DOR630-S1



**EPDM**

- Temperature range: -50 to 130 °C

Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 63 ISO-K	76	5.33	5	304DOR063-S5
DN 80 ISO-K	88.27	5.33	5	304DOR080-S5
DN 100 ISO-K	107	5.33	5	304DOR100-S5
DN 160 ISO-K	158	5.33	5	304DOR160-S5
DN 200 ISO-K	209	5.33	5	304DOR200-S5
DN 250 ISO-K	253	5.33	5	304DOR250-S5

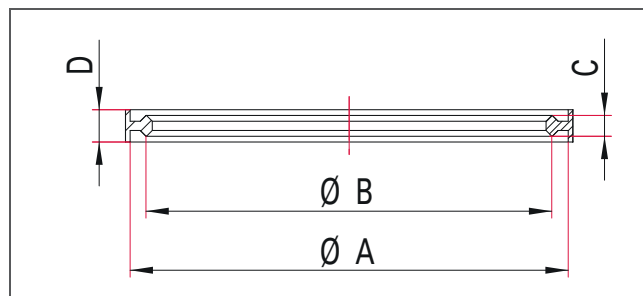
**Silicone**

- Temperature range: -55 to 200 °C

Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 63 ISO-K	76	5.33	5	303DOR063-S5
DN 80 ISO-K	88.27	5.33	5	303DOR080-S5
DN 100 ISO-K	107	5.33	5	303DOR100-S5
DN 160 ISO-K	158	5.33	5	303DOR160-S5
DN 200 ISO-K	209	5.33	5	303DOR200-S5
DN 250 ISO-K	253	5.33	5	303DOR250-S5

**ISO-K Metal Seal, Aligned at Outer Diameter**

- For stainless steel flanges
- No gas permeation
- For single use only
- Temperature range: -196 to 150 °C

**Dimensions****Aluminum EN AW-6082**

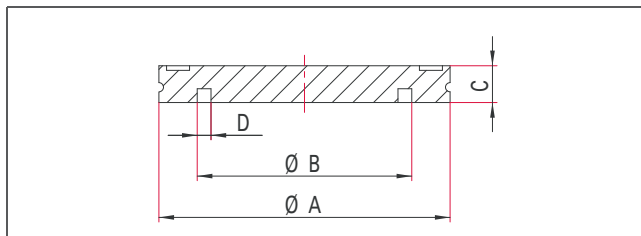
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 63 ISO-K	95	88	4.5	7	310ZSK063
DN 80 ISO-K	110	103	4.5	7	310ZSK080
DN 100 ISO-K	130	123	4.5	7	310ZSK100
DN 160 ISO-K	180	173	4.5	7	310ZSK160
DN 200 ISO-K	240	233	4.5	7	310ZSK200
DN 250 ISO-K	290	283	4.5	7	310ZSK250

## ISO-K Blank Flange

- Available in stainless steel or aluminum



### Dimensions



#### Aluminum EN AW-6082

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure
- Temperature range: -196 bis 200 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 63 ISO-K	95	70	12	4.5	310FBL063
DN 80 ISO-K	110	83	12	4.5	310FBL080
DN 100 ISO-K	130	102	12	4.5	310FBL100
DN 160 ISO-K	180	153	12	4.5	310FBL160
DN 200 ISO-K	240	213	12	4.5	310FBL200
DN 250 ISO-K	290	261	12	4.5	310FBL250

Flanges according to ISO 1609

#### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 63 ISO-K	95	70	12	4.5	320FBL063
DN 80 ISO-K	110	83	12	4.5	320FBL080
DN 100 ISO-K	130	102	12	4.5	320FBL100
DN 160 ISO-K	180	153	12	4.5	320FBL160
DN 200 ISO-K	240	213	12	4.5	320FBL200
DN 250 ISO-K	290	261	12	4.5	320FBL250
DN 320 ISO-K	370	318	17	4.5	320FBL320
DN 400 ISO-K	450	400	17	4.5	320FBL400
DN 500 ISO-K	550	501	17	4.5	320FBL500
DN 630 ISO-K	690	651	22	4.5	320FBL630

Flanges according to ISO 1609

#### Stainless Steel 316L/1.4404

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 63 ISO-K	95	70	12	4.5	370FBL063
DN 80 ISO-K	110	83	12	4.5	370FBL080
DN 100 ISO-K	130	102	12	4.5	370FBL100
DN 160 ISO-K	180	153	12	4.5	370FBL160
DN 200 ISO-K	240	213	12	4.5	370FBL200
DN 250 ISO-K	290	261	12	4.5	370FBL250
DN 320 ISO-K	370	318	17	4.5	370FBL320

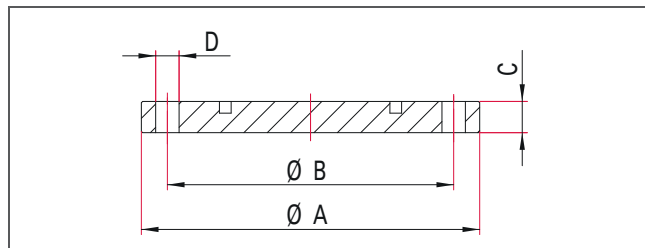
Flanges according to ISO 1609

## ISO-F Blank Flange



- Other flange materials on request
- Other flange sizes on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 63 ISO-F	130	110	12	9	520FBL063
DN 100 ISO-F	165	145	12	9	520FBL100
DN 160 ISO-F	225	200	16	11	520FBL160
DN 200 ISO-F	285	260	16	11	520FBL200
DN 250 ISO-F	335	310	16	11	520FBL250

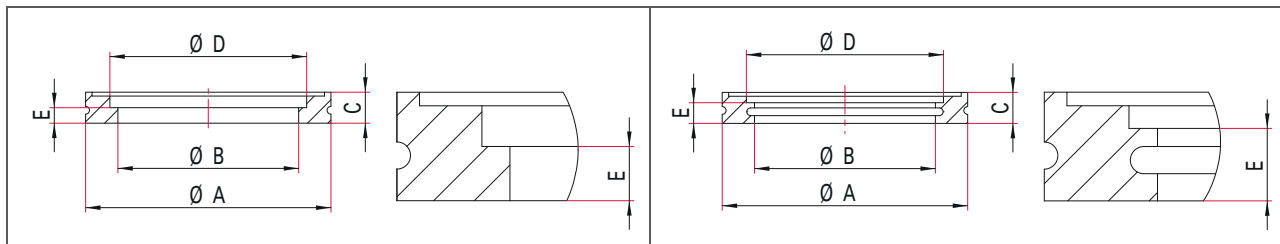
Flanges according to ISO 1609

## ISO-K Weld Ring Flange

- Other flange materials on request



### Dimensions



### Note

Annex S version with weld lip as welding guide

### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 63 ISO-K	63.5 x 1.65	95	70	12	63.8	6	320FAN063-63
DN 63 ISO-K	70 x 2	95	70	12	70.3	6	320FAN063-70
DN 63 ISO-K	76.1 x 3	95	70	12	76.4	6	320FAN063-76
DN 63 ISO-K	76.1 x 3	95	70	12	76.4	8	320FAN063-76-S
DN 80 ISO-K	76.1 x 3	110	83	12	76.4	6	320FAN080-76
DN 80 ISO-K	88.9 x 3	110	83	12	89.2	6	320FAN080-88
DN 100 ISO-K	101.6 x 2.1	130	102	12	101.9	6	320FAN100-101
DN 100 ISO-K	104 x 2	130	102	12	104.3	6	320FAN100-104
DN 100 ISO-K	108 x 3	130	102	12	108.3	6	320FAN100-108
DN 100 ISO-K	108 x 3	130	102	12	108.3	8	320FAN100-108-S
DN 100 ISO-K	114.3 x 2	130	102	12	114.6	6	320FAN100-114
DN 160 ISO-K	152.4 x 2.4	180	153	12	152.7	6	320FAN160-152
DN 160 ISO-K	159 x 3	180	153	12	159.3	6	320FAN160-159
DN 160 ISO-K	159 x 3	180	153	12	159.3	8	320FAN160-159-S
DN 200 ISO-K	203.2 x 2.4	240	213	12	203.6	6	320FAN200-203
DN 200 ISO-K	219 x 3	240	213	12	219.4	6	320FAN200-219
DN 200 ISO-K	219 x 3	240	213	12	219.4	8	320FAN200-219-S
DN 250 ISO-K	254 x 2	290	261	12	254.4	6	320FAN250-254
DN 250 ISO-K	273 x 3	290	261	12	273.4	6	320FAN250-273
DN 250 ISO-K	273 x 3	290	261	12	273.4	8	320FAN250-273-S
DN 320 ISO-K	324 x 3	370	318	17	324.4	8	320FAN320-324
DN 320 ISO-K	324 x 3	370	318	17	324.4	10	320FAN320-324-S
DN 400 ISO-K	406 x 3	450	400	17	406.5	8	320FAN400-406
DN 500 ISO-K	508 x 4	550	501	17	508.5	8	320FAN500-508
DN 630 ISO-K	660 x 5	690	651	22	660.5	12	320FAN630-660

Flanges according to ISO 1609

**Stainless Steel 316L/1.4404**

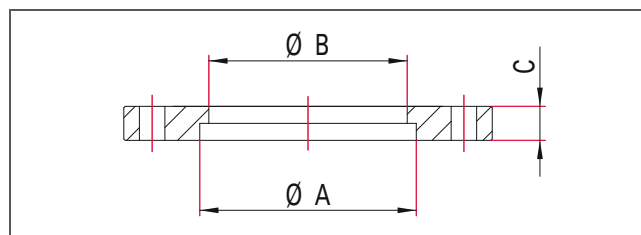
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 350 °C

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 63 ISO-K	63.5 x 1.65	95	70	12	63.8	6	370FAN063-63
DN 63 ISO-K	70 x 2	95	70	12	70.3	6	370FAN063-70
DN 63 ISO-K	76.1 x 3	95	70	12	76.4	6	370FAN063-76
DN 63 ISO-K	76.1 x 3	95	70	12	76.4	8	370FAN063-76-S
DN 80 ISO-K	76.1 x 3	110	83	12	76.4	6	370FAN080-76
DN 80 ISO-K	88.9 x 3	110	83	12	89.2	6	370FAN080-88
DN 100 ISO-K	101.6 x 2.1	130	102	12	101.9	6	370FAN100-101
DN 100 ISO-K	104 x 2	130	102	12	104.3	6	370FAN100-104
DN 100 ISO-K	108 x 3	130	102	12	108.3	6	370FAN100-108
DN 100 ISO-K	108 x 3	130	102	12	108.3	8	370FAN100-108-S
DN 100 ISO-K	114.3 x 2	130	102	12	114.6	6	370FAN100-114
DN 160 ISO-K	159 x 3	180	153	12	159.3	6	370FAN160-159
DN 160 ISO-K	159 x 3	180	153	12	159.3	8	370FAN160-159-S
DN 200 ISO-K	203.2 x 2.4	240	213	12	203.6	6	370FAN200-203
DN 200 ISO-K	219 x 3	240	213	12	219.4	6	370FAN200-219
DN 250 ISO-K	254 x 2	290	261	12	254.4	6	370FAN250-254
DN 250 ISO-K	273 x 3	290	216	12	273.4	6	370FAN250-273
DN 320 ISO-K	324 x 3	370	318	17	324.4	8	370FAN320-324
DN 400 ISO-K	406 x 3	450	400	17	406.5	8	370FAN400-406
DN 500 ISO-K	508 x 4	550	501	17	508.5	8	370FAN500-508

Flanges according to ISO 1609

**ISO-F Weld Flange**

- Other flange sizes or materials available upon request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

**Dimensions****Stainless Steel 304/1.4301**

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	Order number
DN 63 ISO-F	76.1 x 3	76.4	70	12	520FAN063-76
DN 100 ISO-F	108 x 3	108.3	102	12	520FAN100-108
DN 160 ISO-F	159 x 3	159.3	153	16	520FAN160-159
DN 200 ISO-F	219 x 3	219.4	213	16	520FAN200-219
DN 250 ISO-F	273 x 3	273.4	261	16	520FAN250-273

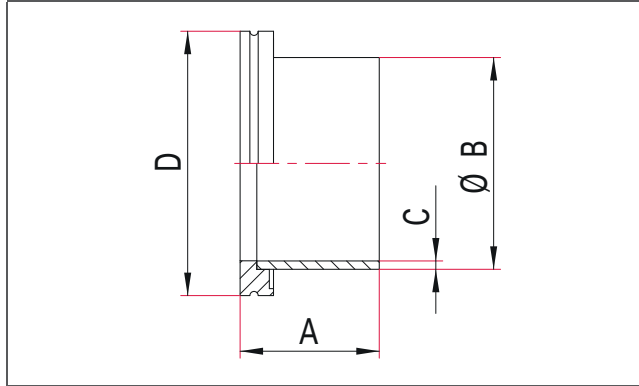
Flanges according to ISO 1609

## ISO-K Half Nipple



- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 1500 hPa over pressure (metal seal)
- Materials: Flange: stainless steel 304/1.4301; tube: stainless steel 304/1.4301 or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	Order number
DN 63 ISO-K	63.5 x 1.65	100	63.5	1.65	320FRA063-63-100
DN 63 ISO-K	76.1 x 3	100	76.1	3	320FRA063-76-100
DN 80 ISO-K	76.1 x 3	100	76.1	3	320FRA080-76-100
DN 80 ISO-K	88.9 x 3	100	88.9	3	320FRA080-88-100
DN 100 ISO-K	101.6 x 2.1	100	101.6	2.1	320FRA100-101-100
DN 100 ISO-K	108 x 3	100	108	3	320FRA100-108-100
DN 160 ISO-K	152.4 x 2.4	100	152.4	2.4	320FRA160-153-100
DN 160 ISO-K	159 x 3	100	159	3	320FRA160-159-100
DN 200 ISO-K	203.2 x 2.4	100	203.2	2.4	320FRA200-203-100
DN 200 ISO-K	219 x 3	100	219	3	320FRA200-219-100
DN 250 ISO-K	254 x 2	100	254	2	320FRA250-254-100
DN 250 ISO-K	273 x 3	100	273	3	320FRA250-273-100
DN 320 ISO-K	324 x 3	100	324	3	320FRA320-324-100
DN 400 ISO-K	406 x 3	100	406,4	3	320FRA400-406-100
DN 500 ISO-K	508 x 4	100	508	4	320FRA500-508-100
DN 630 ISO-K	660 x 5	100	660	5	320FRA630-660-100

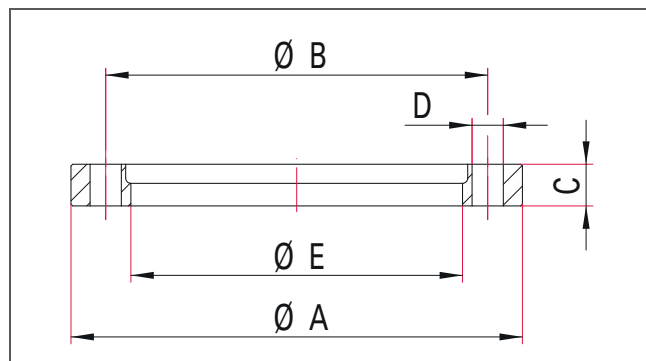
Flanges according to ISO 1609

## ISO-K Rotatable Bolt Ring



- Circlip included
- Fixation: Set of screws

### Dimensions



### Note

The rotatable bolt ring lets you convert an ISO-K flange into a rotatable ISO-F flange.

### Stainless Steel 304/1.4301

- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 63 ISO-K	130	110	12	9	95.5	320FLU063
DN 80 ISO-K	145	125	12	9	110.5	320FLU080
DN 100 ISO-K	165	145	12	9	130.5	320FLU100
DN 160 ISO-K	225	200	16	11	180.7	320FLU160
DN 200 ISO-K	285	260	16	11	240.7	320FLU200
DN 250 ISO-K	335	310	16	11	290.7	320FLU250

Flanges according to ISO 1609

### Nickel-plated Steel S235JR/1.0038

- Temperature range: 0 to 200 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 63 ISO-K	130	110	12	9	95.5	350FLU063
DN 100 ISO-K	165	145	12	9	130.5	350FLU100
DN 160 ISO-K	225	200	16	11	180.7	350FLU160
DN 200 ISO-K	285	260	16	11	240.7	350FLU200
DN 250 ISO-K	335	310	16	11	290.7	350FLU250
DN 320 ISO-K	425	395	20	13,5	370.8	350FLU320

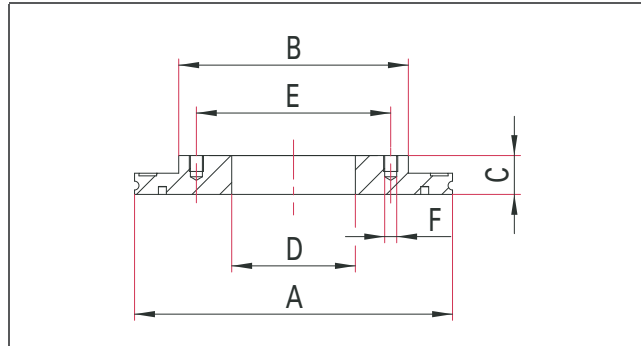
Flanges according to ISO 1609

## ISO-K/ISO-F Adapter Flange



- Other flange sizes on request
- Reduced nominal width implemented with ISO-F blind hole threads
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F	Nominal diameter reduced	Order number
DN 160 ISO-K	180	130	22	70	110	M8	DN 63 ISO-F	320FLR160-063
DN 160 ISO-K	180	165	22	102	145	M8	DN 100 ISO-F	320FLR160-100
DN 200 ISO-K	240	165	20	102	145	M8	DN 100 ISO-F	320FLR200-100
DN 200 ISO-K	240	225	26	153	200	M10	DN 160 ISO-F	320FLR200-160
DN 250 ISO-K	290	225	22	153	200	M10	DN 160 ISO-F	320FLR250-160

Flanges according to ISO 1609

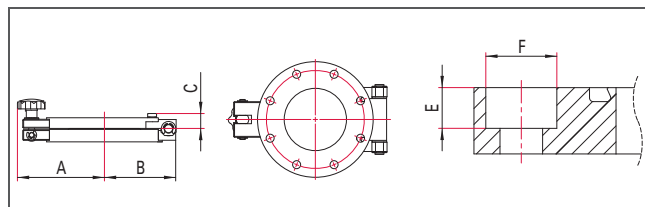


## ISO-F Quick-Access-Door

- Screw holes: Through-holes with counter-bore for cylinder head
- Can be installed using hexagon socket screws
- Bakeout temperature: up to 200 °C
- Seal: FKM
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Temperature range: -15 to 150 °C

### Stainless Steel 304/1.4301, without Sight Glass

#### Dimensions



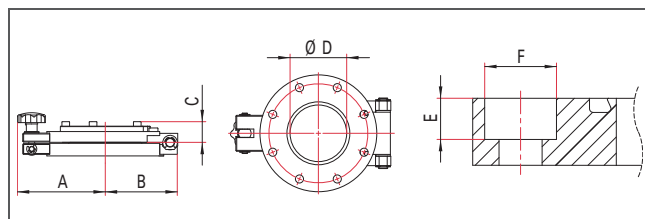
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 ISO-F	98	80	16	-	10	16	520KTU063
DN 100 ISO-F	116	99	16	-	10	16	520KTU100
DN 160 ISO-F	147	130	20	-	12.5	20	520KTU160
DN 200 ISO-F	177	160	20	-	12.5	20	520KTU200

### Stainless Steel 304/1.4301, with Sight Glass

- Order no. suffix -G: with sight glass
- Sight glass: Borosilicate glass



#### Dimensions



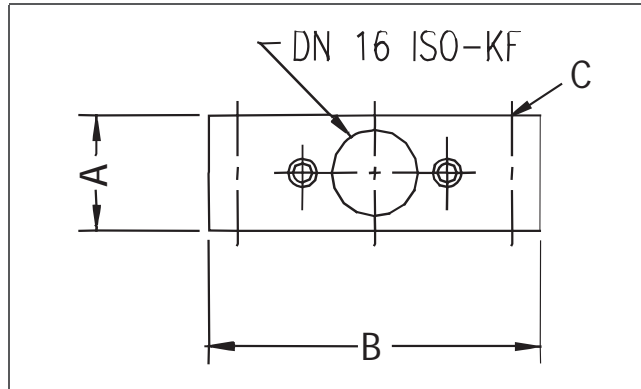
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 ISO-F	98	80	23	63	10	16	520KTU063-G
DN 100 ISO-F	116	99	27	95	10	16	520KTU100-G
DN 160 ISO-F	147	130	31	145	12.5	20	520KTU160-G
DN 200 ISO-F	177	160	31	145	12.5	20	520KTU200-G

## ISO-F Measurement Flange



- Suitable for application with elastomer seal
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 200 °C

### Dimensions



### Aluminum

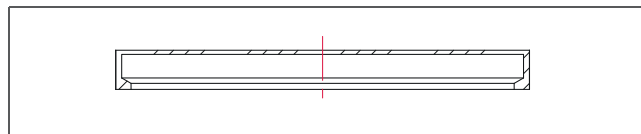
Nominal diameter	A [mm]	B [mm]	C	Order number
DN 63 ISO-F	35	130	4 x M8	PF 308 006-T
DN 100 ISO-F	35	165	8 x M8	PF 308 010-T

## ISO-K Flange Cap



- Made from plastic

### Dimensions



### Polyethelene (PE)

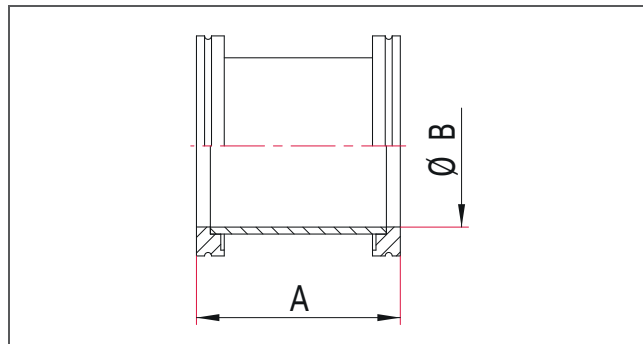
Nominal diameter	Package [Qty.]	Order number
DN 63 ISO-K	5	330FSK063-S5
DN 80 ISO-K	5	330FSK080-S5
DN 100 ISO-K	5	330FSK100-S5
DN 160 ISO-K	5	330FSK160-S5
DN 200 ISO-K	5	330FSK200-S5
DN 250 ISO-K	5	330FSK250-S5

## ISO-K Full Nipple



- Other lengths and materials on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	Order number
DN 63 ISO-K	88	70	320RZS063
DN 63 ISO-K	176	70	320RZS063-176
DN 100 ISO-K	108	102	320RZS100
DN 100 ISO-K	216	102	320RZS100-216
DN 160 ISO-K	138	153	320RZS160
DN 160 ISO-K	276	153	320RZS160-276
DN 200 ISO-K	178	213	320RZS200
DN 250 ISO-K	208	261	320RZS250

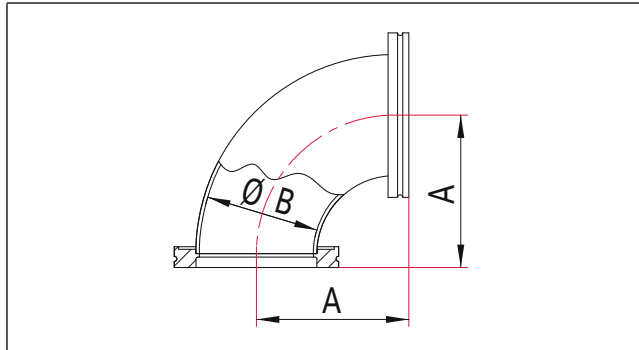
Flanges according to ISO 1609

## ISO-K 90° Elbow, Radius

- Larger flange sizes on request



### Dimensions



### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 63 ISO-K	88	66	320RRB063-90
DN 100 ISO-K	108	100	320RRB100-90
DN 160 ISO-K	232	150	320RRB160-90

Flanges according to ISO 1609

### Stainless Steel 316L/1.4404

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 350 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 63 ISO-K	88	66	370RRB063-90
DN 100 ISO-K	108	100	370RRB100-90

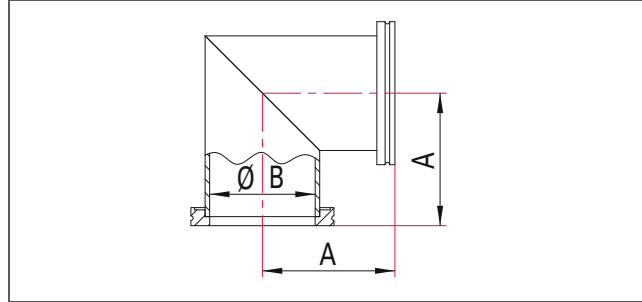
Flanges according to ISO 1609

## ISO-K 90° Elbow, Mitered



- Larger flange sizes on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	Order number
DN 160 ISO-K	138	153	320RWS160-90
DN 200 ISO-K	178	213	320RWS200-90
DN 250 ISO-K	208	261	320RWS250-90

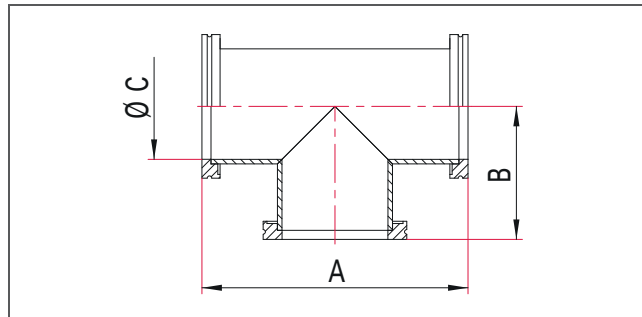
Flanges according to ISO 1609

## ISO-K Tee



- Larger flange sizes on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 63 ISO-K	176	88	70	320RTS063
DN 100 ISO-K	216	108	102	320RTS100
DN 160 ISO-K	276	138	153	320RTS160
DN 200 ISO-K	356	178	213	320RTS200
DN 250 ISO-K	416	208	261	320RTS250

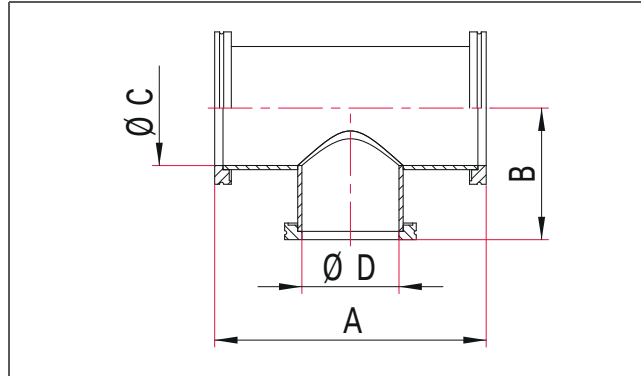
Flanges according to ISO 1609

## ISO-K Reducer Tee



- Other flange sizes and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Nominal diameter reduced	Order number
DN 100 ISO-K	216	107	102	70	DN 63 ISO-K	320RTR100-063
DN 160 ISO-K	276	130	153	70	DN 63 ISO-K	320RTR160-063
DN 160 ISO-K	276	131	153	102	DN 100 ISO-K	320RTR160-100

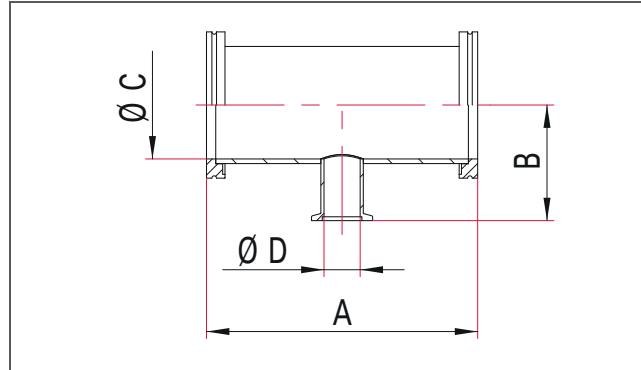
Flanges according to ISO 1609

## ISO-K to ISO-KF Reducer Tee



- Other flange sizes and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Nominal diameter reduced	Order number
DN 63 ISO-K	176	75	70	24	DN 25 ISO-KF	320RTR063-025
DN 63 ISO-K	176	75	70	40.5	DN 40 ISO-KF	320RTR063-040
DN 100 ISO-K	216	100	102	24	DN 25 ISO-KF	320RTR100-025
DN 100 ISO-K	216	100	102	40.5	DN 40 ISO-KF	320RTR100-040
DN 160 ISO-K	276	125	153	24	DN 25 ISO-KF	320RTR160-025
DN 160 ISO-K	276	125	153	40.5	DN 40 ISO-KF	320RTR160-040

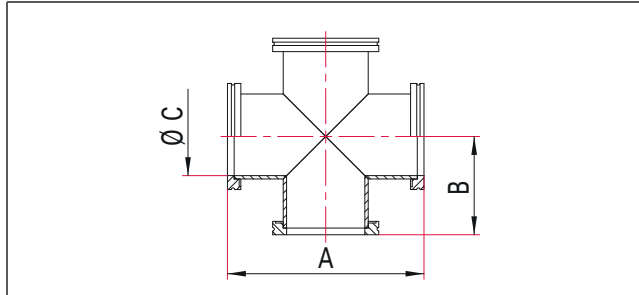
Flanges according to ISO 1609

## ISO-K Cross



- Other flange sizes and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 63 ISO-K	176	88	66	320RKS063
DN 100 ISO-K	216	108	100	320RKS100
DN 160 ISO-K	276	138	153	320RKS160
DN 200 ISO-K	356	178	213	320RKS200
DN 250 ISO-K	416	208	261	320RKS250

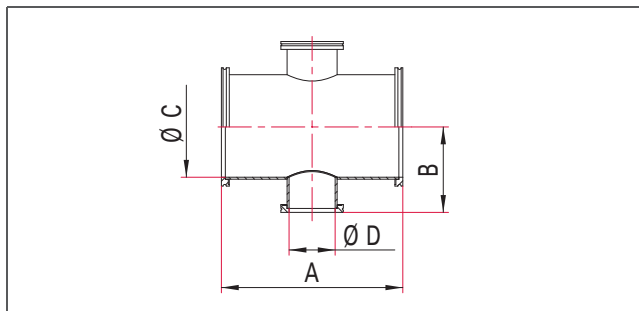
Flanges according to ISO 1609

## ISO-K Reducer Cross



- Other flange sizes and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Nominal diameter reduced	Order number
DN 100 ISO-K	216	107	102	70	DN 63 ISO-K	320RKR100-063
DN 160 ISO-K	276	130	153	70	DN 63 ISO-K	320RKR160-063
DN 160 ISO-K	276	131	153	102	DN 100 ISO-K	320RKR160-100

Flanges according to ISO 1609

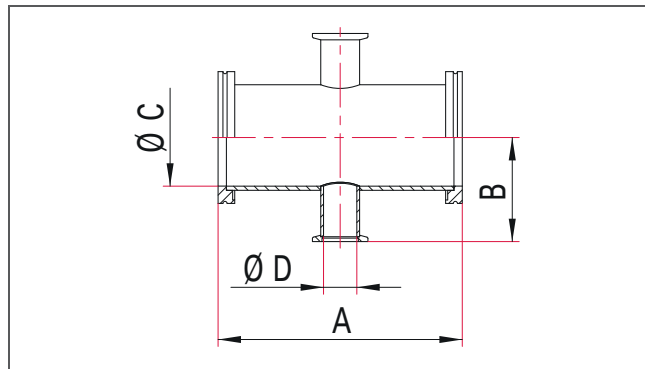


## ISO-K to ISO-KF Adapter Cross



- Other flange sizes and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Nominal diameter reduced	Order number
DN 63 ISO-K	176	75	70	24	DN 25 ISO-KF	320RKR063-025
DN 63 ISO-K	176	75	70	40.5	DN 40 ISO-KF	320RKR063-040
DN 100 ISO-K	216	100	102	24	DN 25 ISO-KF	320RKR100-025
DN 100 ISO-K	216	100	102	40.5	DN 40 ISO-KF	320RKR100-040
DN 160 ISO-K	276	125	153	24	DN 25 ISO-KF	320RKR160-025
DN 160 ISO-K	276	125	153	40.5	DN 40 ISO-KF	320RKR160-040

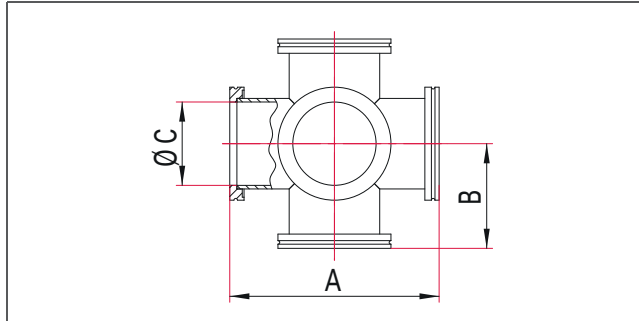
Flanges according to ISO 1609

## ISO-K 6-Way Cross



- Other flange sizes and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 63 ISO-K	176	88	70	320RKD063
DN 100 ISO-K	216	108	102	320RKD100
DN 160 ISO-K	276	138	153	320RKD160
DN 200 ISO-K	356	178	213	320RKD200
DN 250 ISO-K	416	208	261	320RKD250

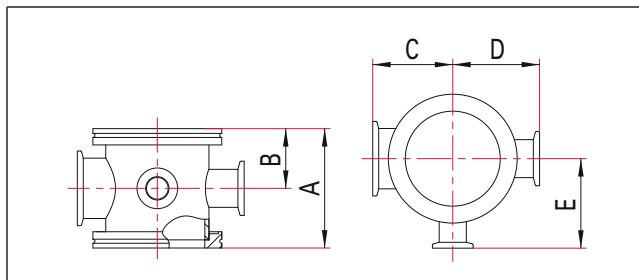
Flanges according to ISO 1609

## ISO-K Instrument Cross



- Three ports: DN 16 KF, DN 25 KF and DN 40 KF
- Other flange sizes and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 63 ISO-K	88	44	59	64	66	320RKM063
DN 100 ISO-K	100	50	77	80	82	320RKM100
DN 160 ISO-K	100	50	107	105	107	320RKM160

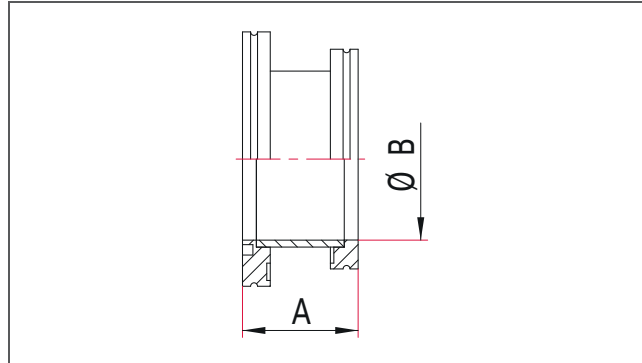
Flanges according to ISO 1609

## ISO-K Reducer, Straight



- Other flange sizes and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 100 ISO-K	50	70	DN 63 ISO-K	<b>320RRG100-063-50</b>
DN 160 ISO-K	50	70	DN 63 ISO-K	<b>320RRG160-063-50</b>
DN 160 ISO-K	50	102	DN 100 ISO-K	<b>320RRG160-100-50</b>
DN 200 ISO-K	50	102	DN 100 ISO-K	<b>320RRG200-100-50</b>
DN 200 ISO-K	50	153	DN 160 ISO-K	<b>320RRG200-160-50</b>
DN 250 ISO-K	50	153	DN 160 ISO-K	<b>320RRG250-160-50</b>
DN 250 ISO-K	50	213	DN 200 ISO-K	<b>320RRG250-200-50</b>

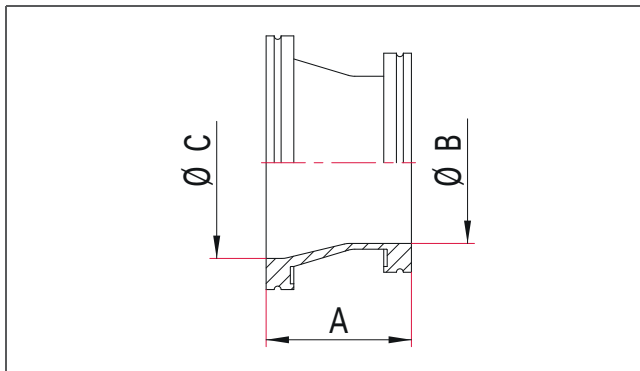
Flanges according to ISO 1609

## ISO-K Conical Reducer



- Material: Stainless steel
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Nominal diameter reduced	Order number
DN 100 ISO-K	63	70	102	DN 63 ISO-K	320RRK100-063-63
DN 160 ISO-K	63	70	153	DN 63 ISO-K	320RRK160-063-63
DN 160 ISO-K	104	102	153	DN 100 ISO-K	320RRK160-100-104

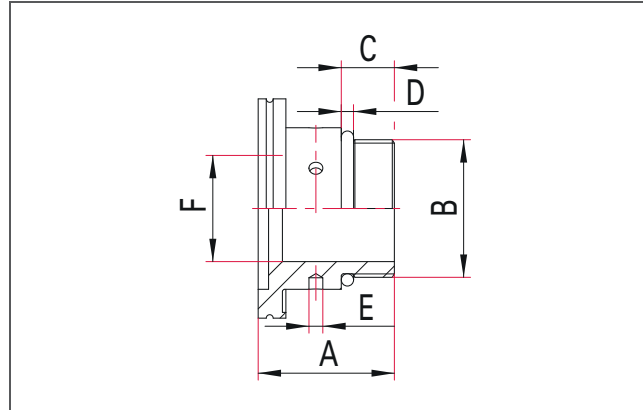
Flanges according to ISO 1609

## ISO-K Flange with Pipe Thread and FPM Seal, Male



- FKM O-ring included
- Holes: (blind holes) for C-spanner wrench: 6 x Ø 6 mm
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -15 to 200 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 ISO-K	59	G2"	23	5	6	48	320AED063-2000
DN 63 ISO-K	60	G3"	23	5	6	50	320AED063-3000
DN 100 ISO-K	60	G3"	23	5	6	70	320AED100-3000

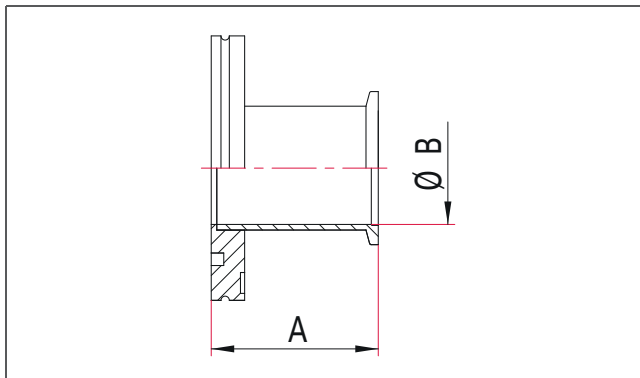
Flanges according to ISO 1609

## ISO-K/KF Straight Adapter



- Other combinations and lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 63 ISO-K	40	24	DN 25 ISO-KF	<b>320RRG063-025-40</b>
DN 63 ISO-K	40	40.5	DN 40 ISO-KF	<b>320RRG063-040-40</b>
DN 63 ISO-K	40	50.6	DN 50 ISO-KF	<b>320RRG063-050-40</b>
DN 100 ISO-K	40	24	DN 25 ISO-KF	<b>320RRG100-025-40</b>
DN 100 ISO-K	40	40.5	DN 40 ISO-KF	<b>320RRG100-040-40</b>
DN 100 ISO-K	40	50.6	DN 50 ISO-KF	<b>320RRG100-050-40</b>
DN 160 ISO-K	40	40.5	DN 40 ISO-KF	<b>320RRG160-040-40</b>

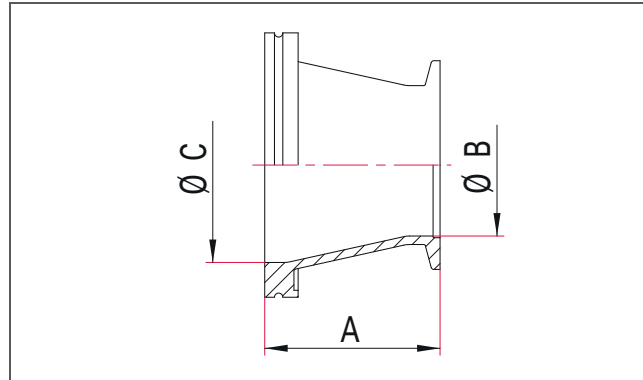
ISO-KF Flanges according to ISO 2861

ISO-K Flanges according to ISO 1609

## ISO-K/KF Conical Adapter

- Available in stainless steel or aluminum

### Dimensions



### Aluminum EN AW-6082

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 150 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Nominal diameter reduced	Order number
DN 63 ISO-K	40	40.5	70	DN 40 ISO-KF	31ORRK063-040-40
DN 63 ISO-K	45	50	70	DN 50 ISO-KF	31ORRK063-050-45

Flanges according to ISO 2861

ISO-K Flanges according to ISO 1609

### Stainless Steel 304/1.4301

- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

Nominal diameter	A [mm]	B [mm]	C [mm]	Nominal diameter reduced	Order number
DN 63 ISO-K	63	24	70	DN 25 ISO-KF	32ORRK063-025-63
DN 63 ISO-K	63	40.5	70	DN 40 ISO-KF	32ORRK063-040-63
DN 63 ISO-K	63	50	70	DN 50 ISO-KF	32ORRK063-050-63
DN 100 ISO-K	63	40.5	102	DN 40 ISO-KF	32ORRK100-040-63
DN 100 ISO-K	63	50	102	DN 50 ISO-KF	32ORRK100-050-63

Flanges according to ISO 2861

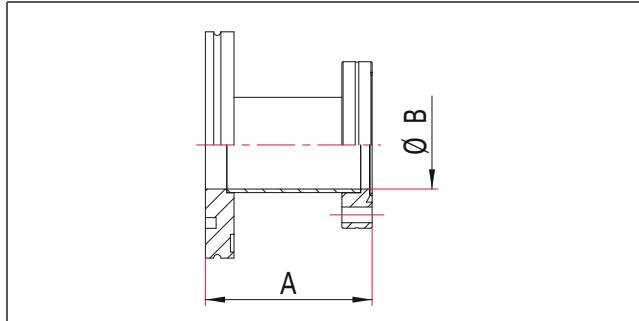
ISO-K Flanges according to ISO 1609

## ISO-K/CF Adapter



- Other flange sizes and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301; CF Flange 304L

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 16 CF	60	16	DN 63 ISO-K	420RUG016-063-60
DN 40 CF	70	37	DN 63 ISO-K	420RUG040-063-70
DN 63 CF	90	66	DN 63 ISO-K	420RUG063-063-90
DN 100 CF	90	102	DN 100 ISO-K	420RUG100-100-90
DN 160 CF	100	153	DN 160 ISO-K	420RUG160-160-100

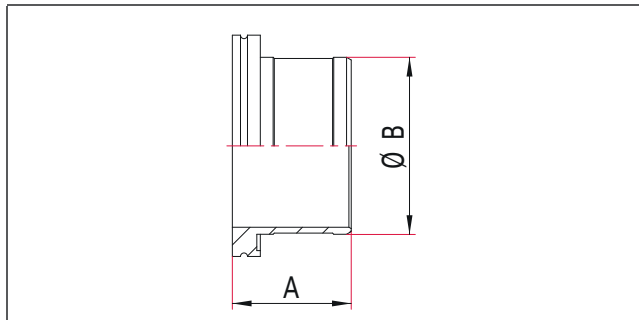
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2  
ISO-K Flanges according to ISO 1609

## ISO-K Sleeve Coupling



- For connecting a CR sleeve (330SMA)
- Fastener: hose clamp (see accessories)

### Dimensions



### Aluminum EN AW-6082

Nominal diameter	A [mm]	B [mm]	Order number
DN 63 ISO-K	51	76	310FMA063
DN 100 ISO-K	56	108	310FMA100
DN 160 ISO-K	56	159	310FMA160

Flanges according to ISO 1609

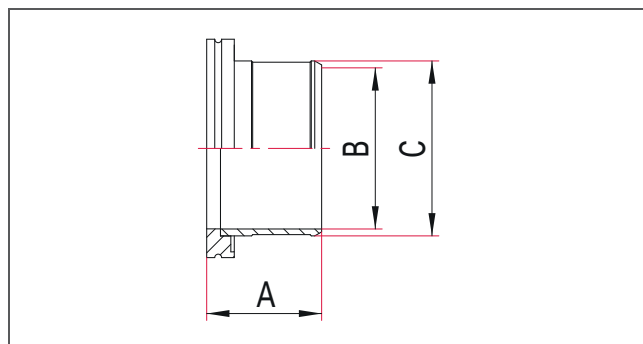


## ISO-K Hose Adapter



- For connecting a PVC hose with embedded spring (330SPM)
- Fastener: hose clamp (see accessories)

### Dimensions



Stainless Steel 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 63 ISO-K	50	70	76.1	320ASP063
DN 100 ISO-K	50	95	101.6	320ASP100

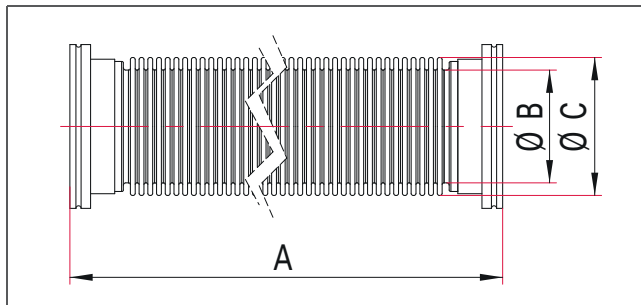
Flanges according to ISO 1609

## ISO-K Corrugated Hose, Flexible



- Flange connection length: 30 mm
- Custom lengths on request
- Pressure min.:  $1 \cdot 10^{-8}$  hPa
- Temperature range: -196 to 300 °C

### Dimensions



**Stainless Steel: Flange 304/1.4301; Bellows 316L**

Nominal diameter	A [mm]	B [mm]	C [mm]	Bend radius, unique movement [mm]	Bend radius, often movement [mm]	Over pressure max. [hPa]	Order number
DN 63 ISO-K	250	65	80	90	330	500	320SWN063-0250
DN 63 ISO-K	500	65	80	90	330	500	320SWN063-0500
DN 63 ISO-K	750	65	80	90	330	500	320SWN063-0750
DN 63 ISO-K	1000	65	80	90	330	500	320SWN063-1000
DN 63 ISO-K	1500	65	80	90	330	500	320SWN063-1500
DN 100 ISO-K	250	100	119	131	530	300	320SWN100-0250
DN 100 ISO-K	500	100	119	131	530	300	320SWN100-0500
DN 100 ISO-K	750	100	119	131	530	300	320SWN100-0750
DN 100 ISO-K	1000	100	119	131	530	300	320SWN100-1000
DN 160 ISO-K	250	150	173	216	1050	100	320SWN160-0250
DN 160 ISO-K	500	150	173	216	1050	100	320SWN160-0500
DN 160 ISO-K	750	150	173	216	1050	100	320SWN160-0750
DN 160 ISO-K	1000	150	173	216	1050	100	320SWN160-1000

Please note that the hose shrinks under vacuum.

The minimum bending radii are applicable for a temperature of 20 °C.

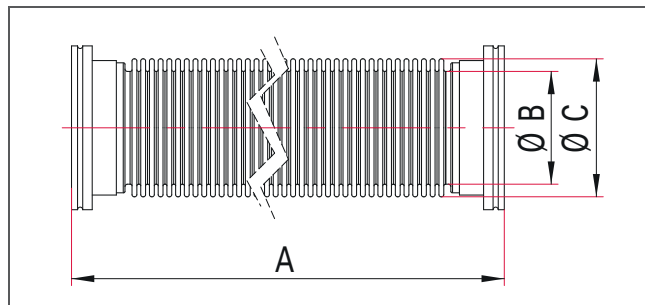
Flanges according to ISO 1609

## ISO-K Corrugated Hose, Flexible, Annealed



- Flange connection length: 30 mm
- Stress relieved; low reset force when bent
- Custom lengths on request
- Pressure min.:  $1 \cdot 10^{-8}$  hPa
- Temperature range: -196 to 300 °C

### Dimensions



Stainless Steel: Flange 304/1.4301; Bellows 316L

Nominal diameter	A [mm]	B [mm]	C [mm]	Bend radius, unique movement [mm]	Over pressure max. [hPa]	Order number
DN 63 ISO-K	250	65	80	90	500	320SWG063-0250
DN 63 ISO-K	500	65	80	90	500	320SWG063-0500
DN 63 ISO-K	750	65	80	90	500	320SWG063-0750
DN 63 ISO-K	1000	65	80	90	500	320SWG063-1000
DN 100 ISO-K	250	100	119	131	300	320SWG100-0250
DN 100 ISO-K	500	100	119	131	300	320SWG100-0500
DN 100 ISO-K	750	100	119	131	300	320SWG100-0750
DN 100 ISO-K	1000	100	119	131	300	320SWG100-1000
DN 160 ISO-K	250	150	173	216	100	320SWG160-0250
DN 160 ISO-K	500	150	173	216	100	320SWG160-0500
DN 160 ISO-K	750	150	173	216	100	320SWG160-0750
DN 160 ISO-K	1000	150	173	216	100	320SWG160-1000

Please note that the hose shrinks under vacuum.

The minimum bending radius is applicable for a temperature of 20 °C.

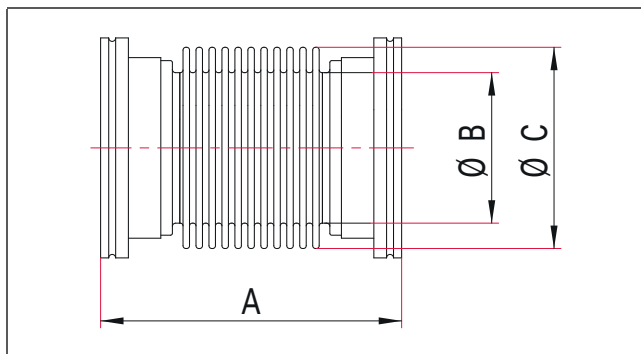
Flanges according to ISO 1609

## ISO-K Spring Bellows



- Flange connection length: 30 mm
- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Materials: Stainless steel (flange: 304; bellows: DN 63 to DN 100 and DN 320: 316L;  
DN 160 to DN 250: 316Ti)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	A [mm]	B [mm]	C [mm]	Axial stroke [mm]	Order number
DN 63 ISO-K	130	65	87	±16	320SFK063-130
DN 63 ISO-K	150	65	87	±20	320SFK063-150
DN 80 ISO-K	130	80	104	±11	320SFK080-130
DN 80 ISO-K	150	80	104	±15	320SFK080-150
DN 100 ISO-K	130	100	127	±17	320SFK100-130
DN 100 ISO-K	150	100	127	±21	320SFK100-150
DN 160 ISO-K	150	150	184	±14	320SFK160-150
DN 160 ISO-K	220	150	184	±25	320SFK160-220
DN 200 ISO-K	220	200	235	±25	320SFK200-220
DN 250 ISO-K	220	250	285	±25	320SFK250-220
DN 320 ISO-K	220	318	368	±25	320SFK320-220

Please note that the spring bellows shrinks under vacuum.

The axial stroke is applicable for a temperature of 20 °C and 10000 load cycles.

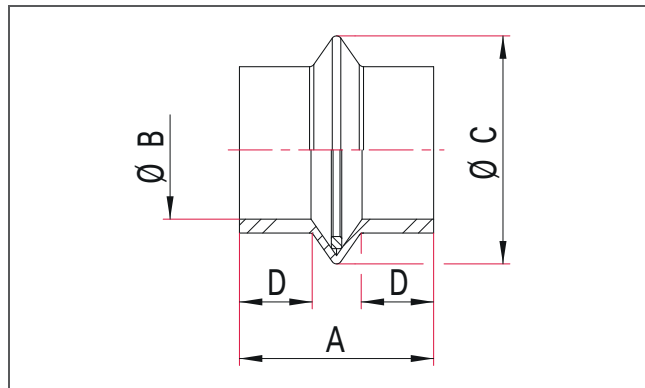
Flanges according to ISO 1609

## ISO-K CR Sleeve



- Sleeve made from chloroprene rubber
- Connection: sleeve coupling (see adapters) and hose clamp (see accessories)
- Pressure range:  $1 \cdot 10^{-5}$  hPa to ambient pressure
- Temperature range: -5 to 120 °C

### Dimensions



### Chloroprene Rubber (CR)

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 63 ISO-K	65	75	115	20	330SMA063
DN 100 ISO-K	75	105	160	16	330SMA100
DN 160 ISO-K	75	156	218	16	330SMA160

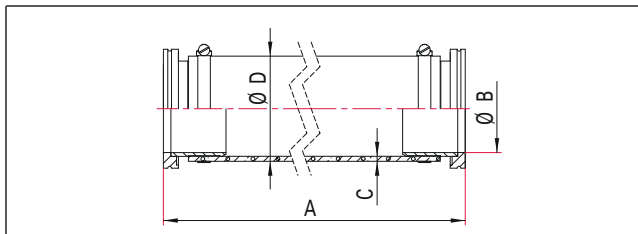
Please note that the sleeve shrinks under vacuum.

### ISO-K PVC Hose with Embedded Spring and Flanges



- Inner tube material: PVC, transparent
- Casing: Steel coil
- Hose cover material: PVC, transparent
- Smooth inner and outer walls
- Custom lengths on request
- Pressure range:  $1 \cdot 10^{-4}$  hPa to ambient pressure
- Temperature range: -10 to 60 °C

#### Dimensions



#### PVC with Stainless Steel Flange 304/1.4301

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Bend radius [mm]	Order number
DN 63 ISO-K	500	70	7.5	90	150	300SPA063-0500
DN 63 ISO-K	1000	70	7.5	90	150	300SPA063-1000
DN 100 ISO-K	500	95	8.5	117	200	300SPA100-0500
DN 100 ISO-K	1000	95	8.5	117	200	300SPA100-1000

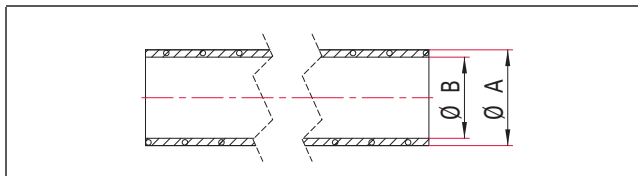
The minimum bending radius is applicable for a temperature of 20 °C.  
Flanges according to ISO 1609

### ISO-K PVC Hose with Embedded Spring



- Inner tube material: PVC, transparent
- Casing: Steel coil
- Hose cover material: PVC, transparent
- Smooth inner and outer walls
- Length: Up to 50 m; min. order: 1 m; orders > 1 m calculated pro rata
- Connection: Hose Adapter and Hose Clamp
- Pressure range:  $1 \cdot 10^{-4}$  hPa to 500 hPa over pressure
- Temperature range: -10 to 60 °C

#### Dimensions



#### PVC

Inner diameter [mm]	A [mm]	B [mm]	Bend radius [mm]	Order number
75	90	75	150	330SPM063
100	117	100	200	330SPM100

The minimum bending radius is applicable for a temperature of 20 °C.

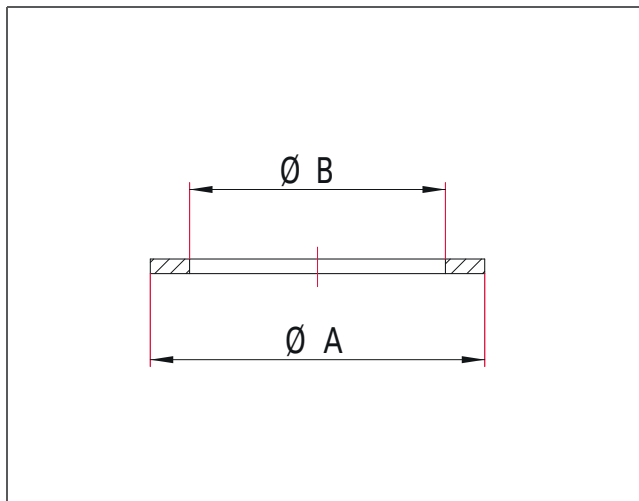


## CF Copper Gasket



- For single use only
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Temperature range: -196 to 200 °C

### Dimensions



### OFHC Copper (Oxygen Free)

Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.3	16	10	490DFL016-S10
DN 25 CF	32.8	25.5	10	490DFL025-S10
DN 40 CF	48.2	36.6	10	490DFL040-S10
DN 50 CF	61.6	50.8	10	490DFL050-S10
DN 63 CF	82.4	63.4	10	490DFL063-S10
DN 75 CF	91.4	76.3	10	490DFL075-S10
DN 100 CF	120.5	101.6	10	490DFL100-S10
DN 130 CF	141.4	127.1	5	490DFL130-S5
DN 160 CF	171.3	152.4	5	490DFL160-S5
DN 200 CF	222.1	203.3	5	490DFL200-S5
DN 250 CF	272.9	254	5	490DFL250-S5
DN 300 CF	313.2	300	5	490DFL300-S5
DN 350 CF	376.6	356.5	5	490DFL350-S5

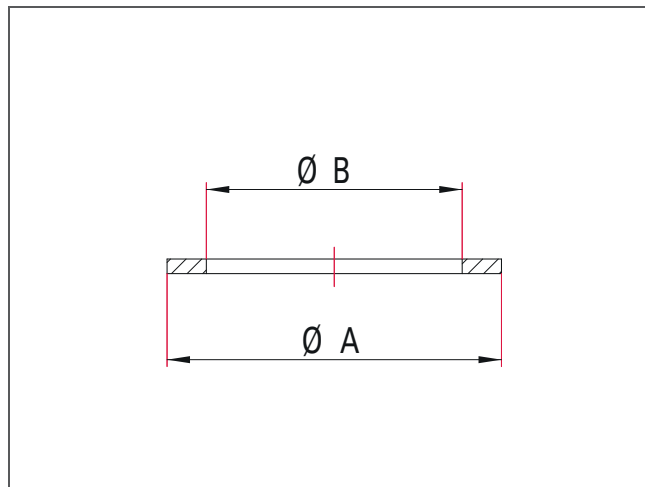


## CF Silver-plated Copper Gasket



- For single use only
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Temperature range: -196 to 450 °C

### Dimensions



### OFHC Copper (Oxygen Free), Silver-plated

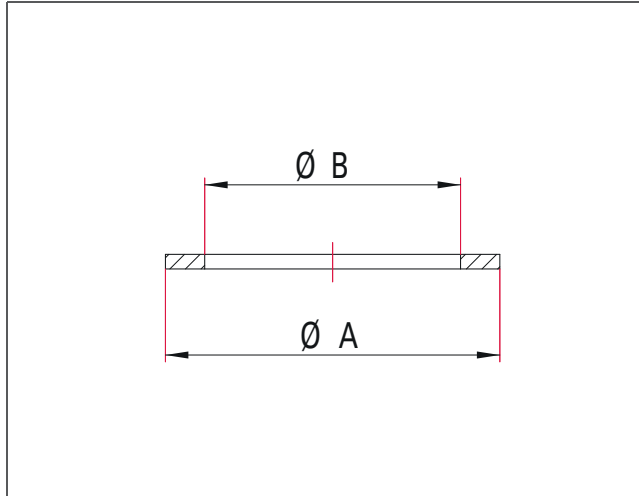
Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.3	16	5	490DFL016-S-S5
DN 25 CF	32.8	25.5	5	490DFL025-S-S5
DN 40 CF	48.2	36.6	5	490DFL040-S-S5
DN 63 CF	82.4	63.4	5	490DFL063-S-S5
DN 100 CF	120.5	101.6	5	490DFL100-S-S5
DN 160 CF	171.3	152.4	5	490DFL160-S-S5
DN 200 CF	222.1	203.3	5	490DFL200-S-S5
DN 250 CF	272.9	254	5	490DFL250-S-S5

## CF Vacuum-annealed Copper Gasket



- Particularly well suited for viewports
- For single use only
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Temperature range: -196 to 200 °C

### Dimensions



### OFHC Copper (Oxygen Free), Vacuum-annealed

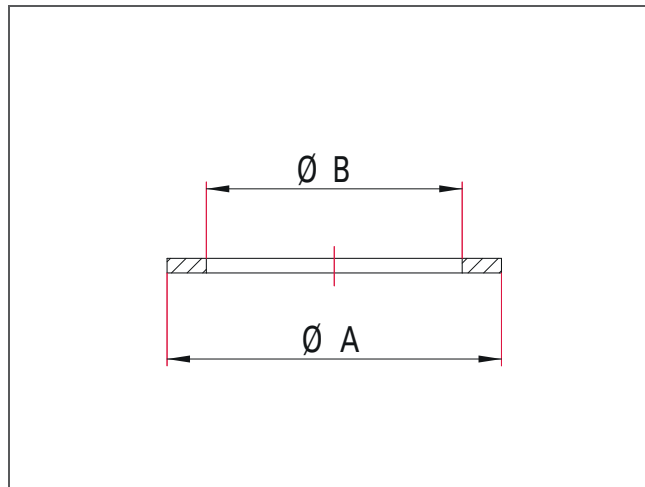
Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.3	16	5	490DFL016-G-S5
DN 40 CF	48.2	36.6	5	490DFL040-G-S5
DN 63 CF	82.4	63.4	5	490DFL063-G-S5
DN 100 CF	120.5	101.6	5	490DFL100-G-S5
DN 160 CF	171.3	152.4	5	490DFL160-G-S5
DN 200 CF	222.1	203.3	5	490DFL200-G-S5
DN 250 CF	272.9	254	5	490DFL250-G-S5

## CF Silver-plated, Vacuum-annealed Copper Gasket



- Particularly well suited for viewports
- For single use only
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Temperature range: -196 to 450 °C

### Dimensions



### OFHC Copper (Oxygen Free), Silver-plated, Vacuum-annealed

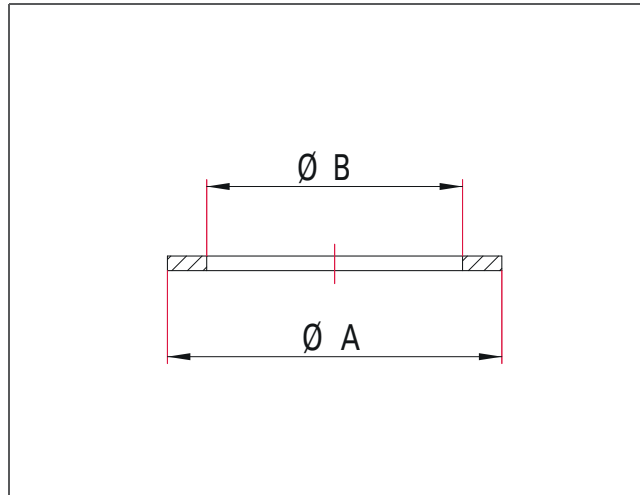
Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.3	16	5	490DFL016-S-G-S5
DN 40 CF	48.2	36.6	5	490DFL040-S-G-S5
DN 63 CF	82.4	63.4	5	490DFL063-S-G-S5
DN 100 CF	120.5	101.6	5	490DFL100-S-G-S5
DN 160 CF	171.3	152.4	5	490DFL160-S-G-S5
DN 200 CF	222.1	203.3	5	490DFL200-S-G-S5
DN 250 CF	272.9	254	5	490DFL250-S-G-S5

## CF Elastomer Gasket FKM

- Reusable
- Version with centering lip: better fixation in flange for easier assembly; higher purity of materials for lower desorption
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Temperature range: -15 to 150 °C (shortly up to 200 °C)

### FKM Cut from Sheet Material

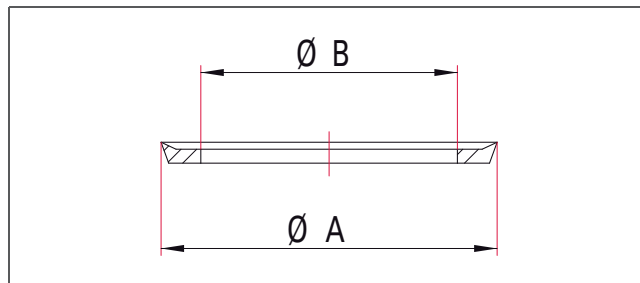
#### Dimensions



Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.4	16	2	402DFL016-S2
DN 40 CF	48.2	37	2	402DFL040-S2
DN 63 CF	82.4	63	2	402DFL063-S2
DN 100 CF	120.5	109	2	402DFL100-S2
DN 160 CF	171.3	152	2	402DFL160-S2
DN 200 CF	222.1	203	2	402DFL200-S2
DN 250 CF	272.9	254	2	402DFL250-S2

### FKM with Centering Lip; Heat-molded

#### Dimensions



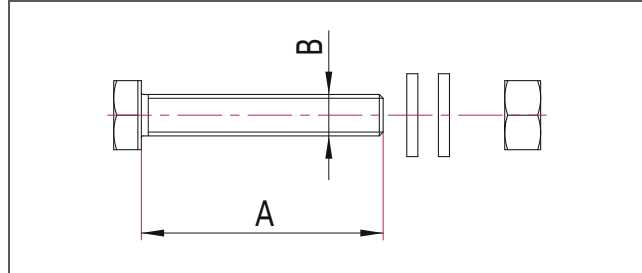
Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.4	16	1	402DFL016-Z
DN 40 CF	48.2	36	1	402DFL040-Z
DN 63 CF	82.4	71	1	402DFL063-Z
DN 100 CF	120.5	109	1	402DFL100-Z
DN 160 CF	171.3	158	1	402DFL160-Z
DN 200 CF	222.1	200	1	402DFL200-Z
DN 250 CF	272.9	254	1	402DFL250-Z

## CF Hexagon Head Screw Set for Flanges with Through-holes



- For installing two flanges with through-holes
- Set includes the screws required for the specified flange size
- Includes two washers and one nut for each screw

### Dimensions



### Stainless Steel A2

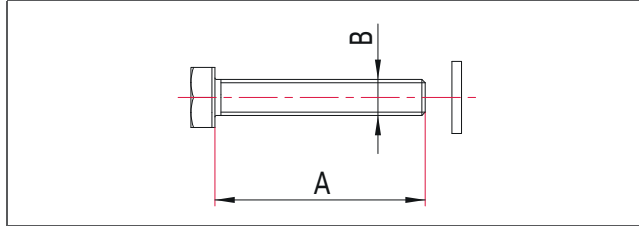
Nominal diameter	A [mm]	B	Number per set	Order number
DN 16 CF	20	M4	6	420BSC016-20
DN 25 CF	35	M6	4	420BSC025-35
DN 40 CF	35	M6	6	420BSC040-35
DN 50 CF	45	M8	8	420BSC050-45
DN 63 CF	45	M8	8	420BSC063-45
DN 75 CF	45	M8	10	420BSC075-45
DN 100 CF	50	M8	16	420BSC100-50
DN 130 CF	55	M8	18	420BSC130-55
DN 160 CF	55	M8	20	420BSC160-55
DN 200 CF	60	M8	24	420BSC200-60
DN 250 CF	65	M8	32	420BSC250-65
DN 300 CF	70	M10	30	420BSC300-70
DN 350 CF	70	M10	36	420BSC350-70

