A PASSION FOR PERFECTION

PFEIFFER VACUUM

The Vacuum Technology Book

Volume II

The Vacuum Technology Book

Volume II



Vacuum generation

Part 3.1

Vacuum generation

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Rotary vane pumps



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Rotary vane pumps

For all applications in the low and fine vacuum range

Rotary vane pumps have proven their usefulness for years in many applications. Coordinated accessories and the selection of suitable materials mean that your rotary vane pumps can be used in many different processes.

Pfeiffer Vacuum offers solutions for different applications with its varied model ranges. Pascal pumps are designed for users who need pumps for simple applications with a good price/performance ratio. The DuoLine meets all demands critical processes place on pumps. HenaLine pumps are used to generate high pumping speeds. The UnoLine Plus pumps are preferably used in drying processes. PentaLine pumps are for users who are interested in highly efficient pumps with affordable operating costs.

Our rotary vane pumps can be supplied with two different pump systems: The single-phase HenaLine and UnoLine Plus pumps cover an inlet pressure range of 1,000 to approximately 0.5 hPa.
The two-stage DuoLine, Pascal and PentaLine pumps, which come with a standard pumping system, have an extended inlet pressure range in high vacuum of up to $5 \cdot 10^{-3}$ hPa.



Overview of series of applications

■ = recommended	Analytics						Semiconductors										Coating										Industry								R & D										Page
	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 manufacture	Heat treatment	Vacuum drying	Vacuum furnaces	Nuclear research	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Single-stage:																																											
HenaLine																																											
Hena 25																			■				■	■		■			■	■												■	16
Hena 40																			■				■	■		■			■	■												■	18
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Hena 630																				■	■	■			■					■	■	■					■						30
Hena 1000																				■	■	■			■					■	■	■											32
Hena 1600																				■	■	■			■					■	■	■											34
UnoLine Plus																																											
BA 251																												■			■	■	■		■							■	38
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Two-stage:																																											
PentaLine®																																											
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Duo 6 / M								■								■			■	■	■	■	■	■	■	■	■	■			■	■	■	■	■	■				■	■	■	52
Duo 11 / M																												■			■	■	■		■							■	54
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Duo 35 / M								■								■			■	■	■	■	■	■	■		■	■			■	■	■	■	■	■				■	■	■	60
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Features at a glance

	Connection flange (inlet)						Pumping speed class					Final pressure without gas ballast									Page
	DN 16	DN 25	DN 40	DN 63	DN 100	DN 160	1.3 to 10 m^3/h	15 to 40 m^3/h	60 to 100 m^3/h	125 to 255 m^3/h	300 to 1,600 m^3/h	2 · 10^{-3} hPa	3 · 10^{-3} hPa	4 · 10^{-3} hPa	6 · 10^{-2} hPa	≤ 0.3 hPa	0.7 hPa	1 hPa	Magnetic coupling	Corrosive gas version	
Single-stage:																					
HenaLine																					
Hena 25			■					■								■					16
Hena 40			■					■								■					18
Hena 60			■						■							■					20
Hena 100			■						■							■					22
Hena 200			■							■						■					24
Hena 300					■						■					■					26
Hena 400					■						■					■					28
Hena 630					■						■					■					30
Hena 1000						■					■							■			32
Hena 1600						■					■						■				34
UnoLine Plus																					
BA 251				■						■					■						38
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Two-stage:																					
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Penta 20		■						■					■								42
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Pascal C1		■	■				■	■	■			■	■							■	84
Pascal C2		■	■				■	■	■			■	■							■	84



Customer benefits

- Large selection of pumps with pumping speeds of 1.3 to 1,600 m^3/h
- Compact and ideal for system integration
- High pumping speeds with small dimensions
- High reliability through pressure oil lubrication of the bearings
- Process-safe due to integrated high vacuum safety valve
- Non-ferrous metal free design offers additional operating safety
- Also available as corrosive gas version

HenaLine

Single-stage rotary vane pumps for low and medium vacuum applications



HenaLine

We offer a complete range of single-stage rotary vane pumps for all low and medium vacuum applications. These pumps have pumping speeds between 25 and 1,600 m^3/h. Oil mist separators, oil return units and safety valves are standard features in this series.

Their reliability, performance and compact size round out the outstanding features of the HenaLine pumps. Moreover, the principle of operation of the HenaLine pumps assures low operating temperatures.

Customer benefits

- Low operating costs
- Suitable for the toughest applications under high thermal loads
- Cost savings through extended maintenance intervals
- Operating and process reliability
- Does not require vibration dampers

Typical applications

- Hard disk coating
- PVD coatings
- Solar cell production
- Mass spectrometry
- Vacuum drying/ thermal treatment
- Electron beam welding
- Surface coating



Mass spectrometry



Vacuum drying



Solar cells

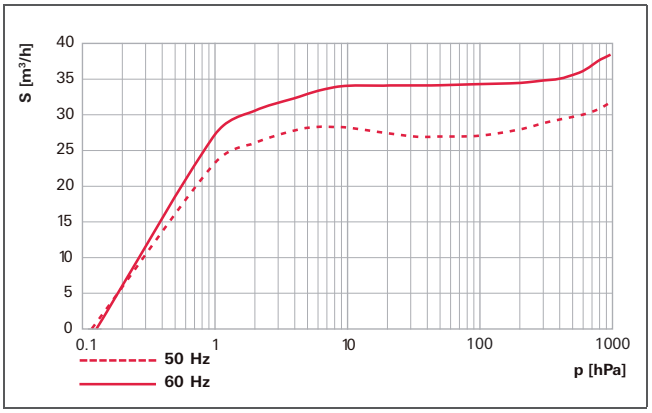
Hena 25

Single-stage, oil-sealed rotary vane pump with a pumping speed up to 30 m³/h.

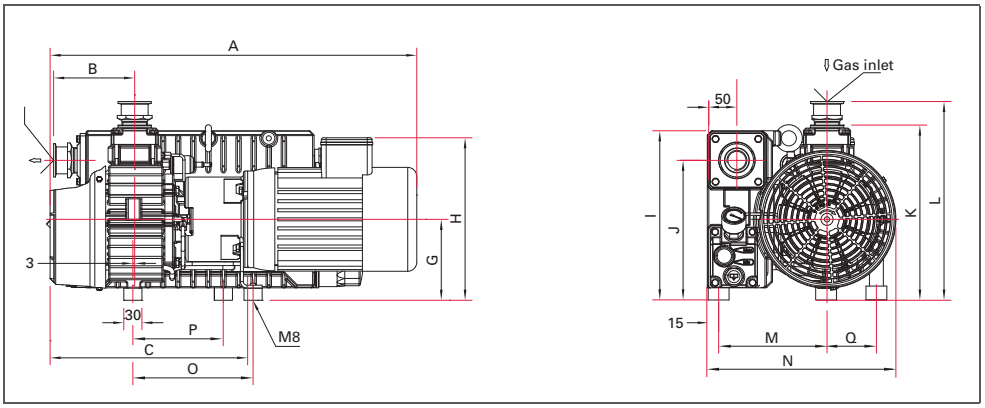


- Powerful rotary vane pump with a pumping speed up to 30 m³/h
- 3-phase motor for 190-208/380-415 V, 50 Hz or 220-230/440-460 V, 60 Hz supply voltages
- Integrated gas ballast and high vacuum safety valve
- For all low and medium vacuum applications

Pumping speed



Dimensions (in mm)



	Hena 25, 3-phase motor, 190-208/380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz	Hena 25, 1-phase motor, 220-240 V, 50 Hz	Hena 25, 1-phase motor, 100-120 V, 60 Hz	Hena 25, 1-phase motor, 220-240 V, 60 Hz
A	599 mm	564 mm	604 mm	604 mm
B	129 mm	129 mm	129 mm	129 mm
C	318 mm	318 mm	318 mm	318 mm
G	123 mm	123 mm	123 mm	123 mm
H	251 mm	240 mm	265 mm	265 mm
I	260 mm	260 mm	260 mm	260 mm
J	210 mm	210 mm	210 mm	210 mm
K	263 mm	263 mm	263 mm	263 mm
L	302 mm	302 mm	302 mm	302 mm
M	171 mm	171 mm	171 mm	171 mm
N	284 mm	284 mm	284 mm	284 mm
O	159 mm	159 mm	159 mm	159 mm
P	120 mm	120 mm	120 mm	120 mm
Q	67 mm	67 mm	67 mm	67 mm

Technical data	Hena 25, 3-phase motor, 190-208/380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz	Hena 25, 1-phase motor, 220-240 V, 50 Hz	Hena 25, 1-phase motor, 100-120 V, 60 Hz	Hena 25, 1-phase motor, 220-240 V, 60 Hz
Flange (out)	DN 40 ISO-KF, female thread G 5/4" pump housing	DN 40 ISO-KF, female thread G 5/4" pump housing	DN 40 ISO-KF, female thread G 5/4" pump housing	DN 40 ISO-KF, female thread G 5/4" pump housing
Flange (in)	DN 40 ISO-KF, female thread G 5/4" pump housing	DN 40 ISO-KF, female thread G 5/4" pump housing	DN 40 ISO-KF, female thread G 5/4" pump housing	DN 40 ISO-KF, female thread G 5/4" pump housing
Operating fluid	P3	P3	P3	P3
Operating fluid filling	1 l	1 l	1 l	1 l
Rotation speed at 50 Hz	1500 min^{-1}	1500 min^{-1}		
Rotation speed at 60 Hz	1800 min^{-1}		1800 min^{-1}	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 60 dB (A)	≤ 60 dB (A)		
Emission sound pressure level without gas ballast at 60 Hz	≤ 63 dB (A)		≤ 63 dB (A)	≤ 63 dB (A)
Ultimate pressure with gas ballast	1.5 hPa	1.5 hPa	1.5 hPa	1.5 hPa
Ultimate pressure without gas ballast	0.3 hPa	0.3 hPa	0.3 hPa	0.3 hPa
Weight	35 kg	42 kg	40 kg	42 kg
Cooling method, standard	Air	Air	Air	Air
Motor protection	3TF			
Rated power 50 Hz	1.0 kW	1.1 kW		
Rated power 60 Hz	1.2 kW		1.5 kW	2.0 kW
Mains requirement: voltage 50 Hz	190-208/380-415 V	220-240 V		
Mains requirement: voltage 60 Hz	220-230/440-460 V		100-120 V	220-240 V
Pumping speed at 50 Hz	25 m^3/h	25 m^3/h		
Pumping speed at 60 Hz	30 m^3/h		30 m^3/h	30 m^3/h
Switch	No	No	No	No
Protection category	IP 55	IP 55	IP 55	IP 55

Order number				
Hena 25	**PK D02 200**	**PK D02 212**	**PK D02 207**	**PK D02 222**

Accessories				
SAS 25, DN 25 ISO-KF, polyester filter	**PK Z60 508**	**PK Z60 508**	**PK Z60 508**	**PK Z60 508**
KAS 25 L, condensate separator for pumping speeds up to 34 m^3/h	**PK Z10 033**	**PK Z10 033**	**PK Z10 033**	**PK Z10 033**
FAK 025, activated carbon filter	**PK Z30 006**	**PK Z30 006**	**PK Z30 006**	**PK Z30 006**
PTC-resistor tripping device	**P 4768 051 FQ**			

Hena 40

Single-stage, oil-sealed rotary vane pump with a pumping speed up to 48 m³/h.

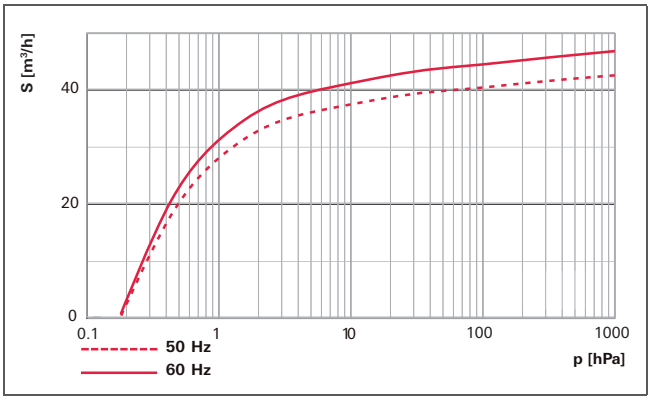


- Powerful rotary vane pump with a pumping speed of 40 m³/h
- 3-phase motor for 190-208/380-415 V, 50 Hz or 220-230/440-460 V, 60 Hz supply voltages
- Integrated gas ballast and high vacuum safety valve
- For all low and medium vacuum applications

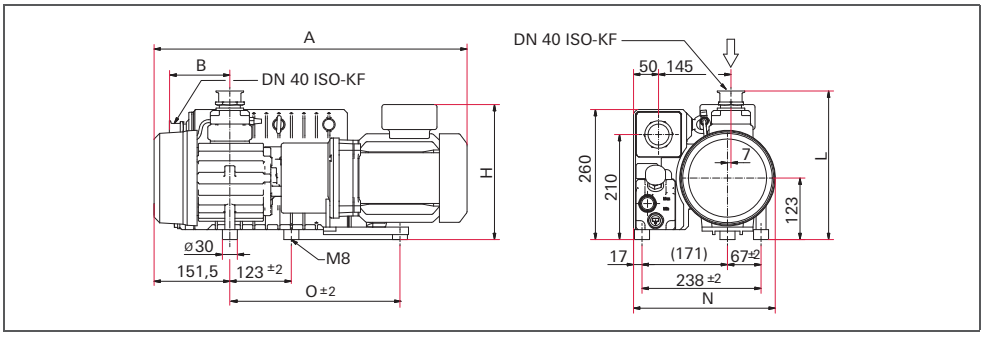
Hena 40 i

- Especially suitable for use in analytical applications
- Integrated oil mist filter with high seperation rate
- Special vane material for long service life
- 1-phase motor according to IEC 60034
- Optimized final pressure

Pumping speed



Dimensions (in mm)



	Hena 40, 3-phase motor, 190-208/380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz	Hena 40 i, 1-phase motor, 230 V 50/60 Hz
A	626 mm	626 mm
B	121 mm	121 mm
H	270 mm	270 mm
L	302 mm	302 mm
N	284 mm	284 mm
O	179 ±2 mm	340 ±2 mm

Technical data	Hena 40, 3-phase motor, 190-208/380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz	Hena 40 i, 1-phase motor, 230 V 50/60 Hz
Flange (out)	DN 40 ISO-KF, female thread G 5/4" pump housing	DN 40 ISO-KF, female thread G 5/4" pump housing
Flange (in)	DN 40 ISO-KF, female thread G 5/4" pump housing	DN 40 ISO-KF, female thread G 5/4" pump housing
Operating fluid	P3	Inland 45
Operating fluid filling	1 l	1 l
Rotation speed at 50 Hz	1500 min^{-1}	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 63 dB (A)	≤ 63 dB (A)
Emission sound pressure level without gas ballast at 60 Hz	≤ 66 dB (A)	≤ 66 dB (A)
Ultimate pressure with gas ballast	1.50 hPa	0.30 hPa
Ultimate pressure without gas ballast	0.30 hPa	0.20 hPa
Weight	48 kg	40 kg
Cooling method, standard	Air	Air
Motor protection	3TF	1TF
Rated power 50 Hz	1.4 kW	1.8 kW
Rated power 60 Hz	1.7 kW	2.0 kW
Mains requirement: voltage 50 Hz	190-208/380-415 V	230 V
Mains requirement: voltage 60 Hz	220-230/440-460 V	230 V
Pumping speed at 50 Hz	40 m^3/h	40 m^3/h
Pumping speed at 60 Hz	48 m^3/h	48 m^3/h
Switch	No	No
Protection category	IP 55	IP 55

Order number		
Hena 40	**PK D02 250**	**PK D02 283**

Accessories		
SAS 40, DN 40 ISO-KF, polyester filter	**PK Z60 510**	**PK Z60 510**
KAS 40, condensate separator for pumping speeds up to 100 m^3/h	**PK Z10 008**	**PK Z10 008**
FAK 040, activated carbon filter	**PK Z30 008**	**PK Z30 008**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**

Hena 60



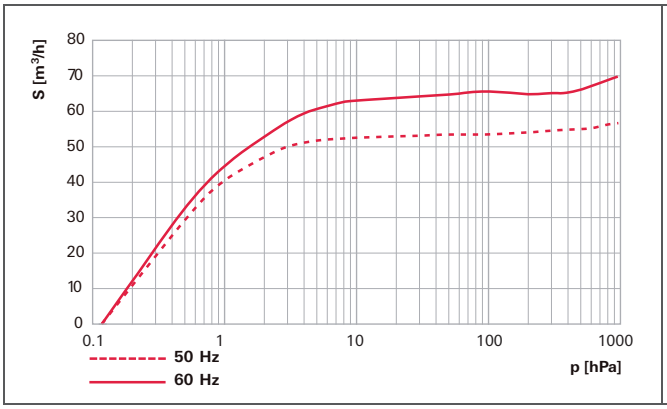
Single-stage, oil-sealed rotary vane pump with a pumping speed up to 76 m³/h.

- Powerful rotary vane pump with a pumping speed up to 76 m³/h
- 3-phase motor for 190-208/380-415 V, 50 Hz or 220-230/440-460 V, 60 Hz supply voltages
- Integrated gas ballast and high vacuum safety valve
- For all low and medium vacuum applications

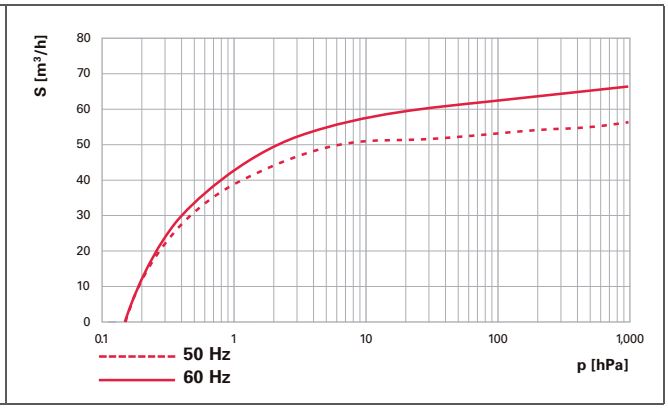
Hena 60 i

- Especially suitable for use in analytical applications
- Integrated oil mist filter with high seperation rate
- Special vane material for long service life
- 1-phase motor according to IEC 60034
- Optimized final pressure

Pumping speed

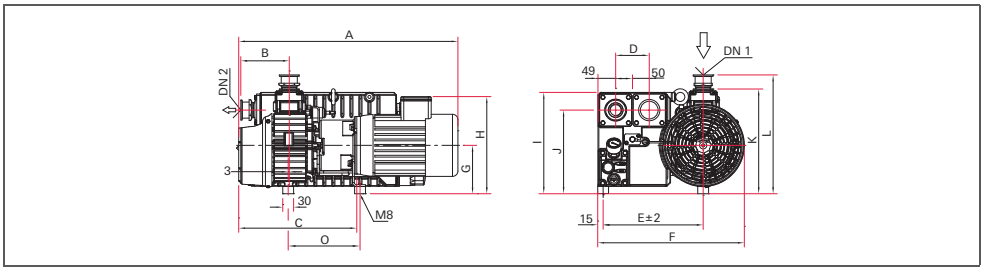


Hena 60, 3-phase motor



Hena 60 i, 1-phase motor

Dimensions (in mm)



	Hena 60, 3-phase motor, 190-208/380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz	Hena 60 i, 1-phase motor, 1TF, 230 V, 50/60 Hz
A	640 mm	636 mm
B	134 mm	124 mm
C	327 mm	
D	93 mm	
E	277 mm	191 mm
F	406 mm	324 mm
G	134 mm	134 mm
H	294 mm	270 mm
I	280 mm	270 mm
J	231 mm	220 mm
K	290 mm	
L	329 mm	325 mm
O	199 mm	323 mm

Technical data	Hena 60, 3-phase motor, 190-208/380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz	Hena 60 i, 1-phase motor, 1TF, 230 V, 50/60 Hz
Flange (out)	DN 40 ISO-KF, female thread G 5/4" pump housing	DN 40 ISO-KF, female thread G 5/4" pump housing
Flange (in)	DN 40 ISO-KF, female thread G 5/4" pump housing	DN 40 ISO-KF, female thread G 5/4" pump housing
Operating fluid	P3	Inland 45
Operating fluid filling	2 l	1 l
Rotation speed at 50 Hz	1500 min^{-1}	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 64 dB (A)	≤ 65 dB (A)
Emission sound pressure level without gas ballast at 60 Hz	≤ 66 dB (A)	≤ 68 dB (A)
Ultimate pressure with gas ballast	1.5 hPa	0.30 hPa
Ultimate pressure without gas ballast	0.3 hPa	0.20 hPa
Weight	68 kg	60 kg
Cooling method, optional	Water	
Cooling method, standard	Air	Air
Motor protection	3TF	1TF
Rated power 50 Hz	2.0 kW	1.8 kW
Rated power 60 Hz	2.4 kW	2 kW
Mains requirement: voltage 50 Hz	190-208, 380-415 V	230 V
Mains requirement: voltage 60 Hz	220-230, 440-460 V	230 V
Pumping speed at 50 Hz	63 m^3/h	63 m^3/h
Pumping speed at 60 Hz	76 m^3/h	76 m^3/h
Switch	No	No
Protection category	IP 55	IP 55

Order number		
Hena 60	**PK D02 300**	**PK D02 333**

Accessories		
SAS 40, DN 40 ISO-KF, polyester filter	**PK Z60 510**	**PK Z60 510**
KAS 40, condensate separator for pumping speeds up to 100 m^3/h	**PK Z10 008**	**PK Z10 008**
FAK 040, activated carbon filter	**PK Z30 008**	**PK Z30 008**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**

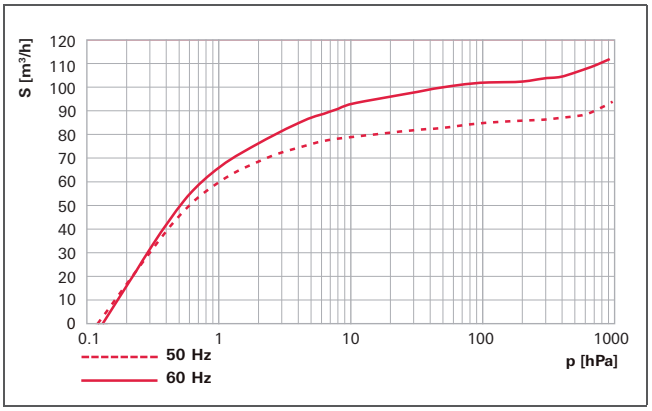
Hena 100

Single-stage, oil-sealed rotary vane pump with a pumping speed up to 120 m³/h

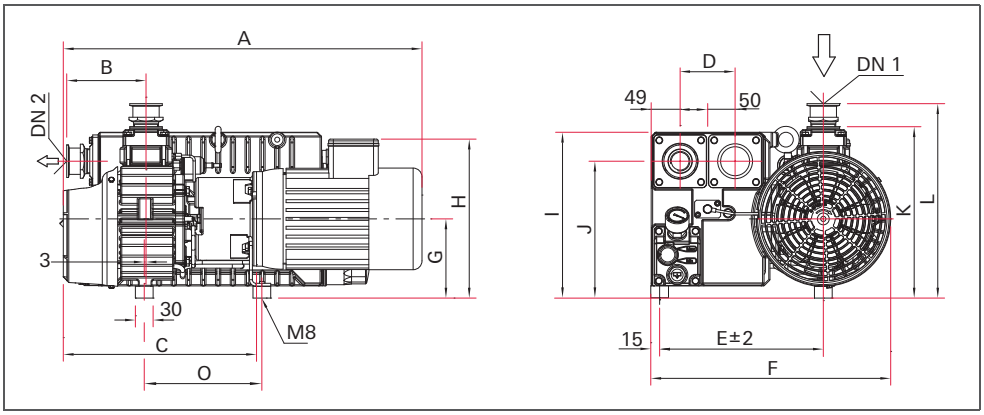


- Powerful rotary vane pump with a pumping speed up to 120 m³/h
- 3-phase motor for 190-208/380-415 V, 50 Hz or 220-230/440-460 V, 60 Hz supply voltages
- Integrated gas ballast and high vacuum safety valve
- For all low and medium vacuum applications

Pumping speed



Dimensions (in mm)



	Hena 100, 3-phase motor, 190-208/380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz
A	699 mm
B	131 mm
C	387 mm
D	93 mm
E	277 mm
F	406 mm
G	134 mm
H	294 mm
I	280 mm
J	231 mm
K	290 mm
L	329 mm
O	226 mm
Connections	
DN 1	DN 40 ISO-KF
DN 2	DN 40 ISO-KF

Technical data	Hena 100, 3-phase motor, 190-208/380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz
Flange (out)	DN 40 ISO-KF, female thread G 5/4" pump housing
Flange (in)	DN 40 ISO-KF, female thread G 5/4" pump housing
Operating fluid	P3
Operating fluid filling	2 l
Rotation speed at 50 Hz	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 65 dB (A)
Emission sound pressure level without gas ballast at 60 Hz	≤ 68 dB (A)
Ultimate pressure with gas ballast	1.5 hPa
Ultimate pressure without gas ballast	0.3 hPa
Weight	77 kg
Cooling method, standard	Air
Motor protection	3TF
Rated power 50 Hz	2.7 kW
Rated power 60 Hz	3.4 kW
Mains requirement: voltage 50 Hz	190-208/380-415 V
Mains requirement: voltage 60 Hz	220-230/440-460 V
Pumping speed at 50 Hz	100 m^3/h
Pumping speed at 60 Hz	120 m^3/h
Switch	No
Protection category	IP 55

Order number	
Hena 100	**PK D02 350**

Accessories	
SAS 40, DN 40 ISO-KF, polyester filter	**PK Z60 510**
KAS 40, condensate separator for pumping speeds up to 100 m^3/h	**PK Z10 008**
FAK 040, activated carbon filter	**PK Z30 008**
PTC-resistor tripping device	**P 4768 051 FQ**

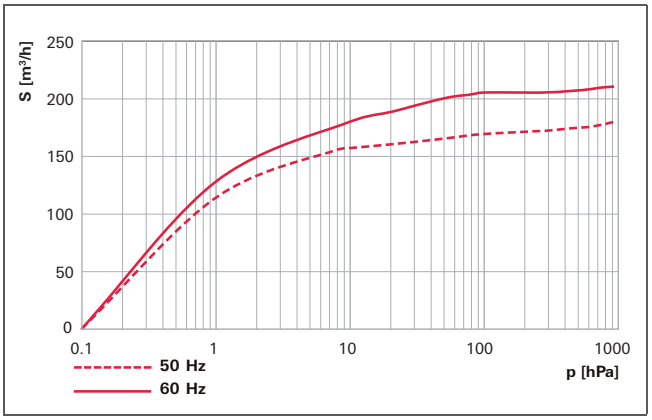
Hena 200

Single-stage, oil-sealed rotary vane pump with a pumping speed up to 240 m³/h

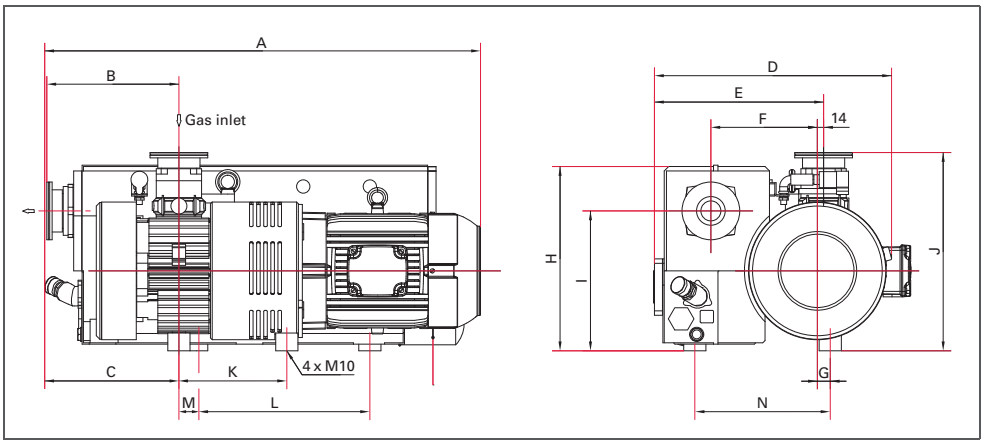


- Powerful rotary vane pump with a pumping speed up to 240 m³/h
- With IE2 motor
- Integrated gas ballast and high vacuum safety valve
- For all low and medium vacuum applications

Pumping speed



Dimensions (in mm)



	Hena 200, 3-phase motor, 200/220-240/ 380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz
A	981 mm
B	298 mm
C	302 mm
D	534 mm
E	381 mm
F	240 mm
G	29 mm
H	415 mm
I	315 mm
J	446 mm
K	243 mm
L	390 mm
M	40 mm
N	305 mm

Technical data	Hena 200, 3-phase motor, 200/220-240/ 380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz
Flange (out)	DN 100 ISO-K, female thread G2" pump housing
Flange (in)	DN 100 ISO-K, female thread G2" pump housing
Operating fluid	P3
Operating fluid filling	6.5 l
Rotation speed at 50 Hz	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 72 dB (A)
Emission sound pressure level without gas ballast at 60 Hz	≤ 74 dB (A)
Ultimate pressure with gas ballast	0.7 hPa
Ultimate pressure without gas ballast	0.3 hPa
Weight	182 kg
Cooling method, optional	Water
Cooling method, standard	Air
Motor protection	3TF
Rated power 50 Hz	5.5 kW
Rated power 60 Hz	6,6 kW
Mains requirement: voltage 50 Hz	200/220-240/ 380-415 V
Mains requirement: voltage 60 Hz	220-230/ 440-460 V
Pumping speed at 50 Hz	200 m^3/h
Pumping speed at 60 Hz	240 m^3/h
Switch	No
Protection category	IP 55

Order number	
Hena 200	**PK D02 400**

Accessories	
SAS 100, DN 100 ISO-K, polyester filter	**PK Z60 512**
KAS 100, condensate separator for pumping speeds up to 630 m^3/h	**PK Z10 012**
FAK 100, activated carbon filter	**PK Z30 012**
Operating fluid level monitoring	**PK 100 116**
Operating fluid temperature switch	**PK 100 125**
PTC-resistor tripping device	**P 4768 051 FQ**

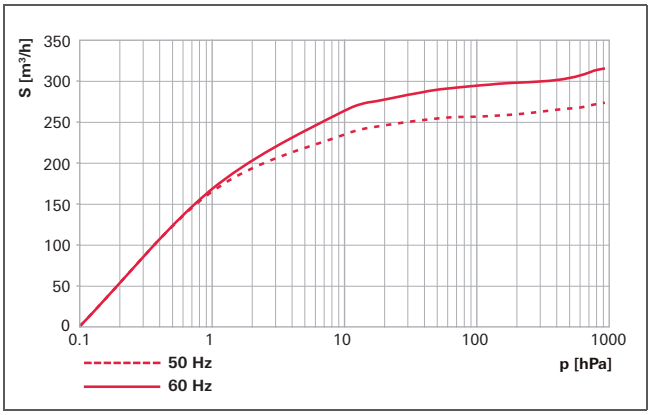
Hena 300

Single-stage, oil-sealed rotary vane pump with a pumping speed up to 360 m³/h

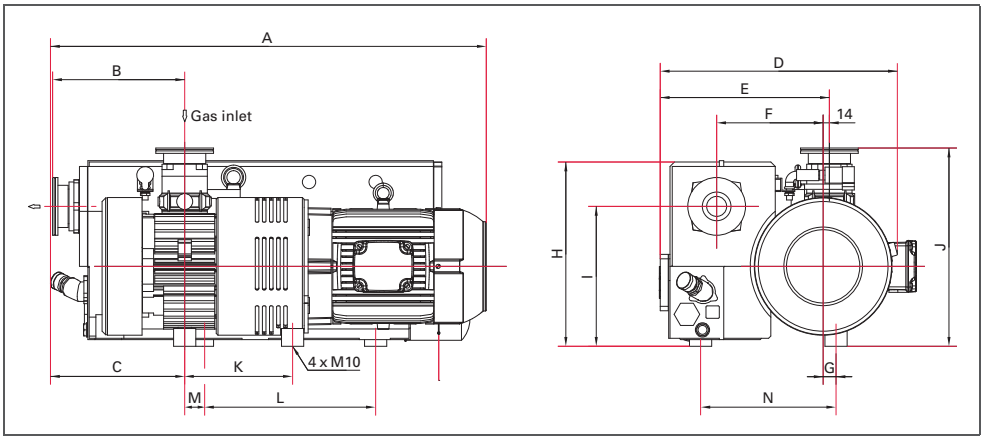


- Powerful rotary vane pump with a pumping speed up to 360 m³/h
- With IE2 motor
- Integrated gas ballast and high vacuum safety valve
- For all low and medium vacuum applications

Pumping speed



Dimensions (in mm)



	Hena 300, 3-phase motor, 200/220-240/ 380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz
A	1081 mm
B	337 mm
C	342 mm
D	536 mm
E	383 mm
F	240 mm
G	29 mm
H	408 mm
I	305 mm
J	437 mm
K	243 mm
L	390 mm
N	350 mm

Technical data	Hena 300, 3-phase motor, 200/220-240/ 380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz
Flange (out)	DN 100 ISO-K, female thread G2" pump housing
Flange (in)	DN 100 ISO-K, female thread G2" pump housing
Operating fluid	P3
Operating fluid filling	6.5 l
Rotation speed at 50 Hz	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 74 dB (A)
Emission sound pressure level without gas ballast at 60 Hz	≤ 76 dB (A)
Ultimate pressure with gas ballast	0.7 hPa
Ultimate pressure without gas ballast	0.3 hPa
Weight	227 kg
Cooling method, optional	Water
Cooling method, standard	Air
Motor protection	3TF
Rated power 50 Hz	7.5 kW
Rated power 60 Hz	9.2 kW
Mains requirement: voltage 50 Hz	200/220-240/ 380-415 V
Mains requirement: voltage 60 Hz	220-230/ 440-460 V
Pumping speed at 50 Hz	300 m^3/h
Pumping speed at 60 Hz	360 m^3/h
Switch	No
Protection category	IP 55

Order number	
Hena 300	**PK D02 450**

Accessories	
SAS 100, DN 100 ISO-K, polyester filter	**PK Z60 512**
KAS 100, condensate separator for pumping speeds up to 630 m^3/h	**PK Z10 012**
FAK 100, activated carbon filter	**PK Z30 012**
Operating fluid level monitoring	**PK 100 116**
Operating fluid temperature switch	**PK 100 125**
PTC-resistor tripping device	**P 4768 051 FQ**

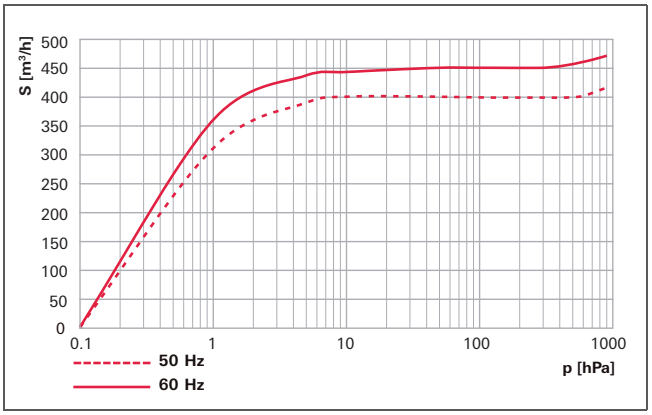
Hena 400



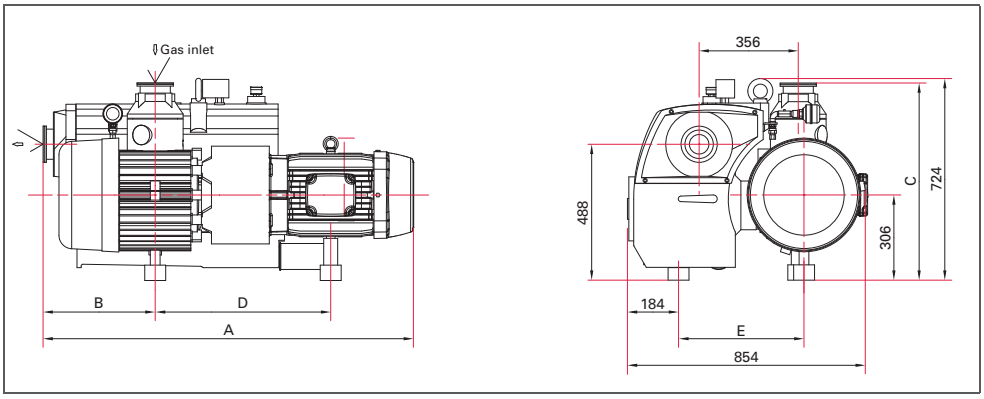
Single-stage, oil-sealed rotary vane pump with a pumping speed up to 480 m³/h

- Powerful rotary vane pump with a pumping speed up to 480 m³/h
- With IE2 motor
- Integrated gas ballast and high vacuum safety valve
- For all low and medium vacuum applications

Pumping speed



Dimensions (in mm)



	Hena 400, 3-phase motor, 200/220-240/ 380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz
A	1392 mm
B	402 mm
C	708 mm
D	657 mm
E	451 mm

Technical data	Hena 400, 3-phase motor, 200/220-240/ 380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz
Flange (out)	DN 100 ISO-K, female thread G3" pump housing
Flange (in)	DN 100 ISO-K, female thread G3" pump housing
Operating fluid	P3
Operating fluid filling	12 l
Rotation speed at 50 Hz	1000 min^{-1}
Rotation speed at 60 Hz	1200 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 77 dB (A)
Emission sound pressure level without gas ballast at 60 Hz	≤ 79 dB (A)
Ultimate pressure with gas ballast	0.7 hPa
Ultimate pressure without gas ballast	0.3 hPa
Weight	535 kg
Cooling method, optional	Water
Cooling method, standard	Air
Motor protection	3TF
Rated power 50 Hz	13.5 kW
Rated power 60 Hz	15 kW
Mains requirement: voltage 50 Hz	200/220-240/ 380-415 V
Mains requirement: voltage 60 Hz	220-230/ 440-460 V
Pumping speed at 50 Hz	400 m^3/h
Pumping speed at 60 Hz	480 m^3/h
Switch	No
Protection category	IP 55

Order number	
Hena 400	**PK D02 500**

Accessories	
SAS 100, DN 100 ISO-K, polyester filter	**PK Z60 512**
KAS 100, condensate separator for pumping speeds up to 630 m^3/h	**PK Z10 012**
FAK 100, activated carbon filter	**PK Z30 012**
Operating fluid level monitoring	**PK 100 116**
Operating fluid temperature switch	**PK 100 125**
PTC-resistor tripping device	**P 4768 051 FQ**

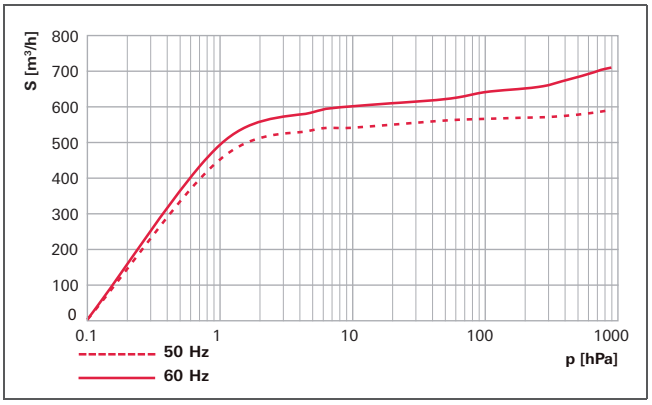
Hena 630



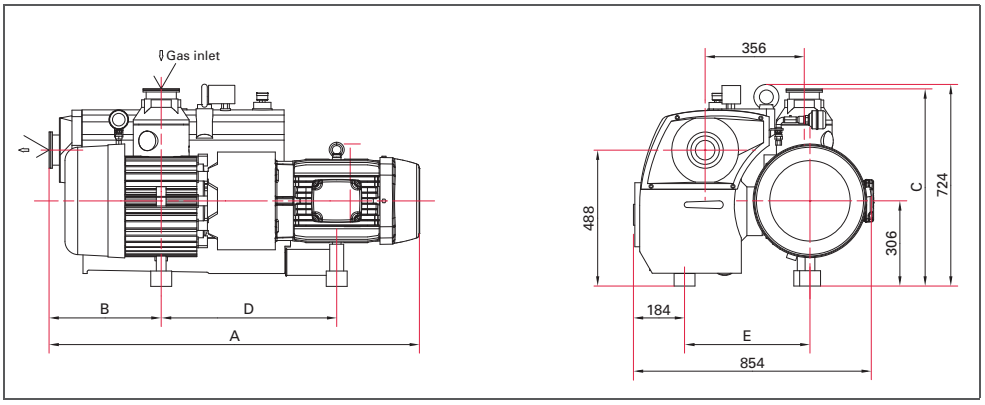
Single-stage, oil-sealed rotary vane pump with a pumping speed up to 760 m³/h

- Powerful rotary vane pump with a pumping speed up to 760 m³/h
- With IE2 motor
- Integrated gas ballast and high vacuum safety valve
- For all low and medium vacuum applications

Pumping speed



Dimensions (in mm)



	Hena 630, 3-phase motor, 220/220-240/ 380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz
A	1774 mm
B	556 mm
C	711 mm
D	846 mm
E	451 mm

Technical data	Hena 630, 3-phase motor, 220/220-240/ 380-415 V, 50 Hz; 220-230/440-460 V, 60 Hz
Flange (out)	DN 100 ISO-K, female thread G3" pump housing
Flange (in)	DN 100 ISO-K, female thread G3" pump housing
Operating fluid	P3
Operating fluid filling	15 l
Rotation speed at 50 Hz	1000 min^{-1}
Rotation speed at 60 Hz	1200 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 77 dB (A)
Emission sound pressure level without gas ballast at 60 Hz	≤ 79 dB (A)
Ultimate pressure with gas ballast	0.7 hPa
Ultimate pressure without gas ballast	0.3 hPa
Weight	650 kg
Cooling method, optional	Water
Cooling method, standard	Air
Motor protection	3TF
Rated power 50 Hz	15 kW
Rated power 60 Hz	18.5 kW
Mains requirement: voltage 50 Hz	220/220-240/ 380-415 V
Mains requirement: voltage 60 Hz	220-230/ 440-460 V
Pumping speed at 50 Hz	630 m^3/h
Pumping speed at 60 Hz	760 m^3/h
Switch	No
Protection category	IP 55

Order number	
Hena 630	**PK D02 600**

Accessories	
SAS 100, DN 100 ISO-K, polyester filter	**PK Z60 512**
KAS 100, condensate separator for pumping speeds up to 630 m^3/h	**PK Z10 012**
FAK 100, activated carbon filter	**PK Z30 012**
Operating fluid level monitoring	**PK 100 116**
Operating fluid temperature switch	**PK 100 125**
PTC-resistor tripping device	**P 4768 051 FQ**

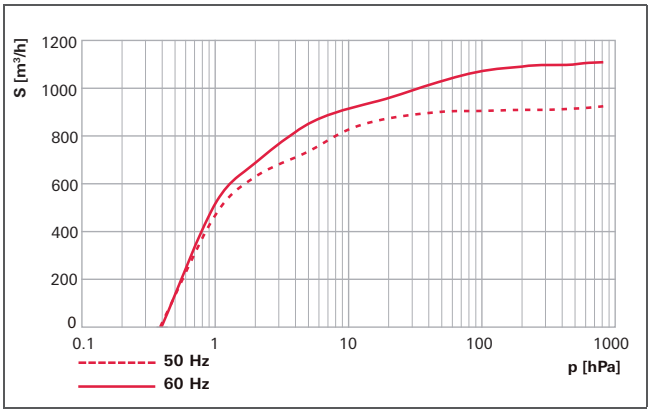
Hena 1000



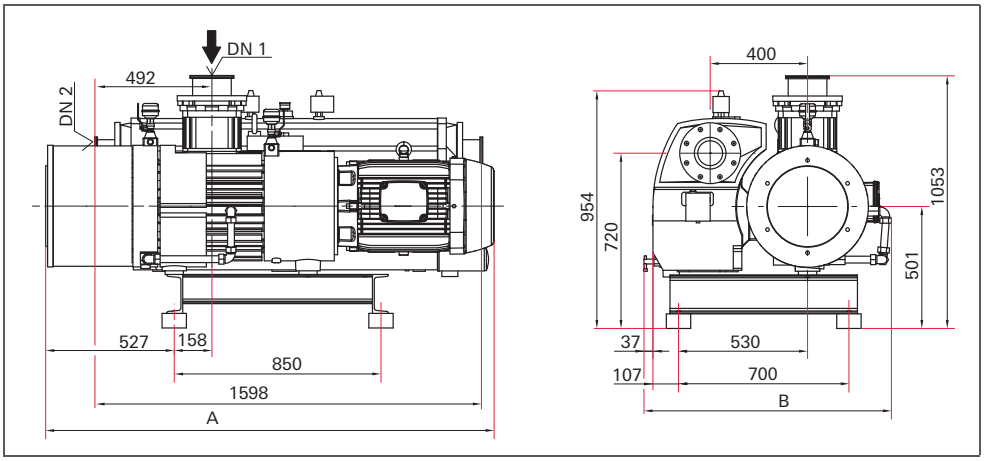
Single-stage, oil-sealed rotary vane pump with a pumping speed up to 1200 m³/h

- Powerful rotary vane pump with a pumping speed up to 1200 m³/h
- With IE2 motor
- Integrated gas ballast and high vacuum safety valve
- For all low and medium vacuum applications

Pumping speed



Dimensions (in mm)



	Hena 1000, 3-phase motor, 380-415/690 V, 50 Hz	Hena 1000, 3-phase motor 220/380 V, 60 Hz
A	1841 mm	1894 mm
B	1019 mm	1050 mm

Technical data	Hena 1000, 3-phase motor, 380-415/690 V, 50 Hz	Hena 1000, 3-phase motor 220/380 V, 60 Hz
Flange (out)	DN 100 ISO-K (2 x)	DN 100 ISO-K (2 x)
Flange (in)	DN 160 ISO-K	DN 160 ISO-K
Operating fluid	P3	P3
Operating fluid filling	30 l	30 l
Rotation speed at 50 Hz	1000 min^{-1}	
Rotation speed at 60 Hz		1200 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 82 dB (A)	
Emission sound pressure level without gas ballast at 60 Hz		≤ 82 dB (A)
Ultimate pressure with gas ballast	1.2 hPa	1.2 hPa
Ultimate pressure without gas ballast	1 hPa	1 hPa
Weight	1200 kg	1230 kg
Cooling method, optional	Water	Water
Cooling method, standard	Air	Air
Motor protection	3TF	3TF
Rated power 50 Hz	22 kW	
Rated power 60 Hz		30 kW
Mains requirement: voltage 50 Hz	380-415/690 V	
Mains requirement: voltage 60 Hz		220/380 V
Pumping speed at 50 Hz	1000 m^3/h	
Pumping speed at 60 Hz		1200 m^3/h
Switch	No	No
Protection category	IP 55	IP 55

Order number		
Hena 1000	**PK D02 700**	**PK D02 701**

Accessories		
SAS 160, DN 160 ISO-K, polyester filter	**PK Z60 514**	**PK Z60 514**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**

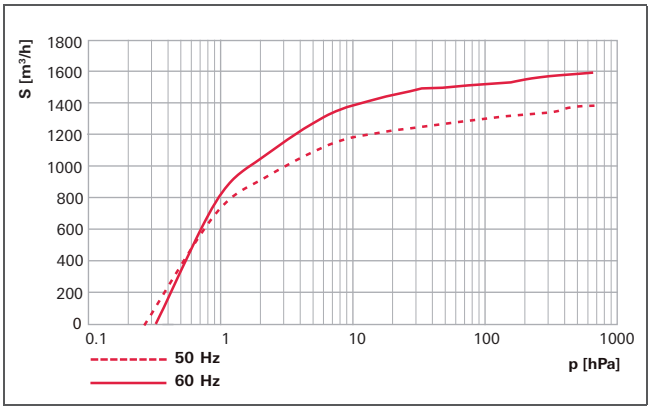
Hena 1600



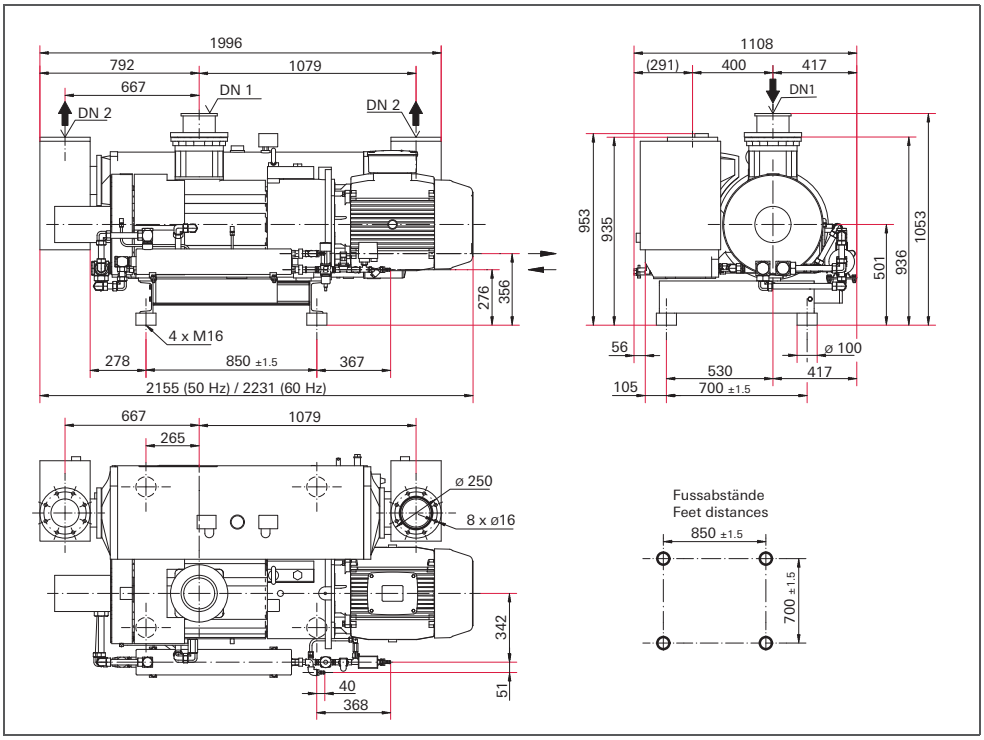
Single-stage, oil-sealed rotary vane pump with a pumping speed up to 1600 m³/h

- Powerful rotary vane pump with a pumping speed up to 1600 m³/h
- With 3-phase motor, IE2
- Integrated oil mist separator provides the highest degree of separation
- Integrated gas ballast and high vacuum safety valve
- For all low and medium vacuum applications

Pumping speed



Dimensions (in mm)



Technical data	Hena 1600, 3-phase motor, 400/690 V, 50 Hz	Hena 1600, 3-phase motor, 220-380 V, 60 Hz
Flange (out)	DN 100 ISO-K (2 x)	DN 100 ISO-K (2 x)
Flange (in)	DN 160 ISO-K	DN 160 ISO-K
Operating fluid	P3	P3
Operating fluid filling	36 l	36 l
Rotation speed at 50 Hz	1000 min^{-1}	
Rotation speed at 60 Hz		1200 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 82 dB (A)	
Emission sound pressure level without gas ballast at 60 Hz		≤ 83 dB (A)
Ultimate pressure with gas ballast	1.2 hPa	1.2 hPa
Ultimate pressure without gas ballast	0.7 hPa	0.7 hPa
Weight	1474 kg	1484 kg
Cooling method, standard	Water	Water
Motor protection	3TF	3TF
Rated power 50 Hz	30 kW	
Rated power 60 Hz		37.0 kW
Mains requirement: voltage 50 Hz	400/690 V	
Mains requirement: voltage 60 Hz		220-380 V
Pumping speed at 50 Hz	1600 m^3/h	
Pumping speed at 60 Hz		1920 m^3/h
Switch	No	No
Protection category	IP 55	

Order number		
Hena 1600	**PK D02 810**	**PK D02 811**

Accessories		
SAS 160, DN 160 ISO-K, polyester filter	**PK Z60 514**	**PK Z60 514**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**

UnoLine Plus

Rugged single-stage rotary vane pump for the harshest industrial applications



UnoLine Plus

UnoLine Plus is ideally suited for industrial applications. This rotary vane pump has a proven track record as both a stand-alone pump and as a backing pump for Pfeiffer Vacuum Roots pumps.

This pump is water-cooled and extremely insensitive to dust and dirt. It is equipped with an oil regeneration system. Separating the process oil from the bearing oil supply extends the life of the pumps. Condensates, contaminants and dust particles can be separated from the operating medium, collected in the vapor separator and drained.

The adjustable cooling water controller enables the UnoLine Plus pumps to maintain the required operating temperature. These pumps are equipped with a gas ballast in order to pump down vapors.

Customer benefits
- Low operating costs
- Maximum process capability
- Long life due to minimal wear
- Ideally suited for drying processes

Typical applications
- Drying processes
- Electron beam welding
- Vacuum furnaces
- Fusion technology
- Biotechnology
- Heat treatment



Vacuum drying

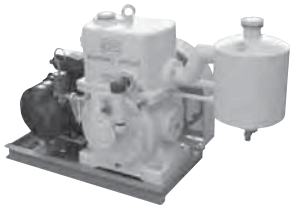


Vacuum furnaces



Electron beam welding

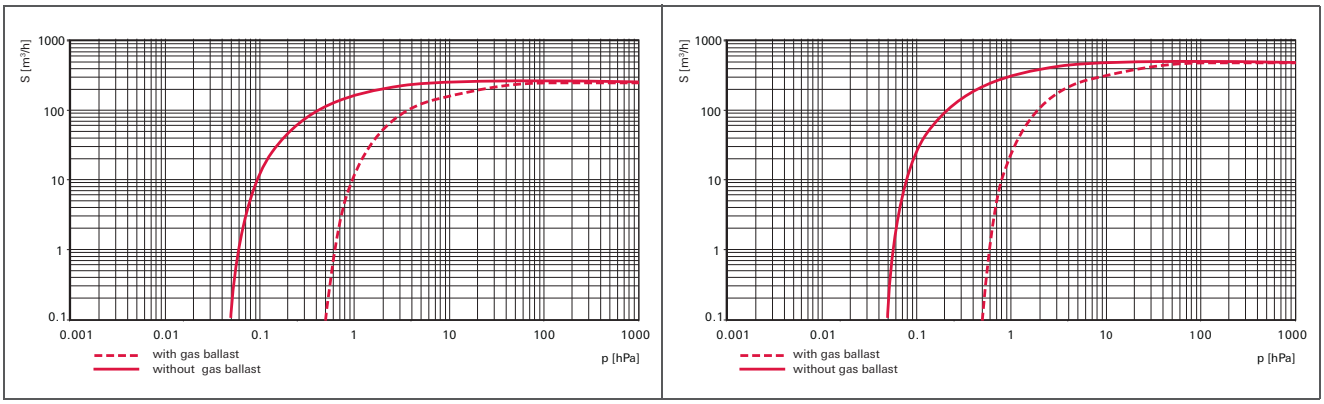
UnoLine Plus



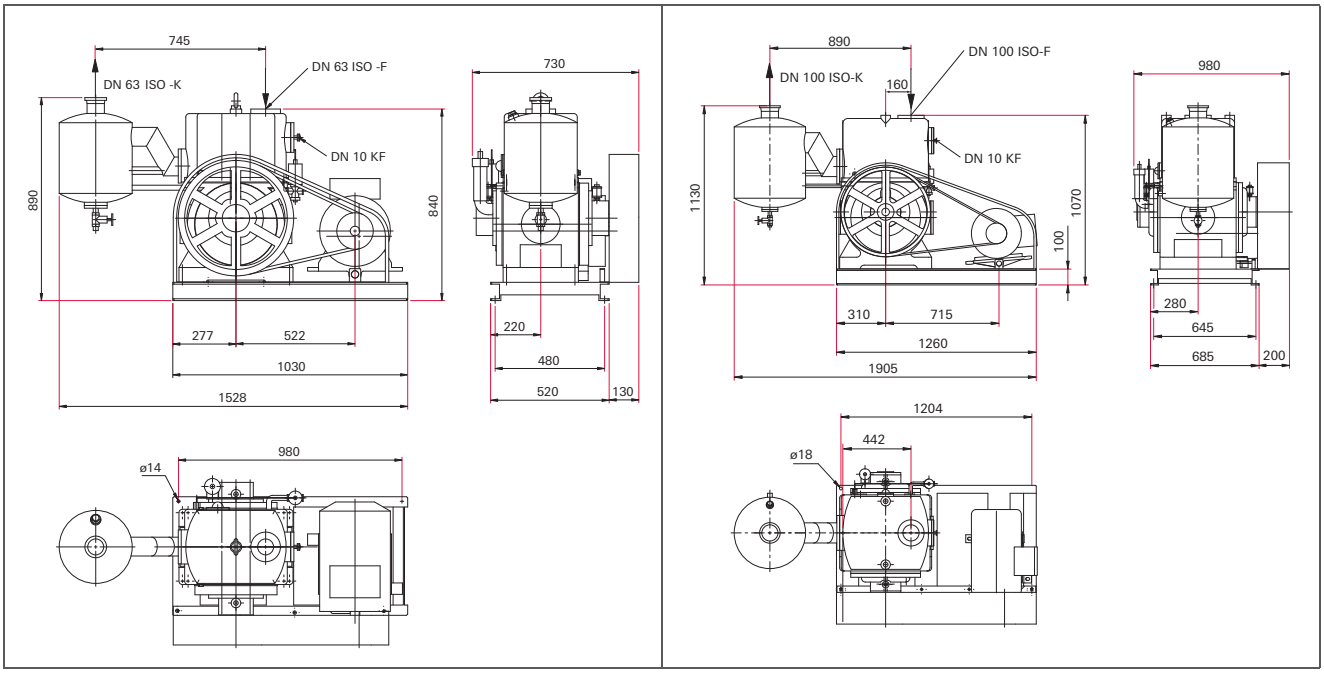
Single-stage rotary vane pump with pumping speeds of 251 m³/h and 501 m³/h:

- Single-stage, high-performance rotary vane pump with a pumping speed of 250 m³/h
- 3-phase motor for 220-240 V, 50 Hz or 380-420 V, 50 Hz supply voltages
- Process integrity thanks to integrated gas ballast valve
- Without HV safety valve
- For low and medium vacuum applications
- Other motor voltages available on request

Pumping speed



Dimensions (in mm)



BA 251, 3-phase motor, 220-240/380-420 V

BA 501, 3-phase motor, 220-240/380-420 V

Technical data	BA 251, 3-phase motor, 220-240/380-420 V, 50 Hz, without HV safety valve	BA 251, 3-phase motor, 440-480 V, 60 Hz, without HV safety valve	BA 501, 3-phase motor, 220-240/380-420 V, 50 Hz, without HV safety valve	BA 501, 3-phase motor, 440-480 V, 60 Hz, without HV safety valve
Flange (out)	DN 63 ISO-K	DN 63 ISO-K	DN 100 ISO-K	DN 100 ISO-K
Flange (in)	DN 63 ISO-F	DN 63 ISO-F	DN 100 ISO-F	DN 100 ISO-F
Exhaust pressure, max.	1500 hPa	1500 hPa	1500 hPa	1500 hPa
Exhaust pressure, min.	Atmospheric pressure	Atmospheric pressure	Atmospheric pressure	Atmospheric pressure
Operating fluid	P3	P3	P3	P3
Operating fluid filling	17 l	17 l	45 l	45 l
Rotation speed at 50 Hz	490 min^{-1}	490 min^{-1}	345 min^{-1}	345 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 63 dB (A)		≤ 65 dB (A)	
Emission sound pressure level without gas ballast at 60 Hz		≤ 63 dB (A)		≤ 65 dB (A)
Ultimate pressure with gas ballast	1 hPa	1 hPa	1 hPa	1 hPa
Ultimate pressure without gas ballast	$6 \cdot 10^{-2}$ hPa	$6 \cdot 10^{-2}$ hPa	$6 \cdot 10^{-2}$ hPa	$6 \cdot 10^{-2}$ hPa
Weight: with motor	570 kg	570 kg	1100 kg	1100 kg
Cooling method, standard	Water	Water	Water	Water
Cooling water pressure	200-1000 kPa	200-1000 kPa	200-1000 kPa	200-1000 kPa
Cooling water temperature	10-30 °C	10-30 °C	10-30 °C	10-30 °C
Cooling water consumption	> 50 l/h	> 50 l/h	> 90 l/h	> 90 l/h
Motor protection	3TF	3TF	3TF	3TF
Nominal rotation speed at 50 Hz	1500 min^{-1}		1500 min^{-1}	
Nominal rotation speed at 60 Hz		1800 min^{-1}		1800 min^{-1}
Rated power 50 Hz	11 kW		15 kW	
Rated power 60 Hz		13 kW		18 kW
Mains requirement: voltage (range)	220-240/380-420 V (± 5 %) 50 Hz	440-480 V (± 5 %) 60 Hz	220-240/380-420 V (± 5 %) 50 Hz	440-480 V (± 5 %) 60 Hz
Mains requirement: voltage 50 Hz	230/400 V		230/400 V	
Mains requirement: voltage 60 Hz		265/460 V		460 V
Mains cable	No	No	No	No
Pumping speed at 50 Hz	250 m^3/h		500 m^3/h	
Pumping speed at 60 Hz		250 m^3/h		500 m^3/h
Switch	No	No	No	No
Protection category	IP 55	IP 55	IP 55	IP 55
Temperature: Operating	80 °C	80 °C	80 °C	80 °C
Ambient temperature	12-40 °C	12-40 °C	12-40 °C	12-40 °C

Order number				
UnoLine Plus	**PK C42 602**	**PK C42 637**	**PK C43 602**	**PK C43 637**

Accessories				
SAS 63, DN 63 ISO-K, polyester filter	**PK Z60 511**	**PK Z60 511**	**PK Z60 511**	**PK Z60 511**
KAS 63, condensate separator for pumping speeds up to 250 m^3/h	**PK Z10 010**	**PK Z10 010**	**PK Z10 010**	**PK Z10 010**
ONF 100, oil mist filter for pumping speeds up to 300 m^3/h	**PK Z40 012**	**PK Z40 012**	**PK Z40 012**	**PK Z40 012**
Oil return unit, ORF 005, standard version	**PK Z90 065**	**PK Z90 065**	**PK Z90 065**	**PK Z90 065**
ZFO 063, zeolite trap	**PK Z70 010**	**PK Z70 010**	**PK Z70 010**	**PK Z70 010**
FAK 063, activated carbon filter	**PK Z30 010**	**PK Z30 010**	**PK Z30 010**	**PK Z30 010**
KLF 063, cold trap	**PK Z80 010**	**PK Z80 010**	**PK Z80 010**	**PK Z80 010**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**	**P 4768 051 FQ**	**P 4768 051 FQ**
Operating fluid level monitoring, 24 V DC for BA 251/501	**PK 133 115 -T**	**PK 133 115 -T**	**PK 133 115 -T**	**PK 133 115 -T**
Cooling water connection unit for BA 251/501	**PK 133 100 -T**	**PK 133 100 -T**	**PK 133 100 -T**	**PK 133 100 -T**
Pressure monitor for cooling water circulation system BA 251/501	**P 4747 161 MF**	**P 4747 161 MF**	**P 4747 161 MF**	**P 4747 161 MF**
EVB 063 PA, Angle valve with position indicator (PI), with pilot valve (PV), 24 V DC	**PF B18 201**	**PF B18 201**	**PF B18 201**	**PF B18 201**

PentaLine®

Two-stage rotary vane pumps for energy-saving operation



PentaLine®

PentaLine® innovative two-stage rotary vane pumps with a pumping speed of 34 m^3/h are the perfect solution for applications in the low and medium vacuum range of up to 10^{-3} hPa. Operating safety and reliability are second nature to them even under the harshest conditions. Industrial uses such as drying and metallurgical processes, analytical tasks or coating applications as well as research and development are easily mastered with the PentaLine pumps.

The optimized drive system in the pumps is both environmentally friendly and efficient. Operating costs are significantly lower than for conventional rotary vane pumps thanks to the roughly 50 % reduction in energy consumption.

Compact and hermetically sealed – the innovative PentaLine is clean and low maintenance. It gives off less heat and has a longer life due to its innovative standby operation.

The innovative motor concept makes them easy to deploy anywhere in the world and meets the ecological design requirements of the EU directive 2005/32/EC. The motor achieves premium efficiency and already exceeds the minimum requirements of efficiency level IE3 which apply from 2017.

The PentaLine pumps run extremely quiet and with a minimum of vibration. They enhance working conditions and make it easier to concentrate.

Customer benefits

- Lower installation costs
- No premature maintenance stops
- Reduced operating costs
- Ultra-quiet operation (particularly in standby mode)

Typical applications

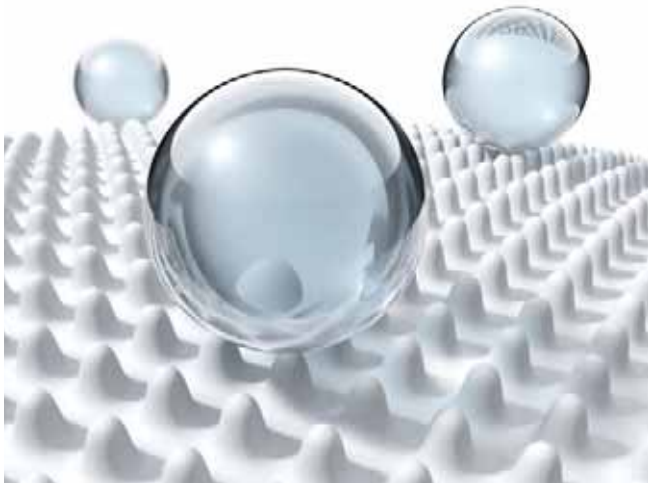
- Mass spectrometry
- Electron microscopy
- Freeze drying
- Metallurgy
- Industrial leak detection
- Hard disk coating
- Optical coating
- Medical technology
- Nanotechnology
- Plasma research



Optical coating



Medical technology



Nanotechnology

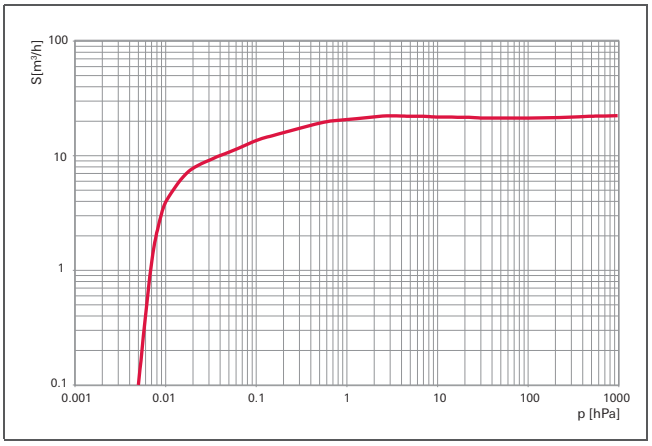
Penta 20



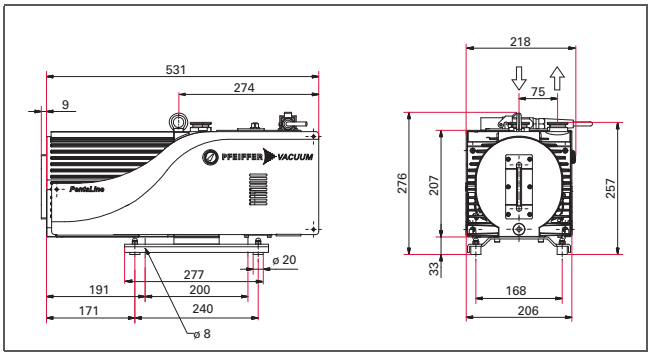
Innovative rotary vane pumps with a pumping speed up to 22 m³/h, power-saving worldwide motor and standby function

- Compact and innovative two-stage rotary vane pump with a pumping speed up to 22 m³/h
- Ideal for nearly all low and medium vacuum applications
- Saves up to 50 % of drive power consumption compared to ordinary rotary vane pumps
- Separating drive and suction chamber affords a clean and hermetically sealed solution

Pumping speed



Dimensions (in mm)



Technical data	Penta 20, 1-ph motor, 110-220 V, 50/60 Hz
Flange (out)	DN 25 ISO-KF
Flange (in)	DN 25 ISO-KF
Operating fluid	P3
Operating fluid filling	1.8 l
Rotation speed at stand-by	900 min^{-1}
Rotation speed max.	1800 min^{-1}
Emission sound pressure level without gas ballast	58 dB (A)
Recommended mains fuse capacity	9 A
Ultimate pressure with gas ballast	$5 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$3 \cdot 10^{-3}$ hPa
Weight	43 kg
Cooling method, standard	Air
Nominal rotation speed at 50 Hz	1800 min^{-1}
Nominal rotation speed at 60 Hz	1800 min^{-1}
Power consumption at 1 hPa	0.41 kW
Power consumption in stand-by mode	0.225 kW
Rated current absorption	100-120 V 50/60 Hz, 6.4 A ; 200-240 V 50/60 Hz, 3.1 A
Mains requirement: voltage (selectable)	100-120 V (± 10 %) 50/60 Hz ; 200-240 V (± 10 %) 50/60 Hz
Mains cable	No
Pumping speed, max.	22 m^3/h
Switch	No
Temperature: Operating	12-40 °C

Ultimate pressure according to PNEUROP

Order number	
Penta 20	**PK D74 010**

Accessories	
SAS 25, DN 25 ISO-KF, polyester filter	**PK Z60 508**
KAS 25 L, condensate separator for pumping speeds up to 34 m^3/h	**PK Z10 033**
ONF 25 L, oil mist filter for pumping speeds of up to 30 m^3/h	**PK Z40 158**
Oil return unit from ONF 25 M, 25 L, 25 XL	**PK 198 545 -T**
ZFO 025, zeolite trap	**PK Z70 006**
FAK 025, activated carbon filter	**PK Z30 006**
KLF 025, cold trap	**PK Z80 006**
URB 025, catalytic trap, 230 V	**PT U10 760**
URB 025, catalytic trap, 115 V	**PT U10 761**
Oil pressure switch for DUO 5/10/20 M and Penta 20/35	**PK 196 484 -T**
Mains cable 230 V AC with safety plug, VII-HAN 3A, 3 m	**P 4564 309 HA**
Mains supply socket	**PM 061 200 -T**
Customizable release connector	**PK 198 548**

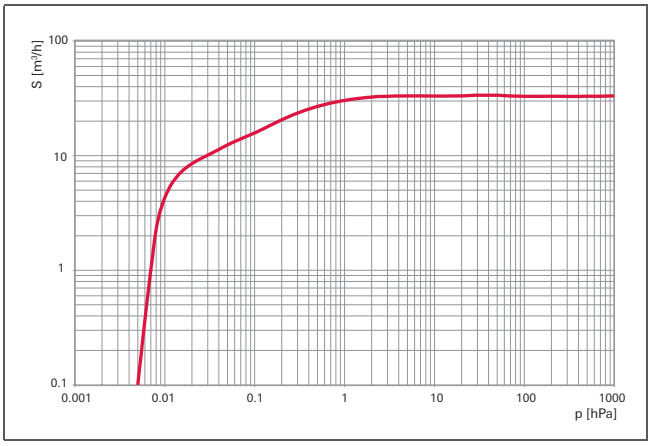
Penta 35



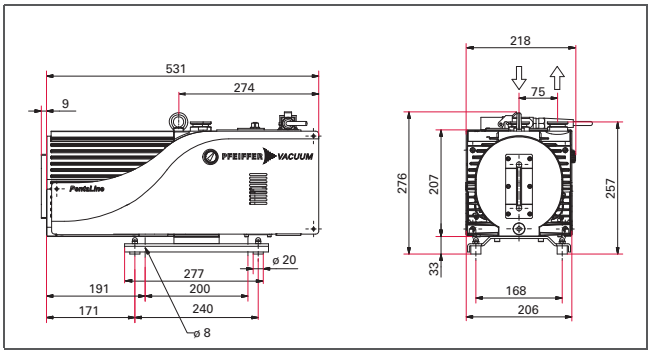
Innovative rotary vane pumps with a pumping speed up to 34 m³/h, power-saving worldwide motor and standby function

- Compact and innovative two-stage rotary vane pump with a pumping speed up to 34 m³/h
- Ideal for nearly all low and medium vacuum applications
- Saves up to 50% of drive power consumption compared to ordinary rotary vane pumps
- Separating drive and suction chamber affords a clean and hermetically sealed solution

Pumping speed



Dimensions (in mm)



Technical data	Penta 35, 1-ph motor, 110-220 V, 50/60 Hz
Flange (in)	DN 25 ISO-KF
Flange (out)	DN 25 ISO-KF
Operating fluid	P3
Operating fluid filling	1.5 l
Rotation speed at stand-by	900 min^{-1}
Rotation speed max.	1800 min^{-1}
Emission sound pressure level without gas ballast	58 dB (A)
Ultimate pressure with gas ballast	$5 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$3 \cdot 10^{-3}$ hPa
Weight	45 kg
Cooling method, standard	Air
Nominal rotation speed at 50 Hz	1800 min^{-1}
Nominal rotation speed at 60 Hz	1800 min^{-1}
Power consumption at 1 hPa	0.41 kW
Power consumption in stand-by mode	0.225 kW
Rated current absorption	100-120 V 50/60 Hz, 7.5 A; 200-240 V 50/60 Hz, 3.7 A
Mains requirement: voltage (selectable)	100-120 V (± 10 %) 50/60 Hz; 200-240 V (± 10 %) 50/60 Hz
Mains cable	No
Pumping speed, max.	34 m^3/h
Switch	No
Temperature: Operating	12-40 °C

Ultimate pressure according to PNEUROP

Order number	
Penta 35	**PK D75 010**

Accessories	
SAS 25, DN 25 ISO-KF, polyester filter	**PK Z60 508**
KAS 25 L, condensate separator for pumping speeds up to 34 m^3/h	**PK Z10 033**
ONF 25 XL, oil mist filter for pumping speeds up to 42 m^3/h	**PK Z40 160**
Oil return unit from ONF 25 M, 25 L, 25 XL	**PK 198 545 -T**
ZFO 025, zeolite trap	**PK Z70 006**
FAK 025, activated carbon filter	**PK Z30 006**
KLF 025, cold trap	**PK Z80 006**
URB 025, catalytic trap, 230 V	**PT U10 760**
URB 025, catalytic trap, 115 V	**PT U10 761**
Oil pressure switch for DUO 5/10/20 M and Penta 20/35	**PK 196 484 -T**
Mains cable 230 V AC with safety plug, VII-HAN 3A, 3 m	**P 4564 309 HA**
Mains supply socket	**PM 061 200 -T**
Customizable release connector	**PK 198 548**

DuoLine™

Two-stage rotary vane pumps for low and medium vacuum



DuoLine™

DuoLine rotary vane pumps with a pumping speed of 1.3 to 250 m^3/h cover all applications in the low and medium vacuum range of up to 10^{-3} hPa. These pumps operate reliably either as a stand-alone pump or a backing pump in Roots or turbo pumping stations even for critical industrial applications such as drying procedures, metallurgical processes or resin casting systems.

The use of a magnetic coupling reduces maintenance and generates significant cost savings per pump and maintenance interval.

The innovative drive concept, alternatively available with a magnetic coupling, means that these pumps are hermetically sealed and therefore clean and environmentally friendly. Oil leakages found in pumps with a conventional radial shaft seal ring no longer occur.

Customer benefits
- High operating safety
- Optimal adjustment to processes
- Easy system integration
- Low maintenance costs

Typical applications
- Electron microscopy
- Optical coating
- Hard disk coating
- Electron beam welding
- Biotechnology
- Heat treatment
- Vacuum drying
- Vacuum furnaces
- Nanotechnology
- Mass spectrometry



Optical coating



Electron microscopy



Electron beam welding

DUO 1.6

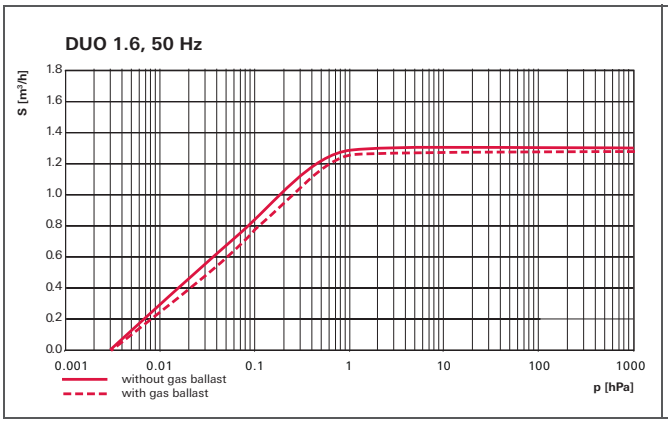


Dual-stage rotary vane pumps with a pumping speed of 1.5 m³/h:

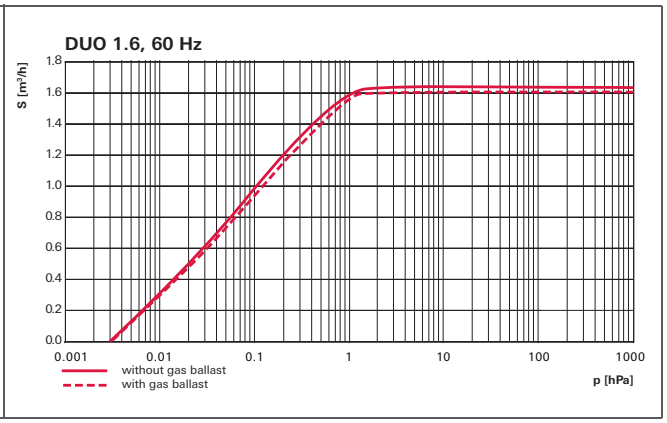
- Dual-stage, high-performance rotary vane pump with a pumping speed of 1.5 m³/h
- With Single-phase motor
- Integrated gas ballast and safety valve
- For all low and medium vacuum applications
- With magnetic coupling
- Special feature: Various motor voltages for worldwide emplyoment
- Other motor voltages available on request

M = Magnetically coupled

Pumping speed

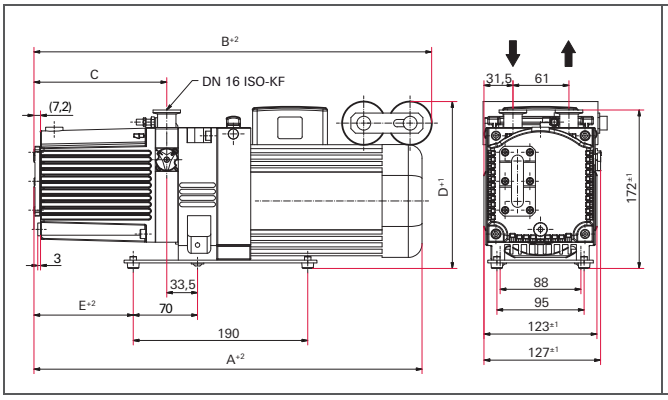


DUO 1.6, 1-phase motor

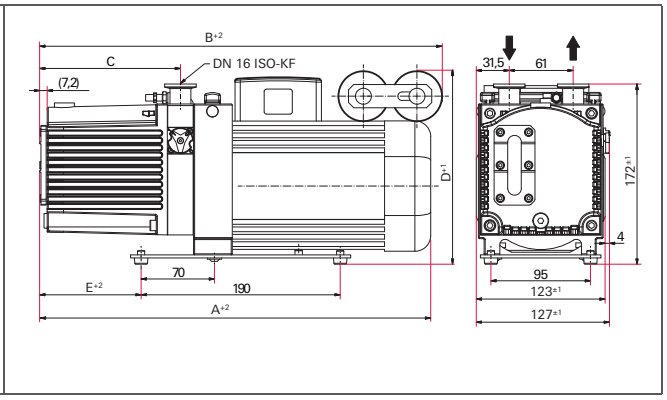


DUO 1.6, 1-phase motor

Dimensions (in mm)



DUO 1.6 M, 1-phase motor



DUO 1.6, 1-phase motor

	DUO 1.6 M, 1-phase motor, 100-105 V, 50 Hz; 100-130 V, 60 Hz	DUO 1.6 M, 1-phase motor, 220-240 V, 50/60 Hz	DUO 1.6, 1-phase motor, 100-105 V, 50 Hz; 100-130 V, 60 Hz	DUO 1.6, 1-phase motor, 220-240 V, 50/60 Hz
A	357 mm	357 mm	315 mm	315 mm
B	376 mm	357 mm	335 mm	315 mm
C	123 mm	123 mm	123 mm	123 mm
D	192 mm	189 mm	192 mm	189 mm
E	85.5 mm	85.5 mm	85.5 mm	85.5 mm

Technical data	DUO 1.6 M, 1-phase motor, 100-105 V, 50 Hz; 100-130 V, 60 Hz	DUO 1.6 M, 1-phase motor, 220-240 V, 50/60 Hz	DUO 1.6, 1-phase motor, 100-105 V, 50 Hz; 100-130 V, 60 Hz	DUO 1.6, 1-phase motor, 220-240 V, 50/60 Hz
Flange (out)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Exhaust pressure, max.	1500 hPa	1500 hPa	1500 hPa	1500 hPa
Exhaust pressure, min.	250 hPa	250 hPa	250 hPa	250 hPa
Operating fluid	P3	P3	P3	P3
Operating fluid filling	0.4 l	0.4 l	0.4 l	0.4 l
Rotation speed at 50 Hz	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}	1800 min^{-1}	1800 min^{-1}	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 48 dB (A)	≤ 48 dB (A)	≤ 48 dB (A)	≤ 48 dB (A)
Ultimate pressure with gas ballast	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa
Weight	10.5 kg	10.5 kg	9.6 kg	9.6 kg
Cooling method, standard	Air	Air	Air	Air
Leak rate safety valve	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s
Magnetic coupling	Yes	Yes		
Rated power 50 Hz	0.075 kW	0.075 kW	0.075 kW	0.075 kW
Rated power 60 Hz	0.090 kW	0.090 kW	0.090 kW	0.090 kW
Mains requirement: voltage 50 Hz	100-105 V	220-240 V	100-105 V	220-240 V
Mains requirement: voltage 60 Hz	110-130 V	220-240 V	110-130 V	220-240 V
Mains cable	No	No	No	No
Pumping speed at 50 Hz	1.25 m^3/h	1.25 m^3/h	1.25 m^3/h	1.25 m^3/h
Pumping speed at 60 Hz	1.50 m^3/h	1.50 m^3/h	1.50 m^3/h	1.50 m^3/h
Switch	Yes	Yes	Yes	Yes
Protection category	IP 40	IP 40	IP 40	IP 40
Ambient temperature	12-40 °C	12-40 °C	12-40 °C	12-40 °C

Order number				
DUO 1.6	**PK D56 107**	**PK D56 112**	**PK D56 707**	**PK D56 712**

Accessories				
KAS 16, condensate separator for pumping speeds from 1.6 to 12 m^3/h	**PK Z10 003**	**PK Z10 003**	**PK Z10 003**	**PK Z10 003**
ONF 16 S, oil mist filter for pumping speeds up to 12 m^3/h	**PK Z40 001**	**PK Z40 001**	**PK Z40 001**	**PK Z40 001**
Oil return unit from ONF 16 S to DUO 1.6 / DUO 3	**PK 005 986 -T**	**PK 005 986 -T**	**PK 005 986 -T**	**PK 005 986 -T**
ONF 16 M, oil mist filter for pumping speeds of up to 12 m^3/h	**PK Z40 003**	**PK Z40 003**	**PK Z40 003**	**PK Z40 003**
ZFO 16, zeolite trap	**PK Z70 003**	**PK Z70 003**	**PK Z70 003**	**PK Z70 003**
Operations monitoring unit 3 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 141 -T**	**PK 196 141 -T**	**PK 196 141 -T**	**PK 196 141 -T**
Operations monitoring unit 2 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 142 -T**	**PK 196 142 -T**	**PK 196 142 -T**	**PK 196 142 -T**
Operations monitoring unit 1 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 157 -T**	**PK 196 157 -T**	**PK 196 157 -T**	**PK 196 157 -T**
Mains cable 230 V with safety plug CEE 7, right angle IEC 320/C13 socket, 2 m	**PK 050 109**	**PK 050 109**	**PK 050 109**	**PK 050 109**
Mains cable 115 V with NEMA-plug, right angle IEC 320/C13 socket, 2 m	**PK 050 110**	**PK 050 110**	**PK 050 110**	**PK 050 110**
SAS 16, DN 16 ISO-KF, polyester filter	**PK Z60 506**	**PK Z60 506**	**PK Z60 506**	**PK Z60 506**
Oil return unit from ONF 16 M to DUO 1.6, 3	**PK 006 080 -T**	**PK 006 080 -T**	**PK 006 080 -T**	**PK 006 080 -T**
Mains cable 115 / 230 V without plug, right angle IEC 320/C13 socket, 3 m	**PK 050 111**	**PK 050 111**	**PK 050 111**	**PK 050 111**

DUO 3

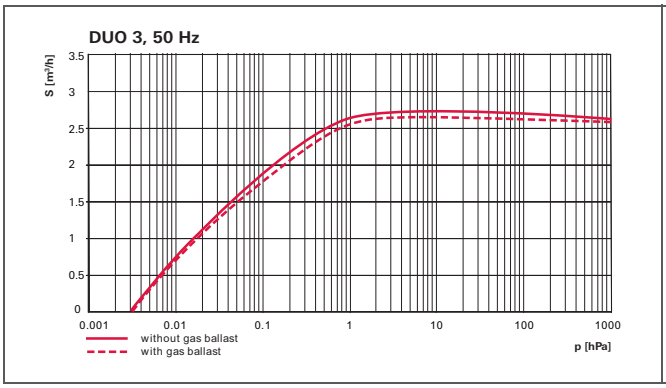


Dual-stage rotary vane pumps with a pumping speed up to 2.9 m³/h:

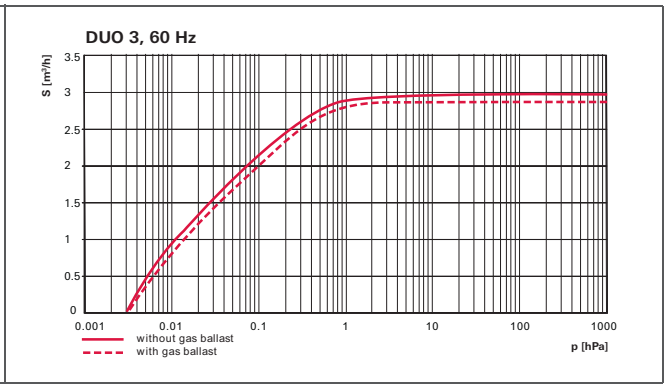
- Dual-stage, high-performance rotary vane pump with a pumping speed up to 2.9 m³/h
- With Single-phase motor
- Integrated gas ballast and safety valve
- For all low and medium vacuum applications
- Magnetic coupling
- Special feature: Various motor voltages for worldwide employment
- Other motor voltages available on request

M = Magnetically coupled

Pumping speed

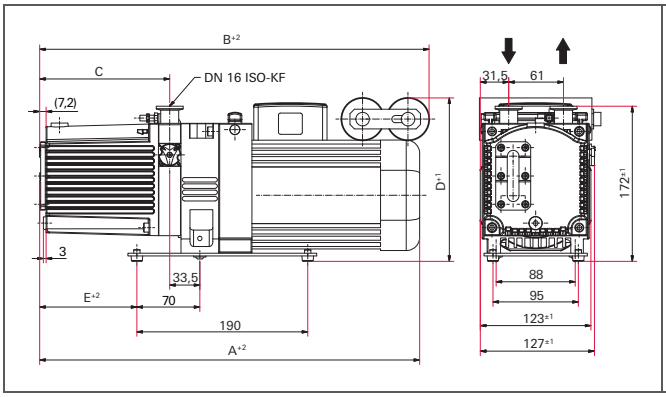


DUO 3, 1-phase motor

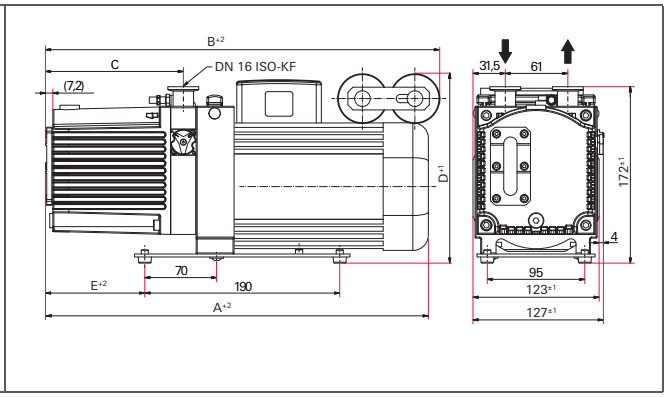


DUO 3, 1-phase motor

Dimensions (in mm)



DUO 3 M, 1-phase motor



DUO 3, 1-phase motor

	DUO 3 M, 1-phase motor, 115/230 V, 50/60 Hz	DUO 3 M, 1-phase motor, 220-240 V, 50/60 Hz	DUO 3, 1-phase motor, 115/230 V, 50/60 Hz	DUO 3, 1-phase motor, 220-240 V, 50/60 Hz
A	351 mm	351 mm	309 mm	309 mm
B	386 mm	351 mm	344 mm	309 mm
C	123 mm	123 mm	123 mm	123 mm
D	176 mm	176 mm	176 mm	176 mm
E	85.5 mm	85.5 mm	85.5 mm	85.5 mm

Technical data	DUO 3 M, 1-phase motor, 115/230 V, 50/60 Hz	DUO 3 M, 1-phase motor, 220-240 V, 50/60 Hz	DUO 3, 1-phase motor, 115/230 V, 50/60 Hz	DUO 3, 1-phase motor, 220-240 V, 50/60 Hz
Flange (out)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Exhaust pressure, max.	1500 hPa	1500 hPa	1500 hPa	1500 hPa
Exhaust pressure, min.	250 hPa	250 hPa	250 hPa	250 hPa
Operating fluid	P3	P3	P3	P3
Operating fluid filling	0.4 l	0.4 l	0.4 l	0.4 l
Rotation speed at 50 Hz	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}
Rotation speed at 60 Hz	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 53 dB (A)	≤ 53 dB (A)	≤ 53 dB (A)	≤ 53 dB (A)
Ultimate pressure with gas ballast	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa
Weight	12 kg	12 kg	11.5 kg	11.3 kg
Cooling method, standard	Air	Air	Air	Air
Leak rate safety valve	$\leq 1 \cdot 10^{-5}$ Pa m³/s	$\leq 1 \cdot 10^{-5}$ Pa m³/s	$\leq 1 \cdot 10^{-5}$ Pa m³/s	$\leq 1 \cdot 10^{-5}$ Pa m³/s
Magnetic coupling	Yes	Yes		
Rated power 50 Hz	0.15 kW	0.15 kW	0.15 kW	0.15 kW
Rated power 60 Hz	0.18 kW	0.18 kW	0.18 kW	0.18 kW
Mains requirement: voltage (selectable)	230 V		230 V	
Mains requirement: voltage 50 Hz	115 V	220-240 V	115 V	220-240 V
Mains requirement: voltage 60 Hz	115 V	220-240 V	115 V	220-240 V
Mains cable	No	No	No	No
Pumping speed at 50 Hz	2.5 m³/h	2.5 m³/h	2.5 m³/h	2.5 m³/h
Pumping speed at 60 Hz	2.9 m³/h	2.9 m³/h	2.9 m³/h	2.9 m³/h
Switch	Yes	Yes	Yes	Yes
Protection category	IP 55	IP 55	IP 55	IP 55
Ambient temperature	12-40 °C	12-40 °C	12-40 °C	12-40 °C

Order number				
DUO 3	**PK D57 111**	**PK D57 112**	**PK D57 711**	**PK D57 712**

Accessories				
KAS 16, condensate separator for pumping speeds from 1.6 to 12 m³/h	**PK Z10 003**	**PK Z10 003**	**PK Z10 003**	**PK Z10 003**
ONF 16 S, oil mist filter for pumping speeds up to 12 m³/h	**PK Z40 001**	**PK Z40 001**	**PK Z40 001**	**PK Z40 001**
Oil return unit from ONF 16 S to DUO 1.6 / DUO 3	**PK 005 986 -T**	**PK 005 986 -T**	**PK 005 986 -T**	**PK 005 986 -T**
ONF 16 M, oil mist filter for pumping speeds of up to 12 m³/h	**PK Z40 003**	**PK Z40 003**	**PK Z40 003**	**PK Z40 003**
ZFO 16, zeolite trap	**PK Z70 003**	**PK Z70 003**	**PK Z70 003**	**PK Z70 003**
Operations monitoring unit 3 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 141 -T**	**PK 196 141 -T**	**PK 196 141 -T**	**PK 196 141 -T**
Operations monitoring unit 2 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 142 -T**	**PK 196 142 -T**	**PK 196 142 -T**	**PK 196 142 -T**
Operations monitoring unit 1 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 157 -T**	**PK 196 157 -T**	**PK 196 157 -T**	**PK 196 157 -T**
Mains cable 230 V with safety plug CEE 7, right angle IEC 320/C13 socket, 2 m	**PK 050 109**	**PK 050 109**	**PK 050 109**	**PK 050 109**
Mains cable 115 V with NEMA-plug, right angle IEC 320/C13 socket, 2 m	**PK 050 110**	**PK 050 110**	**PK 050 110**	**PK 050 110**
SAS 16, DN 16 ISO-KF, polyester filter	**PK Z60 506**	**PK Z60 506**	**PK Z60 506**	**PK Z60 506**
Oil return unit from ONF 16 M to DUO 1.6, 3	**PK 006 080 -T**	**PK 006 080 -T**	**PK 006 080 -T**	**PK 006 080 -T**
Mains cable 115 / 230 V without plug, right angle IEC 320/C13 socket, 3 m	**PK 050 111**	**PK 050 111**	**PK 050 111**	**PK 050 111**

DUO 6

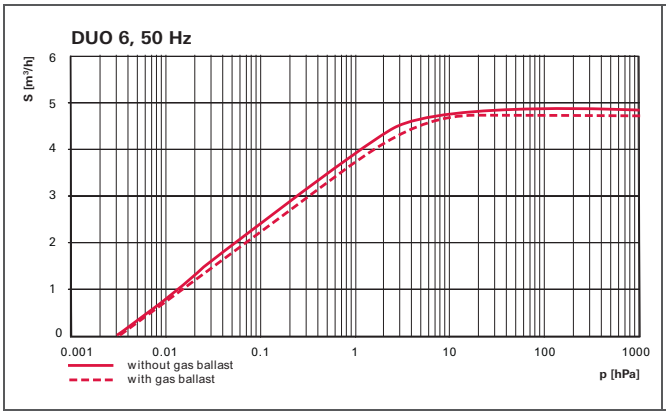


Dual-stage rotary vane pumps with a pumping speed up to 6 m³/h:

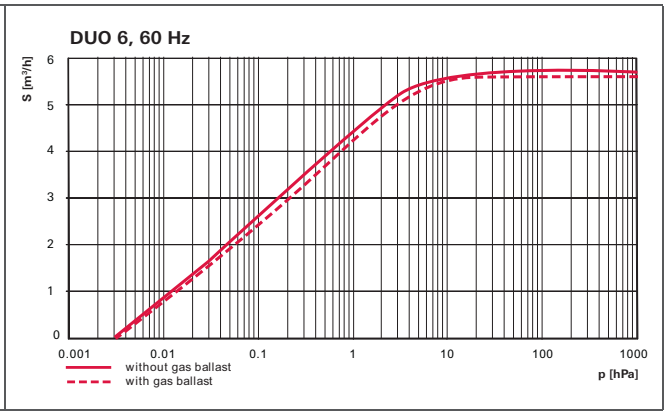
- Dual-stage, high-performance rotary vane pump with a pumping speed up to 6 m³/h
- With Single-phase motor
- Integrated gas ballast and HV safety valve
- For all low and medium vacuum applications
- With magnetic coupling
- Other motor voltages available on request

M = Magnetically coupled

Pumping speed

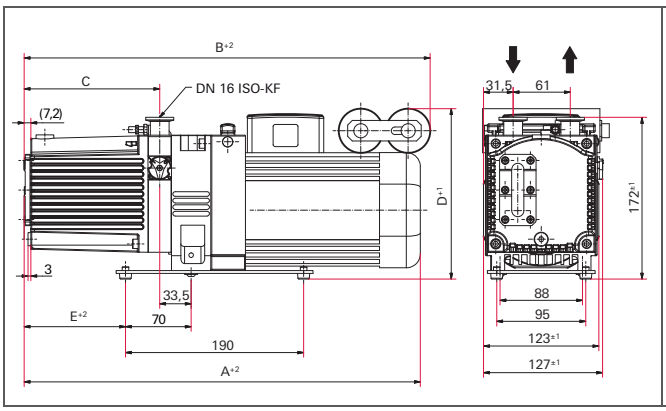


DUO 6, 1-phase motor

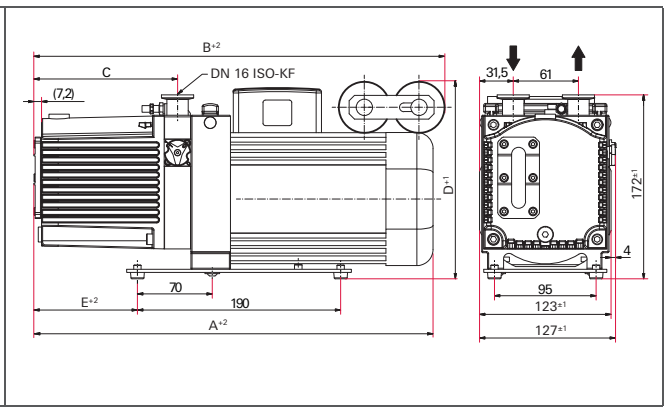


DUO 6, 1-phase motor

Dimensions (in mm)



DUO 6 M, 1-phase motor



DUO 6, 1-phase motor

	DUO 6 M, 1-phase motor, 95-115, 50 Hz; 95-130, 60 Hz	DUO 6 M, 1-phase motor, 220-265 V, 50/60 Hz	DUO 6, 1-phase motor, 95-115, 50 Hz; 95-130, 60 Hz	DUO 6, 1-phase motor, 200-265 V, 50/60 Hz
A	423 mm	413 mm	381 mm	371 mm
B	433 mm	413 mm	391 mm	371 mm
C	145 mm	145 mm	145 mm	145 mm
D	182 mm	177.5 mm	182 mm	177 mm
E	108.5 mm	108.5 mm	107.5 mm	107.5 mm

Technical data	DUO 6 M, 1-phase motor, 95-115, 50 Hz; 95-130, 60 Hz	DUO 6 M, 1-phase motor, 220-265 V, 50/60 Hz	DUO 6, 1-phase motor, 95-115, 50 Hz; 95-130, 60 Hz	DUO 6, 1-phase motor, 200-265 V, 50/60 Hz
Flange (out)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Exhaust pressure, max.	1500 hPa	1500 hPa	1500 hPa	1500 hPa
Exhaust pressure, min.	250 hPa	250 hPa	250 hPa	250 hPa
Operating fluid	P3	P3	P3	P3
Operating fluid filling	0.5 l	0.5 l	0.5 l	0.5 l
Rotation speed at 50 Hz	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}
Rotation speed at 60 Hz	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 53 dB (A)	≤ 53 dB (A)	≤ 53 dB (A)	≤ 53 dB (A)
Ultimate pressure with gas ballast	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa
Weight	17.5 kg	17.5 kg	16 kg	16 kg
Cooling method, standard	Air	Air	Air	Air
Leak rate safety valve	$\leq 1 \cdot 10^{-5}$ Pa m^3/s	$\leq 1 \cdot 10^{-5}$ Pa m^3/s	$\leq 1 \cdot 10^{-5}$ Pa m^3/s	$\leq 1 \cdot 10^{-5}$ Pa m^3/s
Magnetic coupling	Yes	Yes		
Rated power 50 Hz	0.25 kW	0.25 kW	0.25 kW	0.25 kW
Rated power 60 Hz	0.30 kW	0.30 kW	0.30 kW	0.30 kW
Mains requirement: voltage 50 Hz	95-115 V	200-265 V	95-115 V	200-265 V
Mains requirement: voltage 60 Hz	95-130 V	200-265 V	95-130 V	200-265 V
Mains cable	No	No	No	No
Pumping speed at 50 Hz	5 m^3/h	5 m^3/h	5 m^3/h	5 m^3/h
Pumping speed at 60 Hz	6 m^3/h	6 m^3/h	6 m^3/h	6 m^3/h
Switch	Yes	Ja	Yes	Yes
Protection category	IP 55	IP 55	IP 55	IP 55
Ambient temperature	12-40 °C	12-40 °C	12-40 °C	12-40 °C

Order number				
DUO 6	**PK D58 107**	**PK D58 112**	**PKD58 707**	**PK D58 712**

Accessories				
KAS 16, condensate separator for pumping speeds from 1.6 to 12 m^3/h	**PK Z10 003**	**PK Z10 003**	**PK Z10 003**	**PK Z10 003**
ONF 16 S, oil mist filter for pumping speeds up to 12 m^3/h	**PK Z40 001**	**PK Z40 001**	**PK Z40 001**	**PK Z40 001**
Oil return unit from ONF 16 S to DUO 1.6 / DUO 3	**PK 005 986 -T**	**PK 005 986 -T**	**PK 005 986 -T**	**PK 005 986 -T**
ONF 16 M, oil mist filter for pumping speeds of up to 12 m^3/h	**PK Z40 003**	**PK Z40 003**	**PK Z40 003**	**PK Z40 003**
ZFO 16, zeolite trap	**PK Z70 003**	**PK Z70 003**	**PK Z70 003**	**PK Z70 003**
Operations monitoring unit 3 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 141 -T**	**PK 196 141 -T**	**PK 196 141 -T**	**PK 196 141 -T**
Operations monitoring unit 2 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 142 -T**	**PK 196 142 -T**	**PK 196 142 -T**	**PK 196 142 -T**
Operations monitoring unit 1 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 157 -T**	**PK 196 157 -T**	**PK 196 157 -T**	**PK 196 157 -T**
Mains cable 230 V with safety plug CEE 7, right angle IEC 320/C13 socket, 2 m	**PK 050 109**	**PK 050 109**	**PK 050 109**	**PK 050 109**
Mains cable 115 V with NEMA-plug, right angle IEC 320/C13 socket, 2 m	**PK 050 110**	**PK 050 110**	**PK 050 110**	**PK 050 110**
SAS 16, DN 16 ISO-KF, polyester filter	**PK Z60 506**	**PK Z60 506**	**PK Z60 506**	**PK Z60 506**
Oil return unit from ONF 16 M to DUO 1.6, 3	**PK 006 080 -T**	**PK 006 080 -T**	**PK 006 080 -T**	**PK 006 080 -T**
Mains cable 115 / 230 V without plug, right angle IEC 320/C13 socket, 3 m	**PK 050 111**	**PK 050 111**	**PK 050 111**	**PK 050 111**

DUO 11

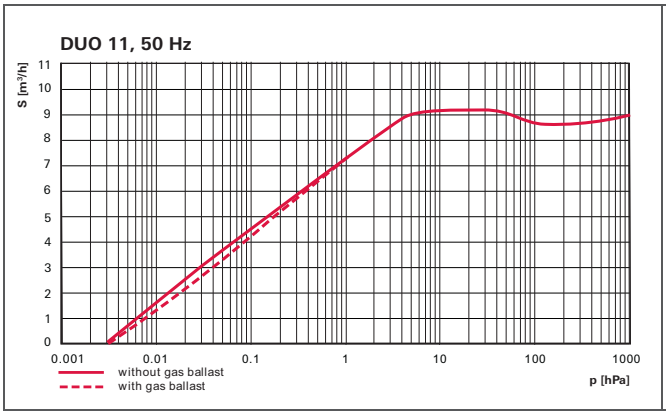


Dual-stage rotary vane pumps with a pumping speed up to 10.5 m³/h:

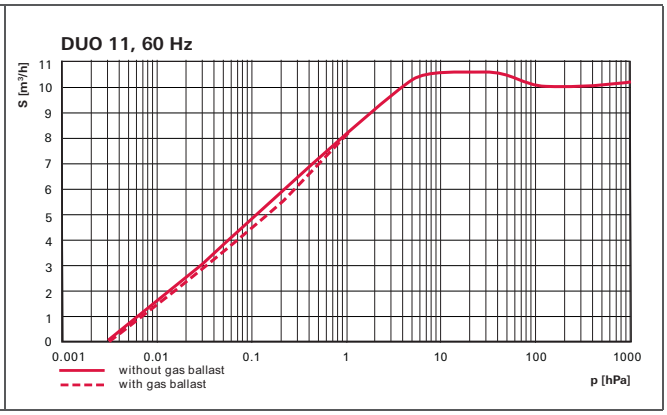
- Dual-stage, high-performance rotary vane pump with a pumping speed up to 10.5 m³/h
- With Single-phase motor
- Integrated gas ballast and HV safety valve
- For all low and medium vacuum applications
- With magnetic coupling
- Other motor voltages available on request

M = Magnetically coupled

Pumping speed

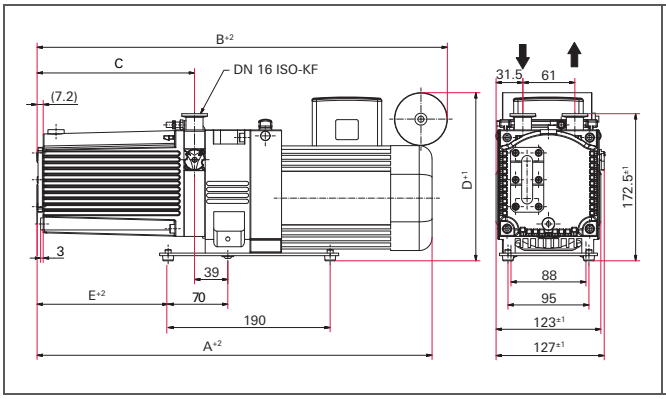


DUO 11, 1-phase motor, 90-130 V

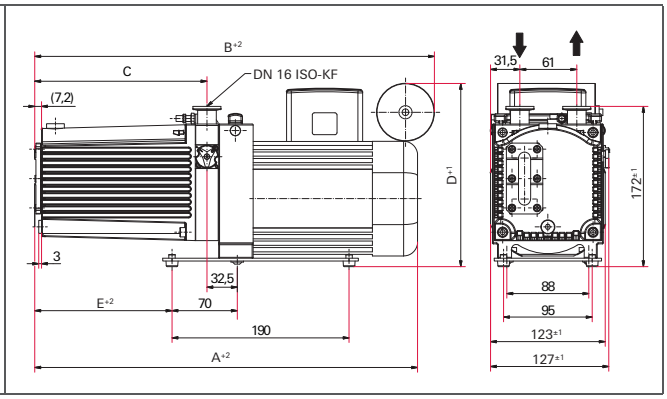


DUO 11, 1-phase motor, 90-130 V

Dimensions (in mm)



DUO 11 M, 1-phase motor



DUO 11, 1-phase motor, 90-130 V

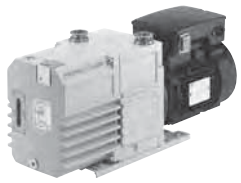
	DUO 11 M, 1-phase motor, 90-130 V, 50/60 Hz	DUO 11 M, 1-phase motor, 180-265 V, 50/60 Hz	DUO 11, 1-phase motor, 90-130 V, 50/60 Hz	DUO 11, 1-phase motor, 180-265 V, 50/60 Hz
A	463 mm	463 mm	411 mm	411 mm
B	481 mm	460 mm	429 mm	409 mm
C	185 mm	185 mm	185 mm	185 mm
D	154 mm	154 mm	197 mm	191 mm
E	197 mm	192 mm	147.5 mm	147.5 mm

Technical data	DUO 11 M, 1-phase motor, 90-130 V, 50/60 Hz	DUO 11 M, 1-phase motor, 180-265 V, 50/60 Hz	DUO 11, 1-phase motor, 90-130 V, 50/60 Hz	DUO 11, 1-phase motor, 180-265 V, 50/60 Hz
Flange (out)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Exhaust pressure, max.	1500 hPa	1500 hPa	1500 hPa	1500 hPa
Exhaust pressure, min.	250 hPa	250 hPa	250 hPa	250 hPa
Operating fluid	P3	P3	P3	P3
Operating fluid filling	0.6 l	0.6 l	0.6 l	0.6 l
Rotation speed at 50 Hz	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}
Rotation speed at 60 Hz	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 55 dB (A)	≤ 55 dB (A)	≤ 55 dB (A)	≤ 55 dB (A)
Ultimate pressure with gas ballast	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa
Weight	19 kg	19 kg	17 kg	17 kg
Cooling method, standard	Air	Air	Air	Air
Leak rate safety valve	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s
Magnetic coupling	Yes	Yes		
Rated power 50 Hz	0.25 kW	0.25 kW	0.25 kW	0.25 kW
Rated power 60 Hz	0.30 kW	0.30 kW	0.30 kW	0.30 kW
Mains requirement: voltage 50 Hz	90-130 V	180-265 V	90-130 V	180-265 V
Mains requirement: voltage 60 Hz	90-130 V	180-265 V	90-130 V	180-265 V
Mains cable	No	No	No	No
Pumping speed at 50 Hz	9.0 m^3/h	9.0 m^3/h	9,0 m^3/h	9.0 m^3/h
Pumping speed at 60 Hz	10.5 m^3/h	10.5 m^3/h	10.5 m^3/h	10.5 m^3/h
Switch	Yes	Yes	Yes	Yes
Protection category	IP 55	IP 55	IP 55	IP 55
Ambient temperature	12-40 °C	12-40 °C	12-40 °C	12-40 °C

Order number				
DUO 11	**PK D59 107**	**PK D59 112**	**PK D59 707**	**PK D59 712**

Accessories				
KAS 16, condensate separator for pumping speeds from 1.6 to 12 m^3/h	**PK Z10 003**	**PK Z10 003**	**PK Z10 003**	**PK Z10 003**
ONF 16 S, oil mist filter for pumping speeds up to 12 m^3/h	**PK Z40 001**	**PK Z40 001**	**PK Z40 001**	**PK Z40 001**
Oil return unit from ONF 16 S to DUO 1.6 / DUO 3	**PK 005 986 -T**	**PK 005 986 -T**	**PK 005 986 -T**	**PK 005 986 -T**
ONF 16 M, oil mist filter for pumping speeds of up to 12 m^3/h	**PK Z40 003**	**PK Z40 003**	**PK Z40 003**	**PK Z40 003**
ZFO 16, zeolite trap	**PK Z70 003**	**PK Z70 003**	**PK Z70 003**	**PK Z70 003**
Operations monitoring unit 3 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 141 -T**	**PK 196 141 -T**	**PK 196 141 -T**	**PK 196 141 -T**
Operations monitoring unit 2 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 142 -T**	**PK 196 142 -T**	**PK 196 142 -T**	**PK 196 142 -T**
Operations monitoring unit 1 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 157 -T**	**PK 196 157 -T**	**PK 196 157 -T**	**PK 196 157 -T**
Mains cable 230 V with safety plug CEE 7, right angle IEC 320/C13 socket, 2 m	**PK 050 109**	**PK 050 109**	**PK 050 109**	**PK 050 109**
Mains cable 115 V with NEMA-plug, right angle IEC 320/C13 socket, 2 m	**PK 050 110**	**PK 050 110**	**PK 050 110**	**PK 050 110**
SAS 16, DN 16 ISO-KF, polyester filter	**PK Z60 506**	**PK Z60 506**	**PK Z60 506**	**PK Z60 506**
Oil return unit from ONF 16 M to DUO 1.6, 3	**PK 006 080 -T**	**PK 006 080 -T**	**PK 006 080 -T**	**PK 006 080 -T**
Mains cable 115 / 230 V without plug, right angle IEC 320/C13 socket, 3 m	**PK 050 111**	**PK 050 111**	**PK 050 111**	**PK 050 111**

DUO 20 M

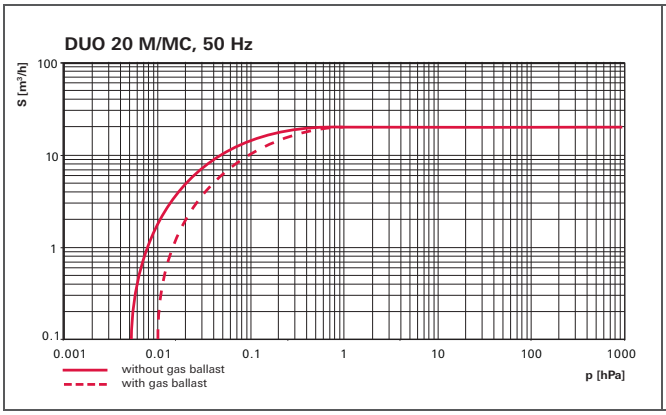


Dual-stage rotary vane pumps with a pumping speed up to 24 m³/h :

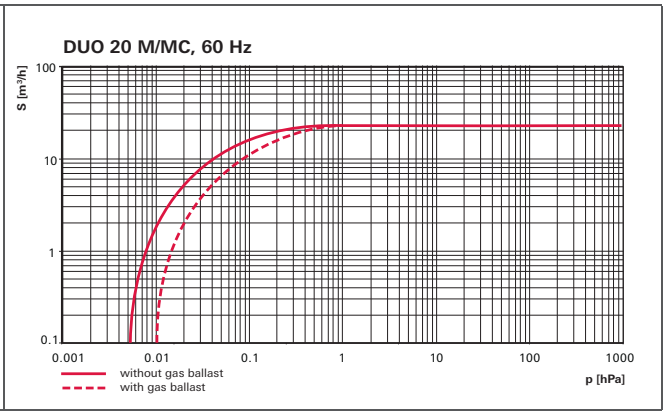
- Dual-stage, high-performance rotary vane pump with a pumping speed up to 24 m³/h
- With 3-phase motor
- With temperature sensor (3TF) for optimum motor protection
- Integrated gas ballast and HV safety valve
- For all low and medium vacuum applications
- Magnetically coupled
- Special feature: Various motor voltages for worldwide employment
- Other motor voltages available on request

M = Magnetically coupled
MC = Corrosive gas version, magnetically coupled
TF = Temperature sensor

Pumping speed

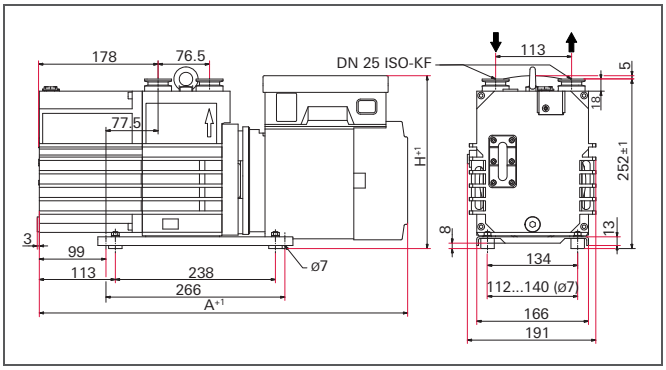


DUO 20 M, 3-phase motor, 3TF



DUO 20 M, 3-phase motor, 3TF

Dimensions (in mm)



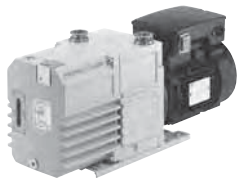
	DUO 20 M, 3-phase motor, 3TF, 220-240/380-420 V, 50 Hz; 250-277/440-480 V, 60 Hz	DUO 20 M, 1-phase motor, 100-110 V, 50 Hz; 100-120 V, 60 Hz	DUO 20 M, 1-phase motor, 200-230 V, 50 Hz; 200-240 V, 60 Hz
A	542 mm	548 mm	548 mm
H	212 mm	257 mm	257 mm

Technical data	DUO 20 M, 3-phase motor, 3TF, 220-240/380-420 V, 50 Hz; 250-277/440-480 V, 60 Hz	DUO 20 M, 1-phase motor, 100-110 V, 50 Hz; 100-120 V, 60 Hz	DUO 20 M, 1-phase motor, 200-230 V, 50 Hz; 200-240 V, 60 Hz
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Exhaust pressure, max.	1500 hPa	1500 hPa	1500 hPa
Exhaust pressure, min.	250 hPa	250 hPa	250 hPa
Operating fluid	P3	P3	P3
Operating fluid filling	1.1 l	1.1 l	1.1 l
Rotation speed at 50 Hz	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}	1800 min^{-1}	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 55 dB (A)	≤ 57 dB (A)	≤ 57 dB (A)
Ultimate pressure with gas ballast	$4 \cdot 10^{-3}$ hPa	$4 \cdot 10^{-3}$ hPa	$4 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$2 \cdot 10^{-3}$ hPa	$2 \cdot 10^{-3}$ hPa	$2 \cdot 10^{-3}$ hPa
Weight	33 kg	44 kg	44 kg
Cooling method, standard	Air	Air	Air
Leak rate safety valve	≤ $1 \cdot 10^{-5}$ Pa m³/s	≤ $1 \cdot 10^{-5}$ Pa m³/s	≤ $1 \cdot 10^{-5}$ Pa m³/s
Magnetic coupling	Yes	Yes	Yes
Motor protection	3TF		
Rated power 50 Hz	0.55 kW	0.75 kW	0.75 kW
Rated power 60 Hz	0.66 kW	0.90 kW	0.90 kW
Mains requirement: voltage (selectable)		200-230, 50 Hz; 200-240, 60 Hz V	100-110, 50 Hz; 100-120, 60 Hz V
Mains requirement: voltage 50 Hz	220-240/380-420 (± 5 %) V	100-110 (± 5 %) V	200-230 (± 5 %) V
Mains requirement: voltage 60 Hz	250-277/440-480 (± 5 %) V	100-120 (± 5 %) V	200-240 (± 5 %) V
Mains cable	No	Yes	Yes
Pumping speed at 50 Hz	20 m³/h	20 m³/h	20 m³/h
Pumping speed at 60 Hz	24 m³/h	24 m³/h	24 m³/h
Switch	No	Yes, with 2 m mains cable and US plug	Yes, with 2 m cable and safety plug
Protection category	IP 55	IP 54	IP 54
Ambient temperature	12-40 °C	12-40 °C	12-40 °C

Order number			
DUO 20 M	**PK D63 105**	**PK D63 707**	**PK D63 712**

Accessories			
SAS 25, DN 25 ISO-KF, polyester filter	**PK Z60 508**	**PK Z60 508**	**PK Z60 508**
KAS 25 L, condensate separator for pumping speeds up to 34 m³/h	**PK Z10 033**	**PK Z10 033**	**PK Z10 033**
ONF 25 L, oil mist filter for pumping speeds of up to 30 m³/h	**PK Z40 158**	**PK Z40 158**	**PK Z40 158**
Oil return unit from ONF 16 M to DUO 5 M, from ONF 25 M to DUO 10 M, from ONF 25 L to DUO 20 M, standard version	**PK 196 172 -T**	**PK 196 172 -T**	**PK 196 172 -T**
ZFO 025, zeolite trap	**PK Z70 006**	**PK Z70 006**	**PK Z70 006**
FAK 025, activated carbon filter	**PK Z30 006**	**PK Z30 006**	**PK Z30 006**
KLF 025, cold trap	**PK Z80 006**	**PK Z80 006**	**PK Z80 006**
URB 025, catalytic trap, 230 V	**PT U10 760**	**PT U10 760**	**PT U10 760**
URB 025, catalytic trap, 115 V	**PT U10 761**	**PT U10 761**	**PT U10 761**
Oil pressure switch for DUO 5/10/20 M and Penta 20/35	**PK 196 484 -T**	**PK 196 484 -T**	**PK 196 484 -T**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**	**P 4768 051 FQ**
Operations monitoring unit 3 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 141 -T**	**PK 196 141 -T**	**PK 196 141 -T**
Operations monitoring unit 2 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 142 -T**	**PK 196 142 -T**	**PK 196 142 -T**
Operations monitoring unit 1 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 157 -T**	**PK 196 157 -T**	**PK 196 157 -T**

DUO 20 MC

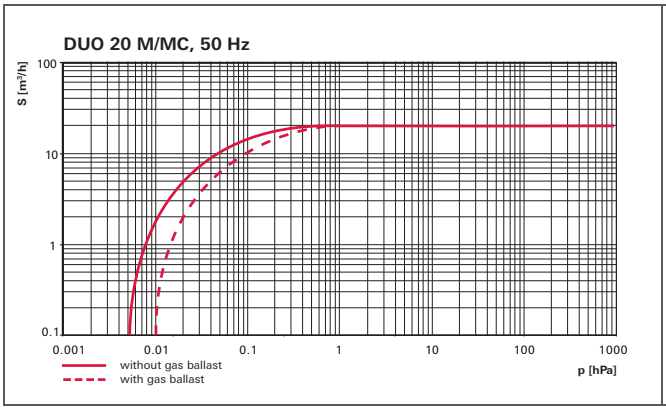


Dual-stage rotary vane pumps with a pumping speed up to 24 m³/h :

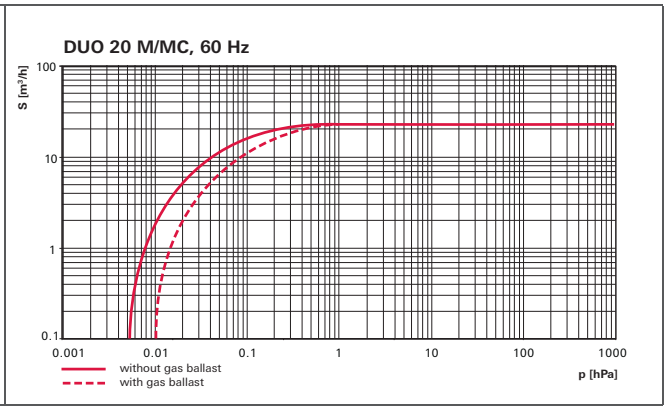
- Dual-stage, high-performance rotary vane pump with a pumping speed up to 24 m³/h
- With 3-phase motor
- With temperature sensor (3TF) for optimum motor protection
- Integrated gas ballast and HV safety valve
- For all low and medium vacuum applications
- Magnetically coupled
- Special feature: Various motor voltages for worldwide employment
- Other motor voltages available on request

M = Magnetically coupled
MC = Corrosive gas version, magnetically coupled
TF = Temperature sensor

Pumping speed

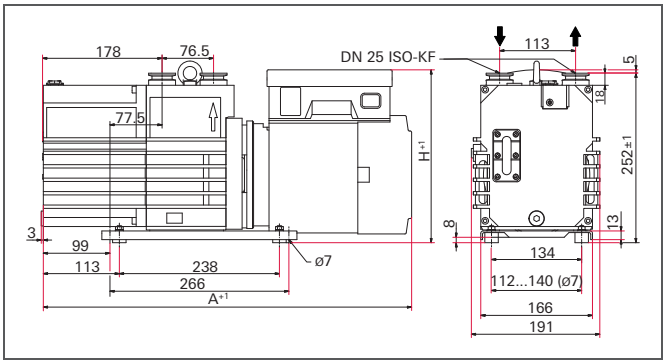


DUO 20 MC, 3-phase motor, 3TF



DUO 20 MC, 3-phase motor, 3TF

Dimensions (in mm)



	DUO 20 MC, 1-phase motor, 100-110 V, 50 Hz; 100-120 V, 60 Hz	DUO 20 MC, 1-phase motor, 200-230 V, 50 Hz; 200-240 V, 60 Hz
A	548 mm	548 mm
H	257 mm	257 mm

Technical data	DUO 20 MC, 1-phase motor, 100-110 V, 50 Hz; 100-120 V, 60 Hz	DUO 20 MC, 1-phase motor, 200-230 V, 50 Hz; 200-240 V, 60 Hz
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF
Exhaust pressure, max.	1500 hPa	1500 hPa
Exhaust pressure, min.	250 hPa	250 hPa
Operating fluid	F4	F4
Operating fluid filling	1.1 l	1.1 l
Rotation speed at 50 Hz	1500 min^{-1}	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 57 dB (A)	≤ 57 dB (A)
Ultimate pressure with gas ballast	$7 \cdot 10^{-3}$ hPa	$7 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$4 \cdot 10^{-3}$ hPa	$4 \cdot 10^{-3}$ hPa
Weight	44 kg	44 kg
Corrosive gas version	Yes	Yes
Cooling method, standard	Air	Air
Leak rate magnetic coupling	≤ $1 \cdot 10^{-6}$ Pa m^3/s	≤ $1 \cdot 10^{-6}$ Pa m^3/s
Leak rate safety valve	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s
Magnetic coupling	Yes	Yes
Rated power 50 Hz	0.75 kW	0.75 kW
Rated power 60 Hz	0.90 kW	0.90 kW
Mains requirement: voltage (selectable)	200-230, 50 Hz; 200-240, 60 Hz V	100-110, 50 Hz; 100-120, 60 Hz V
Mains requirement: voltage 50 Hz	100-110 (± 5 %) V	200-230 (± 5 %) V
Mains requirement: voltage 60 Hz	100-120 (± 5 %) V	200-240 (± 5 %) V
Mains cable	Yes	Yes
Pumping speed at 50 Hz	20 m^3/h	20 m^3/h
Pumping speed at 60 Hz	24 m^3/h	24 m^3/h
Switch	Yes, with 2 m mains cable and US plug	Yes, with 2 m mains cable and safety plug
Protection category	IP 54	IP 54
Ambient temperature	12-40 °C	12-40 °C

Order number		
DUO 20 MC	**PK D63 727**	**PK D63 732**

Accessories		
SAS 25, DN 25 ISO-KF, polyester filter	**PK Z60 508**	**PK Z60 508**
KAS 25 L, condensate separator for pumping speeds up to 34 m^3/h	**PK Z10 033**	**PK Z10 033**
ONF 25 L, oil mist filter for pumping speeds of up to 30 m^3/h	**PK Z40 158**	**PK Z40 158**
Oil return unit from ONF 16 M to DUO 5 M, from ONF 25 M to DUO 10 M, from ONF 25 L to DUO 20 M, standard version	**PK 196 172 -T**	**PK 196 172 -T**
ZFO 025, zeolite trap	**PK Z70 006**	**PK Z70 006**
FAK 025, activated carbon filter	**PK Z30 006**	**PK Z30 006**
KLF 025, cold trap	**PK Z80 006**	**PK Z80 006**
URB 025, catalytic trap, 230 V	**PT U10 760**	**PT U10 760**
URB 025, catalytic trap, 115 V	**PT U10 761**	**PT U10 761**
Oil pressure switch for DUO 5/10/20 M and Penta 20/35	**PK 196 484 -T**	**PK 196 484 -T**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**
Operations monitoring unit 3 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 141 -T**	**PK 196 141 -T**
Operations monitoring unit 2 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 142 -T**	**PK 196 142 -T**
Operations monitoring unit 1 for DUO 1.6/3/6/11 and DUO 5/10/20 M	**PK 196 157 -T**	**PK 196 157 -T**
KAS 40 C, condensate separator, corrosive version for pumping speeds up to 34 m^3/h	**PK Z10 406**	**PK Z10 406**
ONF 025 C, oil mist filter, corrosive gas version up to 24 m^3/h	**PK Z40 406**	**PK Z40 406**

DUO 35

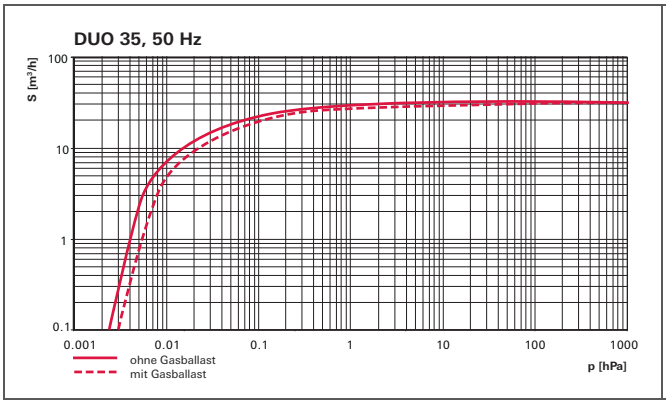


Dual-stage rotary vane pumps with a pumping speed up to 36 m³/h:

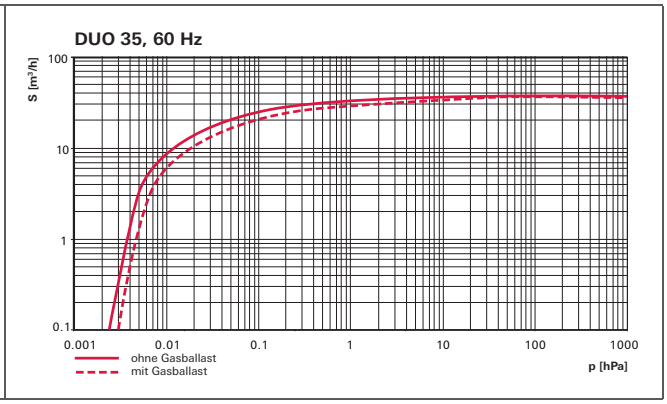
- Dual-stage, high-performance rotary vane pump with a pumping speed up to 36 m³/h
- With 3-phase motor
- With temperature sensor (3TF) for optimum motor protection
- Integrated gas ballast and HV safety valve
- For all low and medium vacuum applications
- Special feature: Various motor voltages for worldwide employment
- Other motor voltages available on request

M = Magnetically coupled
MC = Corrosive gas version with magnetic coupling
TF = Temperature sensor

Pumping speed

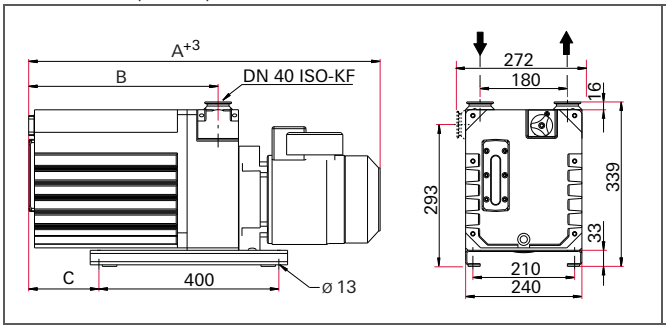


DUO 35, 3-phase motor, 3TF

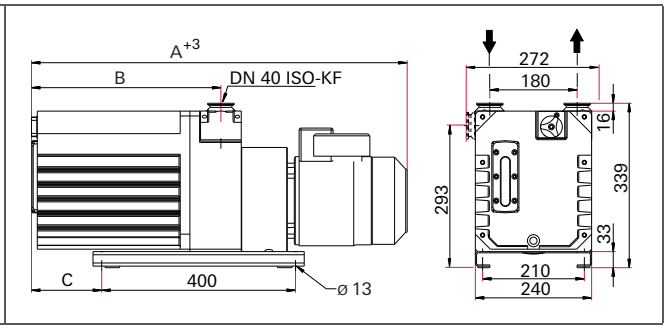


DUO 35, 3-phase motor, 3TF

Dimensions (in mm)



DUO 35, 3-phase motor, 3TF



DUO 35 M, 3-phase motor, 3TF

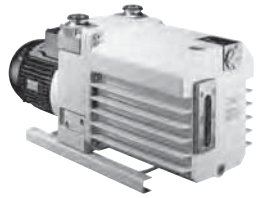
	DUO 35, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz	DUO 35 M, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz	DUO 35 MC, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz
A	658 mm	704 mm	739 mm
B	312 mm	312 mm	312 mm
C	66 mm	66 mm	66 mm

Technical data	DUO 35, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz	DUO 35 M, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz	DUO 35 MC, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Exhaust pressure, max.	1500 hPa	1500 hPa	1500 hPa
Exhaust pressure, min.	250 hPa	250 hPa	250 hPa
Operating fluid	P3	P3	F5
Operating fluid filling	3.2 l	3.2 l	3.2 l
Rotation speed at 50 Hz	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}	1800 min^{-1}	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 61 dB (A)	≤ 61 dB (A)	≤ 61 dB (A)
Ultimate pressure with gas ballast	$3 \cdot 10^{-3}$ hPa	≤ $3 \cdot 10^{-3}$ hPa	≤ $4 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$2 \cdot 10^{-3}$ hPa	≤ $2 \cdot 10^{-3}$ hPa	≤ $3 \cdot 10^{-3}$ hPa
Weight	68 kg	70 kg	74 kg
Cooling method, standard	Air	Air	Air
Leak rate magnetic coupling		≤ $1 \cdot 10^{-7}$ Pa m^3/s	≤ $1 \cdot 10^{-7}$ Pa m^3/s
Leak rate safety valve	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s
Magnetic coupling		Yes	Yes
Motor protection	3TF	3TF	3TF
Rated power 50 Hz	1.1 kW	1.1 kW	1.1 kW
Rated power 60 Hz	1.3 kW	1.3 kW	1.3 kW
Mains requirement: voltage 50 Hz	230/400 (± 5 %) V	230/400 (± 5 %) V	230/400 (± 5 %) V
Mains requirement: voltage 60 Hz	265/460 (± 5 %) V	265/460 (± 5 %) V	265/460 (± 5 %) V
Mains cable	No	No	No
Pumping speed at 50 Hz	32 m^3/h	32 m^3/h	32 m^3/h
Pumping speed at 60 Hz	36 m^3/h	36 m^3/h	36 m^3/h
Switch	No	No	No
Protection category	IP 55	IP 55	IP 55
Ambient temperature	12-40 °C	12-40 °C	12-40 °C