## CF Hexagon Head Screw Set for Flanges with Tapped Holes



- For installing a flange with through-holes on a flange with tapped-holes
- Ideal for installing gate valves
- Set includes the screws required for the specified flange size
- One screw and one washer

### Dimensions



### Stainless Steel A2-70

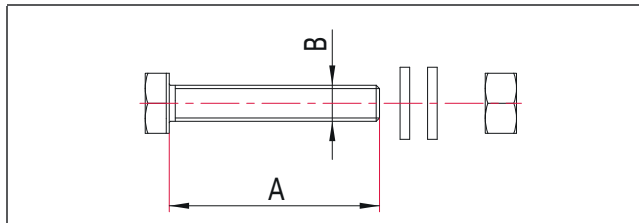
Nominal diameter	A [mm]	B	Number per set	Order number
DN 16 CF	14	M4	6	420BSC016-14
DN 40 CF	20	M6	6	420BSC040-20
DN 63 CF	30	M8	8	420BSC063-30
DN 100 CF	30	M8	16	420BSC100-30
DN 160 CF	35	M8	20	420BSC160-35
DN 200 CF	35	M8	24	420BSC200-35
DN 250 CF	35	M8	32	420BSC250-35

## CF Hexagon Head Screw Set for Spacer Flanges



- For installing a spacer between two standard flanges with through-holes
- Set includes the screws required for the specified flange size
- Includes two washers and one nut for each screw

### Dimensions



### Stainless Steel A2-70

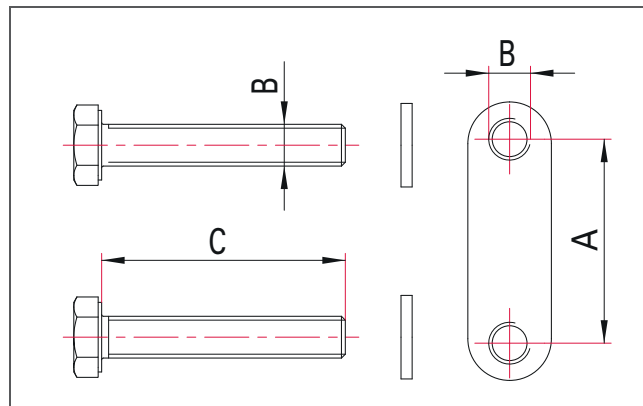
Nominal diameter	A [mm]	B	Number per set	Order number
DN 16 CF	30	M4	6	420BSC016-30
DN 40 CF	50	M6	6	420BSC040-50
DN 63 CF	65	M8	8	420BSC063-65
DN 100 CF	70	M8	16	420BSC100-70
DN 160 CF	80	M8	20	420BSC160-80
DN 200 CF	90	M8	24	420BSC200-90
DN 250 CF	90	M8	32	420BSC250-90

## CF Plate Nut Sets



- Set includes screws and washers for the specified flange size
- Easy assembly with only one wrench (no counter-tightening necessary)

### Dimensions



### Stainless Steel 304; Screws A2-70

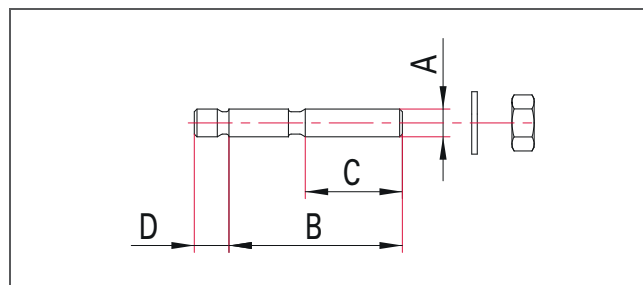
Nominal diameter	A [mm]	B	C [mm]	Number per set	Order number
DN 16 CF	13.5	M4	20	3	420BMD016
DN 40 CF	29.3	M6	35	3	420BMD040
DN 63 CF	35.2	M8	45	4	420BMD063
DN 100 CF	25.4	M8	50	8	420BMD100
DN 160 CF	28.3	M8	55	10	420BMD160

## CF Stud Screw Set with Hexagon Nut



- 10 sets per package
- Includes washer and one nut for each screw

### Dimensions



### Stainless Steel A2

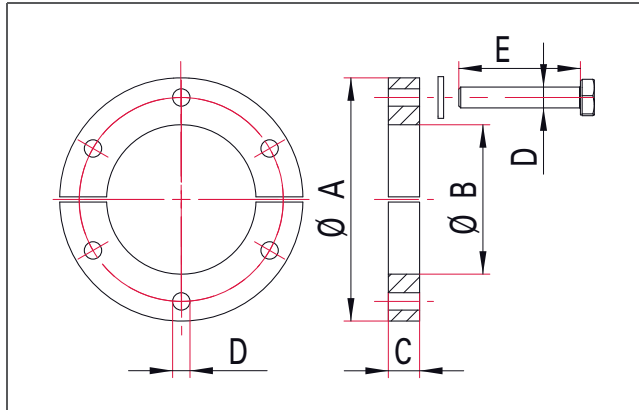
Nominal diameter	A	B [mm]	C [mm]	D [mm]	Order number
DN 25-40 CF	M6	25	18	6	420BST-M6x25
DN 25-40 CF	M6	30	18	6	420BST-M6x30
DN 25-40 CF	M6	35	18	6	420BST-M6x35
DN 63-250 CF	M8	40	22	8	420BST-M8x40
DN 63-250 CF	M8	45	22	8	420BST-M8x45
DN 63-250 CF	M8	50	22	8	420BST-M8x50
DN 63-250 CF	M8	55	22	8	420BST-M8x55
DN 63-250 CF	M8	60	22	8	420BST-M8x60

## CF Hexagon Head Screw Set with Horseshoe Nuts



- For installing two flanges with through-holes
- Easy assembly with only one wrench (no counter-tightening necessary)
- Set contains two horseshoe nut plates with screws and washers

### Dimensions



Stainless Steel 304/1.4301; Screws A2-70

Nominal diameter	A [mm]	B [mm]	C [mm]	D	E [mm]	Order number
DN 16 CF	34	20	6	M4	20	420BMH016
DN 40 CF	69.6	45	9	M6	35	420BMH040
DN 63 CF	113.5	80	12	M8	45	420BMH063
DN 100 CF	151.6	115	12	M8	50	420BMH100
DN 160 CF	202.4	165	12	M8	55	420BMH160

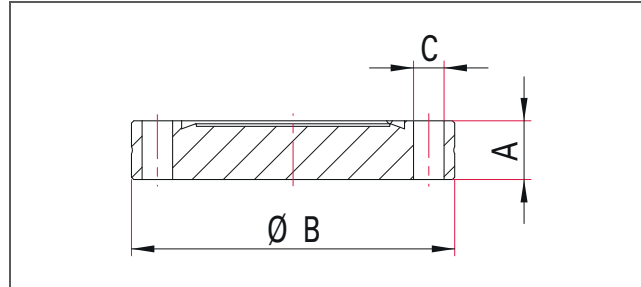


## CF Blank Flange



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	7.75	34	4.4	420FBL016
DN 25 CF	12	54	6.6	420FBL025
DN 40 CF	12.7	69.9	6.6	420FBL040
DN 50 CF	17.3	85.7	8.4	420FBL050
DN 63 CF	17.5	113.5	8.4	420FBL063
DN 75 CF	17.5	117.4	8.4	420FBL075
DN 100 CF	19.8	152	8.4	420FBL100
DN 130 CF	21.4	171.4	8.4	420FBL130
DN 160 CF	22.2	202.4	8.4	420FBL160
DN 200 CF	24.5	253.2	8.4	420FBL200
DN 250 CF	26	304.8	8.4	420FBL250
DN 300 CF	28.5	355.6	10.5	420FBL300
DN 350 CF	28.5	419.1	10.5	420FBL350

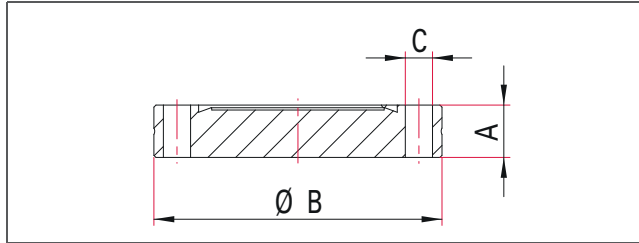
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Blank Flange, with Thread



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L, with Metric Thread

Nominal diameter	A [mm]	B [mm]	C	Order number
DN 16 CF	7.75	34	M4	420FBL016-G
DN 40 CF	12.7	69.9	M6	420FBL040-G
DN 63 CF	17.5	113.5	M8	420FBL063-G
DN 100 CF	19.8	152	M8	420FBL100-G
DN 160 CF	22.2	202.4	M8	420FBL160-G
DN 200 CF	24.5	253.2	M8	420FBL200-G
DN 250 CF	26	304.8	M8	420FBL250-G

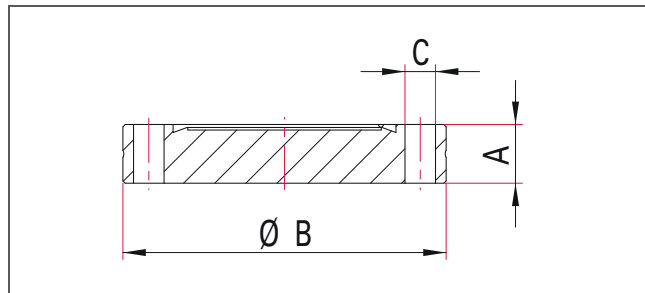
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Blank Flange, 316LN ESR



- Bakeable under vacuum up to 1050 °C
- Low desorption
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Magnetic permeability:  $\leq 1.01$
- Temperature range: -196 to 350 °C

### Dimensions



### Stainless Steel 316LN ESR/1.4429 ESU

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	7.75	34	4.4	480FBL016
DN 25 CF	12	54	6.6	480FBL025
DN 40 CF	12.7	69.9	6.6	480FBL040
DN 50 CF	17.3	85.7	8.4	480FBL050
DN 63 CF	17.5	113.5	8.4	480FBL063
DN 75 CF	17.5	117.4	8.4	480FBL075
DN 100 CF	19.8	152	8.4	480FBL100
DN 130 CF	21.4	171.4	8.4	480FBL130
DN 160 CF	22.2	202.4	8.4	480FBL160
DN 200 CF	24.5	253.2	8.4	480FBL200
DN 250 CF	26	304.8	8.4	480FBL250

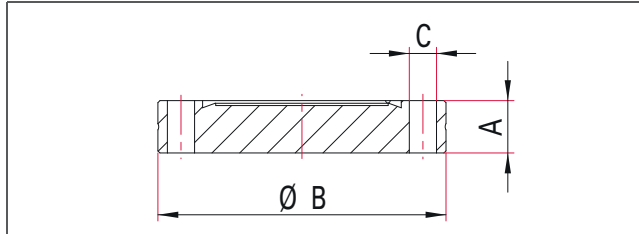
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Blank Flange, with Thread, 316LN ESR



- Bakeable under vacuum up to 1050 °C
- Low desorption
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Magnetic permeability:  $\leq 1.01$
- Temperature range: -196 to 350 °C

### Dimensions



### Stainless Steel 316LN ESR/1.4429 ESU, with Thread

Nominal diameter	A [mm]	B [mm]	C	Order number
DN 16 CF	7.75	34	M4	480FBL016-G
DN 40 CF	12.7	69.9	M6	480FBL040-G
DN 63 CF	17.5	113.5	M8	480FBL063-G
DN 100 CF	19.8	152	M8	480FBL100-G
DN 160 CF	22.2	202.4	M8	480FBL160-G

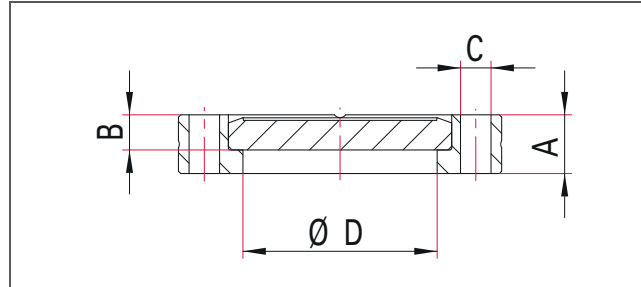
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Blank Flange, Rotatable



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 CF	7.75	5.8	4.4	19.2	420FBD016
DN 40 CF	12.7	7.6	6.6	42	420FBD040
DN 63 CF	17.5	12.6	8.4	72	420FBD063
DN 100 CF	19.8	14.4	8.4	109	420FBD100
DN 160 CF	22.2	15.8	8.4	161	420FBD160
DN 200 CF	24.5	15.8	8.4	207	420FBD200
DN 250 CF	26	16.6	8.4	260	420FBD250

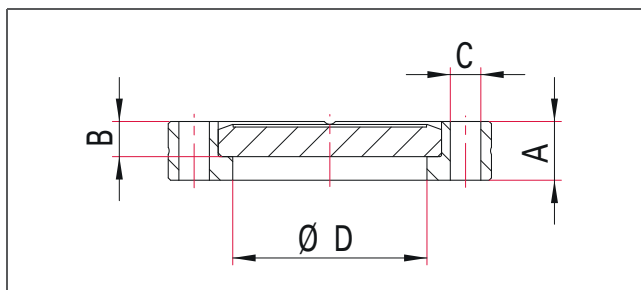
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Blank Flange, Rotatable, 316LN ESR



- Bakeable under vacuum up to 1050 °C
- Low desorption
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Magnetic permeability:  $\leq 1.01$
- Temperature range: -196 to 350 °C

### Dimensions



### Stainless Steel 316LN ESR/1.4429 ESU

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 CF	7.75	5.8	4.4	19.2	480FBD016
DN 40 CF	12.7	7.6	6.6	42	480FBD040
DN 63 CF	17.5	12.6	8.4	72	480FBD063
DN 100 CF	19.8	14.4	8.4	109	480FBD100
DN 160 CF	22.2	15.8	8.4	161	480FBD160

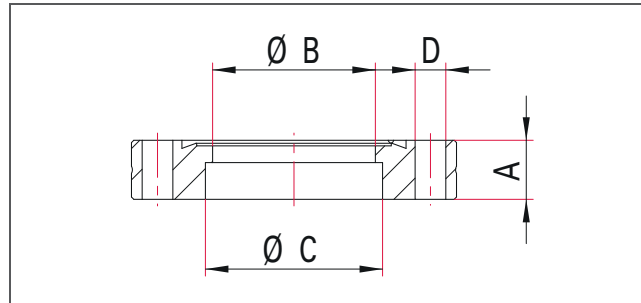
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Weld Flange



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 CF	18 x 1	7.75	16	18.15	4.4	420FAN016-18
DN 16 CF	19.05 x 1.65	7.75	15.75	19.2	4.4	420FAN016-19
DN 25 CF	25.4 x 1.65	12	22.1	25.6	6.6	420FAN025-25
DN 25 CF	28 x 2	12	24	28.2	6.6	420FAN025-28
DN 40 CF	38 x 1.5	12.7	35	38.2	6.6	420FAN040-38
DN 40 CF	40 x 1.5	12.7	37	40.2	6.6	420FAN040-40
DN 40 CF	42.4 x 2	12.7	38.4	42.6	6.6	420FAN040-42
DN 40 CF	44.5 x 2	12.7	40.5	44.7	6.6	420FAN040-44
DN 50 CF	50.8 x 1.65	17.3	47.5	51.1	8.4	420FAN050-50
DN 63 CF	63.5 x 1.65	17.5	60.2	63.8	8.4	420FAN063-63
DN 63 CF	70 x 2	17.5	66	70.3	8.4	420FAN063-70
DN 75 CF	76.1 x 2	17.5	72.1	76.4	8.4	420FAN075-76
DN 100 CF	101.6 x 2.1	19.8	97.4	101.9	8.4	420FAN100-101
DN 100 CF	104 x 2	19.8	100	104.3	8.4	420FAN100-104
DN 100 CF	108 x 2	19.8	104	108.3	8.4	420FAN100-108
DN 130 CF	127 x 1.65	21.4	123.7	127.3	8.4	420FAN130-127
DN 160 CF	152.4 x 2.4	22.2	147.6	152.7	8.4	420FAN160-152
DN 160 CF	154 x 2	22.2	150	154.3	8.4	420FAN160-154
DN 160 CF	159 x 2	22.2	155	159.3	8.4	420FAN160-159
DN 200 CF	203.2 x 2.4	24.5	198.4	203.5	8.4	420FAN200-203
DN 200 CF	204 x 2	24.5	200	204.3	8.4	420FAN200-204
DN 200 CF	205 x 2.5	24.5	200	205.3	8.4	420FAN200-205
DN 250 CF	254 x 2	26	250	254.3	8.4	420FAN250-254
DN 250 CF	256 x 3	26	250	256.3	8.4	420FAN250-256
DN 300 CF	306 x 3	28.5	300	306.3	10.5	420FAN300-306
DN 350 CF	356 x 3	28.5	350	356.3	10.5	420FAN350-356

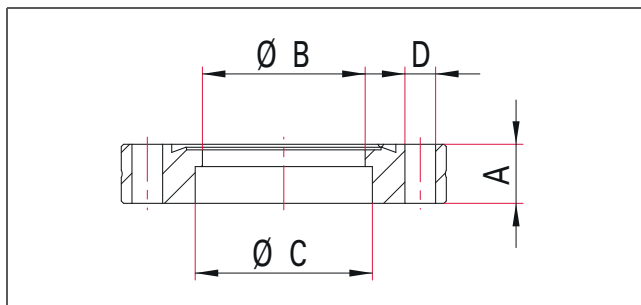
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Weld Flange, with Thread



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L, with Metric Thread

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D	Order number
DN 16 CF	18 x 1	7.75	16	18.15	M4	420FAN016-18-G
DN 25 CF	28 x 2	12	24	28.2	M6	420FAN025-28-G
DN 40 CF	38 x 1.5	12.7	35	38.2	M6	420FAN040-38-G
DN 40 CF	40 x 1.5	12.7	37	40.2	M6	420FAN040-40-G
DN 40 CF	42.4 x 2	12.7	38.4	42.6	M6	420FAN040-42-G
DN 40 CF	44.5 x 2	12.7	40.5	44.7	M6	420FAN040-44-G
DN 63 CF	70 x 2	17.5	66	70.3	M8	420FAN063-70-G
DN 100 CF	104 x 2	19.8	100	104.3	M8	420FAN100-104-G
DN 100 CF	108 x 2	19.8	104	108.3	M8	420FAN100-108-G
DN 160 CF	154 x 2	22.2	150	154.3	M8	420FAN160-154-G
DN 160 CF	159 x 2	22.2	155	159.3	M8	420FAN160-159-G
DN 200 CF	204 x 2	24.5	200	204.3	M8	420FAN200-204-G
DN 200 CF	205 x 2.5	24.5	200	205.3	M8	420FAN200-205-G
DN 250 CF	254 x 2	26	250	254.3	M8	420FAN250-254-G
DN 250 CF	256 x 3	26	250	256.3	M8	420FAN250-256-G
DN 300 CF	306 x 3	28.5	300	306.3	M10	420FAN300-306-G

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### Stainless Steel 304L, with Imperial (UN) Thread

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D	Order number
DN 16 CF	19.05 x 1.65	7.75	15.75	19.2	8-32	420FAN016-19-T
DN 25 CF	25.4 x 1.65	12	22.1	25.6	1/4-28	420FAN025-25-T
DN 40 CF	38 x 1.5	12.7	35	38.2	1/4-28	420FAN040-38-T
DN 40 CF	44.5 x 2	12.7	40.5	44.7	1/4-28	420FAN040-44-T
DN 50 CF	50.8 x 1.65	17.3	47.5	51.1	5/16-24	420FAN050-50-T
DN 63 CF	63.5 x 1.65	17.5	60.2	63.8	5/16-24	420FAN063-63-T
DN 75 CF	76.1 x 2	17.5	72.1	76.4	5/16-24	420FAN075-76-T
DN 100 CF	101.6 x 2.1	19.8	97.4	101.9	5/16-24	420FAN100-101-T
DN 130 CF	127 x 1.65	21.4	123.7	127.3	5/16-24	420FAN130-127-T
DN 160 CF	152.4 x 2.4	22.2	147.6	152.7	5/16-24	420FAN160-152-T
DN 200 CF	203.2 x 2.4	24.5	198.4	203.5	5/16-24	420FAN200-203-T
DN 250 CF	254 x 2	26	250	254,3	5/16-24	420FAN250-254-T

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

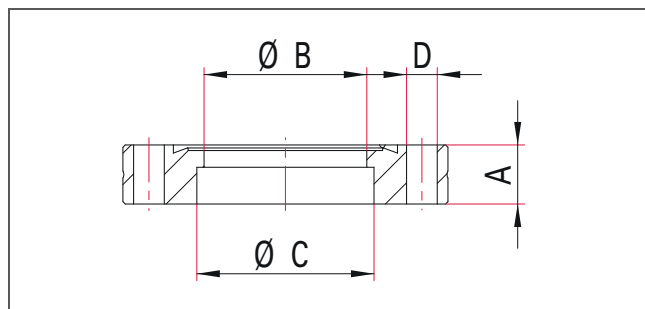


## CF Weld Flange, 316LN ESR



- Bakeable under vacuum up to 1050 °C
- Low desorption
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Magnetic permeability:  $\leq 1.01$
- Temperature range: -196 to 350 °C

### Dimensions



### Stainless Steel 316LN ESR/1.4429 ESU

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 CF	18 x 1	7.75	16	18.15	4.4	480FAN016-18
DN 16 CF	19.05 x 1.65	7.75	15.75	19.2	4.4	480FAN016-19
DN 40 CF	38 x 1.5	12.7	35	38.2	6.6	480FAN040-38
DN 40 CF	40 x 1.5	12.7	37	40.2	6.6	480FAN040-40
DN 63 CF	63.5 x 1.65	17.5	60.2	63.8	8.4	480FAN063-63
DN 63 CF	70 x 2	17.5	66	70.3	8.4	480FAN063-70
DN 100 CF	101.6 x 2.1	19.8	97.4	101.9	8.4	480FAN100-101
DN 100 CF	104 x 2	19.8	100	104.3	8.4	480FAN100-104
DN 100 CF	108 x 2	19.8	104	108.3	8.4	480FAN100-108
DN 160 CF	152.4 x 2.4	22.2	147.6	152.7	8.4	480FAN160-152
DN 160 CF	154 x 2	22.2	150	154.3	8.4	480FAN160-154
DN 160 CF	159 x 2	22.2	155	159.3	8.4	480FAN160-159
DN 200 CF	204 x 2	24.5	200	204.3	8.4	480FAN200-204
DN 250 CF	254 x 2	26	250	254.3	8.4	480FAN250-254

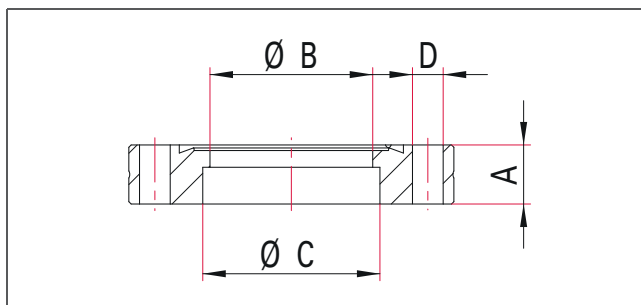
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Weld Flange, with Thread, 316LN ESR



- Bakeable under vacuum up to 1050 °C
- Low desorption
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Magnetic permeability:  $\leq 1.01$
- Temperature range: -196 to 350 °C

### Dimensions



### Stainless Steel 316LN ESR/1.4429 ESU, with Thread

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D	Order number
DN 16 CF	18 x 1	7.75	16	18.15	M4	480FAN016-18-G
DN 40 CF	40 x 1.5	12.7	37	40.2	M6	480FAN040-40-G
DN 63 CF	70 x 2	17.5	66	70.3	M8	480FAN063-70-G
DN 100 CF	104 x 2	19.8	100	104.3	M8	480FAN100-104-G
DN 160 CF	154 x 2	22.2	150	154.3	M8	480FAN160-154-G
DN 200 CF	204 x 2	24.5	200	204.3	M8	480FAN200-204-G
DN 250 CF	254 x 2	26	250	254.3	M8	480FAN250-254-G

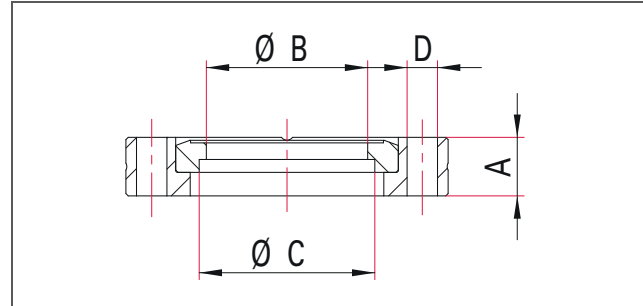
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Weld Flange, Rotatable



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 CF	18 x 1	7.75	16	18.15	4.4	420FAD016-18
DN 16 CF	19,05 x 1,65	7.75	15,75	19.2	4.4	420FAD016-19
DN 25 CF	25.4 x 1.65	12	22.1	25.6	6.6	420FAD025-25
DN 25 CF	28 x 2	12	24	28.2	6.6	420FAD025-28
DN 40 CF	38 x 1.5	12.7	35	38.2	6.6	420FAD040-38
DN 40 CF	40 x 1.5	12.7	37	40.2	6.6	420FAD040-40
DN 40 CF	42.4 x 2	12.7	38.4	42.6	6.6	420FAD040-42
DN 40 CF	44.5 x 2	12.7	40.5	44.7	6.6	420FAD040-44
DN 50 CF	50.8 x 1.65	17.3	47.5	51.1	8.4	420FAD050-50
DN 63 CF	63.5 x 1.65	17.5	60.2	63.8	8.4	420FAD063-63
DN 63 CF	70 x 2	17.5	66	70.3	8.4	420FAD063-70
DN 75 CF	76.1 x 2	17.5	72.1	76.4	8.4	420FAD075-76
DN 100 CF	101.6 x 2.1	19.8	97.4	101.9	8.4	420FAD100-101
DN 100 CF	104 x 2	19.8	100	104.3	8.4	420FAD100-104
DN 100 CF	108 x 2	19.8	104	108.3	8.4	420FAD100-108
DN 130 CF	127 x 1.65	21.4	123.7	127.3	8.4	420FAD130-127
DN 160 CF	152.4 x 2.4	22.2	147.6	152.7	8.4	420FAD160-152
DN 160 CF	154 x 2	22.2	150	154.3	8.4	420FAD160-154
DN 160 CF	159 x 2	22.2	155	159.3	8.4	420FAD160-159
DN 200 CF	203.2 x 2.4	24.5	198.4	203.5	8.4	420FAD200-203
DN 200 CF	204 x 2	24,5	200	204.3	8.4	420FAD200-204
DN 200 CF	205 x 2.5	24.5	200	205.3	8.4	420FAD200-205
DN 250 CF	254 x 2	26	250	254.3	8.4	420FAD250-254
DN 250 CF	256 x 3	26	250	256.3	8.4	420FAD250-256
DN 300 CF	306 x 3	28,5	300	306.3	10.5	420FAD300-306
DN 350 CF	356 x 3	28,5	350	356.3	10.5	420FAD350-356

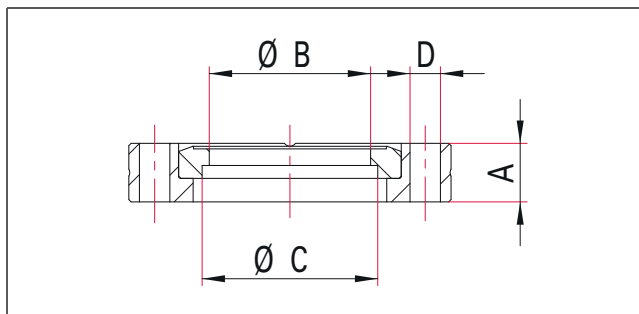
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2.

## CF Weld Flange, Rotatable, with Thread



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L, with Metric Thread

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D	Order number
DN 16 CF	18 x 1	7.75	16	18.15	M4	420FAD016-18-G
DN 25 CF	28 x 2	12	24	28.2	M6	420FAD025-28-G
DN 40 CF	38 x 1.5	12.7	35	38.2	M6	420FAD040-38-G
DN 40 CF	40 x 1.5	12.7	37	40.2	M6	420FAD040-40-G
DN 40 CF	42.4 x 2	12.7	38.4	42.6	M6	420FAD040-42-G
DN 40 CF	44.5 x 2	12.7	40.5	44.7	M6	420FAD040-44-G
DN 50 CF	50.8 x 1.65	17.3	47.5	51.1	M8	420FAD050-50-G
DN 63 CF	70 x 2	17.5	66	70.3	M8	420FAD063-70-G
DN 75 CF	76.1 x 2	17.5	72.1	76.4	M8	420FAD075-76-G
DN 100 CF	104 x 2	19.8	100	104.3	M8	420FAD100-104-G
DN 100 CF	108 x 2	19.8	104	108.3	M8	420FAD100-108-G
DN 160 CF	154 x 2	22.2	150	154.3	M8	420FAD160-154-G
DN 160 CF	159 x 2	22.2	155	159.3	M8	420FAD160-159-G
DN 200 CF	204 x 2	24.5	200	204.3	M8	420FAD200-204-G
DN 200 CF	205 x 2.5	24.5	200	205.3	M8	420FAD200-205-G
DN 250 CF	254 x 2	26	250	254.3	M8	420FAD250-254-G
DN 250 CF	256 x 3	26	250	256.3	M8	420FAD250-256-G
DN 300 CF	306 x 3	28.5	300	306.3	M10	420FAD300-306-G

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### Stainless Steel 304L, with Imperial (UN) Thread

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D	Order number
DN 16 CF	19.05 x 1.65	7.75	15.75	19.2	8-32	420FAD016-19-T
DN 25 CF	25.4 x 1.65	12	22.1	25.6	1/4-28	420FAD025-25-T
DN 40 CF	38 x 1.5	12.7	35	38.2	1/4-28	420FAD040-38-T
DN 40 CF	44.5 x 2	12.7	40.5	44.7	1/4-28	420FAD040-44-T
DN 50 CF	50.8 x 1.65	17.3	47.5	51.1	5/16-24	420FAD050-50-T
DN 63 CF	63.5 x 1.65	17.5	60.2	63.8	5/16-24	420FAD063-63-T
DN 75 CF	76.1 x 2	17.5	72.1	76.4	5/16-24	420FAD075-76-T
DN 100 CF	101.6 x 2.1	19.8	97.4	101.9	5/16-24	420FAD100-101-T
DN 130 CF	127 x 1.65	21.4	123.7	127.3	5/16-24	420FAD130-127-T
DN 160 CF	152.4 x 2.4	22.2	147.6	152.7	5/16-24	420FAD160-152-T
DN 200 CF	203.2 x 2.4	24.5	198.4	203.5	5/16-24	420FAD200-203-T
DN 250 CF	254 x 2	26	250	254.3	5/16-24	420FAD250-254-T

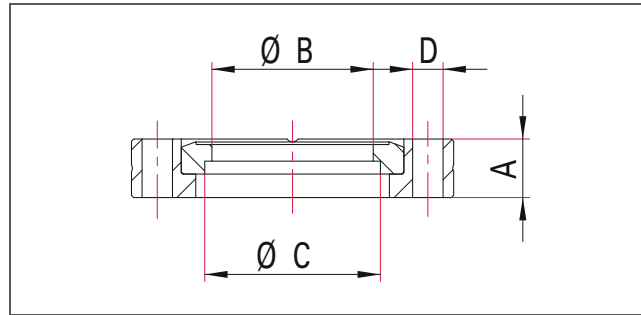
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Weld Flange, Rotatable, 316LN ESR



- Bakeable under vacuum up to 1050 °C
- Low desorption
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Magnetic permeability:  $\leq 1.01$
- Temperature range: -196 to 350 °C

### Dimensions



### Stainless Steel 316LN ESR/1.4429 ESU

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 CF	18 x 1	7.75	16	18.15	4.4	480FAD016-18
DN 16 CF	19.05 x 1.65	7.75	15.75	19.2	4.4	480FAD016-19
DN 40 CF	38 x 1.5	13	35	38.2	6.6	480FAD040-38
DN 40 CF	40 x 1.5	12.7	37	40.2	6.6	480FAD040-40
DN 63 CF	63.5 x 1.65	17.5	60.2	63.8	8.4	480FAD063-63
DN 63 CF	70 x 2	17.5	66	70.3	8.4	480FAD063-70
DN 100 CF	101.6 x 2.1	19.8	97.4	101.9	8.4	480FAD100-101
DN 100 CF	104 x 2	19.8	100	104.3	8.4	480FAD100-104
DN 100 CF	108 x 2	19.8	104	108.3	8.4	480FAD100-108
DN 160 CF	152.4 x 2.4	22.2	147.6	157.7	8.4	480FAD160-152
DN 160 CF	154 x 2	22.2	150	154.3	8.4	480FAD160-154
DN 160 CF	159 x 2	22.2	155	159.3	8.4	480FAD160-159
DN 200 CF	204 x 2	24.5	200	204.3	8.4	480FAD200-204
DN 250 CF	254 x 2	26	250	254.3	8.4	480FAD250-254

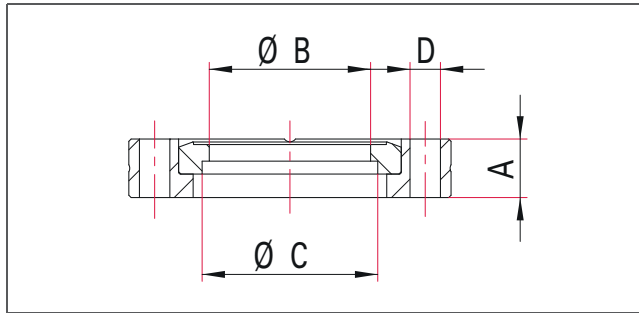
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Weld Flange, Rotatable, with Thread, 316LN ESR



- Bakeable under vacuum up to 1050 °C
- Low desorption
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Magnetic permeability:  $\leq 1.01$
- Temperature range: -196 to 350 °C

### Dimensions



### Stainless Steel 316LN ESR/1.4429 ESU, with Thread

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D	Order number
DN 16 CF	18 x 1	7.75	16	18.15	M4	480FAD016-18-G
DN 40 CF	40 x 1.5	12.7	37	40.2	M6	480FAD040-40-G
DN 63 CF	70 x 2	17.5	66	70.3	M8	480FAD063-70-G
DN 100 CF	104 x 2	19.8	100	104.3	M8	480FAD100-104-G
DN 160 CF	154 x 2	22.2	150	154.3	M8	480FAD160-154-G
DN 200 CF	204 x 2	24.5	200	204.3	M8	480FAD200-204-G
DN 250 CF	254 x 2	26	250	254.3	M8	480FAD250-254-G

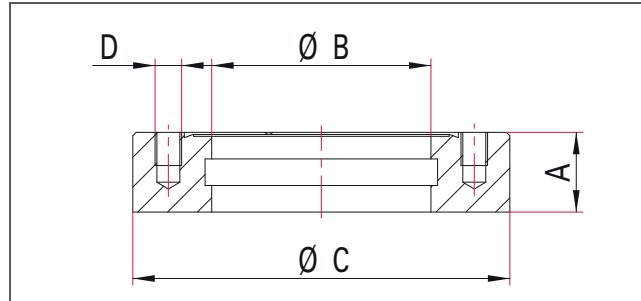
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Weld-On Flange



- Flange for welding to a flat panel or a round chamber/tube
- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L

Nominal diameter	A [mm]	B [mm]	C [mm]	D	Order number
DN 16 CF	16	16	34	M4	420FES016
DN 40 CF	24	37	69.9	M6	420FES040
DN 63 CF	24	66	113.5	M8	420FES063
DN 100 CF	24	102	152	M8	420FES100

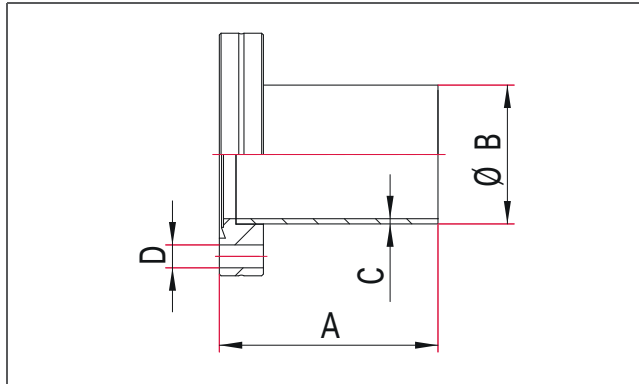
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Half Nipple



- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Other tube dimensions on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 CF	18 x 1	38	18	1	4.4	420FRA016-18-38
DN 16 CF	19.05 x 1.65	38	19.05	1.65	4.4	420FRA016-19-38
DN 25 CF	25.4 x 1.65	52	25.4	1.65	6.6	420FRA025-25-52
DN 40 CF	38 x 1.5	63	38	1.5	6.6	420FRA040-38-63
DN 40 CF	40 x 1.5	63	40	1.5	6.6	420FRA040-40-63
DN 50 CF	50.8 x 1.65	82	50.8	1.65	8.4	420FRA050-50-82
DN 63 CF	63.5 x 1.65	105	63.5	1.65	8.4	420FRA063-63-105
DN 63 CF	70 x 2	105	70	2	8.4	420FRA063-70-105
DN 75 CF	76.1 x 2	90	76.1	2	8.4	420FRA075-76-90
DN 100 CF	101.6 x 2.1	135	101.6	2.1	8.4	420FRA100-101-135
DN 100 CF	108 x 2	135	108	2	8.4	420FRA100-108-135
DN 160 CF	154 x 2	167	154	2	8.4	420FRA160-154-167
DN 160 CF	159 x 2	167	159	2	8.4	420FRA160-159-167

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

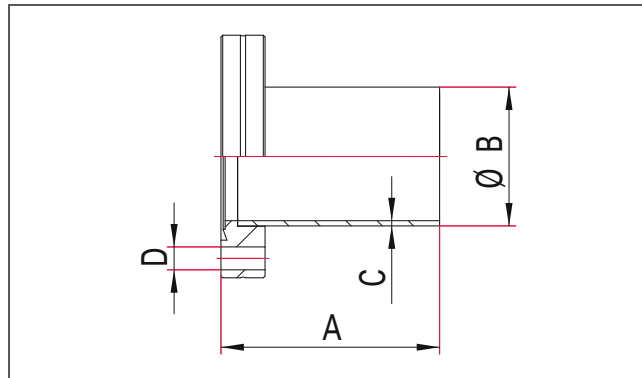


## CF Half Nipple, with Thread



- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Other tube dimensions on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel, with Metric Thread

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D	Order number
DN 16 CF	18 x 1	38	18	1	M4	420FRA016-18-38-G
DN 40 CF	40 x 1.5	63	40	1.5	M6	420FRA040-40-63-G
DN 63 CF	70 x 2	105	70	2	M8	420FRA063-70-105-G
DN 100 CF	108 x 2	135	108	2	M8	420FRA100-108-135-G
DN 160 CF	159 x 2	167	159	2	M8	420FRA160-159-167-G

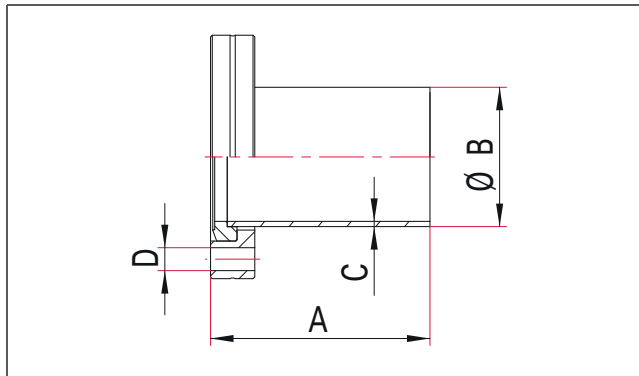
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Half Nipple, Rotatable



- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Other tube diameters on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 CF	18 x 1	38	18	1	4.4	420FRD016-18-38
DN 16 CF	19.05 x 1.65	38	19.05	1.65	4.4	420FRD016-19-38
DN 25 CF	25.4 x 1.65	52	25.4	1.65	6.6	420FRD025-25-52
DN 40 CF	38 x 1.5	63	38	1.5	6.6	420FRD040-38-63
DN 40 CF	40 x 1.5	63	40	1.5	6.6	420FRD040-40-63
DN 50 CF	50.8 x 1.65	82	50.8	1.65	8.4	420FRD050-50-82
DN 63 CF	63.5 x 1.65	105	63.5	1.65	8.4	420FRD063-63-105
DN 63 CF	70 x 2	105	70	2	8.4	420FRD063-70-105
DN 75 CF	76.1 x 2	90	76.1	2	8.4	420FRD075-76-90
DN 100 CF	101.6 x 2.1	135	101.6	2.1	8.4	420FRD100-101-135
DN 100 CF	108 x 2	135	108	2	8.4	420FRD100-108-135
DN 160 CF	154 x 2	167	154	2	8.4	420FRD160-154-167
DN 160 CF	159 x 2	167	159	2	8.4	420FRD160-159-167

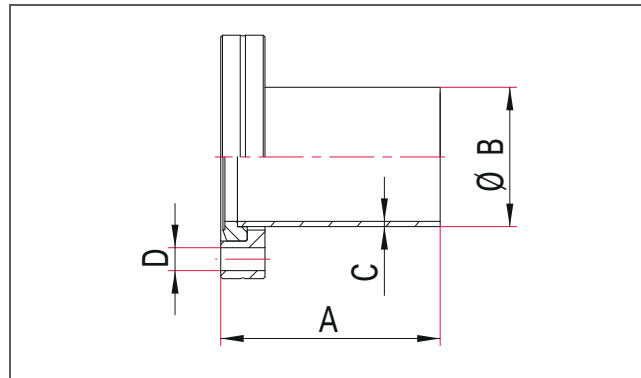
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Half Nipple, Rotatable, with Thread



- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Other tube diameters on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel, with Metric Thread

Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D	Order number
DN 16 CF	18 x 1	38	18	1	M4	420FRD016-18-38-G
DN 40 CF	38 x 1.5	63	38	1.5	M6	420FRD040-38-63-G
DN 40 CF	40 x 1.5	38	40	1.5	M6	420FRD040-40-38-G
DN 40 CF	40 x 1.5	63	40	1.5	M6	420FRD040-40-63-G
DN 63 CF	70 x 2	105	70	2	M8	420FRD063-70-105-G
DN 100 CF	108 x 2	135	108	2	M8	420FRD100-108-135-G
DN 160 CF	159 x 2	167	159	2	M8	420FRD160-159-167-G

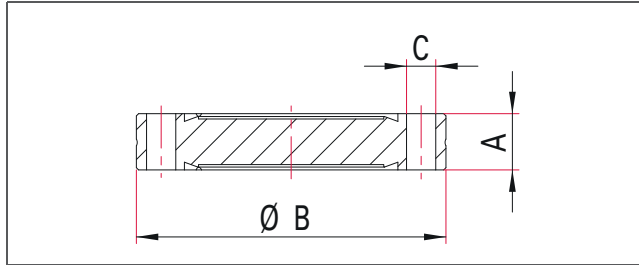
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Spacer Flange



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	7.75	34	4.4	420FDB016
DN 40 CF	12.7	69.9	6.6	420FDB040
DN 63 CF	17.5	113.5	8.4	420FDB063
DN 100 CF	19.8	152	8.4	420FDB100
DN 160 CF	22.2	202.4	8.4	420FDB160

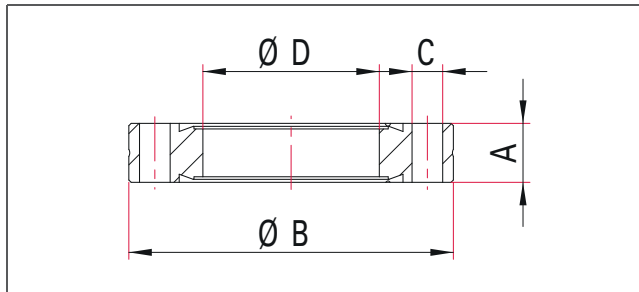
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Spacer Flange with Bore Holes



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 CF	7.75	34	4.4	16	420FDI016
DN 40 CF	12.7	69.9	6.6	37	420FDI040
DN 63 CF	17.5	113.5	8.4	66	420FDI063
DN 100 CF	19.8	152	8.4	102	420FDI100
DN 160 CF	22.2	202.4	8.4	155	420FDI160

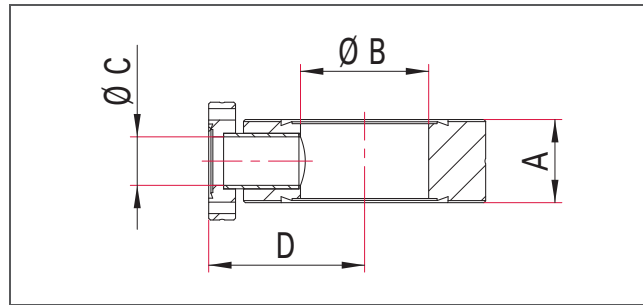
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Spacer Flange with Bore Holes and Port(s)



- Available with up to three DN 16 CF ports with M4 metric thread
- Tube surface: Glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L

Nominal diameter	Number of ports	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 40 CF	1	24	37	14	45	420FDP040-1-16
DN 40 CF	2	24	37	14	45	420FDP040-2-16
DN 40 CF	3	24	37	14	45	420FDP040-3-16
DN 63 CF	1	24	66	14	67	420FDP063-1-16
DN 63 CF	2	24	66	14	67	420FDP063-2-16
DN 63 CF	3	24	66	14	67	420FDP063-3-16
DN 100 CF	1	24	100	14	90	420FDP100-1-16
DN 100 CF	2	24	100	14	90	420FDP100-2-16
DN 100 CF	3	24	100	14	90	420FDP100-3-16
DN 160 CF	1	24	150	14	115	420FDP160-1-16
DN 160 CF	2	24	150	14	115	420FDP160-2-16
DN 160 CF	3	24	150	14	115	420FDP160-3-16

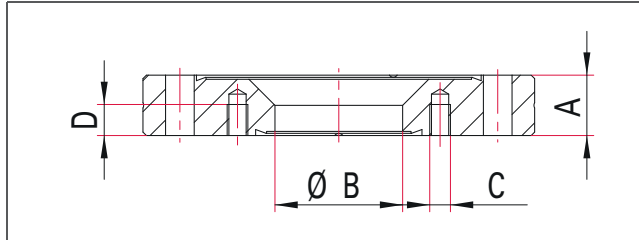
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Reducer Flange



- The reduced-size flange has blind tapped holes. Make sure the screws used for installation are in the correct length.
- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304L

Nominal diameter	A [mm]	B [mm]	C	D [mm]	Nominal diameter reduced	Order number
DN 40 CF	12.7	16	M4	6	DN 16 CF	420FLR040-016
DN 63 CF	17.5	16	M4	6	DN 16 CF	420FLR063-016
DN 63 CF	17.5	37	M6	9	DN 40 CF	420FLR063-040
DN 100 CF	19.8	37	M6	9	DN 40 CF	420FLR100-040
DN 100 CF	19.8	66	M8	13	DN 63 CF	420FLR100-063
DN 160 CF	22.2	37	M6	9	DN 40 CF	420FLR160-040
DN 160 CF	22.2	66	M8	13	DN 63 CF	420FLR160-063
DN 160 CF	22.2	100	M8	13	DN 100 CF	420FLR160-100
DN 200 CF	24.5	37	M6	9	DN 40 CF	420FLR200-040
DN 200 CF	24.5	66	M8	13	DN 63 CF	420FLR200-063
DN 200 CF	24.5	100	M8	13	DN 100 CF	420FLR200-100
DN 200 CF	24.5	155	M8	13	DN 160 CF	420FLR200-160
DN 250 CF	26	37	M6	9	DN 40 CF	420FLR250-040
DN 250 CF	26	66	M8	13	DN 63 CF	420FLR250-063
DN 250 CF	26	100	M8	13	DN 100 CF	420FLR250-100
DN 250 CF	26	155	M8	13	DN 160 CF	420FLR250-160
DN 250 CF	26	200	M8	13	DN 200 CF	420FLR250-200

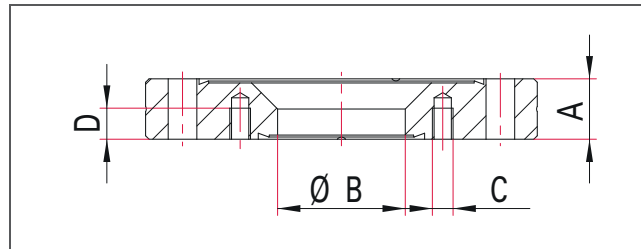
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Reducer Flange, 316LN ESR



- The reduced-size flange has blind tapped holes. Make sure the screws used for installation are the correct length.
- Bakeable under vacuum up to 1050 °C
- Low desorption
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-13}$  hPa to ambient pressure
- Magnetic permeability:  $\leq 1.01$
- Temperature range: -196 to 350 °C

### Dimensions



### Stainless Steel 316LN ESR/1.4429 ESU

Nominal diameter	A [mm]	B [mm]	C	D [mm]	Nominal diameter reduced	Order number
DN 40 CF	12.7	16	M4	6	DN 16 CF	480FLR040-016
DN 63 CF	17.5	16	M4	6	DN 16 CF	480FLR063-016
DN 63 CF	17.5	37	M6	9	DN 40 CF	480FLR063-040
DN 100 CF	19.8	37	M6	9	DN 40 CF	480FLR100-040
DN 100 CF	19.8	66	M8	13	DN 63 CF	480FLR100-063
DN 160 CF	22.2	37	M6	9	DN 40 CF	480FLR160-040
DN 160 CF	22.2	66	M8	13	DN 63 CF	480FLR160-063
DN 160 CF	22.2	100	M8	13	DN 100 CF	480FLR160-100
DN 200 CF	24.5	37	M6	9	DN 40 CF	480FLR200-040
DN 200 CF	24.5	66	M8	13	DN 63 CF	480FLR200-063
DN 200 CF	24.5	100	M8	13	DN 100 CF	480FLR200-100
DN 200 CF	24.5	155	M8	13	DN 160 CF	480FLR200-160
DN 250 CF	26	37	M6	9	DN 40 CF	480FLR250-040
DN 250 CF	26	66	M8	13	DN 63 CF	480FLR250-063
DN 250 CF	26	100	M8	13	DN 100 CF	480FLR250-100
DN 250 CF	26	155	M8	13	DN 160 CF	480FLR250-160
DN 250 CF	26	200	M8	13	DN 200 CF	480FLR250-200

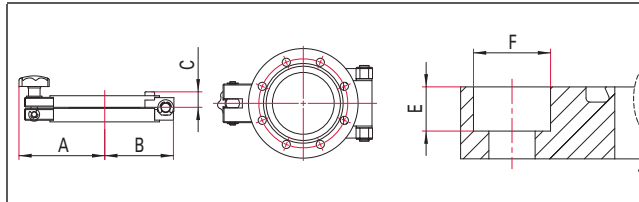
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Quick-Access-Door

- Screw holes: Through-holes with counter-bore for cylinder head
- Can be installed using hexagon socket screws
- Bakeout temperature: up to 200 °C
- Seal: FKM
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Temperature range: -15 to 150 °C

### Stainless Steel, without Sight Glass

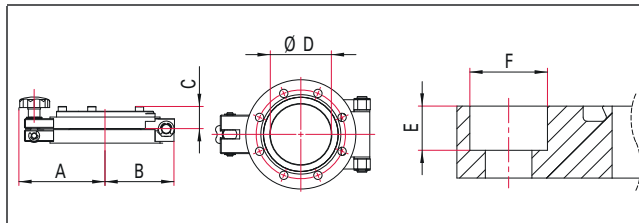
#### Dimensions



Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 CF	88	72	16	-	10	16	420KTU063
DN 100 CF	108	93	16	-	10	16	420KTU100
DN 160 CF	134	119	20	-	10	16	420KTU160
DN 200 CF	160	145	20	-	10	16	420KTU200
DN 250 CF	186	171	20	-	10	16	420KTU250

### Stainless Steel, with Sight Glass

#### Dimensions



- Order no. suffix -G: with sight glass
- Sight glass: Borosilicate glass

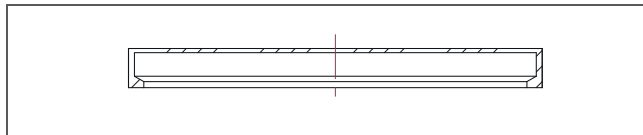
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 CF	88	72	23	63	10	16	420KTU063-G
DN 100 CF	108	93	27	95	10	16	420KTU100-G
DN 160 CF	134	119	31	145	10	16	420KTU160-G
DN 200 CF	160	145	31	145	10	16	420KTU200-G
DN 250 CF	186	171	31	145	10	16	420KTU250-G



## CF Flange Cap

- Made from plastic

### Dimensions



### Polyethylene (PE)

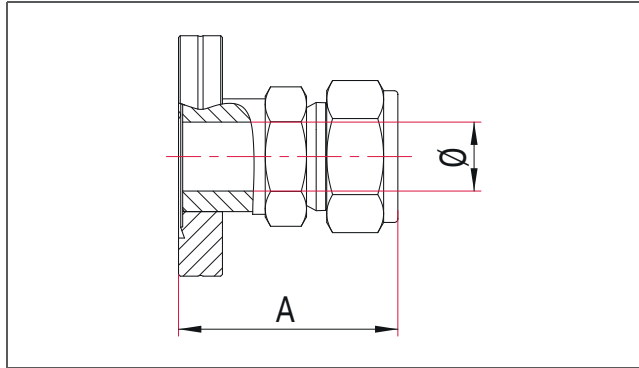
Nominal diameter	Package [Qty.]	Order number
DN 16 CF	10	430FSK016-S10
DN 40 CF	10	430FSK040-S10
DN 63 CF	10	430FSK063-S10
DN 100 CF	10	430FSK100-S10
DN 160 CF	5	430FSK160-S5
DN 200 CF	5	430FSK200-S5
DN 250 CF	5	430FSK250-S5

## CF-Swagelok® Adapter



- For metric and imperial (inch) tube diameters
- Original Swagelok® adapter
- Other flanges sizes and pipe diameters on request
- Pressure range:  $1 \cdot 10^{-9}$  hPa to ambient pressure
- Materials: Stainless steel 304L (Flange)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel for Metric Tube Sizes

Nominal diameter	Tube external diameter	A [mm]	Order number
DN 16 CF	6 mm	39	420ASW016-6
DN 16 CF	8 mm	40	420ASW016-8
DN 40 CF	6 mm	39	420ASW040-6
DN 40 CF	8 mm	40	420ASW040-8
DN 40 CF	10 mm	42	420ASW040-10
DN 40 CF	12 mm	45	420ASW040-12

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### Stainless Steel for Imperial (Inch) Tube Sizes

Nominal diameter	Tube external diameter	A [mm]	Order number
DN 16 CF	1/8"	32	420ASW016-0125
DN 16 CF	1/4"	39	420ASW016-0250
DN 40 CF	1/4"	41	420ASW040-0250
DN 40 CF	1/2"	50	420ASW040-0500

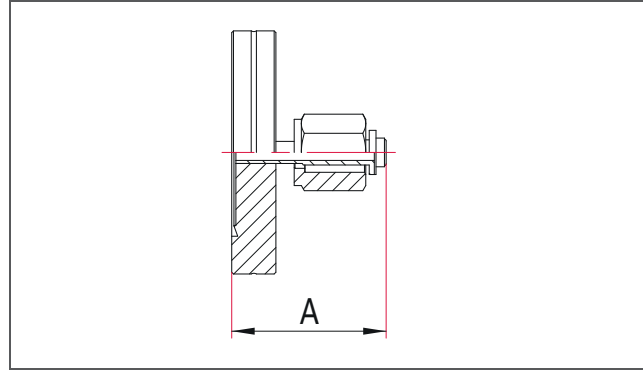
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF-VCR Adapter, Male and Female

- Original Swagelok® VCR-Adapter
- Other flange sizes and VCR adapters on request
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure
- Materials: Flange: Stainless steel 304L; VCR adapter: 316L/1.4404
- Temperature range: -196 to 300 °C

### Female

#### Dimensions

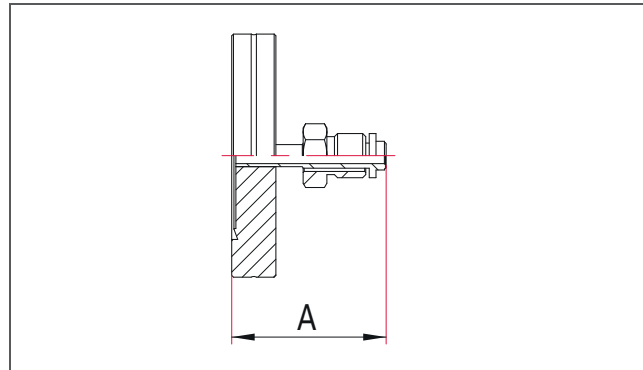


Nominal diameter	VCR connection	A [mm]	Order number
DN 16 CF	1/4"	44	420AVF016-0250
DN 16 CF	1/2"	47	420AVF016-0500
DN 40 CF	1/4"	44	420AVF040-0250
DN 40 CF	1/2"	47	420AVF040-0500

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### Male

#### Dimensions



Nominal diameter	VCR connection	A [mm]	Order number
DN 16 CF	1/4"	44	420AVM016-0250
DN 16 CF	1/2"	47	420AVM016-0500
DN 40 CF	1/4"	44	420AVM040-0250
DN 40 CF	1/2"	47	420AVM040-0500

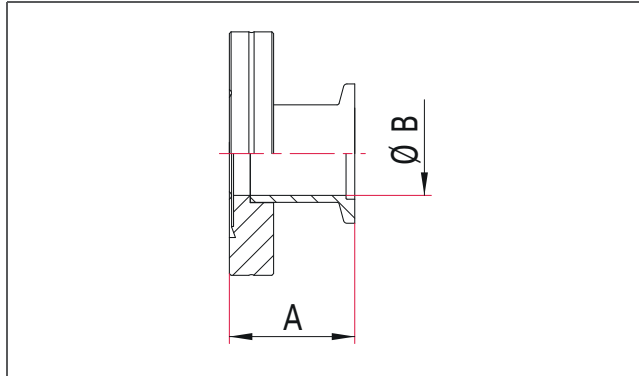
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## ISO-KF/CF Adapter



- Other nominal diameters and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to ambient pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



Stainless Steel 304/1.4301; CF Flange 304L

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 16 CF	36	16	DN 16 ISO-KF	420RUG016-016-36
DN 16 CF	36	16	DN 25 ISO-KF	420RUG016-025-36
DN 16 CF	36	16	DN 40 ISO-KF	420RUG016-040-36
DN 40 CF	36	16	DN 16 ISO-KF	420RUG040-016-36
DN 40 CF	36	24	DN 25 ISO-KF	420RUG040-025-36
DN 40 CF	50	40.5	DN 40 ISO-KF	420RUG040-040-50
DN 63 CF	50	40.5	DN 40 ISO-KF	420RUG063-040-50
DN 100 CF	50	40.5	DN 40 ISO-KF	420RUG100-040-50

ISO-KF Flanges according to ISO 2861

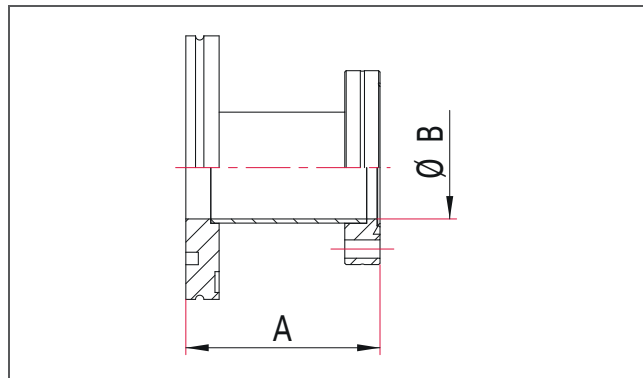
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## ISO-K/CF Adapter



- Other flange sizes and dimensions on request
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (elastomer seal);  
 $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure (metal seal)
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel 304/1.4301; CF Flange 304L

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 16 CF	60	16	DN 63 ISO-K	420RUG016-063-60
DN 40 CF	70	37	DN 63 ISO-K	420RUG040-063-70
DN 63 CF	90	66	DN 63 ISO-K	420RUG063-063-90
DN 100 CF	90	102	DN 100 ISO-K	420RUG100-100-90
DN 160 CF	100	153	DN 160 ISO-K	420RUG160-160-100

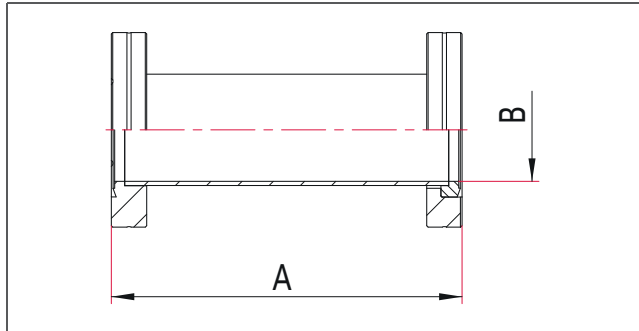
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2  
ISO-K Flanges according to ISO 1609

## CF Full Nipple



- One end fixed; one end rotatable
- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube material on request
- Other lengths and tube dimensions on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 CF	76	16	420RZS016
DN 40 CF	126	37	420RZS040
DN 63 CF	210	66	420RZS063
DN 100 CF	270	104	420RZS100
DN 160 CF	334	155	420RZS160

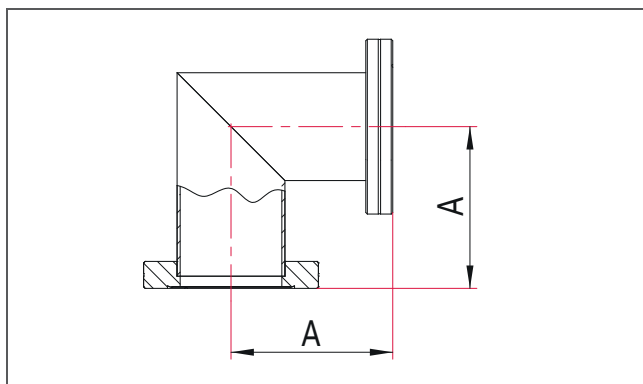
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF 90° Elbow



- One end fixed, one end rotatable
- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	A [mm]	Order number
DN 16 CF	38	420RWS016-90
DN 40 CF	63	420RWS040-90
DN 63 CF	105	420RWS063-90
DN 100 CF	135	420RWS100-90
DN 160 CF	167	420RWS160-90

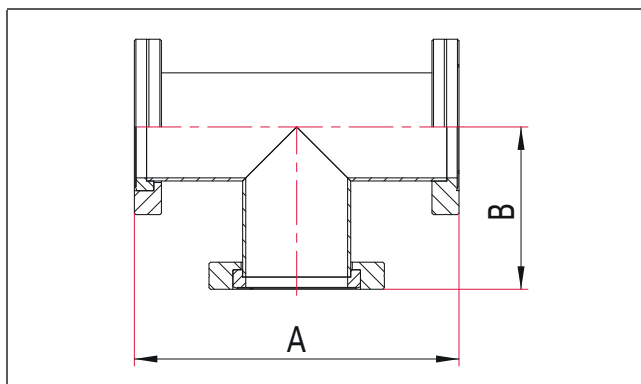
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF Tee



- One rotatable flange per axis
- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

#### Dimensions



#### Stainless Steel

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 CF	76	38	420RTS016
DN 40 CF	126	63	420RTS040
DN 63 CF	210	105	420RTS063
DN 100 CF	270	135	420RTS100
DN 160 CF	334	167	420RTS160

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

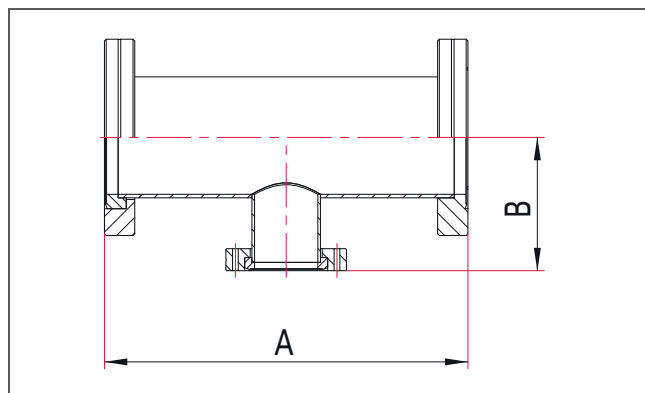


## CF Reducer Tee



- One rotatable flange per axis
- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 40 CF	126	60	DN 16 CF	420RTR040-016
DN 63 CF	210	77	DN 40 CF	420RTR063-040
DN 100 CF	270	95	DN 40 CF	420RTR100-040
DN 100 CF	270	95	DN 63 CF	420RTR100-063
DN 160 CF	334	120	DN 40 CF	420RTR160-040
DN 160 CF	334	120	DN 63 CF	420RTR160-063
DN 160 CF	334	120	DN 100 CF	420RTR160-100

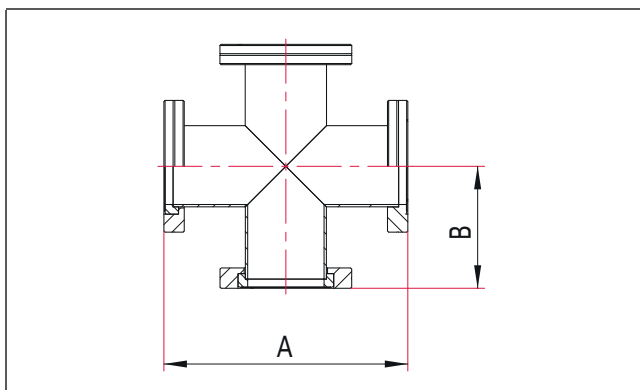
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF 4-Way Cross



- One rotatable flange per axis
- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 CF	76	38	420RKS016
DN 40 CF	126	63	420RKS040
DN 63 CF	210	105	420RKS063
DN 100 CF	270	135	420RKS100
DN 160 CF	334	167	420RKS160

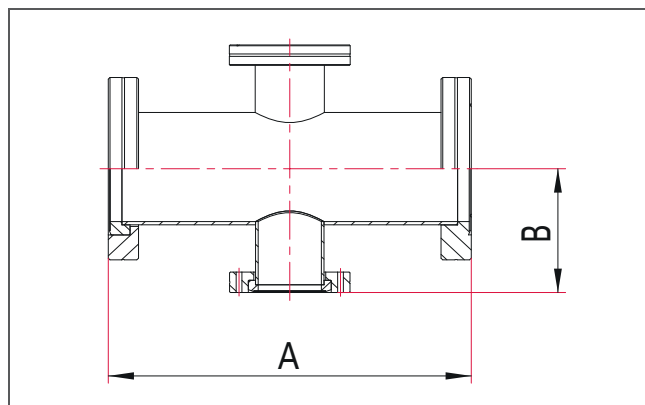
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF 4-Way Reducer Cross



- One rotatable flange per axis
- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 40 CF	126	60	DN 16 CF	420RKR040-016
DN 63 CF	210	77	DN 40 CF	420RKR063-040
DN 100 CF	270	95	DN 40 CF	420RKR100-040
DN 100 CF	270	95	DN 63 CF	420RKR100-063
DN 160 CF	334	120	DN 40 CF	420RKR160-040
DN 160 CF	334	120	DN 63 CF	420RKR160-063
DN 160 CF	334	120	DN 100 CF	420RKR160-100

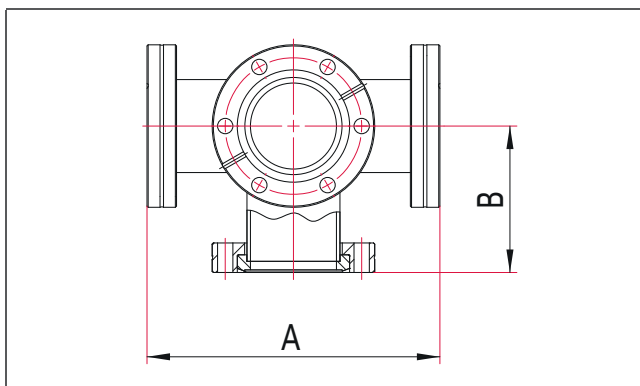
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF 5-Way Cross



- One rotatable flange per axis
- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube material on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 CF	76	38	420RKF016
DN 40 CF	126	63	420RKF040
DN 63 CF	210	105	420RKF063
DN 100 CF	270	135	420RKF100

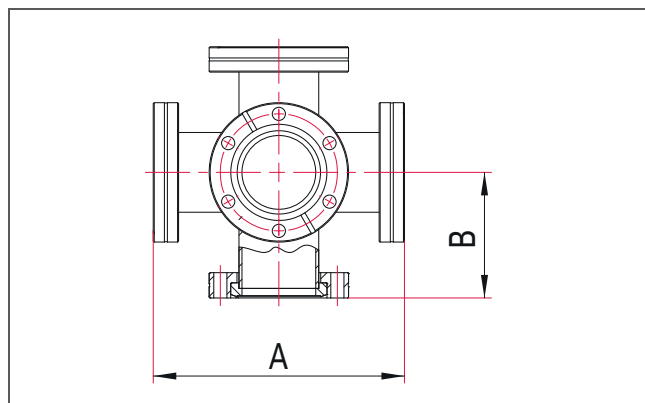
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF 6-Way Cross



- One rotatable flange per axis
- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 CF	76	38	420RKD016
DN 40 CF	126	63	420RKD040
DN 63 CF	210	105	420RKD063
DN 100 CF	270	135	420RKD100
DN 160 CF	334	167	420RKD160
DN 200 CF	406	203	420RKD200

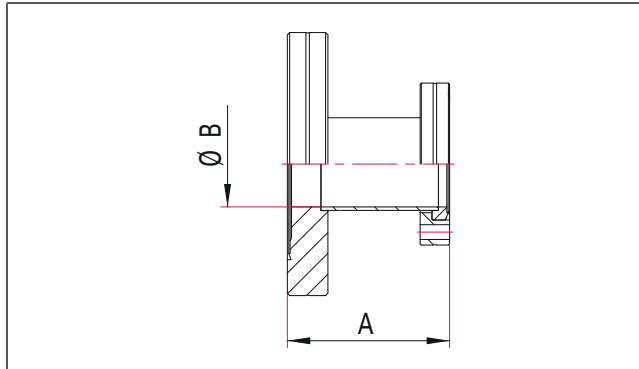
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Reducer Nipple, Straight



- Reduced flange size rotatable
- Tube surface: glass bead blasted (polished version on request)
- Other flange and tube materials on request
- Other lengths and tube dimensions on request
- Bakeout temperature: up to 450 °C
- Tightness:  $\leq 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Flange: stainless steel 304L; tube: stainless steel 304L or better
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel

Nominal diameter	A [mm]	B [mm]	Nominal diameter reduced	Order number
DN 40 CF	70	16	DN 16 CF	420RRG040-016
DN 63 CF	70	16	DN 16 CF	420RRG063-016
DN 63 CF	70	37	DN 40 CF	420RRG063-040
DN 100 CF	70	37	DN 40 CF	420RRG100-040
DN 100 CF	70	66	DN 63 CF	420RRG100-063
DN 160 CF	70	37	DN 40 CF	420RRG160-040
DN 160 CF	127	66	DN 63 CF	420RRG160-063
DN 160 CF	127	104	DN 100 CF	420RRG160-100

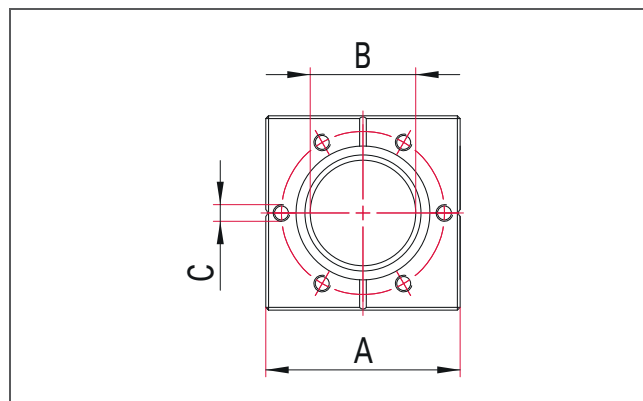
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## CF Cube



- Up to DN 100: manufactured from forged material
- DN 160: manufactured from welded plates
- Bakeout temperature: up to 450 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: Stainless steel 316L/1.4404
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel, with Thread

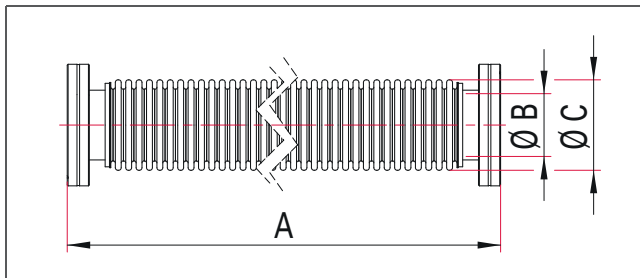
Nominal diameter	A [mm]	B [mm]	C	Thread depth [mm]	Order number
DN 16 CF	35	16	M4	5	470RKK016
DN 40 CF	70,5	38	M6	8	470RKK040
DN 63 CF	114	66	M8	8	470RKK063
DN 100 CF	155	104	M8	8	470RKK100
DN 160 CF	208	155	M8	8	470RKK160

## ISO-CF Corrugated Hose, Flexible



- One flange rotatable
- Other lengths on request
- Pressure range:  $1 \cdot 10^{-9}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C

### Dimensions



Stainless Steel: Flange 304L; Bellows 316L

Nominal diameter	A [mm]	B [mm]	C [mm]	Bend radius, unique movement [mm]	Bend radius, often movement [mm]	Order number
DN 16 CF	250	12	17	50	200	420SWN016-0250
DN 16 CF	500	12	17	50	200	420SWN016-0500
DN 16 CF	750	12	17	50	200	420SWN016-0750
DN 16 CF	1000	12	17	50	200	420SWN016-1000
DN 40 CF	250	37	52	130	250	420SWN040-0250
DN 40 CF	500	37	52	130	250	420SWN040-0500
DN 40 CF	750	37	52	130	250	420SWN040-0750
DN 40 CF	1000	37	52	130	250	420SWN040-1000
DN 63 CF	250	65	81	200	410	420SWN063-0250
DN 63 CF	500	65	81	200	410	420SWN063-0500
DN 63 CF	750	65	81	200	410	420SWN063-0750
DN 63 CF	1000	65	81	200	410	420SWN063-1000
DN 100 CF	250	100	119	230	560	420SWN100-0250
DN 100 CF	500	100	119	230	560	420SWN100-0500
DN 100 CF	750	100	119	230	560	420SWN100-0750
DN 100 CF	1000	100	119	230	560	420SWN100-1000

Please note that the hose shrinks under vacuum.