Order number			
DUO 35	**PK D45 602**	**PK D45 028**	**PK D45 027**

Accessories			
SAS 40, DN 40 ISO-KF, polyester filter	**PK Z60 510**	**PK Z60 510**	
KAS 40, condensate separator for pumping speeds up to 100 m^3/h	**PK Z10 008**	**PK Z10 008**	
ONF 35/65, oil mist filter for DUO 35/65, DUO 35/65 M	**PK Z40 150**	**PK Z40 150**	
Oil return unit from ONF 35/65 to DUO 35/65	**PK 005 950 -T**	**PK 005 950 -T**	**PK 005 950 -T**
ONFR 35/65, oil mist filter with oil return to pump for DUO 35/65, DUO 35/65 M	**PK Z40 151**	**PK Z40 151**	
OFC 35/65, chemical oil filter	**PK Z90 320**	**PK Z90 320**	**PK Z90 320**
OFM 35/65, mechanical oil filter	**PK Z90 321**	**PK Z90 321**	
ZFO 040, zeolite trap	**PK Z70 008**	**PK Z70 008**	
FAK 040, activated carbon filter	**PK Z30 008**	**PK Z30 008**	
KLF 040, cold trap	**PK Z80 008**	**PK Z80 008**	**PK Z80 008**
URB 040, catalytic trap, 230 V	**PT U10 260**	**PT U10 260**	
URB 040, catalytic trap, 115 V	**PT U10 261**	**PT U10 261**	
Oil pressure switch for DUO 35/65; DUO 35/65 MC	**PK 223 720 -U**	**PK 223 720 -U**	**PK 223 720 -U**
Oil pressure switch for DUO 35/65 with OFC/OFM	**PK 223 741 -U**	**PK 223 741 -U**	**PK 223 741 -U**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**	**P 4768 051 FQ**
Operations monitoring unit 3 for DUO 35/65, DUO 125/255	**PK 223 739 -U**	**PK 223 739 -U**	**PK 223 739 -U**
Operations monitoring unit 1 for DUO 35/65	**PK 223 718 AU**	**PK 223 718 AU**	**PK 223 718 AU**
KAS 40 C, condensate separator, corrosive version for pumping speeds up to 100 m^3/h			**PK Z10 408**
ONF 35/65 C, oil mist filter, corrosive gas version for DUO 35/65 MC			**PK Z40 152**
ONFR 35/65 C, oil mist separator with oil return to pump, corrosive gas version for DUO 35/65 MC			**PK Z40 153**

DUO 65

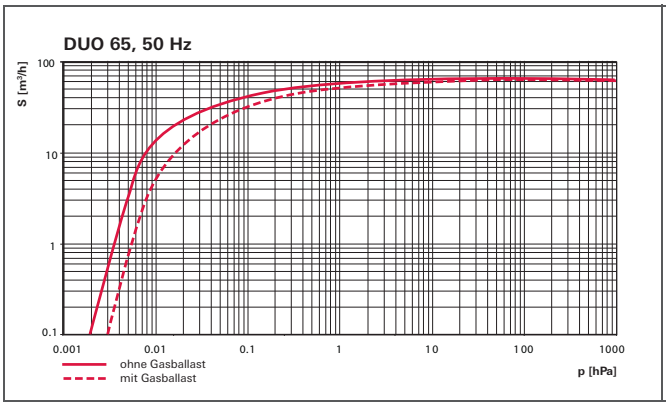


Dual-stage rotary vane pumps with a pumping speed up to 70 m³/h:

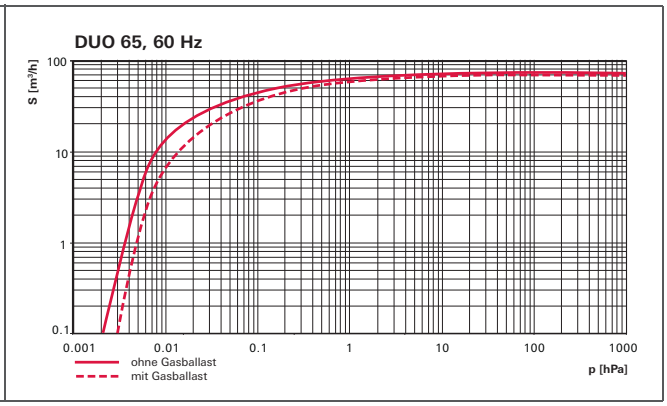
- Dual-stage, high-performance rotary vane pump with a pumping speed up to 70 m³/h
- With 3-phase motor
- With temperature sensor (3TF) for optimum motor protection
- Integrated gas ballast and HV safety valve
- For all low and medium vacuum applications
- Special feature: Various motor voltages for worldwide employment

M = Magnetically coupled
MC = Corrosive gas version, magnetically coupled
TF = Temperature sensor

Pumping speed

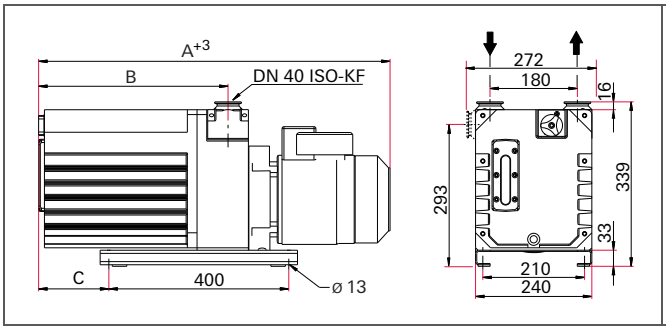


DUO 65, 3-phase motor, 3TF

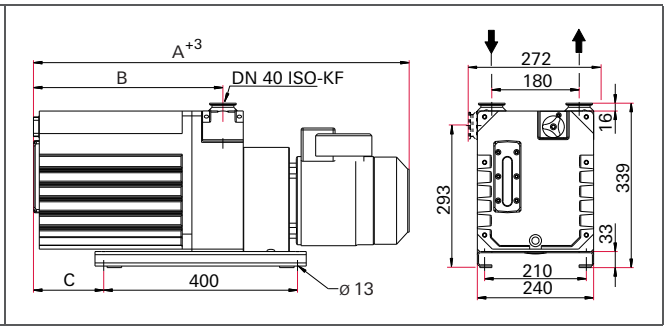


DUO 65, 3-phase motor, 3TF

Dimensions (in mm)



DUO 65, 3-phase motor, 3TF



DUO 65 M, 3-phase motor, 3TF

	DUO 65, 3-phase motor, 3TF, 230/400 V, 50 Hz; 465/460 V, 60 Hz	DUO 65 M, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz	DUO 65 MC, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz
A	738 mm	784 mm	819 mm
B	392 mm	392 mm	392 mm
C	146 mm	146 mm	146 mm

Technical data	DUO 65, 3-phase motor, 3TF, 230/400 V, 50 Hz; 465/460 V, 60 Hz	DUO 65 M, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz	DUO 65 MC, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Exhaust pressure, max.	1500 hPa	1500 hPa	1500 hPa
Exhaust pressure, min.	250 hPa	250 hPa	250 hPa
Operating fluid	P3	P3	F5
Operating fluid filling	4.2 l	4.2 l	4.2 l
Rotation speed at 50 Hz	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}	1800 min^{-1}	1800 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 61 dB (A)	≤ 61 dB (A)	≤ 61 dB (A)
Ultimate pressure with gas ballast	≤ $3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa	$4 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	≤ $2 \cdot 10^{-3}$ hPa	$2 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa
Weight	75 kg	78 kg	83 kg
Cooling method, standard	Air	Air	JA
Leak rate magnetic coupling		≤ $1 \cdot 10^{-7}$ Pa m^3/s	≤ $1 \cdot 10^{-7}$ Pa m^3/s
Leak rate safety valve	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s
Magnetic coupling		Yes	JA
Motor protection	3TF	3TF	3TF
Rated power 50 Hz	1.5 kW	1.5 kW	1.5 kW
Rated power 60 Hz	1.8 kW	1.8 kW	1.8 kW
Mains requirement: voltage 50 Hz	230/400 (± 5 %) V	230/400 (± 5 %) V	230/400 (± 5 %) V
Mains requirement: voltage 60 Hz	265/460 (± 5 %) V	265/460 (± 5 %) V	265/460 (± 5 %) V
Mains cable	No	No	No
Pumping speed at 50 Hz	62 m^3/h	62 m^3/h	62 m^3/h
Pumping speed at 60 Hz	70 m^3/h	70 m^3/h	70 m^3/h
Switch	No	No	No
Protection category	IP 55	IP 55	IP 55
Ambient temperature	12-40 °C	12-40 °C	12-40 °C

Order number			
DUO 65	**PK D46 602**	**PK D46 035**	**PK D46 036**

Accessories			
SAS 40, DN 40 ISO-KF, polyester filter	**PK Z60 510**	**PK Z60 510**	
KAS 40, condensate separator for pumping speeds up to 100 m^3/h	**PK Z10 008**	**PK Z10 008**	
ONF 35/65, oil mist filter for DUO 35/65, DUO 35/65 M	**PK Z40 150**	**PK Z40 150**	
Oil return unit from ONF 35/65 to DUO 35/65	**PK 005 950 -T**	**PK 005 950 -T**	**PK 005 950 -T**
ONFR 35/65, oil mist filter with oil return to pump for DUO 35/65, DUO 35/65 M	**PK Z40 151**	**PK Z40 151**	
OFC 35/65, chemical oil filter	**PK Z90 320**	**PK Z90 320**	**PK Z90 320**
OFM 35/65, mechanical oil filter	**PK Z90 321**	**PK Z90 321**	
ZFO 040, zeolite trap	**PK Z70 008**	**PK Z70 008**	
FAK 040, activated carbon filter	**PK Z30 008**	**PK Z30 008**	
KLF 040, cold trap	**PK Z80 008**	**PK Z80 008**	**PK Z80 008**
URB 040, catalytic trap, 230 V	**PT U10 260**	**PT U10 260**	
URB 040, catalytic trap, 115 V	**PT U10 261**	**PT U10 261**	
Oil pressure switch for DUO 35/65; DUO 35/65 MC	**PK 223 720 -U**	**PK 223 720 -U**	**PK 223 720 -U**
Oil pressure switch for DUO 35/65 with OFC/OFM	**PK 223 741 -U**	**PK 223 741 -U**	**PK 223 741 -U**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**	**P 4768 051 FQ**
Operations monitoring unit 3 for DUO 35/65, DUO 125/255	**PK 223 739 -U**	**PK 223 739 -U**	**PK 223 739 -U**
Operations monitoring unit 1 for DUO 35/65	**PK 223 718 AU**	**PK 223 718 AU**	**PK 223 718 AU**
KAS 40 C, condensate separator, corrosive version for pumping speeds up to 100 m^3/h			**PK Z10 408**
ONF 35/65 C, oil mist filter, corrosive gas version for DUO 35/65 MC			**PK Z40 152**
ONFR 35/65 C, oil mist separator with oil return to pump, corrosive gas version for DUO 35/65 MC			**PK Z40 153**

DUO 125

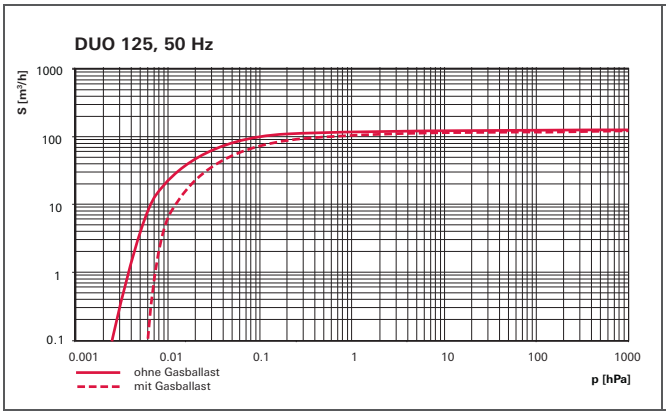


Dual-stage rotary vane pumps with a pumping speed up to 135 m³/h:

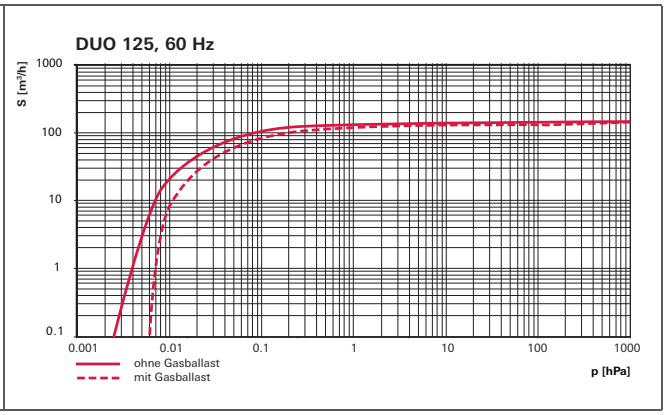
- Dual-stage, high-performance rotary vane pump with a pumping speed up to 135 m³/h
- With 3-phase motor
- With temperature sensor (3TF) for optimum motor protection
- Integrated gas ballast and HV safety valve
- For all low and medium vacuum applications
- Special feature: Various motor voltages for wide application field
- Other motor voltages available on request

TF = Temperature sensor
M = Magnetic coupling

Pumping speed

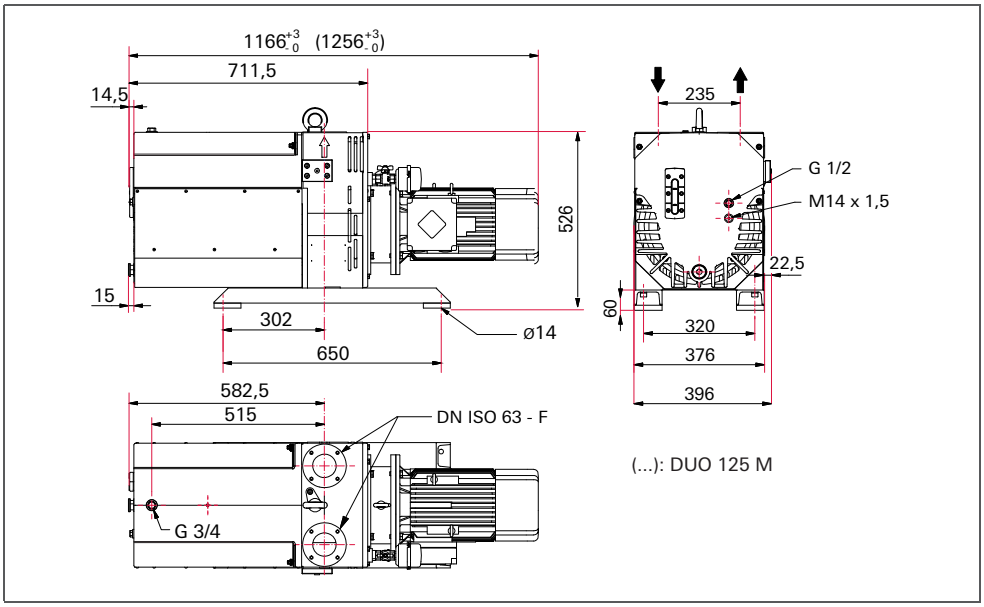


DUO 125, 3-phase motor



DUO 125, 3-phase motor

Dimensions (in mm)



Technical data	DUO 125, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz	DUO 125 M, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz
Flange (out)	DN 63 ISO-F	DN 63 ISO-F
Flange (in)	DN 63 ISO-F	DN 63 ISO-F
Exhaust pressure, max.	1500 hPa	1500 hPa
Exhaust pressure, min.	250 hPa	250 hPa
Operating fluid	P3	P3
Operating fluid filling	14 l	14 l
Rotation speed at 50 Hz	1000 min^{-1}	1000 min^{-1}
Rotation speed at 60 Hz	1200 min^{-1}	1200 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 75 dB (A)	≤ 75 dB (A)
Ultimate pressure with gas ballast	$4 \cdot 10^{-3}$ hPa	$4 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$2 \cdot 10^{-3}$ hPa	$2 \cdot 10^{-3}$ hPa
Weight	225 kg	245 kg
Cooling method, standard	Air	Air
Leak rate magnetic coupling		≤ $1 \cdot 10^{-7}$ Pa m^3/s
Leak rate safety valve	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s
Magnetic coupling		Yes
Motor protection	3TF	3TF
Rated power 50 Hz	4.0 kW	4.0 kW
Rated power 60 Hz	4.5 kW	4.5 kW
Mains requirement: voltage 50 Hz	230/400 V	230/400 V
Mains requirement: voltage 60 Hz	265/460 V	265/460 V
Mains cable	No	No
Pumping speed at 50 Hz	115 m^3/h	115 m^3/h
Pumping speed at 60 Hz	135 m^3/h	135 m^3/h
Switch	No	No
Protection category	IP 55	IP 55
Ambient temperature	12-40 °C	12-40 °C

Order number		
DUO 125	**PK D47 602**	**PK D47 152**

Accessories		
SAS 63, DN 63 ISO-K, polyester filter	**PK Z60 511**	**PK Z60 511**
KAS 63, condensate separator for pumping speeds up to 250 m^3/h	**PK Z10 010**	**PK Z10 010**
ONF 63, oil mist filter for pumping speeds of up to 135 m^3/h	**PK Z40 010**	**PK Z40 010**
Oil return unit, ORF 005, standard version	**PK Z90 065**	**PK Z90 065**
OFM 125, mechanical oil filter	**PK Z90 340**	**PK Z90 340**
ZFO 063, zeolite trap	**PK Z70 010**	**PK Z70 010**
FAK 063, activated carbon filter	**PK Z30 010**	**PK Z30 010**
KLF 063, cold trap	**PK Z80 010**	**PK Z80 010**
Oil pressure switch for DUO 125/255	**PK 223 806 -T**	**PK 223 806 -T**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**
Operations monitoring unit 3 for DUO 35/65, DUO 125/255	**PK 223 739 -U**	**PK 223 739 -U**
Operating fluid level monitoring	**PK 006 001 -T**	**PK 006 001 -T**
Temperature sensor for operating fluid	**PK 006 040 -T**	**PK 006 040 -T**

DUO 255

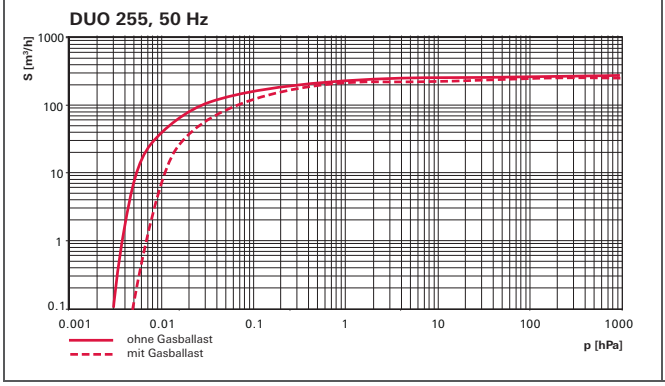


Dual-stage rotary vane pumps with a pumping speed up to 300 m³/h:

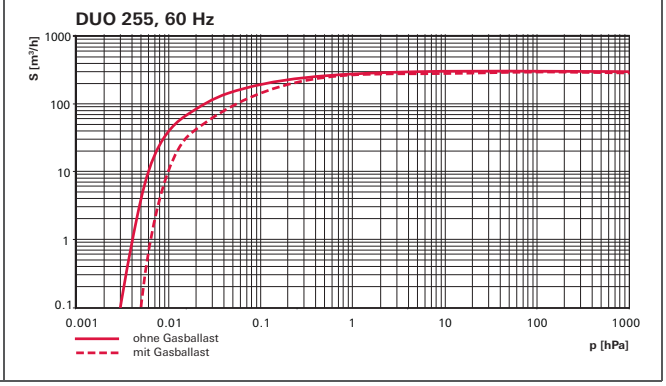
- Dual-stage, high-performance rotary vane pump with a pumping speed up to 255 m³/h
- 3-phase motor for 230/400 V (± 5 %) 50 Hz or 265/460 V (± 5 %) 60 Hz supply voltages
- With temperature sensor (3TF) for optimum motor protection
- Integrated gas ballast and HV safety valve
- For all low and medium vacuum applications
- Special feature: Various motor voltages for worldwide employment
- Other motor voltages available on request

TF = Temperature sensor
M = Magnetic coupling

Pumping speed

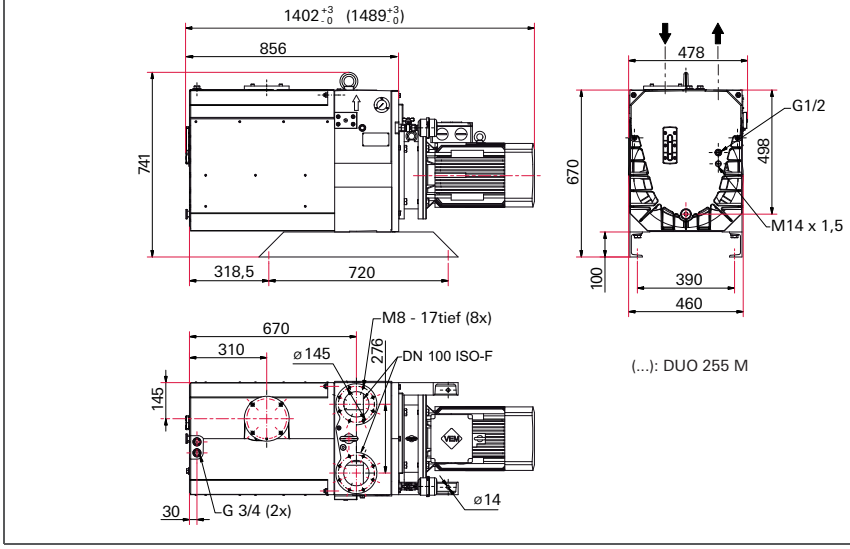


DUO 255, 3-phase motor, 3TF



DUO 255, 3-phase motor, 3TF

Dimensions (in mm)



Technical data	DUO 255, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz	DUO 255 M, 3-phase motor, 3TF, 230/400 V, 50 Hz; 265/460 V, 60 Hz
Flange (out)	DN 100 ISO-F	DN 100 ISO-F
Flange (in)	DN 100 ISO-F	DN 100 ISO-F
Exhaust pressure, max.	1500 hPa	1500 hPa
Exhaust pressure, min.	250 hPa	250 hPa
Operating fluid	P3	P3
Operating fluid filling	25 l	25 l
Rotation speed at 50 Hz	1000 min^{-1}	1000 min^{-1}
Rotation speed at 60 Hz	1200 min^{-1}	1200 min^{-1}
Emission sound pressure level without gas ballast at 50 Hz	≤ 75 dB (A)	≤ 75 dB (A)
Ultimate pressure with gas ballast	$4 \cdot 10^{-3}$ hPa	$4 \cdot 10^{-3}$ hPa
Ultimate pressure without gas ballast	$3 \cdot 10^{-3}$ hPa	$3 \cdot 10^{-3}$ hPa
Weight	360 kg	397 kg
Cooling method, standard	Air	Air
Leak rate magnetic coupling		≤ $1 \cdot 10^{-7}$ Pa m^3/s
Leak rate safety valve	≤ $1 \cdot 10^{-5}$ Pa m^3/s	≤ $1 \cdot 10^{-5}$ Pa m^3/s
Magnetic coupling		Yes
Motor protection	3TF	3TF
Rated power 50 Hz	7.5 kW	7.5 kW
Rated power 60 Hz	9.0 kW	9.0 kW
Mains requirement: voltage 50 Hz	230/400 V	230/400 V
Mains requirement: voltage 60 Hz	265/460 V	265/460 V
Mains cable	No	No
Pumping speed at 50 Hz	250 m^3/h	250 m^3/h
Pumping speed at 60 Hz	300 m^3/h	300 m^3/h
Switch	No	No
Protection category	IP 55	IP 55
Ambient temperature	12-40 °C	12-40 °C

Order number		
DUO 255	**PK D48 602**	**PK D48 152**

Accessories		
SAS 100, DN 100 ISO-K, polyester filter	**PK Z60 512**	**PK Z60 512**
KAS 100, condensate separator for pumping speeds up to 630 m^3/h	**PK Z10 012**	**PK Z10 012**
ONF 100, oil mist filter for pumping speeds up to 300 m^3/h	**PK Z40 012**	**PK Z40 012**
Oil return unit, ORF 005, standard version	**PK Z90 065**	**PK Z90 065**
OFM 255, mechanical oil filter	**PK Z90 341**	**PK Z90 341**
FAK 100, activated carbon filter	**PK Z30 012**	**PK Z30 012**
Oil pressure switch for DUO 125/255	**PK 223 806 -T**	**PK 223 806 -T**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**
Operations monitoring unit 3 for DUO 35/65, DUO 125/255	**PK 223 739 -U**	**PK 223 739 -U**
Operating fluid level monitoring	**PK 006 001 -T**	**PK 006 001 -T**
Temperature sensor for operating fluid	**PK 006 040 -T**	**PK 006 040 -T**

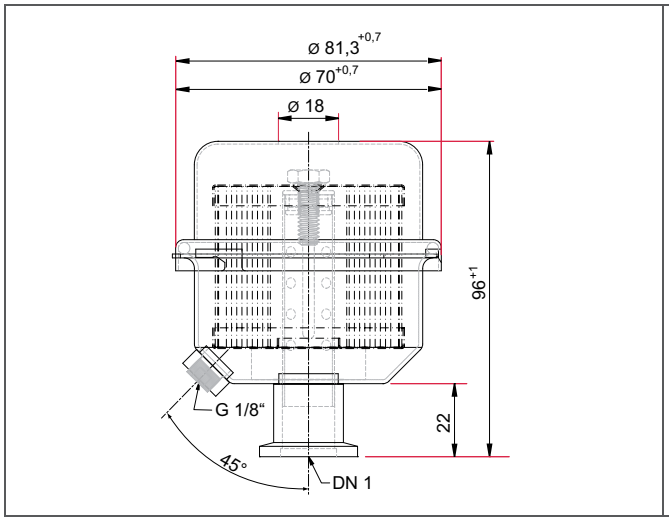
Oil mist filter



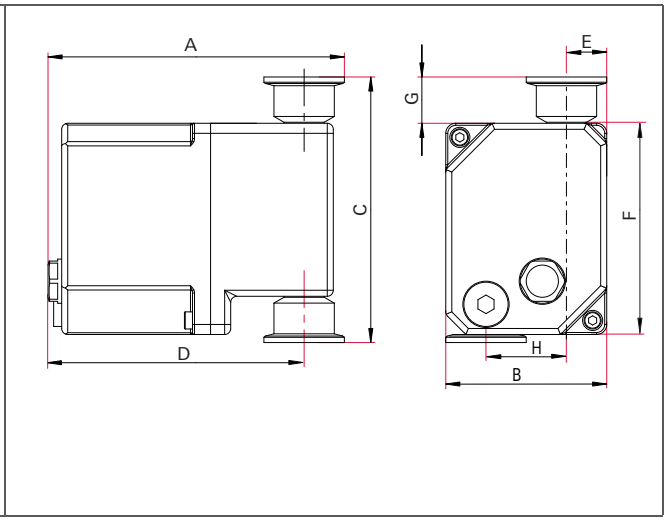
Mounted on the pump's exhaust port, they prevent contamination of the air by oil mist. Satisfies the limits established by the German Clean Air Ordinance if a clean filter is employed (separation rate > 99.98 %).

- Sits on the pump's exhaust port and sustainably prevents contamination of the air by oil mist

Dimensions (in mm)



ONF 16 S, oil mist filter



ONF 16 M, oil mist filter

	ONF 16 M, oil mist filter for pumping speeds of up to 12 m³/h
A	142 mm
B	80 mm
C	120 mm
D	127 mm
E	16 mm
F	105 mm
G	17 mm
H	48 mm

Technical data	ONF 16 S, oil mist filter for pumping speeds up to 12 m³/h	ONF 16 M, oil mist filter for pumping speeds of up to 12 m³/h
Flange (out)		DN 16 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF
Degree of separation	99.98 %	99.98 %
Pressure max. (absolute)	1500 hPa	1500 hPa
Capacity	0.02 l	0.15 l
For pumping speed	12 m³/h	12 m³/h
Weight	0.35 kg	1.35 kg

Order number		
Oil mist filter	**PK Z40 001**	**PK Z40 003**

Accessories		
Oil return unit from ONF 16 S to DUO 1.6 / DUO 3	**PK 005 986 -T**	
Oil return unit from ONF 16 S / ONF 25 S to DUO 5 M / DUO 10 M	**PK 005 987 -T**	
Oil return unit from ONF 16 M to DUO 5 M, from ONF 25 M to DUO 10 M, from ONF 25 L to DUO 20 M, standard version		**PK 196 172 -T**
Oil return unit from ONF 16 M to DUO 1.6, 3		**PK 006 080 -T**

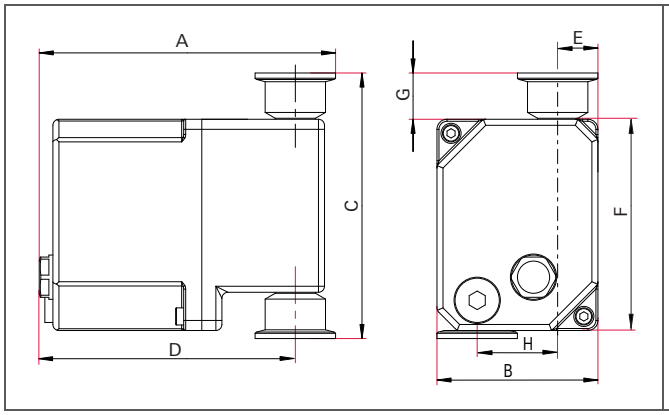
Oil mist filter



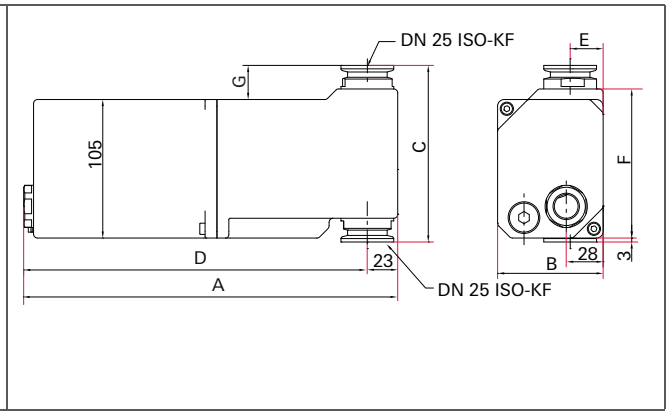
Mounted on the pump's exhaust port, they prevent contamination of the air by oil mist. Satisfies the limits established by the German Clean Air Ordinance if a clean filter is employed (separation rate > 99.98 %).

- Sits on the pump's exhaust port and sustainably prevents contamination of the air by oil mist

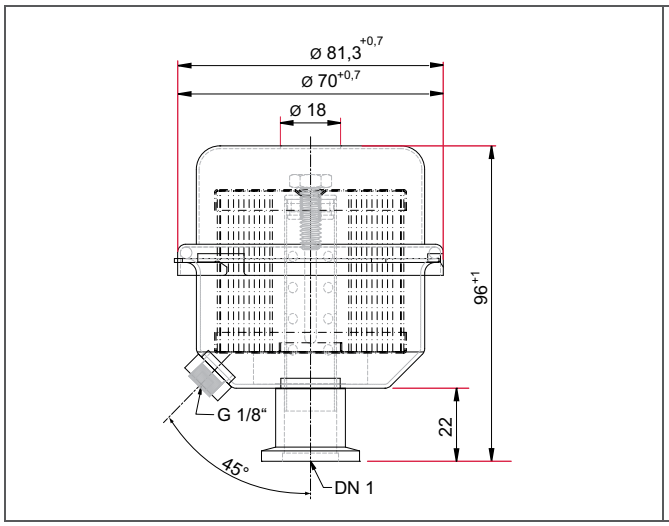
Dimensions (in mm)



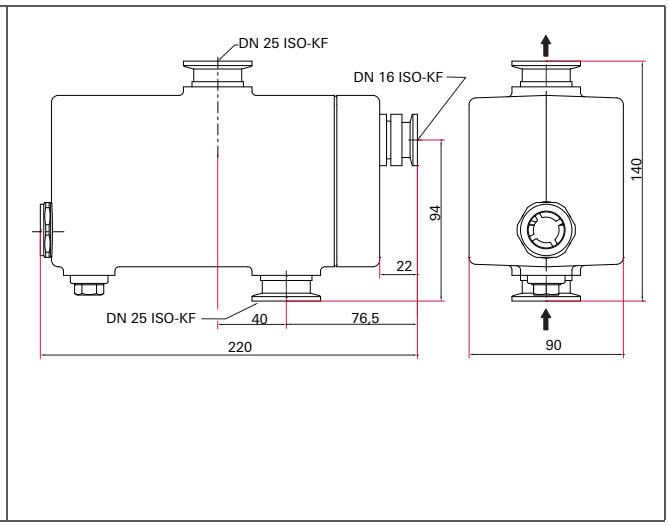
ONF 25 M, oil mist filter
ONF 25 L, oil mist filter



ONF 25 XL, oil mist filter



ONF 25 S, oil mist filter



ONF 025 C, oil mist filter

	ONF 25 M, oil mist filter for pumping speeds of up to 12 m³/h	ONF 25 L, oil mist filter for pumping speeds of up to 30 m³/h	ONF 25 XL, oil mist filter for pumping speeds up to 42 m³/h
A	147 mm	218 mm	284 mm
B	80 mm	80 mm	80 mm
C	132 mm	134 mm	134 mm
D	127 mm	182 mm	261 mm
E	16 mm	25 mm	25 mm
F	105 mm	105 mm	105 mm
G	23 mm	27 mm	26 mm
H	48 mm		

Technical data	ONF 25 M, oil mist filter for pumping speeds of up to 12 m³/h	ONF 25 S, oil mist filter for pumping speeds of up to 12 m³/h	ONF 25 L, oil mist filter for pumping speeds of up to 30 m³/h
Flange (out)	DN 25 ISO-KF	No	DN 25 ISO-KF
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Degree of separation	99.98 %	99.98 %	99.98 %
Pressure max. (absolute)	1500 hPa	1500 hPa	1500 hPa
Capacity	0.15 l	0.02 l	0.25 l
For pumping speed	12 m³/h	12 m³/h	30 m³/h
Weight	1.4 kg	0.35 kg	1.6 kg

Order number			
Oil mist filter	**PK Z40 157**	**PK Z40 004**	**PK Z40 158**

Accessories			
Oil return unit from ONF 16 S / ONF 25 S to DUO 5 M / DUO 10 M		**PK 005 987 -T**	
Oil return unit from ONF 16 M to DUO 5 M, from ONF 25 M to DUO 10 M, from ONF 25 L to DUO 20 M, standard version	**PK 196 172 -T**		**PK 196 172 -T**

Technical data	ONF 25 XL, oil mist filter for pumping speeds up to 42 m³/h	ONF 025 C, oil mist filter, corrosive gas version up to 24 m³/h
Flange (out)	DN 25 ISO-KF	DN 25 ISO-K
Flange (in)	DN 25 ISO-KF	DN 25 ISO-K
Degree of separation	99.98 %	98 %
Pressure max. (absolute)	1500 hPa	1500 hPa
Capacity	0.35 l	0.20 l
For pumping speed	42 m³/h	24 m³/h
Weight	1.9 kg	1.8 kg

Order number		
Oil mist filter	**PK Z40 160**	**PK Z40 406**

Accessories		
Oil return unit from ONF 25 M, 25 L, 25 XL	**PK 198 545 -T**	**PK 196 177 -T**

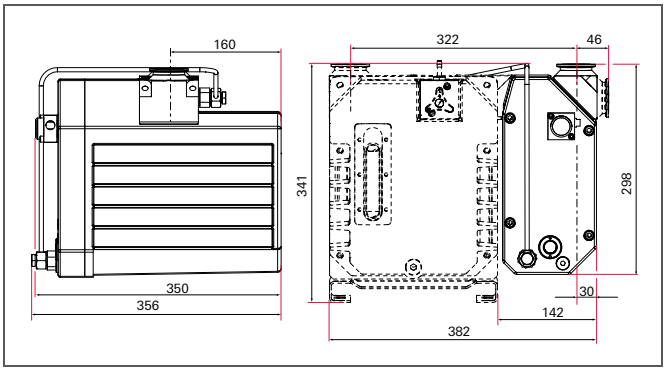
Oil mist filter



Mounted on the pump's exhaust port, they prevent contamination of the air by oil mist. Satisfies the limits established by the German Clean Air Ordinance if a clean filter is employed (separation rate > 99.98 %).

- Sits on the pump's exhaust port and sustainably prevents contamination of the air by oil mist

Dimensions (in mm)



ONFR 35/65, oil mist filter

Technical data	ONF 35/65, oil mist filter for DUO 35/65, DUO 35/65 M	ONF 35/65 C, oil mist filter, corrosive gas version for DUO 35/65 MC	ONFR 35/65, oil mist filter with oil return to pump for DUO 35/65, DUO 35/65 M	ONFR 35/65 C, oil mist separator with oil return to pump, corrosive gas version for DUO 35/65 MC
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 40 flange	DN 40 flange	DN 40 flange	DN 40 flange
Degree of separation	98 %	98 %	98 %	98 %
Pressure max. (absolute)	1500 hPa	1500 hPa	1500 hPa	
Capacity	0.7 l	0.7 l	0.7 l	0.7 l
For pumping speed	35-70 m^3/h	35-70 m^3/h	35-70 m^3/h	35-70 m^3/h
Weight	11 kg	11 kg	11 kg	11 kg

Order number				
Oil mist filter	**PK Z40 150**	**PK Z40 152**	**PK Z40 151**	**PK Z40 153**

Accessories				
Oil return unit from ONF 35/65 to DUO 35/65	**PK 005 950 -T**	**PK 005 950 -T**		
Oil return unit - conversion kit ONFR 35/65 in gas ballast to suction side of DUO 35/65	**PK 005 951 -T**	**PK 005 951 -T**		
Saturation indicator, optical/electrically for ONF 35/65	**P 0991 684**	**P 0991 684**	**P 0991 684**	**P 0991 684**

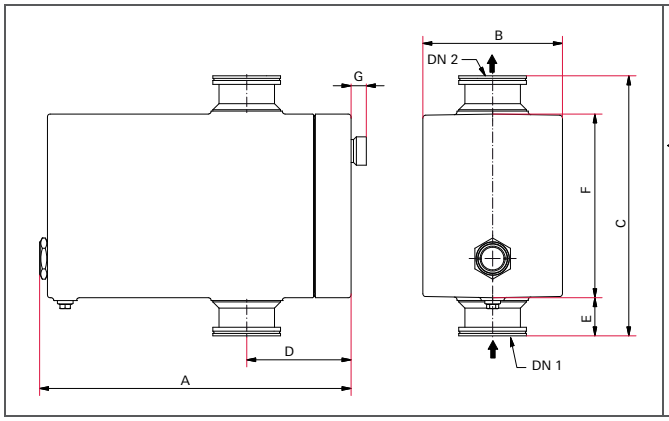
Oil mist filter



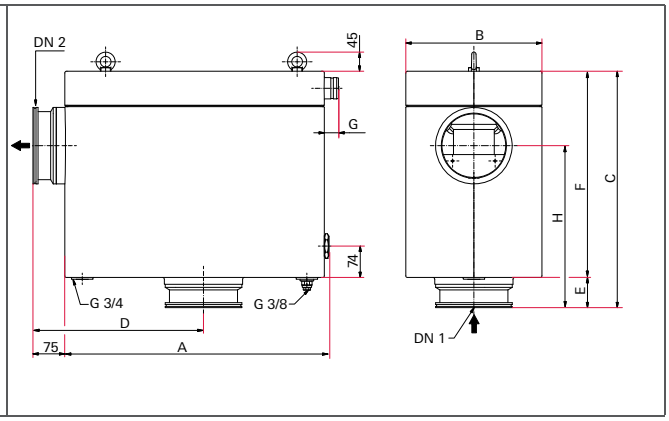
Mounted on the pump's exhaust port, they prevent contamination of the air by oil mist. Satisfies the limits established by the German Clean Air Ordinance if a clean filter is employed (separation rate > 99.98 %).

- Sits on the pump's exhaust port and sustainably prevents contamination of the air by oil mist

Dimensions (in mm)



ONF 63, oil mist filter
ONF 100, oil mist filter



ONF 160, oil mist filter

	ONF 63, oil mist filter for pumping speeds of up to 135 m³/h	ONF 100, oil mist filter for pumping speeds up to 300 m³/h	ONF 160, oil mist filter for pumping speeds of up to 500 m³/h
A	440 mm	457 mm	621 mm
B	196 mm	260 mm	320 mm
C	366 mm	494 mm	556 mm
D	147 mm	150 mm	401 mm
F	260 mm	400 mm	485 mm
G	22 mm	22 mm	34 mm
H			381 mm

Technical data	ONF 63, oil mist filter for pumping speeds of up to 135 m³/h	ONF 100, oil mist filter for pumping speeds up to 300 m³/h	ONF 160, oil mist filter for pumping speeds of up to 500 m³/h
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
Degree of separation	99.98 %	99.98 %	99.98 %
Pressure max. (absolute)	1500 hPa	1500 hPa	1500 hPa
Capacity	1.7 l	2.3 l	7.0 l
Capacity ONF with ORF	1.7 l	2.2 l	3.7 l
For pumping speed	135 m³/h	300 m³/h	500 m³/h
Weight	13.5 kg	27 kg	41 kg

Order number			
Oil mist filter	**PK Z40 010**	**PK Z40 012**	**PK Z40 014**

Accessories			
Oil return unit, ORF 005, standard version	**PK Z90 065**	**PK Z90 065**	**PK Z90 065**

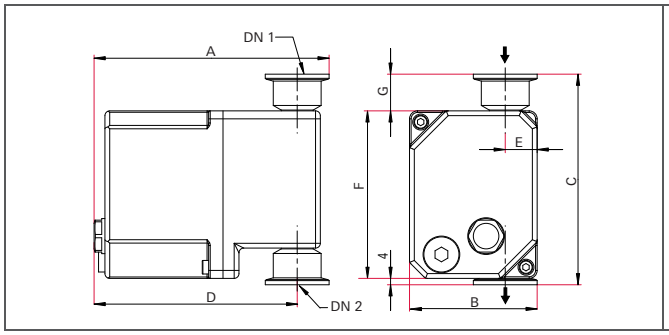
Condensate separators



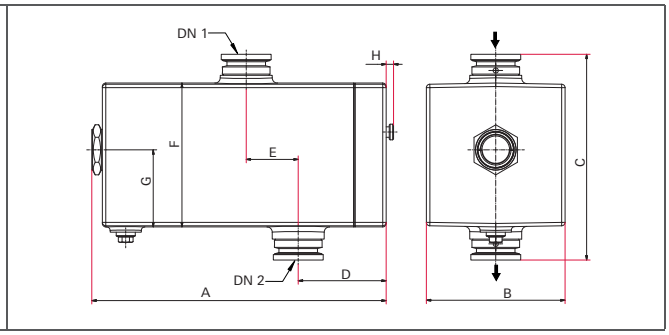
Sits on the pump's intake port and prevent condensate from entering the pump.

- For inlet and outlet ports
- Protects the rotary vane pump against sucked in liquids and condensate return

Dimensions (in mm)



KAS 16, condensate separator
KAS 25, condensate separator
KAS 25 L, condensate separator



KAS 40, condensate separator

	KAS 16, condensate separator for pumping speeds from 1.6 to 12 m³/h	KAS 25, condensate separator for pumping speeds up to 12 m³/h	KAS 25 L, condensate separator for pumping speeds up to 34 m³/h	KAS 40 C, condensate separator, corrosive version for pumping speeds up to 34 m³/h	KAS 40, condensate separator for pumping speeds up to 100 m³/h
A	142 mm	147 mm	202 mm	195 mm	340 mm
B	80 mm	80 mm	80 mm	90 mm	160 mm
C	120 mm	132 mm	132 mm	140 mm	237 mm
D	127 mm	127 mm	182 mm	54 mm	102 mm
DN 1	DN 16 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
DN 2	DN 16 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
E	20 mm	20 mm	20 mm	40 mm	60 mm
F	105 mm	105 mm	105 mm	100 mm	166 mm
G	17 mm	23 mm	23 mm	22 mm	89 mm

Technical data	KAS 16, condensate separator for pumping speeds from 1.6 to 12 m³/h	KAS 25, condensate separator for pumping speeds up to 12 m³/h	KAS 25 L, condensate separator for pumping speeds up to 34 m³/h	KAS 40 C, condensate separator, corrosive version for pumping speeds up to 34 m³/h	KAS 40, condensate separator for pumping speeds up to 100 m³/h
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Pressure max. (absolute)	1500 hPa	1500 hPa	1500 hPa	1500 hPa	1500 hPa
Capacity	0.2 l	0.2 l	0.3 l	0.5 l	3 l
For pumping speed	<12 m³/h	< 12 m³/h	< 34 m³/h	< 34 m³/h	< 100 m³/h
Weight	1.35 kg	1.4 kg	1.5 kg	1.6 kg	6.1 kg
Leak rate	$< 1 \cdot 10^{-6}$ Pa m³/s	$< 1 \cdot 10^{-6}$ Pa m³/s	$< 1 \cdot 10^{-6}$ Pa m³/s	$< 1 \cdot 10^{-6}$ Pa m³/s	$< 1 \cdot 10^{-6}$ Pa m³/s

Order number					
Condensate separators	**PK Z10 003**	**PK Z10 032**	**PK Z10 033**	**PK Z10 406**	**PK Z10 008**

Condensate separators



Sits on the pump's intake port and prevent condensate from entering the pump.

- For inlet and outlet ports
- Protects the rotary vane pump against sucked in liquids and condensate return

	KAS 40 C, condensate separator, corrosive version for pumping speeds up to 100 m³/h	KAS 63, condensate separator for pumping speeds up to 250 m³/h	KAS 63 C, condensate separator, corrosive version for pumping speeds up to 250 m³/h	KAS 100, condensate separator for pumping speeds up to 630 m³/h	KAS 63 C, condensate separator, corrosive version for pumping speeds up to 630 m³/h
A	340 mm	436 mm	436 mm	457 mm	457 mm
B	160 mm	196 mm	196 mm	260 mm	260 mm
C	237 mm	366 mm	366 mm	494 mm	494 mm
D	102 mm	146 mm	146 mm	150 mm	150 mm
E	60 mm				
F	166 mm	260 mm	260 mm	400 mm	400 mm

Technical data	KAS 40 C, condensate separator, corrosive version for pumping speeds up to 100 m³/h	KAS 63, condensate separator for pumping speeds up to 250 m³/h	KAS 63 C, condensate separator, corrosive version for pumping speeds up to 250 m³/h	KAS 100, condensate separator for pumping speeds up to 630 m³/h	KAS 63 C, condensate separator, corrosive version for pumping speeds up to 630 m³/h
Flange (out)	DN 40 ISO-KF	DN 63 ISO-K	DN 63 ISO-KF	DN 100 ISO-K	DN 100 ISO-K
Flange (in)	DN 40 ISO-KF	DN 63 ISO-K	DN 63 ISO-KF	DN 100 ISO-K	DN 100 ISO-K
Pressure max. (absolute)	1500 hPa	1500 hPa	1500 hPa	1500 hPa	1500 hPa
Capacity	3 l	12 l	12 l	19 l	19 l
For pumping speed	< 100 m³/h	< 250 m³/h	< 250 m³/h	< 630 m³/h	< 630 m³/h
Weight	6.1 kg	13.2 kg	13.2 kg	25 kg	25 kg
Leak rate	< $1 \cdot 10^{-6}$ Pa m³/s	< $1 \cdot 10^{-6}$ Pa m³/s	< $1 \cdot 10^{-6}$ Pa m³/s	< $1 \cdot 10^{-6}$ Pa m³/s	< $1 \cdot 10^{-6}$ Pa m³/s

Order number					
Condensate separators	**PK Z10 408**	**PK Z10 010**	**PK Z10 410**	**PK Z10 012**	**PK Z10 412**

Adsorption filter



Filters for employment in conjunction with nitrous gases, acids and bases in the pump.

- For adsorption of inorganic media
- Protects rotary vane pump and operating fluid against gaseous contaminants when installed on the intake side
- Reduces the concentration of harmful exhaust products in combination with oil mist separator when installed on the outlet side
- For employment in conjunction with gases, acids and bases

Technical data	FAK 025, activated carbon filter	FAK 040, activated carbon filter	FAK 063, activated carbon filter	FAK 100, activated carbon filter
Flange (out)	DN 25 ISO-KF	DN 40 ISO-KF	DN 63 ISO-K	DN 100 ISO-K
Flange (in)	DN 25 ISO-KF	DN 40 ISO-KF	DN 63 ISO-K	DN 100 ISO-K
Mounting orientation	Vertical	Vertical	Vertical	Vertical
Filling quantity	1 l	2 l	7.5 l	20 l
For pumping speed up to	30 m^3/h	65 m^3/h	120 m^3/h	500 m^3/h
Weight with contents	4 kg	5.5 kg	16 kg	40 kg
Conductance	$1 \cdot 10^{-2}$ hPa: 2 l/s; 1 hPa: 10 l/s; 100 hPa: 500 l/s	$1 \cdot 10^{-2}$ hPa: 16 l/s; 1 hPa: 150 l/s; 100 hPa: 1000 l/s	$1 \cdot 10^{-2}$ hPa: 5 l/s; 1 hPa: 9 l/s; 100 hPa: 400 l/s	$1 \cdot 10^{-2}$: 5 l/s; 1 hPa: 6 l/s; 100 hPa: 100 l/s
Order number				
Adsorption filter	**PK Z30 006**	**PK Z30 008**	**PK Z30 010**	**PK Z30 012**

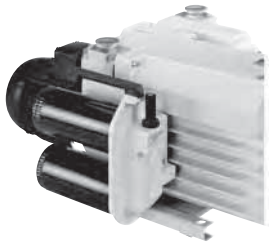
Technical data	ZFO 16, zeolite trap	ZFO 025, zeolite trap	ZFO 040, zeolite trap	ZFO 063, zeolite trap
Flange (out)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF	DN 63 ISO-K
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF	DN 63 ISO-K
Mounting orientation	Horizontal	Vertical	Vertical	Vertical
Filling quantity	0.5 l	2 l	2.3 l	4.3 l
For pumping speed up to	5 m^3/h	30 m^3/h	65 m^3/h	120 m^3/h
Weight with contents	1.5 kg	7 kg	13 kg	17 kg
Heating rod	No	Voltage: 230 V, power input: 200 W, weight: 1.7 kg	Voltage: 230 V, power input: 300 W, weight: 2.7 kg	Voltage: 230 V Power input: 400 W Weight: 3.4 kg
Conductance	$1 \cdot 10^{-2}$ hPa: 0,3 l/s; 1 hPa: 0,7 l/s; 100 hPa: 31 l/s	$1 \cdot 10^{-2}$ hPa: 4 l/s; 1 hPa: 40 l/s; 100 hPa: 900 l/s	$1 \cdot 10^{-2}$ hPa: 7 l/s; 1 hPa: 80 l/s; 100 hPa: 1300 l/s	$1 \cdot 10^{-2}$ hPa: 22 l/s; 1 hPa: 600 l/s; 100 hPa: 4000 l/s
Order number				
Adsorption filter	**PK Z70 003**	**PK Z70 006**	**PK Z70 008**	**PK Z70 010**

Technical data		Heating rod for ZFO 025, 220 V, 50/60 Hz	Heating rod for ZFO 040, 220 V, 50/60 Hz	Heating rod for ZFO 063, 220 V, 50/60 Hz
Power consumption		200 W	300 W	400 W
Mains requirement		220 V, 50/60 Hz	220 V, 50/60 Hz	220 V, 50/60 Hz
Order number				
Zeolite trap heating		**PK Z90 012 A**	**PK Z90 020 A**	**PK Z90 030 A**

Technical data	KLF 025, cold trap	KLF 040, cold trap	KLF 063, cold trap
Flange (out)	DN 25 ISO-KF	DN 40 ISO-KF	DN 63 ISO-K
Flange (in)	DN 25 ISO-KF	DN 40 ISO-KF	DN 63 ISO-K
Mounting orientation	Vertical	Vertical	Vertical
Filling quantity condensate max.	0,1 l	0,4 l	0,75 l
Filling quantity coolant	0.7 l	1.5 l	3.8 l
For pumping speed up to	30 m^3/h	65 m^3/h	120 m^3/h
Weight	3.5 kg	6.5 kg	11.5 kg
Conductance	$1 \cdot 10^{-2}$ hPa: 10 l/s; 1 hPa: 60 l/s; 100 hPa: 800 l/s	$1 \cdot 10^{-2}$ hPa: 16 l/s; 1 hPa: 150 l/s; 100 hPa: 1000 l/s	$1 \cdot 10^{-2}$ hPa: 30 l/s; 1 hPa: 800 l/s; 100 hPa: 3000 l/s
Order number			
Adsorption filter	**PK Z80 006**	**PK Z80 008**	**PK Z80 010**

Technical data	URB 025, catalytic trap, 115 V	URB 025, catalytic trap, 230 V	URB 040, catalytic trap, 115 V	URB 040, catalytic trap, 230 V
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Mounting orientation	Any	Any	Normal operation: any/with water cooling: vertical	Normal operation: any/with water cooling: vertical
Filling quantity	180 g	180 g	480 g	480 g
Weight with contents	1.8 kg	1.8 kg	3.6 kg	3.6 kg
Cooling			Water	Water
Power consumption	25 W	25 W	50 W	50 W
Conductance	$1 \cdot 10^{-2}$ hPa: 3 l/s; 1 hPa: 9 l/s	$1 \cdot 10^{-2}$ hPa: 3 l/s; 1 hPa: 9 l/s	$1 \cdot 10^{-2}$ hPa: 9 l/s; 1 hPa: 45 l/s	$1 \cdot 10^{-2}$ hPa: 9 l/s; 1 hPa: 45 l/s
Voltage	115 V	230 V	115 V	230 V
Order number				
Adsorption filter	**PT U10 761**	**PT U10 760**	**PT U10 261**	**PT U10 260**

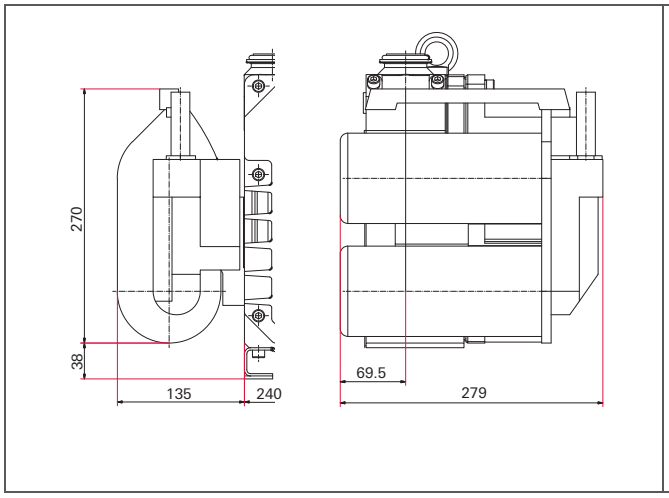
Oil filter



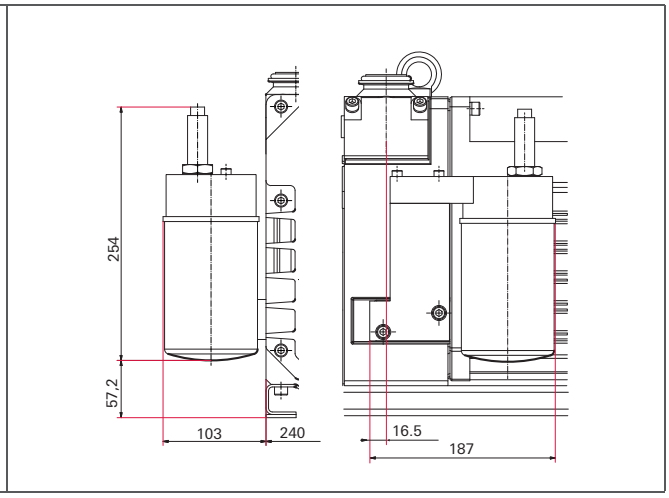
The oil filters are designed for partial-flow installation in the rotary vane pump´s oil circulation system: The oil filters filter out dust and particulate matter from the production process in the operating fluid. This reduces pump wear.

- The chemical oil filter is designed for partial-flow installation in the oil circulation system of rotary vane pumps
- The oil filter filters out dust and particulate matter from the production filter in the operating fluid
- Moreover, corrosive substances are also adsorbed from the operating fluid. This reduces pump wear

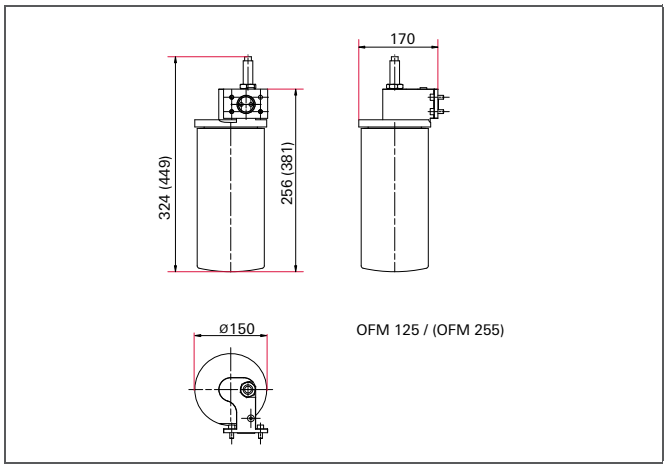
Dimensions (in mm)



OFC 35/65, chemical oil filter



OFM 35/65, mechanical oil filter



OFM 125, mechanical oil filter
OFM 255, mechanical oil filter

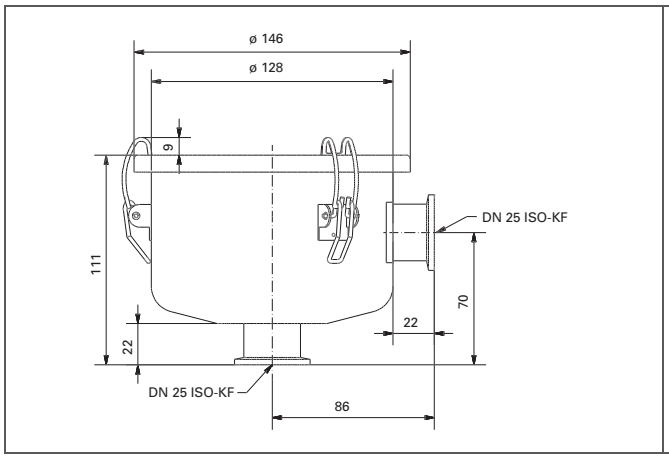
Technical data	OFC 35/65, chemical oil filter	OFM 35/65, mechanical oil filter	OFM 125, mechanical oil filter	OFM 255, mechanical oil filter
Capacity		0.8 l	2.2 l	4.0 l
Capacity chem. filter	0.8 l			
Capacity mech. filter	1.2 l	0.8 l	2.2 l	4.0 l
Filter poresize	12 µm	12 µm	10 µm	10 µm
For	Duo 35/65	Duo 35/65	Duo 125	Duo 255
For pumping speed	35-65 m³/h	35-65 m³/h	125 m³/h	255 m³/h
Weight	8 kg	3.2 kg	2.0 kg	2.5 kg

Order number				
Oil filter	**PK Z90 320**	**PK Z90 321**	**PK Z90 340**	**PK Z90 341**

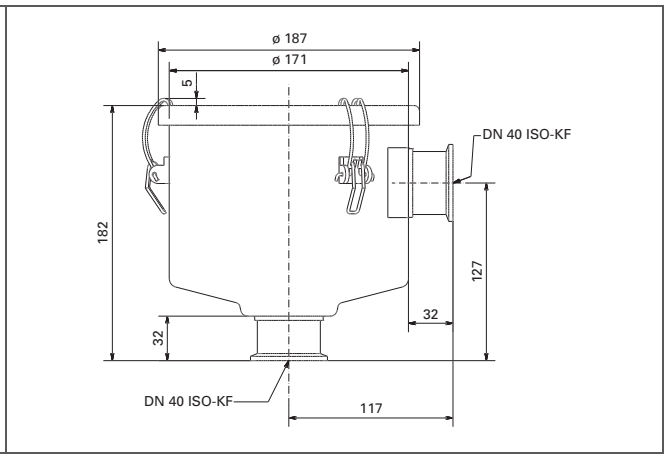
Dust separators

Prevents dust from reaching the pump through the intake tract.

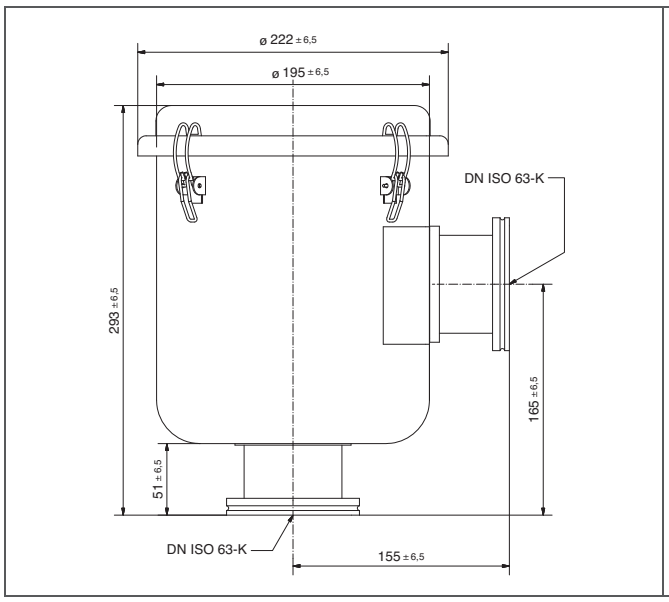
Dimensions (in mm)



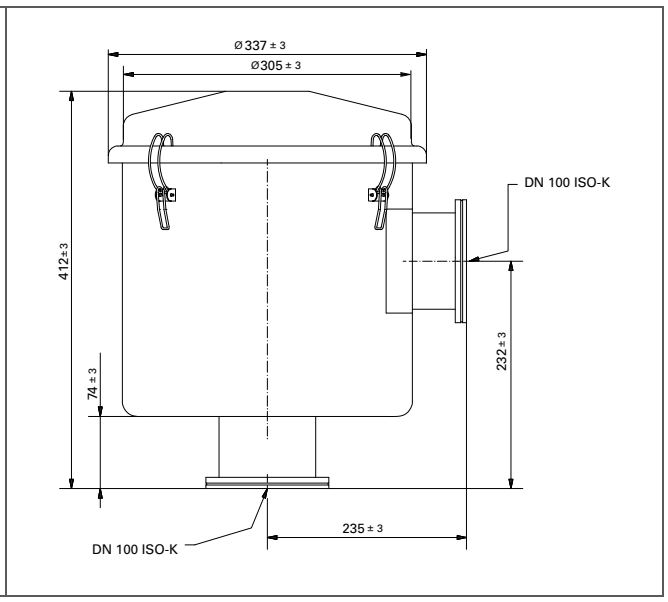
SAS 25, DN 25 ISO-KF



SAS 40, DN 40 ISO-KF



SAS 63, DN 63 ISO-K



SAS 100, DN 100 ISO-K

Technical data	SAS 25, DN 25 ISO-KF	SAS 40, DN 40 ISO-KF	SAS 63, DN 63 ISO-K	SAS 100, DN 100 ISO-K
Flange (out)	DN 25 ISO-KF	DN 40 ISO-KF	DN 63 ISO-K	DN 100 ISO-K
Flange (in)	DN 25 ISO-KF	DN 40 ISO-KF	DN 63 ISO-K	DN 100 ISO-K
Degree of separation	99.7 %	99.7 %	99.7 %	99.7 %
Operating range	1.0 abs.	1.0 abs.	1.0 abs	1.0 abs
Mounting orientation	Vertical/horizontal	Vertical/horizontal	Vertical/horizontal	Vertical/horizontal
For pumping speed up to	20 m^3/h	90 m^3/h	250 m^3/h	630 m^3/h
Weight	1.055 kg	2.06 kg	5.95 kg	12.8 kg
Grain size limit (separable)	5 µm	5 µm	5 µm	5 µm
Leak rate	< 1 · 10^{-5} Pa m^3/s	< 1 · 10^{-5} Pa m^3/s	< 1 · 10^{-5} Pa m^3/s	< 1 · 10^{-5} Pa m^3/s
Conductance	1 hPa: 150 l/s, 100 hPa: 750 l/s	1 hPa: 380 l/s, 100 hPa: 2250 l/s	1 hPa: 2500 l/s, 100 hPa: 20000 l/s	1 hPa: 2000 l/s, 100 hPa: 30000 l/s
Ambient temperature	-26-+104 °C	-26-+104 °C	-26-+104 °C	-26-+104 °C

Order number				
Dust separators	**PK Z60 508**	**PK Z60 510**	**PK Z60 511**	**PK Z60 512**

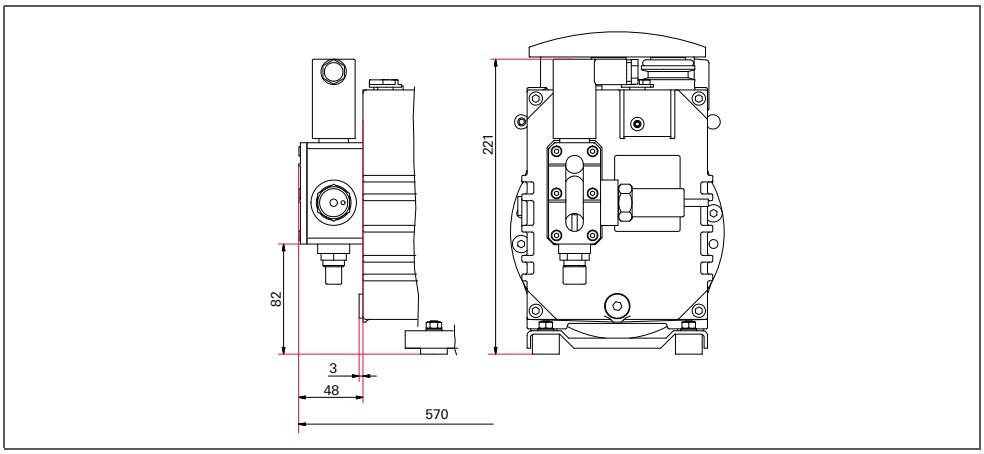
Operations monitoring unit



For integration into control and process monitoring system

- Monitors operating fluid level/temperature and exhaust pressure
- Mounted at the sight glass

Dimensions (in mm)



Order number	Operations monitoring unit 3 for DUO 1.6/3/6/11 and DUO 5/10/20 M	Operations monitoring unit 2 for DUO 1.6/3/6/11 and DUO 5/10/20 M	Operations monitoring unit 1 for DUO 1.6/3/6/11 and DUO 5/10/20 M	Operations monitoring unit 3 for DUO 35/65, DUO 125/255	Operations monitoring unit 1 for DUO 35/65
Operations monitoring unit	**PK 196 141 -T**	**PK 196 142 -T**	**PK 196 157 -T**	**PK 223 739 -U**	**PK 223 718 AU**

Accessories					
Operating fluid level monitoring	**PK 006 001 -T**	**PK 006 001 -T**	**PK 006 001 -T**	**PK 006 001 -T**	**PK 006 001 -T**
Temperature sensor for operating fluid	**PK 006 040 -T**	**PK 006 040 -T**		**PK 006 040 -T**	
Exhaust pressure	**PK 196 380 -T**			**PK 196 380 -T**	

Operating fluid level monitoring

Level switch

- Monitors the operating fluid level
- Mounted at sight glass adapter or casing depending on the pump model

Technical data	Operating fluid level monitoring
Contact	Closing contact, normally open at min. filling level
Contact rating	PNP output, max. 20 mA
Protection category	IP 67
Current max.	35 mA
Supply: Voltage	12-30 V DC

Order number	
Operating fluid level monitoring	**PK 006 001 -T**

Exhaust pressure

- Monitors the exhaust pressure
- Mounted at the sight glass adapter

Technical data	Exhaust pressure
Contact	Two-way contact
Set point	500 hPa
Switching voltage	250 V AC
Switching current V AC	6 A
Protection category	IP 55

Order number	
Exhaust pressure	**PK 196 380 -T**

Pressure monitoring

Pressure switch

- Monitors the oil pressure of the rotary vane pump
- Mounted at the stand

Technical data	Oil pressure switch for DUO 35/65; DUO 35/65 MC	Oil pressure switch for DUO 35/65 with OFC/OFM	Oil pressure switch for DUO 125/255	Oil pressure switch for DUO 5/10/20 M and Penta 20/35
Contact	Closing contact, normally open	Closing contact, normally open	Closing contact, normally open	Closing contact, normally open
Set point	1500 hPa	1500 hPa	1500 hPa	1000 hPa
Switching voltage	250 V	250 V	250 V	250 V
Switching current V AC	2 A	2 A	2 A	2 A
Protection category	IP 55	IP 55	IP 55	IP 55

Order number				
Pressure monitoring	**PK 223 720 -U**	**PK 223 741 -U**	**PK 223 806 -T**	**PK 196 484 -T**

Temperature monitoring

- Monitors the operating fluid temperature
- Mounted at sight glass adapter or casing depending on the pump model

Technical data	Temperature sensor
Method of measurement	PT 100
Protection category	IP 65
Temperature range	-50-+300 °C

Order number	
Temperature monitoring	**PK 006 040 -T**

Pascal

Two-stage rotary vane pumps for low and medium vacuum



Pascal

Two-stage Pascal rotary vane pumps are the result of decades of experience in the design and industrial production of vacuum pumps.

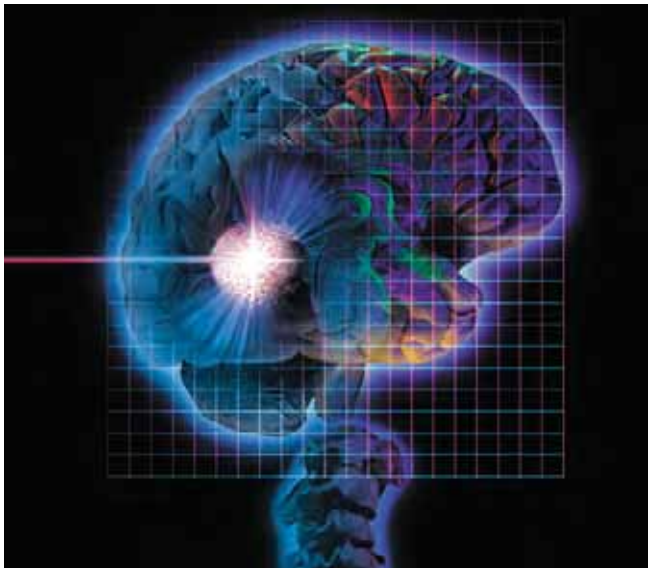
Pumps in the Pascal series with a pumping speed between 5 and 60 m^3/h are used in the most demanding applications in industry, analytics and research & development.

They are distinguished by their high quality and reliability. Four versions of oil-lubricated Pascal pumps allow for optimal adjustment to different requirements. The following versions are available:

- SD-version for all vacuum applications with non-corrosive gases
- I-version for the requirements of instrumental analytics
- C1-version for applications with aggressive or corrosive gases
- C2-version for harsh duty applications with the most aggressive pumping environment

Customer benefits
- High process reliability
- Easy to use and integrate
- Low oil back-streaming
- Low cost of ownership

Typical applications
- Electron microscopy
- Residual gas analysis
- Hard disk coating
- Wear protection
- CD, DVD, Blu-ray production
- Optical coatings
- Vacuum drying
- Space simulation
- Medical applications



Medical applications



Microscopy



Wear protection

Pascal 2005

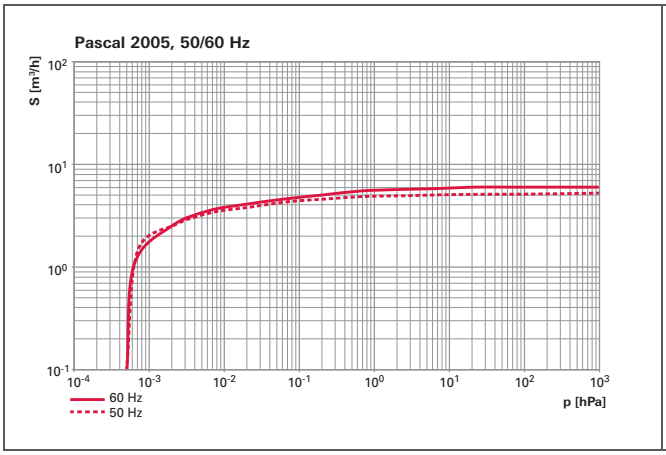


Two-stage Rotary Vane pumps for all major vacuum applications in a wide range of industries.

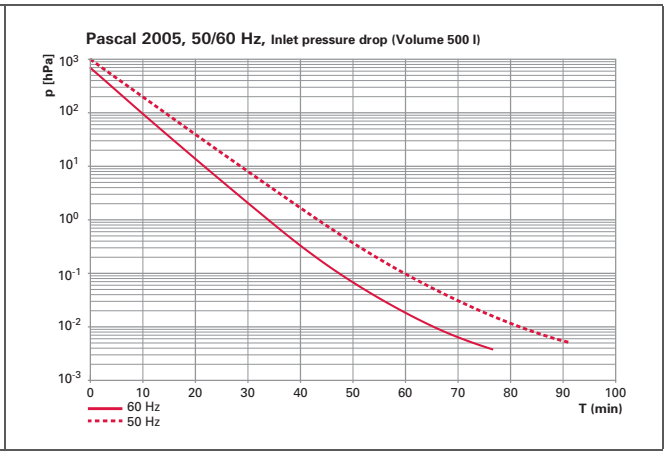
- All major vacuum applications in a wide range of industries
- No oil mist pollution at the exhaust for 5 - 21 m^3/h pumps: thanks to the natural lubrication design, even with high throughputs or frequent cycling
- Low backstreaming rate
- Compact design
- Adjustable inlet and outlet ports, horizontal or vertical orientation for better integration
- Universal 1-phase motors (high & low voltage, 50/60 Hz)
- Easy integration by large OEMs

SD, I, C1 versions are delivered with mineral oil, and C2 versions are prepared for operation with PFPE oil but fluid must be ordered separately

Pumping speed

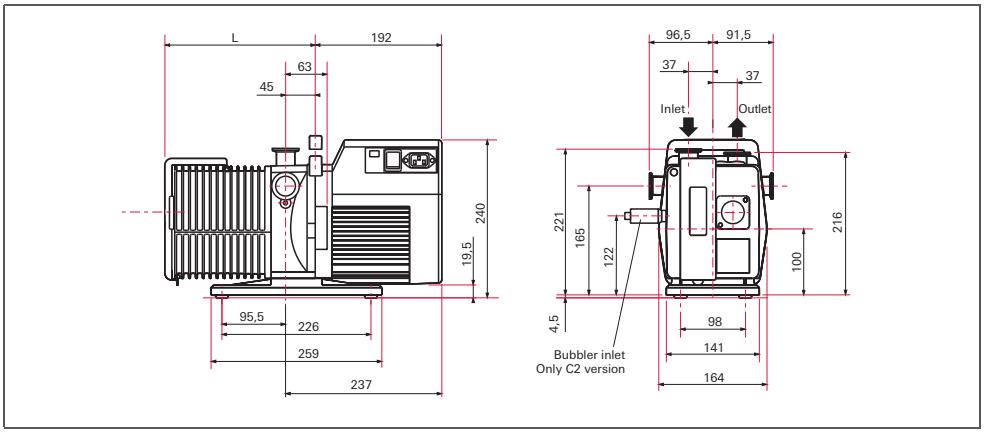


Pascal 2005



Pascal 2005

Dimensions (in mm)



	Pascal 2005
L	228 mm

Technical data	Pascal 2005, 1-phase motor, 180-254 V, 50 Hz/60 Hz, CE/UL/CSA	Pascal 2005, 1-phase motor, 90-132 V, 50 Hz/60 Hz, CE/UL/CSA	Pascal 2005, 3-phase motor, 342-460 V, 50 Hz; 342-520 V, 60 Hz, CE/UL/CSA	Pascal 2005, 3-phase motor, 170-254 V, 50 Hz; 170-300 V, 60 Hz, CE/UL/CSA
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Operating fluid	Mineral oil	Mineral oil	Mineral oil	Mineral oil
Ultimate pressure with gas ballast	10^{-2} hPa	10^{-2} hPa	10^{-2} hPa	10^{-2} hPa
Weight	25 kg	25 kg	25 kg	25 kg
Rated power 50 Hz	0.45 kW	0.45 kW	0.55 kW	0.55 kW
Rated power 60 Hz	0.55 kW	0.55 kW	0.66 kW	0.66 kW
Pumping speed at 50 Hz	5 m³h	5 m³h	5 m³h	5 m³h
Pumping speed at 60 Hz	6 m³h	6 m³h	6 m³h	6 m³h

Order number				
Pascal 2005 SD (5 m³/h)	**205SDMHEM**	**205SDMLAM**	**205SDTHEM**	**205SDTLAM**
Pascal 2005 I (5 m³/h)	**205AEMHEM**	**205AEMLAM**	**205AETHEM**	**205AETLAM**

Accessories				
Oil mist eliminator OME 25 S	**104200**	**104200**	**104200**	**104200**
Oil mist eliminator OME 25 HP	**104199**	**104199**	**104199**	**104199**
Oil mist eliminator OME 25 HP+	**108341**	**108341**	**108341**	**108341**
Oil drain kit ODK 1	**104360**	**104360**	**104360**	**104360**
Oil drain kit ODK 2, 230 V, 50/60 Hz	**104361**	**104361**	**104361**	**104361**
Sorption trap ST 25 S	**104107**	**104107**	**104107**	**104107**
Inlet dust filter DFT 25	**104202**	**104202**	**104202**	**104202**
Liquid nitrogen trap LNT 25 S	**104197**	**104197**	**104197**	**104197**
Liquid nitrogen trap LNT 25 P1	**786346**	**786346**	**786346**	**786346**
Condensate trap CT 25	**104201**	**104201**	**104201**	**104201**
Automatic gas ballast AGB 4, 230 V, 50/60 Hz	**104086**	**104086**	**104086**	**104086**
Oil level switch OLS 4	**104376**	**104376**	**104376**	**104376**

Order number				
Pascal 2005 C1 (5 m³/h)	**205C1MHEM**	**205C1MLAM**	**205C1THEM**	**205C1TLAM**

Accessories				
Oil mist eliminator OME 25 C/H	**066849**	**066849**	**066849**	**066849**
Sorption trap ST 25 C, 220 V	**066841**	**066841**	**066841**	**066841**
Liquid nitrogen trap LNT 25 C	**066889**	**066889**	**066889**	**066889**
External oil filter DE 1, 230 V, 50 Hz	**068990**	**068990**	**068990**	**068990**

Pascal 2010

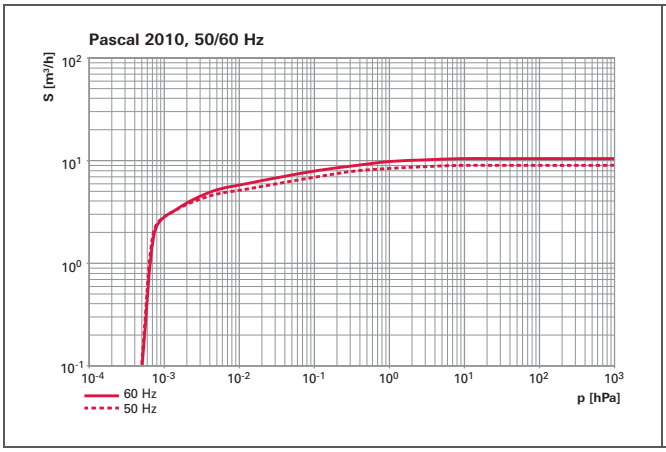


Two-stage Rotary Vane pumps for all major vacuum applications in a wide range of industries.

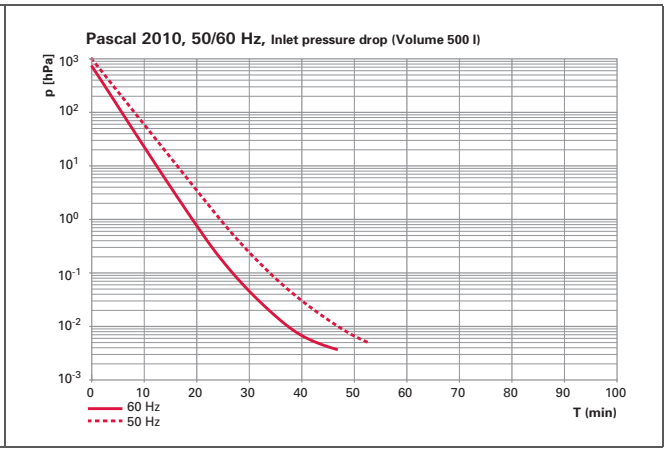
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- Low backstreaming rate
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Pumping speed

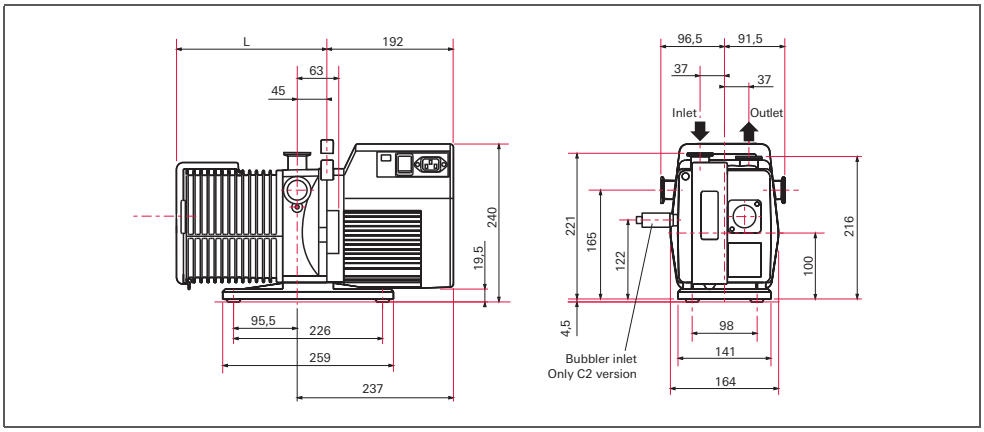


Pascal 2010



Pascal 2010

Dimensions (in mm)



	Pascal 2010
L	245 mm

Technical data	Pascal 2010, 1-phase motor, 180-254 V, 50 Hz/60 Hz, CE/UL/CSA	Pascal 2010, 1-phase motor, 90-132 V, 50 Hz/60 Hz, CE/UL/CSA	Pascal 2010, 3-phase motor, 342-460 V, 50 Hz; 342-520 V, 60 Hz, CE/UL/CSA	Pascal 2010, 3-phase motor, 170-254 V, 50 Hz; 170-300 V, 60 Hz, CE/UL/CSA
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Operating fluid	Mineral oil	Mineral oil	Mineral oil	Mineral oil
Ultimate pressure with gas ballast	10^{-2} hPa	10^{-2} hPa	10^{-2} hPa	10^{-2} hPa
Weight	26 kg	26 kg	26 kg	26 kg
Rated power 50 Hz	0.45 kW	0.45 kW	0.55 kW	0.55 kW
Rated power 60 Hz	0.55 kW	0.55 kW	0.66 kW	0.66 kW
Pumping speed at 50 Hz	9 m³h	9 m³h	9 m³h	9 m³h
Pumping speed at 60 Hz	10.5 m³h	10.5 m³h	10.5 m³h	10.5 m³h

Order number				
Pascal 2010 SD (10 m³/h)	**210SDMHEM**	**210SDMLAM**	**210SDTHEM**	**210SDTLAM**
Pascal 2010 I (10 m³/h)	**210AEMHEM**	**210AEMLAM**	**210AETHEM**	**210AETLAM**

Accessories				
Oil mist eliminator OME 25 S	**104200**	**104200**	**104200**	**104200**
Oil mist eliminator OME 25 HP	**104199**	**104199**	**104199**	**104199**
Oil mist eliminator OME 25 HP+	**108341**	**108341**	**108341**	**108341**
Oil drain kit ODK 1	**104360**	**104360**	**104360**	**104360**
Oil drain kit ODK 2, 230 V, 50/60 Hz	**104361**	**104361**	**104361**	**104361**
Sorption trap ST 25 S	**104107**	**104107**	**104107**	**104107**
Inlet dust filter DFT 25	**104202**	**104202**	**104202**	**104202**
Liquid nitrogen trap LNT 25 S	**104197**	**104197**	**104197**	**104197**
Liquid nitrogen trap LNT 25 P1	**786346**	**786346**	**786346**	**786346**
Condensate trap CT 25	**104201**	**104201**	**104201**	**104201**
Automatic gas ballast AGB 4, 230 V, 50/60 Hz	**104086**	**104086**	**104086**	**104086**
Oil level switch OLS 4	**104376**	**104376**	**104376**	**104376**

Order number				
Pascal 2010 C1 (10 m³/h)	**210C1MHEM**	**210C1MLAM**	**210C1THEM**	**210C1TLAM**
Pascal 2010 C2 (10 m³/h)	**210C2MHEN**	**210C2MLAN**	**210C2THEN**	**210C2TLAN**

Accessories				
Sorption trap ST 25 C, 220 V	**066841**	**066841**	**066841**	**066841**
Liquid nitrogen trap LNT 25 C	**066889**	**066889**	**066889**	**066889**
External oil filter DE 1, 230 V, 50 Hz	**068990**	**068990**	**068990**	**068990**

Pascal 2015

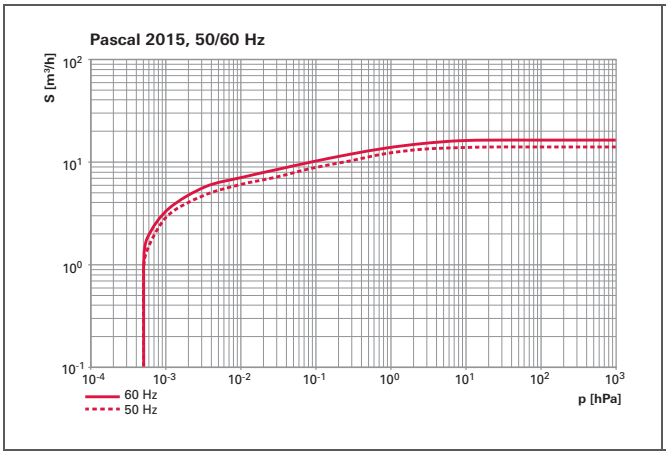


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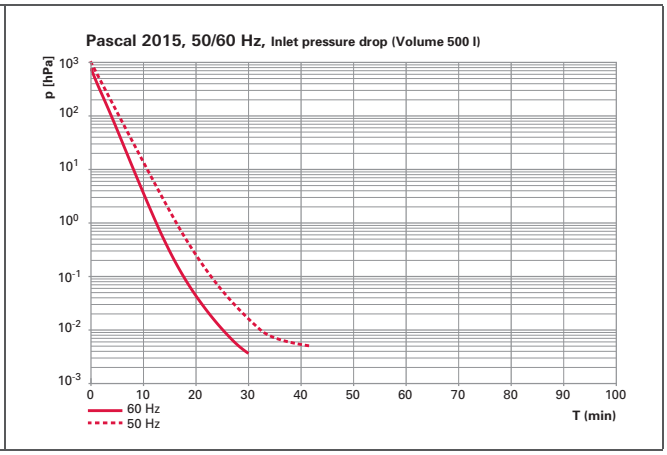
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Pumping speed

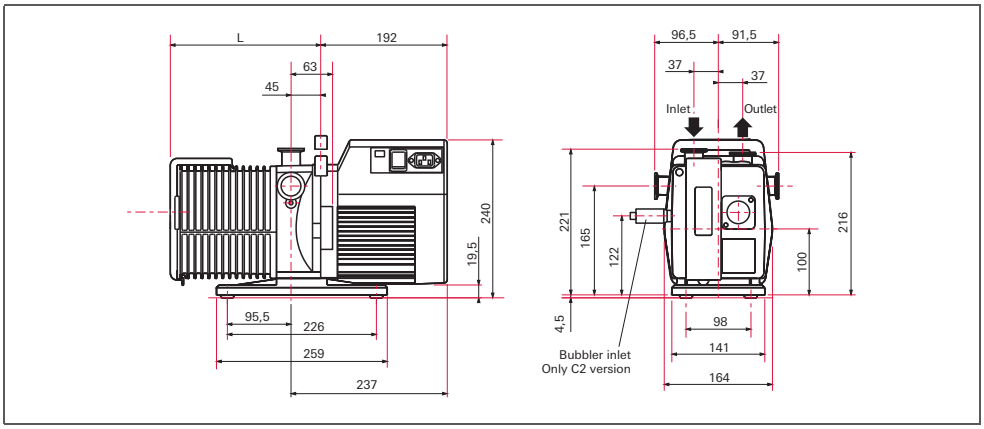


Pascal 2015



Pascal 2015

Dimensions (in mm)



	Pascal 2015
L	270 mm

Technical data	Pascal 2015, 1-phase motor, 180-254 V, 50 Hz/60 Hz, CE/UL/CSA	Pascal 2015, 1-phase motor, 90-132 V, 50 Hz/60 Hz, CE/UL/CSA	Pascal 2015, 3-phase motor, 342-460 V, 50 Hz; 342-520 V, 60 Hz, CE/UL/CSA	Pascal 2015, 3-phase motor, 170-254 V, 50 Hz; 170-300 V, 60 Hz, CE/UL/CSA
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Operating fluid	Mineral oil	Mineral oil	Mineral oil	Mineral oil
Ultimate pressure with gas ballast	10^{-2} hPa	10^{-2} hPa	10^{-2} hPa	10^{-2} hPa
Weight	27 kg	27 kg	27 kg	27 kg
Rated power 50 Hz	0.45 kW	0.45 kW	0.55 kW	0.55 kW
Rated power 60 Hz	0.55 kW	0.55 kW	0.66 kW	0.66 kW
Pumping speed at 50 Hz	14 m^3h	14 m^3h	14 m^3h	14 m^3h
Pumping speed at 60 Hz	16.5 m^3h	16.5 m^3h	16.5 m^3h	16.5 m^3h

Order number				
Pascal 2015 SD (15 m^3/h)	**215SDMHEM**	**215SDMLAM**	**215SDTHEM**	**215SDTLAM**
Pascal 2015 I (15 m^3/h)	**215AEMHEM**	**215AEMLAM**	**215AETHEM**	**215AETLAM**

Accessories				
Oil mist eliminator OME 25 S	**104200**	**104200**	**104200**	**104200**
Oil mist eliminator OME 25 HP	**104199**	**104199**	**104199**	**104199**
Oil mist eliminator OME 25 HP+	**108341**	**108341**	**108341**	**108341**
Oil drain kit ODK 1	**104360**	**104360**	**104360**	**104360**
Oil drain kit ODK 2, 230 V, 50/60 Hz	**104361**	**104361**	**104361**	**104361**
Sorption trap ST 25 S	**104107**	**104107**	**104107**	**104107**
Inlet dust filter DFT 25	**104202**	**104202**	**104202**	**104202**
Liquid nitrogen trap LNT 25 S	**104197**	**104197**	**104197**	**104197**
Liquid nitrogen trap LNT 25 P1	**786346**	**786346**	**786346**	**786346**
Condensate trap CT 25	**104201**	**104201**	**104201**	**104201**
Automatic gas ballast AGB 4, 230 V, 50/60 Hz	**104086**	**104086**	**104086**	**104086**
Oil level switch OLS 4	**104376**	**104376**	**104376**	**104376**

Order number				
Pascal 2015 C1 (15 m^3/h)	**215C1MHEM**	**215C1MLAM**	**215C1THEM**	**215C1TLAM**
Pascal 2015 C2 (15 m^3/h)	**215C2MHEN**	**215C2MLAN**	**215C2THEN**	**215C2TLAN**

Accessories				
Sorption trap ST 25 C, 220 V	**066841**	**066841**	**066841**	**066841**
Liquid nitrogen trap LNT 25 C	**066889**	**066889**	**066889**	**066889**
External oil filter DE 1, 230 V, 50 Hz	**068990**	**068990**	**068990**	**068990**

Pascal 2021

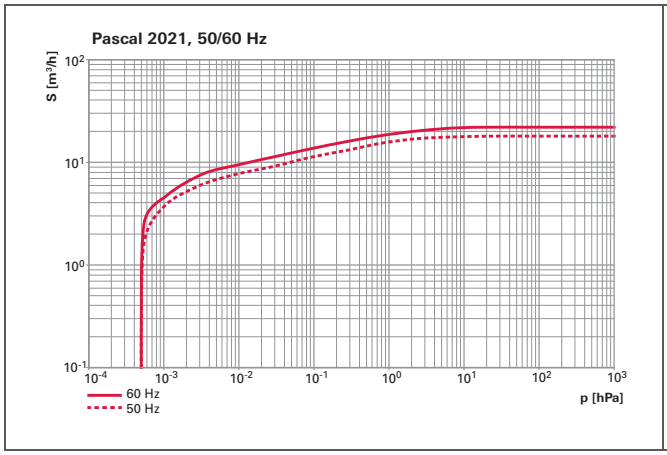


Two-stage Rotary Vane pumps for all major vacuum applications in a wide range of industries.

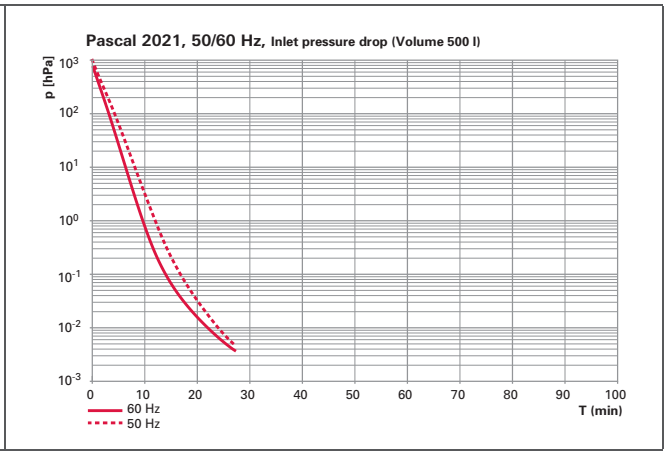
- All major vacuum applications in a wide range of industries
- No oil mist pollution at the exhaust for 5 - 21 m^3/h pumps: thanks to the natural lubrication design, even with high throughputs or frequent cycling
- Low backstreaming rate
- Compact design
- Adjustable inlet and outlet ports, horizontal or vertical orientation for better integration
- Universal 1-phase motors (high & low voltage, 50/60 Hz)
- Easy integration by large OEMs

SD, I, C1 versions are delivered with mineral oil, and C2 versions are prepared for operation with PFPE oil but fluid must be ordered separately

Pumping speed

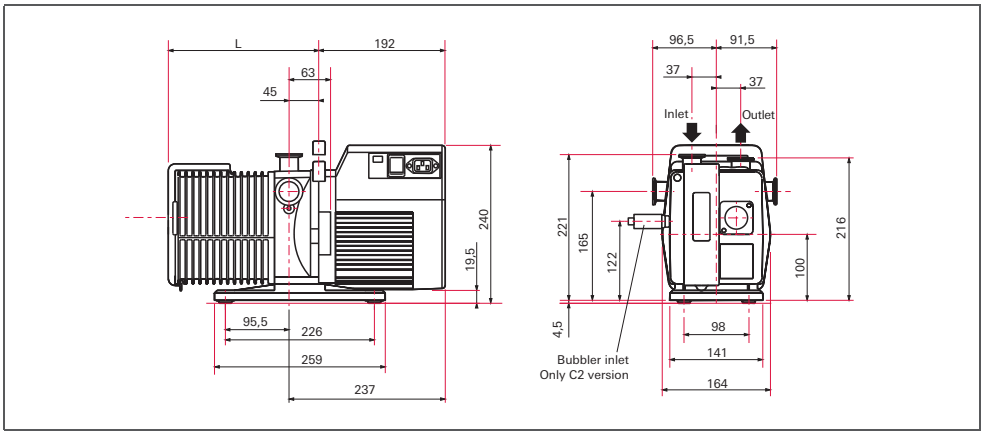


Pascal 2021



Pascal 2021

Dimensions (in mm)



	Pascal 2021
L	291 mm

Technical data	Pascal 2021, 1-phase motor, 180-254 V, 50 Hz/60 Hz, CE/UL/CSA	Pascal 2021, 1-phase motor, 90-132 V, 50 Hz/60 Hz, CE/UL/CSA	Pascal 2021, 3-phase motor, 342-460 V, 50 Hz; 342-520 V, 60 Hz, CE/UL/CSA	Pascal 2021, 3-phase motor, 170-254 V, 50 Hz; 170-300 V, 60 Hz, CE/UL/CSA
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Operating fluid	Mineral oil	Mineral oil	Mineral oil	Mineral oil
Ultimate pressure with gas ballast	10^{-2} hPa	10^{-2} hPa	10^{-2} hPa	10^{-2} hPa
Weight	28 kg	28 kg	28 kg	28 kg
Rated power 50 Hz	0.45 kW	0.45 kW	0.55 kW	0.55 kW
Rated power 60 Hz	0.55 kW	0.55 kW	0.66 kW	0.66 kW
Pumping speed at 50 Hz	18 m^3h	18 m^3h	18 m^3h	18 m^3h
Pumping speed at 60 Hz	22 m^3h	22 m^3h	22 m^3h	22 m^3h

Order number				
Pascal 2021 SD (21 m^3/h)	**221SDMHEM**	**221SDMLAM**	**221SDTHEM**	**221SDTLAM**
Pascal 2021 I (21 m^3/h)	**221AEMHEM**	**221AEMLAM**	**221AETHEM**	**221AETLAM**

Accessories				
Oil mist eliminator OME 25 S	**104200**	**104200**	**104200**	**104200**
Oil mist eliminator OME 25 HP	**104199**	**104199**	**104199**	**104199**
Oil mist eliminator OME 25 HP+	**108341**	**108341**	**108341**	**108341**
Oil drain kit ODK 1	**104360**	**104360**	**104360**	**104360**
Oil drain kit ODK 2, 230 V, 50/60 Hz	**104361**	**104361**	**104361**	**104361**
Sorption trap ST 25 S	**104107**	**104107**	**104107**	**104107**
Inlet dust filter DFT 25	**104202**	**104202**	**104202**	**104202**
Liquid nitrogen trap LNT 25 S	**104197**	**104197**	**104197**	**104197**
Liquid nitrogen trap LNT 25 P1	**786346**	**786346**	**786346**	**786346**
Condensate trap CT 25	**104201**	**104201**	**104201**	**104201**
Automatic gas ballast AGB 4, 230 V, 50/60 Hz	**104086**	**104086**	**104086**	**104086**
Oil level switch OLS 4	**104376**	**104376**	**104376**	**104376**

Order number				
Pascal 2021 C1 (21 m^3/h)	**221C1MHEM**	**221C1MLAM**	**221C1THEM**	**221C1TLAM**
Pascal 2021 C2 (21 m^3/h)	**221C2MHEN**	**221C2MLAN**	**221C2THEN**	**221C2TLAN**

Accessories				
Sorption trap ST 25 C, 220 V	**066841**	**066841**	**066841**	**066841**
Liquid nitrogen trap LNT 25 C	**066889**	**066889**	**066889**	**066889**
External oil filter DE 1, 230 V, 50 Hz	**068990**	**068990**	**068990**	**068990**

Pascal 2033

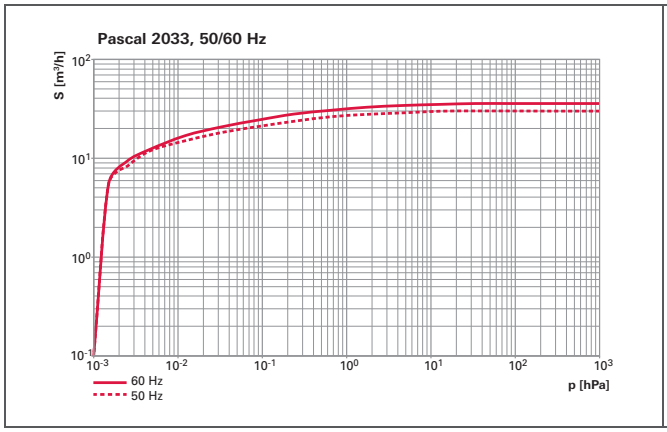


Two-stage Rotary Vane pumps for all major vacuum applications in a wide range of industries.

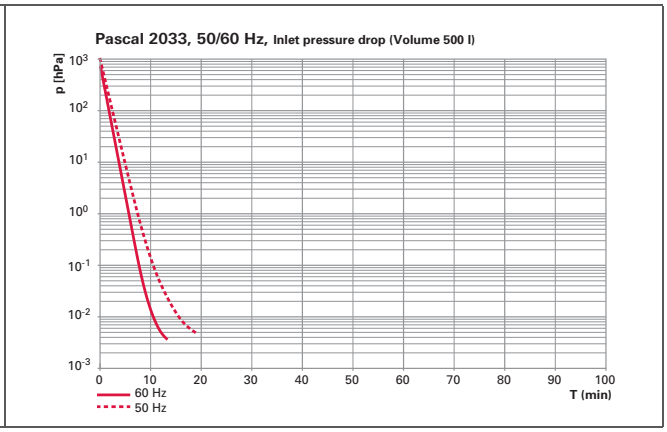
- All major vacuum applications in a wide range of industries
- Low backstreaming rate

SD, I, C1 versions are delivered with mineral oil, and C2 versions are prepared for operation with PFPE oil but fluid must be ordered separately

Pumping speed

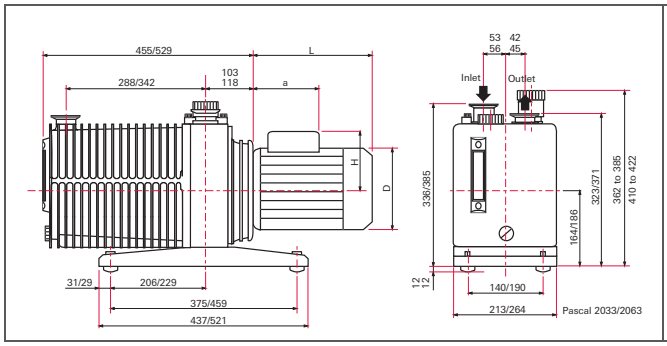


Pascal 2033

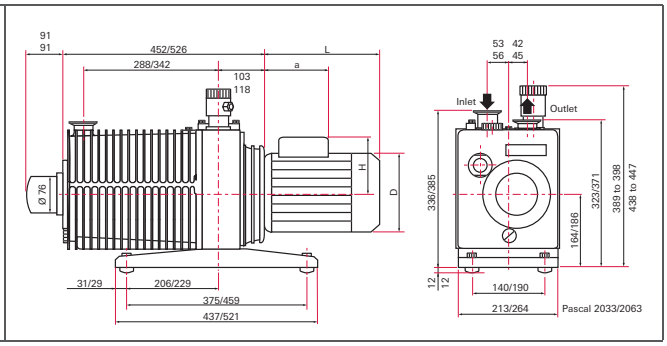


Pascal 2033

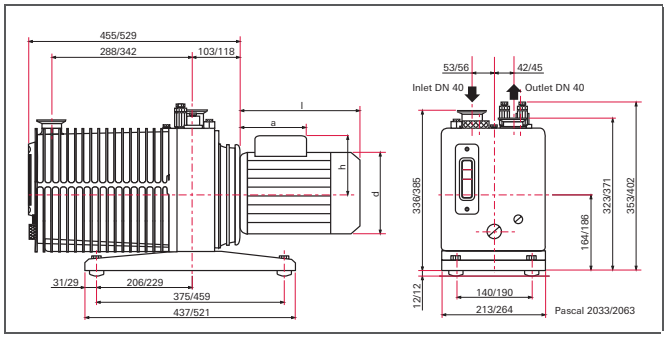
Dimensions (in mm)



Pascal 2033, SD version



Pascal 2033, C1 version



Pascal 2033, C2 version

	3-phase motor Europe	3-phase motor USA/Japan	3-phase motor Rest of the world
A	143 mm	143 mm	200 mm
D	177 mm	177 mm	170 mm
H	137 mm	137 mm	140 mm
L	267 mm	267 mm	270 mm

Technical data	Pascal 2033, 3-phase motor, Europe, 380-415 V, 50 Hz; 380-480 V, 60 Hz, CE	Pascal 2033, 3-phase motor, USA/Japan, 180-220 V, 50 Hz; 190-230 V, 60 Hz, CE/UL/CSA	Pascal 2033, 3-phase motor, Rest of the world, 360-415 V, 50 Hz; 380-480 V, 60 Hz, CE	Pascal 2033, 3-phase motor, Rest of the world, 180-240 V, 50 Hz; 180-240 V, 60 Hz, CE
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Operating fluid	Mineral oil	Mineral oil	Mineral oil	Mineral oil
Ultimate pressure with gas ballast	$2 \cdot 10^{-2}$ hPa	$2 \cdot 10^{-2}$ hPa	$2 \cdot 10^{-2}$ hPa	$2 \cdot 10^{-2}$ hPa
Rated power 50 Hz	1.1 kW	1.5 kW	1.5 kW	1.5 kW
Rated power 60 Hz	1.3 kW	1.8 kW	1.8 kW	1.8 kW
Pumping speed at 50 Hz	30 m³/h	30 m³/h	30 m³/h	30 m³/h
Pumping speed at 60 Hz	36 m³h	36 m³h	36 m³h	36 m³h
Order number				
Weight	65.5 kg	67.5 kg	69 kg	69 kg
Pascal 2033 SD (33 m³/h)	**233SDT1HWMNX**	**233SDT2LWMNX**	**233SDT3HWMNX**	**233SDT3LWMNX**
Accessories				
Oil mist eliminator OME 40 S	**104887**	**104887**	**104887**	**104887**
Oil mist eliminator OME 40 HP+	**200024**	**200024**	**200024**	**200024**
Oil drain kit ODK 136	**118773**	**118773**	**118773**	**118773**
Oil drain kit ODK 236, 230 V, 50/60 Hz	**118776**	**118776**	**118776**	**118776**
Sorption trap ST 40, 230 V (without adsorbend charge)	**053380**	**053380**	**053380**	**053380**
Automatic gas ballast AGB 36, 230 V, 50/60 Hz	**068391**	**068391**	**068391**	**068391**
Oil level switch OLS 36	**104377**	**104377**	**104377**	**104377**
External oil filter DE 1, 230 V, 50 Hz	**068990**	**068990**	**068990**	**068990**
External oil filter DE 2, 230 V, 50 Hz	**104374**	**104374**	**104374**	**104374**
Order number				
Weight	68,5 kg	70,5 kg	72 kg	72 kg
Pascal 2033 C1 (33 m³/h)	**233C1T1HWMNX**	**233C1T2LWMNX**	**233C1T3HWMNX**	**233C1T3LWMNX**
Weight	66,5 kg	68,5 kg	70 kg	70 kg
Pascal 2033 C2 (33 m³/h)	**233C2T1HWNNX**	**233C2T2LWNNX**	**233C2T3HWNNX**	**233C2T3LWNNX**
Accessories				
Oil mist eliminator OME 40 C1	**068785**	**068785**	**068785**	**068785**
External oil filter DE 1, 230 V, 50 Hz	**068990**	**068990**	**068990**	**068990**
External oil filter DE 2, 230 V, 50 Hz	**104374**	**104374**	**104374**	**104374**

Pascal 2063

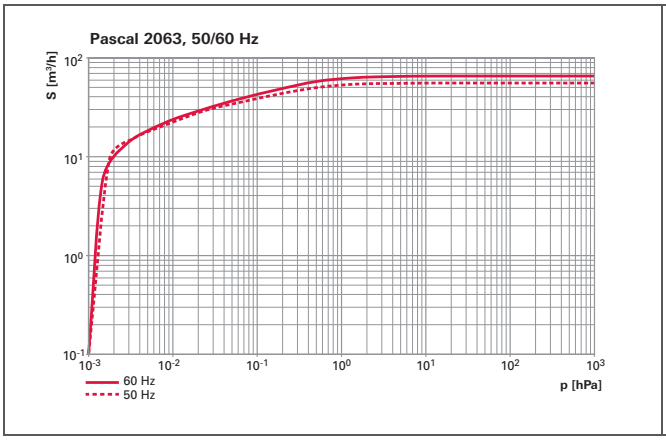


Two-stage Rotary Vane pumps for all major vacuum applications in a wide range of industries.

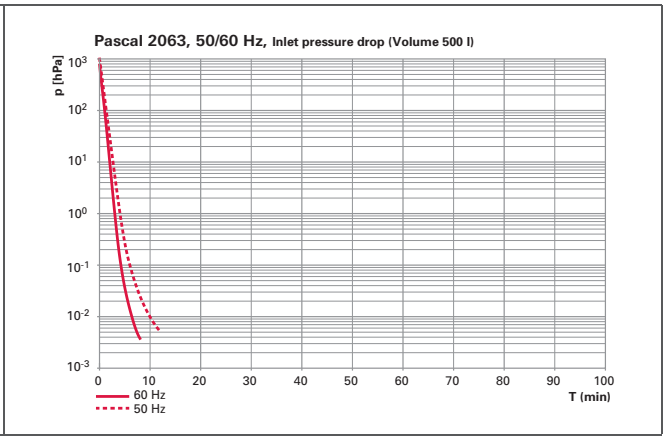
- All major vacuum applications in a wide range of industries
- Low backstreaming rate

SD, I, C1 versions are delivered with mineral oil, and C2 versions are prepared for operation with PFPE oil but fluid must be ordered separately

Pumping speed

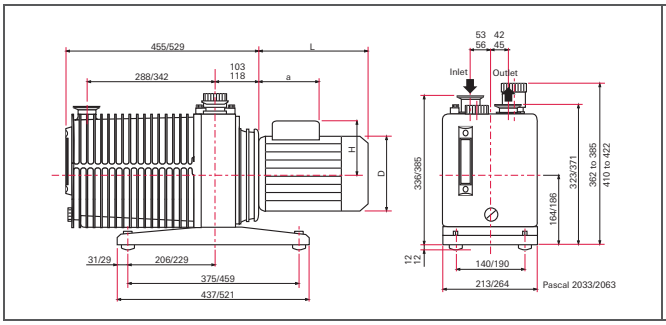


Pascal 2063

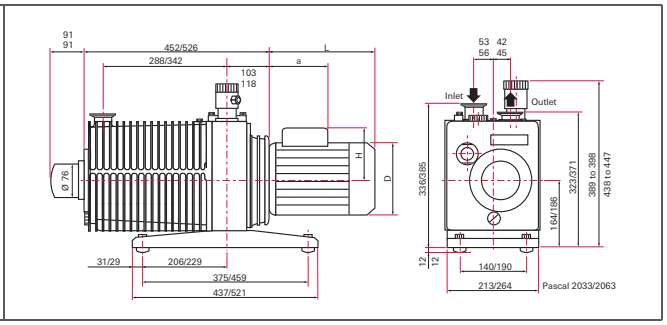


Pascal 2063

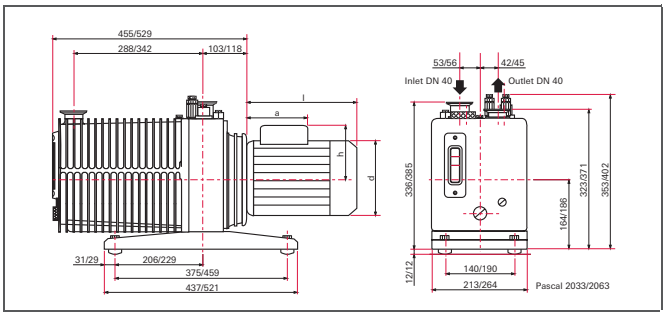
Dimensions (in mm)



Pascal 2063, SD version



Pascal 2063, C1 version



Pascal 2063, C2 version

	3-phase motor Europe	3-phase motor USA/Japan	3-phase motor Rest of the world
A	149 mm	149 mm	230 mm
D	196 mm	196 mm	190 mm
H	144 mm	144 mm	150 mm
L	321 mm	321 mm	300 mm

Technical data	Pascal 2063, 3-phase motor, Europe, 380-415 V, 50 Hz; 380-480 V, 60 Hz, CE	Pascal 2063, 3-phase motor, USA/Japan, 180-220 V, 50 Hz; 190-280 V, 60 Hz, CE/UL/CSA	Pascal 2063, 3-phase motor, Rest of the world, 360-415 V, 50 Hz; 380-480 V, 60 Hz, CE	Pascal 2063, 3-phase motor, Rest of the world, 180-240 V, 50 Hz; 180-240 V, 60 Hz, CE
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Operating fluid	Mineral oil	Mineral oil	Mineral oil	Mineral oil
Ultimate pressure with gas ballast	$2 \cdot 10^{-2}$ hPa	$2 \cdot 10^{-2}$ hPa	$2 \cdot 10^{-2}$ hPa	$2 \cdot 10^{-2}$ hPa
Rated power 50 Hz	2.2 kW	2.2 kW	2.2 kW	2.2 kW
Rated power 60 Hz	2.6 kW	2.6 kW	2.6 kW	2.6 kW
Mains requirement: voltage 50 Hz	380-415 V	180-220 V	360-415 V	180-240 V
Mains requirement: voltage 60 Hz	380-480 V	190-280 V	380-480 V	180-240 V
Pumping speed at 50 Hz	56 m^3h	56 m^3h	56 m^3h	56 m^3h
Pumping speed at 60 Hz	66 m^3h	66 m^3h	66 m^3h	66 m^3h
Order number				
Weight	104 kg	104 kg	103.5 kg	103.5 kg
Pascal 2063 SD (63 m^3/h)	**263SDT1HWMNX**	**263SDT2LWMNX**	**263SDT3HWMNX**	**263SDT3LWMNX**
Accessories				
Oil mist eliminator OME 40 S	**104887**	**104887**	**104887**	**104887**
Oil mist eliminator OME 40 HP+	**200024**	**200024**	**200024**	**200024**
Oil drain kit ODK 136	**118773**	**118773**	**118773**	**118773**
Oil drain kit ODK 236, 230 V, 50/60 Hz	**118776**	**118776**	**118776**	**118776**
Sorption trap ST 40, 230 V (without adsorbend charge)	**053380**	**053380**	**053380**	**053380**
Automatic gas ballast AGB 36, 230 V, 50/60 Hz	**068391**	**068391**	**068391**	**068391**
Oil level switch OLS 36	**104377**	**104377**	**104377**	**104377**
External oil filter DE 1, 230 V, 50 Hz	**068990**	**068990**	**068990**	**068990**
External oil filter DE 2, 230 V, 50 Hz	**104374**	**104374**	**104374**	**104374**
Order number				
Weight	107,5 kg	107,5 kg	107 kg	107 kg
Pascal 2063 C1 (63 m^3/h)	**263C1T1HWMNX**	**263C1T2LWMNX**	**263C1T3HWMNX**	**263C1T3LWMNX**
Weight	104,5 kg	104,5 kg	104 kg	104 kg
Pascal 2063 C2 (63 m^3/h)	**263C2T1HWNNX**	**263C2T2LWNNX**	**263C2T3HWNNX**	**263C2T3LWNNX**
Accessories				
Oil mist eliminator OME 40 C1	**068785**	**068785**	**068785**	**068785**
External oil filter DE 1, 230 V, 50 Hz	**068990**	**068990**	**068990**	**068990**
External oil filter DE 2, 230 V, 50 Hz	**104374**	**104374**	**104374**	**104374**

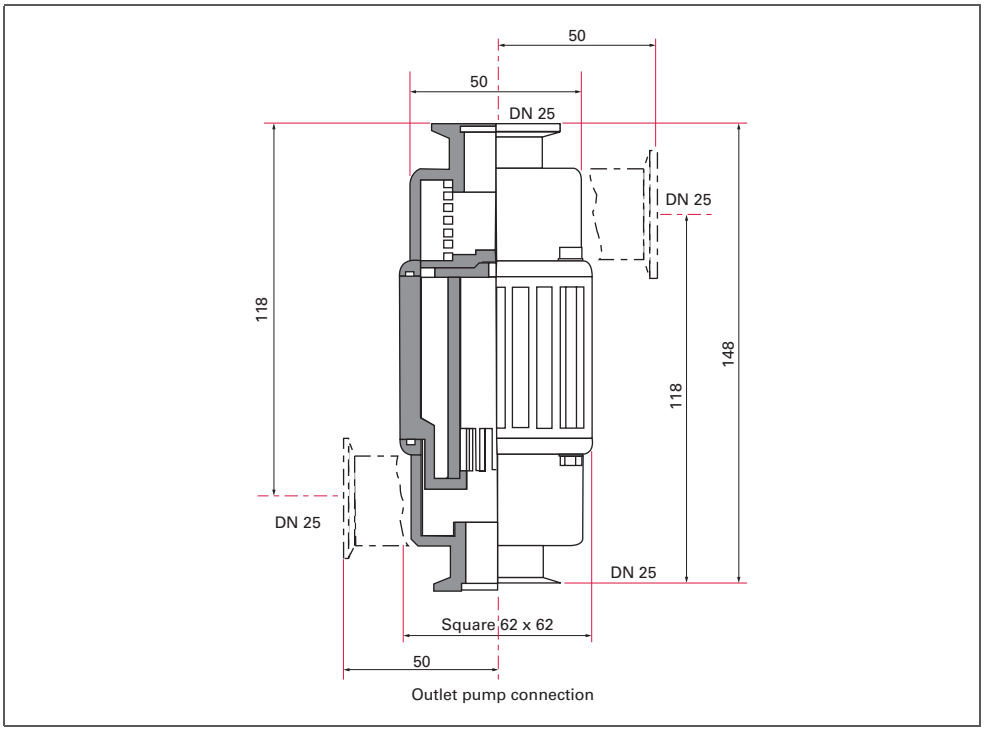
Oil mist eliminator OME 25 S



Oil mist eliminators retain oil mist contained in the exhausted gases with a high level of separation; an internal over pressure valve prevents exceeding the maximum permissible exhaust pressure.

- Body material: Polyamide
- Cartridge material: Epoxy/glass microfiber
- Weight: 0.217 kg
- Inlet/Exhaust port: DN 25 ISO-KF
- Supplied with: 1 centering ring, 1 clamp,1 additional angle port
- Replacement cartridge, single: Order number 068304. Orders must be placed for quantities multiple of 5 (5, 10, 15…)

Dimensions (in mm)



Order number	
Oil mist eliminator OME 25 S	**104200**

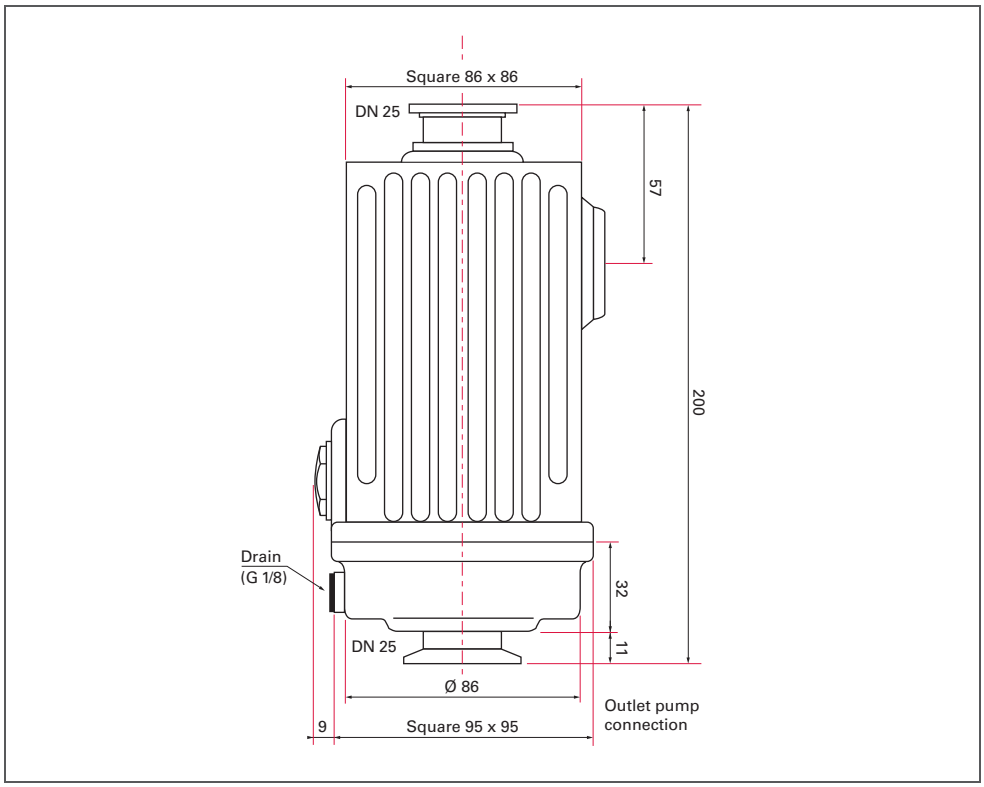
Oil mist eliminator OME 25 HP



Oil mist eliminators retain oil mist contained in the exhausted gases with a high level of separation; an internal over pressure valve prevents exceeding the maximum permissible exhaust pressure.

- Body material: Aluminum
- Cartridge material: Epoxy/glass microfiber
- Weight: 1.2 kg
- Inlet/Exhaust port: DN 25 ISO-KF
- Supplied with: 1 centering ring and 1 clamp
- Replacement cartridge (single): Order number 100522

Dimensions (in mm)



Order number	
Oil mist eliminator OME 25 HP	**104199**

Oil mist eliminator OME 25 HP+



Oil mist eliminators retain oil mist contained in the exhausted gases with a high level of separation; an internal over pressure valve prevents exceeding the maximum permissible exhaust pressure.

- Body material: Aluminum
- Cartridge material: PU/PET/glass micro-fiber/PA
- Weight: 1.2 kg
- Inlet/Exhaust port: DN 25 ISO-KF
- Supplied with: 1 centering ring and 1 clamp
- Replacement cartridge (single): Order number 107494

Order number	
Oil mist eliminator OME 25 HP+	**108341**

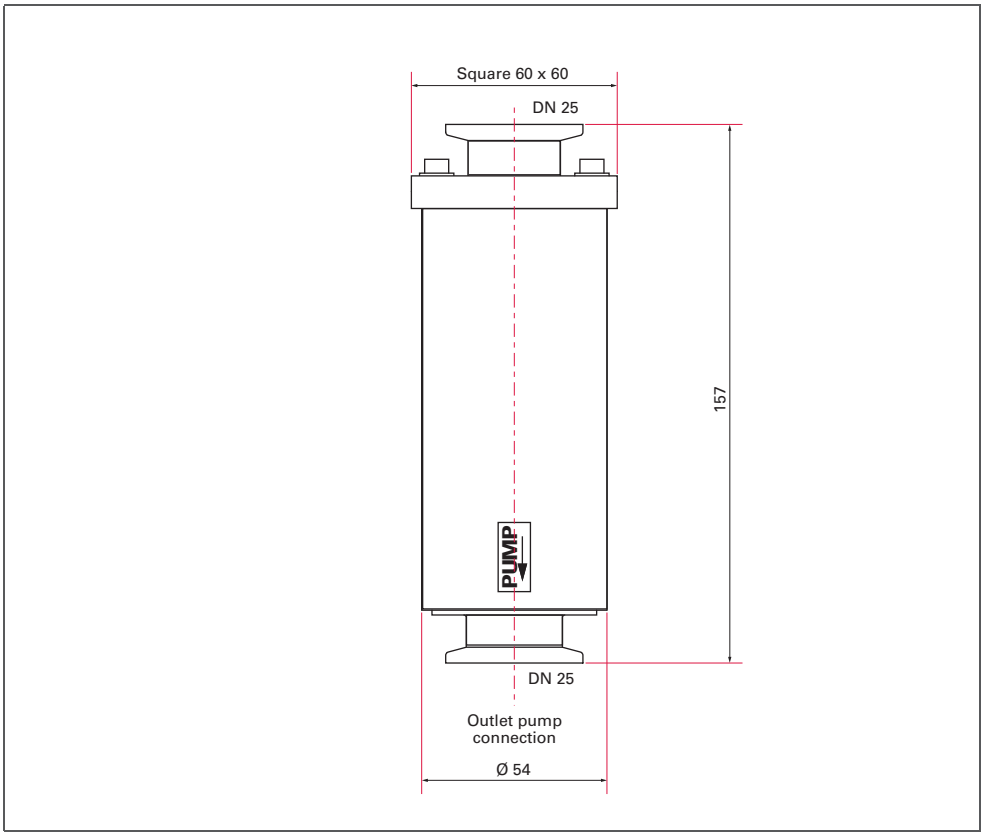
Oil mist eliminator OME 25 C/H



Oil mist eliminators retain oil mist contained in the exhausted gases with a high level of separation; an internal over pressure valve prevents exceeding the maximum permissible exhaust pressure.

- Body material: Stainless steel
- Cartridge material: PTFE/glass microfiber
- Weight: 0.53 kg
- Leak rate < $2 \cdot 10^{-8}$ Pa m^3/s
- Inlet/Exhaust port: DN 25 ISO-KF
- Supplied with: 1 centering ring and 1 clamp
- Replacement cartridge: Order number 066800

Dimensions (in mm)



Order number	
Oil mist eliminator OME 25 C/H	**066849**

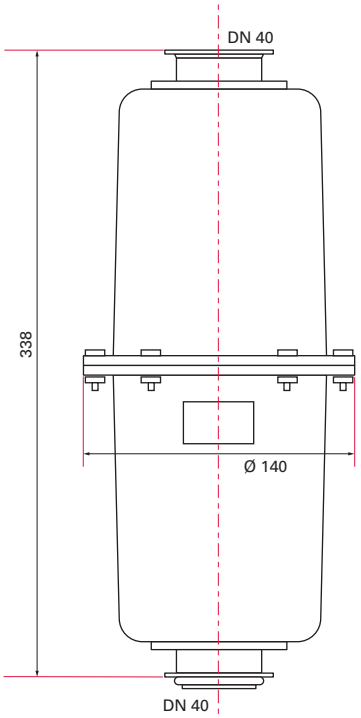
Oil mist eliminator OME40S



Oil mist eliminators retain oil mist contained in the exhausted gases with a high level of separation; an internal over pressure valve prevents exceeding the maximum permissible exhaust pressure.

- Body material: Aluminum
- Cartridge material: Epoxy/glass microfiber
- Weight: 0.9 kg
- Leak rate < $2 \cdot 10^{-8}$ Pa m^3/s
- Inlet/Exhaust port: DN 40 ISO-KF
- Replacement cartridge (single): Order number 068443

Dimensions (in mm)



Order number	
Oil mist eliminator OME40S	**104887**

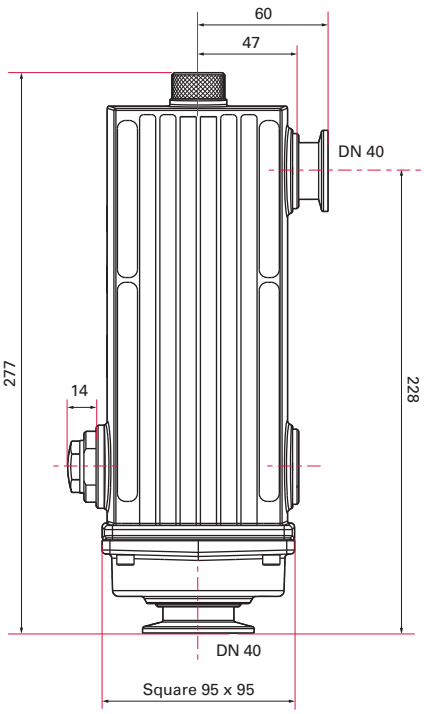
Oil mist eliminator OME40HP+



Oil mist eliminators retain oil mist contained in the exhausted gases with a high level of separation; an internal over pressure valve prevents exceeding the maximum permissible exhaust pressure.

- Body material: Aluminum
- Cartridge material: phenolic resin/glass micro-fiber/polnoter
- Weight: 1.4 kg
- Inlet/Exhaust port: DN 40 ISO-KF
- Supplied with: 1 centering ring and 1 clamp
- Replacement cartridge (single): Order number 115937

Dimensions (in mm)



Order number	
Oil mist eliminator OME40HP+	**200024**

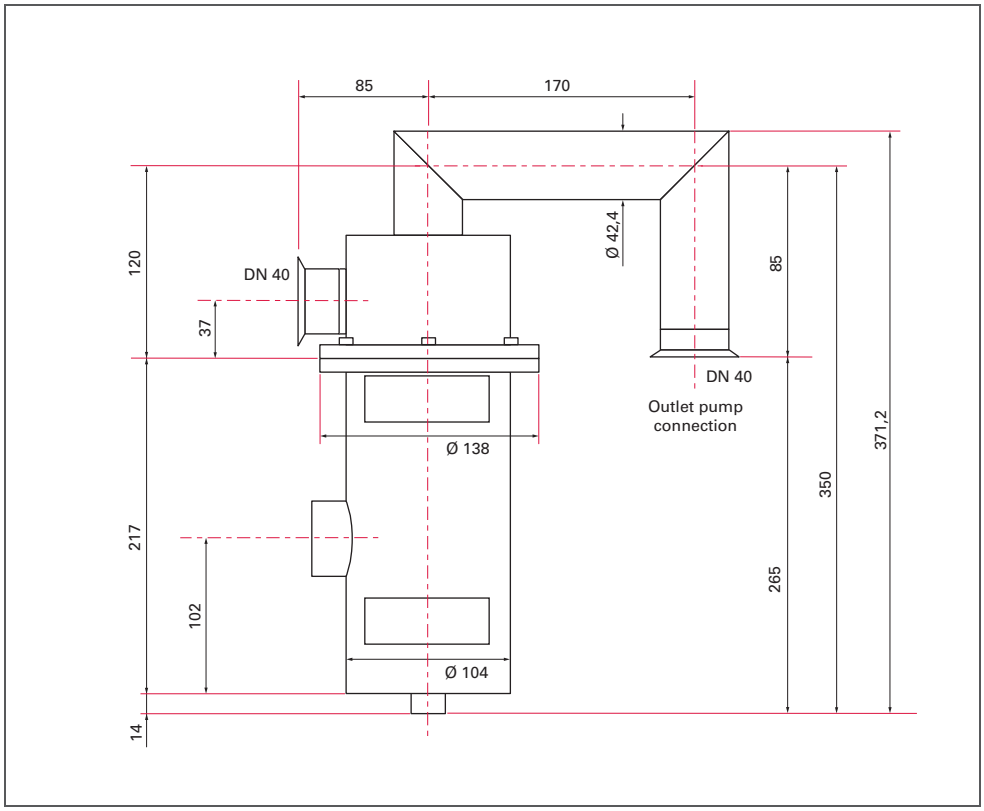
Oil mist eliminator OME40C1



Oil mist eliminators retain oil mist contained in the exhausted gases with a high level of separation; an internal over pressure valve prevents exceeding the maximum permissible exhaust pressure.

- Body material: Stainless steel
- Cartridge material: PTFE/glass microfiber
- Weight: 4.1 kg
- Inlet/Exhaust port: DN 40 ISO-KF
- Replacement cartridge (single): Order number 068778

Dimensions (in mm)



Order number	
Oil mist eliminator OME40C1	**068785**

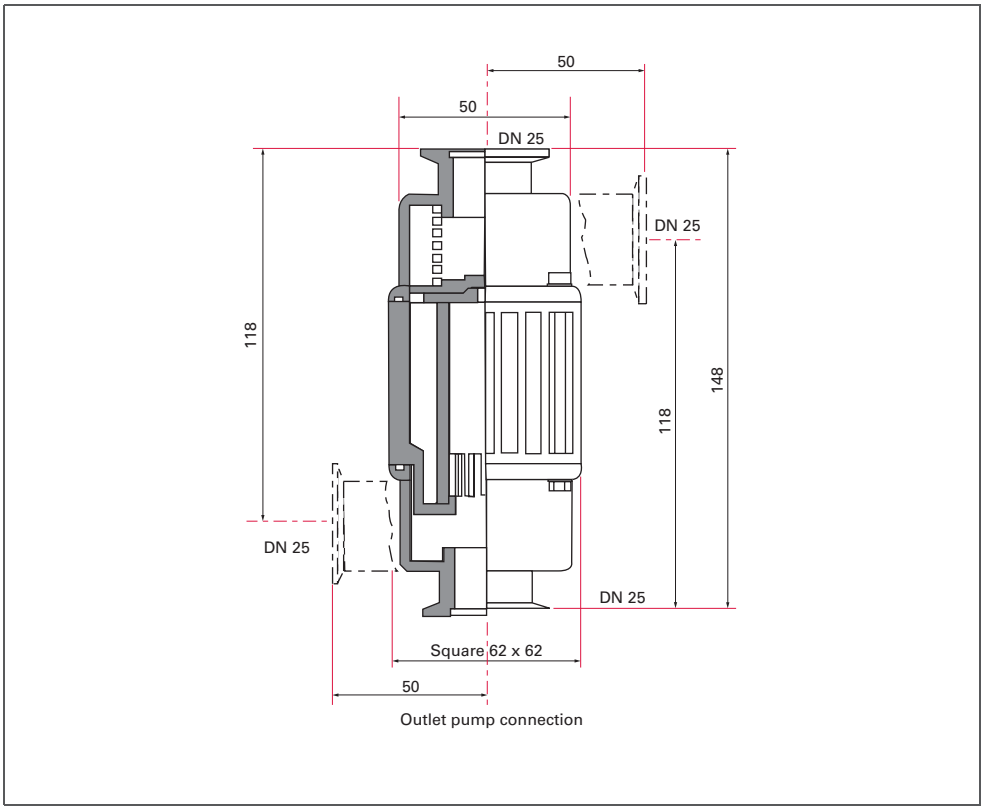
Oil mist eliminator OME40C2



Oil mist eliminators retain oil mist contained in the exhausted gases with a high level of separation; an internal over pressure valve prevents exceeding the maximum permissible exhaust pressure.

- Body material: Stainless steel
- Cartridge material: Polypropylene
- Weight: 4.1 kg
- Inlet/Exhaust port: DN 40 ISO-KF
- Replacement cartridge (single): Order number 100802

Dimensions (in mm)



Order number	
Oil mist eliminator OME40C2	**068942**

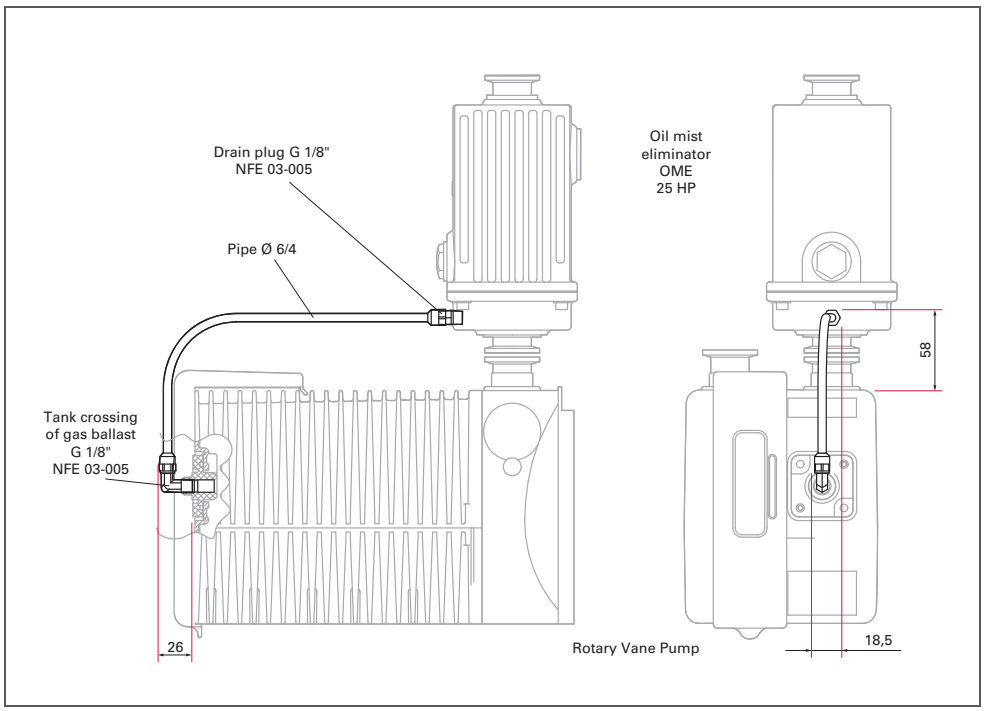
Oil drain kit ODK 1



Oil Drain Kit 1 must be used with oil mist eliminator OME 25 HP. It consists of a drain pipe which is connected on one end to the bottom of the OME 25 HP, and on the other end to the inlet of the gas ballast. ODK1 are recommanded for 5 to 21 m³/h pumps I/SD series.

- Weight: 0.1 kg

Dimensions (in mm)



Order number	
Oil drain kit ODK 1	**104360**

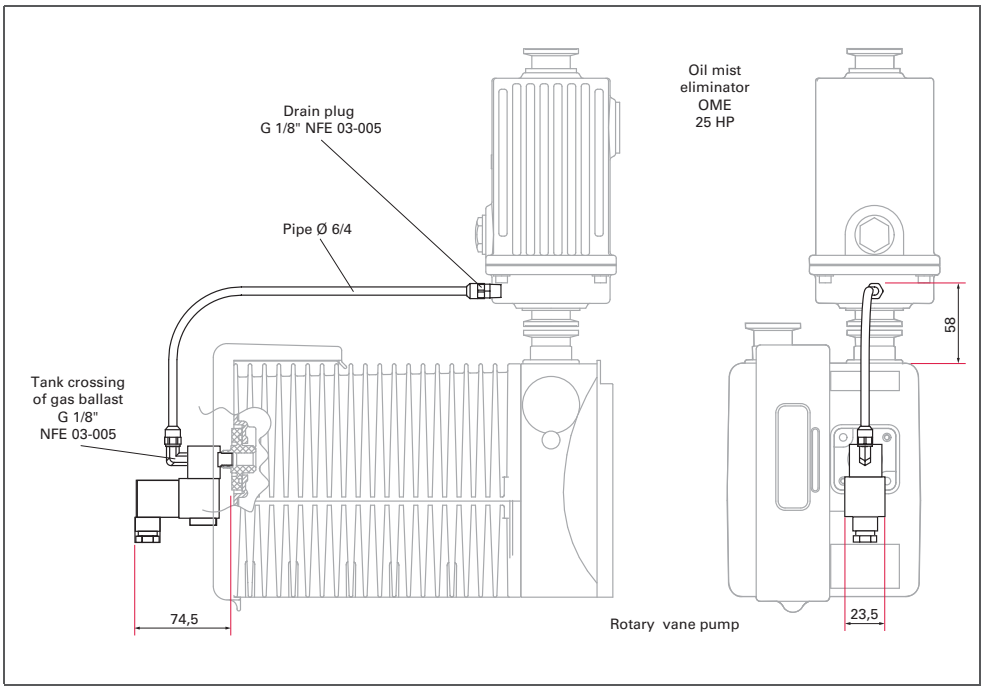
Oil drain kit ODK 2



Oil Drain Kit 2 must be used with oil mist eliminator OME 25 HP. It consists of a drain pipe which is connected on one end to the bottom of the OME 25 HP, and on the other end to the inlet of the gas ballast through a solenoid valve. ODK2 are recommanded for 5 to 21 m³/h pumps I/SD series.

- Weight: 0.3 kg
- Solenoid Valve Voltage: 230 V 50/60 Hz
- Further voltage ranges are available on request

Dimensions (in mm)



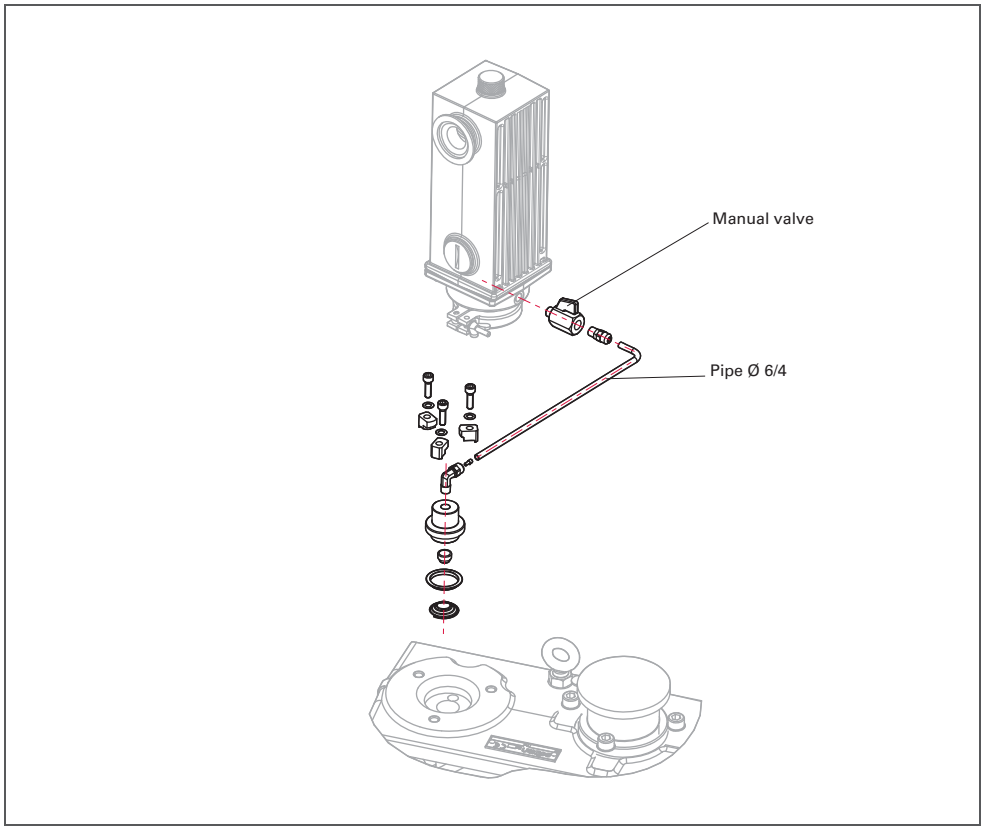
Order number	
Oil drain kit ODK 2	**104361**

Oil drain kit ODK 136

Oil Drain Kit 136 must be used with oil mist eliminator OME 40 HP+. It consists of a drain pipe which is connected on one end to the bottom of the OME 40 HP+, and on the other end to the inlet of the gas ballast through a solenoid valve.



Dimensions (in mm)



Order number	
Oil drain kit ODK 136	**118773**

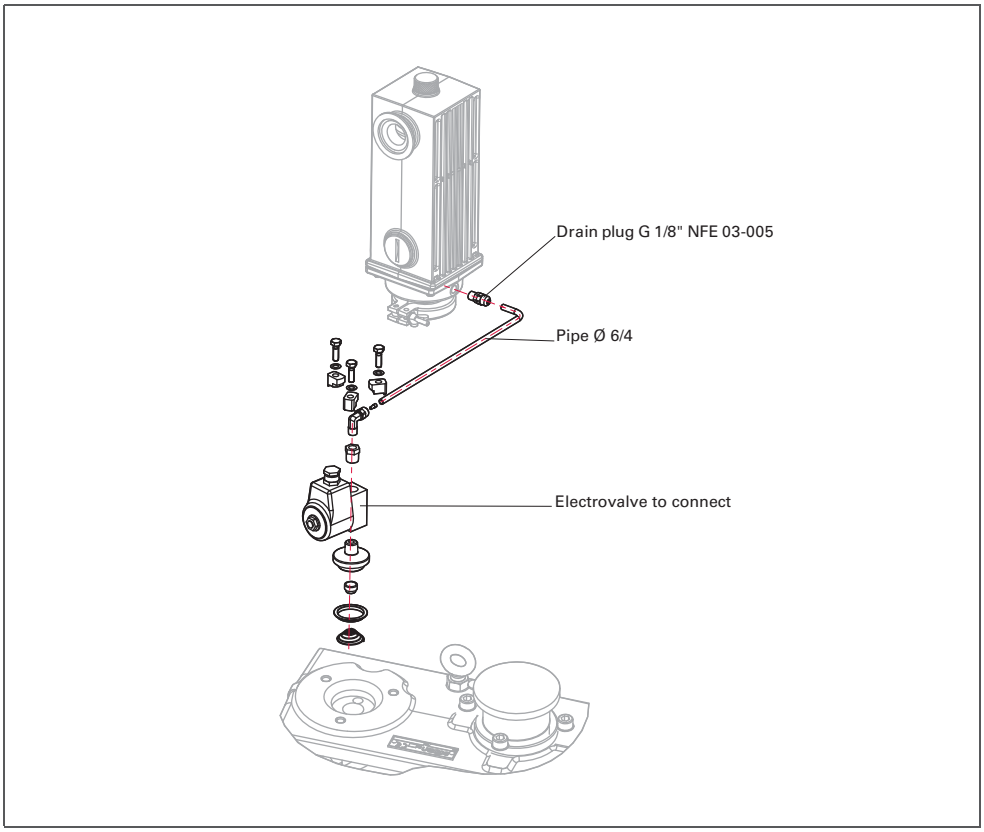
Oil drain kit ODK 236



Oil Drain Kit 236 must be used with oil mist eliminator OME 40 HP+. It consists of a drain pipe which is connected on one end to the bottom of the OME 40 HP+, and on the other end to the inlet of the gas ballast through a solenoid valve.

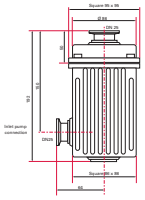
- Solenoid Valve Voltage: 230 V 50/60 Hz
- Further voltage ranges are available on request

Dimensions (in mm)



Order number	
Oil drain kit ODK 236, 230 V, 50/60 Hz	**118776**

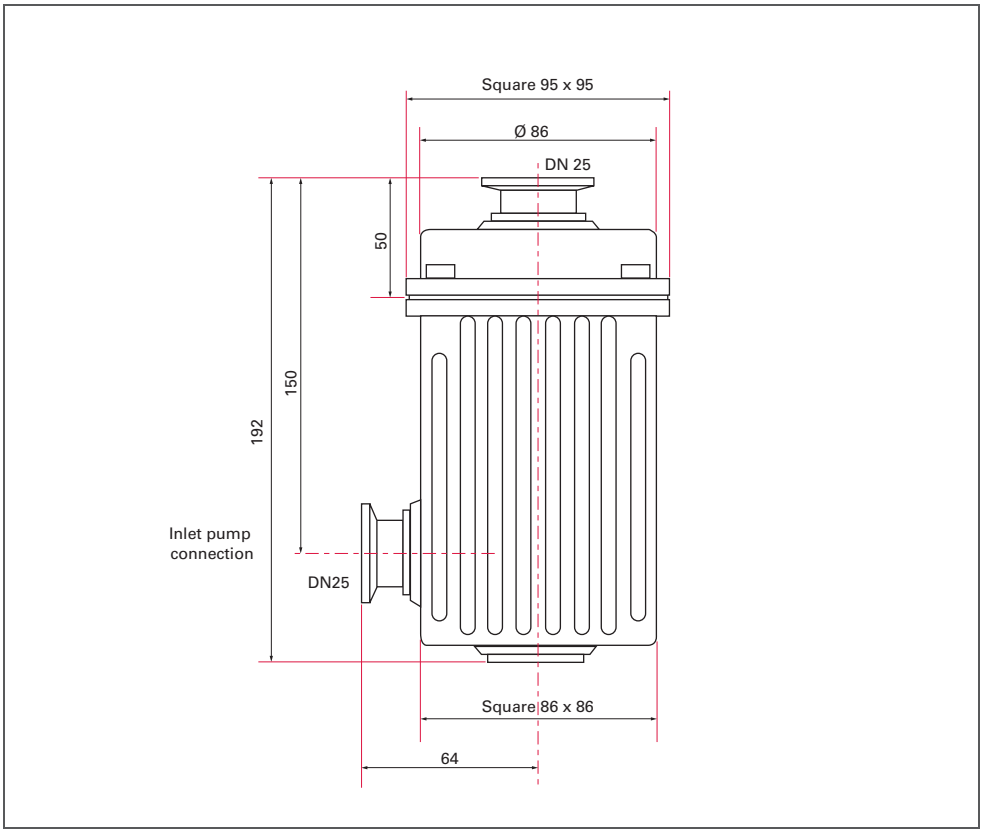
Sorption trap ST 25 S



Sorption traps consist of a sealed body filled with adsorbent media which contains extremely porous surfaces adsorb water or hydrocarbon molecules contained in the pumped gases.

- Body material: Aluminum
- Cartridge material: Stainless steel
- Trap Weight: 1.15 kg
- Adsorbent Weight: 0.36 kg
- Inlet/Exhaust port: DN 25 ISO-KF
- Conductance at 10^{-1} hPa inlet pressure: 45 l/s
- Conductance at 10^{-2} hPa inlet pressure: 11 l/s
- Adsorbent charge: activated alumina: Order number 068779
- Adsorbent charge: zeolite: Order number 068182
- Supplied with: 1 centering ring and 1 clamp

Dimensions (in mm)



Order number	
Sorption trap ST 25 S	**104107**

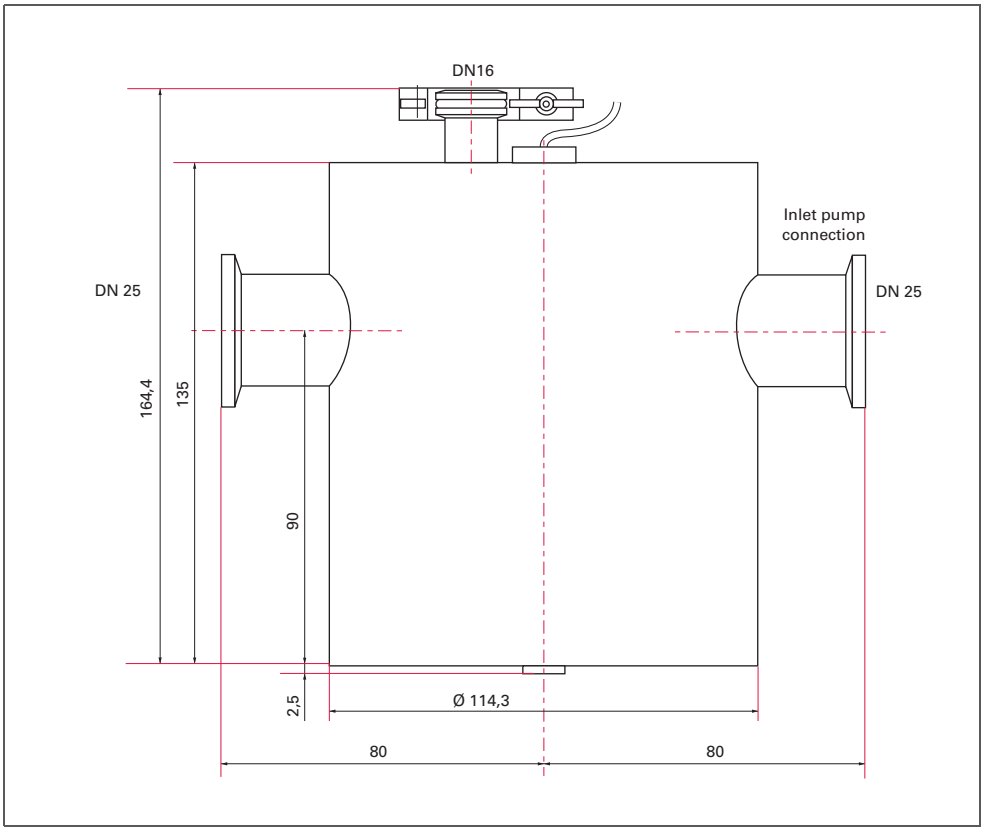
Sorption trap ST25C



Sorption traps consist of a sealed body filled with adsorbent media which contains extremely porous surfaces adsorb water or hydrocarbon molecules contained in the pumped gases.

- Body material: Stainless steel
- Cartridge material: Stainless steel
- Trap Weight: 1.4 kg
- Adsorbent Weight: 0.26 kg
- Inlet/Exhaust port: DN 25 ISO-KF
- Conductance at 10^{-1} hPa inlet pressure: 45 l/s
- Conductance at 10^{-2} hPa inlet pressure: 11 l/s
- Adsorbent charge: activated alumina: Order number 068779
- Adsorbent charge: zeolite: Order number 068182
- Heating element: 220 V Order number: 068319
- Supplied with: 1 centering ring and 1 clamp
- Further voltage ranges are available on request

Dimensions (in mm)



Order number	
Sorption trap ST 25 C, 220 V	**066841**

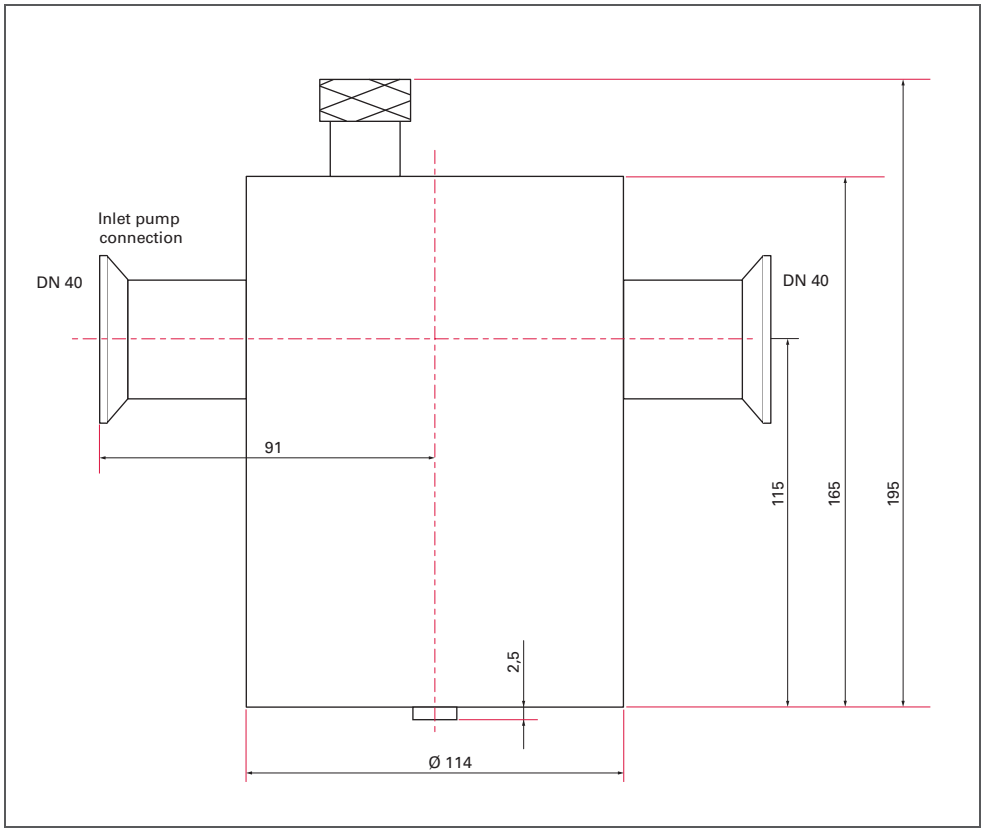
Sorption trap ST40



Sorption traps consist of a sealed body filled with adsorbent media which contains extremely porous surfaces adsorb water or hydrocarbon molecules contained in the pumped gases.

- Body material: Stainless steel
- Cartridge material: Stainless steel
- Trap Weight: 1.7 kg
- Adsorbent Weight: 0.36 kg
- Inlet/Exhaust port: DN 40 ISO-KF
- Conductance at 10^{-2} hPa inlet pressure: 25 l/s
- Adsorbent charge: activated alumina: Order number 068779
- Adsorbent charge: zeolite: Order number 068182
- Heating element: 220 V Order number: 068319
- Supplied with: 1 centering ring and 1 clamp
- Trap is supplied with zeolite charge
- Further voltage ranges are available on request

Dimensions (in mm)



Order number	
Sorption trap ST 40, 230 V (without adsorbend charge)	**053380**

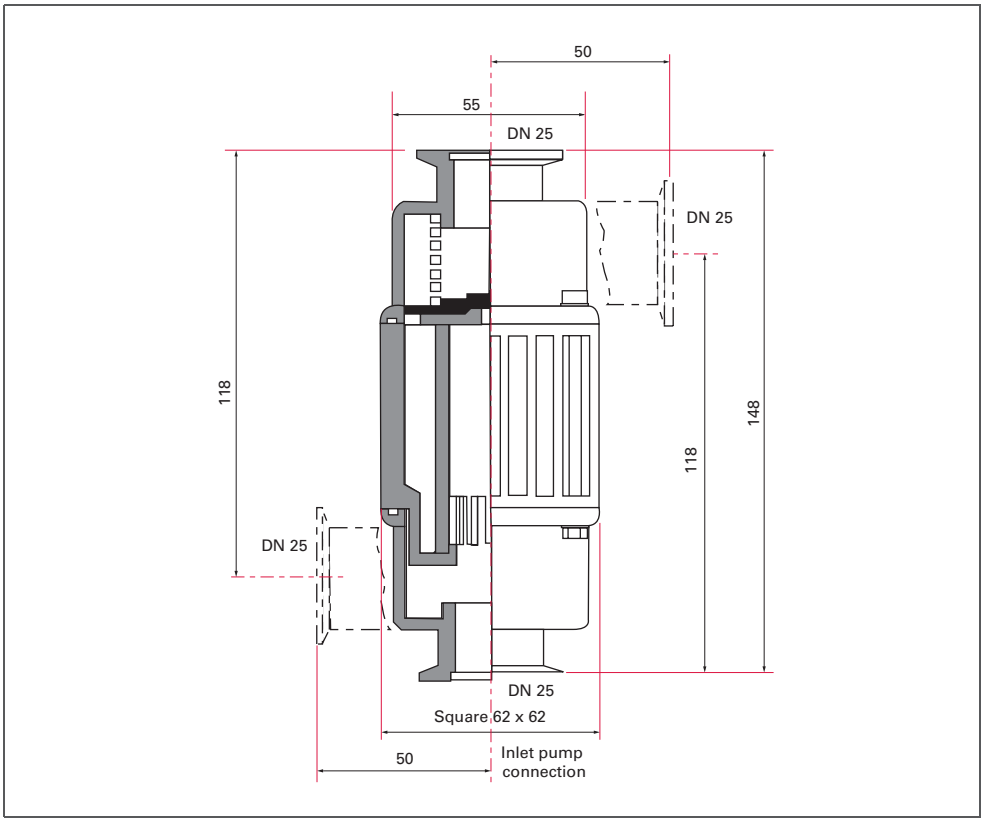
Inlet dust filter DFT 25



Using inlet dust filters will prevent solid particles from entering into the rotary vane pump and avoid concentration of solid media which can act as an abrasive and shorten the pump lifetime.

- Body material: Polyamide
- Cartridge material: Epoxy/glass microfiber
- Weight: 0.217 kg
- Filtration threshold: 6 µm
- Inlet/Exhaust port: DN 25 ISO-KF
- Conductance at 10^{-2} hPa inlet pressure: 2 l/s
- Conductance at 10^{-2} hPa inlet pressure: 0.6 l/s
- Replacement cartridge (set of 1) Order number 068445
- Supplied with: 1 centering ring, 1 clamp and additional angle port

Dimensions (in mm)



Order number	
Inlet dust filter DFT 25	**104202**

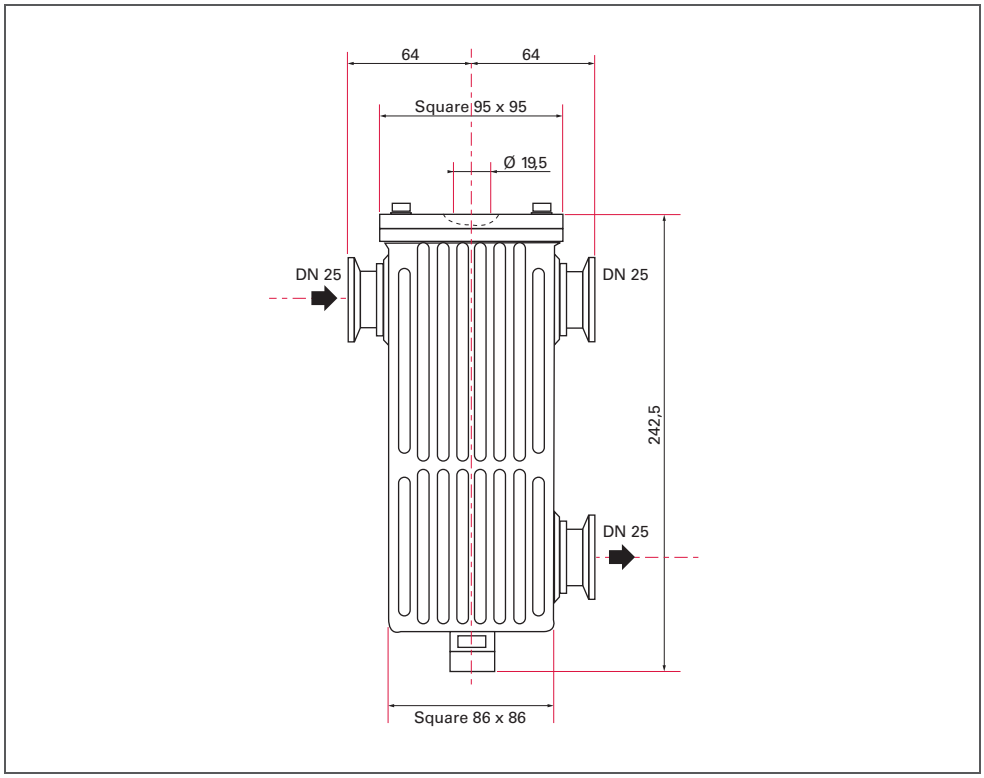
Liquid nitrogen trap LNT 25 S



Liquid nitrogen traps condense all gases at the pump inlet whose critical condensation temperature is above -196° C (77K).

- Body material: Aluminum
- Thimble material: Stainless steel
- Weight: 1.690 kg
- Liquid nitrogen capacity: 0.5 l
- Inlet/Exhaust port: DN 25 ISO-KF
- Conductance at 10^{-1} hPa inlet pressure: 44 l/s
- Conductance at 10^{-2} hPa inlet pressure: 10 l/s
- Fill interval at 10^{-2} hPa inlet pressure: 5 h
- Fill interval at ultimate inlet pressure: 11 h
- Supplied with: 1 centering ring, 1 clamp and additional angle port

Dimensions (in mm)



Order number	
Liquid nitrogen trap LNT 25 S	**104197**

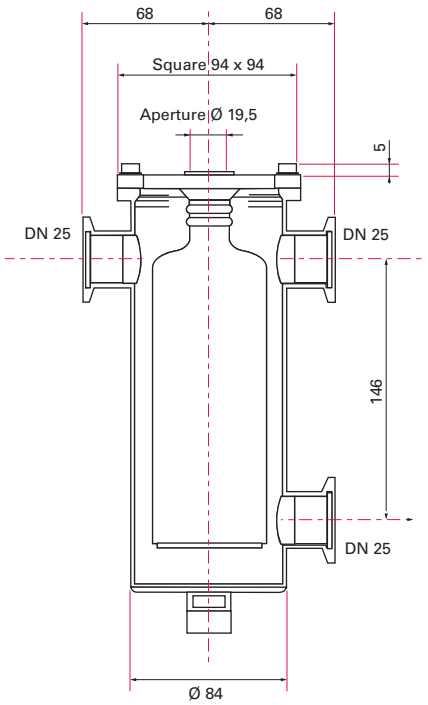
Liquid nitrogen trap LNT 25 C



Liquid nitrogen traps condense all gases at the pump inlet whose critical condensation temperature is above -196° C (77K).

- Body material: Stainless steel
- Thimble material: Stainless steel
- Weight: 1.885 kg
- Liquid nitrogen capacity: 0.5 l
- Inlet/Exhaust port: DN 25 ISO-KF
- Conductance at 10^{-1} hPa inlet pressure: 33 l/s
- Conductance at 10^{-2} hPa inlet pressure: 6 l/s
- Fill interval at 10^{-2} hPa inlet pressure: 5 h 30
- Fill interval at ultimate inlet pressure: 14 h
- Supplied with: 1 centering ring and 1 clamp

Dimensions (in mm)



Order number	
Liquid nitrogen trap LNT 25 C	**066889**

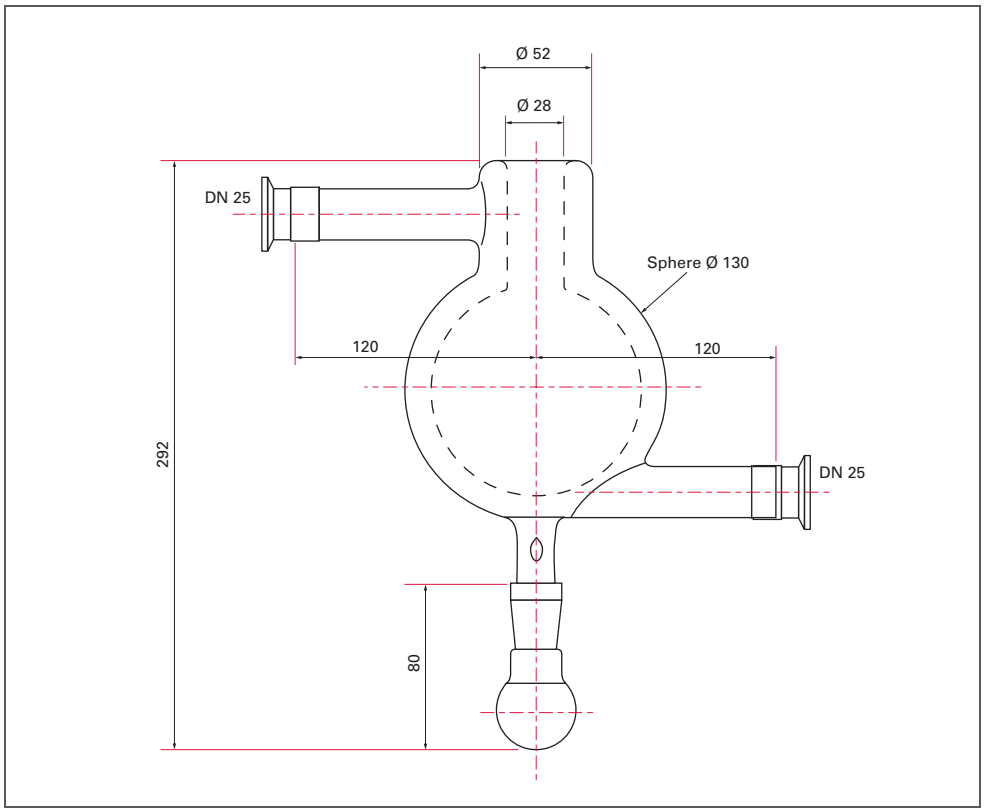
Liquid nitrogen trap LNT 25 P1



Liquid nitrogen traps condense all gases at the pump inlet whose critical condensation temperature is above -196° C (77K).

- Body material: Glass
- Flanges material: Aluminum
- Weight: 1 kg
- Liquid nitrogen capacity: 0.5 l
- Inlet/Exhaust port: DN 25 ISO-KF
- Conductance at 10^{-2} hPa inlet pressure: 6 l/s
- Fill interval at ultimate inlet pressure: 5 h

Dimensions (in mm)



Order number	
Liquid nitrogen trap LNT 25 P1	**786346**

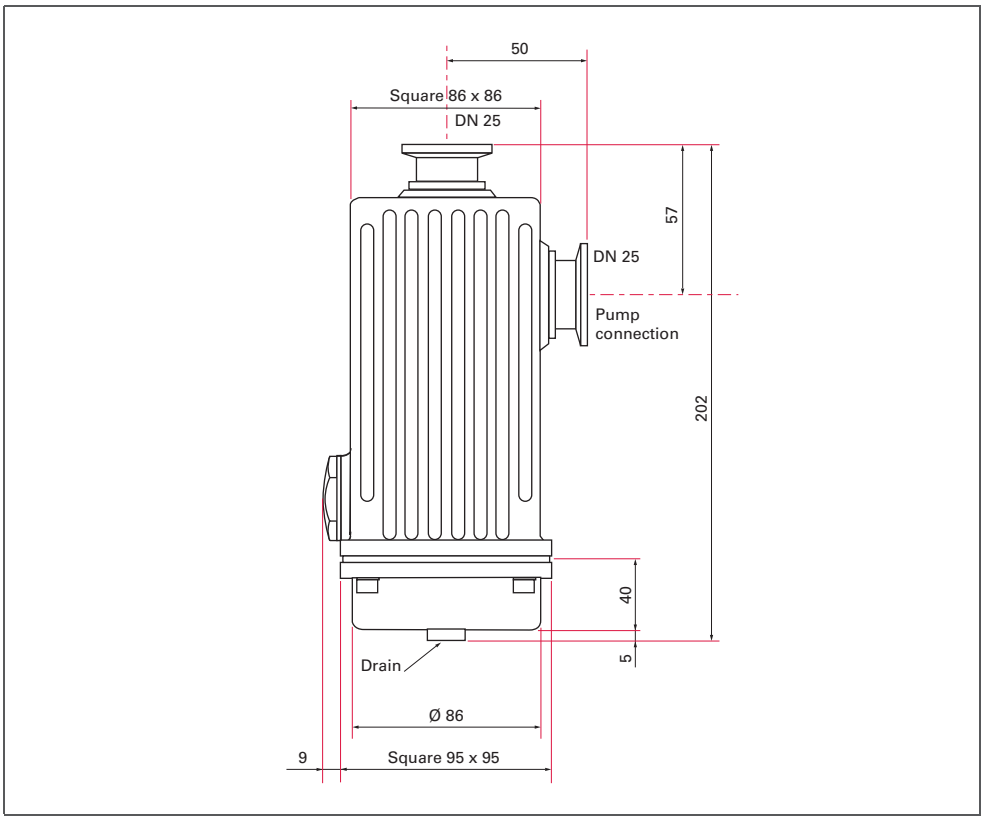
Condensate trap CT 25



Using condensate traps at the pump inlet will prevent introduction of some solid or liquid products (foam, deposits...) which could mix with the oil and reduce pump lifetime.

- Body material: Aluminum
- Filter material: Stainless steel
- Weight: 1.2 kg
- Trap capacity: 0.6 l
- Inlet/Exhaust port: DN 25 ISO-KF
- Conductance at 10^{-1} hPa inlet pressure: 15 l/s
- Conductance at 10^{-2} hPa inlet pressure: 6 l/s
- Replacement filter Order number: 066825
- Supplied with: 1 centering ring and 1 clamp

Dimensions (in mm)



Order number	
Condensate trap CT 25	**104201**

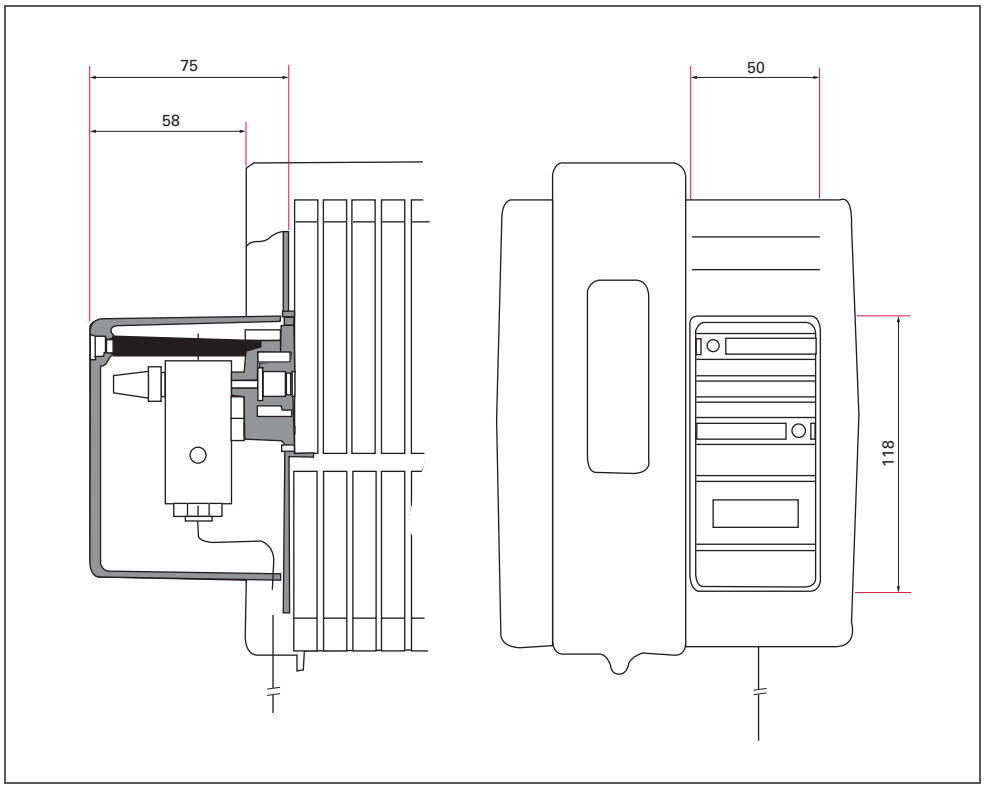
Automatic gas ballast AGB 4



Electrically operated gas ballast is the remote controlled version of the manual gas ballast of the rotary vane pump. It consists of a Normally Closed solenoid valve which enables air injection into the high pressure stage of the pump.

- Delivered with: 600 mm cable (without plug) all necessary connection parts
- Weight: 0.3 kg
- Spare coil 230 V 50/60 Hz: Order number 103552
- Further voltage ranges are available on request

Dimensions (in mm)



Order number	
Automatic gas ballast AGB 4, 230 V, 50/60 Hz	**104086**

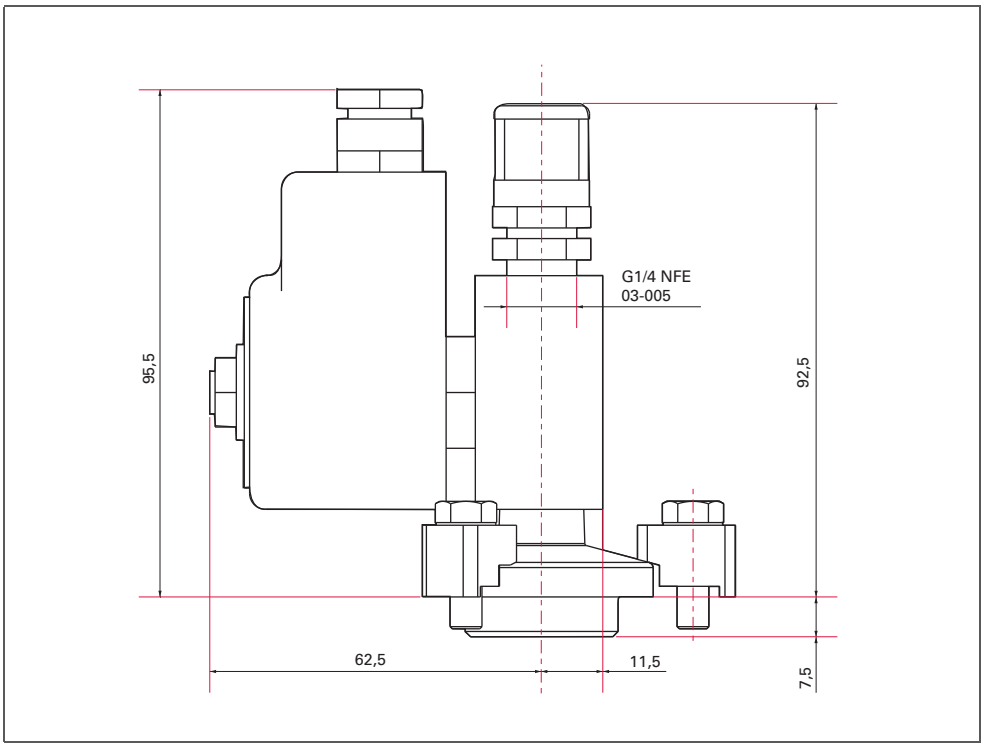
Automatic gas ballast AGB36



Electrically operated gas ballast is the remote controlled version of the manual gas ballast of the rotary vane pump. It consists of a Normally Closed solenoid valve which enables air injection into the high pressure stage of the pump.

- Delivered without cable and plug. All necessary connection parts
- Weight: 0.7 kg
- Spare coil 230 V 50/60 Hz: Order number 104866
- Further voltage ranges are available on request

Dimensions (in mm)



Order number	
Automatic gas ballast AGB 36, 230 V, 50/60 Hz	**068391**

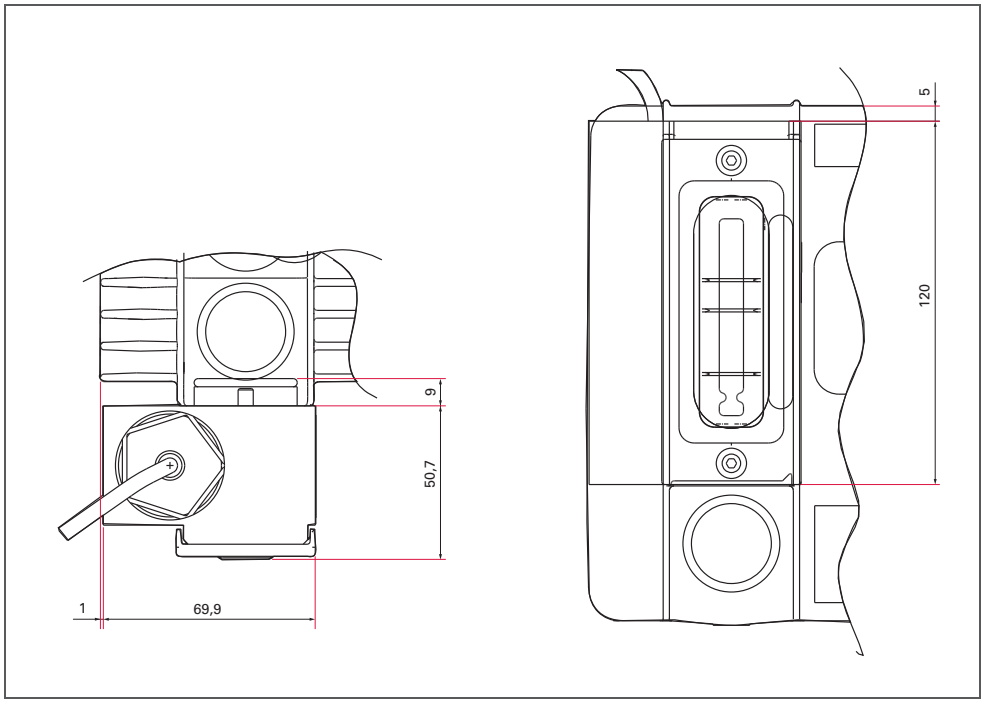
Oil level switch OLS 4

Oil Level Switch provide information about oil level inside the oil casing of the rotary vane pump.



- Material: Stainless steel/aluminum
- Number of contacts: 2
- Open status when below oil level
- Closed status when above oil level
- Switching capacity: 10 VA 250 V AC/DC 0.5 A
- Cable: 1 m, without plug
- Weight: 0.85 kg
- Supplied with all necessary components for installation on the oil casing.

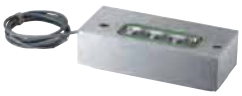
Dimensions (in mm)



Order number	
Oil level switch OLS 4	**104376**

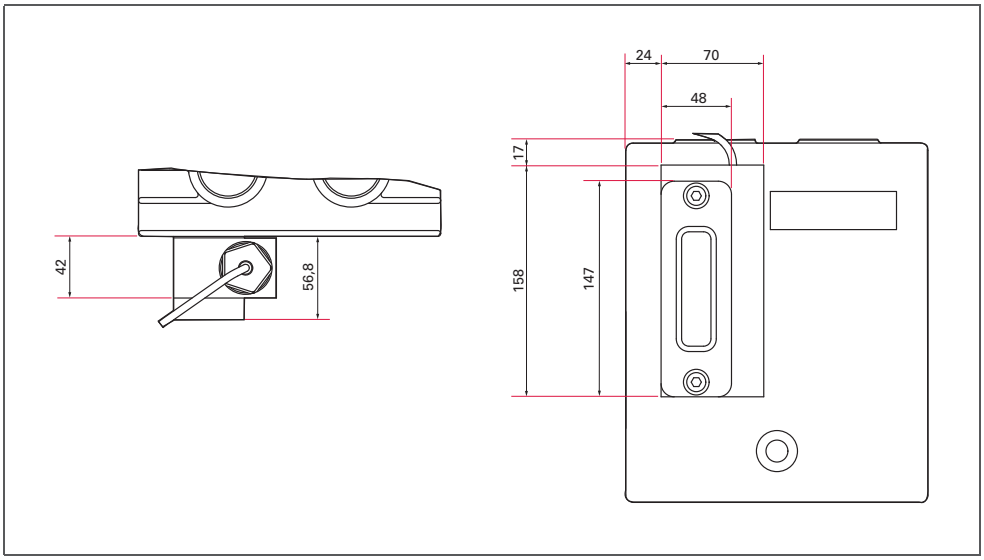
Oil level switch OLS 36

Oil Level Switch provide information about oil level inside the oil casing of the rotary vane pump.



- Material: Stainless steel/aluminum
- Number of contacts: 2
- Open status when below oil level
- Closed status when above oil level
- Switching capacity: 10 VA 250 V AC/DC 0.5 A
- Cable: 1 m, without plug
- Weight: 1.1 kg
- Supplied with all necessary components for installation on the oil casing.

Dimensions (in mm)



Order number	
Oil level switch OLS 36	**104377**

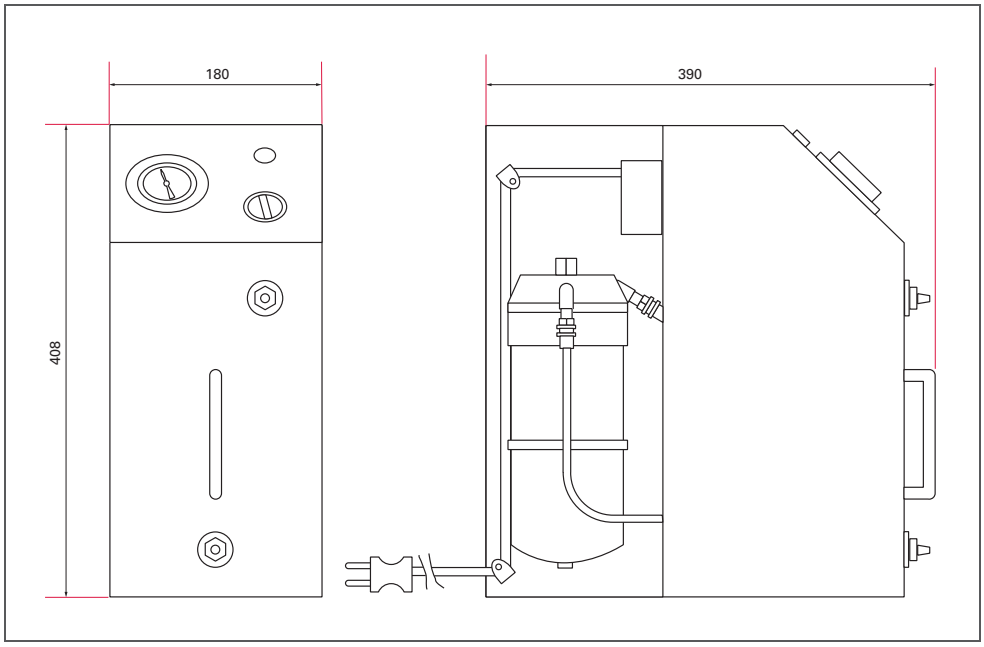
External oil filter DE 1



DE filtration system is a stand-alone unit consisting of a magnetically driven gear pump which circulates oil through 1 filtration cartridge.

- Weight: 12 kg
- Mains requirement voltage: 110/220 V, 50 Hz or 115/230 V, 60 Hz
- Hydrocarbon oil flow: 1000 - 1500 cm^3/min at 65 °C
- Synthetic oil flow: 1000 cm^3/min at 65 °C
- Replacement cartridge activated alumina: Order number: 068880
- Replacement cartridge activated charcoal: Order number: 112953
- Replacement cartridge cellulose: Order number: 078212
- Replacement cartridge cellulose (for USA): Order number: 12633
- Standard factory installed cartridges are activated alumina
- Oil volume: 1.2 l

Dimensions (in mm)



Order number	
External oil filter DE 1, 230 V, 50 Hz	**068990**

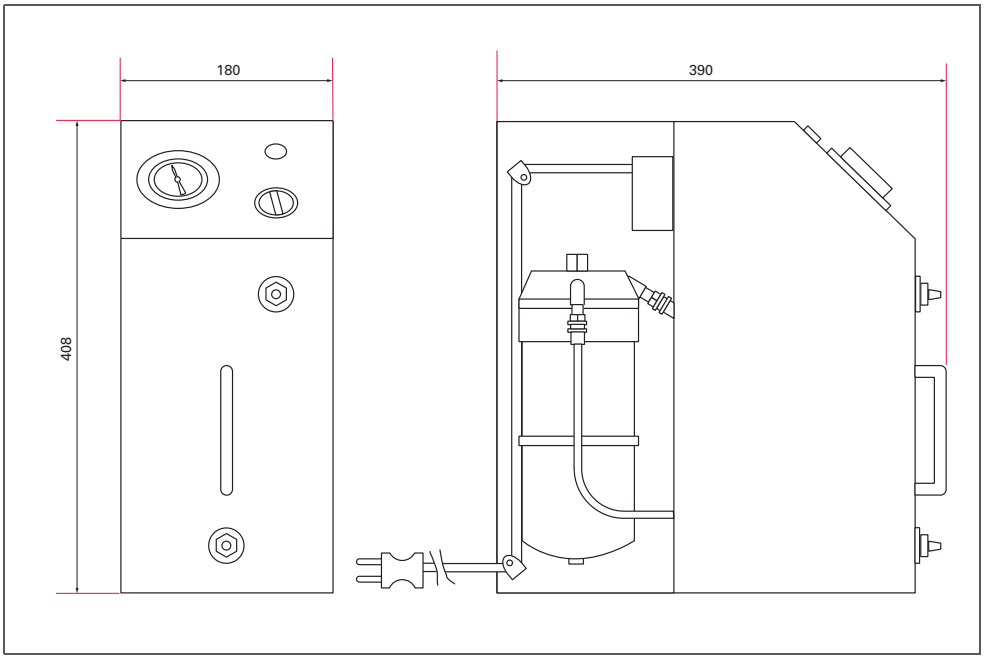
External oil filter DE 2



DE filtration system is a stand-alone unit consisting of a magnetically driven gear pump which circulates oil through 2 filtration cartridges.

- Weight: 17 kg
- Mains requirement voltage: 110/220 V, 50 Hz or 115/230 V, 60 Hz
- Hydrocarbon oil flow: 1000 - 1500 cm^3/min at 65 °C
- Synthetic oil flow: 1000 cm^3/min at 65 °C
- Replacement cartridge activated alumina: Order number: 068880
- Replacement cartridge activated charcoal: Order number: 112953
- Replacement cartridge cellulose: Order number: 078212
- Replacement cartridge cellulose (for USA): Order number: 12633
- Standard factory installed cartridges are activated alumina
- Oil volume: 1.8 l

Dimensions (in mm)



Order number	
External oil filter DE 2, 230 V, 50 Hz	**104374**

Diaphragm pumps

The ideal backing pump for Pfeiffer Vacuum turbopumps



Contents

Diaphragm pumps

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MVP 030-3 136
MVP 040-2 138
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Diaphragm pumps

The ideal backing pump for Pfeiffer Vacuum turbopumps

Thanks to their compact design, diaphragm pumps are excellently suited for integration in increasingly small analytical systems and turbopumping stations. They have pumping speeds ranging from 0.25 to 4.3 m^3/h.

Our diaphragm pumps work completely without oil, making them ideal for all processes where a clean, dry vacuum is needed. They are reliable pumps that operate with minimum of vibration and noise.



Overview of series and applications

■ = recommended	Analytics						Semiconductors									Coating										Industry									R & D										Page
	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	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Diaphragm pumps																																											
MVP 006-4		■	■																													■							■			130
MVP 015-2	■	■	■	■	■	■								■																		■			■			■	■			132
MVP 020-3	■	■	■	■	■	■								■												■						■			■			■	■			134
MVP 030-3	■	■	■	■	■	■								■												■						■			■			■	■			136
MVP 040-2	■	■	■	■	■	■								■												■			■			■						■	■			138
MVP 070-3	■	■	■	■	■	■																				■			■			■			■			■	■			140

Features at a glance

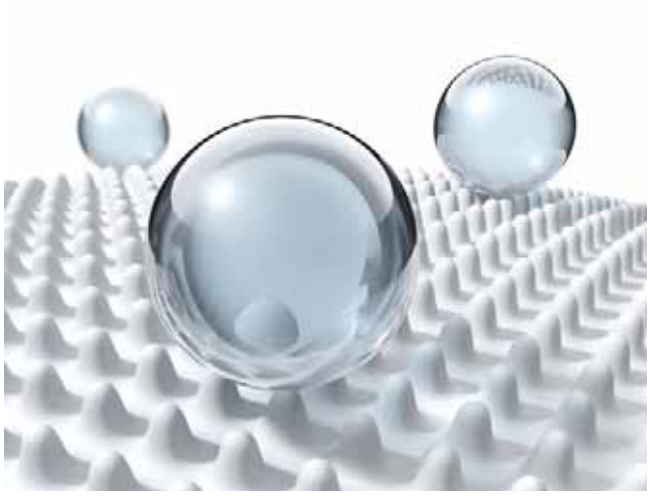
	Connection flange (inlet)				Pumping speed class						Final pressure without gas ballast						
	G 1/8"	G 1/4"	DN 16 ISO-KF / G 1/8"	DN 16 ISO-KF	0.3 m^3/h	1 m^3/h	1.2 m^3/h	1.8 m^3/h	2.3 m^3/h	3.8 m^3/h	< 5 · 10^{-1} hPa	< 1 hPa	< 1.5 hPa	< 2 hPa	< 3.5 hPa	< 4 hPa	Page
Diaphragm pumps																	
MVP 006-4	■				■									■			130
MVP 015-2 / MVP 015-4	■		■			■					■				■		132
MVP 020-3	■						■							■			134
MVP 030-3	■							■							■		136
MVP 040-2		■							■							■	138
MVP 070-3		■		■						■		■	■				140



Medical technology

Typical applications

- Mass spectrometry
- Leak detection
- Medical technology
- Nuclear research
- Nanotechnology



Nanotechnology



Customer benefits

- High process safety
- Low operating costs
- Long maintenance intervals
- Extremely maintenance friendly

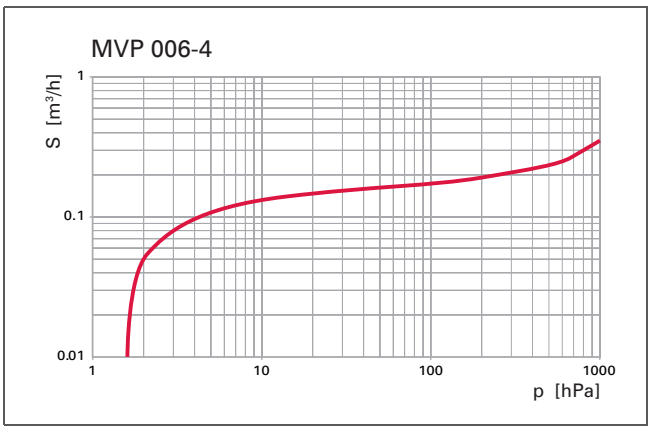
MVP 006

Dry and oil-free diaphragm pumps with a pumping speed of up to 0.25 m^3/h:

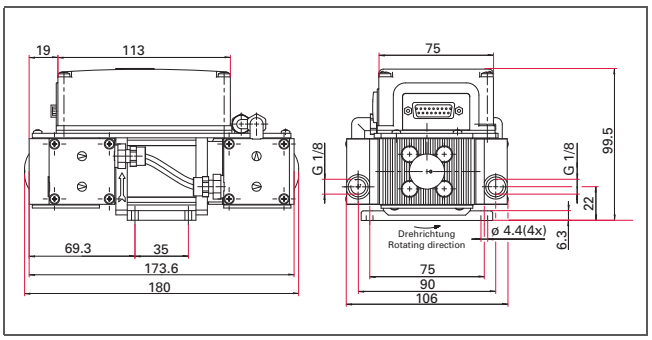


- Extremely small but high-performance diaphragm pump with a pumping speed up to 0.25 m^3/h
- Due to compact measures and little weight it is ideally suited for integration in analysis systems and turbo pumping stations
- Lower costs due to long service life of diaphragms and valves
- Suitable for worldwide and flexible applications thanks to direct voltage
- Substantial accessories expand the field of applications
- For all applications where a dry and oil-free vacuum is required

Pumping speed



Dimensions (in mm)



Technical data	MVP 006-4, Diaphragm pump, 24 V DC
Flange (out)	G 1/8" + Silencer
Flange (in)	G 1/8"
Intake pressure max.	1050 hPa
Exhaust pressure, max.	1300 hPa
Rotation speed at stand-by	1000 min^{-1}
Rotation speed max.	3000 min^{-1}
Rotation speed min.	1000 min^{-1}
Emission sound pressure level without gas ballast	≤ 50 dB (A)
Ultimate pressure without gas ballast	≤ 2 hPa
Exhaust pressure max.	1300 hPa
Weight	1.8 kg
Cooling method, standard	Air
Leak rate	$6 \cdot 10^{-3}$ Pa m^3/s
Pumping speed, max.	0.25 m^3/h
Protection category	IP 20
Current consumption	0.9 A
Ambient temperature	5-40 °C
Supply: Voltage	24 (± 10 %) V DC

Order number	
MVP 006	**PK T05 070**

Accessories	
TPS 110, mains pack for wall/ standard rail fitting	**PM 061 340 -T**
TPS 180, mains pack for wall/ standard rail fitting	**PM 061 341 -T**
Connection cable TPS - MVP 006, 3 m	**PM 061 892 -T**
Connection cable TPS 180 - MVP 006-4 with HiPace 80/HiPace 10, 2 x 0.5 m	**PM 061 399 -T**
Mains cable 230 V AC with safety plug, Euro socket C13 (straight), 3 m	**P 4564 309 ZA**
Mains cable 115 V AC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZE**
Mains cable 115 / 230 V without plug, IEC 320/C13 socket, 3 m	**P4 564 309 ZH**
Screw-in flange DN 16 ISO-KF / G 1/8" incl. seal	**PK 050 108 -T**
Hose connection DN 6x400 mm with straight fitting G 1/8" and G 1/4" including sealing rings	**P 0920 739 E**
Screw-in-flange, DN 16 KF/ G 1/4"	**PM 006 994**
Angled screw coupling, G 1/8" for hose of MVP 015	**P 0920 773 E**

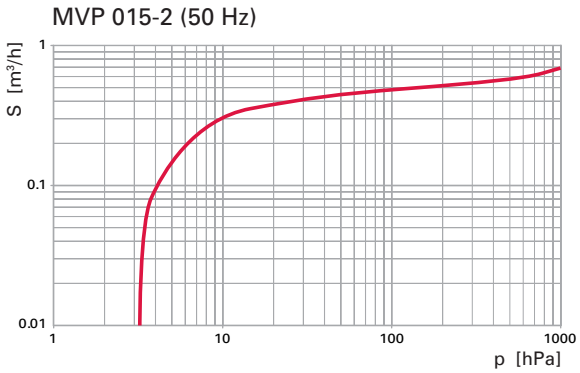
MVP 015



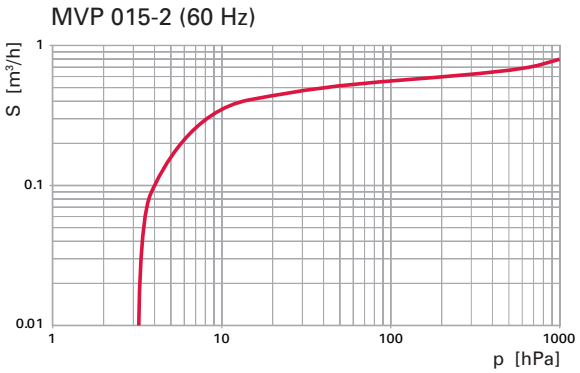
Dry and oil-free diaphragm pumps with a pumping speed of up to 0.7 m^3/h:

- Compact diaphragm pump with a pumping speed of up to 0.7 m^3/h
- For mains voltage: 90-127 V, 50 Hz, respectively 187-265 V, 60 Hz
- Ideal for applications where a dry and oil-free vacuum is required

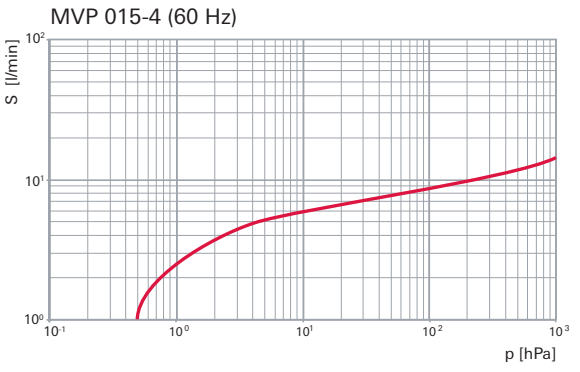
Pumping speed



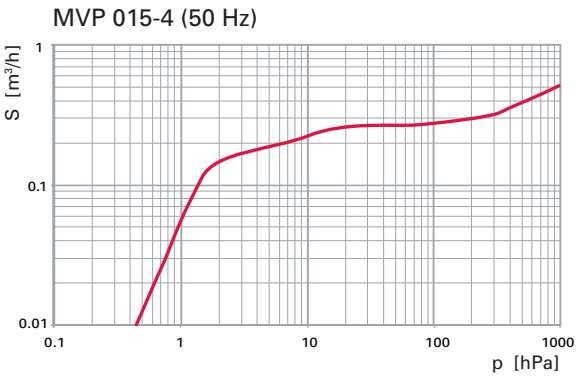
MVP 015-2, Diaphragm pump



MVP 015-2, Diaphragm pump

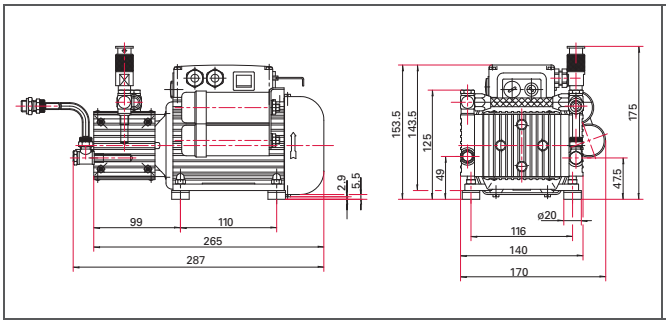


MVP 015-4, Diaphragm pump

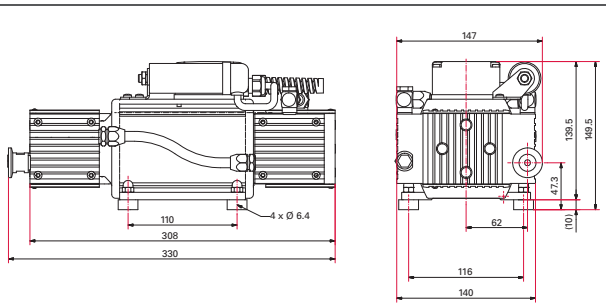


MVP 015-4, Diaphragm pump

Dimensions (in mm)



MVP 015-2, Diaphragm pump



MVP 015-4, Diaphragm pump

Technical data	MVP 015-2, Diaphragm pump, 100-115/208-236 V, 50/60 Hz	MVP 015-4, Diaphragm pump, 120 V, 60 Hz	MVP 015-4, Diaphragm pump, 230 V, 50 Hz
Flange (out)	G 1/8" + silencer	G 1/8" + silencer	G 1/8" + silencer
Flange (in)	G 1/8" elbow union + enclosed hose DN 6 x 1000 mm with a straight union in G 1/4" at the end	DN 16 ISO-KF / G 1/8"	DN 16 ISO-KF / G 1/8"
Intake pressure max.		1100 hPa	1100 hPa
Exhaust pressure, max.	1100 hPa	1100 hPa	1100 hPa
Rotation speed at 50 Hz	1500 min^{-1}		1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}	1800 min^{-1}	
Emission sound pressure level without gas ballast	≤ 52 dB (A)	≤ 52 dB (A)	≤ 52 dB (A)
Ultimate pressure with gas ballast	≤ 4.5 hPa		
Ultimate pressure without gas ballast	≤ 3.5 hPa	≤ 0.50 hPa	≤ 0,50 hPa
Weight	6.5 kg	7.5 kg	7.5 kg
Cooling method, standard	Air	Air	Air
Leak rate	$5 \cdot 10^{-4}$ Pa m^3/s	$< 5 \cdot 10^{-4}$ Pa m^3/s	$< 5 \cdot 10^{-4}$ Pa m^3/s
Mains requirement: voltage 50 Hz	100-115; 208-236 V		230 V
Mains requirement: voltage 60 Hz	100-115; 208-236 V	120 V	
Pumping speed at 50 Hz	0.50 m^3/h		0.50 m^3/h
Pumping speed at 60 Hz	0.70 m^3/h	0.60 m^3/h	
Switch	Yes	No	No
Protection category	IP 20	IP 54	IP 54
Current consumption	1.1 A	0.8 A	0.3 A
Ambient temperature	12-40 °C	12-40 °C	12-40 °C

Order number			
MVP 015	**PK T05 100**	**PK T05 064**	**PK T05 065**

Accessories			
Backing pump relay box, shielded, 1-phase 7A for TC 110 and TCP 350, M8 plug	**PM 071 282 -X**	**PM 071 282 -X**	**PM 071 282 -X**
Backing pump relay box, shielded, 1-phase 7 A for TC 400/1200, TM 700 and TCP 350, M12 plug	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**
Mains cable 230 V AC with safety plug, Euro socket C13 (straight), 3 m	**P 4564 309 ZA**		
Mains cable 115 V AC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZE**		
Mains cable 115 / 230 V without plug, IEC 320/C13 socket, 3 m	**P4 564 309 ZH**		
Screw-in flange DN 16 ISO-KF / G 1/8" incl. seal	**PK 050 108 -T**		
Screw-in-flange, DN 16 KF/ G 1/4"	**PM 006 994**	**PM 006 994**	**PM 006 994**
Hose connection DN 6x400 mm with straight fitting G 1/8" and G 1/4" including sealing rings		**P 0920 739 E**	**P 0920 739 E**

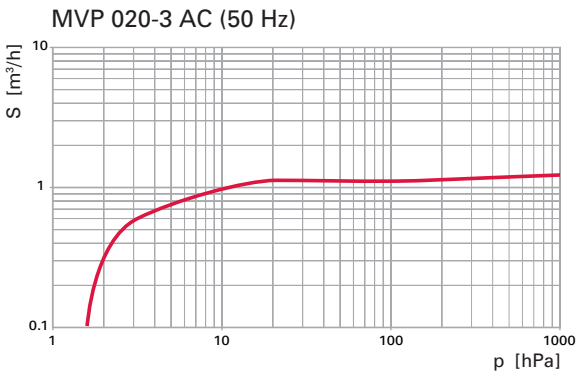
MVP 020



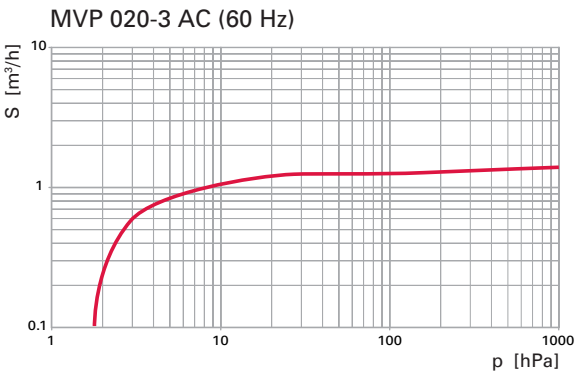
Dry and oil-free diaphragm pumps with a pumping speed of up to 1.4 m^3/h:

- High-performance diaphragm pump with a pumping speed of up to 1.4 m^3/h
- For mains voltage: 100-120 V, 50 Hz respectively 200-230 V, 60 Hz
- Ideal for applications where a dry and oil-free vacuum is required

Pumping speed

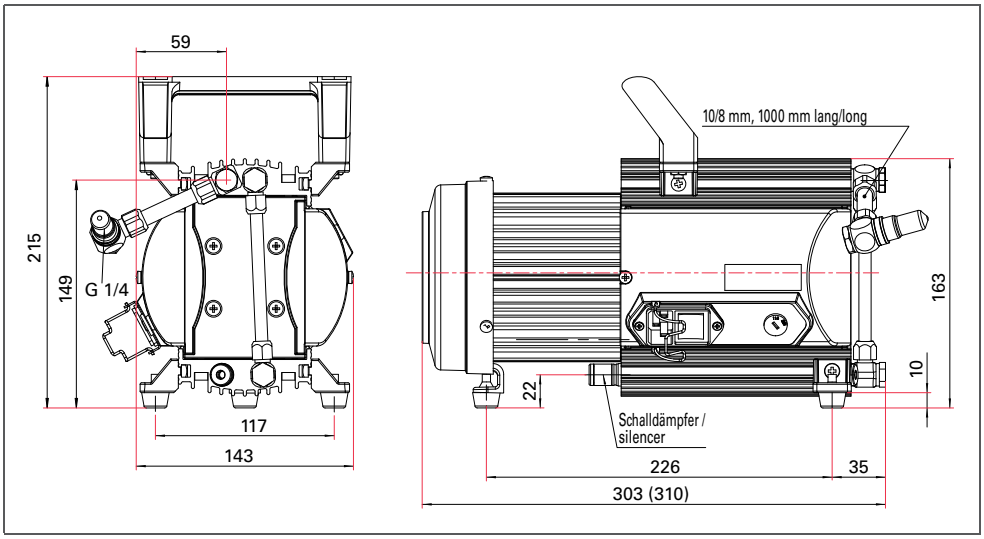


MVP 020-3 AC, Diaphragm pump



MVP 020-3 AC, Diaphragm pump

Dimensions (in mm)



Technical data	MVP 020-3 AC, Diaphragm pump, 100-120/200-230 V, 50/60 Hz
Flange (out)	G 1/8" + silencer
Flange (in)	G 1/8" elbow union + enclosed hose DN 6 x 1000 mm with a elbow union in G 1/4" at the end
Intake pressure max.	1100 hPa
Exhaust pressure, max.	1100 hPa
Rotation speed at 50 Hz	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}
Emission sound pressure level without gas ballast	≤ 48 dB (A)
Ultimate pressure without gas ballast	≤ 2 hPa
Weight	6.5 kg
Cooling method, standard	Air
Leak rate	$1 \cdot 10^{-2}$ Pa m^3/s
Mains requirement: voltage 50 Hz	100-115; 200-230 V
Mains requirement: voltage 60 Hz	100-115; 120 ; 200-230 V
Pumping speed at 50 Hz	1.2 m^3/h
Pumping speed at 60 Hz	1.4 m^3/h
Switch	Yes
Protection category	IP 40
Current consumption	1.7 A
Ambient temperature	12-40 °C

Order number	
MVP 020	**PK T01 100**

Accessories	
Backing pump relay box, shielded, 1-phase 7A for TC 110 and TCP 350, M8 plug	**PM 071 282 -X**
Backing pump relay box, shielded, 1-phase 7 A for TC 400/1200, TM 700 and TCP 350, M12 plug	**PM 071 284 -X**
Mains cable 115 / 230 V without plug, right angle IEC 320/C13 socket, 3 m	**PK 050 111**
Mains cable 230 V with safety plug CEE 7, right angle IEC 320/C13 socket, 2 m	**PK 050 109**
Mains cable 115 V with NEMA-plug, right angle IEC 320/C13 socket, 2 m	**PK 050 110**
Screw-in flange DN 16 ISO-KF / G 1/8" incl. seal	**PK 050 108 -T**
Flushing gas nozzle for MVP 020-3 / MVP 030-3	**PK 050 122**

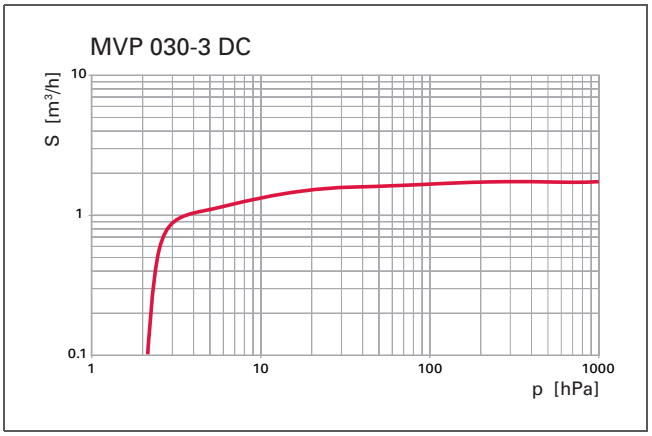
MVP 030



Dry and oil-free diaphragm pumps with a pumping speed of up to 1.8 m^3/h:

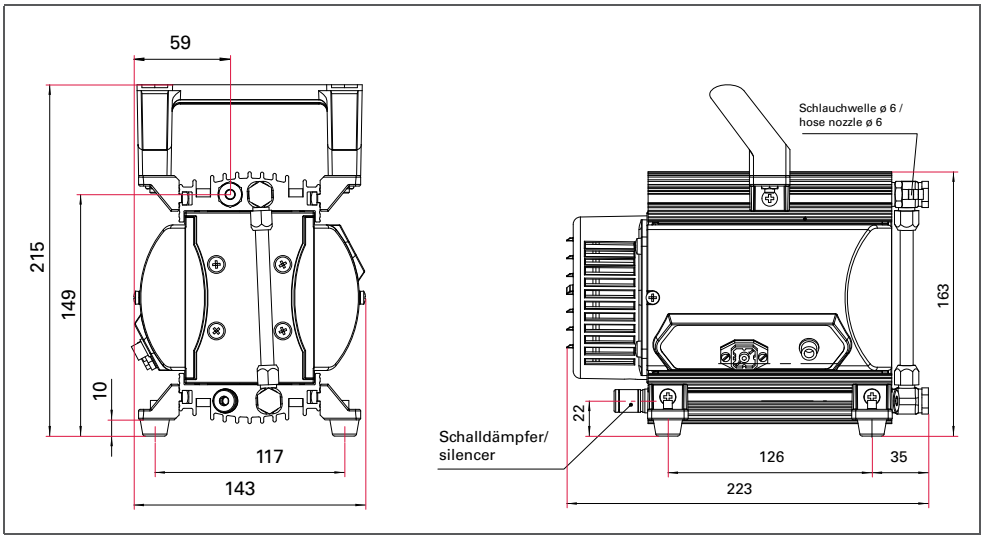
- High-performance diaphragm pump with a pumping speed of up to 1.8 m^3/h
- For 24 V DC direct voltage supply
- Interval operation and rotation speed control
- Optimal process adaptation
- Ideal for applications where a dry and oil-free vacuum is required

Pumping speed



MVP 030-3 DC, Diaphragm pump

Dimensions (in mm)



Technical data	MVP 030-3 DC, Diaphragm pump, 24 V
Flange (out)	G 1/8" + silencer
Flange (in)	G 1/8" + hose wave DN 6
Intake pressure max.	1100 hPa
Exhaust pressure, max.	1100 hPa
Rotation speed at 50 Hz	2400 min^{-1}
Emission sound pressure level without gas ballast	≤ 48 dB (A)
Ultimate pressure with gas ballast	3.0 hPa
Ultimate pressure without gas ballast	2.5 hPa
Weight	4.3 kg
Cooling method, standard	Air
Leak rate	$1 \cdot 10^{-2}$ Pa m^3/s
Pumping speed	1.8 m^3/h
Switch	No
Protection category	IP 40
Current consumption	4.5 A
Ambient temperature	12-40 °C
Supply: Voltage	24 V DC

Order number	
MVP 030	**PK T01 190**

Accessories	
Flushing gas nozzle for MVP 020-3 / MVP 030-3	**PK 050 122**
TPS 110, mains pack for wall/ standard rail fitting	**PM 061 340 -T**
TPS 180, mains pack for wall/ standard rail fitting	**PM 061 341 -T**
Mains cable 115 V AC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZE**
Mains cable 230 V AC with safety plug, Euro socket C13 (straight), 3 m	**P 4564 309 ZA**
Mains cable 115 / 230 V without plug, IEC 320/C13 socket, 3 m	**P4 564 309 ZH**
Connection cable TPS - MVP	**PM 061 441- T**
Screw-in flange DN 16 ISO-KF / G 1/8" incl. seal	**PK 050 108 -T**

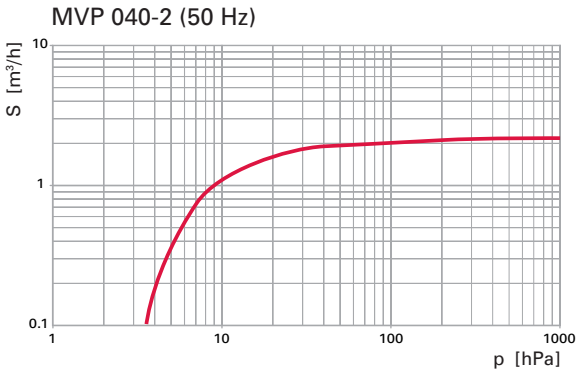
MVP 040



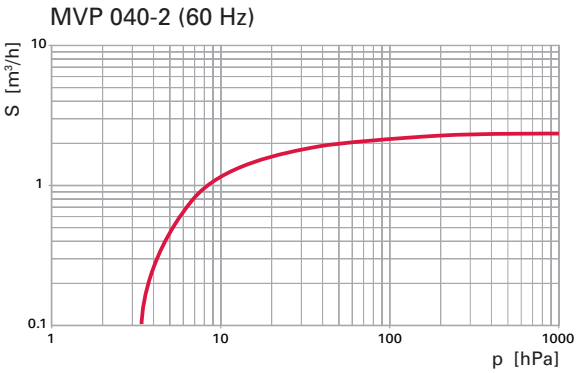
Dry and oil-free diaphragm pumps with a pumping speed up to 2.5 m^3/h:

- Robust and high-performance diaphragm pump with a pumping speed of up to 2.5 m^3/h
- For mains voltage: 90-126/180-254 V, 50/60 Hz
- Integrated gas ballast valve allows few amounts of humidity
- Ideal for applications where a dry and oil-free vacuum is required

Pumping speed

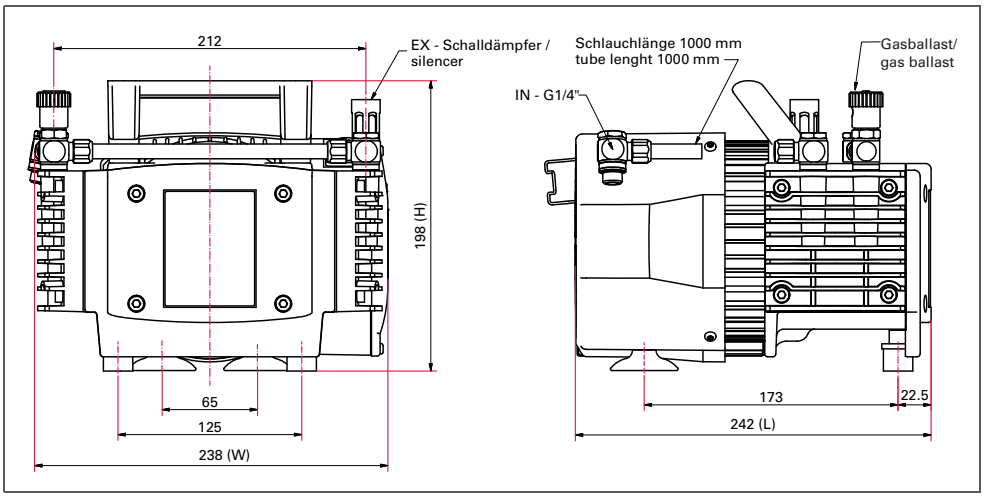


MVP 040-2, Diaphragm pump



MVP 040-2, Diaphragm pump

Dimensions (in mm)



Technical data	MVP 040-2, Diaphragm pump, 100-115 V, 50/60 Hz; 120 V, 60 Hz; 200-230 V, 50/60 Hz
Flange (out)	G 1/4" + silencer
Flange (in)	G 1/4" elbow union with enclosed hose 10/8, 1000 mm with an elbow union in G 1/4" at the end
Intake pressure max.	1100 hPa
Exhaust pressure, max.	1100 hPa
Rotation speed at 50 Hz	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}
Emission sound pressure level without gas ballast	≤ 53 dB (A)
Ultimate pressure with gas ballast	5 hPa
Ultimate pressure without gas ballast	4 hPa
Weight	11.4 kg
Cooling method, standard	Air
Leak rate	$2 \cdot 10^{-3}$ Pa m^3/s
Mains requirement: voltage 50 Hz	100-115; 00-230 V
Mains requirement: voltage 60 Hz	100-115; 120; 200-230 V
Pumping speed at 50 Hz	2.3 m^3/h
Pumping speed at 60 Hz	2.5 m^3/h
Switch	Yes
Protection category	IP 40
Current consumption	3.4 A
Ambient temperature	12-40 °C

Order number	
MVP 040	**PK T01 210**

Accessories	
Backing pump relay box, shielded, 1-phase 7A for TC 110 and TCP 350, M8 plug	**PM 071 282 -X**
Backing pump relay box, shielded, 1-phase 7 A for TC 400/1200, TM 700 and TCP 350, M12 plug	**PM 071 284 -X**
Mains cable 115 / 230 V without plug, right angle IEC 320/C13 socket, 3 m	**PK 050 111**
Mains cable 230 V with safety plug CEE 7, right angle IEC 320/C13 socket, 2 m	**PK 050 109**
Mains cable 115 V with NEMA-plug, right angle IEC 320/C13 socket, 2 m	**PK 050 110**
Screw-in flange DN 16 ISO-KF / G1/4" incl. seal (for MVP 040-2, MVP 070-3 inlet/outlet)	**PK 050 114 -T**

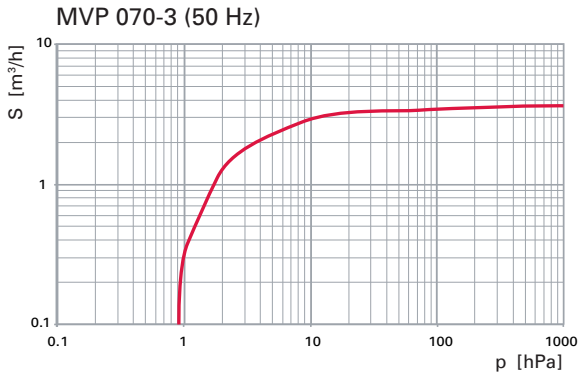
MVP 070



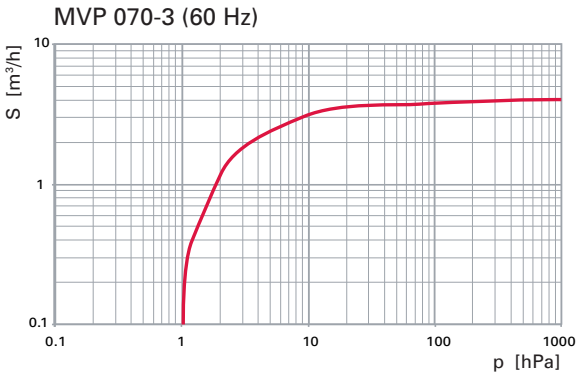
Dry and oil-free diaphragm pumps with a pumping speed of up to 4.3 m^3/h:

- Diaphragm pump with a pumping speed of up to 4.3 m^3/h
- For mains voltage: 90-126/180-254 V, 50/60 Hz
- Ideal for applications, where a dry and oil-free vacuum is required

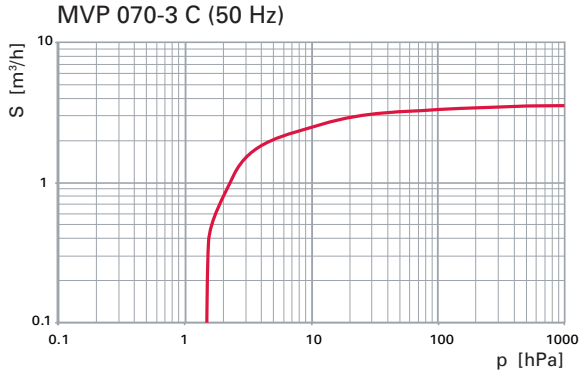
Pumping speed



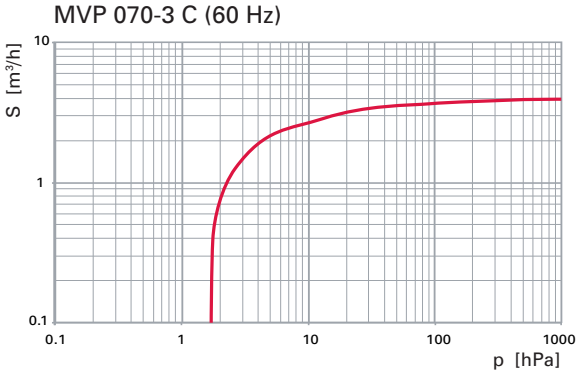
MVP 070-3, Diaphragm pump



MVP 070-3, Diaphragm pump

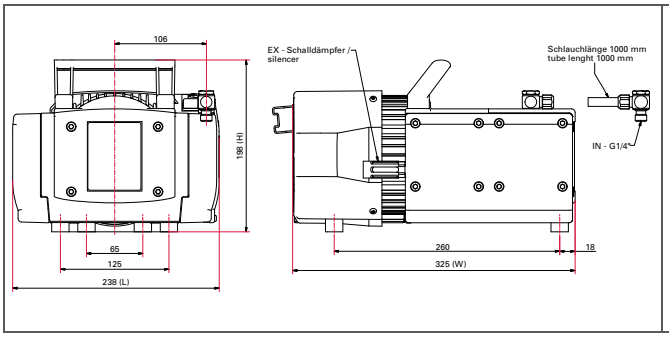


MVP 070-3 C, Diaphragm pump

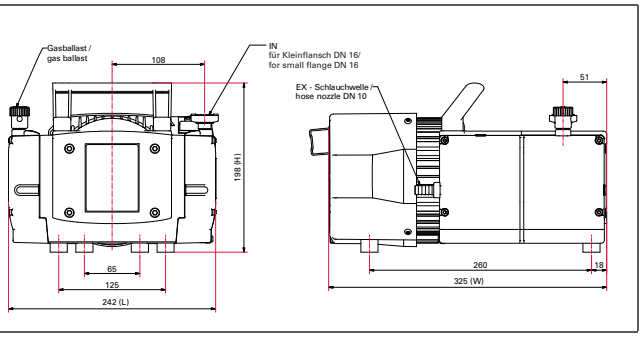


MVP 070-3 C, Diaphragm pump

Dimensions (in mm)



MVP 070-3, Diaphragm pump



MVP 070-3 C, Diaphragm pump

Technical data	MVP 070-3, Diaphragm pump, 100-115 V, 50/60 Hz; 120 V, 60 Hz; 200-230 V, 50/60 Hz	MVP 070-3 C, Diaphragm pump, 100-115 V, 50/60 Hz; 120 V, 60 Hz; 200-230 V, 50/60 Hz
Flange (out)	G 1/4" + silencer	Hose nipple 10 mm
Flange (in)	G 1/4" elbow union + enclosed hose 10/8, 1000 mm with a elbow union in G 1/4" at the end	DN 16 ISO-KF
Intake pressure max.	1100 hPa	1100 hPa
Exhaust pressure, max.	1100 hPa	1100 hPa
Rotation speed at 50 Hz	1500 min^{-1}	1500 min^{-1}
Rotation speed at 60 Hz	1800 min^{-1}	1800 min^{-1}
Emission sound pressure level without gas ballast	≤ 55 dB (A)	≤ 50 dB (A)
Ultimate pressure with gas ballast		3.0 hPa
Ultimate pressure without gas ballast	1.0 hPa	1.5 hPa
Weight	16.4 kg	14.3 kg
Cooling method, standard	Air	Air
Leak rate	$2 \cdot 10^{-3}$ Pa m^3/s	$2 \cdot 10^{-3}$ Pa m^3/s
Mains requirement: voltage 50 Hz	100-115 ; 200-230 V	100-115 ; 200-230 V
Mains requirement: voltage 60 Hz	100-115 ; 120 ; 200-230 V	100-115 ; 120 ; 200-230 V
Pumping speed at 50 Hz	3.8 m^3/h	3.4 m^3/h
Pumping speed at 60 Hz	4.3 m^3/h	3.8 m^3/h
Switch	Yes	Yes
Protection category	IP 40	IP 40
Current consumption	5.7 A	5.7 A
Ambient temperature	12-40 °C	12-40 °C

Order number		
MVP 070	**PK T01 310**	**PK T01 360**

Accessories		
Backing pump relay box, shielded, 1-phase 7A for TC 110 and TCP 350, M8 plug	**PM 071 282 -X**	**PM 071 282 -X**
Backing pump relay box, shielded, 1-phase 7 A for TC 400/1200, TM 700 and TCP 350, M12 plug	**PM 071 284 -X**	**PM 071 284 -X**
Mains cable 115 / 230 V without plug, right angle IEC 320/C13 socket, 3 m	**PK 050 111**	**PK 050 111**
Mains cable 230 V with safety plug CEE 7, right angle IEC 320/C13 socket, 2 m	**PK 050 109**	**PK 050 109**
Mains cable 115 V with NEMA-plug, right angle IEC 320/C13 socket, 2 m	**PK 050 110**	**PK 050 110**
Screw-in flange DN 16 ISO-KF / G1/4" incl. seal (for MVP 040-2, MVP 070-3 inlet/outlet)	**PK 050 114 -T**	

Screw pumps

Optimum ultimate pressure. Absolutely oil-free. Cool running.



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Screw pumps

Optimum ultimate pressure. Absolutely oil-free. Cool running.

HeptaDry is a full series of dry compressing screw pumps with pumping speeds from 100 to 600 m^3/h. They can be used for both industrial applications and coating.

One special advantage consists of their single-piece, variable-pitch rotors. They assure the efficient internal compression to reduce energy cost requirements in the HeptaDry pumps.

In addition, thermally sensitive gases can also be pumped. High quality seals between the bearing and suction chamber increase operating safety.

The innovative design and low speed of the pumps result in low stressing of the bearings and seals, which are easy and straightforward to clean.

Ideal for use as stand-alone pumps or in combination with OktaLine Roots pumps.



Overview of series and applications

■ = recommended	Analytics						Semiconductors									Coating										Industry									R & D										Page
	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	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
HeptaDry																																											
Hepta 100							■	■								■			■	■	■	■	■	■	■		■	■	■			■					■	■			■	148
Hepta 200																			■	■	■	■	■	■	■			■			■	■	■					■	■			■	150
Hepta 300																			■	■	■	■	■	■	■			■			■	■	■					■	■			■	152
Hepta 400																			■	■	■	■	■	■	■			■			■	■	■					■	■			■	154
Hepta 600																				■	■	■			■						■	■	■					■	■			■	156

Features at a glance

	Connection flange (inlet)		Pumping speed class					Ultimate pressure		Page
	DN 63 ISO-K	DN 100 ISO-K	100 m^3/h	200 m^3/h	300 m^3/h	400 m^3/h	600 m^3/h	< 0.01 hPa (at 60 Hz)	< 0.05 hPa (at 60 Hz)	
HeptaDry										
Hepta 100	■		■					■	■	148
Hepta 200	■			■				■	■	150
Hepta 300	■				■			■	■	152
Hepta 400	■					■		■	■	154
Hepta 600		■					■	■	■	156



Glass coating

Typical applications

- Solar cell production
- Glass coating
- CD, DVD, Blu-ray production
- Electron beam welding
- Vacuum furnaces
- Space simulation
- Biotechnology



Space simulation



Customer benefits

- Absolutely dry and oil-free
- Low cost of ownership
- Complete series with pumping capacity of 100 to 600 m^3/h
- Low energy consumption, low noise level
- Cost saving through long maintenance intervals
- Highest process safety

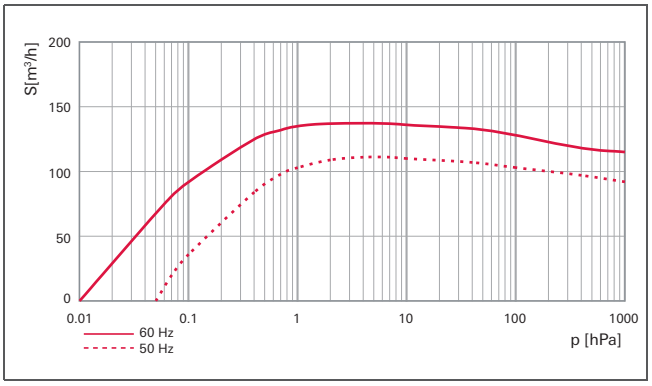
Hepta 100



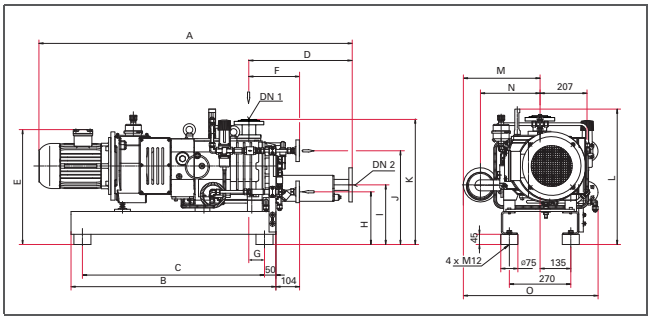
Dry screw pumps with a pumping speed of 110 m³/h at 50 Hz and 130 m³/h at 60 Hz:

- For mains voltage: 190-208/380-415, 50 Hz, 3 ph
- Ideal solution for all areas in which oil-free vacuum is required
- Lower energy costs thanks to internal compression
- For applications in the low and medium vacuum

Pumping speed



Dimensions (in mm)



	Hepta 100 P, 190-208/380-415 V, 50 Hz	Hepta 100 P, 3TF, 220-230/440-460 V, 60 Hz	Hepta 100 P, 3TF, 220/380 V, 60 Hz
A	1395 mm	1395 mm	1395 mm
B	900 mm	900 mm	900 mm
C	800 mm	800 mm	800 mm
D	454 mm	454 mm	454 mm
E	505 mm	505 mm	505 mm
F	222 mm	222 mm	222 mm
G	68 mm	68 mm	68 mm
H	232 mm	232 mm	232 mm
I	262 mm	262 mm	262 mm
J	412 mm	412 mm	412 mm
K	533 mm	533 mm	533 mm
L	597 mm	597 mm	597 mm
M	337 mm	337 mm	337 mm
N	262 mm	262 mm	262 mm
O	586 mm	586 mm	586 mm
Connections			
DN 1	DN 63 ISO-K	DN 63 ISO-K	DN 63 ISO-K
DN 2	DN 40 PN 16	DN 40 PN 16	DN 40 PN 16

Technical data	Hepta 100 P, 190-208/380-415 V, 50 Hz	Hepta 100 P, 3TF, 220-230/440-460 V, 60 Hz	Hepta 100 P, 3TF, 220/380 V, 60 Hz
Flange (in)	DN 63 ISO-K	DN 63 ISO-K	DN 63 ISO-K
Flange (out)	DN 40 PN 16	DN 40 PN 16	DN 40 PN 16
Operating fluid	D1	D1	D1
Operating fluid filling	1.6 l	1.6 l	1.6 l
Ultimate pressure	≤ 0.05 hPa	≤ 0.01 hPa	≤ 0.01 hPa
Weight	275 kg	275 kg	275 kg
Cooling water pressure	300-600 kPa	300-600 kPa	300-600 kPa
Cooling water temperature	10-30 °C	10-30 °C	10-30 °C
Cooling water consumption	2-6 l/min	2-6 l/min	2-6 l/min
Motor rating 50 Hz	3.5 kW		
Motor rating 60 Hz		4.8 kW	4.8 kW
Nominal rotation speed at 50 Hz	3000 min^{-1}		
Nominal rotation speed at 60 Hz		3600 min^{-1}	3600 min^{-1}
Nominal pumping speed at 50 Hz	110 m^3/h		
Nominal pumping speed at 60 Hz		130 m^3/h	130 m^3/h
Mains requirement: voltage 50 Hz	190-208/380-415 V		
Mains requirement: voltage 60 Hz		220-230/440-460 V	220-380 V
Sound pressure level	70 dB (A)	74 dB (A)	74 dB (A)
Protection category	IP 55	IP 55	IP 55
Ambient temperature	0-50 °C	0-50 °C	0-50 °C

Order number			
Hepta 100	**PU V11 420**	**PU V11 422**	**PU V11 423**

Accessories			
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**	**P 4768 051 FQ**

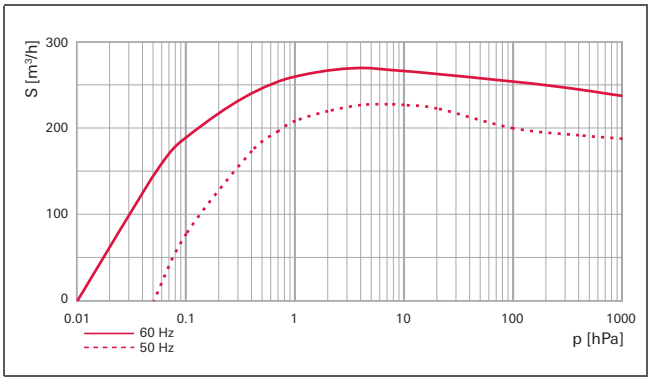
Hepta 200



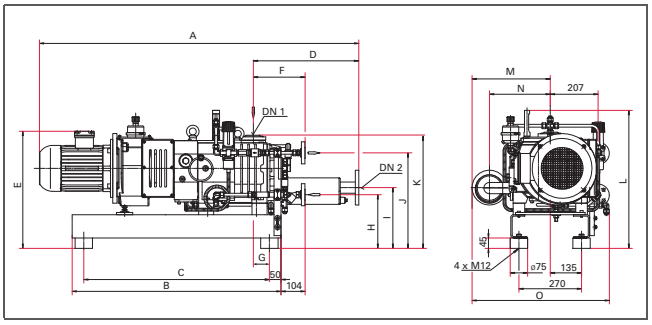
Dry screw pumps with a pumping speed of 220 m³/h at 50 Hz and 265 m³/h at 60 Hz:

- For mains voltage: 190-208/380-415, 50 Hz, 3 ph
- Ideal solution for all areas in which oil-free vacuum is required
- Lower energy costs thanks to internal compression
- For applications in the low and medium vacuum

Pumping speed



Dimensions (in mm)



	Hepta 200 P, 190-208/380-415 V, 50 Hz	Hepta 200 P, 220-230/440-460 V, 60 Hz	Hepta 200 P, 220/380 V, 60 Hz
A	1664 mm	1664 mm	1664 mm
B	1160 mm	1160 mm	1160 mm
C	1060 mm	1060 mm	1060 mm
D	602 mm	602 mm	602 mm
E	552 mm	552 mm	552 mm
F	237 mm	278 mm	278 mm
G	83 mm	83 mm	83 mm
H	232 mm	232 mm	232 mm
I	278 mm	264 mm	264 mm
J	412 mm	412 mm	412 mm
K	491 mm	491 mm	491 mm
L	609 mm	609 mm	609 mm
M	365 mm	365 mm	365 mm
N	282 mm	282 mm	282 mm
O	619 mm	619 mm	619 mm
Connections			
DN 1	DN 63 ISO-K	DN 63 ISO-K	DN 63 ISO-K
DN 2	DN 50 PN 16	DN 50 PN 16	DN 50 PN 16

Technical data	Hepta 200 P, 190-208/380-415 V, 50 Hz	Hepta 200 P, 220-230/440-460 V, 60 Hz	Hepta 200 P, 220/380 V, 60 Hz
Flange (in)	DN 63 ISO-K	DN 63 ISO-K	DN 63 ISO-K
Flange (out)	DN 50 PN 16	DN 50 PN 16	DN 50 PN 16
Operating fluid	D1	D1	D1
Operating fluid filling	1.6 l	1.6 l	1.6 l
Ultimate pressure	≤ 0.05 hPa	≤ 0.01 hPa	≤ 0.01 hPa
Weight	326 kg	326 kg	356 kg
Cooling water pressure	300-600 kPa	300-600 kPa	300-600 kPa
Cooling water temperature	10-30 °C	10-30 °C	10-30 °C
Cooling water consumption	2-6 l/min	2-6 l/min	2-6 l/min
Motor rating 50 Hz	6 kW		
Motor rating 60 Hz		7.6 kW	7.6 kW
Nominal rotation speed at 50 Hz	3000 min^{-1}		
Nominal rotation speed at 60 Hz		3600 min^{-1}	3600 min^{-1}
Nominal pumping speed at 50 Hz	220 m^3/h		
Nominal pumping speed at 60 Hz		265 m^3/h	265 m^3/h
Mains requirement: voltage 50 Hz	190-208/380-415 V		
Mains requirement: voltage 60 Hz		220-230/440-460 V	220-380 V
Sound pressure level	71 dB (A)	76 dB (A)	76 dB (A)
Protection category	IP 55	IP 55	IP 55
Ambient temperature	0-50 °C	0-50 °C	0-50 °C

Order number			
Hepta 200	**PU V21 420**	**PU V21 422**	**PU V21 423**

Accessories			
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**	**P 4768 051 FQ**

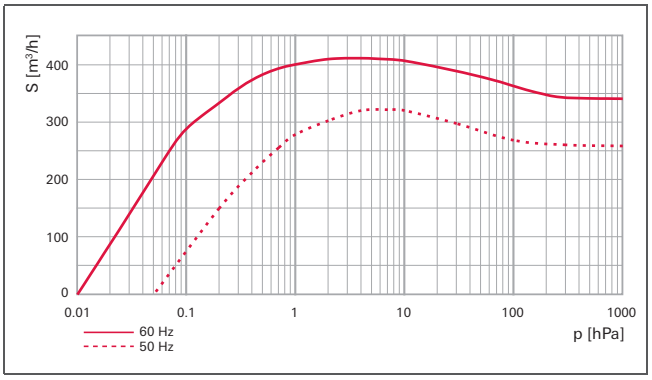
Hepta 300



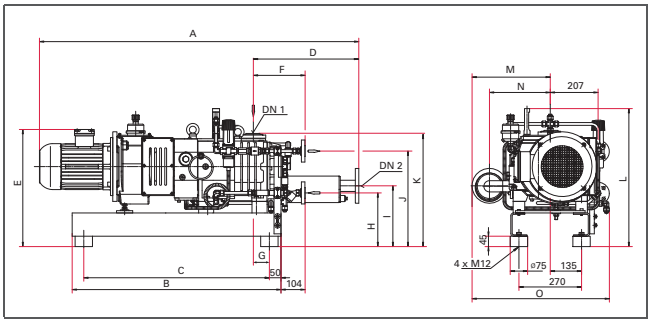
Dry screw pumps with a pumping speed of 320 m³/h at 50 Hz and 410 m³/h at 60 Hz:

- For mains voltage: 190-208/220-240/380-415, 50 Hz, 3 ph
- Ideal solution for all areas in which oil-free vacuum is required
- Lower energy costs thanks to internal compression
- For applications in the low and medium vacuum

Pumping speed



Dimensions (in mm)



	Hepta 300 P, 190-208/220-240/ 380-415 V, 50 Hz	Hepta 300 P, 220-230/440-460 V, 60 Hz	Hepta 300 P, 220/380 V, 60 Hz
A	1660 mm	1660 mm	1660 mm
B	1230 mm	1230 mm	1230 mm
C	1130 mm	1130 mm	1130 mm
D	533 mm	533 mm	533 mm
E	552 mm	552 mm	552 mm
F	236 mm	236 mm	236 mm
G	81 mm	81 mm	81 mm
H	231 mm	231 mm	231 mm
I	262 mm	262 mm	262 mm
J	411 mm	411 mm	411 mm
K	495 mm	495 mm	495 mm
L	609 mm	609 mm	609 mm
M	364 mm	364 mm	364 mm
N	282 mm	282 mm	282 mm
O	620 mm	620 mm	620 mm
Connections			
DN 1	DN 63 ISO-K	DN 63 ISO-K	DN 63 ISO-F
DN 2	DN 50 PN 16	DN 50 PN 16	DN 50 PN 16

Technical data	Hepta 300 P, 190-208/220-240/ 380-415 V, 50 Hz	Hepta 300 P, 220-230/440-460 V, 60 Hz	Hepta 300 P, 220/380 V, 60 Hz
Flange (in)	DN 63 ISO-K	DN 63 ISO-K	DN 63 ISO-K
Flange (out)	DN 50 PN 16	DN 50 PN 16	DN 50 PN 16
Operating fluid	D1	D1	D1
Operating fluid filling	1.6 l	1.6 l	1.6 l
Ultimate pressure	≤ 0.05 hPa	≤ 0.01 hPa	≤ 0.01 hPa
Weight	330 kg	381 kg	381 kg
Cooling water pressure	300-600 kPa	300-600 kPa	300-600 kPa
Cooling water temperature	10-30 °C	10-30 °C	10-30 °C
Cooling water consumption	2-6 l/min	2-6 l/min	2-6 l/min
Motor rating 50 Hz	7.5 kW		
Motor rating 60 Hz		9.5 kW	9.5 kW
Nominal rotation speed at 50 Hz	3000 min^{-1}		
Nominal rotation speed at 60 Hz		3600 min^{-1}	3600 min^{-1}
Nominal pumping speed at 50 Hz	320 m^3/h		
Nominal pumping speed at 60 Hz		410 m^3/h	410 m^3/h
Mains requirement: voltage 50 Hz	190-208/220-240/ 380-415 V		
Mains requirement: voltage 60 Hz		220-230/440-460 V	220-380 V
Sound pressure level	72 dB (A)	77 dB (A)	77 dB (A)
Protection category	IP 55	IP 55	IP 55
Ambient temperature	0-50 °C	0-50 °C	0-50 °C

Order number			
Hepta 300	**PU V31 420**	**PU V31 422**	**PU V31 423**

Accessories			
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**	**P 4768 051 FQ**

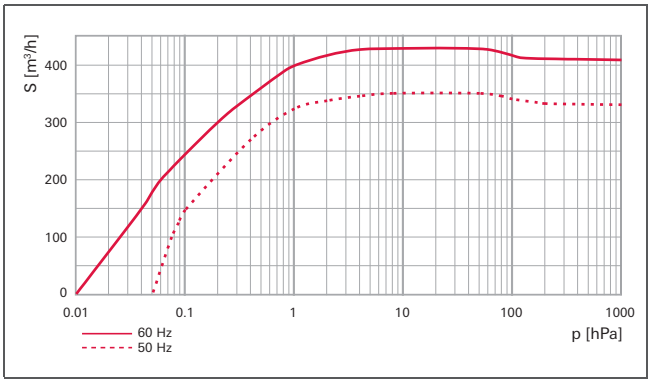
Hepta 400



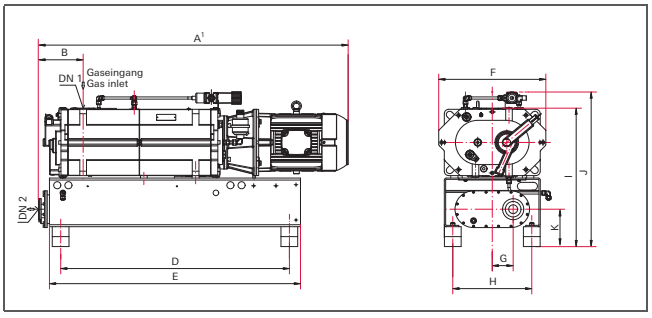
Dry screw pumps with a pumping speed of 350 m³/h at 50 Hz and 420 m³/h at 60 Hz:

- For mains voltage: 190-208/220-240/380-415 V, 50 Hz
- Ideal solution for all areas in which oil-free vacuum is required
- Lower energy costs thanks to internal compression
- For applications in the low and medium vacuum

Pumping speed



Dimensions (in mm)



	Hepta 400 P, 190-208/220-240/ 380-415 V, 50 Hz	Hepta 400 P, 220-230/440-460 V, 60 Hz	Hepta 400 P, 220/380 V, 60 Hz
A	1429 mm	1429 mm	1429 mm
B	243 mm	243 mm	243 mm
D	1025 mm	1025 mm	1025 mm
E	1125 mm	1125 mm	1125 mm
F	480 mm	480 mm	480 mm
G	94 mm	94 mm	94 mm
H	354 mm	354 mm	354 mm
I	630 mm	630 mm	630 mm
J	700 mm	700 mm	700 mm
K	169 mm	169 mm	169 mm
Connections			
DN 1	DN 63 ISO-K	DN 63 ISO-K	DN 63 ISO-K
DN 2	DN 80 PN 16	DN 80 PN 16	DN 80 PN 16

Technical data	Hepta 400 P, 190-208/220-240/ 380-415 V, 50 Hz	Hepta 400 P, 220-230/440-460 V, 60 Hz	Hepta 400 P, 220/380 V, 60 Hz
Flange (in)	DN 63 ISO-K	DN 63 ISO-K	DN 63 ISO-K
Flange (out)	DN 80 PN 16	DN 80 PN 16	DN 80 PN 16
Operating fluid	D1	D1	D1
Operating fluid filling	1.6 l	1.6 l	1.6 l
Ultimate pressure	≤ 0.05 hPa	≤ 0.01 hPa	≤ 0.01 hPa
Weight	526 kg	526 kg	526 kg
Cooling water pressure	300-600 kPa	300-600 kPa	300-600 kPa
Cooling water temperature	10-30 °C	10-30 °C	10-30 °C
Cooling water consumption	4-8 l/min	4-8 l/min	4-8 l/min
Motor rating 50 Hz	7.5 kW		
Motor rating 60 Hz		9.5 kW	9.5 kW
Nominal rotation speed at 50 Hz	3000 min^{-1}		
Nominal rotation speed at 60 Hz		3600 min^{-1}	3600 min^{-1}
Nominal pumping speed at 50 Hz	350 m^3/h		
Nominal pumping speed at 60 Hz		420 m^3/h	420 m^3/h
Mains requirement: voltage 50 Hz	190-208/220-240/ 380-415 V		
Mains requirement: voltage 60 Hz		220-230/440-460 V	220-380 V
Sound pressure level	66 dB (A)	69 dB (A)	69 dB (A)
Protection category	IP 55	IP 55	IP 55
Ambient temperature	0-50 °C	0-50 °C	0-50 °C

Order number			
Hepta 400	**PU V41 420**	**PU V41 422**	**PU V41 423**

Accessories			
SAS 63, DN 63 ISO-K, polyester filter	**PK Z60 511**	**PK Z60 511**	**PK Z60 511**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**	**P 4768 051 FQ**

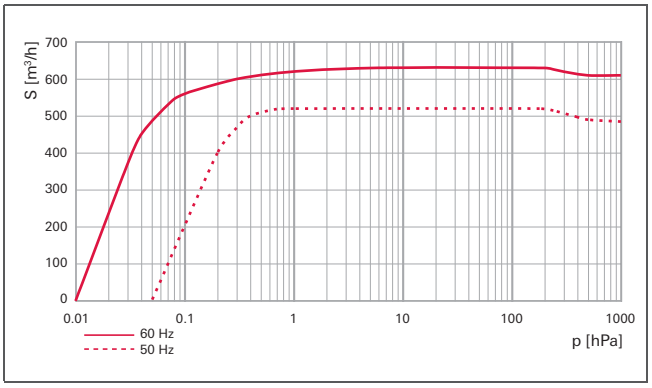
Hepta 600



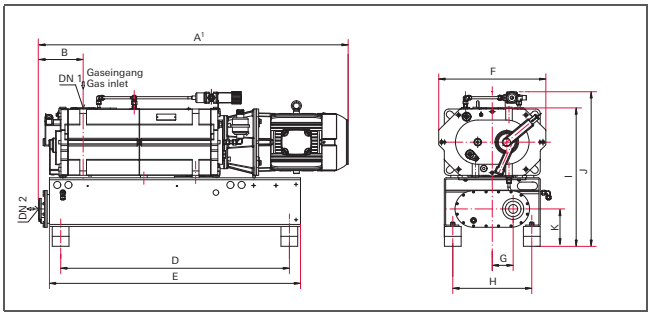
Dry screw pumps with a pumping speed of 525 m³/h at 50 Hz and 630 m³/h at 60 Hz:

- For mains voltage: 190-208/220-240/380-415 V, 50 Hz
- Ideal solution for all areas in which oil-free vacuum is required
- Lower energy costs thanks to internal compression
- For applications in the low and medium vacuum

Pumping speed



Dimensions (in mm)



	Hepta 600 P, 190-208/220-240/ 380-415 V, 50 Hz	Hepta 600 P, 220-230/440-460 V, 60 Hz	Hepta 600 P, 220/380 V, 60 Hz
A	1540 mm	1540 mm	1540 mm
B	367 mm	367 mm	367 mm
D	800 mm	800 mm	800 mm
E	1000 mm	1000 mm	1000 mm
F	563 mm	563 mm	563 mm
G	94 mm	94 mm	94 mm
H	400 mm	400 mm	400 mm
I	616 mm	616 mm	616 mm
J	686 mm	686 mm	685 mm
K	123 mm	123 mm	123 mm
Connections			
DN 1	DN 100 ISO-K	DN 100 ISO-K	DN 100 ISO-K
DN 2	DN 80 PN 16	DN 80 PN 16	DN 80 PN 16

Technical data	Hepta 600 P, 190-208/220-240/ 380-415 V, 50 Hz	Hepta 600 P, 220-230/440-460 V, 60 Hz	Hepta 600 P, 220/380 V, 60 Hz
Flange (in)	DN 100 ISO-K	DN 100 ISO-K	DN 100 ISO-K
Flange (out)	DN 80 PN 16	DN 80 PN 16	DN 80 PN 16
Operating fluid	D1	D1	D1
Operating fluid filling	1.3 l	1.3 l	1.3 l
Ultimate pressure	≤ 0.05 hPa	≤ 0.01 hPa	≤ 0.01 hPa
Weight	747 kg	747 kg	780 kg
Cooling water pressure	300-600 kPa	300-600 kPa	300-600 kPa
Cooling water temperature	10-30 °C	10-30 °C	10-30 °C
Cooling water consumption	0-6 l/min	0-6 l/min	0-6 l/min
Motor rating 50 Hz	15 kW		
Motor rating 60 Hz		17.3 kW	17 kW
Nominal rotation speed at 50 Hz	3000 min^{-1}		
Nominal rotation speed at 60 Hz		3600 min^{-1}	3600 min^{-1}
Nominal pumping speed at 50 Hz	525 m^3/h		
Nominal pumping speed at 60 Hz		630 m^3/h	630 m^3/h
Mains requirement: voltage 50 Hz	190-208/220-240/ 380-415 V		
Mains requirement: voltage 60 Hz		220-230/440-460 V	220-380 V
Sound pressure level	70 dB (A)	75 dB (A)	75 dB (A)
Protection category	IP 55	IP 55	IP 55
Ambient temperature	0-50 °C	0-50 °C	0-50 °C

Order number			
Hepta 600	**PU V61 420**	**PU V61 422**	**PU V61 423**

Accessories			
SAS 100, DN 100 ISO-K, polyester filter	**PK Z60 512**	**PK Z60 512**	**PK Z60 512**
PTC-resistor tripping device	**P 4768 051 FQ**	**P 4768 051 FQ**	**P 4768 051 FQ**

Multi-stage Roots pumps

Clean and dry vacuum for various applications and markets



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Multi-stage Roots pumps

Clean and dry vacuum for various applications and markets

Multi-stage Roots pumps by Pfeiffer Vacuum are used in various application. Small air-cooled ACP pumps are very low maintenance and are distinguished by their reliable performance. They are used in analytical applications as well as in clean processes for semiconductor production and plasma cleaning. The compact Roots pumps A 100 L and A 180 L can be easily integrated in systems due to their small dimensions. Load-locks and transfer chambers in semiconductor and photovoltaic production systems are typical areas of application for this type of pump. The large water-cooled ACP 120 with its high pumping speed and low final pressure are used in research and development, vacuum coating and metallurgy. Process pumps in the A3P, A3H and AD 73 KH series, as well as the A4 series, are used in large numbers in aggressive applications in the semiconductor and coating industry.

Nevertheless, all of these areas have one thing in common: they require a clean and dry vacuum. The technology of the multi-stage Roots pumps is the perfect solution. Lubricants and sealing material between the rotor and stator are not required by the contact-free working pumping module. Thus, hydrocarbon vapor backstreaming can be avoided. In the suction chamber of the pumps, no sealing materials have been used. This means the pumps are free of particles, extremely reliable and stable over a long period of time and also stand out due to their low cost of ownership.



Overview of series and applications

■ = recommended	Analytics						Semiconductors									Coating										Industry										R & D										Page
	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 manufacture	Heat treatment	Vacuum drying	Vacuum furnaces	Nuclear research	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Clean processes – Air cooled																																												
SD versions																																												
ACP 15	■	■	■	■		■	■	■				■	■			■		■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	166
ACP 28	■	■	■	■		■	■	■				■	■			■		■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	170
ACP 40	■	■	■	■		■	■	■				■	■			■		■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	174
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ACP 40 G	■		■			■	■	■				■	■			■		■	■	■		■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	174
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ACP 120 G (gas ballast)																	■	■	■	■		■	■	■	■	■				■	■	■	■	■	■	■	■	■	■	■	■	■	■	186
ACG 600 (gas ballast)																	■	■	■	■		■	■	■	■					■	■	■	■	■	■	■	■	■	■	■	■	■	■	190
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A 103 P SEMI S2								■		■	■	■	■	■			■	■	■	■		■	■	■	■																			196
A 603 P Standard								■		■	■	■	■	■			■	■	■	■		■	■	■	■																			196
A 603 P SEMI S2								■		■	■	■	■	■			■	■	■	■		■	■	■	■																			196
A 1003 P Standard								■		■	■	■	■	■			■	■	■	■		■	■	■	■																			196
A 1003 P SEMI S2								■		■	■	■	■	■			■	■	■	■		■	■	■	■																			196
Harsh duty applications																																												
A 203 H							■		■	■	■	■	■	■	■		■	■	■	■																							202
A 803 H							■		■	■	■	■	■	■	■		■	■	■	■																							202
A 1503 H							■		■	■	■	■	■	■	■		■	■	■	■																							202
A 1803 H							■		■	■	■	■	■	■	■		■	■	■	■																							202

Features at a glance

	Connection flange (inlet)						Pumping speed class												Typical final pressure						Version					Pro-cesses			Cool-ing		
	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF	DN 50 ISO KF	DN 100 ISO-K	DN 160 ISO-K	15 m^3/h	28 m^3/h	40 m^3/h	100 m^3/h	120 m^3/h	160 m^3/h	180 m^3/h	480 m^3/h	560 m^3/h	700 m^3/h	900 m^3/h	1200 m^3/h	1700 m^3/h	0.03 hPa without gas ballast	6.6 · 10^{-3} hPa	6.5 · 10^{-3} hPa	5 · 10^{-4} hPa	3 · 10^{-4} hPa	2 · 10^{-2} hPa	Standard	Corrosive Gas	Energy Saving	For condensable gases	SEMI S2	Clean Processes	Medium Duty Applications	Harsh Duty Applications	Air	Water	Page
Clean processes – Air cooled																																		
SD versions																																		
ACP 15		■					■													■						■					■			■		166
ACP 28		■						■												■						■					■			■		170
ACP 40			■						■											■						■					■			■		174
G versions																																		
ACP 15 G	■						■													■							■				■			■		166
ACP 28 G		■						■												■							■				■			■		170
ACP 40 G			■						■											■							■				■			■		174
CV versions																																		
ACP 28 CV		■						■												■									■		■			■		170
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Clean processes – Compact																																		
A 100 L Standard				■						■											■					■					■				■	180
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A 180 L Standard							■	■								■	■	■	■	■		■	■	■	■											178
Clean processes – Industrial																																		
ACP 120 Standard				■																						■					■				■	186
ACP 120 G (Gas Ballast)				■																							■				■				■	186
ACG 600 G (Gas Ballast)					■									■	■												■				■				■	190
ACG 600 Standard					■																					■					■				■	190
Medium duty applications																																		
A 103 P Standard				■							■											■										■			■	196
A 103 P SEMI S2				■							■											■								■		■			■	196
A 603 P Standard					■									■	■										■							■			■	196
A 603 P SEMI S2					■									■	■										■					■		■			■	196
A 1003 P Standard					■												■								■	■						■			■	196
A 1003 P SEMI S2					■												■								■					■		■			■	196
Harsh duty applications																																		
A 203 H Standard				■								■													■	■						■			■	202
A 203 H Large volume version				■								■													■		■					■			■	202
A 803 H Standard					■											■							■				■					■			■	202
A1503H Standard					■													■					■				■					■			■	202
A 1803 H Standard						■													■				■				■					■			■	202
A 1803 H Large volume version						■													■				■				■					■			■	202



Customer benefits

- Clean and dry vacuum
- Particle-free, extremely reliable with long-term stability
- Low maintenance
- Low operating costs

ACP 15 / 28 / 40

Dry compact multi-stage Roots pumps, clean vacuum, high reliability



ACP 15 / 28 / 40

The multi-stage Roots pump technology of the ACP series meets the requirements of applications where a clean and dry vacuum is needed.

Series at a glance:

Standard version (SD version):
The SD version is designed for applications that require the pumping of clean (dust-free) and non-corrosive gases. Standard pumps are equipped with a gas ballast device to improve the pumping of light gases and avoid vapor condensation inside the pump. Three gas ballast options are available to satisfy customer needs.

Version for corrosive gases (G version):
The G version pump is compatible with traces of corrosive gases. An inert purge gas protects low pressure and high pressure bearings and dilutes corrosive gases in the suction chamber.

Version for condensable vapors (CV version):
The CV version is specially designed for avoiding vapor condensation inside the pump block. This occurs through:
- a high gas ballast throughput for heating up pumps and diluting condensable gases.
- A silencer with a drain screw for releasing liquid at the lowest point of the exhaust.
- Purge gas injection to protect the ball bearings and the shaft seals.

The CV version has a water vapor capacity of up to 1,000 grams per hour.

Customer benefits
- Enhanced process quality thanks to oil-free pump system
- Ideal replacement for scroll pumps and oil-lubricated pumps
- Low operating costs due to long maintenance intervals and air cooling
- Longterm stability of process conditions
- Pump parameters can be adjusted to the process using the integrated frequency converter

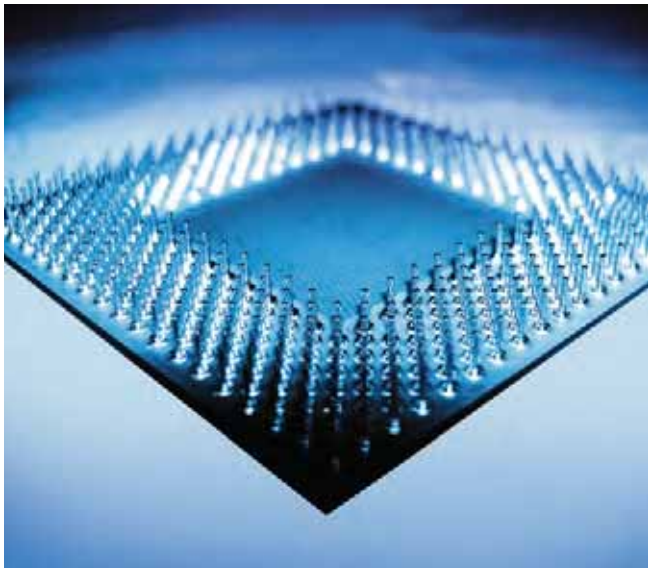
Typical applications
- Analytical instruments
- Research & development
- Plasma cleaning
- Load-lock and transfer chambers
- Portable turbopumping stations



Microscopy



Industry



Semiconductors

ACP 15

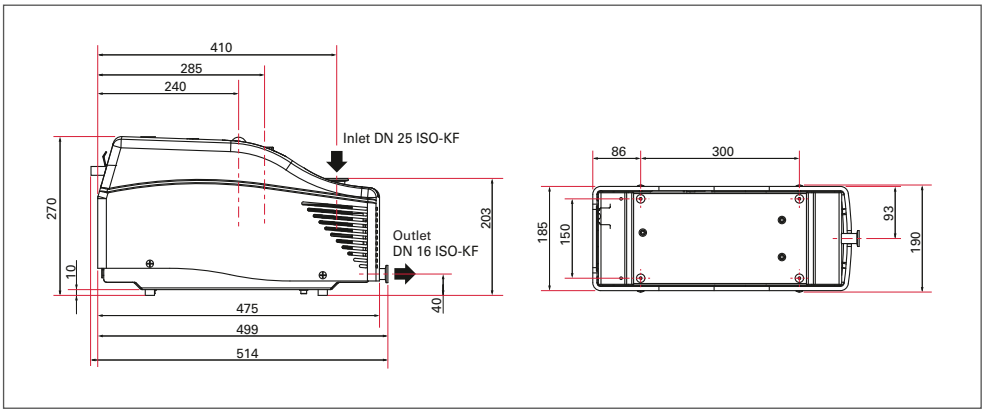


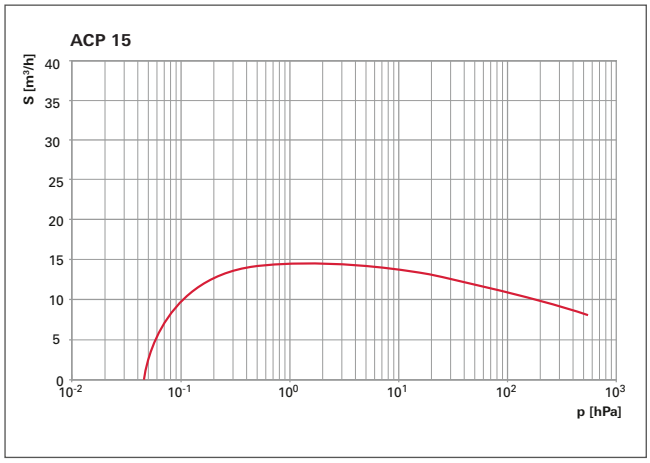
Dry, compact multi-stage Roots pumps with a pumping speed of max. 14 m³/h

Due to frictionless design, no contamination through particles: no wearing parts in the path of the gas flow

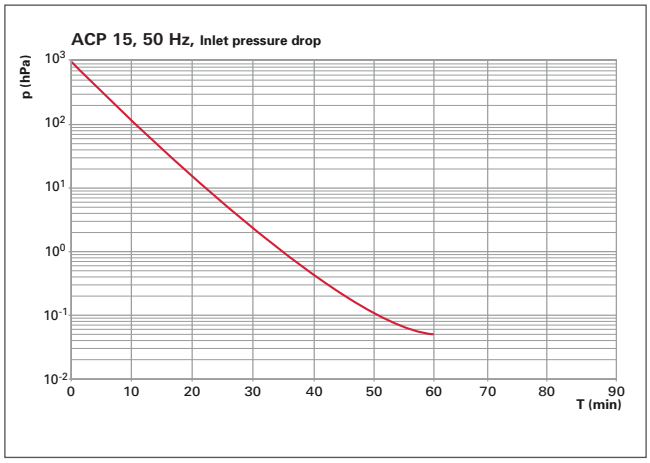
- No hydrocarbon vapor backstreaming: pumps in the ACP series are lubricant-free in the pumping module
- Constant performance (pumping speed, maximum continuous inlet pressure and ultimate pressure)
- High reliability: thanks to extensive experience with dry Roots pumps since 1988
- Low maintenance costs: no annual service, complete overhaul only every 20,000 hours (ACP 15)
- Suitable for condensable vapors: with gas ballast and drainable silencer

Dimensions





ACP 15 pumping speed



ACP 15 pump down time

Technical data	ACP 15, standard	ACP 15, G version
Dimensions (L x W x H)	514 x 190 x 270 mm	514 x 190 x 270 mm
Flange (out)	DN 16 ISO-KF	DN 16 ISO-KF
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF
Weight	23 kg	23 kg
Helium leak rate, max.	$5 \cdot 10^{-8}$ Pa m^3/s	$5 \cdot 10^{-8}$ Pa m^3/s
Continuous inlet pressure, max.	1013 hPa	1013 hPa
Corrosive gas		Yes (light duty)
Cooling	Air	Air
Power consumption at ultimate pressure	450 W	450 W
N_2 purge gas flow, min.		5 slm
Mains requirement: Voltage	100-230 V +/-10%, 50/60 Hz, 200-440 V +/-10%, 50/60 Hz	100-230 V +/-10%, 50/60 Hz, 200-440 V +/-10%, 50/60 Hz
Processes	Clean Processes	Light duty applications
Pumping speed, max.	14 m^3/h	14 m^3/h
Typical ultimate pressure	0.03 hPa	0.03 hPa
Typical ultimate pressure with gas ballast	0.1 hPa	
Typical ultimate pressure with N_2 purge		0.1 hPa
Ambient temperature	12 to 40 °C	12 to 40 °C
Version	Standard	Corrosive gas
Water vapor capacity, max.	80 g/h	

Accessories		
External silencer ES 25 S, DN 25	**109873**	**109873**
Noise Reduction Cover NRC 15, for ACP 15 pumps	**111968**	**111968**
Sound Enclosure kit SEK 15, for ACP 15 pumps	**112779**	**112779**

Order number guide ACP 15

V5	a	T	S	b	c	d	F
Pump model	Versions	Inlet port DN 25	Exhaust port DN 16	Gas ballast	Frequency converter	Power cord	Rubber feet
ACP 15	SA, GA	T	S	M, B, R[1], F	F, T	K, A, S, J, E, Z, R[2]	F

[1] R is the only option for G version
[2] R is the only option for three phased pump

Order number matrix ACP 15

Order number

V5 a TS b c d F

Versions	a
SD version	SA
G version	GA

Gas ballast	b
Manual (On/Off)	M
Blanked	B
R 1/4“ port (GA version)	R[1)]
Permanent filter (mesh) with defined gas throughput	F

Frequency converter	c
1-phase	F
3-phase	T

Power cord	c
UK	K
US	A
Switzerland	S
Japan (1 cable only)	J
Europe	E
Without	Z
3-phase (without plug)	R[2)]

[1)] R is the only option for G version
[2)] R is the only option for three phased pump

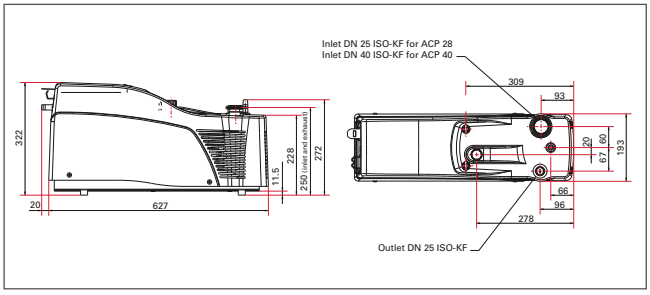
ACP 28



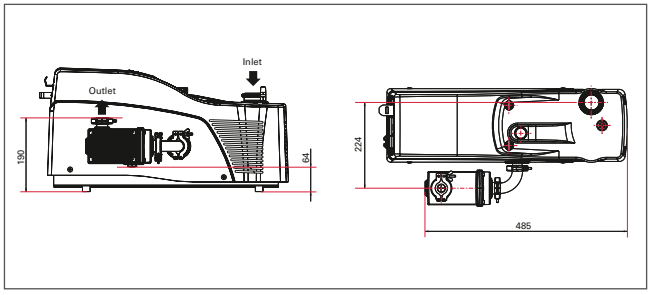
Dry, compact multi-stage Roots pumps with a pumping speed of max. 27 m³/h

- Due to frictionless design, no contamination due to particles: no wearing parts in the path of the gas flow
- No hydrocarbon vapor backstreaming: pumps in the ACP series are lubricant-free in the pumping module
- Constant performance (pumping speed, maximum continuous inlet pressure and ultimate pressure)
- High reliability: thanks to extensive experience with dry Roots pumps since 1988
- Low maintenance costs: no annual service, complete overhaul only every 22,000 hours of operation for the ACP 28/40
- Suitable for condensable vapors: with gas ballast and drainable silencers.