The minimum bending radii are applicable for a temperature of 20 °C.

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

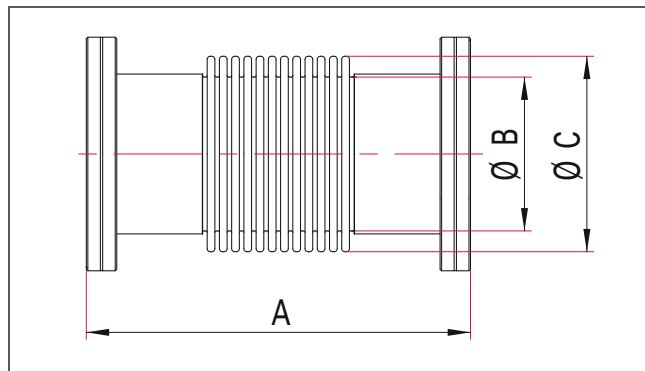


## ISO-CF Spring Bellows



- One flange rotatable
- Other lengths on request
- Pressure range:  $1 \cdot 10^{-9}$  hPa to ambient pressure
- Materials: flange: stainless steel: 304L; bellows: stainless steel 316L
- Temperature range: -196 to 300 °C

### Dimensions



### Stainless Steel: Flange 304L; Bellows 316L

Nominal diameter	A [mm]	B [mm]	C [mm]	Axial stroke [mm]	Order number
DN 16 CF	110	15	26	±5	420SFK016-110
DN 40 CF	160	37	59	±10	420SFK040-160
DN 63 CF	250	66	87	±18	420SFK063-250
DN 100 CF	250	100	128	±22	420SFK100-250
DN 160 CF	270	155	184	±15	420SFK160-270

Please note that the spring bellows shrinks under vacuum.

The axial stroke is applicable for a temperature of 20 °C and 10000 load cycles.

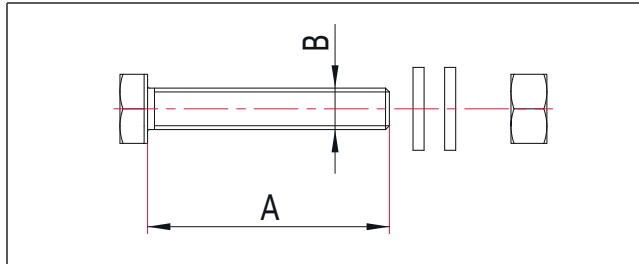
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## COF Screw Set



- For the assembly of two flanges with through holes
- Set includes the screws required for the specified flange size
- Set includes two washers and one nut for each screw

### Dimensions



### Stainless Steel A2-70

Nominal diameter	A [mm]	B	Package [Qty.]	Order number
DN 400 COF	75	M12	36	620BSC400
DN 450 COF	90	M16	36	620BSC450
DN 500 COF	100	M16	36	620BSC500
DN 600 COF	100	M16	40	620BSC600
DN 800 COF	100	M16	52	620BSC800

### Stainless Steel A4-80

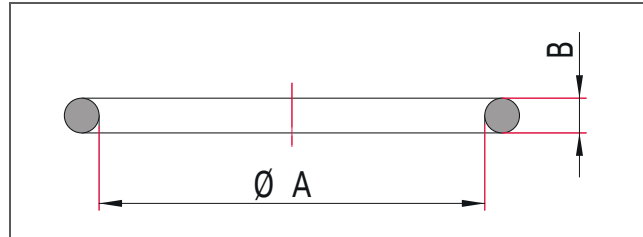
Nominal diameter	A [mm]	B	Package [Qty.]	Order number
DN 400 COF	75	M12	36	670BSC400
DN 450 COF	90	M16	36	670BSC450
DN 500 COF	100	M16	36	670BSC500
DN 600 COF	100	M16	40	670BSC600
DN 800 COF	100	M16	52	670BSC800

## COF Elastomer Seal



- For single use only
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Temperature range: -15 to 150 °C

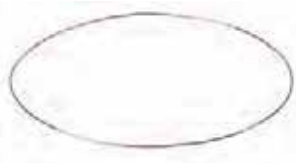
### Dimensions



### FKM

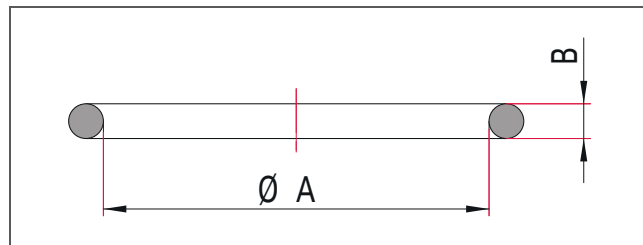
Nominal diameter	A [mm]	B [mm]	Order number
DN 400 COF	436	2.5	602DOR400-S1
DN 400 COF	491	2.5	602DOR450-S1
DN 500 COF	535	2.5	602DOR500-S1
DN 600 COF	635	2.5	602DOR600-S1
DN 800 COF	835	2.5	602DOR800-S1

## COF Copper Wire Seal



- For single use only
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 200 °C

### Dimensions



### OFHC Copper (Annealed)

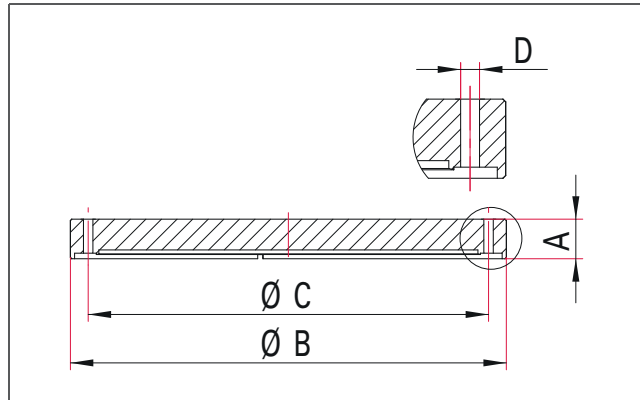
Nominal diameter	A [mm]	B [mm]	Order number
DN 400 COF	435.8	2	690DDR400
DN 450 COF	491.4	2	690DDR450
DN 500 COF	535.4	2	690DDR500
DN 600 COF	635.4	2	690DDR600
DN 800 COF	835.4	2	690DDR800

## COF Blank Flange

- Flange material: 304L/1.4307 stainless steel, forged
- Other flange materials available upon request
- Bakeout temperature: up to 300 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 200 °C

### Stainless Steel, Female

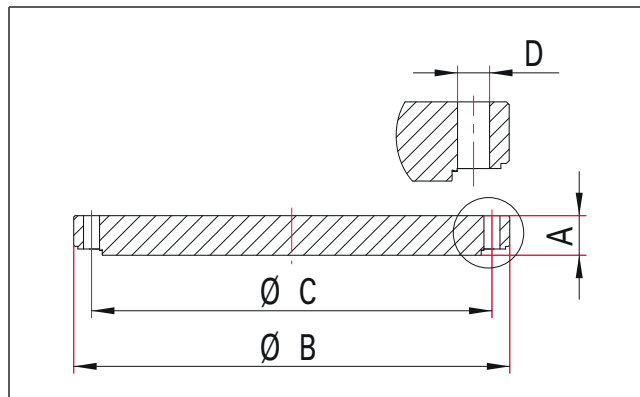
#### Dimensions



Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 400 COF	33	497	454	13	620FBF400
DN 450 COF	38	562	513.1	17	620FBF450
DN 500 COF	43	595	559	17	620FBF500
DN 600 COF	43	690	661	17	620FBF600
DN 800 COF	43	890	859	17	620FBF800

### Stainless Steel, Male

#### Dimensions



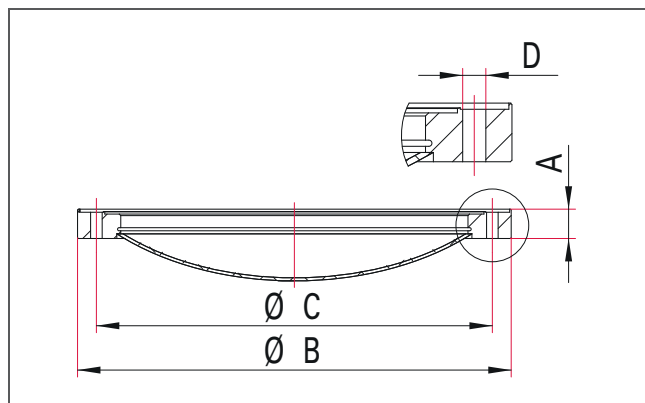
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 400 COF	33	497	454	13	620FBM400
DN 450 COF	38	562	513.1	17	620FBM450
DN 500 COF	43	595	559	17	620FBM500
DN 600 COF	43	690	661	17	620FBM600
DN 800 COF	43	890	859	17	620FBM800

## COF Blank Flange, with Domed Stainless Steel Disk or Dished Head

- Other flange materials available upon request
- Bakeout temperature: up to 300 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Materials: (flange) 304L/1.4307 stainless steel, forged
- Temperature range: -196 to 200 °C

### Stainless Steel, Female

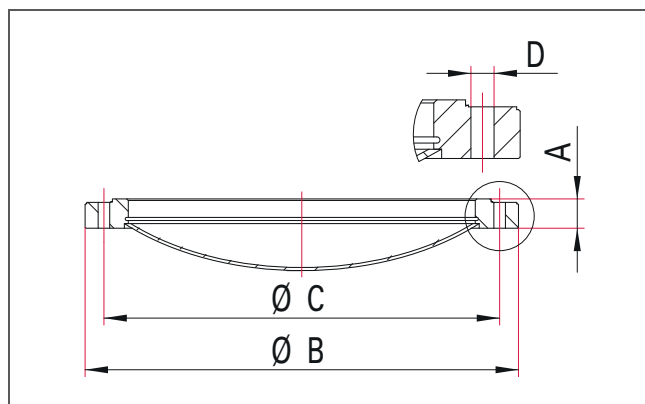
#### Dimensions



Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 400 COF	33	497	454	13	620FBF400-S
DN 450 COF	38	562	513.1	17	620FBF450-S
DN 500 COF	43	595	559	17	620FBF500-S
DN 600 COF	43	690	661	17	620FBF600-S
DN 800 COF	43	890	859	17	620FBF800-S

### Stainless Steel, Male

#### Dimensions



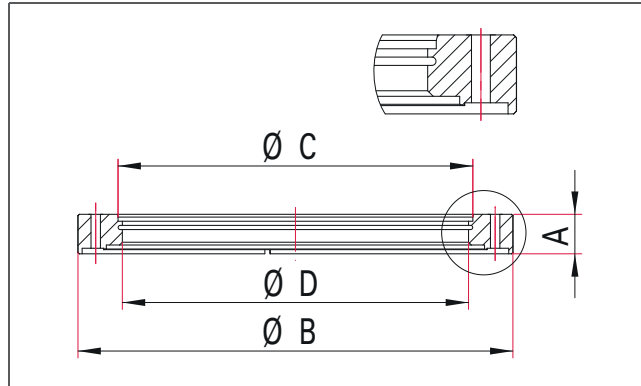
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 400 COF	33	497	454	13	620FBM400-S
DN 450 COF	38	562	513.1	17	620FBM450-S
DN 500 COF	43	595	559	17	620FBM500-S
DN 600 COF	43	690	661	17	620FBM600-S
DN 800 COF	43	890	859	17	620FBM800-S

## COF Weld Flange

- Flange material: 304L/1.4307 stainless steel, forged
- With weld lip
- Other flange materials available upon request
- Bakeout temperature: up to 300 °C
- Pressure range:  $1 \cdot 10^{-12}$  hPa to ambient pressure
- Temperature range: -196 to 200 °C

### Stainless Steel, Female

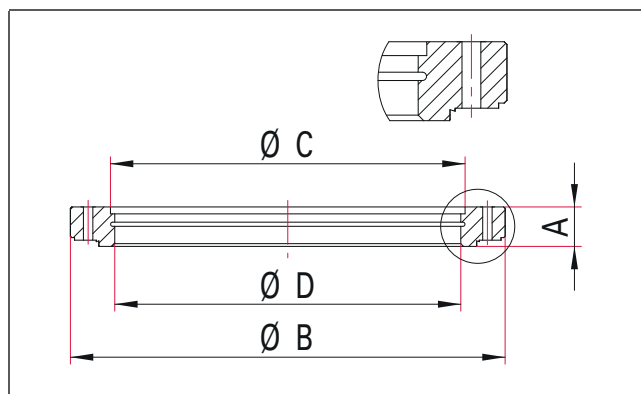
#### Dimensions



Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 400 COF	406 x 3	33	497	406.3	400	620FAF400
DN 450 COF	458 x 4	38	562	458.5	450	620FAF450
DN 500 COF	508 x 4	43	595	508.5	500	620FAF500
DN 600 COF	610 x 5	43	690	610.5	600	620FAF600
DN 800 COF	812 x 6	43	890	812.5	800	620FAF800

### Stainless Steel, Male

#### Dimensions



Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 400 COF	406 x 3	33	497	406.3	400	620FAM400
DN 450 COF	458 x 4	38	562	458.5	450	620FAM450
DN 500 COF	508 x 4	43	595	508.5	500	620FAM500
DN 600 COF	610 x 5	43	690	610.5	600	620FAM600
DN 800 COF	812 x 6	43	890	812.5	800	620FAM800

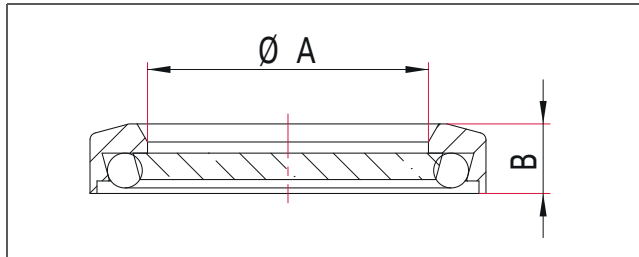


## ISO-KF Viewport, Borosilicate



- Aluminum frame with integrated FKM O-ring, installation without additional seal
- Circumferential rim for outer centering on the ISO-KF connector flange
- Not suitable for installation on base plate
- Heat up and cool down speed: max. 5 K/min
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -15 to 150 °C

### Dimensions



### Aluminum/Borosilicate

Nominal diameter	A [mm]	B [mm]	Order number
DN 25 KF	26	10	110GSG025
DN 40 KF	41	10	110GSG040
DN 50 KF	52	10	110GSG050

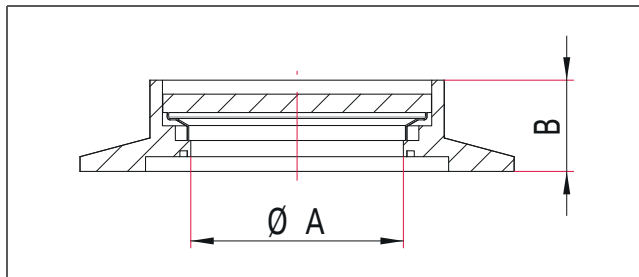
Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage.

## ISO-KF Viewport, Fused Silica (Synthetic Amorphous Quartz)



- Stainless Steel frame; glass soldered
- Transmission in UV spectrum to 200 nm
- Heat up and cool down speed: max. 5 K/min
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -100 to 200 °C

### Dimensions



### Stainless Steel/Fused Silica (Synthetic Amorphous Quartz), UV

Nominal diameter	A [mm]	B [mm]	Order number
DN 25 KF	16	9.9	120GSG025-silica-uv
DN 40 KF	36	13.7	120GSG040-silica-uv

Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage.  
Flanges according to ISO 2861

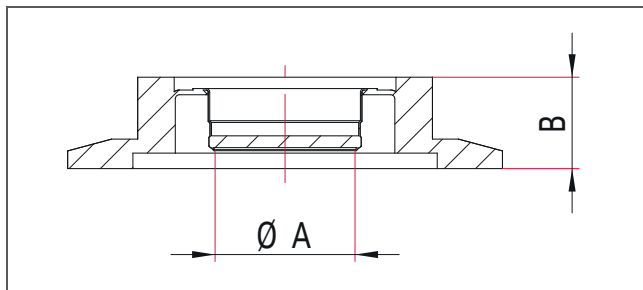


## ISO-KF Viewport, Sapphire



- Stainless steel frame; glass soldered
- Transmission in IR spectrum to 4500 nm
- Heat up and cool down speed: max. 5 K/min
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -100 to 350 °C

### Dimensions



### Stainless Steel/Sapphire

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 KF	15	12.7	120GSG016-saphir
DN 40 KF	24	13	120GSG040-saphir

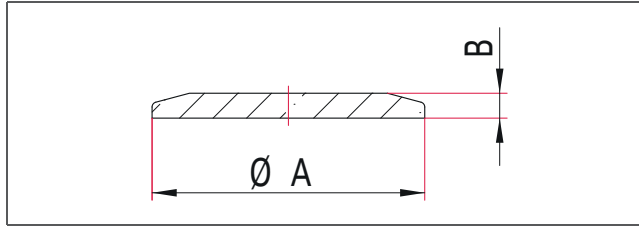
Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage.  
Flanges according to ISO 2861

## ISO-KF Glass Blank Flange



- Installation with outer centering ring and elastomer seal
- Fastening elements: Clamping ring made from plastic (no usage of metal connection elements)
- Heat up and cool down speed: max. 5 K/min
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure

### Dimensions



### Note

These flanges are manufactured without seal grooves for centering rings.

### Borosilicate

- Temperature range: -15 to 150 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 KF	30	5	160FBL016
DN 25 KF	40	5	160FBL025
DN 40 KF	55	5	160FBL040
DN 50 KF	75	5	160FBL050

Caution! Risk of injury by glass splinters. Do not use Glass Blank Flange which show apparent damage.

### Quartz

- Temperature range: -15 to 200 °C

Nominal diameter	A [mm]	B [mm]	Order number
DN 16 KF	30	5	180FBL016
DN 25 KF	40	5	180FBL025
DN 40 KF	55	5	180FBL040
DN 50 KF	75	5	180FBL050

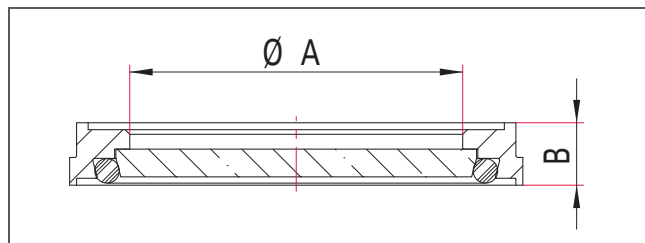
Caution! Risk of injury by glass splinters. Do not use Glass Blank Flange which show apparent damage.

## ISO-K Viewport



- Frame with integrated FKM O-ring, installation without additional seal
- Circumferential rim for outer centering on the ISO-K counterflange
- Not suitable for mounting on base plate or with ISO-F flange
- Heat up and cool down speed: max. 5 K/min
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (at temperatures  $> 60$  °C only to ambient pressure); DN 200 to ambient pressure
- Temperature range:  $-15$  to  $150$  °C; DN 200 to  $60$  °C

### Dimensions



### Stainless Steel/Borosilicate

Nominal diameter	A [mm]	B [mm]	Pressure range	Order number
DN 63 ISO-K	72	13.5	$1 \cdot 10^{-8}$ hPa to 500 hPa over pressure	322GSG063
DN 100 ISO-K	104	15	$1 \cdot 10^{-8}$ hPa to 500 hPa over pressure	322GSG100
DN 160 ISO-K	153	17.5	$1 \cdot 10^{-8}$ hPa to 500 hPa over pressure	322GSG160
DN 200 ISO-K	210	17.5	$1 \cdot 10^{-8}$ hPa to ambient pressure	322GSG200

Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage.

### Aluminum/Borosilicate

Nominal diameter	A [mm]	B [mm]	Pressure range	Order number
DN 63 ISO-K	72	13.5	$1 \cdot 10^{-8}$ hPa to 500 hPa over pressure	PF 410 011-T
DN 100 ISO-K	104	15.5	$1 \cdot 10^{-8}$ hPa to 500 hPa over pressure	PF 411 011-T
DN 160 ISO-K	153	17.2	$1 \cdot 10^{-8}$ hPa to 500 hPa over pressure	PF 412 011-T

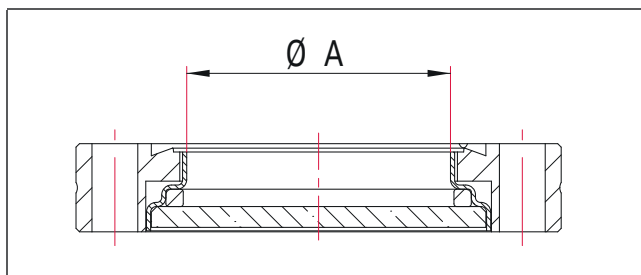
Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage.

## CF Viewport



- Always use washers for installation
- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



### Note

Item no. suffix -PB: Lead glass for x-ray protection; glass thickness: 5 mm; provides the same protection as 1.5 mm of lead at 100 kV or 1 mm at 200 kV.

### Stainless Steel/Kodial

- Heat up and cool down speed: max. 3 K/min
- Temperature range: -20 to 200 °C, bakeable up to 350 °C

Nominal diameter	A [mm]	Order number
DN 16 CF	16	420GSG016
DN 40 CF	38	420GSG040
DN 63 CF	63	420GSG063
DN 100 CF	89	420GSG100
DN 160 CF	135	420GSG160
DN 200 CF	135	420GSG200

Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage. Please use annealed copper gaskets or elastomer seals to minimize stress inside the glass. Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### Stainless Steel/Kodial with Lead Glass Shielding

- Heat up and cool down speed: max. 3 K/min
- Temperature range: -20 to 200 °C, bakeable to 350 °C

Nominal diameter	A [mm]	Order number
DN 16 CF	16	420GSG016-PB
DN 40 CF	33	420GSG040-PB
DN 63 CF	63	420GSG063-PB
DN 100 CF	89	420GSG100-PB
DN 160 CF	135	420GSG160-PB

Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage. Please use annealed copper gaskets or elastomer seals to minimize stress inside the glass. Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### Stainless Steel/Sapphire

- Heat up and cool down speed: max. 5 K/min
- Temperature range: -100 to 300 °C, bakeable up to 450 °C

Nominal diameter	A [mm]	Order number
DN 16 CF	12	420GSG016-saphir
DN 40 CF	24	420GSG040-saphir
DN 63 CF	49	420GSG063-saphir

Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage. Please use annealed copper gaskets or elastomer seals to minimize stress inside the glass. Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**Stainless Steel/Fused Silica, UV**

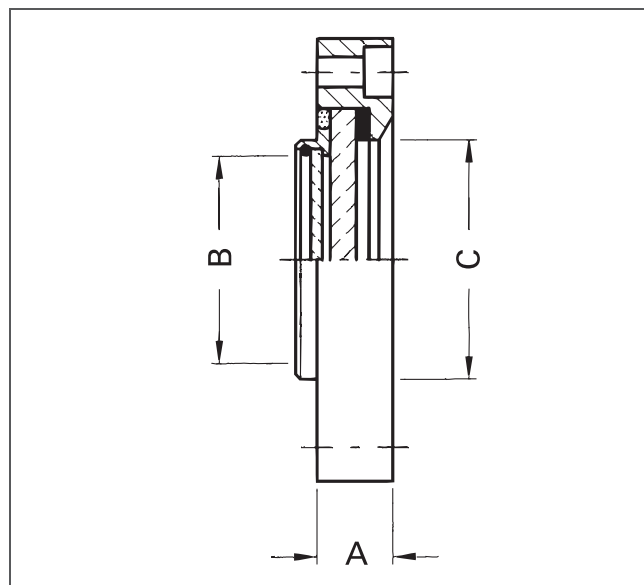
- Heat up and cool down speed: max. 5 K/min
- Temperature range: -100 to 200 °C

Nominal diameter	A [mm]	Order number
DN 16 CF	16	420GSG016-silica-uv
DN 40 CF	36	420GSG040-silica-uv
DN 63 CF	68	420GSG063-silica-uv
DN 100 CF	99	420GSG100-silica-uv

Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage. Please use annealed copper gaskets or elastomer seals to minimize stress inside the glass. Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**ISO-F Viewport**

- Sight glasses with replaceable safety glass, especially suitable for coating systems
- With integrated FKM O-ring; installation without additional seal
- Including claw clamps, bolts, washers and nuts for installation
- Heat up and cool down speed: max. 5 K/min
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure (at temperatures > 60 °C only to ambient pressure)
- Temperature range: -15 to 150 °C

**Dimensions****Black Anodized Aluminum/Borosilicate**

Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 63 ISO-F	20	60	70	PF 410 013-T
DN 100 ISO-F	22	92	100	PF 411 013-T
DN 160 ISO-F	30	142	154	PF 412 013-T

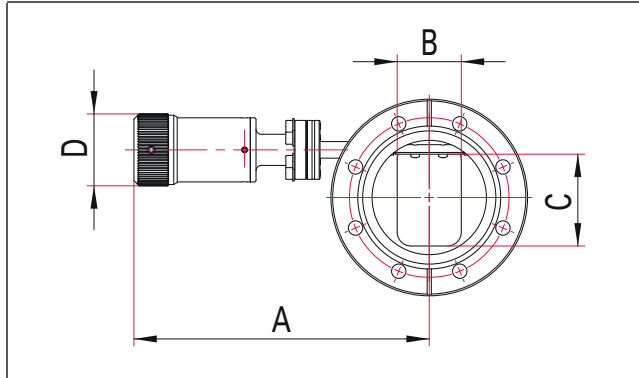
Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage

## CF Shutter, Manual



- Hermetically sealed, suitable for UHV
- Bellows-sealed feedthrough
- Handwheel with snap-in stages
- Bakeout temperature: up to 250 °C
- Operating temperature: up to 80 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Angle of rotation: 0 to 90 ° with snap-in stages in 10 ° increments
- Pressure range:  $1 \cdot 10^{-9}$  hPa to ambient pressure
- Service life: 500000 cycles
- Mounting orientation: any

### Dimensions



### Stainless Steel

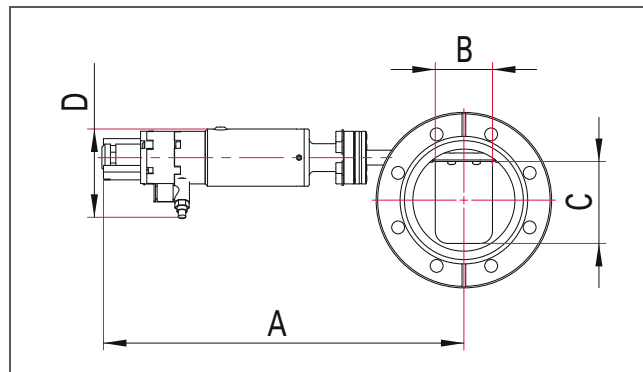
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 40 CF	152	22	30	42	420MBL040
DN 63 CF	171	37	51	42	420MBL063
DN 100 CF	186	65	90	42	420MBL100
DN 160 CF	212	111	123	42	420MBL160

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2



- Hermetically sealed, suitable for UHV
- Bellows-sealed feedthrough
- Pneumatically operated; double-acting
- Opening and closing speed adjustable
- Connection: (compressed air) 6 mm hose connection
- Bakeout temperature: up to 250 °C, pneumatic drive (removable) up to 60 °C
- Operating temperature: up to 60 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Angle of rotation: 0 to 90 ° (final position adjustable)
- Pressure range:  $1 \cdot 10^{-9}$  hPa to ambient pressure
- Compressed air (overpressure) max.: 0.7 MPa
- Compressed air (overpressure) min.: 0.15 MPa
- Service life: 500000 cycles
- Mounting orientation: any

#### Dimensions



#### Stainless Steel

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 40 CF	214	22	30	59	420MBL040-p
DN 63 CF	234	37	51	59	420MBL063-p
DN 100 CF	249	65	90	59	420MBL100-p
DN 160 CF	276	111	123	59	420MBL160-p

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

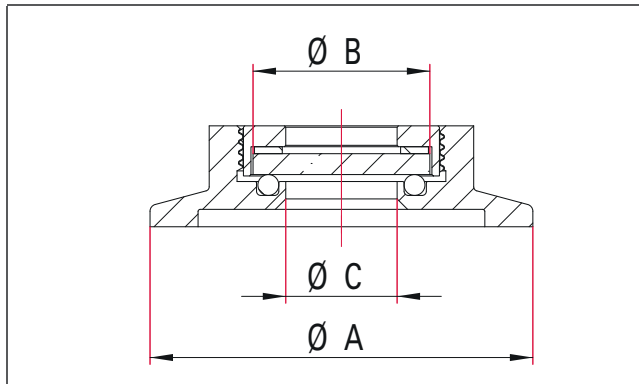
## ISO-KF, ISO-K, CF Glass Retainers

These retainers can be used for vacuum-tight installation of 1" (24.8 to 25.8 mm) or 2" (49.8 to 51 mm) optical glasses. These are the standard sizes offered by many manufacturers in optical quality. We offer a wide range of the most commonly used optical glasses as accessories.

- Simple replacement of glasses
- Accessories: Face wrench, optical glasses
- Glass not included
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -15 to 150 °C

### KF Flange with Viewport Retainer/Stainless Steel

#### Dimensions

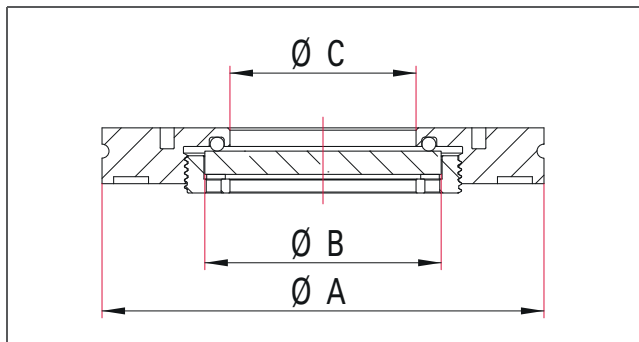


Nominal diameter	A [mm]	B [mm]	C [mm]	Glass thickness [mm]	Order number
DN 40 KF	55	24.8-25.8	16	3-7	120GAG040-25

Flanges according to ISO 2861

### ISO-K Flange with Viewport Retainer/Stainless Steel

#### Dimensions



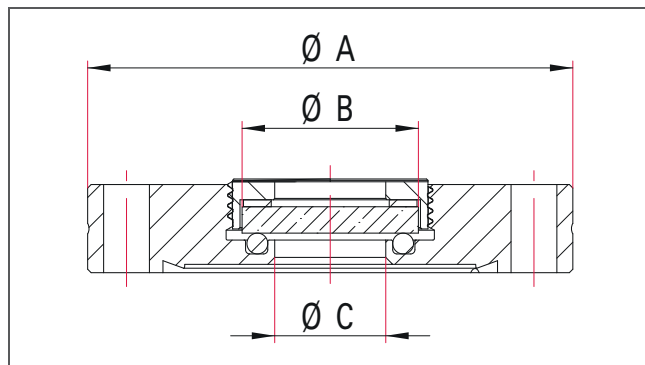
Nominal diameter	A [mm]	B [mm]	C [mm]	Glass thickness [mm]	Order number
DN 63 ISO-K	95	49.8-51	40	3.8-8	320GAG063-50

Flanges according to ISO 1609



## CF Flange with Viewport Retainer/Stainless Steel

## Dimensions



Nominal diameter	A [mm]	B [mm]	C [mm]	Glass thickness [mm]	Order number
DN 40 CF	69.9	24.8-25.8	16	3-7	420GAG040-25
DN 63 CF	113.5	49.8-51	40	3.8-8	420GAG063-50

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Accessories for Glass Retainers



- Adjustable face wrench
- Tool to tighten and loosen the threaded insert of the glass retainer

## Face Wrench

Materials	Order number
Steel, bronzed	GAG-SLS

## Borosilicate Float Glass

- Transmission range: 0.35 to 2  $\mu\text{m}$
- Extremely temperature-resistant; low thermal expansion coefficient
- Chemical-resistant
- Temperature range: up to 350 °C

## Borosilicate

Glass diameter [mm]	Glass thickness [mm]	Order number
25.4	3.8	GSG025-Boroflo
50.8	5.5	GSG050-Boroflo

Caution! Risk of injury by glass splinters. Do not use glasses which show apparent damage.

## Calcium Fluoride

- Transmission range: 0.2 to 6  $\mu\text{m}$
- Parallelism: 3 arc minutes
- Planarity: 2 wavelengths at 633 nm
- Surface quality: 40/20 scratch/dig
- Temperature range: up to 200  $^{\circ}\text{C}$

### Calcium Fluoride

Glass diameter [mm]	Glass thickness [mm]	Order number
25.4	3	GSG025-CaF2
50.8	5	GSG050-CaF2

Caution! Risk of injury by glass splinters. Do not use glasses which show apparent damage.

## Fused Silica (Synthetic Amorphous Quartz)

- Transmission range: 0.2 to 2  $\mu\text{m}$
- Parallelism: 3 arc minutes
- Planarity: 1 wavelength at 633 nm
- Surface quality: 40/20 scratch/dig
- Temperature range: up to 350  $^{\circ}\text{C}$

### Optical Glass, Fused Silica (Synthetic Amorphous Quartz)

Glass diameter [mm]	Glass thickness [mm]	Order number
25.4	3	GSG025-Silica-UV
50.8	5	GSG050-Silica-UV

Caution! Risk of injury by glass splinters. Do not use glasses which show apparent damage.

## Zinc Selenide

- Transmission range: 0.7 to 15  $\mu\text{m}$
- Parallelism: 3 arc minutes
- Planarity: 1/20 wavelength at 10.6  $\mu\text{m}$
- Surface quality: 60/40 scratch/dig
- Temperature range: up to 200  $^{\circ}\text{C}$

### Zinc Selenide

Glass diameter [mm]	Glass thickness [mm]	Order number
25.4	3	GSG025-ZnSe
50.8	5	GSG050-ZnSe

Caution! Risk of injury by glass splinters. Do not use glasses which show apparent damage.





## Thread Lubricant

- Friction coefficient comparable to that of oiled screws
- Contains solid lubricant, mineral oil, thickener and powdered metal
- Recommended for uncoated stainless steel screws in heated flanges

### Customer benefit

- Permits easy disassembly even after prolonged high temperature use.
- Prevents seizing of threads at high temperatures or high torque.

### Thread Lubricant

Tube size [g]	Temperature range [°C]	Order number
100	-30 to 650	YFG-100

Not for use in vacuum!

## Vacuum Greases and Oils

### Note

- Lubricants in general should be used only sparingly, because some degree of degassing is inevitable.
- One criterion for choosing a vacuum grease is the vapor pressure at working temperature (see data sheets for details). The vapor pressure should be lower than the targeted final pressure.

### Silicone Grease

- Good greasing and sealing ability
- Low surface energy, tendency to creep
- Indissoluble in water, methanol, ethanol and acetone



Tube size [g]	Temperature range [°C]	Vapor pressure at 20°C [hPa]	Application	Order number
50	-40 to 150	$5 \cdot 10^{-7}$	Versatile ultra-high-vacuum grease based on silicone	YFS-50

### Mineral Grease

- The UHV and HV greases from Apiezon® are based on mineral greases and are silicone-free
- Lower vapor pressure than silicone grease
- No creeping
- The Apiezon®-greases we offer are optimized for various areas of application



Tube size [g]	Temperature range [°C]	Vapor pressure at 20°C [hPa]	Application	Order number
25	-10 to 240	$2.3 \cdot 10^{-9}$	Type H: for use at temperatures above 30 °C	YFS-H
50	10 to 30	$9.3 \cdot 10^{-11}$	Type L: Ultra-high vacuum, particularly low vapor pressure	YFS-L
100	10 to 30	$2.3 \cdot 10^{-9}$	Type M: high vacuum use	YFS-M
25	10 to 30	$2.3 \cdot 10^{-9}$	Type M: general vacuum use at room temperature	B 8010 070 28
25	-269 to 30	$8 \cdot 10^{-10}$	Type N: cryogenic applications	YFS-N

**Greases and Oils Based on Perfluoropolyether**

- Good lubricity and low vapor pressure
- Resistance to chemicals: Very good
- Resistance to oxidation: Very good
- Resistance to thermal decomposition: Good

Tube size	Temperature range [°C]	Vapor pressure at 20°C [hPa]	Application	Order number
10 ml	-60 to 300	$1 \cdot 10^{-12}$	Oil for sliding elastomer seals under vacuum	<b>B N845 804-T</b>
10 g	-20 to 200	$1 \cdot 10^{-12}$	Grease for sliding elastomer seals under vacuum	<b>B 2751 055 UB</b>
30 g	-60 to 300	$1 \cdot 10^{-12}$	Grease for sliding elastomer seals under vacuum	<b>B N845 805-T</b>

**Sealants**

- For sealing small leaks
- Available as spray or paste

**Sealants**

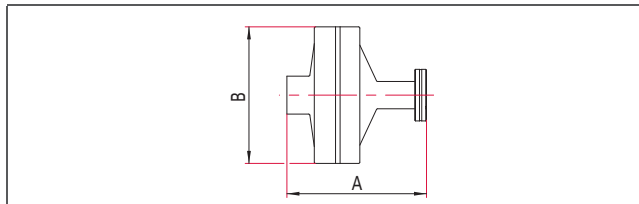
Application	Quantity [g]	Temperature range [°C]	Order number
Spray	170	up to 350	<b>B 2751 049-E</b>
Paste	100	-40 to 200	<b>B 2753 420-K</b>

## Burst Disk



- EN ISO 4126-2 and AD2000 Merkblatt (leaflet) A1 compliant
- No moving parts
- Burst pressure is lower than 500 hPa overpressure, therefore not within the scope of the Pressure Directive 97/23/EC
- Unit must be replaced after bursting
- Tightness:  $< 1 \cdot 10^{-11} \text{ Pa m}^3/\text{s}$
- Materials: Stainless steel 316L (housing and membrane)
- Temperature range: 20 to 280 °C

### Dimensions



### Customer benefit

- Functional verification: Delivery with Inspection Certificate 3.1 according to EN 10204 including results of the destructive tests of two samples within the manufactured batch.

### Stainless Steel

Flange (in)	A [mm]	B [mm]	Burst pressure min. [hPa]	Burst pressure max. [hPa]	Order number
DN 16 CF	92	90	405	495	420VBS016-0_5bar

Burst pressure = overpressure

Burst pressure data refer to temperature of 22 °C. Burst pressure drops with rising temperatures.

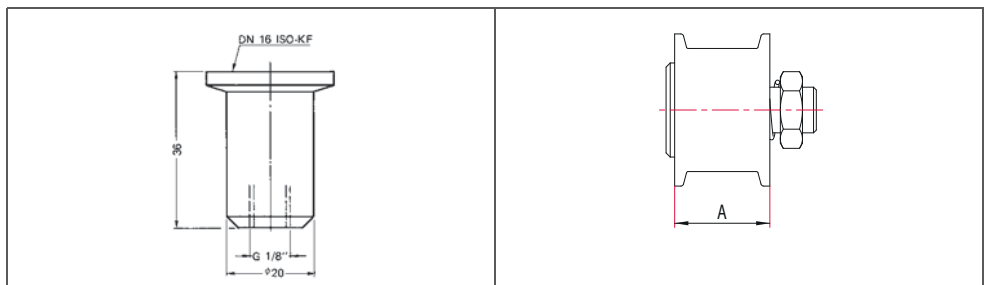
To be used for vacuum chambers. No safety component in terms of the machinery directive 2006/42/EC.

## Pressure Relief Valves



- Protects vacuum systems from over pressures

### Dimensions



PF I30 032

120VUS016

120VUS040

### Pressure Relief Valves

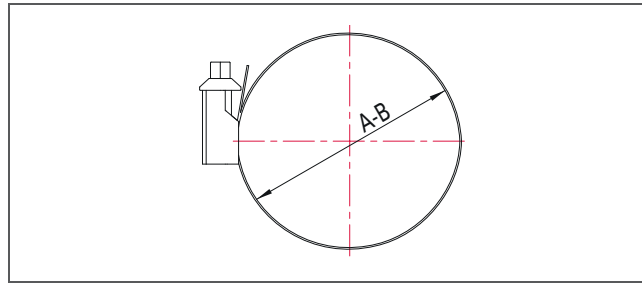
Nominal diameter	Tightness [Pa m³/s]	Can be opened to a pressure difference of [hPa]	Differential pressure	Order number
DN 16 KF	$1 \cdot 10^{-9}$	200 to 500	not modifiable	PF I30 032
DN 40 KF	$1 \cdot 10^{-9}$	app. 400	modifiable to app. +/- 100 hPa	120VUS016
DN 40 KF	$1 \cdot 10^{-9}$	app. 200	modifiable to app. +/- 100 hPa	120VUS040

## ISO-KF Hose Clamp

- 2 pieces per pkg.
- Temperature range: 0 to 100 °C



### Dimensions



### Steel, Zinc-plated

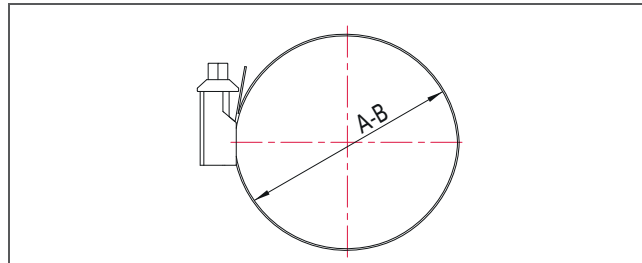
Nominal diameter	A [Max. Ø mm]	B [Min. Ø mm]	Order number
DN 16 KF	22	12	150SSS016
DN 25 KF	32	20	150SSS025
DN 40 KF	50	35	150SSS040
DN 50 KF	60	40	150SSS050

## ISO-K Hose Clamp

- 2 pieces per pkg.
- Temperature range: 0 to 100 °C



### Dimensions



### Steel, Zinc-plated

Nominal diameter	A [Max. Ø mm]	B [Min. Ø mm]	Order number
DN 63 ISO-K	90	70	350SSS063
DN 100 ISO-K	130	110	350SSS100
DN 160 ISO-K	175	160	350SSS160

# Custom components





## Custom components

Pfeiffer Vacuum can produce every feasible component, from stainless steel, aluminum alloys, titanium or any other possible material. Starting with full nipples in special lengths, custom flanges, an additional port on standard components, adapters, hoses or spring bellows, precision mechanical parts to individual solutions. With our years of experience and vacuum expertise, we can provide extensive knowledge in system specifications, design and engineering. Our physicists, designers and production specialists develop and produce each feasible part for your specific requirements. The specifications are based on your requirements: from a rough sketch to a complete set of blue prints, from a starting point towards to a finished product. From prototype construction to serial production. In addition, Pfeiffer Vacuum supplies mechanical or electrical components to meet customer's specifications or provides you with a kit of components from the catalog and/or customized components.

### Technical execution

Customized components are made from high quality materials. Special cleaning procedures guarantee contamination-free surfaces suitable for vacuum, which meet the highest requirements and are ready for immediate operation. All production phases are documented and quality tested. You will receive a quality report containing the leak testing protocol and other test results.

### Options

We can also supply the following services upon request:

- Material certification
- Cleaning and final magnetization heat treatment under vacuum
- Design and production as pressure component
- FEM (Finite Elements Method) calculations
- Assembly under cleanroom conditions

### Product testing

In addition to the standard leak test for vacuum components other tests can be carried out:

- Integral helium leak test
- Baking and residual gas analysis at ultimate vacuum
- Pressure test
- 3D control
- Permeability test
- Electrical isolation test
- Dye penetrant test
- X-ray testing of welded seams

Vacuum-safe blocking, dosage and control



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## Vacuum-safe blocking, dosing and control

The vacuum-safe blocking or regulating and dosing of gas flows requires valves which meet both the process-specific as well as the vacuum-specific requirements. In addition to the basic function of the valve, valve parameters such as structure and size, drive type, operating pressure, tightness of the valve seat and housing, conductivity or gas flow, operating temperature, opening and closing times, service life or materials determine the selection.

Pfeiffer Vacuum stocks a wide range of valves which fulfill both vacuum requirements as well as those of the specific tasks and thus offer a reliable solution for almost all processes. In addition to manually operated valves, we also offer pneumatic, electropneumatic, electromagnetic and motor operated valves for automation processes. We place great importance on user friendliness such as ergonomic grips, and low amount of force. Integrated position sensors and a service life of up to 10 million cycles will make your daily work easier.





## Features at a glance

	Nominal diameter										Operation			Housing			Seal			Page		
	DN 5	DN 10	DN 16	DN 25	DN 40	DN 50	DN 63	DN 100	DN 160	DN 200	DN 250	Manual	Electromagnetic	Pneumatic	Electropneumatic	Aluminum	Stainless steel	Brass	FKM		PTFE	Metal
<b>Valves</b>																						
Angle valves			■	■	■		■	■				■	■	■	■	■	■		■		■	228
Inline valves			■	■	■		■	■				■	■	■	■	■	■		■			251
Diaphragm valves			■	■	■							■				■			■			258
Butterfly valves			■	■	■	■	■					■				■	■		■			259
HV gate valves			■	■	■		■	■	■	■	■	■			■	■			■			263
UHV gate valves					■		■	■	■	■	■	■			■		■		■		■	270
Mini angle valves	■											■	■		■		■		■			274
Mini inline valves	■												■				■		■			278
Venting valves		■										■					■	■	■			280
Pressure relief valves			■		■												■		■			281
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**Customer benefits**

- Specific applications possible
- Ideal for automation processes
- Quick reaction to control commands
- High reliability
- Easy to operate
- Compact design



Angle valves



Inline valves



HV gate valves



UHV gate valves

## Series

**Angle valves** have high levels of tightness, are robust, suitable for use in industrial applications and are insensitive to contamination. Valves with flange sizes DN 16 KF to DN 150 ISO-K are available with aluminium and stainless steel housings. In addition to manual versions we also offer valves with pneumatic, electropneumatic and electromagnetic operation. The angle valves are bellows-sealed and generally have integrated position indicators. For the UHV range, welded housings in the nominal sizes DN 16 CF to DN 63 CF are available, whose valve plate is either sealed with FKM or with copper (in all-metal versions). The FKM O-rings and all-metal valve plates may also be replaced.

**Inline valves** are generally constructed like angle valves. However, their inlet flanges lie in one axis and their flow resistance is slightly larger than angle valves. We can offer you inline valves with flange sizes DN 16 KF to DN 40 KF with stainless steel housings, both manually actuated as well as with pneumatic and electropneumatically actuated operation, each with a position indicator.

**HV gate valves** are characterized by free passage, which results in high conductivity and the associated minimum power losses for high vacuum pumps. We offer high vacuum gate valves with aluminum housings in flange sizes DN 16 KF to DN 250 ISO-F, whose manual or electropneumatic drive is sealed with the help of a gate feedthrough. In addition we also have the high vacuum gate valves with stainless steel housing in flange sizes DN 16 KF to DN 250 ISO-F, whose electropneumatic drive is sealed with a rotary feedthrough. The electropneumatic gate valves come with a position indicator.

**UHV gate valves** have lubricant-free mechanics, are bellows-sealed and have a metallicly-sealed stainless steel housings. Thus, they are suitable for ultra high vacuum and for pressures of up to  $1 \cdot 10^{-10}$  hPa. We can also offer ultra high vacuum gate valves in nominal sizes DN 40 CF to DN 250 CF, with manual operation or electropneumatic operation with position indicators.



**Diaphragm valves** are robust and suitable for venting, rough-metering and locking. They are available in flange sizes DN 16 KF to DN 40 KF with aluminum housing and manual drive.

**Mini angle and mini inline valves** in the nominal size DN 5 are characterized by their small size and are often used for gas inlets or targeted ventilation. Their inlets and outlet ports (thread M14x1) may have adapters (accessories) mounted so that they can be used as connections for DN 10 KF flanges or clamping screws for pipes with external diameters of 6 mm or 6.35 mm. We offer valves with electromagnetic, in bellows-sealed version with manual or electromagnetic operation.

**Venting valves** are simple, manually operated valves in the nominal size DN 10 KF for ventilation with ambient air.

**Pressure relief valves** may be used to limit the over-pressure in vacuum systems if you take their maximum flow rate into account. We offer pressure relief valves in flange sizes DN 16 KF and DN 40 KF with stainless steel housing.

**Gas dosing valves** allow defined gas volumes to enter the vacuum system. Our dosing valves span a broad regulating range: from large gas flow rates up to  $1,700 \text{ hPa} \cdot \text{l/s}$ , e.g. for manual venting, to excellently reproducible gas flows in the high vacuum range, to the lowest gas flows of  $1 \cdot 10^{-10} \text{ hPa} \cdot \text{l/s}$ . Such small gas rates are realized with our bakeable all-metal gas dosing valves. They are used for the inlet for high-purity gas under UHV conditions for mass spectrometer applications.



Diaphragm valves



Mini angle and mini inline valves



Pressure relief valves



Gas dosing valves



Gas regulating valves

**Gas regulating valves** are automated controllable gas dosing valves. We offer electromagnetic or motor operated regulating valves for the high vacuum range and thermo-mechanical controllable and bakeable all-metal gas regulating valves for the UHV range. In addition, you can find suitable control units for the regulating valves.

**Ball valves** are very robust valves with free passages and suitable for vacuum of roughly  $1 \cdot 10^{-5}$  hPa. We offer manually actuated 2-way and 3-way ball valves in flange sizes DN 10 KF to DN 40 KF. The 3-way versions have bore holes of the "L" and "T" types. Due to the size of the bore holes the switching of the three connections are not free of overlapping.



Ball valves

**Butterfly valves** are gate valves whose valve plates are pivoted in the valve opening. They have an almost free passage, are suitable for high vacuum and also have a lower flow resistance compared to angle or inline valves. We offer manually actuated butterfly valves in nominal sizes DN 16 KF to DN 63 ISO-F.



Butterfly valves

## General information

All Pfeiffer Vacuum valves meet the high quality requirements for vacuum components. They are helium leak tested and have better leakage rates than  $10^{-10}$  Pa m<sup>3</sup>/s for high vacuum valves,  $10^{-11}$  Pa m<sup>3</sup>/s for UHV valves, and  $10^{-7}$  Pa m<sup>3</sup>/s for ball valves.

## Important information relating to the technical data

The minimum attainable ultimate pressure in the overall system depends on a number of factors, in particular the pump system, the desorption rates, the interior surfaces and the pump-down time. Minimum pressures listed in the product description are empirical values that can be achieved with a well designed vacuum system. In individual cases they may be exceeded or not met. When using elastomer seals their permeation also needs to be taken into account. It is dependent of the material, temperature and gas type.

The permitted maximum and minimum temperature for the overall system is based on the lowest maximum temperature and the highest minimum temperature of the components used.

The flange connections and components were developed to implement vacuum proof connections. They can only bear limited mechanical loads. Therefore it is necessary to test whether static or dynamic loads need to be absorbed by additional elements (e.g. brackets) when designing a vacuum system.