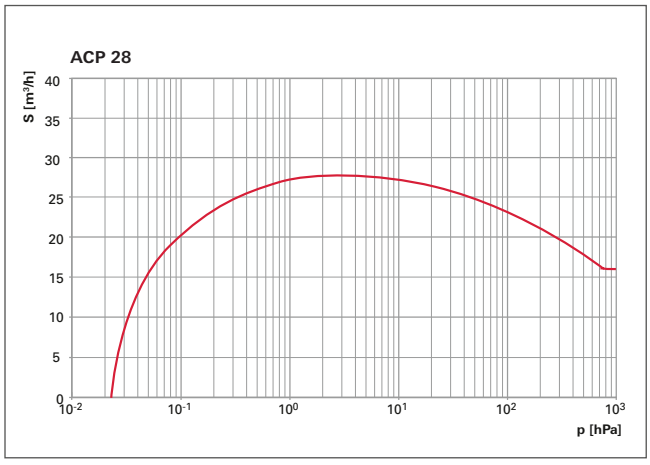
Dimensions



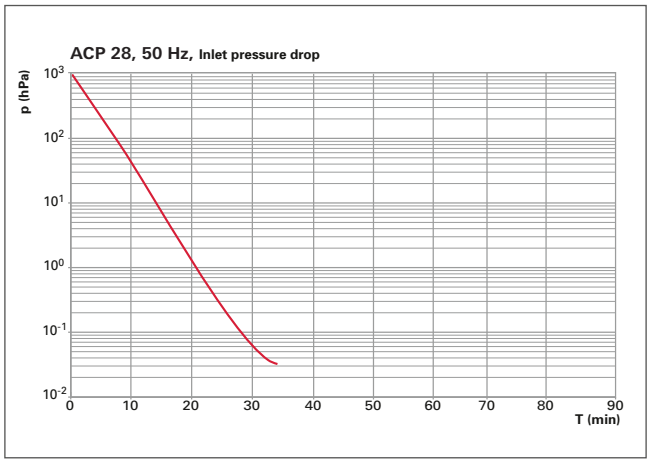
ACP 28 Standard



ACP 28 CV version



ACP 28 pumping speed



ACP 28 pump down time

Technical data:	ACP 28, standard	ACP 28, G version	ACP 28, CV version
Dimensions (L x W x H)	647 x 193 x 322 mm	647 x 193 x 322 mm	647 x 308 x 322 mm
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Weight	30 kg	30 kg	30 kg
Helium leak rate, max.	$5 \cdot 10^{-8}$ Pa m^3/s	$5 \cdot 10^{-8}$ Pa m^3/s	$5 \cdot 10^{-8}$ Pa m^3/s
Continuous inlet pressure. max.	1013 hPa	1013 hPa	1013 hPa
Corrosive gas		Yes (light duty)	Yes (light duty)
Cooling	Air	Air	Air
Power consumption at ultimate pressure	700 W	700 W	700 W
N_2 purge gas flow, min.		3.7 slm	
Mains requirement: Voltage	100-230 V +/-10%, 50/60 Hz; 200-440 V +/-10%, 50/60 Hz	100-230 V +/-10%, 50/60 Hz; 200-440 V +/-10%, 50/60 Hz	100-230 V +/-10%, 50/60 Hz; 200-440 V +/-10%, 50/60 Hz
Processes	Clean Processes	Light duty applications	Light duty applications
Pumping speed, max.	27 m^3/h	27 m^3/h	27 m^3/h
Typical ultimate pressure	0.03 hPa	0.03 hPa	0.03 hPa
Typical ultimate pressure with gas ballast	0.1 hPa		0.2 hPa
Typical ultimate pressure with N_2 purge		0.1 hPa	
Ambient temperature	12 to 40 °C	12 to 40 °C	12 to 40 °C
Version	Standard	Corrosive gas	For condensable gases
Water vapor capacity, max.	120 g/h		700 g/h

Accessories			
Inlet particle filter IPF 25, DN 25	**111649**	**111649**	**111649**
External silencer ES 25 S, DN 25	**109873**	**109873**	**109873**
Noise Reduction Cover NRC 28/40, for ACP 28 and ACP 40	**112637**	**112637**	
Sound Enclosure Kit SEK 28/40, for ACP 28 and ACP 40	**114379**	**114379**	

Order number guide ACP 28

V6	a	T	S	b	c	d	e
Pump model	Versions	Inlet/Exhaust	Motor	Frequency converter	Power cord	Gas ballast	Options
ACP 28	SA, GA, GV	DN 25/ DN 25	S	F, T	K, A, S, J, E, Z, R[1)]	M, B[2)], F, V[3)], H[3)]	F, R

[1)] R is the only option for 3-phased pumps
[2)] B is the only option for G version
[3)] V or H are the only options for CV versions

Order number matrix
ACP 28

Order number

V6	a	TS	b	c	d	e

Versions	a
SD version	SA
G version	GA
CV version	GV

Frequency converter	b
1-phase	F
3-phase	T

Power cord	c
UK	K
US	A
Switzerland	S
Japan (1 cable only)	J
Europe	E
Without	Z
3-phase (without plug)	R[1)]

Gas ballast	d
Manual (On/Off)	M
Blanked	B[2)]
Permanent filter (mesh)	F
Manual (On/Off) (CV version)	V[3)]
Permanent filter (CV version)	H[3)]

Options	e
Rubber feet	F
Wheels	R

[1)] R is the only option for 3-phased pumps
[2)] B is the only option for G version
[3)] V or H are the only options for CV versions

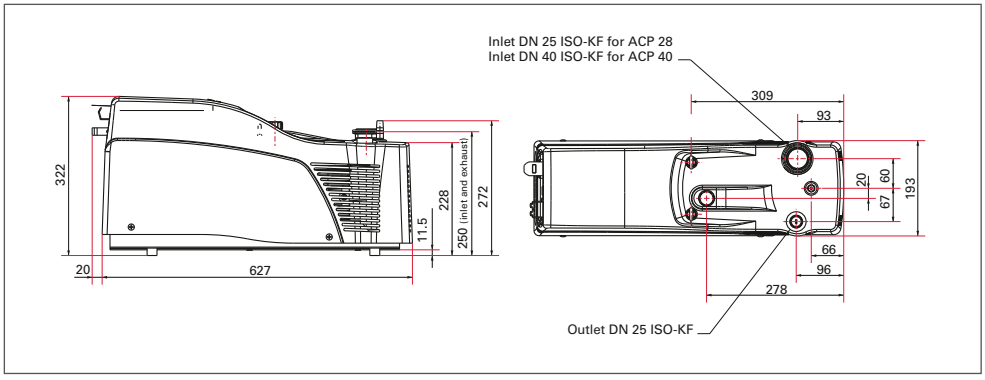
ACP 40

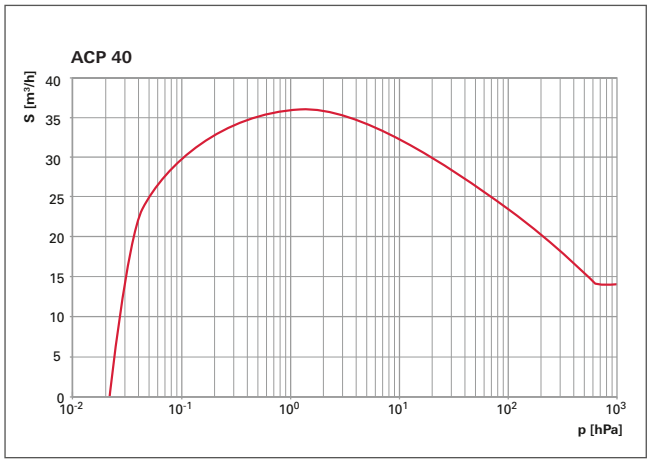


Dry, compact multi-stage Roots pumps with a pumping speed of max, 37 m^3/h

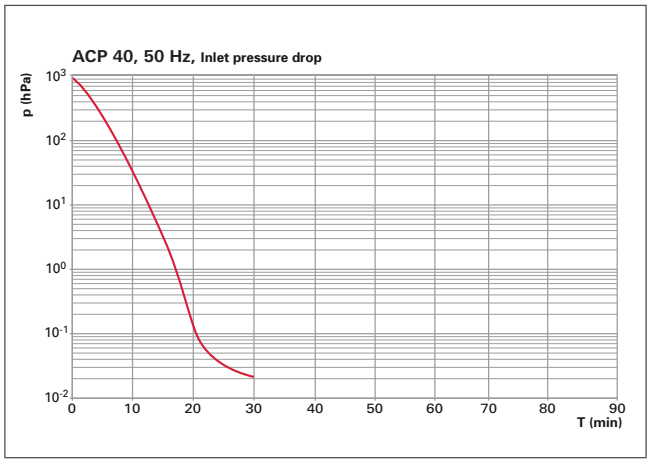
- Due to frictionless design, no contamination due to particles: no wearing parts in the path of gas flow
- No hydrocarbon vapor backstreaming: pumps in the ACP series are lubricant-free in the pumping module
- Constant performance (pumping speed, maximum continuous inlet pressure and ultimate pressure)
- High reliability: thanks to extensive experience with dry Roots pumps since 1988
- Low maintenance costs: no annual service, complete overhaul only every 22,000 hours for the ACP 28/40
- Suitable for condensable vapors: with gas ballast and drainable silencers.

Dimensions





ACP 40 pumping speed



ACP 40 pump down time

Technical data	ACP 40, standard	ACP 40, G version	ACP 40, CV version
Dimensions (L x W x H)	647 x 193 x 322 mm	647 x 193 x 322 mm	647 x 308 x 322 mm
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
flange (in)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Weight	32 kg	32 kg	32 kg
Helium leak rate, max.	$5 \cdot 10^{-8}$ Pa m^3/s	$5 \cdot 10^{-8}$ Pa m^3/s	$5 \cdot 10^{-8}$ Pa m^3/s
Continuous inlet pressure. max.	1013 hPa	1013 hPa	1013 hPa
Corrosive gas		Yes (light duty)	Yes (light duty)
Cooling	Air	Air	Air
Power consumption at ultimate pressure	700 W	700 W	700 W
N_2 Sperrgasfluss, min		3,7 Slm	
Mains requirement: Voltage	100–230 V +/-10%, 50/60 Hz, 200–440 V +/-10%, 50/60 Hz	100–230 V +/-10%, 50/60 Hz, 200–440 V +/-10%, 50/60 Hz	100–230 V +/-10%, 50/60 Hz, 200–440 V +/-10%, 50/60 Hz
Processes	Clean Processes	Light duty applications	Light duty applications
Pumping speed, max.	37 m^3/h	37 m^3/h	37 m^3/h
Typical ultimate pressure	0.03 hPa	0.03 hPa	0.03 hPa
Typical ultimate pressure with gas ballast	0.1 hPa		0.2 hPa
Typical ultimate pressure with N_2 purge		0.1 hPa	
Ambient temperature			12 to 40 °C
Version	Standard	Corrosive gas	For condensable gases
Water vapor capacity, max.	120 g/h		700 g/h

Accessories			
Inlet particle filter IPF 40, DN40	**111647**	**111647**	**111647**
External silencer ES 25 S, DN 25	**109873**	**109873**	**109873**
Noise Reduction Cover NRC 28/40, for ACP 28 and ACP 40	**112637**	**112637**	
Sound Enclosure Kit SEK 28/40, for ACP 28 and ACP 40	**114379**	**114379**	

Order number guide ACP 40

V8	a	C	S	b	c	d	e
Pump model	Versions	Inlet/Exhaust	Motor	Frequency converter	Power cord	Gas ballast	Options
ACP 40	SA, GA, GV	DN 40/ DN 25	S	F, T	K, A, S, J, E, Z, R[1)]	M, B[2)], F, V[3)], H[3)]	F, R

[1)] R is the only option for 3-phased pumps
[2)] B is the only option for G version
[3)] V or H are the only options for CV versions

Order number matrix
ACP 40

Order number

V8	a	CS	b	c	d	e

Versions	a
SD version	SA
G version	GA
CV version	GV

Frequency converter	b
1-phase	F
3-phase	T

Power cord	c
UK	K
US	A
Switzerland	S
Japan (1 cable only)	J
Europe	E
Without	Z
3-phase (without plug)	R[1]

Gas ballast	d
Manual (On/Off)	M
Blanked	B[2]
Permanent filter (mesh)	F
Manual (On/Off) (CV version)	V[3]
Permanent filter (CV version)	H[3]

Options	e
Rubber feet	F
Wheels	R

[1] R is the only option for 3-phased pumps
[2] B is the only option for G version
[3] V or H are the only options for CV versions

A 100 L and A 180 L

Integrated pump for light duty processes



A 100 L and A 180 L

Since the market launch of A 100 L Series, they have revolutionized the pump integration into semiconductor production facilities. Despite their compact dimensions, A 100 L and A 180 L pumps provide high pumping speeds and short pumpdown times. Today, integrated pumps are state of the art and the A 100 L is installed worldwide in many 300 mm semiconductor fabs. When used in clean processes such as load-locks and transfer chambers these pumps eliminate vacuum line effects in pump installations. High reliability and long-term stability distinguish these pumps.

Series at a glance:

A 100 L (Standard version):
Compact dry pump for light duty applications with a pumping speed of 100 m^3/h.

A 100 L ES (Energy-saving version):
Compact oil-free pump for light duty applications with a pumping speed of 100 m^3/h and integrated automatic energy-saving mode which reduces operating costs by up to 50 %.

A 180 L (Standard version):
Our new compact oil-free pump with a pumping speed of 180 m^3/h designed for heavy cycling.

Customer benefits
- Low operating costs
- Easy and flexible integration in systems thanks to compact size
- High performance for high throughput
- Low vibration and noise level
- Low power consumption
- High reliability

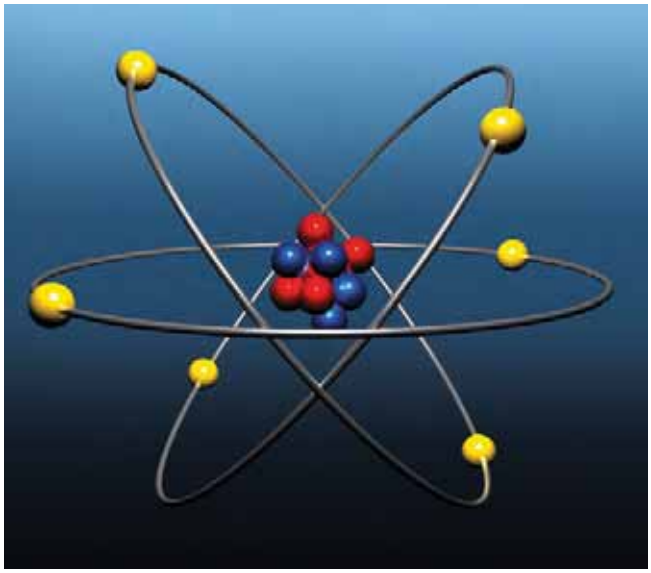
Typical applications
- Load-locks and transfer chambers
- Semiconductor industry
- Photovoltaics
- Research & Development
- Cryogenics

A 180 L
- Pumping speed of 180 m^3/h
- Designed for heavy pumpdown cycles
- Energy-efficient for low operating costs
- Easy system integration due to compact size

Find out more information about this product here:



Semiconductor industry



Research & Development



Photovoltaics

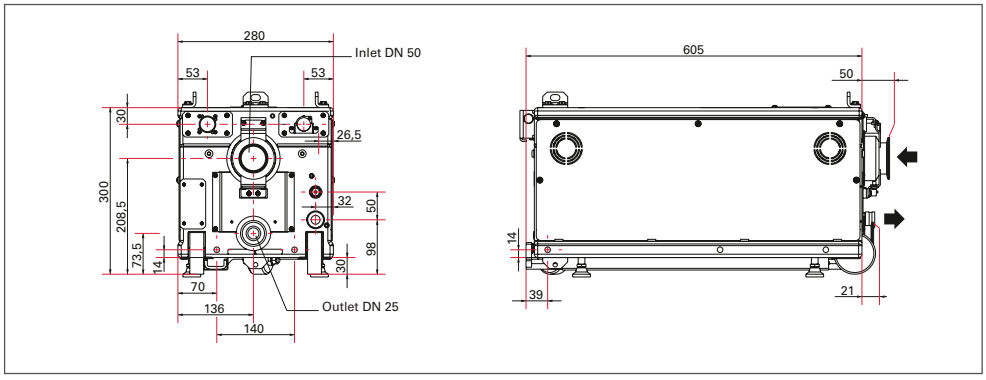
A 100 L / A 100 L ES

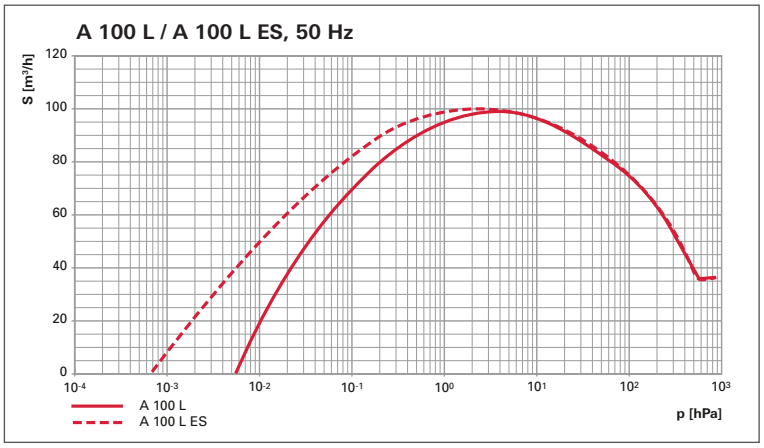


Compact dry pump for light duty applications with a pumping speed of 100 m³/h.

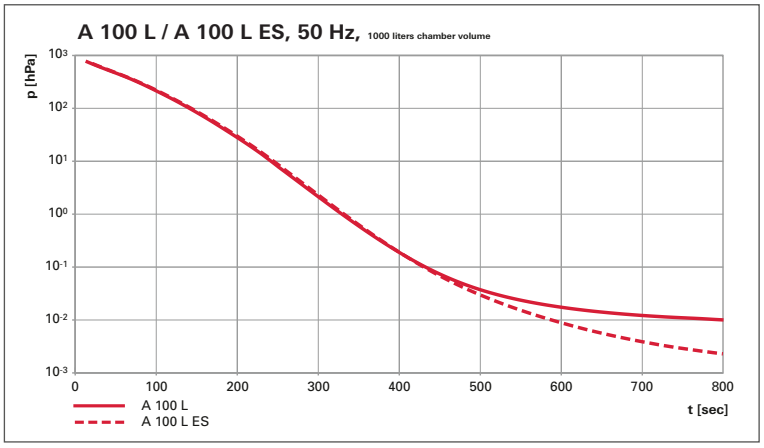
- Pump is equipped with water cooling circuit
- Hour counter and three color LEDs provide information about pump status on its front panel
- 16 pin or 19 pin interface connector transfers discrete Input/Output information to the tool
- Optional RS232 or RS485 serial interface provides control and monitoring functions
- High throughput, pumping speed 100 m³/h

Dimensions





Pumping speed



Pumpdown time

Technical data	A 100 L	A 100 L ES
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 50 ISO-KF	DN 50 ISO-KF
I/O interfaces	SPI 16 pin, SPI 19 pin	SPI 16 pin, SPI 19 pin
Frequency	50–60 Hz	50–60 Hz
Weight	100 kg	100 kg
Cooling	Water	Water
Power consumption at ultimate pressure	1.6 kW	< 0.8 kW
Power consumption in standby mode	0.50–1.2 kW	0.2–0.5 kW
Noise level, max.	58 dB (A)	55 dB (A)
Continuous inlet flow. max.	20 slm	20 slm
Cooling water flow, min.	1.6 l/mn	1.6 l/mn
Power supply voltage, 3 phases	200-208 V; 380-400 V	200-208 V; 380-400 V
Pumping speed	100 m^3/h	100 m^3/h
Interface	RS-232/-485	RS-232/-485
Typical ultimate pressure	$6.6 \cdot 10^{-3}$ hPa	$7 \cdot 10^{-4}$ hPa
Typical vibration displacement (at inlet flange 10–1,000 Hz)	1.5 µm	1.5 µm
Typical vibration acceleration (at inlet flange 10–1,000 Hz)	0.1 $m.s^{-2}$	0.1 $m.s^{-2}$
Typical vibration speed (at inlet flange 10–1,000 Hz)	1 $mm.s^{-1}$	1 $mm.s^{-1}$
Water connection	Quick connect 1/4 NPT	Quick connect 1/4 NPT
Cycle frequency, max.	For 25 liter volume: 40 s	For 25 liter volume: 40 s

Accessories		
Anti-earthquake square kit	**109790**	**109790**
N_2 pressurization kit	**107956S**	**107956S**
Anti-noise device	**110868**	**110868**
RS-232/-485 interface board	**111923**	**111923**
Emergency stop	**107849**	**107849**

Order number guide A 100 L / A 100 L ES

A 100 L	a	1	b	c	4
Pump model	Power supply	Electrical Connection	RS232 Network	Remote plug	Reserved
A 100 L	3, 4, 5	1	3, 4	2, 3	4

Order number matrix A 100 L / A 100 L ES

Order number

A100L a 1 b c 4

Power supply	a
Low Voltage	3
High Voltage	4
Low Voltage (A 100 L ES)	5

RS232 Network	b
Without	3
With	4

Remote plug	c
16 pins	2
19 pins	3

ACP 120 and ACG 600

Dry pumps for industrial use



ACP 120 and ACG 600

Based on the tens of thousands of semiconductor process pumps installed worldwide, the ACP 120 brings the advantages of multi-stage Roots pumps to bear in industrial applications as well. The ACP 120 can be combined into different pumping stations with additional Roots pumps. The roots pumping station ACG 600 can form the basis for a completely lubricant-free pump system for vacuum solutions in decorative or tool coating.

Series at a glance:

Standard version:
The Standard version is designed for applications that require the pumping of clean (dust-free) and non-corrosive gases.

Version for corrosive gases (G version):
With a purge gas port for slightly corrosive processes or for pumping down condensable media.

Customer benefits
- Cleanliness, no risk of particulate contamination
- Low power consumption
- High reliability
- Extended life time between maintenance

Typical applications
- Coating
- Research & Development
- Freeze drying
- Glass coating
- Cylinder evacuation
- Leak detection systems



Freeze drying



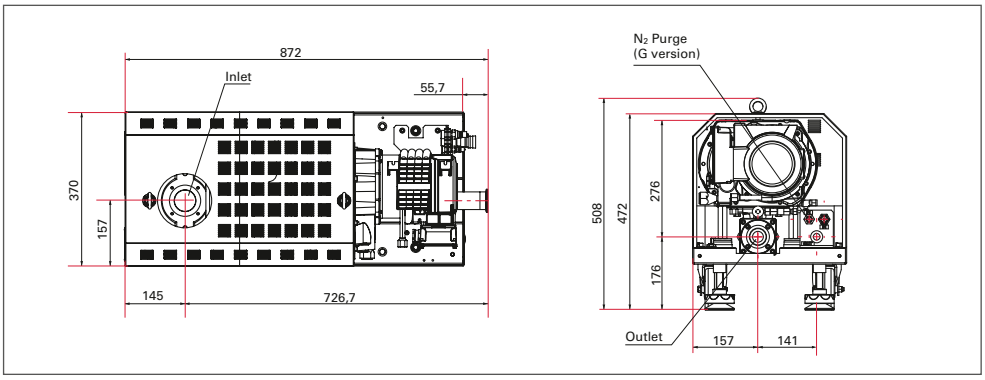
Coating

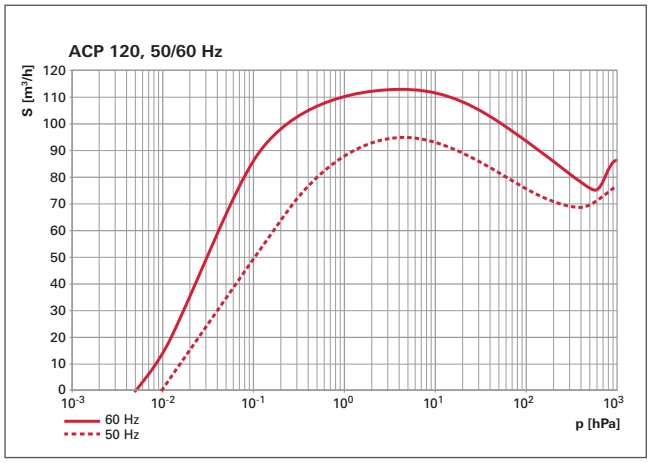
ACP 120



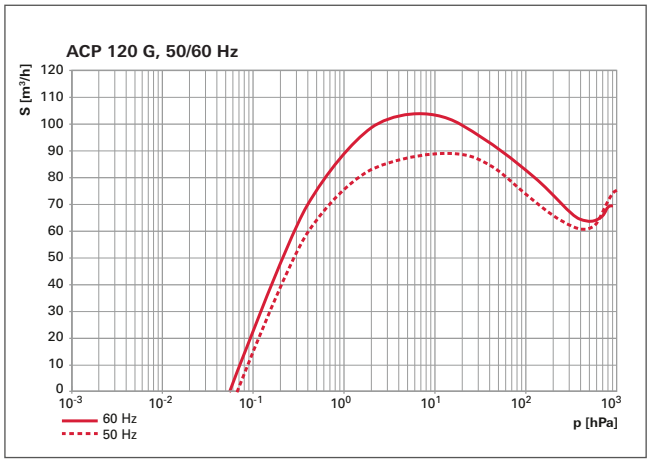
- Water cooled
- Optional version with DN 50 ISO-K inlet pipe
- Optional large volume version
- High throughput, pumping speed 110 m^3/h
- 3-phase motor – 200 V to 480 V

Dimensions





ACP 120 standard version



ACP 120 G version

Technical data	ACP 120 Standard version	ACP 120 Standard version, large volumes	ACP 120 G version	ACP 120 G version, large volumes
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 50 ISO-KF	DN 50 ISO-KF	DN 50 ISO-KF	DN 50 ISO-KF
Dimensions (L x W x H)	872 x 370 x 469 mm	872 x 370 x 469 mm	872 x 370 x 469 mm	872 x 370 x 469 mm
Frequency	50-60 Hz	60 Hz	50-60 Hz	60 Hz
Weight	205 kg	205 kg	205 kg	205 kg
Cooling	Water	Water	Water	Water
Power consumption at ultimate pressure, 50 Hz	1.3 kW		1.3 kW	
Power consumption at ultimate pressure, 60 Hz	1.5 kW	1.5 kW	1.5 kW	1.5 kW
Noise level, max.	65 dB (A)	65 dB (A)	65 dB (A)	65 dB (A)
Continuous inlet flow. max.	80 slm	80 slm	80 slm	80 slm
Cooling water flow, min.	5 l/mn	5 l/mn	5 l/mn	5 l/mn
Power supply voltage, 3 phase	200-480 V	200-230 V; 380-480 V	200-480 V	200-230 V; 380-480 V
Pumping speed at 50 Hz	95 m^3/h		95 m^3/h	
Saugvermögen bei 60 Hz	112 m^3/h	112 m^3/h	112 m^3/h	112 m^3/h
Typical ultimate pressure, 50 Hz	$3 \cdot 10^{-2}$ hPa			
Typical ultimate pressure, 60 Hz	$1.5 \cdot 10^{-2}$ hPa	$1.5 \cdot 10^{-2}$ hPa		$5 \cdot 10^{-2}$ hPa
Typical ultimate pressure with N_2 purge, 50 Hz			$9 \cdot 10^{-2}$ hPa	
Typical ultimate pressure with N_2 purge, 60 Hz			$5 \cdot 10^{-2}$ hPa	
Volume size, max.	1 m^3	10 m^3	1 m^3	10 m^3
Ambient temperature	5 to 40 °C	5 to 40 °C	5 to 40 °C	5 to 40 °C

G = Version with gas ballast

Accessories				
Inlet pipe, DN 50 ISO-KF	**106308**	**106308**	**106308**	**106308**
Isolation valve, DN 50 ISO-KF, manual	**30501M**	**30501M**	**30501M**	**30501M**

Order number guide ACP 120

ACP 120	a	SP	b	1	c	d	1
Pump model	Versions	Standard 3ph motor	Inlet	Cables	Silencer	Frequency converter	Reserved
ACP 120	S, G	SP	1, 2	1	1, 2	1, 2, 3	1

Notes:
A) G version is recommended for pumping small amounts of condensable or corrosive gases.
It includes a N_2 purge circuit with injection points.
B) with APC 120 frequency converter option, the maximum volume to be evacuated (not cycling) is 10 m^3
without APC 120 frequency converter option, the maximum volume to be evacuated (not cycling) is 1 m^3.

Order number matrix ACP 120

Order number

ACP120 a SP b 1 c d 1

Versions	a
Standard version	S
G version	G

Inlet	b
without inlet spool	1
with DN 50 ISO-KF spool	2

Silencer	c
standard	1
drainable	2

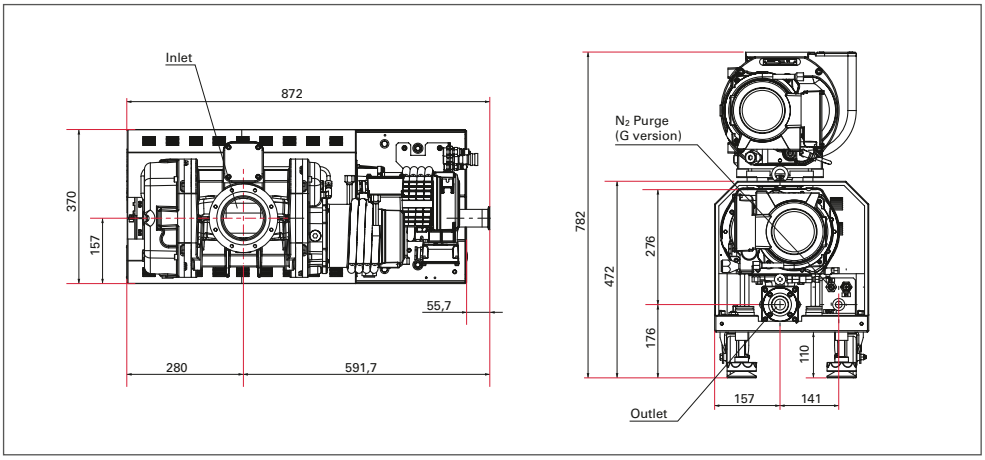
Frequency converter	d
without	1
with – Low voltage (60 Hz large volume)	2
with – High voltage (60 Hz large volume)	3

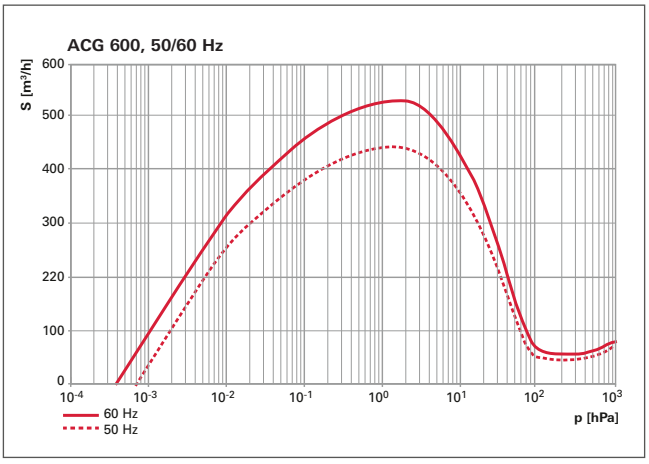
ACG 600



- Water cooled
- Optional nitrogen gas ballast to protect the pump from corrosive or condensable gases
- Inlet flange DN 100 ISO-K
- Optional large volume version
- High throughput, pumping speed 560 m^3/h
- 3-phase motor – 200 V to 480 V
- Integrated N_2-gas ballast

Dimensions





ACG 600 standard version

Technical data	ACG 600 Standard version	ACG 600 Standard version, large volumes	ACG 600 G version	ACG 600 G version, large volumes
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 100 ISO-K	DN 100 ISO-K	DN 100 ISO-K	DN 100 ISO-K
Dimensions (L x W x H)	872 x 370 x 779 mm	872 x 370 x 779 mm	872 x 370 x 779 mm	872 x 370 x 779 mm
Frequency	50–60 Hz	60 Hz	50–60 Hz	60 Hz
Weight	320 kg	320 kg	320 kg	320 kg
Cooling	Water	Water	Water	Water
Power consumption at ultimate pressure, 50 Hz	1.8 kW		1.8 kW	
Power consumption at ultimate pressure, 60 Hz	2 kW	2 kW	2 kW	2 kW
Noise level, max.	68 dB (A)	68 dB (A)	68 dB (A)	68 dB (A)
Continuous inlet flow. max.	60 slm	60 slm	60 slm	60 slm
Cooling water flow, min.	5 l/mn	5 l/mn	5 l/mn	5 l/mn
Power supply voltage, 3 phase	200-480 V	200-230 V; 380-480 V	200-480 V	200-230 V; 380-480 V
Pumping speed at 50 Hz	480 m^3/h		480 m^3/h	
Pumping speed at 60 Hz	560 m^3/h	560 m^3/h	560 m^3/h	560 m^3/h
Typischer Enddruck 50 Hz	$8 \cdot 10^{-3}$ hPa			
Typical ultimate pressure, 60 Hz	$9 \cdot 10^{-4}$ hPa	$9 \cdot 10^{-4}$ hPa		
Typical ultimate pressure with N_2 purge, 50 Hz			$9 \cdot 10^{-3}$ hPa	
Typical ultimate pressure with N_2 purge, 60 Hz			$6 \cdot 10^{-3}$ hPa	$6 \cdot 10^{-3}$ hPa
Volume size, max.	1 m^3	10 m^3	1 m^3	10 m^3
Ambient temperature	5 to 40 °C	5 to 40 °C	5 to 40 °C	5 to 40 °C

G = Version with gas ballast

Accessories				
Isolation valve, DN 100 ISO-KF, manual	**30503M**	**30503M**	**30503M**	**30503M**

Order number guide ACG 600

ACG 600	a	SP	1	1	b	c	1
Pump model	Versions	Standard 3 ph Motor	Inlet	Cables	Silencer	Frequency converter	Reserved
ACG 600	S, G	SP	1	1	1, 2	1, 2, 3	1

Notes:
A) G version is recommended for pumping small amounts of condensable or corrosive gases.
It includes a N_2 purge circuit with injection points.
B) with APC 120 frequency converter option, the maximum volume to be evacuated (not cycling) is 10 m^3.
without APC 120 frequency converter option, the maximum volume to be evacuated (not cycling) is 1 m^3.

Order number matrix ACG 600

Order number

ACG600 **a** SP 1 1 **b** **c** 1

Versions	a
Standard version	S
G version	G

Silencer	b
standard	1
drainable	2

Frequency converter	c
without	1
with – Low voltage (60Hz large volume)	2
with – High voltage (60Hz large volume)	3

A3P series

Advanced, energy-efficient technology for medium duty processes



A3P series

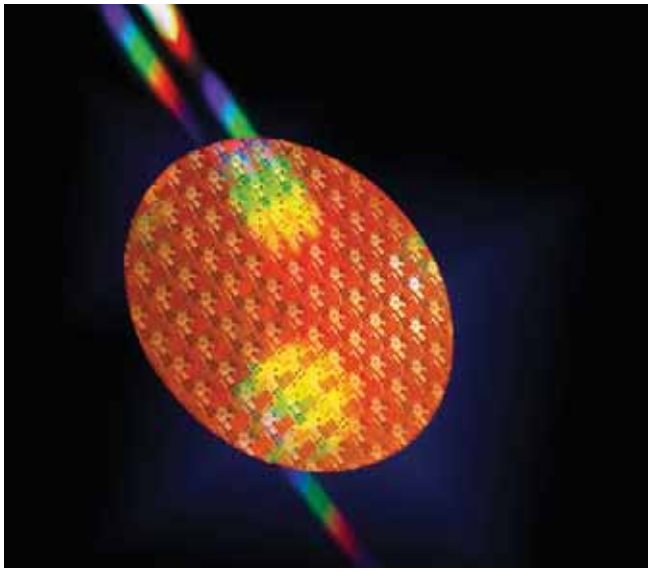
The A3P series of vacuum pumps, offer high reliability and the necessary equipment to withstand traces of aggressive and corrosive media. The three models available in the series cover a wide spectrum of pumping speeds. Compared to conventional pumps, energy savings of up to 50 % can be achieved with the A3P range. These pumps are designed for quiet and low-vibration operation and are CE and SEMI S2 compliant. Due to their compact dimensions, they can easily be integrated into existing systems and save up to 50 % space compared to conventional pumps.

Customer benefits

- Low power consumption
- Easy integration into existing systems due to their compact and lightweight design
- Longer service life through high resistance to corrosive media
- No need for an external silencer
- Reduced operating costs
- Compatible with semiconductor fab requirements

Recommended applications

- Oxide etching
- Poly etching
- Stripping
- Ashing
- Implant source



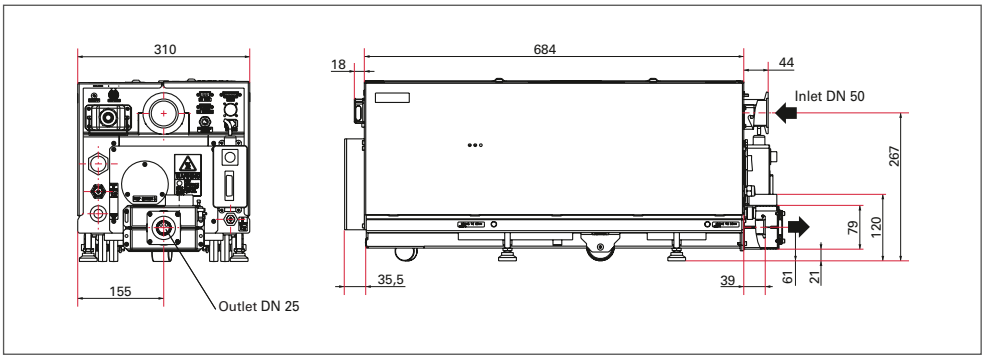
Semiconductors

A3P series

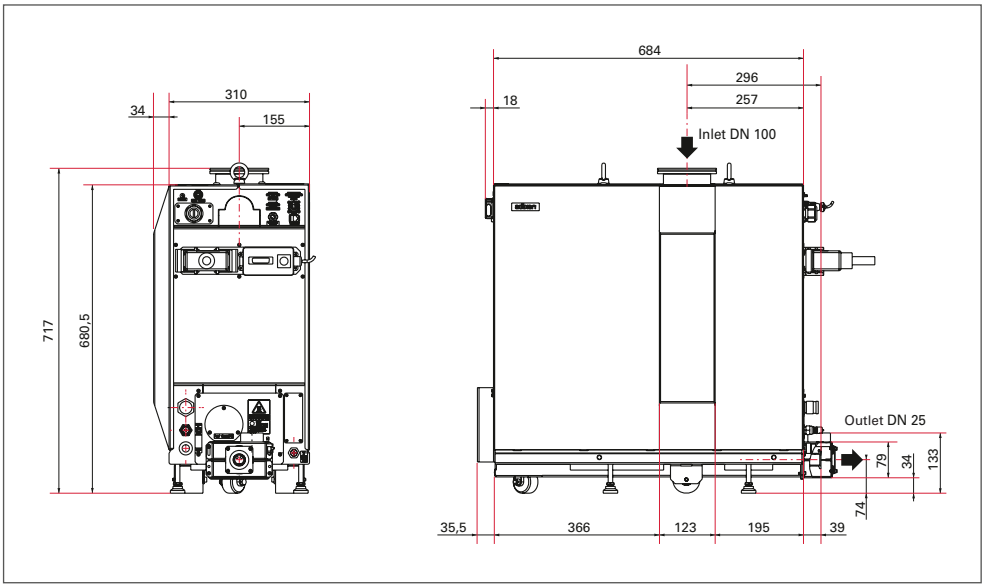


- Low operating costs
- Small footprint
- Light weight for simpler assembly
- High reliability in medium duty applications
- Compatible with semiconductor fab requirements

Dimensions



A 103 P



A 603 P, A 1003 P

Technical data	A 103 P	A 603 P	A 1003 P
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 50 ISO-K	DN 100 ISO-K	DN 100 ISO-K
Dimensions (L x W x H)	684 x 310 x 323 mm	684 x 342 x 662 mm	684 x 342 x 662 mm
Weight	125 kg	270 kg	270 kg
Cooling	Water	Water	Water
Power consumption at ultimate pressure	1 kW	1.3 kW	1.6 kW
Continuous inlet flow, max.	50 slm	25 slm	25 slm
Cooling water flow, min.	1.5 l/mn	1.5 l/mn	1.5 l/mn
Nominal motor rating	2.5 kW	4.7 kW	5 kW
N_2 purge gas flow, max.	60 slm	60 slm	60 slm
N_2 purge gas flow, min.	5 slm	5 slm	5 slm
Power supply voltage, 3 phase	200-230 V; 380-440 V	200-230 V; 380-440 V	200-230 V; 380-440 V
Pumping speed	120 m^3/h		900 m^3/h
Pumping speed at 50 Hz		480 m^3/h	
Pumping speed at 60 Hz		570 m^3/h	
Noise level	< 58 dB (A)	< 65 dB (A)	< 65 dB (A)
Typical ultimate pressure	$6.5 \cdot 10^{-3}$ hPa		$3 \cdot 10^{-4}$ hPa
Typical ultimate pressure, 50 Hz		$5 \cdot 10^{-4}$ hPa	
Typical ultimate pressure, 60 Hz		$3 \cdot 10^{-4}$ hPa	
Typical ultimate pressure with N_2 purge	(with 20 slm purge) $2.6 \cdot 10^{-2}$ hPa		(with 20 slm purge) $1 \cdot 10^{-3}$ hPa
Typical ultimate pressure with N_2 purge, 50 Hz		(with 20 slm purge) $2 \cdot 10^{-3}$ hPa	
Typical ultimate pressure with N_2 purge, 60 Hz		(with 20 slm purge) $1 \cdot 10^{-3}$ hPa	
Full load current	11.4 A (for 200-230 V); 6 A (380-440 V)	17.6 A (for 220-230 V); 9.4 A (for 380-440 V)	22.8 A (for 220-230 V); 12 A (for 380-440 V)
Volume size, max.	1 m^3	1 m^3	1 m^3
Water temperature	10 to 25 °C	10 to 25 °C	10 to 25 °C
Water connector	Brass, stainless steel	Brass, stainless steel	Brass, stainless steel

Accessories			
Isolation valve, manual	**30501M**	**30503M**	**30503M**
Isolation valve, 24 V DC	**30501B**	**30503B**	**30503B**
Cable for isolation valve, 24 V DC, 2.5 m	**A330071**	**A330071**	**A330071**
Seismic brackets kit	**110914**	**110914**	**110914**
Hand held remote display, 1.5 m cable	**118952S**	**118952S**	**118952S**

Order number guide A3P series

A3P	a	2	b	c	d	0	e	f	0	g	0
Product	Pump model	Pump type	Voltage	Inlet port	Water connector	Purge system	Cable type	Purge configuration	OEM	SEMI S2	Reserved
A 103 P	G	2	1, 2	5	0, 1	0	1, 2	0, 1, 2	0	0, 1	0
A 603 P	D	2	1, 2	6	0, 1	0	1, 2	0, 1, 2	0	0, 1	0
A 1003 P	C	2	1, 2	6	0, 1	0	1, 2	0, 1, 2	0	0, 1	0

Order number matrix A3P series

Order number

A3P a 2 b c d 0 e f 0 g 0

Pump model	a
A 103 P	G
A 603 P	D
A 1003 P	C

Voltage	b
Low Voltage	1
High Voltage	2

Inlet port	c
DN 50	5
DN 100	6

Water connector	d
Brass	0
Stainless Steel	1

Cable type	e
Hard wire	1
Plug	2

Purge configuration	f
Without standby	0
With standby	1
Single purge	2

SEMI S2	g
Without	0
With	1

A3H series

Energy and cost efficient solutions for the most demanding applications



A3H series

Harsh duty processes in semiconductor production always provide new challenges for vacuum pumps. Based on the proven multi-stage Roots technology, Pfeiffer Vacuum offers pump solutions with the A3H series with different pumping speeds for 300 mm wafer semiconductor fabs with 45 nm technology nodes and less.

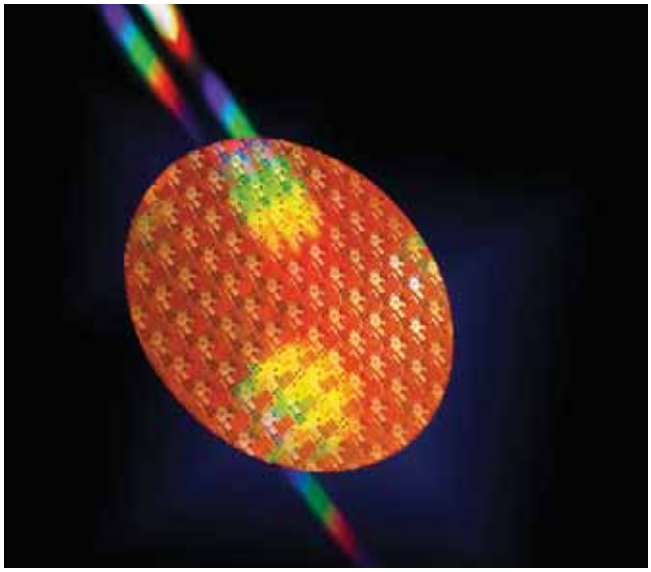
Through the use of corrosion-resistant materials and a high gas throughput, this pump series is ideal for use in demanding CVD processes. A high particle tolerance and condensation resistance distinguishes the pumps of the A3H series. Their compact and modular construction allows for space-saving integration in existing systems. Long maintenance intervals and low energy consumption provide for low operating costs.

Customer benefits

- Reduced operating costs through low energy consumption
- Reduced space needed through compact construction
- Proven durability
- High process-safety
- Longer maintenance intervals through improved particle tolerance and condensation resistance

Typical applications

- Metal etching
- CVD processes (PECVD, SACVD, LPCVD)
- ALD
- Diffusion processes
- Epitaxy



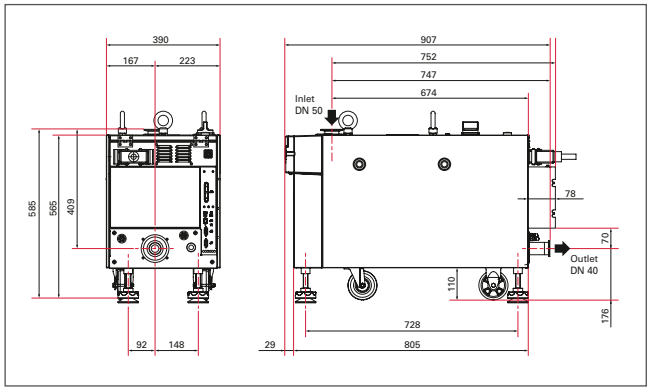
Semiconductors

A3H series

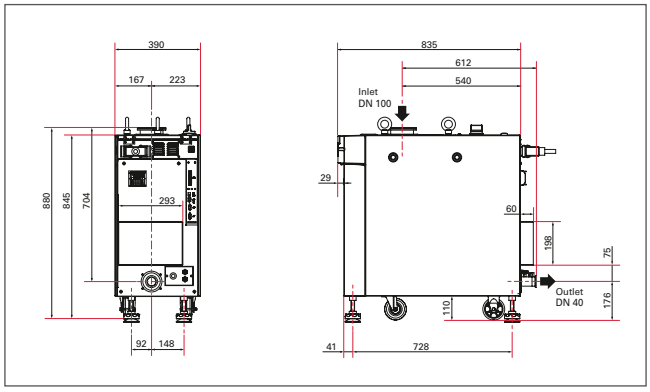


- Longer maintenance intervals through improved particle tolerance and condensation resistance.
- Optimal efficiency for demanding CVD processes through the use of corrosion-resistant materials and high gas throughput
- Reduced operating costs through low energy consumption
- Reduced space needed through compact design
- Low noise emission and low vibration level
- Compliant with CE and SEMI S2 standards

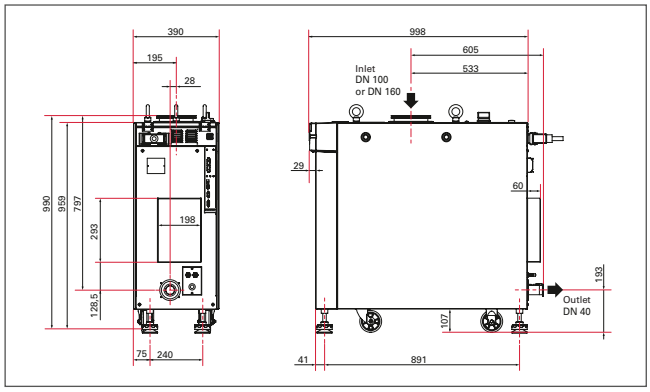
Dimensions



A 203 H



A 803 H



A 1503 H

Technical data (general)	A 203 H	A 803 H	A 1503 H	A 1803 H
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 50 ISO-K	DN 100 ISO-K	DN 100 ISO-K	DN 100 ISO-K
Dimensions (L x W x H)	907 x 390 x 585 mm	894 x 390 x 880 mm	1,058 x 390 x 986mm	1,058 x 390 x 986mm
Cooling	Water	Water	Water	Water
Noise level, max.	65 dB (A)	68 dB (A)	69 dB (A)	69 dB (A)
Continuous inlet flow, max.	150 slm	100 slm	100 slm	70 slm
Cooling water flow, min.	2 l/mn	2.5 l/mn	2.5 l/mn	2.5 l/mn
N_2 purge gas flow, max.	120 slm	120 slm	120 slm	120 slm
N_2 purge gas flow, min.	20 slm	20 slm	20 slm	20 slm
Power supply voltage, 3 phase	200-208 V; 380-400 V; 415 V; 460 V; 480 V	200-208 V; 380-400 V; 415 V; 460 V; 480 V	200-208 V; 380-400 V; 415 V; 460 V; 480 V	200-208 V; 380-400 V; 415 V; 460 V; 480 V
Ambient temperature	5 to 40 °C	5 to 40 °C	5 to 40 °C	5 to 40 °C
Full load current	10 A; 20 A (for 200-208 V)	20 A; 27 A (for 200-208 V)	10 A; 32 A (for 200-208 V)	10 A; 32 A (for 200-208 V)
Water connector	Brass, stainless steel; 1/4 inch, 3/8 inch NPT	Brass, stainless steel; 1/4 inch, 3/8 inch NPT	Brass, stainless steel; 1/4 inch, 3/8 inch NPT	Brass, stainless steel; 1/4 inch, 3/8 inch NPT

Technical data	A 203 H Standard version	A 803 H Standard version	A 1503 H Standard version	A 1503 H Standard version
Frequency	50 Hz	60 Hz	60 Hz	60 Hz
Weight	265 kg	385 kg	545 kg	545 kg
Power consumption at ultimate pressure, 50 Hz	1.8 kW	2.2 kW		
Power consumption at ultimate pressure, 60 Hz		2.4 kW	3.4 kW	2.8 kW
Pumping speed at 50 Hz	130 m^3/h	600 m^3/h		
Pumping speed at 60 Hz	160 m^3/h	700 m^3/h	1200 m^3/h	1700 m^3/h
Typical base pressure, 50 Hz	$6 \cdot 10^{-2}$ hPa	$1 \cdot 10^{-3}$ hPa		
Typical base pressure, 60 Hz	$2 \cdot 10^{-2}$ hPa	$5 \cdot 10^{-4}$ hPa	$5 \cdot 10^{-4}$ hPa	$5 \cdot 10^{-4}$ hPa
Typical base pressure with N_2 purge, 50 Hz	$5 \cdot 10^{-1}$ hPa	$1 \cdot 10^{-2}$ hPa		
Typical base pressure with N_2 purge, 60 Hz	$1 \cdot 10^{-1}$ hPa	$5 \cdot 10^{-3}$ hPa	$5 \cdot 10^{-3}$ hPa	$5 \cdot 10^{-3}$ hPa
Volume size, max.	1 m^3	1 m^3	1 m^3	1 m^3

Accessories				
Isolation valve, manual		**30503M**	**30503M**	**30503M**
Isolation valve, 24 V DC		**30503E**	**30503E**	**30503E**
Cable for isolation valve, 24 V DC, 3.5 m		**106532**	**106532**	**106532**
Hand held remote display, 1.5 m cable	**119988S**	**119988S**	**119988S**	**119988S**
Hand Held Remote control	**110942**	**110942**	**110942**	**110942**
Cable for hand held remote display,15 m	**107079**	**107079**	**107079**	**107079**
Seismic brackets kit	**A328947**	**A328947**	**A328947**	**A328947**

Technical data	A 203 H Large volume version			A 1803 H Large volume version
Frequency	60 Hz			60 Hz
Power consumption at ultimate pressure, 60 Hz	2 kW			2.6 kW
Noise level, max.	65 dB (A)			69 dB (A)
Continuous inlet flow. max.	150 slm			100 slm
Pumping speed at 60 Hz	160 m^3/h			1200 m^3/h
Typical ultimate pressure, 60 Hz	$2 \cdot 10^{-2}$ hPa			$5 \cdot 10^{-4}$ hPa
Typical ultimate pressure with N_2 purge, 60 Hz	$1 \cdot 10^{-1}$ hPa			$5 \cdot 10^{-3}$ hPa
Volume size, max.	50 m^3			50 m^3

Accessories				
Hand held remote display, 1.5 m cable	**119988S**			**119988S**
Hand Held Remote control	**110942**			**110942**
Cable for hand held remote display,15 m	**107079**			**107079**
Seismic brackets kit	**A328947**			**A328947**

Order number guide A3H series

A3H	a	b	C	c	d	e	f	g	h	i	j	O
Product	Pump model	Application	Customer specific	Temperature Control	Power supply	Water & N_2 Quick connects	Exhaust	Inlet flange	Roots By-pass	Purge line	ADK specific	Reserved
A 203 H	A	1 4 7	C	S	X	X	1	0	0	1	0	0
A 308 H	B	1 3 4 5	C	S L S S	X	X	1 0 1 1	1	1 1 1 2	1	0	0
A 1503 H	C	1 3 5 7	C	S or H L H S or H	X	X	1 0 1 1	1	1 1 2 1	1 1 1 1	0	0
A 1803 H	D	1 3 4 7	C	S or H L S or H or L S or H	X	X	1 0 1 1	1 or 2	1	1	0 or 1	0

HHR SD (Hand-held Remote Data Record) included
ELT versions includes frequency converter on Roots (all models) & intermediate heat exchanger (A 1503 H & A 1803 H only) / No Exhaust Heater
EHT version includes Hot roots kit (A 1503 H & A 1803 H)

Appendix: Ordering guide A3H – Notes on Digits

b – Applications
- **1:** Standard
- **3:** Standard cold
- **4:** Large volumes
- **5:** High flows
- **7:** Standard 60 Hz

c – Temperature Control
- **S:** Standard version (STD) – Exhaust heater
- **L:** Extended low temperature version (ELT) Roots/FB heat exchanger (A 1503 H & A 1803 H) No exhaust heater
- **H:** Extended high temperature version: Hot Roots Kit (A 1503 H & A 1803 H) Exhaust heater

e – Water & N_2 Quick connects
- **Material:** applies to both Water & N_2 Quick Connect – Brass or Stainless Steel
- **Size:** 1/4" NPT or 3/8" NPT

f – Exhaust
- **0:** Without check-valve
- **1:** With Check-valve (standard configuration)

h – Roots By-Pass
- **1:** Standard by-pass – For most of the applications
- **2:** Blocked by-pass – For specific powdery applications or high H_2 flows applications

j – ADK specific
- **1:** With – for 2_{nd} Roots pumps interface cable

Order number matrix A3H series

Order number

A3H a b C c d e f g h i j 0

Pump model	a
A 203 H	A
A 308 H	B
A 1503 H	C
A 1803 H	D

Application	b
Standard	1
Standard cold	3
Large volume	4
High flows	5
Standard 60 Hz	7

Temperature control	c
Standard version (STD)	S
Extended low temperature (ELT)	L
Extended high temperature (EHT)	H

Power supply	d
200-208 V 60 Hz	1
380-400 V 50 Hz	3
415 V 50 Hz	4
460 V 60 Hz	5
480 V 60 Hz	6
200-208 V 50 Hz	7

Water & N2 / Quick connects	e
Brass 1/4" NPT	1
Stainless steel 1/4" NPT	2
Brass 3/8" NPT	3
Stainless steel 3/8" NPT	4

Exhaust	f
Without check valve	0
With check valve	1

Inlet flange	g
DN 50	0
DN 100	1
DN 160	2

Roots By-pass	h
NA	0
Standard	1
Blocked	2

Purge line	i
Standard	1

ADK specific	j
Without	0
With	1

A4 series

The latest dry pump generation for the most demanding processes



A4 series

The new generation dry process pumps are specially developed for demanding processes in the semiconductor and coating industry. These pumps are made of sturdy materials to prevent corrosion. Their extended temperature range enables them to be perfectly adapted to the particular process and prevents deposits of particles from building up inside the pump.

Energy-efficient motors coupled with an optimized idling mode help to reduce fab operating costs. This new pump generation comes with extended monitoring options which enable the operating history of the pumps to be accessed. An early warning system for upcoming maintenance is also integrated.

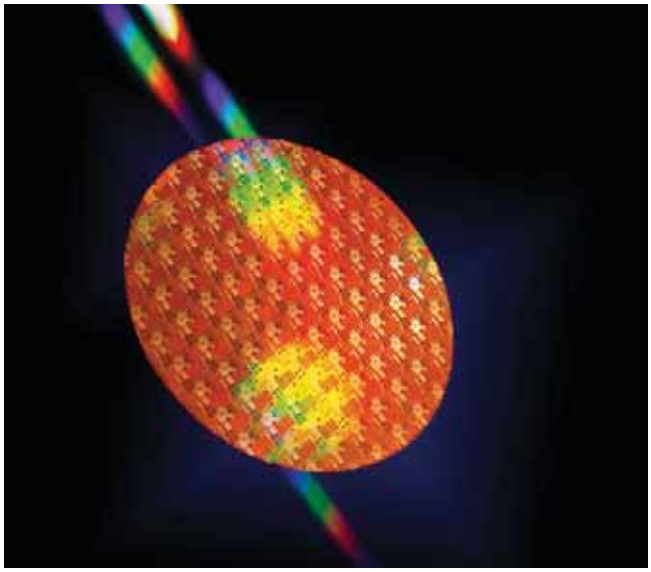
Find out more information on pumps in this series here:

Customer benefits

- Increased process resistance
- Reduced operating costs
- Extended monitoring options for detailed operating information
- Fully compatible with pumps from predecessor series

Typical applications

- Semiconductors
- Photovoltaics



Semiconductors



Photovoltaics

AD 73 KH

The new dry high-performance pump for process applications



AD 73 KH

The AD 73 KH pump was developed specifically for applications in demanding processes. It is distinguished particularly by its high pumping speed and low ultimate pressure. The outstanding ratio of pumping speed to energy use of the AD 73 KH is unparalleled in the market place. These pumps are tolerant to corrosion and particles and provide extensive options for adjusting them to your particular process.

Customer benefits

- Specially developed for demanding processes
- Very small footprint of less than 1 m^2
- Low energy consumption
- Reliable due to its anticorrosion and particle handling capability
- Enhanced safety due to a static strength of all internal components of 20 bar

Typical applications

- Photovoltaics
- Semiconductors
- Flat screen production



Photovoltaics



Semiconductors



Flat screen production

Roots pumps

For all low and medium vacuum applications



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Okta 6000 / M 230
Okta 8000 232
Okta 18000 234

Gas-circulation-cooled OktaLine G 236

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Okta 1500 G 238
Okta 4000 G 240
Okta 8000 G 242

OktaLine ATEX 244

Okta 500 ATEX 244
Okta 1000 ATEX 246
Okta 2000 ATEX 248
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Roots pumping stations 254

Roots pumps

For all low and medium vacuum applications

The OktaLine series Roots pumps can be perfectly tailored to customer-specific requirements by different pumping speeds and versions. This type of pump needs a backing pump both suited to the application and designed for the gas stream.

The high-precision production technology makes it possible to achieve very high compression values, which in turn allows for maximum pumping speed at very low gas exit temperatures. Pfeiffer Vacuum Roots pumps offer low operating costs at high uptime, since electrical power and (depending on the process) a gaseous purge medium (e.g. air) are all that they require. A high cost water-cooling unit is not required. The magnet coupled version makes leaks at the shaft feedthrough a thing of the past.

Used in combination with other Roots pumps or appropriate backing pumps, Roots pumps can be adapted perfectly to any application. Pfeiffer Vacuum as the leading supplier of vacuum solutions has more than 50 years of experience in the design of customer-specific solutions.



Overview of series and applications

■ = recommended	Analytics						Semiconductors									Coating										Industry									Nuclear research	R & D									Page
	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	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Roots pumps																																											
Convection-cooled OktaLine																																											
Okta 250							■	■	■	■					■	■	■		■			■	■	■	■		■			■			■		■		■		■	■		220
Okta 500							■	■	■	■					■	■	■		■			■	■	■	■		■			■	■		■		■		■		■	■		222
Okta 1000							■	■	■	■							■		■	■	■	■	■	■	■					■	■	■	■		■		■		■		■	224
Okta 2000							■	■	■	■									■	■	■	■	■	■	■					■	■	■	■	■	■		■		■		■	226
Okta 4000							■	■	■	■										■	■	■			■					■		■	■	■	■		■		■		■	228
Okta 6000																				■	■	■			■					■		■		■	■		■				■	230
Okta 8000																				■	■				■							■		■			■					232
Okta 18000																				■	■				■							■		■			■					234
Gas-circulation-cooled OktaLine G																																											
Okta 500 G																												■	■			■	■	■	■	■	■	■	■			236
Okta 1500 G																												■	■			■	■	■	■	■	■	■	■			238
Okta 4000 G																												■	■			■	■	■	■	■						240
Okta 8000 G																												■	■			■	■	■	■	■						242
OktaLine ATEX																																											
Okta 500 ATEX																																■	■	■								■	244
Okta 1000 ATEX																																■	■	■								■	246
Okta 2000 ATEX																																■	■	■								■	248
Okta 4000 ATEX																																■	■	■								■	250

Features at a glance

	Connection flange (inlet)								Coating									Leak rate		Version				
	DN 63	DN 100	DN 150	DN 160	DN 250	DN 300	DN 320	DN 400	250 m^3/h	500 m^3/h	1,000 m^3/h	1,500 m^3/h	2,000 m^3/h	4,000 m^3/h	6,000 m^3/h	8,000 m^3/h	18,000 m^3/h	1 · 10^{-2} hPa l/s	1 · 10^{-5} hPa l/s	Standard with motor	Standard without motor	Standard with motor and magnetic coupling	ATEX with motor and magnetic coupling [1]	Page
Roots pumps																								
Convection-cooled OktaLine																								
Okta 250	■								■									■	■	■	■	■		220
Okta 500		■								■								■	■	■	■	■		222
Okta 1000				■							■							■	■	■	■	■		224
Okta 2000				■									■					■	■	■	■	■		226
Okta 4000					■									■				■	■	■	■	■		228
Okta 6000					■										■			■	■	■	■	■		230
Okta 8000							■									■		■		■	■			232
Okta 18000								■ [2]									■	■		■	■			234
Gas-circulation-cooled OktaLine G																								
Okta 500 G		■								■								■			■			236
Okta 1500 G				■								■						■			■			238
Okta 4000 G					■									■				■			■			240
Okta 8000 G						■										■		■			■			242
OktaLine ATEX																								
Okta 500 ATEX		■ [3]								■									■				■	244
Okta 1000 ATEX			■ [3]								■								■				■	246
Okta 2000 ATEX			■ [3]										■						■				■	248
Okta 4000 ATEX					■ [3]									■					■				■	250

[1] With blocked overflow valve, ATEX in accordance with directive 94/ EC: group II, device category 3G, IIB, temperature class T3 X for ambient temperatures of + 5 °C to + 40 °C

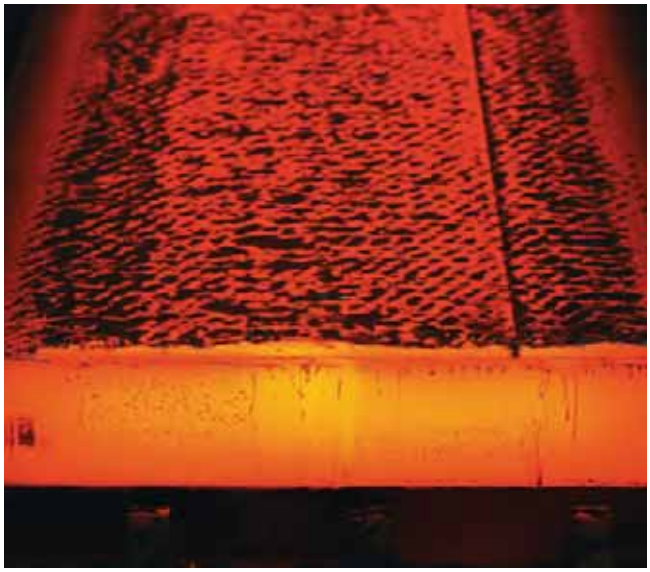
[2] PN 10

[3] PN 16



Customer benefits

- Large pumping speed range from 145 to 27,400 m^3/h
- Long life thanks to robust, compact design
- Short pumpdown time through high compression ratio and overflow valve
- Maintenance free, high operating safety and maximum availability due to the optional magnetic coupling
- Low operating costs through air cooling and optional magnetic coupling
- A cooling water unit is not required
- Pumps available in stainless steel versions upon request



Steel degassing



Vacuum drying



Electron beam welding

Available series

- Convection-cooled
- Gas-circulation-cooled
- ATEX (in accordance with Directive 94/9/EC)

The integrated overflow valve is standard in all convection-cooled pumps. This makes it possible to switch the pump on at atmospheric pressure. The pump is thus automatically protected from thermal overload. The additional pumping speed gains allow for shorter cycle times in load lock applications and time-critical processes. Monitoring with fault-prone pressure switches and slow start up with cost-intensive frequency converters is no longer needed.

Typical applications:

- Glass and foil coating
- Plasma etching
- PVD and CVD
- Vacuum metallurgy
- Space simulation
- Vacuum drying / freeze drying
- Steel degassing / secondary metallurgy
- Electron beam welding

Note:

- Additional equipment and motor voltages available upon request.
- The differential pressure at the overflow valve is based on a nominal speed at 60 Hz; for higher speeds or pressure differentials please contact the Pfeiffer Vacuum sales department.

Convection-cooled OktaLine Roots pumps for all low and medium vacuum applications

The pumping speeds of convection-cooled Roots pumps range from 145 to 27,400 m^3/ h. They can easily be combined and used in low and medium vacuum applications. Typical uses include industrial applications, coating, the semiconductor industry and research and development, or in chemical and process technology applications.

The gear box and bearings in our Roots pumps are separated from the gas pumping chamber. The contactless operating principle of the Roots pistons allows for technically dry operations.

A further advantage: thanks to convection cooling, installation and operating costs are significantly lower than for water-cooled pumps. The OktaLine can therefore be universally used.

The design concept for our proven Roots pumps was expanded to include magnetic couplings. These hermetically sealed pumps in the OktaLine M series mean that critical gases such as helium can be pumped without any problem and operating costs are minimized as the system works without a shaft feedthrough.



OktaLine



Space simulation



OktaLine M magnetic coupling



OktaLine G



Vacuum furnaces

OktaLine G gas-circulation-cooled Roots pumps. High differential pressures with lower power consumption

High pressure ranges and maximum differential pressures, in continuous operation up to 870 hPa, are ideal operating conditions for gas-circulation-cooled Roots pumps in the OktaLine G series.
At various power ratings from 5.5 kW up to a nominal rating of 200 kW, a pumping speed of 210 to 12,000 m^3/h can be achieved. Gas-circulation-cooled Roots pumps can be operated without backing pumps.

Thanks to the frequency converter, energy use can be significantly reduced. Pumping speeds can be precisely adjusted. Gas-circulation-cooled Roots pumps are characterized by maximum reproducibility in process technologies and significantly lower operating costs compared to vacuum process pumps, such as injectors or liquid ring pumps.

Used as stand-alone pumps, they can be used in the pressure range from 130 to 1,013 hPa. Connecting two of these pumps in series enables the ultimate pressure to be reduced to 20 to 30 hPa. In combination with further Roots pumps the possible ultimate pressure can be reduced to the medium vacuum range. The motors and gas coolers needed for operation are both designed to meet process-specific requirements. In combination with Roots pumps it is possible in many cases to dispense with a pumping stage by using the OktaLine G, which saves money and significantly increases operating reliability. Other specific parts such as couplings, temperature sensors, spray equipment and base frames are available as optional components.

OktaLine ATEX – For processes in explosion hazardous environments or for the evacuation of explosive gases

The pumps were developed in compliance with the ATEX directive and meet the highest explosion protection standards.

- The instructions in the operating manual must be followed when operating the pump. Please contact our technical department for additional support for your particular application.
- Outdoors: The pumps are suitable for use in device group II. Device category 3(G) for gases and vapors in explosion groups IIA and IIB in temperature class T3 according to the requirements of Directive 94/9/EC.
- Indoors: The pumps are suitable for conveying explosive mixtures in explosion groups IIA and IIB from Zone 2 (device category 3(G)) in temperature class T3 in accordance with Directive 94/9/EC.
- When the intervals for inspection, maintenance or review given in the operating manual are exceeded, or if repair, review, maintenance or inspection work is not performed properly then all guarantee and liability claims against Pfeiffer Vacuum shall be void. This shall also apply to the use of non-original Pfeiffer Vacuum replacement parts.

All ATEX pumps are hermetically sealed due to the magnetic coupling.

- Graphite cast iron, flange connection dimensions in accordance with DIN/EN 1092 PN 16



OktaLine ATEX



Chemical plants

Okta 250

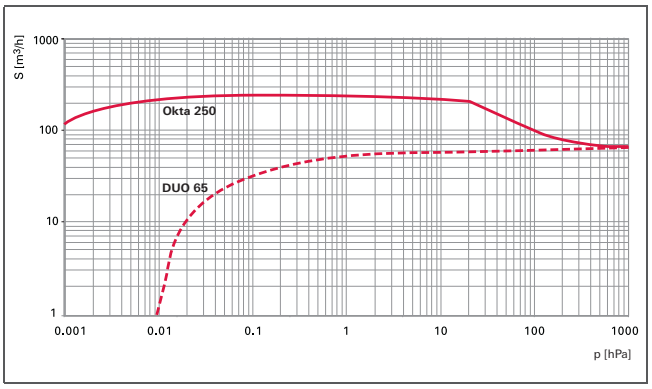


Roots pumps with a pumping speed from 145 to 440 m³/h:

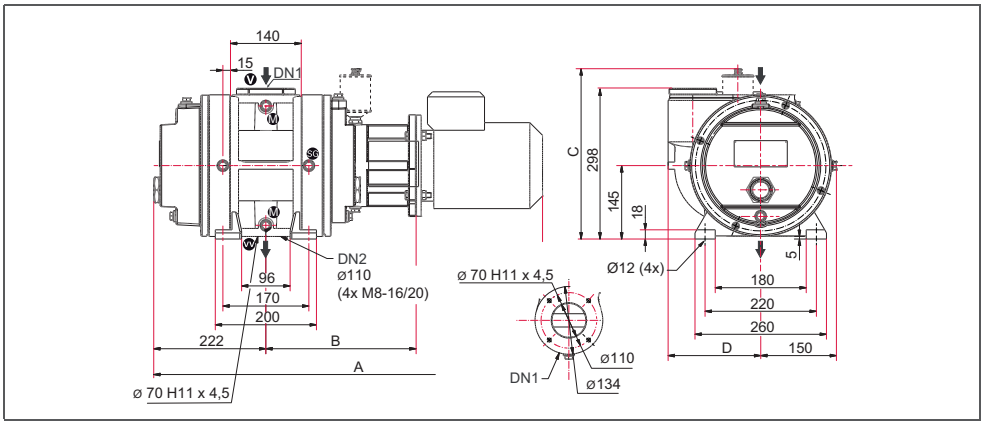
- High-performance Roots pump with a pumping speed of 145 to 440 m³/h
- With 3-phase motor, IE2
- No thermal overload thanks to integral overflow valve
- For applications in the low and medium vacuum

Okta = Standard pumps with radial shaft sealing rings, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F
Okta M = Standard pumps, hermetically sealed thanks to magnetic coupling, housing parts made of gray cast iron nodular graphite cast iron, flange connection in accordance with ISO-F

Pumping speed



Dimensions (in mm)



	Okta 250, Roots pump, 230/400 V, 50 Hz; 265/460 V, 60 Hz	Okta 250, Roots pump without motor	Okta 250 M, Roots pump, 230/400 V, 50 Hz; 265/460 V, 60 Hz
A	769 mm	-	799 mm
B	297 mm	297 mm	327 mm
C	337 mm	337 mm	298 mm
D	183 mm	183 mm	183 mm
Connections			
DN 1	DN 63 ISO-F	DN 63 ISO-F	DN 63 ISO-F
DN 2	DN 63 ISO-F	DN 63 ISO-F	DN 63 ISO-F

Technical data	Okta 250, Roots pump, 230/400 V, 50 Hz; 265/460 V, 60 Hz	Okta 250, Roots pump without motor	Okta 250 M, Roots pump, 230/400 V, 50 Hz; 265/460 V, 60 Hz
Flange (out)	DN 63 ISO-F	DN 63 ISO-F	DN 63 ISO-F
Flange (in)	DN 63 ISO-F	DN 63 ISO-F	DN 63 ISO-F
Version	Standard with motor	Standard without motor	Standard with motor and magnetic coupling
Operating fluid	P3	P3	P3
Operating fluid filling	1.5 l	1.5 l	1.5 l
Differential pressure at the overflow valve	75 hPa	75 hPa	75 hPa
Rotation speed	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}
Rotation speed max.	4500 min^{-1}	4500 min^{-1}	4500 min^{-1}
Rotation speed min.	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	75 dB (A)	75 dB (A)	75 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	70 dB (A)	70 dB (A)	70 dB (A)
Weight: with motor	95 kg		122 kg
Weight: without motor		85 kg	
Cooling method, standard	Air	Air	Air
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-6}$ Pa m^3/s
Motor protection	3TF		3TF
Nominal rotation speed at 50 Hz	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}
Rated power 50 Hz	0.75 kW		0.75 kW
Rated power 60 Hz	0.90 kW		0.90 kW
Nominal pumping speed	145-440 m^3/h	145-440 m^3/h	145-440 m^3/h
Nominal pumping speed at 50 Hz	290 m^3/h	290 m^3/h	290 m^3/h
Nominal pumping speed at 60 Hz	350 m^3/h	350 m^3/h	350 m^3/h
Mains requirement: voltage 50 Hz	230/400 V		230/400 V
Mains requirement: voltage 60 Hz	265/460 V		265/460 V
Protection category	IP 55	IP 55	IP 55
Ambient temperature	5-40 °C	5-40 °C	5-40 °C

Order number			
Okta 250	**PP W21 000**	**PP W21 001**	**PP W22 000**

Accessories			
Splinter shield for Okta 250 / 250 M	**PK 300 010 -X**	**PK 300 010 -X**	**PK 300 010 -X**

Okta 500

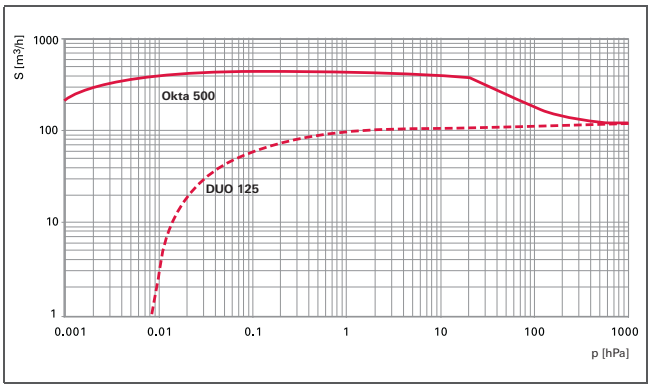


Roots pumps with a pumping speed of 280 to 840 m³/h:

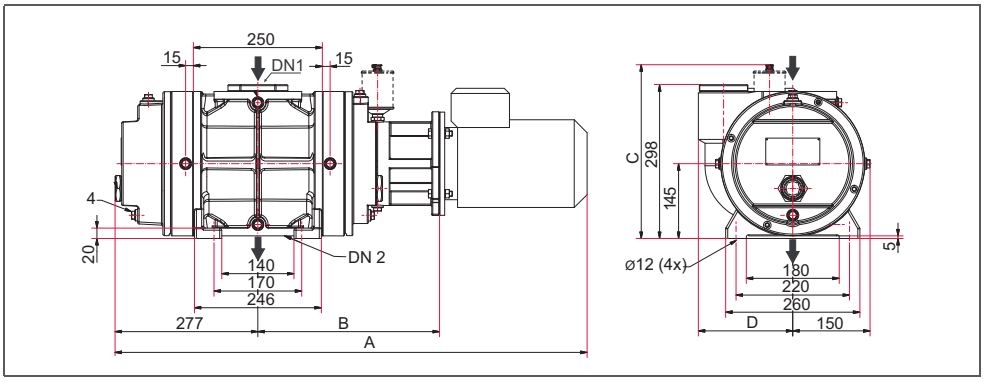
- High-performance Roots pump with a pumping speed of 280 to 840 m³/h
- With 3-phase motor, IE2
- No thermal overload thanks to integral overflow valve
- For applications in the low and medium vacuum

Okta = Standard pumps with radial shaft sealing rings, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F
Okta M = Standard pumps, hermetically sealed thanks to magnetic coupling, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F

Pumping speed



Dimensions (in mm)



	Okta 500, Roots pump, 230/400 V, 50 Hz ; 265/460 V, 60 Hz	Okta 500, Roots pump without motor	Okta 500 M, Roots pump, 230/400 V, 50 Hz ; 265/460 V, 60 Hz
A	915 mm	-	950 mm
B	352 mm	352 mm	382 mm
C	337 mm	337 mm	298 mm
D	183 mm	183 mm	183 mm
Connections			
DN 1	DN 100 ISO-F	DN 100 ISO-F	DN 100 ISO-F
DN 2	DN 100 ISO-F	DN 100 ISO-F	DN 100 ISO-F

Technical data	Okta 500, Roots pump, 230/400 V, 50 Hz ; 265/460 V, 60 Hz	Okta 500, Roots pump without motor	Okta 500 M, Roots pump, 230/400 V, 50 Hz ; 265/460 V, 60 Hz
Flange (out)	DN 100 ISO-F	DN 100 ISO-F	DN 100 ISO-F
Flange (in)	DN 100 ISO-F	DN 100 ISO-F	DN 100 ISO-F
Version	Standard with motor	Standard without motor	Standard with motor and magnetic coupling
Operating fluid	P3	P3	P3
Operating fluid filling	1.5 l	1.5 l	1.5 l
Differential pressure at the overflow valve	75 hPa	75 hPa	75 hPa
Rotation speed	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}
Rotation speed max.	4500 min^{-1}	4500 min^{-1}	4500 min^{-1}
Rotation speed min.	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	75 dB (A)	75 dB (A)	75 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	70 dB (A)	70 dB (A)	70 dB(A)
Weight: with motor	132 kg		145 kg
Weight: without motor		115 kg	
Cooling method, standard	Air	Air	Air
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-6}$ Pa m^3/s
Motor protection	3TF		3TF
Nominal rotation speed at 50 Hz	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}
Rated power 50 Hz	1.5 kW		1.5 kW
Rated power 60 Hz	1.8 kW		1.8 kW
Nominal pumping speed	280-840 m^3/h	280-840 m^3/h	280-840 m^3/h
Nominal pumping speed at 50 Hz	560 m^3/h	560 m^3/h	560 m^3/h
Nominal pumping speed at 60 Hz	670 m^3/h	670 m^3/h	670 m^3/h
Mains requirement: voltage 50 Hz	230/400 V		230/400 V
Mains requirement: voltage 60 Hz	265/460 V		265/460 V
Protection category	IP 55	IP 55	IP 55
Ambient temperature	5-40 °C	5-40 °C	5-40 °C

Order number			
Okta 500	**PP W31 000**	**PP W31 001**	**PP W32 000**

Accessories			
Splinter shield for Okta 500 / 500 M / 500 G	**PP 030 149 AX**	**PP 030 149 AX**	**PP 030 149 AX**

Okta 1000



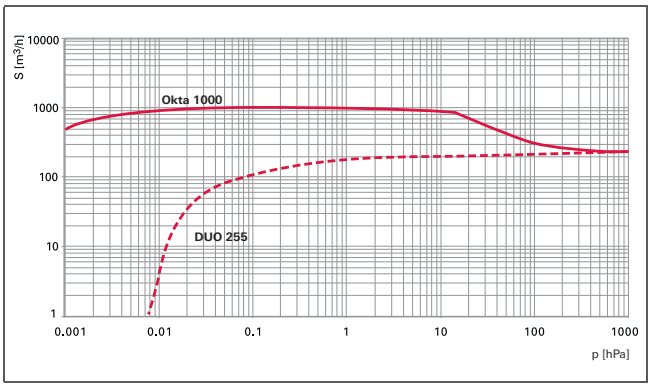
Roots pump with a pumping speed of 590 to 1775 m³/h:

- High-performance Roots pump with a pumping speed of 590 to 1775 m³/h
- For mains voltage: 230/400 V, 50 Hz respectively 265/460 V, 60 Hz
- No thermal overload thanks to integral overflow valve
- For applications in the low and medium vacuum

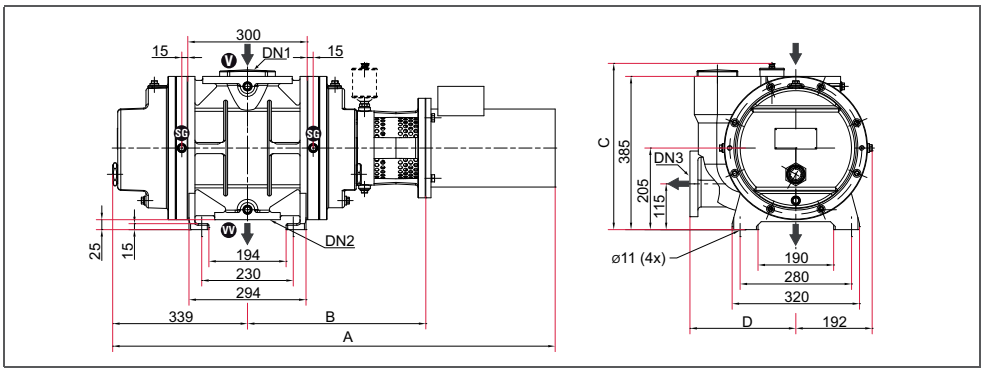
Okta = Standard pumps with radial shaft sealing rings, housing parts made of gray cast iron or nodular graphite cast iron , flange connection in accordance with ISO-F

Okta = Standard pumps, hermetically sealed thanks to magnetic coupling, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F

Pumping speed



Dimensions (in mm)



	Okta 1000, Roots pump, 230/400 V, 50 Hz ; 265/460 V, 60 Hz	Okta 1000, Roots pump without motor	Okta 1000 M, Roots pump, 230/400 V, 50 Hz ; 265/460, 60 Hz
A	1112 mm	-	1125 mm
B	448 mm	448 mm	461 mm
C	418 mm	418 mm	402 mm
D	266 mm	266 mm	266 mm
Connections			
DN 1	DN 160 ISO-F	DN 160 ISO-F	DN 160 ISO-F
DN 2	DN 100 ISO-F	DN 100 ISO-F	DN 100 ISO-F
DN 3	DN 100 ISO-F	DN 100 ISO-F	DN 100 ISO-F

Technical data	Okta 1000, Roots pump, 230/400 V, 50 Hz ; 265/460 V, 60 Hz	Okta 1000, Roots pump without motor	Okta 1000 M, Roots pump, 230/400 V, 50 Hz ; 265/460, 60 Hz
Flange (out)	DN 100 ISO-F	DN 100 ISO-F	DN 100 ISO-F
Flange (in)	DN 160 ISO-F	DN 160 ISO-F	DN 160 ISO-F
Version	Standard with motor	Standard without motor	Standard with motor and magnetic coupling
Operating fluid	P3	P3	P3
Operating fluid filling	2.9 l	2.9 l	2.9 l
Differential pressure at the overflow valve	45 hPa	45 hPa	45 hPa
Rotation speed	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}
Rotation speed max.	4500 min^{-1}	4500 min^{-1}	4500 min^{-1}
Rotation speed min.	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	75 dB (A)	75 dB (A)	75 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	72 dB (A)	72 dB (A)	72 dB (A)
Weight: with motor	240 kg		265 kg
Weight: without motor		215 kg	
Cooling method, standard	Air	Air	Air
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s	$< 1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-6}$ Pa m^3/s
Motor protection	3TF		3TF
Nominal rotation speed at 50 Hz	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}
Rated power 50 Hz	3.0 kW		3.0 kW
Rated power 60 Hz	3.5 kW		3.5 kW
Nominal pumping speed	590-1775 m^3/h	590-1775 m^3/h	590-1775 m^3/h
Nominal pumping speed at 50 Hz	1180 m^3/h	1180 m^3/h	1180 m^3/h
Nominal pumping speed at 60 Hz	1420 m^3/h	1420 m^3/h	1420 m^3/h
Mains requirement: voltage 50 Hz	230/400 V		230/400 V
Mains requirement: voltage 60 Hz	265/460 V		265/460 V
Protection category	IP 55	IP 55	IP 55
Ambient temperature	5-40 °C	5-40 °C	5-40 °C

Order number			
Okta 1000	**PP W41 000**	**PP W41 001**	**PP W42 000**

Accessories			
Splinter shield for Okta 1000 / 1000 M / 1500 G / 2000 / 2000 M	**PP 031 114 -X**	**PP 031 114 -X**	**PP 031 114 -X**

Okta 2000

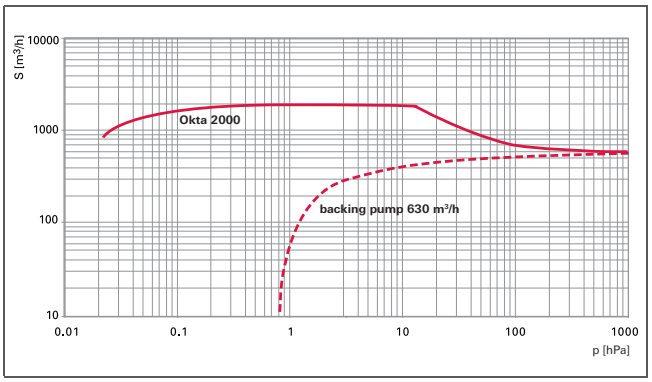


Roots pump with a pumping speed of 1075 to 3230 m³/h:

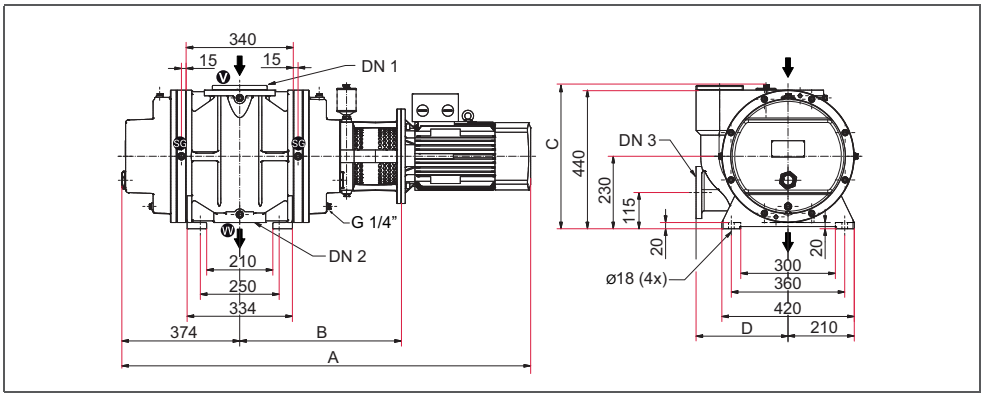
- High-performance Roots pump with a pumping speed of 1075 to 3230 m³/h
- For mains voltage: 230/400 V, 50 Hz respectively 265/460 V, 60 Hz
- No thermal overload thanks to integral overflow valve
- For applications in the low and medium vacuum

Okta = Standard pumps with radial shaft sealing rings, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F
Okta M = Standard pumps, hermetically sealed thanks to magnetic coupling, housing parts made of gray cast iron nodular graphite cast iron , flange connection in accordance with ISO-F

Pumping speed



Dimensions (in mm)



	Okta 2000, Roots pump, 230/400 V, 50 Hz ; 265/460 V, 60 Hz	Okta 2000, Roots pump without motor	Okta 2000 M, Roots pump, 230/400 V, 50 Hz ; 265/460 V, 60 Hz
A	1297 mm	-	1317 mm
B	513 mm	513 mm	532 mm
C	458 mm	458 mm	458 mm
D	292 mm	292 mm	292 mm
Connections			
DN 1	DN 160 ISO-F	DN 160 ISO-F	DN 160 ISO-F
DN 2	DN 100 ISO-F	DN 100 ISO-F	DN 100 ISO-F
DN 3	DN 100 ISO-F	DN 100 ISO-F	DN 100 ISO-F

Technical data	Okta 2000, Roots pump, 230/400 V, 50 Hz ; 265/460 V, 60 Hz	Okta 2000, Roots pump without motor	Okta 2000 M, Roots pump, 230/400 V, 50 Hz ; 265/460 V, 60 Hz
Flange (out)	DN 100 ISO-F	DN 100 ISO-F	DN 100 ISO-F
Flange (in)	DN 160 ISO-F	DN 160 ISO-F	DN 160 ISO-F
Version	Standard with motor	Standard without motor	Standard with motor and magnetic coupling
Operating fluid	P3	P3	P3
Operating fluid filling	5 l	5 l	5 l
Differential pressure at the overflow valve	35 hPa	35 hPa	35 hPa
Rotation speed	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}
Rotation speed max.	4500 min^{-1}	4500 min^{-1}	4500 min^{-1}
Rotation speed min.	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	75 dB (A)	75 dB (A)	75 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	72 dB (A)	72 dB (A)	72 dB (A)
Weight: with motor	340 kg		360 kg
Weight: without motor		290 kg	
Cooling method, standard	Air	Air	Air
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-6}$ Pa m^3/s
Motor protection	3TF		3TF
Nominal rotation speed at 50 Hz	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}
Rated power 50 Hz	5.5 kW		5.5 kW
Rated power 60 Hz	6.3 kW		6.3 kW
Nominal pumping speed	1075-3230 m^3/h	1075-3230 m^3/h	1075-3230 m^3/h
Nominal pumping speed at 50 Hz	2155 m^3/h	2155 m^3/h	2155 m^3/h
Nominal pumping speed at 60 Hz	2585 m^3/h	2585 m^3/h	2585 m^3/h
Mains requirement: voltage 50 Hz	230/400 V		230/400 V
Mains requirement: voltage 60 Hz	265/460 V		265/460 V
Protection category	IP 55	IP 55	IP 55
Ambient temperature	5-40 °C	5-40 °C	5-40 °C

Order number			
Okta 2000	**PP W61 000**	**PP W61 001**	**PP W62 000**

Accessories			
Splinter shield for Okta 1000 / 1000 M / 1500 G / 2000 / 2000 M	**PP 031 114 -X**	**PP 031 114 -X**	**PP 031 114 -X**

Okta 4000

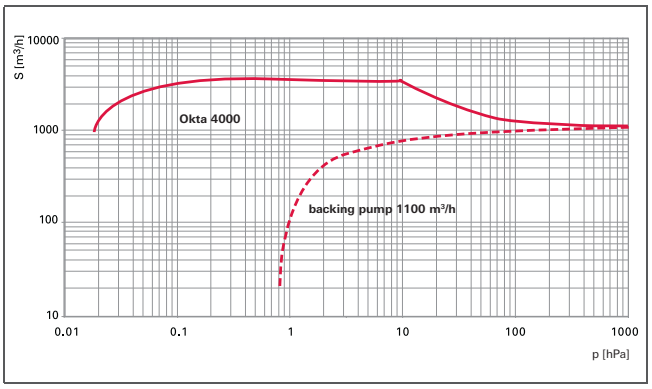


Roots pump with a pumping speed of 2160 to 6490 m³/h:

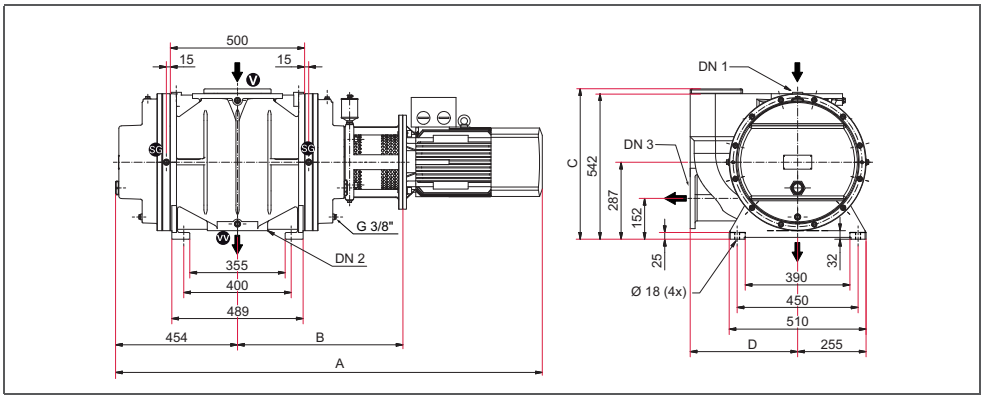
- High-performance Roots pump with a pumping speed of 2160 to 6490 m³/h
- For mains voltage: 400/690 V, 50 Hz respectively 460 V, 60 Hz
- No thermal overload thanks to integral overflow valve
- For applications in the low and medium vacuum

Okta = Standard pumps with radial shaft sealing rings, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F
Okta M = Standard pumps, hermetically sealed thanks to magnetic coupling, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F

Pumping speed



Dimensions (in mm)



	Okta 4000, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz	Okta 4000, Roots pump without motor	Okta 4000 M, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz
A	1589 mm	-	1651 mm
B	616 mm	616 mm	678 mm
C	560 mm	560 mm	560 mm
D	400 mm	400 mm	400 mm
Connections			
DN 1	DN 250 ISO-F	DN 250 ISO-F	DN 250 ISO-F
DN 2	DN 160 ISO-F	DN 160 ISO-F	DN 160 ISO-F
DN 3	DN 160 ISO-F	DN 160 ISO-F	DN 160 ISO-F

Technical data	Okta 4000, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz	Okta 4000, Roots pump without motor	Okta 4000 M, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz
Flange (out)	DN 160 ISO-F	DN 160 ISO-F	DN 160 ISO-F
Flange (in)	DN 250 ISO-F	DN 250 ISO-F	DN 250 ISO-F
Version	Standard with motor	Standard without motor	Standard with motor and magnetic coupling
Operating fluid	P3	P3	P3
Operating fluid filling	6.8 l	6.8 l	6.8 l
Differential pressure at the overflow valve	25 hPa	25 hPa	25 hPa
Rotation speed	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}
Rotation speed max.	4500 min^{-1}	4500 min^{-1}	4500 min^{-1}
Rotation speed min.	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	79 dB (A)	79 dB (A)	79 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	74 dB (A)	74 dB (A)	74 dB (A)
Weight: with motor	640 kg		655 kg
Weight: without motor		520 kg	
Cooling method, standard	Air	Air	Air
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-6}$ Pa m^3/s
Motor protection	3TF		3TF
Nominal rotation speed at 50 Hz	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}
Rated power 50 Hz	11 kW		11 kW
Rated power 60 Hz	13.2 kW		13.2 kW
Nominal pumping speed	2160-6490 m^3/h	2160-6490 m^3/h	2160-6490 m^3/h
Nominal pumping speed at 50 Hz	4325 m^3/h	4325 m^3/h	4325 m^3/h
Nominal pumping speed at 60 Hz	5190 m^3/h	5190 m^3/h	5190 m^3/h
Mains requirement: voltage 50 Hz	400/690 V		400/690 V
Mains requirement: voltage 60 Hz	460 V		460 V
Protection category	IP 55	IP 55	IP 55
Ambient temperature	5-40 °C	5-40 °C	5-40 °C

Order number			
Okta 4000	**PP W71 000**	**PP W71 001**	**PP W72 000**

Accessories			
Splinter shield for Okta 4000 / 4000 M / 4000 G / 6000 / 6000 M	**PP 031 136 -X**	**PP 031 136 -X**	**PP 031 136 -X**

Okta 6000

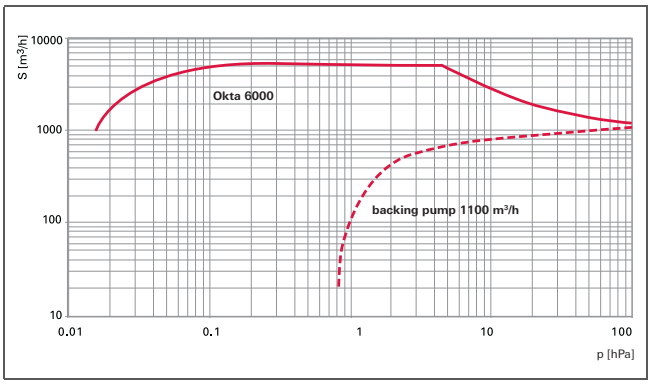


Roots pump with a pumping speed of 3240 to 9730 m³/h:

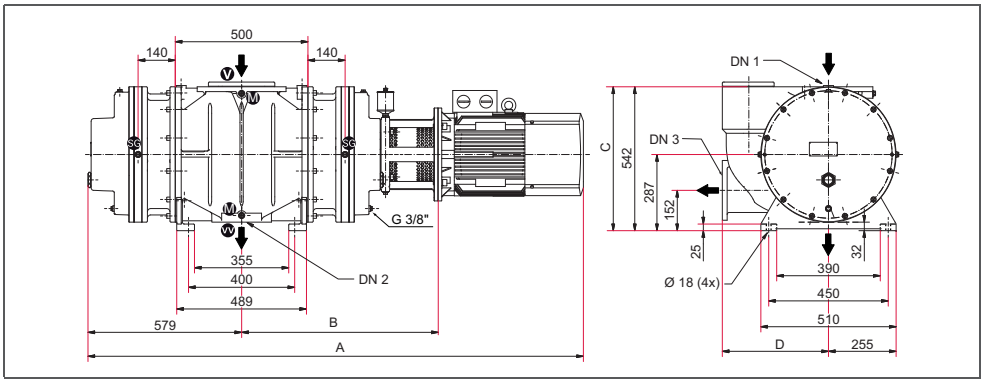
- High-performance Roots pump with a pumping speed of 3240 to 9730 m³/h
- For mains voltage: 400 V, 50 Hz respectively 460 V, 60 Hz
- No thermal overload thanks to integral overflow valve
- For applications in the low and medium vacuum

Okta = Standard pumps with radial shaft sealing rings, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F
Okta M = Standard pumps, hermetically sealed thanks to magnetic coupling, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F

Pumping speed



Dimensions (in mm)



	Okta 6000, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz	Okta 6000, Roots pump without motor	Okta 6000 M, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz
A	1867 mm	-	1954 mm
B	741 mm	655 mm	828 mm
C	560 mm	510 mm	560 mm
D	400 mm	390 mm	400 mm
Connections			
DN 1	DN 250 ISO-F	DN 250 ISO-F	DN 250 ISO-F
DN 2	DN 160 ISO-F	DN 160 ISO-F	DN 160 ISO-F
DN 3	DN 160 ISO-F	DN 160 ISO-F	DN 160 ISO-F

Technical data	Okta 6000, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz	Okta 6000, Roots pump without motor	Okta 6000 M, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz
Flange (out)	DN 160 ISO-F	DN 160 ISO-F	DN 160 ISO-F
Flange (in)	DN 250 ISO-F	DN 250 ISO-F	DN 250 ISO-F
Version	Standard with motor	Standard without motor	Standard with motor and magnetic coupling
Operating fluid	P3	P3	P3
Operating fluid filling	6.8 l	6.8 l	6.8 l
Differential pressure at the overflow valve	20 hPa	20 hPa	20 hPa
Rotation speed	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}	from 1500 to 4500 min^{-1}
Rotation speed max.	4500 min^{-1}	4500 min^{-1}	4500 min^{-1}
Rotation speed min.	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	79 dB (A)	79 dB (A)	79 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	74 dB (A)	74 dB (A)	74 dB (A)
Weight: with motor	840 kg		875 kg
Weight: without motor		715 kg	
Cooling method, standard	Air	Air	Air
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-6}$ Pa m^3/s
Motor protection	3TF		3TF
Nominal rotation speed at 50 Hz	3000 min^{-1}	3000 min^{-1}	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}	3600 min^{-1}	3600 min^{-1}
Rated power 50 Hz	15.0 kW		15.0 kW
Rated power 60 Hz	18.5 kW		18.5 kW
Nominal pumping speed	3240-9730 m^3/h	3240-9730 m^3/h	3240-9730 m^3/h
Nominal pumping speed at 50 Hz	6485 m^3/h	6485 m^3/h	6485 m^3/h
Nominal pumping speed at 60 Hz	7785 m^3/h	7785 m^3/h	7785 m^3/h
Mains requirement: voltage 50 Hz	400/690 V		400/690 V
Mains requirement: voltage 60 Hz	460 V		460 V
Protection category	IP 55	IP 55	IP 55
Ambient temperature	5-40 °C	5-40 °C	5-40 °C

Order number			
Okta 6000	**PP W76 000**	**PP W76 001**	**PP W77 000**

Accessories			
Splinter shield for Okta 4000 / 4000 M / 4000 G / 6000 / 6000 M	**PP 031 136 -X**	**PP 031 136 -X**	**PP 031 136 -X**

Okta 8000

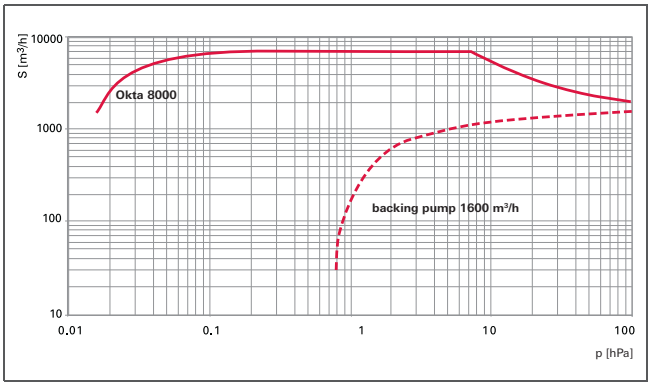


Roots pump with a pumping speed of 3350 to 12550 m³/h:

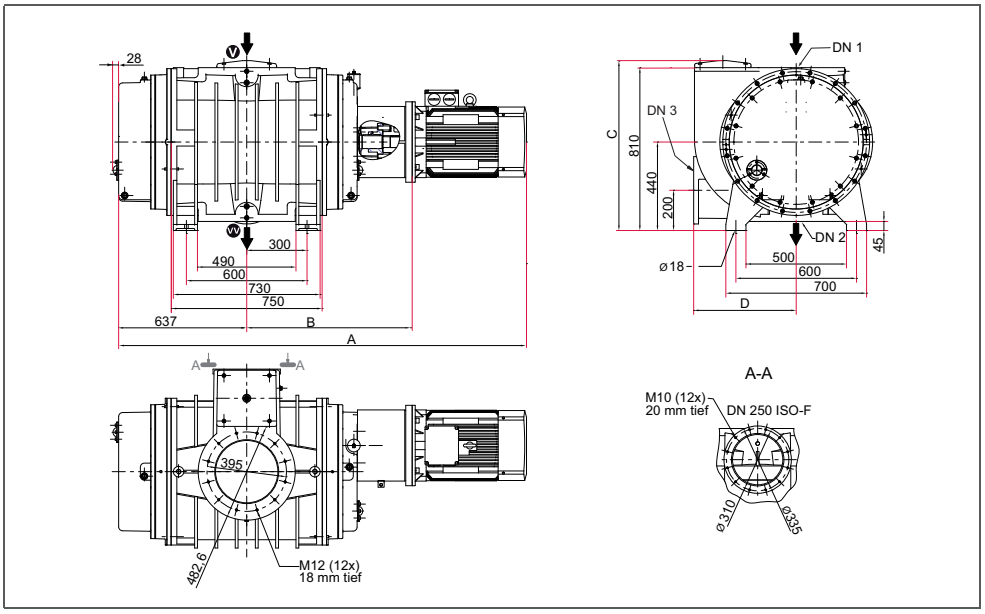
- High-performance Roots pump with a pumping speed of 3350 to 12550 m³/h
- For mains voltage: 400 V, 50 Hz respectively 400/690 V, 50 Hz
- No thermal overload thanks to integral overflow valve
- For applications in the low and medium vacuum

Okta = Standard pumps with radial shaft sealing rings, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F

Pumping speed



Dimensions (in mm)



	Okta 8000, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz	Okta 8000, Roots pump without motor
A	2156 mm	-
B	791 mm	791 mm
C	845 mm	845 mm
D	510 mm	510 mm
Connections		
DN 1	DN 320 ISO-F	DN 320 ISO-F
DN 2	DN 320 ISO-F	DN 320 ISO-F
DN 3	DN 250 ISO-F	DN 250 ISO-F

Technical data	Okta 8000, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz	Okta 8000, Roots pump without motor
Flange (out)	DN 320 ISO-F	DN 320 ISO-F
Flange (in)	DN 320 ISO-F	DN 320 ISO-F
Version	Standard with motor	Standard without motor
Operating fluid	P3	P3
Operating fluid filling	21 l	21 l
Differential pressure at the overflow valve	23 hPa	23 hPa
Rotation speed	from 1200 to 2250 min^{-1}	from 1200 to 2250 min^{-1}
Rotation speed max.	2250 min^{-1}	2250 min^{-1}
Rotation speed min.	1200 min^{-1}	1200 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	78 dB (A)	78 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	74 dB (A)	74 dB (A)
Weight: with motor	1660 kg	
Weight: without motor		1480 kg
Cooling method, standard	Air	Air
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-3}$ Pa m^3/s
Motor protection	3TF	
Nominal rotation speed at 50 Hz	1500 min^{-1}	1500 min^{-1}
Nominal rotation speed at 60 Hz	1800 min^{-1}	1800 min^{-1}
Rated power 50 Hz	22 kW	
Rated power 60 Hz	25 kW	
Nominal pumping speed	3350-12550 m^3/h	3350-12550 m^3/h
Nominal pumping speed at 50 Hz	8370 m^3/h	8370 m^3/h
Nominal pumping speed at 60 Hz	10040 m^3/h	10040 m^3/h
Mains requirement: voltage 50 Hz	400/690 V	
Mains requirement: voltage 60 Hz	460 V	
Protection category	IP 55	IP 55
Ambient temperature	5-40 °C	5-40 °C

Order number		
Okta 8000	**PP W80 000**	**PP W80 001**

Accessories		
Splinter shield for Okta 8000/Okta 8000 G	**PP 030 152 -X**	**PP 030 152 -X**

Okta 18000

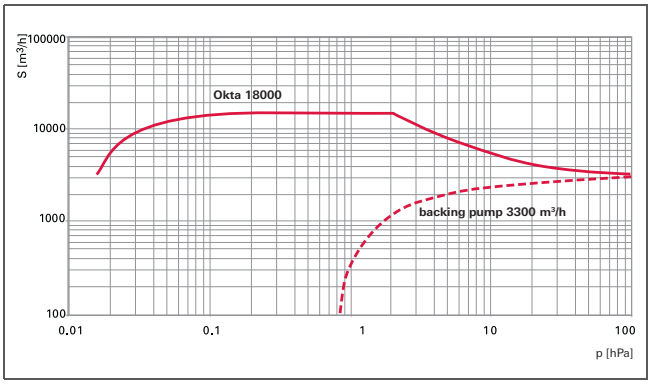


Roots pump with a pumping speed of 7310 to 27400 m³/h:

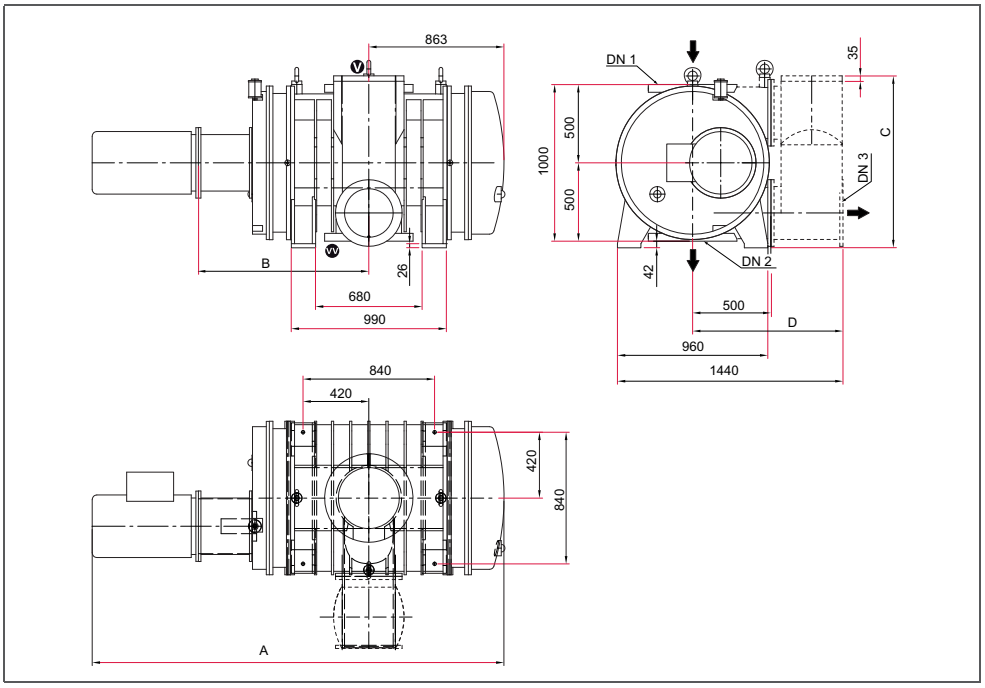
- High-performance Roots pump with a pumping speed of 7310 to 27400 m³/h
- For mains voltage: 400 V, 50 Hz respectively 460 V, 60 Hz
- No thermal overload thanks to integral overflow valve
- For applications in the low and medium vacuum

Okta = Standard pumps with radial shaft sealing rings, housing parts made of gray cast iron or nodular graphite cast iron, flange connection in accordance with ISO-F

Pumping speed



Dimensions (in mm)



	Okta 18000, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz	Okta 18000, Roots pump without motor
A	2789 mm	-
B	1090 mm	1090 mm
C	1099 mm	1099 mm
D	960 mm	960 mm
Connections		
DN 1	DN 400 PN 10	DN 400 PN 10
DN 2	DN 400 PN 10	DN 400 PN 10
DN 3	DN 320 ISO-F	DN 320 ISO-F

Technical data	Okta 18000, Roots pump, 400/690 V, 50 Hz ; 460 V, 60 Hz	Okta 18000, Roots pump without motor
Flange (out)	DN 400 PN 10	DN 400 PN 10
Flange (in)	DN 400 PN 10	DN 400 PN 10
Version	Standard with motor	Standard without motor
Operating fluid	P3	P3
Operating fluid filling	68 l	68 l
Differential pressure at the overflow valve	7 hPa	7 hPa
Rotation speed	from 1200 to 2250 min^{-1}	from 1200 to 2250 min^{-1}
Rotation speed max.	2250 min^{-1}	2250 min^{-1}
Rotation speed min.	1200 min^{-1}	1200 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	79 dB (A)	79 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	75 dB (A)	75 dB (A)
Weight: with motor	3100 kg	
Weight: without motor		2800 kg
Cooling method, standard	Air	Air
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s	$1 \cdot 10^{-3}$ Pa m^3/s
Motor protection	3TF	
Nominal rotation speed at 50 Hz	1500 min^{-1}	
Nominal rotation speed at 60 Hz	1800 min^{-1}	
Rated power 50 Hz	45 kW	
Rated power 60 Hz	52 kW	
Nominal pumping speed	7310-27400 m^3/h	7310-27400 m^3/h
Nominal pumping speed at 50 Hz	18270 m^3/h	18270 m^3/h
Nominal pumping speed at 60 Hz	21925 m^3/h	21925 m^3/h
Mains requirement: voltage 50 Hz	400/690 V	
Mains requirement: voltage 60 Hz	460 V	
Protection category	IP 55	
Ambient temperature	5-40 °C	5-40 °C

Order number		
Okta 18000	**PP W90 000**	**PP W90 001**

Accessories		
Splinter shield for Okta 18000	**PP 030 336 -T**	**PP 030 336 -T**

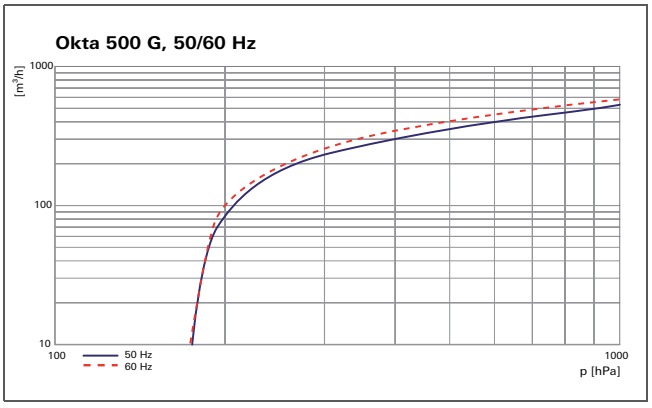
Okta 500 G

Gas-cooled Roots pump with a pumping speed range from 210 to 630 m³/h

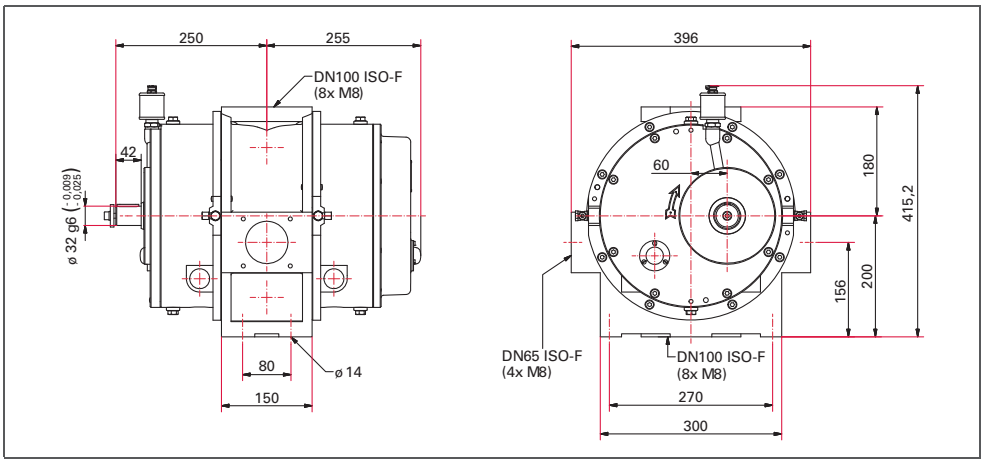


- High-performance gas cooled roots pump with a pumping speed from 210 to 630 m³/h
- For applications in the low and medium vacuum
- Single stage pressure range from 130 to 1013 hPa, in series with smaller final pressure
- Connection flange DN 100 ISO-F
- No thermal overload thanks to gas cooling
- With sealing gas connection
- Customized design and offer of a complete unit for motor, gas cooler and coupling on request

Pumping speed



Dimensions (in mm)



Technical data	Okta 500 G, gas-cooled Roots pump without motor, DN 100 ISO-F
Flange (out)	DN 100 ISO-F
Flange (in)	DN 100 ISO-F
Operating fluid	P3
Operating fluid filling	3 l
Rotation speed	from 1200 to 3600 min^{-1}
Rotation speed max.	3600 min^{-1}
Rotation speed min.	1200 min^{-1}
Ultimate pressure without gas ballast	130 hPa
Weight: without motor	125 kg
Cooling method, standard	gas-cooled
Cooling gas connection	DN 63 ISO-F
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s
Motor rating	max. 18.5 kW
Nominal rotation speed at 50 Hz	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}
Nominal pumping speed	210-630 m^3/h
Nominal pumping speed at 50 Hz	520 m^3/h
Nominal pumping speed at 60 Hz	630 m^3/h
Noise level with connected exhaust line	75-105 dB (A)
Protection category	IP 55
Sealing gas	Yes
Ambient temperature	5-40 °C

Order number	
Okta 500 G	**PP G30 001**

Accessories	
Splinter shield for Okta 500 / 500 M / 500 G	**PP 030 149 AX**

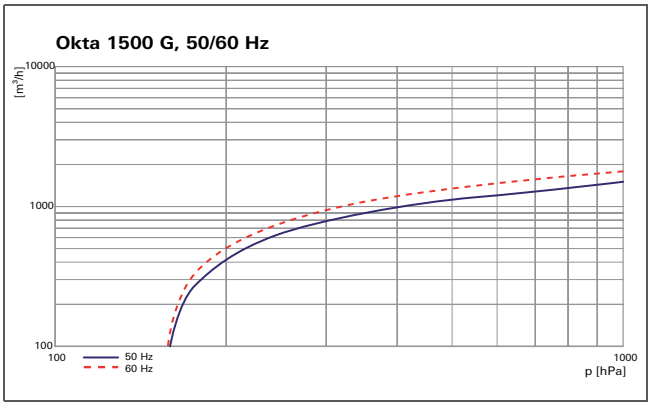
Okta 1500 G

Gas-cooled Roots pump with a pumping speed range from 750 to 3600 m³/h

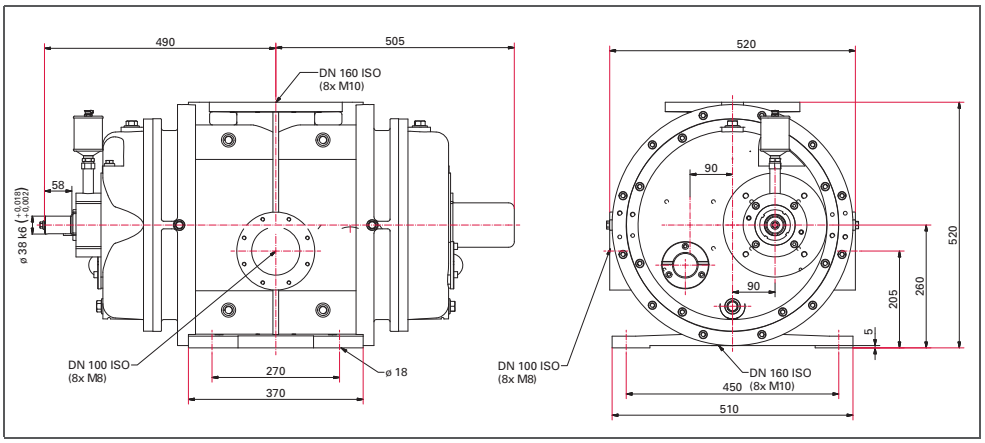


- High-performance gas cooled roots pump with a pumping speed from 750 to 3600 m³/h
- For applications in the low and medium vacuum
- Single stage pressure range from 130 to 1013 hPa, in series with smaller final pressure
- Connection flange DN 160 ISO-F
- No thermal overload thanks to gas cooling
- With sealing gas connection
- Customized design and offer for motor, gas cooler, and coupling on request

Pumping speed



Dimensions (in mm)



Technical data	Okta 1500 G, gas-cooled Roots pump without motor, DN 160 ISO-F
Flange (out)	DN 160 ISO-F
Flange (in)	DN 160 ISO-F
Operating fluid	P3
Operating fluid filling	7 l
Rotation speed	from 750 to 3600 min^{-1}
Rotation speed max.	3600 min^{-1}
Rotation speed min.	750 min^{-1}
Ultimate pressure without gas ballast	130 hPa
Weight: without motor	460 kg
Cooling method, standard	gas-cooled
Cooling gas connection	DN 100 ISO-F
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s
Motor rating	max. 2 x 30 kW
Nominal rotation speed at 50 Hz	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}
Nominal pumping speed	750-3600 m^3/h
Nominal pumping speed at 50 Hz	1500 m^3/h
Nominal pumping speed at 60 Hz	1800 m^3/h
Noise level with connected exhaust line	75-105 dB (A)
Protection category	IP 55
Sealing gas	Yes
Ambient temperature	5-40 °C

Order number	
Okta 1500 G	**PP G50 001**

Accessories	
Splinter shield for Okta 1000 / 1000 M / 1500 G / 2000 / 2000 M	**PP 031 114 -X**

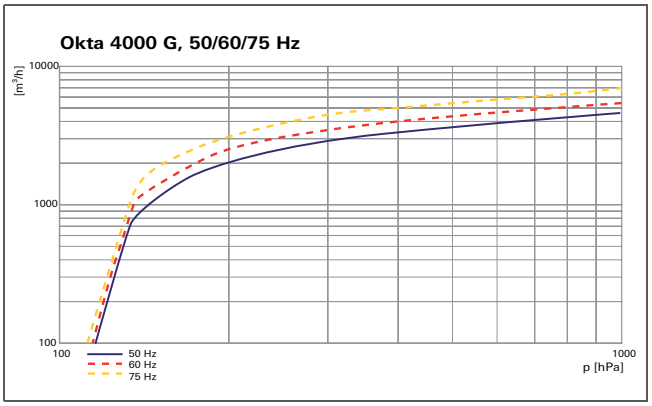
Okta 4000 G

Gas-cooled Roots pump with a pumping speed range from 2300 to 6900 m³/h

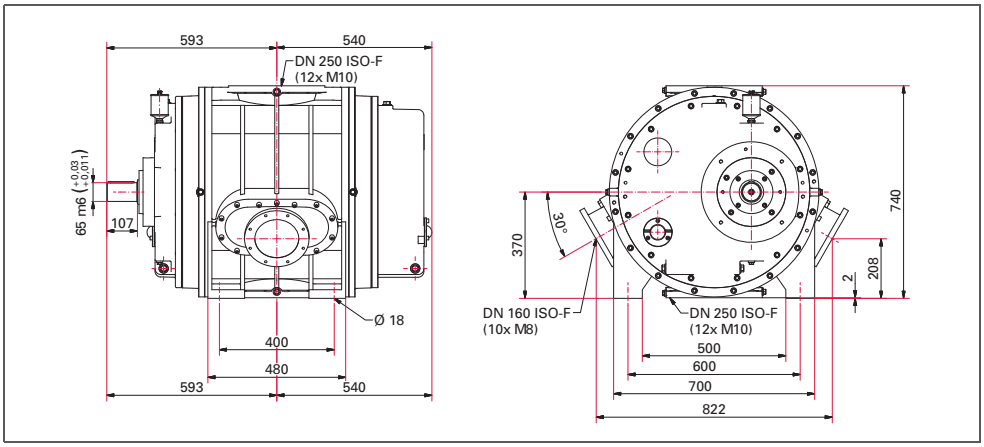


- High-performance gas cooled roots pump with a pumping speed from 2300 to 6900 m³/h
- For applications in the low and medium vacuum
- Single stage pressure range from 130 to 1013 hPa, in series with smaller final pressure
- Connection flange DN 250 ISO-F
- No thermal overload thanks to gas cooling
- With sealing gas connection
- Customized design and offer for motor, gas cooler, and coupling on request

Pumping speed



Dimensions (in mm)



Technical data	Okta 4000 G, gas-cooled Roots pump without motor, DN 250 ISO-F
Flange (out)	DN 250 ISO-F
Flange (in)	DN 250 ISO-F
Operating fluid	P3
Operating fluid filling	21 l
Rotation speed	from 750 to 2250 min^{-1}
Rotation speed max.	2250 min^{-1}
Rotation speed min.	750 min^{-1}
Ultimate pressure without gas ballast	130 hPa
Weight: without motor	1150 kg
Cooling method, standard	gas-cooled
Cooling gas connection	DN 160 ISO-F
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s
Motor rating	max. 132 kW
Nominal rotation speed at 50 Hz	1500 min^{-1}
Nominal rotation speed at 60 Hz	1800 min^{-1}
Nominal pumping speed	2300-6900 m^3/h
Nominal pumping speed at 50 Hz	4600 m^3/h
Nominal pumping speed at 60 Hz	5500 m^3/h
Noise level with connected exhaust line	75-105 dB (A)
Protection category	IP 55
Sealing gas	Yes
Ambient temperature	5-40 °C

Order number	
Okta 4000 G	**PP G70 001**

Accessories	
Splinter shield for Okta 4000 / 4000 M / 4000 G / 6000 / 6000 M	**PP 031 136 -X**

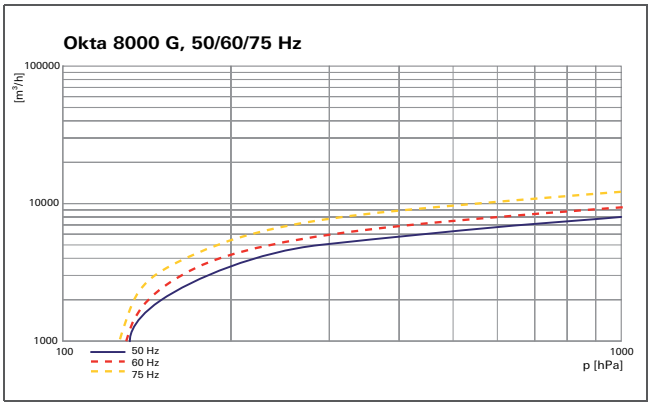
Okta 8000 G

Gas-cooled Roots pump with a pumping speed range from 4000 to 12000 m³/h

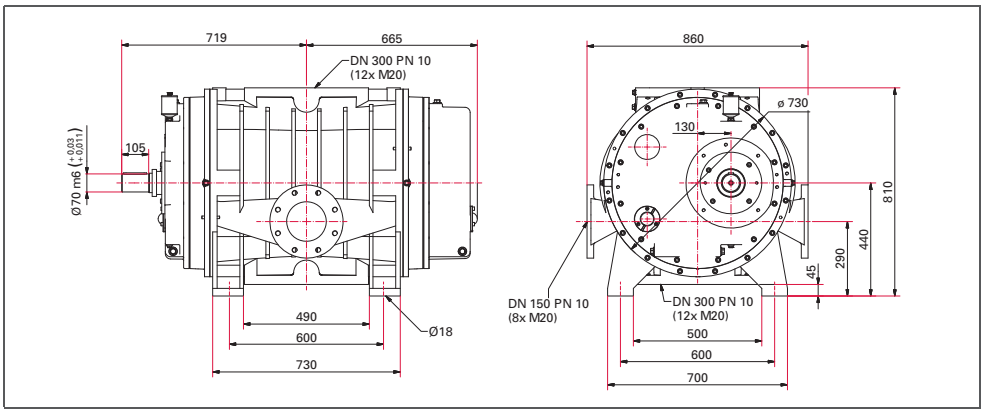


- High-performance gas cooled roots pump with a pumping speed from 4000 to 12000 m³/h
- For applications in the low and medium vacuum
- Single stage pressure range from 130 to 1013 hPa, in series with smaller final pressure
- Connection flange DN 300 PN 10
- No thermal overload thanks to gas cooling
- With sealing gas connection
- Customized design and offer for motor, gas cooler, and coupling on request

Pumping speed



Dimensions (in mm)



Technical data	Okta 8000 G, gas-cooled Roots pump without motor, DN 300 PN 10
Flange (out)	DN 300 PN 10
Flange (in)	DN 300 PN 10
Dimensions (L x W x H)	1384 x 860 x 810 mm
Operating fluid	P3
Operating fluid filling	21 l
Rotation speed	from 750 to 2250 min^{-1}
Rotation speed max.	2250
Rotation speed min.	750
Ultimate pressure without gas ballast	130 hPa
Weight: without motor	1500 kg
Cooling method, standard	gas-cooled
Cooling gas connection	DN 150 PN 10
Leak rate	$1 \cdot 10^{-3}$ Pa m^3/s
Motor rating	max. 200 kW
Nominal rotation speed at 50 Hz	1500 min^{-1}
Nominal rotation speed at 60 Hz	1800 min^{-1}
Nominal pumping speed	4000-12000 m^3/h
Nominal pumping speed at 50 Hz	8000 m^3/h
Nominal pumping speed at 60 Hz	9600 m^3/h
Noise level with connected exhaust line	75-105 dB (A)
Protection category	IP 55
Sealing gas	Yes
Ambient temperature	5-40 °C

Order number	
Okta 8000 G	**PP G80 001**

Accessories	
Splinter shield for Okta 8000 G	**PP 070 315 -U**

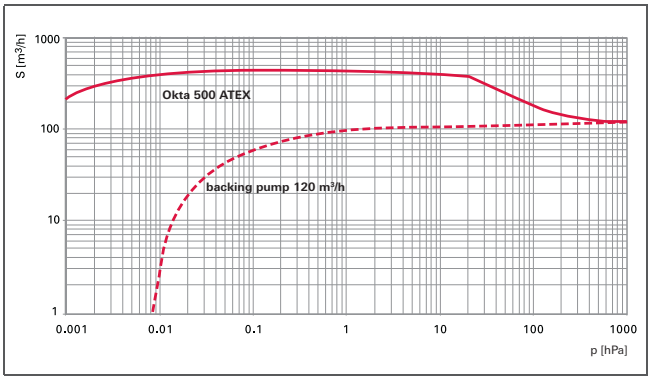
Okta 500 ATEX



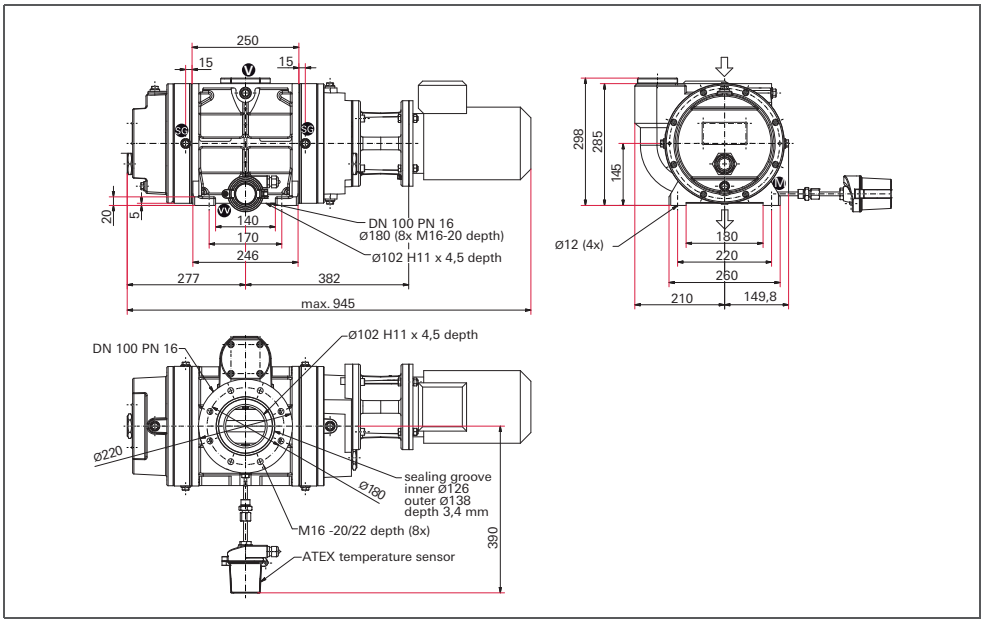
Roots pumps with a pumping speed of 280 to 670 m³/h:

- High-performance Roots pump with a pumping speed of 280 to 670 m³/h
- Hermetically sealed, through magnetic coupling, leakage rate 1 • 10^{-5} hPa
- Pump without motor (coupling and motor lantern are included in delivery)
- Pressure-surge resistant up to 1600 kPa
- No thermal overload thanks to integrated temperature sensor
- For ATEX applications (directive 94/9/EC)

Pumping speed



Dimensions (in mm)



Technical data	Okta 500 ATEX, Roots pump, 230/400 V, 50 Hz; 265/460 V, 60 Hz
Flange (out)	DN 100 PN 16
Flange (in)	DN 100 PN 16
Version	ATEX with motor and magnetic coupling, blocked overflow-valve, ATEX according to directive 94/9/EC: group II, category 3G, equipment-group IIB, temperature class T3 X + 5 °C ≤ T_a ≤ +40 °C
Operating fluid	P3
Operating fluid filling	1.5 l
Rotation speed	from 1500 to 3600 min^{-1}
Rotation speed max.	3600 min^{-1}
Rotation speed min.	1500 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	75 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	70 dB (A)
Weight: with motor	154 kg
Cooling method, standard	Air
Leak rate	$1 \cdot 10^{-6}$ Pa m^3/s
Motor protection	3TF
Nominal rotation speed at 50 Hz	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}
Rated power 50 Hz	1.5 kW
Rated power 60 Hz	1.8 kW
Nominal pumping speed	280-670 m^3/h
Nominal pumping speed at 50 Hz	560 m^3/h
Nominal pumping speed at 60 Hz	670 m^3/h
Mains requirement: voltage 50 Hz	230/400 V
Mains requirement: voltage 60 Hz	265/460 V
Protection category	IP 55
Ambient temperature	5-40 °C

Order number	
Okta 500 ATEX	**PP W33 300**

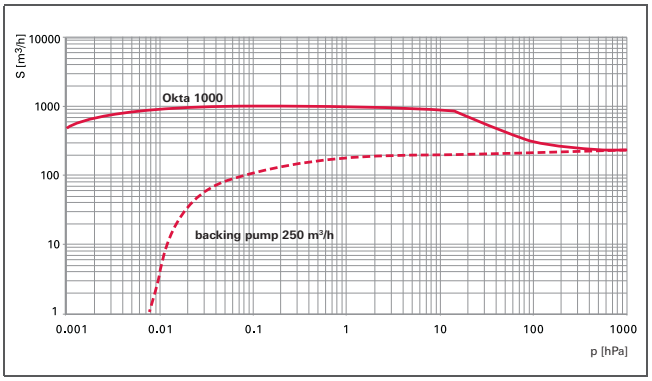
Okta 1000 ATEX



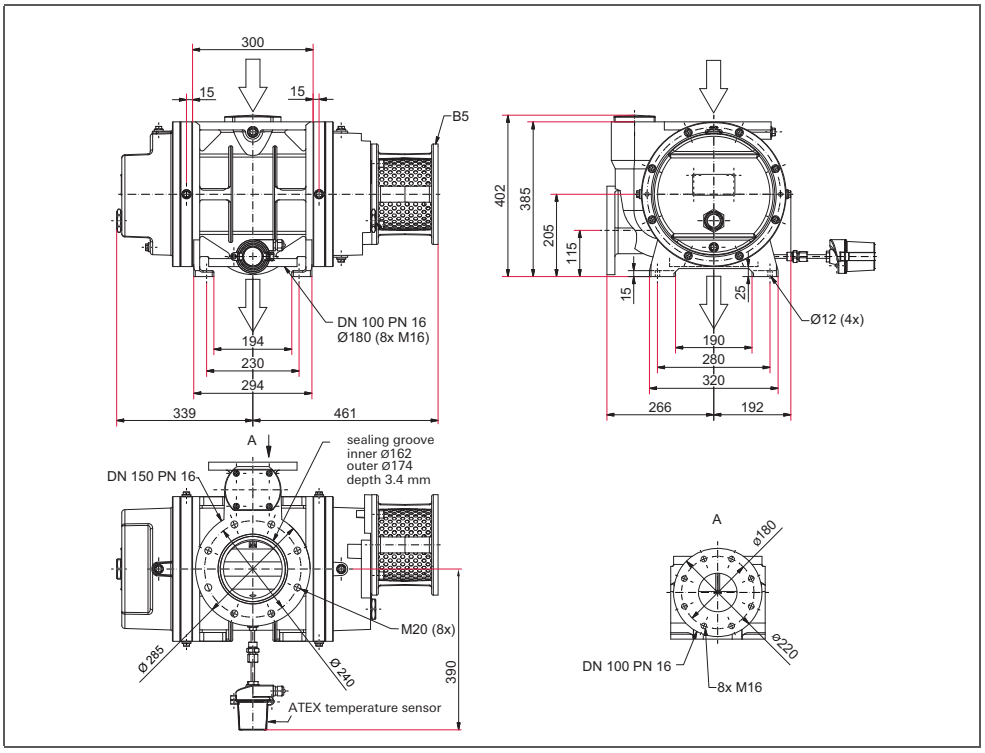
Roots pump with a pumping speed of 590 to 1420 m³/h:

- High-performance Roots pump with a pumping speed of 590 to 1420 m³/h
- With 3-phase ATEX motor
- Hermetically sealed, through magnetic coupling, leakage rate 1 • 10^{-5} hPa
- Pressure-surge resistant up to 1600 kPa
- No thermal overload thanks to integrated temperature sensor
- For ATEX applications (directive 94/9/EC)

Pumping speed



Dimensions (in mm)



Technical data	Okta 1000 ATEX, Roots pump, 230/400 V, 50 Hz; 265/460 V, 60 Hz
Flange (out)	DN 100 PN 16
Flange (in)	DN 150 PN 16
Version	ATEX with motor and magnetic coupling, blocked overflow-valve, ATEX according to directive 94/9/EC: group II, category 3G, equipment-group IIB, temperature class T3 X + 5 °C ≤ T_a ≤ +40 °C
Operating fluid	P3
Operating fluid filling	2.9 l
Rotation speed	from 1500 to 3600 min^{-1}
Rotation speed max.	3600 min^{-1}
Rotation speed min.	1500 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	75 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	72 dB (A)
Weight: with motor	255 kg
Cooling method, standard	Air
Leak rate	$1 \cdot 10^{-6}$ Pa m^3/s
Motor protection	3TF
Nominal rotation speed at 50 Hz	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}
Rated power 50 Hz	3.0 kW
Rated power 60 Hz	3.5 kW
Nominal pumping speed	590-1420 m^3/h
Nominal pumping speed at 50 Hz	1180 m^3/h
Nominal pumping speed at 60 Hz	1420 m^3/h
Mains requirement: voltage 50 Hz	230/400 V
Mains requirement: voltage 60 Hz	265/460 V
Protection category	IP 55
Ambient temperature	5-40 °C

Order number	
Okta 1000 ATEX	**PP W43 300**

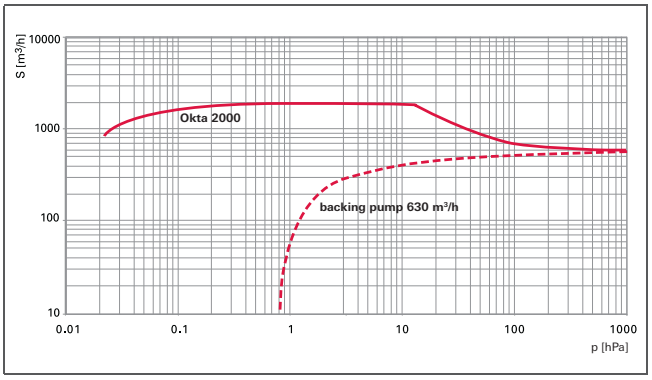
Okta 2000 ATEX



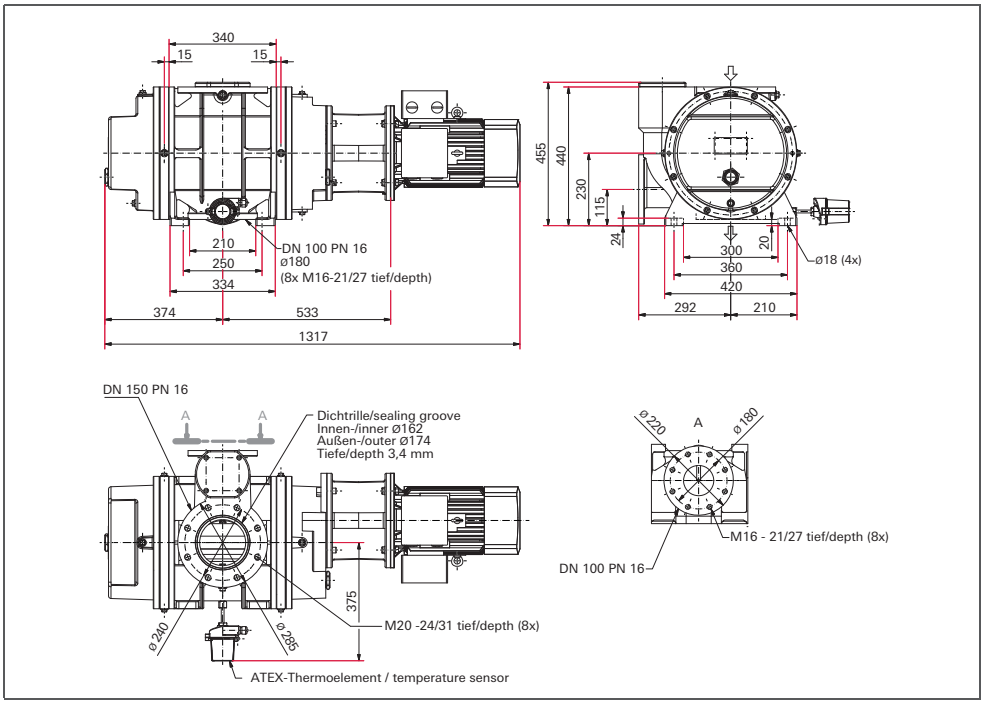
Roots pump with a pumping speed of 1080 to 2585 m³/h:

- High-performance Roots pump with a pumping speed of 1080 to 2585 m³/h
- With 3-phase ATEX motor
- Hermetically sealed, through magnetic coupling, leakage rate 1 • 10^{-5} hPa
- Pressure-surge resistant up to 1600 kPa
- No thermal overload thanks to integrated temperature sensor
- For ATEX applications (directive 94/9/EC)

Pumping speed



Dimensions (in mm)



Technical data	Okta 2000 ATEX, Roots pump
Flange (out)	DN 100 PN 16
Flange (in)	DN 150 PN 16
Version	ATEX with motor and magnetic coupling, blocked overflow-valve, ATEX according to directive 94/9/EC: group II, category 3G, equipment-group IIB, temperature class T3 X + 5 °C ≤ T_a ≤ +40 °C
Operating fluid	P3
Operating fluid filling	5 l
Rotation speed	from 1500 to 3600 min^{-1}
Rotation speed max.	3600 min^{-1}
Rotation speed min.	1500 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	75 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	72 dB (A)
Weight: with motor	390 kg
Cooling method, standard	Air
Leak rate	$1 \cdot 10^{-6}$ Pa m^3/s
Motor protection	3TF
Nominal rotation speed at 50 Hz	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}
Rated power 50 Hz	5.5 kW
Rated power 60 Hz	6.3 kW
Nominal pumping speed	1080-2585 m^3/h
Nominal pumping speed at 50 Hz	2155 m^3/h
Nominal pumping speed at 60 Hz	2585 m^3/h
Mains requirement: voltage 50 Hz	230/400 V
Mains requirement: voltage 60 Hz	265/460 V
Protection category	IP 55
Ambient temperature	5-40 °C

Order number	
Okta 2000 ATEX	**PP W63 300**

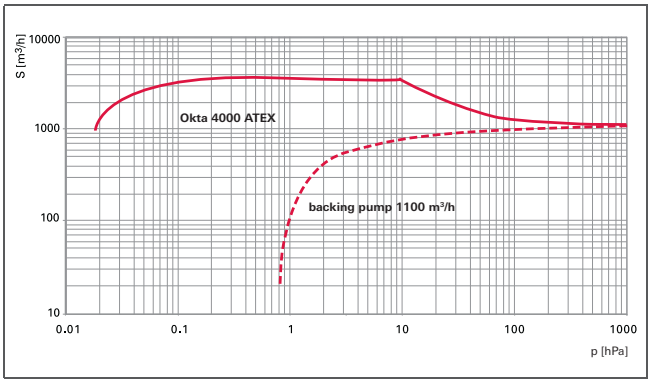
Okta 4000 ATEX



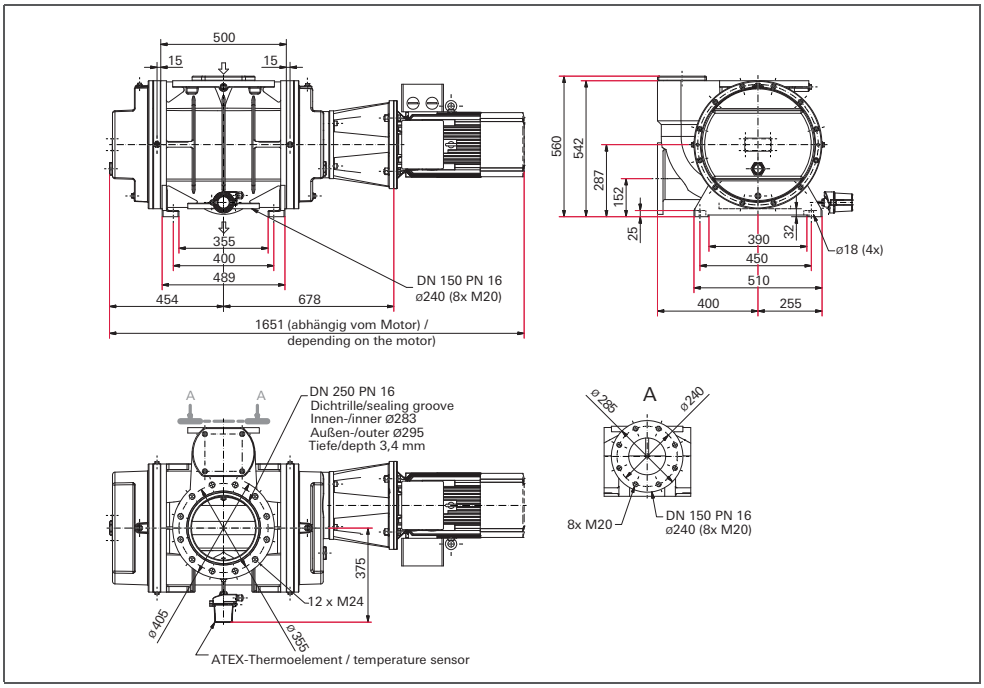
Roots pump with a pumping speed of 2160 to 5190 m³/h:

- High-performance Roots pump with a pumping speed of 2160 to 5190 m³/h
- With 3-phase ATEX motor
- Hermetically sealed, thanks to magnetic coupling, leakage rate < 1 · 10^{-5} hPa
- Pressure-surge resistant up to 1600 kPa
- No thermal overload thanks to integrated temperature sensor
- For ATEX applications (directive 94/9/EC)

Pumping speed



Dimensions (in mm)



Technical data	Okta 4000 ATEX, Roots pump, 230/ 400 V, 50 Hz
Flange (out)	DN 150 PN 16
Flange (in)	DN 250 PN 16
Version	ATEX with motor and magnetic coupling, blocked overflow-valve, ATEX according to directive 94/9/EC: group II, category 3G, equipment-group IIB, temperature class T3 X + 5 °C ≤ T_a ≤ +40 °C
Operating fluid	P3
Operating fluid filling	7 l
Rotation speed	from 1500 to 3600 min^{-1}
Rotation speed max.	3600 min^{-1}
Rotation speed min.	1500 min^{-1}
Emission sound pressure level (EN ISO 2151) at intake pressure 10 hPa	79 dB (A)
Emission sound pressure level (EN ISO 2151) at intake pressure 1 hPa	74 dB (A)
Weight: with motor	700 kg
Cooling method, standard	Air
Leak rate	$1 \cdot 10^{-6}$ Pa m^3/s
Motor protection	3TF
Nominal rotation speed at 50 Hz	3000 min^{-1}
Nominal rotation speed at 60 Hz	3600 min^{-1}
Rated power 50 Hz	11 kW
Rated power 60 Hz	13 kW
Nominal pumping speed	2160-5190 m^3/h
Nominal pumping speed at 50 Hz	4325 m^3/h
Nominal pumping speed at 60 Hz	5190 m^3/h
Mains requirement: voltage 50 Hz	230/400 V
Mains requirement: voltage 60 Hz	265/460 V
Protection category	IP 55
Ambient temperature	5-40 °C

Order number	
Okta 4000 ATEX	**PP W73 300**

Accessories

If there is a risk that solids (e.g. wealding beads, loose parts from within the pipeline) enter the pump during the operating phase, a suitable protective strainer should be used at the connection flange (inlet).