## Angle valves, manual, DN 16 to 40 ISO-KF

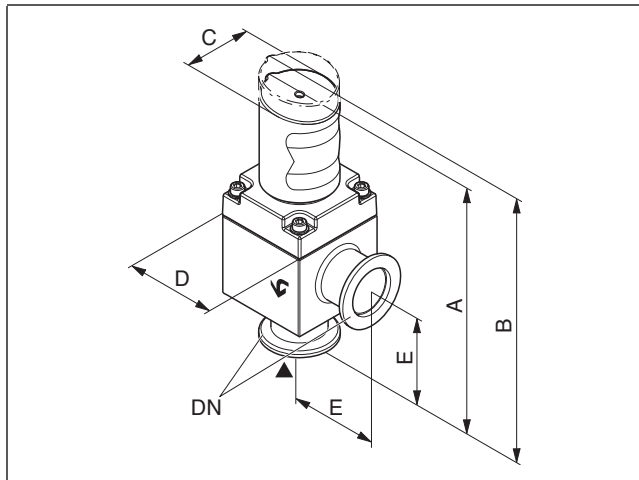


- Quick opening by partly turning the rotary knob
- Bellows-sealed
- With visual indication of open and closed positions
- Service life: 10000 operating cycles

SA = Manually actuated, aluminum housing

SX = Manually actuated, stainless steel housing

### Dimensions



	AVC 016 SA	AVC 025 SA	AVC 040 SA
A	141.3 mm	145.3 mm	186.2 mm
B	149.5 mm	155.7 mm	201.4 mm
C	39.6 mm	39.6 mm	50 mm
D	45 mm	54 mm	69 mm
E	40 mm	50 mm	65 mm

	AVC 016 SX	AVC 025 SX	AVC 040 SX
A	143.9 mm	148.9 mm	189.2 mm
B	152.1 mm	159.1 mm	204.4 mm
C	39.6 mm	39.6 mm	50 mm
D	45 mm	54 mm	69 mm
E	40 mm	50 mm	65 mm

Technical data	AVC 016 SA AVC 016 SX	AVC 025 SA AVC 025 SX	AVC 040 SA AVC 040 SX
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Actuator	Rotary knob	Rotary knob	Rotary knob
Bakeout temperature: actuator	50 °C	50 °C	50 °C
Operating pressure max.	2000 hPa (abs.)	2000 hPa (abs.)	1500 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	2000 hPa	1500 hPa
Differential pressure in closing direction	4000 hPa	4000 hPa	2000 hPa
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Conductance for molecular flow	5 l/s	14 l/s	45 l/s
Service life	10000 cycles	10000 cycles	10000 cycles

	AVC 016 SA	AVC 025 SA	AVC 040 SA
Bakeout temperature: housing	80 °C	80 °C	80 °C
Housing	Aluminum	Aluminum	Aluminum
Weight	0.31 kg	0.42 kg	0.85 kg
<b>Order number</b>	<b>PF A31 003</b>	<b>PF A41 003</b>	<b>PF A51 003</b>

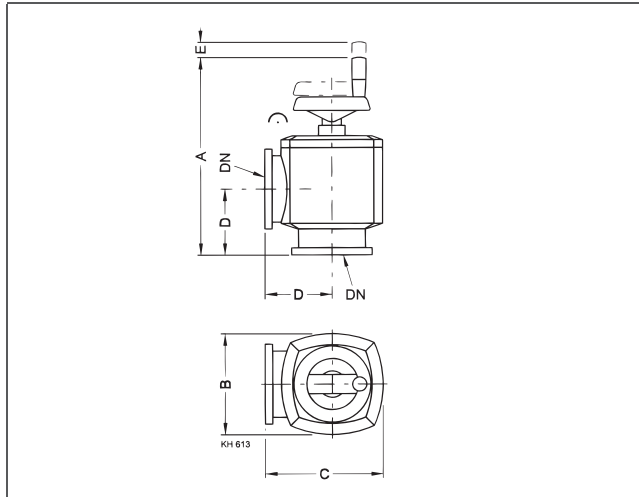
	AVC 016 SX	AVC 025 SX	AVC 040 SX
Bakeout temperature: housing	150 °C	150 °C	150 °C
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.34 kg	0.49 kg	0.96 kg
<b>Order number</b>	<b>PF A31 033</b>	<b>PF A41 033</b>	<b>PF A51 033</b>

## Angle valves, manual, DN 63 to 100 ISO-K



- Spindle drive with ergonomic handwheel for continuous opening
  - Bellows-sealed
  - With visual indication of open and closed positions
  - Service life: 10000 operating cycles
- SA = Manually actuated, aluminum housing  
 SX = Manually actuated, stainless steel housing

### Dimensions



	EVB 063 SA	EVB 100 SA
A	266 mm	320 mm
B	124 mm	164 mm
C	150 mm	190 mm
D	88 mm	108 mm
E	20 mm	25 mm

	EVB 063 SX	EVB 100 SX
A	266 mm	320 mm
B	124 mm	164 mm
C	150 mm	190 mm
D	88 mm	108 mm
E	20 mm	25 mm

Technical data	EVB 063 SA EVB 063 SX	EVB 100 SA EVB 100 SX
Flange (out)	DN 63 ISO-K	DN 100 ISO-K
Flange (in)	DN 63 ISO-K	DN 100 ISO-K
Actuator	Spindle	Spindle
Bakeout temperature: actuator	60 °C	60 °C
Bakeout temperature: housing	150 °C	150 °C
Operating pressure max.	1500 hPa (abs.)	1500 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM
Differential pressure in opening direction	1500 hPa	1500 hPa
Differential pressure in closing direction	1500 hPa	1500 hPa
Feedthrough	Bellows, stainless steel	Bellows, stainless steel
Conductance for molecular flow	140 l/s	330 l/s
Can be opened to a pressure difference of	1500 hPa	1500 hPa
Service life	10000 cycles	10000 cycles

	EVB 063 SA	EVB 100 SA
Housing	Aluminum	Aluminum
Weight	3.6 kg	6.1 kg
<b>Order number</b>	<b>PF B12 001</b>	<b>PF B22 001</b>

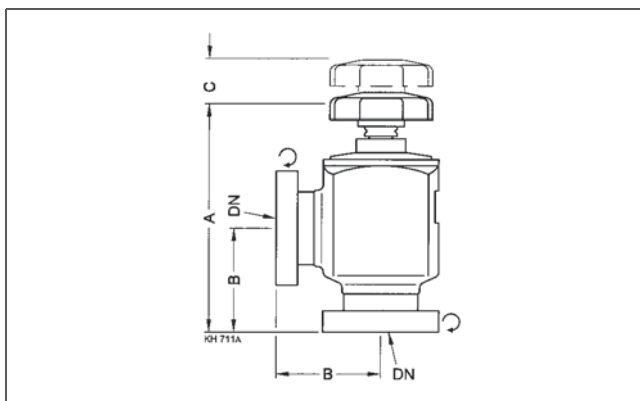
	EVB 063 SX	EVB 100 SX
Housing	Stainless steel	Stainless steel
Weight	6.5 kg	11.1 kg
<b>Order number</b>	<b>PF B12 031</b>	<b>PF B22 031</b>

## Angle valves, manual, DN 16 to 63 CF



- Suitable for UHV applications
- Hermetically sealed, welded stainless steel body
- Bellows-sealed
- Valve plate replaceable
- For high purity and toxic gases
- For gas analysis

### Dimensions



	UVH 016 - VI	UVH 040 - VI	UVH 063 - VI
A	104.2 mm	150.9 mm	231.2 mm
B	38 mm	63 mm	105 mm
C	15 mm	27 mm	36 mm

Technical data	UVH 016 - VI	UVH 040 - VI	UVH 063 - VI
Flange (out)	DN 16 CF-R	DN 40 CF-R	DN 63 CF-R
Flange (in)	DN 16 CF-R	DN 40 CF-R	DN 63 CF-R
Actuator	Hand wheel	Hand wheel	Hand wheel
Heat up and cool down speed	4 K/min	4 K/min	4 K/min
Bakeout temperature: with adjustment knob	80 °C	80 °C	80 °C
Bakeout temperature: without adjustment knob	180 °C	180 °C	180 °C
Operating pressure max.	4000 hPa (abs.)	4000 hPa (abs.)	4000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal: Valve plate	FKM	FKM	FKM
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.35 kg	1.8 kg	4.8 kg
Conductance for molecular flow	3 l/s	38 l/s	100 l/s
Service life	50000 cycles	50000 cycles	50000 cycles

Order number			
Angle valves	PF C32 032	PF C52 032	PF C62 032

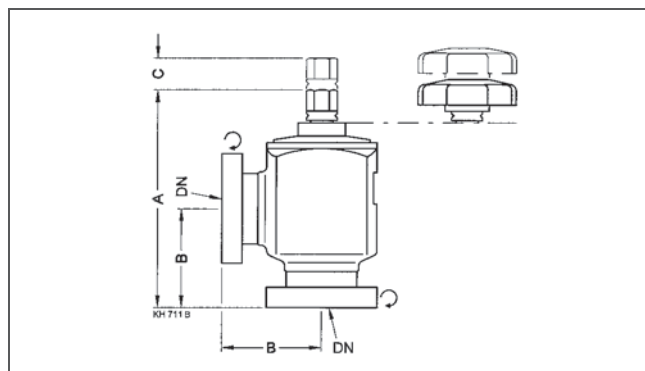


## All-metal angle valves, manual, DN 16 to 63 CF



- Suitable for UHV applications
- Hermetically sealed, welded stainless steel body
- Bellows-sealed
- Valve plate replaceable
- For high purity and toxic gases
- For gas analysis

### Dimensions



	UVH 016 - CU	UVH 040 - CU	UVH 063 - CU
A	88 mm	140 mm	210 mm
B	38 mm	63 mm	105 mm
C	15 mm	27 mm	36 mm

Technical data	UVH 016 - CU	UVH 040 - CU	UVH 063 - CU
Flange (out)	DN 16 CF-R	DN 40 CF-R	DN 63 CF-R
Flange (in)	DN 16 CF-R	DN 40 CF-R	DN 63 CF-R
Actuator	Hand wheel / Outer hexagon	Hand wheel / Outer hexagon	Hand wheel / Outer hexagon
Heat up and cool down speed	4 K/min	4 K/min	2 K/min
Bakeout temperature: with adjustment knob	80 °C	80 °C	80 °C
Bakeout temperature: without adjustment knob	300 °C	300 °C	300 °C
Operating pressure max.	4000 hPa (abs.)	4000 hPa (abs.)	4000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-11}$ hPa	$1 \cdot 10^{-11}$ hPa	$1 \cdot 10^{-11}$ hPa
Tightness	$5 \cdot 10^{-13}$ Pa m <sup>3</sup> /s	$5 \cdot 10^{-13}$ Pa m <sup>3</sup> /s	$5 \cdot 10^{-13}$ Pa m <sup>3</sup> /s
Seal plate	Copper	Copper	Copper
Seal: Valve plate	Copper	Copper	Copper
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.4 kg	2 kg	5 kg
Conductance for molecular flow	3 l/s	38 l/s	100 l/s
Service life	1000 cycles	1000 cycles	1000 cycles

Order number			
Angle valves	PF K32 032	PF K52 032	PF K62 032

## Angle valves, electropneumatic, with PI, with PV, DN 16 to 40 ISO-KF



- Bellows-sealed
- With visual position indicator
- Normally closed (n.c.)
- Service life: 10 million operating cycles

AVC = Angle valve with bellows feedthrough

PA = Electropneumatically actuated, aluminum housing

PX = Electropneumatically actuated, stainless steel housing

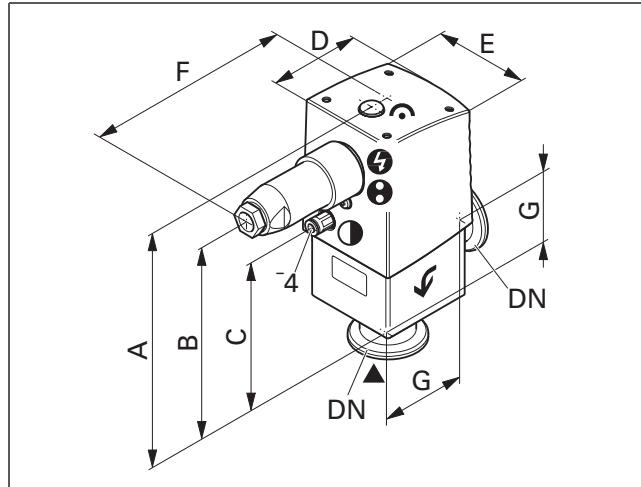
AC = Alternating current

DC = Direct current

PI = Position indicator

PV = Pilot valve

### Dimensions



	AVC 016 PA	AVC 025 PA	AVC 040 PA
A	142 mm	146.9 mm	188.8 mm
B	112.9 mm	117.8 mm	159.7 mm
C	75.1 mm	79 mm	114.9 mm
D	55 mm	64.3 mm	81.3 mm
E	51.4 mm	60.1 mm	75.7 mm
F	93.2 mm	97.8 mm	105.3 mm
G	40 mm	50 mm	65 mm

Technical data	AVC 016 PA	AVC 025 PA	AVC 040 PA
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Bakeout temperature: actuator, pilot valve	50 °C	50 °C	50 °C
Bakeout temperature: housing	80 °C	80 °C	80 °C
Operating pressure max.	2000 hPa	2000 hPa	2000 hPa
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	2000 hPa	2000 hPa
Differential pressure in closing direction	5000 hPa	5000 hPa	5000 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	4 cm <sup>3</sup>	11 cm <sup>3</sup>	35 cm <sup>3</sup>
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Housing	Aluminum	Aluminum	Aluminum
Weight	0.49 kg	0.68 kg	1.21 kg
Power pilot valve	2.5 W	2.5 W	2.5 W
Conductance for molecular flow	5 l/s	14 l/s	45 l/s
Opening time	100 ms	120 ms	260 ms
Closing time	100 ms	160 ms	540 ms
Service life	10000000 cycles	10000000 cycles	10000000 cycles
Electrical position indicator	Included	Included	Included
Electrical position indicator: Rating	250 V AC / 0.1 A ; 50 V DC / 0.25 A	250 V AC / 0.1 A ; 50 V DC / 0.25 A	250 V AC / 0.1 A ; 50 V DC / 0.25 A
Control valve	Included	Included	Included

	AVC 016 PA	AVC 025 PA	AVC 040 PA
Supply	24 V AC	24 V AC	24 V AC
<b>Order number</b>	<b>PF A38 103</b>	<b>PF A48 103</b>	<b>PF A58 103</b>
Supply	24 V DC	24 V DC	24 V DC
<b>Order number</b>	<b>PF A38 204</b>	<b>PF A48 204</b>	<b>PF A58 204</b>
Supply	100-115 V AC	100-115 V AC	100-115 V AC
<b>Order number</b>	<b>PF A38 403</b>	<b>PF A48 403</b>	<b>PF A58 403</b>
Supply	200-230 V AC	200-230 V AC	200-230 V AC
<b>Order number</b>	<b>PF A38 403</b>	<b>PF A48 503</b>	<b>PF A58 503</b>

## Angle valves, electropneumatic, with PI, with PV, DN 16 to 40 ISO-KF



- Bellows-sealed
- With visual position indicator
- Normally closed (n.c.)
- Service life: 10 million operating cycles

AVC = Angle valve with bellows feedthrough

PA = Electropneumatically actuated, aluminum housing

PX = Electropneumatically actuated, stainless steel housing

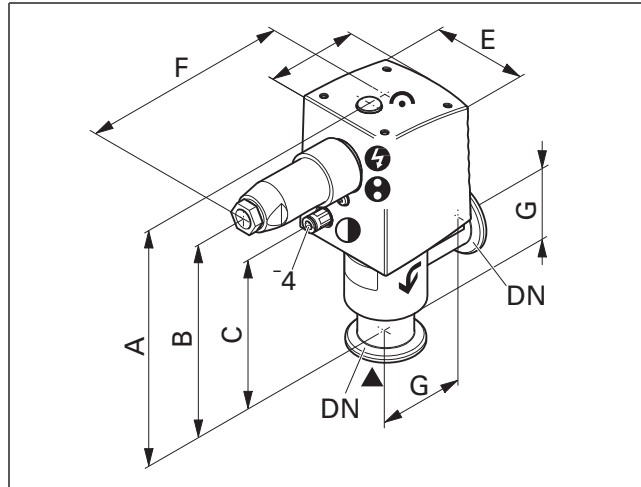
AC = Alternating current

DC = Direct current

PI = Position indicator

PV = Pilot valve

### Dimensions



	AVC 016 PX	AVC 025 PX	AVC 040 PX
A	144.5 mm	150.3 mm	191.8 mm
B	115.4 mm	121.2 mm	162.7 mm
C	77.6 mm	82.5 mm	117.9 mm
D	55 mm	64.3 mm	81.3 mm
E	51.4 mm	60.1 mm	75.7 mm
F	93.2 mm	97.8 mm	105.3 mm
G	40 mm	50 mm	65 mm

Technical data	AVC 016 PX	AVC 025 PX	AVC 040 PX
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Bakeout temperature: actuator, pilot valve	50 °C	50 °C	50 °C
Bakeout temperature: housing	150 °C	150 °C	150 °C
Operating pressure max.	2000 hPa (abs.)	2000 hPa (abs.)	2000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	2000 hPa	2000 hPa
Differential pressure in closing direction	5000 hPa	5000 hPa	5000 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	4 cm <sup>3</sup>	11 cm <sup>3</sup>	35 cm <sup>3</sup>
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.52 kg	0.75 kg	1.33 kg
Power pilot valve	4.8 / 3.6 VA	4.8/3.6 VA	4.8 / 3.6 VA
Conductance for molecular flow	5 l/s	14 l/s	45 l/s
Opening time	100 ms	120 ms	260 ms
Closing time	100 ms	160 ms	540 ms
Service life	10000000 cycles	10000000 cycles	10000000 cycles
Electrical position indicator	Included	Included	Included
Electrical position indicator: Rating	250 V AC / 0.1 A ; 50 V DC / 0.25 A	250 V AC / 0.1 A ; 50 V DC / 0.25 A	250 V AC / 0.1 A ; 50 V DC / 0.25 A
Control valve	Included	Included	Included

	AVC 016 PX	AVC 025 PX	AVC 040 PX
Supply	24 V AC	24 V DC	24 V AC
<b>Order number</b>	<b>PF A38 133</b>	<b>PF A48 133</b>	<b>PF A58 133</b>
Supply	24 V DC	24 V DC	24 V DC
<b>Order number</b>	<b>PF A38 234</b>	<b>PF A48 234</b>	<b>PF A58 234</b>
Supply	100-115 V AC	100-115 V AC	100-115 V AC
<b>Order number</b>	<b>PF A38 433</b>	<b>PF A48 433</b>	<b>PF A58 533</b>
Supply	200-230 V AC	200-230 V AC	200-230 V AC
<b>Order number</b>	<b>PF A38 533</b>	<b>PF A48 533</b>	<b>PF A58 533</b>

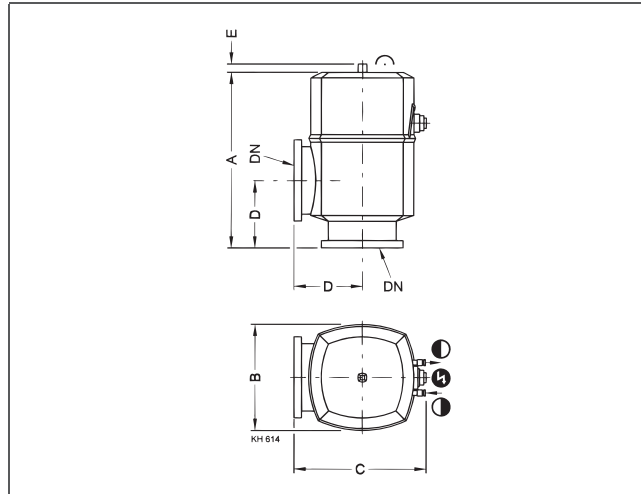
## Angle valves, electropneumatic, with PI, with PV, DN 63 to 160 ISO-K



- Bellows-sealed
- With visual position indicator
- Normally closed (n.c.)
- Service life: 1.5 million operating cycles

EVB = Angle valve with bellows feedthrough  
 PA = Electropneumatically actuated, aluminum housing  
 PX = Electropneumatically actuated, stainless steel housing  
 AC = Alternating current  
 DC = Direct current  
 PI = Position indicator  
 PV = Pilot valve

### Dimensions



	EVB 063 PA	EVB 100 PA	EVB 160 PA
A	250 mm	282 mm	366 mm
B	124 mm	164 mm	215 mm
C	168 mm	208 mm	264 mm
D	88 mm	108 mm	138 mm
E	14 mm	14 mm	14 mm

	EVB 063 PX	EVB 100 PX
A	250 mm	282 mm
B	124 mm	164 mm
C	168 mm	208 mm
D	88 mm	108 mm
E	14 mm	14 mm

Technical data	EVB 063 PA EVB 063 PX	EVB 100 PA EVB 100 PX	EVB 160 PA
Flange (out)	DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K
Flange (in)	DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K
Bakeout temperature: actuator, pilot valve	60 °C	60 °C	60 °C
Operating pressure max.	1500 hPa (abs.)	1500 hPa (abs.)	1500 hPa (abs.)
Operating pressure min.	1 · 10 <sup>-8</sup> hPa	1 · 10 <sup>-8</sup> hPa	1 · 10 <sup>-8</sup> hPa
Tightness	1 · 10 <sup>-10</sup> Pa m <sup>3</sup> /s	1 · 10 <sup>-10</sup> Pa m <sup>3</sup> /s	1 · 10 <sup>-10</sup> Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	1500 hPa	1500 hPa	1500 hPa
Differential pressure in closing direction	1500 hPa	1500 hPa	1500 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	75 cm <sup>3</sup>	195 cm <sup>3</sup>	570 cm <sup>3</sup>
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Housing	Aluminum	Aluminum	Aluminum
Power pilot valve	3.1/2.2 W	3.1/2.2 W	3.1/2.2 W
Conductance for molecular flow	140 l/s	330 l/s	800 l/s
Opening time	300 ms	400 ms	600 ms
Closing time	300 ms	400 ms	650 ms
Service life	1500000 cycles	1500000 cycles	1500000 cycles
Electrical position indicator	Included	Included	Included
Control valve	Included	Included	Included
Electrical position indicator: Rating	250 V AC / 0,125 A ; 50 V DC / 0,25 A	250 V AC / 0,125 A ; 50 V DC / 0,25 A	250 V AC / 0,125 A ; 50 V DC / 0,25 A

Technical data	EVB 063 PA	EVB 100 PA	EVB 160 PA
Bakeout temperature: housing	80 °C	80 °C	80 °C
Weight	4 kg	6.7 kg	11.4 kg

	EVB 063 PA	EVB 100 PA	EVB 160 PA
Supply	24 V AC	24 V AC	24 V AC
<b>Order number</b>	<b>PF B18 101</b>	<b>PF B28 101</b>	<b>PF B38 101</b>
Supply	24 V DC	24 V DC	24 V DC
<b>Order number</b>	<b>PF B18 201</b>	<b>PF B28 201</b>	<b>PF B38 201</b>
Supply	100-115 V AC	100-115 V AC	100-115 V AC
<b>Order number</b>	<b>PF B18 401</b>	<b>PF B28 401</b>	<b>PF B38 401</b>
Supply	200-240 V AC	200-240 V AC	200-240 V AC
<b>Order number</b>	<b>PF B18 501</b>	<b>PF B28 501</b>	<b>PF B38 501</b>

Technical data	EVB 063 PX	EVB 100 PX
Bakeout temperature: housing	150 °C	150 °C
Weight	6.8 kg	11.7 kg

	EVB 063 PX	EVB 100 PX
Supply	24 V AC	24 V AC
<b>Order number</b>	<b>PF B18 131</b>	<b>PF B28 131</b>
Supply	24 V DC	24 V DC
<b>Order number</b>	<b>PF B18 231</b>	<b>PF B28 231</b>
Supply	100-115 V AC	100-115 V AC
<b>Order number</b>	<b>PF B18 431</b>	<b>PF B28 431</b>
Supply	200-240 V AC	200-240 V AC
<b>Order number</b>	<b>PF B18 531</b>	<b>PF B28 531</b>

## Angle valves, pneumatic, with PI, without PV, DN 16 to 40 ISO-KF



- Bellows-sealed
- With visual position indicator
- Normally closed (n.c.)
- Service life: 10 million operating cycles

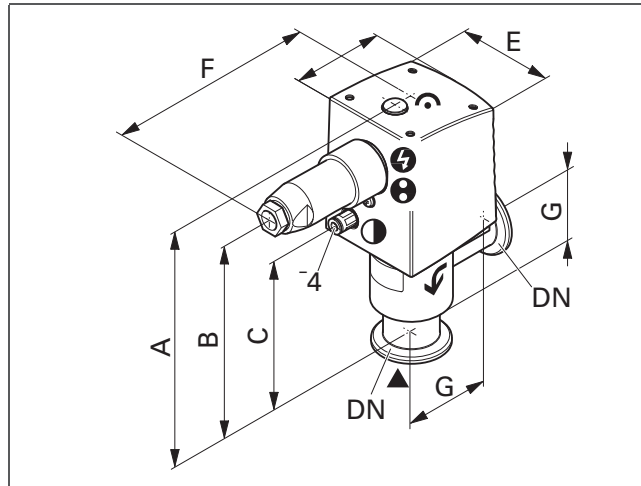
AVC = Angle valve with bellows feedthrough

PA = Pneumatically actuated, aluminum housing

PX= Pneumatically actuated, stainless steel housing

PI = Position indicator

### Dimensions



	AVC 016 PA	AVC 025 PA	AVC 040 PA
A	142 mm	146.9 mm	188.8 mm
B	112.9 mm	117.8 mm	159.7 mm
C	75.1 mm	79 mm	114.9 mm
D	55 mm	64.3 mm	81.3 mm
E	51.4 mm	60,1 mm	75.7 mm
F	93.2 mm	97.8 mm	105.3 mm
G	40 mm	50 mm	65 mm

	AVC 016 PX	AVC 025 PX	AVC 040 PX
A	144.5 mm	150.3 mm	191.8 mm
B	115.4 mm	121.2 mm	162.2 mm
C	77.6 mm	82.5 mm	117.9 mm
D	55 mm	64.3 mm	81.3 mm
E	51.4 mm	60,1 mm	75.7 mm
F	93.2 mm	97.8 mm	105.3 mm
G	40 mm	50 mm	65 mm



Technical data	AVC 016 PA AVC 016 PX	AVC 025 PA AVC 025 PX	AVC 040 PA AVC 040 PX
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Bakeout temperature: actuator, pilot valve	50 °C	50 °C	50 °C
Operating pressure max.	2000 hPa (abs.)	2000 hPa (abs.)	2000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	2000 hPa	2000 hPa
Differential pressure in closing direction	5000 hPa	5000 hPa	5000 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	4 cm <sup>3</sup>	11 cm <sup>3</sup>	35 cm <sup>3</sup>
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Conductance for molecular flow	5 l/s	14 l/s	45 l/s
Opening time	100 ms	120 ms	260 ms
Closing time	100 ms	160 ms	540 ms
Service life	10000000 cycles	10000000 cycles	10000000 cycles
Electrical position indicator	Included	Included	Included
Electrical position indicator: Rating	250 V AC / 0.1 A ; 50 V DC / 0.25 A	250 V AC / 0.1 A ; 50 V DC / 0.25 A	250 V AC / 0.1 A ; 50 V DC / 0.25 A

	AVC 016 PA	AVC 025 PA	AVC 040 PA
Bakeout temperature: housing	80 °C	80 °C	80 °C
Housing	Aluminum	Aluminum	Aluminum
Weight	0.49 kg	0.68 kg	1.21 kg
<b>Order number</b>	<b>PF A36 003</b>	<b>PF A46 003</b>	<b>PF A56 003</b>

	AVC 016 PX	AVC 025 PX	AVC 040 PX
Bakeout temperature: housing	150 °C	150 °C	150 °C
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.52 kg	0.75 kg	1.33 kg
<b>Order number</b>	<b>PF A36 033</b>	<b>PF A46 033</b>	<b>PF A56 033</b>

## Angle valves, pneumatic, with PI, without PV, DN 63 to 160 ISO-K



- Bellows-sealed
- With visual position indicator
- Normally closed (n.c.)
- Service life: 1.5 million operating cycles

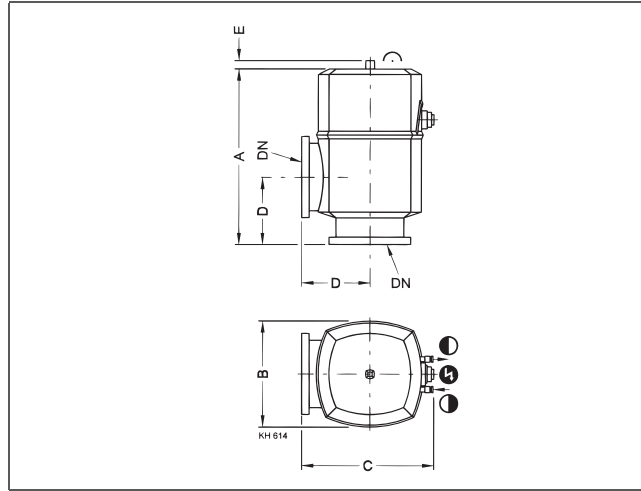
EVB = Angle valve with bellows feedthrough

PA = Pneumatically actuated, aluminum housing

PX = Pneumatically actuated, stainless steel housing

PI = Position indicator

### Dimensions



	EVB 063 PA	EVB 100 PA	EVB 160 PA
A	250 mm	282 mm	366 mm
B	124 mm	164 mm	215 mm
C	168 mm	208 mm	264 mm
D	88 mm	108 mm	138 mm
E	14 mm	14 mm	14 mm

	EVB 063 PX	EVB 100 PX
A	250 mm	282 mm
B	124 mm	164 mm
C	168 mm	208 mm
D	88 mm	108 mm
E	14 mm	14 mm

Technical data	EVB 063 PA EVB 063 PX	EVB 100 PA EVB 100 PX	EVB 160 PA
Flange (out)	DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K
Flange (in)	DN 63 ISO-K	DN 100 ISO-K	DN 160 ISO-K
Bakeout temperature: actuator, pilot valve	60 °C	60 °C	60 °C
Operating pressure max.	1500 hPa (abs.)	1500 hPa (abs.)	1500 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	1500 hPa	1500 hPa	1500 hPa
Differential pressure in closing direction	1500 hPa	1500 hPa	1500 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	75 cm <sup>3</sup>	195 cm <sup>3</sup>	570 cm <sup>3</sup>
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Conductance for molecular flow	140 l/s	330 l/s	800 l/s
Opening time	300 ms	400 ms	600 ms
Closing time	300 ms	400 ms	650 ms
Service life	1500000 cycles	1500000 cycles	1500000 cycles
Electrical position indicator	Included	Included	Included
Electrical position indicator: Rating	250 V AC / 0.125 A ; 50 V DC / 0.25 A	250 V AC / 0.125 A ; 50 V DC / 0.25 A	250 V AC / 0.125 A ; 50 V DC / 0.25 A

	EVB 063 PA	EVB 100 PA	EVB 160 PA
Bakeout temperature: housing	80 °C	80 °C	150 °C
Housing	Aluminum	Aluminum	Aluminum
Weight	4 kg	6.7 kg	11.4 kg
<b>Order number</b>	<b>PF B16 002</b>	<b>PF B26 002</b>	<b>PF B36 002</b>

	EVB 063 PX	EVB 100 PX
Bakeout temperature: housing	150 °C	150 °C
Housing	Stainless steel	Stainless steel
Weight	6.8 kg	11.7 kg
<b>Order number</b>	<b>PF B16 032</b>	<b>PF B26 032</b>

## Angle valves, pneumatic, without PI, without PV, DN 16 to 40 ISO-KF



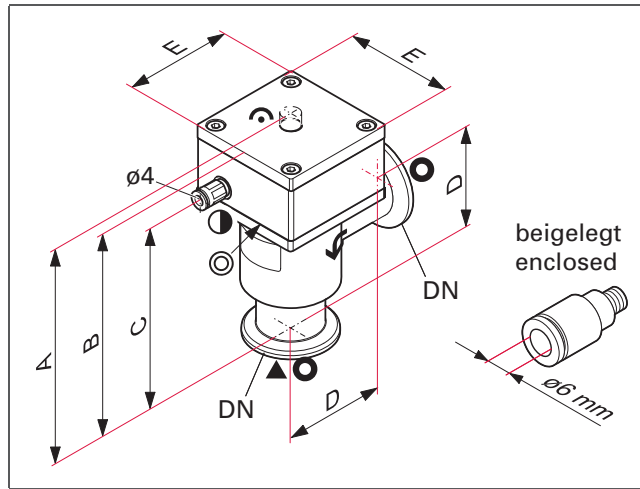
- Bellows-sealed
- With visual position indicator
- Normally closed (n.c.)
- Service life: 10 million operating cycles

AVC = Angle valve with bellows feedthrough

PA = Pneumatically actuated, aluminum housing

PX = Pneumatically actuated, stainless steel housing

### Dimensions



	AVC 016 PA	AVC 025 PA	AVC 040 PA
A	100.5 mm	108.5 mm	150.5 mm
B	95.7 mm	102.6 mm	144.7 mm
C	75.6 mm	80.6 mm	116.6 mm
D	40 mm	50 mm	65 mm
E	45 mm	54 mm	69 mm

	AVC 016 PX	AVC 025 PX	AVC 040 PX
A	103 mm	112 mm	153.5 mm
B	98.2 mm	106 mm	147.7 mm
C	78.1 mm	84 mm	119.6 mm
D	40 mm	50 mm	65 mm
E	45 mm	54 mm	69 mm

Technical data	AVC 016 PA AVC 016 PX	AVC 025 PA AVC 025 PX	AVC 040 PA AVC 040 PX
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Bakeout temperature: actuator, pilot valve	120 °C	120 °C	120 °C
Operating pressure max.	2000 hPa (abs.)	2000 hPa (abs.)	2000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	2000 hPa	2000 hPa
Differential pressure in closing direction	5000 hPa	5000 hPa	5000 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	400 cm <sup>3</sup>	11 cm <sup>3</sup>	35 cm <sup>3</sup>
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Conductance for molecular flow	5 l/s	14 l/s	45 l/s
Opening time	100 ms	120 ms	260 ms
Closing time	100 ms	160 ms	540 ms
Service life	10000000 cycles	10000000 cycles	10000000 cycles

	AVC 016 PA	AVC 025 PA	AVC 040 PA
Bakeout temperature: housing	80 °C	80 °C	80 °C
Housing	Aluminum	Aluminum	Aluminum
Weight	0.38 kg	0.57 kg	1.17 kg
<b>Order number</b>	<b>PF A35 004</b>	<b>PF A45 004</b>	<b>PF A55 004</b>

	AVC 016 PX	AVC 025 PX	AVC 040 PX
Bakeout temperature: housing	150 °C	150 °C	150 °C
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.42 kg	0.66 kg	1.28 kg
<b>Order number</b>	<b>PF A35 034</b>	<b>PF A45 034</b>	<b>PF A55 034</b>

## Angle valves, electropneumatic, with PI, with PV, n.o., DN 16 to 40 ISO-KF



- Bellows-sealed
- With visual position indicator
- Normally open (n.o.)
- Service life: 10 million operating cycles

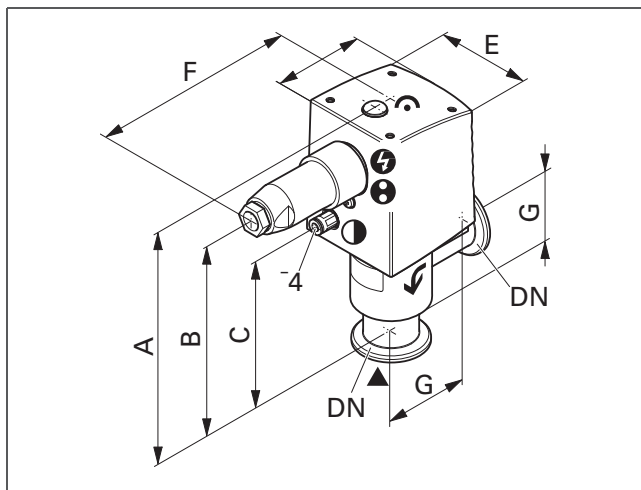
AVC = Angle valve with bellows feedthrough

PA = Electropneumatically actuated, aluminum housing

PX = Electropneumatically actuated, stainless steel housing

DC = Direct current

### Dimensions



	AVC 016 PA	AVC 025 PA	AVC 040 PA
A	142 mm	146.9 mm	188.8 mm
B	112.9 mm	117.8 mm	159.7 mm
C	75.1 mm	79 mm	114.9 mm
D	55 mm	64.3 mm	81.3 mm
E	51.4 mm	60.1 mm	75.7 mm
F	93.2 mm	97.8 mm	105.3 mm
G	40 mm	50 mm	65 mm

	AVC 016 PX	AVC 025 PX	AVC 040 PX
A	144.5 mm	150.3 mm	191.8 mm
B	115.4 mm	121.2 mm	162.7 mm
C	77.6 mm	82.5 mm	117.9 mm
D	55 mm	64.3 mm	81.3 mm
E	51.4 mm	60.1 mm	75.7 mm
F	93.2 mm	97.8 mm	105.3 mm
G	40 mm	50 mm	65 mm

Technical data	AVC 016 PA AVC 016 PX	AVC 025 PA AVC 025 PX	AVC 040 PA AVC 040 PX
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Bakeout temperature: actuator, pilot valve	50 °C	50 °C	50 °C
Operating pressure max.	2000 hPa (abs.)	2000 hPa (abs.)	2000 hPa (abs.)
Operating pressure min.	1 · 10 <sup>-8</sup> hPa	1 · 10 <sup>-8</sup> hPa	1 · 10 <sup>-8</sup> hPa
Tightness	1 · 10 <sup>-10</sup> Pa m <sup>3</sup> /s	1 · 10 <sup>-10</sup> Pa m <sup>3</sup> /s	1 · 10 <sup>-10</sup> Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	2000 hPa	2000 hPa
Differential pressure in closing direction	5000 hPa	5000 hPa	5000 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	4 cm <sup>3</sup>	11 cm <sup>3</sup>	35 cm <sup>3</sup>
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Power pilot valve	2.5 W	2.5 W	2.5 W
Conductance for molecular flow	5 l/s	14 l/s	45 l/s
Opening time	100 ms	120 ms	260 ms
Closing time	100 ms	160 ms	540 ms
Service life	10000000 cycles	10000000 cycles	10000000 cycles
Electrical position indicator	Included	Included	Included
Electrical position indicator: Rating	250 V AC / 0.1 A ; 50 V DC / 0.25 A	250 V AC / 0.1 A ; 50 V DC / 0.25 A	250 V AC / 0.1 A ; 50 V DC / 0.25 A
Control valve	Included	Included	Included
Supply	24 V DC	24 V DC	24 V DC

	AVC 016 PA	AVC 025 PA	AVC 040 PA
Bakeout temperature: housing	80 °C	80 °C	80 °C
Housing	Aluminum	Aluminum	Aluminum
Weight	0.49 kg	0.68 kg	1.21 kg
<b>Order number</b>	<b>PF A38 205</b>	<b>PF A48 205</b>	<b>PF A58 205</b>

	AVC 016 PX	AVC 025 PX	AVC 040 PX
Bakeout temperature: housing	150 °C	150 °C	150 °C
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.52 kg	0.75 kg	1.33 kg
<b>Order number</b>	<b>PF A38 235</b>	<b>PF A48 235</b>	<b>PF A58 235</b>

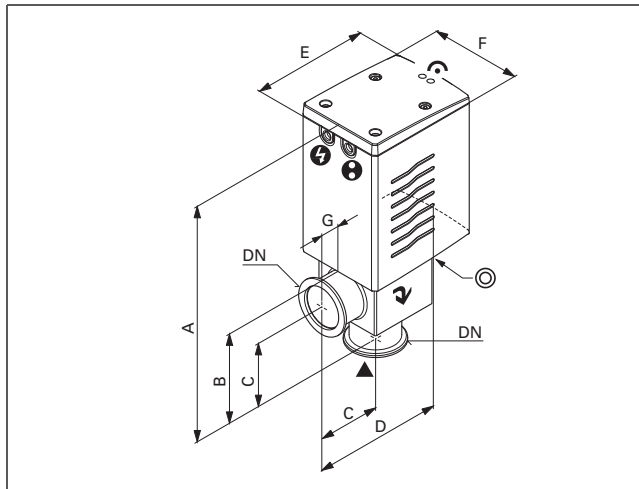
## Angle valves, solenoid actuated, with PI, DN 16 to 40 ISO-KF



- Bellows-sealed
- With visible indication of open and closed positions
- Normally closed (n.c.)
- Modulation by means of line voltage or additional control voltage in remote mode
- Service life: 2 million operating cycles

AVC = Angle valve with bellows feedthrough  
 MA = Solenoid actuated, aluminum housing  
 MX = Solenoid actuated, stainless steel housing  
 DC = Direct current

### Dimensions



	AVC 016 MA	AVC 025 MA	AVC 040 MA
A	170.9 mm	193 mm	246 mm
B	51.4 mm	64.9 mm	92.9 mm
C	40 mm	50 mm	65 mm
D	96 mm	112.7 mm	139 mm
E	86 mm	97.3 mm	119.5 mm
F	59 mm	70 mm	90 mm
G	10 mm	15.4 mm	19.5 mm

	AVC 016 MX	AVC 025 MX	AVC 040 MX
A	172.9 mm	196.4 mm	249 mm
B	53.4 mm	68.3 mm	95.9 mm
C	40 mm	50 mm	65 mm
D	96 mm	112.7 mm	139 mm
E	86 mm	97.3 mm	119.5 mm
F	59 mm	70 mm	90 mm
G	10 mm	15.4 mm	19.5 mm



Technical data	AVC 016 MA AVC 016 MX	AVC 025 MA AVC 025 MX	AVC 040 MA AVC 040 MX
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Pickup/holding power	405 / 8.1 W	416 / 8.3 W	367 / 7.5 W
Operating pressure max.	1300 hPa (abs.)	1300 hPa (abs.)	1000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	1300 hPa	1300 hPa	1000 hPa
Differential pressure in closing direction	1300 hPa	1300 hPa	1300 hPa
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Mounting orientation	Any	Any	Any
Conductance for molecular flow	4 l/s	13 l/s	35 l/s
Can be opened to a pressure difference of	1300 hPa	1300 hPa	1300 hPa
Opening time	100 ms	120 ms	230 ms
Switching frequency at 40°C	30 min <sup>-1</sup>	30 min <sup>-1</sup>	30 min <sup>-1</sup>
Switching frequency at 50°C	20 min <sup>-1</sup>	20 min <sup>-1</sup>	20 min <sup>-1</sup>
Closing time	220 ms	230 ms	650 ms
Service life	2000000 cycles	2000000 cycles	2000000 cycles
Electrical position indicator	Included	Included	Included
Electrical position indicator: Rating	30 V DC / 0.1 A	30 V DC / 0.1 A	30 V DC / 0.1 A
Control voltage	15-30 V DC	15-30 V DC	15-30 V DC
Control current	3-5 mA	3-5 mA	3-5 mA
Ambient temperature	0-50 °C	0-50 °C	0-50 °C
Supply	90-264 V , 47-63 Hz	90-264 V , 47-63 Hz	90-264 V , 47-63 Hz

	AVC 016 MA	AVC 025 MA	AVC 040 MA
Housing	Aluminum	Aluminum	Aluminum
Weight	1.1 kg	1.9 kg	4.3 kg
<b>Order number</b>	<b>PF A34 506</b>	<b>PF A44 506</b>	<b>PF A54 506</b>

	AVC 016 MX	AVC 025 MX	AVC 040 MX
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	1.2 kg	2 kg	4.4 kg
<b>Order number</b>	<b>PF A34 536</b>	<b>PF A44 536</b>	<b>PF A54 536</b>

## Angle valves, solenoid actuated, without PI, DN 10 ISO-KF

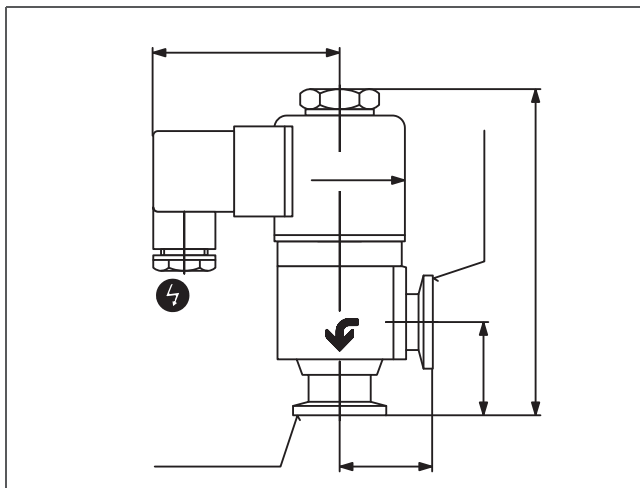


- Flange size DN 10 ISO-KF
- Housing material: Aluminum
- Solenoid actuated, without vacuum feedthrough
- Normally closed (n.c.)
- Service life: 1.5 million operating cycles

EVC = Angle valve without vacuum feedthrough

DC = Direct current

### Dimensions



Technical data	EVC 110 M
Flange (out)	DN 10 ISO-KF
Flange (in)	DN 10 ISO-KF
Pickup/holding power	35/15 W
Bakeout temperature: actuator	80 °C
Bakeout temperature: housing	150 °C
Operating pressure max.	1000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM
Differential pressure in opening direction	1000 hPa
Differential pressure in closing direction	1000 hPa
Housing	Aluminum
Weight	0.46 kg
Conductance for molecular flow	1 l/s
Can be opened to a pressure difference of	2000 hPa
Opening time	45 ms
Switching frequency	50 min <sup>-1</sup>
Closing time	60 ms
Service life	1500000 cycles

Supply	24 V, 50/60 Hz
<b>Order number</b>	<b>PF A23 101</b>
Supply	24 V DC
<b>Order number</b>	<b>PF A23 201</b>
Supply	115 V, 50/60 Hz
<b>Order number</b>	<b>PF A23 401</b>
Supply	230 V, 50/60 Hz
<b>Order number</b>	<b>PF A23 501</b>

## Inline-valves, manual, DN 16 to 40 ISO-KF

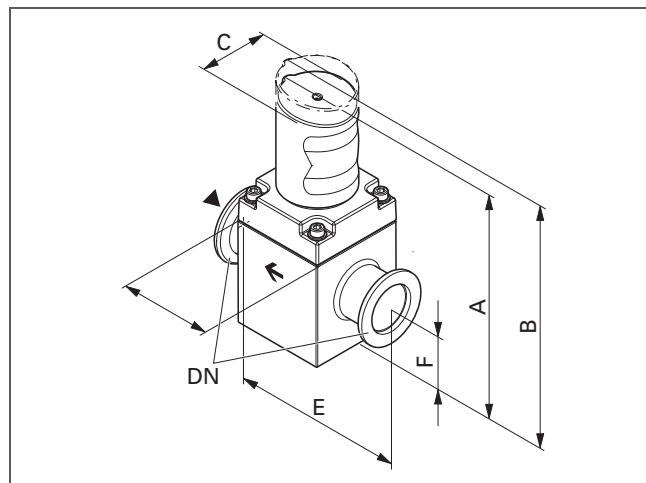


- Quick opening by partly turning the rotary knob
- Bellows-sealed
- With visual indication of open and closed positions
- Service life: 10000 operating cycles

DVC = Inline valve with bellows feedthrough

SX = Manually actuated, stainless steel housing

### Dimensions



	DVC 016 SX	DVC 025 SX	DVC 040 SX
A	125.4 mm	132 mm	166.5 mm
B	133.6 mm	142.4 mm	181.7 mm
C	39.6 mm	39.6 mm	50 mm
D	45 mm	54 mm	69 mm
E	80 mm	100 mm	139 mm
F	20 mm	31.8 mm	40.8 mm

Technical data	DVC 016 SX	DVC 025 SX	DVC 040 SX
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Actuator	Rotary knob	Rotary knob	Rotary knob
Bakeout temperature: actuator	50 °C	50 °C	50 °C
Bakeout temperature: housing	150 °C	150 °C	150 °C
Operating pressure max.	2000 hPa (abs.)	2000 hPa (abs.)	1500 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	2000 hPa	1500 hPa
Differential pressure in closing direction	4000 hPa	4000 hPa	2000 hPa
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.71 kg	1.09 kg	1.83 kg
Conductance for molecular flow	2.5 l/s	7 l/s	20 l/s
Service life	10000 cycles	10000 cycles	10000 cycles

Order number			
Inline valves	PF D31 033	PF D41 033	PF D51 033

## Inline-valves, electropneumatic, with PI, with PV, DN 16 to 40 ISO-KF



- Bellows-sealed
- With visual position indicator
- Normally closed (n.c.)
- With electrical position indicator
- Service life: 10 million operating cycles

DVC = Inline valve with bellows feedthrough

PX = Electropneumatically actuated, stainless steel housing

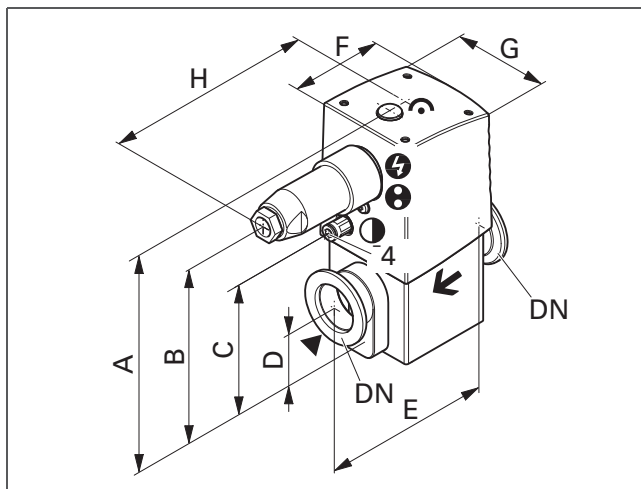
AC = Alternating current

DC = Direct current

PI = Position indicator

PV = Pilot valve

### Dimensions



	DVC 016 PX	DVC 025 PX	DVC 040 PX
A	126.1 mm	133.6 mm	169.1 mm
B	97 mm	104.5 mm	140 mm
C	59.2 mm	65.7 mm	95.2 mm
D	20 mm	31.8 mm	40.8 mm
E	80 mm	100 mm	130 mm
F	55 mm	64.3 mm	81.3 mm
G	51.4 mm	60.1 mm	75.7 mm
H	93.2 mm	97.8 mm	105.3 mm

Technical data	DVC 016 PX	DVC 025 PX	DVC 040 PX
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Bakeout temperature: actuator, pilot valve	50 °C	50 °C	50 °C
Bakeout temperature: housing	150 °C	150 °C	150 °C
Operating pressure max.	2000 hPa (abs.)	2000 hPa (abs.)	2000 hPa (abs.)
Operating pressure min.	1 · 10 <sup>-8</sup> hPa	1 · 10 <sup>-8</sup> hPa	1 · 10 <sup>-8</sup> hPa
Tightness	1 · 10 <sup>-10</sup> Pa m <sup>3</sup> /s	1 · 10 <sup>-10</sup> Pa m <sup>3</sup> /s	1 · 10 <sup>-10</sup> Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	2000 hPa	2000 hPa
Differential pressure in closing direction	5000 hPa	5000 hPa	5000 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	4 cm <sup>3</sup>	11 cm <sup>3</sup>	35 cm <sup>3</sup>
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.89 kg	1.35 kg	2.2 kg
Conductance for molecular flow	2.5 l/s	7 l/s	20 l/s
Opening time	100 ms	120 ms	260 ms
Closing time	100 ms	160 ms	540 ms
Service life	10000000 cycles	10000000 cycles	10000000 cycles
Electrical position indicator	Included	Included	Included
Electrical position indicator: Rating	250 V AC / 0.1 A ; 50 V DC / 0.25 A	250 V AC / 0.1 A ; 50 V DC / 0.25 A	250 V AC / 0.1 A ; 50 V DC / 0.25 A
Control valve	Included	Included	Included

	DVC 016 PX	DVC 025 PX	DVC 040 PX
Supply	24 V AC	24 V AC	24 V AC
Power pilot valve	4.8/3.6 W	4.8/3.6 W	4.8/3.6 W
<b>Order number</b>	<b>PF D38 133</b>	<b>PF D48 133</b>	<b>PF D58 133</b>
Supply	24 V DC	24 V DC	24 V DC
Power pilot valve	2.5 W	2.5 W	2.5 W
<b>Order number</b>	<b>PF D38 234</b>	<b>PF D48 234</b>	<b>PF D58 234</b>
Supply	100-115 V AC	100-115 V AC	100-115 V AC
Power pilot valve	4.8/3.6 W	4.8/3.6 W	4.8/3.6 W
<b>Order number</b>	<b>PF D38 433</b>	<b>PF D48 433</b>	<b>PF D58 433</b>
Supply	200-230 V AC	200-230 V AC	200-230 V AC
Power pilot valve	4.8/3.6 W	4.8/3.6 W	4.8/3.6 W
<b>Order number</b>	<b>PF D38 533</b>	<b>PF D48 533</b>	<b>PF D58 533</b>

## Inline-valves, pneumatic, with PI, without PV, DN 16 to 40 ISO-KF

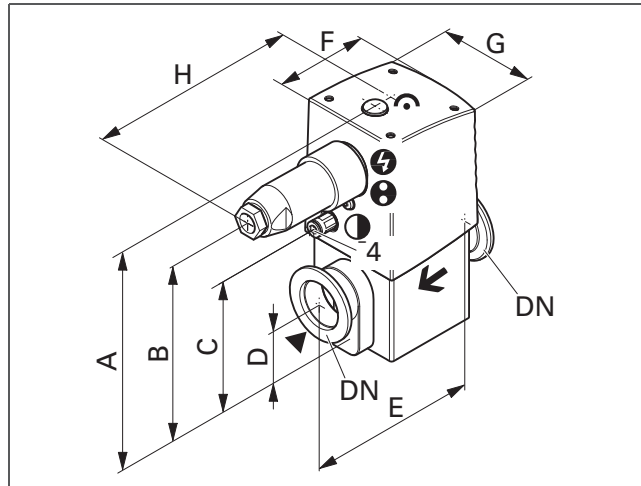


- Bellows-sealed
- With visual position indicator
- Normally closed (n.c.)
- Service life: 10 million operating cycles

DVC = Inline valve with bellows feedthrough

PX = Pneumatically actuated, stainless steel housing

### Dimensions



	DVC 016 PX	DVC 025 PX	DVC 040 PX
A	126.1 mm	133.6 mm	169.1 mm
B	97 mm	104.5 mm	140 mm
C	59.2 mm	65.7 mm	95.2 mm
D	20 mm	31.8 mm	40.8 mm
E	80 mm	100 mm	130 mm
F	55 mm	64.3 mm	81.3 mm
G	51.4 mm	60.1 mm	75.7 mm
H	93.2 mm	97.8 mm	105.3 mm

Technical data	DVC 016 PX	DVC 025 PX	DVC 040 PX
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Bakeout temperature: actuator, pilot valve	50 °C	50 °C	50 °C
Bakeout temperature: housing	150 °C	150 °C	150 °C
Operating pressure max.	2000 hPa (abs.)	2000 hPa (abs.)	2000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	2000 hPa	2000 hPa
Differential pressure in closing direction	5000 hPa	5000 hPa	5000 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	4 cm <sup>3</sup>	11 cm <sup>3</sup>	35 cm <sup>3</sup>
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.89 kg	1.35 kg	2.2 kg
Conductance for molecular flow	2.5 l/s	7 l/s	20 l/s
Opening time	100 ms	120 ms	260 ms
Closing time	100 ms	160 ms	540 ms
Service life	10000000 cycles	10000000 cycles	10000000 cycles
Electrical position indicator	Included	Included	Included
Electrical position indicator: Rating	250 V AC / 0.1 A ; 50 V DC/ 0.25 A	250 V AC / 0.1 A ; 50 V DC/ 0.25 A	250 V AC / 0.1 A ; 50 V DC/ 0.25 A

Order number			
Inline valves	PF D36 033	PF D46 033	PF D56 033

## Inline-valves, electropneumatic with PI, with PV, n.o., DN 16 to 40 ISO-KF

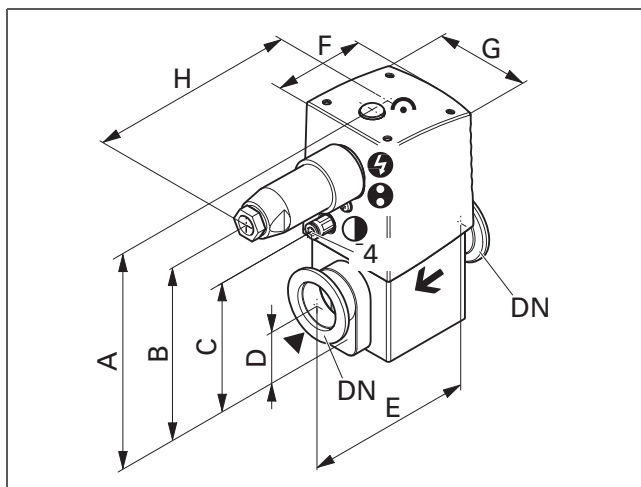


- Bellows-sealed
- With visual position indicator
- Normally open (n.o.)
- Service life: 10 million operating cycles

DVC = Inline valve with bellows feedthrough

PX = Electropneumatically actuated, stainless steel housing

### Dimensions



	DVC 016 PX	DVC 025 PX	DVC 040 PX
A	126.1 mm	133.6 mm	169.1 mm
B	97 mm	104.5 mm	140 mm
C	59.2 mm	65.7 mm	95.2 mm
D	20 mm	31.8 mm	40.8 mm
E	80 mm	100 mm	130 mm
F	55 mm	64.3 mm	81.3 mm
G	51.4 mm	60.1 mm	75.7 mm
H	93.2 mm	97.8 mm	105.3 mm



Technical data	DVC 016 PX	DVC 025 PX	DVC 040 PX
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Bakeout temperature: actuator, pilot valve	50 °C	50 °C	50 °C
Bakeout temperature: housing	150 °C	150 °C	150 °C
Operating pressure max.	2000 hPa (abs.)	2000 hPa (abs.)	2000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	2000 hPa	2000 hPa
Differential pressure in closing direction	5000 hPa	5000 hPa	5000 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	4 cm <sup>3</sup>	11 cm <sup>3</sup>	35 cm <sup>3</sup>
Feedthrough	Bellows, stainless steel	Bellows, stainless steel	Bellows, stainless steel
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	0.89 kg	1.35 kg	2.2 kg
Power pilot valve	2.5 W	2.5 W	2.5 W
Conductance for molecular flow	2.5 l/s	7 l/s	20 l/s
Opening time	100 ms	120 ms	260 ms
Closing time	100 ms	160 ms	540 ms
Service life	10000000 cycles	10000000 cycles	10000000 cycles
Electrical position indicator	Included	Included	Included
Electrical position indicator: Rating	250 V AC / 0.1 A ; 50 V DC/ 0.25 A	250 V AC / 0.1 A ; 50 V DC/ 0.25 A	250 V AC / 0.1 A ; 50 V DC/ 0.25 A
Control valve	Included	Included	Included
Supply	24 V AC	24 V DC	24 V DC

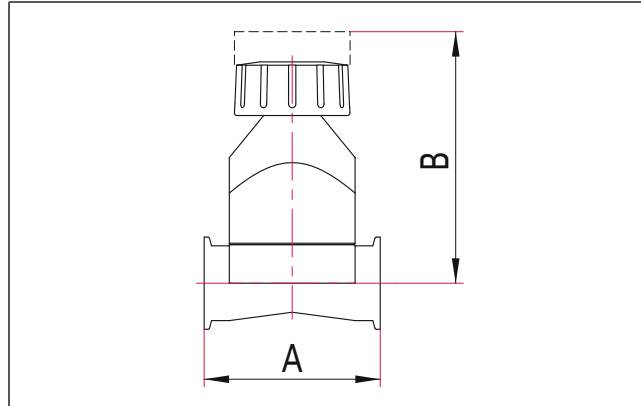
Order number			
Inline valves	PF D38 235	PF D48 235	PF D58 235

## Diaphragm valves, manual



- Robust vacuum valve for venting, rough-metering and locking
- Service life: 100000 operating cycles
- The membrane seals the valve seat and the housing
- With visual indication of open and closed positions

### Dimensions



	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
A	52 mm	80 mm	105 mm
B	66.5 mm	111 mm	132 mm

Technical data	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Actuator	Spindle	Spindle	Spindle
Bakeout temperature: actuator	50 °C	50 °C	50 °C
Bakeout temperature: housing	100 °C	100 °C	100 °C
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal: Valve plate	FKM	FKM	FKM
Pressure range	$1 \cdot 10^{-7}$ hPa to 5000 hPa (abs.)	$1 \cdot 10^{-7}$ hPa to 5000 hPa (abs.)	$1 \cdot 10^{-7}$ hPa to 5000 hPa (abs.)
Housing	Aluminum	Aluminum	Aluminum
Conductance for molecular flow	2 l/s	5 l/s	17 l/s

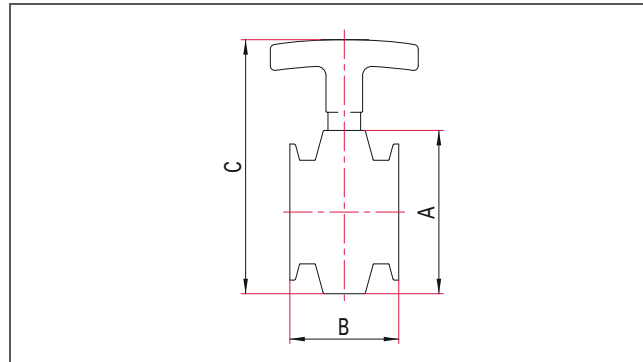
Order number			
Diaphragm valves	110VME016	110VME025	110VME040

## Butterfly valves, manual, aluminum, DN 16 to 50 ISO-KF



- Swivel valve plate with FKM seal
- Service life: 3000 operating cycles
- Valve position indicated by T-handle
- Nearly free clearance in open position
- Double valve head seal made from FKM

### Dimensions



	DN 16 ISO- KF	DN 25 ISO- KF	DN 40 ISO- KF	DN 50 ISO- KF
A	80 mm	80 mm	80 mm	90 mm
B	60 mm	60 mm	50 mm	60 mm
C	123 mm	123 mm	123 mm	140 mm

Technical data	DN 16 ISO- KF	DN 25 ISO- KF	DN 40 ISO- KF	DN 50 ISO- KF
Flange (out)	DN 16 ISO- KF	DN 25 ISO- KF	DN 40 ISO- KF	DN 50 ISO- KF
Flange (in)	DN 16 ISO- KF	DN 25 ISO- KF	DN 40 ISO- KF	DN 50 ISO- KF
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM	FKM
Pressure range	$1 \cdot 10^{-8}$ hPa to ambient pressure	$1 \cdot 10^{-8}$ hPa to ambient pressure	$1 \cdot 10^{-8}$ hPa to ambient pressure	$1 \cdot 10^{-8}$ hPa to ambient pressure
Housing	Aluminum	Aluminum	Aluminum	Aluminum
Temperature range	-15 to 130 °C	-15 to 130 °C	-15 to 130 °C	-15 to 130 °C

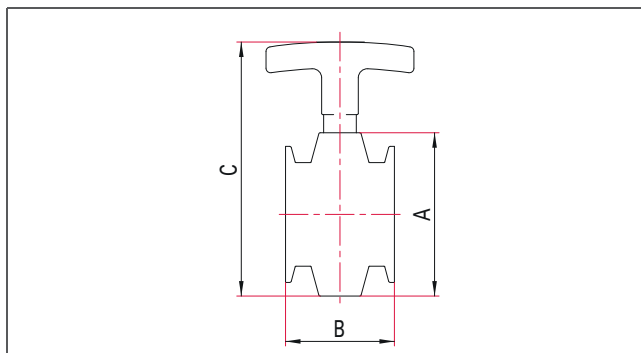
Order number				
Butterfly valves	<b>110VSM016</b>	<b>110VSM025</b>	<b>110VSM040</b>	<b>110VSM050</b>

## Butterfly valves, manual, stainless steel, DN 16 to 50 ISO-KF



- Swivel valve plate with FKM seal
- Service life: 3000 operating cycles
- Valve position indicated by T-handle
- Nearly free clearance in open position
- Double valve head seal made from FKM

### Dimensions



	DN 16 ISO- KF	DN 25 ISO- KF	DN 40 ISO- KF	DN 50 ISO- KF
A	80 mm	80 mm	80 mm	90 mm
B	60 mm	60 mm	60 mm	60 mm
C	123 mm	123 mm	123 mm	140 mm

Technical data	DN 16 ISO- KF	DN 25 ISO- KF	DN 40 ISO- KF	DN 50 ISO- KF
Flange (out)	DN 16 ISO- KF	DN 25 ISO- KF	DN 40 ISO- KF	DN 50 ISO- KF
Flange (in)	DN 16 ISO- KF	DN 25 ISO- KF	DN 40 ISO- KF	DN 50 ISO- KF
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM	FKM
Pressure range	$1 \cdot 10^{-8}$ hPa to ambient pressure	$1 \cdot 10^{-8}$ hPa to ambient pressure	$1 \cdot 10^{-8}$ hPa to ambient pressure	$1 \cdot 10^{-8}$ hPa to ambient pressure
Housing	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Temperature range	-15 to 130 °C	-15 to 130 °C	-15 to 130 °C	-15 to 130 °C

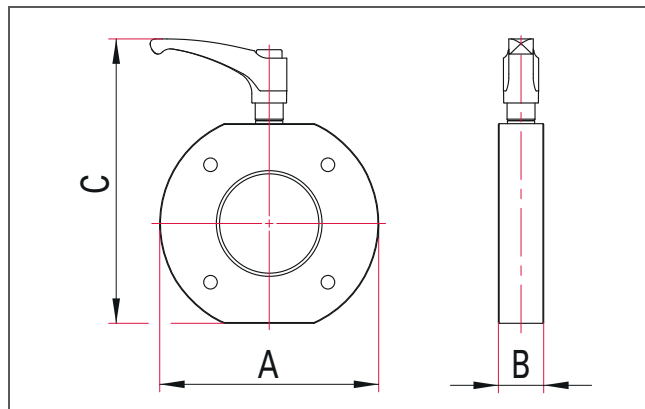
Order number				
Butterfly valves	120VSM016	120VSM025	120VSM040	120VSM050

## Butterfly valves, manual, aluminum, DN 63 ISO-F



- Swivel valve plate with FKM seal
- Service life: 3000 operating cycles
- Nearly free clearance in open position
- Valve position indicated by handle
- Double valve head seal made from FKM

### Dimensions



	DN 63 ISO-F
A	145 mm
B	30 mm
C	190 mm

Technical data	DN 63 ISO-F
Flange (out)	DN 63 ISO-F
Flange (in)	DN 63 ISO-F
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM
Pressure range	$1 \cdot 10^{-8}$ hPa to ambient pressure
Housing	Aluminum
Scope of delivery	with set of M8 x 75 screws
Temperature range	-15 to 130 °C

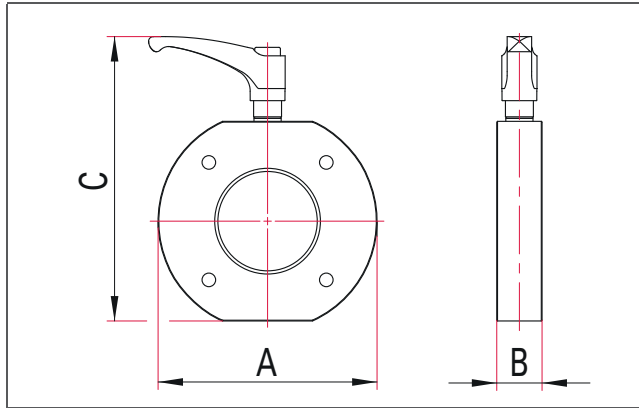
Order number	
Butterfly valves	<b>510VSM063</b>

## Butterfly valves, manual, stainless steel, DN 63 ISO-F



- Swivel valve plate with FKM seal
- Service life: 3000 operating cycles
- Nearly free clearance in open position
- Valve position indicated by handle
- Double valve head seal made from FKM

### Dimensions



	DN 63 ISO-F
A	145 mm
B	30 mm
C	190 mm

Technical data	DN 63 ISO-F
Flange (out)	DN 63 ISO-F
Flange (in)	DN 63 ISO-F
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM
Pressure range	$1 \cdot 10^{-8}$ hPa to ambient pressure
Housing	Stainless steel
Temperature range	-15 to 130 °C

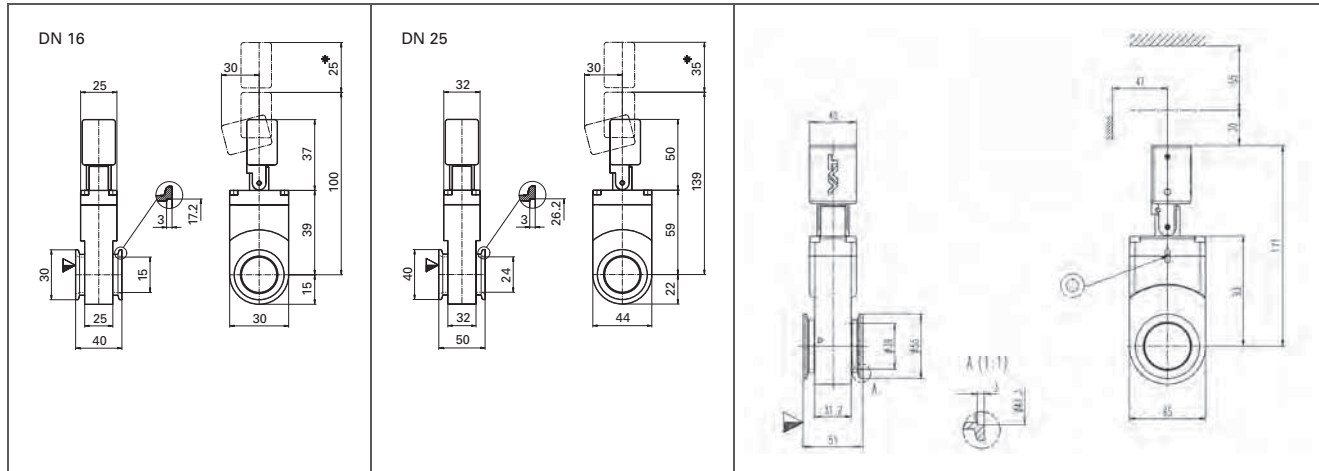
Order number	
Butterfly valves	520VSM063

## HV gate valve, manual, DN 16 to 40 ISO-KF



- High conductance due to free clearance
  - Vulcanized valve disk seal
  - Service life: 50000 operating cycles
- SVV = Gate valve  
HA = Manually actuated, aluminum housing

### Dimensions



SVV 016 HA

SVV 025 HA

SVV 040 HA

Technical data	SVV 016 HA	SVV 025 HA	SVV 040 HA
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Actuator	Toggle lever	Toggle lever	Toggle lever
Bakeout temperature: actuator	80 °C	80 °C	80 °C
Bakeout temperature: housing	100 °C	100 °C	100 °C
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal: Housing	FKM	FKM	FKM
Seal: Valve seat	FKM	FKM	FKM
Differential pressure in opening direction	1000 hPa	1000 hPa	1000 hPa
Differential pressure in closing direction	1000 hPa	1000 hPa	1000 hPa
Pressure max.	2000 hPa	2000 hPa	2000 hPa
Pressure min.	$1 \cdot 10^{-7}$ hPa	$1 \cdot 10^{-7}$ hPa	$1 \cdot 10^{-7}$ hPa
Feedthrough	Shaft feedthrough	Shaft feedthrough	Shaft feedthrough
Housing	Aluminum	Aluminum	Aluminum
Weight	0.4 kg	0.4 kg	0.7 kg
Conductance for molecular flow	10 l/s	34 l/s	140 l/s
Can be opened to a pressure difference of	30 hPa	30 hPa	30 hPa
Service life	50000 cycles	50000 cycles	50000 cycles
Valve plate	Stainless steel	Stainless steel	Stainless steel

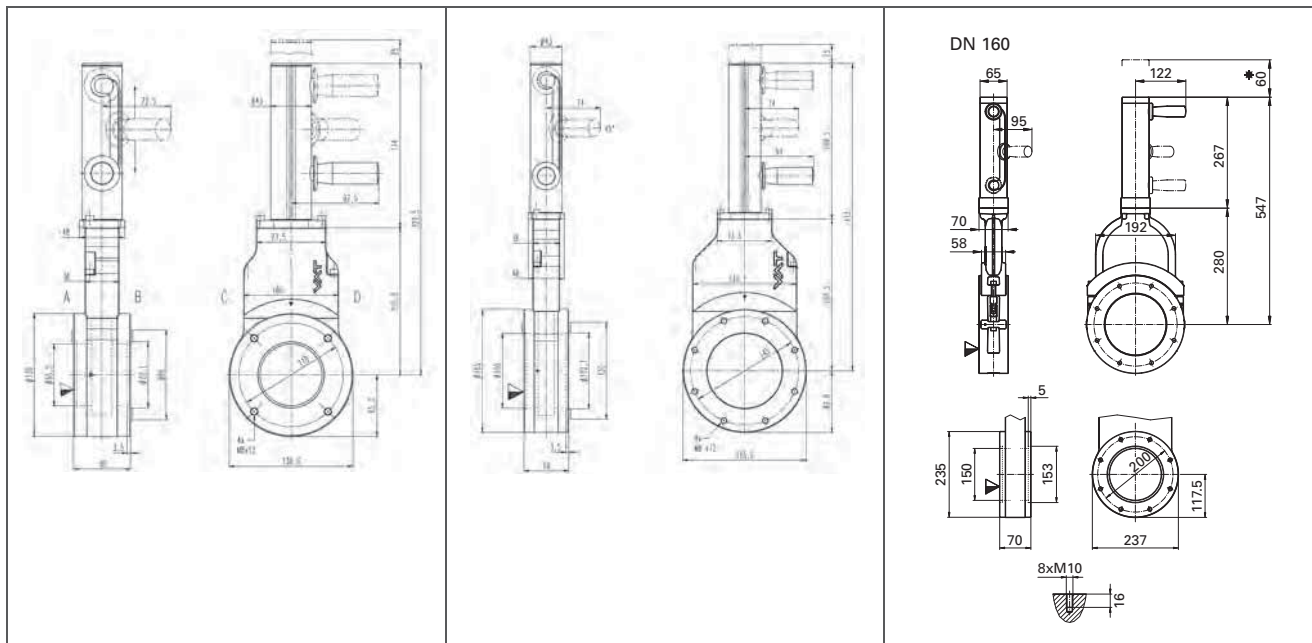
Order number			
HV gate valves	PF D31 000	PF D41 000	PF D51 000

## HV gate valve, manual, DN 63 to 160 ISO-F



- High conductance due to free clearance
  - Service life: up to 200000 operating cycles
- SVV = Gate valve  
HA = Manually actuated, aluminum housing

### Dimensions



SVV 063 HA

SVV 100 HA

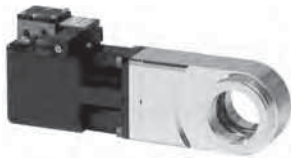
SVV 160 HA

Technical data	SVV 063 HA	SVV 100 HA	SVV 160 HA
Flange (out)	DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F
Flange (in)	DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F
Actuator	Connecting rod	Connecting rod	Connecting rod
Bakeout temperature: actuator	80 °C	80 °C	80 °C
Bakeout temperature: housing	120 °C	120 °C	120 °C
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal: Housing	FKM	FKM	FKM
Seal: Valve seat	FKM	FKM	FKM
Differential pressure in opening direction	1600 hPa	1600 hPa	1600 hPa
Differential pressure in closing direction	1600 hPa	1600 hPa	1600 hPa
Pressure max.	1600 hPa (abs.)	1600 hPa (abs.)	1600 hPa (abs.)
Pressure min.	$1 \cdot 10^{-7}$ hPa	$1 \cdot 10^{-7}$ hPa	$1 \cdot 10^{-7}$ hPa
Feedthrough	Shaft feedthrough	Shaft feedthrough	Shaft feedthrough
Housing	Aluminum	Aluminum	Aluminum
Weight	3 kg	4.5 kg	9 kg
Conductance for molecular flow	550 l/s	2000 l/s	6000 l/s
Can be opened to a pressure difference of	30 hPa	30 hPa	30 hPa
Service life	200000 cycles	200000 cycles	100000 cycles
Valve plate	Stainless steel	Stainless steel	Stainless steel

Order number			
HV gate valves	PF E11 001	PF E21 001	PF E31 001



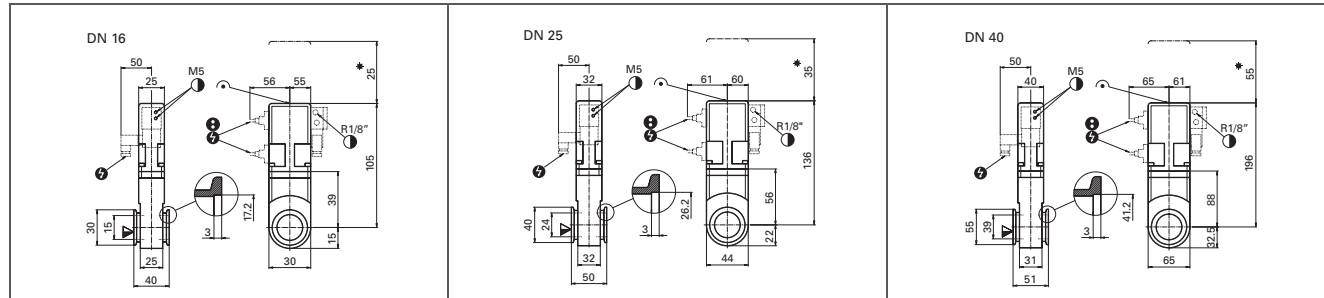
## HV gate valve, electropneumatic, with PI, with PV, DN 16 to 40 ISO-KF



- High conductance due to free clearance
- Vulcanized valve disk seal
- With visible indication of open and closed positions
- Service life: 50000 operating cycles

SVV = Gate valve  
 PA = Electropneumatically actuated, aluminum housing  
 DC = Direct current  
 PI = Position indicator  
 PV = Pilot valve

### Dimensions



SVV 016 PA

SVV 025 PA

SVV 040 PA

Technical data	SVV 016 PA	SVV 025 PA	SVV 040 PA
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Actuator	Electropneumatic	Electropneumatic	Electropneumatic
Bakeout temperature: actuator	50 °C	50 °C	50 °C
Bakeout temperature: housing	100 °C	100 °C	100 °C
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal: Housing	FKM	FKM	FKM
Seal: Valve seat	FKM	FKM	FKM
Differential pressure in opening direction	1000 hPa	1000 hPa	1000 hPa
Differential pressure in closing direction	1000 hPa	1000 hPa	1000 hPa
Compressed air (overpressure) max.	7000 hPa	7000 hPa	7000 hPa
Compressed air (overpressure) min.	4500 hPa	4500 hPa	4500 hPa
Compressed air volume	10 cm <sup>3</sup>	30 cm <sup>3</sup>	70 cm <sup>3</sup>
Pressure max.	1000 hPa (abs.)	1000 hPa (abs.)	1000 hPa (abs.)
Pressure min.	$1 \cdot 10^{-7}$ hPa	$1 \cdot 10^{-7}$ hPa	$1 \cdot 10^{-7}$ hPa
Feedthrough	Shaft feedthrough	Shaft feedthrough	Shaft feedthrough
Housing	Aluminum	Aluminum	Aluminum
Weight	0.8 kg	0.8 kg	1.2 kg
Position feedback: Load capacity	50 V / 0.5 A / 10 W	50 V / 0.5 A / 10 W	50 V / 0.5 A / 10 W
Power consumption	24 V DC / 5.4 W	24 V DC / 5.4 W	24 V DC / 5.4 W
Conductance for molecular flow	10 l/s	34 l/s	140 l/s
Can be opened to a pressure difference of	30 hPa	30 hPa	30 hPa
Closing/opening time	0.8 s	1.1 s	1.2 s
Service life	50000 cycles	50000 cycles	50000 cycles
Valve plate	Stainless steel	Stainless steel	Stainless steel

	SVV 016 PA	SVV 025 PA	SVV 040 PA
Supply	24 V DC	24 V DC	24 V DC
<b>Order number</b>	<b>PF D38 200</b>	<b>PF D48 200</b>	<b>PF D58 200</b>
Supply	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz
<b>Order number</b>	<b>PF D38 100</b>	<b>PF D48 100</b>	<b>PF D58 100</b>
Supply	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
<b>Order number</b>	<b>PF D38 500</b>	<b>PF D48 500</b>	<b>PF D58 500</b>

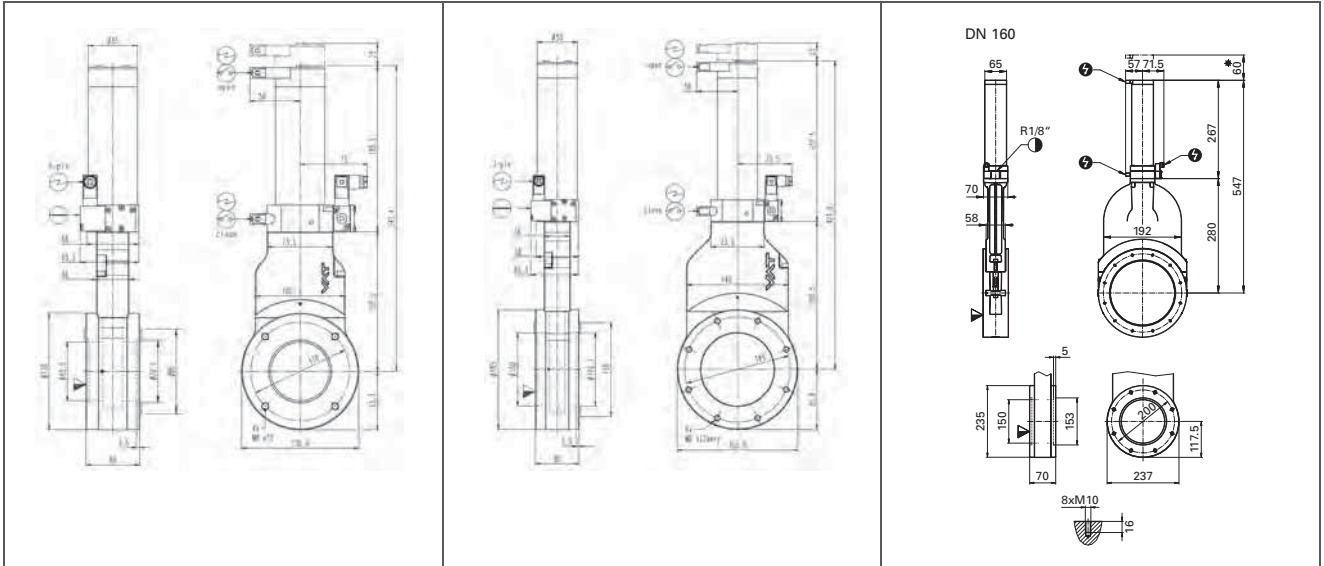
## HV gate valve, electropneumatic, with PI, with PV, ISO-F Aluminum, DN 63 to 250 ISO-F



- High conductance due to free clearance
- With visual indication of open and closed positions
- Service life: up to 200000 operating cycles

SVV = Gate valve  
 PA = Electropneumatically actuated  
 DC = Direct current  
 PI = Position indicator  
 PV = Pilot valve

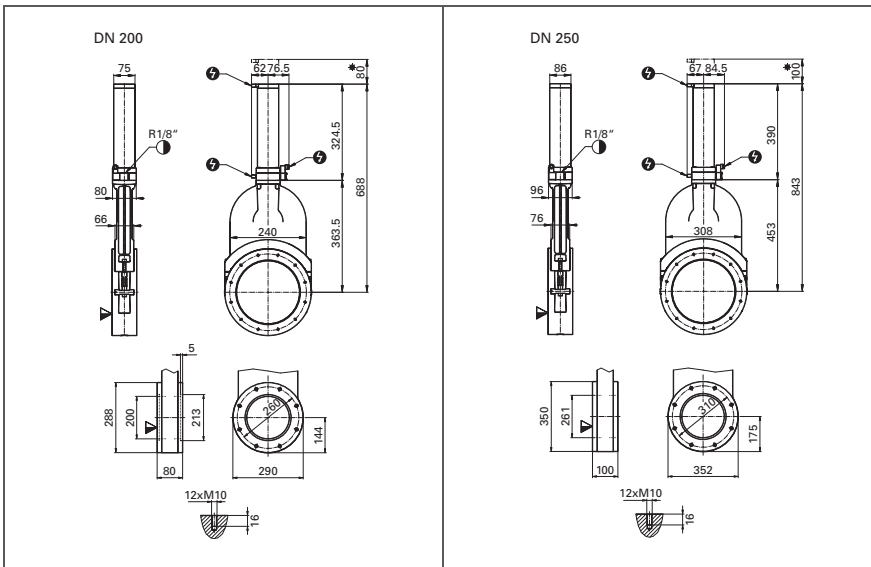
### Dimensions



SVV 063 PA

SVV 100 PA

SVV 160 PA



SVV 200 PA

SVV 250 PA

Technical data	SVV 063 PA	SVV 100 PA	SVV 160 PA	SVV 200 PA	SVV 250 PA
Flange (out)	DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F	DN 200 ISO-F	DN 250 ISO-F
Flange (in)	DN 63 ISO-F	DN 100 ISO-F	DN 160 ISO-F	DN 200 ISO-F	DN 250 ISO-F
Actuator	Electropneumatic	Electropneumatic	Electropneumatic	Electropneumatic	Electropneumatic
Bakeout temperature: actuator	50 °C	50 °C	50 °C	50 °C	50 °C
Bakeout temperature: housing	120 °C	120 °C	120 °C	120 °C	120 °C
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal: Housing	FKM	FKM	FKM	FKM	FKM
Seal: Valve seat	FKM	FKM	FKM	FKM	FKM
Differential pressure in opening direction	1600 hPa	1600 hPa	1600 hPa	1600 hPa	1200 hPa
Differential pressure in closing direction	1600 hPa	1600 hPa	1600 hPa	1600 hPa	1200 hPa
Compressed air (overpressure) max.	7000 hPa	7000 hPa	7000 hPa	7000 hPa	7000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	160 cm <sup>3</sup>	220 cm <sup>3</sup>	500 cm <sup>3</sup>	9000 cm <sup>3</sup>	1500 cm <sup>3</sup>
Pressure max.	1600 hPa (abs.)	1600 hPa (abs.)	1600 hPa (abs.)	160 hPa (abs.)	1200 hPa (abs.)
Pressure min.	$1 \cdot 10^{-7}$ hPa	$1 \cdot 10^{-7}$ hPa	$1 \cdot 10^{-7}$ hPa	$1 \cdot 10^{-7}$ hPa	$1 \cdot 10^{-7}$ hPa
Feedthrough	Shaft feedthrough	Shaft feedthrough	Shaft feedthrough	Shaft feedthrough	Shaft feedthrough
Housing	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Weight	3 kg	4.5 kg	9 kg	18 kg	25 kg
Position feedback: Load capacity	250 V AC / 2 A ; 50 V DC / 1.2 A	250 V AC / 2 A ; 50 V DC / 1.2 A	250 V AC / 2 A ; 50 V DC / 1.2 A	250 V AC / 2 A ; 50 V DC / 1.2 A	250 V AC / 2 A ; 50 V DC / 1.2 A
Power consumption	24 V DC / 5.4 W	24 V DC / 5.4 W	24 V DC / 5.4 W	24 V DC / 5.4 W	24 V DC / 5.4 W
Conductance for molecular flow	550 l/s	2000 l/s	6000 l/s	12000 l/s	22000 l/s
Can be opened to a pressure difference of	30 hPa	30 hPa	30 hPa	30 hPa	30 hPa
Closing/opening time	1.5 s	2 s	2 s	3 s	5 s
Service life	200000 cycles	200000 cycles	100000 cycles	100000 cycles	100000 cycles
Valve plate	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel

	SVV 063 PA	SVV 100 PA	SVV 160 PA	SVV 200 PA	SVV 250 PA
Supply	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
<b>Order number</b>	<b>PF E18 201</b>	<b>PF E28 201</b>	<b>PF E38 201</b>	<b>PF E48 201</b>	<b>PF E58 201</b>
Supply	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz
<b>Order number</b>	<b>PF E18 101</b>	<b>PF E28 101</b>	<b>PF E38 101</b>	<b>PF E48 101</b>	<b>PF E58 101</b>
Supply	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
<b>Order number</b>	<b>PF E18 501</b>	<b>PF E28 501</b>	<b>PF E38 501</b>	<b>PF E48 501</b>	<b>PF E58 501</b>

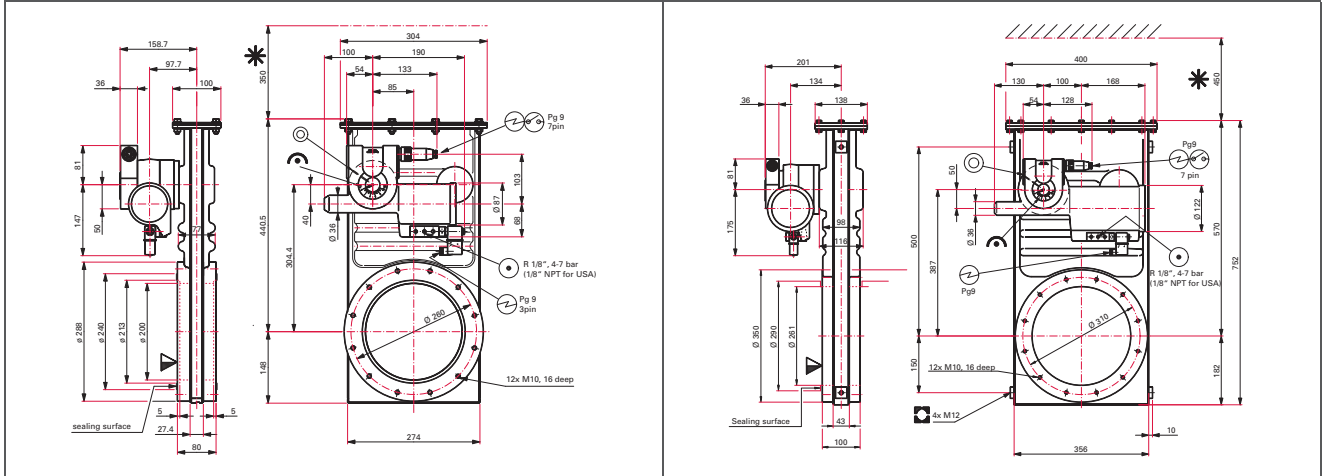
## HV gate valve, electropneumatic, with PI, with PV, ISO-F Stainless steel, DN 200 to 250 ISO-F



- High conductance due to free clearance
- With visual indication of open and closed positions
- Service life: 200000 operating cycles
- Stainless steel housing

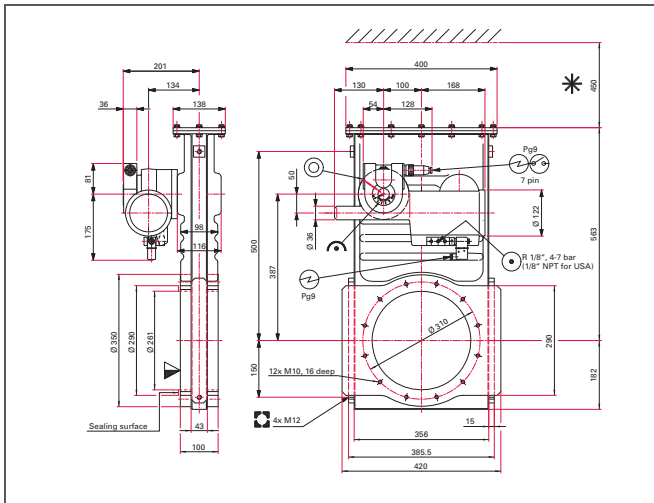
SVV = Gate valve  
 PA = Electropneumatically actuated  
 AC = Alternating current  
 DC = Direct current  
 PI = Position indicator  
 PV = Pilot valve

### Dimensions



SVV 201 PA

SVV 251 PA



SVV 252 PA

Technical data	SVV 201 PA	SVV 251 PA	SVV 252 PA
Flange (out)	DN 200 ISO-F	DN 250 ISO-F	DN 250 ISO-F
Flange (in)	DN 200 ISO-F	DN 250 ISO-F	DN 250 ISO-F
Actuator	Electropneumatic	Electropneumatic	Electropneumatic
Bakeout temperature: actuator	50 °C	50 °C	50 °C
Bakeout temperature: housing	150 °C	150 °C	150 °C
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal: Housing	FKM	FKM	FKM
Seal: Valve seat	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	1200 hPa	1200 hPa
Differential pressure in closing direction	2000 hPa	1200 hPa	1200 hPa
Compressed air (overpressure) max.	7000 hPa	7000 hPa	7000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa	4000 hPa
Compressed air volume	280 cm <sup>3</sup>	750 cm <sup>3</sup>	750 cm <sup>3</sup>
Pressure max.	2000 hPa (abs.)	1200 hPa (abs.)	1200 hPa (abs.)
Pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Feedthrough	Rotary feedthrough	Rotary feedthrough	Rotary feedthrough
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	30 kg	60 kg	60 kg
Position feedback: Load capacity	250 V AC / 5 A ; 50 V DA / 3 A	250 V AC / 5 A ; 50 V DA / 3 A	250 V AC / 5 A ; 50 V DA / 3 A
Power consumption	24 V DC / 2.5 W	24 V DC / 2.5 W	24 V DC / 2.5 W
Conductance for molecular flow	12000 l/s	22000 l/s	22000 l/s
Can be opened to a pressure difference of	30 hPa	30 hPa	30 hPa
Closing/opening time	2.5 s	4.5 s	4.5 s
Service life	200000 cycles	200000 cycles	200000 cycles
Valve plate	Stainless steel	Stainless steel	Stainless steel

	SVV 201 PA	SVV 251 PA	SVV 252 PA
Supply	24 V DC	24 V DC	24 V DC
<b>Order number</b>	<b>PF E48 240</b>	<b>PF E58 240</b>	<b>PF E58 250</b>
Supply	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz
<b>Order number</b>	<b>PF E48 140</b>	<b>PF E58 140</b>	<b>PF E58 150</b>
Supply	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
<b>Order number</b>	<b>PF E48 540</b>	<b>PF E58 540</b>	<b>PF E58 550</b>

## UHV gate valve, manual, DN 40 to 200 CF

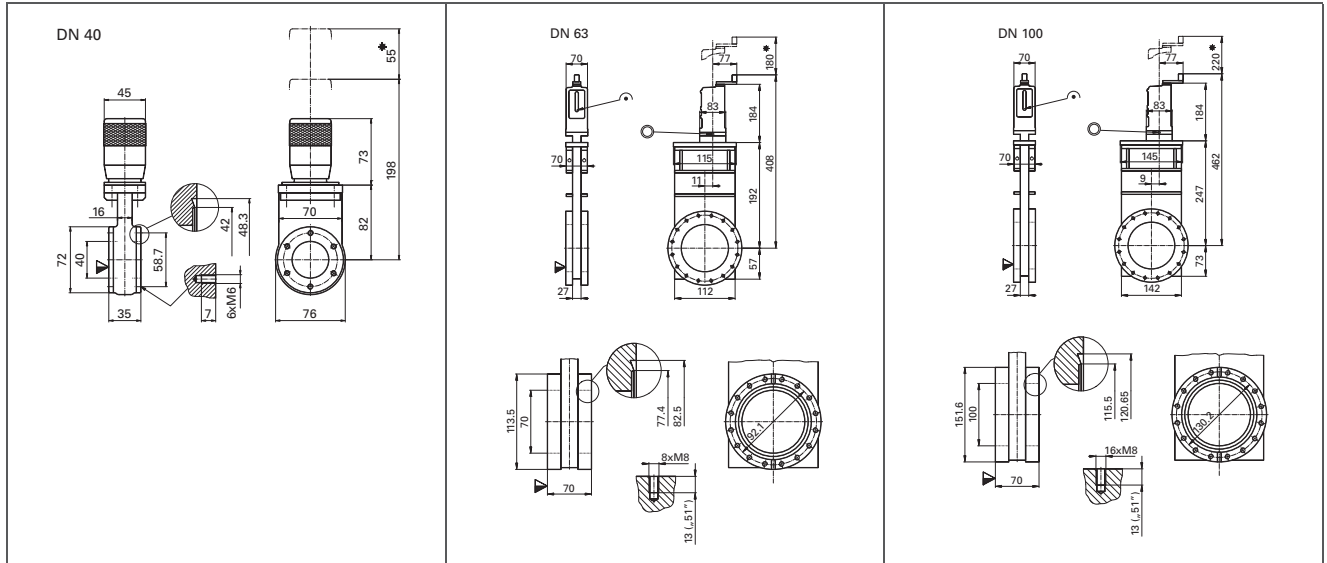


- Metal-sealed stainless steel housing
- Vulcanized, cavity-free valve disk seal
- Bellows-sealed
- Lubricant-free mechanics
- High conductance due to free clearance
- Service life: 50000 operating cycles

SVV = Gate valve

HF/HM = Manually actuated

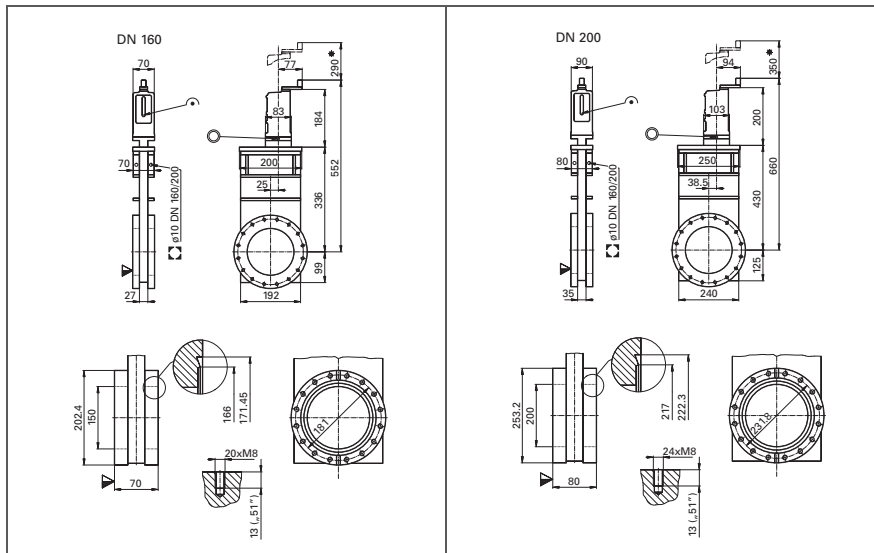
### Dimensions



SVV 040 HM

SVV 063 HF

SVV 100 HF



SVV 160 HF

SVV 200 HF

Technical data	SVV 040 HM	SVV 063 HF	SVV 100 HF
Flange (out)	DN 40 CF-F	DN 63 CF-F	DN 100 CF-F
Flange (in)	DN 40 CF-F	DN 63 CF-F	DN 100 CF-F
Actuator	Hand wheel	Hand wheel	Hand wheel
Bakeout temperature: Valve open, under vacuum	250 °C	250 °C	250 °C
Bakeout temperature: Valve closed	200 °C	200 °C	200 °C
Tightness: Housing	$5 \cdot 10^{-11}$ Pa m <sup>3</sup> /s	$5 \cdot 10^{-11}$ Pa m <sup>3</sup> /s	$5 \cdot 10^{-11}$ Pa m <sup>3</sup> /s
Tightness: Valve seat	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal: Housing	Metal	Metal	Metal
Seal: Valve seat	FKM	FKM	FKM
Differential pressure in opening direction	2000 hPa	1600 hPa	1600 hPa
Differential pressure in closing direction	2000 hPa	1600 hPa	1600 hPa
Pressure max.	2000 hPa (abs.)	1600 hPa (abs.)	1600 hPa (abs.)
Pressure min.	$1 \cdot 10^{-10}$ hPa	$1 \cdot 10^{-10}$ hPa	$1 \cdot 10^{-10}$ hPa
Feedthrough	Bellows	Bellows	Bellows
Housing	Stainless steel	Stainless steel	Stainless steel
Weight	1.8 kg	9 kg	12 kg
Conductance for molecular flow	220 l/s	600 l/s	1700 l/s
Can be opened to a pressure difference of	30 hPa	30 hPa	30 hPa
Service life	50000 cycles	50000 cycles	50000 cycles
Valve plate	Stainless steel	Stainless steel	Stainless steel

Order number			
UHV gate valves	PF F51 031	PF F61 031	PF F71 031

Technical data	SVV 160 HF	SVV 200 HF
Flange (out)	DN 160 CF-F	DN 200 CF-F
Flange (in)	DN 160 CF-F	DN 200 CF-F
Actuator	Hand wheel	Hand wheel
Bakeout temperature: Valve open, under vacuum	250 °C	250 °C
Bakeout temperature: Valve closed	200 °C	200 °C
Tightness: Housing	$5 \cdot 10^{-11}$ Pa m <sup>3</sup> /s	$5 \cdot 10^{-11}$ Pa m <sup>3</sup> /s
Tightness: Valve seat	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal: Housing	Metal	Metal
Seal: Valve seat	FKM	FKM
Differential pressure in opening direction	1600 hPa	1600 hPa
Differential pressure in closing direction	1600 hPa	1600 hPa
Pressure max.	1600 hPa (abs.)	1600 hPa (abs.)
Pressure min.	$1 \cdot 10^{-10}$ hPa	$1 \cdot 10^{-10}$ hPa
Feedthrough	Bellows	Bellows
Housing	Stainless steel	Stainless steel
Weight	18 kg	24 kg
Conductance for molecular flow	6000 l/s	12000 l/s
Can be opened to a pressure difference of	30 hPa	30 hPa
Service life	50000 cycles	50000 cycles
Valve plate	Stainless steel	Stainless steel

Order number		
UHV gate valves	PF F81 031	PF F91 031

## UHV gate valve, electropneumatic, with PI, with PV, DN 40 to 250 CF



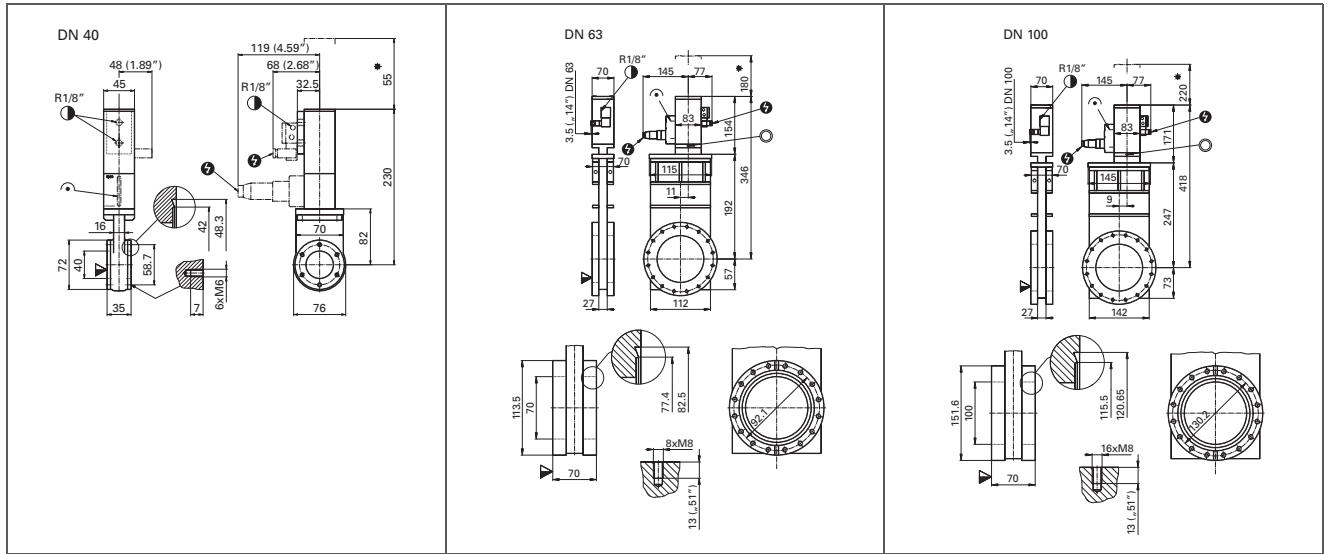
- Metal-sealed stainless steel housing
- Vulcanized, cavity-free valve disk seal (up to DN 200 CF)
- Bellows-sealed
- Lubricant-free mechanics
- Service life: 50000 operating cycles

SVV = Gate valve

PM/PF = Electropneumatically actuated

DC = Direct current

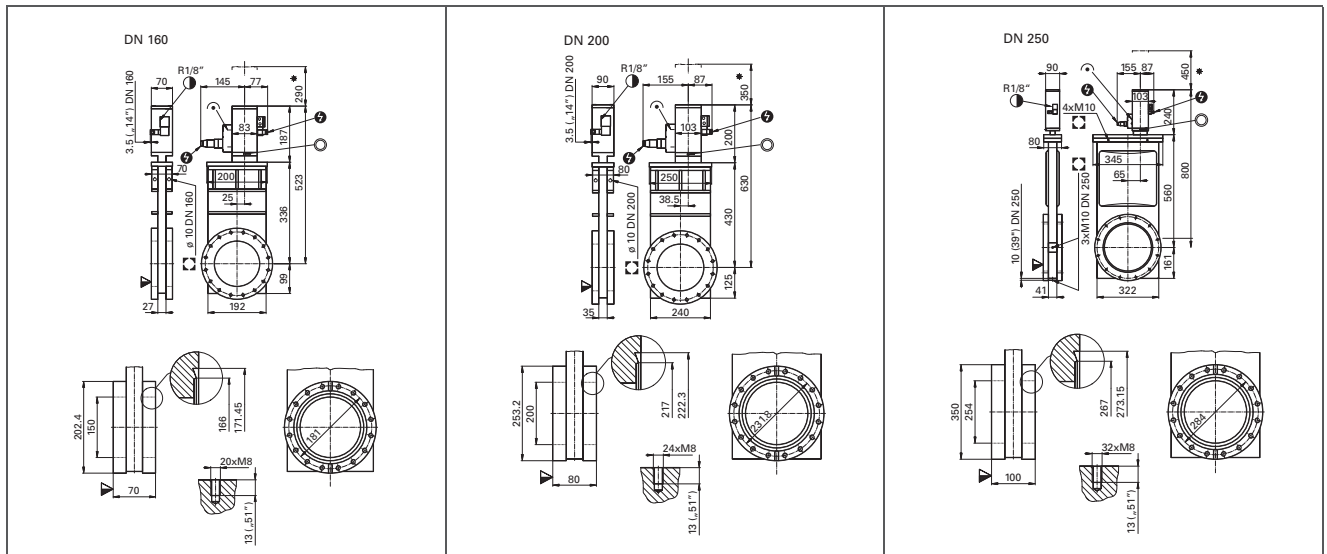
### Dimensions



SVV 040 PM

SVV 063 PF

SVV 100 PF



SVV 160 PF

SVV 200 PF

SVV 250 PF



General technical data	
Actuator	Electropneumatic
Bakeout temperature: actuator	200 °C (position indicator 80 °C, pilot valve 50 °C)
Bakeout temperature: Valve open, under vacuum	250 °C
Bakeout temperature: Valve closed	200 °C
Tightness: Housing	$5 \cdot 10^{-11}$ Pa m <sup>3</sup> /s
Tightness: Valve seat	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal: Housing	Metal
Seal: Valve seat	FKM
Compressed air (overpressure) max.	7000 hPa
Pressure min.	$1 \cdot 10^{-10}$ hPa
Feedthrough	Bellows
Housing	Stainless steel
Power consumption	24 V DC / 5.4 W
Can be opened to a pressure difference of	30 hPa
Service life	50000 cycles
Valve plate	Stainless steel

Technical data	SVV 040 PM	SVV 063 PF	SVV 100 PF
Flange (out)	DN 40 CF-F	DN 63 CF-F	DN 100 CF-F
Flange (in)	DN 40 CF-F	DN 63 CF-F	DN 100 CF-F
Compressed air (overpressure) min.	5000 hPa	4000 hPa	4000 hPa
Compressed air volume	60 cm <sup>3</sup>	80 cm <sup>3</sup>	110 cm <sup>3</sup>
Pressure max.	2000 hPa	1600 hPa	1600 hPa
Weight	1.8 kg	9 kg	12 kg
Position feedback: Load capacity	250 V AC / 5 A ; 50 V DC / 3 A	250 V AC / 2 A ; 50 V DC / 1.2 A	250 V AC / 2 A ; 50 V DC / 1.2 A
Conductance for molecular flow	220 l/s	600 l/s	1700 l/s
Closing/opening time	0.7 s	1 s	1.2 s

	SVV 040 PM	SVV 063 PF	SVV 100 PF
Supply	24 V DC	24 V DC	24 V DC
<b>Order number</b>	<b>PF F58 231</b>	<b>PF F68 231</b>	<b>PF F78 231</b>
Supply	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz
<b>Order number</b>	<b>PF F58 131</b>	<b>PF F68 131</b>	<b>PF F78 131</b>
Supply	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
<b>Order number</b>	<b>PF F58 531</b>	<b>PF F68 531</b>	<b>PF F78 531</b>

Technical data	SVV 160 PF	SVV 200 PF	SVV 250 PF
Flange (out)	DN 160 CF-F	DN 200 CF-F	DN 250 CF-F
Flange (in)	DN 160 CF-F	DN 200 CF-F	DN 250 CF-F
Compressed air (overpressure) min.	4000 hPa	4000 hPa	5000 hPa
Compressed air volume	140 cm <sup>3</sup>	250 cm <sup>3</sup>	350 cm <sup>3</sup>
Pressure max.	1600 hPa	1600 hPa	1200 hPa
Weight	18 kg	24 kg	42 kg
Position feedback: Load capacity	250 V AC / 2 A ; 50 V DC / 1.2 A	250 V AC / 2 A ; 50 V DC / 1.2 A	250 V AC / 2 A ; 50 V DC / 1.2 A
Conductance for molecular flow	6000 l/s	12000 l/s	26000 l/s
Closing/opening time	1.5 s	2 s	4 s

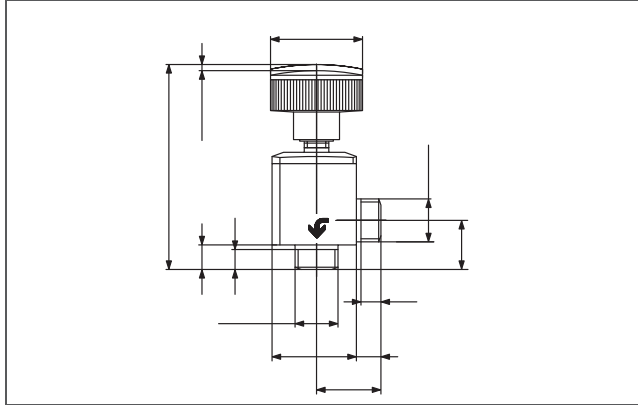
	SVV 160 PF	SVV 200 PF	SVV 250 PF
Supply	24 V DC	24 V DC	24 V DC
<b>Order number</b>	<b>PF F88 231</b>	<b>PF F98 231</b>	<b>PF F98 241</b>
Supply	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz
<b>Order number</b>	<b>PF F88 131</b>	<b>PF F98 131</b>	<b>PF F98 141</b>
Supply	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
<b>Order number</b>	<b>PF F88 531</b>	<b>PF F98 531</b>	<b>PF F98 541</b>

## Mini angle valves, manual, DN 5



- Two connections required as accessories
- Bellows-sealed
- Service life: 1.5 million operating cycles

### Dimensions

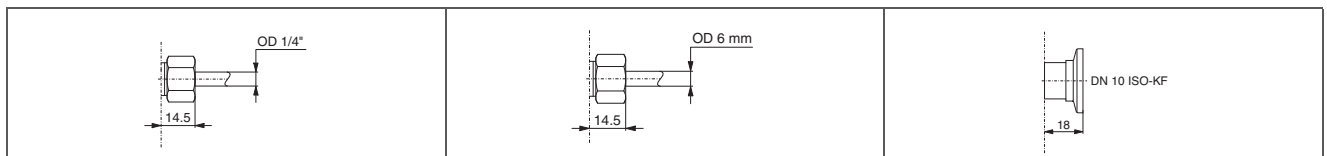


Technical data	EVI 005 S
Flange (out)	DN 5 mm M14x1
Flange (in)	DN 5 mm M14x1
Bakeout temperature: actuator	70 °C
Bakeout temperature: housing	150 °C
Operating pressure max.	4000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM
Differential pressure in opening direction	4000 hPa
Differential pressure in closing direction	4000 hPa
Feedthrough	Bellows, stainless steel
Housing	Stainless steel
Weight	150 g
Conductance for laminar flow	4 l/s
Conductance for molecular flow	0.4 l/s
Can be opened to a pressure difference of	4000 hPa
Service life	1500000 cycles
Ambient temperature	5-70 °C
Valve plate	Stainless steel

Order number	
Mini angle valves	<b>PF H12 031</b>

Accessories	
Connection, for 1/4" tube O.D.	<b>PT 420 913-T</b>
Connection, for 6 mm tube O.D.	<b>PT 420 914-T</b>
Connection, DN 10 ISO-KF	<b>PT 420 912-T</b>

### Dimensions



Connection, for 1/4" tube O.D.

Connection, for 6 mm tube O.D.

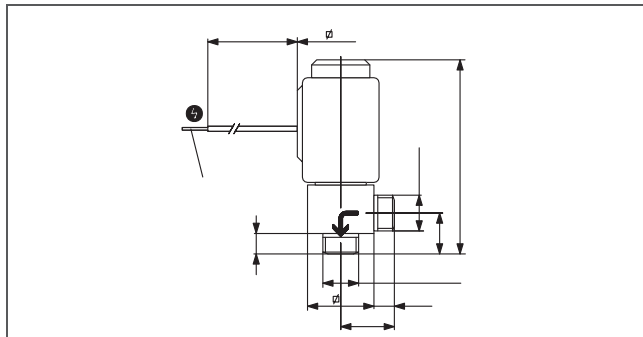
Connection, DN 10 ISO-KF

## Mini angle valves, solenoid actuated, without position indicator (PI), DN 5

- Two connections required as accessories
- Normally closed (n.c.)
- Service life: 2 million operating cycles



### Dimensions

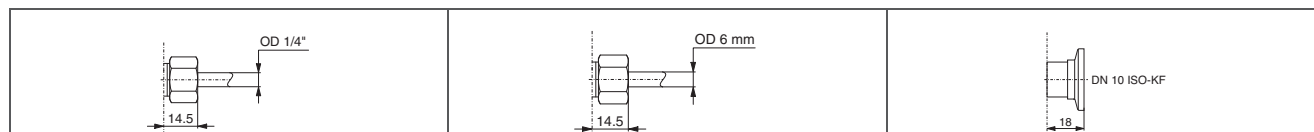


Technical data	EVI 005 M
Flange (out)	DN 5 mm M14x1
Flange (in)	DN 5 mm M14x1
Actuator	Solenoid actuated
Version	Normally closed (n.c.)
Bakeout temperature: actuator	120 °C
Bakeout temperature: housing	150 °C
Operating pressure max.	1500 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM
Differential pressure in opening direction	1500 hPa
Differential pressure in closing direction	5000 hPa
Housing	Stainless steel
Weight	300 g
Conductance for laminar flow	3 l/s
Conductance for molecular flow	0.3 l/s
Can be opened to a pressure difference of	1000 hPa
Switching frequency	300 min <sup>-1</sup>
Closing/opening time	7/30 ms
Protection acc. to DIN 40050	IP 65
Service life	2000000 cycles
Ambient temperature	5-40 °C
Supply	24 V DC
Supply: Power consumption max.	10 W

Order number	
Mini angle valves	<b>PF H13 231</b>

Accessories	
Connection, for 1/4" tube O.D.	<b>PT 420 913-T</b>
Connection, for 6 mm tube O.D.	<b>PT 420 914-T</b>
Connection, DN 10 ISO-KF	<b>PT 420 912-T</b>

### Dimensions



Connection, for 1/4" tube O.D.

Connection, for 6 mm tube O.D.

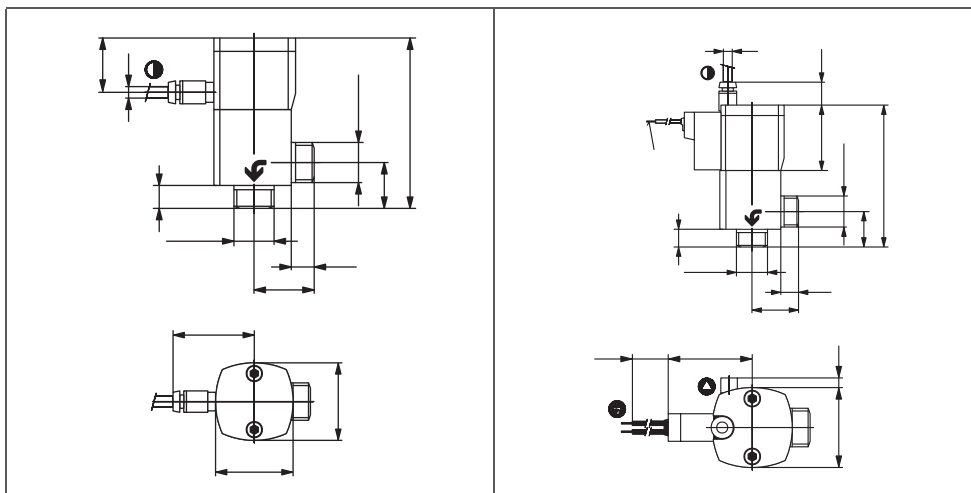
Connection, DN 10 ISO-KF

## Mini angle valves, pneumatic and electropneumatic, without position indicator (PI), DN 5



- Bellows-sealed
  - Normally closed (n.c.)
  - Two connections required as accessories
  - Service life: 1.5 million operating cycles
  - Variants:
    - EVI 005 P = pneumatic (without pilot valve);
    - EVI 105 P = electropneumatic (with pilot valve)
- EVI = Mini angle valve with bellows feedthrough

### Dimensions



EVI 005 P, Mini angle valve,  
without control valve

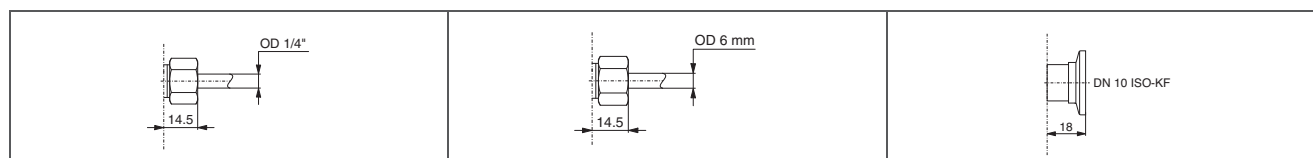
EVI 105 P, Mini angle valve,  
with control valve

Technical data	EVI 005 P	EVI 105 P
Flange (out)	DN 5 mm M14x1	DN 5 mm M14x1
Flange (in)	DN 5 mm M14x1	DN 5 mm M14x1
Bakeout temperature: actuator	80 °C	80 °C
Bakeout temperature: housing	150 °C	150 °C
Operating pressure max.	4000 hPa (abs.)	4000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM
Differential pressure in opening direction	3000 hPa	3000 hPa
Differential pressure in closing direction	3000 hPa	3000 hPa
Compressed air (overpressure) max.	8000 hPa	8000 hPa
Compressed air (overpressure) min.	4000 hPa	4000 hPa
Feedthrough	Bellows, stainless steel	Bellows, stainless steel
Housing	Stainless steel	Stainless steel
Weight	200 g	200 g
Conductance for laminar flow	4 l/s	4 l/s
Conductance for molecular flow	0.4 l/s	0.4 l/s
Can be opened to a pressure difference of	3000 hPa	3000 hPa
Switching frequency	150 min <sup>-1</sup>	150 min <sup>-1</sup>
Closing/opening time	35/35 ms	35/35 ms
Protection acc. to DIN 40050	IP 65	IP 65
Service life	1500000 cycles	1500000 cycles
Control valve		Included
Ambient temperature	5-80 °C	5-40 °C
Supply		24 V DC
Supply: Power consumption max.		1 W

Order number		
Mini angle valves	PF H15 031	PF H17 231

Accessories		
Connection, for 1/4" tube O.D.	PT 420 913-T	PT 420 913-T
Connection, for 6 mm tube O.D.	PT 420 914-T	PT 420 914-T
Connection, DN 10 ISO-KF	PT 420 912-T	PT 420 912-T

## Dimensions



Connection, for 1/4" tube O.D.

Connection, for 6 mm tube O.D.

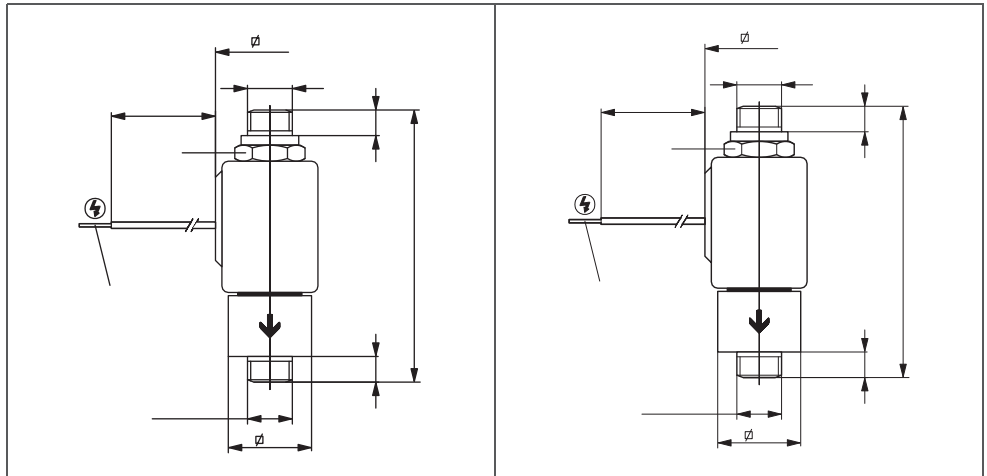
Connection, DN 10 ISO-KF

## Mini-Inline-Valve, solenoid actuated, without position indicator (PI), n.c. and n.o., DN 5



- Two connections required as accessories
  - Service life: 2 million operating cycles
  - Variants:  
DVI 005 M = normally closed (n.c.);  
DVI 205 M = normally open (n.o.)
- DVI = Mini inline valve with bellows feedthrough  
M = Solenoid actuated

### Dimensions



DVI 005 M, Mini-Inline-Valve,  
solenoid actuated,  
normally closed

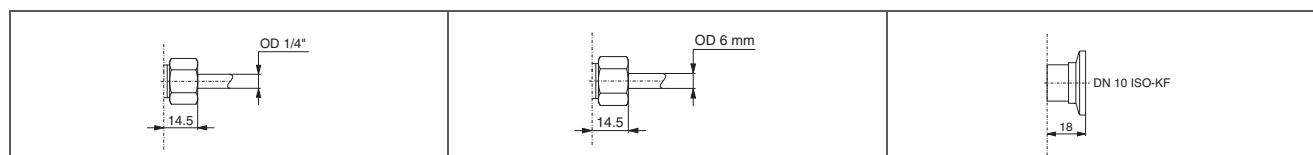
DVI 205 M, Mini-Inline-Valve,  
solenoid actuated,  
normally open

Technical data	DVI 005 M	DVI 205 M
Flange (out)	DN 5 mm M14x1	DN 5 mm M14x1
Flange (in)	DN 5 mm M14x1	DN 5 mm M14x1
Actuator	Solenoid actuated	Solenoid actuated
Version	Normally closed	Normally open
Bakeout temperature: actuator	120 °C	120 °C
Bakeout temperature: housing	150 °C	150 °C
Operating pressure max.	1000 hPa (abs.)	2000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM
Differential pressure in opening direction	1500 hPa	2000 hPa
Differential pressure in closing direction	5000 hPa	4000 hPa
Housing	Stainless steel	Stainless steel
Weight	300 g	300 g
Conductance for laminar flow	2 l/s	2 l/s
Conductance for molecular flow	0.2 l/s	0.2 l/s
Can be opened to a pressure difference of	1000 hPa	4000 hPa
Switching frequency	300 min <sup>-1</sup>	300 min <sup>-1</sup>
Closing/opening time	7/30 ms	30/10 ms
Protection acc. to DIN 40050	IP 65	IP 65
Service life	2000000 cycles	2000000 cycles
Ambient temperature	5-40 °C	5-40 °C
Supply	24 V DC	24 V DC
Supply: Power consumption max.	10 W	10 W

Order number		
Mini inline valves	<b>PF H13 232</b>	<b>PF H13 233</b>

Accessories		
Connection, for 1/4" tube O.D.	<b>PT 420 913-T</b>	<b>PT 420 913-T</b>
Connection, for 6 mm tube O.D.	<b>PT 420 914-T</b>	<b>PT 420 914-T</b>
Connection, DN 10 ISO-KF	<b>PT 420 912-T</b>	<b>PT 420 912-T</b>

### Dimensions



Connection, for 1/4" tube O.D.

Connection, for 6 mm tube O.D.

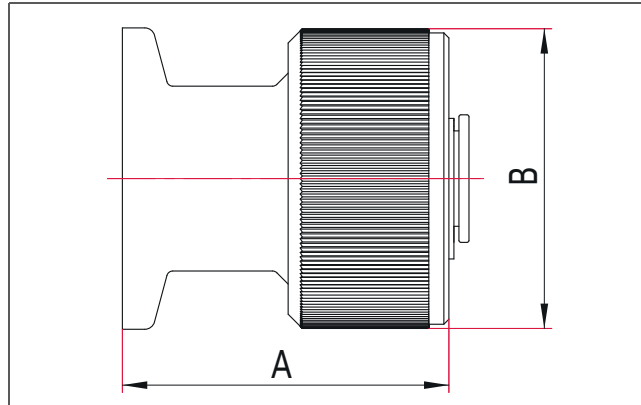
Connection, DN 10 ISO-KF

## Venting valve, manual, DN 10 ISO-KF

- Manually operated screw cap for venting with ambient air



### Dimensions



	Venting valve, manually actuated, stainless steel	Venting valve, manually actuated, brass, nickel-plated
A	40 mm	40 mm
B	30 mm	30 mm

Technical data	Venting valve, manually actuated, stainless steel	Venting valve, manually actuated, brass, nickel-plated
Flange (in)	DN 10 ISO-KF	DN 10 ISO-KF
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM (valve seal)	FKM (valve seal)
Pressure range	$1 \cdot 10^{-8}$ hPa to 3000 hPa (abs.)	$1 \cdot 10^{-8}$ hPa to 3000 hPa (abs.)
Materials	Stainless steel	Brass, nickel-plated
Temperature range	-30 to 130 °C	-30 to 130 °C

Flanges according to ISO 2861

Order number		
Venting valves	120VBE010	140VBE010

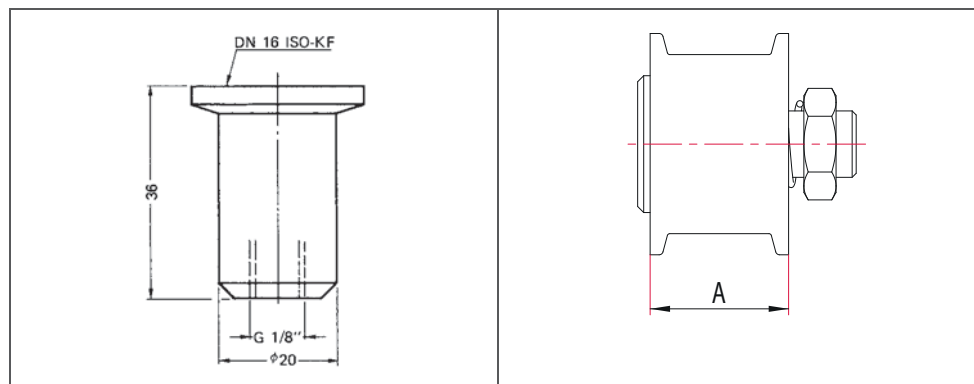
Accessories		
Reducer Centering Ring, Stainless Steel 304/ 1.4301, DN 10/16 ISO-KF	122ZRR016	122ZRR016



## Pressure relief valves, DN 16 and 40 ISO-KF

- Housing material: Stainless steel
- Response pressure: 1200 to 1500 hPa (abs.)
- 120VUS016 and 120VUS040 with modifiable differential pressure to app. +/- 100 hPa

### Dimensions



Pressure relief valve, DN 16 ISO-KF

Pressure relief valve, DN 16 ISO-KF

Technical data	AVA 016 X	Pressure Relief Valve, DN 16 ISO-KF	Pressure Relief Valve, DN 40 KF
Flange (out)	G 1/8"	DN 16 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 40 ISO-KF
Tightness	$1 \cdot 10^{-9}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-9}$ Pa m <sup>3</sup> /s	$1 \cdot 10^{-9}$ Pa m <sup>3</sup> /s
Seal	FKM	FKM	FKM
Differential pressure	not modifiable	modifiable to app. +/- 100 hPa	modifiable to app. +/- 100 hPa
Pressure range	$1 \cdot 10^{-8}$ hPa to 1200 hPa (abs.)	$1 \cdot 10^{-7}$ hPa to 500 hPa over pressure	$1 \cdot 10^{-7}$ hPa to 500 hPa over pressure
Flow rate max.	6 l/min		
Housing	Stainless steel	Stainless steel	Stainless steel
Can be opened to a pressure difference of	200 to 500 hPa	app. 400 hPa	app. 200 hPa
Temperature range	0 to 50 °C	5 to 60 °C	5 to 60 °C

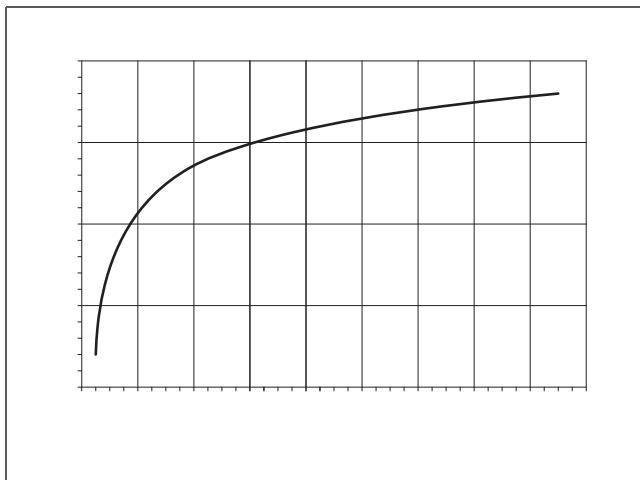
Order number			
Pressure relief valves	PF 130 032	120VUS016	120VUS040

## Coarse gas dosing valve, manual, DN 10 ISO-KF

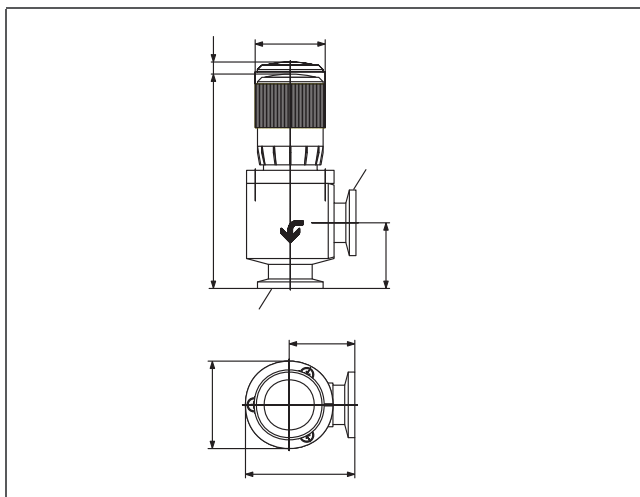
- For slow, manual venting
- Service life: 200000 operating cycles



### Characteristic



### Dimensions



Technical data	EVD 010 H
Flange (in)	DN 10 ISO-KF
Flange (out)	DN 10 ISO-KF
Bakeout temperature	100 °C
Operating pressure max.	3000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-7}$ hPa
Tightness	$1 \cdot 10^{-9}$ Pa m <sup>3</sup> /s
Seal	FKM
Gas flow max. controllable	$1.7 \cdot 10^3$ hPa l/s
Gas flow min. controllable	40 hPa l/s
Housing	Aluminum
Weight	0.2 kg
Can be opened to a pressure difference of	3000 hPa

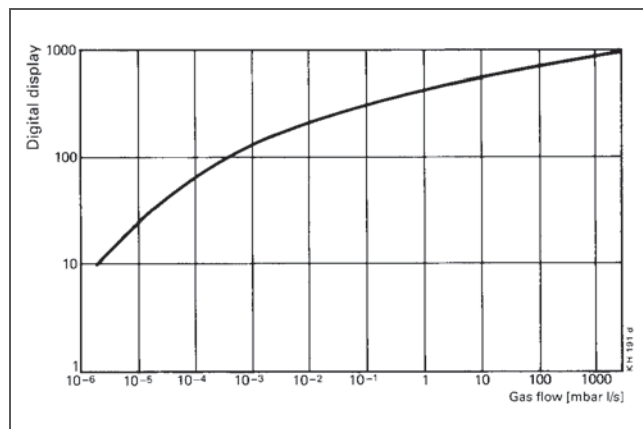
Order number	
Gas dosing valves	PF I22 001

## Gas dosing valve with separate shut-off valve, manual, DN 16 ISO-KF

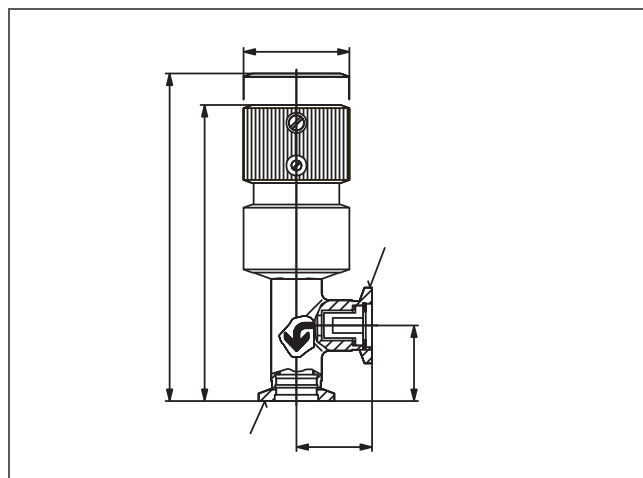


- Closable without changing the gas flow setting
- Optimum characteristic
- Digital position display
- Excellent reproducibility
- Extremely small dead volume
- Very broad regulating range

### Characteristic



### Dimensions



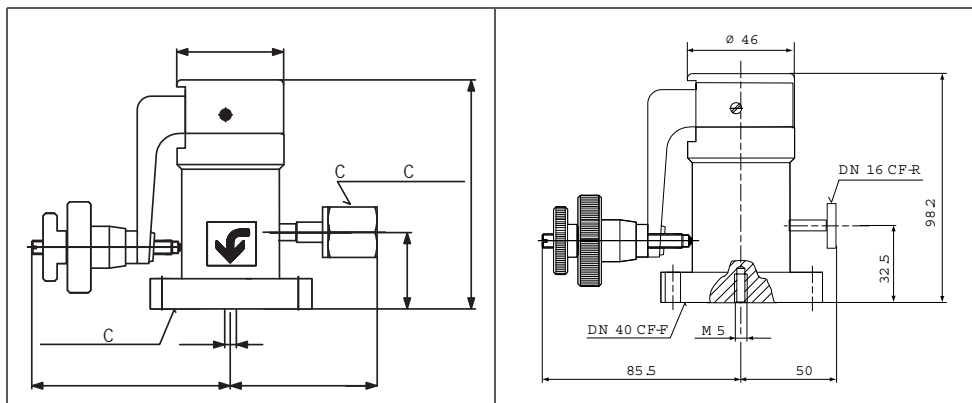
Technical data	EVN 116
Flange (out)	DN 16 ISO-KF
Flange (in)	DN 16 ISO-KF
Bakeout temperature: flanges	150 °C
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM
Differential pressure	2500 hPa
Dosing sleeve	Fluorplastomer
Gas flow max. controllable	1000 hPa l/s
Gas flow min. controllable	$5 \cdot 10^{-6}$ hPa l/s
Housing/needle/filter	Stainless steel
Weight	0.4 kg
Temperature: Operating	80 °C
Dead volume	0.032 cm <sup>3</sup>

Order number	
Gas dosing valves	PF I32 031

## All-metal gas dosing valve, manual, DN 40 CF

- Minimum dead volume
- Operating temperature up to 200 °C
- For mass spectrometer applications
- Specific routing of gas stream when a capillary (accessory) is used

### Dimensions



UDV 040, All-metal gas dosing valve

UDV 046, All-metal gas dosing valve

Technical data	UDV 040	UDV 046
Flange (out)	DN 40 CF-F	DN 40 CF-F
Flange (in)	VCR 1/4"	DN 16 CF-R
Actuator	Manual	Manual
Operating pressure	1 · 10 <sup>-10</sup> hPa to 1500 hPa (abs.)	1 · 10 <sup>-10</sup> hPa to 1500 hPa (abs.)
Tightness	1 · 10 <sup>-12</sup> Pa m <sup>3</sup> /s	1 · 10 <sup>-12</sup> Pa m <sup>3</sup> /s
Inlet pressure max.	1 · 10 <sup>-10</sup> hPa to 3 MP	1 · 10 <sup>-10</sup> hPa to 3 MP
Gas flow max. at inlet pressure of 1000 hPa	600 hPa	600 hPa
Flow rate min. for: air	1 · 10 <sup>-9</sup> hPa l/s	1 · 10 <sup>-9</sup> hPa l/s
Flow rate min. for: pure gases	1 · 10 <sup>-10</sup> hPa l/s	1 · 10 <sup>-10</sup> hPa l/s
Housing	Stainless steel	Stainless steel
Weight	1.4 kg	1.4 kg
Temperature: Bakeout	350 °C	350 °C
Temperature: Operating	200 °C	200 °C
Valve seat	Copper	Copper
Valve plate	Sapphire	Sapphire

Order number		
Gas dosing valves	PF I52 031	PF I52 035

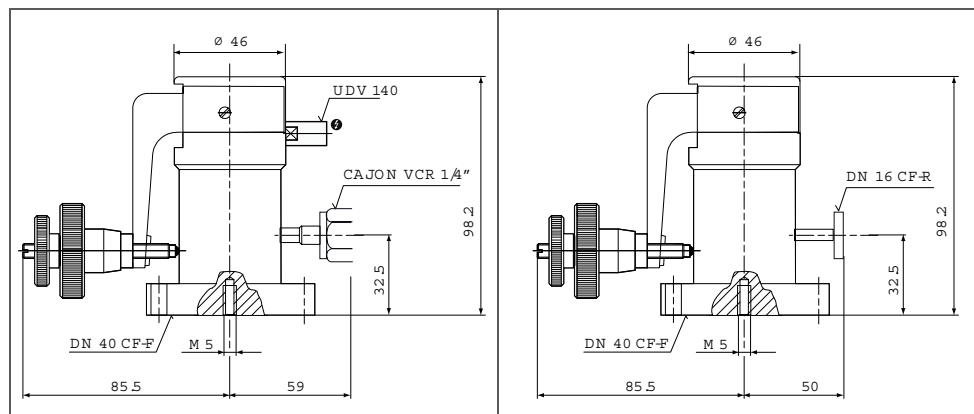
Accessories		
Complete capillary, vacuum side, length 1 m	PT 418 976 -T	PT 418 976 -T
Complete capillary, inlet side, length 2 m	PT 420 537 -T	PT 420 537 -T
Heater, 200 °C	PT 420 376-T	PT 420 376-T

## All-metal gas regulating valve, manual/thermomechanic, DN 40 CF



- Minimum dead volume
- Operating temperature up to 200 °C
- For mass spectrometer applications
- Specific routing of gas stream when a capillary (accessory) is used

### Dimensions



UDV 140, All-metal gas regulating valve

UDV 146, All-metal gas regulating valve

Technical data	UDV 140	UDV 146
Flange (out)	DN 40 CF-F	DN 40 CF-F
Flange (in)	VCR 1/4"	DN 16 CF-R
Actuator	Manual/ thermomechanic	Manual/ thermomechanic
Operating pressure	1 · 10 <sup>-10</sup> hPa to 1500 hPa (abs.)	1 · 10 <sup>-10</sup> hPa to 1500 hPa (abs.)
Tightness	1 · 10 <sup>-12</sup> Pa m <sup>3</sup> /s	1 · 10 <sup>-12</sup> Pa m <sup>3</sup> /s
Inlet pressure max.	1 · 10 <sup>-10</sup> hPa to 3 MP	1 · 10 <sup>-10</sup> hPa to 3 MP
Gas flow max. at inlet pressure of 1000 hPa	600 hPa	600 hPa
Flow rate min. for: air	1 · 10 <sup>-9</sup> hPa l/s	1 · 10 <sup>-9</sup> hPa l/s
Flow rate min. for: pure gases	1 · 10 <sup>-10</sup> hPa l/s	1 · 10 <sup>-10</sup> hPa l/s
Housing	Stainless steel	Stainless steel
Weight	1.4 kg	1.4 kg
Temperature: Bakeout	(Cable removed) 350 °C	(Cable removed) 350 °C
Temperature: Operating	200 °C	200 °C
Valve seat	Copper	Copper
Valve plate	Sapphire	Sapphire

Order number		
Gas regulating valves	PF I52 032	PF I52 034

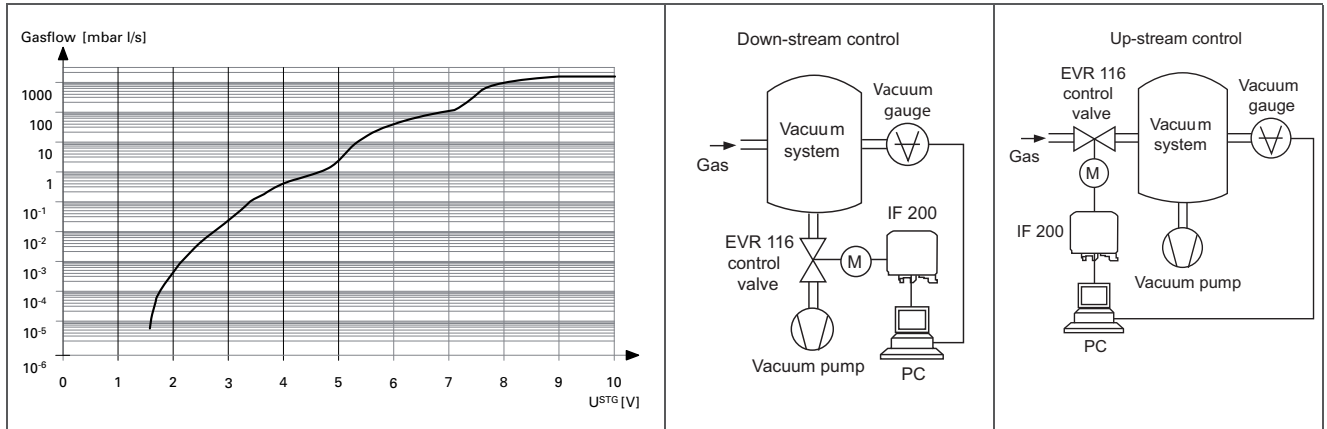
Accessories		
Complete capillary, vacuum side, length 1 m	PT 418 976 -T	PT 418 976 -T
Complete capillary, inlet side, length 2 m	PT 420 537 -T	PT 420 537 -T
Heater, 200 °C	PT 420 376-T	PT 420 376-T
RVG 050 C, Control unit all-metal gas regulating valves, 115/230 V	PF I00 795	PF I00 795

## Gas regulating valve EVR 116, motorized, DN 16 ISO-KF



- High gas throughput
- Very broad regulating range
- With integrated motor control electronics

### Characteristic

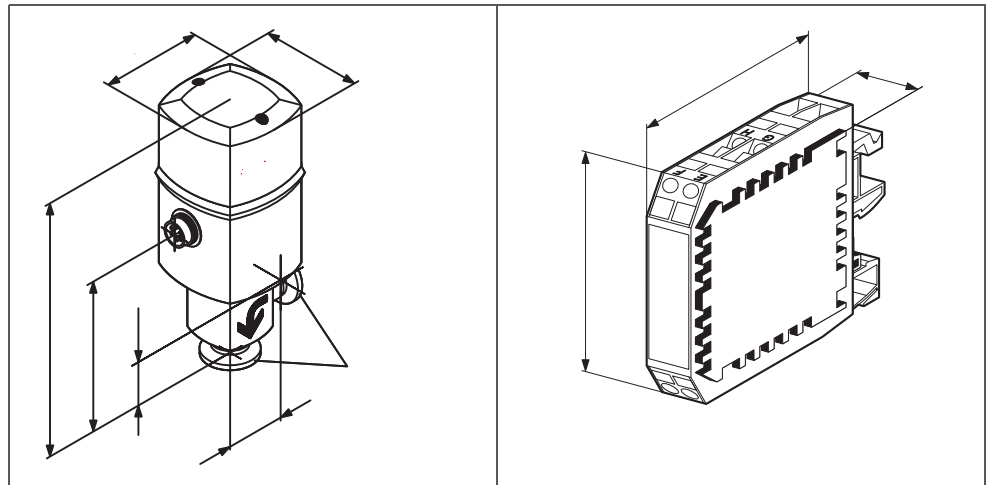


EVR 116, Gas regulating valve

IF 200, Interface for EVR 116

IF 200, Interface for EVR 116

### Dimensions



EVR 116, Gas regulating valve

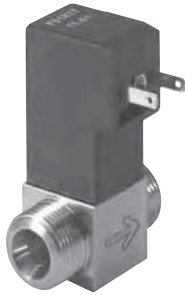
IF 200, Interface for EVR 116

Technical data	EVR 116	IF 200, Interface for EVR 116
Connection		Terminals
Flange (out)	DN 16 ISO-KF	
Flange (in)	DN 16 ISO-KF	
Control	RVC 300 or IF 200	
Control	60 °C	
Bakeout temperature: actuator	80 °C	
Bakeout temperature: housing		Mounting rail
Fixation	2500 hPa (abs.)	
Operating pressure max.	$1 \cdot 10^{-8}$ hPa	
Operating pressure min.	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s	
Tightness	FKM	
Seal	Fluorplastomer	
Dosing sleeve	1250 hPa l/s	
Gas flow max. controllable	$5 \cdot 10^{-6}$ hPa l/s	
Gas flow min. controllable	Stainless steel	
Housing/needle/filter	0.75 kg	40 g
Weight	0-10 V DC	
Control voltage	< 3 / 4 s	
Closing/opening time		RS-232-C
Interface	5-40 °C	
Ambient temperature		0.5 A
Supply	24 V DC	24 V DC
Supply: Voltage	12 W	

Order number		
Gas regulating valves	PF I39 931	PF I00 091

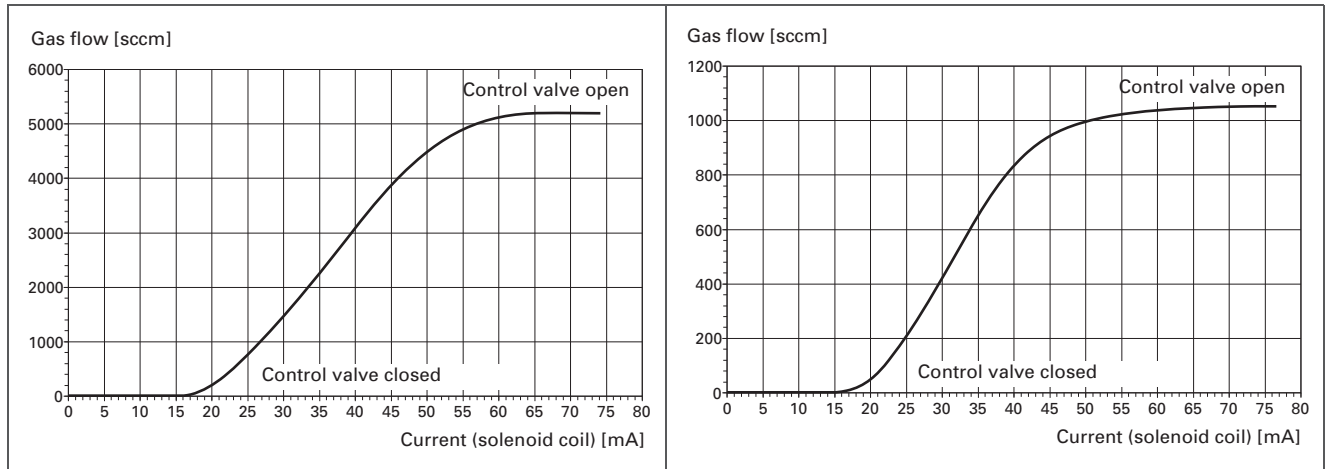
Accessories		
RVC-EVR, connection cable, 3 m	PT 583 115-T	PT 583 115-T
RVC-EVR, connection cable, 5 m	PT 583 116-T	PT 583 116-T
RVC-EVR, connection cable, 10 m	PT 583 117-T	PT 583 117-T
RVC-EVR, connection cable, 15 m	PT 583 118-T	PT 583 118-T
RVC-EVR, connection cable, 20 m	PT 583 119-T	PT 583 119-T

## Gas regulating valves, solenoid actuated, RME 005 A, DN 5



- Two connections required as accessories
- Including connector
- Drive: Solenoid
- Regulating range from 0.85 to 85 hPa l/s
- Normally closed (n.c.)