Splinter shield	
Splinter shield for Okta 250 / 250 M	**PK 300 010 -X**
Splinter shield for Okta 500 / 500 M / 500 G	**PP 030 149 AX**
Splinter shield for Okta 1000 / 1000 M / 1500 G / 2000 / 2000 M	**PP 031 114 -X**
Splinter shield for Okta 4000 / 4000 M / 4000 G / 6000 / 6000 M	**PP 031 136 -X**
Splinter shield for Okta 8000/Okta 8000 G	**PP 030 152 -X**
Splinter shield for Okta 18000	**PP 030 336 -T**
Splinter shield for Okta 8000 G	**PP 070 315 -U**

Operating fluid	
P3, mineral oil, 1 l	**PK 001 106 -T**
P3, mineral oil, 5 l	**PK 001 107 -T**
P3, mineral oil, 20 l	**PK 001 108 -T**
P3, mineral oil, 50 l	**PK 001 109 -T**
P3, mineral oil, 200 l	**PK 001 110 -T**

Roots pumping stations

Proven solutions for Roots pumping stations



What is a pumping station?
Pumping stations are combinations of individual pumps. The standard pumping stations in this chapter are composed of a Roots pump and an oil-lubricated or dry backing pump which compresses against atmospheric pressure.

Special pumping stations are two-stage or multi-stage pumping stations with different types of pumps connected in series or parallel.

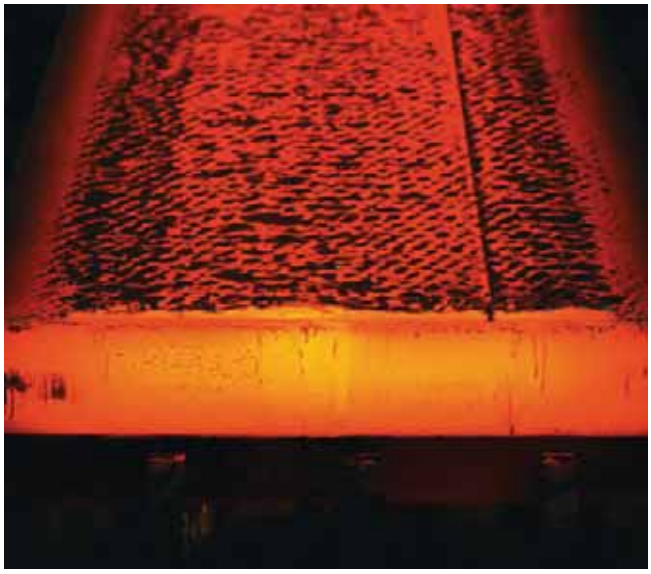
The following pump types can be used:
- Single-stage and two-stage rotary vane pumps
- Dry pumps
- Roots pumps
- Turbopumps

The complete vacuum solution
Pfeiffer Vacuum provides you with a complete customer-specific vacuum solution from a single source. Our pumping stations can be complemented with measuring and analytical devices as well as pumping station controls (SPS).

Typical applications
- Load locks and transfer chambers
- Optical coatings
- Electron beam welding
- Vacuum drying
- Metallurgy
- Wear protection
- Photovoltaics
- Space simulation



Electron beam welding



Metallurgy



Photovoltaics



CombiLine WU with UnoLine Plus



CombiLine WU with HenaLine



LRS 1



LRS 2



LRS 3

Series

Pumping stations with single-stage rotary vane pumps:

CombiLine WU with UnoLine Plus
- Pumping speeds of up to 5,000 m^3/h
- Ultimate pressure of up to $2 \cdot 10^{-3}$ hPa
- Air cooled (water cooling for backing pump)
- Integrated oil mist separator and oil return unit
- Components mounted on a common frame and connected up

CombiLine WU with HenaLine
- Pumping speeds of up to 5,700 m^3/h
- Ultimate pressure of up to $8 \cdot 10^{-3}$ hPa
- Air cooled (water cooling for backing pump optional)
- Integrated oil mist separator and oil return unit
- Components mounted on a common frame and connected up

Pumping stations with two-stage rotary vane pumps:

LRS 1
- Pumping speeds of up to 360 m^3/h
- Ultimate pressure of up to $2 \cdot 10^{-4}$ hPa
- Integrated overflow valve
- Air-cooled
- Compact

LRS 2
- Pumping speeds of up to 360 m^3/h
- Ultimate pressure of up to $2 \cdot 10^{-4}$ hPa
- Air-cooled
- Modular configuration
- Components mounted on a common frame and connected up

LRS 3
- Pumping speeds of 360 to 720 m^3/h
- Ultimate pressure of up to $2 \cdot 10^{-4}$ hPa
- Air-cooled
- Modular configuration
- Components mounted on a common frame and connected up

CombiLine WD with DuoLine
- Pumping speeds of up to 3,000 m^3/h
- Ultimate pressure of up to $5 \cdot 10^{-4}$ hPa
- Integrated safety and gas ballast valve
- Complete pumping station with optional magnetic coupling
- Components mounted on a common frame and connected up



CombiLine WD with DuoLine

Oil-free pumping station, with dry compressing backing pump:

DRS 1
- Pumping speeds of up to 285 m^3/h
- Ultimate pressure of up to $3 \cdot 10^{-3}$ hPa
- Combination of single-stage and multi-stage Roots pumps
- Air-cooled
- Components mounted on a common frame and connected up



DRS 1

CombiLine WH with UniDry 50
- Pumping speeds of up to 470 m^3/h
- Ultimate pressure of up to $5 \cdot 10^{-3}$ hPa
- Versions available with convection cooling or water cooling as well as an optional inert gas panel
- Contact-free compression
- Components mounted on a common frame and connected up



CombiLine WH with UniDry 50

CombiLine WH with HeptaDry
- Pumping speeds of up to 5,800 m^3/h
- Ultimate pressure of up to $5 \cdot 10^{-4}$ hPa
- Combination of Roots pumps and screw pumps
- Contact-free compression
- Components mounted on a common frame and connected up

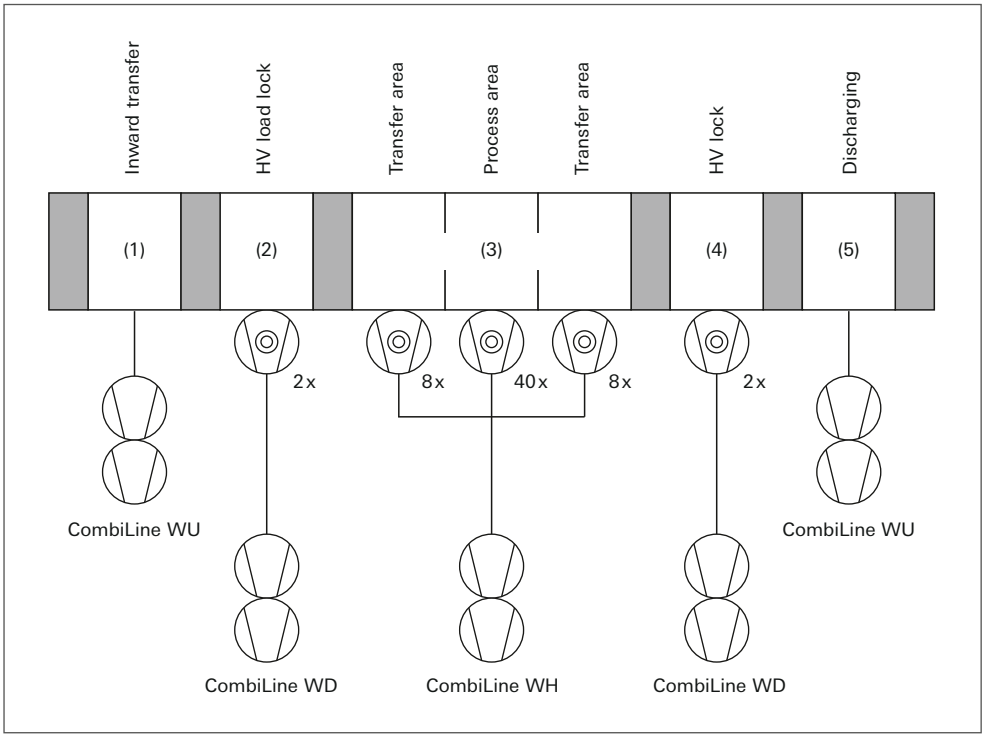


CombiLine WH with HeptaDry

Further information on our
Roots pumping stations can be found at
www.pfeiffer-vacuum.com

Customized pumping stations (special pumping stations)

The versatility of Roots pumping stations is shown by the following example of a glass coating plant:



Example of a glass coating plant

(1) Quickest possible inwards transfer of a substrate with atmospheric pressure at a high pumping speed of the mechanical backing pump (in this case a single-stage rotary vane pump) and a high pumping speed of the Roots pump to the transfer pressure of the subsequent HV load lock.
(2) In the HV load lock a combination of a Roots pump is used as a backing pump for turbopumps to lower the pressure to the high vacuum range. This pumping station uses a two-stage rotary vane pump for an optimal backing pressure for the turbopumps.
(3) In the processing and transfer area a dry Roots pumping station with a high pumping speed serves as a backing pump system for a large number of turbopumps. In this chamber a low base pressure needs to be generated and high gas loads must also be evacuated from the chamber during the process and compressed against atmospheric pressure.
(4) and (5) The outlet side load locks are structured symmetrically to the inlet-side load locks.

ATEX-certified Roots pumps are available for flammable gas mixtures. For applications with extreme backing pump pumping speed requirements, our gas-circulation-cooled Roots pumps can be supplied in a stage which compresses against atmospheric pressure.

For requirements of extremely high pumping speeds and/or ultimate pressures < 10^{-3} hPa:

We offer multi-stage pumping stations with maximized pumping speeds as well as variations with Pfeiffer Vacuum turbopumps for use in high vacuum. We develop and manufacture individual solutions for you which are adapted to fit your application.

Your benefits: our expertise

- Complete design of vacuum systems
- Precise dimensioning of components, based on in-house developed calculation programs
- Perfectly adapted to your process requirements

If you give us the design specifications we will calculate the:

- Pumping speed
- Evacuation times
- Conductivity
- Intermediate pressures
- Gas outlet temperature
- Cooling effect



Three-stage pumping station for steel degassing



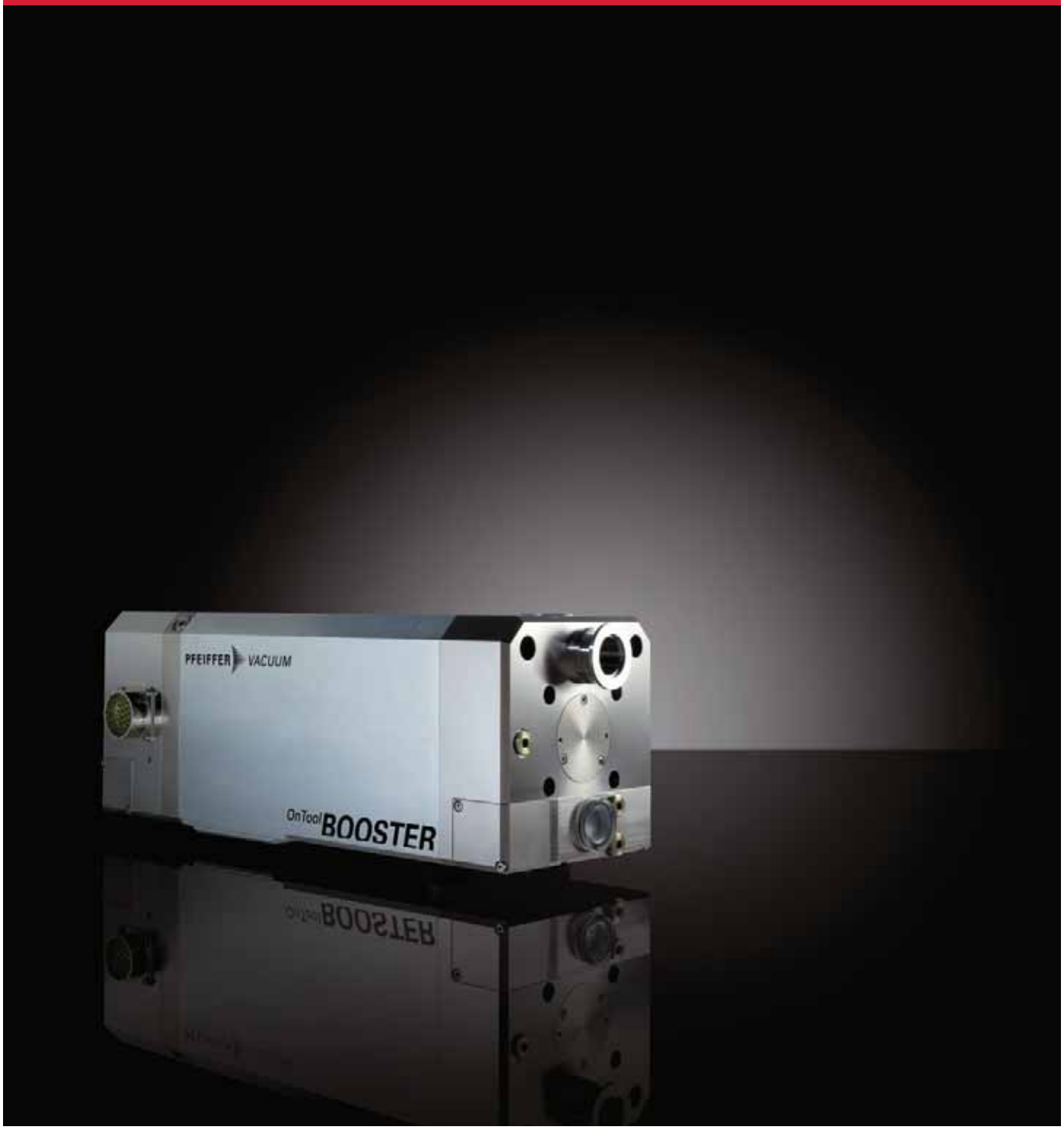
Three-stage module for steel degassing



Gas-cooled pumping station for high pumping speed at low vacuum

Side channel pumps

OnTool Booster – High vacuum pump that works against atmosphere



Side channel pumps

Introduction 262
Overview of series and applications 263
Features at a glance 263

OnTool Booster

OnTool Booster 150 264

Side channel pumps

OnTool Booster – High vacuum pump that works against atmosphere

The OnTool Booster combines high performance and compact design to blaze a new trail in vacuum technology.

It has very high pumping speeds of up to 130 m^3/h and an ultimate pressure of $< 1 \cdot 10^{-5}$ hPa. The OnTool Booster is the perfect solution for clean applications in coating, the semiconductor industry or research and development – without any particles or condensation. It can be used in many applications, either as a stand-alone pump or as a backing pump for turbopumps.



Overview of series and applications

■ = recommended	Analytics						Semiconductors									Coating										Industry								R & D									Page
	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	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Side channel pumps																																										
OnTool Booster																																										
OnTool Booster 150	■		■				■	■				■	■			■		■		■		■	■				■		■	■					■	■	■					264

Features at a glance

	Pumping speed class 130 m^3/h	Connection flange (inlet) DN 50 ISO-KF	Ultimate pressure < $1 \cdot 10^{-5}$ hPa	
Side channel pumps				
OnTool Booster				
OnTool Booster 150	■	■	■	264

Customer benefits

- Easy and flexible integration in systems due to compact size
- Short cycle times – optimized for a low transfer pressure
- Cost saving – runs without a backing pump
- Low noise and vibrations

Typical applications

- Transfer chambers
- Load locks
- EUV lithography
- Mass spectrometry
- Solar cell coating
- Optical coating
- Surface processing
- Simulation chambers



Optical coating



Solar cell production

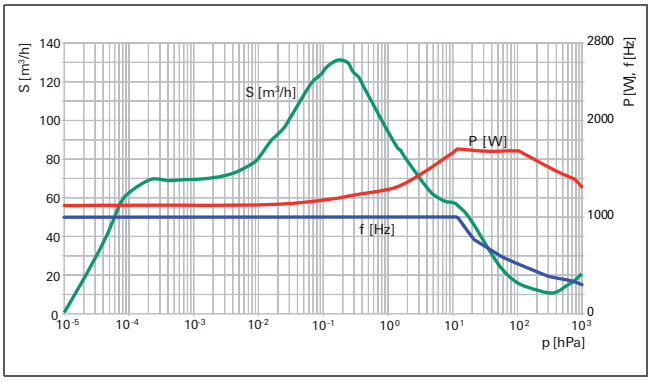
OnTool Booster 150



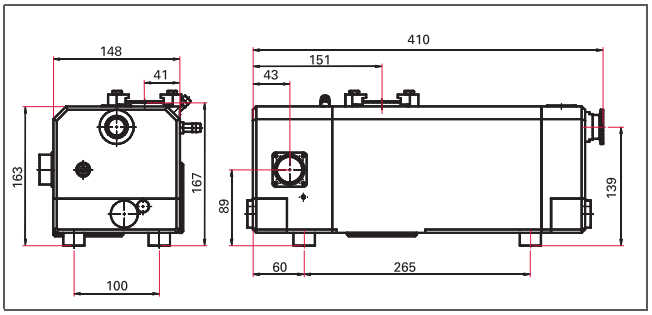
Compact, powerful high-vacuum pump against atmosphere with a pumping speed of up to 130 m³/h and an ultimate pressure of < 1·10⁻⁵ hPa:

- Compact, powerful high-vacuum pump that works against atmosphere (no backing pump required) with a maximum pumping speed of up to 130 m³/h
- The pump reaches an ultimate pressure of < 1 · 10⁻⁵ hPa and is water-cooled as standard
- Can be used as either a stand-alone or backing pump

Pumping speed



Dimensions (in mm)



Technical data	OnTool Booster 150 for TCP 3000, DN 50 ISO-KF
Flange (out)	DN 25 ISO-KF
Flange (in)	DN 50 ISO-KF
Intake pressure max.	1030 hPa
Exhaust pressure, max.	1100 hPa
Operating fluid	F3
Operating fluid filling	24 ml
Rotation speed	60000 min^{-1}
Inlet pressure max.	1013 hPa
Ultimate pressure	< 1 · 10^{-5} hPa
Gas ballast	20 hPa l/s
Gas ballast carrier and cooling gas	5 hPa l/s
Gas throughput for Ar	17 hPa l/s
Weight	35 kg
Run-up time	25 sec.
Cooling method, standard	Water
Cooling water temperature	15-30 °C
Cooling water consumption	120 l/h
Power consumption at zero throughput	1.1 kW
Max. power consumption: pump	2 kW
Permissible magnetic field max.	2.5 mT
Motor rating 50 Hz	1700 W
Motor rating 60 Hz	1700 W
Mains requirement: voltage 50 Hz	1~230-240/ 3~208-240 V
Mains requirement: voltage 60 Hz	1~230-240 /3~208-240 V
Pumping speed	130 m^3/h
Pumping speed at 1000 hPa	18 m^3/h
Pumping speed for Ar	129 m^3/h
Pumping speed for N_2	135 m^3/h
Pumping speed: air	130 m^3/h
Noise level with connected exhaust line	< 64 dB (A)
Protection category	IP 51
Quantity of sealing gas	400 hPa l/s
Ambient temperature	12-40 °C

Order number	
OnTool Booster 150	**PR P00 010**

Accessories	
Non-return flap, DN 25 ISO-KF	**PK 004 521 -U**
Sintering filter for sealing gas inlet G 1/8"	**PR 003 505 -T**
Spacer, stainless steel, DN 50 ISO-KF	**PF 123 250 -X**
Bellow, stainless steel, DN 50 ISO-KF	**PF 130 250 -X**
TCP 2000, 1-phase	**PR C01 000**
TCP 2000, 3-phase	**PR C01 001**
TCP 2000, 1-phase, with Profibus	**PR C01 004**
TCP 2000, 3-phase, with Profibus	**PR C01 005**
Connection cable with connection box	**PR 003 543 -T**
Connection cable with connection box	**PR 003 544 -T**
Elbow union with orifice for gas ballast, 0.2 mm	**PR 003 578 -U**

Turbopumps



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Turbopumps

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Turbopumps

The turbopump family includes a wide range of pumping speeds from 10 to 2,800 l/s. The pumps provide high cost-efficiency and flexibility. Well-proven bearing systems offer optimized reliability.

Due to the proven rotor design we are able to achieve high pumping speeds, high gas throughput as well high compression for light gases. These features allow the turbopumps to be used with a variety of backing pumps.

Series

- HiPace 10 – 800:
  Compact, ball or hybrid bearing turbopumps in the pumping speed class from 10 to 800 l/s. Robust design. Minimal space needs. High reliability.
- HiPace 1200 – 2300:
  Compact hybrid bearing turbopumps in the pumping speed class from 1,000 to 2,000 l/s. High pumping speed. High gas throughput. Fast run-up time.
- HiPace 300 – 800 M, ATH 500 M:
  Compact magnetically levitated turbopumps in the pumping speed class from 300 to 800 l/s. High gas throughput. Low vibration operation. Low energy consumption.
- ATH 1600 – 3200 M:
  Compact magnetically levitated turbopumps in the pumping speed class from 1,400 to 2,800 l/s. High critical backing pressure. Very high gas throughput. Outstanding longterm stability.

Service

One advantage of Pfeiffer Vacuum turbopumps with hybrid bearing is the on-site service provided by Pfeiffer Vacuum Field Service. Maintenance intervals of up to 4 years are made possible by the unique bearing design. Maintenance costs are therefore only a fraction of those of rival products.



Overview of series and applications

■ = recommended	Analytics						Semiconductor										Coating										Industry										R & D										Page
	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 Epitany)	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 manufacture	Heat treatment	Vacuum drying	Vacuum furnaces	Nuclear research	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Hybrid bearing < 1,000 l/s																																												
HiPace 10	■	■	■	■		■																				■	■		■	■										■	■	282
HiPace 60 P																				■		■	■							■										■	■	286
HiPace 80	■	■	■	■		■		■					■	■	■	■				■		■	■			■	■		■	■			■		■	■		■			■	■	290
HiPace 300	■	■	■	■		■		■	■			■	■	■	■	■				■		■	■	■		■	■	■	■	■	■		■		■	■		■			■	■	298
HiPace 300 C	■	■	■	■		■		■	■			■		■	■					■		■	■	■									■		■	■		■			■	■	298
HiPace 300 P	■	■	■	■		■		■	■			■		■	■					■		■	■	■						■	■		■		■	■		■			■	■	298
HiPace 300 Plus	■		■	■		■							■			■																											298
HiPace 400			■	■		■		■	■			■	■	■	■	■				■		■	■	■		■	■	■	■	■	■		■		■	■		■		■	■	312
HiPace 400 C														■	■																												312
HiPace 400 P			■	■		■		■	■			■		■	■					■		■	■	■							■		■		■	■		■		■	■	312
HiPace 700			■	■		■		■	■			■	■		■	■				■		■	■	■		■	■	■	■	■			■		■	■		■		■	■	320
HiPace 700 C			■	■		■		■	■			■	■			■				■		■	■	■								■	■		■	■		■		■	■	320
HiPace 700 P			■	■		■		■	■		■	■			■				■	■		■	■	■							■		■	■	■	■		■		■	■	320
HiPace 700 Plus	■		■	■		■							■			■																											320
HiPace 800			■	■		■		■	■			■	■		■	■				■		■	■	■		■			■		■		■		■	■		■		■	■	328
HiPace 800 C			■	■		■		■	■			■	■			■				■		■	■	■								■	■		■	■		■		■	■	328
HiPace 800 P			■	■		■		■	■		■	■			■				■	■		■	■	■							■		■	■	■	■		■		■	■	328
Hybrid bearing > 1,000 l/s																																												
HiPace 1200								■				■						■	■	■	■	■	■	■	■	■		■	■		■	■	■			■		■		■			■	338
HiPace 1200 C								■	■	■	■	■			■					■	■	■	■	■	■					■	■	■		■	■		■		■			■	338
HiPace 1200 T									■	■	■							■																									338
HiPace 1500								■	■			■					■	■		■	■	■	■	■	■	■		■	■		■	■	■			■		■		■			■	344
HiPace 1500 C								■	■	■	■	■			■					■	■	■	■	■	■					■	■	■		■	■		■		■			■	344
HiPace 1500 T									■	■	■							■																									344
HiPace 1800								■	■			■								■	■		■	■	■					■	■	■			■		■						350
HiPace 1800 C								■	■	■	■	■			■					■	■		■	■	■					■	■	■		■	■		■						350
HiPace 1800 T									■	■	■																																350
HiPace 2300								■	■			■					■		■	■	■		■	■	■	■		■			■	■	■					■						354
HiPace 2300 C								■	■	■	■	■			■					■	■		■	■	■					■	■	■		■			■						354
HiPace 2300 T									■	■	■								■																									354
Magnetic bearing < 1,000 l/s																																												
HiPace 300 M	■	■	■	■		■		■				■	■			■			■		■	■	■		■	■				■				■		■	■		■		■	■	386
ATH 500 M		■	■	■	■	■	■	■	■			■	■	■	■	■		■	■	■	■	■	■	■	■	■				■			■	■	■	■	■	■	■	■	■	■	398
ATH 500 MT										■	■							■		■																							398
HiPace 700 M	■		■	■		■		■				■	■			■		■	■		■	■	■		■							■	■		■	■		■		■	■	390
HiPace 800 M	■		■			■		■				■	■			■		■	■		■	■	■		■							■	■		■	■		■		■	■	394
Magnetic bearing > 1,000 l/s																																												
ATH 1603 M		■	■	■	■	■	■	■	■			■	■		■		■	■	■	■	■	■	■	■	■	■		■			■		■	■	■	■	■	■	■	■	■	■	406
ATH 1600 MT										■								■		■																							406
ATH 2303 M							■	■	■			■	■		■		■	■	■	■	■	■	■	■	■	■		■			■		■	■	■	■	■	■	■	■	■	■	412
ATH 2300 MT										■								■		■																							412
ATH 2800 M							■	■	■			■			■			■		■	■	■	■	■	■	■		■			■		■	■	■	■	■	■	■	■	■	■	418
ATH 2800 MT										■								■		■																							418
ATH 3200 M							■	■	■			■			■		■	■		■	■	■	■	■	■	■		■			■		■	■	■	■	■	■	■	■	■	■	422
ATH 3200 MT										■								■		■																							422
ATP 2300 M			■	■	■	■	■				■	■			■			■				■	■	■	■					■		■	■	■	■	■	■	■	■	■	■	426

Features at a glance

	Pumping speed class																Connection flange (inlet)								Mounting orientation									
	10 l/s	50 l/s	60 l/s	80 l/s	300 l/s	400 l/s	500 l/s	700 l/s	800 l/s	1,200 l/s	1,500 l/s	1,600 l/s	1,800 l/s	2,300 l/s	2,800 l/s	3,200 l/s	DN 25	DN 40	DN 63	DN 100	DN 160	DN 200	DN 250	DN 320	Standard (0°-90°)	Vertical (0°)	Upside down (90°–180°)	in any orientation	Corrosive gas version	Particulate matter	Low vibration	Ball bearing	Magnetic bearing	Hybrid bearing	Page
Hybrid bearing < 1,000 l/s																																			
HiPace 10	■																■											■		■		■			282
HiPace 60 P			■																■									■						■	286
HiPaceTM 80				■														■	■									■						■	290
HiPace 300					■															■								■						■	298
HiPace 300 C					■															■					■				■	■				■	298
HiPace 300 P					■															■								■		■				■	298
HiPace 300 Plus					■															■						■		■			■			■	298
HiPace 400						■														■								■						■	312
HiPace 400 C						■														■					■				■	■				■	312
HiPace 400 P						■														■								■		■				■	312
HiPace 700								■													■							■						■	320
HiPace 700 C								■													■				■				■	■				■	320
HiPace 700 P								■													■							■		■				■	320
HiPace 700 Plus								■													■					■		■			■			■	320
HiPace 800									■												■							■						■	328
HiPace 800 C									■												■				■				■	■				■	328
HiPace 800 P									■												■							■		■				■	328
Hybrid bearing > 1,000 l/s																																			
HiPace 1200										■												■			■		■			■				■	338
HiPace 1200 C										■												■			■		■		■	■				■	338
HiPace 1200 T										■												■			■					■				■	338
HiPace 1500											■												■		■		■			■				■	344
HiPace 1500 C											■												■		■		■		■	■				■	344
HiPace 1500 T											■												■		■					■				■	344
HiPace 1800													■									■			■		■			■				■	350
HiPace 1800 C													■									■			■		■		■	■				■	350
HiPace 1800 T													■									■			■					■				■	350
HiPace 2300														■									■		■		■			■				■	354
HiPace 2300 C														■									■		■		■		■	■				■	354
HiPace 2300 T														■									■		■					■				■	354
Magnetic bearing < 1,000 l/s																																			
HiPace 300 M					■															■								■			■		■		386
ATH 500 M							■													■	■							■					■		398
ATH 500 MT							■													■	■							■		■			■		398
HiPace 700 M								■													■							■			■		■		390
HiPace 800 M									■													■						■			■		■		394
Magnetic bearing > 1,000 l/s																																			
ATH 1603 M												■										■	■					■					■		406
ATH 1600 MT												■										■	■					■		■			■		406
ATH 2303 M														■									■					■					■		412
ATH 2300 MT														■								■	■					■		■			■		412
ATH 2800 M															■								■					■					■		418
ATH 2800 MT															■								■					■		■			■		418
ATH 3200 M																■								■				■					■		422
ATH 3200 MT																■								■				■		■			■		422
ATP 2300 M														■								■	■					■					■		426



Customer benefits

- Extensive range of pumps for a wide variety of applications
- Maximum reliability and safety
- High cost-efficiency and flexibility
- Easy systems integration
- Extensive range of accessories

Important information relating to the technical data

Pumping speed
The pumping speed of a turbopump depends on its size and design. It is stated in liters per second and is a function of the intake pressure. The pumping speed characteristics are assigned to the respective products.

Compression ratio
The compression ratio of a turbopump is the ratio between forevacuum pressure measured at the forevacuum flange of the pump and the high vacuum pressure at the intake flange. Compression is stated for different types of gas and is measured without gas load. With the compression ratio it is possible to determine for a given backing pump the theoretical final pressure of the entire pumping station configuration.

Ultimate pressure
The data stated for the ultimate pressure apply for the conditions defined in DIN 28428. These values are measured in clean dry conditions, using metal seals in the high vacuum area and after baking out or degassing the pump for 48 hours. Pumps with an aluminum housing are unsuitable for baking out, therefore the ultimate pressure is stated without baking the pump out and with clean FKM seals. The ultimate pressures stated in the technical data are typical conservative measured values. We can easily exceed these values by pretreatment of the vacuum system (venting with dry inert gas, degassing by heating). The theoretically attainable minimum values depend on the gas type-specific compression ratios K_{oi} and the partial pressures P_{vvi} on the forevacuum side as well as the system-specific gas flows Q_{total} like, for example, desorption from the surface being pumped down by a turbopump having an effective pumping speed of S_{eff}.

$$P_{end\ min} = \frac{Q_{total}}{S_{eff}} + \frac{P_{vv1}}{K_{01}} + \ldots + \frac{P_{vvn}}{K_{0n}}$$

As a rule, these theoretical ultimate pressures that can be achieved are only approximations since the system-specific conditions will generally have a significant influence on the final pressures.

Ultimate pressures for turbopumps depending on housing material, flange type, backing pump used and rotor coating:
Ultimate pressure conforms to DIN 28 428, attained in a measuring dome 48 hours after bake-out.

	Rotary vane pump or dry backing pump with p < 0.05 hPa	Diaphragm pump with p < 5 hPa	Corrosive gas version with rotary vane pump or dry backing pump with p < 0.05 hPa
Stainless steel housing with CF-F[1)]	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa
Stainless steel housing with ISO-K[2)]	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa
Aluminum housing with ISO-K[3)]	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa

[1)] Bakeable with copper seal, [2)] Bakeable with aluminum seal [3)] Not bakeable, with elastomer seal

Gas throughput
The term gas throughput is used to describe the ability of the turbopump to pump quantities of gas at a specific pressure. There are certain parameters influenced by the specific application. All gas throughput data stated in the technical data apply under the following conditions:

- Operation with a backing pump which offers the minimum performance data of the backing pump specified in connection with the gas load data.
- Operation with water cooling at the specified water flow and a water supply temperature of 25° C, a maximum ambient temperature of 25° C and the use of sealing gas (in connection with heavy gases)

A turbopump cannot be operated simultaneously at its maximum gas load and at its maximum forevacuum pressure.

Maximum permissible forevacuum pressure
The maximum permissible forevacuum pressure of the turbopump is the pressure at which the turbopump still produces a compression of 100. It depends on the gas load pumped through the turbopump and the pumping speed of the backing system used. For gas load operation, the forevacuum pressure should not exceed more than approximately 50 % of the maximum permissible forevacuum pressure.

Safety is important

Notes relating to the mounting materials for turbopumps
Our turbopumps are distinguished by a high degree of safety. This is based on our own theoretical and practical analyses of the crash behavior and the high safety margins in the design of the pumps. We also apply the same standards to the interface between the pumps and the customer's system. For this reason, we are offering a full range of installation components which ensure safe interface connections and which are presented together with the pump accessories.

Drive electronics at a glance



General – standards
Common features of all drive electronics:
- Protection class IP 54
- Optionally RS-485 interface, Profibus, DeviceNet or E74
- Accessory outputs and remote inputs and outputs



TC 110 – Smallest integrated solution
- Compact installation dimensions
- 24 V DC operating voltage with a power rating of up to 150 W
- Power supply, RS-485 interface, remote connection with the 15 pin D-Sub 9
- Optionally available as TC 110 RS (RS-485) Profibus or E74, with additional connections for accessories and interface connection



TC 400 – Medium-sized integrated solution with connector panel
- Operating voltage: 48 V DC or 24 V DC with a power rating of up to 350 W
- Power supply, RS-485 interface, accessories and remote connection through the respective plug and socket connections
- Optionally with Profibus, DeviceNet or E74



TM 700 – Medium-sized integrated solution with connector panel for magnetically levitated turbopumps
- Operating voltage: 48 V DC with a power rating of up to 300 W
- Power supply, RS-485 interface, accessories and remote connection with the relevant plug and socket connections
- Optionally with Profibus, DeviceNet or E74
- Combines the advantages of the TC 400 with an integrated digital 5-axis magnetic bearing controller



TC 1200 – Large integrated solution with connector panel
- Mains connection: 115 – 230 V AC
- Power supply, RS-485 interface, accessories and remote connection with the relevant plug and socket connections
- Input power up to 1,200 W
- Optionally with Profibus, DeviceNet or E74

OBC V4 – Large integrated solution with connector panel
- Mains connection: Voltage: 230 V AC
- Integrated digital with 5-axis magnetic bearing controller



TCP 350 – External electronic drive unit
- Mains connection: 95 – 265 V AC
- Complete electronics in a single unit



Magpower – External electronic drive unit
- Mains connection: 200 – 240 V AC
- ½ (of 19“) rack size



Electronic drive units at a glance

	Integrated					External	
	TC 110	TC 400	TM 700	TC 1200	OBC V4	TCP 350	Magpower
HiPace 10	■						
HiPace 60 P	■						
HiPace 80	■					■	
HiPace 300	■	■				■	
HiPace 400 – 800		■				■	
HiPace 300 P / C		■					
HiPace 300 Plus	■						
HiPace 700 Plus		■					
HiPace 300 – 800 M			■				
HiPace 1200 – 2300				■			
ATH 1603 – 2303 M					■		■
ATH 1600–2300 MT					■		■
ATH 2800 – 3200 M/MT							■
ATP 2300 M					■		■

Integrated drive electronics

Integrated solutions for drive electronics are standard today. Integrating the power supply pack at the same time saves expensive cabling and reduces the space needed in the control cabinet.

OPS 40, 70 and 100 are optimized for convection cooled or air cooled operation. The power rating is therefore adjusted to suit these types of operation.
OPS 400, TC 1200 and OBC V4 with protection class IP 54 are suitable for industrial environments and provide the same power rating as standard external power supply packs.

Examples of optional power supply packs (On-board Power Supply, OPS)



HiPace 10
OPS 40



HiPace 80
OPS 70



HiPace 300
OPS 100



HiPace 700 M
OPS 400

Examples of optional power supply packs (On-board Power Supply, OPS)



HiPace 1200 – 2300
TC 1200



ATH 1603 M
OBC V4

Optional integrated power supply packs at a glance

	External			
	OPS 40	OPS 70	OPS 100	OPS 400
HiPace® 10	■			
HiPace® 60 P		■		
HiPace® 80		■		
HiPace® 300 with TC 110			■	
HiPace® 300 with TC 400				■
HiPace® 400–800 with TC 400				■
HiPace® 300 P / C				■
HiPace® 300 Plus			■	
HiPace® 700 Plus				■
HiPace® 300–800 M				■


HiPACE

Hybrid bearing

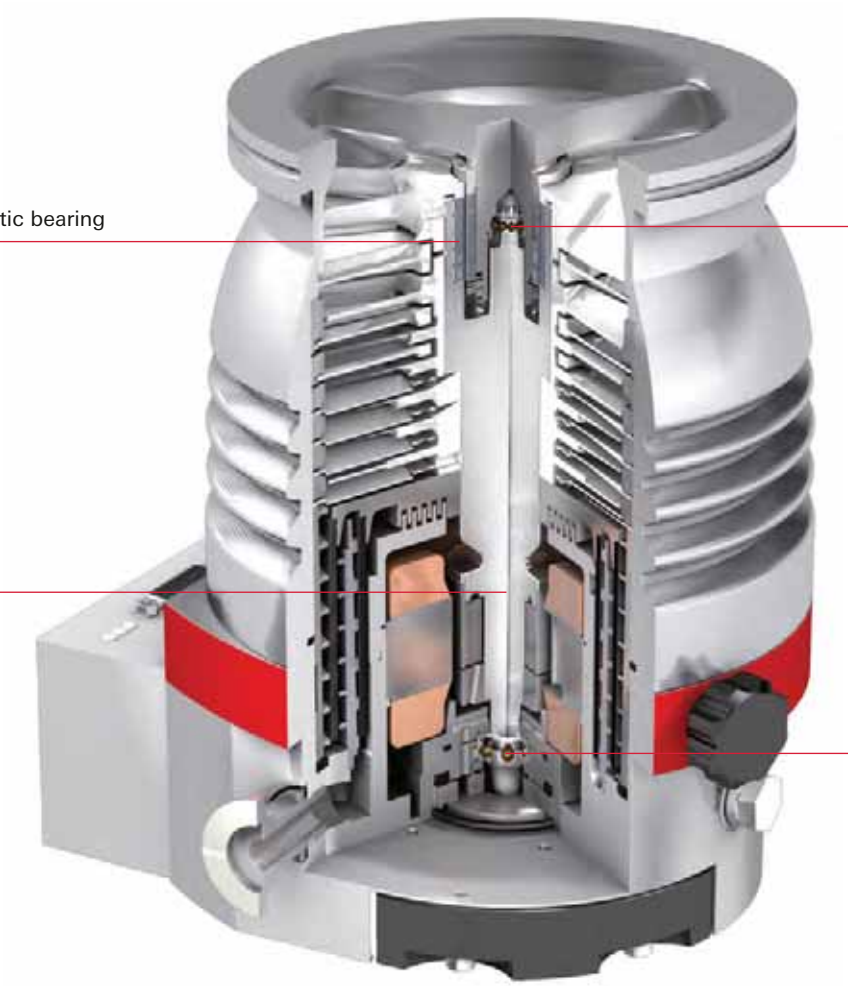
The outstanding features of the Pfeiffer Vacuum HiPace series are its unique rotor design with proven hybrid bearings. This represents a new class of industrial suitability, while simultaneously reducing operating costs. All Pfeiffer Vacuum HiPace turbopumps incorporate an integrated drive electronics. In fact, even the power supply unit is integrated in the HiPace 1200 to 2300.

It's advanced design is started with reliability and ruggedness. Even with difficult applications, the pump provides safe and dependable operation. The pump features integration security concepts and patented venting mechanisms. All turbopumps in the HiPace series conform to the SEMI S2 standard. The pump also has outstanding accessibility as all the connections are within 120 degrees.

Versions
The turbopumps in the 80–800 l/s range are also offered with an integrated Holweck stage. The advantages of this design include:

- Higher backing pressure
- Lower power consumption
- Higher compression

From the 300 l/s pumping speed class onward, the HiPace is also available in a corrosive-gas version. These pumps have a highly developed rotor coating and come with an integrated sealing gas supply system with electrical shutoff valve as standard. Corrosive-gas versions do not incorporate a Holweck stage. In addition to the standard design with RS-485 interface, Pfeiffer Vacuum also offers optional versions with DeviceNet or Profibus in response to modern control concepts.



The combination of a ceramic ball bearing on the fore-vacuum side and a permanent magnetic radial bearing on the high vacuum side is called hybrid bearing.

This bearing technology does not require electromagnets and has a long service life with maintenance intervals of approximately 4 years. The ball bearing and the operating fluid reservoir can be replaced on site within less than 30 minutes.

HiPace® 10 – 800

Compact, ball or hybrid bearing turbopumps in the pumping speed class from 10 to 800 l/s

HiPace stands for a full range of compact and powerful turbopumps in the pumping speed range of 10 to 2,000 l/s. It provides high cost-efficiency and flexibility which allows almost all pumps of this range to be installed in any orientation. The proven bearing system guarantees unrivaled reliability. High pumping speed, high critical backing pressure and high gas throughput as well as excellent compression for light gases are made possible by the innovative rotor design.

Integrated electronic drive unit
The integrated drive electronics prevent costly cabling. In addition, various interface versions – Profibus, DeviceNet or E74 – are available. Due to the innovative electronic components we have doubled the lifetime of these powerful drive units.

Fast run-up time
The run-up time of the HiPace has been significantly reduced. This makes the pumps ready for action quicker than ever. This is an incalculable benefit for your production. In addition, we provide extended remote and sensor functions. These allow you to evaluate pump data such as temperatures. Improved diagnostics ensure maximum pump availability and support service.


HiPace® 10


HiPace® 80


HiPace® 300


HiPace® 800

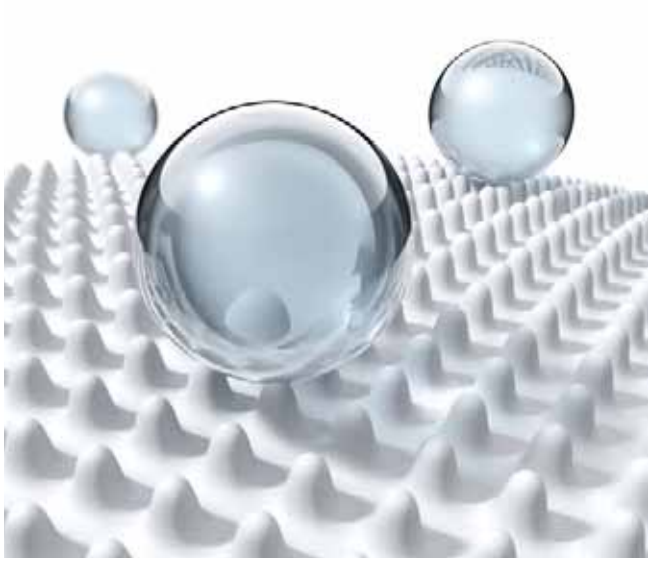
High-performance technology
Due to the well thought-out design of the HiPace turbopumps, the housing makes the pumps extremely light and extends the application spectrum. Another design achievement results in an innovative rotor geometry providing quiet operation and sets standards for significantly improving gas loads.

For universal applications
HiPace Plus pumps are specially designed for electron microscopy and high-end mass spectrometry. Our HiPace C series provides turbopumps especially for corrosive applications. In addition, we have HiPace P pumps which are suitable for industrial use, as they are insensitive to process dust and intruding particles.

Customer benefits
- Complete series with pumping speeds from 10 to 800 l/s
- Robust design and proven bearing system offer the highest reliability
- Minimal space requirements to compact construction
- High gas throughput and high pumping speed
- Installation in any orientation[1)]
- Suitable for industrial use due to protection class IP 54
- Corrosive gas version available
- SEMI S2 and UL certification
- Full range of accessories extends the possible uses
- Extended maintenance intervals
- Bearing replacement on site

[1)] HiPace 700C, 0 to 90° / HiPace Plus, 0°

Typical applications
- Mass spectrometry
- Leak detection
- Electron microscopy
- Residual gas analysis
- Particle accelerators
- Nanotechnology



Nanotechnology



Electron microscopy



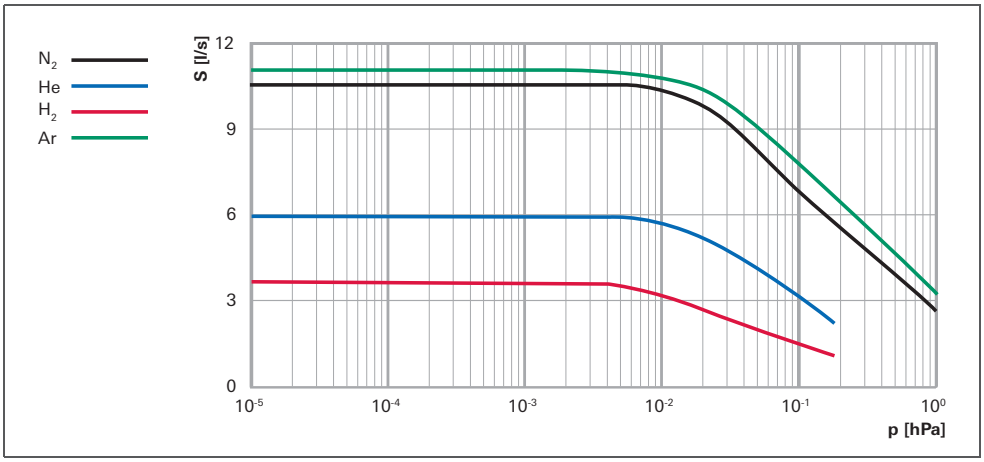
Particle accelerator

HiPace® 10



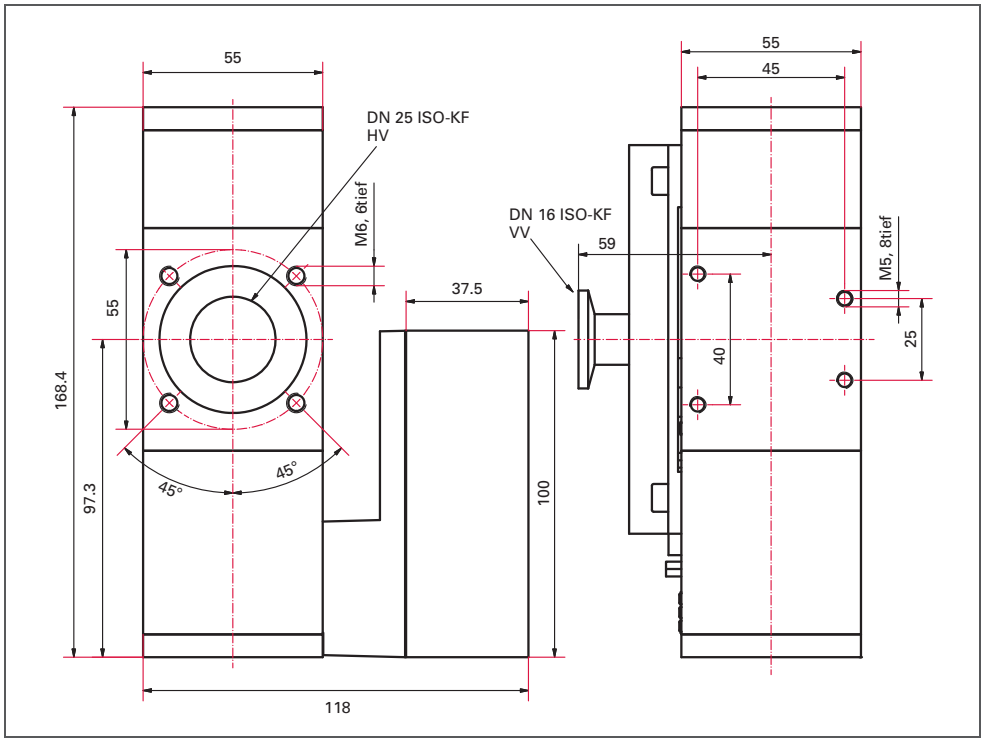
- The world's smallest series-production turbopump
- A powerful, rugged turbopump with a pumping speed of 10 l/s for N_2
- DN 25 connection
- Integrated drive electronics with 24 V supply voltage
- Mobile usable
- Requires no additional cooling
- Electronic connection in direction of fore-vacuum connection

Pumping speed



HiPace® 10

Dimensions (in mm)



HiPace® 10 with TC 110, DN 25

Technical data	HiPace® 10 with TC 110, DN 25
Connection nominal diameter	
Flange (out)	DN 16 ISO-KF / G 1/8''
Flange (in)	DN 25
Pumping speed	
Pumping speed for Ar	11.5 l/s
Pumping speed for H_2	3.7 l/s
Pumping speed for He	6 l/s
Pumping speed for N_2	10 l/s
Compression	
Compression ratio for Ar	$2.5 \cdot 10^7$
Compression ratio for H_2	$3 \cdot 10^2$
Compression ratio for He	$3 \cdot 10^3$
Compression ratio for N_2	$3 \cdot 10^6$
Fore-vacuum max. for N_2	25 hPa
Gas througput	
Gas throughput at full rotational speed for Ar	0.37 hPa l/s
Gas throughput at full rotational speed for H_2	2.78 hPa l/s
Gas throughput at full rotational speed for He	0.48 hPa l/s
Gas throughput at full rotational speed for N_2	0.37 hPa l/s
Electronic drive unit	with TC 110
Operating voltage	24 (± 5 %) V DC
Rotation speed ± 2 %	90000 min^{-1}
Rotation speed variable	50-100 %
Mounting orientation	in any orientation
Ultimate pressure*	$< 5 \cdot 10^{-5}$ hPa
Weight	1.8 kg
Run-up time	0.9 min
Cooling method, standard	Convection
Bearing	Ball bearing
Sound pressure level	< 50 dB (A)
Interfaces	RS-485, Remote
Protection category	IP 54
Permissible magnetic field max.	3 mT
Order number pump Pumpe	**PM P03 960**

*Ultimate pressure please find description on page 272

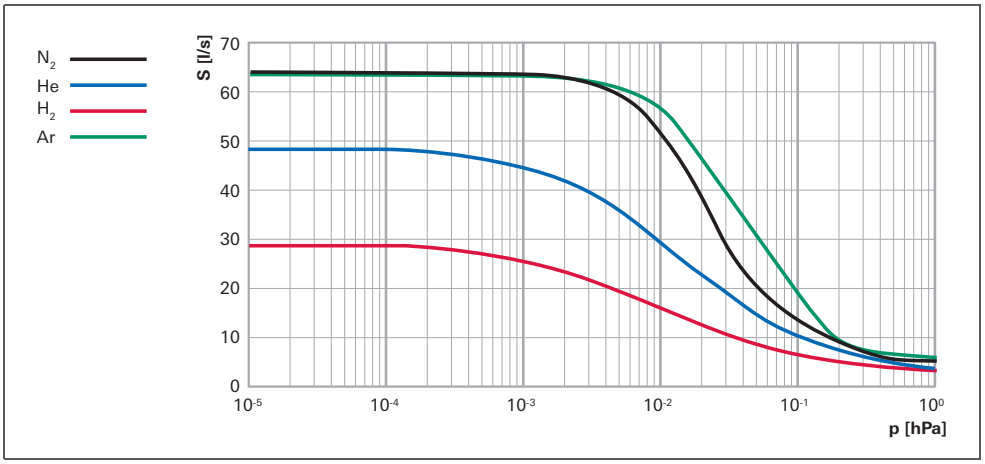
Accessories	HiPace® 10 with TC 110, DN 25
Order number pump Pumpe	**PM P03 960**
Power supplies/power	
DCU - power supply with display control unit	**PM C01 820**
TPS - mains pack for wall/standard rail fitting	**PM 061 340 -T**
TPS - mains packl 19" rack module 3 RU	**PM 061 344 -T**
Control units	
DCU - Display Control Unit	**PM 061 348 -T**
HPU - Handheld Programming Unit	**PM 051 510 -T**
Accessories for HPU	**PM 061 005 -T**
Mains cable DCU/TPS/TCP, 3 m	
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**
115 V AC mains cable with UL plug	**P 4564 309 ZE**
208 V AC mains cable with UL plug	**P 4564 309 ZF**
Connection cable, length 3 m between	
Connection cable for HiPace with TC 110 to TPS/DCU 110/111/180/181 with accessorie ports and RS-485	**PM 061 351 -T**
Connection cable for HiPace with TC 110 to power supply TPS/DCU 110/111/180/181	**PM 061 350 -T**
Backing pump control	
Backing pump relay box, shielded, 1-phase 20 A	**PM 061 373 -T**
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 282 -X**
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**
TCS 15 for controlling backing pumps	**PM 061 685 -X**
HiPace-ACP connection cable	**PM 071 142 -X**
General accessories	
Connecting adapter DN 25 ISO-KF	**PM 093 315 -T**
Centering ring	**PF 110 125 -T**
Centering ring with integrated mesh screen	**PF 113 225 -T**
USB/RS-485-Converter	**PM 061 207 -T**
Interface cable 3 m	**PM 061 283 -T**
Y-connector M12 for RS-485	**P 4723 010**
Connection cable RJ 45 on M 12	**PM 051 726 -T**
TCS 11, adapter for TC 110 with interface RS-485	**PM 061 636 -U**
TCS 12, adapter for TC 110 with interface RS-485, 4 accessory ports	**PM 061 638 -U**
Mounting materials	
Centering ring with 4 prackets, screws and U-washers	**PM 016 627 -T**

HiPace® 60 P



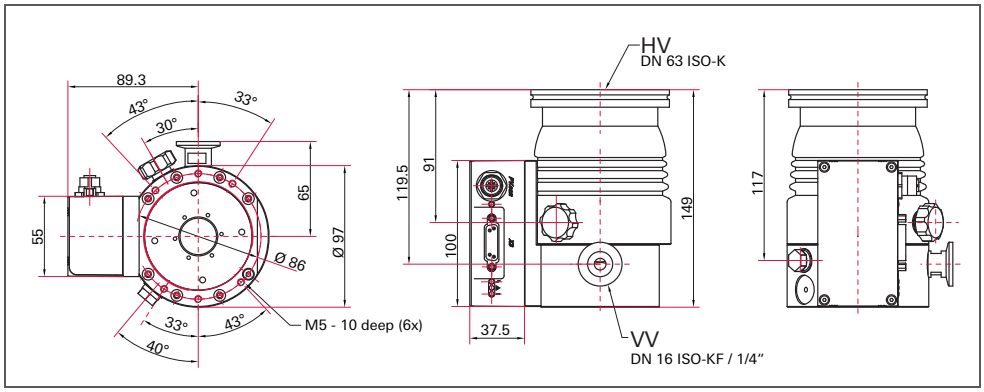
- Small yet powerful turbo molecular pump without Holweck-stage with a pumping speed of up to 64 l/s for N_2
- Integrated TC 110 drive electronics
- Installation in any orientation
- Simple and reliable system integration
- Insensitive to dust
- Extensive accessories expand the range of applications

Pumping speed



HiPace® 60 P

Dimensions (in mm)



HiPace® 60 P with TC 110, DN 63 ISO-K

Technical data	HiPace® 60 P with TC 110, DN 63 ISO-K
Connection nominal diameter	
Flange (out)	DN 16 ISO-KF / G 1/4''
Flange (in)	DN 63 ISO-K
Venting connection	G 1/8"
Pumping speed	
Pumping speed for Ar	63 l/s
Pumping speed for H_2	28 l/s
Pumping speed for He	48 l/s
Pumping speed for N_2	64 l/s
Compression	
Compression ratio for Ar	$2 \cdot 10^6$
Compression ratio for H_2	$2 \cdot 10^2$
Compression ratio for He	$3.5 \cdot 10^2$
Compression ratio for N_2	$1 \cdot 10^6$
Fore-vacuum max. for N_2	4 hPa
Gas througput	
Gas throughput at full rotational speed for Ar	0.83 hPa l/s
Gas throughput at full rotational speed for H_2	55 hPa l/s
Gas throughput at full rotational speed for He	55 hPa l/s
Gas throughput at full rotational speed for N_2	9.2 hPa l/s
Electronic drive unit	with TC 110
Operating voltage	24 (± 5 %) V DC
Rotation speed ± 2 %	90000 min^{-1}
Rotation speed variable	50-100 %
Mounting orientation	in any orientation
Ultimate pressure*	$< 1 \cdot 10^{-6}$ hPa
Weight	2.2 kg
Run-up time	1.1 min
Cooling method, optional	Air/Water
Cooling method, standard	Convection
Cooling water temperature	5-25 °C
Cooling water consumption	75 l/h
Bearing	Hybrid
Sound pressure level	≤ 48 dB (A)
Interfaces	RS-485, Remote
Protection category	IP 54
Permissible magnetic field max.	4 mT
Order number pump Pumpe	**PM P04 000**

*Ultimate pressure please find description on page 272

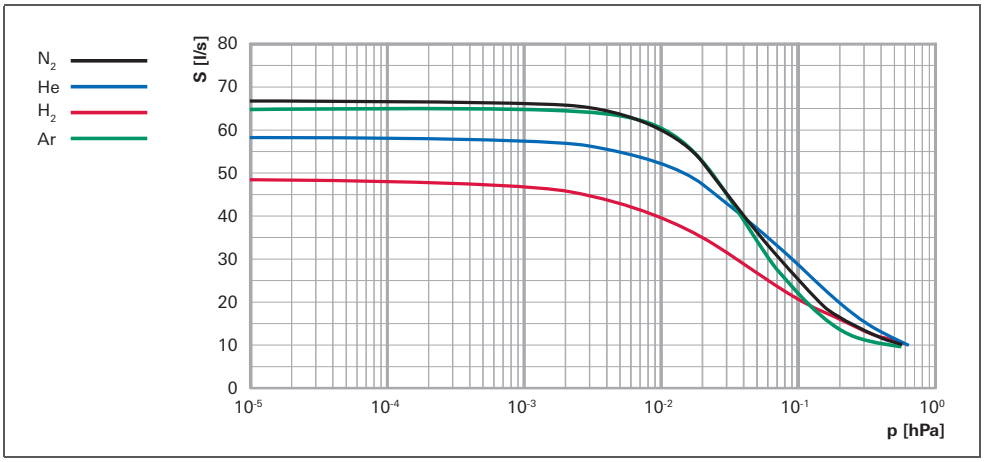
Accessories	HiPace® 60 P with TC 110, DN 63 ISO-K
Order number pump Pumpe	**PM P04 000**
Power supplies/power	
DCU - power supply with display control unit	**PM C01 820** **PM C01 821**
TPS - mains pack for wall/standard rail fitting	**PM 061 340 -T** **PM 061 341 -T**
TPS - mains packl 19" rack module 3 RU	**PM 061 344 -T** **PM 061 345 -T**
Control units	
DCU - Display Control Unit	**PM 061 348 -T**
HPU - Handheld Programming Unit	**PM 051 510 -T**
Accessories for HPU	**PM 061 005 -T**
Mains cable DCU/TPS/TCP, 3 m	
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**
115 V AC mains cable with UL plug	**P 4564 309 ZE**
208 V AC mains cable with UL plug	**P 4564 309 ZF**
Connection cable, length 3 m between	
Connection cable for HiPace with TC 110 to TPS/DCU 110/111/180/181 with accessorie ports and RS-485	**PM 061 351 -T**
Connection cable for HiPace with TC 110 to power supply TPS/DCU 110/111/180/181	**PM 061 350 -T**
Venting accessories	
Venting valve	**PM Z01 290**
Air drier TTV 001	**PM Z00 121**
Cooling accessories	
Air cooling	**PM Z01 300**
Water cooling	**PM 016 623 -T**
Backing pump control	
Backing pump relay box, shielded, 1-phase 20 A	**PM 061 373 -T**
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 282 -X**
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**
TCS 15 for controlling backing pumps	**PM 061 685 -X**
HiPace-ACP connection cable	**PM 071 142 -X**
General accessories	
Sealing gas valve	**PM Z01 310**
Sealing gas throttle	**PM Z01 316**
Centering ring coated	**PM 016 206 -U**
Centering ring coated with protection screen	**PM 016 208 -U**
Centering ring coated with splinter shield	**PM 016 207 -U**
Vibration dampers	**PM 006 800 -X**
USB/RS-485-Converter	**PM 061 207 -T**
Interface cable 3 m	**PM 061 283 -T**
Y-connector M12 for RS-485	**P 4723 010**
TCS 11, adapter for TC 110 with interface RS-485	**PM 061 636 -U**
TCS 12, adapter for TC 110 with interface RS-485, 4 accessory ports	**PM 061 638 -U**
Mounting materials	
Centering ring coated, bracket screws	**PM 016 360 -T**
Centering ring coated with protection screen, bracket screws	**PM 016 362 -T**
Centering ring coated with splinter shield, bracket screws	**PM 016 361 -T**
Centering ring coated DN 63 ISO-K, 4 prackets M8	**PM 016 510 -T**
Centering ring coated DN 63 ISO-K, 4 prackets M8, protection screen	**PM 016 512 -T**
Centering ring coated DN 63 ISO-K, 4 prackets M8, splinter shield	**PM 016 511 -T**

HiPace® 80

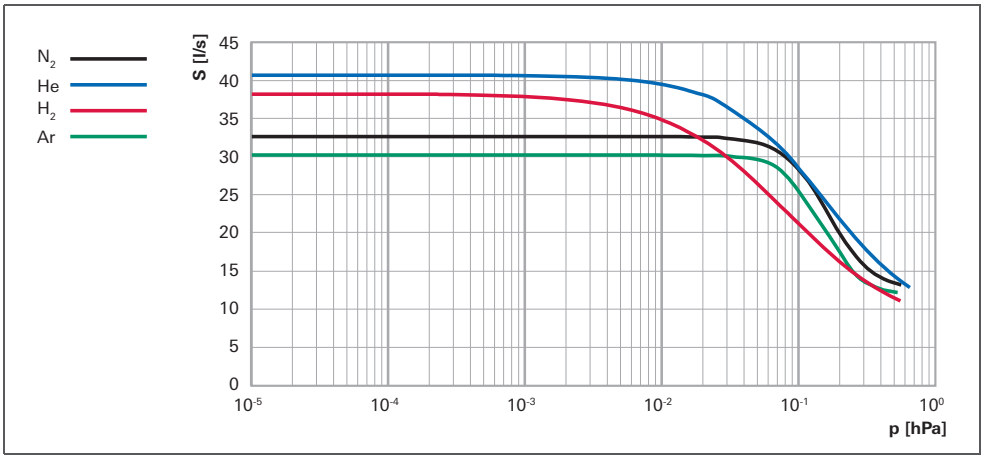


- Small yet powerful turbopump with a pumping speed of up to 67 l/s for N_2
- Integrated TC 110 drive electronics
- For installation in any orientation
- Ideal for dependable systems integration
- Extensive accessories expand the range of applications

Pumping speed

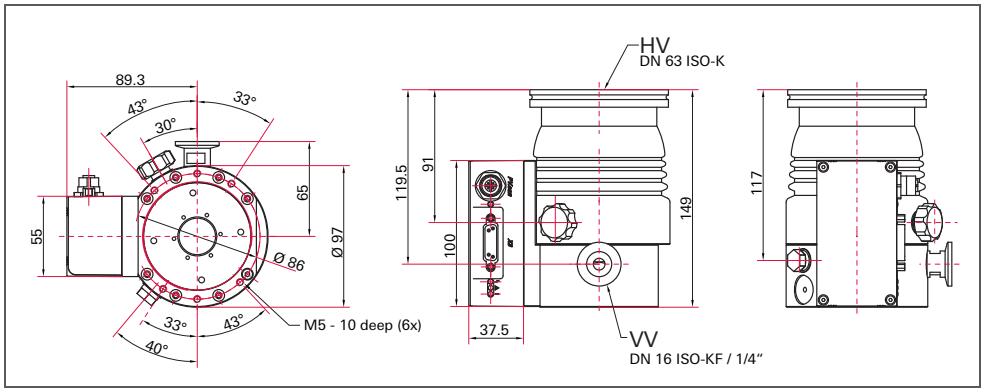


HiPace® 80 with TC 110, DN 63 ISO-K
HiPace® 80 with TC 110, DN 63 CF-F

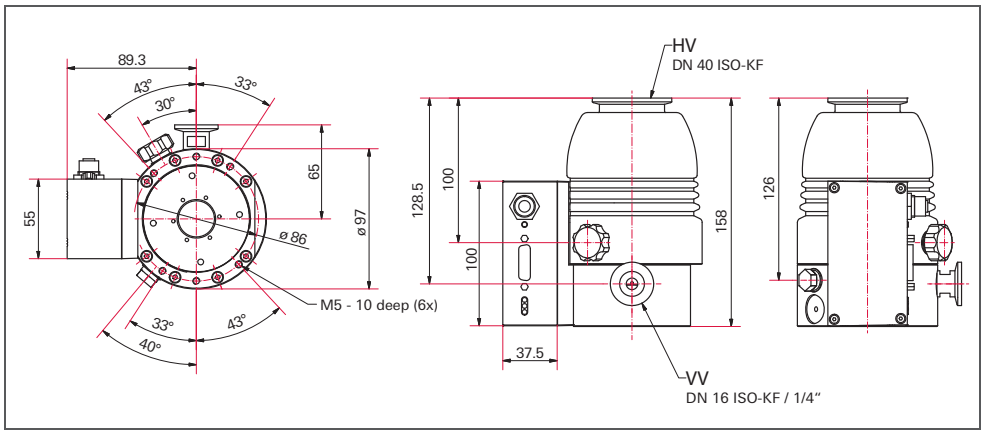


HiPace® 80 with TC 110, DN 40 ISO-KF

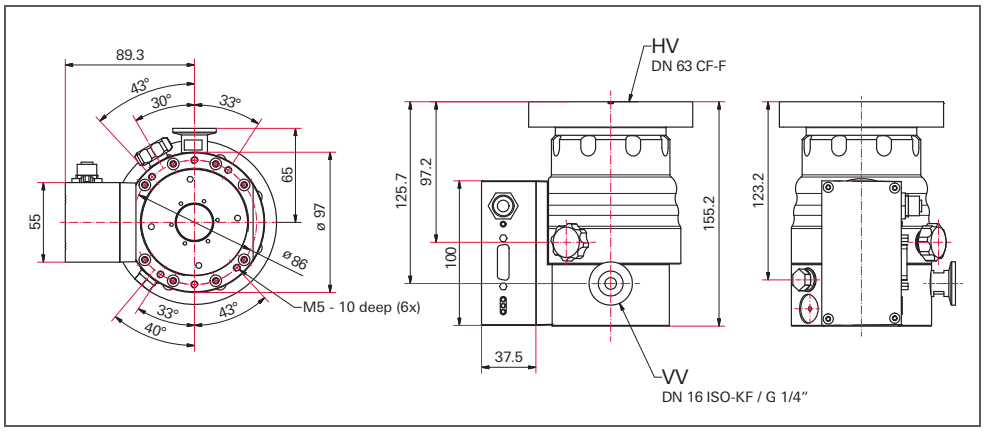
Dimensions (in mm)



HiPace® 80 with TC 110, DN 63 ISO-K



HiPace® 80 with TC 110, DN 40 ISO-KF



HiPace® 80 with TC 110, DN 63 CF-F

Technical data	HiPace® 80 with TC 110, DN 63 ISO-K	HiPace® 80 with TC 110, DN 63 CF-F	HiPace® 80 with TC 110, DN 40 ISO-KF	
Connection nominal diameter				
Flange (out)	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	
Flange (in)	DN 63 ISO-K	DN 63 CF-F	DN 40 ISO-KF	
Venting connection	G 1/8"	G 1/8"	G 1/8"	
Pumping speed				
Pumping speed for Ar	66 l/s	66 l/s	30 l/s	
Pumping speed for H_2	48 l/s	48 l/s	38 l/s	
Pumping speed for He	58 l/s	58 l/s	41 l/s	
Pumping speed for N_2	67 l/s	67 l/s	35 l/s	
Compression				
Compression ratio for Ar	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	
Compression ratio for H_2	$1.4 \cdot 10^{5}$	$1.4 \cdot 10^{5}$	$1.4 \cdot 10^{5}$	
Compression ratio for He	$1.3 \cdot 10^{7}$	$1.3 \cdot 10^{7}$	$1.3 \cdot 10^{7}$	
Compression ratio for N_2	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	
Fore-vacuum max. for N_2	22 hPa	22 hPa	22 hPa	
Gas througput				
Gas throughput at full rotational speed for Ar	0.54 hPa l/s	0.54 hPa l/s	0.54 hPa l/s	
Gas throughput at full rotational speed for H_2	15.3 hPa l/s	15.3 hPa l/s	15.3 hPa l/s	
Gas throughput at full rotational speed for He	2.7 hPa l/s	2.7 hPa l/s	2.7 hPa l/s	
Gas throughput at full rotational speed for N_2	1.3 hPa l/s	1.3 hPa l/s	1.3 hPa l/s	
Electronic drive unit	with TC 110	with TC 110	with TC 110	
Separate electronic drive unit				
Operating voltage	24 (± 5 %) V DC	24 (± 5 %) V DC	24 (± 5 %) V DC	
Rotation speed ± 2 %	90000 min^{-1}	90000 min^{-1}	90000 min^{-1}	
Rotation speed variable	50-100 %	50-100 %	50-100 %	
Mounting orientation	in any orientation	in any orientation	in any orientation	
Ultimate pressure*	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa	
Weight	2.4 kg	3.8 kg	2.4 kg	
Run-up time	1.7 min	1.7 min	1.7 min	
Cooling method, optional	Air/Water	Air/Water	Air/Water	
Cooling method, standard	Convection	Convection	Convection	
Cooling water temperature	5-25 °C	5-25 °C	5-25 °C	
Cooling water consumption	75 l/h	75 l/h	75 l/h	
Bearing	Hybrid	Hybrid	Hybrid	
Sound pressure level	≤ 48 dB (A)	≤ 48 dB (A)	≤ 48 dB (A)	
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote	
Protection category	IP 54	IP 54	IP 54	
Permissible magnetic field max.	3.3 mT	3.3 mT	3.3 mT	
Order number pump Pumpe	**PM P03 940**	**PM P03 941**	**PM P03 942**	

*Ultimate pressure please find description on page 272

	HiPace® 80 for TCP 350, DN 63 ISO-K	HiPace® 80 for TCP 350, DN 63 CF-F	HiPace® 80 for TCP 350, DN 40 ISO-KF
	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"
	DN 63 ISO-K	DN 63 CF-F	DN 40 ISO-KF
	G 1/8"	G 1/8"	G 1/8"
	66 l/s	66 l/s	30 l/s
	48 l/s	48 l/s	38 l/s
	58 l/s	58 l/s	41 l/s
	67 l/s	67 l/s	35 l/s
	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$
	$1.4 \cdot 10^{5}$	$1.4 \cdot 10^{5}$	$1.4 \cdot 10^{5}$
	$1.3 \cdot 10^{7}$	$1.3 \cdot 10^{7}$	$1.3 \cdot 10^{7}$
	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$
	22 hPa	22 hPa	22 hPa
	0.54 hPa l/s	0.54 hPa l/s	0.54 hPa l/s
	15.3 hPa l/s	15.3 hPa l/s	15.3 hPa l/s
	2.7 hPa l/s	2.7 hPa l/s	2.7 hPa l/s
	1.3 hPa l/s	1.3 hPa l/s	1.3 hPa l/s
	for TCP 350	for TCP 350	for TCP 350
	YES	YES	YES
	90000 min^{-1}	90000 min^{-1}	90000 min^{-1}
	50-100 %	50-100 %	50-100 %
	in any orientation	in any orientation	in any orientation
	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa
	2.1 kg	3.5 kg	2.1 kg
	1.7 min	1.7 min	1.7 min
	Air/Water	Air/Water	Air/Water
	Convection	Convection	Convection
	5-25 °C	5-25 °C	5-25 °C
	75 l/h	75 l/h	75 l/h
	Hybrid	Hybrid	Hybrid
	≤ 48 dB (A)	≤ 48 dB (A)	≤ 48 dB (A)
	RS-485, Remote	RS-485, Remote	RS-485, Remote
	IP 54	IP 54	IP 54
	3.3 mT	3.3 mT	3.3 mT
	PM P03 943	**PM P03 944**	**PM P03 945**

Accessories	HiPace® 80 with TC 110, DN 63 ISO-K	HiPace® 80 with TC 110, DN 63 CF-F	HiPace® 80 with TC 110, DN 40 ISO-KF	
Order number pump Pumpe	**PM P03 940**	**PM P03 941**	**PM P03 942**	
Power supplies/power				
DCU - power supply with display control unit	**PM C01 820** **PM C01 821**	**PM C01 820** **PM C01 821**	**PM C01 820** **PM C01 821**	
TPS - mains pack for wall/standard rail fitting	**PM 061 340 -T** **PM 061 341 -T**	**PM 061 340 -T** **PM 061 341 -T**	**PM 061 340 -T** **PM 061 341 -T**	
TPS - mains packl 19" rack module 3 RU	**PM 061 344 -T** **PM 061 345 -T**	**PM 061 344 -T** **PM 061 345 -T**	**PM 061 344 -T** **PM 061 345 -T**	
Control units				
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**	
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**	
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**	
Mains cable DCU/TPS/TCP, 3 m				
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	
115 V AC mains cable with UL plug	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	
208 V AC mains cable with UL plug	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	
Connection cable, length 3 m between				
Connection cable for HiPace with TC 110 to TPS/DCU 110/111/180/181 with accessorie ports and RS-485	**PM 061 351 -T**	**PM 061 351 -T**	**PM 061 351 -T**	
Connection cable for HiPace with TC 110 to power supply TPS/DCU 110/111/180/181	**PM 061 350 -T**	**PM 061 350 -T**	**PM 061 350 -T**	
Connection cable TCP 350 - HiPace with 2 accessorie ports M8, 3 m				
External drive units				
TCP 350				
TCP 350 PB - Profibus				
TCP 350 DN - DeviceNet				
Venting accessories				
Venting valve	**PM Z01 290**	**PM Z01 290**	**PM Z01 290**	
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	
Cooling accessories				
Air cooling	**PM Z01 300**	**PM Z01 300**	**PM Z01 300**	
Water cooling	**PM 016 623 -T**	**PM 016 623 -T**	**PM 016 623 -T**	
Heating accessories				
Heating jacket 230 V AC, Euro-style safety plug		**PM 061 360 -T**		
Heating jacket 208 V AC, UL plug		**PM 061 361 -T**		
Heating jacket 115 V AC, UL plug		**PM 061 362 -T**		
Backing pump control				
Backing pump relay box, shielded, 1-phase 20 A	**PM 061 373 -T**	**PM 061 373 -T**	**PM 061 373 -T**	
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 282 -X**	**PM 071 282 -X**	**PM 071 282 -X**	
Connection cable from TCP 350 to backing pump relay box (length 2 m)				
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	
TCS 15 for controlling backing pumps	**PM 061 685 -X**	**PM 061 685 -X**	**PM 061 685 -X**	
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**	

	HiPace® 80 for TCP 350, DN 63 ISO-K	HiPace® 80 for TCP 350, DN 63 CF-F	HiPace® 80 for TCP 350, DN 40 ISO-KF
	PM P03 943	PM P03 944	PM P03 945
	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA
	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE
	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF
	PM 061 353 -T	PM 061 353 -T	PM 061 353 -T
	PM C01 740	PM C01 740	PM C01 740
	PM C01 741	PM C01 741	PM C01 741
	PM C01 742	PM C01 742	PM C01 742
	PM Z01 290	PM Z01 290	PM Z01 290
	PM Z00 121	PM Z00 121	PM Z00 121
	PM Z01 300	PM Z01 300	PM Z01 300
	PM 016 623 -T	PM 016 623 -T	PM 016 623 -T
		PM 061 360 -T	
		PM 061 361 -T	
		PM 061 362 -T	
	PM 061 373 -T	PM 061 373 -T	PM 061 373 -T
	PM 071 282 -X	PM 071 282 -X	PM 071 282 -X
	PM 061 376 -T	PM 061 376 -T	PM 061 376 -T
	PM Z01 205	PM Z01 205	PM Z01 205
	PM Z01 206	PM Z01 206	PM Z01 206

Accessories	HiPace® 80 with TC 110, DN 63 ISO-K	HiPace® 80 with TC 110, DN 63 CF-F	HiPace® 80 with TC 110, DN 40 ISO-KF	
Order number pump Pumpe	**PM P03 940**	**PM P03 941**	**PM P03 942**	
General accessories				
Sealing gas valve	**PM Z01 310**	**PM Z01 310**	**PM Z01 310**	
Sealing gas throttle	**PM Z01 316**	**PM Z01 316**	**PM Z01 316**	
Centering ring			**PF 110 140 -T**	
Centering ring with integrated mesh screen			**PF 113 240 -T**	
Centering ring coated	**PM 016 206 -U**			
Centering ring coated with protection screen	**PM 016 208 -U**			
Centering ring coated with splinter shield	**PM 016 207 -U**		**PM 006 375 -X**	
Protection screen		**PM 016 333**		
Splinter shield		**PM 016 312**		
Vibration dampers	**PM 006 800 -X**	**PM 006 801 -X**	**PM 006 799 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	
Connection cable, plug M12, RJ 45, 3 m				
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**	
TCS 11, adapter for TC 110 with interface RS-485	**PM 061 636 -U**	**PM 061 636 -U**	**PM 061 636 -U**	
TCS 12, adapter for TC 110 with interface RS-485, 4 accessory ports	**PM 061 638 -U**	**PM 061 638 -U**	**PM 061 638 -U**	
Mounting materials				
Centering ring coated, bracket screws	**PM 016 360 -T**			
Centering ring coated with protection screen, bracket screws	**PM 016 362 -T**			
Centering ring coated with splinter shield, bracket screws	**PM 016 361 -T**			
Set of hexagon screws for trough hole (CF-F)		**PM 016 683 -T**		
Set of stud screws for tapped hole (CF-F)		**PM 016 684 -T**		
Set of stud screws for trough hole (CF)		**PM 016 733 -T**		
Clamping ring with Centering ring			**PM 016 625 -T**	
Clamping ring with Centering ring with splinter shield			**PM 016 626-T**	
Centering ring coated DN 63 ISO-K, 4 prackets M8	**PM 016 510 -T**			
Centering ring coated DN 63 ISO-K, 4 prackets M8, protection screen	**PM 016 512 -T**			
Centering ring coated DN 63 ISO-K, 4 prackets M8, splinter shield	**PM 016 511 -T**			

Content

	HiPace® 80 for TCP 350, DN 63 ISO-K	HiPace® 80 for TCP 350, DN 63 CF-F	HiPace® 80 for TCP 350, DN 40 ISO-KF
	PM P03 943	PM P03 944	PM P03 945
	PM Z01 310	PM Z01 310	PM Z01 310
	PM Z01 316	PM Z01 316	PM Z01 316
			PF 110 140 -T
			PF 113 240 -T
	PM 016 206 -U		
	PM 016 208 -U		
	PM 016 207 -U		PM 006 375 -X
		PM 016 333	
		PM 016 312	
	PM 006 800 -X	PM 006 801 -X	PM 006 799 -X
	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T
	PM 051 726 -T	PM 051 726 -T	PM 051 726 -T
	PM 016 360 -T		
	PM 016 362 -T		
	PM 016 361 -T		
		PM 016 683 -T	
		PM 016 684 -T	
		PM 016 733 -T	
			PM 016 625 -T
			PM 016 626-T
	PM 016 510 -T		
	PM 016 512 -T		
	PM 016 511 -T		

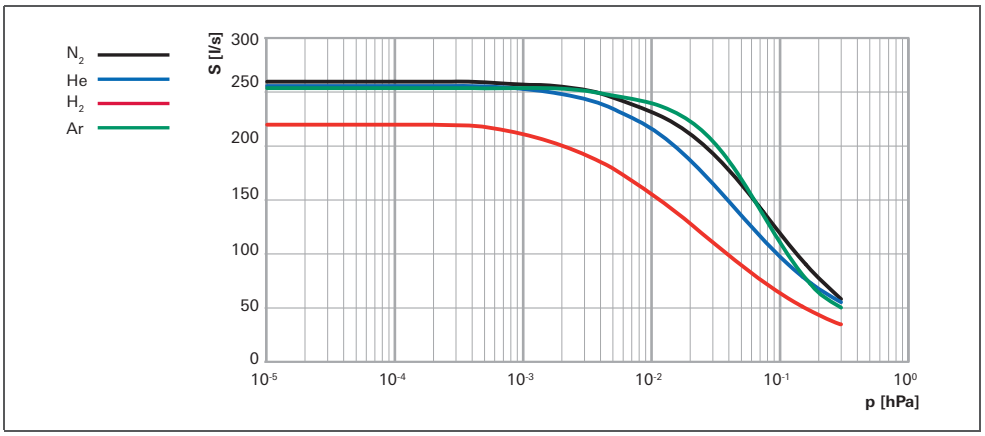
HiPace® 300



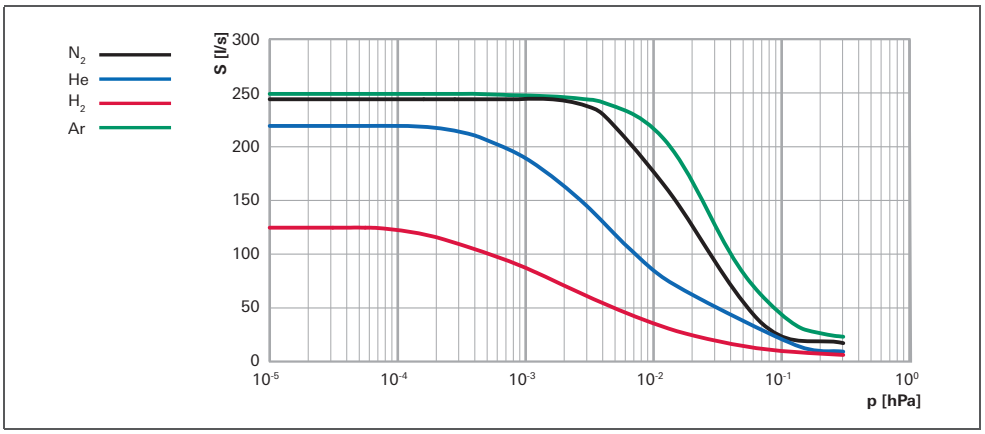
- Rugged, powerful turbopump with a pumping speed of up to 260 l/s for N_2
- Integrated TC 400 drive electronics
- Ideal for analytical and industrial applications
- For installation in any orientation
- With integrated water cooling for maximum gas throughput
- Flexible through the ability to employ up to 4 accessories
- Ideal for fast cycles
- Extensive accessories expand the range of applications

C=Corrosive gas version

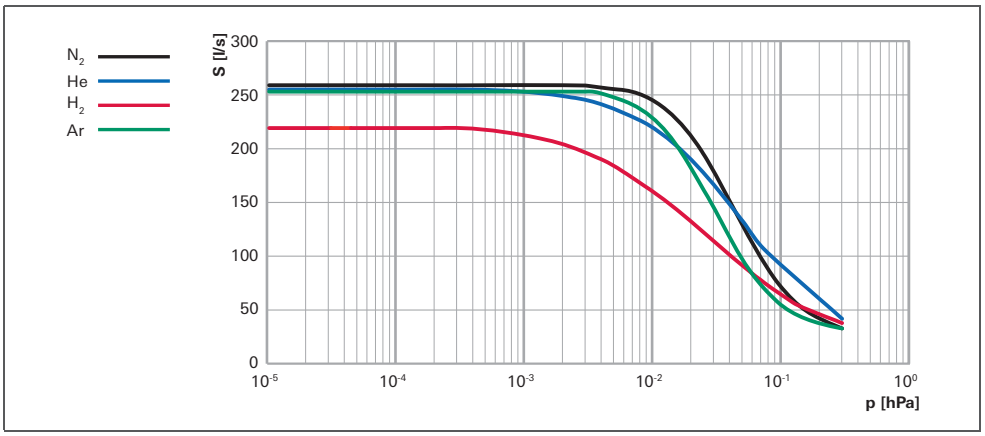
Pumping speed



HiPace® 300 with TC 400

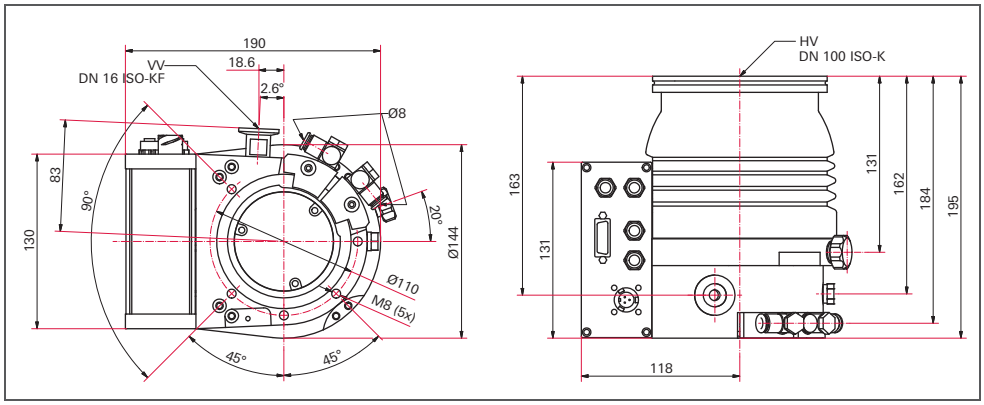


HiPace® 300 C with TC 400
HiPace® 300 P with TC 400

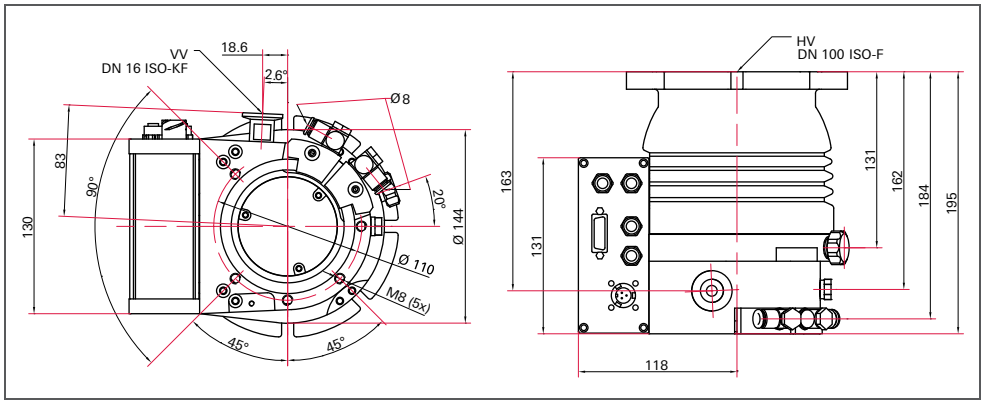


HiPace® 300 with TC 110
HiPace® 300 Plus with TC 110

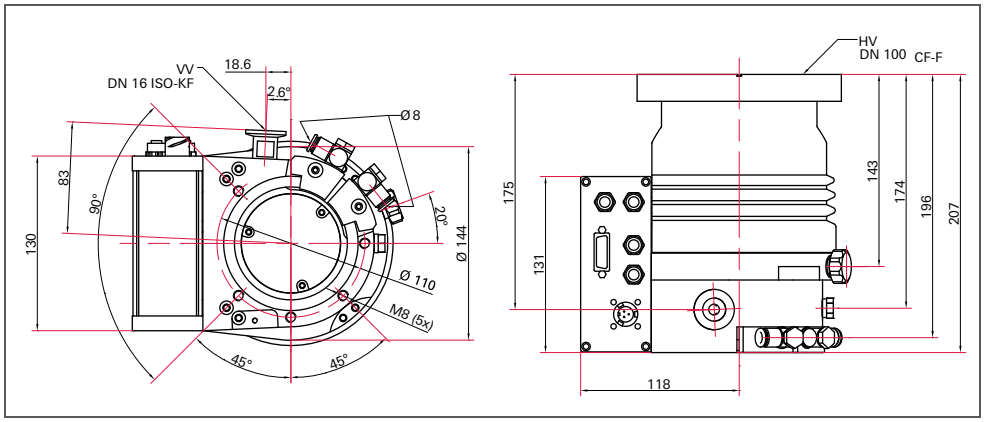
Dimensions (in mm)



HiPace® 300 with TC 400, DN 100 ISO-K



HiPace® 300 with TC 400, DN 100 ISO-F



HiPace® 300 with TC 400, DN 100 CF-F

Technical data	HiPace® 300 with TC 400, DN 100 ISO-K	HiPace® 300 with TC 400, DN 100 CF-F	HiPace® 300 with TC 400, DN 100 ISO-F	HiPace® 300 P with TC 400, DN 100 ISO-K	
Connection nominal diameter					
Flange (out)	DN 16 ISO-KF / G 1/4''	DN 16 ISO-KF / G 1/4''	DN 16 ISO-KF / G 1/4''	DN 16 ISO-KF / G 1/4"	
Flange (in)	DN 100 ISO-K	DN 100 CF-F	DN 100 ISO-F	DN 100 ISO-K	
Venting connection	G 1/8"	G 1/8"	G 1/8"	G 1/8"	
Pumping speed					
Pumping speed for Ar	255 l/s	255 l/s	255 l/s	250 l/s	
Pumping speed for H_2	220 l/s	220 l/s	220 l/s	125 l/s	
Pumping speed for He	255 l/s	255 l/s	255 l/s	220 l/s	
Pumping speed for N_2	260 l/s	260 l/s	260 l/s	245 l/s	
Compression					
Compression ratio for Ar	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{7}$	
Compression ratio for H_2	$9 \cdot 10^{5}$	$9 \cdot 10^{5}$	$9 \cdot 10^{5}$	$3 \cdot 10^{2}$	
Compression ratio for He	$> 1 \cdot 10^{8}$	$> 1 \cdot 10^{8}$	$> 1 \cdot 10^{8}$	$2 \cdot 10^{3}$	
Compression ratio for N_2	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{6}$	
Fore-vacuum max. for N_2	20 hPa	20 hPa	20 hPa	1 hPa	
Gas througput					
Gas throughput at full rotational speed for Ar	7 hPa l/s	7 hPa l/s	7 hPa l/s	2.9 hPa l/s	
Gas throughput at full rotational speed for H_2	> 14 hPa l/s	> 14 hPa l/s	> 14 hPa l/s	> 20 hPa l/s	
Gas throughput at full rotational speed for He	10 hPa l/s	10 hPa l/s	10 hPa l/s	> 10 hPa l/s	
Gas throughput at full rotational speed for N_2	14 hPa l/s	14 hPa l/s	14 hPa l/s	14 hPa l/s	
Electronic drive unit	with TC 400	with TC 400	with TC 400	with TC 400	
Separate electronic drive unit					
Operating voltage	24 (± 5 %) V DC	24 (± 5 %) V DC	24 (± 5 %) V DC	24 (± 5 %) V DC	
Rotation speed ± 2 %	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}	
Rotation speed variable	35-100 %	35-100 %	35-100 %	35-100 %	
Mounting orientation	in any orientation	in any orientation	in any orientation	in any orientation	
Ultimate pressure*	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	
Weight	6.7 kg	8.7 kg	7 kg	6.4 kg	
Run-up time	1.8 min	1.8 min	1.8 min	1.2 min	
Corrosive gas version					
Cooling method, optional	Air	Air	Air	Air	
Cooling method, standard	Water	Water	Water	Water	
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C	15-35 °C	
Cooling water consumption	50 l/h	50 l/h	50 l/h	50 l/h	
Bearing	Hybrid	Hybrid	Hybrid	Hybrid	
Particulate matter				YES	
Sound pressure level	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	
Protection category	IP 54	IP 54	IP 54	IP 54	
Low vibrations					
Permissible magnetic field max.	5.5 mT	5.5 mT	5.5 mT	5.5 mT	
Order number pump Pumpe	**PM P03 900**	**PM P03 901**	**PM P03 902**	**PM P04 710**	

*Ultimate pressure please find description on page 272

	HiPace® 300 P with TC 400, DN 100 CF-F	HiPace® 300 P with TC 400, DN 100 ISO-F	HiPace® 300 C with TC 400, DN 100 ISO-K	HiPace® 300 C with TC 400, DN 100 CF-F	HiPace® 300 C with TC 400, DN 100 ISO-F
	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"
	DN 100 CF-F	DN 100 ISO-F	DN 100 ISO-K	DN 100 CF-F	DN 100 ISO-F
	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"
	250 l/s	250 l/s	250 l/s	250 l/s	250 l/s
	125 l/s	125 l/s	125 l/s	125 l/s	125 l/s
	220 l/s	220 l/s	220 l/s	220 l/s	220 l/s
	245 l/s	245 l/s	245 l/s	245 l/s	245 l/s
	> $1 \cdot 10^7$	> $1 \cdot 10^7$	> $1 \cdot 10^7$	> $1 \cdot 10^7$	> $1 \cdot 10^7$
	$3 \cdot 10^2$	$3 \cdot 10^2$	$3 \cdot 10^2$	$3 \cdot 10^2$	$3 \cdot 10^2$
	$2 \cdot 10^3$	$2 \cdot 10^3$	$2.2 \cdot 10^3$	$2.2 \cdot 10^3$	$2.2 \cdot 10^3$
	> $1 \cdot 10^6$	> $1 \cdot 10^6$	> $1 \cdot 10^6$	> $1 \cdot 10^6$	> $1 \cdot 10^6$
	1 hPa	1 hPa	1 hPa	1 hPa	1 hPa
	2.9 hPa l/s	2.9 hPa l/s	4.4 hPa l/s	4.4 hPa l/s	4.4 hPa l/s
	> 20 hPa l/s	> 20 hPa l/s	> 50 hPa l/s	> 50 hPa l/s	> 50 hPa l/s
	> 10 hPa l/s	> 10 hPa l/s	> 20 hPa l/s	> 20 hPa l/s	> 20 hPa l/s
	14 hPa l/s	14 hPa l/s	17 hPa l/s	17 hPa l/s	17 hPa l/s
	with TC 400	with TC 400	with TC 400	with TC 400	with TC 400
	24 (± 5 %) V DC	24 (± 5 %) V DC	24 (± 5 %) V DC	24 (± 5 %) V DC	24 (± 5 %) V DC
	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}
	35-100 %	35-100 %	35-100 %	35-100 %	35-100 %
	in any orientation	in any orientation	Standard (0°-90°)	Standard (0°-90°)	Standard (0°-90°)
	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa
	8.4 kg	6.7 kg	6.4 kg	8.4 kg	6.7 kg
	1.2 min	1.2 min	1.2 min	1.2 min	1.2 min
			YES	YES	YES
	Air	Air	Air	Air	Air
	Water	Water	Water	Water	Water
	15-35 °C	15-35 °C	15-35 °C	15-35 °C	15-35 °C
	50 l/h	50 l/h	50 l/h	50 l/h	50 l/h
	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid
	YES	YES	YES	YES	YES
	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)
	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote
	IP 54	IP 54	IP 54	IP 54	IP 54
	5.5 mT	5.5 mT	5.5 mT	5.5 mT	5.5 mT
	PM P04 711	**PM P04 712**	**PM P03 906**	**PM P03 996**	**PM P03 907**

Accessories	HiPace® 300 with TC 400, DN 100 ISO-K	HiPace® 300 with TC 400, DN 100 CF-F	HiPace® 300 with TC 400, DN 100 ISO-F	HiPace® 300 P with TC 400, DN 100 ISO-K	
Order number pump Pumpe	**PM P03 900**	**PM P03 901**	**PM P03 902**	**PM P04 710**	
Power supplies/power					
DCU - power supply with display control unit	**PM C01 822**	**PM C01 822**	**PM C01 822**	**PM C01 822**	
TPS - mains pack for wall/standard rail fitting	**PM 061 342 -T**	**PM 061 342 -T**	**PM 061 342 -T**	**PM 061 342 -T**	
TPS - mains packl 19" rack module 3 RU	**PM 061 346 -T**	**PM 061 346 -T**	**PM 061 346 -T**	**PM 061 346 -T**	
Control units					
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**	
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**	
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**	
Mains cable DCU/TPS/TCP, 3 m					
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	
115 V AC mains cable with UL plug	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	
208 V AC mains cable with UL plug	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	
Connection cable, length 3 m between					
Connection cable for HiPace with TC 110 to TPS/DCU 110/111/180/181 with accessorie ports and RS-485					
Connection cable for HiPace with TC 110 to power supply TPS/DCU 110/111/180/181					
Connection cable for HiPace with TC 400/TM 700 to power supply TPS/DCU 310/311/400/401	**PM 061 352 -T**	**PM 061 352 -T**	**PM 061 352 -T**	**PM 061 352 -T**	
TCP 350 - HiPace					
Venting accessories					
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	
Cooling accessories					
Air cooling	**PM Z01 302**	**PM Z01 302**	**PM Z01 302**	**PM Z01 302**	
Water cooling					
Heating accessories					
Heating jacket 230 V AC, Euro-style safety plug		**PM 061 366 -T**			
Heating jacket 208 V AC, UL plug		**PM 061 367 -T**			
Heating jacket 115 V AC, UL plug		**PM 061 368 -T**			
Backing pump control					
Backing pump relay box, shielded, 1-phase 20 A	**PM 061 375 -T**	**PM 061 375 -T**	**PM 061 375 -T**	**PM 061 375 -T**	
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**	
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	
TCS 15 for controlling backing pumps					
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**	

	HiPace® 300 P with TC 400, DN 100 CF-F	HiPace® 300 P with TC 400, DN 100 ISO-F	HiPace® 300 C with TC 400, DN 100 ISO-K	HiPace® 300 C with TC 400, DN 100 CF-F	HiPace® 300 C with TC 400, DN 100 ISO-F
	PM P04 711	PM P04 712	PM P03 906	PM P03 996	PM P03 907
	PM C01 822	PM C01 822	PM C01 822	PM C01 822	PM C01 822
	PM 061 342 -T	PM 061 342 -T	PM 061 342 -T	PM 061 342 -T	PM 061 342 -T
	PM 061 346 -T	PM 061 346 -T	PM 061 346 -T	PM 061 346 -T	PM 061 346 -T
	PM 061 348 -T	PM 061 348 -T	PM 061 348 -T	PM 061 348 -T	PM 061 348 -T
	PM 051 510 -T	PM 051 510 -T	PM 051 510 -T	PM 051 510 -T	PM 051 510 -T
	PM 061 005 -T	PM 061 005 -T	PM 061 005 -T	PM 061 005 -T	PM 061 005 -T
	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA
	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE
	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF
	PM 061 352 -T	PM 061 352 -T	PM 061 352 -T	PM 061 352 -T	PM 061 352 -T
	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291
	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121
	PM Z01 302	PM Z01 302	PM Z01 302	PM Z01 302	PM Z01 302
	PM 061 366 -T			PM 061 366 -T	
	PM 061 367 -T			PM 061 367 -T	
	PM 061 368 -T			PM 061 368 -T	
	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T
	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X
	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T
	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205
	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206
	PM 071 142 -X	PM 071 142 -X	PM 071 142 -X	PM 071 142 -X	PM 071 142 -X

Accessories	HiPace® 300 with TC 400, DN 100 ISO-K	HiPace® 300 with TC 400, DN 100 CF-F	HiPace® 300 with TC 400, DN 100 ISO-F	HiPace® 300 P with TC 400, DN 100 ISO-K	
Order number pump Pumpe	**PM P03 900**	**PM P03 901**	**PM P03 902**	**PM P04 710**	
General accessories					
Sealing gas valve	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**	
Sealing gas throttle	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	
Centering ring coated	**PM 016 210 -U**		**PM 016 210 -U**	**PM 016 210 -U**	
Centering ring coated with protection screen	**PM 016 212 -U**		**PM 016 212 -U**	**PM 016 212 -U**	
Centering ring coated with splinter shield	**PM 016 211 -U**		**PM 016 211 -U**	**PM 016 211 -U**	
Protection screen		**PM 016 336**			
Splinter shield		**PM 016 315**			
Vibration dampers	**PM 006 459 -X**	**PM 006 488 -X**		**PM 006 459 -X**	
Vibration isolator					
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**	**P 4723 010**	
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**		
TCS 11, adapter for TC 110 with interface RS-485					
TCS 12, adapter for TC 110 with interface RS-485, 4 accessory ports					
Mounting materials					
Centering ring coated, bracket screws	**PM 016 365 -T**			**PM 016 365 -T**	
Centering ring coated with protection screen, bracket screws	**PM 016 367 -T**			**PM 016 367 -T**	
Centering ring coated with splinter shield, bracket screws	**PM 016 366 -T**			**PM 016 366 -T**	
Centering ring coated with hexagon bolts			**PM 016 450 -T**		
Centering ring coated with protection screen, hexagon bolts			**PM 016 452 -T**		
Centering ring coated with splinter shield, hexagon bolts			**PM 016 451 -T**		
Centering ring coated with stud screws			**PM 016 455 -T**		
Centering ring coated with protection screen with stud screws			**PM 016 457 -T**		
Centering ring coated with splinter shield with stud screws			**PM 016 456 -T**		
Set of hexagon screws for trough hole (CF-F)		**PM 016 690 -T**			
Set of stud screws for tapped hole (CF-F)		**PM 016 692 -T**			
Set of stud screws for trough hole (CF)		**PM 016 734 -T**			

	HiPace® 300 P with TC 400, DN 100 CF-F	HiPace® 300 P with TC 400, DN 100 ISO-F	HiPace® 300 C with TC 400, DN 100 ISO-K	HiPace® 300 C with TC 400, DN 100 CF-F	HiPace® 300 C with TC 400, DN 100 ISO-F
	PM P04 711	PM P04 712	PM P03 906	PM P03 996	PM P03 907
	PM Z01 312	PM Z01 312	PM Z01 312	PM Z01 312	PM Z01 312
	PM Z01 317	PM Z01 317	PM Z01 317	PM Z01 317	PM Z01 317
		PM 016 210 -U	PM 016 210 -U		PM 016 210 -U
		PM 016 212 -U	PM 016 212 -U		PM 016 212 -U
		PM 016 211 -U	PM 016 211 -U		PM 016 211 -U
	PM 016 336			PM 016 336	
	PM 016 315			PM 016 315	
	PM 006 488 -X		PM 006 459 -X	PM 006 488 -X	
	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T
	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T
	P 4723 010	P 4723 010	P 4723 010	P 4723 010	P 4723 010
			P 4723 013	P 4723 013	P 4723 013
			PM 016 365 -T		
			PM 016 367 -T		
			PM 016 366 -T		
		PM 016 450 -T			PM 016 450 -T
		PM 016 452 -T			PM 016 452 -T
		PM 016 451 -T			PM 016 451 -T
		PM 016 455 -T			PM 016 455 -T
		PM 016 457 -T			PM 016 457 -T
		PM 016 456 -T			PM 016 456 -T
	PM 016 690 -T			PM 016 690 -T	
	PM 016 692 -T			PM 016 692 -T	
	PM 016 734 -T			PM 016 734 -T	

Technical data	HiPace® 300 Plus with TC 110, DN 100 ISO-K	HiPace® 300 Plus with TC 110, DN 100 CF-F	HiPace® 300 Plus with TC 110, DN 100 ISO-F	HiPace® 300 with TC 110, DN 100 ISO-K	
Connection nominal diameter					
Flange (out)	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	
Flange (in)	DN 100 ISO-K	DN 100 CF-F	DN 100 ISO-F	DN 100 ISO-K	
Venting connection	G 1/8"	G 1/8"	G 1/8"	G 1/8"	
Pumping speed					
Pumping speed for Ar	255 l/s	255 l/s	255 l/s	255 l/s	
Pumping speed for H_2	220 l/s	220 l/s	220 l/s	220 l/s	
Pumping speed for He	255 l/s	255 l/s	255 l/s	255 l/s	
Pumping speed for N_2	260 l/s	260 l/s	260 l/s	260 l/s	
Compression					
Compression ratio for Ar	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	
Compression ratio for H_2	$9 \cdot 10^5$	$9 \cdot 10^5$	$9 \cdot 10^5$	$9 \cdot 10^5$	
Compression ratio for He	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	
Compression ratio for N_2	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	
Fore-vacuum max. for N_2	15 hPa	15 hPa	15 hPa	15 hPa	
Gas througput					
Gas throughput at full rotational speed for Ar	2 hPa l/s	2 hPa l/s	2 hPa l/s	2 hPa l/s	
Gas throughput at full rotational speed for H_2	> 14 hPa l/s	> 14 hPa l/s	> 14 hPa l/s	> 14 hPa l/s	
Gas throughput at full rotational speed for He	8 hPa l/s	8 hPa l/s	8 hPa l/s	8 hPa l/s	
Gas throughput at full rotational speed for N_2	5 hPa l/s	5 hPa l/s	5 hPa l/s	5 hPa l/s	
Electronic drive unit	with TC 110	with TC 110	with TC 110	with TC 110	
Separate electronic drive unit					
Operating voltage	24 (± 5 %) V DC	24 (± 5 %) V DC	24 (± 5 %) V DC	24 (± 5 %) V DC	
Rotation speed ± 2 %	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}	
Rotation speed variable	35-100 %	35-100 %	35-100 %	35-100 %	
Mounting orientation	vertical, flange up	vertical, flange up	vertical, flange up	in any orientation	
Ultimate pressure*	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	
Weight	5.8 kg	7.8 kg	6.1 kg	6.2 kg	
Run-up time	3.5 min	3.5 min	3.5 min	3.5 min	
Corrosive gas version					
Cooling method, optional	Water	Water	Water	Water	
Cooling method, standard	Air	Air	Air	Air	
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C	15-35 °C	
Cooling water consumption	50 l/h	50 l/h	50 l/h	50 l/h	
Bearing	Hybrid	Hybrid	Hybrid	Hybrid	
Particulate matter					
Sound pressure level	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	
Protection category	IP 54	IP 54	IP 54	IP 54	
Low vibrations	YES	YES	YES		
Permissible magnetic field max.	5.5 mT	5.5 mT	5.5 mT	5.5 mT	
Order number pump Pumpe	**PM P03 980**	**PM P03 981**	**PM P03 982**	**PM P03 990**	

*Ultimate pressure please find description on page 272

	HiPace® 300 with TC 110, DN 100 CF-F	HiPace® 300 with TC 110, DN 100 ISO-F	HiPace® 300 for TCP 350, DN 100 ISO-K	HiPace® 300 for TCP 350, DN 100 CF-F	HiPace® 300 for TCP 350, DN 100 ISO-F
	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"	DN 16 ISO-KF / G 1/4"
	DN 100 CF-F	DN 100 ISO-F	DN 100 ISO-K	DN 100 CF-F	DN 100 ISO-F
	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"
	255 l/s	255 l/s	255 l/s	255 l/s	255 l/s
	220 l/s	220 l/s	220 l/s	220 l/s	220 l/s
	255 l/s	255 l/s	255 l/s	255 l/s	255 l/s
	260 l/s	260 l/s	260 l/s	260 l/s	260 l/s
	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$
	$9 \cdot 10^{5}$	$9 \cdot 10^{5}$	$9 \cdot 10^{5}$	$9 \cdot 10^{5}$	$9 \cdot 10^{5}$
	> $1 \cdot 10^{8}$	> $1 \cdot 10^{8}$	> $1 \cdot 10^{8}$	> $1 \cdot 10^{8}$	> $1 \cdot 10^{8}$
	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$
	15 hPa	15 hPa	17 hPa	17 hPa	17 hPa
	2 hPa l/s	2 hPa l/s	4 hPa l/s	4 hPa l/s	4 hPa l/s
	> 14 hPa l/s	> 14 hPa l/s	> 14 hPa l/s	> 14 hPa l/s	> 14 hPa l/s
	8 hPa l/s	8 hPa l/s	11 hPa l/s	11 hPa l/s	11 hPa l/s
	5 hPa l/s	5 hPa l/s	7 hPa l/s	7 hPa l/s	7 hPa l/s
	with TC 110	with TC 110	for TCP 350	for TCP 350	for TCP 350
			YES	YES	YES
	24 (± 5 %) V DC	24 (± 5 %) V DC			
	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}
	35-100 %	35-100 %	35-100 %	35-100 %	35-100 %
	in any orientation	in any orientation	in any orientation	in any orientation	in any orientation
	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa
	8.2 kg	6.5 kg	5.8 kg	7.8 kg	6.1 kg
	3.5 min	3.5 min	2.5 min	2.5 min	2.5 min
	Water	Water	Air	Air	Air
	Air	Air	Water	Water	Water
	15-35 °C	15-35 °C	15-35 °C	15-35 °C	15-35 °C
	50 l/h	50 l/h	50 l/h	50 l/h	50 l/h
	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid
	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)
	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote
	IP 54	IP 54	IP 54	IP 54	IP 54
	5.5 mT	5.5 mT	5.5 mT	5.5 mT	5.5 mT
	PM P03 991	**PM P03 992**	**PM P03 993**	**PM P03 994**	**PM P03 995**

Accessories	HiPace® 300 Plus with TC 110, DN 100 ISO-K	HiPace® 300 Plus with TC 110, DN 100 CF-F	HiPace® 300 Plus with TC 110, DN 100 ISO-F	HiPace® 300 with TC 110, DN 100 ISO-K	
Order number pump Pumpe	**PM P03 980**	**PM P03 981**	**PM P03 982**	**PM P03 990**	
Power supplies/power					
DCU - power supply with display control unit	**PM C01 821**	**PM C01 821**	**PM C01 821**	**PM C01 821**	
TPS - mains pack for wall/standard rail fitting	**PM 061 341 -T**	**PM 061 341 -T**	**PM 061 341 -T**	**PM 061 341 -T**	
TPS - mains packl 19" rack module 3 RU	**PM 061 345 -T**	**PM 061 345 -T**	**PM 061 345 -T**	**PM 061 345 -T**	
Control units					
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**	
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**	
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**	
Mains cable DCU/TPS/TCP, 3 m					
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	
115 V AC mains cable with UL plug	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	
208 V AC mains cable with UL plug	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	
Connection cable, length 3 m between					
Connection cable for HiPace with TC 110 to TPS/DCU 110/111/180/181 with accessorie ports and RS-485	**PM 061 351 -T**	**PM 061 351 -T**	**PM 061 351 -T**	**PM 061 351 -T**	
Connection cable for HiPace with TC 110 to power supply TPS/DCU 110/111/180/181	**PM 061 350 -T**	**PM 061 350 -T**	**PM 061 350 -T**	**PM 061 350 -T**	
Connection cable for HiPace with TC 400/TM 700 to power supply TPS/DCU 310/311/400/401					
TCP 350 - HiPace					
External drive units					
TCP 350					
TCP 350 PB - Profibus					
TCP 350 DN - DeviceNet					
Venting accessories					
Venting valve	**PM Z01 290**	**PM Z01 290**	**PM Z01 290**	**PM Z01 290**	
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	
Cooling accessories					
Air cooling	**PM Z01 301**	**PM Z01 301**	**PM Z01 301**	**PM Z01 301**	
Water cooling	**PM 016 624 -T**	**PM 016 624 -T**	**PM 016 624 -T**	**PM 016 624 -T**	
Heating accessories					
Heating jacket 230 V AC, Euro-style safety plug		**PM 061 363 -T**			
Heating jacket 208 V AC, UL plug		**PM 061 364 -T**			
Heating jacket 115 V AC, UL plug		**PM 061 365 -T**			
Backing pump control					
Backing pump relay box, shielded, 1-phase 20 A	**PM 061 373 -T**	**PM 061 373 -T**	**PM 061 373 -T**	**PM 061 373 -T**	
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 282 -X**	**PM 071 282 -X**	**PM 071 282 -X**	**PM 071 282 -X**	
Control cable for pumping stations 0.7 m					
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	
TCS 15 for controlling backing pumps	**PM 061 685 -X**	**PM 061 685 -X**	**PM 061 685 -X**	**PM 061 685 -X**	
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**	

	HiPace® 300 with TC 110, DN 100 CF-F	HiPace® 300 with TC 110, DN 100 ISO-F	HiPace® 300 for TCP 350, DN 100 ISO-K	HiPace® 300 for TCP 350, DN 100 CF-F	HiPace® 300 for TCP 350, DN 100 ISO-F
	PM P03 991	PM P03 992	PM P03 993	PM P03 994	PM P03 995
	PM C01 821	PM C01 821			
	PM 061 341 -T	PM 061 341 -T			
	PM 061 345 -T	PM 061 345 -T			
	PM 061 348 -T	PM 061 348 -T			
	PM 051 510 -T	PM 051 510 -T			
	PM 061 005 -T	PM 061 005 -T			
	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA
	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE
	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF
	PM 061 351 -T	PM 061 351 -T			
	PM 061 350 -T	PM 061 350 -T			
			PM 061 356 -T	PM 061 356 -T	PM 061 356 -T
			PM C01 740	PM C01 740	PM C01 740
			PM C01 741	PM C01 741	PM C01 741
			PM C01 742	PM C01 742	PM C01 742
	PM Z01 290	PM Z01 290	PM Z01 291	PM Z01 291	PM Z01 291
	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121
	PM Z01 301	PM Z01 301	PM Z01 302	PM Z01 302	PM Z01 302
	PM 016 624 -T	PM 016 624 -T			
	PM 061 363 -T			PM 061 366 -T	
	PM 061 364 -T			PM 061 367 -T	
	PM 061 365 -T			PM 061 368 -T	
	PM 061 373 -T	PM 061 373 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T
	PM 071 282 -X	PM 071 282 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X
	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205
	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206
	PM 061 685 -X	PM 061 685 -X			
	PM 071 142 -X	PM 071 142 -X			