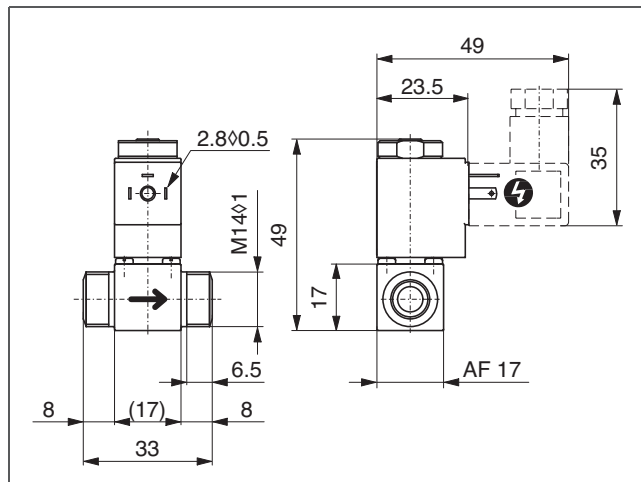
### Characteristic



RME 005 A, Gas regulating valve

RME 005 A, Gas regulating valve

### Dimensions





Technical data	RME 005 A
Flange (in)	DN 5 mm M14x1
Flange (out)	DN 5 mm M14x1
Response time	< 30 ms
Control	RVC 300
Bakeout temperature: actuator, powerless	80 °C
Operating pressure max.	2000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m <sup>3</sup> /s
Seal	FKM
Mounting orientation	Any, preferably perpendicular
Duty cycle (ED)	100 %
Housing	Stainless steel
Weight	96 g
Control voltage	0-24 V DC
Ambient temperature	5-50 °C
Supply: Power consumption max.	2.5 W

	RME 005 A
Gas flow max. controllable	85 hPa l/s
Gas flow min. controllable	0.85 hPa l/s
<b>Order number</b>	<b>PF I13 931</b>
Gas flow max. controllable	17 hPa l/s
Gas flow min. controllable	0.17 hPa l/s
<b>Order number</b>	<b>PF I13 932</b>
Gas flow max. controllable	8.5 hPa l/s
Gas flow min. controllable	0.085 hPa l/s
<b>Order number</b>	<b>PF I13 933</b>
Gas flow max. controllable	1.7 hPa l/s
Gas flow min. controllable	0.017 hPa l/s
<b>Order number</b>	<b>PF I13 934</b>
Gas flow max. controllable	0.8 hPa l/s
Gas flow min. controllable	0.008 hPa l/s
<b>Order number</b>	<b>PF I13 935</b>
Gas flow max. controllable	0.17 hPa l/s
Gas flow min. controllable	0.0017 hPa l/s
<b>Order number</b>	<b>PF I13 936</b>

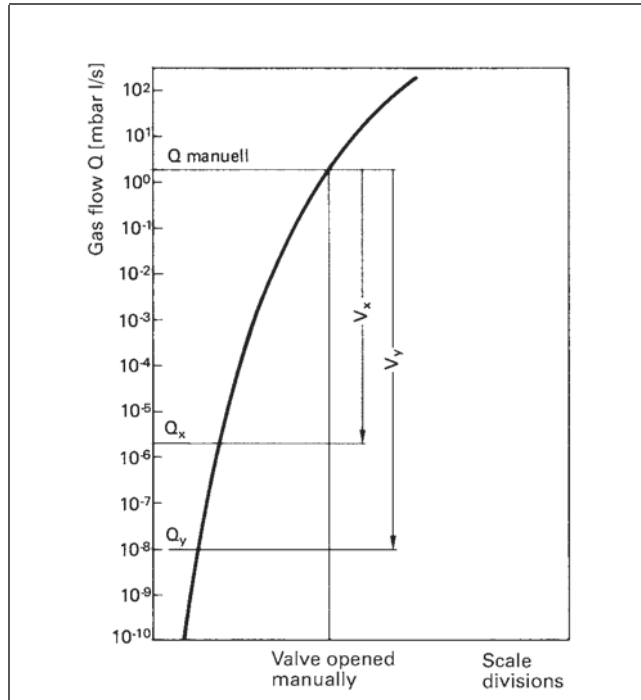
Accessories	
Connection, for 1/4" tube O.D.	PT 420 913-T
Connection, for 6 mm tube O.D.	PT 420 914-T
Connection, DN 10 ISO-KF	PT 420 912-T
RVC 300 - RME 005, connection cable, 3 m	PT 250 003-T
RVC 300 - RME 005, connection cable, 5 m	PT 250 005-T
RVC 300 - RME 005, connection cable, 10 m	PT 250 010-T
RVC 300 - RME 005, connection cable, 15 m	PT 250 015-T
RVC 300 - RME 005, connection cable, 20 m	PT 250 020-T
RVC 300 - RME 005, connection cable, 25 m	PT 250 025-T

## Control unit RVG 050 C for UDV 140 and UDV 146

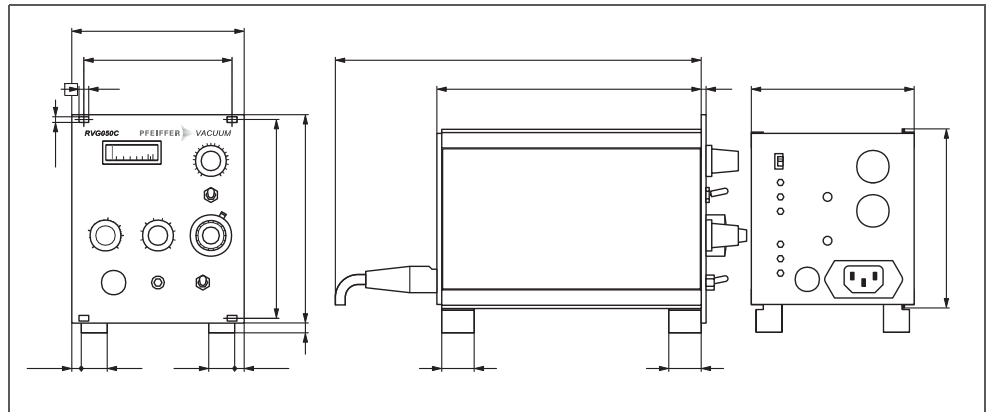


- For creating a control section in conjunction with UHV gas dosing valves UDV 140 or UDV 146

### Characteristic



### Dimensions



Technical data	RVG 050 C
Output for valve heater: Voltage	20 V DC
Output for valve heater: Current	0.5 A
Weight	2.3 kg
Actual value input: Analog voltage	10 V DC
Actual value input: Impedance	100 kΩ
Power consumption	20 VA
Mains requirement: voltage (selectable)	115/230 V AC
Control range for 1 bar N <sub>2</sub> , inlet side	1 · 10 <sup>-9</sup> - 100 hPa l/s
Control characteristic (proportional-integral)	PI
Set point input: External	10 V DC
Set point input: Impedance	100 kΩ
Set point input: Internal (scale division)	0-1000
Ambient temperature	5-50 °C
Time constant, adjustable	2-30 s

Order number	
Gas regulating valves	PF I00 795

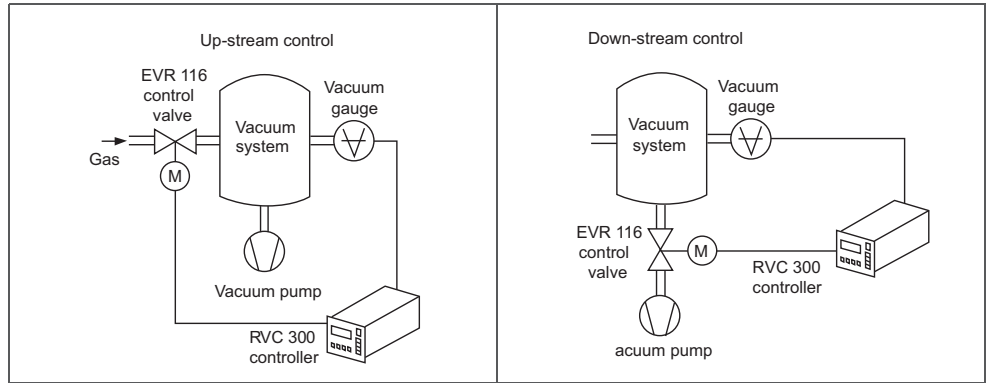
Accessories	
UDV 146, All-metal gas regulating valve, DN 16 CF-F	PF I52 034
RVG-UDV, extension cable, 2 m, 200 °C	PT 519 953 -T
RVG-UDV, connection cable, 3 m, 80 °C	PT 519 178 -T
RVG-UDV, connection cable, 12 m, 80 °C	PT 519 343 -T

## Control unit RVC 300 for EVR 116 and RME 005 A



- For creating a control section in conjunction with EVR 116 or RME 005 A regulating valves
- Simple operation
- Self-explanatory LCD display and function keys
- Analog/digital inputs/outputs and interfaces
- Settable PID regulating algorithm
- For system manufacturers, as a supplement to their own control unit

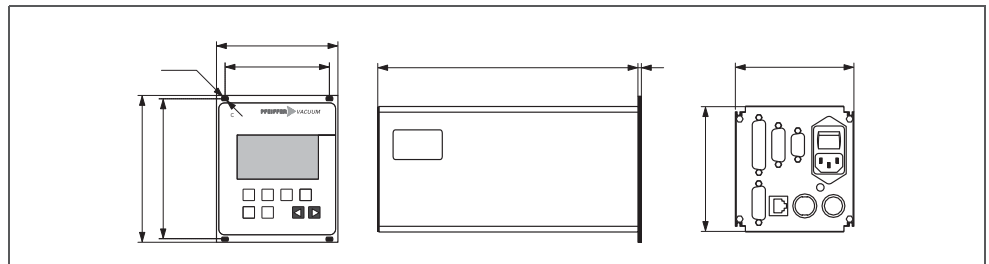
### Characteristic



RVC 300, Control unit gas regulating valves

RVC 300, Control unit gas regulating valves

### Dimensions



Technical data	RVC 300
Output: Analog	4 channels: Pressure sensor signal/ valve signal (0-10 V DC)/ valve position EVR 116/ + 10 V DC reference voltage (10 mA)
Output: Digital	8 channels: Valve closed/ valve open/ valve in position/ valve error/ sensor error/ ready/ emission ON/ sensor status
Input: Analog	2 channels: Pressure setpoint (nominal value)/ flow setpoint (nominal value)
Input: Digital	8 channels: Flow decrease/ flow increase/ external CLOSE/ external OPEN/ flow mode/ pressure mode/ emission ON/ Degas ON
Weight	1.65 kg
Mains requirement: frequency (range)	50/60 Hz
Mains requirement: power consumption	50 VA
Mains requirement: voltage (range)	90-250 V
Control range	APR 250/260: 1 - 1100 hPa
Control range	CMR 361/371: 1 - 1100 hPa
Control range	TPR 280/281: $5 \cdot 10^{-4}$ - 1000 hPa
Control range	PCR 280: $5 \cdot 10^{-4}$ - 1500 hPa
Control range	CMR 362/372: 0.1 - 110 hPa
Control range	CMR 363/373: $1 \cdot 10^{-2}$ - 11 hPa
Control range	CMR 364/374: $1 \cdot 10^{-3}$ - 1.1 hPa
Control range	CMR 365/375: $1 \cdot 10^{-4}$ - 0.11 hPa
Control range	IKR 251/261: $2 \cdot 10^{-9}$ - $1 \cdot 10^{-2}$ hPa
Control range	IMR 265: $2 \cdot 10^{-6}$ - 1000 hPa
Control range	PBR 260: $5 \cdot 10^{-10}$ - 1000 hPa
Control range	PKR 251/261: $5 \cdot 10^{-9}$ - 1000 hPa
Interface: Baud rates	9600 Bd
Interface: Type	RS-232, RS-485
Temperature: Operating	5 to 50 °C
Temperature: Storage	-40 to 60 °C

Order number	
Gas regulating valves	PF I00 792

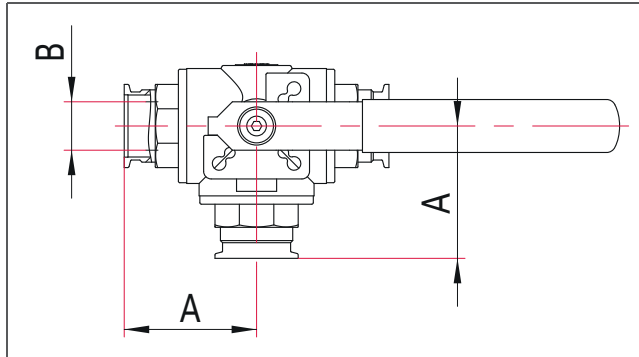
Accessories	
RVC 300 - RME 005, connection cable, 3 m	PT 250 003-T
RVC 300 - RME 005, connection cable, 5 m	PT 250 005-T
RVC 300 - RME 005, connection cable, 10 m	PT 250 010-T
RVC 300 - RME 005, connection cable, 15 m	PT 250 015-T
RVC 300 - RME 005, connection cable, 20 m	PT 250 020-T
RVC-EVR, connection cable, 3 m	PT 583 115-T
RVC-EVR, connection cable, 5 m	PT 583 116-T
RVC-EVR, connection cable, 10 m	PT 583 117-T
RVC-EVR, connection cable, 15 m	PT 583 118-T
RVC-EVR, connection cable, 20 m	PT 583 119-T
RME 005 A, Gas regulating valve, regulating range from 0.0017 to 0.17 hPa l/s	PF I13 936
RME 005 A, Gas regulating valve, regulating range from 0.008 to 0.8 hPa l/s	PF I13 935
RME 005 A, Gas regulating valve, regulating range from 0.017 to 1.7 hPa l/s	PF I13 934
RME 005 A, Gas regulating valve, regulating range from 0.085 to 8.5 hPa l/s	PF I13 933
RME 005 A, Gas regulating valve, regulating range from 0.17 to 17 hPa l/s	PF I13 932
RME 005 A, Gas regulating valve, regulating range from 0.85 to 85 hPa l/s	PF I13 931
EVR 116, Gas regulating valve	PF I39 931

## Ball valve, 3-way, manual, DN 16 to 40 ISO-KF



- Ball made from stainless steel (1.4401) with a T- or L-shaped through hole
- Ball valve with large-scale free clearance
- Not overlap-free

### Dimensions



	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
A	60 mm	75 mm	87.5 mm
B	11 mm	20 mm	32 mm

Technical data	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Actuator	90° turning of handle	90° turning of handle	90° turning of handle
Tightness	$< 1 \cdot 10^{-7}$ Pa m <sup>3</sup> /s	$< 1 \cdot 10^{-7}$ Pa m <sup>3</sup> /s	$< 1 \cdot 10^{-7}$ Pa m <sup>3</sup> /s
Seal	Ball: PTFE (reinforced with fiberglass); Stem: PTFE/FKM	Ball: PTFE (reinforced with fiberglass); Stem: PTFE/FKM	Ball: PTFE (reinforced with fiberglass); Stem: PTFE/FKM
Pressure range	$1 \cdot 10^{-5}$ hPa to 500 hPa over pressure	$1 \cdot 10^{-5}$ hPa to 500 hPa over pressure	$1 \cdot 10^{-5}$ hPa to 500 hPa over pressure
Flange	Stainless steel 1.4301	Stainless steel 1.4301	Stainless steel 1.4301
Housing	Stainless steel 1.4408	Stainless steel 1.4408	Stainless steel 1.4408
Nominal diameter	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Service life	20000 Cycles	20000 Cycles	20000 Cycles
Temperature range	-20 to 80 °C media temperature	-20 to 80 °C media temperature	-20 to 80 °C media temperature

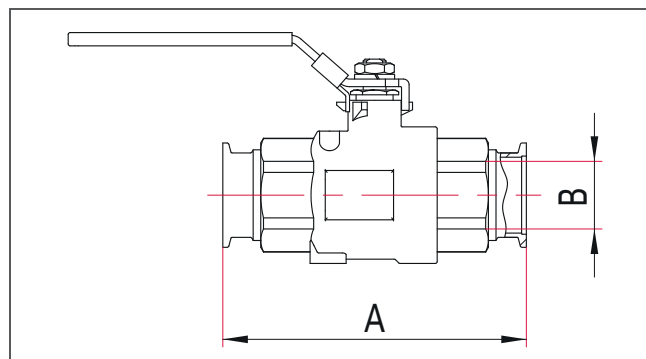
Order number			
Ball valves	120VKD016-L	120VKD025-L	120VKD040-L
Ball valves	120VKD016-T	120VKD025-T	120VKD040-T

## Ball valve, manual, stainless steel, DN 10 to 40 ISO-KF

- Ball valve with large-scale free clearance
- Ball made from stainless steel (1.4401)



### Dimensions



	DN 10 ISO-KF	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
A	100 mm	110 mm	130 mm	160 mm
B	10 mm	15 mm	24 mm	36 mm

Technical data	DN 10 ISO-KF	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Actuator	90° turning of handle	90° turning of handle	90° turning of handle	90° turning of handle
Tightness	$< 1 \cdot 10^{-7}$ Pa m <sup>3</sup> /s	$< 1 \cdot 10^{-7}$ Pa m <sup>3</sup> /s	$< 1 \cdot 10^{-7}$ Pa m <sup>3</sup> /s	$< 1 \cdot 10^{-7}$ Pa m <sup>3</sup> /s
Seal	PTFE (glass fiber reinforced)	PTFE (glass fiber reinforced)	PTFE (glass fiber reinforced)	PTFE (glass fiber reinforced)
Pressure range	1 · 10 <sup>-5</sup> hPa bis 500 hPa over pressure	1 · 10 <sup>-5</sup> hPa bis 500 hPa over pressure	1 · 10 <sup>-5</sup> hPa bis 500 hPa over pressure	1 · 10 <sup>-5</sup> hPa bis 500 hPa over pressure
Flange	Stainless steel 1.4301	Stainless steel 1.4301	Stainless steel 1.4301	Stainless steel 1.4301
Housing	Stainless steel 1.4408	Stainless steel 1.4408	Stainless steel 1.4408	Stainless steel 1.4408
Nominal diameter	DN 10 ISO-KF	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Service life	20000 Cycles	20000 Cycles	20000 Cycles	20000 Cycles
Temperature range	-20 to 80 °C media temperature	-20 to 80 °C media temperature	-20 to 80 °C media temperature	-20 to 80 °C media temperature

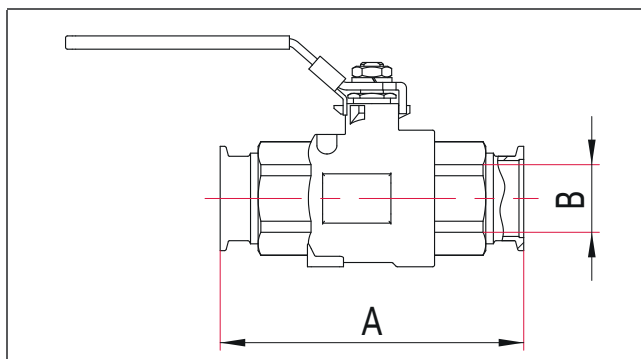
Order number				
Ball valves	<b>120VKZ010</b>	<b>120VKZ016</b>	<b>120VKZ025</b>	<b>120VKZ040</b>

## Ball valve, manual, brass, nickel-plated, DN 10 to 40 ISO-KF

- Ball valve with large-scale free clearance
- Ball made from brass, hard-chrome plated



### Dimensions



	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
A	90 mm	110 mm	135 mm
B	15 mm	24 mm	40 mm

Technical data	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Actuator	90° turning of handle	90° turning of handle	90° turning of handle
Tightness	$< 1 \cdot 10^{-7}$ Pa m <sup>3</sup> /s	$< 1 \cdot 10^{-7}$ Pa m <sup>3</sup> /s	$< 1 \cdot 10^{-7}$ Pa m <sup>3</sup> /s
Seal	Ball: PTFE; Stem: FKM/NBR	Ball: PTFE; Stem: FKM/NBR	Ball: PTFE; Stem: FKM/NBR
Pressure range	1 · 10 <sup>-5</sup> hPa bis 500 hPa over pressure	1 · 10 <sup>-5</sup> hPa bis 500 hPa over pressure	1 · 10 <sup>-5</sup> hPa bis 500 hPa over pressure
Flange	Stainless steel 1.4301	Stainless steel 1.4301	Stainless steel 1.4301
Housing	Brass, nickel plated	Brass, nickel plated	Brass, nickel plated
Nominal diameter	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Service life	20000 Cycles	20000 Cycles	20000 Cycles
Temperature range	-20 to 80 °C media temperature	-20 to 80 °C media temperature	-20 to 80 °C media temperature

Order number			
Ball valves	140VKZ016	140VKZ025	140VKZ040





# Feedthroughs

Transfer of electrical currents, signals, fluids and movements into the vacuum



# Contents

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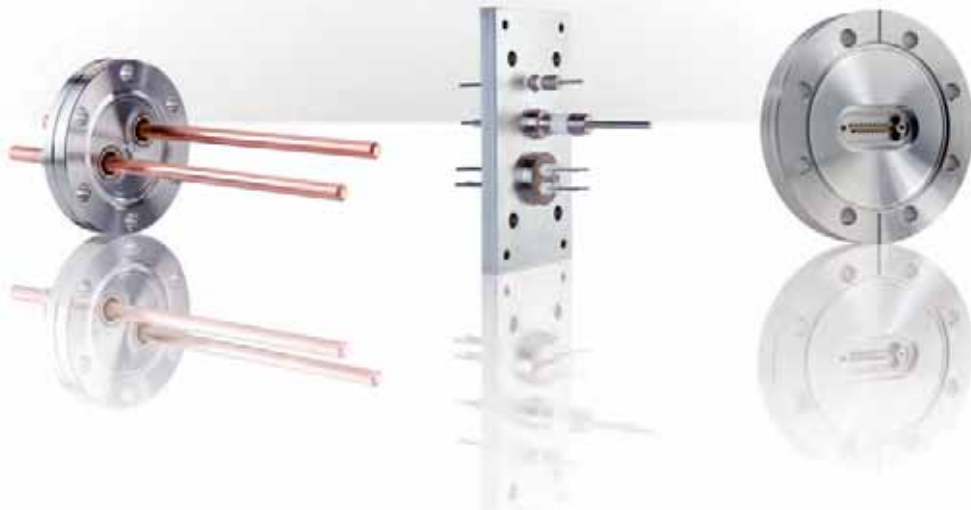


# Feedthroughs

## Transfer of electrical currents, signals, fluids and movements into the vacuum

The operation of vacuum equipment often requires the transfer of electrical currents, voltages and signals, fluids or mechanical movements through the recipient walls. Pfeiffer Vacuum offers a vast selection of feedthroughs that serve as solutions for various requirements for vacuum sealed installation in flanges. The range extends from elastomer sealed components for high vacuum use to hermetically sealed feedthroughs for UHV applications.

In addition to our standard solutions we also offer custom solutions on request. In accordance with your requirements, we can combine every possible selection of standard feedthroughs on a flange, or weld additional conventionally used feedthroughs.





## Features at a glance

	Nominal diameter						Flange systems			Page
	DN 16	DN 25	DN 40	DN 50	DN 63	DN 100	ISO-KF	ISO-K	CF	
<b>Feedthroughs</b>										
Electrical feedthroughs	■	■	■	■	■	■	■	■	■	306
Thermocouple feedthroughs	■	■	■				■		■	330
Fluid feedthroughs	■		■				■		■	334
Isolators	■		■				■		■	338
Pipe feedthroughs	■	■	■				■			339
Rotary feedthroughs	■		■		■		■	■	■	340
Rotary/linear feedthroughs	■	■	■				■		■	346
Linear feedthroughs	■		■				■		■	350



**Customer benefits**

- Specific applications possible
- Compact
- High reliability
- Very long service life



Electrical feedthroughs



Thermocouple feedthroughs



Fluid feedthroughs

## Series

**Electrical feedthroughs** serve to transfer electrical power or signals. We offer individual and multiple feedthroughs, for operating voltages up to 30 kV and currents of up to 600 A. We offer wire conductor, coaxial, sub-D and round socket connector versions. In addition you can also find the appropriate plugs, connectors and terminals for air and vacuum side connections.

**Thermocouple feedthroughs** transmit weak thermal electrical voltages and need to be adapted to the thermocouple used. The materials in the two-wire conductor of our feedthroughs for type K thermocouples are identical with those of the thermocouple and thus provide a thermoelectrically neutral transmission of the thermoelectric voltage. Should additional electrical capacity be transmitted, you may select a combination feedthrough. For mantle thermocouples we offer elastomer-sealed feedthroughs with o-rings that provide a vacuum seal for the mantle.

**Fluid Feedthroughs** are pipes welded into the flange, whose ends are open or have Swagelok® or VCR connections. Should cold or warm fluid be fed through, the use of thermally isolated versions is recommended.

**Isolators** are used for the galvanic separation of areas. The ceramics soldered to the flange connections provide a hermetic seal and are designed for potential differences of up to 30 kV.

**Pipe Feedthroughs** provide a vacuum sealed clamp around glass or metal tubes through two elastomeric O-rings positioned in series. The feedthroughs are available in diameters of 10 to 25 mm.

**Mechanical feedthroughs** are devices for transmitting movements into the vacuum. Their actuator is fitted vacuum-sealed in a flange. We offer rotary feedthroughs, rotary/linear feedthroughs and linear feedthroughs: elastomer-sealed for the high vacuum range or hermetically sealed and UHV capable as bellows-sealed or magnetically coupled variants. A further selection of devices for transferring movement in the vacuum can be found in the „Manipulators“ chapter.



## General information

All Pfeiffer Vacuum components meet the quality requirements for vacuum components. The feedthroughs are helium leak tested and have a better leakage rate than  $10^{-10}$  Pa m<sup>3</sup>/s for ISO-KF, ISO-K flanges and  $10^{-11}$  Pa m<sup>3</sup>/s for CF flanges. The welding adapters are welded from the inside making them vacuum suitable and avoiding virtual leaks such as cracks and blind holes.

## Important information relating to the technical data

The minimum final pressure which can be attained in the overall system depends on a number of factors, in particular the pump system, the desorption rates, the interior surface and the pump-down time. Minimum pressures listed in the product description are empirical values that can be achieved with a well designed vacuum system. In individual cases they may be exceeded or not achieved. When using elastomer seals the gas permeability (permeation) also needs to be taken into account. This is dependent on the material, temperature and type of gas.

The permissible upper and lower temperature limits for the overall system are based on the lowest upper value and the highest lower value for the system components involved. Please take into account the various maximum temperature conditions in the vacuum and air. High temperatures in the air create corrosion on the conducting materials or at the soldering spots. Low temperatures can lead to condensation of humidity and thus to corrosion or flashovers. Such conditions need to be prevented along with the use of fluids that may damage the feedthroughs.

The flange connections and components were developed to provide vacuum sealed connections. They are only able to bear limited loads. It is therefore necessary to examine whether structural or dynamic loads need to be borne by additional elements (e.g. brackets) when designing a vacuum system.

Feedthroughs insulated using ceramics must not to be subjected to mechanical loads. Damage to the ceramics generally leads to a leak and may result in a reduction or loss of electrical isolation.

The operating voltages listed are based on the direct voltage and the ambient conditions: Room temperature, external dry air, internal vacuum <  $10^{-4}$  hPa. In the event of particularly high gas pressures, flashovers may occur depending on the combination of the residual gas, the electrode intervals and the orientation of the electrical field. High temperatures reduce the maximum permitted operating voltages and currents.

When connecting and operating feedthroughs, relevant local safety regulations must be adhered to.



Isolators



Pipe feedthroughs



Mechanical feedthroughs

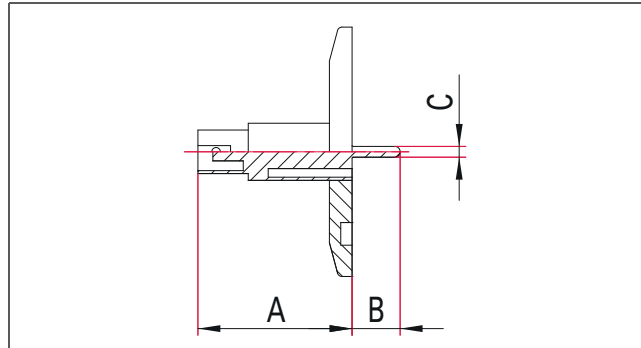
## Coaxial Feedthrough, Flanged, BNC

- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 500 V DC
- Current: 3 A per pin
- Temperature range: -100 to 300 °C (vacuum side)
- Including atmosphere sided plug (-65 to 165 °C)

### ISO-KF, BNC, Grounded Shield

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	36	8	2.4	120XBG016-1
DN 40 KF	1	36	10	2.4	120XBG040-1
DN 40 KF	2	36	10	2.4	120XBG040-2
DN 40 KF	4	36	10	2.4	120XBG040-4

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

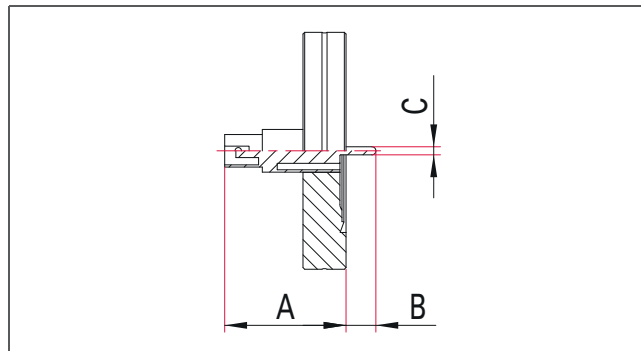
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF, BNC, Grounded Shield

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	35	8	2.4	420XBG016-1
DN 40 CF	1	35	8	2.4	420XBG040-1
DN 40 CF	2	35	8	2.4	420XBG040-2
DN 40 CF	4	35	8	2.4	420XBG040-4

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

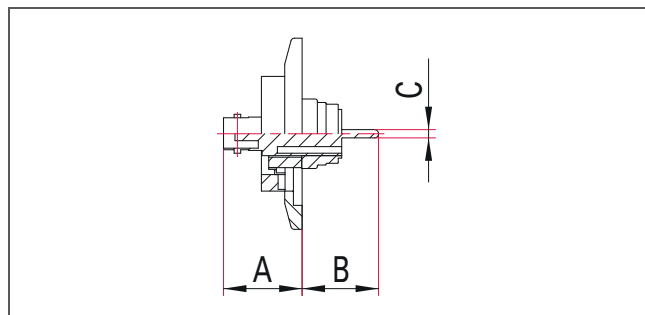
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**ISO-KF, BNC, Floating Shield**

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

**Dimensions**



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	65	17	2.4	120XBF016-1
DN 40 KF	1	53	30	2.4	120XBF040-1

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

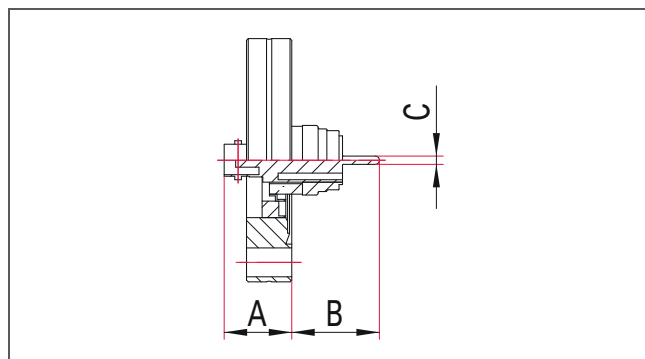
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**CF, BNC, Floating Shield**

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

**Dimensions**



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	51	32	2.4	420XBF016-1
DN 40 CF	1	18	25	2.4	420XBF040-1

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

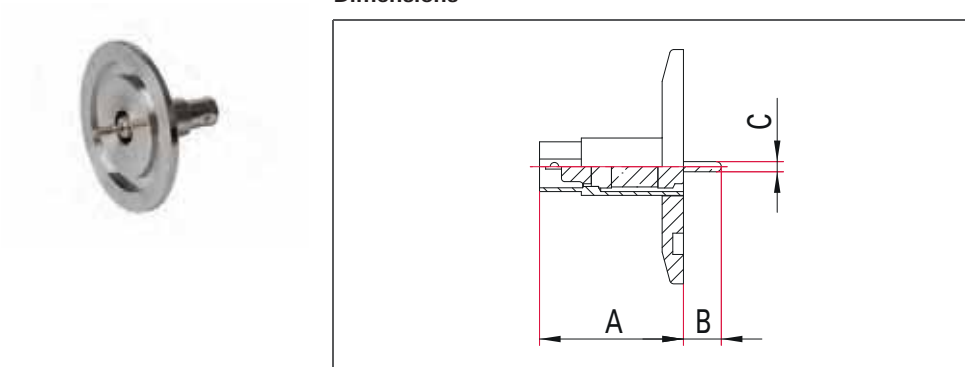
## Coaxial Feedthrough, Flanged, MHV

- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 5 kV DC
- Current: 3 A per pin
- Temperature range: -100 to 300 °C (vacuum side)
- Including atmosphere sided plug (-65 to 165 °C)

### ISO-KF, MHV, Grounded Shield

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

#### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	36	6	2.4	120XMG016-1
DN 40 KF	1	34	9	2.4	120XMG040-1
DN 40 KF	2	34	9	2.4	120XMG040-2

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

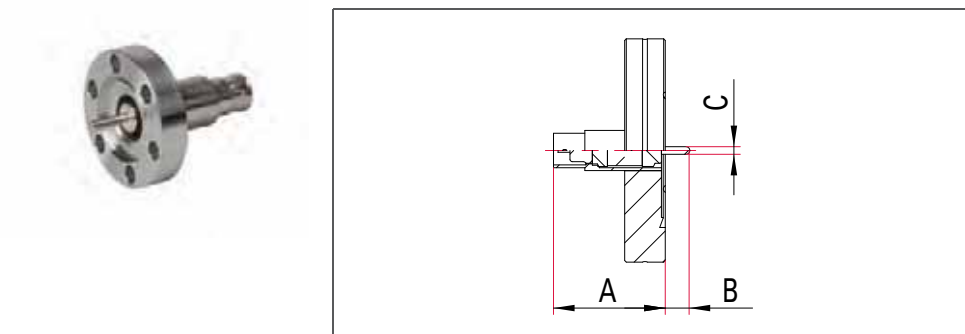
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF, MHV, Grounded Shield

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

#### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	35	8	2.4	420XMG016-1
DN 40 CF	1	35	8	2.4	420XMG040-1
DN 40 CF	2	35	8	2.4	420XMG040-2

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

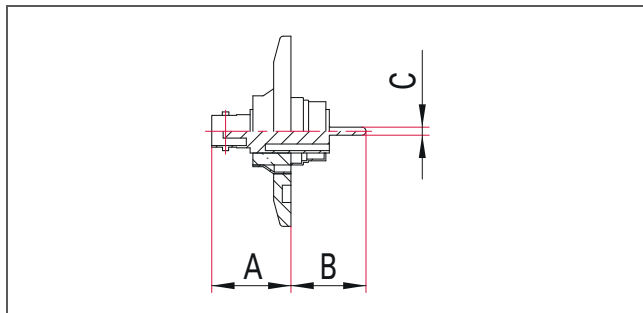
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**ISO-KF, MHV, Floating Shield**

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

**Dimensions**



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	66	17	2.4	120XMF016-1
DN 40 KF	1	53	30	2.4	120XMF040-1

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

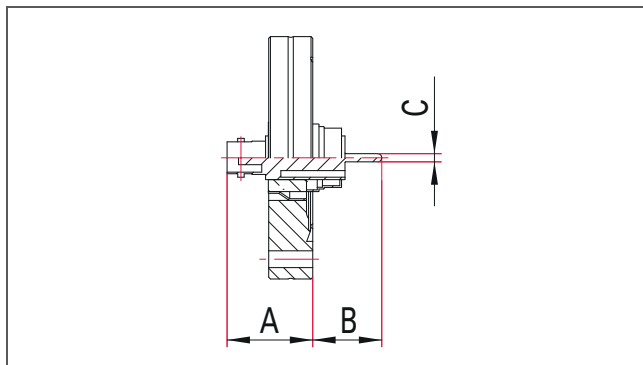
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**CF, MHV, Floating Shield**

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

**Dimensions**



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	51	32	2.4	420XMF016-1
DN 40 CF	1	18	25	2.4	420XMF040-1

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

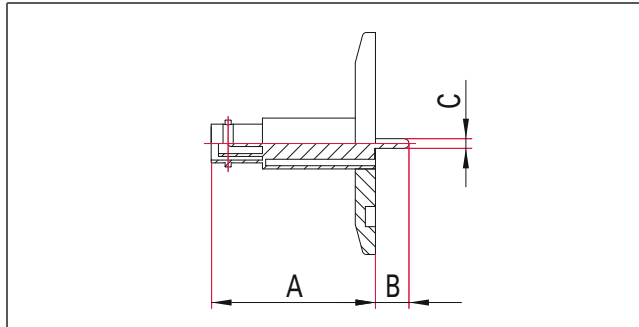
## Coaxial Feedthrough, Flanged, SHV

- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 5 kV DC
- Current: 5 A per pin
- Temperature range: -100 to 300 °C (vacuum side)
- Including atmosphere sided plug (-65 to 165 °C)

### ISO-KF, SHV-5, Grounded Shield

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

#### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	43	7	2.4	120XSG016-1
DN 40 KF	1	41	9	2.4	120XSG040-1
DN 40 KF	2	41	9	2.4	120XSG040-2

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

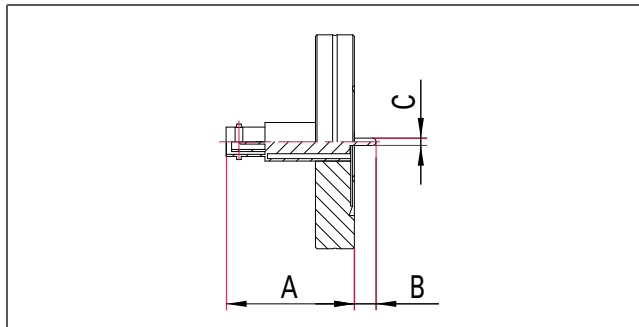
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF, SHV-5, Grounded Shield

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

#### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	42	8	2.4	420XSG016-1
DN 40 CF	1	42	8	2.4	420XSG040-1
DN 40 CF	2	42	8	2.4	420XSG040-2

The specified voltages and currents refer to the following ambient conditions:

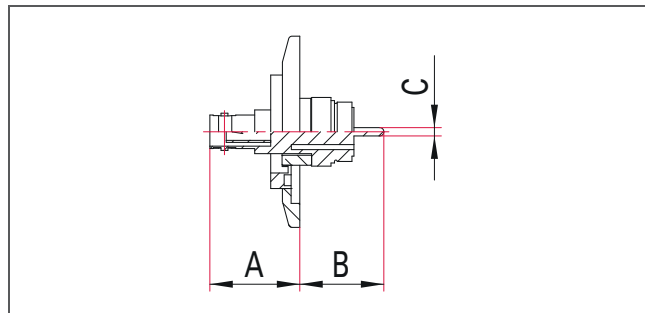
room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**ISO-KF, SHV-5, Floating Shield**

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

**Dimensions**

Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	51	36	2.4	120XSF016-1
DN 40 KF	1	49	38	2.4	120XSF040-1

The specified voltages and currents refer to the following ambient conditions:

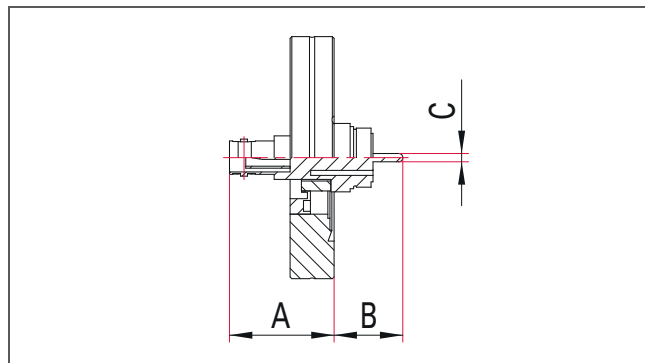
room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

**CF, SHV-5, Floating Shield**

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

**Dimensions**

Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	52	35	2.4	420XSF016-1
DN 40 CF	1	58	30	2.4	420XSF040-1

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

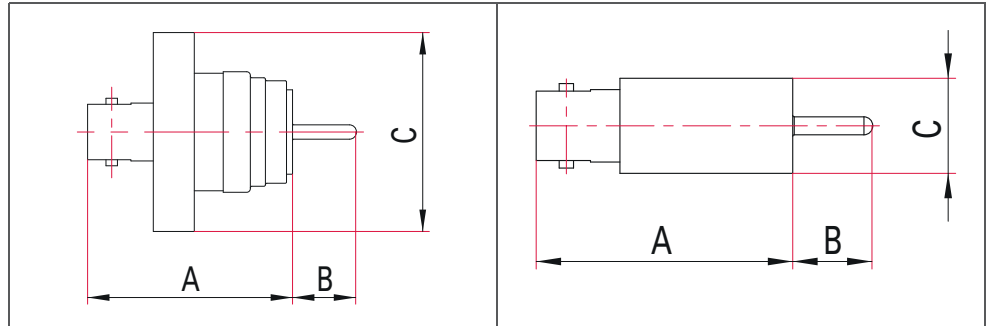
## Coaxial Feedthrough, Weld Adapter

- Item no. suffix -os: Plug not included
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Temperature range: -100 to 300 °C (vacuum side)
- Including atmosphere sided plug (-65 to 165 °C)

### BNC, 500 V DC, 3 A

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure
- Current: 3 A
- Voltage: 500 V DC

#### Dimensions



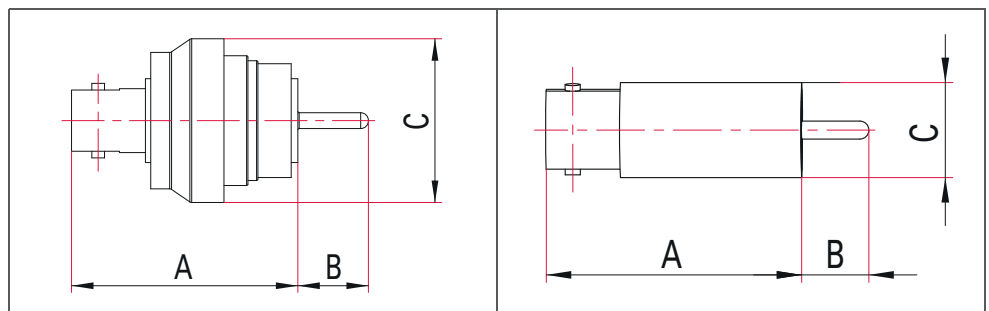
Shield	A [mm]	B [mm]	C [mm]	Order number
Floating	34	10	33	XBF
Floating	34	10	25	XBF-Mini
Grounded	34	10	13	XBG
Grounded	34	10	13	XBG-os

The specified voltages and currents refer to the following ambient conditions:  
room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

### MHV, 5 kV DC, 3 A

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure
- Current: 3 A
- Voltage: 5 kV DC

#### Dimensions



Shield	A [mm]	B [mm]	C [mm]	Order number
Floating	35	9	33	XMF
Floating	34	10	25	XMF-Mini
Grounded	34	9	13	XMG
Grounded	34	9	13	XMG-os

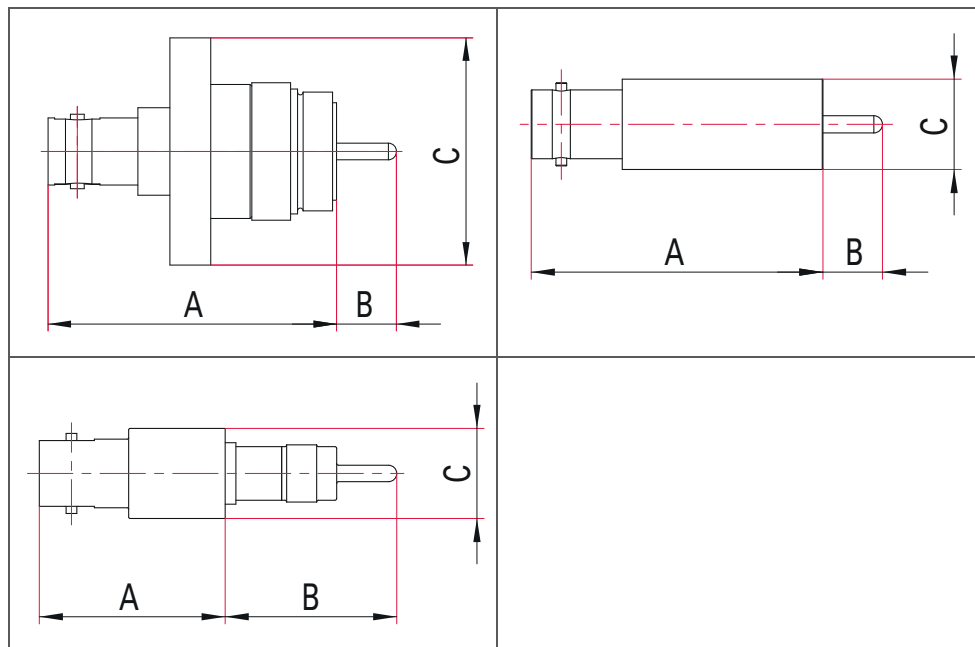
The specified voltages and currents refer to the following ambient conditions:  
room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa



**SHV, 5 and 10 kV DC, 5 A**

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure
- Current: 5 A
- Voltage: XSF-5 and XSG-5: 5 kV DC; XSG-10: 10 kV DC

**Dimensions**



Shield	A [mm]	B [mm]	C [mm]	Order number
Floating	41	9	33	XSF-5
Grounded	41	9	13	XSG-5
Grounded, exposed	41	9	13	XSG-5-exp
Grounded	61	9	13	XSG-10
Grounded, exposed	61	9	13	XSG-10-exp

The specified voltages and currents refer to the following ambient conditions:  
 room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

**Plug Atmosphere Side**

- Material: Plastic
- Temperature range: -65 to 165 °C

**Plug, Atmosphere Side**

Shield	Bestellnummer
BNC	XB-st
MHV	XM-st
SHV, 5 kV	XS5-st

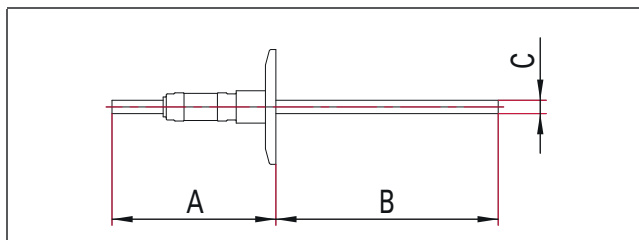
## Electrical Feedthrough (Wire Conductor), Flanged, 1 kV, 20 A

- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, molybdenum, nickel on request
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 1 kV DC
- Current: 20 A
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	2	67	35	1.3	120XST016-1-20-2
DN 16 KF	4	67	35	1.3	120XST016-1-20-4
DN 25 KF	2	56	45	1.3	120XST025-1-20-2
DN 25 KF	4	56	46	1.3	120XST025-1-20-4
DN 40 KF	2	53	49	1.3	120XST040-1-20-2
DN 40 KF	4	53	49	1.3	120XST040-1-20-4

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

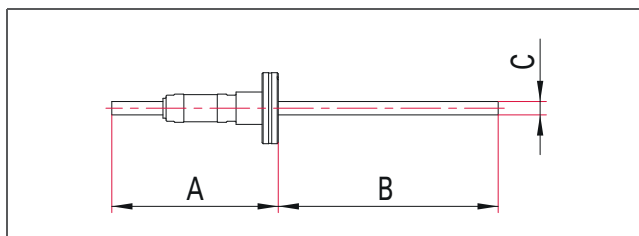
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	2	67	35	1.3	420XST016-1-20-2
DN 16 CF	4	67	35	1.3	420XST016-1-20-4
DN 40 CF	2	55	46	1.3	420XST040-1-20-2
DN 40 CF	4	53	49	1.3	420XST040-1-20-4

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

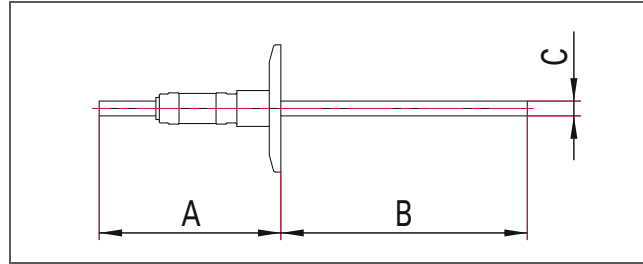
## Electrical Feedthrough (Wire Conductor), Flanged, 5 kV, 15 A

- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, molybdenum, nickel on request
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 5 kV DC
- Current: 15 A
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	2	60	42	1.3	120XST016-5-15-2
DN 16 KF	4	60	42	1.3	120XST016-5-15-4
DN 40 KF	2	47	55	1.3	120XST040-5-15-2
DN 40 KF	4	47	55	1.3	120XST040-5-15-4

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

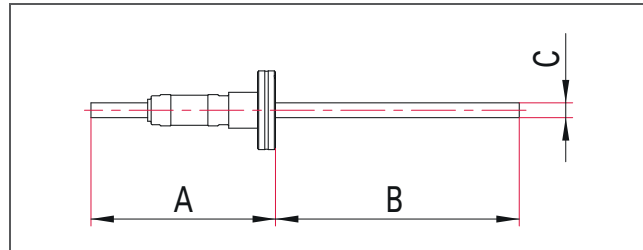
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	2	60	41	1.3	420XST016-5-15-2
DN 16 CF	4	60	41	1.3	420XST016-5-15-4
DN 40 CF	2	57	45	1.3	420XST040-5-15-2
DN 40 CF	4	57	45	1.3	420XST040-5-15-4

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

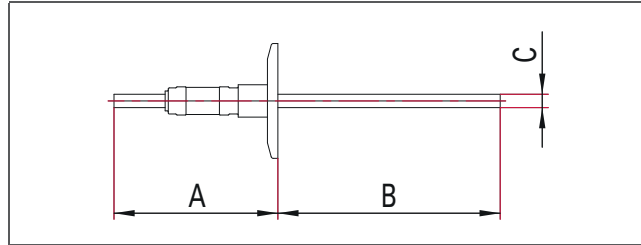
## Electrical Feedthrough (Wire Conductor), Flanged, 5 KV, 30 A

- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, molybdenum, nickel on request
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 5 kV DC
- Current: 30 A
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	50	135	2.4	120XST016-5-30-1
DN 16 KF	2	50	135	2.4	120XST016-5-30-2
DN 40 KF	1	50	135	2.4	120XST040-5-30-1
DN 40 KF	2	50	135	2.4	120XST040-5-30-2
DN 40 KF	4	50	135	2.4	120XST040-5-30-4

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

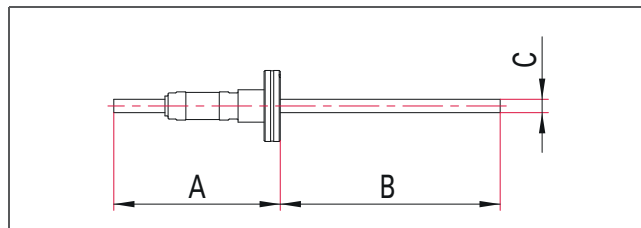
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	52	132	2.4	420XST016-5-30-1
DN 16 CF	2	52	132	2.4	420XST016-5-30-2
DN 40 CF	1	57	127	2.4	420XST040-5-30-1
DN 40 CF	2	57	127	2.4	420XST040-5-30-2
DN 40 CF	4	57	127	2.4	420XST040-5-30-4

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

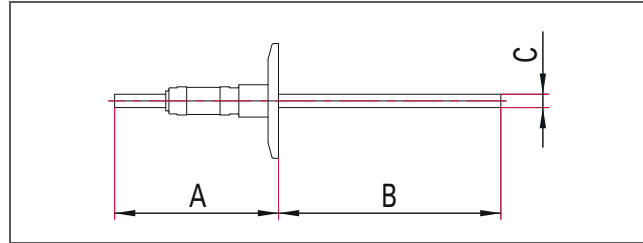
## Electrical Feedthrough (Wire Conductor), Flanged, 10 kV, 30 A

- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, molybdenum, nickel on request
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 10 kV DC
- Current: 30 A
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	59	125	2.4	120XST016-10-30-1
DN 16 KF	2	59	125	2.4	120XST016-10-30-2
DN 40 KF	1	59	125	2.4	120XST040-10-30-1
DN 40 KF	2	59	125	2.4	120XST040-10-30-2
DN 40 KF	4	59	125	2.4	120XST040-10-30-4

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

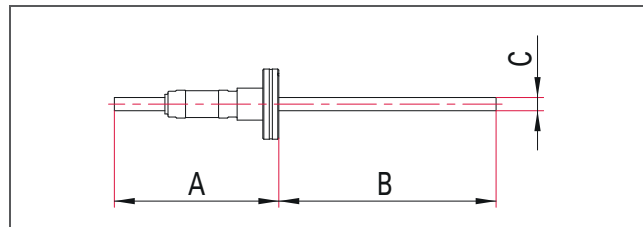
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	62	122	2.4	420XST016-10-30-1
DN 16 CF	2	67	117	2.4	420XST016-10-30-2
DN 40 CF	1	62	122	2.4	420XST040-10-30-1
DN 40 CF	2	67	117	2.4	420XST040-10-30-2
DN 40 CF	4	67	117	2.4	420XST040-10-30-4

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

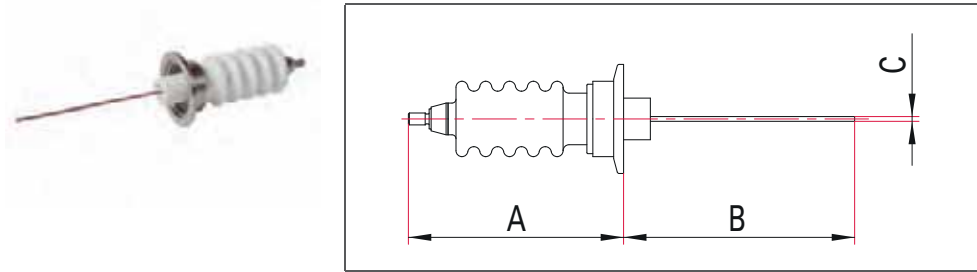
## Electrical Feedthrough (Wire Conductor), Flanged, 30 kV, 30 A

- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel on request
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 30 kV DC
- Current: 30 A
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 40 KF	1	105	121	2.4	120XST040-30-30-1

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

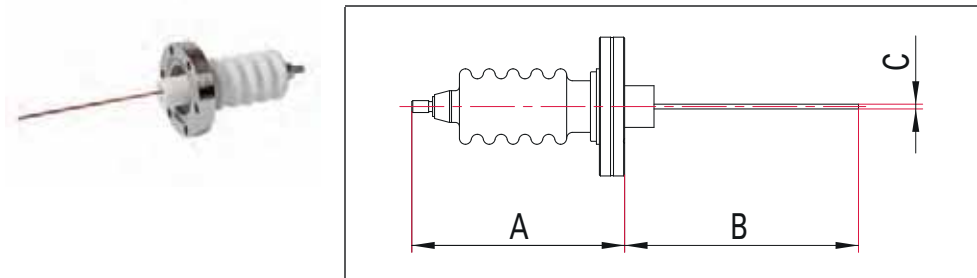
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 40 CF	1	108	116	2.4	420XST040-30-30-1

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

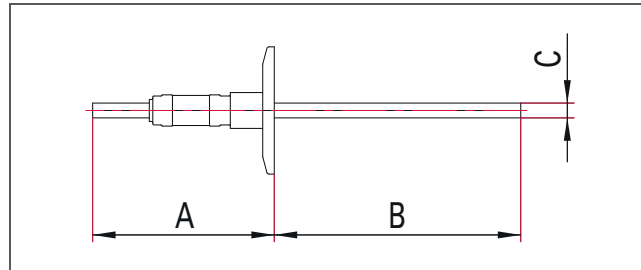
## Electrical Feedthrough (Wire Conductor), Flanged, 5 kV, 150 A

- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, Ni on request
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 5 kV DC
- Current: 150 A
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	66	118	6.35	120XST016-5-150-1
DN 25 KF	1	80	105	6.35	120XST025-5-150-1
DN 40 KF	1	80	105	6.35	120XST040-5-150-1
DN 40 KF	2	80	105	6.35	120XST040-5-150-2

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

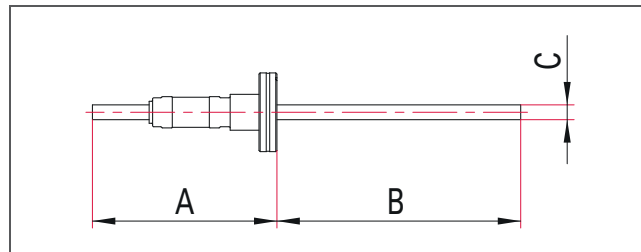
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	68	116	6.35	420XST016-5-150-1
DN 40 CF	1	81	103	6.35	420XST040-5-150-1
DN 40 CF	2	81	103	6.35	420XST040-5-150-2

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

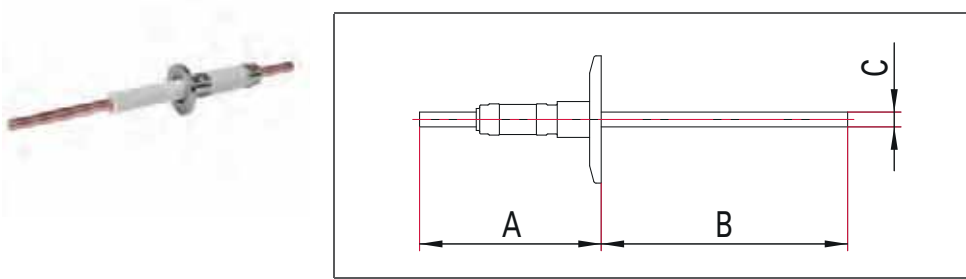
## Electrical Feedthrough (Wire Conductor), Flanged, 12 kV, 150 A

- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, Ni on request
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 12 kV DC
- Current: 150 A
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	83	102	6.35	120XST016-12-150-1
DN 40 KF	1	91	93	6.35	120XST040-12-150-1
DN 40 KF	2	91	93	6.35	120XST040-12-150-2

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

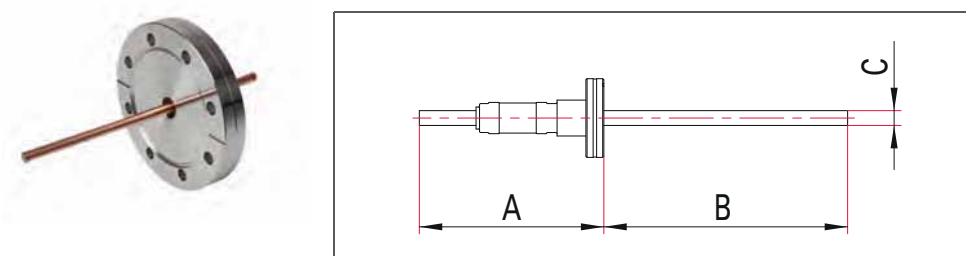
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	83	102	6.35	420XST016-12-150-1
DN 40 CF	1	88	97	6.35	420XST040-12-150-1
DN 40 CF	2	88	97	6.35	420XST040-12-150-2

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2



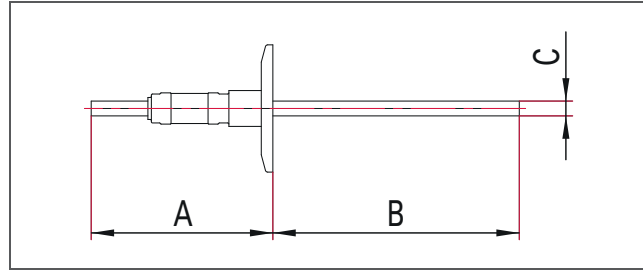
## Electrical Feedthrough (Wire Conductor), Flanged, 3 kV, 600 A

- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material Ni on request
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 3 kV DC
- Current: 600 A
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 40 KF	1	97	88	19.05	120XST040-3-600-1

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

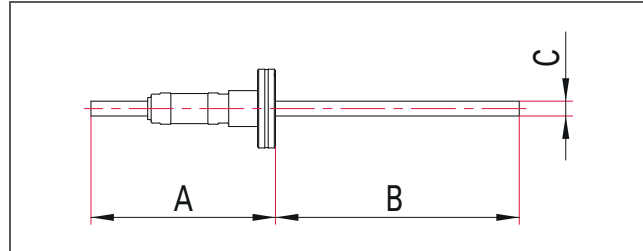
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 40 CF	1	97	85	19.05	420XST040-3-600-1

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

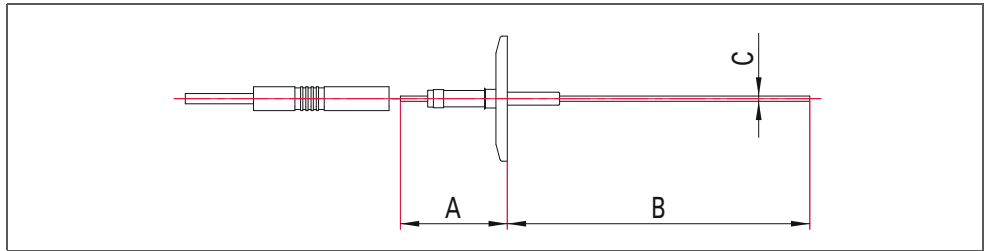
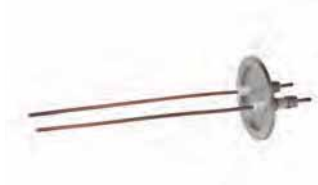
## Electrical Feedthroughs (Wire Conductor), Flanged, with Silicone Plug

- Plug and silicone cable (length 2.4 m) included (-55 to 125 °C)
- Conductor material: Copper
- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Voltage [kV]	Current [A]	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 40 KF	10	30	2	45	133	2.4	120XSP040-10-30-2
DN 40 KF	10	30	4	45	133	2.4	120XSP040-10-30-4
DN 40 KF	5	30	2	35	142	2.4	120XSP040-5-30-2
DN 40 KF	5	30	4	35	142	2.4	120XSP040-5-30-4

The specified voltages and currents refer to the following ambient conditions: room temperature, outside:

dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

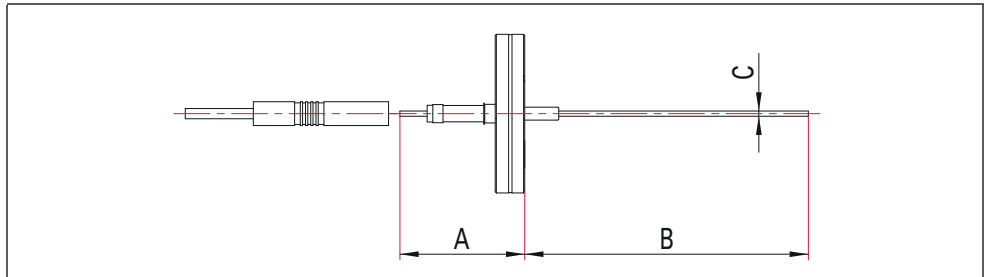
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Voltage [kV]	Current [A]	Pins	A [mm]	B [mm]	C [mm]	Order number
DN 40 CF	10	30	2	52	135	2.4	420XSP040-10-30-2
DN 40 CF	10	30	4	52	135	2.4	420XSP040-10-30-4
DN 40 CF	5	30	2	43	135	2.4	420XSP040-5-30-2
DN 40 CF	5	30	4	43	135	2.4	420XSP040-5-30-4

The specified voltages and currents refer to the following ambient conditions: room temperature, outside:

dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

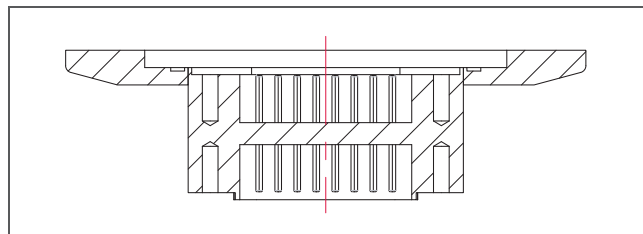
## D-Sub Feedthroughs, Flanged

- Pin material: Stainless steel (gold-plated)
- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 500 V DC
- Current: 5 A per pin
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF/ISO-K, Male

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	Order number
DN 40 KF	9	120XSD040-9
DN 50 KF	15	120XSD050-15
DN 63 ISO-K	25	320XSD063-25
DN 100 ISO-K	50	320XSD100-50

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

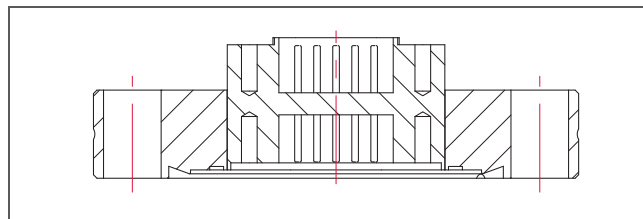
ISO-K Flanges according to ISO 1609

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF, Male

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	Order number
DN 40 CF	9	420XSD040-9
DN 63 CF	15	420XSD063-15
DN 63 CF	25	420XSD063-25
DN 63 CF	2 x 25	420XSD063-25-2
DN 100 CF	50	420XSD100-50

The specified voltages and currents refer to the following ambient conditions:

room temperature, outside: dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

ISO-K Flanges according to ISO 1609

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

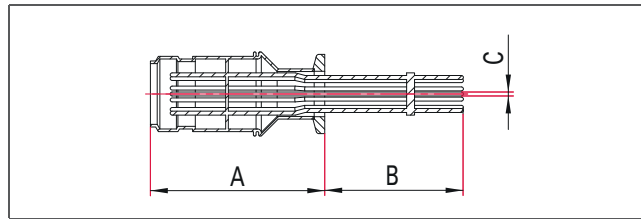
## Electrical Feedthroughs (Wire Conductor), with Outside Plug, Flanged

- Plug with soldering pins included, atmosphere side MIL-C-5015-compliant (-65 to 125 °C)
- Conductor material: Alumel
- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Voltage: 700 V DC
- Current: up to 10 A per pin (do not exceed maximum total current)
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	Current [A]	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	4	28	74	67	1.42	120XSS016-4
DN 16 KF	6	36	74	67	1.42	120XSS016-6
DN 16 KF	10	50	74	67	1.42	120XSS016-10
DN 40 KF	4	28	62	79	1.42	120XSS040-4
DN 40 KF	6	36	62	79	1.42	120XSS040-6
DN 40 KF	10	50	62	79	1.42	120XSS040-10
DN 40 KF	20	75	64	88	1.42	120XSS040-20

The specified voltages and currents refer to the following ambient conditions: room temperature, outside:

dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

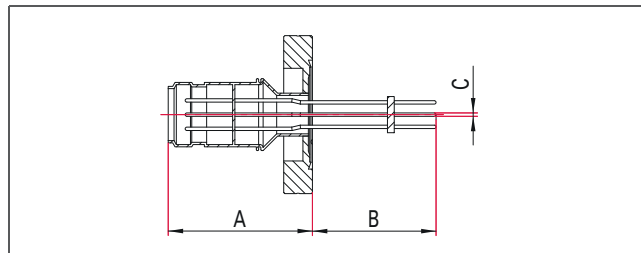
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Pins	Current [A]	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	4	28	74	67	1.42	420XSS016-4
DN 16 CF	6	36	74	67	1.42	420XSS016-6
DN 16 CF	10	50	74	67	1.42	420XSS016-10
DN 40 CF	20	75	66	87	1.42	420XSS040-20

The specified voltages and currents refer to the following ambient conditions: room temperature, outside:

dry air, inside: vacuum  $< 1 \cdot 10^{-4}$  hPa

ISO-KF Flanges according to ISO 2861

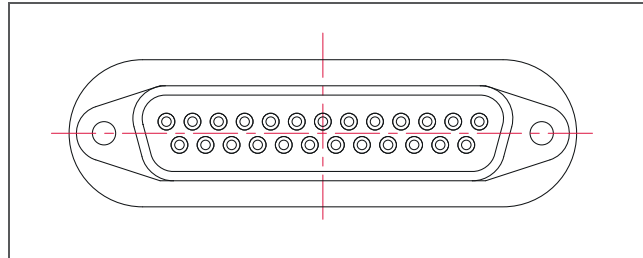
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## D-Sub Feedthroughs, Weld Adapter, Male



- Weldable with a welding lip, please note welding instructions
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure
- Materials: Stainless steel; Pins: stainless steel (gold-plated)
- Voltage: 500 V DC
- Current: 5 A per pin
- Temperature range: -100 to 300 °C (vacuum side)

### Dimensions



### Weld Adapter, male

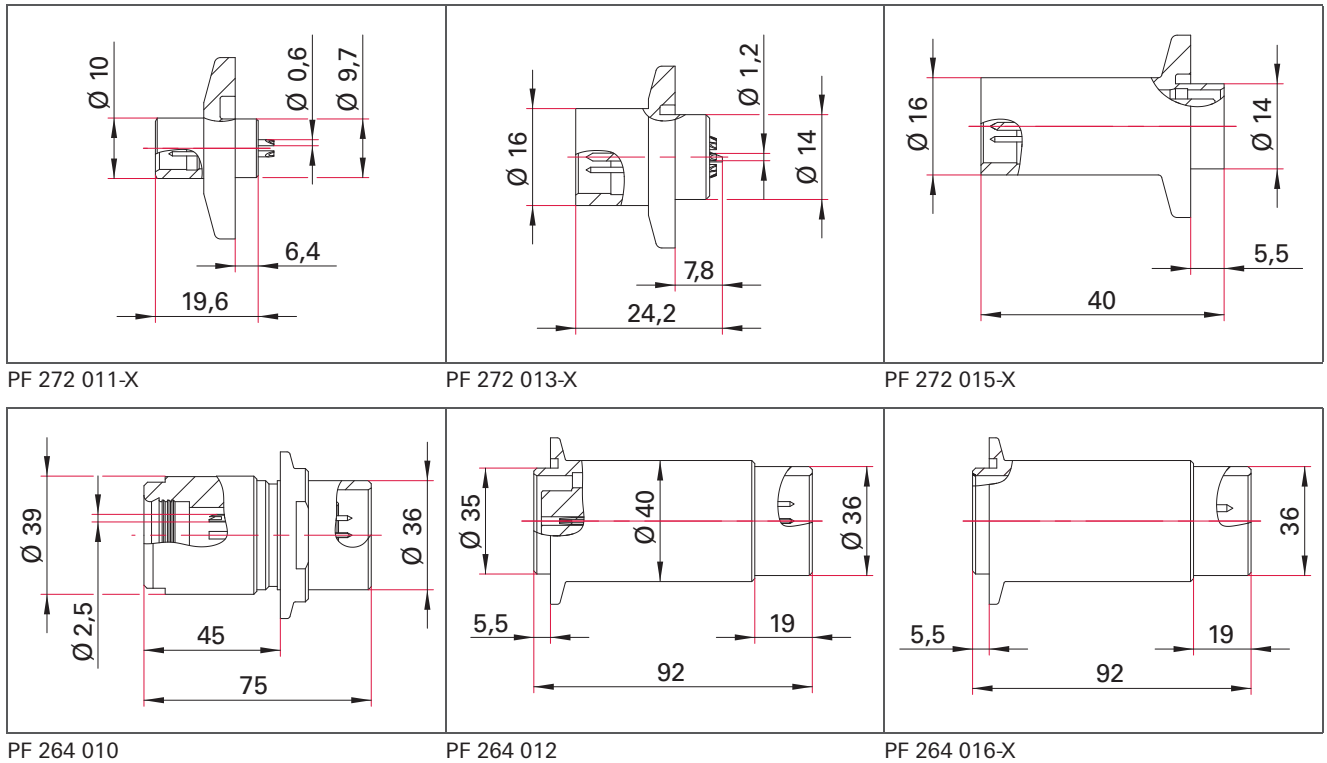
Pins	Order number
9	XSD-9
15	XSD-15
25	XSD-25
50	XSD-50

## Electrical Feedthrough Round Socket, Flanged



- Electrical feedthroughs for currents of up to 16 A and voltages of up to 800 V
- Nickel-plated or chrome-plated steel
- Connector (accessorie) for PF 272 015-X, PF 264 012, PF 264 016-X
- Soldered connection for PF 272 011-X, PF 272 013-X, PF 264 010
- Connection: Atmospheric side: Connector (accessorie)
- Bakeout temperature: 130 °C
- Tightness:  $1 \cdot 10^{-10}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Isolator: PTFE/Araldit
- Contact: Gold-plated bronze

### Dimensions



### ISO-KF

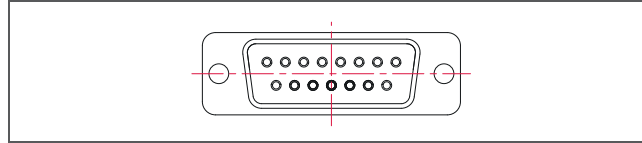
Nominal diameter	Voltage, per pole [V]	Current, per pole [A]	Pins	Order number
DN 16 ISO-KF	50	1	4	PF 272 011-X
DN 16 ISO-KF	50	2	9	PF 272 013-X
DN 16 ISO-KF	50	2	9	PF 272 015-X
DN 40 ISO-KF	380	16	7	PF 264 010
DN 40 ISO-KF	380	16	7	PF 264 012
DN 40 ISO-KF	800	16	4	PF 264 016-X

## Accessories for D-Sub Feedthroughs

### D-Sub plug, Female, Atmosphere Side, with Pins

- comes with pins
- Heat up and cool down speed: max. 25 K/min
- Voltage: 500 V DC
- Current: 5 A per pin
- Temperature range: -55 to 80 °C

#### Dimensions

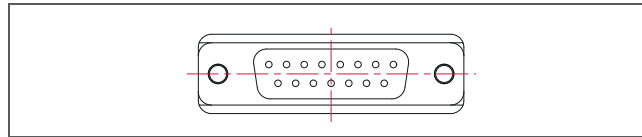


Pins	Order number
9	XSD-9-s-atm
15	XSD-15-s-atm
25	XSD-25-s-atm
50	XSD-50-s-atm

### D-Sub Plug, Female, Vacuum Side, PEEK, without Pins

- without pins
- UHV suitable
- Heat up and cool down speed: max. 25 K/min
- Voltage: 500 V DC
- Current: 5 A per pin
- Temperature range: -196 to 250 °C

#### Dimensions



Pins	Order number
9	XSD-9-s-vac
15	XSD-15-s-vac
25	XSD-25-s-vac
50	XSD-50-s-vac

### Flat Cable for D-Sub, Vacuum-suitable

- Conductor: copper, with kapton isolation and monofilment PEEK tissue
- UHV suitable
- Cable length: 990 mm
- Wire diameter: 0.89 mm
- Temperature range: -55 to 250 °C

Pins	Order number
9	XSD-9-cable
15	XSD-15-cable
25	XSD-25-cable
50	XSD-50-cable

### Pins for D-Sub Plug, Vacuum and Atmosphere Side, Female

- Installation with crimping tool (not included)

Pins	Order number
10	XSD-contacts

## Accessories for Electrical Feedthroughs Round Socket

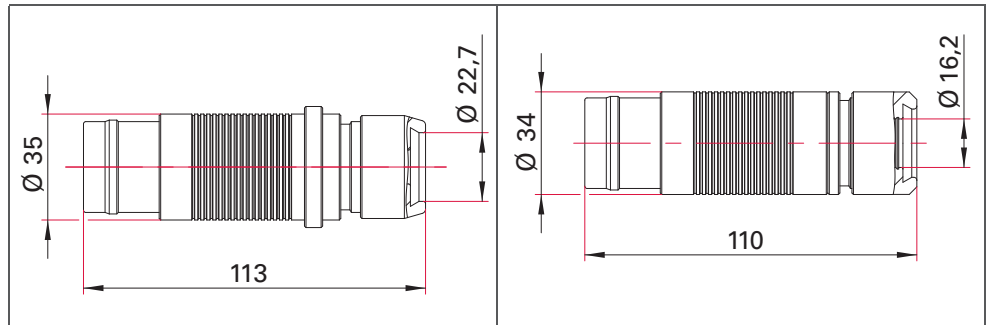


- PF 296 022-T for feedthrough PF 264 016-X
- PF 297 010 for feedthrough PF 272 011-X

### Outside Connector, Atmosphere Side

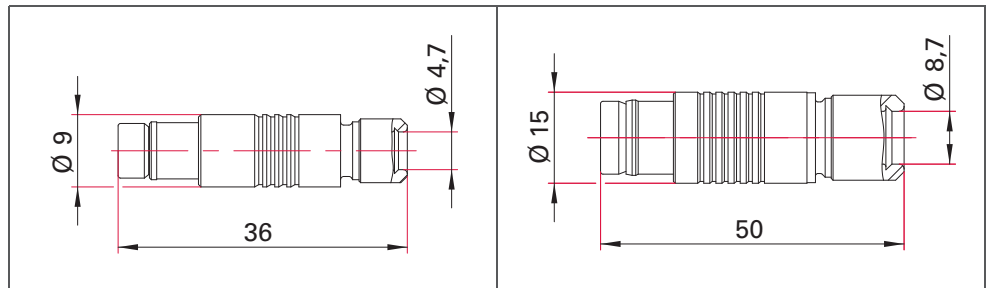
Pins	Order number
7	PF 296 010
4	PF 296 022-T
4	PF 297 010
9	PF 297 013-T

### Dimensions



PF 296 010

PF 296 022-T



PF 297 010

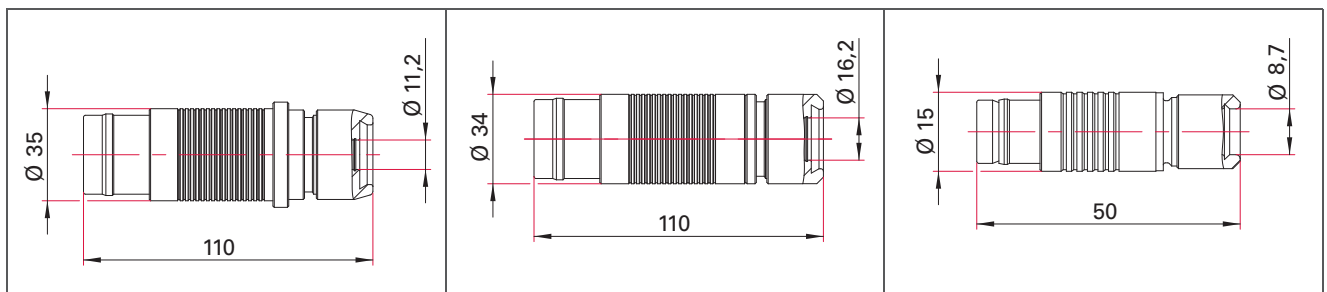
PF 297 013-T

### Inside Connector, Vacuum Side



Pins	Order number
7	PF 296 012
4	PF 296 024-T
9	PF 297 015-T

### Dimensions



PF 296 012

PF 296 024-T

PF 297 015-T

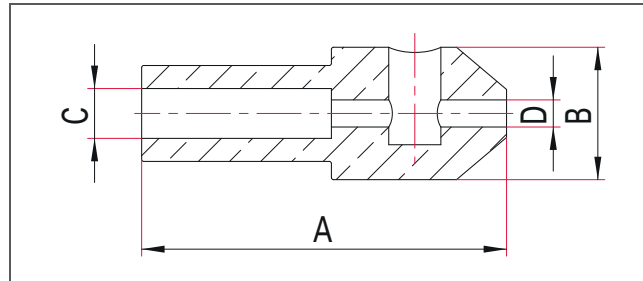


## Plug-on Connectors for Wire Conductor and Coaxial Feedthroughs



- Quantity: 10 per package
- Including hexagon socket wrench for flat head screw
- Materials: BeCu (gold-plated)
- Current max.: XAK015A: 15 A; XAK030A: 30 A
- Temperature range: max. air: 150 °C, vacuum: 200 °C

### Dimensions



BeCu (gold-plated)

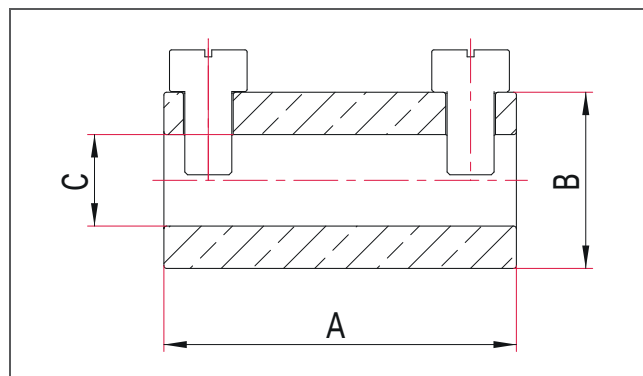
Wire diameter [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
1.3	17.5	6.35	1.3	1.3	XAK015A
2.4	17.5	6.35	2.4	1.3	XAK030A

## Contact Clamp for Wire Conductor and Coaxial Feedthroughs



- 1 piece per package
- Materials: BeCu (gold-plated)
- Current max.: XKL015A: 15 A; XKL030A: 30 A; XKL150A: 150 A
- Temperature range: max. air: 150 °C, vacuum: 400 °C

### Dimensions



BeCu (gold-plated)

Wire diameter [mm]	A [mm]	B [mm]	C [mm]	Order number
1.3	12.7	4.75	1.5	XKL015A
2.4	14.2	6.35	3.1	XKL030A
6.35	25.4	12.7	6.6	XKL150A

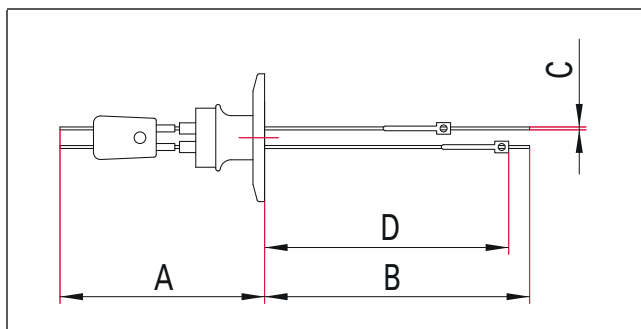
## Combi-Feedthroughs, Flanged, Electrical and Thermocouple, Type K

- Thermocouple, 1 pair type K: Chromel (+)/Alumel (-), (type C, E, J on request)
- 2 conductors made of copper (nickel on request)
- Includes atmosphere sided miniature plug for thermocouple (-65 to 125 °C)
- Other flange combinations on request
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Materials: Stainless steel (flange)
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Voltage [kV]	Current [A]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 KF	5	30	83	114	2.4	102	120XK0016-5-30

Electrical specifications are based on ambient pressure on the air side and  $1 \cdot 10^{-4}$  hPa on the vacuum side.

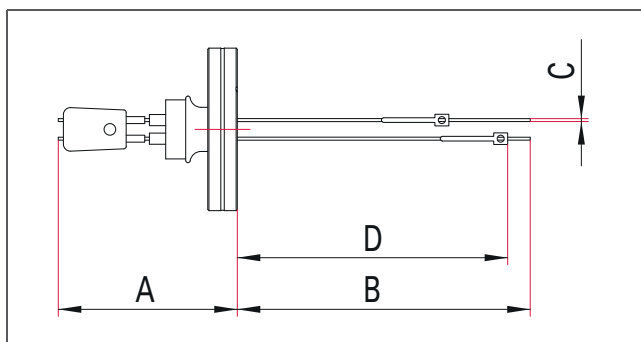
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Voltage [kV]	Current [A]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 16 CF	5	30	83	114	2.4	102	420XK0016-5-30
DN 40 CF	5	30	72	126	2.4	113	420XK0040-5-30

Electrical specifications are based on ambient pressure on the air side and  $1 \cdot 10^{-4}$  hPa on the vacuum side.

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

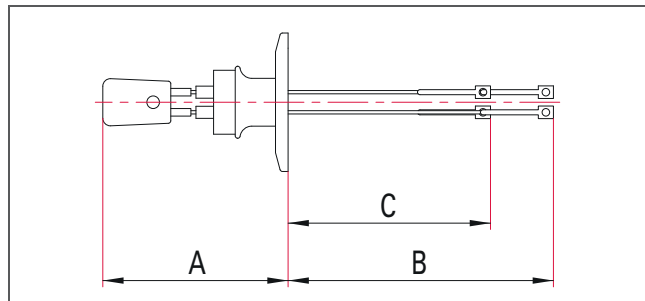
## Thermocouple Feedthrough, Flanged, Type K

- Thermocouple Type K: Chromel (+)/Alumel (-), (types C, E, J, T, N, R, S on request)
- Vacuum-side lugs with screw connections for the thermo wire (including screws)
- Including atmosphere sided miniature plug (-65 to 125 °C)
- Wire Pairs: 1-4
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Materials: Stainless steel (flange)
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Wire pairs	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	1	47	102	76	120XTK016-1
DN 16 KF	2	67	102	76	120XTK016-2
DN 16 KF	3	71	102	76	120XTK016-3
DN 40 KF	1	35	110	85	120XTK040-1
DN 40 KF	2	57	117	91	120XTK040-2
DN 40 KF	4	51	93	67	120XTK040-4

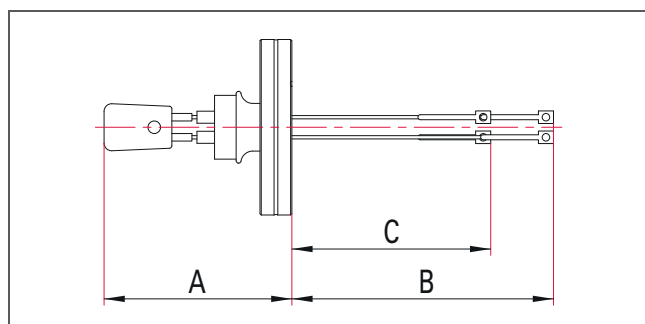
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Wire pairs	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	1	47	102	76	420XTK016-1
DN 16 CF	2	65	104	78	420XTK016-2
DN 16 CF	3	71	102	76	420XTK016-3
DN 40 CF	1	36	110	85	420XTK040-1
DN 40 CF	2	47	117	91	420XTK040-2
DN 40 CF	4	50	102	76	420XTK040-4

ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

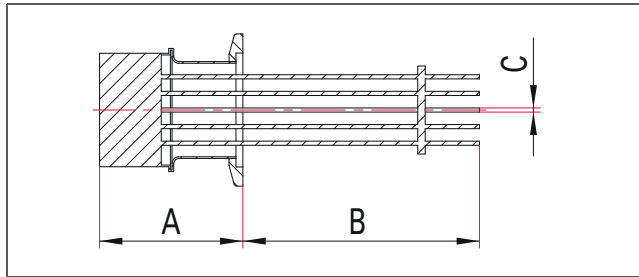
## Thermocouple Feedthrough, Type K, Flanged, with MS Plug

- Thermocouple Type K: Chromel (+)/Alumel (-), (type E, J on request)
- Including atmosphere sided MIL-C-5015-compliant MS plug (-65 to 125 °C)
- Thermocouples: 3 and 5
- Heat up and cool down speed: max. 25 K/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Materials: Stainless steel (flange)
- Temperature range: -100 to 300 °C (vacuum side)

### ISO-KF

- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Wire pairs	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	3	71	69	1.4	120XTK016-3-S
DN 16 KF	5	71	69	1.4	120XTK016-5-S

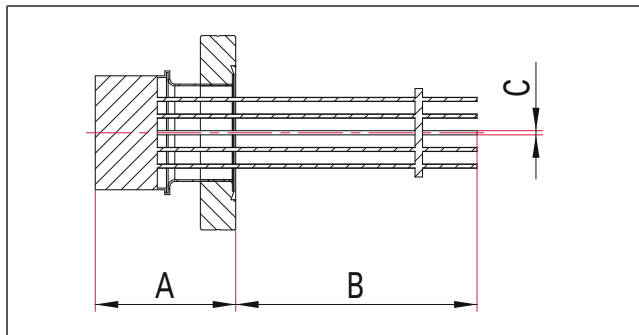
ISO-KF Flanges according to ISO 2861

CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF

- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure

### Dimensions



Nominal diameter	Wire pairs	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	3	71	69	1.4	420XTK016-3-S
DN 16 CF	5	71	69	1.4	420XTK016-5-S

ISO-KF Flanges according to ISO 2861

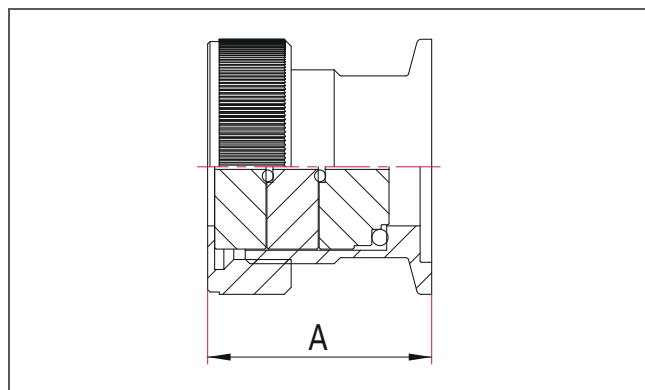
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Mantle Thermocouple Feedthrough, Flanged



- Mantle thermocouples with diameter 1.5 mm (bigger diameters on request)
- Vacuum-suitable sealing with two in-line arranged FKM seals
- Number of wire feedthroughs: 1 to 4 (wires not included)
- Unused, open wire feedthroughs have to be closed
- Tightness:  $1 \cdot 10^{-9}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-7}$  hPa to ambient pressure
- Materials: Stainless steel
- Temperature range: -15 to 130 °C

### Dimensions



### Stainless Steel

Nominal diameter	Number of feedthroughs	A [mm]	Order number
DN 16 KF	1 wire	38	120XTD016-1
DN 16 KF	2 wires	38	120XTD016-2
DN 25 KF	1 wire	42	120XTD025-1
DN 25 KF	2 wires	42	120XTD025-2
DN 25 KF	3 wires	42	120XTD025-3
DN 25 KF	4 wires	42	120XTD025-4

## Fluid Feedthroughs ISO-KF

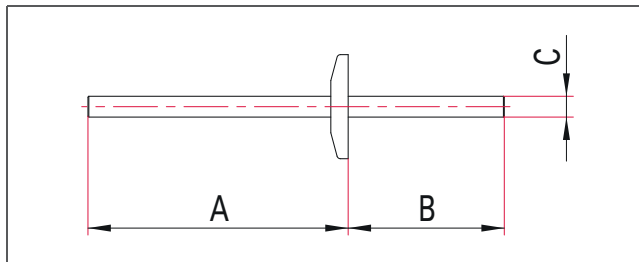
- Flange material: Stainless steel
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 500 hPa over pressure
- Temperature range: -196 to 300 °C (vacuum side)

### Note

Please note: VCR adapters cannot be installed on the vacuum side of DN 16 flanges due to their size.

### ISO-KF Fluid Feedthrough, Single Tube

#### Dimensions

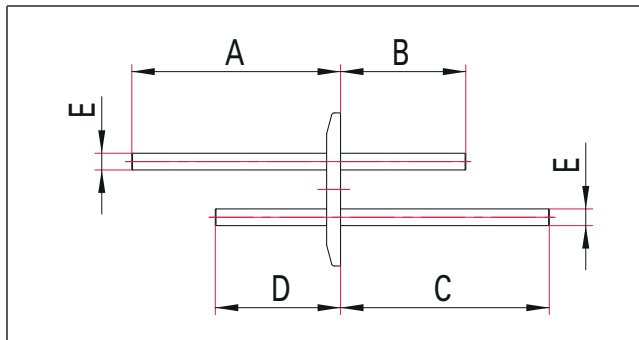


Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	P	P	75	45	6	120XFL016-PP
DN 16 KF	S	S	103	73	6	120XFL016-SS
DN 40 KF	P	P	75	45	6	120XFL040-PP
DN 40 KF	S	S	103	73	6	120XFL040-SS
DN 40 KF	V	V	105	75	6	120XFL040-VV

P = tube end; V = VCR male; S = Swagelok® fitting  
Flanges according to ISO 2861

### ISO-KF Fluid Feedthrough, Double Tube

#### Dimensions



Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 40 KF	P	P	75	45	75	45	6	120XFL040-2-PP
DN 40 KF	S	S	103	73	103	73	6	120XFL040-2-SS
DN 40 KF	V	V	105	75	105	75	6	120XFL040-2-VV

P = tube end; V = VCR male; S = Swagelok® fitting  
Flanges according to ISO 2861

## Fluid Feedthroughs CF

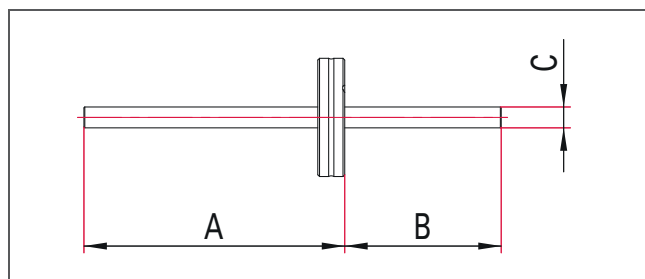
- Flange material: Stainless steel
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure
- Temperature range: -196 to 300 °C (vacuum side)

### Note

Please note: VCR adapters cannot be installed on the vacuum side of DN 16 flanges due to their size.

### CF Fluid Feedthrough, Single Tube

#### Dimensions



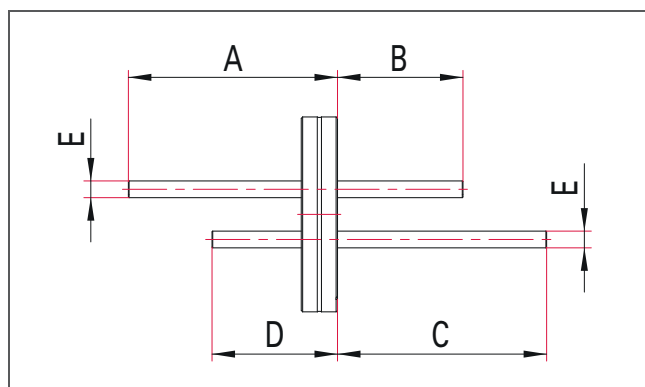
Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	P	P	75	45	6	420XFL016-PP
DN 16 CF	S	S	73	103	6	420XFL016-SS
DN 40 CF	P	P	75	45	6	420XFL040-PP
DN 40 CF	S	S	103	73	6	420XFL040-SS
DN 40 CF	V	V	105	75	6	420XFL040-VV

P = tube end; V = VCR male; S = Swagelok® fitting

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF Fluid Feedthrough, Double Tube

#### Dimensions



Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 40 CF	P	P	75	45	75	45	6	420XFL040-2-PP
DN 40 CF	S	S	104	73	103	73	6	420XFL040-2-SS
DN 40 CF	V	V	105	75	104	74	6	420XFL040-2-VV

P = tube end; V = VCR male; S = Swagelok® fitting

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Fluid Feedthroughs, Thermally insulated ISO-KF

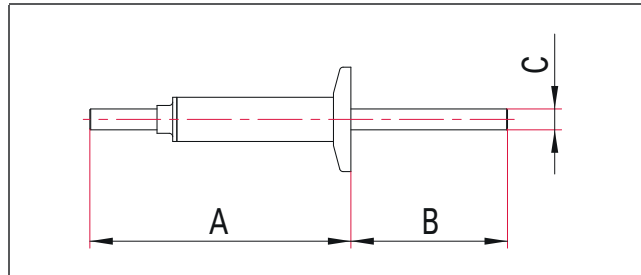
- Flange-tube connection: Thermally insulated tube
- Flange material: Stainless steel
- Suitable for liquid nitrogen
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-8}$  hPa to 1500 hPa over pressure
- Temperature range: -196 to 300 °C (vacuum side)

### Note

Please note: VCR adapters cannot be installed on the vacuum side of DN 16 flanges due to their size.

### ISO-KF Fluid Feedthrough, Single Tube

#### Dimensions

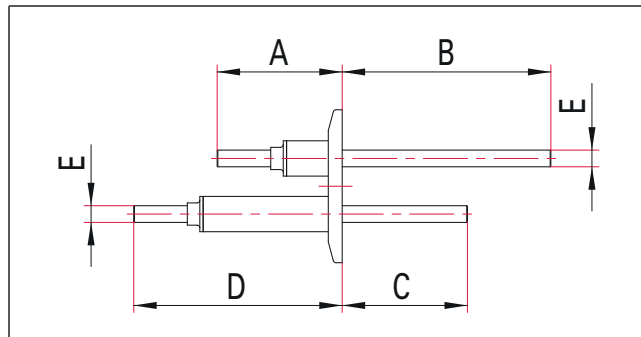


Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	P	P	75	45	6	120XFN016-PP
DN 16 KF	S	S	103	73	6	120XFN016-SS
DN 40 KF	P	P	75	45	6	120XFN040-PP
DN 40 KF	S	S	103	73	6	120XFN040-SS
DN 40 KF	V	V	105	75	6	120XFN040-VV

P = tube end; V = VCR male; S = Swagelok® fitting  
Flanges according to ISO 2861

### ISO-KF Fluid Feedthrough, Double Tube

#### Dimensions



Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 40 KF	P	P	45	75	45	75	6	120XFN040-2-PP
DN 40 KF	S	S	73	103	73	103	6	120XFN040-2-SS
DN 40 KF	V	V	75	105	75	105	6	120XFN040-2-VV

P = tube end; V = VCR male; S = Swagelok® fitting  
Flanges according to ISO 2861



## Fluid Feedthroughs, Thermally insulated CF

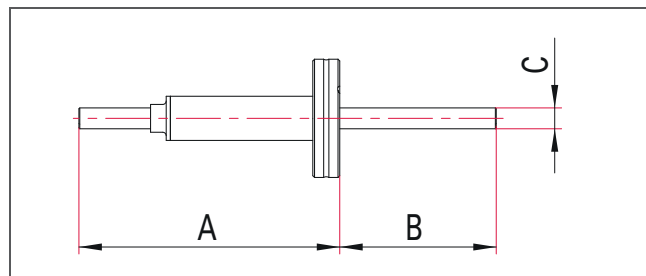
- Flange-tube connection: Thermally insulated tube
- Flange material: Stainless steel
- Suitable for liquid nitrogen
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-11}$  hPa to 1500 hPa over pressure
- Temperature range: -196 to 300 °C (vacuum side)

### Note

Please note: VCR adapters cannot be installed on the vacuum side of DN 16 flanges due to their size.

### CF Fluid Feedthrough, Single Tube

#### Dimensions



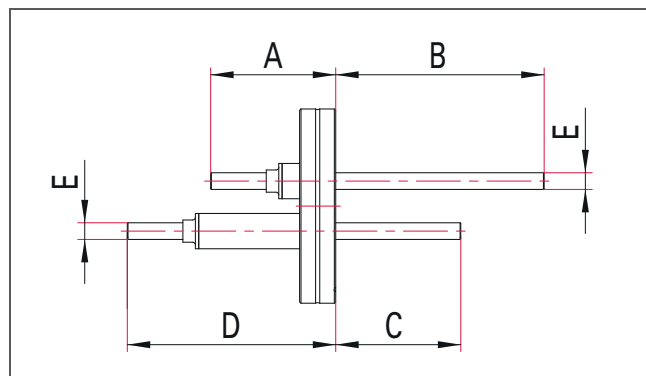
Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	P	P	75	45	6	420XFN016-PP
DN 16 CF	S	S	103	73	6	420XFN016-SS
DN 40 CF	P	P	75	45	6	420XFN040-PP
DN 40 CF	S	S	103	73	6	420XFN040-SS
DN 40 CF	V	V	105	75	6	420XFN040-VV

P = tube end; V = VCR male; S = Swagelok® fitting

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### CF Fluid Feedthrough, Double Tube

#### Dimensions



Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 40 CF	P	P	45	75	45	75	6	420XFN040-2-PP
DN 40 CF	S	S	73	103	73	103	6	420XFN040-2-SS
DN 40 CF	V	V	75	105	75	105	6	420XFN040-2-VV

P = tube end; V = VCR male; S = Swagelok® fitting

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

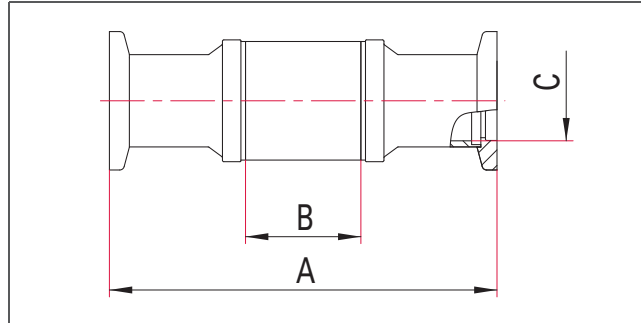
### Isolators ISO-KF



- Stainless steel flange
- Heat up and cool down speed: max. 25 °C/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Temperature range: 0 to 250 °C

#### ISO-KF Isolators

##### Dimensions



Nominal diameter	Voltage [kV]	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	15	92	25	16	120XIS016-15
DN 16 KF	30	117	51	16	120XIS016-30
DN 40 KF	30	104	51	35	120XIS040-30

Flanges according to ISO 2861

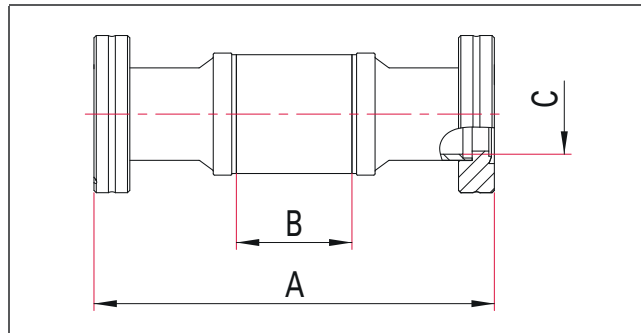
### Isolators CF



- Stainless steel flange
- Heat up and cool down speed: max. 25 °C/min
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-11}$  hPa to ambient pressure
- Temperature range: 0 to 250 °C

#### CF Isolators

##### Dimensions



Nominal diameter	Voltage [kV]	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	15	92	25	16	420XIS016-15
DN 16 CF	30	117	51	16	420XIS016-30
DN 40 CF	30	107	51	35	420XIS040-30

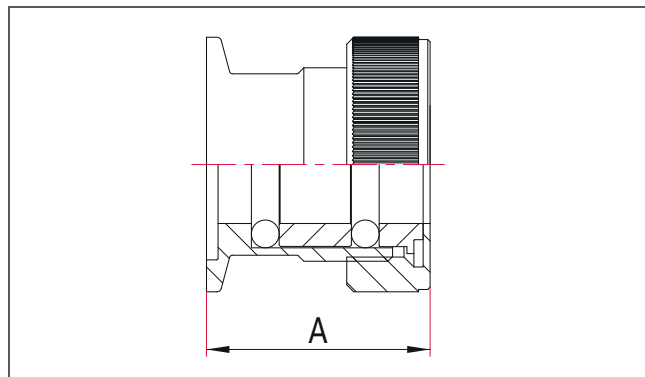
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Tube Compression Fittings ISO-KF



- Tube can be fed through
- Manual opening and closing
- Double-sealed with FKM O-rings
- Pressure range:  $1 \cdot 10^{-7}$  hPa to ambient pressure
- Temperature range: -15 to 130 °C

### Dimensions



### Stainless Steel 304/1.4301

Nominal diameter	Tube diameter [mm]	A [mm]	Order number
DN 16 KF	10	38	120XQV016-10
DN 16 KF	12	38	120XQV016-12
DN 25 KF	16	45	120XQV025-16
DN 40 KF	20	46	120XQV040-20
DN 40 KF	25	46	120XQV040-25

## Bellows-sealed Rotary Feedthrough



420MRB016

- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Stainless steel ball bearing with dry lubrication, suitable for UHV
- Mode of operation: DN 16: Operating handle with snap-in stages in 10 ° increments; DN 40: shaft connections on both sides
- Operating temperature: DN 16: up to 80 °C; DN 40: up to 300 °C
- Tightness:  $< 1 \cdot 10^{-11} \text{ Pa m}^3/\text{s}$
- Pressure range:  $1 \cdot 10^{-9} \text{ hPa}$  to 500 hPa over pressure
- Mounting orientation: any
- Materials: Stainless steel

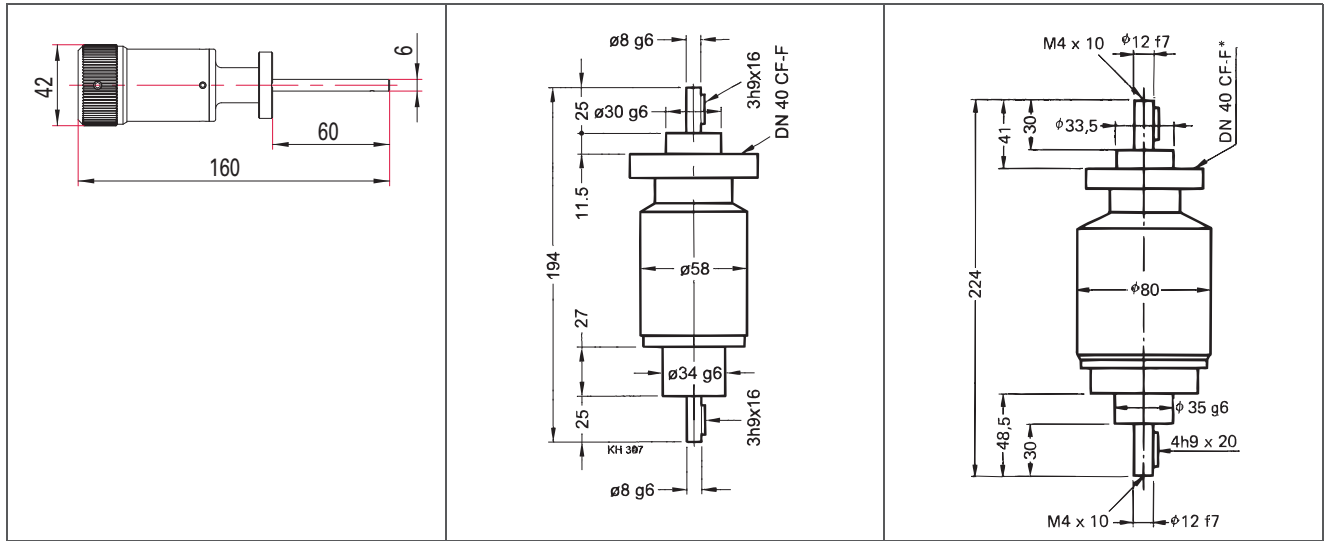


PF 621 010-T  
PF 621 012-T

**Note**

Options for 420MRB: customized shaft

**Dimensions**



420MRB016

PF 621 010-T

PF 621 012-T

**Manual/Shaft Connections**

Nominal diameter	Transferable torque static [Nm]	Transferable torque dynamic [Nm]	Shaft load, axial [N]	Shaft load, radial [N]	Thread	Order number
DN 16 CF	0.1	0.2	10	20	M3	420MRB016
DN 40 CF-F	3	4	20	60	No	PF 621 010-T
DN 40 CF-F	5	10	30	100	No	PF 621 012-T

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

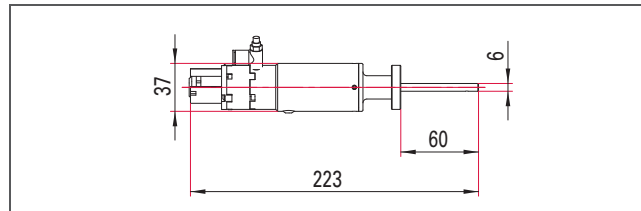
## Bellows-sealed Rotary Feedthrough, Pneumatic



- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Stainless steel ball bearing with dry lubrication, suitable for UHV
- Adjustable swivel speed
- Connection: (compressed air) 6 mm hose connection
- Bakeout temperature: up to 250 °C, pneumatic drive (removable) up to 60 °C
- Mode of operation: Pneumatically operated; double acting
- Operating temperature: up to 60 °C
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Angle of rotation: 0 to 180 ° (final position adjustable)
- Compressed air (overpressure) max.: 0.7 MPa
- Compressed air (overpressure) min.: 0.15 MPa
- Mounting orientation: any
- Materials: Stainless steel
- Service life: 500000 cycles

### Pneumatic

### Dimensions



Nominal diameter	Transferable torque static [Nm]	Transferable torque dynamic [Nm]	Shaft load, axial [N]	Shaft load, radial [N]	Thread	Order number
DN 16 CF	0.1	0.2	10	20	M3	420MRB016-p

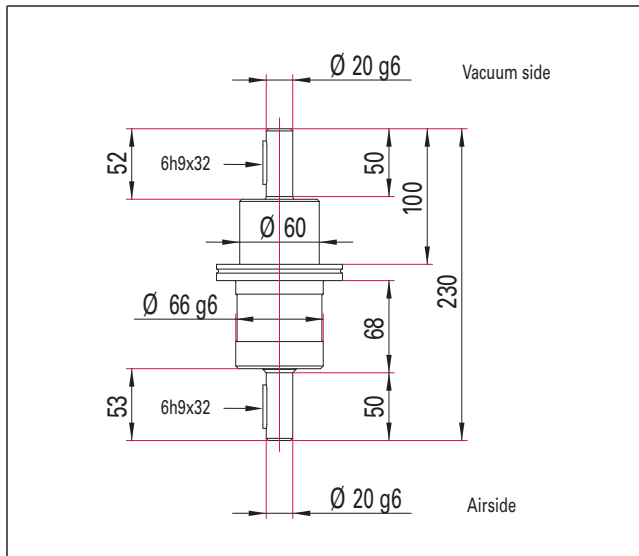
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Elastomer-sealed Rotary Feedthrough DN 63 ISO-K



- With FKM shaft seal and ball bearing, greased to be suitable for vacuum
- Rotary speed can be increased by up to a factor of two if reduced service life is acceptable
- With through shaft for directly transmitting high torques
- Bakeout temperature: 110 °C
- Operating temperature: 50 °C
- Tightness (static):  $1 \cdot 10^{-10}$  Pa m<sup>3</sup>/s
- Seal: FKM
- Rotation speed: 500 min<sup>-1</sup>
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Mounting orientation: any
- Materials: Housing: aluminum; shaft: stainless steel
- Service life (revolutions): 10000000

### Dimensions



### ISO-K

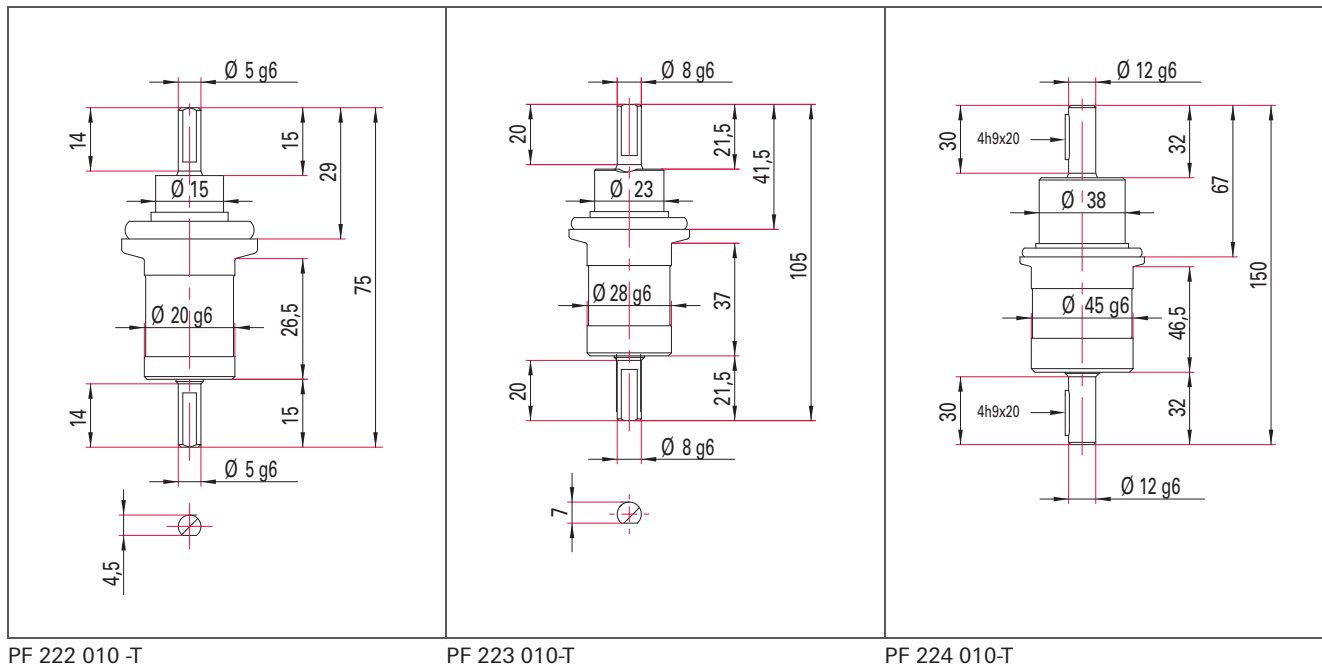
Nominal diameter	Transferable torque [Nm]	Shaft connection [mm]	Shaft load, axial [N]	Shaft load, radial [N]	Order number
DN 63 ISO-K	100	$\varnothing 20 \times 50$	100	500	PF 420 010-T

## Elastomer-sealed Rotary Feedthrough DN 16 - 40 ISO-KF



- With FKM shaft seal and ball bearing, greased to be suitable for vacuum
- Rotary speed can be increased by up to a factor of two if reduced service life is acceptable
- With through shaft for directly transmitting high torques
- With integrated FKM O-ring, installation without additional seal
- Bakeout temperature: 110 °C
- Operating temperature: up to 50 °C
- Tightness (static):  $1 \cdot 10^{-10}$  Pa m<sup>3</sup>/s
- Seal: FKM
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Mounting orientation: any
- Materials: Housing: aluminum; shaft: stainless steel
- Service life (revolutions): 20000000

### Dimensions



### ISO-KF

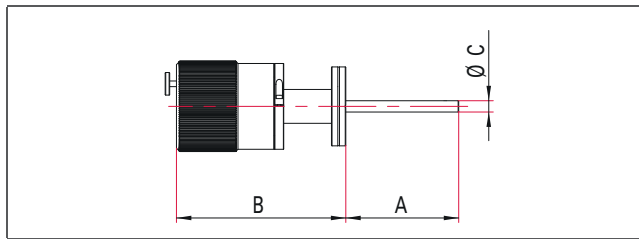
Nominal diameter	Transferable torque [Nm]	Shaft connection [mm]	Shaft load, axial [N]	Shaft load, radial [N]	Order number
DN 16 ISO-KF	1.5	$\varnothing 5 \times 14$	30	60	PF 222 010-T
DN 25 ISO-KF	6	$\varnothing 8 \times 20$	50	150	PF 223 010-T
DN 40 ISO-KF	25	$\varnothing 12 \times 30$	60	250	PF 224 010-T

## Rotary Magnetic Feedthrough



- Magnetic coupling with samarium-cobalt magnets
- Stainless steel ball bearing with dry lubrication, suitable for UHV
- Hermetically sealed, suitable for UHV
- Fixing brake
- Bakeout temperature: 200 °C
- Operating temperature: -15 to 80 °C
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Angle of rotation: 360 °
- Pressure range:  $1 \cdot 10^{-10}$  hPa to 500 hPa over pressure
- Scale: (DN 40) Accuracy of reading 1/10 °
- Shaft connection: with threaded hole, vented: DN 16: M3x6; DN 40: M5x10

### Dimensions



### Note

Upon exceeding the maximum torque, the magnets snap into the next stable position, the feedthrough does not suffer any damage.

### Manual

Nominal diameter	A [mm]	B [mm]	C [mm]	Torque [Nm]	Order number
DN 16 CF	50	82	6	0.5	420MRM016
DN 40 CF	100	150	10	8	420MRM040

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

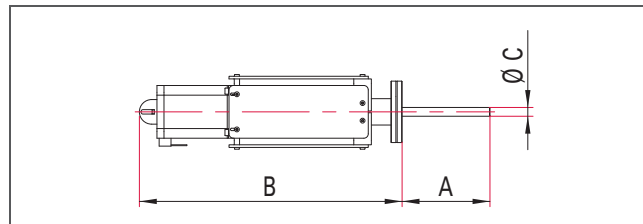


## Rotary Magnetic Feedthrough, Motorized

- Magnetic coupling with samarium-cobalt magnets
- Stainless steel ball bearing with dry lubrication, suitable for UHV
- Hermetically sealed, suitable for UHV
- Bakeout temperature with electric parts: 80 °C
- Bakeout temperature without electric parts: 200 °C
- Operating temperature: -10 to 50 °C
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Angle of rotation: 360 °
- Pressure range:  $1 \cdot 10^{-10}$  hPa to 500 hPa over pressure
- Shaft connection: with threaded hole, vented: DN 16: M3x6; DN 40: M5x10

### Motorized

#### Dimensions



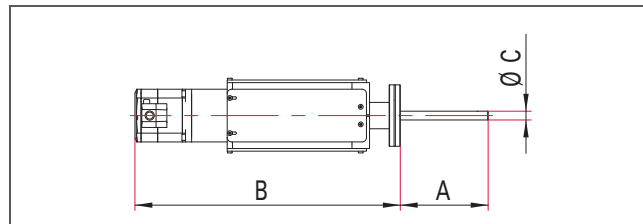
- Torque: max. 3 Nm
- Rotation speed: 500 min<sup>-1</sup>
- Transmission: optional available
- Motor version: 2-phase stepper motor

Nominal diameter	A [mm]	B [mm]	C [mm]	Lowest angular resolution [°]	Order number
DN 40 CF	100	299	10	0.45	420MRM040-m

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### Motorized, high precision

#### Dimensions



- Including resolver control, driver and controller
- Torque: max. 8 Nm
- Rotation speed: 30 min<sup>-1</sup>
- Transmission: backlash-free Harmonic Drive® gear (gear reduction 100:1)
- Motor version: 2-phase stepper motor

Nominal diameter	A [mm]	B [mm]	C [mm]	Lowest angular resolution [°]	Order number
DN 40 CF	100	302	10	0.0036	420MRM040-hm

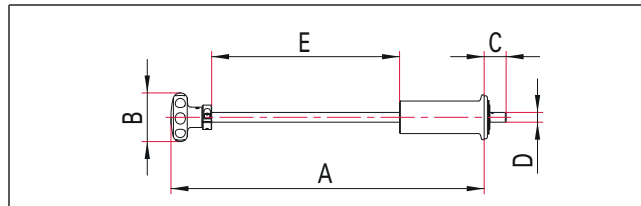
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Elastomer-sealed Rotary/Linear Feedthrough Long Version MDD



- Direct power transmission using elastomer-sealed shaft
- Shaft made from hardened stainless steel, diameter 12 mm
- Freely rotatable and slidable
- Adjustable stroke limiting stops
- Bakeout temperature: 200 °C
- Operating temperature: -15 to 150 °C
- Tightness (static):  $1 \cdot 10^{-10}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Lubricant: Perfluoropolyether grease
- Transferable torque dynamic: 20 Nm
- Shaft connection: with threaded hole, vented: M6x12
- Shaft load, axial: 100 N

### Dimensions



### Note

Options: additional stroke lengths, motor drive, alternative vacuum grease: mineral or silicone grease

### Elastomer-sealed Rotary/Linear Feedthrough Long Version

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 40 KF	404	60	27	12	250	120MDD040-0250
DN 40 KF	654	60	27	12	500	120MDD040-0500
DN 40 KF	904	60	27	12	750	120MDD040-0750

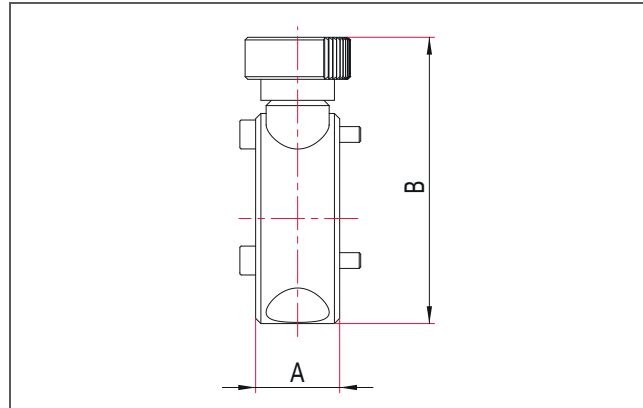
Flanges according to ISO 2861

## Clamping Device for Rotary/Linear Feedthroughs MDD



- To fix the guide rod in any position
- Can be installed after system installation and removed again as desired
- Bakeout temperature: 200 °C

### Dimensions



### Clamping Device for Rotary/Linear Feedthroughs MDD

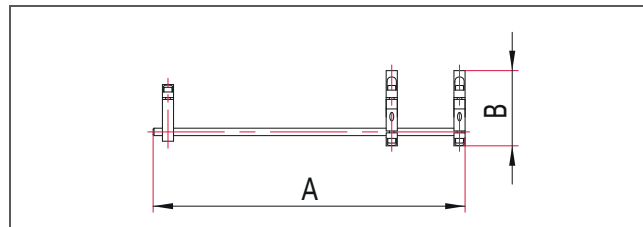
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 KF	16	55	120MDD-B

## Anti-twist Lock for Rotary/Linear Feedthroughs MDD



- Fixes angle position if only linear movement is to be transferred
- Can be installed after system installation and removed again as desired
- Bakeout temperature: 200 °C

### Dimensions



### Anti-twist Lock for Rotary/Linear Feedthroughs MDD

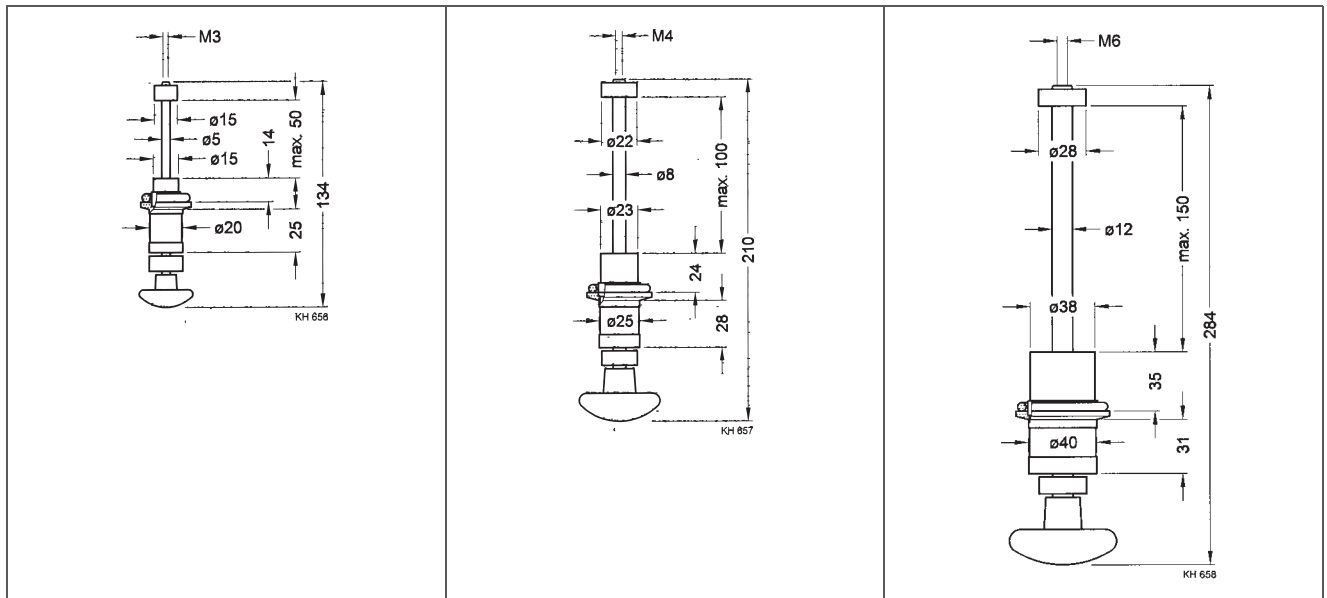
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 KF	386	81	120MDD040-0250-VS
DN 40 KF	636	81	120MDD040-0500-VS
DN 40 KF	886	81	120MDD040-0750-VS

## Elastomer-sealed Rotary/Linear Feedthrough DS



- Direct power transmission using elastomer-sealed shaft
- Freely rotatable and slidable
- Adjustable stroke limiting stops
- Bakeout temperature: 110 °C
- Operating temperature: max. 50 °C
- Tightness (static):  $1 \cdot 10^{-10}$  Pa m<sup>3</sup>/s
- Seal: FKM
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Materials: Housing: aluminum; shaft: stainless steel

### Dimensions



PF 242 010 -T

PF 243 010 -T

PF 244 011 -T

### Elastomer-sealed Rotary/Linear Feedthrough

Nominal diameter	Load capacity radial: at max. displacement [N]	Load capacity radial: at max. displacement [Nm]	Stroke [mm]	Shaft connection	Order number
DN 16 ISO-KF	10	2	50	M3 x 6 / ø 5 mm	PF 242 010 -T
DN 25 ISO-KF	15	8	100	M4 x 8 / ø 8 mm	PF 243 010 -T
DN 40 ISO-KF	30	20	150	M6 x 10 / ø 12 mm	PF 244 011 -T

## Anti-twist Lock for Rotary/Linear Feedthroughs DS

- Fixes angle position if only linear movement is to be transferred
- Can be installed after system installation and removed again as desired
- Bakeout temperature: 200 °C

### Anti-twist Lock for Rotary/Linear Feedthroughs DS

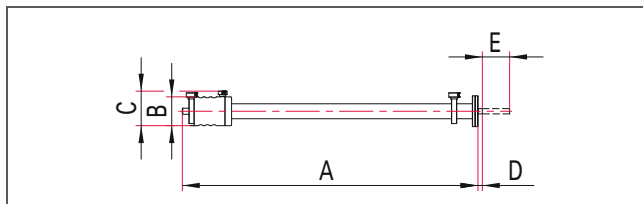
Nominal diameter	Length [mm]	Order number
DN 16 CF	50	PT 226 978 -T
DN 25 CF	100	PT 226 979 -T
DN 40 CF	150	PT 226 980 -T

## Magnetically Guided Rotary/Linear Feedthrough MDM



- Stainless steel ball bearing for linear and rotational movement with dry lubrication suitable for UHV
- Magnetic coupling with samarium-cobalt magnets
- Hermetically sealed, suitable for UHV
- Shaft made from hardened stainless steel, diameter 12 mm
- Freely rotatable and slidable
- Adjustable stroke limiting stops
- Bakeout temperature: 200 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-10}$  hPa to 500 hPa
- Transferable torque: 2.3 Nm
- Shaft connection: threaded hole, vented: M6x15
- Shaft load, axial: 50 N

### Dimensions



### Note

Options: additional stroke lengths, additional flange sizes, higher axial force and higher torque

### Magnetically Guided Rotary/Linear Feedthrough

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 40 CF	422	65.5	79	20	250	420MDM040-0250
DN 40 CF	672	65.5	79	20	500	420MDM040-0500
DN 40 CF	922	65.5	79	20	750	420MDM040-0750

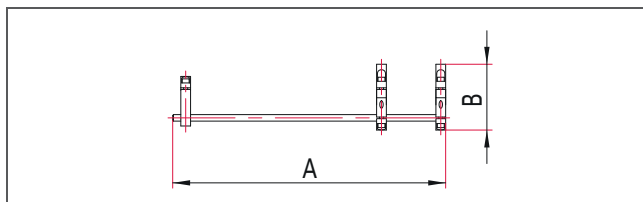
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Anti-twist Lock for Rotary/Linear Feedthroughs MDM



- Fixes angle position if only linear movement is to be transferred
- Angle position adjustable
- Can be installed after system installation and removed again as desired
- Bakeout temperature: 200 °C

### Dimensions



### Anti-twist Lock for Rotary/Linear Feedthroughs MDM

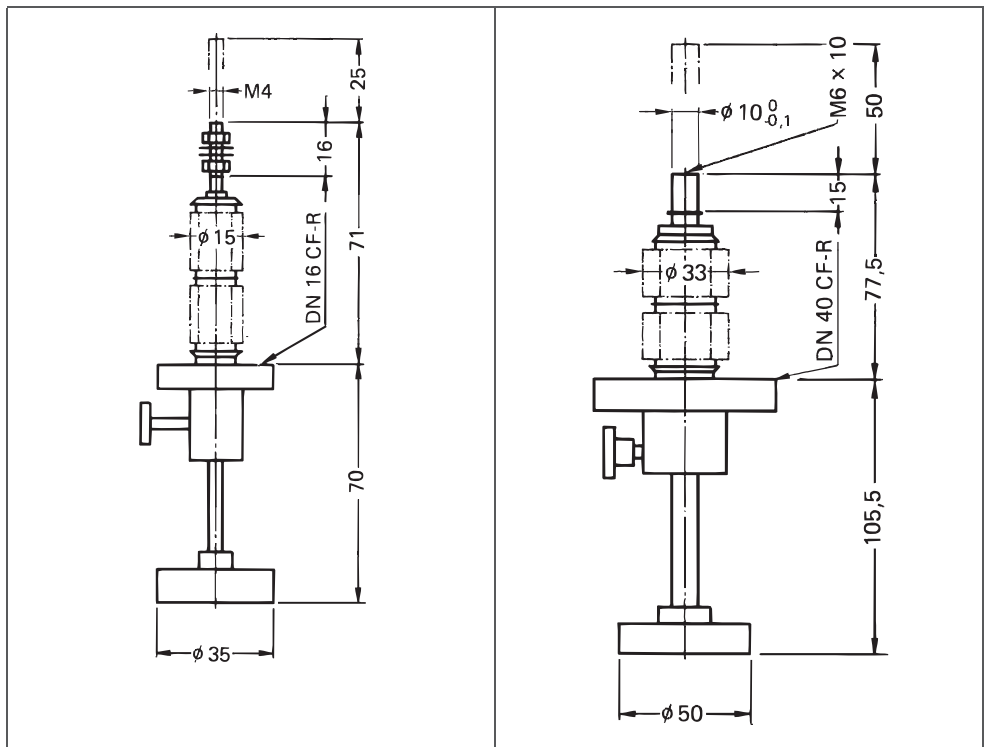
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 CF	381	103	420MDM040-0250-VS
DN 40 CF	631	103	420MDM040-0500-VS
DN 40 CF	881	103	420MDM040-0750-VS

## Bellows-sealed Linear Feedthrough



- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Direct manual push/pull actuation
- With setscrew
- Bakeout temperature: up to 300 °C
- Load capacity radial: at max. displacement: DN 16: 20 N; DN 40: 100 N
- Load capacity: torsion: DN 16: 0.2 Nm; DN 40: 0.5 Nm
- Mode of operation: handle
- Operating temperature: up to 300 °C
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure
- Mounting orientation: any
- Materials: Stainless steel; hand knob: aluminum
- Service life: 10000 cycles

### Dimensions



PF 630 010-T

PF 631 010-T

### Manual

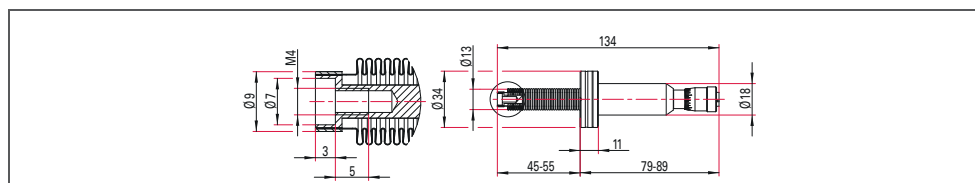
Nominal diameter	Stroke [mm]	Shaft load, axial: to atmosphere [N]	Shaft load, axial: to vacuum [N]	Order number
DN 16 CF-R	25	100	85	PF 630 010-T
DN 40 CF-R	50	200	140	PF 631 010-T

## Bellows-sealed Precision Linear Feedthrough

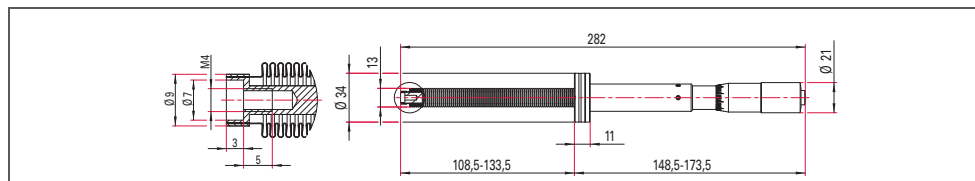
- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Bakeout temperature: feedthrough: up to 300 °C
- Bakeout temperature: micrometer screw/piston: up to 100 °C
- Mode of operation: Micrometer screw
- Operating temperature: up to 50 °C
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure
- Mounting orientation: any
- Service life: 10000 cycles

### Manual, Fine

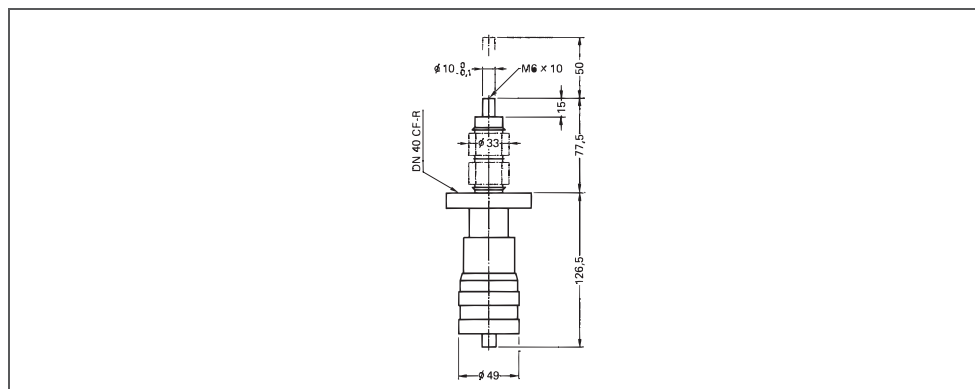
#### Dimensions



420MZF016-010



420MZF016-025

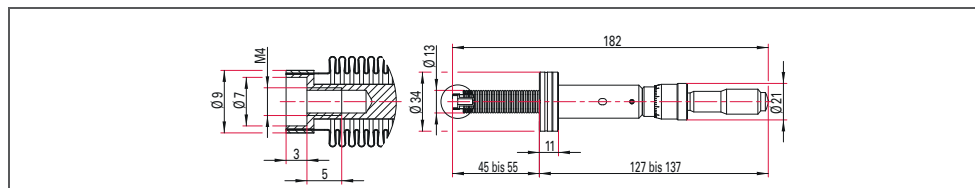


PF 631 012-T

Nominal diameter	Stroke [mm]	Resolution [ $\mu$ m]	Accuracy [ $\mu$ m]	Order number
DN 16 CF	10	5	5	420MZF016-010
DN 16 CF	25	10	10	420MZF016-025
DN 40 CF-R	50	5	5	PF 631 012-T

### Manual, Superfine

#### Dimensions



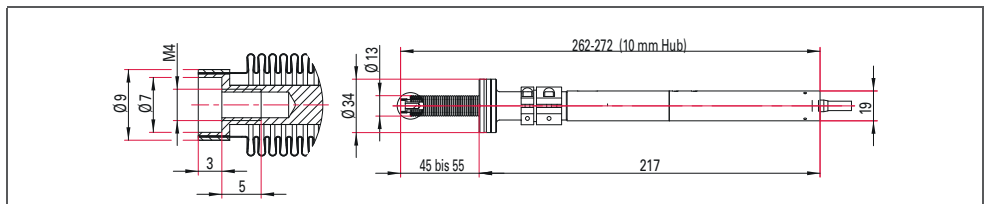
Nominal diameter	Stroke [mm]	Resolution [ $\mu$ m]	Accuracy [ $\mu$ m]	Order number
DN 16 CF	10	0.5	3	420MZF016-010-s

## Bellows-sealed Precision Linear Feedthrough Motorized

- Hermetically sealed, suitable for UHV
- Bellows-sealed
- For motorized fine positioning of components in the vacuum
- Maximum load moment on bellows: 0.2 Nm
- Easy bakeout with comfortable motor disassembly and position fixing device
- Bakeout temperature with electric parts: 70 °C
- Bakeout temperature without electric parts: 200 °C
- Axial force: max. 45 N
- Fixation: Screw M4 x 5 (on actuator)
- Operating temperature: max. 65 °C
- Pressure range:  $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure
- Service life: 10000 cycles
- Motor version: 2-phase stepper motor

### Motorized, 10 mm Adjustment Travel

#### Dimensions

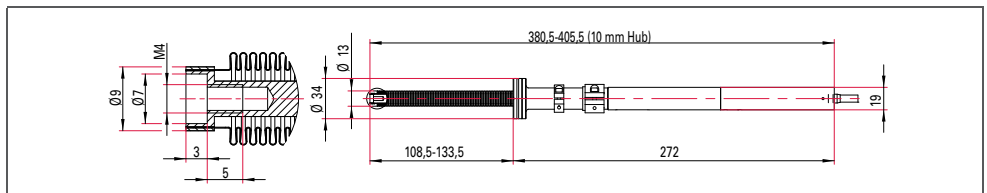


Nominal diameter	Stroke [mm]	Resolution [ $\mu\text{m}$ ]	Accuracy [ $\mu\text{m}$ ]	Order number
DN 16 CF	10	0.05	3	420MZF016-010-m

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2.