Accessories	HiPace® 300 Plus with TC 110, DN 100 ISO-K	HiPace® 300 Plus with TC 110, DN 100 CF-F	HiPace® 300 Plus with TC 110, DN 100 ISO-F	HiPace® 300 with TC 110, DN 100 ISO-K	
Order number pump Pumpe	**PM P03 980**	**PM P03 981**	**PM P03 982**	**PM P03 990**	
General accessories					
Sealing gas valve	**PM Z01 311**	**PM Z01 311**	**PM Z01 311**	**PM Z01 311**	
Sealing gas throttle	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	
Centering ring coated	**PM 016 210 -U**		**PM 016 210 -U**	**PM 016 210 -U**	
Centering ring coated with protection screen	**PM 016 212 -U**		**PM 016 212 -U**	**PM 016 212 -U**	
Centering ring coated with splinter shield	**PM 016 211 -U**		**PM 016 211 -U**	**PM 016 211 -U**	
Protection screen		**PM 016 336**			
Splinter shield		**PM 016 315**			
Vibration dampers	**PM 006 459 -X**	**PM 006 488 -X**		**PM 006 459 -X**	
Vibration isolator	**PM 016 600 -U**	**PM 016 715 -U**	**PM 016 600 -U**		
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**	**P 4723 010**	
Y-connector M12 for accessories					
Connection cable RJ 45 on M 12					
TCS 11, adapter for TC 110 with interface RS-485	**PM 061 636 -U**	**PM 061 636 -U**	**PM 061 636 -U**	**PM 061 636 -U**	
TCS 12, adapter for TC 110 with interface RS-485, 4 accessory ports	**PM 061 638 -U**	**PM 061 638 -U**	**PM 061 638 -U**	**PM 061 638 -U**	
Mounting materials					
Centering ring coated, bracket screws	**PM 016 365 -T**			**PM 016 365 -T**	
Centering ring coated with protection screen, bracket screws	**PM 016 367 -T**			**PM 016 367 -T**	
Centering ring coated with splinter shield, bracket screws	**PM 016 366 -T**			**PM 016 366 -T**	
Centering ring coated with hexagon bolts			**PM 016 450 -T**		
Centering ring coated with protection screen, hexagon bolts			**PM 016 452 -T**		
Centering ring coated with splinter shield, hexagon bolts			**PM 016 451 -T**		
Centering ring coated with stud screws			**PM 016 455 -T**		
Centering ring coated with protection screen with stud screws			**PM 016 457 -T**		
Centering ring coated with splinter shield with stud screws			**PM 016 456 -T**		
Set of hexagon screws for trough hole (CF-F)		**PM 016 690 -T**			
Set of stud screws for tapped hole (CF-F)		**PM 016 692 -T**			
Set of stud screws for trough hole (CF)		**PM 016 734 -T**			

	HiPace® 300 with TC 110, DN 100 CF-F	HiPace® 300 with TC 110, DN 100 ISO-F	HiPace® 300 for TCP 350, DN 100 ISO-K	HiPace® 300 for TCP 350, DN 100 CF-F	HiPace® 300 for TCP 350, DN 100 ISO-F
	PM P03 991	PM P03 992	PM P03 993	PM P03 994	PM P03 995
	PM Z01 311	PM Z01 311	PM Z01 311 PM Z01 312	PM Z01 311 PM Z01 312	PM Z01 311 PM Z01 312
	PM Z01 317	PM Z01 317	PM Z01 317	PM Z01 317	PM Z01 317
		PM 016 210 -U	PM 016 210 -U		PM 016 210 -U
		PM 016 212 -U	PM 016 212 -U		PM 016 212 -U
		PM 016 211 -U	PM 016 211 -U		PM 016 211 -U
	PM 016 336			PM 016 336	
	PM 016 315			PM 016 315	
	PM 006 488 -X		PM 006 459 -X	PM 006 488 -X	
	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T
	PM 061 283 -T	PM 061 283 -T			
	P 4723 010	P 4723 010			
			PM 051 726 -T	PM 051 726 -T	PM 051 726 -T
	PM 061 636 -U	PM 061 636 -U			
	PM 061 638 -U	PM 061 638 -U			
			PM 016 365 -T		
			PM 016 367 -T		
			PM 016 366 -T		
		PM 016 450 -T			PM 016 450 -T
		PM 016 452 -T			PM 016 452 -T
		PM 016 451 -T			PM 016 451 -T
		PM 016 455 -T			PM 016 455 -T
		PM 016 457 -T			PM 016 457 -T
		PM 016 456 -T			PM 016 456 -T
	PM 016 690 -T			PM 016 690 -T	
	PM 016 692 -T			PM 016 692 -T	
	PM 016 734 -T			PM 016 734 -T	

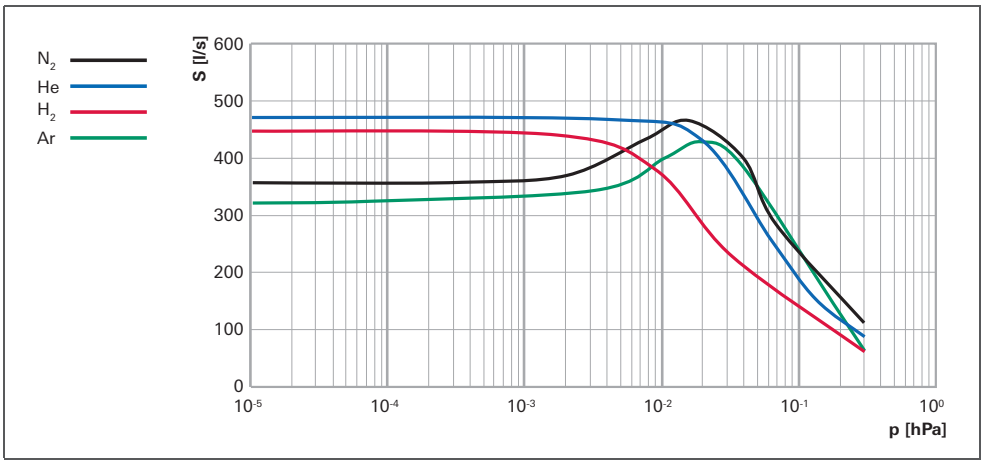
Content

HiPace® 400

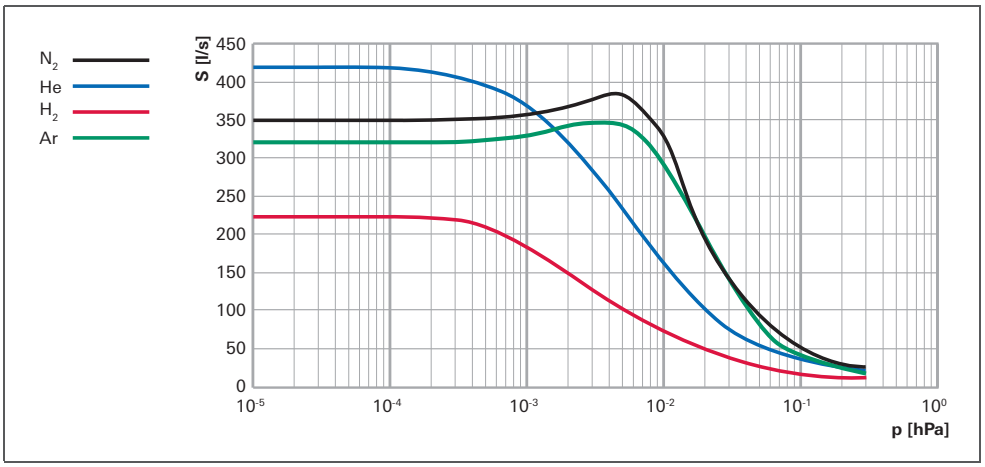


- Compact yet powerful turbopump with a pumping speed up to 355 l/s for N_2
- Integrated TC 400 drive electronics
- For installation in any orientation
- Integrated, powerful cooling system

Pumping speed

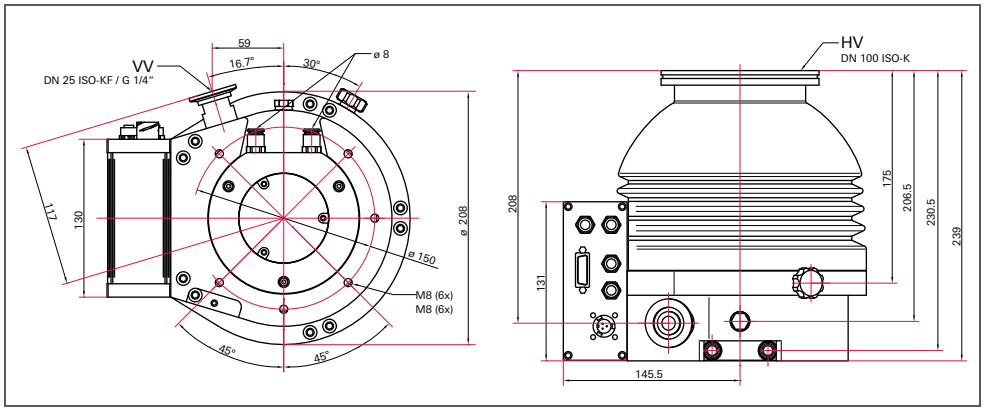


HiPace® 400

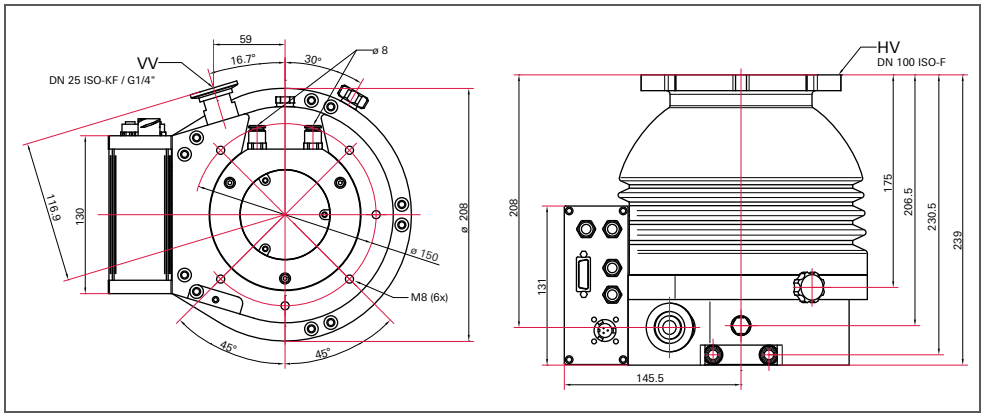


HiPace® 400 P with TC 400

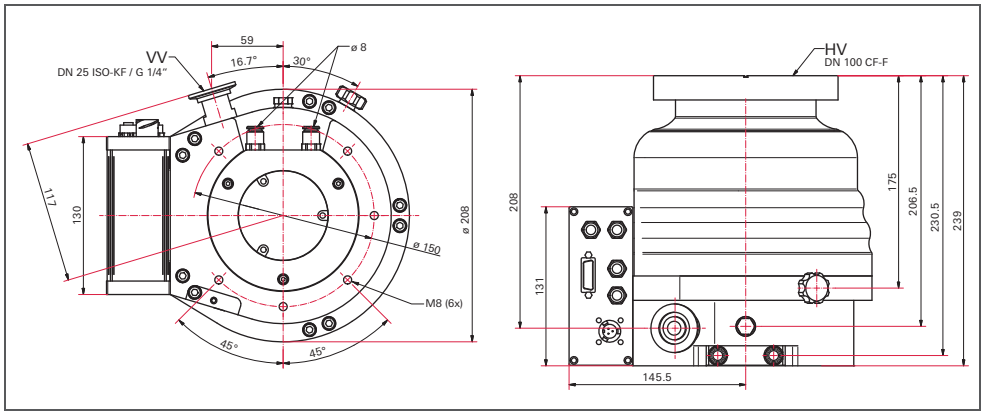
Dimensions (in mm)



HiPace® 400 with TC 400, DN 100 ISO-K



HiPace® 400 with TC 400, DN 100 ISO-F



HiPace® 400 with TC 400, DN 100 CF-F

Technical data	HiPace® 400 with TC 400, DN 100 ISO-K	HiPace® 400 with TC 400, DN 100 CF-F	HiPace® 400 with TC 400, DN 100 ISO-F	HiPace® 400 for TCP 350, DN 100 ISO-K	
Connection nominal diameter					
Flange (out)	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	
Flange (in)	DN 100 ISO-K	DN 100 CF-F	DN 100 ISO-F	DN 100 ISO-K	
Venting connection	G 1/8"	G 1/8"	G 1/8"	G 1/8"	
Pumping speed					
Pumping speed for Ar	320 l/s	320 l/s	320 l/s	320 l/s	
Pumping speed for H_2	445 l/s	445 l/s	445 l/s	445 l/s	
Pumping speed for He	470 l/s	470 l/s	470 l/s	470 l/s	
Pumping speed for N_2	355 l/s	355 l/s	355 l/s	355 l/s	
Compression					
Compression ratio for Ar	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	
Compression ratio for H_2	$4 \cdot 10^5$	$4 \cdot 10^5$	$4 \cdot 10^5$	$4 \cdot 10^5$	
Compression ratio for He	$3 \cdot 10^7$	$3 \cdot 10^7$	$3 \cdot 10^7$	$3 \cdot 10^7$	
Compression ratio for N_2	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	
Fore-vacuum max. for N_2	11 hPa	11 hPa	11 hPa	10 hPa	
Gas througput					
Gas throughput at full rotational speed for Ar	3.5 hPa l/s	3.5 hPa l/s	3.5 hPa l/s	1.5 hPa l/s	
Gas throughput at full rotational speed for H_2	> 14 hPa l/s	> 14 hPa l/s	> 14 hPa l/s	> 8 hPa l/s	
Gas throughput at full rotational speed for He	20 hPa l/s	20 hPa l/s	20 hPa l/s	5 hPa l/s	
Gas throughput at full rotational speed for N_2	6.5 hPa l/s	6.5 hPa l/s	6.5 hPa l/s	3 hPa l/s	
Electronic drive unit	with TC 400	with TC 400	with TC 400	for TCP 350	
Separate electronic drive unit				YES	
Operating voltage	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC		
Rotation speed ± 2 %	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	
Rotation speed variable	60-100 %	60-100 %	60-100 %	60-100 %	
Mounting orientation	in any orientation	in any orientation	in any orientation	in any orientation	
Ultimate pressure*	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	
Weight	11.6 kg	17.5 kg	12 kg	10.7 kg	
Run-up time	2 min	2 min	2 min	5.5 min	
Cooling method, optional	Air	Air	Air	Air	
Cooling method, standard	Water	Water	Water	Water	
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C	15-35 °C	
Cooling water consumption	100 l/h	100 l/h	100 l/h	100 l/h	
Bearing	Hybrid	Hybrid	Hybrid	Hybrid	
Particulate matter					
Sound pressure level	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	
Protection category	IP 54	IP 54	IP 54	IP 54	
Permissible magnetic field max.	6 mT	6 mT	6 mT	6 mT	
Order number pump Pumpe	**PM P04 023**	**PM P04 024**	**PM P04 025**	**PM P04 026**	

*Ultimate pressure please find description on page 272

	HiPace® 400 for TCP 350, DN 100 CF-F	HiPace® 400 for TCP 350, DN 100 ISO-F	HiPace® 400 P with TC 400, DN 100 ISO-K	HiPace® 400 P with TC 400, DN 100 CF-F	HiPace® 400 P with TC 400, DN 100 ISO-F
	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"
	DN 100 CF-F	DN 100 ISO-F	DN 100 ISO-K	DN 100 CF-F	DN 100 ISO-F
	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"
	320 l/s	320 l/s	320 l/s	320 l/s	320 l/s
	445 l/s	445 l/s	225 l/s	225 l/s	225 l/s
	470 l/s	470 l/s	420 l/s	420 l/s	420 l/s
	355 l/s	355 l/s	350 l/s	350 l/s	350 l/s
	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{7}$
	$4 \cdot 10^{5}$	$4 \cdot 10^{5}$	$4 \cdot 10^{2}$	$4 \cdot 10^{2}$	$4 \cdot 10^{2}$
	$3 \cdot 10^{7}$	$3 \cdot 10^{7}$	$3 \cdot 10^{3}$	$3 \cdot 10^{3}$	$3 \cdot 10^{3}$
	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{6}$	$> 1 \cdot 10^{6}$	$> 1 \cdot 10^{6}$
	10 hPa	10 hPa	0.9 hPa	0.9 hPa	0.9 hPa
	1.5 hPa l/s	1.5 hPa l/s	1 hPa l/s	1 hPa l/s	1 hPa l/s
	> 8 hPa l/s	> 8 hPa l/s	4 hPa l/s	4 hPa l/s	4 hPa l/s
	5 hPa l/s	5 hPa l/s	4 hPa l/s	4 hPa l/s	4 hPa l/s
	3 hPa l/s	3 hPa l/s	2 hPa l/s	2 hPa l/s	2 hPa l/s
	for TCP 350	for TCP 350	with TC 400	with TC 400	with TC 400
	YES	YES			
			48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC
	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}
	60-100 %	60-100 %	60-100 %	60-100 %	60-100 %
	in any orientation	in any orientation	in any orientation	in any orientation	in any orientation
	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa
	16.6 kg	11.1 kg	10.9 kg	16.8 kg	11.3 kg
	5.5 min	5.5 min	1.6 min	1.6 min	1.6 min
	Air	Air	Air	Air	Air
	Water	Water	Water	Water	Water
	15-35 °C	15-35 °C	15-35 °C	15-35 °C	15-35 °C
	100 l/h	100 l/h	100 l/h	100 l/h	100 l/h
	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid
			YES	YES	YES
	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)
	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote
	IP 54	IP 54	IP 54	IP 54	IP 54
	6 mT	6 mT	6 mT	6 mT	6 mT
	PM P04 027	**PM P04 028**	**PM P04 740**	**PM P04 741**	**PM P04 742**

Accessories	HiPace® 400 with TC 400, DN 100 ISO-K	HiPace® 400 with TC 400, DN 100 CF-F	HiPace® 400 with TC 400, DN 100 ISO-F	HiPace® 400 for TCP 350, DN 100 ISO-K	
Order number pump Pumpe	**PM P04 023**	**PM P04 024**	**PM P04 025**	**PM P04 026**	
Power supplies/power					
DCU - power supply with display control unit	**PM C01 823**	**PM C01 823**	**PM C01 823**		
TPS - mains pack for wall/standard rail fitting	**PM 061 343 -T**	**PM 061 343 -T**	**PM 061 343 -T**		
TPS - mains packl 19" rack module 3 RU	**PM 061 347 -T**	**PM 061 347 -T**	**PM 061 347 -T**		
Control units					
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**		
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**		
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**		
Mains cable DCU/TPS/TCP, 3 m					
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	
115 V AC mains cable with UL plug	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	
208 V AC mains cable with UL plug	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	
Connection cable, length 3 m between					
Connection cable for HiPace with TC 400/TM 700 to power supply TPS/DCU 310/311/400/401	**PM 061 352 -T**	**PM 061 352 -T**	**PM 061 352 -T**		
TCP 350 - HiPace				**PM 061 356 -T**	
External drive units					
TCP 350				**PM C01 740**	
TCP 350 PB - Profibus				**PM C01 741**	
TCP 350 DN - DeviceNet				**PM C01 742**	
Venting accessories					
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	
Cooling accessories					
Air cooling	**PM Z01 303**	**PM Z01 303**	**PM Z01 303**	**PM Z01 303**	
Heating accessories					
Heating jacket 230 V AC, Euro-style safety plug		**PM 061 369 -T**			
Heating jacket 208 V AC, UL plug		**PM 061 370 -T**			
Heating jacket 115 V AC, UL plug		**PM 061 371 -T**			
Backing pump control					
Backing pump relay box, shielded, 1-phase 20 A	**PM 061 375 -T**	**PM 061 375 -T**	**PM 061 375 -T**	**PM 061 375 -T**	
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**		
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	
Adapter cable, TCP 350 - backing pump relay box, M12				**PM 061 377 -T**	
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**		

	HiPace® 400 for TCP 350, DN 100 CF-F	HiPace® 400 for TCP 350, DN 100 ISO-F	HiPace® 400 P with TC 400, DN 100 ISO-K	HiPace® 400 P with TC 400, DN 100 CF-F	HiPace® 400 P with TC 400, DN 100 ISO-F
	PM P04 027	PM P04 028	PM P04 740	PM P04 741	PM P04 742
			PM C01 822	PM C01 822	PM C01 822
			PM 061 342 -T	PM 061 342 -T	PM 061 342 -T
			PM 061 346 -T	PM 061 346 -T	PM 061 346 -T
			PM 061 348 -T	PM 061 348 -T	PM 061 348 -T
			PM 051 510 -T	PM 051 510 -T	PM 051 510 -T
			PM 061 005 -T	PM 061 005 -T	PM 061 005 -T
	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA
	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE
	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF
			PM 061 352 -T	PM 061 352 -T	PM 061 352 -T
	PM 061 356 -T	PM 061 356 -T			
	PM C01 740	PM C01 740			
	PM C01 741	PM C01 741			
	PM C01 742	PM C01 742			
	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291
	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121
	PM Z01 303	PM Z01 303	PM Z01 303	PM Z01 303	PM Z01 303
	PM 061 369 -T			PM 061 369 -T	
	PM 061 370 -T			PM 061 370 -T	
	PM 061 371 -T			PM 061 371 -T	
	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T
	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X
			PM 061 675 -T	PM 061 675 -T	PM 061 675 -T
	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205
	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206
	PM 061 377 -T	PM 061 377 -T			
			PM 071 142 -X	PM 071 142 -X	PM 071 142 -X

Accessories	HiPace® 400 with TC 400, DN 100 ISO-K	HiPace® 400 with TC 400, DN 100 CF-F	HiPace® 400 with TC 400, DN 100 ISO-F	HiPace® 400 for TCP 350, DN 100 ISO-K	
Order number pump Pumpe	**PM P04 023**	**PM P04 024**	**PM P04 025**	**PM P04 026**	
General accessories					
Sealing gas valve	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**	
Sealing gas throttle	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	
Centering ring coated	**PM 016 210 -U**		**PM 016 210 -U**	**PM 016 210 -U**	
Centering ring coated with protection screen	**PM 016 212 -U**		**PM 016 212 -U**	**PM 016 212 -U**	
Centering ring coated with splinter shield	**PM 016 211 -U**		**PM 016 211 -U**	**PM 016 211 -U**	
Protection screen		**PM 016 336**			
Splinter shield		**PM 016 315**			
Vibration dampers	**PM 006 459 -X**	**PM 006 488 -X**		**PM 006 459 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**		
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**		
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**		
Connection cable RJ 45 on M 12				**PM 051 726 -T**	
Mounting materials					
Centering ring coated, bracket screws	**PM 016 380 -T**			**PM 016 380 -T**	
Centering ring coated with protection screen, bracket screws	**PM 016 382 -T**			**PM 016 382 -T**	
Centering ring coated with splinter shield, bracket screws	**PM 016 381 -T**			**PM 016 381 -T**	
Centering ring coated with hexagon bolts			**PM 016 450 -T**		
Centering ring coated with protection screen, hexagon bolts			**PM 016 452 -T**		
Centering ring coated with splinter shield, hexagon bolts			**PM 016 451 -T**		
Centering ring coated with stud screws			**PM 016 455 -T**		
Centering ring coated with protection screen with stud screws			**PM 016 457 -T**		
Centering ring coated with splinter shield with stud screws			**PM 016 456 -T**		
Set of hexagon screws for trough hole (CF-F)		**PM 016 690 -T**			
Set of stud screws for tapped hole (CF-F)		**PM 016 692 -T**			
Set of stud screws for trough hole (CF)		**PM 016 734 -T**			

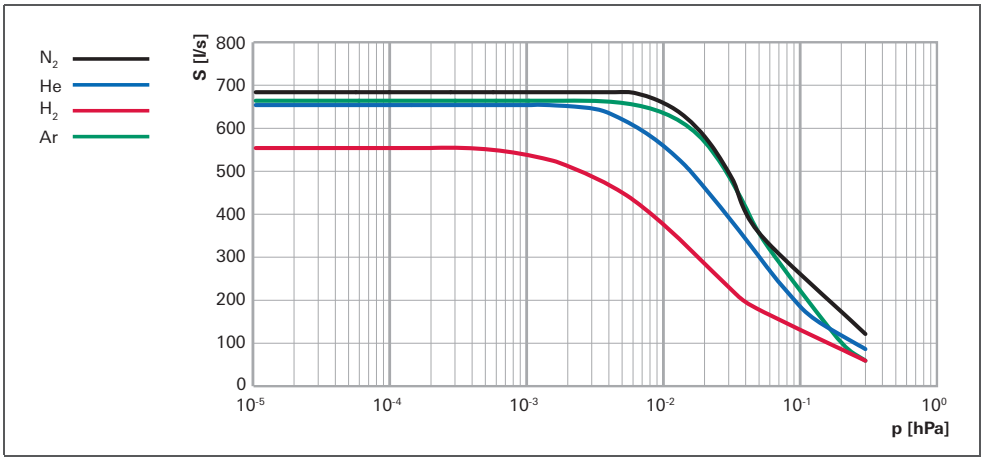
	HiPace® 400 for TCP 350, DN 100 CF-F	HiPace® 400 for TCP 350, DN 100 ISO-F	HiPace® 400 P with TC 400, DN 100 ISO-K	HiPace® 400 P with TC 400, DN 100 CF-F	HiPace® 400 P with TC 400, DN 100 ISO-F
	PM P04 027	PM P04 028	PM P04 740	PM P04 741	PM P04 742
	PM Z01 312	PM Z01 312	PM Z01 313	PM Z01 313	PM Z01 313
	PM Z01 317	PM Z01 317	PM Z01 318	PM Z01 318	PM Z01 318
		PM 016 210 -U	PM 016 210 -U		PM 016 210 -U
		PM 016 212 -U	PM 016 212 -U		PM 016 212 -U
		PM 016 211 -U	PM 016 211 -U		PM 016 211 -U
	PM 016 336			PM 016 336	
	PM 016 315			PM 016 315	
	PM 006 488 -X		PM 006 459 -X	PM 006 488 -X	
	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T
			PM 061 283 -T	PM 061 283 -T	PM 061 283 -T
			P 4723 010	P 4723 010	P 4723 010
			P 4723 013	P 4723 013	P 4723 013
	PM 051 726 -T	PM 051 726 -T			
			PM 016 380 -T		
			PM 016 382 -T		
			PM 016 381 -T		
		PM 016 450 -T			PM 016 450 -T
		PM 016 452 -T			PM 016 452 -T
		PM 016 451 -T			PM 016 451 -T
		PM 016 455 -T			PM 016 455 -T
		PM 016 457 -T			PM 016 457 -T
		PM 016 456 -T			PM 016 456 -T
	PM 016 690 -T			PM 016 690 -T	
	PM 016 692 -T			PM 016 692 -T	
	PM 016 734 -T			PM 016 734 -T	

HiPace® 700

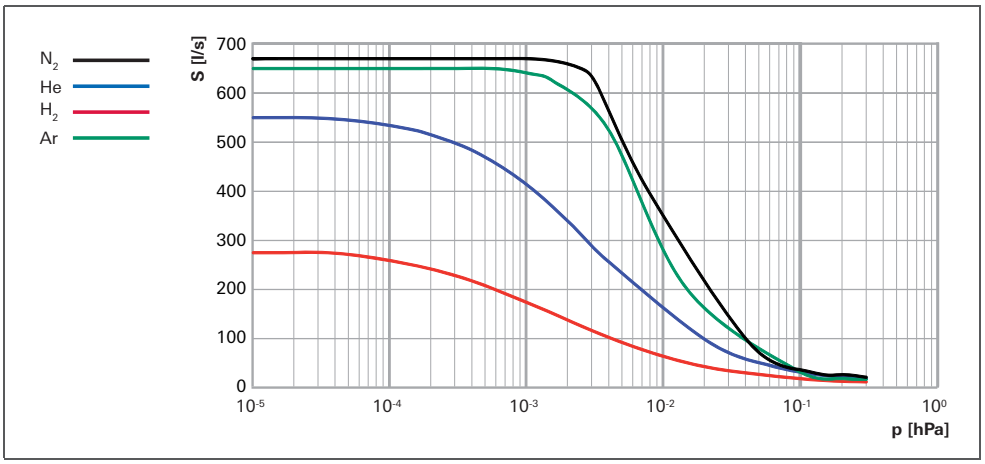


- Compact yet powerful turbopump with a pumping speed of up to 685 l/s for N_2
- Maximum vacuum performance with minimum power consumption
- For installation in any orientation
- Integrated TC 400 drive electronics
- Integrated, powerful cooling system
- Corrosive gas version available

Pumping speed

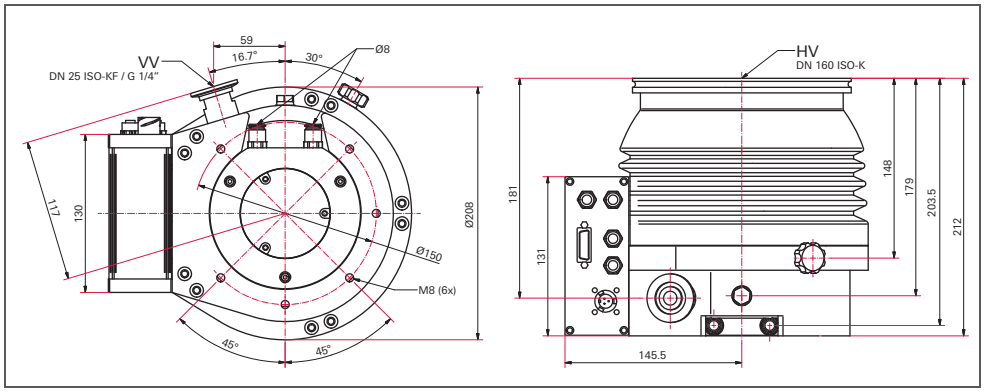


HiPace® 700

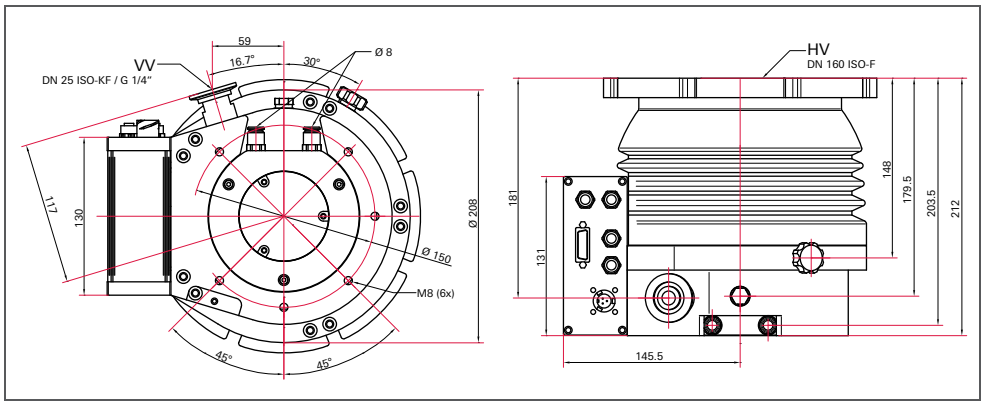


HiPace® 700 P with TC 400

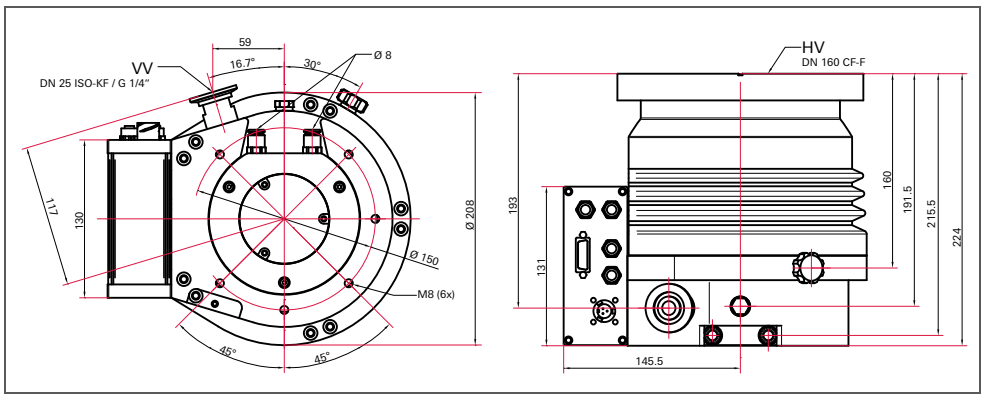
Dimensions (in mm)



HiPace® 700 with TC 400, DN 160 ISO-K



HiPace® 700 with TC 400, DN 160 ISO-F



HiPace® 700 with TC 400, DN 160 CF-F

Technical data	HiPace® 700 with TC 400, DN 160 ISO-K	HiPace® 700 with TC 400, DN 160 CF-F	HiPace® 700 with TC 400, DN 160 ISO-F	HiPace® 700 for TCP 350, DN 160 ISO-K	HiPace® 700, for TCP 350, DN 160 CF-F	
Connection nominal diameter						
Flange (out)	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	
Flange (in)	DN 160 ISO-K	DN 160 CF-F	DN 160 ISO-F	DN 160 ISO-K	DN 160 CF-F	
Venting connection	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	
Pumping speed						
Pumping speed for Ar	665 l/s	665 l/s	665 l/s	665 l/s	665 l/s	
Pumping speed for H_2	555 l/s	555 l/s	555 l/s	555 l/s	555 l/s	
Pumping speed for He	655 l/s	655 l/s	655 l/s	655 l/s	655 l/s	
Pumping speed for N_2	685 l/s	685 l/s	685 l/s	685 l/s	685 l/s	
Compression						
Compression ratio for Ar	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	
Compression ratio for H_2	$4 \cdot 10^5$	$4 \cdot 10^5$	$4 \cdot 10^5$	$4 \cdot 10^5$	$4 \cdot 10^5$	
Compression ratio for He	$3 \cdot 10^7$	$3 \cdot 10^7$	$3 \cdot 10^7$	$3 \cdot 10^7$	$3 \cdot 10^7$	
Compression ratio for N_2	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	
Fore-vacuum max. for N_2	11 hPa	11 hPa	11 hPa	10 hPa	10 hPa	
Gas througput						
Gas throughput at full rotational speed for Ar	3.5 hPa l/s	3.5 hPa l/s	3.5 hPa l/s	1.5 hPa l/s	1.5 hPa l/s	
Gas throughput at full rotational speed for H_2	> 14 hPa l/s	> 14 hPa l/s	> 14 hPa l/s	> 8 hPa l/s	> 8 hPa l/s	
Gas throughput at full rotational speed for He	20 hPa l/s	20 hPa l/s	20 hPa l/s	5 hPa l/s	5 hPa l/s	
Gas throughput at full rotational speed for N_2	6.5 hPa l/s	6.5 hPa l/s	6.5 hPa l/s	3 hPa l/s	3 hPa l/s	
Electronic drive unit	with TC 400	with TC 400	with TC 400	for TCP 350	for TCP 350	
Separate electronic drive unit				YES	YES	
Operating voltage	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC			
Rotation speed ± 2 %	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	
Rotation speed variable	60-100 %	60-100 %	60-100 %	60-100 %	60-100 %	
Mounting orientation	in any orientation	in any orientation	in any orientation	in any orientation	in any orientation	
Ultimate pressure*	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	
Weight	11.5 kg	17.4 kg	12.1 kg	10.6 kg	16.5 kg	
Run-up time	2 min	2 min	2 min	5.5 min	5.5 min	
Cooling method, optional	Air	Air	Air	Air	Air	
Cooling method, standard	Water	Water	Water	Water	Water	
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C	15-35 °C	15-35 °C	
Cooling water consumption	100 l/h	100 l/h	100 l/h	100 l/h	100 l/h	
Bearing	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	
Particulate matter						
Sound pressure level	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	
Protection category	IP 54	IP 54	IP 54	IP 54	IP 54	
Low vibrations						
Permissible magnetic field max.	6 mT	6 mT	6 mT	6 mT	6 mT	
Order number pump Pumpe	**PM P03 933**	**PM P03 934**	**PM P03 935**	**PM P04 080**	**PM P04 081**	

*Ultimate pressure please find description on page 272

	HiPace® 700, for TCP 350, DN 160 ISO-F	HiPace® 700 P with TC 400, DN 160 ISO-K	HiPace® 700 P with TC 400, DN 160 ISO-F	HiPace® 700 P with TC 400, DN 160 CF-F	HiPace® 700 Plus with TC 400, DN 160 ISO-K	HiPace® 700 Plus with TC 400, DN 160 CF-F	HiPace® 700 Plus with TC 400, DN 160 ISO-F
	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"
	DN 160 ISO-F	DN 160 ISO-K	DN 160 ISO-F	DN 160 CF-F	DN 160 ISO-K	DN 160 CF-F	DN 160 ISO-F
	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"
	665 l/s	650 l/s	650 l/s	650 l/s	665 l/s	665 l/s	665 l/s
	555 l/s	275 l/s	275 l/s	275 l/s	555 l/s	555 l/s	555 l/s
	655 l/s	550 l/s	550 l/s	550 l/s	655 l/s	655 l/s	655 l/s
	685 l/s	670 l/s	670 l/s	670 l/s	685 l/s	685 l/s	685 l/s
	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$
	$4 \cdot 10^{5}$	$4 \cdot 10^{2}$	$4 \cdot 10^{2}$	$4 \cdot 10^{2}$	$4 \cdot 10^{5}$	$4 \cdot 10^{5}$	$4 \cdot 10^{5}$
	$3 \cdot 10^{7}$	$3 \cdot 10^{3}$	$3 \cdot 10^{3}$	$3 \cdot 10^{3}$	$3 \cdot 10^{7}$	$3 \cdot 10^{7}$	$3 \cdot 10^{7}$
	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{6}$	$> 1 \cdot 10^{6}$	$> 1 \cdot 10^{6}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$
	10 hPa	1.1 hPa	1.1 hPa	1.1 hPa	11 hPa	11 hPa	11 hPa
	1.5 hPa l/s	1 hPa l/s	1 hPa l/s	1 hPa l/s	3.5 hPa l/s	3.5 hPa l/s	3.5 hPa l/s
	> 8 hPa l/s	6 hPa l/s	6 hPa l/s	6 hPa l/s	> 14 hPa l/s	> 14 hPa l/s	> 14 hPa l/s
	5 hPa l/s	4 hPa l/s	4 hPa l/s	4 hPa l/s	20 hPa l/s	20 hPa l/s	20 hPa l/s
	3 hPa l/s	2 hPa l/s	2 hPa l/s	2 hPa l/s	6.5 hPa l/s	6.5 hPa l/s	6.5 hPa l/s
	for TCP 350	with TC 400	with TC 400	with TC 400	with TC 400	with TC 400	with TC 400
	YES						
		48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC	24 (± 5 %) V DC	24 (± 5 %) V DC	24 (± 5 %) V DC
	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}
	60-100 %	60-100 %	60-100 %	60-100 %	60-100 %	60-100 %	60-100 %
	in any orientation	in any orientation	in any orientation	in any orientation	vertical, flange up	vertikal, flange up	vertical, flange up
	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa
	11.2 kg	10.8 kg	11.4 kg	16.7 kg	11.5 kg	17.4 kg	12.1 kg
	5.5 min	1.6 min	1.6 min	1.6 min	4 min	4 min	4 min
	Air	Air	Air	Air	Air	Air	Air
	Water	Water	Water	Water	Water	Water	Water
	15-35 °C	15-35 °C	15-35 °C	15-35 °C	15-35 °C	15-35 °C	15-35 °C
	100 l/h	100 l/h	100 l/h	100 l/h	100 l/h	100 l/h	100 l/h
	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid
		YES	YES	YES			
	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)
	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote
	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54
					YES	YES	Yes
	6 mT	6 mT	6 mT	6 mT	6 mT	6 mT	6 mT
	PM P04 082	**PM P04 275**	**PM P04 680**	**PM P04 681**	**PM P04 440**	**PM P04 441**	**PM P04 442**

Accessories	HiPace® 700 with TC 400, DN 160 ISO-K	HiPace® 700 with TC 400, DN 160 CF-F	HiPace® 700 with TC 400, DN 160 ISO-F	HiPace® 700 for TCP 350, DN 160 ISO-K	HiPace® 700, for TCP 350, DN 160 CF-F	
Order number pump Pumpe	**PM P03 933**	**PM P03 934**	**PM P03 935**	**PM P04 080**	**PM P04 081**	
Power supplies/power						
DCU - power supply with display control unit	**PM C01 823**	**PM C01 823**	**PM C01 823**			
TPS - mains pack for wall/standard rail fitting	**PM 061 343 -T**	**PM 061 343 -T**	**PM 061 343 -T**			
TPS - mains packl 19" rack module 3 RU	**PM 061 347 -T**	**PM 061 347 -T**	**PM 061 347 -T**			
Control units						
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**			
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**			
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**			
Mains cable DCU/TPS/TCP, 3 m						
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	
115 V AC mains cable with UL plug	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	
208 V AC mains cable with UL plug	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	
Connection cable, length 3 m between						
Connection cable for HiPace with TC 400/TM 700 to power supply TPS/DCU 310/311/400/401	**PM 061 352 -T**	**PM 061 352 -T**	**PM 061 352 -T**			
TCP 350 - HiPace				**PM 061 356 -T**	**PM 061 356 -T**	
External drive units						
TCP 350				**PM C01 740**	**PM C01 740**	
TCP 350 PB - Profibus				**PM C01 741**	**PM C01 741**	
TCP 350 DN - DeviceNet				**PM C01 742**	**PM C01 742**	
Venting accessories						
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	
Cooling accessories						
Air cooling	**PM Z01 303**	**PM Z01 303**	**PM Z01 303**	**PM Z01 303**	**PM Z01 303**	
Heating accessories						
Heating jacket 230 V AC, Euro-style safety plug		**PM 061 369 -T**			**PM 061 369 -T**	
Heating jacket 208 V AC, UL plug		**PM 061 370 -T**			**PM 061 370 -T**	
Heating jacket 115 V AC, UL plug		**PM 061 371 -T**			**PM 061 371 -T**	
Backing pump control						
Backing pump relay box, shielded, 1-phase 20 A	**PM 061 375 -T**	**PM 061 375 -T**	**PM 061 375 -T**	**PM 061 375 -T**	**PM 061 375 -T**	
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**	
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	
Adapter cable, TCP 350 - backing pump relay box, M12				**PM 061 377 -T**	**PM 061 377 -T**	
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**			

	HiPace® 700, for TCP 350, DN 160 ISO-F	HiPace® 700 P with TC 400, DN 160 ISO-K	HiPace® 700 P with TC 400, DN 160 ISO-F	HiPace® 700 P with TC 400, DN 160 CF-F	HiPace® 700 Plus with TC 400, DN 160 ISO-K	HiPace® 700 Plus with TC 400, DN 160 CF-F	HiPace® 700 Plus with TC 400, DN 160 ISO-F
	PM P04 082	PM P04 275	PM P04 680	PM P04 681	PM P04 440	PM P04 441	PM P04 442
		PM C01 823	PM C01 823	PM C01 823	PM C01 822	PM C01 822	PM C01 822
		PM 061 343 -T	PM 061 343 -T	PM 061 343 -T	PM 061 342 -T	PM 061 342 -T	PM 061 342 -T
		PM 061 347 -T	PM 061 347 -T	PM 061 347 -T	PM 061 346 -T	PM 061 346 -T	PM 061 346 -T
		PM 061 348 -T	PM 061 348 -T	PM 061 348 -T	PM 061 348 -T	PM 061 348 -T	PM 061 348 -T
		PM 051 510 -T	PM 051 510 -T	PM 051 510 -T	PM 051 510 -T	PM 051 510 -T	PM 051 510 -T
		PM 061 005 -T	PM 061 005 -T	PM 061 005 -T	PM 061 005 -T	PM 061 005 -T	PM 061 005 -T
	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA
	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE
	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF
		PM 061 352 -T	PM 061 352 -T	PM 061 352 -T	PM 061 352 -T	PM 061 352 -T	PM 061 352 -T
	PM 061 356 -T						
	PM C01 740						
	PM C01 741						
	PM C01 742						
	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291
	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121
	PM Z01 303	PM Z01 303	PM Z01 303	PM Z01 303	PM Z01 303	PM Z01 303	PM Z01 303
				PM 061 369 -T		PM 061 369 -T	
				PM 061 370 -T		PM 061 370 -T	
				PM 061 371 -T		PM 061 371 -T	
	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T
	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X
	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T
	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205
	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206
	PM 061 377 -T						
		PM 071 142 -X	PM 071 142 -X	PM 071 142 -X	PM 071 142 -X	PM 071 142 -X	PM 071 142 -X

Accessories	HiPace® 700 with TC 400, DN 160 ISO-K	HiPace® 700 with TC 400, DN 160 CF-F	HiPace® 700 with TC 400, DN 160 ISO-F	HiPace® 700 for TCP 350, DN 160 ISO-K	HiPace® 700, for TCP 350, DN 160 CF-F	
Order number pump Pumpe	**PM P03 933**	**PM P03 934**	**PM P03 935**	**PM P04 080**	**PM P04 081**	
General accessories						
Sealing gas valve	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**	
Sealing gas throttle	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	
Centering ring coated	**PM 016 216 -U**		**PM 016 216 -U**	**PM 016 216 -U**		
Centering ring coated with protection screen	**PM 016 218 -U**		**PM 016 218 -U**	**PM 016 218 -U**		
Centering ring coated with splinter shield	**PM 016 217 -U**		**PM 016 217 -U**	**PM 016 217 -U**		
Protection screen		**PM 016 339**			**PM 016 339**	
Splinter shield		**PM 016 318**			**PM 016 318**	
Vibration dampers	**PM 006 492 -X**	**PM 006 493 -X**		**PM 006 492 -X**	**PM 006 493 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**			
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**			
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**			
Connection cable RJ 45 on M 12				**PM 051 726 -T**	**PM 051 726 -T**	
Mounting materials						
Centering ring coated, bracket screws	**PM 016 375 -T**			**PM 016 375 -T**		
Centering ring coated with protection screen, bracket screws	**PM 016 377 -T**			**PM 016 377 -T**		
Centering ring coated with splinter shield, bracket screws	**PM 016 376 -T**			**PM 016 376 -T**		
Centering ring coated with hexagon bolts			**PM 016 460 -T**			
Centering ring coated with protection screen, hexagon bolts			**PM 016 462 -T**			
Centering ring coated with splinter shield, hexagon bolts			**PM 016 461 -T**			
Centering ring coated with stud screws			**PM 016 465 -T**			
Centering ring coated with protection screen with stud screws			**PM 016 467 -T**			
Centering ring coated with splinter shield with stud screws			**PM 016 466 -T**			
Set of hexagon screws for trough hole (CF-F)		**PM 016 691 -T**			**PM 016 691 -T**	
Set of stud screws for tapped hole (CF-F)		**PM 016 693 -T**			**PM 016 693 -T**	
Set of stud screws for trough hole (CF)		**PM 016 735 -T**			**PM 016 735 -T**	

Content

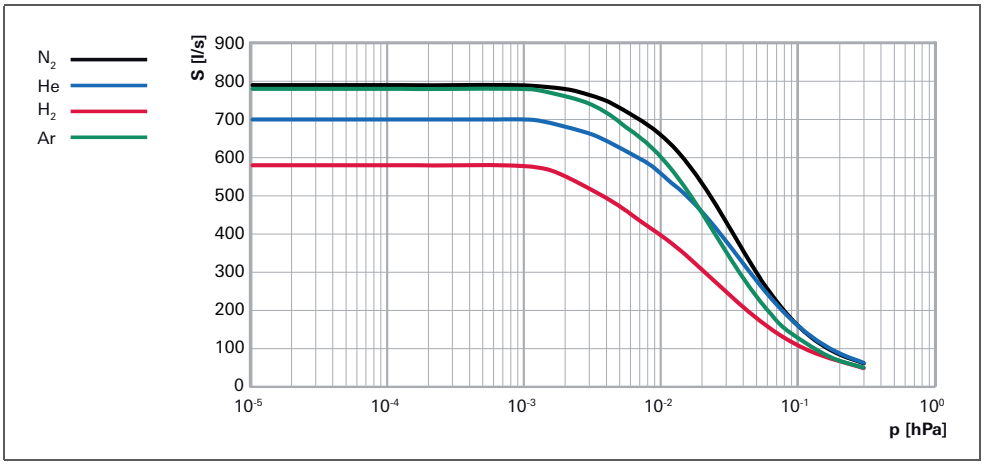
	HiPace® 700, for TCP 350, DN 160 ISO-F	HiPace® 700 P with TC 400, DN 160 ISO-K	HiPace® 700 P with TC 400, DN 160 ISO-F	HiPace® 700 P with TC 400, DN 160 CF-F	HiPace® 700 Plus with TC 400, DN 160 ISO-K	HiPace® 700 Plus with TC 400, DN 160 CF-F	HiPace® 700 Plus with TC 400, DN 160 ISO-F
	PM P04 082	PM P04 275	PM P04 680	PM P04 681	PM P04 440	PM P04 441	PM P04 442
	PM Z01 312	PM Z01 313	PM Z01 313	PM Z01 313	PM Z01 312	PM Z01 312	PM Z01 312
	PM Z01 317	PM Z01 318	PM Z01 318	PM Z01 318	PM Z01 317	PM Z01 317	PM Z01 317
	PM 016 216 -U	PM 016 216 -U	PM 016 216 -U		PM 016 216 -U		PM 016 216 -U
	PM 016 218 -U	PM 016 218 -U	PM 016 218 -U		PM 016 218 -U		PM 016 218 -U
	PM 016 217 -U	PM 016 217 -U	PM 016 217 -U		PM 016 217 -U		PM 016 217 -U
				PM 016 339		PM 016 339	
				PM 016 318		PM 016 318	
		PM 006 492 -X		PM 006 493 -X	PM 006 492 -X	PM 006 493 -X	
	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T
		PM 061 283 -T	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T
		P 4723 010	P 4723 010	P 4723 010	P 4723 010	P 4723 010	P 4723 010
		P 4723 013	P 4723 013	P 4723 013	P 4723 013	P 4723 013	P 4723 013
	PM 051 726 -T						
		PM 016 375 -T			PM 016 375 -T		
		PM 016 377 -T			PM 016 377 -T		
		PM 016 376 -T			PM 016 376 -T		
	PM 016 460 -T		PM 016 460 -T				PM 016 460 -T
	PM 016 462 -T		PM 016 462 -T				PM 016 462 -T
	PM 016 461 -T		PM 016 461 -T				PM 016 461 -T
	PM 016 465 -T		PM 016 465 -T				PM 016 465 -T
	PM 016 467 -T		PM 016 467 -T				PM 016 467 -T
	PM 016 466 -T		PM 016 466 -T				PM 016 466 -T
				PM 016 691 -T		PM 016 691 -T	
				PM 016 693 -T		PM 016 693 -T	
				PM 016 735 -T		PM 016 735 -T	

HiPace® 800

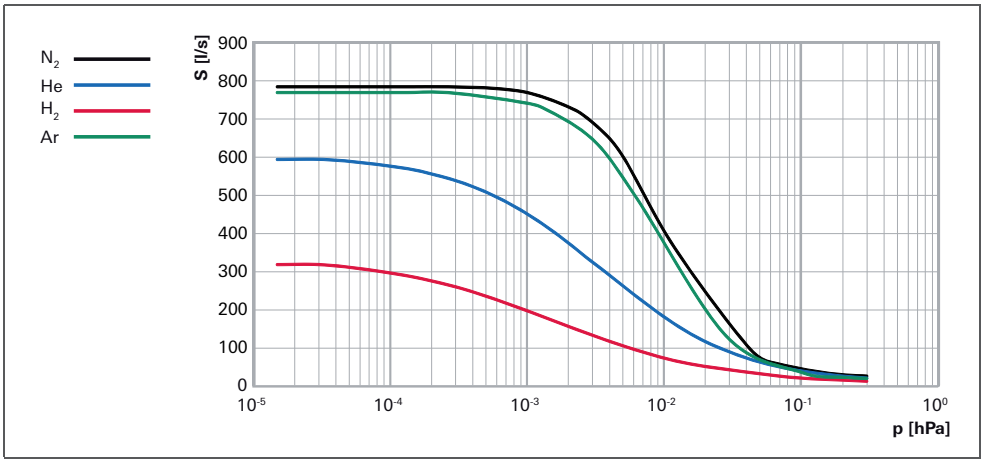


- Compact yet powerful turbopump with a pumping speed of up to 790 l/s for N_2
- Maximum vacuum performance with minimum power consumption
- Integrated TC 400 drive electronics
- For installation in any orientation
- Integrated, powerful cooling system

Pumping speed

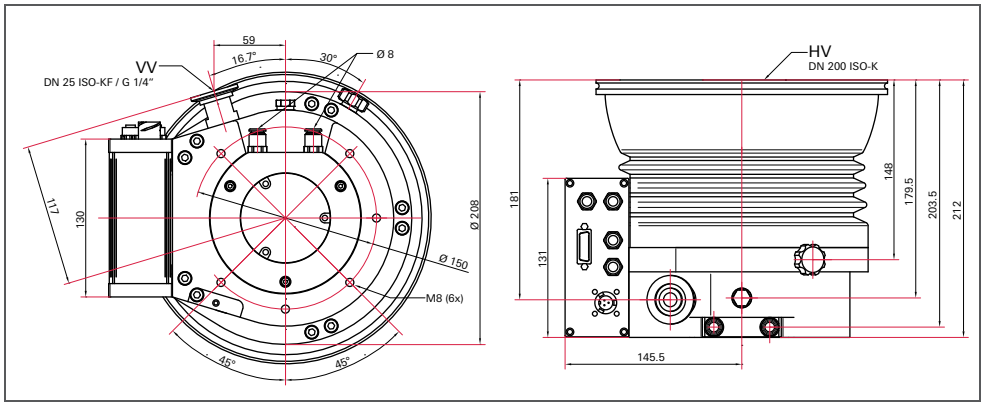


HiPace® 800

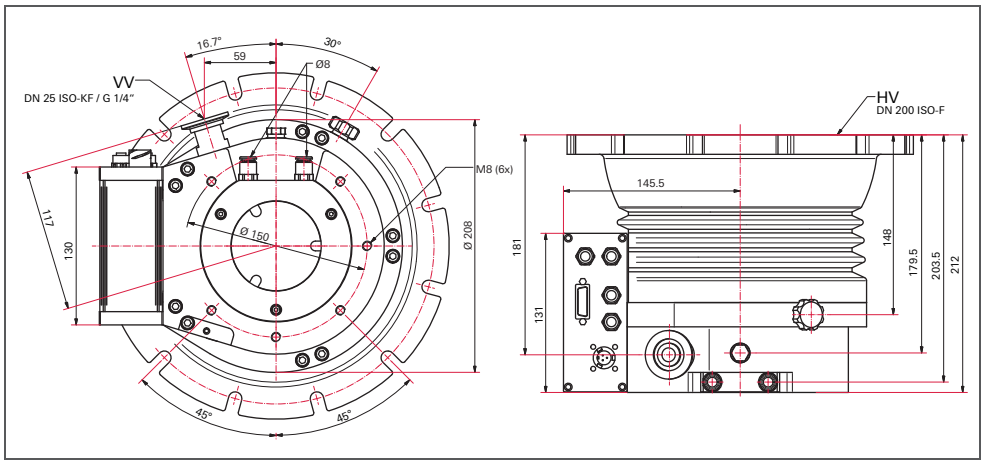


HiPace® 800 P with TC 400

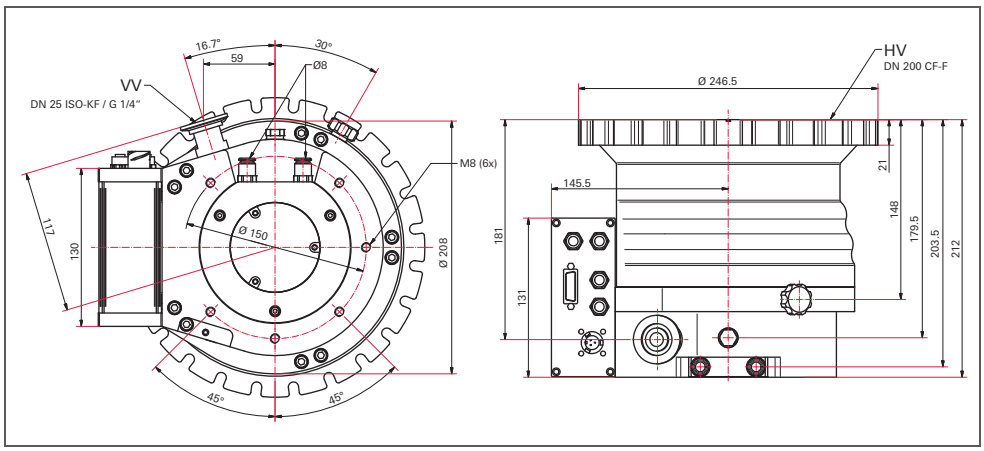
Dimensions (in mm)



HiPace® 800 with TC 400, DN 200 ISO-K



HiPace® 800 with TC 400, DN 200 ISO-F



HiPace® 800 with TC 400, DN 200 CF-F

Technical data	HiPace® 800 with TC 400, DN 200 ISO-K	HiPace® 800 with TC 400, DN 200 CF-F	HiPace® 800 with TC 400, DN 200 ISO-F	HiPace® 800 with TCP 350, DN 200 ISO-F	
Connection nominal diameter					
Flange (out)	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 KF	
Flange (in)	DN 200 ISO-K	DN 200 CF-F	DN 200 ISO-F	DN 200 ISO-K / G 1/4"	
Venting connection	G 1/8"	G 1/8"	G 1/8"	G 1/8"	
Pumping speed					
Pumping speed for Ar	780 l/s	780 l/s	780 l/s	780 l/s	
Pumping speed for H_2	580 l/s	580 l/s	580 l/s	580 l/s	
Pumping speed for He	700 l/s	700 l/s	700 l/s	700 l/s	
Pumping speed for N_2	790 l/s	790 l/s	790 l/s	790 l/s	
Compression					
Compression ratio for Ar	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	
Compression ratio for H_2	$4 \cdot 10^5$	$4 \cdot 10^5$	$4 \cdot 10^5$	$4 \cdot 10^5$	
Compression ratio for He	$3 \cdot 10^7$	$3 \cdot 10^7$	$3 \cdot 10^7$	$3 \cdot 10^7$	
Compression ratio for N_2	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	
Fore-vacuum max. for N_2	11 hPa	11 hPa	11 hPa	10 hPa	
Gas througput					
Gas throughput at full rotational speed for Ar	3.5 hPa l/s	3.5 hPa l/s	3.5 hPa l/s	1.5 hPa l/s	
Gas throughput at full rotational speed for H_2	> 14 hPa l/s	> 14 hPa l/s	> 14 hPa l/s	> 8 hPa l/s	
Gas throughput at full rotational speed for He	20 hPa l/s	20 hPa l/s	20 hPa l/s	5 hPa l/s	
Gas throughput at full rotational speed for N_2	6.5 hPa l/s	6.5 hPa l/s	6.5 hPa l/s	3 hPa l/s	
Electronic drive unit	with TC 400	with TC 400	with TC 400	TCP 350	
Operating voltage	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC		
Rotation speed ± 2 %	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	
Rotation speed variable	60-100 %	60-100 %	60-100 %	60-100 %	
Mounting orientation	in any orientation	in any orientation	in any orientation	in any orientation	
Ultimate pressure*	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa		
Weight	12.8 kg	19.1 kg	13.6 kg	11.9 kg	
Run-up time	2 min	2 min	2 min	5.5 min	
Cooling method, optional	Air	Air	Air	Air	
Cooling method, standard	Water	Water	Water	Water	
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C	15-35 °C	
Cooling water consumption	100 l/h	100 l/h	100 l/h	100 l/h	
Bearing	Hybrid	Hybrid	Hybrid	Hybrid	
Particulate matter					
Sound pressure level	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	
Protection category	IP 54	IP 54	IP 54	IP 54	
Fore-vacuum max. for Ar	11 hPa			11 hPa	
Fore-vacuum max. for H_2	6 hPa			6 hPa	
Fore-vacuum max. for He	11 hPa			13 hPa	
Permissible magnetic field max.	6 mT	6 mT	6 mT	6 mT	
Order number pump Pumpe	**PM P04 300**	**PM P04 301**	**PM P04 302**	**PM P04 670**	

*Ultimate pressure please find description on page 272

	HiPace® 800 with TCP 350, DN 200 CF-F	HiPace® 800 with TCP 350, DN 200 ISO-F	HiPace® 800 P with TC 400, DN 200 ISO-K	HiPace® 800 P with TC 400, DN 200 CF-F	HiPace® 800 P with TC 400, DN 200 ISO-F
	DN 25 KF	DN 25 KF	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"	DN 25 ISO-KF / G 1/4"
	DN 200 CF-F / G 1/4"	DN 200 ISO-F / G 1/4"	DN 200 ISO-K	DN 200 CF-F	DN 200 ISO-F
	G 1/8"	G 1/8"	G 1/8"	G 1/8"	G 1/8"
	780 l/s	780 l/s	770 l/s	770 l/s	770 l/s
	580 l/s	580 l/s	320 l/s	320 l/s	320 l/s
	700 l/s	700 l/s	595 l/s	595 l/s	595 l/s
	790 l/s	790 l/s	785 l/s	785 l/s	785 l/s
	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{7}$
	$4 \cdot 10^{5}$	$4 \cdot 10^{5}$	$4 \cdot 10^{2}$	$4 \cdot 10^{2}$	$4 \cdot 10^{2}$
	$3 \cdot 10^{7}$	$3 \cdot 10^{7}$	$3 \cdot 10^{3}$	$3 \cdot 10^{3}$	$3 \cdot 10^{3}$
	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{6}$	$> 1 \cdot 10^{6}$	$> 1 \cdot 10^{6}$
	10 hPa	10 hPa	1.1 hPa	1.1 hPa	1.1 hPa
	1.5 hPa l/s	1.5 hPa l/s	2 hPa l/s	2 hPa l/s	2 hPa l/s
	> 8 hPa l/s	> 8 hPa l/s	8 hPa l/s	8 hPa l/s	8 hPa l/s
	5 hPa l/s	5 hPa l/s	5 hPa l/s	5 hPa l/s	5 hPa l/s
	3 hPa l/s	3 hPa l/s	2.5 hPa l/s	2.5 hPa l/s	2.5 hPa l/s
	TCP 350	TCP 350	with TC 400	with TC 400	with TC 400
			48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC
	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}
	60-100 %	60-100 %	60-100 %	60-100 %	60-100 %
	in any orientation	in any orientation	in any orientation	in any orientation	in any orientation
			$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa
	18.2 kg	12.7 kg	12.7 kg	18.9 kg	13.5 kg
	5.5 min	5.5 min	1.6 min	1.6 min	1.6 min
	Air	Air	Air	Air	Air
	Water	Water	Water	Water	Water
	15-35 °C	15-35 °C	15-35 °C	15-35 °C	15-35 °C
	100 l/h	100 l/h	100 l/h	100 l/h	100 l/h
	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid
			YES	YES	YES
	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)
	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote
	IP 54	IP 54	IP 54	IP 54	IP 54
	11 hPa	11 hPa			
	6 hPa	6 hPa			
	13 hPa	13 hPa			
	6 mT	6 mT	6 mT	6 mT	6 mT
	PM P04 671	**PM P04 672**	**PM P04 790**	**PM P04 791**	**PM P04 276**

Accessories	HiPace® 800 with TC 400, DN 200 ISO-K	HiPace® 800 with TC 400, DN 200 CF-F	HiPace® 800 with TC 400, DN 200 ISO-F	HiPace® 800 with TCP 350, DN 200 ISO-F	
Order number pump Pumpe	**PM P04 300**	**PM P04 301**	**PM P04 302**	**PM P04 670**	
Power supplies/power					
DCU - power supply with display control unit	**PM C01 823**	**PM C01 823**	**PM C01 823**		
TPS - mains pack for wall/standard rail fitting	**PM 061 343 -T**	**PM 061 343 -T**	**PM 061 343 -T**		
TPS - mains packl 19" rack module 3 RU	**PM 061 347 -T**	**PM 061 347 -T**	**PM 061 347 -T**		
Control units					
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**		
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**		
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**		
Mains cable DCU/TPS/TCP, 3 m					
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	
115 V AC mains cable with UL plug	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	
208 V AC mains cable with UL plug	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	
Connection cable, length 3 m between					
Connection cable for HiPace with TC 400/TM 700 to power supply TPS/DCU 310/311/400/401	**PM 061 352 -T**	**PM 061 352 -T**	**PM 061 352 -T**		
TCP 350 - HiPace				**PM 061 356 -T**	
External drive units					
TCP 350				**PM C01 740**	
TCP 350 PB - Profibus				**PM C01 741**	
TCP 350 DN - DeviceNet				**PM C01 742**	
Venting accessories					
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	
Cooling accessories					
Air cooling	**PM Z01 303**	**PM Z01 303**	**PM Z01 303**	**PM Z01 303**	
Heating accessories					
Heating jacket 230 V AC, Euro-style safety plug		**PM 061 369 -T**		**PM 061 369 -T**	
Heating jacket 208 V AC, UL plug		**PM 061 370 -T**		**PM 061 370 -T**	
Heating jacket 115 V AC, UL plug		**PM 061 371 -T**		**PM 061 371 -T**	
Backing pump control					
Backing pump relay box, shielded, 1-phase 20 A	**PM 061 375 -T**	**PM 061 375 -T**	**PM 061 375 -T**	**PM 061 375 -T**	
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**		
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	
Adapter cable, TCP 350 - backing pump relay box, M12				**PM 061 377 -T**	
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**		

	HiPace® 800 with TCP 350, DN 200 CF-F	HiPace® 800 with TCP 350, DN 200 ISO-F	HiPace® 800 P with TC 400, DN 200 ISO-K	HiPace® 800 P with TC 400, DN 200 CF-F	HiPace® 800 P with TC 400, DN 200 ISO-F
	PM P04 671	PM P04 672	PM P04 790	PM P04 791	PM P04 276
			PM C01 823	PM C01 823	PM C01 823
			PM 061 343 -T	PM 061 343 -T	PM 061 343 -T
			PM 061 347 -T	PM 061 347 -T	PM 061 347 -T
			PM 061 348 -T	PM 061 348 -T	PM 061 348 -T
			PM 051 510 -T	PM 051 510 -T	PM 051 510 -T
			PM 061 005 -T	PM 061 005 -T	PM 061 005 -T
	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA	P 4564 309 ZA
	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE	P 4564 309 ZE
	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF	P 4564 309 ZF
			PM 061 352 -T	PM 061 352 -T	PM 061 352 -T
	PM 061 356 -T	PM 061 356 -T			
	PM C01 740	PM C01 740			
	PM C01 741	PM C01 741			
	PM C01 742	PM C01 742			
	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291	PM Z01 291
	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121	PM Z00 121
	PM Z01 303	PM Z01 303	PM Z01 303	PM Z01 303	PM Z01 303
	PM 061 369 -T	PM 061 369 -T		PM 061 369 -T	
	PM 061 370 -T	PM 061 370 -T		PM 061 370 -T	
	PM 061 371 -T	PM 061 371 -T		PM 061 371 -T	
	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T	PM 061 375 -T
	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X
			PM 061 675 -T	PM 061 675 -T	PM 061 675 -T
	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205	PM Z01 205
	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206	PM Z01 206
	PM 061 377 -T	PM 061 377 -T			
			PM 071 142 -X	PM 071 142 -X	PM 071 142 -X

Accessories	HiPace® 800 with TC 400, DN 200 ISO-K	HiPace® 800 with TC 400, DN 200 CF-F	HiPace® 800 with TC 400, DN 200 ISO-F	HiPace® 800 with TCP 350, DN 200 ISO-F	
Order number pump Pumpe	**PM P04 300**	**PM P04 301**	**PM P04 302**	**PM P04 670**	
General accessories					
Sealing gas valve	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**	
Sealing gas throttle	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**	
Centering ring coated	**PM 016 220 -U**		**PM 016 220 -U**	**PM 016 220 -U**	
Centering ring coated with protection screen	**PM 016 222 -U**		**PM 016 222 -U**	**PM 016 222 -U**	
Centering ring coated with splinter shield	**PM 016 221 -U**		**PM 016 221 -U**	**PM 016 221 -U**	
Protection screen		**PM 016 342**			
Splinter shield		**PM 016 321**			
Vibration dampers	**PM 006 668 -X**	**PM 006 669 -X**		**PM 006 668 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**	**P 4723 010**	
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**	**P 4723 013**	
Connection cable RJ 45 on M 12	**PM 051 726 -T**	**PM 051 726 -T**	**PM 051 726 -T**	**PM 051 726 -T**	
Mounting materials					
Centering ring coated, bracket screws	**PM 016 390 -T**			**PM 016 390 -T**	
Centering ring coated with protection screen, bracket screws	**PM 016 392 -T**			**PM 016 392 -T**	
Centering ring coated with splinter shield, bracket screws	**PM 016 391 -T**			**PM 016 391 -T**	
Centering ring coated with hexagon bolts			**PM 016 470 -T**		
Centering ring coated with protection screen, hexagon bolts			**PM 016 472 -T**		
Centering ring coated with splinter shield, hexagon bolts			**PM 016 471 -T**		
Centering ring coated with stud screws			**PM 016 475 -T**		
Centering ring coated with protection screen with stud screws			**PM 016 477 -T**		
Centering ring coated with splinter shield with stud screws			**PM 016 476 -T**		
Set of hexagon screws for trough hole (CF-F)		**PM 016 687 -T**			
Set of stud screws for tapped hole (CF-F)		**PM 016 688 -T**			
Set of stud screws for trough hole (CF)		**PM 016 736 -T**			

	HiPace® 800 with TCP 350, DN 200 CF-F	HiPace® 800 with TCP 350, DN 200 ISO-F	HiPace® 800 P with TC 400, DN 200 ISO-K	HiPace® 800 P with TC 400, DN 200 CF-F	HiPace® 800 P with TC 400, DN 200 ISO-F
	PM P04 671	PM P04 672	PM P04 790	PM P04 791	PM P04 276
	PM Z01 312	PM Z01 312	PM Z01 313	PM Z01 313	PM Z01 313
	PM Z01 317	PM Z01 317	PM Z01 318	PM Z01 318	PM Z01 318
	PM 016 220 -U	PM 016 220 -U	PM 016 220 -U		PM 016 220 -U
		PM 016 222 -U	PM 016 222 -U		PM 016 222 -U
		PM 016 221 -U	PM 016 221 -U		PM 016 221 -U
	PM 016 342			PM 016 342	
	PM 016 321			PM 016 321	
	PM 006 669 -X		PM 006 668 -X	PM 006 669 -X	
	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T
	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T
	P 4723 010	P 4723 010	P 4723 010	P 4723 010	P 4723 010
	P 4723 013	P 4723 013	P 4723 013	P 4723 013	P 4723 013
	PM 051 726 -T	PM 051 726 -T			
			PM 016 390 -T		
			PM 016 392 -T		
			PM 016 391 -T		
		PM 016 470 -T			PM 016 470 -T
		PM 016 472 -T			PM 016 472 -T
		PM 016 471 -T			PM 016 471 -T
		PM 016 475 -T			PM 016 475 -T
		PM 016 477 -T			PM 016 477 -T
		PM 016 476 -T			PM 016 476 -T
	PM 016 687 -T			PM 016 687 -T	
	PM 016 688 -T			PM 016 688 -T	
	PM 016 736 -T			PM 016 736 -T	

HiPace® 1200 – 2300

Compact hybrid bearing turbopumps
Pumping speed class from 1,000 to 2,000 l/s

Intelligent sensors
The HiPace 1200 to 2300 turbopumps can also be mounted upside down. Our bearing system guarantees unrivaled reliability. Thanks to advanced rotor design, high pumping speeds are achieved along with high compression ratio for light gases and high gas throughput. Combined with a reliable sensor system, the HiPace series achieves the highest level of reliability on the market.

Efficient technology
With the proven and optimized bearing system, we offer you not just enhanced product performance compared to competitors but also first and foremost a longer service life. In this series, a sealing gas valve protects the bearings from particles or reactive gases. The HiPace is therefore not only compact, but also extremely rugged and suitable for industrial use. It results in an optimized integration capability. Time is money – extended service intervals and problem-free on-site bearing replacement speak for themselves.


HiPace® 1200


HiPace® 1500


HiPace® 1800


HiPace® 2300

Integrated electronic drive unit
The integrated drive electronics eliminates costly cabling. In addition, they are available with various interface versions in the same package. Through innovative electronic components, we have doubled the lifetime of these powerful drive units. The run-up time of the HiPace has also been considerably reduced, which makes the pump ready to operate in an even shorter time. In addition, we provide extended remote and sensor functions. These allow you to monitor pump data such as temperatures. Improved diagnostics ensure maximum pump availability through status-based maintenance and support service in an intelligent manner.

Sophisticated design
We have set the market trend with our well-thought-out design of the HiPace. This is evidenced by its functional housing which makes the pumps extremely light and extends the spectrum of applications. Also, the innovative rotor geometry designed for low vibration operation set the industrie standard. The integrated cooling system ensures that turbopumps can become more powerful without overheating.

Customer benefits
- Four sizes with pumping speeds from 1,000 to 2,000 l/s
- High pumping speed for light gases (H_2, He) and heavy gases (Ar, CF_4)
- High gas throughput, even for heavy gases (Ar, CF_4)
- Installation position 0° to 90° and 90° to 180° available
- Corrosive gas version (C-types) available
- Integrated sealing gas system with throttle and valve
- Wide voltage range: 90 to 265 V
- Interfaces: RS-485, Remote; Profibus or DeviceNet optional
- Semi S2-compatible, UL, CSA and TÜV certification
- Suitable for industrial use due to protection class IP 54
- Highest process capability, resistant to particles

Typical applications
- Photovoltaics
- PVD/CVD processes
- Implantation
- Space simulation
- Vacuum furnaces
- Hard coating



Photovoltaics



Vacuum furnaces



Space simulation

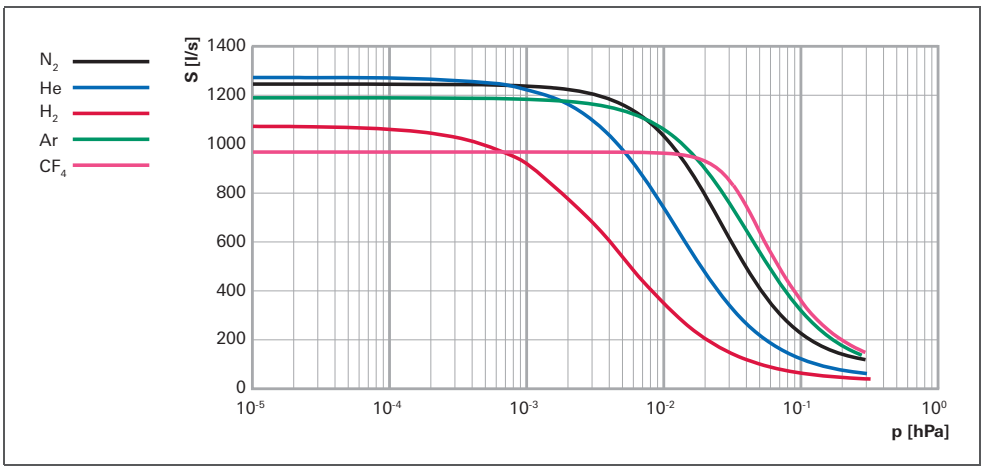
HiPace® 1200



- Powerful turbopump with a pumping speed of up to 1250 l/s for N_2
- Integrated TC 1200 drive electronics with power supply
- Cooling: Water cooling
- Integrated sealing gas system with electric sealing gas valve 24 V DC
- Protection Class: IP 54
- Interfaces: RS-485, Remote (Profibus/DeviceNet on request)
- Extensive accessories expand the range of applications

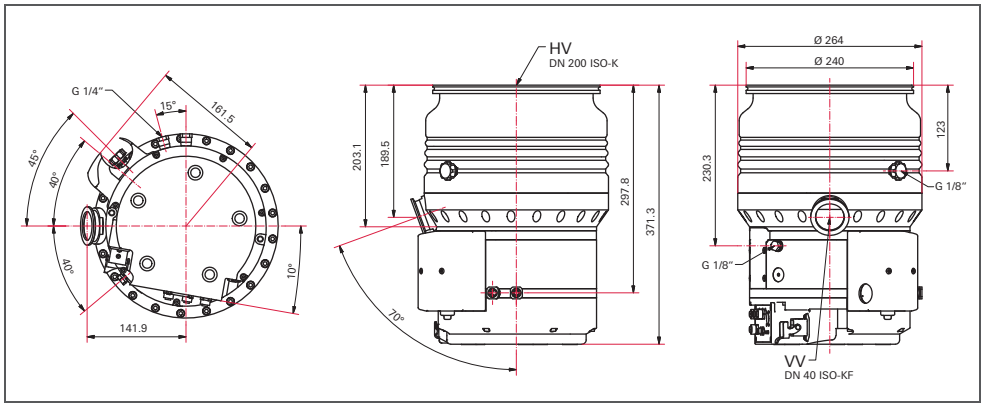
C = Corrosive gas version
U = Upside-down installation orientation

Pumping speed

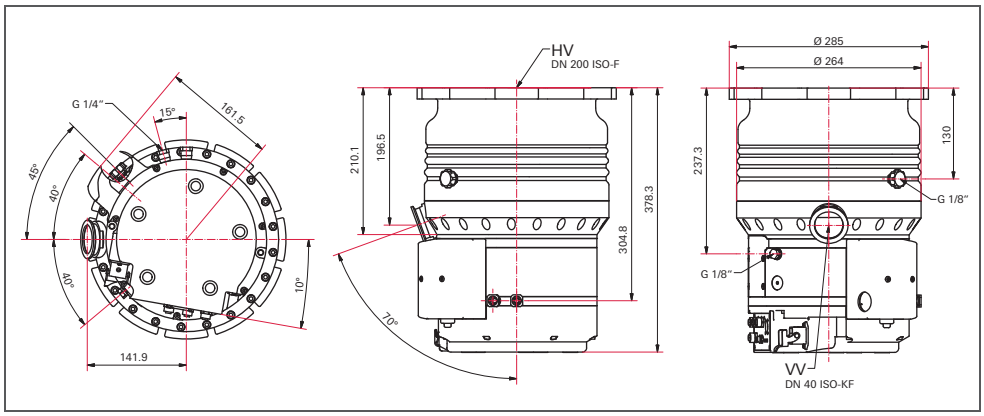


HiPace® 1200

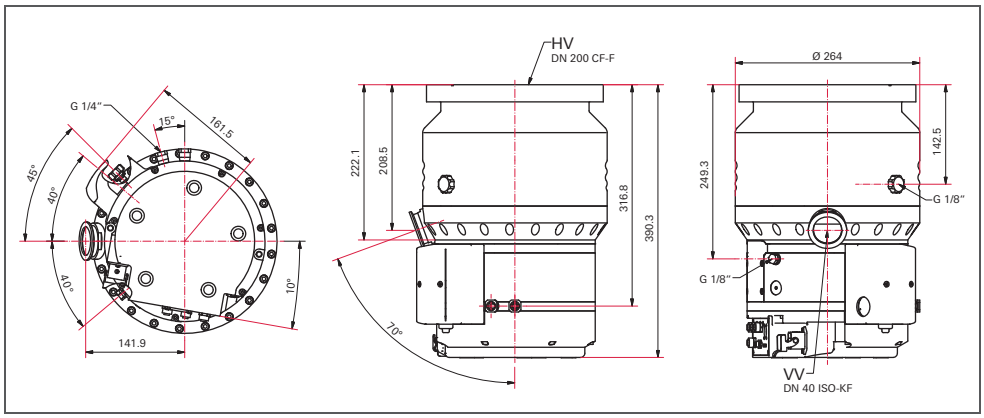
Dimensions (in mm)



HiPace® 1200 with TC 1200, DN 200 ISO-K



HiPace® 1200 with TC 1200, DN 200 ISO-F



HiPace® 1200, with TC 1200, DN 200 CF-F

Technical data	HiPace® 1200 with TC 1200, DN 200 ISO-K	HiPace® 1200 with TC 1200, DN 200 ISO-F	HiPace® 1200, with TC 1200, DN 200 CF-F	
Connection nominal diameter				
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	
Flange (in)	DN 200 ISO-K	DN 200 ISO-F	DN 200 CF-F	
Venting connection	G 1/8"	G 1/8"	G 1/8"	
Pumping speed				
Pumping speed for Ar	1200 l/s	1200 l/s	1200 l/s	
Pumping speed for H_2	1100 l/s	1100 l/s	1100 l/s	
Pumping speed for He	1300 l/s	1300 l/s	1300 l/s	
Pumping speed for N_2	1250 l/s	1250 l/s	1250 l/s	
Pumping speed for CF_4				
Compression				
Compression ratio for Ar	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	
Compression ratio for H_2	$6 \cdot 10^3$	$6 \cdot 10^3$	$6 \cdot 10^3$	
Compression ratio for He	$2 \cdot 10^5$	$2 \cdot 10^5$	$2 \cdot 10^5$	
Compression ratio for N_2	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	
Compression ratio for CF_4				
Fore-vacuum max. for N_2	2 hPa	2 hPa	2 hPa	
Gas througput				
Gas throughput at full rotational speed for Ar	11 hPa l/s	11 hPa l/s	6 hPa l/s	
Gas throughput at full rotational speed for H_2	> 30 hPa l/s	> 30 hPa l/s	> 30 hPa l/s	
Gas throughput at full rotational speed for He	> 30 hPa l/s	> 30 hPa l/s	16 hPa l/s	
Gas throughput at full rotational speed for N_2	20 hPa l/s	20 hPa l/s	16 hPa l/s	
Gas throughput at full rotational speed for CF_4				
Electronic drive unit	with TC 1200	with TC 1200	with TC 1200	
Operating voltage	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	
Rotation speed ± 2 %	37800 min^{-1}	37800 min^{-1}	37800 min^{-1}	
Rotation speed variable	50-100 %	50-100 %	50-100 %	
Ultimate pressure*	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	
Weight	27 kg	28 kg	40 kg	
Run-up time	2.5 min	2.5 min	2.5 min	
Integrated power supply	YES	YES	YES	
Corrosive gas version				
Cooling method, standard	Water	Water	Water	
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C	
Cooling water consumption	100 l/h	100 l/h	100 l/h	
Bearing	Hybrid	Hybrid	Hybrid	
Particulate matter	YES	YES	YES	
Sound pressure level	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote	
Protection category	IP 54	IP 54	IP 54	
Permissible magnetic field max.	6 mT	6 mT	6 mT	

*Ultimate pressure please find description on page 272

Order number pump Pumpe				
Installation orientation: Standard 0-90°	**PM P03 910**	**PM P03 911**	**PM P03 912**	
Installation orientation: Upside-down 90-180°	**PM P03 913**	**PM P03 914**	**PM P03 915**	
Installation orientation: Standard 0-90°, Profibus	**PM P04 110**	**PM P04 111**	**PM P04 112**	
Installation orientation: Upside-down 90-180°, Profibus	**PM P04 113**	**PM P04 114**	**PM P04 115**	

	HiPace® 1200 C with TC 1200, DN 200 ISO-K, corrosive	HiPace® 1200 C with TC 1200, DN 200 ISO-F, corrosive	HiPace® 1200 C with TC 1200, DN 200 CF-F, corrosive
	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
	DN 200 ISO-K	DN 200 ISO-F	DN 200 CF-F
	G 1/8"	G 1/8"	G 1/8"
	1200 l/s	1200 l/s	1200 l/s
	1100 l/s	1100 l/s	1100 l/s
	1300 l/s	1300 l/s	1300 l/s
	1250 l/s	1250 l/s	1250 l/s
	950 l/s	950 l/s	950 l/s
	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
	$6 \cdot 10^3$	$6 \cdot 10^3$	$6 \cdot 10^3$
	$2 \cdot 10^5$	$2 \cdot 10^5$	$2 \cdot 10^5$
	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
	2 hPa	2 hPa	2 hPa
	11 hPa l/s	11 hPa l/s	6 hPa l/s
	> 30 hPa l/s	> 30 hPa l/s	> 30 hPa l/s
	> 30 hPa l/s	> 30 hPa l/s	16 hPa l/s
	20 hPa l/s	20 hPa l/s	16 hPa l/s
	12 hPa l/s	12 hPa l/s	6 hPa l/s
	with TC 1200	with TC 1200	with TC 1200
	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz
	37800 min^{-1}	37800 min^{-1}	37800 min^{-1}
	50-100 %	50-100 %	50-100 %
	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-8}$ hPa
	27 kg	28 kg	40 kg
	2.5 min	2.5 min	2.5 min
	YES	YES	YES
	YES	YES	YES
	Water	Water	Water
	15-35 °C	15-35 °C	15-35 °C
	100 l/h	100 l/h	100 l/h
	Hybrid	Hybrid	Hybrid
	YES	YES	YES
	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)
	RS-485, Remote	RS-485, Remote	RS-485, Remote
	IP 54	IP 54	IP 54
	6 mT	6 mT	6 mT

	PM P03 916	**PM P03 917**	**PM P04 190**
	PM P03 918	**PM P03 919**	**PM P04 191**
	PM P04 116	**PM P04 117**	
	PM P04 118	**PM P04 119**	

Content

Accessories	HiPace® 1200 with TC 1200, DN 200 ISO-K	HiPace® 1200 with TC 1200, DN 200 ISO-F	HiPace® 1200, with TC 1200, DN 200 CF-F	
Order number pump Pumpe	**PM P03 910 PM P03 913 PM P04 110 PM P04 113**	**PM P03 911 PM P03 914 PM P04 111 PM P04 114**	**PM P03 912 PM P03 915 PM P04 112 PM P04 115**	
Control units				
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**	
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**	
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**	
Mains cable DCU/TPS/TCP, 3 m				
230 V AC mains cable with Euro-style safety plug	**P 4564 309 HA**	**P 4564 309 HA**	**P 4564 309 HA**	
208 V AC mains cable with UL plug	**P 4564 309 HB**	**P 4564 309 HB**	**P 4564 309 HB**	
Venting accessories				
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	
Heating accessories				
Heating jacket 230 V AC, Euro-style safety plug			**PM 071 272 -T**	
Heating jacket 208 V AC, UL plug			**PM 071 273 -T**	
Heating jacket 115 V AC, UL plug			**PM 071 274 -T**	
Backing pump control				
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	
Backing pump relay box, shielded, 1-phase 20 A	**PM 071 285 -X**	**PM 071 285 -X**	**PM 071 285 -X**	
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**	
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**	
General accessories				
Sealing gas valve	**PM Z01 313**	**PM Z01 313**	**PM Z01 313**	
Sealing gas throttle	**PM Z01 318**	**PM Z01 318**	**PM Z01 318**	
Centering ring coated	**PM 016 220 -U**	**PM 016 220 -U**		
Centering ring coated with protection screen	**PM 016 222 -U**	**PM 016 222 -U**		
Centering ring coated with splinter shield	**PM 016 221 -U**	**PM 016 221 -U**		
Protection screen			**PM 016 342**	
Splinter shield			**PM 016 321**	
Vibration dampers	**PM 006 668 -X**		**PM 006 669 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**	
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**	
Mounting materials				
Centering ring coated, bracket screws	**PM 016 390 -T**			
Centering ring coated with protection screen, bracket screws	**PM 016 392 -T**			
Centering ring coated with splinter shield, bracket screws	**PM 016 391 -T**			
Centering ring coated with hexagon bolts		**PM 016 470 -T**		
Centering ring coated with protection screen, hexagon bolts		**PM 016 472 -T**		
Centering ring coated with splinter shield, hexagon bolts		**PM 016 471 -T**		
Centering ring coated with stud screws		**PM 016 475 -T**		
Centering ring coated with protection screen with stud screws		**PM 016 477 -T**		
Centering ring coated with splinter shield with stud screws		**PM 016 476 -T**		
Set of hexagon screws for trough hole (CF-F)			**PM 016 687 -T**	
Set of stud screws for tapped hole (CF-F)			**PM 016 688 -T**	
Set of stud screws for trough hole (CF)			**PM 016 736 -T**	

	HiPace® 1200 C with TC 1200, DN 200 ISO-K, corrosive	HiPace® 1200 C with TC 1200, DN 200 ISO-F, corrosive	HiPace® 1200 C with TC 1200, DN 200 CF-F, corrosive
	PM P03 916 PM P03 918 PM P04 116 PM P04 118	PM P03 917 PM P03 919 PM P04 117 PM P04 119	PM P04 190 PM P04 191
	PM 061 348 -T	PM 061 348 -T	PM 061 348 -T
	PM 051 510 -T	PM 051 510 -T	PM 051 510 -T
	PM 061 005 -T	PM 061 005 -T	PM 061 005 -T
	P 4564 309 HA	P 4564 309 HA	P 4564 309 HA
	P 4564 309 HB	P 4564 309 HB	P 4564 309 HB
	PM Z01 291	PM Z01 291	PM Z01 291
	PM Z00 121	PM Z00 121	PM Z00 121
			PM 071 272 -T
			PM 071 273 -T
			PM 071 274 -T
	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X
	PM 071 285 -X	PM 071 285 -X	PM 071 285 -X
	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T
	PM Z01 205	PM Z01 205	PM Z01 205
	PM Z01 206	PM Z01 206	PM Z01 206
	PM 071 142 -X	PM 071 142 -X	PM 071 142 -X
	PM Z01 313	PM Z01 313	PM Z01 313
	PM Z01 318	PM Z01 318	PM Z01 318
	PM 016 220 -U	PM 016 220 -U	
	PM 016 222 -U	PM 016 222 -U	
	PM 016 221 -U	PM 016 221 -U	
			PM 016 342
			PM 016 321
	PM 006 668 -X		PM 006 669 -X
	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T
	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T
	P 4723 010	P 4723 010	P 4723 010
	P 4723 013	P 4723 013	P 4723 013
	PM 016 390 -T		
	PM 016 392 -T		
	PM 016 391 -T		
		PM 016 470 -T	
		PM 016 472 -T	
		PM 016 471 -T	
		PM 016 475 -T	
		PM 016 477 -T	
		PM 016 476 -T	
			PM 016 687 -T
			PM 016 688 -T
			PM 016 736 -T

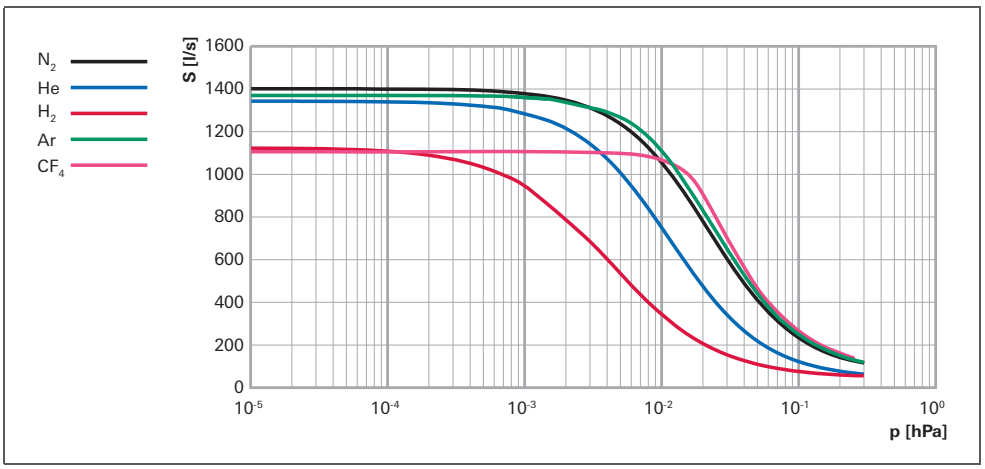
HiPace® 1500



- Powerful turbopump with a pumping speed of up to 1450 l/s for N_2
- Integrated TC 1200 drive electronics with power supply
- Integrated sealing gas system with electric sealing gas valve 24 V DC
- Cooling: Water cooling
- Protection Class: IP 54
- Interfaces: RS-485, Remote (Profibus/DeviceNet on request)
- Extensive accessories expand the range of applications

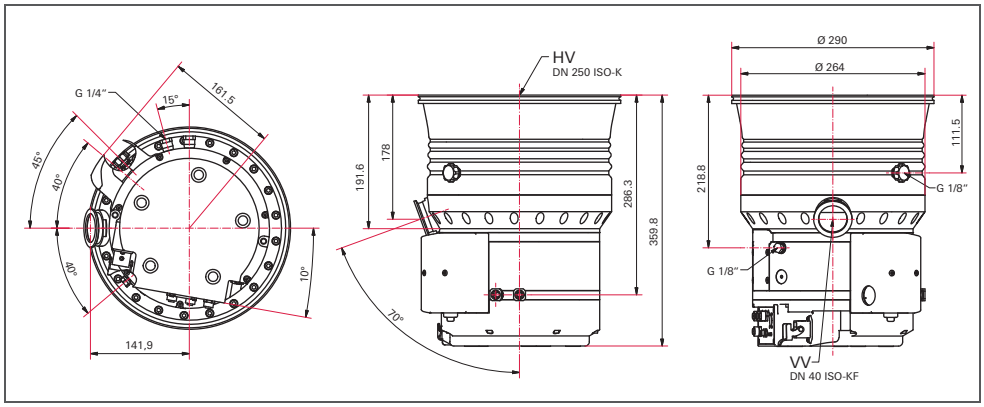
C = Corrosive gas version
U = Upside-down installation orientation

Pumping speed

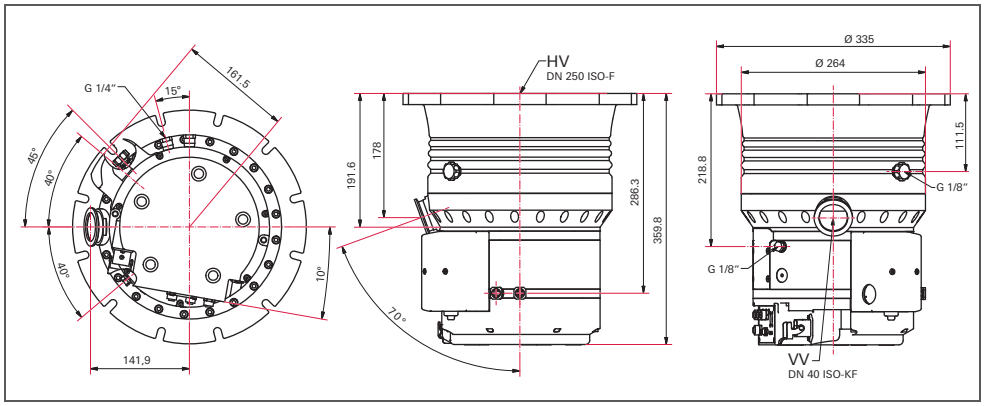


HiPace® 1500

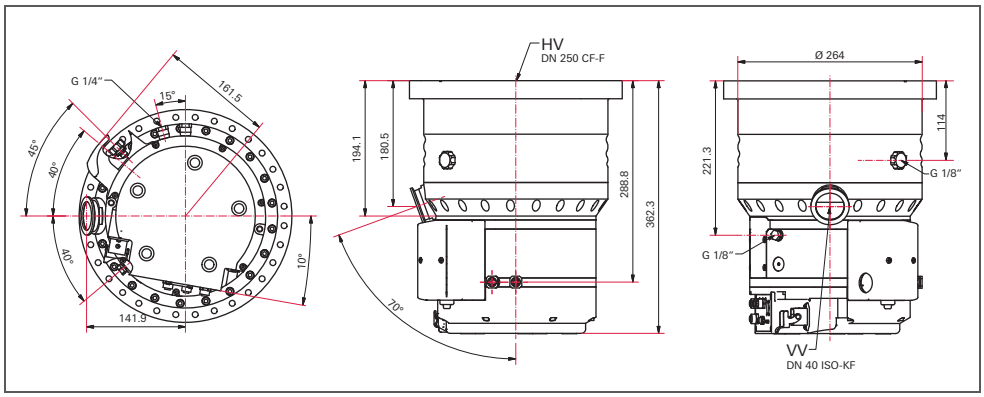
Dimensions (in mm)



HiPace® 1500 with TC 1200, DN 250 ISO-K



HiPace® 1500 with TC 1200, DN 250 ISO-F



HiPace® 1500 with TC 1200, DN 250 CF-F

Technical data	HiPace® 1500 with TC 1200, DN 250 ISO-K	HiPace® 1500 with TC 1200, DN 250 ISO-F	HiPace® 1500 with TC 1200, DN 250 CF-F	
Connection nominal diameter				
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	
Flange (in)	DN 250 ISO-K	DN 250 ISO-F	DN 250 CF-F	
Venting connection	G 1/8"	G 1/8"	G 1/8"	
Pumping speed				
Pumping speed for Ar	1350 l/s	1350 l/s	1350 l/s	
Pumping speed for H_2	1150 l/s	1150 l/s	1150 l/s	
Pumping speed for He	1350 l/s	1350 l/s	1350 l/s	
Pumping speed for N_2	1400 l/s	1400 l/s	1400 l/s	
Pumping speed for CF_4				
Compression				
Compression ratio for Ar	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	
Compression ratio for H_2	$6 \cdot 10^3$	$6 \cdot 10^3$	$6 \cdot 10^3$	
Compression ratio for He	$2 \cdot 10^5$	$2 \cdot 10^5$	$2 \cdot 10^5$	
Compression ratio for N_2	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	
Compression ratio for CF_4				
Fore-vacuum max. for N_2	2 hPa	2 hPa	2 hPa	
Gas througput				
Gas throughput at full rotational speed for Ar	11 hPa l/s	11 hPa l/s	6 hPa l/s	
Gas throughput at full rotational speed for H_2	> 30 hPa l/s	> 30 hPa l/s	> 30 hPa l/s	
Gas throughput at full rotational speed for He	> 30 hPa l/s	> 30 hPa l/s	16 hPa l/s	
Gas throughput at full rotational speed for N_2	20 hPa l/s	20 hPa l/s	16 hPa l/s	
Gas throughput at full rotational speed for CF_4				
Electronic drive unit	with TC 1200	with TC 1200	with TC 1200	
Operating voltage	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	
Rotation speed ± 2 %	37800 min^{-1}	37800 min^{-1}	37800 min^{-1}	
Rotation speed variable	50-100 %	50-100 %	50-100 %	
Ultimate pressure*	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	
Weight	29 kg	30 kg	41 kg	
Run-up time	2.5 min	2.5 min	2.5 min	
Integrated power supply	YES	YES	YES	
Corrosive gas version				
Cooling method, standard	Water	Water	Water	
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C	
Cooling water consumption	100 l/h	100 l/h	100 l/h	
Bearing	Hybrid	Hybrid	Hybrid	
Particulate matter	YES	YES	YES	
Sound pressure level	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote	
Protection category	IP 54	IP 54	IP 54	
Permissible magnetic field max.	6 mT	6 mT	6 mT	

*Ultimate pressure please find description on page 272

Order number pump Pumpe				
Installation orientation: Standard 0-90°	**PM P04 060**	**PM P04 061**	**PM P04 062**	
Installation orientation: Upside-down 90-180°	**PM P04 063**	**PM P04 064**	**PM P04 065**	
Installation orientation: Standard 0-90°, Profibus	**PM P04 120**	**PM P04 121**	**PM P04 122**	
Installation orientation: Upside-down 90-180°, Profibus	**PM P04 123**	**PM P04 124**	**PM P04 125**	

	HiPace® 1500 C with TC 1200, DN 250 ISO-K, corrosive	HiPace® 1500 C with TC 1200, DN 250 ISO-F, corrosive	HiPace® 1500 C with TC 1200, DN 250 CF-F, corrosive
	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
	DN 250 ISO-K	DN 250 ISO-F	DN 250 CF-F
	G 1/8"	G 1/8"	G 1/8"
	1350 l/s	1350 l/s	1350 l/s
	1150 l/s	1150 l/s	1150 l/s
	1350 l/s	1350 l/s	1350 l/s
	1400 l/s	1400 l/s	1400 l/s
	1100 l/s	1100 l/s	1100 l/s
	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
	$6 \cdot 10^3$	$6 \cdot 10^3$	$6 \cdot 10^3$
	$2 \cdot 10^5$	$2 \cdot 10^5$	$2 \cdot 10^5$
	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
	2 hPa	2 hPa	2 hPa
	11 hPa l/s	11 hPa l/s	6 hPa l/s
	> 30 hPa l/s	> 30 hPa l/s	> 30 hPa l/s
	> 30 hPa l/s	> 30 hPa l/s	16 hPa l/s
	20 hPa l/s	20 hPa l/s	16 hPa l/s
	12 hPa l/s	12 hPa l/s	6 hPa l/s
	with TC 1200	with TC 1200	with TC 1200
	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz
	37800 min^{-1}	37800 min^{-1}	37800 min^{-1}
	50-100 %	50-100 %	50-100 %
	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-8}$ hPa
	29 kg	30 kg	41 kg
	2.5 min	2.5 min	2.5 min
	YES	YES	YES
	YES	YES	YES
	Water	Water	Water
	15-35 °C	15-35 °C	15-35 °C
	100 l/h	100 l/h	100 l/h
	Hybrid	Hybrid	Hybrid
	YES	YES	YES
	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)
	RS-485, Remote	RS-485, Remote	RS-485, Remote
	IP 54	IP 54	IP 54
	6 mT	6 mT	6 mT

	PM P04 066	**PM P04 067**	**PM P04 192**
	PM P04 068	**PM P04 069**	**PM P04 193**
	PM P04 126	**PM P04 127**	
	PM P04 128	**PM P04 129**	

Accessories	HiPace® 1500 with TC 1200, DN 250 ISO-K	HiPace® 1500 with TC 1200, DN 250 ISO-F	HiPace® 1500 with TC 1200, DN 250 CF-F	
Order number pump Pumpe	**PM P04 060 PM P04 063 PM P04 120 PM P04 123**	**PM P04 061 PM P04 064 PM P04 121 PM P04 124**	**PM P04 062 PM P04 065 PM P04 122 PM P04 125**	
Control units				
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**	
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**	
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**	
Mains cable DCU/TPS/TCP, 3 m				
230 V AC mains cable with Euro-style safety plug	**P 4564 309 HA**	**P 4564 309 HA**	**P 4564 309 HA**	
208 V AC mains cable with UL plug	**P 4564 309 HB**	**P 4564 309 HB**	**P 4564 309 HB**	
Venting accessories				
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	
Heating accessories				
Heating jacket 230 V AC, Euro-style safety plug			**PM 071 272 -T**	
Heating jacket 208 V AC, UL plug			**PM 071 273 -T**	
Heating jacket 115 V AC, UL plug			**PM 071 274 -T**	
Backing pump control				
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	
Backing pump relay box, shielded, 1-phase 20 A	**PM 071 285 -X**	**PM 071 285 -X**	**PM 071 285 -X**	
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**	
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**	
General accessories				
Sealing gas valve	**PM Z01 313**	**PM Z01 313**	**PM Z01 313**	
Sealing gas throttle	**PM Z01 318**	**PM Z01 318**	**PM Z01 318**	
Centering ring coated	**PM 016 225 -U**	**PM 016 225 -U**		
Centering ring coated with protection screen	**PM 016 227 -U**	**PM 016 227 -U**		
Centering ring coated with splinter shield	**PM 016 226 -U**	**PM 016 226 -U**		
Protection screen			**PM 016 345**	
Splinter shield			**PM 016 324**	
Vibration dampers	**PM 006 670 -X**		**PM 006 671 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**	
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**	
Mounting materials				
Centering ring coated, bracket screws	**PM 016 395 -T**			
Centering ring coated with protection screen, bracket screws	**PM 016 397 -T**			
Centering ring coated with splinter shield, bracket screws	**PM 016 396 -T**			
Centering ring coated with hexagon bolts		**PM 016 480 -T**		
Centering ring coated with protection screen, hexagon bolts		**PM 016 482 -T**		
Centering ring coated with splinter shield, hexagon bolts		**PM 016 481 -T**		
Centering ring coated with stud screws		**PM 016 485 -T**		
Centering ring coated with protection screen with stud screws		**PM 016 487 -T**		
Centering ring coated with splinter shield with stud screws		**PM 016 486 -T**		
Set of hexagon screws for trough hole (CF-F)			**PM 016 694 -T**	
Set of stud screws for tapped hole (CF-F)			**PM 016 695 -T**	
Set of stud screws for trough hole (CF)			**PM 016 737 -T**	

Content

	HiPace® 1500 C with TC 1200, DN 250 ISO-K, corrosive	HiPace® 1500 C with TC 1200, DN 250 ISO-F, corrosive	HiPace® 1500 C with TC 1200, DN 250 CF-F, corrosive
	PM P04 066 PM P04 068 PM P04 126 PM P04 128	PM P04 067 PM P04 069 PM P04 127 PM P04 129	PM P04 192 PM P04 193
	PM 061 348 -T	PM 061 348 -T	PM 061 348 -T
	PM 051 510 -T	PM 051 510 -T	PM 051 510 -T
	PM 061 005 -T	PM 061 005 -T	PM 061 005 -T
	P 4564 309 HA	P 4564 309 HA	P 4564 309 HA
	P 4564 309 HB	P 4564 309 HB	P 4564 309 HB
	PM Z01 291	PM Z01 291	PM Z01 291
	PM Z00 121	PM Z00 121	PM Z00 121
			PM 071 272 -T
			PM 071 273 -T
			PM 071 274 -T
	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X
	PM 071 285 -X	PM 071 285 -X	PM 071 285 -X
	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T
	PM Z01 205	PM Z01 205	PM Z01 205
	PM Z01 206	PM Z01 206	PM Z01 206
	PM 071 142 -X	PM 071 142 -X	PM 071 142 -X
	PM Z01 313	PM Z01 313	PM Z01 313
	PM Z01 318	PM Z01 318	PM Z01 318
	PM 016 225 -U	PM 016 225 -U	
	PM 016 227 -U	PM 016 227 -U	
	PM 016 226 -U	PM 016 226 -U	
			PM 016 345
			PM 016 324
	PM 006 670 -X		PM 006 671 -X
	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T
	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T
	P 4723 010	P 4723 010	P 4723 010
	P 4723 013	P 4723 013	P 4723 013
	PM 016 395 -T		
	PM 016 397 -T		
	PM 016 396 -T		
		PM 016 480 -T	
		PM 016 482 -T	
		PM 016 481 -T	
		PM 016 485 -T	
		PM 016 487 -T	
		PM 016 486 -T	
			PM 016 694 -T
			PM 016 695 -T
			PM 016 737 -T

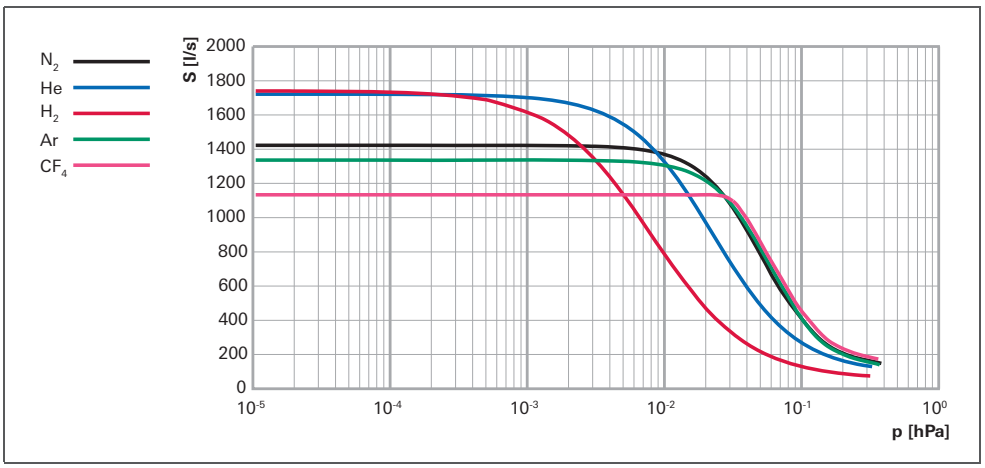
HiPace® 1800



- Powerful turbopump with a pumping speed of up to 1450 l/s for N_2
- Integrated TC 1200 drive electronics with power supply
- Integrated sealing gas system with electric sealing gas valve 24 V DC
- Cooling: Water cooling
- Protection Class: IP 54
- Interfaces: RS-485, Remote (Profibus/DeviceNet on request)
- Extensive accessories expand the range of applications

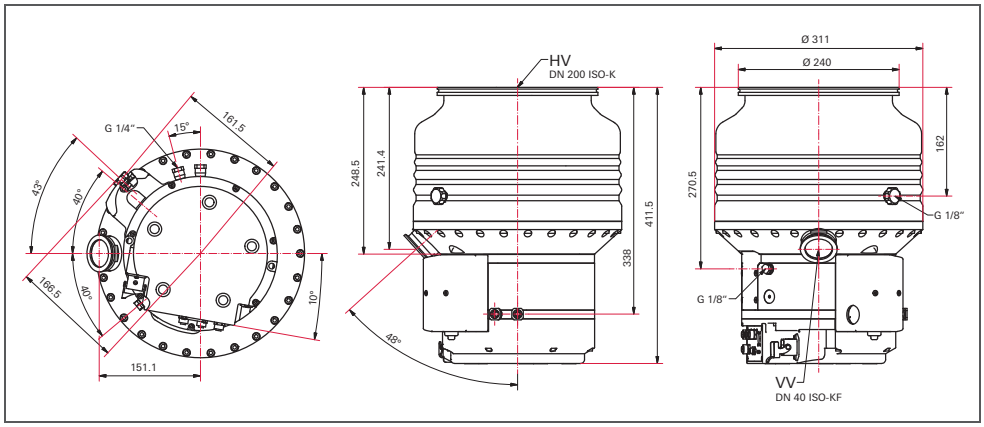
C = Corrosive gas version
U = Upside-down installation orientation

Pumping speed

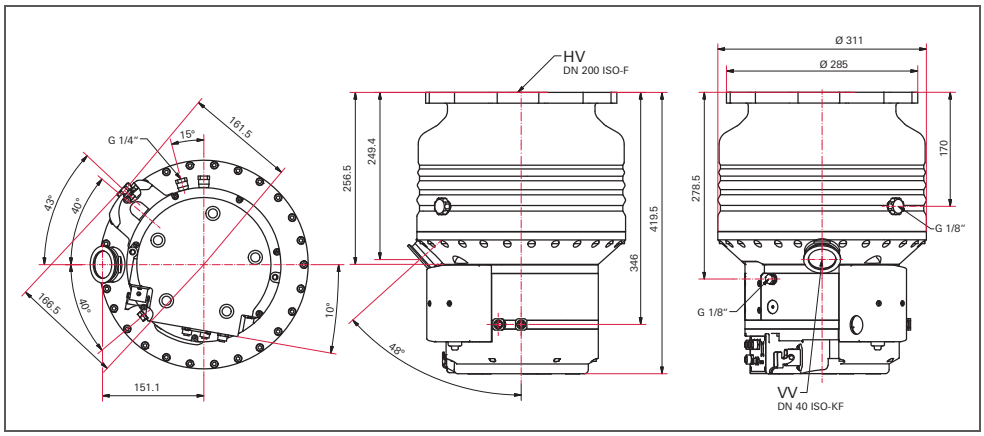


HiPace® 1800

Dimensions (in mm)



HiPace® 1800 with TC 1200, DN 200 ISO-K



HiPace® 1800 with TC 1200, DN 200 ISO-F

Technical data	HiPace® 1800 with TC 1200, DN 200 ISO-K	HiPace® 1800 with TC 1200, DN 200 ISO-F	HiPace® 1800 U with TC 1200, DN 200 ISO-K, upside down version	HiPace® 1800 U with TC 1200, DN 200 ISO-F, upside down version
Connection nominal diameter				
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 200 ISO-K	DN 200 ISO-F	DN 200 ISO-K	DN 200 ISO-F
Venting connection	G 1/8"	G 1/8"	G 1/8"	G 1/8"
Pumping speed				
Pumping speed for Ar	1370 l/s	1370 l/s	1370 l/s	1370 l/s
Pumping speed for H_2	1700 l/s	1700 l/s	1700 l/s	1700 l/s
Pumping speed for He	1650 l/s	1650 l/s	1650 l/s	1650 l/s
Pumping speed for N_2	1450 l/s	1450 l/s	1450 l/s	1450 l/s
Pumping speed for CF_4			1050 l/s	1050 l/s
Compression				
Compression ratio for Ar	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
Compression ratio for H_2	$2 \cdot 10^4$	$2 \cdot 10^4$	$2 \cdot 10^4$	$2 \cdot 10^4$
Compression ratio for He	$3 \cdot 10^5$	$3 \cdot 10^5$	$3 \cdot 10^5$	$3 \cdot 10^5$
Compression ratio for N_2	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
Compression ratio for CF_4			$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
Fore-vacuum max. for N_2	1.8 hPa	1.8 hPa	1.8 hPa	1.8 hPa
Gas througput				
Gas throughput at full rotational speed for Ar	16 hPa l/s	16 hPa l/s	16 hPa l/s	16 hPa l/s
Gas throughput at full rotational speed for H_2	> 30 hPa l/s	> 30 hPa l/s	> 30 hPa l/s	> 30 hPa l/s
Gas throughput at full rotational speed for He	20 hPa l/s	20 hPa l/s	20 hPa l/s	20 hPa l/s
Gas throughput at full rotational speed for N_2	20 hPa l/s	20 hPa l/s	20 hPa l/s	20 hPa l/s
Gas throughput at full rotational speed for CF_4			14 hPa l/s	14 hPa l/s
Electronic drive unit	with TC 1200	with TC 1200	with TC 1200	with TC 1200
Operating voltage	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz
Rotation speed ± 2 %	31500 min^{-1}	31500 min^{-1}	31500 min^{-1}	31500 min^{-1}
Rotation speed variable	50-100 %	50-100 %	50-100 %	50-100 %
Ultimate pressure*	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa
Weight	33 kg	34 kg	33 kg	34 kg
Run-up time	4 min	4 min	4 min	4 min
Integrated power supply	YES	YES	YES	YES
Corrosive gas version			YES	YES
Cooling method, standard	Water	Water	Water	Water
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C	15-35 °C
Cooling water consumption	100 l/h	100 l/h	100 l/h	100 l/h
Bearing	Hybrid	Hybrid	Hybrid	Hybrid
Particulate matter	YES	YES	YES	YES
Sound pressure level	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote	RS-485, Remote
Protection category	IP 54	IP 54	IP 54	IP 54
Permissible magnetic field max.	7 mT	7 mT	7 mT	7 mT

*Ultimate pressure please find description on page 272

Order number pump Pumpe				
Installation orientation: Standard 0-90°	**PM P04 070**	**PM P04 071**	**PM P04 076**	**PM P04 077**
Installation orientation: Upside-down 90-180°	**PM P04 073**	**PM P04 074**	**PM P04 078**	**PM P04 079**
Installation orientation: Standard 0-90°, Profibus	**PM P04 130**	**PM P04 131**	**PM P04 136**	**PM P04 137**
Installation orientation: Upside-down 90-180°, Profibus	**PM P04 133**	**PM P04 134**	**PM P04 138**	**PM P04 139**

Accessories	HiPace® 1800 with TC 1200, DN 200 ISO-K	HiPace® 1800 with TC 1200, DN 200 ISO-F	HiPace® 1800 U with TC 1200, DN 200 ISO-K, upside down version	HiPace® 1800 U with TC 1200, DN 200 ISO-F, upside down version
Order number pump Pumpe	**PM P04 070 PM P04 073 PM P04 130 PM P04 133**	**PM P04 071 PM P04 074 PM P04 131 PM P04 134**	**PM P04 076 PM P04 078 PM P04 136 PM P04 138**	**PM P04 077 PM P04 079 PM P04 137 PM P04 139**
Control units				
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**
Mains cable DCU/TPS/TCP, 3 m				
230 V AC mains cable with Euro-style safety plug	**P 4564 309 HA**	**P 4564 309 HA**	**P 4564 309 HA**	**P 4564 309 HA**
208 V AC mains cable with UL plug	**P 4564 309 HB**	**P 4564 309 HB**	**P 4564 309 HB**	**P 4564 309 HB**
Venting accessories				
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**
Backing pump control				
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**
Backing pump relay box, shielded, 1-phase 20 A	**PM 071 285 -X**	**PM 071 285 -X**	**PM 071 285 -X**	**PM 071 285 -X**
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**
General accessories				
Sealing gas valve	**PM Z01 313**	**PM Z01 313**	**PM Z01 313**	**PM Z01 313**
Sealing gas throttle	**PM Z01 318**	**PM Z01 318**	**PM Z01 318**	**PM Z01 318**
Centering ring coated	**PM 016 220 -U**	**PM 016 220 -U**	**PM 016 220 -U**	**PM 016 220 -U**
Centering ring coated with protection screen	**PM 016 222 -U**	**PM 016 222 -U**	**PM 016 222 -U**	**PM 016 222 -U**
Centering ring coated with splinter shield	**PM 016 221 -U**	**PM 016 221 -U**	**PM 016 221 -U**	**PM 016 221 -U**
Vibration dampers	**PM 006 668 -X**		**PM 006 668 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**	**P 4723 010**
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**	**P 4723 013**
Mounting materials				
Centering ring coated, bracket screws	**PM 016 410 -T**		**PM 016 410 -T**	
Centering ring coated with protection screen, bracket screws	**PM 016 412 -T**		**PM 016 412 -T**	
Centering ring coated with splinter shield, bracket screws	**PM 016 411 -T**		**PM 016 411 -T**	
Centering ring coated with hexagon bolts		**PM 016 470 -T**		**PM 016 470 -T**
Centering ring coated with protection screen, hexagon bolts		**PM 016 472 -T**		**PM 016 472 -T**
Centering ring coated with splinter shield, hexagon bolts		**PM 016 471 -T**		**PM 016 471 -T**
Centering ring coated with stud screws		**PM 016 475 -T**		**PM 016 475 -T**
Centering ring coated with protection screen with stud screws		**PM 016 477 -T**		**PM 016 477 -T**
Centering ring coated with splinter shield with stud screws		**PM 016 476 -T**		**PM 016 476 -T**

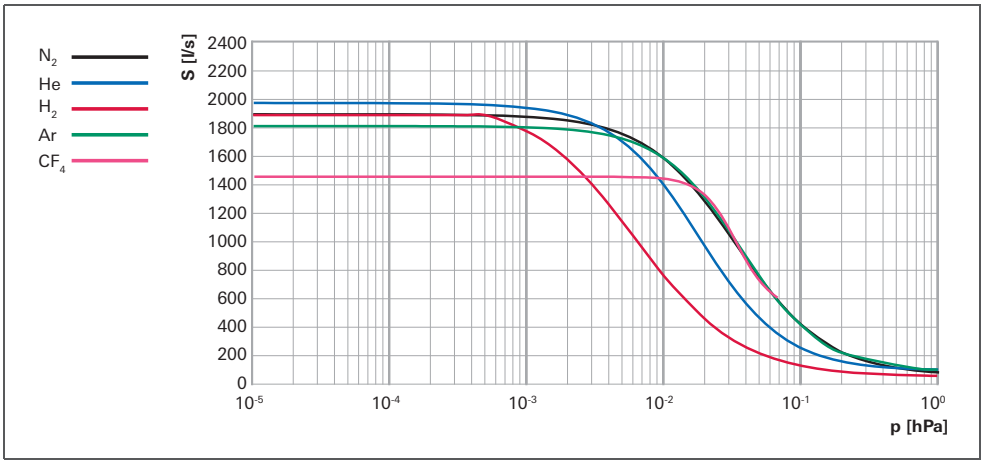
HiPace® 2300



- Powerful turbopump with a pumping speed of up to 1900 l/s for N_2
- DN 250 ISO-K flange
- Integrated TC 1200 drive electronics with power supply
- Integrated sealing gas system with electric sealing gas valve 24 V DC
- Cooling: Water cooling
- Protection Class: IP 54
- Interfaces: RS-485, Remote (Profibus/DeviceNet on request)
- Extensive accessories expand the range of applications

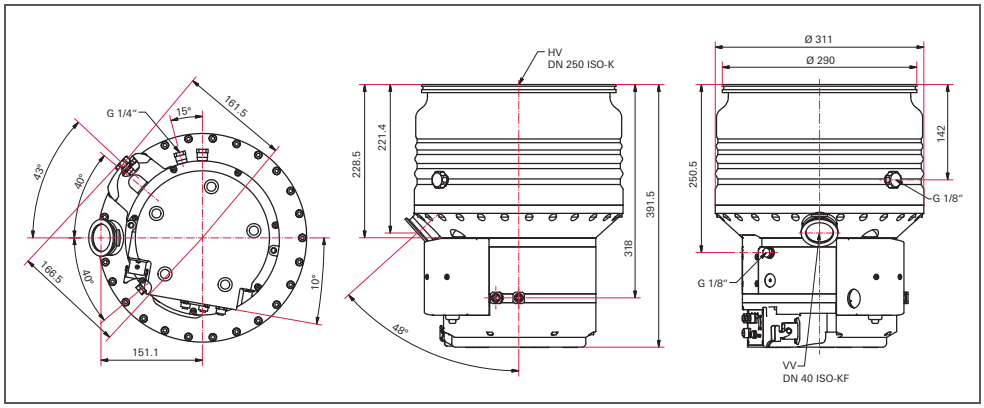
C=Corrosive gas version
U=Upside-down installation orientation

Pumping speed

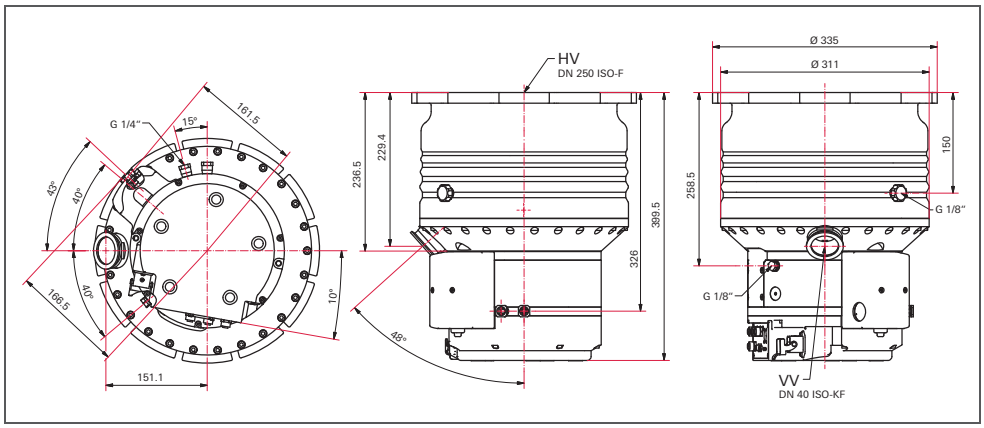


HiPace® 2300

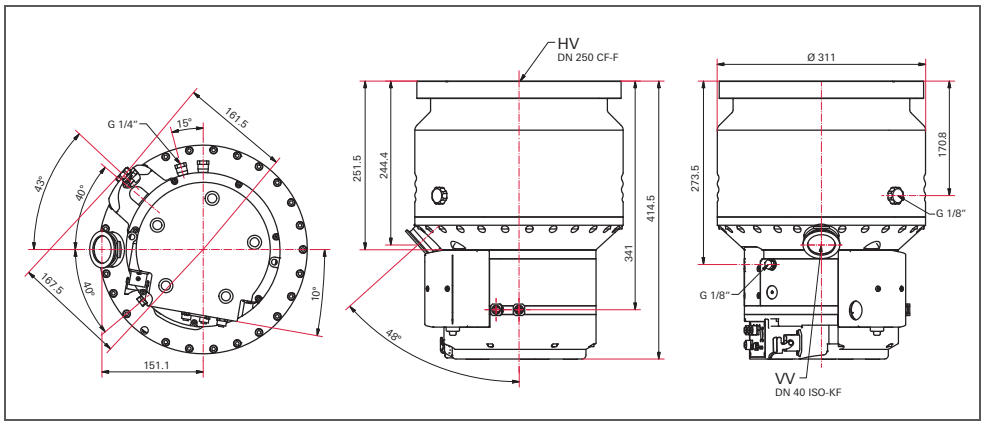
Dimensions (in mm)



HiPace® 2300 with TC 1200, DN 250 ISO-K



HiPace® 2300 with TC 1200, DN 250 ISO-F



HiPace® 2300 with TC 1200, DN 250 CF-F

Technical data	HiPace® 2300 with TC 1200, DN 250 ISO-K	HiPace® 2300 with TC 1200, DN 250 ISO-F	HiPace® 2300 with TC 1200, DN 250 CF-F	
Connection nominal diameter				
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	
Flange (in)	DN 250 ISO-K	DN 250 ISO-F	DN 250 CF-F	
Venting connection	G 1/8"	G 1/8"	G 1/8"	
Pumping speed				
Pumping speed for Ar	1800 l/s	1800 l/s	1800 l/s	
Pumping speed for H_2	1850 l/s	1850 l/s	1850 l/s	
Pumping speed for He	2000 l/s	2000 l/s	2000 l/s	
Pumping speed for N_2	1900 l/s	1900 l/s	1900 l/s	
Pumping speed for CF_4				
Compression				
Compression ratio for Ar	> $1 \cdot 10^8$	> $1 \cdot 10^8$	> $1 \cdot 10^8$	
Compression ratio for H_2	$2 \cdot 10^4$	$2 \cdot 10^4$	$2 \cdot 10^4$	
Compression ratio for He	$3 \cdot 10^5$	$3 \cdot 10^5$	$3 \cdot 10^5$	
Compression ratio for N_2	> $1 \cdot 10^8$	> $1 \cdot 10^8$	> $1 \cdot 10^8$	
Compression ratio for CF_4				
Fore-vacuum max. for N_2	1.8 hPa	1.8 hPa	1.8 hPa	
Gas througput				
Gas throughput at full rotational speed for Ar	16 hPa l/s	16 hPa l/s	8 hPa l/s	
Gas throughput at full rotational speed for H_2	> 30 hPa l/s	> 30 hPa l/s	> 30 hPa l/s	
Gas throughput at full rotational speed for He	20 hPa l/s	20 hPa l/s	10 hPa l/s	
Gas throughput at full rotational speed for N_2	20 hPa l/s	20 hPa l/s	11 hPa l/s	
Gas throughput at full rotational speed for CF_4				
Electronic drive unit	with TC 1200	with TC 1200	with TC 1200	
Operating voltage	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	
Rotation speed ± 2 %	31500 min^{-1}	31500 min^{-1}	31500 min^{-1}	
Rotation speed variable	50-100 %	50-100 %	50-100 %	
Ultimate pressure*	< $1 \cdot 10^{-7}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	
Weight	34 kg	35 kg	47 kg	
Run-up time	4 min	4 min	4 min	
Integrated power supply	YES	YES	YES	
Corrosive gas version				
Cooling method, standard	Water	Water	Water	
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C	
Cooling water consumption	100 l/h	100 l/h	100 l/h	
Bearing	Hybrid	Hybrid	Hybrid	
Particulate matter	YES	YES	YES	
Sound pressure level	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)	
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote	
Protection category	IP 54	IP 54	IP 54	
Permissible magnetic field max.	7 mT	7 mT	7 mT	

*Ultimate pressure please find description on page 272

Order number pump Pumpe				
Installation orientation: Standard 0-90°	**PM P03 920**	**PM P03 921**	**PM P03 922**	
Installation orientation: Upside-down 90-180°	**PM P03 923**	**PM P03 924**	**PM P03 925**	
Installation orientation: Standard 0-90°, Profibus	**PM P04 140**	**PM P04 141**	**PM P04 142**	
Installation orientation: Upside-down 90-180°, Profibus	**PM P04 143**	**PM P04 144**	**PM P04 145**	

	HiPace® 2300 C with TC 1200, DN 250 ISO-K, corrosive	HiPace® 2300 C with TC 1200, DN 250 ISO-F, corrosive	HiPace® 2300 C with TC 1200, DN 250 CF-F, corrosive
	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
	DN 250 ISO-K	DN 250 ISO-F	DN 250 CF-F
	G 1/8"	G 1/8"	G 1/8"
	1800 l/s	1800 l/s	1800 l/s
	1850 l/s	1850 l/s	1850 l/s
	2000 l/s	2000 l/s	2000 l/s
	1900 l/s	1900 l/s	1900 l/s
	1450 l/s	1450 l/s	1450 l/s
	> $1 \cdot 10^8$	> $1 \cdot 10^8$	> $1 \cdot 10^8$
	$2 \cdot 10^4$	$2 \cdot 10^4$	$2 \cdot 10^4$
	$3 \cdot 10^5$	$3 \cdot 10^5$	$3 \cdot 10^5$
	> $1 \cdot 10^8$	> $1 \cdot 10^8$	> $1 \cdot 10^8$
	> $1 \cdot 10^8$	> $1 \cdot 10^8$	> $1 \cdot 10^8$
	1.8 hPa	1.8 hPa	1.8 hPa
	16 hPa l/s	16 hPa l/s	8 hPa l/s
	> 30 hPa l/s	> 30 hPa l/s	> 30 hPa l/s
	20 hPa l/s	20 hPa l/s	10 hPa l/s
	20 hPa l/s	20 hPa l/s	11 hPa l/s
	14 hPa l/s	14 hPa l/s	8 hPa l/s
	with TC 1200	with TC 1200	with TC 1200
	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz
	31500 min^{-1}	31500 min^{-1}	31500 min^{-1}
	50-100 %	50-100 %	50-100 %
	< $1 \cdot 10^{-7}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $1 \cdot 10^{-8}$ hPa
	34 kg	35 kg	47 kg
	4 min	4 min	4 min
	YES	YES	YES
	YES	YES	YES
	Water	Water	Water
	15-35 °C	15-35 °C	15-35 °C
	100 l/h	100 l/h	100 l/h
	Hybrid	Hybrid	Hybrid
	YES	YES	YES
	≤ 50 dB (A)	≤ 50 dB (A)	≤ 50 dB (A)
	RS-485, Remote	RS-485, Remote	RS-485, Remote
	IP 54	IP 54	IP 54
	7 mT	7 mT	7 mT

	PM P03 926	**PM P03 927**	**PM P04 194**
	PM P03 928	**PM P03 929**	**PM P04 195**
	PM P04 146	**PM P04 147**	**PM P04 200**
	PM P04 148	**PM P04 149**	**PM P04 201**

Accessories	HiPace® 2300 with TC 1200, DN 250 ISO-K	HiPace® 2300 with TC 1200, DN 250 ISO-F	HiPace® 2300 with TC 1200, DN 250 CF-F	
Order number pump Pumpe	**PM P03 920 PM P03 923 PM P04 140 PM P04 143**	**PM P03 921 PM P03 924 PM P04 141 PM P04 144**	**PM P03 922 PM P03 925 PM P04 142 PM P04 145**	
Control units				
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**	
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**	
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**	
Mains cable DCU/TPS/TCP, 3 m				
230 V AC mains cable with Euro-style safety plug	**P 4564 309 HA**	**P 4564 309 HA**	**P 4564 309 HA**	
208 V AC mains cable with UL plug	**P 4564 309 HB**	**P 4564 309 HB**	**P 4564 309 HB**	
Venting accessories				
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**	
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**	
Heating accessories				
Heating jacket 230 V AC, Euro-style safety plug			**PM 071 275 -T**	
Heating jacket 208 V AC, UL plug			**PM 071 276 -T**	
Heating jacket 115 V AC, UL plug			**PM 071 277 -T**	
Backing pump control				
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**	
Backing pump relay box, shielded, 1-phase 20 A	**PM 071 285 -X**	**PM 071 285 -X**	**PM 071 285 -X**	
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**	
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**	
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**	
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**	
General accessories				
Sealing gas valve	**PM Z01 313**	**PM Z01 313**	**PM Z01 313**	
Sealing gas throttle	**PM Z01 318**	**PM Z01 318**	**PM Z01 318**	
Centering ring coated	**PM 016 225 -U**	**PM 016 225 -U**		
Centering ring coated with protection screen	**PM 016 227 -U**	**PM 016 227 -U**		
Centering ring coated with splinter shield	**PM 016 226 -U**	**PM 016 226 -U**		
Protection screen			**PM 016 345**	
Splinter shield			**PM 016 324**	
Vibration dampers	**PM 006 670 -X**		**PM 006 671 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**	
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**	
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**	
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**	
Mounting materials				
Centering ring coated, bracket screws	**PM 016 415 -T**			
Centering ring coated with protection screen, bracket screws	**PM 016 417 -T**			
Centering ring coated with splinter shield, bracket screws	**PM 016 416-T**			
Centering ring coated with hexagon bolts		**PM 016 480 -T**		
Centering ring coated with protection screen, hexagon bolts		**PM 016 482 -T**		
Centering ring coated with splinter shield, hexagon bolts		**PM 016 481 -T**		
Centering ring coated with stud screws		**PM 016 485 -T**		
Centering ring coated with protection screen with stud screws		**PM 016 487 -T**		
Centering ring coated with splinter shield with stud screws		**PM 016 486 -T**		
Set of hexagon screws for trough hole (CF-F)			**PM 016 694 -T**	
Set of stud screws for tapped hole (CF-F)			**PM 016 695 -T**	
Set of stud screws for trough hole (CF)			**PM 016 737 -T**	

	HiPace® 2300 C with TC 1200, DN 250 ISO-K, corrosive	HiPace® 2300 C with TC 1200, DN 250 ISO-F, corrosive	HiPace® 2300 C with TC 1200, DN 250 CF-F, corrosive
	PM P03 926 PM P03 928 PM P04 146 PM P04 148	PM P03 927 PM P03 929 PM P04 147 PM P04 149	PM P04 194 PM P04 195 PM P04 200 PM P04 201
	PM 061 348 -T	PM 061 348 -T	PM 061 348 -T
	PM 051 510 -T	PM 051 510 -T	PM 051 510 -T
	PM 061 005 -T	PM 061 005 -T	PM 061 005 -T
	P 4564 309 HA	P 4564 309 HA	P 4564 309 HA
	P 4564 309 HB	P 4564 309 HB	P 4564 309 HB
	PM Z01 291	PM Z01 291	PM Z01 291
	PM Z00 121	PM Z00 121	PM Z00 121
			PM 071 275 -T
			PM 071 276 -T
			PM 071 277 -T
	PM 071 284 -X	PM 071 284 -X	PM 071 284 -X
	PM 071 285 -X	PM 071 285 -X	PM 071 285 -X
	PM 061 675 -T	PM 061 675 -T	PM 061 675 -T
	PM Z01 205	PM Z01 205	PM Z01 205
	PM Z01 206	PM Z01 206	PM Z01 206
	PM 071 142 -X	PM 071 142 -X	PM 071 142 -X
	PM Z01 313	PM Z01 313	PM Z01 313
	PM Z01 318	PM Z01 318	PM Z01 318
	PM 016 225 -U	PM 016 225 -U	
	PM 016 227 -U	PM 016 227 -U	
	PM 016 226 -U	PM 016 226 -U	
			PM 016 345
			PM 016 324
	PM 006 670 -X		PM 006 671 -X
	PM 061 207 -T	PM 061 207 -T	PM 061 207 -T
	PM 061 283 -T	PM 061 283 -T	PM 061 283 -T
	P 4723 010	P 4723 010	P 4723 010
	P 4723 013	P 4723 013	P 4723 013
	PM 016 415 -T		
	PM 016 417 -T		
	PM 016 416-T		
		PM 016 480 -T	
		PM 016 482 -T	
		PM 016 481 -T	
		PM 016 485 -T	
		PM 016 487 -T	
		PM 016 486 -T	
			PM 016 694 -T
			PM 016 695 -T
			PM 016 737 -T

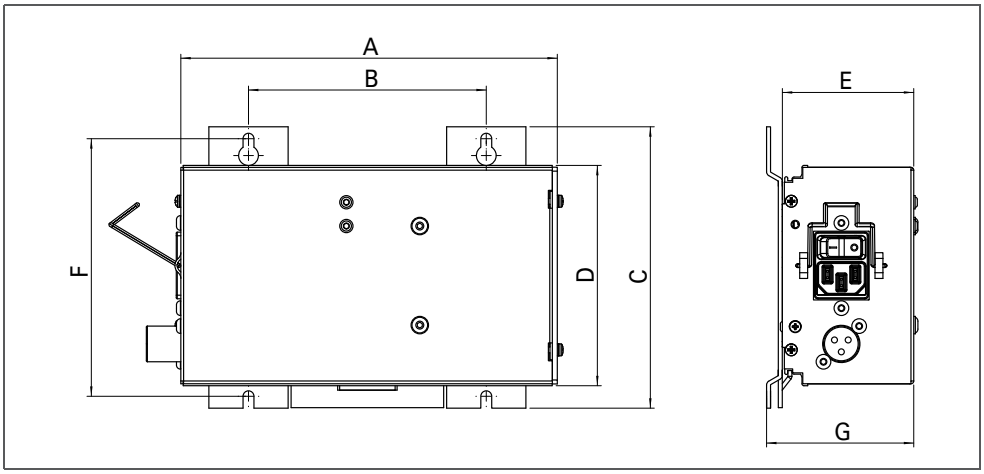
TPS wall rail fitting

Power supplies for wall and standard-rail mounting. Simple integration and Plug and Play-ready. Performance ideally matched to the respective pump model. Satisfies international standards.



- Power supply for wall or standard-rail mounting
- Ideally matched to HiPace 10 and HiPace 80

Dimensions (in mm)



TPS 110
TPS 180
TPS 310
TPS 400

	TPS 110	TPS 180	TPS 310	TPS 400
A	169 mm	190 mm	190 mm	190 mm
B	120 mm	120 mm	120 mm	120 mm
C	142 mm	142 mm	142 mm	142 mm
D	111.2 mm	111.2 mm	111.2 mm	111.2 mm
E	48.7 mm	58.4 mm	67.3 mm	104.6 mm
F	130 mm	130 mm	130 mm	130 mm
G	56.6 mm	66.5 mm	75.3 mm	112.5 mm

Technical data	TPS 110	TPS 180	TPS 310	TPS 400
Output voltage	24 (± 2 %) V DC	24 (± 2 %) V DC	24 (± 2 %) V DC	48 (± 2 %) V DC
Output current	4.6 A	7.5 A	12.5 A	8.4 A
Weight	0.7 kg	1.0 kg	1.1 kg	1.75 kg
Mains requirement: frequency (range)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Mains requirement: power consumption	130 VA	210 VA	340 VA	450 VA
Mains requirement: voltage (range)	115-230 (-20-+15 %) V AC	115-230 (-20-+15 %) V AC	115-230 (-20-+15 %) V AC	115-230 (-20/+15 %) V AC
Protection category	IP 20	IP 20	IP 20	IP 20
Ambient temperature	5-50 °C	5-50 °C	5-50 °C	5-50 °C

Order number				
TPS wall rail fitting	**PM 061 340 -T**	**PM 061 341 -T**	**PM 061 342 -T**	**PM 061 343 -T**

Accessories				
Mains cable 230 V AC with safety plug, Euro socket C13 (straight), 3 m	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**
Mains cable 115 V AC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**
Mains cable 208 V DC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**

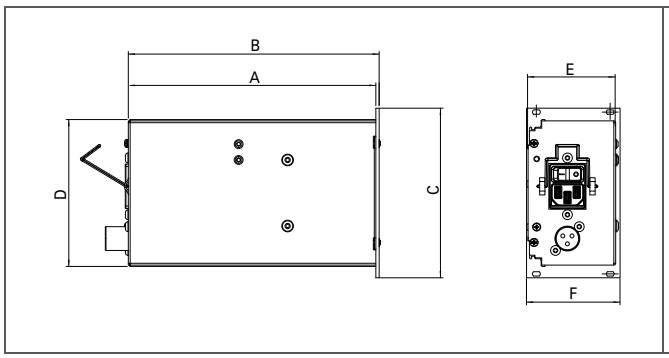
TPS-19" rack module

Power supply in the form of a 3HU 19" rack module with front panel; for installation directly in 19" rack systems. Performance ideally matched to the respective HiPace pump model. Plug and Play-ready. Satisfies international standards.

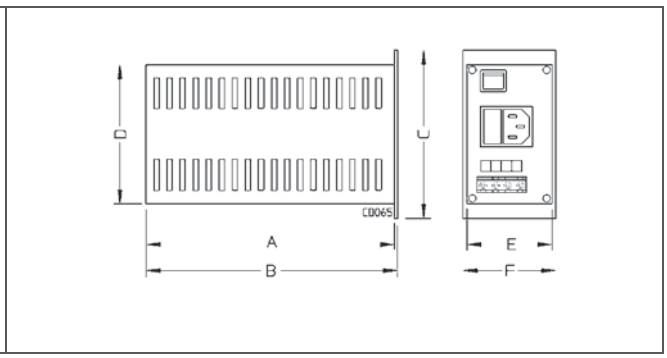
- Mains pack as 19" partial plug-in 3HU with front plate
- Ideally matched to HiPace 10/60/80 and SplitFlow 50



Dimensions (in mm)



TPS 111
TPS 181



TPS 311
TPS 401

	TPS 111	TPS 181	TPS 311	TPS 401
A	161.5 mm	187.5 mm	187.5 mm	187.5 mm
B	164 mm	190 mm	190 mm	190 mm
C	128.4 mm	128.4 mm	128.4 mm	128.4 mm
D	111.2 mm	111.2 mm	111.2 mm	111.2 mm
E	48.7 mm	58.4 mm	67.3 mm	104.6 mm
F	50.5 mm	60.7 mm	70.8 mm	106.4 mm

Technical data	TPS 111	TPS 181	TPS 311	TPS 401
Output voltage	24 (± 2 %) V DC	24 (± 2 %) V DC	24 (± 2 %) V DC	48 (± 2 %) V DC
Output current	4.6 A	7.5 A	12.5 A	8.4 A
Weight	0.7 kg	1.0 kg	1.1 kg	1.75 kg
Mains requirement: frequency (range)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Mains requirement: power consumption	130 VA	210 VA	340 VA	450 VA
Mains requirement: voltage (range)	115-230 (-20-+15 %) V AC	115-230 (-20 - +15 %) V AC	115-230 (-20-+15 %) V AC	115-230 (-20-+15 %) V AC
Protection category	IP 20	IP 20	IP 20	IP 20
Ambient temperature	5-50 °C	5-50 °C	5-50 °C	5-50 °C

Order number				
TPS-19" rack module	**PM 061 344 -T**	**PM 061 345 -T**	**PM 061 346 -T**	**PM 061 347 -T**

Accessories				
Mains cable 230 V AC with safety plug, Euro socket C13 (straight), 3 m	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**
Mains cable 115 V AC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**
Mains cable 208 V DC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**

Content

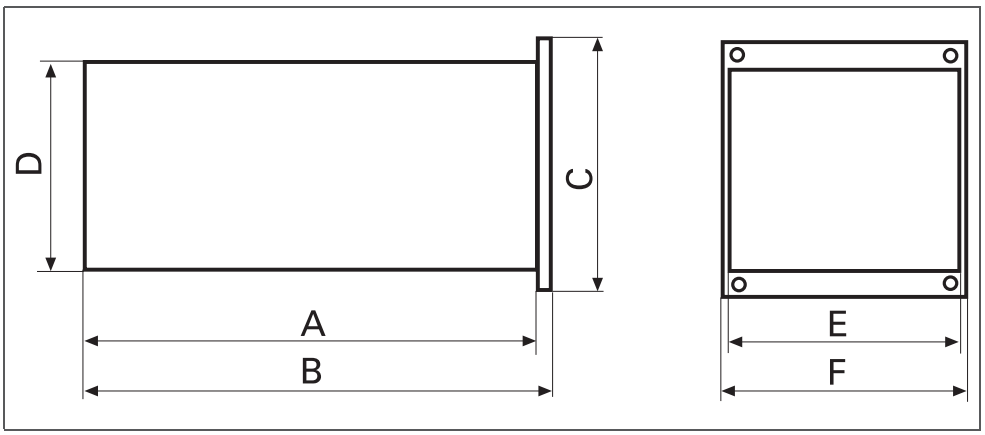
DCU with integrated power supply

Display Control Unit (DCU) with integrated power supply for electrical supply to the HiPace series of pumps. 3HU 19" rack module with easy-to-read, backlit display. The DCU affords operation and monitoring of all parameters of the HiPace turbopumps.



- To control and monitor all parameters of the drive electronics
- With integrated power supply
- Ideally matched to HiPace 10 and HiPace 80

Dimensions (in mm)



DCU 110
DCU 180
DCU 310
DCU 400

	DCU 110	DCU 180	DCU 310	DCU 400
A	197.5 mm	227.5 mm	227.5 mm	227.5 mm
B	200 mm	230 mm	230 mm	230 mm
C	128.5 mm	128.5 mm	128.5 mm	128.5 mm
D	111.2 mm	111.2 mm	111.2 mm	111.2 mm
E	106 mm	106 mm	106 mm	106 mm
F	106.4 mm	106.4 mm	106.4 mm	106.4 mm

Technical data	DCU 110	DCU 180	DCU 310	DCU 400
Output voltage	24 (± 2 %) V DC	24 (± 2 %) V DC	24 (± 2 %) V DC	48 (± 2 %) V DC
Output current	4.6 A	7.5 A	12.5 A	8.4 A
Weight	1.2 kg	1.7 kg	1.85 kg	2.3 kg
Mains requirement: frequency (range)	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Mains requirement: power consumption	130 VA	210 VA	340 VA	450 VA
Mains requirement: voltage (range)	115-230 (-20-+15 %) V AC	115-230 (-20-+15 %) V AC	115-230 (-20-+15 %) V AC	115-230 (-20-+15 %) V AC
Protection category	IP 20	IP 20	IP 20	IP 20
Ambient temperature	5-50 °C	5-50 °C	5-50 °C	5-50 °C

Order number				
DCU with integrated power supply	**PM C01 820**	**PM C01 821**	**PM C01 822**	**PM C01 823**

Accessories				
Mains cable 230 V AC with safety plug, Euro socket C13 (straight), 3 m	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**
Mains cable 115 V AC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**
Mains cable 208 V DC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**

Control and display units

Control and display units for setting and monitoring the operating parameters of the turbopumps.

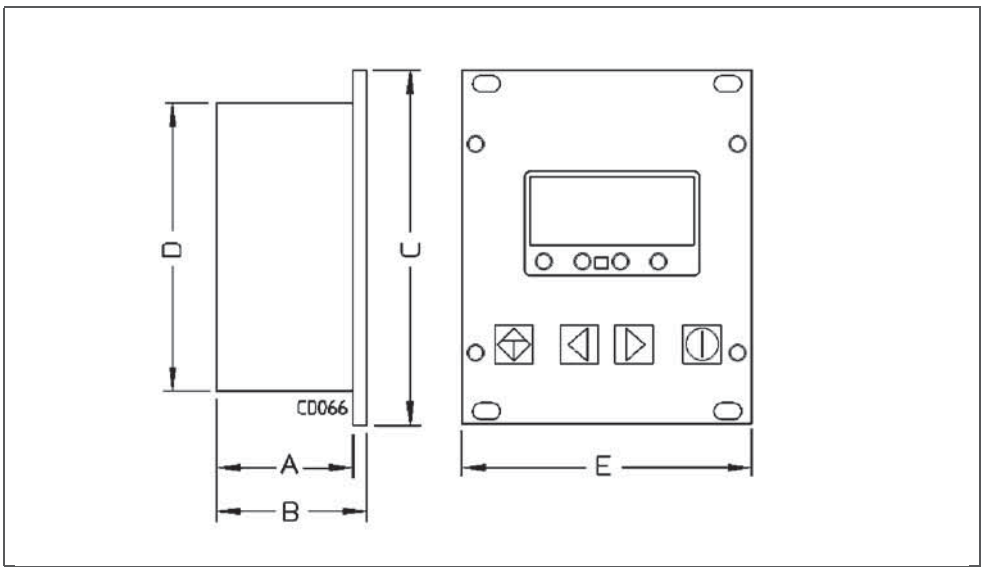
DCU 002



DCU 002, Display control unit

- For operating and monitoring all parameters of the drive electronics
- Power supplied exclusively from the drive electronics
- Suitable for all HiPace turbopumps
- 19" rack module, 3HU
- Connects to the pump´s drive electronics via RS-485 interface
- Interface cable (3 m) for drive electronics included in scope of delivery
- Various Pfeiffer Vacuum gauges can be connected and read

Dimensions (in mm)



DCU 002, Display control unit

	DCU 002, Display control unit
A	50 mm
B	52.5 mm
C	128.5 mm
D	106 mm
E	106.3 mm

Technical data	DCU 002, Display control unit
Connection	12-30 V DC
Weight	0.4 kg
Power consumption	5 VA
Protection category	IP 20
Ambient temperature	5-50 °C

Order number	
DCU 002, Display control unit	**PM 061 348 -T**

Accessories	
Connection cable, plug M12, RJ 45, 3 m	**PM 051 726 -T**

HPU 001



HPU 001, handheld programming unit

- The ideal assistant for controlling and monitoring the pump parameters
- Administration of complete pump configurations / parameter records
- Connects to the pump's drive electronics via RS-485 interface
- Connection cable (3 m) for drive electronics included in scope of delivery
- Multilingual menus
- For loading and copying parameter records
- Graphical display

Technical data	HPU 001, handheld programming unit
Dimensions (L x W x H)	150 x 80 x 30 mm
Connection	9-24 V DC
Weight	0.25 kg
Power consumption	2 W
Protection category	IP 20
Ambient temperature	5-40 °C

Order number	
HPU 001, handheld programming unit	**PM 051 510 -T**

Accessories	
Connection cable, plug M12, RJ 45, 3 m	**PM 051 726 -T**
Accessories package for HPU - Power supply, software and PC cable	**PM 061 005 -T**

Accessories package for HPU



Accessories package for HPU - Power supply, software and PC cable

- Scope of delivery: CD (with HPU Communicator software), HPU-PC connection cable, power supply for HPU, 3 power cord plug adapters (America, UK, Southern Europe)
- The HPU Communicator software enables the pump parameter records to be displayed and administered on the PC and/or sent via e-mail
- The HPU-PC connection cable is used to exchange data between PC and HPU

Technical data	Accessories package for HPU - Power supply, software and PC cable
Dimensions (L x W x H)	150 x 80 x 30 mm
Connection	9-24 V DC
Weight	0.23 kg
Power consumption	2 W
Protection category	IP 20
Ambient temperature	5-40 °C

Order number	
Accessories package for HPU	**PM 061 005 -T**

Mains cables and connection cables

Various mains and connection cables afford a secure electrical connection.
Other lengths upon request.



Mains cables and connection cables	Order number
Mains cable 230 V AC with safety plug, Euro socket C13 (straight), 3 m	**P 4564 309 ZA**
Mains cable 115 V AC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZE**
Mains cable 208 V DC with UL plug, Euro socket C 13 (straight), 3 m	**P 4564 309 ZF**
Mains cable 230 V AC with safety plug, VII-HAN 3A, 3 m	**P 4564 309 HA**
Mains cable 208 V AC with UL plug-HAN 3A, 3 m	**P 4564 309 HB**
Connection cable for HiPace with TC 110 and RS-485 interface to power supply TPS/DCU 110/111/180/181	**PM 061 350 -T**
Connection cable for HiPace with TC 110 and RS-485 interface and 2 accessory ports to power supply TPS/DCU 110/111/180/181	**PM 061 351 -T**
Connection cable for HiPace with TC 400/TM 700 to power supply TPS/DCU 310/311/400/401	**PM 061 352 -T**
Connection cable from TCP 350 to HiPace with 2 accessory ports M8, 3 m	**PM 061 353 -T**
Connection cable from TCP 350 to HiPace with 2 accessory ports M12, 3 m	**PM 061 356 -T**

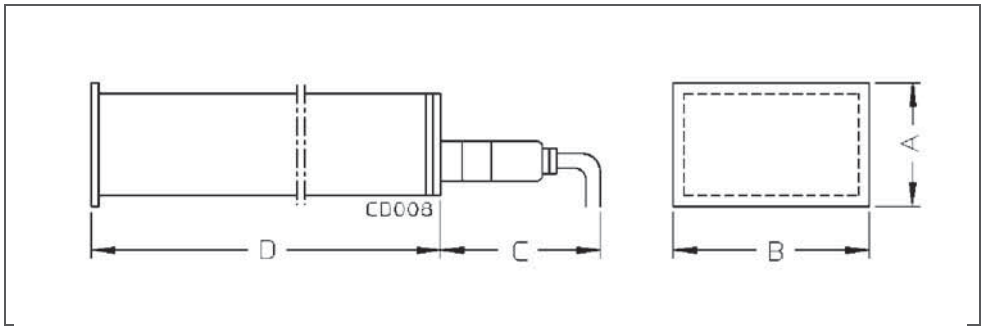
External drive units

External drives for HiPace pumps via connection cables.



- The TCP 350 drive electronics unit is employed for driving and monitoring the HiPace 80, 300, 400, 700 und 800
- Complete electronics in a single unit
- Mating plug for "Remote" connector included in scope of delivery

Dimensions (in mm)



TCP 350

	TCP 350 drive electronics	TCP 350 drive electronics	TCP 350 DN, drive electronics
A	128.5 mm	128.5 mm	128.5 mm
B	141.9 mm	141.9 mm	141.9 mm
C	120 mm	120 mm	120 mm
D	232 mm	232 mm	232 mm

Technical data	TCP 350 drive electronics	TCP 350 drive electronics	TCP 350 DN, drive electronics
Frequency	50/60 Hz	50-60 Hz	50-60 Hz
Weight	2.8 kg	2.8 kg	2.8 kg
Cable length Turbo-TCP max.	100 m	100 m	100 m
Mains requirement: power consumption	400 VA	400 VA	400 VA
Mains requirement: voltage (range)	95-265 V AC	95-265 V AC	95-265 V AC
Interface	RS-485/RS-232/ Remote (SPS-compatible)	RS-485/RS-232/ Remote (SPS-compatible) and Profibus	RS-485/RS-232/ Remote (SPS-compatible) and DeviceNet
Protection category	IP 20	IP 20	IP 20
Ambient temperature	5-40 °C	5-40 °C	5-40 °C

Order number			
External drive units	**PM C01 740**	**PM C01 741**	**PM C01 742**

Venting accessories

Venting valve, shielded

Accessories for safe and secure venting of the HiPace turbopumps. For secure processes and maximum reliability.



Venting valve, shielded, 24 V DC, G 1/8", for connection to TC 110

- Cable for connection to TC 110 and TCP 350 included in scope of delivery
- Venting mode, venting time and venting period adjustable via electronic drive unit and DCU/HPU
- Connection: G 1/8"
- Normally closed valve
- Connects with M8 plug directly to accessory outputs of connection cable, TCS 12/TCS 13 and TC 100 with interface (PB, E74, RS)

Venting valve, shielded, 24 V DC, G 1/8", for connection to TC 400/1200 and TM 700

- Cable for connection to devices included in the scope of delivery
- Venting mode, venting time and venting period adjustable via electronic drive unit and DCU/HPU
- Connection: G 1/8"
- Normally closed valve
- Can be connected with M12 plug directly to the accessory outputs of the electronic drive unit

Technical data	Venting valve, shielded, 24 V DC, G 1/8", for connection to TC 110	Venting valve, shielded, 24 V DC, G 1/8", for connection to TC 400/1200 and TM 700
Flange (out)	G 1/8"	G 1/8"
Flange (in)	G 1/8"	G 1/8"
Venting gas excess pressure, max.	150 kPa (absolute)	150 kPa (absolute)
Gas flow at atmospheric pressure	130 hPa l/s	130 hPa l/s
Weight	100 g	100 g
Control voltage	24 V DC	24 V DC

Order number		
Venting valve, shielded	**PM Z01 290**	**PM Z01 291**

Accessories		
TTV 001, air drier for venting turbopumps	**PM Z00 121**	**PM Z00 121**

Content

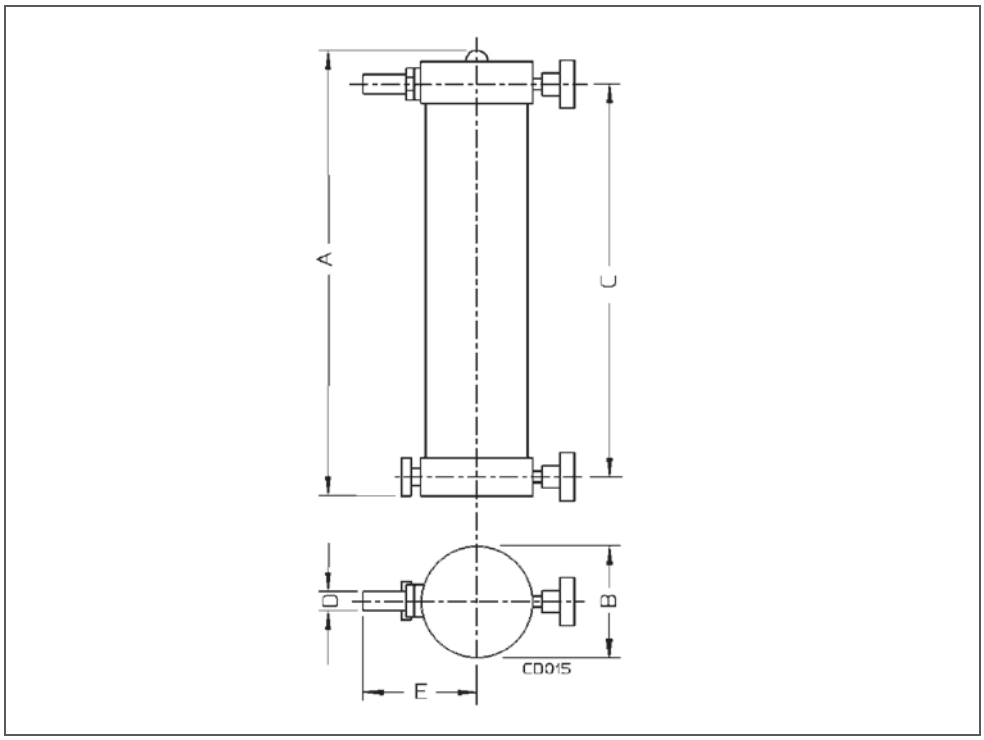
TTV 001



TTV 001, air drier for venting turbopumps

- Dries air securely for venting the turbopumps
- Shortens pump-down time
- Color indicator shows saturation of drying agent
- Simple connection to venting valves
- Hose nozzle G 1/8" for 9 mm hose
- G 1/8" connection for additional accessories

Dimensions (in mm)



TTV 001, air drier

	TTV 001, air drier for venting turbopumps
A	235 mm
B	59 mm
C	206 mm
D	9 mm
E	57 mm

Order number	
TTV 001, air drier	**PM Z00 121**

Cooling accessories

Accessories for cooling. For maximum reliability and process flexibility.

Air cooling

Ideal for systems integration, does not require additional water supply.



Air cooling	Control voltage	Order number
Air cooling for SplitFlow 50, HiPace 60/80 with TC 110	24 V DC	**PM Z01 300**
Air cooling for HiPace 300 with TC 110	24 V DC	**PM Z01 301**
Air cooling for HiPace 300 with TC 400	24 V DC	**PM Z01 302**
Air cooling for HiPace 400/700 and 800 with TC 400/TM 700	24 V DC	**PM Z01 303**
Air cooling, shielded, for HiPace 400/700/800 and 300700/800 M with TC 400/TM 700	24 V DC	**PM Z01 363**

Water cooling

For maximum performance and additional process flexibility.
Required for maximum performance and fast cycling. Indispensable for UHV applications when pump is heated.



Water cooling	Order number
Water cooling for HiPace 60/80 for plug-in connection 8 mm	**PM 016 623 -T**
Water cooling for HiPace 300 with plug-in connection 8 mm	**PM 016 624 -T**

Heating accessories

In many cases, it is necessary to condition the turbopump for cleaning in UHV operation or for process adaptation. Matching heating elements are available. Automatic control by means of integrated TC 110, TC 400, TC 1200 and TM 700 drive electronics.



Heating accessories	Order number
Heating sleeve for HiPace 80 with TC 110, 230 V AC, safety plug	PM 061 360 -T
Heating sleeve for HiPace 80 with TC 110, 208 V AC, UL plug	PM 061 361 -T
Heating sleeve for HiPace 80 with TC 110, 115 V AC, UL plug	PM 061 362 -T
Heating sleeve for HiPace 300 with TC 110, 230 V AC, safety plug	PM 061 363 -T
Heating sleeve for HiPace 300 with TC 110, 208 V AC, UL plug	PM 061 364 -T
Heating sleeve for HiPace 300 with TC 110, 208 V AC, UL plug	PM 061 365 -T
Heating sleeve for HiPace 300 with TC 400, 230 V AC, safety plug	PM 061 366 -T
Heating sleeve for HiPace 300 with TC 400, 208 V AC, UL plug	PM 061 367 -T
Heating sleeve for HiPace 300 with TC 400, 115 V AC, UL plug	PM 061 368 -T
Heating sleeve for HiPace 400/700 and 800 with TC 400, 230 V AC, safety plug	PM 061 369 -T
Heating sleeve for HiPace 400/700 and 800 with TC 400, 208 V AC, UL plug	PM 061 370 -T
Heating sleeve for HiPace 400/700 and 800 with TC 400, 115 V AC, UL plug	PM 061 371 -T
Heating sleeve, shielded, for HiPace 400/700/800 with TC 400 PB/TM 700, 230 V AC, safety plug	PM 071 269 -T
Heating sleeve, shielded, for HiPace 400/700/800 with TC 400 PB/TM 700, 208 V AC, UL plug	PM 071 270 -T
Heating sleeve, shielded, for HiPace 400/700/800 with TC 400 PB/TM 700, 115 V AC, UL plug	PM 071 271 -T
Heating sleeve, shielded, for HiPace 1200/1500 with TC1200, 230 V AC, safety plug	PM 071 272 -T
Heating sleeve, shielded, for HiPace 1200/1500 with TC 1200, 208 V AC, UL plug	PM 071 273 -T
Heating sleeve, shielded, for HiPace 1200/1500 with TC 1200, 115 V AC, UL plug	PM 071 274 -T
Heating sleeve, shielded, for HiPace 2300 with TC 1200, 230 V AC, safety plug	PM 071 275 -T
Heating sleeve, shielded, for HiPace 2300 with TC 1200, 208 V AC, UL plug	PM 071 276 -T
Heating sleeve, shielded, for HiPace 2300 with TC 1200, 115 V AC, UL plug	PM 071 277 -T

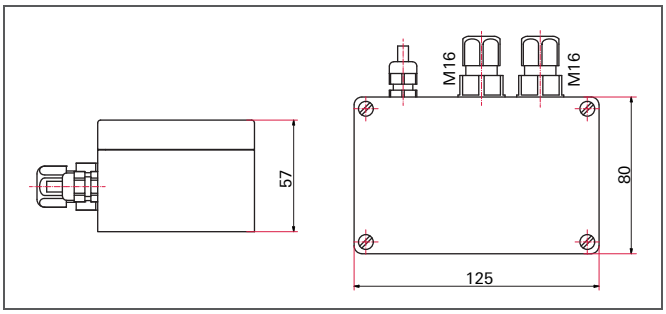
Backing pump control

HiPace turbopumps afford meaningful control of backing pumps. Pumping station control is effected via TC 110, TC 400, TC 1200 and TM 700 as well as TCP 350. Parameter setting with DCU. Process adaptation performed in interval mode.



- The fore-vacuum safety valve is installed in the fore-vacuum line of the pump combination, between turbopump and backing pump
- Additional security against gas backstreaming in the event of a power failure
- 230 V AC connection voltage

Dimensions (in mm)



Backing pump relay box, shielded

Technical data	TVV 001 fore-vacuum safety valve, 230 V AC	TVV 001 fore-vacuum safety valve, 115 V AC	Backing pump relay box, single phase 20 A, for TC 110 and TCP 350, M8 plug	Backing pump relay box, single phase 20 A, for TC 400 and TCP 350, M12 plug
Flange (out)	DN 16 ISO-KF	DN 16 ISO-KF		
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF		
Permanent current max.	0.6 A	0.6 A		
Pressure max. (absolute)	100 kPa	100 kPa		
Weight	0.4 kg	0.4 kg		
Contact rating			20 A	20 A
Leak rate	$1 \cdot 10^{-5}$ Pa m³/s	$1 \cdot 10^{-5}$ Pa m³/s		
Mains requirement: frequency (range)			50/60 Hz	50/60 Hz
Mains requirement: voltage	230 V AC, 50/60 Hz	115 V AC, 50/60 Hz		
Mains requirement: voltage (range)			100-240 (± 10 %) V AC	100-240 (± 10 %) V AC
Protection category	IP 65	IP 65		
Control voltage			24 V DC	24 V DC
Ambient temperature	0-55 °C	0-55 °C		
Time delay	0.5-35 s	0.5-35 s		

Order number				
Fore-vacuum safety valves	**PM Z01 205**	**PM Z01 206**	**PM 061 373 -T**	**PM 061 375 -T**

Technical data	Backing pump relay box, shielded, 1-phase 7A for TC 110 and TCP 350, M8 plug	Backing pump relay box, shielded, single phase 7 A for TC 400/1200 and TM 3000	Backing pump relay box, shielded, 1-phase 20 A for TC 400/1200, TM 700 and TCP 350, M12 plug
Contact rating	7 A	7.0 A	20 A
Control voltage	24 V DC	24 V DC	24 V DC

Order number			
Backing pump relay boxes	**PM 071 282 -X**	**PM 071 284 -X**	**PM 071 285 -X**

Technical data	Control cable for pumping stations 0.7 m	TCS 15 for controlling backing pumps	HiPace-ACP connection cable	Adapter cable, TCP 350 - backing pump relay box, M8
	D-Sub 26- pole for connecting TC 400/ 1200 and TM 700	For connecting to TC 110	D-Sub 15-pin plug / 15-pin connector with M12 plug as control lead	D-Sub - M8
	For controlling Penta Line, XtraDry and Adixen backing pumps (ACP series) via M12 plug	For controlling Penta Line, XtraDry and adixen backing pumps (ACP series) via M12 bushing	Controls rotation speed of ACP backing pumps	Length: 2 m, other lengths on request
	For controlling a fore-vacuum safety valve through strands	Control of a fore-vacuum safety valve on M8 socket	Connection to M12 connector via control cable PM 061 675 –T or to control adapter PM 061 685 –X	

Order number				
Control cables	**PM 061 675 -T**	**PM 061 685 -X**	**PM 071 142 -X**	**PM 061 376 -T**

Mounting materials

Mounting kits

Installation materials for the safest possible mounting of turbopumps.

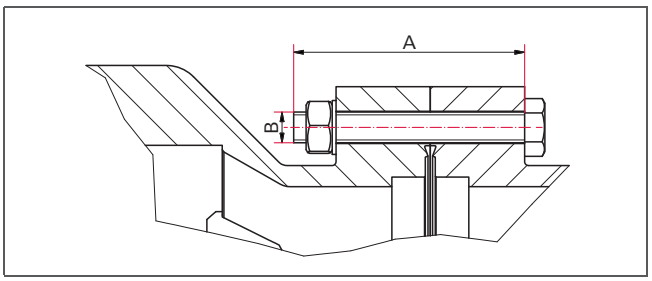
Mounting kits	Order number
Mounting kit for HiPace 10, DN 25 ISO-KF, including centering ring with 4 claws, screws and U-washers	PM 016 627 -T
Mounting kit for HiPace 80, DN 40 ISO-KF, including centering ring and clamping ring	PM 016 625 -T
Mounting kit for HiPace 80, DN 63 ISO-K, including coated centering ring, bracket screws	PM 016 360 -T
Mounting kit for HiPace 300, DN 100 ISO-K, including coated centering ring, bracket screws	PM 016 365 -T
Mounting kit for HiPace 400, DN 100 ISO-K, including coated centering ring	PM 016 380 -T
Mounting kit for HiPace 700, DN 160 ISO-K, including coated centering ring, bracket screws	PM 016 375 -T
Mounting kit for HiPace 1200, DN 200 ISO-K, including coated centering ring, bracket screws	PM 016 390 -T
Mounting kit for HiPace 1500, DN 250 ISO-K, including coated centering ring, bracket screws	PM 016 395 -T
Mounting kit for HiPace 1800, DN 200 ISO-K, including coated centering ring, bracket screws	PM 016 410 -T
Mounting kit for HiPace 2300, DN 250 ISO-K, including coated centering ring, bracket screws	PM 016 415 -T
Mounting kit for HiPace 2400 MC, DN 250 ISO-K, including coated centering ring, bracket screws	PM 016 420 -T
Mounting kit for HiPace 80, DN 63 ISO-K, including coated centering ring, protection screen, bracket screws	PM 016 362 -T
Mounting kit for HiPace 300, DN 100 ISO-K, including coated centering ring, protection screen, bracket screws	PM 016 367 -T
Mounting kit for HiPace 400, DN 100 ISO-K, including coated centering ring, protection screen, bracket screws	PM 016 382 -T
Mounting kit for HiPace 700, DN 160 ISO-K, including coated centering ring, protection screen, bracket screws	PM 016 377 -T
Mounting kit for HiPace 1200, DN 200 ISO-K, including coated centering ring, protection screen, bracket screws	PM 016 392 -T
Mounting kit for HiPace 1500, DN 250 ISO-K, including coated centering ring, protection screen, bracket screws	PM 016 397 -T
Mounting kit for HiPace 1800, DN 200 ISO-K, including coated centering ring, protection screen, bracket screws	PM 016 412 -T
Mounting kit for HiPace 2300, DN 250 ISO-K, including coated centering ring, protection screen, bracket screws	PM 016 417 -T
Mounting kit for HiPace 2400 MC, DN 250 ISO-K, including coated centering ring, protection screen, bracket screws	PM 016 422 -T
Mounting kit for HiPace 80, DN 40 ISO-KF, splinter shield, clamping ring	PM 016 626-T
Mounting kit for HiPace 80, DN 63 ISO-K, including coated centering ring, splinter shield, bracket screws	PM 016 361 -T
Mounting kit for HiPace 300, DN 100 ISO-K, including coated centering ring, splinter shield, bracket screws	PM 016 366 -T
Mounting kit for HiPace 400, DN 100 ISO-K, including coated centering ring, splinter shield, bracket screws	PM 016 381 -T
Mounting kit for HiPace 700, DN 160 ISO-K, including coated centering ring, splinter shield, bracket screws	PM 016 376 -T
Mounting kit for HiPace 1200, DN 200 ISO-K, including coated centering ring, splinter shield, bracket screws	PM 016 391 -T
Mounting kit for HiPace 1500, DN 250 ISO-K, including coated centering ring, splinter shield, bracket screws	PM 016 396 -T
Mounting kit for HiPace 1800, DN 200 ISO-K, including coated centering ring, splinter shield, bracket screws	PM 016 411 -T
Mounting kit for HiPace 2300, DN 250 ISO-K, including coated centering ring, splinter shield, bracket screws	PM 016 416-T
Mounting kit for HiPace 2400 MC, DN 250 ISO-K, including coated centering ring, splinter shield, bracket screws	PM 016 421 -T
Mounting kit for HiPace 80, DN 63 ISO-K to DN 63 ISO-F, including coated centering ring, claws	PM 016 510 -T
Mounting kit for HiPace 300 and HiPace 400, DN 100 ISO-F, including coated centering ring, hexagon screws	PM 016 450 -T
Mounting kit for HiPace 700, DN 160 ISO-F, including coated centering ring, hexagon screws	PM 016 460 -T
Mounting kit for HiPace 1200/1800, DN 200 ISO-F, including coated centering ring, hexagon screws	PM 016 470 -T
Mounting kit for HiPace 1500 and HiPace 2300, DN 250 ISO-F, including coated centering ring, hexagon screws	PM 016 480 -T
Mounting kit for HiPace 3400 MC, DN 320 ISO-F, including coated centering ring, hexagon screws	PM 016 490 -T

Mounting kits	Order number
Mounting kit for HiPace 80, DN 63 ISO-K to DN 63 ISO-F, including coating centering ring, protection screen, claws	**PM 016 512 -T**
Mounting kit for HiPace 300/400, DN 100 ISO-F, including coated centering ring, protective screen, hexagon screws	**PM 016 452 -T**
Mounting kit for HiPace 700, DN 160 ISO-F, including coated centering ring, protection screen, hexagon screws	**PM 016 462 -T**
Mounting kit for HiPace 1200/1800, DN 200 ISO-F, including coated centering ring, protective screen, hexagon screws	**PM 016 472 -T**
Mounting kit for HiPace 1500 and HiPace 2300, DN 250 ISO-F, including coated centering ring, protective screen, hexagon screws	**PM 016 482 -T**
Mounting kit for HiPace 3400 MC, DN 320 ISO-F, including coated centering ring, protection screen, hexagon screws	**PM 016 492 -T**
Mounting kit for HiPace 80, DN 63 ISO-K to DN 63 ISO-F, including coated centering ring, splinter and claws	**PM 016 511 -T**
Mounting kit for HiPace 300/400, DN 100 ISO-F, including coated centering ring, splinter shield, hexagon screws	**PM 016 451 -T**
Mounting kit for HiPace 700, DN 160 ISO-F, including coated centering ring, splinter shield, hexagon screws	**PM 016 461 -T**
Mounting kit for HiPace 1200/1800, DN 200 ISO-F, including coated centering ring, splinter shield, hexagon screws	**PM 016 471 -T**
Mounting kit for HiPace 1500 and HiPace 2300, DN 250 ISO-F, including coated centering ring, splinter shield, hexagon screws	**PM 016 481 -T**
Mounting kit for HiPace 3400 MC, DN 320 ISO-F, including coated centering ring, splinter shield, hexagon screws	**PM 016 491 -T**
Mounting kit for HiPace 300 and HiPace 400, DN 100 ISO-F, including coated centering ring, stud screws	**PM 016 455 -T**
Mounting kit for HiPace 700, DN 160 ISO-F, including coated centering ring, stud screws	**PM 016 465 -T**
Mounting kit for HiPace 1200 and HiPace 1800, DN 200 ISO-F, including coated centering ring, stud screws	**PM 016 475 -T**
Mounting kit for HiPace 1500 and HiPace 2300, DN 250 ISO-F, including coated centering ring, stud screws	**PM 016 485 -T**
Mounting kit for HiPace 3400 MC, DN 320 ISO-F, including coated centering ring, stud screws	**PM 016 495 -T**
Mounting kit for HiPace 300 and HiPace 400, DN 100 ISO-F, including coated centering ring, protection screen, stud screws	**PM 016 457 -T**
Mounting kit for HiPace 700, DN 160 ISO-F, including coated centering ring, protection screen, stud screws	**PM 016 467 -T**
Mounting kit for HiPace 1200/1800, DN 200 ISO-F, including coated centering ring, protective screen, stud screws	**PM 016 477 -T**
Mounting kit for HiPace 1500 and HiPace 2300, DN 250 ISO-F, including coated centering ring, protective screen, stud screws	**PM 016 487 -T**
Mounting kit for HiPace 3400 MC, DN 320 ISO-F, including coated centering ring, protection screen, stud screws	**PM 016 497 -T**
Mounting kit for HiPace 300/400, DN 100 ISO-F, including coated centering ring, splinter shield, stud screws	**PM 016 456 -T**
Mounting kit for HiPace 700, DN 160 ISO-F, including coated centering ring, splinter shield, stud screws	**PM 016 466 -T**
Mounting kit for HiPace 1200/1800, DN 200 ISO-F, including coated centering ring, splinter shield, stud screws	**PM 016 476 -T**
Mounting kit for HiPace 1500 and 2300, DN 250 ISO-F, including coated centering ring, splinter shield, stud screws	**PM 016 486 -T**
Mounting kit for HiPace 3400 MC, DN 320 ISO-F, including coated centering ring, splinter shield, stud screws	**PM 016 496 -T**

Mounting materials

Set of hexagon screws for trough hole

Dimensions (in mm)

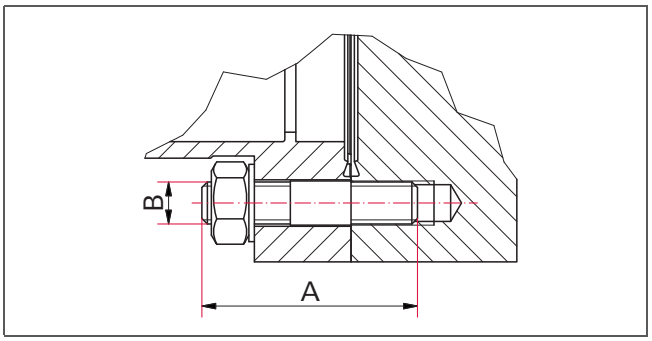


Flange (in)	A	B	C	Order number
DN 63 CF-F	45	M8	8	**PM 016 683 -T**
DN 100 CF-F	50	M8	16	**PM 016 690 -T**
DN 160 CF-F	55	M8	20	**PM 016 691 -T**
DN 200 CF-F	60	M8	25	**PM 016 687 -T**
DN 250 CF-F	60	M8	32	**PM 016 694 -T**

C = quantity delivered

Set of stud screws for tapped hole, 8 count M8

Dimensions (in mm)

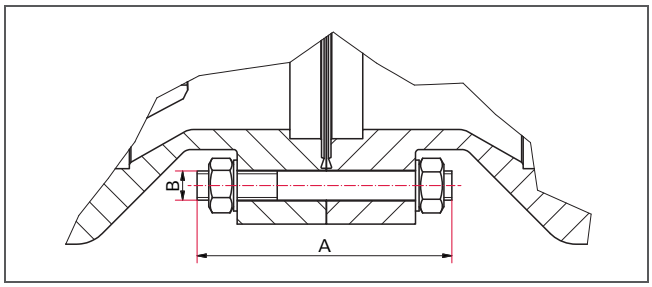


Flange (in)	A	B	C	Order number
DN 63 CF-F	39	M8	8	**PM 016 684 -T**
DN 100 CF-F	39	M8	16	**PM 016 692 -T**
DN 160 CF-F	44	M8	20	**PM 016 693 -T**
DN 200 CF-F	47	M8	24	**PM 016 688 -T**
DN 250 CF-F	47	M8	32	**PM 016 695 -T**

C = quantity delivered

Set of stud screws for trough hole

Dimensions (in mm)



Flange (in)	Order number
DN 63 CF-F	**PM 016 733 -T**
DN 100 CF-F	**PM 016 734 -T**
DN 160 CF-F	**PM 016 735 -T**
DN 200 CF-F	**PM 016 736 -T**
DN 250 CF-F	**PM 016 737 -T**

General accessories

These accessories broaden the range of potential applications and offer maximum reliability.

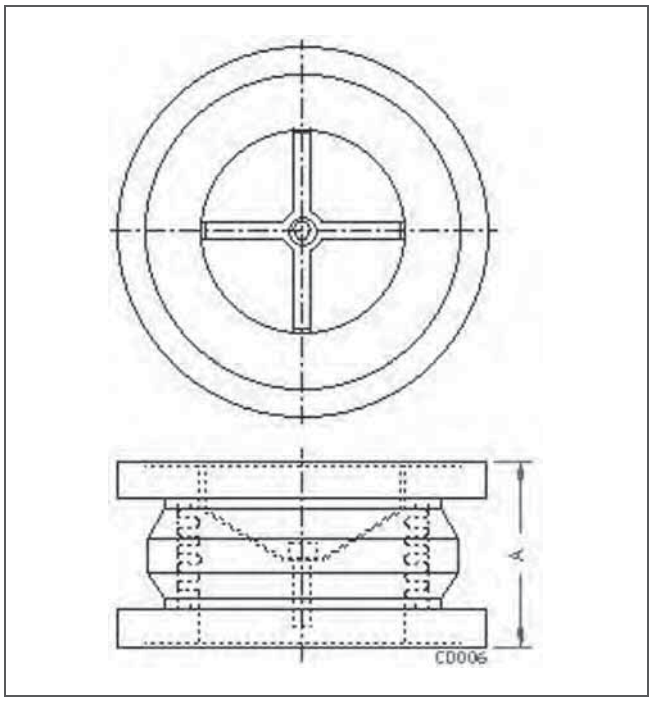
General accessories	Order number
Y-Connector M12 to RS-485	**P 4723 010**
Y-connector, shielded, M12 for accessories	**P 4723 013**
Sealing gas valve for HiPace 80	**PM Z01 310**
Sealing gas valve, shielded for HiPace 300 with TC 110	**PM Z01 311**
Sealing gas valve, shielded for HiPace 300/400/700 and 800 with TC 400 and TM 700	**PM Z01 312**
Sealing gas valve, shielded, HiPace 400/700/800 P and C with TC 400 and HiPace 1200 - 2300 with TC 1200	**PM Z01 313**
Sealing gas throttle for HiPace 60/80	**PM Z01 316**
Sealing gas throttle for HiPace 300/400/700 and 800	**PM Z01 317**
Sealing gas throttle for HiPace 400/700/800 P and C version and HiPace 1200 - 2300	**PM Z01 318**
Connection adapter DN 25 ISO-KF	**PM 093 315 -T**
USB converter to RS-485 interface	**PM 061 207 -T**
Interface cable, M12 m straight / M12 m straight, 3.0 m	**PM 061 283 -T**
TCS 11, adapter for TC 110 with interface RS-485	**PM 061 636 -U**
TCS 12, adapter for TC 110 with interface RS-485, 4 accessory ports and coupling set	**PM 061 638 -U**
Vibration isolator for DN 100 ISO-F / DN 100 ISO-K	**PM 016 600 -U**
Connection cable, plug M12, RJ 45, 3 m	**PM 051 726 -T**

Vibration dampers

For employment of turbopumps on systems and plants that are extremely sensitive to vibration. Reliable damping in vertical attitude. Integral securing means eliminate the need for support.



Dimensions (in mm)



Vibration dampers	A	Order number
Vibration damper for HiPace 60/80, DN 63 ISO-K	87 mm	**PM 006 800 -X**
Vibration damper for HiPace 60/80, DN 63 CF-F	98 mm	**PM 006 801 -X**
Vibration damper for HiPace 80, DN 40 ISO-KF	85 mm	**PM 006 799 -X**
Vibration damper for HiPace 300/400, DN 100 ISO-K		**PM 006 459 -X**
Vibration damper for HiPace 300/400, DN 100 CF-F	99 mm	**PM 006 488 -X**
Vibration damper for HiPace 700, DN 160 ISO-K	84 mm	**PM 006 492 -X**
Vibration damper for HiPace 700, DN 160 CF-F	104 mm	**PM 006 493 -X**
Vibration damper for HiPace 800/1200/1800, DN 200 ISO-K	83 mm	**PM 006 668 -X**
Vibration damper for HiPace 800/1200, DN 200 CF-F	108 mm	**PM 006 669 -X**
Vibration damper for HiPace 1500/2300, DN 250 ISO-K	84 mm	**PM 006 670 -X**
Vibration damper for HiPace 1500/2300, DN 250 CF-F	112 mm	**PM 006 671 -X**

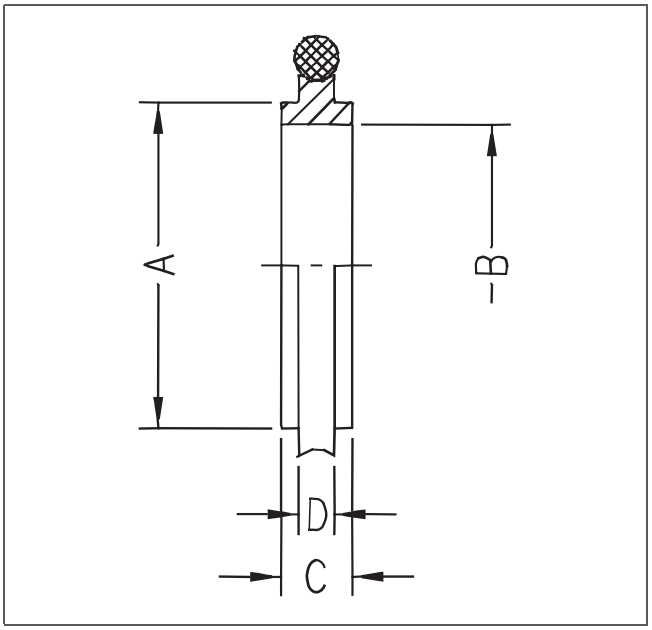
Centering rings, protection screens, splinter shields

These elements offer maximum protection against foreign objects with the lowest conductivity losses. Optimally matched to the respective pump size, engineered in accordance with the latest containment analysis findings.

- DN 25 ISO-KF



Dimensions (in mm)

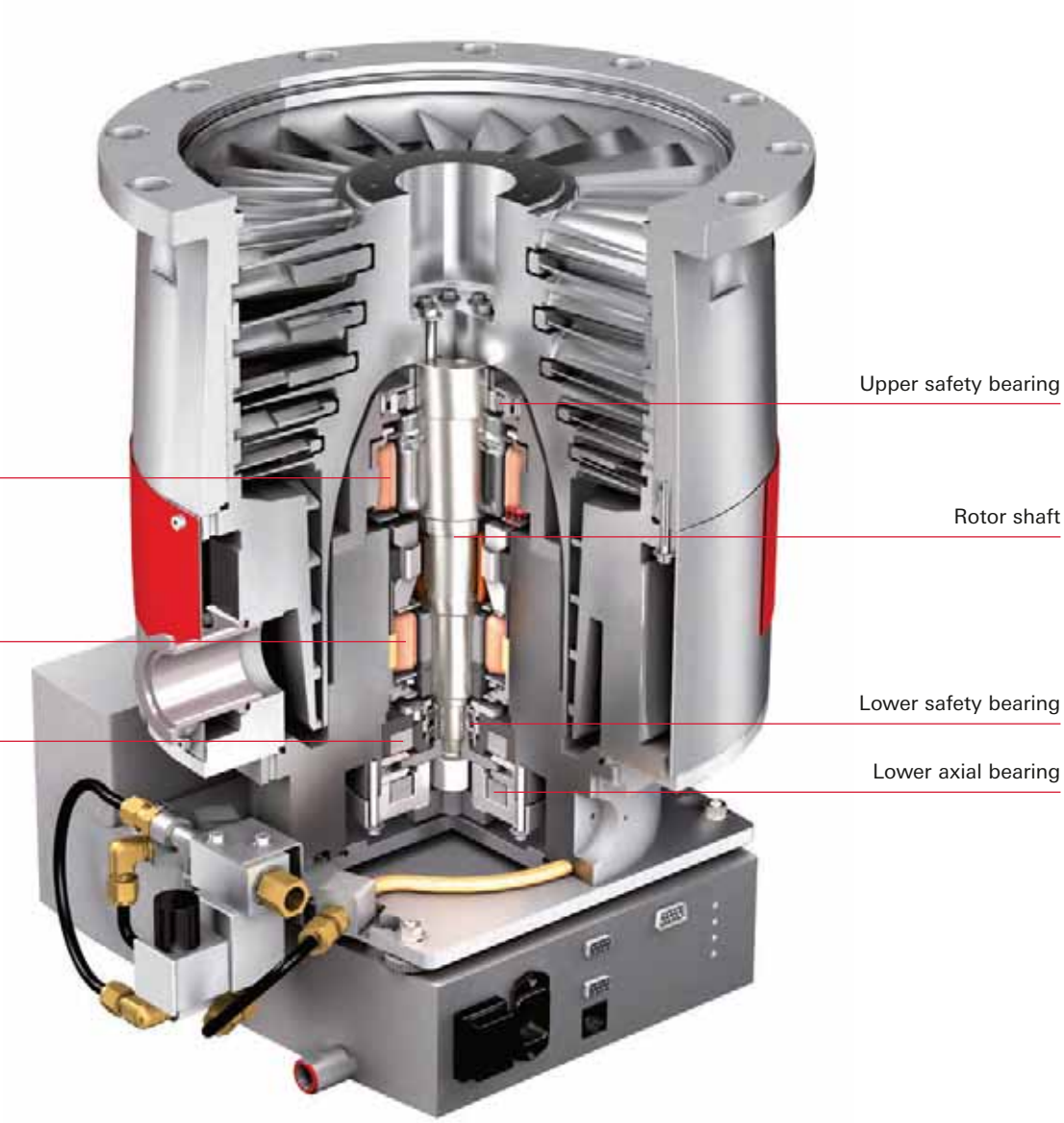


Centering ring	Materials	Flange (in)	A	B	C	D	Order number
Centering ring, FPM/Aluminum, DN 25 ISO-KF	FPM/Aluminum	DN 25 ISO-KF	26	25	8	3.9	**PF 110 125 -T**
Centering ring with integrated mesh screen, DN 25 ISO-KF	FPM/stainless steel	DN 25 ISO-KF	26	19.5	8	3.9	**PF 113 225 -T**
Centering ring with integrated mesh screen, DN 40 ISO-KF	FPM/stainless steel	DN 40 ISO-KF	41	32	8	3.9	**PF 113 240 -T**

Centering ring	Order number
Centering ring with multifunction coating, DN 63 ISO-K/-F	PM 016 206 -U
Centering ring with multifunction coating, DN 100 ISO-K/-F	PM 016 210 -U
Centering ring with multifunction coating, DN 160 ISO-K/-F	PM 016 216 -U
Centering ring with multifunction coating, DN 200 ISO-K/-F	PM 016 220 -U
Centering ring with multifunction coating, DN 250 ISO-K/-F	PM 016 225 -U
Centering ring with multifunction coating, DN 320 ISO-K/-F	PM 016 232 -U
Centering ring with multifunction coating and integrated protection screen, DN 63 ISO-K/-F	PM 016 208 -U
Centering ring with multifunction coating and integrated protection screen, DN 100 ISO-K/-F	PM 016 212 -U
Centering ring with multifunction coating and integrated protection screen, DN 160 ISO-K/-F	PM 016 218 -U
Centering ring with multifunction coating and integrated protection screen, DN 200 ISO-K/-F	PM 016 222 -U
Centering ring with multifunction coating and integrated protection screen, DN 250 ISO-K/-F	PM 016 227 -U
Centering ring with integrated splinter shield, DN 40 ISO-KF	PM 006 375 -X
Centering ring with multifunction coating and integrated splinter shield, DN 63 ISO-K/-F	PM 016 207 -U
Centering ring with multifunction coating and integrated splinter shield, DN 100 ISO-K/-F	PM 016 211 -U
Centering ring with multifunction coating and integrated splinter shield, DN 160 ISO-K/-F	PM 016 217 -U
Centering ring with multifunction coating and integrated splinter shield, DN 200 ISO-K/-F	PM 016 221 -U
Centering ring with multifunction coating and integrated splinter shield, DN 250 ISO-K/-F	PM 016 226 -U
Protection screen for turbopumps, DN 63 CF-F	PM 016 333
Protection screen for turbopumps, DN 100 CF-F	PM 016 336
Protection screen for turbopumps, DN 160 CF-F	PM 016 339
Protection screen for turbopumps, DN 200 CF-F	PM 016 342
Protection screen for turbopumps, DN 250 CF-F	PM 016 345
Splinter shield for turbopumps, DN 63 CF-F	PM 016 312
Splinter shield for turbopumps, DN 100 CF-F	PM 016 315
Splinter shield for turbopumps, DN 160 CF-F	PM 016 318
Splinter shield for turbopumps, DN 200 CF-F	PM 016 321
Splinter shield for turbopumps, DN 250 CF-F	PM 016 324

Magnetic bearing

Electromagnetic bearings are also called ‘active magnetically levitated‘, because the rotor position is continuously monitored and adjusted accordingly. This enables wear-free, low vibration operation with an automatic out-of-balance compensation. Continuous rotor stability is assured. These bearings are maintenance-free and require no lubrication.


Upper safety bearing
Upper radial bearing
Rotor shaft
Lower radial bearing
Lower safety bearing
Upper axial bearing
Lower axial bearing

HiPace® 300 – 800 M, ATH 500 M

Compact magnetically levitated turbopumps in the pumping speed class from 300 to 800 l/s

Technically perfect
The HiPace M and ATH 500 M/MT have an active 5-axis magnetic bearing. Using this bearing technology, the rotor position is controlled in real-time. During operation, automatic out-of-balance compensation occurs. It allows minimal vibrations for the best possible process tolerance. The low energy consumption and ultra-low service costs guarantee cost-efficient operation.

Compatible
Do the different interface standards make your life difficult? We offer integrated drive electronics for all magnetically levitated turbopumps with standardized interfaces and connectors. The choice is yours..


HiPace® 300 M


ATH 500 M


HiPace® 700 M


HiPace® 800 M

Leading
The highest pumping speeds, compression and gas throughput or minimal vibration are classic vacuum parameters which our customers expect. All 5-axis magnetically levitated pumps in the series deliver excellent performance data in their specialized fields. This makes them the perfect answer for all noncorrosive applications in analytics, research & development as well as in reactive processes in the coating and semiconductor sectors.

ATH 500 MT is the smallest temperature controlled magnetically levitated bearing turbopump in the market. These pumps can be used in applications with agressive chemicals in order to minimize the condensation or corrosions in the pump.

Safe
Our maintenance-free, magnetically levitated turbopumps only use high-quality safety bearings which ensure safety during operation. Even the harshest environments are no problem for our HiPace thanks to its IP 54 protection class. Product tests according to ISO 27892 also show that all pumps meet the most stringent safety requirements.

Customer benefits
- Very easy installation
- Any mounting orientation
- Integrated electronic drive unit
- Clean vacuum due to lubricant-free magnetic bearings
- High gas throughput for all process gases
- Low vibrations and low magnetic stray field
- Automatic out-of-balance compensation
- Broad rotation speed range
- Outstanding long-term stability and reliability
- Corrosive applications for heated pump (ATH 500 MT)

Typical applications
- High-end electron microscopy
- Residual gas analysis
- Optical coating
- Plasma research
- Biotechnology
- Medical technology
- Semiconductor applications
- Thin film technology
- Hard disc production



Optical coating



Medical technology



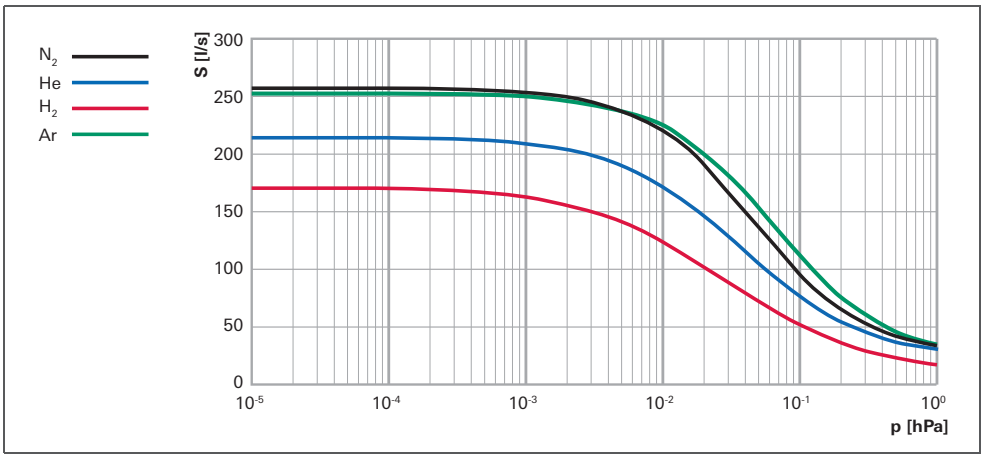
Electron microscopy

HiPace® 300 M



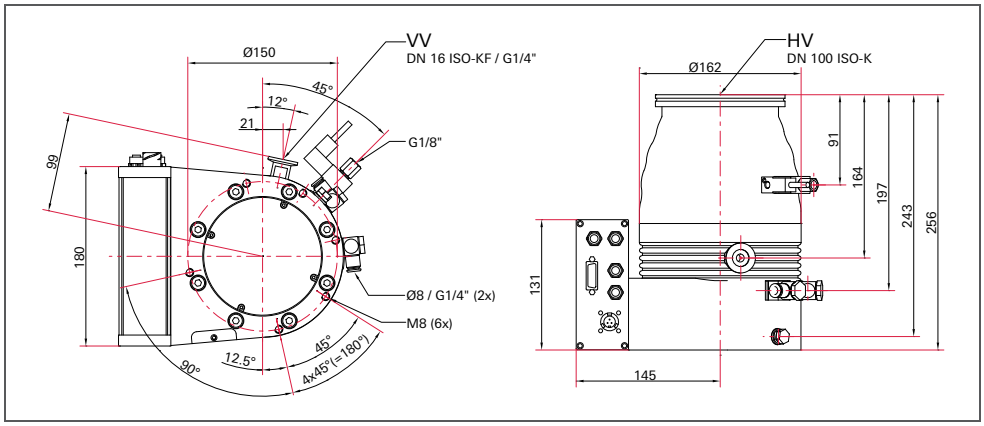
- 5-axis magnetically levitated turbopump with a pumping speed of 255 l/s for N_2
- Integrated digital magnetic bearing controller TM 700
- Installation in any orientation; flexible through connectivity of up to 4 accessory parts
- With integrated water cooling for maximum gas throughput
- Interfaces: RS-485, Remote (Profibus/DeviceNet on request)
- The turbopump features extremely low vibration and is oil-free
- With patented In-field sensor calibration
- Including venting valve and patented "pulsed venting"
- Protection Class: IP 54
- Extensive accessories expand the range of applications

Pumping speed

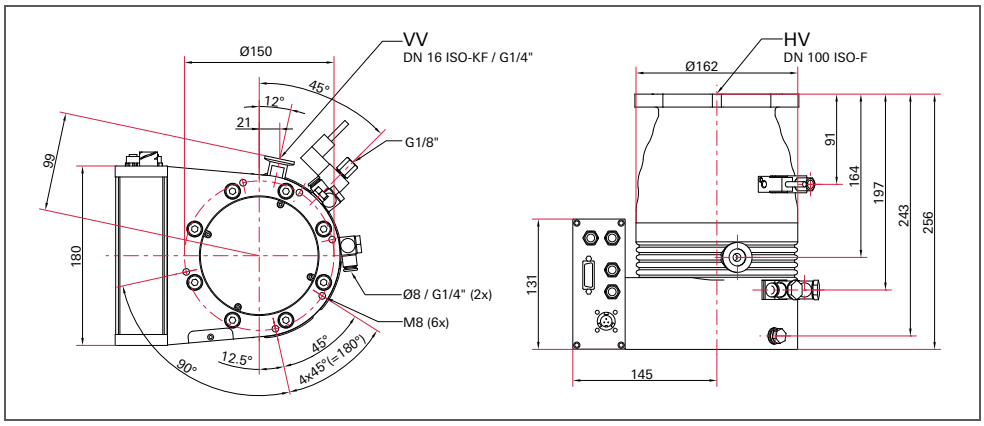


HiPace® 300 M

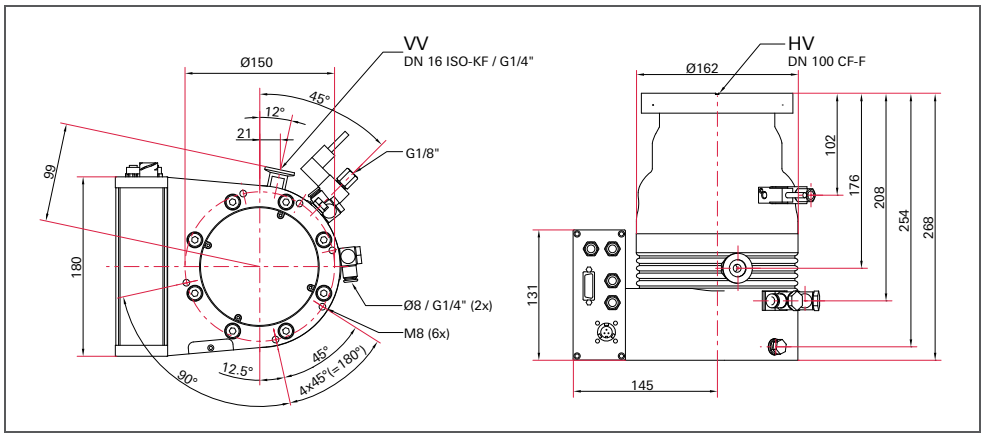
Dimensions (in mm)



HiPace® 300 M with TM 700, DN 100 ISO-K



HiPace® 300 M with TM 700, DN 100 ISO-F



HiPace® 300 M with TM 700, DN 100 CF-F

Technical data	HiPace® 300 M with TM 700, DN 100 ISO-K	HiPace® 300 M with TM 700, DN 100 CF-F	HiPace® 300 M with TM 700, DN 100 ISO-F
Connection nominal diameter			
Flange (out)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Flange (in)	DN 100 ISO-K	DN 100 CF-F	DN 100 ISO-F
Venting connection	G 1/8"	G 1/8"	G 1/8"
Pumping speed			
Pumping speed for Ar	250 l/s	250 l/s	250 l/s
Pumping speed for H_2	170 l/s	170 l/s	170 l/s
Pumping speed for He	215 l/s	215 l/s	215 l/s
Pumping speed for N_2	255 l/s	255 l/s	255 l/s
Compression			
Compression ratio for Ar	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$
Compression ratio for H_2	$5 \cdot 10^5$	$5 \cdot 10^5$	$5 \cdot 10^5$
Compression ratio for He	> $1 \cdot 10^8$	> $1 \cdot 10^8$	> $1 \cdot 10^8$
Compression ratio for N_2	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$	> $1 \cdot 10^{11}$
Fore-vacuum max. for N_2	20 hPa	20 hPa	20 hPa
Gas througput			
Gas throughput at 0.1 hPa HV for Ar	11 hPa l/s	11 hPa l/s	11 hPa l/s
Gas throughput at 0.1 hPa HV for H_2	5 hPa l/s	5 hPa l/s	5 hPa l/s
Gas throughput at 0.1 hPa HV for He	8 hPa l/s	8 hPa l/s	8 hPa l/s
Gas throughput at 0.1 hPa HV for N_2	10 hPa l/s	10 hPa l/s	10 hPa l/s
Gas throughput at full rotational speed for Ar	13 hPa l/s	13 hPa l/s	13 hPa l/s
Gas throughput at full rotational speed for N_2	28 hPa l/s	28 hPa l/s	28 hPa l/s
Electronic drive unit	with TM 700	with TM 700	with TM 700
Operating voltage	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC
Rotation speed ± 2 %	60000 min^{-1}	60000 min^{-1}	60000 min^{-1}
Rotation speed variable	20-100 %	20-100 %	20-100 %
Mounting orientation	in any orientation	in any orientation	in any orientation
Ultimate pressure*	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa
Weight	13.1 kg	17.2 kg	13.4 kg
Run-up time	< 2 min	< 2 min	< 2 min
Cooling method, optional	Air, convection	Air, convection	Air, convection
Cooling method, standard	Water	Water	Water
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C
Cooling water consumption	80 l/h	80 l/h	80 l/h
Bearing	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated
Sound pressure level	≤ 45 dB (A)	≤ 45 dB (A)	≤ 45 dB (A)
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote
Protection category	IP 54	IP 54	IP 54
Low vibrations	YES	YES	YES
Permissible magnetic field max.	5 mT	5 mT	5 mT
Order number pump Pumpe	**PM P03 950**	**PM P03 952**	**PM P03 951**

*Ultimate pressure please find description on page 272

Accessories	HiPace® 300 M with TM 700, DN 100 ISO-K	HiPace® 300 M with TM 700, DN 100 CF-F	HiPace® 300 M with TM 700, DN 100 ISO-F
Order number pump Pumpe	**PM P03 950**	**PM P03 952**	**PM P03 951**
Power supplies/power			
DCU - power supply with display control unit	**PM C01 823**	**PM C01 823**	**PM C01 823**
TPS - mains pack for wall/standard rail fitting	**PM 061 343 -T**	**PM 061 343 -T**	**PM 061 343 -T**
TPS - mains packl 19" rack module 3 RU	**PM 061 347 -T**	**PM 061 347 -T**	**PM 061 347 -T**
Control units			
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**
Mains cable DCU/TPS/TCP, 3 m			
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**
115 V AC mains cable with UL plug	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**
208 V AC mains cable with UL plug	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**
Connection cable, length 3 m between			
Connection cable for HiPace with TC 400/TM 700 to power supply TPS/DCU 310/311/400/401	**PM 061 352 -T**	**PM 061 352 -T**	**PM 061 352 -T**
Venting accessories			
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**
Cooling accessories			
Air cooling	**PM Z01 363**	**PM Z01 363**	**PM Z01 363**
Heating accessories			
Heating jacket 208 V AC, UL plug		**PM 071 267 -T**	
Heating jacket 115 V AC, UL plug		**PM 071 268 -T**	
Heating jacket 230 V AC, Euro-style safety plug		**PM 071 266 -T**	
Backing pump control			
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**
Backing pump relay box, shielded, 1-phase 20 A	**PM 071 285 -X**	**PM 071 285 -X**	**PM 071 285 -X**
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**
General accessories			
Sealing gas valve	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**
Sealing gas throttle	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**
Centering ring coated	**PM 016 210 -U**		**PM 016 210 -U**
Centering ring coated with protection screen	**PM 016 212 -U**		**PM 016 212 -U**
Centering ring coated with splinter shield	**PM 016 211 -U**		**PM 016 211 -U**
Protection screen		**PM 016 336**	
Splinter shield		**PM 016 315**	
Vibration dampers	**PM 006 459 -X**	**PM 006 488 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**
Mounting materials			
Centering ring coated with splinter shield, hexagon bolts			**PM 016 450 -T**
Centering ring coated with protection screen, hexagon bolts			**PM 016 452 -T**
Centering ring coated with splinter shield, hexagon bolts			**PM 016 451 -T**
Centering ring coated with stud screws			**PM 016 455 -T**
Centering ring coated with protection screen with stud screws			**PM 016 457 -T**
Centering ring coated with splinter shield with stud screws			**PM 016 456 -T**
Set of hexagon screws for trough hole (CF-F)		**PM 016 690 -T**	
Set of stud screws for tapped hole (CF-F)		**PM 016 692 -T**	
Set of stud screws for trough hole (CF)		**PM 016 734 -T**	
Coated centering ring, bracket screws	**PM 016 775 -T**		
Centering ring coated with protection screen, bracket screws	**PM 016 776 -T**		
Centering ring coated with splinter shield, bracket screws	**PM 016 777 -T**		

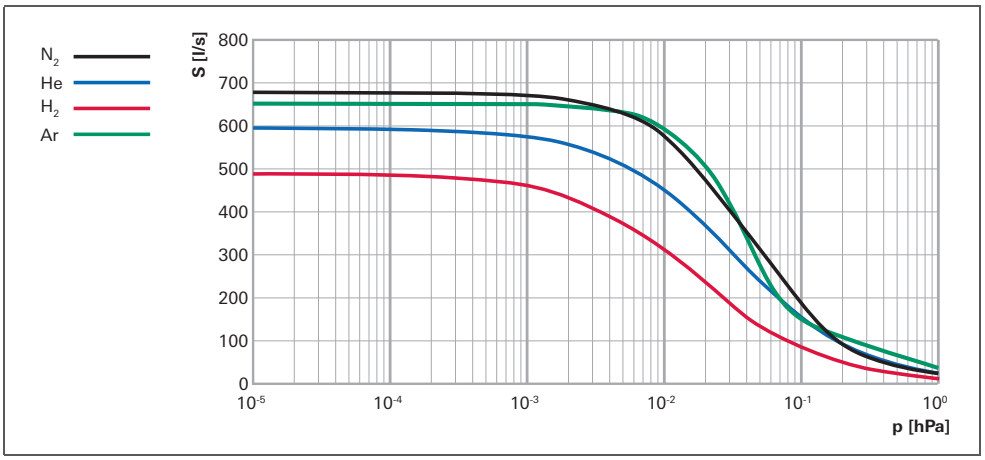
Content

HiPace® 700 M



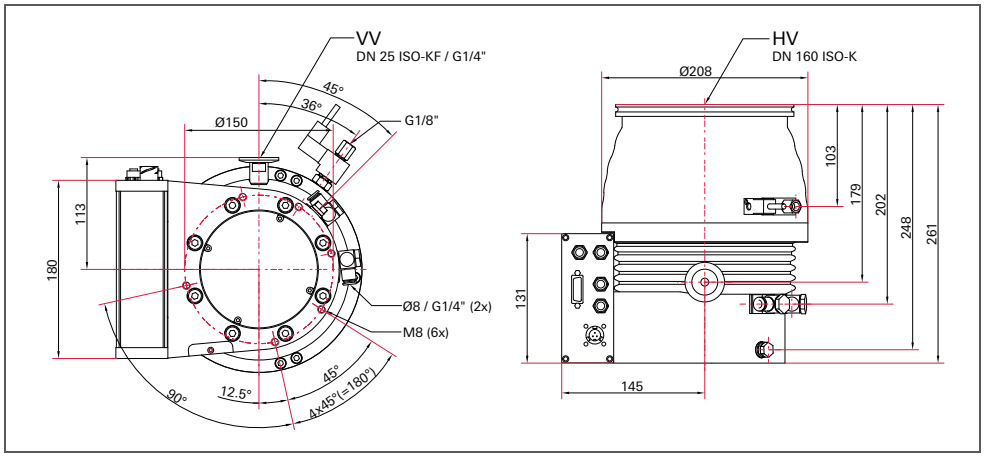
- 5-axis magnetically levitated turbopump with a pumping speed of 685 l/s for N_2
- Integrated digital magnetic bearing controller TM 700
- Installation in any orientation; flexible through connectivity of up to 4 accessory parts
- With integrated water cooling for maximum gas throughput
- Interfaces: RS-485, Remote (Profibus/DeviceNet on request)
- The turbopump features extremely low vibration and is oil-free
- With patented In-field sensor calibration
- Including venting valve and patented "pulsed venting"
- Protection Class: IP 54
- Extensive accessories expand the range of applications

Pumping speed

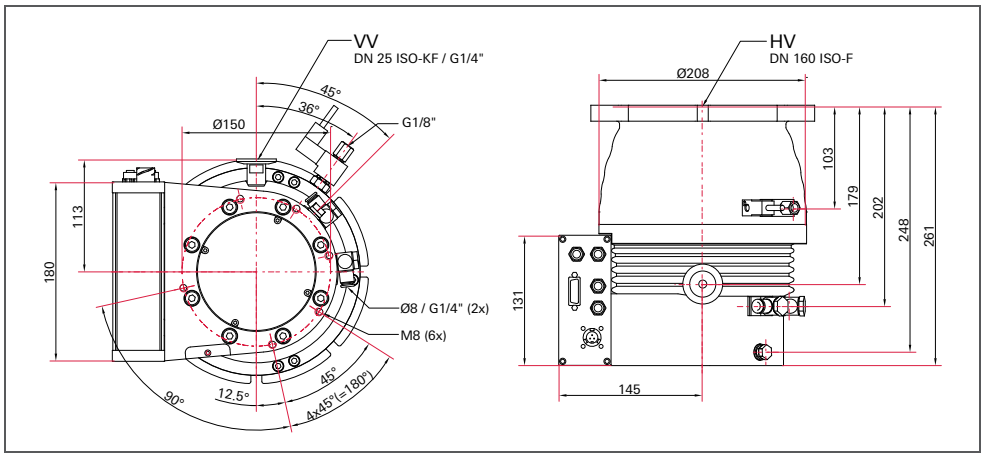


HiPace® 700 M

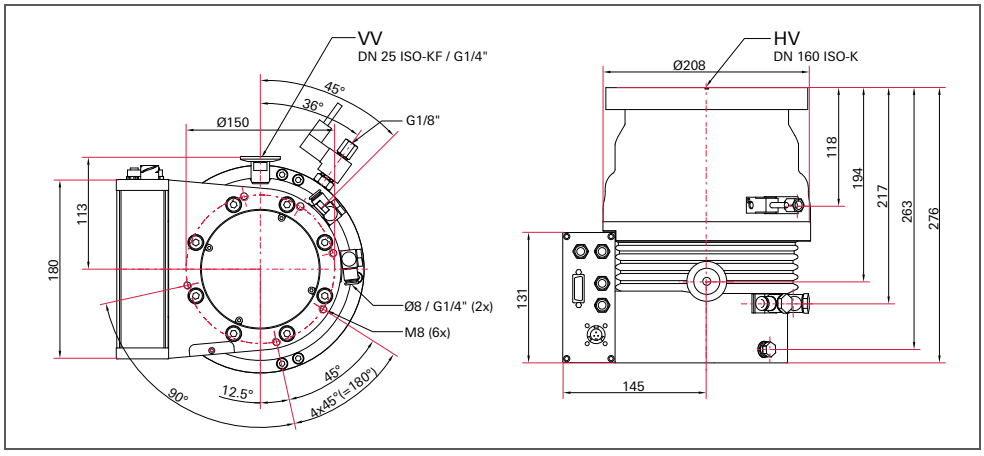
Dimensions (in mm)



HiPace® 700 M with TM 700, DN 160 ISO-K



HiPace® 700 M with TM 700, DN 160 ISO-F



HiPace® 700 M with TM 700, DN 160 CF-F

Technical data	HiPace® 700 M with TM 700, DN 160 ISO-K	HiPace® 700 M with TM 700, DN 160 CF-F	HiPace® 700 M with TM 700, DN 160 ISO-F
Connection nominal diameter			
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 160 ISO-K	DN 160 CF-F	DN 160 ISO-F
Venting connection	G 1/8"	G 1/8"	G 1/8"
Pumping speed			
Pumping speed for Ar	660 l/s	660 l/s	660 l/s
Pumping speed for H_2	480 l/s	480 l/s	480 l/s
Pumping speed for He	600 l/s	600 l/s	600 l/s
Pumping speed for N_2	685 l/s	685 l/s	685 l/s
Compression			
Compression ratio for Ar	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$
Compression ratio for H_2	$2 \cdot 10^{5}$	$2 \cdot 10^{5}$	$2 \cdot 10^{5}$
Compression ratio for He	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{7}$
Compression ratio for N_2	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$
Fore-vacuum max. for N_2	8 hPa	8 hPa	8 hPa
Gas througput			
Gas throughput at 0.1 hPa HV for Ar	16 hPa l/s	16 hPa l/s	16 hPa l/s
Gas throughput at 0.1 hPa HV for H_2	9 hPa l/s	9 hPa l/s	9 hPa l/s
Gas throughput at 0.1 hPa HV for He	16 hPa l/s	16 hPa l/s	16 hPa l/s
Gas throughput at 0.1 hPa HV for N_2	16 hPa l/s	16 hPa l/s	16 hPa l/s
Gas throughput at full rotational speed for Ar	8 hPa l/s	8 hPa l/s	8 hPa l/s
Gas throughput at full rotational speed for N_2	13 hPa l/s	13 hPa l/s	13 hPa l/s
Electronic drive unit	with TM 700	with TM 700	with TM 700
Operating voltage	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC
Rotation speed ± 2 %	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}
Rotation speed variable	20-100 %	20-100 %	20-100 %
Mounting orientation	in any orientation	in any orientation	in any orientation
Ultimate pressure*	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa
Weight	15.7 kg	20.8 kg	16.4 kg
Run-up time	4 min	4 min	4 min
Cooling method, optional	Air, Convection	Air, Convection	Air, Convection
Cooling method, standard	Water	Water	Water
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C
Cooling water consumption	80 l/h	80 l/h	80 l/h
Bearing	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated
Sound pressure level	≤ 45 dB (A)	≤ 45 dB (A)	≤ 45 dB (A)
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote
Protection category	IP 54	IP 54	IP 54
Low vibrations	YES	YES	YES
Permissible magnetic field max.	5 mT	5 mT	5 mT
Order number pump Pumpe	**PM P04 450**	**PM P04 452**	**PM P04 451**

*Ultimate pressure please find description on page 272

Content

Accessories	HiPace® 700 M with TM 700, DN 160 ISO-K	HiPace® 700 M with TM 700, DN 160 CF-F	HiPace® 700 M with TM 700, DN 160 ISO-F
Order number pump Pumpe	**PM P04 450**	**PM P04 452**	**PM P04 451**
Power supplies/power			
DCU - power supply with display control unit	**PM C01 823**	**PM C01 823**	**PM C01 823**
TPS - mains pack for wall/standard rail fitting	**PM 061 343 -T**	**PM 061 343 -T**	**PM 061 343 -T**
TPS - mains packl 19" rack module 3 RU	**PM 061 347 -T**	**PM 061 347 -T**	**PM 061 347 -T**
Control units			
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**
Mains cable DCU/TPS/TCP, 3 m			
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**
115 V AC mains cable with UL plug	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**
208 V AC mains cable with UL plug	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**
Connection cable, length 3 m between			
Connection cable for HiPace with TC 400/TM 700 to power supply TPS/DCU 310/311/400/401	**PM 061 352 -T**	**PM 061 352 -T**	**PM 061 352 -T**
Venting accessories			
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**
Cooling accessories			
Air cooling	**PM Z01 363**	**PM Z01 363**	**PM Z01 363**
Heating accessories			
Heating jacket 208 V AC, UL plug		**PM 071 270 -T**	
Heating jacket 115 V AC, UL plug		**PM 071 271 -T**	
Heating jacket 230 V AC, Euro-style safety plug		**PM 071 269 -T**	
Backing pump control			
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**
Backing pump relay box, shielded, 1-phase 20 A	**PM 071 285 -X**	**PM 071 285 -X**	**PM 071 285 -X**
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**
General accessories			
Sealing gas valve	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**
Sealing gas throttle	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**
Centering ring coated	**PM 016 216 -U**		**PM 016 216 -U**
Centering ring coated with protection screen	**PM 016 218 -U**		**PM 016 218 -U**
Centering ring coated with splinter shield	**PM 016 217 -U**		**PM 016 217 -U**
Protection screen		**PM 016 339**	
Splinter shield		**PM 016 318**	
Vibration dampers	**PM 006 492 -X**	**PM 006 493 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**
Mounting materials			
Centering ring coated with splinter shield, hexagon bolts			**PM 016 460 -T**
Centering ring coated with protection screen, hexagon bolts			**PM 016 462 -T**
Centering ring coated with splinter shield, hexagon bolts			**PM 016 461 -T**
Centering ring coated with stud screws			**PM 016 465 -T**
Centering ring coated with protection screen with stud screws			**PM 016 467 -T**
Centering ring coated with splinter shield with stud screws			**PM 016 466 -T**
Set of hexagon screws for trough hole (CF-F)		**PM 016 691 -T**	
Set of stud screws for tapped hole (CF-F)		**PM 016 693 -T**	
Set of stud screws for trough hole (CF)		**PM 016 735 -T**	
Coated centering ring, bracket screws	**PM 016 385 -T**		
Centering ring coated with protection screen, bracket screws	**PM 016 387 -T**		
Centering ring coated with splinter shield, bracket screws	**PM 016 386 -T**		

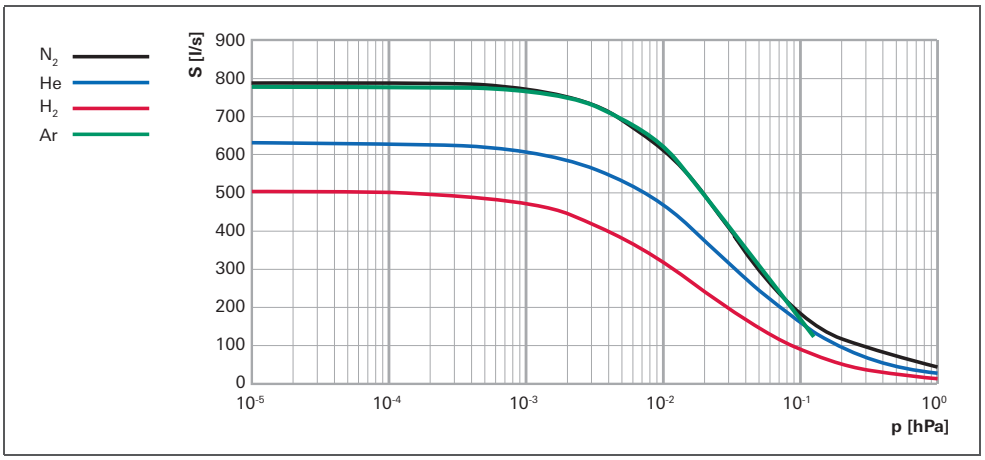
Content

HiPace® 800 M



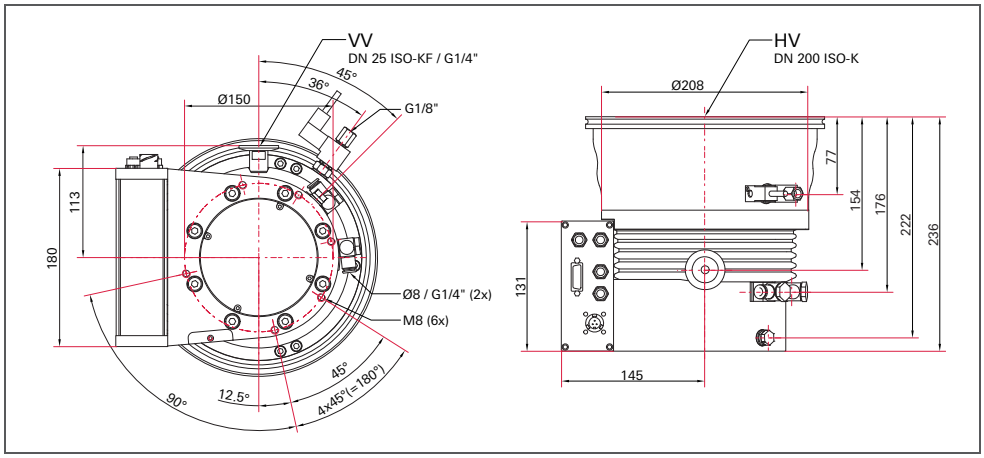
- 5-axis magnetically levitated turbopump with a pumping speed of 790 l/s for N_2
- Integrated digital magnetic bearing controller TM 700
- Installation in any orientation; flexible through connectivity of up to 4 accessory parts
- With integrated water cooling for maximum gas throughput
- Interfaces: RS-485, Remote (Profibus/DeviceNet on request)
- The turbopump features extremely low vibration and is oil-free
- With patented in-field sensor calibration
- Including venting valve and patented "pulsed venting"
- Protection Class: IP 54
- Extensive accessories expand the range of applications

Pumping speed

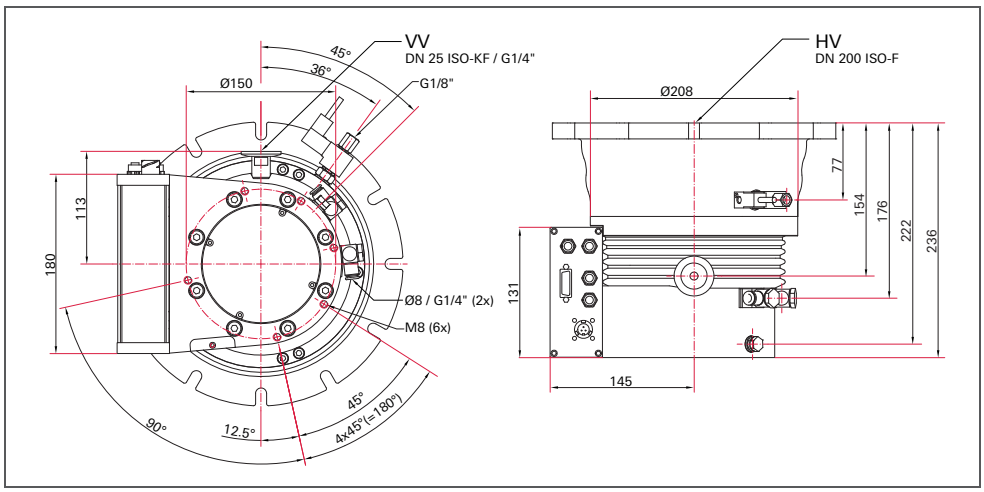


HiPace® 800 M

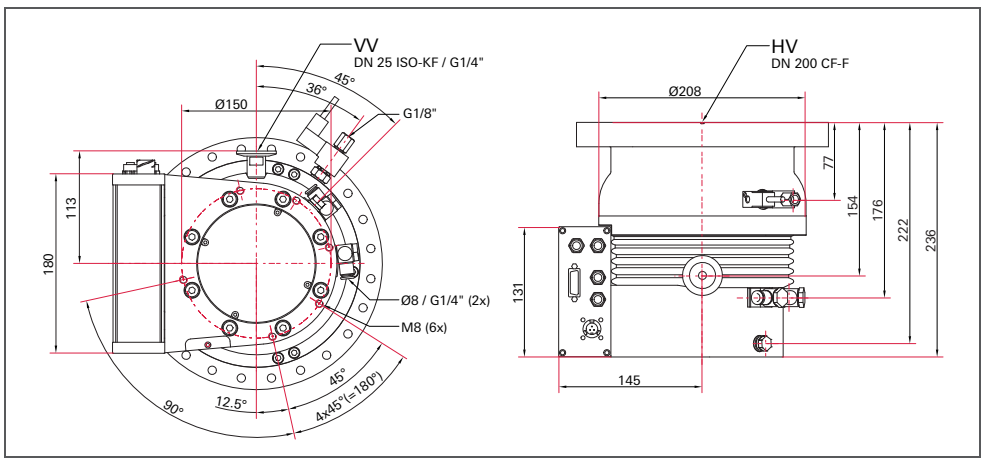
Dimensions (in mm)



HiPace® 800 M with TM 700, DN 200 ISO-K



HiPace® 800 M with TM 700, DN 200 ISO-F



HiPace® 800 M with TM 700, DN 200 CF-F

Technical data	HiPace® 800 M with TM 700, DN 200 ISO-K	HiPace® 800 M with TM 700, DN 200 CF-F	HiPace® 800 M with TM 700, DN 200 ISO-F
Connection nominal diameter			
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Flange (in)	DN 200 ISO-K	DN 200 CF-F	DN 200 ISO-F
Venting connection	G 1/8"	G 1/8"	G 1/8"
Pumping speed			
Pumping speed for Ar	775 l/s	775 l/s	775 l/s
Pumping speed for H_2	500 l/s	500 l/s	500 l/s
Pumping speed for He	625 l/s	625 l/s	625 l/s
Pumping speed for N_2	790 l/s	790 l/s	790 l/s
Compression			
Compression ratio for Ar	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$
Compression ratio for H_2	$2 \cdot 10^{5}$	$2 \cdot 10^{5}$	$2 \cdot 10^{5}$
Compression ratio for He	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{7}$	$> 1 \cdot 10^{7}$
Compression ratio for N_2	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$	$> 1 \cdot 10^{11}$
Fore-vacuum max. for N_2	8 hPa	8 hPa	8 hPa
Gas througput			
Gas throughput at 0.1 hPa HV for Ar	16 hPa l/s	16 hPa l/s	16 hPa l/s
Gas throughput at 0.1 hPa HV for H_2	9 hPa l/s	9 hPa l/s	9 hPa l/s
Gas throughput at 0.1 hPa HV for He	16 hPa l/s	16 hPa l/s	16 hPa l/s
Gas throughput at 0.1 hPa HV for N_2	16 hPa l/s	16 hPa l/s	16 hPa l/s
Gas throughput at full rotational speed for Ar	8 hPa l/s	8 hPa l/s	8 hPa l/s
Gas throughput at full rotational speed for N_2	13 hPa l/s	13 hPa l/s	13 hPa l/s
Electronic drive unit	with TM 700	with TM 700	with TM 700
Operating voltage	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC
Rotation speed ± 2 %	49200 min^{-1}	49200 min^{-1}	49200 min^{-1}
Rotation speed variable	20-100 %	20-100 %	20-100 %
Mounting orientation	in any orientation	in any orientation	in any orientation
Ultimate pressure*	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa
Weight	17.2 kg	21.6 kg	18 kg
Run-up time	4 min	4 min	4 min
Cooling method, optional	Air, Convection	Air, Convection	Air, Convection
Cooling method, standard	Water	Water	Water
Cooling water temperature	15-35 °C	15-35 °C	15-35 °C
Cooling water consumption	80 l/h	80 l/h	80 l/h
Bearing	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated
Sound pressure level	≤ 45 dB (A)	≤ 45 dB (A)	≤ 45 dB (A)
Interfaces	RS-485, Remote	RS-485, Remote	RS-485, Remote
Protection category	IP 54	IP 54	IP 54
Low vibrations	YES	YES	YES
Permissible magnetic field max.	5 mT	5 mT	5 mT
Order number pump Pumpe	**PM P04 460**	**PM P04 462**	**PM P04 461**

*Ultimate pressure please find description on page 272

Accessories	HiPace® 800 M with TM 700, DN 200 ISO-K	HiPace® 800 M with TM 700, DN 200 CF-F	HiPace® 800 M with TM 700, DN 200 ISO-F
Order number pump Pumpe	**PM P04 460**	**PM P04 462**	**PM P04 461**
Power supplies/power			
DCU - power supply with display control unit	**PM C01 823**	**PM C01 823**	**PM C01 823**
TPS - mains pack for wall/standard rail fitting	**PM 061 343 -T**	**PM 061 343 -T**	**PM 061 343 -T**
TPS - mains packl 19" rack module 3 RU	**PM 061 347 -T**	**PM 061 347 -T**	**PM 061 347 -T**
Control units			
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**	**PM 061 348 -T**
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**	**PM 051 510 -T**
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**	**PM 061 005 -T**
Mains cable DCU/TPS/TCP, 3 m			
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**	**P 4564 309 ZA**	**P 4564 309 ZA**
115 V AC mains cable with UL plug	**P 4564 309 ZE**	**P 4564 309 ZE**	**P 4564 309 ZE**
208 V AC mains cable with UL plug	**P 4564 309 ZF**	**P 4564 309 ZF**	**P 4564 309 ZF**
Connection cable, length 3 m between			
Connection cable for HiPace with TC 400/TM 700 to power supply TPS/DCU 310/311/400/401	**PM 061 352 -T**	**PM 061 352 -T**	**PM 061 352 -T**
Venting accessories			
Venting valve	**PM Z01 291**	**PM Z01 291**	**PM Z01 291**
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**	**PM Z00 121**
Cooling accessories			
Air cooling	**PM Z01 363**	**PM Z01 363**	**PM Z01 363**
Heating accessories			
Heating jacket 208 V AC, UL plug		**PM 071 270 -T**	
Heating jacket 115 V AC, UL plug		**PM 071 271 -T**	
Heating jacket 230 V AC, Euro-style safety plug		**PM 071 269 -T**	
Backing pump control			
Backing pump relay box, shielded, 1-phase 7 A	**PM 071 284 -X**	**PM 071 284 -X**	**PM 071 284 -X**
Backing pump relay box, shielded, 1-phase 20 A	**PM 071 285 -X**	**PM 071 285 -X**	**PM 071 285 -X**
Control cable for pumping stations 0.7 m	**PM 061 675 -T**	**PM 061 675 -T**	**PM 061 675 -T**
HiPace-ACP connection cable	**PM 071 142 -X**	**PM 071 142 -X**	**PM 071 142 -X**
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**	**PM Z01 205**
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**	**PM Z01 206**
General accessories			
Sealing gas valve	**PM Z01 312**	**PM Z01 312**	**PM Z01 312**
Sealing gas throttle	**PM Z01 317**	**PM Z01 317**	**PM Z01 317**
Centering ring coated	**PM 016 220 -U**		**PM 016 220 -U**
Centering ring coated with protection screen	**PM 016 222 -U**		**PM 016 222 -U**
Centering ring coated with splinter shield	**PM 016 221 -U**		**PM 016 221 -U**
Protection screen		**PM 016 342**	
Splinter shield		**PM 016 321**	
Vibration dampers	**PM 006 668 -X**	**PM 006 669 -X**	
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**	**PM 061 207 -T**
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**	**PM 061 283 -T**
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**	**P 4723 010**
Y-connector M12 for accessories	**P 4723 013**	**P 4723 013**	**P 4723 013**
Mounting materials			
Coated centering ring, bracket screws	**PM 016 390 -T**		
Centering ring coated with protection screen, bracket screws	**PM 016 392 -T**		
Centering ring coated with splinter shield, bracket screws	**PM 016 391 -T**		
Centering ring coated with splinter shield, hexagon bolts			**PM 016 470 -T**
Centering ring coated with protection screen, hexagon bolts			**PM 016 472 -T**
Centering ring coated with splinter shield, hexagon bolts			**PM 016 471 -T**
Centering ring coated with stud screws			**PM 016 475 -T**
Centering ring coated with protection screen with stud screws			**PM 016 477 -T**
Centering ring coated with splinter shield with stud screws			**PM 016 476 -T**
Set of hexagon screws for trough hole (CF-F)		**PM 016 687 -T**	
Set of stud screws for tapped hole (CF-F)		**PM 016 688 -T**	
Set of stud screws for trough hole (CF)		**PM 016 736 -T**	
Coated centering ring, bracket screws	**PM 016 390 -T**		
Centering ring coated with protection screen, bracket screws	**PM 016 392 -T**		
Centering ring coated with splinter shield, bracket screws	**PM 016 391 -T**		

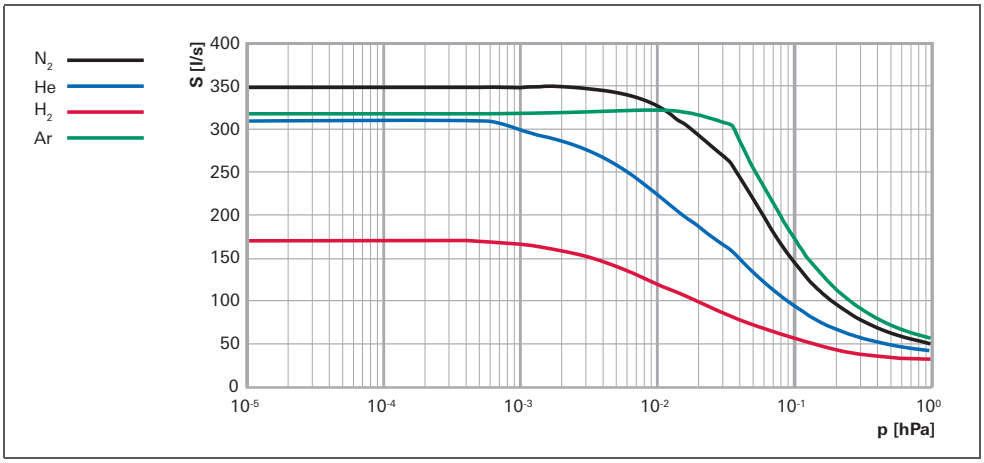
Content

ATH 500 M



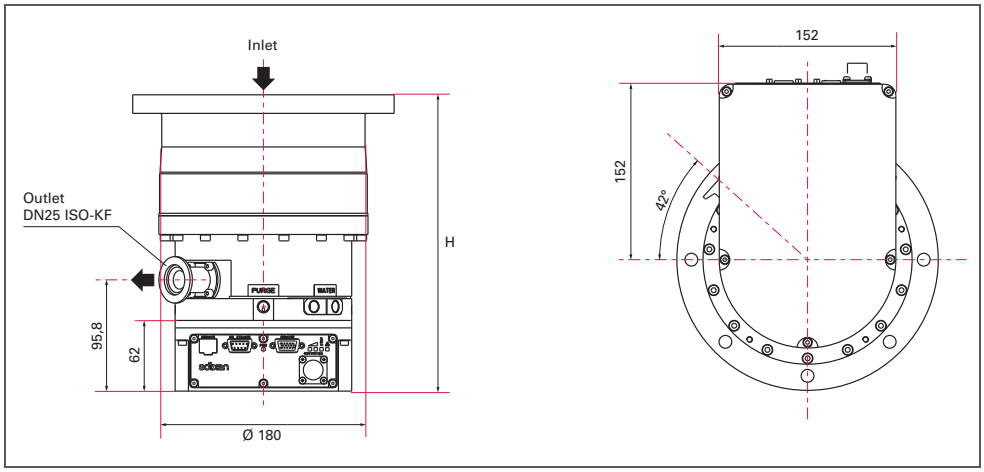
- Compact integrated drive electronics
- Installation in any orientation
- Water or air cooled
- CE marked and ROHS compliant
- Heated version (MT) available for corrosive applicaitons.

Pumping speed



ATH 500 M

Dimensions (in mm)



ATH 500 M

	ATH 500 M, DN 100 ISO-F	ATH 500 M, DN 100 ISO-K	ATH 500 M, DN 100 CF-F	ATH 500 M, DN 160 ISO-F	ATH 500 M, DN 160 ISO-K	ATH 500 M, DN 160 CF-F
H	294,5 mm	294,5 mm	304,9 mm	254,9 mm	254,9 mm	275,9 mm

Technical data	ATH 500 M, DN 100 ISO-F	ATH 500 M, DN 100 ISO-K	ATH 500 M, DN 100 CF-F	ATH 500 M, DN 160 ISO-F	ATH 500 M, DN 160 ISO-K	
Connection nominal diameter						
Flange (out)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	
Flange (in)	DN 100 ISO-F	DN 100 ISO-K	DN 100 CF-F	DN 160 ISO-F	DN 160 ISO-K	
Pumping speed						
Pumping speed for Ar	320 l/s	320 l/s	320 l/s	530 l/s	530 l/s	
Pumping speed for H_2	170 l/s	170 l/s	170 l/s	190 l/s	190 l/s	
Pumping speed for He	310 l/s	310 l/s	310 l/s	390 l/s	390 l/s	
Pumping speed for N_2	350 l/s	350 l/s	350 l/s	550 l/s	550 l/s	
Compression						
Compression ratio for Ar	$> 8 \cdot 10^6$	$> 8 \cdot 10^6$	$> 8 \cdot 10^6$	$> 8 \cdot 10^6$	$> 8 \cdot 10^6$	
Compression ratio for H_2	$> 2 \cdot 10^2$	$> 2 \cdot 10^2$	$> 2 \cdot 10^2$	$> 2 \cdot 10^2$	$> 2 \cdot 10^2$	
Compression ratio for He	$> 1 \cdot 10^4$	$> 1 \cdot 10^4$	$> 1 \cdot 10^4$	$> 1 \cdot 10^4$	$> 1 \cdot 10^4$	
Compression ratio for N_2	$> 2 \cdot 10^7$	$> 2 \cdot 10^7$	$> 2 \cdot 10^7$	$> 2 \cdot 10^7$	$> 2 \cdot 10^7$	
Fore-vacuum max. for N_2	2.6 hPa	2.6 hPa	2.6 hPa	2.6 hPa	2.6 hPa	
Gas througput						
Gas throughput at full rotational speed for Ar, heated pump at 65 C						
Gas throughput at full rotational speed for H_2, heated pump at 65 C						
Gas throughput at full rotational speed for N_2, heated pump at 65 C						
Gas throughput for Ar	42.3 hPa l/s	42.3 hPa l/s	42.3 hPa l/s	42.3 hPa l/s	42.3 hPa l/s	
Gas throughput for H_2	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	
Gas throughput for He	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	
Gas throughput for N_2	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	
Electronic drive unit	Integrated drive electronics	Integrated drive electronics	Integrated drive electronics	Integrated drive electronics	Integrated drive electronics	
Operating voltage	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC	
Rotation speed ± 2 %	50000 min^{-1}	50000 min^{-1}	50000 min^{-1}	50000 min^{-1}	50000 min^{-1}	
Mounting orientation	in any orientation	in any orientation	in any orientation	in any orientation	in any orientation	
Ultimate pressure	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa	
Weight	17 kg	17 kg	17 kg	17 kg	17 kg	
Run-up time	< 2 min	< 2 min	< 2 min	< 2 min	< 2 min	
Corrosive gas version						
Cooling water temperature	15-25 °C	15-25 °C	15-25 °C	15-25 °C	15-25 °C	
Cooling water consumption	1.0 l/min	1.0 l/min	1.0 l/min	1.0 l/min	1.0 l/min	
Bearing	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	
Power consumption at ultimate pressure	100 W	100 W	100 W	100 W	100 W	
Sound pressure level	≤ 42 dB (A)	≤ 42 dB (A)	≤ 42 dB (A)	≤ 42 dB (A)	≤ 42 dBA	

Order number pump Pumpe						
Profibus, water cooling	**VY362100**	**VY312100**	**VY322100**	**VY462100**	**VY412100**	
Remote, water cooling	**V2362100**	**V2312100**	**V2322100**	**V2462100**	**V2412100**	
Profibus, air cooling	**VY361100**	**VY311100**	**VY321100**	**VY461100**	**VY411100**	
Remote, air cooling	**V2361100**	**V2311100**	**V2321100**	**V2461100**	**V2411100**	

	ATH 500 M, DN 160 CF-F	ATH 500 MT, DN 100 ISO-K	ATH 500 MT, DN 100 ISO-F	ATH 500 MT, DN 100 CF-F	ATH 500 MT, DN 160 ISO-F	ATH 500 MT, DN 160 ISO-K	ATH 500 MT, DN 160 CF-F
	DN 25 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
	DN 160 CF-F	DN 100 ISO-K	DN 100 ISO-F	DN 100 CF-F	DN 160 ISO-F	DN 160 ISO-K	DN 160 CF-F
	530 l/s	320 l/s	320 l/s	320 l/s	530 l/s	530 l/s	530 l/s
	190 l/s	170 l/s	170 l/s	170 l/s	190 l/s	190 l/s	190 l/s
	390 l/s	310 l/s	310 l/s	310 l/s	390 l/s	390 l/s	390 l/s
	550 l/s	350 l/s	350 l/s	350 l/s	550 l/s	550 l/s	550 l/s
	$> 8 \cdot 10^6$	$> 8 \cdot 10^6$	$> 8 \cdot 10^6$	$> 8 \cdot 10^6$	$> 8 \cdot 10^6$	$> 8 \cdot 10^6$	$> 8 \cdot 10^6$
	$> 2 \cdot 10^2$	$> 2 \cdot 10^2$	$> 2 \cdot 10^2$	$> 2 \cdot 10^2$	$> 2 \cdot 10^2$	$> 2 \cdot 10^2$	$> 2 \cdot 10^2$
	$> 1 \cdot 10^4$	$> 1 \cdot 10^4$	$> 1 \cdot 10^4$	$> 1 \cdot 10^4$	$> 1 \cdot 10^4$	$> 1 \cdot 10^4$	$> 1 \cdot 10^4$
	$> 2 \cdot 10^7$	$> 2 \cdot 10^7$	$> 2 \cdot 10^7$	$> 2 \cdot 10^7$	$> 2 \cdot 10^7$	$> 2 \cdot 10^7$	$> 2 \cdot 10^7$
	2.6 hPa	2.6 hPa	2.6 hPa	2.6 hPa	2.6 hPa	2.6 hPa	2.6 hPa
		5.1 hPa l/s	5.1 hPa l/s	5.1 hPa l/s	5.1 hPa l/s	5.1 hPa l/s	5.1 hPa l/s
		> 16.9 hPa l/s	> 16.9 hPa l/s	> 16.9 hPa l/s	> 16.9 hPa l/s	> 16.9 hPa l/s	> 16.9 hPa l/s
		8.5 hPa l/s	8.5 hPa l/s	8.5 hPa l/s	8.5 hPa l/s	8.5 hPa l/s	8.5 hPa l/s
	42.3 hPa l/s	42.3 hPa l/s	42.3 hPa l/s	42.3 hPa l/s	42.3 hPa l/s	42.3 hPa l/s	42.3 hPa l/s
	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s
	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s	> 169 hPa l/s
	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s
	Integrated drive electronics	Integrated drive electronics	Integrated drive electronics	Integrated drive electronics	Integrated drive electronics	Integrated drive electronics	Integrated drive electronics
	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC	48 (± 5 %) V DC
	50000 min^{-1}	50000 min^{-1}	50000 min^{-1}	50000 min^{-1}	50000 min^{-1}	50000 min^{-1}	50000 min^{-1}
	in any orientation	in any orientation	in any orientation	in any orientation	in any orientation	in any orientation	in any orientation
	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-8}$ hPa
	17 kg	18 kg	18 kg	18 kg	18 kg	18 kg	18 kg
	< 2 min	< 2 min	< 2 min	< 2 min	< 2 min	< 2 min	< 2 min
		YES	YES	YES	YES	YES	YES
	15-25 °C	15-25 °C	15-25 °C	15-25 °C	15-25 °C	15-25 °C	15-25 °C
	1.0 l/min	1.0 l/min	1.0 l/min	1.0 l/min	1.0 l/min	1.0 l/min	1.0 l/min
	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated
	100 W	100 W	100 W	100 W	100 W	100 W	100 W
	≤ 42 dB (A)	≤ 42 dB (A)	≤ 42 dB (A)	≤ 42 dB (A)	≤ 42 dB (A)	≤ 42 dB (A)	≤ 42 dB (A)

	VY422100						
	V2422100	**VR312103**	**VR362103**	**VR322103**	**VR462103**	**VR412103**	**VR422103**
	VY421100						
	V2421100						

Content

Accessories	ATH 500 M, DN 100 ISO-F	ATH 500 M, DN 100 ISO-K	ATH 500 M, DN 100 CF-F	ATH 500 M, DN 160 ISO-F	ATH 500 M, DN 160 ISO-K	
Order number pump Pumpe	**VY362100 V2362100 VY361100 V2361100**	**VY312100 V2312100 VY311100 V2311100**	**VY322100 V2322100 VY321100 V2321100**	**VY462100 V2462100 VY461100 V2461100**	**VY412100 V2412100 VY411100 V2411100**	
Power supplies/power						
External power supply for ATH 500 M/MT	**114866**	**114866**	**114866**	**114866**	**114866**	
Control units						
Hand Held Remote with cable	**114461**	**114461**	**114461**	**114461**	**114461**	
Mains cable DCU/TPS/TCP						
Mains cable 2,0 m Euro-style safety plug 200 - 240 V AC 48 VDC power supply (for ATH 500M)	**103566**	**103566**	**103566**	**103566**	**103566**	
Mains cable 2,0 m UL plug 200 - 240 V AC 48 VDC power supply (for ATH 500M)	**103567**	**103567**	**103567**	**103567**	**103567**	
Mains cable 3,5 m 48 V DC (for ATH 500 M)	**A331328-035**	**A331328-035**	**A331328-035**	**A331328-035**	**A331328-035**	
Venting accessories						
Air venting valve	**200043**	**200043**	**200043**	**200043**	**200043**	
Cooling accessories						
Air cooling kit (for ATH500M)	**118543S**	**118543S**	**118543S**	**118543S**	**118543S**	
General accessories						
Purge valve kit 24 DVC (for ATH 500 M)	**115303S**	**115303S**	**115303S**	**115303S**	**115303S**	
Purge plug with O-ring (for ATH 500 M)	**115298S**	**115298S**	**115298S**	**115298S**	**115298S**	
Stainless inlet screen kit	**118001**	**118001**	**118001**	**118002**	**118002**	
Mounting materials						
Set of screws			**118690**	**110676S**	**117996**	
Set of screws with Centering ring				**110675**		

	ATH 500 M, DN 160 CF-F	ATH 500 MT, DN 100 ISO-K	ATH 500 MT, DN 100 ISO-F	ATH 500 MT, DN 100 CF-F	ATH 500 MT, DN 160 ISO-F	ATH 500 MT, DN 160 ISO-K	ATH 500 MT, DN 160 CF-F
	VY422100 V2422100 VY421100 V2421100	VR312103	VR362103	VR322103	VR462103	VR412103	VR422103
	114866	114866	114866	114866	114866	114866	114866
	114461	114461	114461	114461	114461	114461	114461
	103566	103566	103566	103566	103566	103566	103566
	103567	103567	103567	103567	103567	103567	103567
	A331328-035	A331328-035	A331328-035	A331328-035	A331328-035	A331328-035	A331328-035
	200043	200043	200043	200043	200043	200043	200043
	118543S						
	115303S						
	115298S	115298S	115298S	115298S	115298S	115298S	115298S
	118002	118001	118001	118001	118002	118002	118002
	118690			118690	110676S	117996	118690
					110675		

ATH 1603 – 2303 M, ATH 1600 – 2300 MT, ATH 2800 – 3200 M/MT, ATP 3200 M

Compact magnetically levitated turbopumps pumping speed class from 1,400 to 2,800 l/s

Reliable

Our turbopumps in the ATH M and ATP[1)] M series are more than just magnetically levitated – an active 5-axis magnetic bearing monitors the position of the rotor and regulates any deviation from the correct position in real-time. Through the use of this high-quality bearing technology, we achieve the best possible long-term stability and reliability coupled with quiet running properties. The bearing technology and process equipment of the high vacuum pumps make our ATH M and ATP M series a benchmark for high-performance turbopumps in semiconductor production, thin film or glass coating, as well as in many industrial and R&D applications.

[1)] ATP = no Holweck stage (optimized for high compression or light gas pumping)



ATH 1603 M, with integrated electronic drive unit
OBC V4



ATH 2303 M, with integrated electronic drive unit
OBC V4



ATH 2800 M



ATH 3200 M

High performance
Our magnetically levitated turbopumps are optimized for vacuum production processes with a high gas throughput. The ATH-MT models features a temperature management control through an intergrated heater. The process oriented regulation of the pump temperature keeps the process gas exposed part of the pump at constant temperature up to 75 °C in order to minimize undesirable by-product condensation or process gas corrosions in the pump.

Pfeiffer Vacuum's extensive experience in demanding vacuum applications assist in the optimization of our products for your specific applications.

Safe
In the event of a power loss, the rotor acts as a generator and supplies power to the battery-free controller. The rotor gradually slows down and smoothly goes into mechanical emergency bearing mode. In the event of an extreme air dump or a unexpected failure in the cable between the pump and the controller, the emergency bearings come into play. The status of the bearings is monitored by the controller. A venting valve regulated by the controller can slow down the rotor quickly and effectively in the event of a massive ingress of air or mechanical shock to prevent damage to the pump.

In R&D applications, the pumps are distinguished by their minimal low vibration signature even at a low final pressure. A variable rpm setting makes optimizing process conditions for direct replacement of old high vacuum pumps through adaptation to their pumping speed.

Customer benefits
- Clean vacuum due to lubricant-free magnetic bearings
- Very high gas throughput for all process gases
- Outstanding long-term stability and reliability
- High critical backing pressure
- High air ingress stability
- Low lifetime costs due to maintenance-free maglev technology
- Freely selectable rotation speed in a broad RPM range for optimized process customization
- Ultra-low noise and vibration
- Can be installed in any orientation
- Temperature management for corrosive applications

Typical applications
- Glass coating
- Semiconductor processes
- Flat panel display manufacture
- Load-lock applications
- Photovoltaics
- LED/OLED



Glass coating



Semiconductor manufacutur



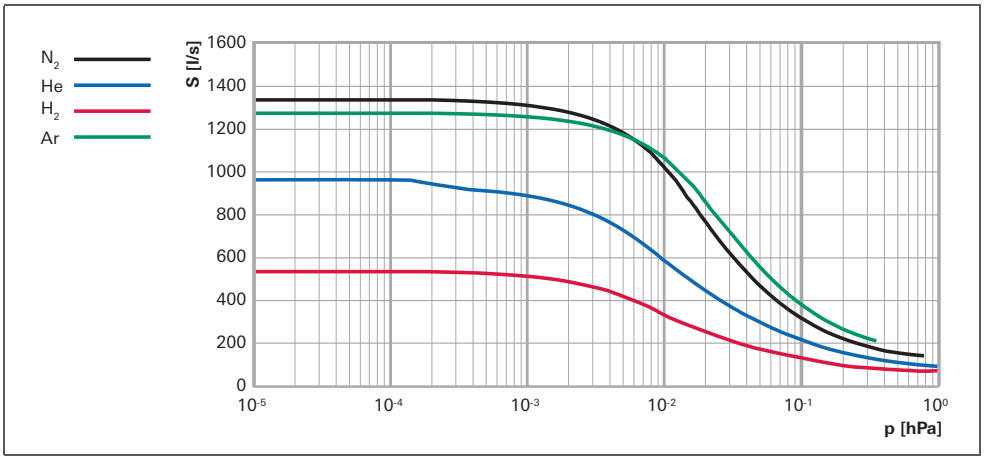
Photovoltaics

ATH 1600 M

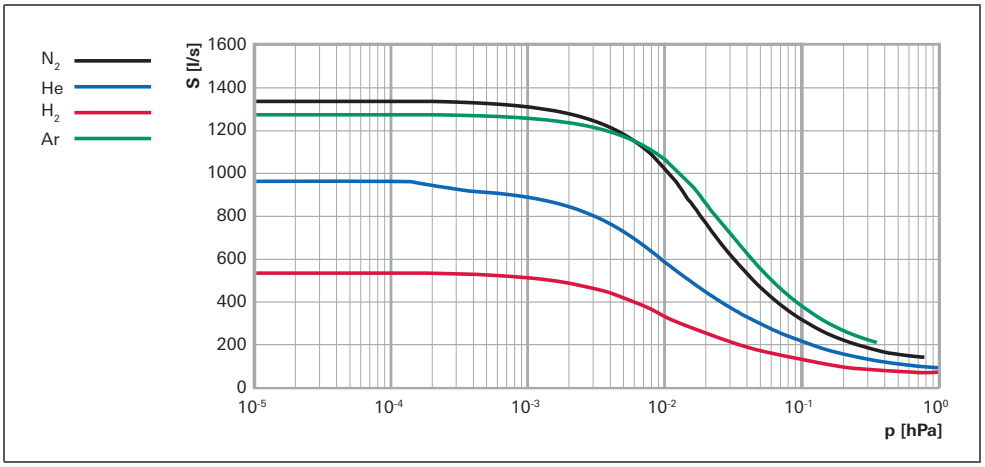


- Operation with integrated OBC drive electronics or Magpwer external drive electronics
- Installation in any orientation
- Water cooled
- CE marked and ROHS compliant
- Heated version (MT) available for corrosive applicaitons.

Pumping speed

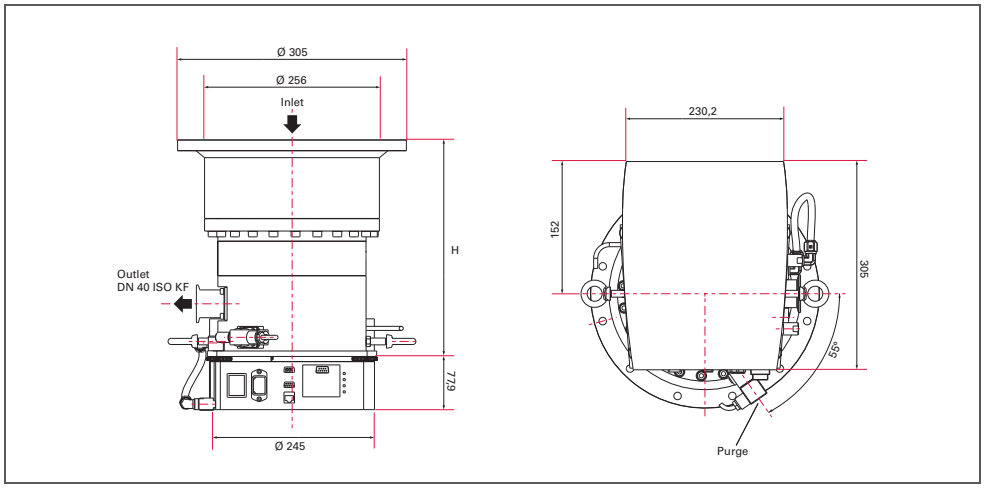


ATH 1603 M



ATH 1600 MT

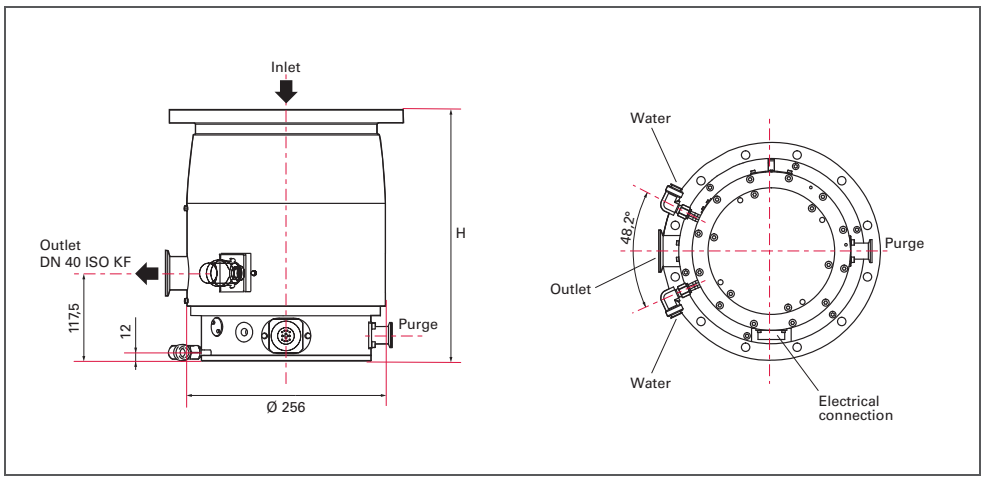
Dimensions (in mm)



ATH 1603 M

	ATH 1603 M, DN 200 ISO-F	ATH 1603 M, DN 200 CF-F	ATH 1603 M, DN 250 ISO-F	ATH 1603 M, DN 250 CF-F
H	320,2 mm	327,5 mm	317,2 mm	317,2 mm

Dimensions (in mm)



ATH 1600 MT

	ATH 1600 MT, DN 200 ISO-F	ATH 1600 MT, DN 200 CF-F	ATH 1600 MT, DN 250 ISO-F	ATH 1600 MT, DN 250 CF-F
H	316,9 mm	343,4 mm	316,9 mm	328,9 mm

Technical data	ATH 1603 M, DN 200 ISO-F	ATH 1603 M, DN 200 CF-F	ATH 1603 M, DN 250 ISO-F	ATH 1603 M, DN 250 CF-F	
Connection nominal diameter					
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	
Flange (in)	DN 200 ISO-F	DN 200 CF-F	DN 250 ISO-F	DN 250 CF-F	
Pumping speed					
Pumping speed for Ar	1280 l/s	1280 l/s	1350 l/s	1350 l/s	
Pumping speed for H_2	540 l/s	540 l/s	540 l/s	540 l/s	
Pumping speed for He	940 l/s	940 l/s	970 l/s	970 l/s	
Pumping speed for N_2	1360 l/s	1360 l/s	1400 l/s	1400 l/s	
Compression					
Compression ratio for Ar	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	
Compression ratio for H_2	$> 5 \cdot 10^2$	$> 5 \cdot 10^2$	$> 5 \cdot 10^2$	$> 5 \cdot 10^2$	
Compression ratio for He	$> 4 \cdot 10^4$	$> 4 \cdot 10^4$	$> 4 \cdot 10^4$	$> 4 \cdot 10^4$	
Compression ratio for N_2	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	
Fore-vacuum max. for N_2	1.7 hPa	1.7 hPa	1.7 hPa	1.7 hPa	
Gas througput					
Gas throughput at full rotational speed for Ar, heated pump at 75 C					
Gas throughput at full rotational speed for H_2, heated pump at 75 C					
Gas throughput at full rotational speed for N_2, heated pump at 75 C					
Gas throughput for Ar	20.3 hPa l/s	20.3 hPa l/s	20.3 hPa l/s	20.3 hPa l/s	
Gas throughput for H_2	> 67.6 hPa l/s	> 67.6 hPa l/s	> 67.6 hPa l/s	> 67.6 hPa l/s	
Gas throughput for He	> 67.6 hPa l/s	> 67.6 hPa l/s	> 67.6 hPa l/s	> 67.6 hPa l/s	
Gas throughput for N_2	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	
Operating voltage	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	
Rotation speed ± 2 %	39000 min^{-1}	39000 min^{-1}	39000 min^{-1}	39000 min^{-1}	
Mounting orientation	in any orientation	in any orientation	in any orientation	in any orientation	
Ultimate pressure	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa	
Weight	34 (pump) + 8 (controller) kg	34 (pump) + 8 (controller) kg	34 (pump) + 8 (controller) kg	34 (pump) + 8 (controller) kg	
Run-up time	< 6 min	< 6 min	< 6 min	< 6 min	
Corrosive gas version					
Cooling method	Water	Water	Water	Water	
Cooling water temperature	15-25 °C	15-25 °C	15-25 °C	15-25 °C	
Cooling water consumption	1.0 l/min	1.0 l/min	1.0 l/min	1.0 l/min	
Bearing	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	
Power consumption at ultimate pressure	300 W	300 W	300 W	300 W	
Cooling water temperature max.	40 °C	40 °C	40 °C	40 °C	
Sound pressure level	≤ 48 dB (A)	≤ 48 dB (A)	≤ 48 dB (A)	≤ 48 dB (A)	
Protection category	IP 54	IP 54	IP 54	IP 54	

Order number pump Pumpe					
External drive electronics	**Y2562100**	**Y2522100**	**Y2662100**	**Y2622100**	
OBC V4 Profibus	**YN56215A**	**YN52215A**	**YN66215A**	**YN62215A**	
OBC V4 DeviceNet	**YL56215A**	**YL52215A**	**YL66215A**	**YL62215A**	
OBC V4 Remote	**YJ56215A**	**YJ52215A**	**YJ66215A**	**YJ62215A**	

	ATH 1600 MT, DN 200 ISO-F	ATH 1600 MT, DN 200 CF-F	ATH 1600 MT, DN 250 ISO-F	ATH 1600 MT, DN 250 CF-F
	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
	DN 200 ISO-F	DN 200 CF-F	DN 250 ISO-F	DN 250 CF-F
	1280 l/s	1280 l/s	1350 l/s	1350 l/s
	540 l/s	540 l/s	540 l/s	540 l/s
	940 l/s	940 l/s	970 l/s	970 l/s
	1360 l/s	1360 l/s	1400 l/s	1400 l/s
	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
	$> 5 \cdot 10^2$	$> 5 \cdot 10^2$	$> 5 \cdot 10^2$	$> 5 \cdot 10^2$
	$> 4 \cdot 10^3$	$> 4 \cdot 10^3$	$> 4 \cdot 10^3$	$> 4 \cdot 10^3$
	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
	2.2 hPa	2.2 hPa	2.2 hPa	2.2 hPa
	8.5 hPa l/s	8.5 hPa l/s	8.5 hPa l/s	8.5 hPa l/s
	> 16.9 hPa l/s	> 16.9 hPa l/s	> 16.9 hPa l/s	> 16.9 hPa l/s
	16.9 hPa l/s	16.9 hPa l/s	16.9 hPa l/s	16.9 hPa l/s
	20.3 hPa l/s	20.3 hPa l/s	20.3 hPa l/s	20.3 hPa l/s
	> 67.6 hPa l/s	> 67.6 hPa l/s	> 67.6 hPa l/s	> 67.6 hPa l/s
	> 67.6 hPa l/s	> 67.6 hPa l/s	> 67.6 hPa l/s	> 67.6 hPa l/s
	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s
	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz
	39000 min^{-1}	39000 min^{-1}	39000 min^{-1}	39000 min^{-1}
	in any orientation	in any orientation	in any orientation	in any orientation
	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa
	34 (pump) + 8 (controller) kg	34 (pump) + 8 (controller) kg	34 (pump) + 8 (controller) kg	34 (pump) + 8 (controller) kg
	< 6 min	< 6 min	< 6 min	< 6 min
	YES	YES	YES	YES
	Water	Water	Water	Water
	15-25 °C	15-25 °C	15-25 °C	15-25 °C
	1.0 l/min	1.0 l/min	1.0 l/min	1.0 l/min
	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated
	300 W	300 W	300 W	300 W
	40 °C	40 °C	40 °C	40 °C
	≤ 48 dB (A)	≤ 48 dB (A)	≤ 48 dB (A)	≤ 48 dB (A)
	IP 54	IP 54	IP 54	IP 54

	P6562100	**P6522100**	**P6662100**	**P6622100**
	PM56215A	**PM52215A**	**PN66215A**	**PM62215A**
	PI56215A	**PI52215A**	**PI66215A**	**PI62215A**

Accessories	ATH 1603 M, DN 200 ISO-F	ATH 1603 M, DN 200 CF-F	ATH 1603 M, DN 250 ISO-F	ATH 1603 M, DN 250 CF-F	
Order number pump Pumpe	**Y2562100 YN56215A YL56215A YJ56215A**	**Y2522100 YN52215A YL52215A YJ52215A**	**Y2662100 YN66215A YL66215A YJ66215A**	**Y2622100 YN62215A YL62215A YJ62215A**	
Power supplies/power					
Magpower drive electronic	**120917**	**120917**	**120917**	**120917**	
Cabel for mains connection					
Mains cable 2,5 m Euro-style safety plug 200 - 240 V WS	**A328405**	**A328405**	**A328405**	**A328405**	
Mains cable 2,5 m UL plug 200 - 240 V WS	**A331729**	**A331729**	**A331729**	**A331729**	
Connection cable					
Interconnecting cable (pump to Magpower external drive electronics), L = 1,0 m	**A215300-010-C6-D**	**A215300-010-C6-D**	**A215300-010-C6-D**	**A215300-010-C6-D**	
Interconnecting cable (pump to Magpower external drive electronics), L = 3,5 m	**A215300-035-C6-D**	**A215300-035-C6-D**	**A215300-035-C6-D**	**A215300-035-C6-D**	
Interconnecting cable (pump to Magpower external drive electronics), L = 5,0 m	**A215300-050-C6-D**	**A215300-050-C6-D**	**A215300-050-C6-D**	**A215300-050-C6-D**	
Interconnecting cable (pump to Magpower external drive electronics), L = 10,0 m	**A215300-100-C6-D**	**A215300-100-C6-D**	**A215300-100-C6-D**	**A215300-100-C6-D**	
Interconnecting cable (pump to Magpower external drive electronics), L = 20,0 m	**A215300-200-C6-D**	**A215300-200-C6-D**	**A215300-200-C6-D**	**A215300-200-C6-D**	
Venting accessories					
Venting valve (for OBC V4 and Magpower)	**114280**	**114280**	**114280**	**114280**	
Valve cable (Magpower external drive electronics to venting valve), L = 1,0 m	**A462403-010**	**A462403-010**	**A462403-010**	**A462403-010**	
Valve cable (Magpower external drive electronics to venting valve), L = 3,5 m	**A462403-035**	**A462403-035**	**A462403-035**	**A462403-035**	
Valve cable (Magpower external drive electronics to venting valve), L = 5,0 m	**A462403-050**	**A462403-050**	**A462403-050**	**A462403-050**	
Valve cable (Magpower external drive electronics to venting valve), L = 10,0 m	**A462403-100**	**A462403-100**	**A462403-100**	**A462403-100**	
Valve cable (Magpower external drive electronics to venting valve), L=20,0m	**A462403-200**	**A462403-200**	**A462403-200**	**A462403-200**	
Cooling accessories					
Water valve cable (for MT pumps only), L=1,0m					
Water valve cable (for MT pumps only), L=3,5m					
Water valve cable (for MT pumps only), L=5,0m					
Water valve cable (for MT pumps only), L=10,0m					
Water valve cable (for MT pumps only), L=20,0m					
Heating accessories					
Heater band cable (for MT pumps only), L=1,0m					
Heater band cable (for MT pumps only), L=3,5m					
Heater band cable (for MT pumps only), L=5,0m					
Heater band cable (for MT pumps only), L=10,0m					
Heater band cable (for MT pumps only), L=20,0m					
General accessories					
Purge valve, 25 sccm	**118900**	**118900**	**118900**	**118900**	
Purge valve, 50 sccm	**111921**	**111921**	**111921**	**111921**	
Rotatable flange		**303131**			
Aluminum inlet screen	**109200**	**109200**	**111640**	**111640**	
Stainless inlet screen kit	**108872**	**108872**	**108762**	**108762**	
Dust filter	**106229**	**106229**	**106229**	**106229**	
Mounting materials					
Set of screws	**110676S**	**111664**	**110676S**	**111665**	
Set of screws with Centering ring	**110675**		**110675**		

Content

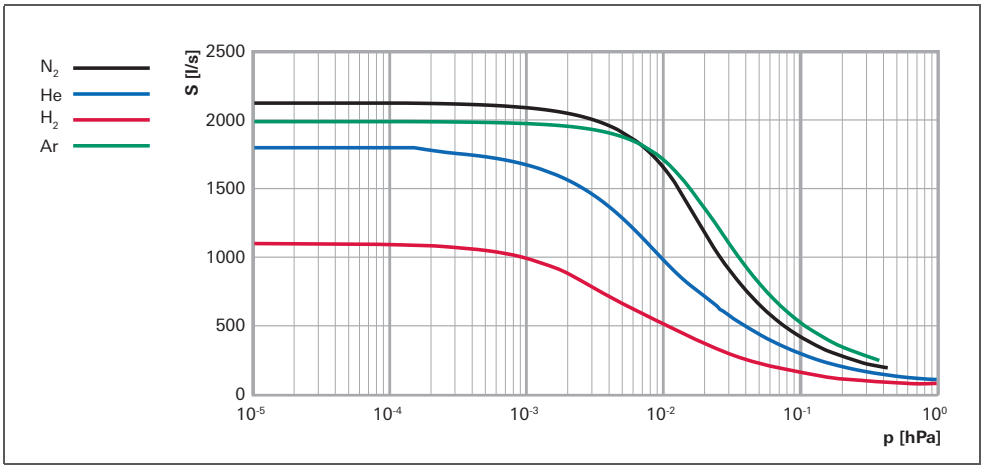
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	120917	120917	120917	120917
	A328405	A328405	A328405	A328405
	A331729	A331729	A331729	A331729
	A215300-010-C6-D	A215300-010-C6-D	A215300-010-C6-D	A215300-010-C6-D
	A215300-035-C6-D	A215300-035-C6-D	A215300-035-C6-D	A215300-035-C6-D
	A215300-050-C6-D	A215300-050-C6-D	A215300-050-C6-D	A215300-050-C6-D
	A215300-100-C6-D	A215300-100-C6-D	A215300-100-C6-D	A215300-100-C6-D
	A215300-200-C6-D	A215300-200-C6-D	A215300-200-C6-D	A215300-200-C6-D
	114280	114280	114280	114280
	A462403-010	A462403-010	A462403-010	A462403-010
	A462403-035	A462403-035	A462403-035	A462403-035
	A462403-050	A462403-050	A462403-050	A462403-050
	A462403-100	A462403-100	A462403-100	A462403-100
	A462403-200	A462403-200	A462403-200	A462403-200
	A462401-010	A462401-010	A462401-010	A462401-010
	A462401-035	A462401-035	A462401-035	A462401-035
	A462401-050	A462401-050	A462401-050	A462401-050
	A462401-100	A462401-100	A462401-100	A462401-100
	A462401-200	A462401-200	A462401-200	A462401-200
	A460082-010	A460082-010	A460082-010	A460082-010
	A460082-035	A460082-035	A460082-035	A460082-035
	A460082-050	A460082-050	A460082-050	A460082-050
	A460082-100	A460082-100	A460082-100	A460082-100
	A460082-200	A460082-200	A460082-200	A460082-200
	118900	118900	118900	118900
	111921	111921	111921	111921
		303131		
	109200	109200	111640	111640
	108872	108872	108762	108762
	106229	106229	106229	106229
	110676S	111664	110676S	111665
	110675		110675	

ATH 2300 M



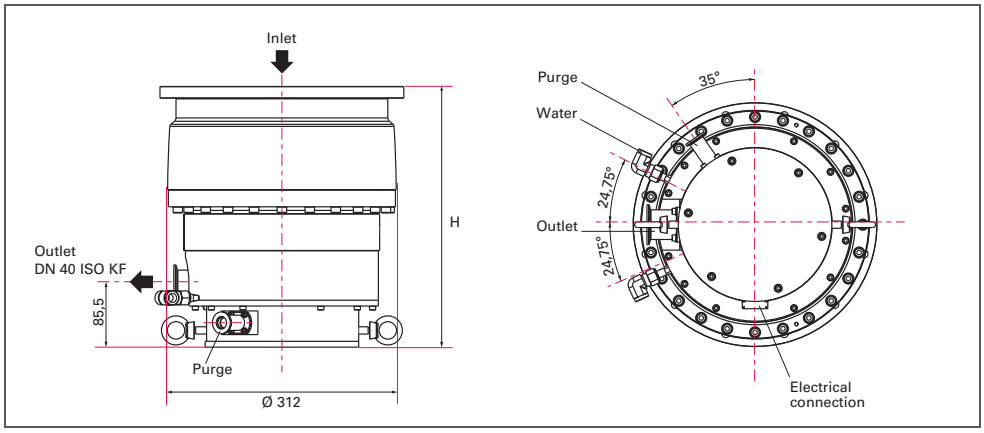
- Operation with integrated OBC drive electronics or Magpwer external drive electronics
- Installation in any orientation
- Water cooled
- CE marked and ROHS compliant
- Heated version (MT) available for corrosive applicaitons.