### Motorized, 25 mm Adjustment Travel

#### Dimensions



Nominal diameter	Stroke [mm]	Resolution [ $\mu\text{m}$ ]	Accuracy [ $\mu\text{m}$ ]	Order number
DN 16 CF	25	0.05	3	420MZF016-025-m

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2.







# Manipulators

Movement and positioning in the vacuum



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## Manipulators

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## Movement and positioning in the vacuum

Movement often needs to be transmitted by vacuum sealed manipulators or mechanical feedthroughs to push, rotate or tilt probes or components such as measuring and analytical equipment within the vacuum. Devices which have free flange connections on both sides and an open passageway are referred to as manipulators while components whose actuators are installed vacuum sealed in a flange are referred to as mechanical feedthroughs. The latter are characterized by their compact design. Manipulators may be combined with each other and expanded. In addition, mechanical feedthroughs can be fitted onto them. Thus a wide range of movements can be transferred into the vacuum and wide-ranging tasks can be performed.

Manipulator flanges are subjected to sizable forces due to atmospheric pressure, particularly where large nominal diameters are involved. To ensure that flanges remain in a stable position even under vacuum, we place great importance on the inherent rigidity when designing our manipulators and optimize them by using the Finite Elements Method (FEM) in our calculations. Together with the installation of high quality mechanical components this means that movements are extremely precise, smooth and free of play with excellent reproducibility. The low wear also means higher reliability and a very long service life.

Pfeiffer Vacuum offers a large selection of manipulators and mechanical feedthroughs for axial and lateral movements, for rotation and angle shifting. In addition to manually operated equipment we also offer motor drives for automated processes.





## Features at a glance

	Nominal diameter					Deflection		Axial hub								Rotary and adjusting angle			Resolution					Actuator type			Page									
	DN 16	DN 25	DN 40	DN 63	DN 100	+/- 12,5 mm	+/- 25 mm	10 mm	25 mm	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm	500 mm	750 mm	3°	180°	360°	0.05 µm	0.5 µm	1 µm	1.25 µm	2 µm		5 µm	10 µm	Manual	Motorized	Pneumatic				
<b>Manipulators</b>																																				
Z-axis manipulators			■	■	■						■	■	■		■	■																■	■		362	
XY-axis manipulators			■	■	■	■	■																	■	■	■	■					■	■		364	
XYZ-axis manipulators			■			■					■	■	■		■	■																■			366	
Rotary manipulators			■	■	■																■											■			367	
Adjusting devices for angle and length compensation			■	■	■				■										■													■			368	
Bellows-sealed rotary feedthroughs	■		■																	■	■											■		■	369	
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Magnetic rotary feedthroughs	■		■																		■											■	■		373	
Elastomer sealed rotary/linear feedthroughs	■	■	■										■				■	■			■											■			375	
Magnetic rotary/linear feedthroughs			■										■				■	■			■											■			378	
Bellows-sealed linear feedthroughs	■		■					■	■	■													■	■								■	■	■	■	379

**Customer benefits**

- A wide variety of movements possible
- Highest precision and excellent reproducibility
- Can be used in automation processes
- High reliability
- Very long service life



Z-/XY-/XYZ-Precision manipulators



Rotary manipulators



Port aligner

## Series

**Z-/XY-/XYZ-Precision manipulators** have a metallic seal through welded diaphragm bellows and are designed for ambient pressure of up to  $10^{-10}$  hPa. We supply standard versions in nominal diameter DN 40 CF to DN 100 CF axial travel of up to 400 mm and lateral movements of up to  $\pm 25$  mm actuated both manually and with multiphase motors.

**Rotary manipulators** in the nominal diameter DN 40 CF to DN 100 CF have PTFE sliding gaskets with two differentially pumped intermediate spaces. They are used in a pressure range from atmospheric pressure up to  $10^{-10}$  hPa.

**Port aligners** serve as angle ( $3^\circ$ ) and length ( $\pm 5$  mm) compensation in the nominal diameter DN 40 CF to DN 100 CF. They have a metallic seal through welded diaphragm bellows and are designed for ambient pressure of up to  $10^{-10}$  hPa.

**Rotary feedthroughs** are available in three vacuum sealed versions: hermetically sealed with diaphragm bellows and UHV capable, or magnetically coupled or elastomer sealed with FKM shaft seals for transferring high torques. The diaphragm bellows-sealed and elastomer-sealed versions have free shaft ends on the air side to enable drive units to be mounted. Magnetically coupled rotary feedthroughs do not have any free shaft ends. We therefore supply them as manually operated and motor driven versions.

**Rotary/Linear feedthroughs** are available in two vacuum sealed versions; as a hermetically sealed and magnetically coupled UHV version, and as an elastomer-sealed version using FKM seals for transferring high torques.

**Linear feedthroughs** for the transmission of linear movements in the pressure range of  $10^{-9}$  hPa to 1000 hPa overpressure are hermetically sealed with welded corrugated bellows. They are fitted with micrometer screws or are motorized for precision movements.



## General information

All manipulators and mechanical feedthroughs from Pfeiffer Vacuum are helium leak tested and have leak rates better than  $10^{-10}$  Pa m<sup>3</sup>/s in an ISO-KF and ISO-K and  $10^{-11}$  Pa m<sup>3</sup>/s in a CF version.

## Important information relating to the technical data

The minimum final pressure that can be attained in the overall system depends on a number of factors, in particular the pump system, the desorption rates, the interior surface and the pump-down time. Minimum pressures listed in the product descriptions are empirical values that can be achieved with a well designed vacuum system. In individual cases they may be exceeded or not achieved. When using elastomer seals the gas permeability (permeation) also needs to be taken into account. This is dependent on the material, temperature and type of gas.

The permissible upper and lower temperature limits for the overall system are based on the lowest upper value and the highest lower value for the system components involved. The flange connections of the components were developed to provide vacuum sealed connections. They can only bear limited mechanical loads. It is therefore necessary to examine whether structural or dynamic loads need to be borne by additional elements (e. g. brackets) when designing a vacuum system.



Rotary feedthroughs



Rotary/linear feedthroughs



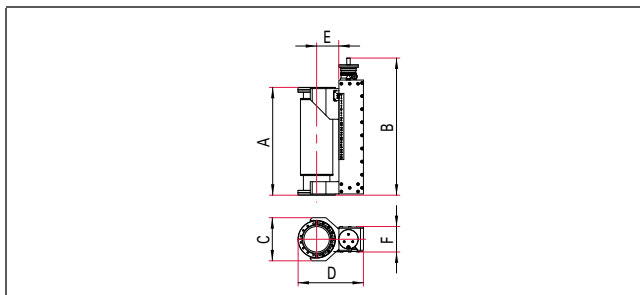
Linear feedthroughs

## Z-Axis Precision Manipulator



- Recirculating ball guidance system and recirculating ball bearing drive
- Zero-backlash and no stick-slip effect
- Guidance and drive wear-free and maintenance-free
- Extremely stable design concept minimizes position offset due to pressure changes
- Fixing brake prevents independent movement
- Connection flange with through holes, traversable flange with threaded holes
- Bakeout temperature: 230 °C
- Operating temperature: -15 to 80 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-10}$  hPa to ambient pressure
- Mounting orientation: any
- Inner diameter: DN 40: 38 mm; DN 63: 65 mm; DN 100: 102 mm
- Service life: min. 10000 cycles at full deflection (bellows easy to replace)
- Materials: Stainless steel (bellows: 316L, flange and tube: 304L, housing: 304)

### Dimensions



### Note

Options: additional travel ways, more cycles for bellows, spindle tolerance class IT3 or IT1 (standard IT5), kit for converting to motorized drive, FEM-simulation for custom load and installation

### Customer benefit

- Maximum accuracy and excellent reproducibility
- Very long service life
- High reliability
- Easy, ergonomic operability

### Z-Axis Precision Manipulator

- Resolution: 5 µm
- Repeatable precision: 5 µm

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 40 CF	150 to 250	370	84	175	50	82	420MZA040-100
DN 40 CF	150 to 300	420	84	175	50	82	420MZA040-150
DN 40 CF	165 to 365	485	84	175	50	82	420MZA040-200
DN 40 CF	190 to 490	610	84	175	50	82	420MZA040-300
DN 40 CF	220 to 620	740	84	175	50	82	420MZA040-400
DN 63 CF	150 to 250	370	128	217	70	82	420MZA063-100
DN 63 CF	150 to 300	420	128	217	70	82	420MZA063-150
DN 63 CF	165 to 365	485	128	217	70	82	420MZA063-200
DN 63 CF	190 to 490	610	128	217	70	82	420MZA063-300
DN 63 CF	220 to 620	740	128	217	70	82	420MZA063-400
DN 100 CF	190 to 290	410	176	267	91	104	420MZA100-100
DN 100 CF	190 to 340	460	176	267	91	104	420MZA100-150
DN 100 CF	190 to 390	510	176	267	91	104	420MZA100-200
DN 100 CF	190 to 490	610	176	267	91	104	420MZA100-300
DN 100 CF	212 to 612	732	176	267	91	104	420MZA100-400

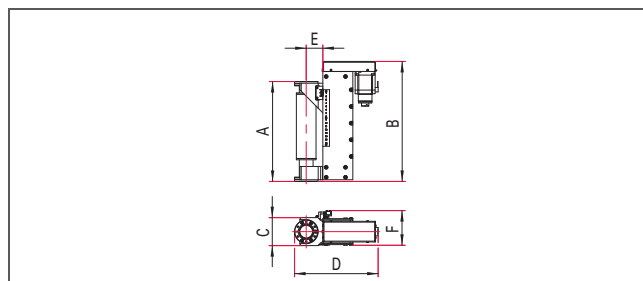
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Z-Axis Precision Manipulator Motorized



- Recirculating ball guidance system and recirculating ball bearing drive
- Zero-backlash and no stick-slip effect
- Guidance and drive wear-free and maintenance-free
- Extremely stable design concept minimizes position offset due to pressure changes
- Adjustable end switches
- Fixing brake (currentless closed) prevents independent movement
- Connection flange with through holes, traversable flange with threaded holes
- Bakeout temperature with electric parts: 80 °C
- Bakeout temperature without electric parts: 230 °C
- Operating temperature: -10 to 50 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-10}$  hPa to ambient pressure
- Mounting orientation: any
- Inner diameter: DN 40: 38 mm; DN 63: 65 mm; DN 100: 102 mm
- Service life: min. 10000 cycles at full deflection (bellows easy to replace)
- Power consumption: motor: 4.8 V DC, max. 2.8 A/phase bipolar parallel; brake: 24 V DC, 0.5 A
- Materials: Stainless steel (bellows: 316L, flange and tube: 304L, housing: 304)
- Motor version: 2-phase stepper motor

### Dimensions



### Note

Options: additional travel ways, more cycles for bellows, displacement sensor, spindle tolerance class IT3 or IT1 (standard IT5), servo or DC motor, FEM-simulation for custom load and installation

### Customer benefit

- Maximum accuracy and excellent reproducibility
- Very long service life
- High reliability
- Suitable for process automation

### Z-Axis Precision Manipulator Motorized

- Resolution: 1.25 μm (at 1/8 motor step)
- Repeatable precision: 1.25 μm (at 1/8 motor step)

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 40 CF	150 to 250	310	84	251	50	104	420MZA040-100-m
DN 40 CF	150 bis 300	360	84	251	50	104	420MZA040-150-m
DN 40 CF	165 to 365	425	84	251	50	104	420MZA040-200-m
DN 40 CF	190 to 490	550	84	251	50	104	420MZA040-300-m
DN 40 CF	220 to 620	680	84	251	50	104	420MZA040-400-m
DN 63 CF	150 to 250	310	128	293	70	104	420MZA063-100-m
DN 63 CF	150 to 300	360	128	293	70	104	420MZA063-150-m
DN 63 CF	165 to 365	425	128	293	70	104	420MZA063-200-m
DN 63 CF	190 to 490	550	128	293	70	104	420MZA063-300-m
DN 63 CF	220 to 620	680	128	293	70	104	420MZA063-400-m
DN 100 CF	190 to 290	350	176	343	91	126	420MZA100-100-m
DN 100 CF	190 to 340	400	176	343	91	126	420MZA100-150-m
DN 100 CF	190 to 390	450	176	343	91	126	420MZA100-200-m
DN 100 CF	190 to 490	550	176	343	91	126	420MZA100-300-m
DN 100 CF	212 to 612	672	176	343	91	126	420MZA100-400-m

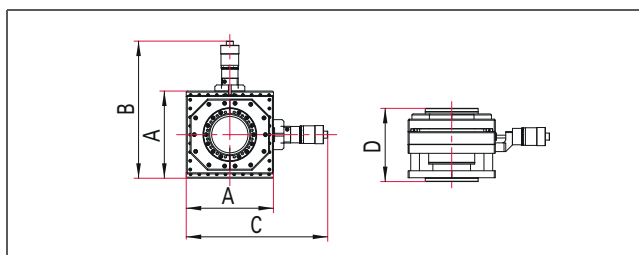
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## XY-Axis Precision Manipulator



- Precision cross roller guides
- Zero-backlash and no stick-slip effect
- Guidance and drive wear-free and maintenance-free
- Extremely stable design concept minimizes position offset due to pressure changes
- Micrometer screws with big knobs - easy to handle and easy to read
- Opposite-sense scale with zero-mid-position
- Maximum x and y deflection fully usable simultaneously
- Connection flange with through holes, traversable flange with threaded holes
- Bakeout temperature: 230 °C
- Operating temperature: -15 to 80 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-10}$  hPa to ambient pressure
- Mounting orientation: any
- Inner diameter: DN 40: 38 mm, DN 63: 65 mm, DN 100: 102 mm
- Service life: min. 10000 cycles at full deflection (bellows easy to replace)
- Materials: bellows: stainless steel 316L, flange and tube: stainless steel 304L, housing: aluminum anodized

### Dimensions



### Note

Options: more cycles for bellows, FEM-simulation for custom load and installation

### Customer benefit

- Maximum accuracy and excellent reproducibility
- Very long service life
- High reliability
- Easy, ergonomic operability

### X/Y Deflection: +/- 12.5 mm

- Repeatability precision:  $< 5 \mu\text{m}$

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Resolution [μm]	Accuracy [μm]	Order number
DN 40 CF	154	270	270	130	5	< 5	420MXY040-12

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### X/Y Deflection: +/- 25 mm

- Repeatability precision:  $< 3 \mu\text{m}$

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Resolution [μm]	Accuracy [μm]	Order number
DN 63 CF	204	371	371	184	2	< 3	420MXY063-25
DN 100 CF	254	394	406	210	2	< 3	420MXY100-25

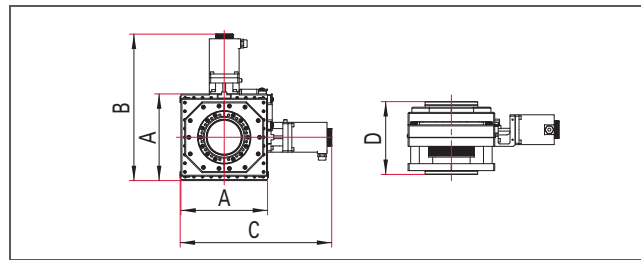
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## XY-Axis Precision Manipulator Motorized



- Precision cross roller guides
- Zero-backlash and no stick-slip effect
- Guidance and drive wear-free and maintenance-free
- Extremely stable design concept minimizes position offset due to pressure changes
- Maximum x and y deflection fully usable simultaneously
- Connection flange with through holes, traversable flange with threaded holes
- Bakeout temperature with electric parts: 80 °C
- Bakeout temperature without electric parts: 230 °C
- Operating temperature: -10 to 50 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-10}$  hPa to ambient pressure
- Mounting orientation: any
- Inner diameter: DN 40: 38 mm, DN 63: 65 mm, DN 100: 102 mm
- Service life: min. 10000 cycles at full deflection (bellows easy to replace)
- Materials: bellows: stainless steel 316L, flange and tube: stainless steel 304L, housing: aluminum anodized
- Motor version: 2-phase stepper motor

### Dimensions



### Note

Options: more cycles for bellows, displacement sensor, FEM-simulation for custom load and installation

### Customer benefit

- Maximum accuracy and excellent reproducibility
- Very long service life
- High reliability
- Suitable for process automation

### X/Y Deflection: +/- 12.5 mm

- Motor with additional micrometer screw for manual adjustment
- Power consumption: Motor: 4.1 V DC, max. 1.2 A/phase bipolar
- Repeatable precision: 3 μm (at full motor step)

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Resolution [μm]	Accuracy [μm]	Order number
DN 40 CF	154	270	270	130	1	< 3	420MXY040-12-m

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### X/Y Deflection: +/- 25 mm

- Motor with additional handwheel for manual adjustment
- Power consumption: Motor: 2 V DC, max. 4 A/phase bipolar
- Repeatable precision: 1.25 μm (at half motor step)

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Resolution [μm]	Accuracy [μm]	Order number
DN 63 CF	204	389	389	184	1.25	< 3	420MXY063-25-m
DN 100 CF	254	423	437	210	1.25	< 3	420MXY100-25-m

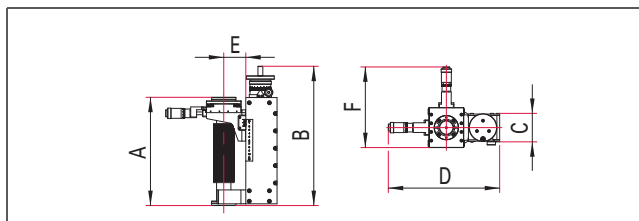
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## XYZ-Axis Precision Manipulator



- Compact design for precise 3-axis manipulation
- Z-axis: recirculating ball bearing guides and ball bearing spindle drives
- XY-axis: precision cross roller guides
- Zero-backlash and no stick-slip effect
- Guidance and drive wear-free and maintenance-free
- Extremely stable design concept minimizes position offset due to pressure changes
- Micrometer screws with big knobs - easy to handle and easy to read
- Z-axis fixing brake prevents independent movement
- Connection flange with through holes, traversable flange with threaded holes
- Resolution: 5 µm
- Bakeout temperature: 230 °C
- Operating temperature: -15 to 80 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-10}$  hPa to ambient pressure
- Mounting orientation: any
- Accuracy:  $< 5$  µm (XY-axis)
- Inner diameter: 38 mm
- Service life: min. 10000 cycles at full deflection (bellows easy to replace)
- Materials: bellows: stainless steel 316L, flange and tube: stainless steel 304L, housing: stainless steel 304, XY-unit: aluminum anodized
- Repeatable precision: 5 µm

### Dimensions



### Note

Options: additional z-axis travel ways, more cycles for bellows, motor drive for one or all axis, spindle tolerance class IT3 or IT1 (standard IT5), FEM-simulation for custom load and installation

### Customer benefit

- Maximum accuracy and excellent reproducibility
- Very long service life
- High reliability
- Easy, ergonomic operability

**X/Y Deflection: +/- 12.5 mm**

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Z-Deflection [mm]	Order number
DN 40 CF	210 to 310	400	82	321	63.5	232	100	420MXYZ040-100
DN 40 CF	210 to 360	450	82	321	63.5	232	150	420MXYZ040-150
DN 40 CF	225 to 425	515	82	321	63.5	232	200	420MXYZ040-200
DN 40 CF	250 to 550	640	82	321	63.5	232	300	420MXYZ040-300
DN 40 CF	280 to 680	770	82	321	63.5	232	400	420MXYZ040-400

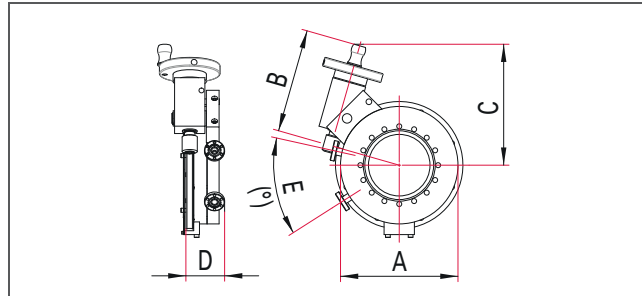
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Rotary Manipulator, Differentially-pumped



- Continuous rotation
- UHV compatible
- Two differentially pumped sections, PTFE-sealed
- Connection differentially-pumped sections: DN16CF
- Resolution: 5  $\mu$ m
- Bakeout temperature: 150 °C
- Operating temperature: max. 50 °C
- Pressure range:  $1 \cdot 10^{-10}$  hPa to ambient pressure
- Mounting orientation: any
- Inner diameter: DN 40: 38 mm; DN 63: 64 mm; DN 100: 102 mm
- Repeatable precision: 5 ' (arc minutes)

### Dimensions



### Note

Options: stepper motor on request

### Rotary Manipulator, differentially pumped

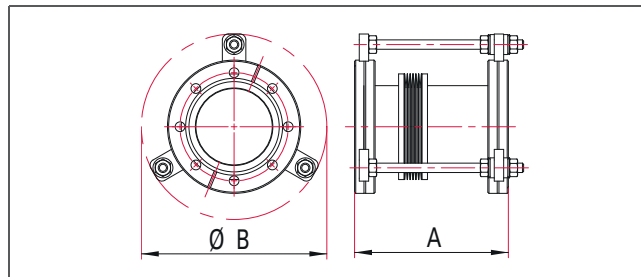
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [°]	Order number
DN 40 CF	115	76	81	41	60	420MDP040
DN 63 CF	146	93	91	48	45	420MDP063
DN 100 CF	197	116	110	54	45	420MDP100

## Port Aligner for Angular and Linear Adjustment



- Ball joint for easy angular adjustment
- Adjustment angle: 3 °
- Maximum angle and stroke simultaneously usable
- Flanges with through holes
- Bakeout temperature: 250 °C
- Axial stroke: +/- 5 mm
- Operating temperature: -15 to 80 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-10}$  hPa to 500 hPa over pressure
- Mounting orientation: any
- Inner diameter: DN 40: 38 mm; DN 63: 65 mm; DN 100: 102 mm
- Service life: Min. 10000 cycles at full deflection
- Materials: Stainless steel (bellows 316L, flange and tube 304L, holders 304)

### Dimensions



### Note

Options: longer axial stroke, shorter design concept

### Port Aligner for Angular and Linear Adjustment

Nominal diameter	A [mm]	B [mm]	Order number
DN 40 CF	105 - 115	115	420MPA040
DN 63 CF	135 - 145	159	420MPA063
DN 100 CF	145 - 155	206	420MPA100

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2



## Bellows-sealed Rotary Feedthrough



420MRB016

- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Stainless steel ball bearing with dry lubrication, suitable for UHV
- Mode of operation: DN 16: Operating handle with snap-in stages in 10 ° increments; DN 40: shaft connections on both sides
- Operating temperature: DN 16: up to 80 °C; DN 40: up to 300 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure
- Mounting orientation: any
- Materials: Stainless steel

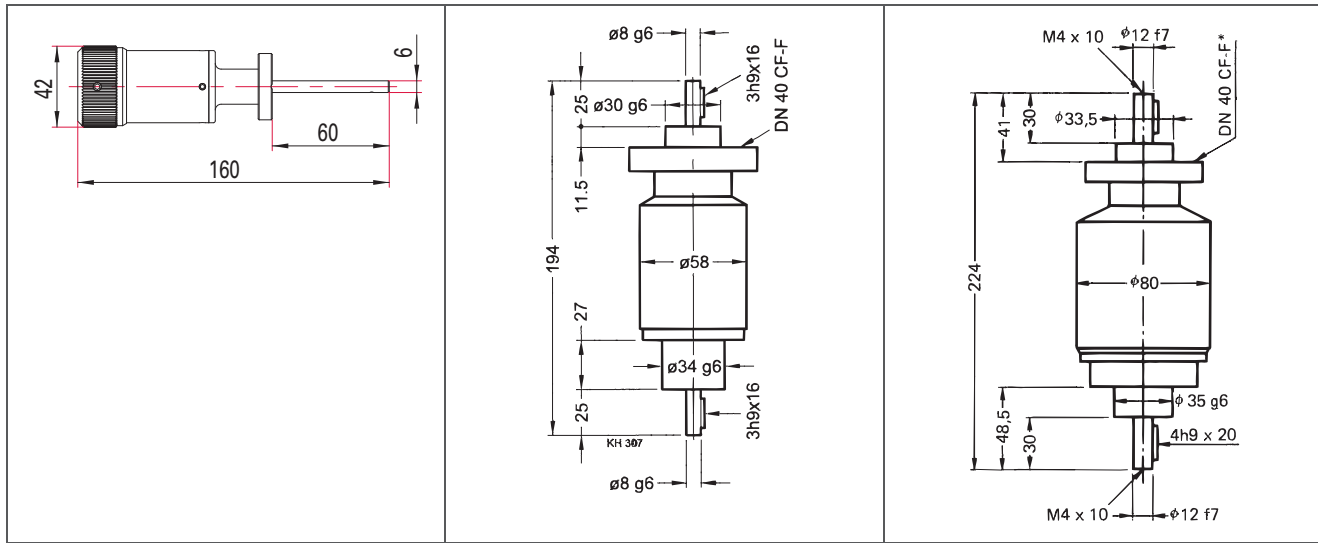


PF 621 010-T  
PF 621 012-T

**Note**

Options for 420MRB: customized shaft

**Dimensions**



420MRB016

PF 621 010-T

PF 621 012-T

**Manual/Shaft Connections**

Nominal diameter	Transferable torque static [Nm]	Transferable torque dynamic [Nm]	Shaft load, axial [N]	Shaft load, radial [N]	Thread	Order number
DN 16 CF	0.1	0.2	10	20	M3	420MRB016
DN 40 CF-F	3	4	20	60	No	PF 621 010-T
DN 40 CF-F	5	10	30	100	No	PF 621 012-T

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

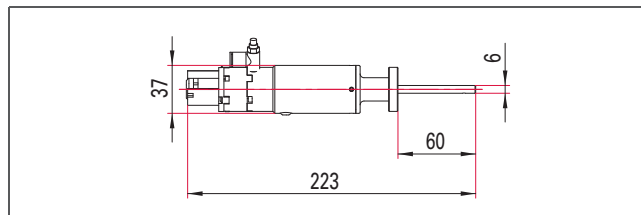
## Bellows-sealed Rotary Feedthrough, Pneumatic



- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Stainless steel ball bearing with dry lubrication, suitable for UHV
- Adjustable swivel speed
- Connection: (compressed air) 6 mm hose connection
- Bakeout temperature: up to 250 °C, pneumatic drive (removable) up to 60 °C
- Mode of operation: Pneumatically operated; double acting
- Operating temperature: up to 60 °C
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Angle of rotation: 0 to 180 ° (final position adjustable)
- Compressed air (overpressure) max.: 0.7 MPa
- Compressed air (overpressure) min.: 0.15 MPa
- Mounting orientation: any
- Materials: Stainless steel
- Service life: 500000 cycles

### Pneumatic

### Dimensions



Nominal diameter	Transferable torque static [Nm]	Transferable torque dynamic [Nm]	Shaft load, axial [N]	Shaft load, radial [N]	Thread	Order number
DN 16 CF	0.1	0.2	10	20	M3	420MRB016-p

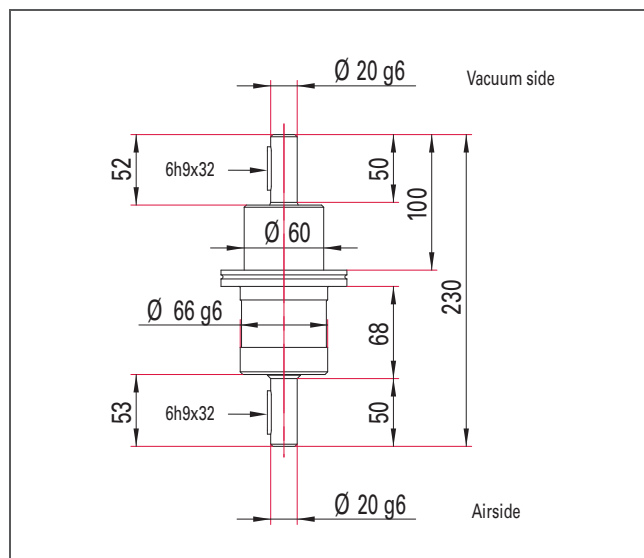
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Elastomer-sealed Rotary Feedthrough DN 63 ISO-K



- With FKM shaft seal and ball bearing, greased to be suitable for vacuum
- Rotary speed can be increased by up to a factor of two if reduced service life is acceptable
- With through shaft for directly transmitting high torques
- Bakeout temperature: 110 °C
- Operating temperature: 50 °C
- Tightness (static):  $1 \cdot 10^{-10}$  Pa m<sup>3</sup>/s
- Seal: FKM
- Rotation speed: 500 min<sup>-1</sup>
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Mounting orientation: any
- Materials: Housing: aluminum; shaft: stainless steel
- Service life (revolutions): 10000000

### Dimensions



### ISO-K

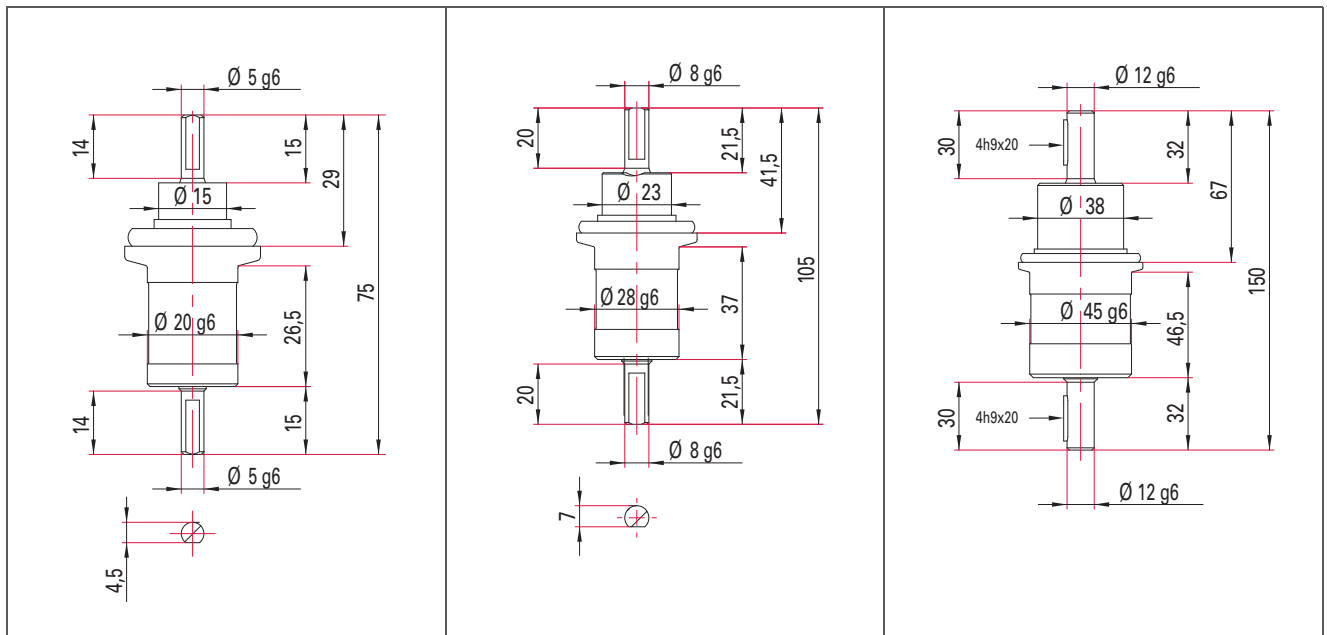
Nominal diameter	Transferable torque [Nm]	Shaft connection [mm]	Shaft load, axial [N]	Shaft load, radial [N]	Order number
DN 63 ISO-K	100	$\varnothing 20 \times 50$	100	500	PF 420 010-T

## Elastomer-sealed Rotary Feedthrough DN 16 - 40 ISO-KF



- With FKM shaft seal and ball bearing, greased to be suitable for vacuum
- Rotary speed can be increased by up to a factor of two if reduced service life is acceptable
- With through shaft for directly transmitting high torques
- With integrated FKM O-ring, installation without additional seal
- Bakeout temperature: 110 °C
- Operating temperature: up to 50 °C
- Tightness (static):  $1 \cdot 10^{-10}$  Pa m<sup>3</sup>/s
- Seal: FKM
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Mounting orientation: any
- Materials: Housing: aluminum; shaft: stainless steel
- Service life (revolutions): 20000000

### Dimensions



PF 222 010 -T

PF 223 010-T

PF 224 010-T

### ISO-KF

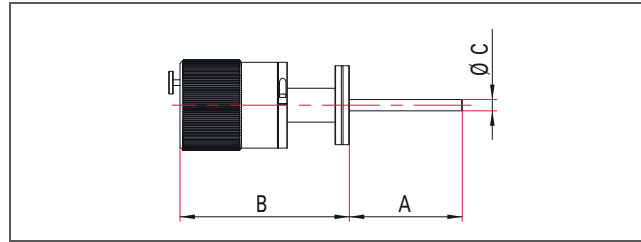
Nominal diameter	Transferable torque [Nm]	Shaft connection [mm]	Shaft load, axial [N]	Shaft load, radial [N]	Order number
DN 16 ISO-KF	1.5	ø 5 x 14	30	60	PF 222 010 -T
DN 25 ISO-KF	6	ø 8 x 20	50	150	PF 223 010-T
DN 40 ISO-KF	25	ø 12 x 30	60	250	PF 224 010-T

## Rotary Magnetic Feedthrough



- Magnetic coupling with samarium-cobalt magnets
- Stainless steel ball bearing with dry lubrication, suitable for UHV
- Hermetically sealed, suitable for UHV
- Fixing brake
- Bakeout temperature: 200 °C
- Operating temperature: -15 to 80 °C
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Angle of rotation: 360 °
- Pressure range:  $1 \cdot 10^{-10}$  hPa to 500 hPa over pressure
- Scale: (DN 40) Accuracy of reading 1/10 °
- Shaft connection: with threaded hole, vented: DN 16: M3x6; DN 40: M5x10

### Dimensions



### Note

Upon exceeding the maximum torque, the magnets snap into the next stable position, the feedthrough does not suffer any damage.

### Manual

Nominal diameter	A [mm]	B [mm]	C [mm]	Torque [Nm]	Order number
DN 16 CF	50	82	6	0.5	420MRM016
DN 40 CF	100	150	10	8	420MRM040

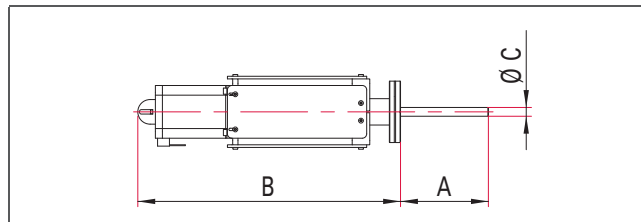
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Rotary Magnetic Feedthrough, Motorized

- Magnetic coupling with samarium-cobalt magnets
- Stainless steel ball bearing with dry lubrication, suitable for UHV
- Hermetically sealed, suitable for UHV
- Bakeout temperature with electric parts: 80 °C
- Bakeout temperature without electric parts: 200 °C
- Operating temperature: -10 to 50 °C
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Angle of rotation: 360 °
- Pressure range:  $1 \cdot 10^{-10}$  hPa to 500 hPa over pressure
- Shaft connection: with threaded hole, vented: DN 16: M3x6; DN 40: M5x10

### Motorized

#### Dimensions



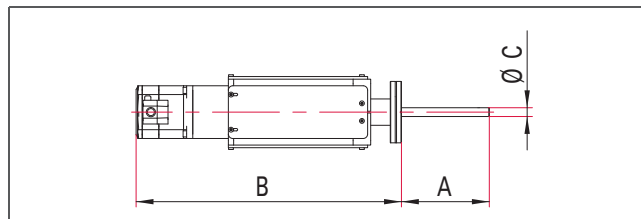
- Torque: max. 3 Nm
- Rotation speed: 500 min<sup>-1</sup>
- Transmission: optional available
- Motor version: 2-phase stepper motor

Nominal diameter	A [mm]	B [mm]	C [mm]	Lowest angular resolution [°]	Order number
DN 40 CF	100	299	10	0.45	420MRM040-m

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

### Motorized, high precision

#### Dimensions



- Including resolver control, driver and controller
- Torque: max. 8 Nm
- Rotation speed: 30 min<sup>-1</sup>
- Transmission: backlash-free Harmonic Drive® gear (gear reduction 100:1)
- Motor version: 2-phase stepper motor

Nominal diameter	A [mm]	B [mm]	C [mm]	Lowest angular resolution [°]	Order number
DN 40 CF	100	302	10	0.0036	420MRM040-hm

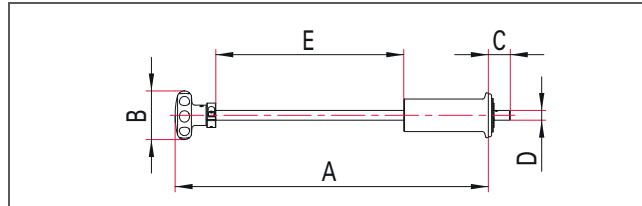
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Elastomer-sealed Rotary/Linear Feedthrough Long Version MDD



- Direct power transmission using elastomer-sealed shaft
- Shaft made from hardened stainless steel, diameter 12 mm
- Freely rotatable and slidable
- Adjustable stroke limiting stops
- Bakeout temperature: 200 °C
- Operating temperature: -15 to 150 °C
- Tightness (static):  $1 \cdot 10^{-10}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Lubricant: Perfluoropolyether grease
- Transferable torque dynamic: 20 Nm
- Shaft connection: with threaded hole, vented: M6x12
- Shaft load, axial: 100 N

### Dimensions



### Note

Options: additional stroke lengths, motor drive, alternative vacuum grease: mineral or silicone grease

### Elastomer-sealed Rotary/Linear Feedthrough Long Version

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 40 KF	404	60	27	12	250	120MDD040-0250
DN 40 KF	654	60	27	12	500	120MDD040-0500
DN 40 KF	904	60	27	12	750	120MDD040-0750

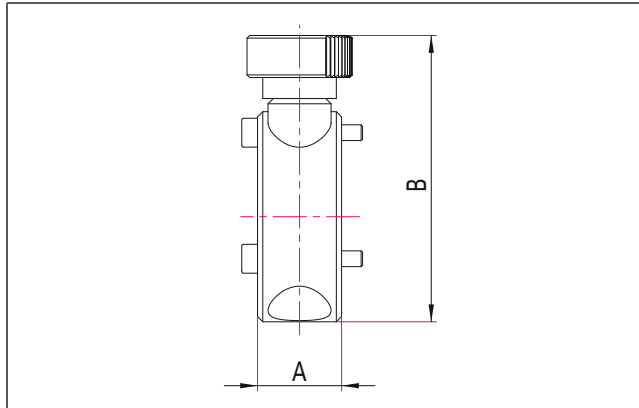
Flanges according to ISO 2861

## Clamping Device for Rotary/Linear Feedthroughs MDD



- To fix the guide rod in any position
- Can be installed after system installation and removed again as desired
- Bakeout temperature: 200 °C

### Dimensions



### Clamping Device for Rotary/Linear Feedthroughs MDD

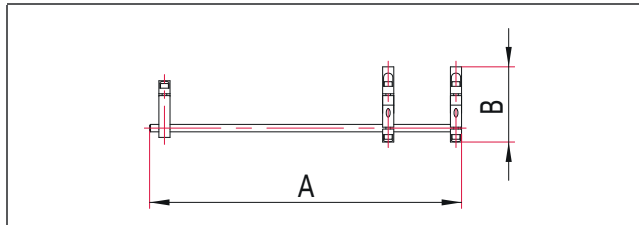
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 KF	16	55	120MDD-B

## Anti-twist Lock for Rotary/Linear Feedthroughs MDD



- Fixes angle position if only linear movement is to be transferred
- Can be installed after system installation and removed again as desired
- Bakeout temperature: 200 °C

### Dimensions



### Anti-twist Lock for Rotary/Linear Feedthroughs MDD

Nominal diameter	A [mm]	B [mm]	Order number
DN 40 KF	386	81	120MDD040-0250-VS
DN 40 KF	636	81	120MDD040-0500-VS
DN 40 KF	886	81	120MDD040-0750-VS

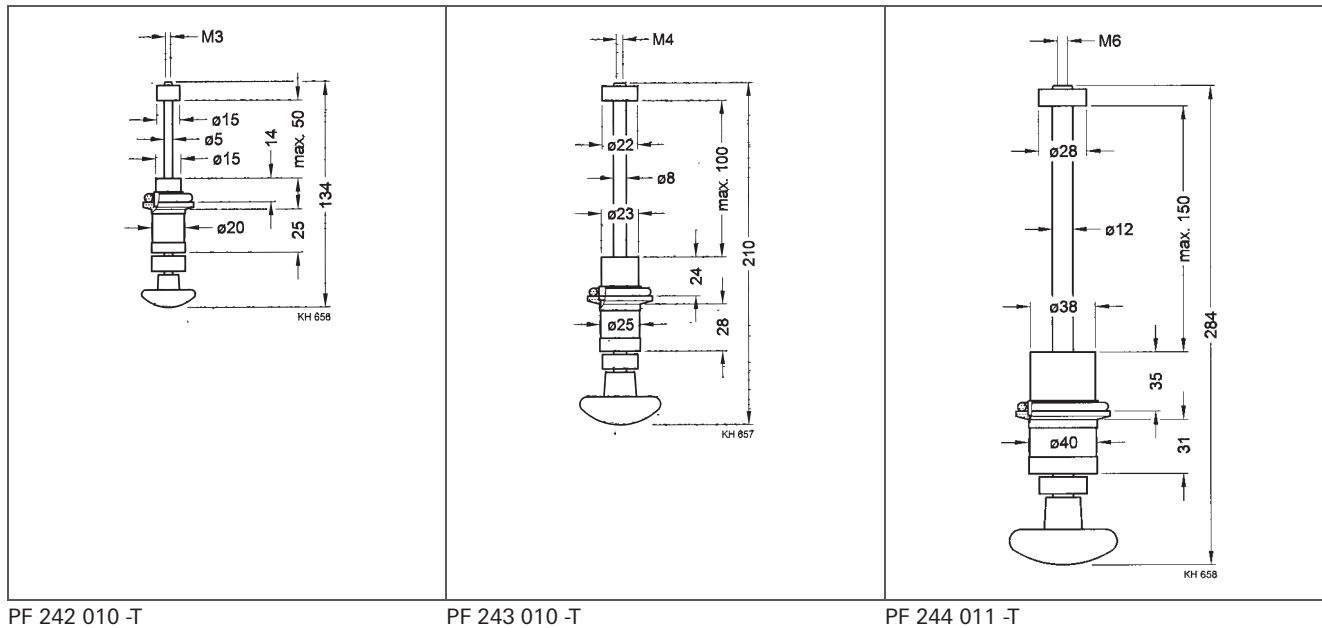


## Elastomer-sealed Rotary/Linear Feedthrough DS



- Direct power transmission using elastomer-sealed shaft
- Freely rotatable and slidable
- Adjustable stroke limiting stops
- Bakeout temperature: 110 °C
- Operating temperature: max. 50 °C
- Tightness (static):  $1 \cdot 10^{-10}$  Pa m<sup>3</sup>/s
- Seal: FKM
- Pressure range:  $1 \cdot 10^{-8}$  hPa to ambient pressure
- Materials: Housing: aluminum; shaft: stainless steel

### Dimensions



### Elastomer-sealed Rotary/Linear Feedthrough

Nominal diameter	Load capacity radial: at max. displacement [N]	Load capacity radial: at max. displacement [Nm]	Stroke [mm]	Shaft connection	Order number
DN 16 ISO-KF	10	2	50	M3 x 6 / $\varnothing$ 5 mm	PF 242 010 -T
DN 25 ISO-KF	15	8	100	M4 x 8 / $\varnothing$ 8 mm	PF 243 010 -T
DN 40 ISO-KF	30	20	150	M6 x 10 / $\varnothing$ 12 mm	PF 244 011 -T

## Anti-twist Lock for Rotary/Linear Feedthroughs DS

- Fixes angle position if only linear movement is to be transferred
- Can be installed after system installation and removed again as desired
- Bakeout temperature: 200 °C

### Anti-twist Lock for Rotary/Linear Feedthroughs DS

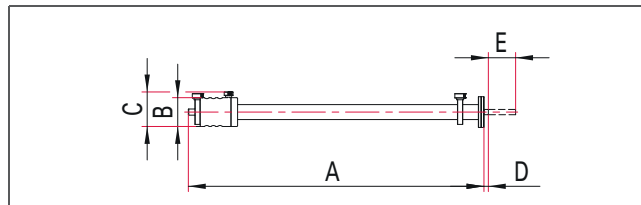
Nominal diameter	Length [mm]	Order number
DN 16 CF	50	PT 226 978 -T
DN 25 CF	100	PT 226 979 -T
DN 40 CF	150	PT 226 980 -T

## Magnetically Guided Rotary/Linear Feedthrough MDM



- Stainless steel ball bearing for linear and rotational movement with dry lubrication suitable for UHV
- Magnetic coupling with samarium-cobalt magnets
- Hermetically sealed, suitable for UHV
- Shaft made from hardened stainless steel, diameter 12 mm
- Freely rotatable and slidable
- Adjustable stroke limiting stops
- Bakeout temperature: 200 °C
- Tightness:  $< 1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-10}$  hPa to 500 hPa
- Transferable torque: 2.3 Nm
- Shaft connection: threaded hole, vented: M6x15
- Shaft load, axial: 50 N

### Dimensions



### Note

Options: additional stroke lengths, additional flange sizes, higher axial force and higher torque

### Magnetically Guided Rotary/Linear Feedthrough

Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 40 CF	422	65.5	79	20	250	420MDM040-0250
DN 40 CF	672	65.5	79	20	500	420MDM040-0500
DN 40 CF	922	65.5	79	20	750	420MDM040-0750

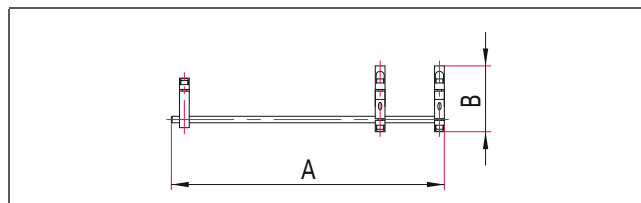
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

## Anti-twist Lock for Rotary/Linear Feedthroughs MDM



- Fixes angle position if only linear movement is to be transferred
- Angle position adjustable
- Can be installed after system installation and removed again as desired
- Bakeout temperature: 200 °C

### Dimensions



### Anti-twist Lock for Rotary/Linear Feedthroughs MDM

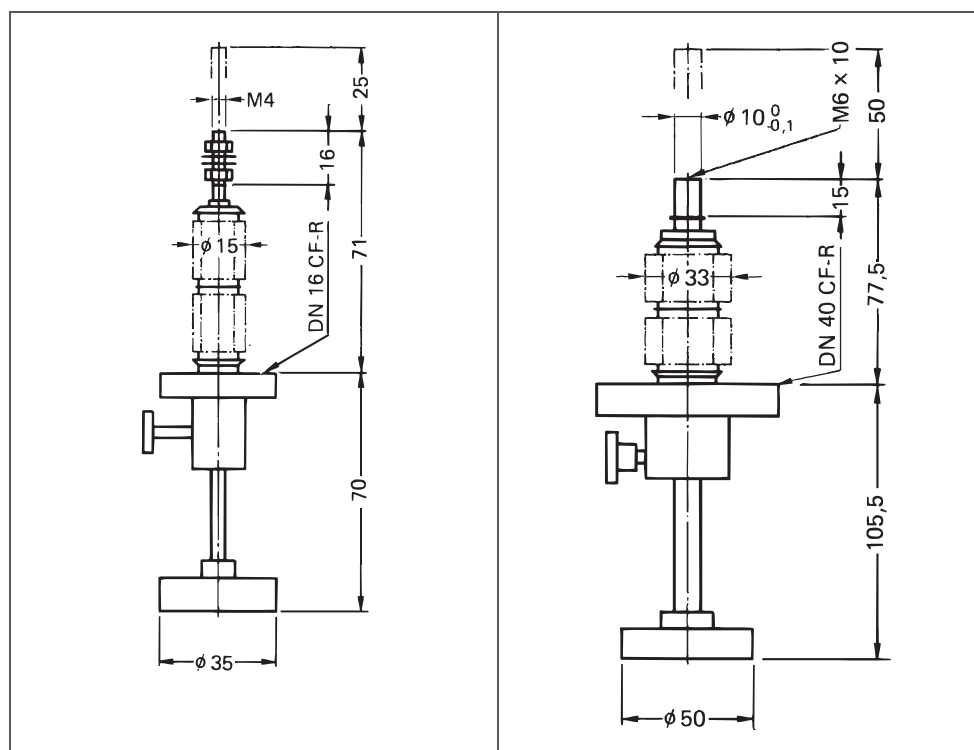
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 CF	381	103	420MDM040-0250-VS
DN 40 CF	631	103	420MDM040-0500-VS
DN 40 CF	881	103	420MDM040-0750-VS

## Bellows-sealed Linear Feedthrough



- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Direct manual push/pull actuation
- With setscrew
- Bakeout temperature: up to 300 °C
- Load capacity radial: at max. displacement: DN 16: 20 N; DN 40: 100 N
- Load capacity: torsion: DN 16: 0.2 Nm; DN 40: 0.5 Nm
- Mode of operation: handle
- Operating temperature: up to 300 °C
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure
- Mounting orientation: any
- Materials: Stainless steel; hand knob: aluminum
- Service life: 10000 cycles

### Dimensions



PF 630 010-T

PF 631 010-T

### Manual

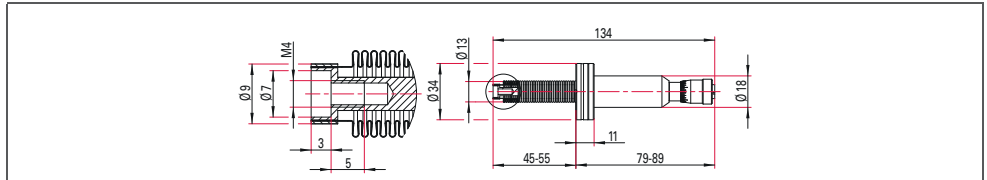
Nominal diameter	Stroke [mm]	Shaft load, axial: to atmosphere [N]	Shaft load, axial: to vacuum [N]	Order number
DN 16 CF-R	25	100	85	PF 630 010-T
DN 40 CF-R	50	200	140	PF 631 010-T

## Bellows-sealed Precision Linear Feedthrough

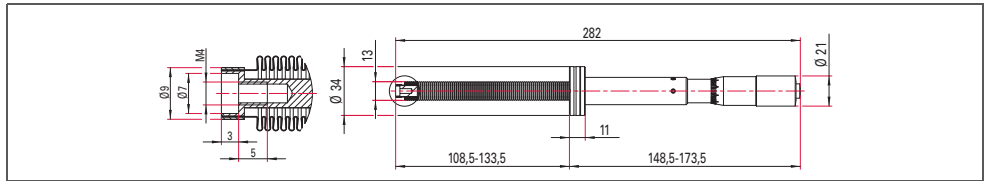
- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Bakeout temperature: feedthrough: up to 300 °C
- Bakeout temperature: micrometer screw/piston: up to 100 °C
- Mode of operation: Micrometer screw
- Operating temperature: up to 50 °C
- Tightness:  $1 \cdot 10^{-11}$  Pa m<sup>3</sup>/s
- Pressure range:  $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure
- Mounting orientation: any
- Service life: 10000 cycles

Manual, Fine

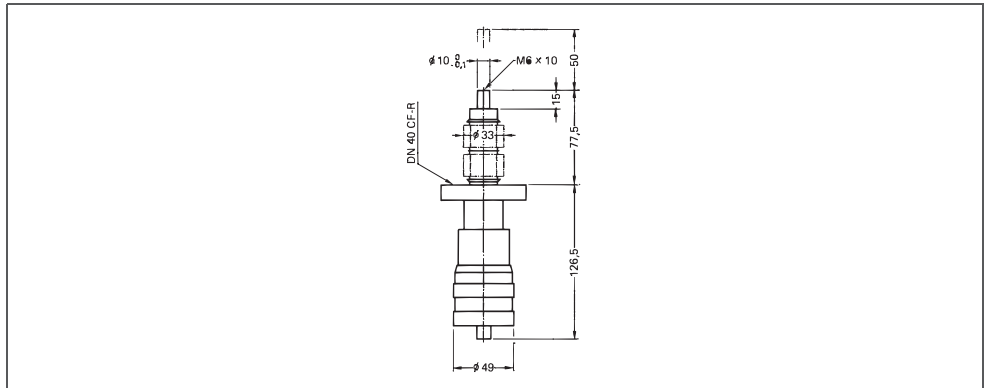
### Dimensions



420MZF016-010



420MZF016-025

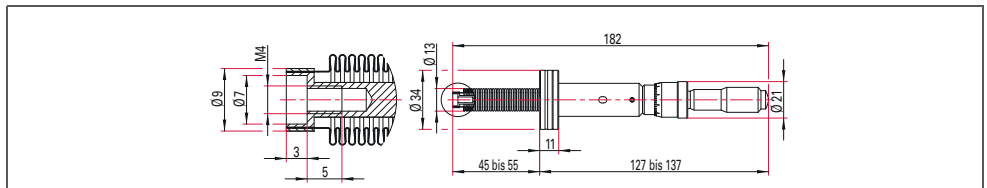


PF 631 012-T

Nominal diameter	Stroke [mm]	Resolution [ $\mu$ m]	Accuracy [ $\mu$ m]	Order number
DN 16 CF	10	5	5	420MZF016-010
DN 16 CF	25	10	10	420MZF016-025
DN 40 CF-R	50	5	5	PF 631 012-T

Manual, Superfine

### Dimensions



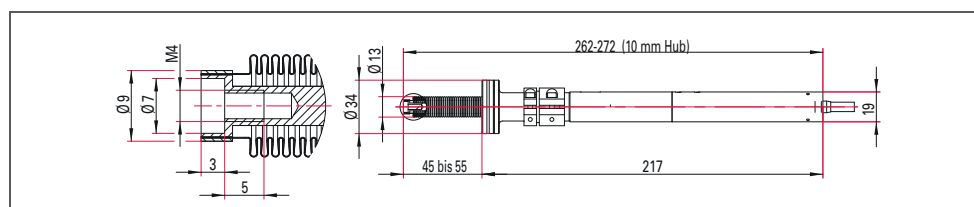
Nominal diameter	Stroke [mm]	Resolution [ $\mu$ m]	Accuracy [ $\mu$ m]	Order number
DN 16 CF	10	0.5	3	420MZF016-010-s

## Bellows-sealed Precision Linear Feedthrough Motorized

- Hermetically sealed, suitable for UHV
- Bellows-sealed
- For motorized fine positioning of components in the vacuum
- Maximum load moment on bellows: 0.2 Nm
- Easy bakeout with comfortable motor disassembly and position fixing device
- Bakeout temperature with electric parts: 70 °C
- Bakeout temperature without electric parts: 200 °C
- Axial force: max. 45 N
- Fixation: Screw M4 x 5 (on actuator)
- Operating temperature: max. 65 °C
- Pressure range:  $1 \cdot 10^{-9}$  hPa to 500 hPa over pressure
- Service life: 10000 cycles
- Motor version: 2-phase stepper motor

### Motorized, 10 mm Adjustment Travel

#### Dimensions

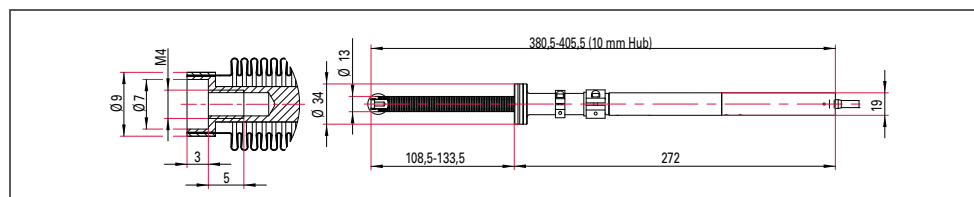


Nominal diameter	Stroke [mm]	Resolution [ $\mu\text{m}$ ]	Accuracy [ $\mu\text{m}$ ]	Order number
DN 16 CF	10	0.05	3	420MZF016-010-m

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2.

### Motorized, 25 mm Adjustment Travel

#### Dimensions



Nominal diameter	Stroke [mm]	Resolution [ $\mu\text{m}$ ]	Accuracy [ $\mu\text{m}$ ]	Order number
DN 16 CF	25	0.05	3	420MZF016-025-m

Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2.

# Custom manipulators

Individual solutions from Pfeiffer Vacuum –  
Innovative. Precise. Dependable.



## Custom manipulators

Pfeiffer Vacuum offers more than just standard solutions. To meet your requirements, manipulators and mechanical feedthroughs can be modified and manufactured as customized solutions to perfectly meet your needs. Thanks to our years of experience we are conversant with almost all possible requirements and will provide extensive advice on matters of system specifications, design and engineering.

Based on proven basic structures we manufacture every possible variant and develop individual solutions for movement and positioning specifications to meet your requirements from the prototype stage right up to serial production.

### Examples of customized developments:

- Additional axial travel distances
- Increased axial force
- Increased torque
- Adjusted shaft ends and lengths
- Adjustment of connecting flanges or flange materials
- Increased cycle count
- Increased precision
- Gear between motor and feedthrough to adjust the speed or phase resolution
- Displacement transducer or tachometer
- Servo motor or DC motor instead of multiphase motor

### Examples of product modifications

- Very large travel distances
- Very large additional loads
- Additional nominal diameters
- Additional shaft diameter
- Motorization (if not available as standard version)
- Motor controls

Our manipulators and mechanical feedthroughs can also be combined with other Pfeiffer Vacuum products and optimally configured to one another. For example, the installation situation in vacuum chambers can be examined and the impact of external loads simulated using the FEM (Finite Element Method) calculations in the design phase.

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