Pumping speed



ATH 2303 M

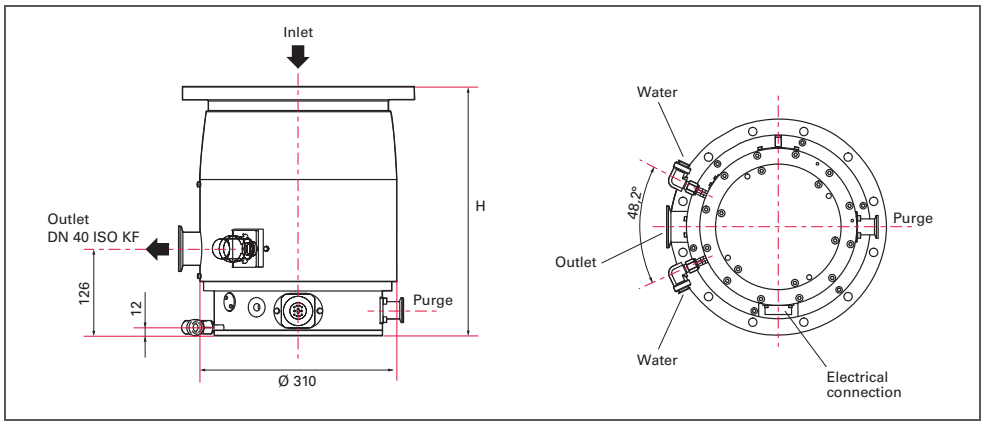
Dimensions (in mm)



ATH 2303 M

	ATH 2303 M, DN 250 ISO-F	ATH 2303 M, DN 250 CF-F
H	343,5 mm	398,1 mm

Dimensions (in mm)



ATH 2300 MT

	ATH 2300 MT, DN 200 ISO-F	ATH 2300 MT, DN 250 ISO-F	ATH 2300 MT, DN 250 CF-F
H	402,5 mm	358,5 mm	402,5 mm

Technical data	ATH 2303 M, DN 250 ISO-F	ATH 2303 M, DN 250 CF-F	ATH 2300 MT, DN 200 ISO-F	
Connection nominal diameter				
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	
Flange (in)	DN 250 ISO-F	DN 250 CF-F	DN 200 ISO-F	
Pumping speed				
Pumping speed for Ar	2000 l/s	2000 l/s	1450 l/s	
Pumping speed for H_2	1100 l/s	1100 l/s	1100 l/s	
Pumping speed for He	1800 l/s	1800 l/s	1650 l/s	
Pumping speed for N_2	2150 l/s	2150 l/s	1550 l/s	
Compression				
Compression ratio for Ar	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	
Compression ratio for H_2	$> 1 \cdot 10^3$	$> 1 \cdot 10^3$	$> 2 \cdot 10^3$	
Compression ratio for He	$> 3 \cdot 10^4$	$> 3 \cdot 10^4$	$> 3 \cdot 10^4$	
Compression ratio for N_2	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	
Fore-vacuum max. for N_2	2.9 hPa	2.9 hPa	2.8 hPa	
Gas througput				
Gas throughput at full rotational speed for Ar, heated pump at 75 C			8.5 hPa l/s	
Gas throughput at full rotational speed for H_2, heated pump at 75 C			> 16.9 hPa l/s	
Gas throughput at full rotational speed for N_2, heated pump at 75 C			16.9 hPa l/s	
Gas throughput for Ar	25.4 hPa l/s	25.4 hPa l/s	25.4 hPa l/s	
Gas throughput for H_2	> 67.6 hPa l/s	> 67.6 hPa l/s	> 67.6 hPa l/s	
Gas throughput for He	> 67.6 hPa l/s	> 67.6 hPa l/s	> 67.6 hPa l/s	
Gas throughput for N_2	67.6 hPa l/s	67.6 hPa l/s	67.6 hPa l/s	
Operating voltage	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	
Rotation speed ± 2 %	31000 min^{-1}	31000 min^{-1}	31000 min^{-1}	
Mounting orientation	in any orientation	in any orientation	in any orientation	
Ultimate pressure	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa	
Weight	60 (pump) + 8 (controller) kg	60 (pump) + 8 (controller) kg	60 (pump) + 8 (controller) kg	
Run-up time	< 8 min	< 8 min	< 8 min	
Corrosive gas version			YES	
Cooling method	Water	Water	Water	
Cooling water temperature	15-25 °C	15-25 °C	15-25 °C	
Cooling water consumption	1.0 l/min	1.0 l/min	1.0 l/min	
Bearing	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	
Power consumption at ultimate pressure	350 W	350 W	350 W	
Cooling water temperature max.	40 °C	40 °C	40 °C	
Sound pressure level	≤ 47 dB (A)	≤ 47 dB (A)	≤ 47 dB (A)	
Protection category	IP 54	IP 54	IP 54	

Order number pump Pumpe				
External drive electronics	**X2662100**	**X2622100**	**Q6562100**	
OBC V4 Profibus	**XN66215A**	**XN62215A**	**QM56215A**	
OBC V4 DeviceNet	**XL66215A**	**XL62215A**		
OBC V4 Remote	**XJ66215A**	**XJ62215A**	**QI56215A**	

	ATH 2300 MT, DN 250 ISO-F	ATH 2300 MT, DN 250 CF-F
	DN 40 ISO-KF	DN 40 ISO-KF
	DN 250 ISO-F	DN 250 CF-F
	2000 l/s	2000 l/s
	1100 l/s	1100 l/s
	1800 l/s	1800 l/s
	2150 l/s	2150 l/s
	> $1 \cdot 10^{8}$	> $1 \cdot 10^{8}$
	> $2 \cdot 10^{3}$	> $2 \cdot 10^{3}$
	> $3 \cdot 10^{4}$	> $3 \cdot 10^{4}$
	> $1 \cdot 10^{8}$	> $1 \cdot 10^{8}$
	2.8 hPa	2.8 hPa
	8.5 hPa l/s	8.5 hPa l/s
	> 16.9 hPa l/s	> 16.9 hPa l/s
	16.9 hPa l/s	16.9 hPa l/s
	25.4 hPa l/s	25.4 hPa l/s
	> 67.6 hPa l/s	> 67.6 hPa l/s
	> 67.6 hPa l/s	> 67.6 hPa l/s
	67.6 hPa l/s	67.6 hPa l/s
	200-240 V AC, 50/60 Hz	100-120/200-240 V AC, 50/60 Hz
	31000 min^{-1}	31000 min^{-1}
	in any orientation	in any orientation
	< $6 \cdot 10^{-9}$ hPa	< $6 \cdot 10^{-9}$ hPa
	60 (pump) + 8 (controller) kg	60 (pump) + 8 (controller) kg
	< 8 min	< 8 min
	YES	YES
	Water	Water
	15-25 °C	15-25 °C
	1.0 l/min	1.0 l/min
	Magnetically Levitated	Magnetically Levitated
	350 W	350 W
	40 °C	40 °C
	≤ 47 dB (A)	≤ 47 dB (A)
	IP 54	IP 54

	Q6662100	**Q6622100**
	QM66215A	**QM62215A**
	QI66215A	**QI62215A**

Accessories	ATH 2303 M, DN 250 ISO-F	ATH 2303 M, DN 250 CF-F	ATH 2300 MT, DN 200 ISO-F	
Order number pump Pumpe	**X2662100 XN66215A XL66215A XJ66215A**	**X2622100 XN62215A XL62215A XJ62215A**	**Q6562100 QM56215A QI56215A**	
Power supplies/power				
Magpower drive electronic	**120917**	**120917**	**120917**	
Cabel for mains connection				
Mains cable 2,5 m Euro-style safety plug 200 - 240 V WS	**A328405**	**A328405**	**A328405**	
Mains cable 2,5 m UL plug 200 - 240 V WS	**A331729**	**A331729**	**A331729**	
Connection cable				
Interconnecting cable (pump to Magpower external drive electronics), L = 1,0 m	**A215300-010-C6-D**	**A215300-010-C6-D**	**A215300-010-C6-D**	
Interconnecting cable (pump to Magpower external drive electronics), L = 3,5 m	**A215300-035-C6-D**	**A215300-035-C6-D**	**A215300-035-C6-D**	
Interconnecting cable (pump to Magpower external drive electronics), L = 5,0 m	**A215300-050-C6-D**	**A215300-050-C6-D**	**A215300-050-C6-D**	
Interconnecting cable (pump to Magpower external drive electronics), L = 10,0 m	**A215300-100-C6-D**	**A215300-100-C6-D**	**A215300-100-C6-D**	
Interconnecting cable (pump to Magpower external drive electronics), L = 20,0 m	**A215300-200-C6-D**	**A215300-200-C6-D**	**A215300-200-C6-D**	
Venting accessories				
Venting valve (for OBC V4 and Magpower)	**114280**	**114280**	**114280**	
Valve cable (Magpower external drive electronics to venting valve), L = 1,0 m	**A462403-010**	**A462403-010**	**A462403-010**	
Valve cable (Magpower external drive electronics to venting valve), L = 3,5 m	**A462403-035**	**A462403-035**	**A462403-035**	
Valve cable (Magpower external drive electronics to venting valve), L = 5,0 m	**A462403-050**	**A462403-050**	**A462403-050**	
Valve cable (Magpower external drive electronics to venting valve), L = 10,0 m	**A462403-100**	**A462403-100**	**A462403-100**	
Valve cable (Magpower external drive electronics to venting valve), L=20,0m	**A462403-200**	**A462403-200**	**A462403-200**	
Cooling accessories				
Water valve cable (for MT pumps only), L=1,0m			**A462401-010**	
Water valve cable (for MT pumps only), L=3,5m			**A462401-035**	
Water valve cable (for MT pumps only), L=5,0m			**A462401-050**	
Water valve cable (for MT pumps only), L=10,0m			**A462401-100**	
Water valve cable (for MT pumps only), L=20,0m			**A462401-200**	
Heating accessories				
Heater band cable (for MT pumps only), L=1,0m			**A460082-010**	
Heater band cable (for MT pumps only), L=3,5m			**A460082-035**	
Heater band cable (for MT pumps only), L=5,0m			**A460082-050**	
Heater band cable (for MT pumps only), L=10,0m			**A460082-100**	
Heater band cable (for MT pumps only), L=20,0m			**A460082-200**	
General accessories				
Purge valve, 25 sccm	**118900**	**118900**	**118900**	
Purge valve, 50 sccm	**111921**	**111921**	**111921**	
Aluminum inlet screen	**111640**	**111640**	**109200**	
Stainless inlet screen kit	**108762**	**108762**	**108872**	
Dust filter	**106229**	**106229**	**106229**	
Mounting materials				
Set of screws	**110676S**	**118690**		
Set of screws with Centering ring	**110034**		**110034 114510**	

Content

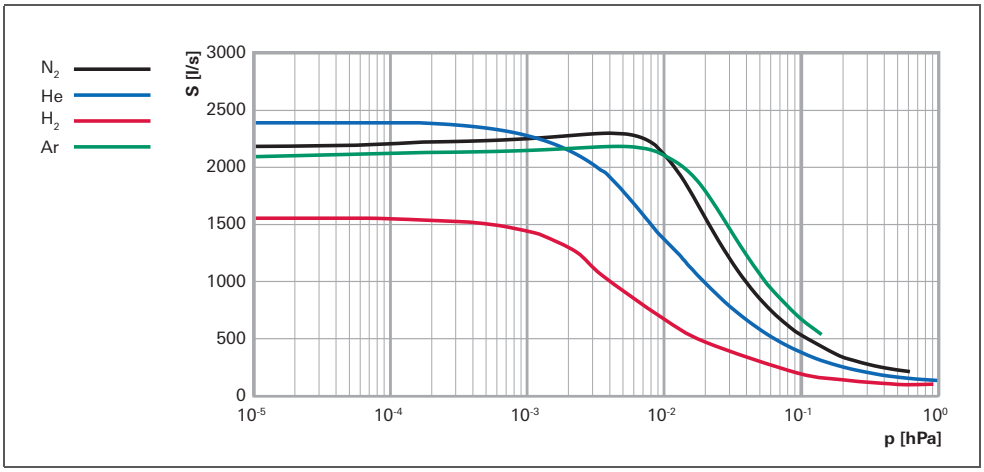
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	A328405	A328405
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	A215300-200-C6-D	A215300-200-C6-D
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	A462403-035	A462403-035
	A462403-050	A462403-050
	A462403-100	A462403-100
	A462403-200	A462403-200
	A462401-010	A462401-010
	A462401-035	A462401-035
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	A462401-100	A462401-100
	A462401-200	A462401-200
	A460082-010	A460082-010
	A460082-035	A460082-035
	A460082-050	A460082-050
	A460082-100	A460082-100
	A460082-200	A460082-200
	118900	118900
	111921	111921
	111640	111640
	108762	108762
	106229	106229
	110676S	118690
	110034	

ATH 2800 M



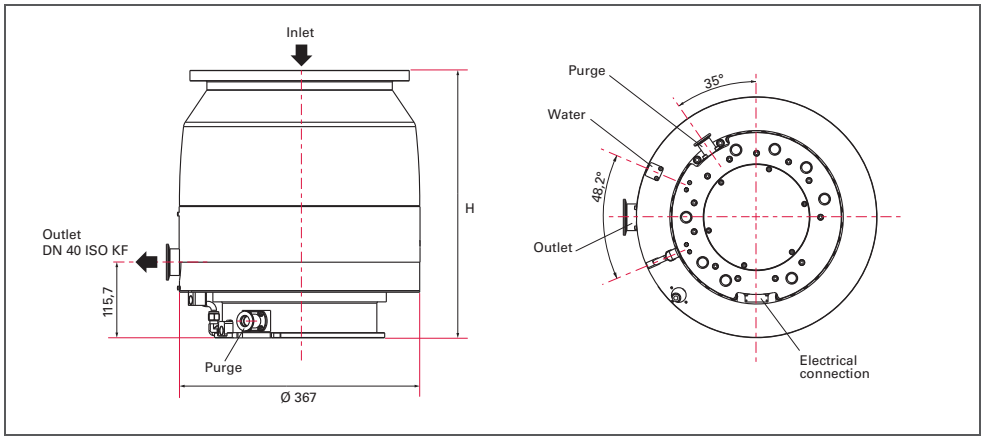
- Operation with Magpower external drive electronics
- Installation in any orientation
- Water cooled
- CE marked and ROHS compliant
- Heated version (MT) available for corrosive applicaitons.

Pumping speed



ATH 2800 M

Dimensions (in mm)



ATH 2800 M

	ATH 2800 M, DN 250 ISO-F	ATH 2800 M, VG 250
H	409 mm	409 mm

Technical data	ATH 2800 M, DN 250 ISO-F, External drive electronics, Water cooled, Non-heated	ATH 2800 M, VG 250, External drive electronics, Water cooled, Non-heated	ATH 2800 MT, DN 250 ISO-F, External drive electronics, Water cooled, Heated	ATH 2800 MT, VG 250, External drive electronics, Water cooled, Heated
Connection nominal diameter				
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 250 ISO-F	VG 250	DN 250 ISO-F	VG 250
Pumping speed				
Pumping speed for Ar	2100 l/s	2100 l/s	2100 l/s	2100 l/s
Pumping speed for H_2	1550 l/s	1550 l/s	1550 l/s	1550 l/s
Pumping speed for He	2400 l/s	2400 l/s	2400 l/s	2400 l/s
Pumping speed for N_2	2200 l/s	2200 l/s	2200 l/s	2200 l/s
Compression				
Compression ratio for Ar	> $1 \cdot 10^8$	> $1 \cdot 10^8$	> $1 \cdot 10^8$	> $1 \cdot 10^8$
Compression ratio for H_2	> $2 \cdot 10^3$	> $2 \cdot 10^3$	> $2 \cdot 10^3$	> $2 \cdot 10^3$
Compression ratio for He	> $3 \cdot 10^4$	> $3 \cdot 10^4$	> $3 \cdot 10^4$	> $3 \cdot 10^4$
Compression ratio for N_2	> $1 \cdot 10^8$	> $1 \cdot 10^8$	> $1 \cdot 10^8$	> $1 \cdot 10^8$
Fore-vacuum max. for N_2	2.1 hPa	2.1 hPa	2.1 hPa	2.1 hPa
Gas througput				
Gas throughput at full rotational speed for Ar, heated pump at 75 C			11.8 hPa l/s	11.8 hPa l/s
Gas throughput at full rotational speed for H_2, heated pump at 75 C			> 16.9 hPa l/s	> 16.9 hPa l/s
Gas throughput at full rotational speed for N_2, heated pump at 75 C			16.9 hPa l/s	16.9 hPa l/s
Gas throughput for Ar	> 37.2 hPa l/s	> 37.2 hPa l/s	> 37.2 hPa l/s	> 37.2 hPa l/s
Gas throughput for H_2	> 84.5 hPa l/s	> 84.5 hPa l/s	> 84.5 hPa l/s	> 84.5 hPa l/s
Gas throughput for He	> 84.5 hPa l/s	> 84.5 hPa l/s	> 84.5 hPa l/s	> 84.5 hPa l/s
Gas throughput for N_2	84.5 hPa l/s	84.5 hPa l/s	84.5 hPa l/s	84.5 hPa l/s
Electronic drive unit	External drive electronics	External drive electronics	External drive electronics	External drive electronics
Operating voltage	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz
Rotation speed ± 2 %	25000 min^{-1}	25000 min^{-1}	25000 min^{-1}	25000 min^{-1}
Mounting orientation	in any orientation	in any orientation	in any orientation	in any orientation
Ultimate pressure	< $6 \cdot 10^{-9}$ hPa	< $6 \cdot 10^{-9}$ hPa	< $6 \cdot 10^{-9}$ hPa	< $6 \cdot 10^{-9}$ hPa
Weight	85 (pump) + 8 (controller) kg	85 (pump) + 8 (controller) kg	85 (pump) + 8 (controller) kg	85 (pump) + 8 (controller) kg
Run-up time	< 10 min	< 10 min	< 10 min	< 10 min
Corrosive gas version			YES	YES
Cooling method	Water	Water	Water	Water
Cooling water temperature	15-25 °C	15-25 °C	15-25 °C	
Cooling water consumption	1.0 l/min	1.0 l/min	1.0 l/min	1.0 l/min
Bearing	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated
Power consumption at ultimate pressure	400 W	400 W	400 W	
Cooling water temperature max.	40 °C	40 °C	40 °C	
Sound pressure level	≤ 45 dB (A)	≤ 45 dB (A)	≤ 45 dB (A)	≤ 45 dB (A)
Interfaces	Via External drive electronics	Via External drive electronics	Via External drive electronics	Via External drive electronics
Order number pump Pumpe	**U2662100**	**U26A2100**	**U6662100**	**U66A2100**

Accessories	ATH 2800 M, DN 250 ISO-F, External drive electronics, Water cooled, Non-heated	ATH 2800 M, VG 250, External drive electronics, Water cooled, Non-heated	ATH 2800 MT, DN 250 ISO-F, External drive electronics, Water cooled, Heated	ATH 2800 MT, VG 250, External drive electronics, Water cooled, Heated
Order number pump Pumpe	**U2662100**	**U26A2100**	**U6662100**	**U66A2100**
Power supplies/power				
Magpower drive electronic	**120917**	**120917**	**120917**	**120917**
Cabel for mains connection				
Mains cable 2,5 m Euro-style safety plug 200 - 240 V WS	**A328405**	**A328405**	**A328405**	**A328405**
Mains cable 2,5 m UL plug 200 - 240 V WS	**A331729**	**A331729**	**A331729**	**A331729**
Connection cable				
Interconnecting cable (pump to Magpower external drive electronics), L = 1,0 m	**A215300-010-C6-D**	**A215300-010-C6-D**	**A215300-010-C6-D**	**A215300-010-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 3,5 m	**A215300-035-C6-D**	**A215300-035-C6-D**	**A215300-035-C6-D**	**A215300-035-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 5,0 m	**A215300-050-C6-D**	**A215300-050-C6-D**	**A215300-050-C6-D**	**A215300-050-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 10,0 m	**A215300-100-C6-D**	**A215300-100-C6-D**	**A215300-100-C6-D**	**A215300-100-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 20,0 m	**A215300-200-C6-D**	**A215300-200-C6-D**	**A215300-200-C6-D**	**A215300-200-C6-D**
Venting accessories				
Venting valve (for OBC V4 and Magpower)	**114280**	**114280**	**114280**	
Valve cable (Magpower external drive electronics to venting valve), L = 1,0 m	**A462403-010**	**A462403-010**	**A462403-010**	**A462403-010**
Valve cable (Magpower external drive electronics to venting valve), L = 3,5 m	**A462403-035**	**A462403-035**	**A462403-035**	**A462403-035**
Valve cable (Magpower external drive electronics to venting valve), L = 5,0 m	**A462403-050**	**A462403-050**	**A462403-050**	**A462403-050**
Valve cable (Magpower external drive electronics to venting valve), L = 10,0 m	**A462403-100**	**A462403-100**	**A462403-100**	**A462403-100**
Valve cable (Magpower external drive electronics to venting valve), L=20,0m	**A462403-200**	**A462403-200**	**A462403-200**	**A462403-200**
Cooling accessories				
Water valve cable (for MT pumps only), L=1,0m			**A462401-010**	**A462401-010**
Water valve cable (for MT pumps only), L=3,5m			**A462401-035**	**A462401-035**
Water valve cable (for MT pumps only), L=5,0m			**A462401-050**	**A462401-050**
Water valve cable (for MT pumps only), L=10,0m			**A462401-100**	**A462401-100**
Water valve cable (for MT pumps only), L=20,0m			**A462401-200**	**A462401-200**
Heating accessories				
Heater band cable (for MT pumps only), L=1,0m			**A460082-010**	**A460082-010**
Heater band cable (for MT pumps only), L=3,5m			**A460082-035**	**A460082-035**
Heater band cable (for MT pumps only), L=5,0m			**A460082-050**	**A460082-050**
Heater band cable (for MT pumps only), L=10,0m			**A460082-100**	**A460082-100**
Heater band cable (for MT pumps only), L=20,0m			**A460082-200**	**A460082-200**
General accessories				
Purge valve, 25 sccm	**118900**	**118900**	**118900**	**118900**
Purge valve, 50 sccm	**111921**	**111921**	**111921**	**111921**
Stainless inlet screen kit	**112128**	**112128**	**112128**	**112128**
Dust filter	**106229**	**106229**	**106229**	**106229**
Mounting materials				
Set of screws	**110676S**		**110676S**	
Set of screws with Centering ring	**110034**	**113189**	**110034**	**113189**

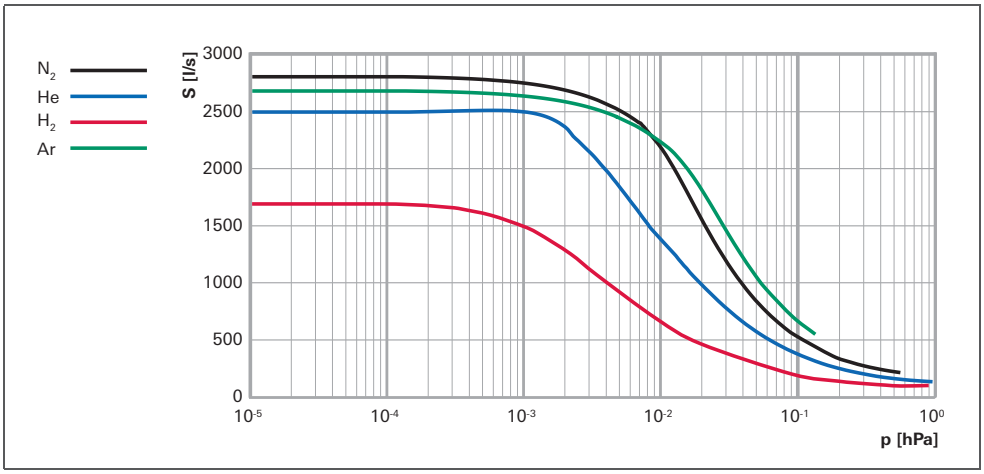
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ATH 3200 M



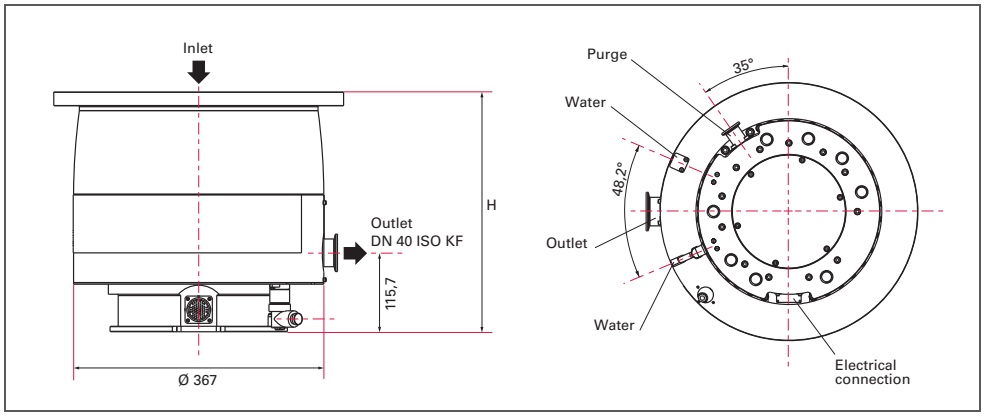
- Operation with Magpower external drive electronics
- Installation in any orientation
- Water cooled
- CE marked and ROHS compliant
- Heated version (MT) available for corrosive applicaitons.

Pumping speed



ATH 3200 M

Dimensions (in mm)



ATH 3200 M

	ATH 3200 M, DN 320 ISO-F	ATH 3200 M, VG 350
H	351,4 mm	351,4 mm

Technical data	ATH 3200 M, DN 320, ISO-F, External drive electronics, Water cooled, Non-heated	ATH 3200 M, VG 350, External drive electronics, Water cooled, Non-heated	ATH 3200 MT, DN 320 ISO-F, External drive electronics, Water cooled, Heated	ATH 3200 MT, VG 350, External drive electronics, Water cooled, Heated
Connection nominal diameter				
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 320 ISO-F	VG 350	DN 320 ISO-F	VG 350
Pumping speed				
Pumping speed for Ar	2700 l/s	2700 l/s	2700 l/s	2700 l/s
Pumping speed for H_2	1700 l/s	1700 l/s	1700 l/s	1700 l/s
Pumping speed for He	2500 l/s	2500 l/s	2500 l/s	2500 l/s
Pumping speed for N_2	2800 l/s	2800 l/s	2800 l/s	2800 l/s
Compression				
Compression ratio for Ar	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
Compression ratio for H_2	$> 2 \cdot 10^3$	$> 2 \cdot 10^3$	$> 2 \cdot 10^3$	$> 2 \cdot 10^3$
Compression ratio for He	$> 3 \cdot 10^4$	$> 3 \cdot 10^4$	$> 3 \cdot 10^4$	$> 3 \cdot 10^4$
Compression ratio for N_2	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
Fore-vacuum max. for N_2	2.1 hPa	2.1 hPa	2.1 hPa	2.1 hPa
Gas througput				
Gas throughput at full rotational speed for Ar, heated pump at 75 C			11.8 hPa l/s	11.8 hPa l/s
Gas throughput at full rotational speed for H_2, heated pump at 75 C			> 16.9 hPa l/s	> 16.9 hPa l/s
Gas throughput at full rotational speed for N_2, heated pump at 75 C			16.9 hPa l/s	16.9 hPa l/s
Gas throughput for Ar	> 37.2 hPa l/s	> 37.2 hPa l/s	> 37.2 hPa l/s	> 37.2 hPa l/s
Gas throughput for H_2	> 84.5 hPa l/s	> 84.5 hPa l/s	> 84.5 hPa l/s	> 84.5 hPa l/s
Gas throughput for He	> 84.5 hPa l/s	> 84.5 hPa l/s	> 84.5 hPa l/s	> 84.5 hPa l/s
Gas throughput for N_2	84.5 hPa l/s	84.5 hPa l/s	84.5 hPa l/s	84.5 hPa l/s
Electronic drive unit	External drive electronics	External drive electronics	External drive electronics	External drive electronics
Operating voltage	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz
Rotation speed ± 2 %	25000 min^{-1}	25000 min^{-1}	25000 min^{-1}	25000 min^{-1}
Mounting orientation	in any orientation	in any orientation	in any orientation	in any orientation
Ultimate pressure	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa
Weight	85 (pump) + 8 (controller) kg	85 (pump) + 8 (controller) kg	85 (pump) + 8 (controller) kg	85 (pump) + 8 (controller) kg
Run-up time	< 10 min	< 10 min	< 10 min	< 10 min
Corrosive gas version			YES	YES
Cooling method	Water	Water	Water	Water
Cooling water temperature	15-25 °C	15-25 °C	15-25 °C	15-25 °C
Cooling water consumption	1.0 l/min	1.0 l/min	1.0 l/min	1.0 l/min
Bearing	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated	Magnetically Levitated
Power consumption at ultimate pressure	400 W	400 W	400 W	400 W
Cooling water temperature max.	40 °C	40 °C	40 °C	40 °C
Sound pressure level	≤ 45 dB (A)	≤ 45 dB (A)	≤ 45 dB (A)	≤ 45 dB (A)
Interfaces	Via External drive electronics	Via External drive electronics	Via External drive electronics	Via External drive electronics
Order number pump Pumpe	**U2C62100**	**U2DA2100**	**U6C62100**	**U6DA2100**

Accessories	ATH 3200 M, DN 320, ISO-F, External drive electronics, Water cooled, Non-heated	ATH 3200 M, VG 350, External drive electronics, Water cooled, Non-heated	ATH 3200 MT, DN 320 ISO-F, External drive electronics, Water cooled, Heated	ATH 3200 MT, VG 350, External drive electronics, Water cooled, Heated
Order number pump Pumpe	**U2C62100**	**U2DA2100**	**U6C62100**	**U6DA2100**
Power supplies/power				
Magpower drive electronic	**120917**	**120917**	**120917**	**120917**
Cabel for mains connection				
Mains cable 2,5 m Euro-style safety plug 200 - 240 V WS	**A328405**	**A328405**	**A328405**	**A328405**
Mains cable 2,5 m UL plug 200 - 240 V WS	**A331729**	**A331729**	**A331729**	**A331729**
Connection cable				
Interconnecting cable (pump to Magpower external drive electronics), L = 1,0 m	**A215300-010-C6-D**	**A215300-010-C6-D**	**A215300-010-C6-D**	**A215300-010-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 3,5 m	**A215300-035-C6-D**	**A215300-035-C6-D**	**A215300-035-C6-D**	**A215300-035-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 5,0 m	**A215300-050-C6-D**	**A215300-050-C6-D**	**A215300-050-C6-D**	**A215300-050-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 10,0 m	**A215300-100-C6-D**	**A215300-100-C6-D**	**A215300-100-C6-D**	**A215300-100-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 20,0 m	**A215300-200-C6-D**	**A215300-200-C6-D**	**A215300-200-C6-D**	**A215300-200-C6-D**
Venting accessories				
Venting valve (for OBC V4 and Magpower)	**114280**	**114280**	**114280**	**114280**
Valve cable (Magpower external drive electronics to venting valve), L = 1,0 m	**A462403-010**	**A462403-010**	**A462403-010**	**A462403-010**
Valve cable (Magpower external drive electronics to venting valve), L = 3,5 m	**A462403-035**	**A462403-035**	**A462403-035**	**A462403-035**
Valve cable (Magpower external drive electronics to venting valve), L = 5,0 m	**A462403-050**	**A462403-050**	**A462403-050**	**A462403-050**
Valve cable (Magpower external drive electronics to venting valve), L = 10,0 m	**A462403-100**	**A462403-100**	**A462403-100**	**A462403-100**
Valve cable (Magpower external drive electronics to venting valve), L=20,0m	**A462403-200**	**A462403-200**	**A462403-200**	**A462403-200**
Cooling accessories				
Water valve cable (for MT pumps only), L=1,0m			**A462401-010**	**A462401-010**
Water valve cable (for MT pumps only), L=3,5m			**A462401-035**	**A462401-035**
Water valve cable (for MT pumps only), L=5,0m			**A462401-050**	**A462401-050**
Water valve cable (for MT pumps only), L=10,0m			**A462401-100**	**A462401-100**
Water valve cable (for MT pumps only), L=20,0m			**A462401-200**	**A462401-200**
Heating accessories				
Heater band cable (for MT pumps only), L=1,0m			**A460082-010**	**A460082-010**
Heater band cable (for MT pumps only), L=3,5m			**A460082-035**	**A460082-035**
Heater band cable (for MT pumps only), L=5,0m			**A460082-050**	**A460082-050**
Heater band cable (for MT pumps only), L=10,0m			**A460082-100**	**A460082-100**
Heater band cable (for MT pumps only), L=20,0m			**A460082-200**	**A460082-200**
General accessories				
Purge valve, 25 sccm	**118900**	**118900**	**118900**	**118900**
Purge valve, 50 sccm	**111921**	**111921**	**111921**	**111921**
Stainless inlet screen kit	**112132**	**114683**	**112132**	**114683**
Dust filter	**106229**	**106229**	**106229**	**106229**
Mounting materials				
Set of screws with Centering ring	**113189**	**113189**	**113189**	**113189**

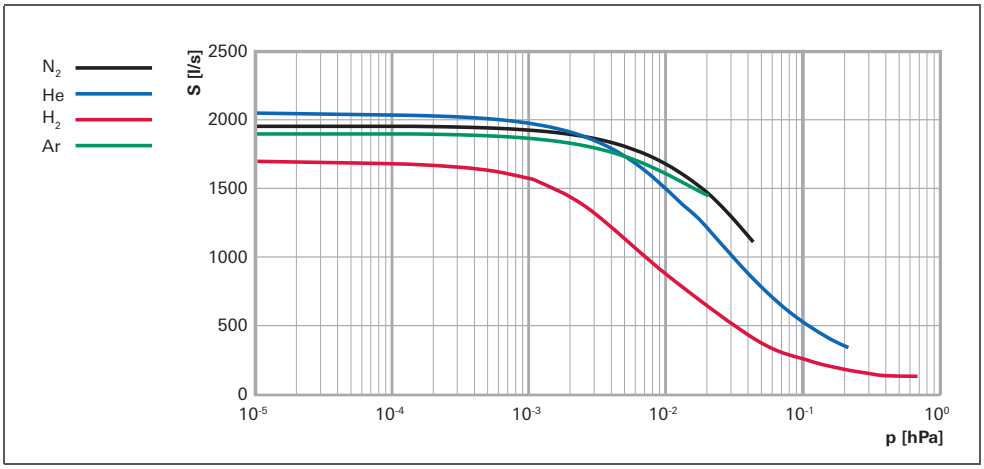
Content

ATP 2300 M



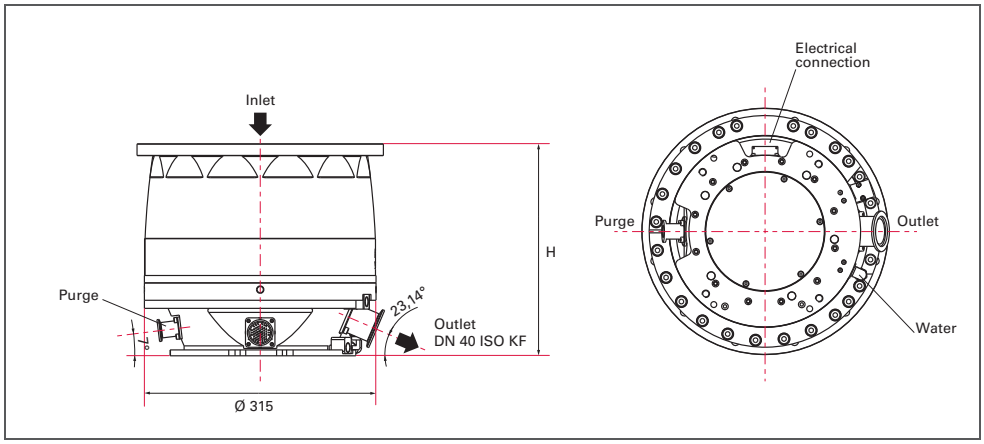
- Operation with integrated OBC drive electronics or Magpwer external drive electronics
- Installation in any orientation
- Water cooled
- CE marked and ROHS compliant
- Designed especially for light gas pumping applications

Pumping speed



ATP 2300 M

Dimensions (in mm)



ATP 2300 M

	ATP 2300 M, DN 250 ISO-F	ATP 2300 M, DN 250 CF-F
H	289,2 mm	333,2 mm

Technical data	ATP 2300 M, DN 250 ISO-F	ATP 2300 M, DN 250 CF-F
Connection nominal diameter		
Flange (out)	DN 40 ISO-KF	DN 40 ISO-KF
Flange (in)	DN 250 ISO-F	DN 250 CF-F
Pumping speed		
Pumping speed for Ar	1900 l/s	1900 l/s
Pumping speed for H_2	1700 l/s	1700 l/s
Pumping speed for He	2050 l/s	2050 l/s
Pumping speed for N_2	1950 l/s	1950 l/s
Compression		
Compression ratio for Ar	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
Compression ratio for H_2	$> 7 \cdot 10^3$	$> 7 \cdot 10^3$
Compression ratio for He	$> 1 \cdot 10^5$	$> 1 \cdot 10^5$
Compression ratio for N_2	$> 1 \cdot 10^8$	$> 1 \cdot 10^8$
Fore-vacuum max. for N_2	2.1 hPa	2.1 hPa
Gas througput		
Gas throughput for Ar	15.2 hPa l/s	15.2 hPa l/s
Gas throughput for H_2	> 50.7 hPa l/s	> 50.7 hPa l/s
Gas throughput for He	> 50.7 hPa l/s	> 50.7 hPa l/s
Gas throughput for N_2	37.2 hPa l/s	37.2 hPa l/s
Operating voltage	200-240 V AC, 50/60 Hz	200-240 V AC, 50/60 Hz
Rotation speed ± 2 %	31000 min^{-1}	31000 min^{-1}
Mounting orientation	in any orientation	in any orientation
Ultimate pressure	$< 6 \cdot 10^{-9}$ hPa	$< 6 \cdot 10^{-9}$ hPa
Weight	52 (pump) + 8 (controller) kg	52 (pump) + 8 (controller) kg
Run-up time	< 8 min	< 8 min
Cooling method	Water	Water
Cooling water temperature	15-25 °C	15-25 °C
Cooling water consumption	1.0 l/min	1.0 l/min
Bearing	Magnetically Levitated	Magnetically Levitated
Power consumption at ultimate pressure	350 W	350 W
Cooling water temperature max.	40 °C	40 °C
Sound pressure level	≤ 46 dB (A)	≤ 46 dB (A)
Interfaces	Via External drive electronics	Via External drive electronics
Protection category	IP 54	IP 54

Order number pump Pumpe		
External drive electronics	**T2662100**	**T2622100**
OBC V4 Profibus	**TN66215A**	**TN62215A**
OBC V4 DeviceNet	**TL66215A**	**TL62215A**
OBC V4 Remote	**TJ66215A**	**TJ62215A**

Accessories	ATP 2300 M, DN 250 ISO-F	ATP 2300 M, DN 250 CF-F
Order number pump Pumpe	**T2662100 TN66215A TL66215A TJ66215A**	**T2622100 TN62215A TL62215A TJ62215A**
Power supplies/power		
Magpower drive electronic	**120917**	**120917**
Cabel for mains connection		
Mains cable 2,5 m Euro-style safety plug 200 - 240 V WS	**A328405**	**A328405**
Mains cable 2,5 m UL plug 200 - 240 V WS	**A331729**	**A331729**
Connection cable		
Interconnecting cable (pump to Magpower external drive electronics), L = 1,0 m	**A215300-010-C6-D**	**A215300-010-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 3,5 m	**A215300-035-C6-D**	**A215300-035-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 5,0 m	**A215300-050-C6-D**	**A215300-050-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 10,0 m	**A215300-100-C6-D**	**A215300-100-C6-D**
Interconnecting cable (pump to Magpower external drive electronics), L = 20,0 m	**A215300-200-C6-D**	**A215300-200-C6-D**
Venting accessories		
Venting valve (for OBC V4 and Magpower)	**114280**	**114280**
Valve cable (Magpower external drive electronics to venting valve), L = 1,0 m	**A462403-010**	**A462403-010**
Valve cable (Magpower external drive electronics to venting valve), L = 3,5 m	**A462403-035**	**A462403-035**
Valve cable (Magpower external drive electronics to venting valve), L = 5,0 m	**A462403-050**	**A462403-050**
Valve cable (Magpower external drive electronics to venting valve), L = 10,0 m	**A462403-100**	**A462403-100**
Valve cable (Magpower external drive electronics to venting valve), L=20,0m	**A462403-200**	**A462403-200**
General accessories		
Purge valve, 25 sccm	**118900**	**118900**
Purge valve, 50 sccm	**111921**	**111921**
Aluminum inlet screen	**111640**	**111640**
Stainless inlet screen kit	**108762**	**108762**
Dust filter	**106229**	**106229**
Mounting materials		
Set of screws	**110676S**	**118690**
Set of screws with Centering ring	**110034**	

Electronic controllers

Electronics for optimum maglev turbo pump control, minimum physical size and matching electrical supply rating offer maximum reliability. Control and display units for setting and monitoring the operating parameters of the turbopumps. Compact mounting with integrated drive electronics (OBC V4) and external drive electronics (Magpower) are available.

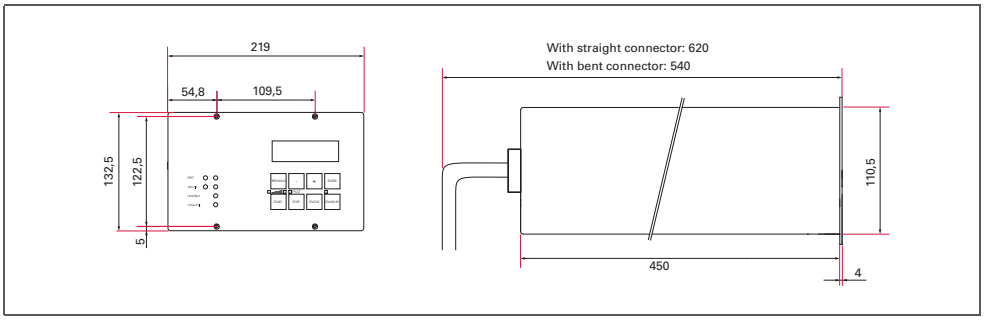
Magpower



Magpower controller

- Digital external drive electronics for ATH-M and ATP-M maglev pumps (except ATH 500 series)
- Compact 1/2 (of 19") rack size
- Full interchangeability to any ATH-M and ATP-M pumps
- CE marked and ROHS compliant

Dimensions (in mm)



Magpower external drive electronics

Technical data	Magpower controller
Dimensions (L x W x H)	450 x 219 x 132.5 mm
Weight	8.7 kg
Power consumption housing heater	0.25 kW
Mains requirement: power consumption	16 A
Power supply frequency	50 to 60 Hz
Power supply voltage	200 to 240 V
Ambient temperature	≤ 40 °C

Order number	
Magpower external drive electronics	**120917**

HHR



Hand Held Remote (HHR) with cable

- Hand held remote controller and display unit for operating the turbopump parameters. For pump OBC V4 integrated drive electronics and ATH500M.
- Compact size, with cable connection
- Power supplied exclusively from the pump controller
- CE marked and ROHS compliant

Technical data	Hand Held Remote (HHR) with cable
Weight	0.6 (with cable) kg

Order number	
Hand Held Remote (HHR) with cable	**114461**

Power supply

External power supply for ATH 500 M/MT

- Provide stable power supply for ATH 500 M during operation
- External power supply
- 48 V DC output
- Delivered without power cable
- CE marked and ROHS compliant

Technical data	External power supply for ATH 500 M/MT
Output voltage	48 V
Weight	6.0 kg
Power supply frequency	50 to 60 Hz
Power supply voltage	200 to 240 V

Order number	
External power supply for ATH 500 M/MT	**114866**

Interconnecting cable (pump to Magpower external drive electronics)

Interconnecting cable between pump and external drive electronics (not needed for pump equipped with integrated drive electronics OBC V4). Standard cable lengths are listed. For customized cables, please consult us.

- Between pump and Magpower external drive electronics. Not required for OBC V4 equipped pumps.
- For all ATH-M and ATP-M series pumps except ATH 500 M

Interconnecting cable (pump to Magpower external drive electronics)	Order number
Interconnecting cable (pump to Magpower external drive electronics), L = 1.0 m	A215300-010-C6-D
Interconnecting cable (pump to Magpower external drive electronics), L = 3.5 m	A215300-035-C6-D
Interconnecting cable (pump to Magpower external drive electronics), L = 5.0 m	A215300-050-C6-D
Interconnecting cable (pump to Magpower external drive electronics), L = 10.0 m	A215300-100-C6-D
Interconnecting cable (pump to Magpower external drive electronics), L = 20.0 m	A215300-200-C6-D

Valve cable (external drive electronics to venting valve)

Interconnecting cable between controller and venting valve (not needed for pump equipped with integrated drive electronics OBC V4). Standard cable lengths are listed. For customized cables, please consult us.

- Between Magpower external drive electronics and venting valve
- For all ATH-M and ATP-M series pumps except ATH 500 M

Valve cable (external drive electronics to venting valve)	Order number
Valve cable (Magpower external drive electronics to venting valve), L = 1.0 m	A462403-010
Valve cable (Magpower external drive electronics to venting valve), L = 3.5 m	A462403-035
Valve cable (Magpower external drive electronics to venting valve), L = 5.0 m	A462403-050
Valve cable (Magpower external drive electronics to venting valve), L = 10.0 m	A462403-100
Valve cable (Magpower external drive electronics to venting valve), L = 20.0 m	A462403-200

Heater band cables and water valve cables

Interconnecting cables between controller and heater band / water valve (not needed for pump equipped with integrated drive electronics OBC V4). Only for heated pumps of the MT series. Standard cable lengths are listed. For customized cables, please consult us.

- Interconnecting cable between Magpower external drive electronics and heater band
- For all ATH-MT series (temperature controlled) pumps except ATH 500 MT

	Heater band cable (for MT pumps only), L = 1.0 m	Heater band cable (for MT pumps only), L = 3.5 m	Heater band cable (for MT pumps only), L = 5.0 m	Heater band cable (for MT pumps only), L = 10.0 m	Heater band cable (for MT pumps only), L = 20.0 m
Power supply frequency	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz
Power supply voltage	200 to 240 V	200 to 240 V	200 to 240 V	200 to 240 V	200 to 240 V
Order number	**A460082-010**	**A460082-035**	**A460082-050**	**A460082-100**	**A460082-200**

	Water valve cable (for MT pumps only), L = 1.0 m	Water valve cable (for MT pumps only), L = 3.5 m	Water valve cable (for MT pumps only), L = 5.0 m	Water valve cable (for MT pumps only), L = 10.0 m	Water valve cable (for MT pumps only), L = 20.0 m
Power supply voltage	24 V	24 V	24 V	24 V	24 V
Order number	**A462401-010**	**A462401-035**	**A462401-050**	**A462401-100**	**A462401-200**

Mounting kits

Mounting bolts for ATH-M series installation. It is extremely important to use the designated high strength mounting materials and follow the installation safety instructions described in the operating manual. For any special mounting configuration request, please consult us.

- High strength turbopump mounting kit

Mounting kits	Order number
Mounting bolts for ISO-F (for ATH 500 M, DN160; ATH 1600 M, DN 200/250; ATH 2300 M, DN 250; ATH 2800 M, DN 250) without centering ring	**110676S**
Mounting bolts for ISO-F (for ATH 1600 M, DN 200/250) with centering ring	**110675**
Mounting bolts for ISO-F (for ATH 2300 M, DN 250; ATH 2800 M, DN 250) with centering ring	**110034**
Mounting bolts for ISO-F (for ATH 2300 M, DN 200) with centering ring	**114510**
Mounting bolts for ISO-F and VG (for ATH 2800 M, VG 250; ATH 3200 M, DN 320 / VG 350) with centering ring	**113189**
Mounting bolts for ISO-K (for ATH 500 M, DN 160)	**117996**
Mounting bolts for CF-F (for ATH 500 M, DN100/160; ATH 2300 M, DN 200/250)	**118690**
Mounting bolts for CF-F (for ATH 1600 M, DN 200)	**111664**
Mounting bolts for CF-F (for ATH 1600 M, DN 250)	**111665**

Power cord

Power supply cord to the drive electronics

Power cord	Order number
Power cord 2.5 m Europe standard 200 - 240 V AC	**A328405**
Power cord 2.5 m US standard 200 - 240 V AC	**A331729**
Power cord 3.5 m 48 V DC (for ATH 500 M)	**A331328-035**
Power cord 2.0 m Europe standard 200 - 240 V AC 48 VDC power supply (for ATH500M)	**103566**
Power cord 2.0 m US standard 200 - 240 V AC 48 VDC power supply (for ATH500M)	**103567**

Venting valves and other accessories

Venting valves, purge valves, air filters and associated accessories for ATH M series are found here.

Venting valves and other accessories	Order number
Air cooling kit (for ATH 500 M)	**118543S**
Purge valve kit 24 DVC (for ATH 500 M)	**115303S**
Purge plug with O-ring (for ATH 500 M)	**115298S**
Purge flow reduction device DN16 25 sccm	**066950**
Purge flow reduction device DN16 50 sccm	**066752**
Purge valve 25 sccm	**118900**
Purge valve 50 sccm	**111921**
Air venting valve (for OBC V4 and Magpower)	**114280**
Air venting valve (for ATH 500 M)	**200043**
Dust filter	**106229**
Water inlet valve 24 V DC	**108668**

Inlet screen

All ATH-M and ATP-M series are delivered with stainless inlet screens. The screen protects the pump against solid particles accidentally falling into the high speed rotating turbopump. It is important to protect the pump during the operation. The screen is integrated into the pump housing. For any special screen size, mesh size, or shape, please consult us.

- The screen protects the pump against solid particles
- It is integrated into the pump housing
- All ATH-M and ATP-M pumps are delivered with inlet screen

	Stainless inlet screen kit for DN100	Stainless inlet screen kit for DN160	Stainless inlet screen kit for DN200 - M 4.5	Stainless inlet screen kit for DN250 - M 5
Flange	DN100	DN160	DN200	DN250
Mesh	5 mm	5 mm	4,5 mm	5 mm
Material	Stainless	Stainless	Stainless	Stainless
Order number	**118001**	**118002**	**108872**	**108762**

	Stainless inlet screen kit for DN250 - M 8	Stainless inlet screen kit for DN320 - M 8	Stainless inlet screen kit for DN350 - M 8
Flange	DN250	DN320	DN350
Mesh	8 mm	8 mm	8 mm
Material	Stainless	Stainless	Stainless
Order number	**112128**	**112132**	**114683**

	Aluminum inlet screen kit for DN200	Aluminum inlet screen kit for DN250
Flange	DN200	DN200
Mesh	4,5 mm	5 mm
Material	Aluminum	Aluminum
Order number	**109200**	**111640**

Rotatable flange

Rotatable flanges are available for ISO-K and CF-F housing installation. For more information, please consult the general catalog.

- Rotatable flange for pump mounting

Rotatable flange	Order number
Rotatable flange DN100 ISO-K	**068348**
Rotatable flange DN160 ISO-K	**068088**
Rotatable flange DN100 CF-F	**303127**
Rotatable flange DN160 CF-F	**303129**
Rotatable flange DN200 CF-F	**303131**
Rotatable flange DN250 CF-F	**303133**

SplitFlow®

The ideal turbopump for mass spectrometry and electron microscopy



Differentially pumped vacuum solutions
Turbopumps from Pfeiffer Vacuum with more than one vacuum port are called SplitFlow. They are an economical alternative to discrete pumps for a number of multi-chamber systems. Applications, which are mainly found in analytics, are referred to as differentially pumped systems.
Features such as compact design, reliability, cost efficiency and flexible design are vital for this purpose. A SplitFlow pump can provide all of the above.

We work hand in hand with our customers in a joint development process to find the best possible solution. Customer-specific solutions developed by creating vacuum calculations and designs using state-of-the-art calculation procedures are important components of Pfeiffer Vacuum expertise. We have an extensive and flexible modular system on hand to put the resulting solution into practice. A SplitFlow pump can be created from tried and tested core components so that a cost-effective and reliable product is available after only a short development period.

Customer benefits
- Cost savings by replacing several discrete pumps with just one single SplitFlow pump
- Improved reliability through reduced number of components
- Smaller dimensions through very compact design
- Reduced power requirement, less installation work and reduced service costs
- Optimal adjustment of the vacuum performance
- Noise and vibration-optimized design for highly sensitive applications
- UL certification

Typical applications
- Electron microscopy
- Mass spectrometry
- Leak detection



Electron microscopy



Leak detection



a) Standard HiPace pump



b) SplitFlow pump

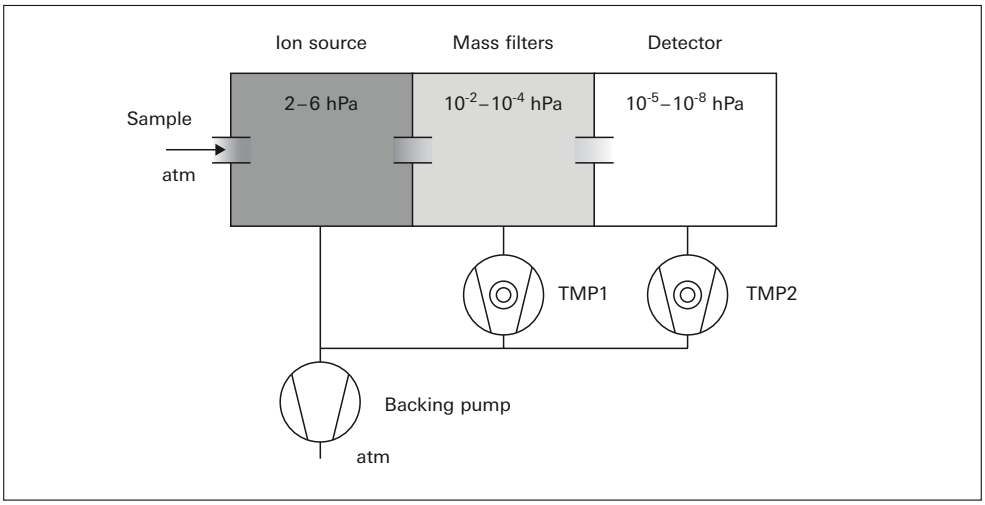
There are two types that can be used:

a) Any standard HiPace pump with an additional side tap for all sizes and flange types

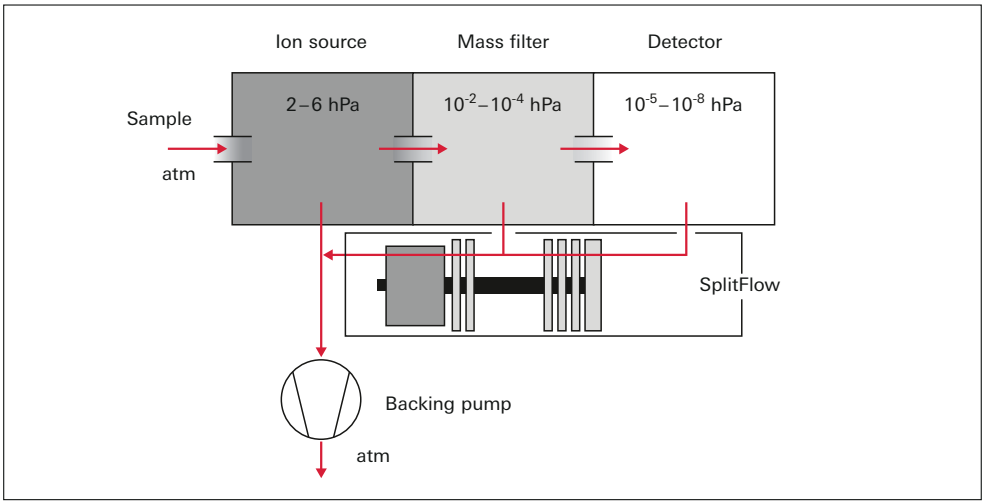
b) SplitFlow pump with customer-specific dimensions and flange arrangement

These SplitFlow pumps are available with pumping speeds of up to 500 l/s. They can be designed for pressure ranges of up to 10^{-11} hPa. Due to the proven bearing system, with a ball bearing on the fore-vacuum side and a permanent magnetic bearing on the high vacuum side, very long rotors with several packs of rotor discs are possible. An optimal adaptation of the pumps to the size and required number of vacuum ports is possible for a number of applications.

A mass spectrometer provides an excellent illustration of the SplitFlow technology.



Schematic drawing of a mass spectrometer with discrete turbomolecular pumps



Schematic drawing of a mass spectrometer with SplitFlow pump

Service
The service concepts for SplitFlow pumps offer great flexibility and can be adjusted to meet customer needs. Maintenance intervals of up to four years are possible.

Drive concepts
SplitFlow pumps can be selected with any type of Pfeiffer Vacuum drive electronics. Both 24 V and 48 V power supply versions are available. Customer-specific parameterization of the drive electronic units can be carried out in the factory before delivery.

Extensive accessories
- Fans
- Venting and sealing gas valves
- Vacuum gauges
- Protective screens and splinter shields
- Special cables
- Power supply packs
- Valves
- Relay box

Complete vacuum solution
Pfeiffer Vacuum provides you with a complete customer-specific vacuum solution from a single source:

Vacuum chamber + SplitFlow turbopump + backing pump + gauges + valves + fasteners

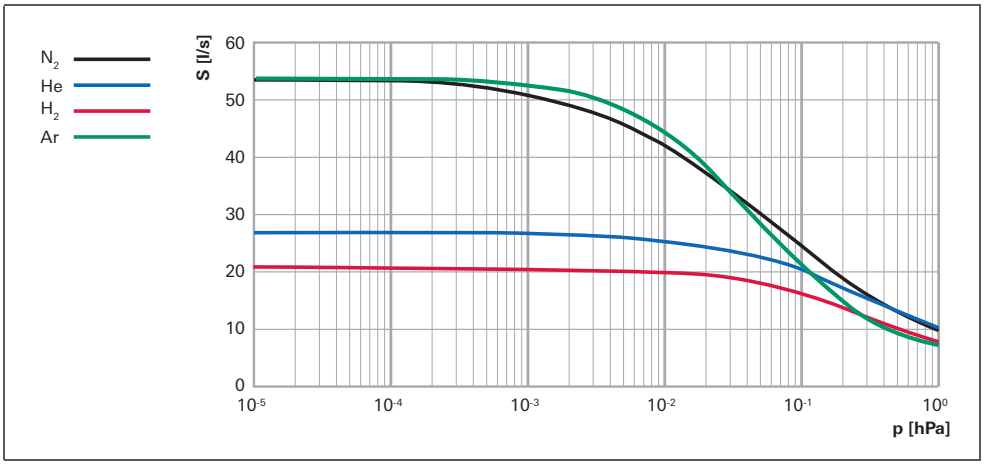
Save time and money and benefit from our years of experience, paired with optimally matched high quality products.

SplitFlow™ 50



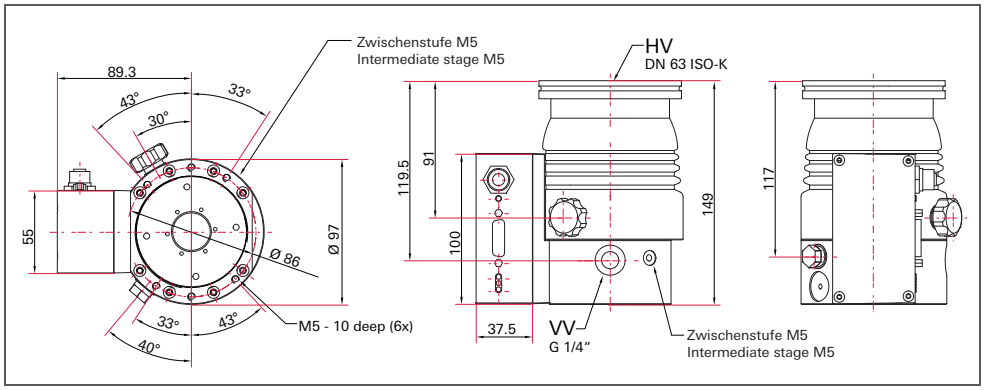
- Small yet powerful turbopump based on HiPace technology
- With a pumping speed up to 53 l/s for N_2 at the high vacuum flange and 0,15 l/s at interstage pumping
- Integrated TC 110 drive electronics
- For installation in any orientation
- Ideal for analytical applications such as leak detection and mass spectrometry
- Extensive accessories expand the range of applications

Pumping speed

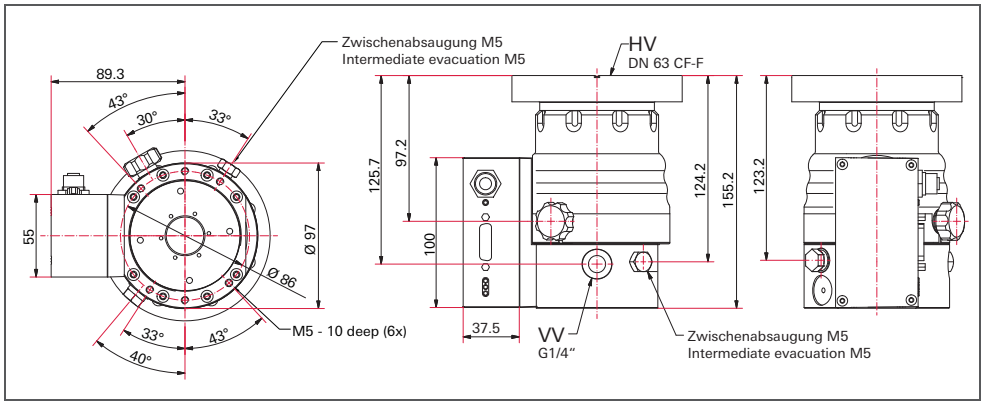


SplitFlow™ 50

Dimensions (in mm)



SplitFlow™ 50 with TC 110, DN 63 ISO-K



SplitFlow™ 50 with TC 110, DN 63 CF-F

Technical data	SplitFlow™ 50 with TC 110, DN 63 ISO-K	SplitFlow™ 50 with TC 110, DN 63 CF-F
Connection nominal diameter		
Flange (out)	G 1/4"	G 1/4"
Flange (in)	DN 63 ISO-K	DN 63 CF-F
Flange (interstage pumping)	M5	M5
Venting connection	G 1/8"	G 1/8"
Pumping speed (without gas ballast)		
Pumping speed (interstage pumping) for Ar	0.13 l/s	0.13 l/s
Pumping speed (interstage pumping) for H_2	0.3 l/s	0.3 l/s
Pumping speed (interstage pumping) for He	0.16 l/s	0.16 l/s
Pumping speed (interstage pumping) for N_2	0.15 l/s	0.15 l/s
Pumping speed for Ar	53 l/s	53 l/s
Pumping speed for H_2	21 l/s	21 l/s
Pumping speed for He	27 l/s	27 l/s
Pumping speed for N_2	53 l/s	53 l/s
Compression		
Compression ratio (interstage pumping/ fore-vacuum) for Ar	$1.50 \cdot 10^3$	$1.50 \cdot 10^3$
Compression ratio (interstage pumping/ fore-vacuum) for H_2	$2 \cdot 10^1$	$2 \cdot 10^1$
Compression ratio (interstage pumping/ fore-vacuum) for He	$5 \cdot 10^1$	$5 \cdot 10^1$
Compression ratio (interstage pumping/ fore-vacuum) for N_2	$9 \cdot 10^2$	$9 \cdot 10^2$
Compression ratio for Ar	$2.10 \cdot 10^8$	$2.10 \cdot 10^8$
Compression ratio for H_2	$1.30 \cdot 10^4$	$1.30 \cdot 10^4$
Compression ratio for He	$1.8 \cdot 10^5$	$1.8 \cdot 10^5$
Compression ratio for N_2	$1 \cdot 10^8$	$1 \cdot 10^8$
Fore-vacuum max. for N_2	20 hPa	20 hPa
Gas througput		
Gas throughput at full rotational speed for Ar	0.46 hPa l/s	0.46 hPa l/s
Gas throughput at full rotational speed for H_2	110 hPa l/s	110 hPa l/s
Gas throughput at full rotational speed for He	7.3 hPa l/s	7.3 hPa l/s
Gas throughput at full rotational speed for N_2	1.8 hPa l/s	1.8 hPa l/s
Electronic drive unit	with TC 110	with TC 110
Operating voltage	24 (± 5 %) V DC	24 (± 5 %) V DC
Rotation speed ± 2 %	90000 min^{-1}	90000 min^{-1}
Rotation speed variable	50-100 %	50-100 %
Mounting orientation	in any orientation	in any orientation
Ultimate pressure*	< $4 \cdot 10^{-7}$ hPa	< $4 \cdot 10^{-7}$ hPa
Weight	2.3 kg	3.7 kg
Run-up time	1.3 min	1.3 min
Cooling method, optional	Air/Water	Air/Water
Cooling method, standard	Convection	Convection
Cooling water temperature	5-25 °C	5-25 °C
Cooling water consumption	75 l/h	75 l/h
Bearing	Hybrid	Hybrid
Sound pressure level	≤ 48 dB (A)	≤ 48 dB (A)
Interfaces	RS-485, Remote	RS-485, Remote
Protection category	IP 54	IP 54
Permissible magnetic field max.	3 mT	3 mT
Order number pump Pumpe	**PM P04 340**	**PM P04 342**

*Ultimate pressure please find description on page 272

Accessories	SplitFlow™ 50 with TC 110, DN 63 ISO-K	SplitFlow™ 50 with TC 110, DN 63 CF-F
Order number pump Pumpe	**PM P04 340**	**PM P04 342**
Power supplies/power		
DCU - power supply with display control unit	**PM C01 820** **PM C01 821**	**PM C01 820** **PM C01 821**
TPS - mains pack for wall/standard rail fitting	**PM 061 340 -T** **PM 061 341 -T**	**PM 061 340 -T** **PM 061 341 -T**
TPS - mains packl 19" rack module 3 RU	**PM 061 344 -T** **PM 061 345 -T**	**PM 061 344 -T** **PM 061 345 -T**
Control units		
DCU - Display Control Unit	**PM 061 348 -T**	**PM 061 348 -T**
HPU - Handheld Programming Unit	**PM 051 510 -T**	**PM 051 510 -T**
Accessories for HPU	**PM 061 005 -T**	**PM 061 005 -T**
Mains cable DCU/TPS/TCP, 3 m		
230 V AC mains cable with Euro-style safety plug	**P 4564 309 ZA**	**P 4564 309 ZA**
115 V AC mains cable with UL plug	**P 4564 309 ZE**	**P 4564 309 ZE**
208 V AC mains cable with UL plug	**P 4564 309 ZF**	**P 4564 309 ZF**
Connection cable, length 3 m between		
Connection cable for HiPace with TC 110 to TPS/ DCU 110/111/180/181 with accessorie ports and RS-485	**PM 061 351 -T**	**PM 061 351 -T**
Connection cable for HiPace with TC 110 to power supply TPS/DCU 110/111/180/181	**PM 061 350 -T**	**PM 061 350 -T**
Venting accessories		
Venting valve	**PM Z01 290**	**PM Z01 290**
Air drier TTV 001	**PM Z00 121**	**PM Z00 121**
Cooling accessories		
Air cooling	**PM Z01 300**	**PM Z01 300**
Water cooling	**PM 016 623 -T**	**PM 016 623 -T**
Heating accessories		
Heating jacket 230 V AC, Euro-style safety plug		**PM 061 360 -T**
Heating jacket 208 V AC, UL plug		**PM 061 361 -T**
Heating jacket 115 V AC, UL plug		**PM 061 362 -T**
Backing pump control		
Backing pump relay box, shielded, 1-phase 20 A	**PM 061 373 -T**	**PM 061 373 -T**
TVV 001 backing pump safety valve, 230 V AC	**PM Z01 205**	**PM Z01 205**
TVV 001 backing pump safety valve, 115 V AC	**PM Z01 206**	**PM Z01 206**
TCS 15 for controlling backing pumps	**PM 061 685 -X**	**PM 061 685 -X**

Accessories	SplitFlow™ 50 with TC 110, DN 63 ISO-K	SplitFlow™ 50 with TC 110, DN 63 CF-F
Order number pump Pumpe	**PM P04 340**	**PM P04 342**
General accessories		
Sealing gas valve	**PM Z01 310**	**PM Z01 310**
Sealing gas throttle	**PM Z01 316**	**PM Z01 316**
Centering ring coated	**PM 016 206 -U**	
Centering ring coated with protection screen	**PM 016 208 -U**	
Centering ring coated with splinter shield	**PM 016 207 -U**	
Protection screen		**PM 016 333**
Splinter shield		**PM 016 312**
Vibration dampers	**PM 006 800 -X**	**PM 006 801 -X**
USB/RS-485-Converter	**PM 061 207 -T**	**PM 061 207 -T**
Interface cable 3 m	**PM 061 283 -T**	**PM 061 283 -T**
Y-connector M12 for RS-485	**P 4723 010**	**P 4723 010**
Connection cable RJ 45 on M 12	**PM 051 726 -T**	**PM 051 726 -T**
TCS 11, adapter for TC 110 with interface RS-485	**PM 061 636 -U**	**PM 061 636 -U**
TCS 12, adapter for TC 110 with interface RS-485, 4 accessory ports	**PM 061 638 -U**	**PM 061 638 -U**
Mounting materials		
Centering ring coated, bracket screws	**PM 016 360 -T**	
Centering ring coated with protection screen, bracket screws	**PM 016 362 -T**	
Centering ring coated with splinter shield, bracket screws	**PM 016 361 -T**	
Set of hexagon screws for trough hole (CF-F)		**PM 016 683 -T**
Set of stud screws for tapped hole (CF-F)		**PM 016 684 -T**
Set of stud screws for trough hole (CF)		**PM 016 733 -T**
Centering ring coated DN 63 ISO-K, 4 prackets M8	**PM 016 510 -T**	
Centering ring coated DN 63 ISO-K, 4 prackets M8, protection screen	**PM 016 512 -T**	
Centering ring coated DN 63 ISO-K, 4 prackets M8, splinter shield	**PM 016 511 -T**	

Content

Turbo pumping stations

Modular pumping stations for clean vacuum



HiCube®

With our HiCube® turbo pumping stations we have developed the perfect vacuum solution for a wide range of applications.

The modular design of the HiCube series allows for unprecedented diversity, which meet the demands of pumping speeds ranging from 35 l/s to 685 l/s. Turbopumps and backing pumps are perfectly matched: just "plug-and-play" whenever the need arises.

What makes the HiCube vacuum solution special is the combination of a turbopump from the HiPace series with a backing pump designed specifically to meet the application-specific requirements. We can offer you the new HiCube in the Eco, Classic and Pro versions; available with a dry or oil-sealed backing pump and a final pressure of up to $5 \cdot 10^{-10}$ hPa.

Thanks to their mobility, all HiCube pumping stations provide easy high vacuum generation precisely where it is needed. The robust engineering and the ready-to-connect, fully automated pump unit guarantee maximum reliability.

The use of HiPace allows us to offer you state-of-the-art turbopump technology in a compact pumping station. What you stand to gain is flexibility, high performance, long product life and easy integration into your applications. We can provide the appropriate ISO-KF, ISO-K or CF-F flanges.

Customer benefits

- The combination of turbopump and backing pump are ideally matched; usable for a wide variety of applications
- Modular design allows for easy modification to suit the application
- Service friendly thanks to easy access to the individual components
- Integrated drive electronics, no need for additional controls
- Plug-and-play – no installation or cabling needed
- Long service life and high level of safety thanks to robust design
- Fore-vacuum safety valve (optional) prevents venting of vacuum chambers during power failure
- Direct connection of gauges possible

Typical applications

- Research & Development
- Accelerators
- Analytics
- Surface physics
- Vacuum process technology
- General vacuum applications



Accelerators



Vacuum furnaces



Glass coating

Comparison of pumpdown times HiCube® Classic

Pump-down time to of 1,000 hPa at 1 · 10^{-5} hPa for vacuum chambers with a volume of 10, 100, and 1,000 l (calculated values at 50 Hz, run-up time not taken into account)

Turbopump	Backing pump	10 l	100 l	1,000 l
HiCube® 80 Classic				
HiPace DN 80/DN 63	MVP 040	98 s	978 s	9,778 s
	MVP 070	59 s	594 s	5,941 s
	Duo 3	77 s	774 s	7,737 s
	Duo 5 M	43 s	426 s	4,257 s
HiCube® 300 Classic				
HiPace 300	MVP 040	87 s	867 s	8,670 s
	MVP 070	50 s	499 s	4,992 s
	Duo 3	68 s	682 s	6,820 s
	Duo 5 M	35 s	350 s	3,500 s
HiCube® 400 Classic				
HiPace 400	MVP 040	83 s	–	–
	MVP 070	48 s	485 s	4,847 s
	Duo 3	67 s	669 s	6,691 s
	Duo 5 M	34 s	342 s	3,416 s
HiCube® 700 Classic				
HiPace 700	MVP 040	82 s	–	–
	MVP 070	47 s	474 s	4,743 s
	Duo 3	65 s	653 s	6,534 s
	Duo 5 M	33 s	332 s	3,317 s

Comparison of pumpdown times HiCube® Pro

Pump-down time of 1,000 hPa at 1 · 10^{-5} hPa for vacuum chambers with a volume of 10, 100, and 1,000 l (calculated value at 50 Hz, run-up time not taken into account)

Turbopump	Backing pump	10 l	100 l	1,000 l
HiCube® 80 Pro				
HiPace DN 80, DN 63	ACP 15	21 s	208 s	2,079 s
	ACP 28	12 s	116 s	1,161 s
	Penta 20	13 s	134 s	1,339 s
	Penta 35	10 s	99 s	990 s
HiCube® 300 Pro				
HiPace 300	ACP 15	18 s	178 s	1,780 s
	ACP 28	9 s	91 s	913 s
	Penta 20	9 s	93 s	934 s
	Penta 35	7 s	66 s	663 s
HiCube® 400 Pro				
HiPace 400	ACP 15	18 s	175 s	1,751 s
	ACP 28	9 s	89 s	892 s
	Penta 20	9 s	90 s	898 s
	Penta 35	6 s	64 s	644 s
HiCube® 700 Pro				
HiPace 700	ACP 15	17 s	169 s	1,692 s
	ACP 28	8 s	84 s	836 s
	Penta 20	8 s	84 s	838 s
	Penta 35	6 s	58 s	582 s



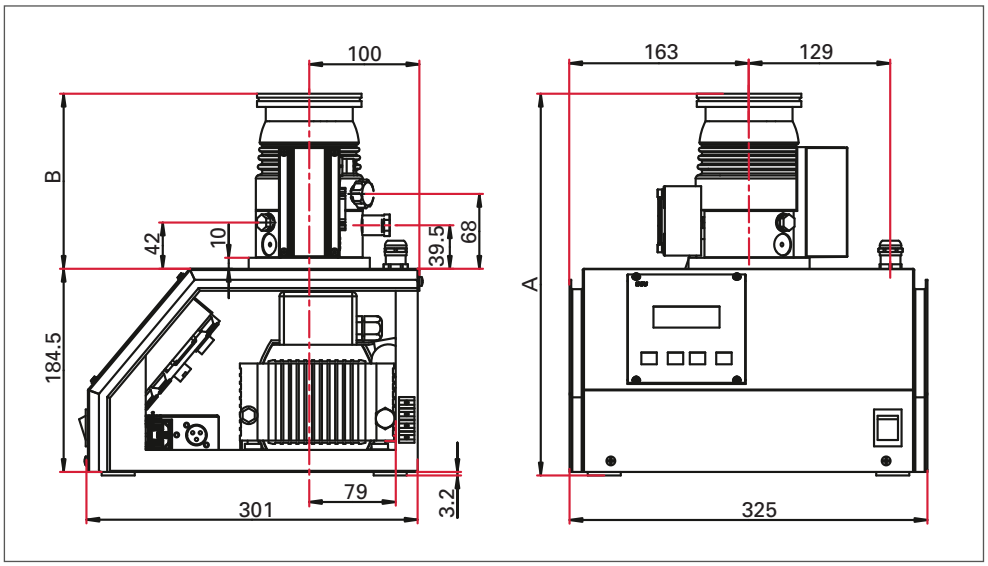
HiCube® Eco

Completely dry[1] turbo pumping station with pumping speeds from 35 to 67 l/s

- Ready-for-use pumping station
- Compact and cost-effective
- Dry high vacuum pumping system with turbopump and diaphragm pump
- Flexible and versatile
- Extensive accessories
- Control unit with direct connection of vacuum gauges possible

[1] Also available with water cooling

Dimensions (in mm)



Technical data	HiCube® Eco DN 40 ISO-KF	HiCube® Eco DN 63 ISO-K/CF-F
Connection flange (inlet)	DN 40 ISO-KF	DN 63 ISO-K/CF-F
Mains requirement: power consumption	230 W	230 W
Mains requirement	110 V, 50/60 Hz; 230 V, 50/60 Hz	110 V, 50/60 Hz; 230 V, 50/60 Hz
Pumping speed for N_2	35 l/s	67 l/s
Backing pump pumping speed at 50 Hz	0.9 m^3/h	0.9 m^3/h
Pumping station components	HiPace 80, MVP 015-2, TPS 110, DCU 002	HiPace 80, MVP 015-2, TPS 110, DCU 002
Ultimate pressure	< 1 · 10^{-7} hPa	< 1 · 10^{-7} hPa
Weight	17 kg	17 kg

Order number		
HiCube® 80 Eco, DN 63 ISO-K, with DCU 002[2]		**PM S03 555**
HiCube® 80 Eco, DN 63 CF-F, with DCU 002[2)]		**PM S03 556**
HiCube® 80 Eco, DN 40 ISO-K, with DCU 002[2]	**PM S03 557**	

[2)] DCU 002 – Display and control device. Allows easy operation and connection of vacuum gauges

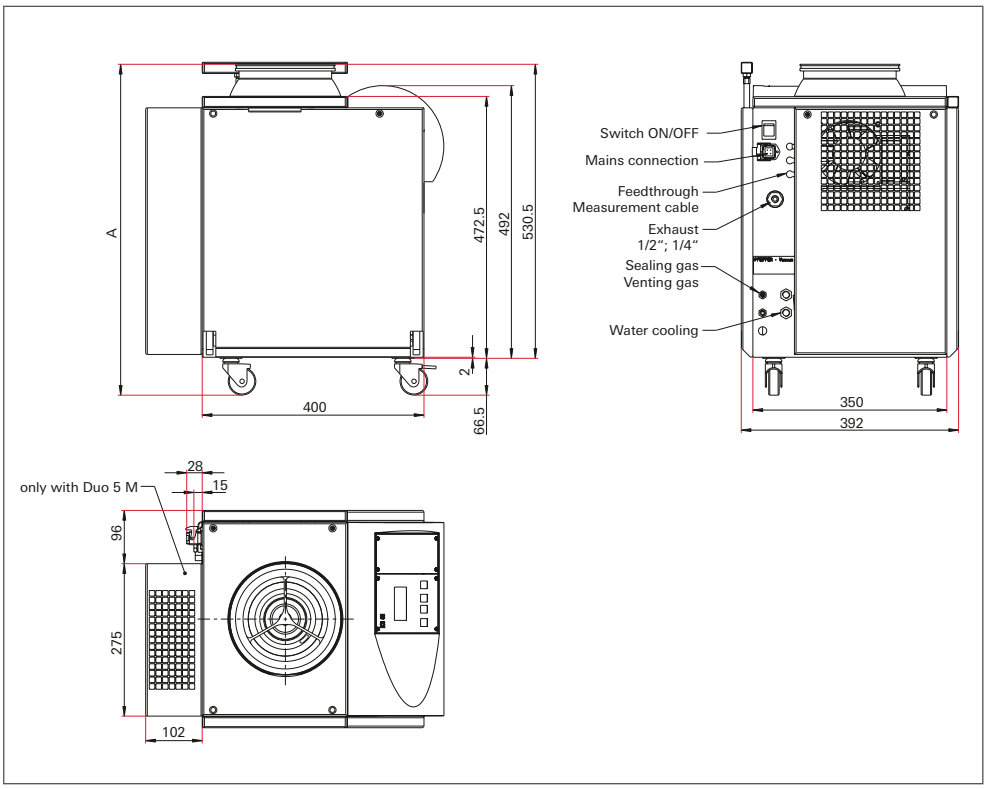


HiCube® Classic

Completely dry or oil-sealed turbo pumping station with pumping speeds from 35 to 685 l/s for short pumpdown times

- Combined pumping station with turbopump and backing pump for all high vacuum applications
- Air-cooled and ready for operation
- Also available with water cooling
- Compact and cost-effective
- Flexible and versatile
- Extensive accessories
- Control unit with integrated gauge connection

Dimensions (in mm)



Turbopump	A
HiPace® 80 DN 40 ISO-KF	590 mm
HiPace® 80 DN 63 ISO-K	581 mm
HiPace® 80 DN 63 CF-F	587 mm
HiPace® 300 DN 100 ISO-KF	580 mm
HiPace® 300 DN 100 CF-F	592 mm
HiPace® 400 DN 100 ISO-KF	624 mm
HiPace® 400 DN 100 CF-F	624 mm
HiPace® 700 DN 160 ISO-KF	597 mm
HiPace® 700 DN 160 CF-F	609 mm

Technical data	HiCube® 80 Classic DN 40 ISO-KF	HiCube® 80 Classic DN 63 ISO-K	HiCube® 80 Classic DN 63 CF-F	HiCube® 300 Classic DN 100 ISO-K	HiCube® 300 Classic DN 100 CF-F
Connection flange (inlet)	DN 40 ISO-KF	DN 63 ISO-K	DN 63 CF-F	DN 100 ISO-K	DN 100 CF-F
Pumping speed for nitrogen N_2	35 l/s	67 l/s	67 l/s	260 l/s	260 l/s
Ultimate pressure					
with DuoLine rotary vane pump	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa
with MVP diaphragm pump	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-8}$ hPa
Backing pump pumping speed at 50 Hz					
MVP 040 diaphragm pump	2.3 m^3/h	2.3 m^3/h	2.3 m^3/h	2.3 m^3/h	2.3 m^3/h
MVP 070 diaphragm pump	3.8 m^3/h	3.8 m^3/h	3.8 m^3/h	3.8 m^3/h	3.8 m^3/h
Duo 3 rotary vane pump	2.5 m^3/h	2.5 m^3/h	2.5 m^3/h	2.5 m^3/h	2.5 m^3/h
Duo 5 M rotary vane pump	5 m^3/h	5 m^3/h	5 m^3/h	5 m^3/h	5 m^3/h
Pumping station weight:[1)]					
with MVP 040 diaphragm pump	36.4 kg	36.4 kg	37.8 kg	41.2 kg	43.2 kg
with MVP 070 diaphragm pump	41.4 kg	41.4 kg	42.8 kg	46.2 kg	48.2 kg
with Duo 3 rotary vane pump	35.5 kg	35.5 kg	36.9 kg	40.3 kg	42.3 kg
with Duo 5 M rotary vane pump	44.0 kg	44.0 kg	45.4 kg	48.8 kg	50.8 kg
Power input					
with MVP 040 diaphragm pump	290 W	290 W	290 W	480 W	480 W
with MVP 070 diaphragm pump	360 W	360 W	360 W	550 W	550 W
with Duo 3 rotary vane pump	270 W	270 W	270 W	460 W	460 W
with Duo 5 M rotary vane pump	360 W	360 W	360 W	550 W	550 W

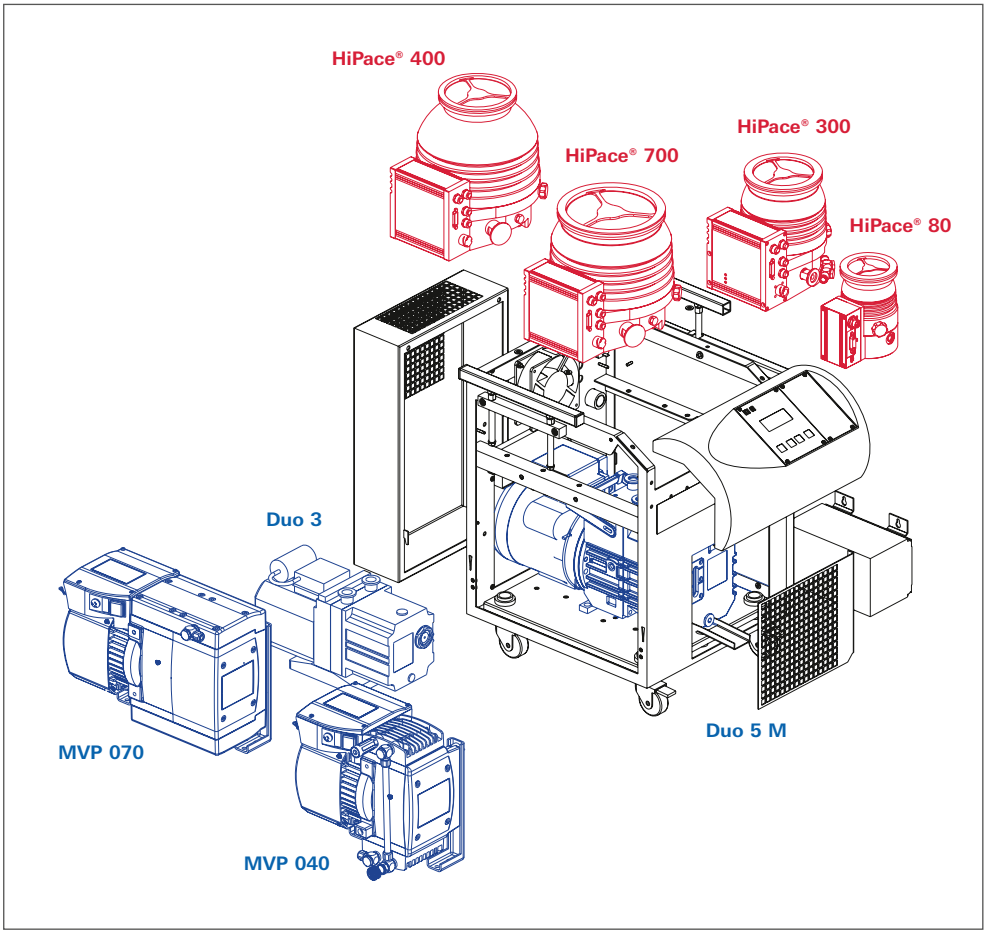
Technical data	HiCube® 400 Classic DN 100 ISO-K	HiCube® 400 Classic DN 100 CF-F	HiCube® 700 Classic DN 160 ISO-K	HiCube® 700 Classic DN 160 CF-F
Connection flange (inlet)	DN 100 ISO-K	DN 100 CF-F	DN 160 ISO-K	DN 160 CF-F
Pumping speed for nitrogen N_2	355 l/s	355 l/s	685 l/s	685 l/s
Ultimate pressure				
with DuoLine rotary vane pump	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 5 \cdot 10^{-10}$ hPa
with MVP diaphragm pump	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-8}$ hPa	$< 1 \cdot 10^{-7}$ hPa	$< 1 \cdot 10^{-8}$ hPa
Backing pump pumping speed at 50 Hz				
MVP 070 diaphragm pump	3.8 m^3/h	3.8 m^3/h	3.8 m^3/h	3.8 m^3/h
Duo 3 rotary vane pump	2.5 m^3/h	2.5 m^3/h	2.5 m^3/h	2.5 m^3/h
Duo 5 M rotary vane pump	5 m^3/h	5 m^3/h	5 m^3/h	5 m^3/h
Pumping station weight:[1)]				
with MVP 070 diaphragm pump	51.6 kg	57.5 kg	52.0 kg	57.9 kg
with Duo 3 rotary vane pump	45.7 kg	51.6 kg	46.1 kg	52.0 kg
with Duo 5 M rotary vane pump	54.2 kg	60.1 kg	54.6 kg	60.5 kg
Power input				
with MVP 070 diaphragm pump	670 W	670 W	670 W	670 W
with Duo 3 rotary vane pump	580 W	580 W	580 W	580 W
with Duo 5 M rotary vane pump	670 W	670 W	670 W	670 W

Final pressure in a measuring dome after 48-hour bakeout, only possible with metallic seals on the HV flange.
(final pressure with elastomer seal (standard, not bakeable): $< 1 \cdot 10^{-7}$ hPa

[1)] without fore-vacuum safety valve

Content

Modular design



Order number matrix HiCube® Classic

Order number

PM	S	aa	bb	c	d	e

Turbopump			aa
HiPace® 80	DN 40 ISO-KF	TC 110	20
HiPace® 80	DN 63 ISO-K	TC 110	21
HiPace® 80	DN 63 CF-F	TC 110	22
HiPace® 300	DN 100 ISO-K	TC 400	23
HiPace® 300	DN 100 CF-F	TC 400	24
HiPace® 400	DN 100 ISO-K	TC 400	25
HiPace® 400	DN 100 CF-F	TC 400	26
HiPace® 700	DN 160 ISO-K	TC 400	27
HiPace® 700	DN 160 CF-F	TC 400	28

Diaphragm pumps and rotary vane pumps			bb
Diaphragm pump			
MVP 040	110 V AC 60 Hz		22
MVP 040	230 V AC 50/60 Hz		23
MVP 070	110 V AC 60 Hz		24
MVP 070	230 V AC 50/60 Hz		25
MVP 040	110 V AC 60 Hz	with TVV 001[1)]	28
MVP 040	230 V AC 50/60 Hz	with TVV 001[1)]	29
MVP 070	110 V AC 60 Hz	with TVV 001[1)]	30
MVP 070	230 V AC 50/60 Hz	with TVV 001[1)]	31
Rotary vane pump			
Duo 3	110 V AC 50/60 Hz		32
Duo 3	230 V AC 50/60 Hz		33
Duo 5 M	110 V AC 50/60 Hz		34
Duo 5 M	230 V AC 50/60 Hz		35
Duo 3	110 V AC 50/60 Hz	with AVC 016[1)]	36
Duo 3	230 V AC 50/60 Hz	with AVC 016[1)]	37
Duo 5 M	110 V AC 50/60 Hz	with AVC 016[1)]	38
Duo 5 M	230 V AC 50/60 Hz	with AVC 016[1)]	39

[1)] Fore-vacuum safety valve

General options	c
Standard, on rubber feet	0
on rollers, 4 steerable rollers, 2 brakes	1
Drier TTV 001 with connection to venting valve	2
on rollers + drier TTV 001	3

Cable options	d
Standard (without cable set for external operation)	0
Cable set and fore-vacuum line 3 m (for external operation of the turbopump)	1
Cable set and fore-vacuum line 5 m (for external operation of the turbopump)	2
Cable set and fore-vacuum line 10 m (for external operation of the turbopump)	3

Cooling options	e
Standard, air cooling	0
Water cooling	1
Water cooling + heating sleeve	2

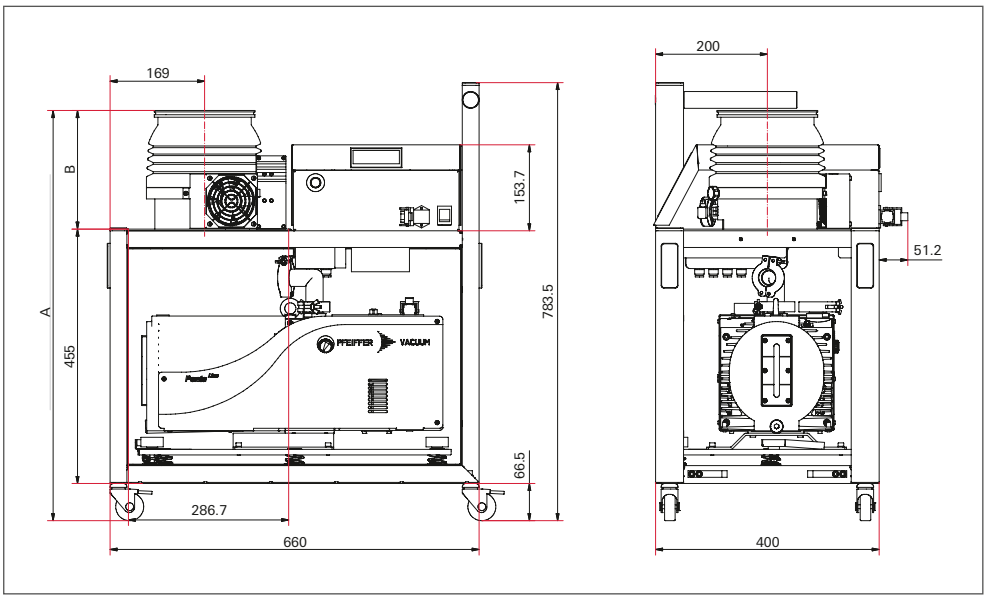


HiCube® Pro

Completely dry or oil-sealed turbo pumping station with pumping speeds from 35 to 685 l/s for particularly fast pumpdown times

- Combined pumping station with turbopump and backing pump for all high vacuum applications
- Air-cooled and ready for operation
- Also available with water cooling
- Compact and cost-effective
- Flexible and versatile
- Extensive accessories
- Control unit with direct connection of vacuum gauges possible

Dimensions (in mm)



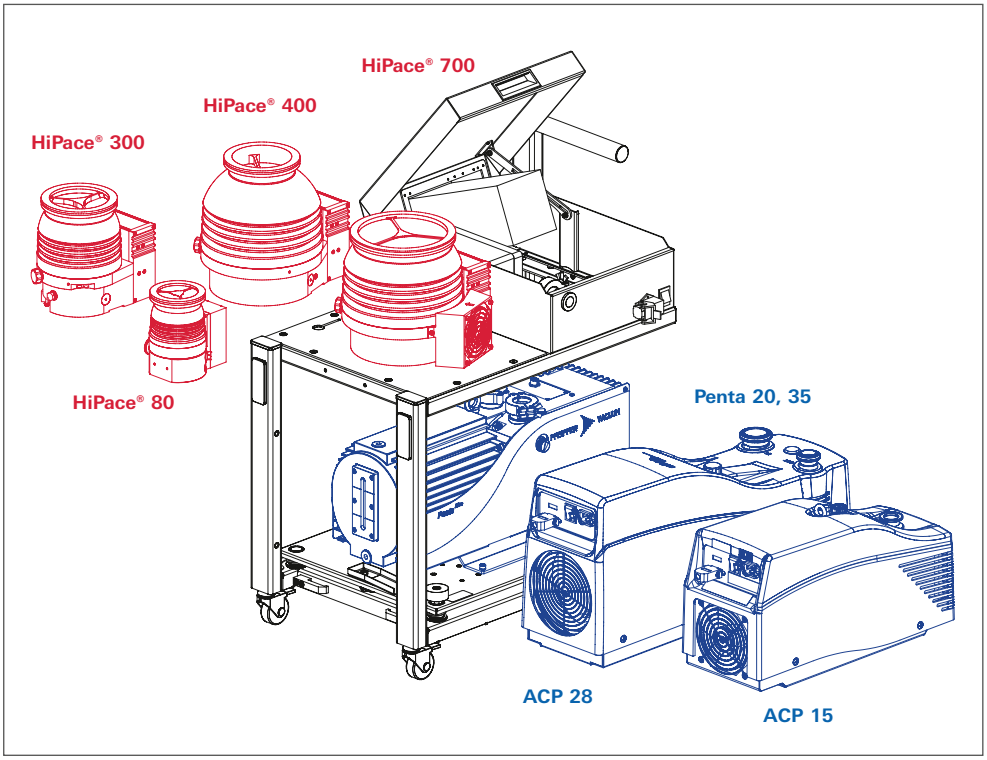
Turbopump	A	B
HiPace® 80 DN 40 ISO-KF	679.5 mm	158 mm
HiPace® 80 DN 63 ISO-K	670.5 mm	149 mm
HiPace® 80 DN 63 CF-F	676.5 mm	155 mm
HiPace® 300 DN 100 ISO-KF	716.5 mm	195 mm
HiPace® 300 DN 100 CF-F	728.5 mm	207 mm
HiPace® 400 DN 100 ISO-KF	760.5 mm	239 mm
HiPace® 400 DN 100 CF-F	760.5 mm	239 mm
HiPace® 700 DN 160 ISO-KF	733.5 mm	212 mm
HiPace® 700 DN 160 CF-F	745.5 mm	224 mm

Technical data – Pumping station	HiCube® 80 Pro DN 40 ISO-KF	HiCube® 80 Pro DN 63 ISO-K	HiCube® 80 Pro DN 63 CF-F	HiCube® 300 Pro DN 100 ISO-K	HiCube® 300 Pro DN 100 CF-F
Connection flange (inlet)	DN 40 ISO-KF	DN 63 ISO-K	DN 63 CF-F	DN 100 ISO-K	DN 100 CF-F
Pumping speed for nitrogen N_2	35 l/s	67 l/s	67 l/s	260 l/s	260 l/s
Ultimate pressure					
with ACP multi-stage Roots pump	< $1 \cdot 10^{-7}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa
with PentaLine rotary vane pump	< $1 \cdot 10^{-7}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa
Backing pump pumping speed at 50 Hz					
ACP 15 multi-stage Roots pump	14 m^3/h	14 m^3/h	14 m^3/h	14 m^3/h	14 m^3/h
ACP 28 multi-stage Roots pump	27 m^3/h	27 m^3/h	27 m^3/h	27 m^3/h	27 m^3/h
Penta 20 rotary vane pump	22 m^3/h	22 m^3/h	22 m^3/h	22 m^3/h	22 m^3/h
Penta 35 rotary vane pump	34 m^3/h	34 m^3/h	34 m^3/h	34 m^3/h	34 m^3/h
Pumping station weight:1)					
ACP 15 multi-stage Roots pump	60.2 kg	60.2 kg	61.6 kg	65.0 kg	67.0 kg
ACP 28 multi-stage Roots pump	69.2 kg	69.2 kg	70.6 kg	74.0 kg	76.0 kg
Penta 20 rotary vane pump	82.2 kg	82.2 kg	83.6 kg	87.0 kg	89.0 kg
Penta 35 rotary vane pump	84.2 kg	84.2 kg	85.6 kg	89.0 kg	91.0 kg
Mains connection – power consumption					
ACP 15 multi-stage Roots pump	660 W	660 W	660 W	850 W	850 W
ACP 28 multi-stage Roots pump	1,160 W	1,160 W	1,160 W	1,350 W	1,350 W
Penta 20 rotary vane pump	1,100 W	1,100 W	1,100 W	1,290 W	1,290 W
Penta 35 rotary vane pump	1,585 W	1,585 W	1,585 W	1,775 W	1,775 W

Technical data – Pumping station	HiCube® 400 Pro DN 100 ISO-K	HiCube® 400 Pro DN 100 CF-F	HiCube® 700 Pro DN 160 ISO-K	HiCube® 700 Pro DN 160 CF-F
Connection flange (inlet)	DN 100 ISO-K	DN 100 CF-F	DN 160 ISO-K	DN 160 CF-F
Pumping speed for nitrogen N_2	355 l/s	355 l/s	685 l/s	685 l/s
Ultimate pressure				
with multi-stage ACP Roots pump	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa
with PentaLine rotary vane pump	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa	< $1 \cdot 10^{-7}$ hPa	< $5 \cdot 10^{-10}$ hPa
Backing pump pumping speed at 50 Hz				
ACP 15 multi-stage Roots pump	14 m^3/h	14 m^3/h	14 m^3/h	14 m^3/h
ACP 28 multi-stage Roots pump	27 m^3/h	27 m^3/h	27 m^3/h	27 m^3/h
Penta 20 rotary vane pump	22 m^3/h	22 m^3/h	22 m^3/h	22 m^3/h
Penta 35 rotary vane pump	34 m^3/h	34 m^3/h	34 m^3/h	34 m^3/h
Pumping station weight: 1)				
ACP 15 multi-stage Roots pump	70.4 kg	76.3 kg	70.8 kg	76.7 kg
ACP 28 multi-stage Roots pump	79.4 kg	85.3 kg	79.8 kg	85.7 kg
Penta 20 rotary vane pump	92.4 kg	98.3 kg	92.8 kg	98.7 kg
Penta 35 rotary vane pump	94.4 kg	100.3 kg	94.8 kg	100.7 kg
Mains requirement – power consumption				
ACP 15 multi-stage Roots pump	970 W	970 W	970 W	970 W
ACP 28 multi-stage Roots pump	1,910 W	1,910 W	1,910 W	1,910 W
Penta 20 rotary vane pump	1,410 W	1,410 W	1,410 W	1,410 W
Penta 35 rotary vane pump	1,895 W	1,895 W	1,895 W	1,895 W

Final pressure in a measuring dome after 48-hour bakeout, only possible with metallic seals on the HV flange.
(final pressure with elastomer seal (standard, not bakeable): < $1 \cdot 10^{-7}$ hPa
[1] without fore-vacuum safety valve

Modular design



Order number matrix HiCube® Pro

Order number

PM S aa bb c d e

Turbopump			aa
HiPace® 80	DN 40 ISO-KF	TC 110	40
HiPace® 80	DN 63 ISO-K	TC 110	41
HiPace® 80	DN 63 CF-F	TC 110	42
HiPace® 300	DN 100 ISO-K	TC 400	43
HiPace® 300	DN 100 CF-F	TC 400	44
HiPace® 400	DN 100 ISO-K	TC 400	45
HiPace® 400	DN 100 CF-F	TC 400	46
HiPace® 700	DN 160 ISO-K	TC 400	47
HiPace® 700	DN 160 CF-F	TC 400	48

Rotary vane and multi-stage Roots pump			bb
Rotary vane pump			
Penta 20	110 V AC 50/60 Hz		48
Penta 20	230 V AC 50/60 Hz		49
Penta 35	110 V AC 50/60 Hz		50
Penta 35	230 V AC 50/60 Hz		51
Penta 20	110 V AC 50/60 Hz	with AVC 025 MA[1)]	54
Penta 20	230 V AC 50/60 Hz	with AVC 025 MA[1)]	55
Penta 35	110 V AC 50/60 Hz	with AVC 025 MA[1)]	56
Penta 35	230 V AC 50/60 Hz	with AVC 025 MA[1)]	57
Multi-stage Roots pump			
ACP 15	110 V AC 50/60 Hz	with AVC 025 MA[1)]	58
ACP 15	230 V AC 50/60 Hz	with AVC 025 MA[1)]	59
ACP 28	110 V AC 50/60 Hz	with AVC 025 MA[1)]	60
ACP 28	230 V AC 50/60 Hz	with AVC 025 MA[1)]	61

[1)] fore-vacuum safety valve

General options	c
General	
Standard, 4 rollers	0
4 rollers, venting valve	1
4 rollers, venting valve + drier TTV 001 with connection to venting valve	2
4 rollers, oil mist separator (ONF)	3
4 rollers, venting valve, oil mist separator (ONF)	4
4 rollers, venting valve, drier TTV 001 with connection to venting valve, oil mist separator (ONF)	5

Cable options	d
Standard (without cable set for external operation)	0
Cable set and fore-vacuum line 3 m (for external operation of the turbopump)	1
Cable set and fore-vacuum line 5 m (for external operation of the turbopump)	2
Cable set and fore-vacuum line 10 m (for external operation of the turbopump)	3

Cooling options	e
Standard, air cooling	0
Water cooling	1
Water cooling + heating sleeve	2

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The Vacuum Technology Book

Volume II



Vacuum measurement, analysis, leak detection

Part 3.2

Vacuum measurement, analysis, leak detection

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Measurement equipment

Vacuum gauges for all vacuum areas and applications



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Measurement equipment

Vacuum gauges for all vacuum areas and applications

Many vacuum applications operate only in a specific pressure range. Analog and digital total vacuum or pressure measurement instruments are used to measure and control the total pressure in a vacuum system. Pfeiffer Vacuum offers three different lines of total pressure gauges.

The criteria for selecting a vacuum gauge are based upon various conditions:

- The pressure range to be detected
- Gas composition (inert or corrosive)
- Required accuracy and repeatability
- Ambient conditions such as ionizing radiation

Each series separately covers the entire pressure range. Pfeiffer Vacuum provides you with the best solution for your total pressure measurement tasks based on the relevant application.

DigiLine

- Total pressure vacuum gauge with digital signal outlet

ActiveLine

- Total pressure vacuum gauge with analog signal outlet

ModulLine

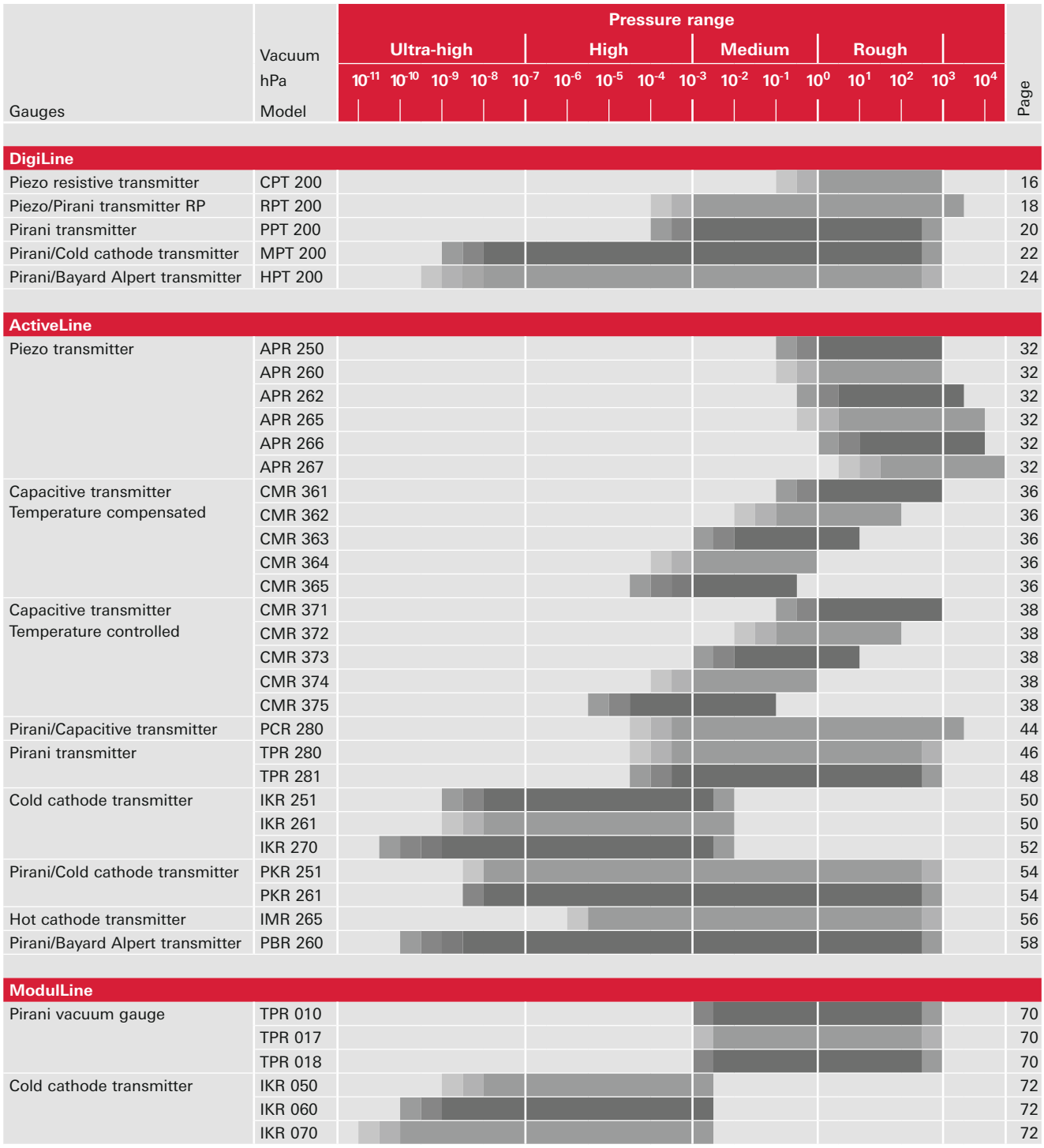
- Total pressure measurement in areas with ionizing radiation



Overview of series and applications

■ = recommended	Analytics						Semiconductors										Coating										Industry										R & D										Page
	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 manufacture	Heat treatment	Vacuum drying	Vacuum furnaces	Nuclear research	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Measuring equipment and controllers																																												
DigiLine																																												
Transmitter																																												
Piezo	■	■	■	■	■	■														■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■							16
Piezo/Pirani	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	18
Pirani	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	20
Pirani/ Cold cathodes	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	22
Pirani/ Bayard-Alpert	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■							■		■	■	■	■		■	■	■	■	■		■	■	■	■	24
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Transmitter																																												
Piezo	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								32
Capacitative temperature compensated	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	36
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Pirani/ Capacitive	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	44
Pirani	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	46
Cold cathode	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■							■	■	■	■	■	■	■	■	■		■		■	■	■			50
Pirani/ Cold cathode	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■							■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	54
Hot cathodes	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■		■	■	■	■	■	56
Pirani/ Bayard-Alpert	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■		■	■	■	■		■	■	■	■	58
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Vacuum gauges																																												
Pirani																										■							■	■		■		■						70
Cold cathode																										■							■	■		■								72

Features at a glance



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Piezo resistive transmitter	CPT 200	16
Piezo/Pirani transmitter RP	RPT 200	18
Pirani transmitter	PPT 200	20
Pirani/Cold cathode transmitter	MPT 200	22
Pirani/Bayard Alpert transmitter	HPT 200	24
ActiveLine		
Piezo transmitter	APR 250	32
	APR 260	32
	APR 262	32
	APR 265	32
	APR 266	32
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Capacitive transmitter Temperature compensated	CMR 361	36
	CMR 362	36
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Capacitive transmitter Temperature controlled	CMR 371	38
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Pirani/Capacitive transmitter	PCR 280	44
Pirani transmitter	TPR 280	46
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Cold cathode transmitter	IKR 251	50
	IKR 261	50
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Pirani/Cold cathode transmitter	PKR 251	54
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Hot cathode transmitter	IMR 265	56
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ModulLine		
Pirani vacuum gauge	TPR 010	70
	TPR 017	70
	TPR 018	70
Cold cathode transmitter	IKR 050	72
	IKR 060	72
	IKR 070	72

Depending on the measuring principle the measurement precision will decline at the area limits.



Customer benefits

- Easy integration
- Flexible use
- Low installation effort
- Secure data transmission
- Proven long life

DigiLine

Innovative vacuum measurement for the digital age



DigiLine

The DigiLine series is designed for industrial and research applications that need wiring that is easy to install and reliable. The series covers the entire technically relevant vacuum range with measuring principles encompassing Piezo, Pirani, and hot and cold cathode vacuum gauges. All transmitters have an RS-485 interface which can be used to connect up to 16 measuring points to a controller. An additional voltage outlet that is proportional to the pressure and two switch-points as well as Profibus and DeviceNet interfaces are available as options. Protection class IP 54 and DIN M12 connector assemblies qualify these vacuum gauges for usage in heavy-duty environments.

Customer benefits

- Pressure range $5 \cdot 10^{-10}$ to 2,000 hPa covers the entire vacuum range.
- Digital outlet signal for error-free data transmission
- Transmission of numerical pressure values saves characteristics and recalculations
- Protection class IP 54 and DIN M12 connector assemblies for reliable operation in heavy-duty environments.
- Remote control for easy adjustment.
- Optional Profibus and DeviceNet fieldbus interfaces meeting industrial standards

Typical applications

- Hard disk coating
- PVD coating
- Solar cell production
- Space simulation
- Vacuum drying / Heat treatment
- Electron beam welding
- Surface coating
- Fusion technology



Space simulation



Vacuum drying



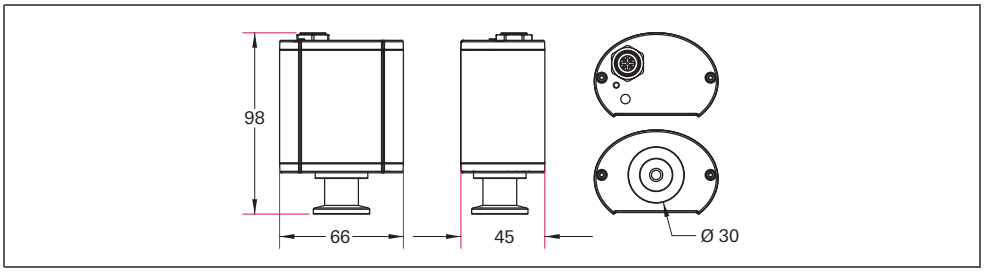
Solar cell production

Piezo-resistive Gauge CPT 200 (1 – 2000 hPa)



- 1 to 2000 hPa
- Robust sensor
- Gas type independent measurement
- Profibus DP Interface (optional)
- DeviceNet Interface (optional)
- Analog output and set points (optional)

Dimensions (in mm)



Technical data	CPT 200, DN 16 ISO-KF, RS-485	CPT 200, DN 16 ISO-KF, RS-485, analog	CPT 200, DN 16 ISO-KF, RS-485, Profibus	CPT 200, DN 16 ISO-KF, RS-485, DeviceNet
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Seal	FPM	FPM	FPM	FPM
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Full scale	2000	2000	2000	2000
Accuracy	1-1200 hPa: ± 0.1 % F.S.; >1200 hPa: ± 1 % F.S.	1-1200 hPa: ± 0.1 % F.S.; >1200 hPa: ± 1 % F.S.	1-1200 hPa: ± 0.1 % F.S.; >1200 hPa: ± 1 % F.S.	1-1200 hPa: ± 0.1 % F.S.; >1200 hPa: ± 1 % F.S.
Weight	190 g	190 g	190 g	190 g
Materials in contact with media	Ceramic, stainless steel, FPM	Ceramic, stainless steel, FPM	Ceramic, stainless steel, FPM	Ceramic, stainless steel, FPM
Measurement range max.	2000 hPa	2000 hPa	2000 hPa	2000 hPa
Measurement range min.	1 hPa	1 hPa	1 hPa	1 hPa
Sensor cable length max.	1000 m	100 m	100 m	100 m
Method of measurement	Diaphragm, piezoresistive (gas type independent)	Diaphragm, piezoresistive (gas type independent)	Diaphragm, piezoresistive (gas type independent)	Diaphragm, piezoresistive (gas type independent)
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	Digital RS-485 ; M12, 5-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Temperature: Bakeout	70 °C	70 °C	70 °C	70 °C
Temperature: Operating	5-60 °C	5-60 °C	5-60 °C	5-60 °C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	1.5 W	2.2 W	3.0 W	2.0 W

Order number				
CPT 200, DN 16 ISO-KF	**PT R36 130**	**PT R36 131**	**PT R36 132**	**PT R36 133**

Accessories				
Centering ring with poral filter, Pore size: 20 µm, FPM/stainless steel, DN 16 ISO-KF	**PF 117 216 -T**	**PF 117 216 -T**	**PF 117 216 -T**	**PF 117 216 -T**
Fine filter, pore size 4 µm, DN 16 ISO-KF	**PT 120 132 -T**	**PT 120 132 -T**	**PT 120 132 -T**	**PT 120 132 -T**

Further accessories see controller DPG 202

Technical data	CPT 200, G 1/4", RS-485	CPT 200, G 1/4", RS-485, analog	CPT 200, G 1/4", RS-485, Profibus	CPT 200, G 1/4", RS-485, DeviceNet
Flange (in)	G 1/4"	G 1/4"	G 1/4"	G 1/4"
Seal	FPM	FPM	FPM	FPM
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Full scale	2000	2000	2000	2000
Accuracy	1-1200 hPa: ± 0.1 % F.S.; >1200 hPa: ± 1 % F.S.	1-1200 hPa: ± 0.1 % F.S.; >1200 hPa: ± 1 % F.S.	1-1200 hPa: ± 0.1 % F.S.; >1200 hPa: ± 1 % F.S.	1-1200 hPa: ± 0.1 % F.S.; >1200 hPa: ± 1 % F.S.
Weight	190 g	190 g	190 g	190 g
Materials in contact with media	Ceramic, stainless steel, FPM		Ceramic, stainless steel, FPM	Ceramic, stainless steel, FPM
Measurement range max.	2000 hPa		2000 hPa	2000 hPa
Measurement range min.	1 hPa		1 hPa	1 hPa
Sensor cable length max.	100 m	100 m	100 m	100 m
Method of measurement	Diaphragm, piezoresistive (gas type independent)	Diaphragm, piezoresistive (gas type independent)	Diaphragm, piezoresistive (gas type independent)	Diaphragm, piezoresistive (gas type independent)
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	Digital RS-485 ; M12, 5-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Temperature: Bakeout	70 °C	70 °C	70 °C	70 °C
Temperature: Operating	5-60 °C	5-60 °C	5-60 °C	5-60 °C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	1.5 W	2.2 W	3.0 W	2.0 W

Order number				
CPT 200 , G 1/4"	**PT R36 210**	**PT R36 211**	**PT R36 212**	**PT R36 213**

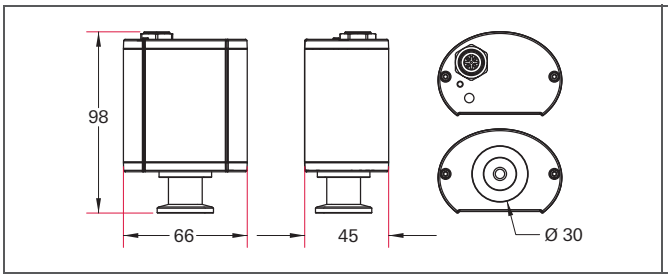
Further accessories see controller DPG 202

Piezo/Pirani Gauge RPT 200 (1 · 10^{-4} – 1200 hPa)

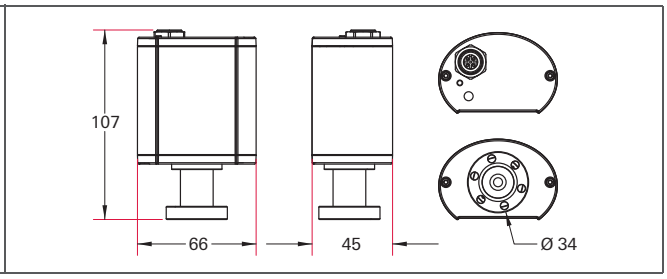


- 1 · 10^{-4} to 1200 hPa
- Combination of two sensors
- High accuracy up to atmospheric pressure
- Profibus DP Interface (optional)
- DeviceNet Interface (optional)
- Analog output and set points (optional)

Dimensions (in mm)



RPT 200, DN 16 ISO-KF



RPT 200, DN 16 CF-F

Technical data	RPT 200, DN 16 ISO-KF, RS-485	RPT 200, DN 16 ISO-KF, RS-485, analog	RPT 200, DN 16 ISO-KF, RS-485, Profibus	RPT 200, DN 16 ISO-KF, RS-485, DeviceNet
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Seal	Metal	Metal	Metal	Metal
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Full scale	1200	1200	1200	1200
Accuracy	< 2 · 10^{-3} factor 2; 2 · 10^{-3} - 10 hPa: ± 10 %; 10-1200 hPa: ± 0.3 % F.S.	< 2 · 10^{-3} factor 2; 2 · 10^{-3} - 10 hPa: ± 10 %; 10-1200 hPa: ± 0.3 % F.S.	< 2 · 10^{-3} factor 2; 2 · 10^{-3} - 10 hPa: ± 10 %; 10-1200 hPa: ± 0.3 % F.S.	< 2 · 10^{-3} factor 2; 2 · 10^{-3} - 10 hPa: ± 10 %; 10-1200 hPa: ± 0.3 % F.S.
Weight	195 g	195 g	195 g	195 g
Materials in contact with media	Stainless steel, Tungsten, gold, silicon oxide, glass	Stainless steel, Tungsten, gold, silicon oxide, glass	Stainless steel, Tungsten, gold, silicon oxide, glass	Stainless steel, Tungsten, gold, silicon oxide, glass
Measurement range max.	1200 hPa	1200 hPa	1200 hPa	1200 hPa
Measurement range min.	1 · 10^{-4} hPa	1 · 10^{-4} hPa	1 · 10^{-4} hPa	1 · 10^{-4} hPa
Sensor cable length max.	100 m	100 m	100 m	100 m
Method of measurement	Piezo/Pirani	Piezo/Pirani	Piezo/Pirani	Piezo/Pirani
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	Digital RS-485 ; M12, 5-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Temperature: Bakeout	125 °C	125 °C	125 °C	125 °C
Temperature: Operating	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	2.5 W	3.2 W	4.0 W	2.9 W
Repeatability: % of measurement	10-1200 hPa: ± 0.1% F.S.; 1 · 10^{-3} - 1 hPa: ± 1 %	10-1200 hPa: ± 0.1% F.S.; 1 · 10^{-3} - 1 hPa: ± 1 %	10-1200 hPa: ± 0.1% F.S.; 1 · 10^{-3} - 1 hPa: ± 1 %	10-1200 hPa: ± 0.1% F.S.; 1 · 10^{-3} - 1 hPa: ± 1 %

Order number				
RPT 200, DN 16 ISO-KF	**PT R37 130**	**PT R37 131**	**PT R37 132**	**PT R37 133**

Accessories				
Centering ring with poral filter, Pore size: 20 µm, FPM/stainless steel, DN 16 ISO-KF	**PF 117 216 -T**	**PF 117 216 -T**	**PF 117 216 -T**	**PF 117 216 -T**
Fine filter, pore size 4 µm, DN 16 ISO-KF	**PT 120 132 -T**	**PT 120 132 -T**	**PT 120 132 -T**	**PT 120 132 -T**

Further accessories see controller DPG 202

Technical data	RPT 200, DN 16CF-F, RS-485	RPT 200, DN 16 CF-F, RS-485, analog	RPT 200, DN 16 CF-F, RS-485, Profibus	RPT 200, DN 16 CF-F, RS-485, DeviceNet
Flange (in)	DN 16 CF-F	DN 16 CF-F	DN 16 CF-F	DN 16 CF-F
Seal	Metal	Metal	Metal	Metal
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Full scale	1200	1200	1200	1200
Accuracy	< 2 · 10^{-3} factor 2; 2 · 10^{-3} - 10 hPa: ± 10 %; 10-1200 hPa: ± 0.3 % F.S.	< 2 · 10^{-3} factor 2; 2 · 10^{-3} - 10 hPa: ± 10 %; 10-1200 hPa: ± 0.3 % F.S.	< 2 · 10^{-3} factor 2; 2 · 10^{-3} - 10 hPa: ± 10 %; 10-1200 hPa: ± 0.3 % F.S.	< 2 · 10^{-3} factor 2; 2 · 10^{-3} - 10 hPa: ± 10 %; 10-1200 hPa: ± 0.3 % F.S.
Weight	225 g	225 g	225 g	225 g
Materials in contact with media	Stainless steel, Tungsten, gold, silicon oxide, glass	Stainless steel, Tungsten, gold, silicon oxide, glass	Stainless steel, Tungsten, gold, silicon oxide, glass	Stainless steel, Tungsten, gold, silicon oxide, glass
Measurement range max.	1200 hPa	1200 hPa	1200 hPa	1200 hPa
Measurement range min.	1 · 10^{-4} hPa	1 · 10^{-4} hPa	1 · 10^{-4} hPa	1 · 10^{-4} hPa
Sensor cable length max.	100 m	100 m	100 m	100 m
Method of measurement	Piezo/Pirani	Piezo/Pirani	Piezo/Pirani	Piezo/Pirani
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	Digital RS-485 , M12, 5-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Temperature: Bakeout	125 °C	125 °C	125 °C	125 °C
Temperature: Operating	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	2.5 W	3.2 W	4.0 W	2.9 W
Repeatability: % of measurement	10-1200 hPa: ± 0.1% F.S.; 1 · 10^{-3} - 1 hPa: ± 1 %	10-1200 hPa: ± 0.1% F.S.; 1 · 10^{-3} - 1 hPa: ± 1 %	10-1200 hPa: ± 0.1% F.S.; 1 · 10^{-3} - 1 hPa: ± 1 %	10-1200 hPa: ± 0.1% F.S.; 1 · 10^{-3} - 1 hPa: ± 1 %

Order number				
RPT 200, DN 16 CF-F	**PT R37 310**	**PT R37 311**	**PT R37 312**	**PT R37 313**

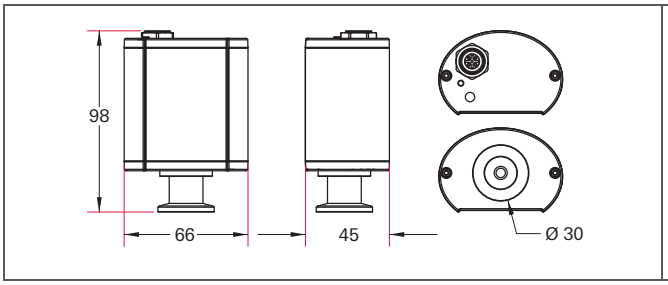
Further accessories see controller DPG 202

Pirani Gauge PPT 200 (1 · 10^{-4} – 1000 hPa)

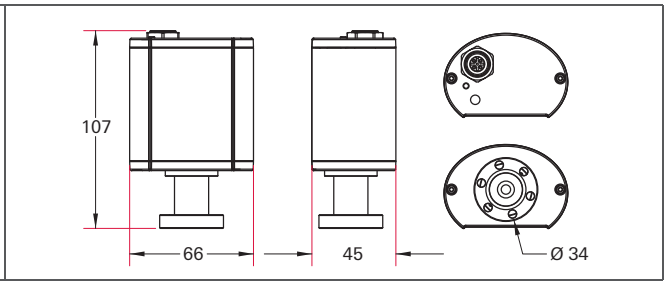


- 1 · 10^{-4} to 1000 hPa
- High protection level for industrial applications
- Pulsed sensor for improved accuracy
- Profibus DP Interface (optional)
- DeviceNet Interface (optional)
- Analog output and set points (optional)

Dimensions (in mm)



PPT 200, DN 16 ISO-KF



PPT 200, DN 16 CF-F

Technical data	PPT 200, DN 16 ISO-KF, RS-485	PPT 200, DN 16 ISO-KF, RS-485, analog	PPT 200, DN 16 ISO-KF, RS-485, Profibus	PPT 200, DN 16 ISO-KF, RS-485, DeviceNet
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Seal	Metal	Metal	Metal	Metal
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Accuracy: % of measurement	< 2 · 10^{-3} hPa: < factor 2, 2 · 10^{-3} - 20 hPa: ± 10 %, 20 - 1000 hPa: ± 30 %	< 2 · 10^{-3} hPa: < factor 2, 2 · 10^{-3} - 20 hPa: ± 10 %, 20 - 1000 hPa: ± 30 %	< 2 · 10^{-3} hPa: < factor 2, 2 · 10^{-3} - 20 hPa: ± 10 %, 20 - 1000 hPa: ± 30 %	< 2 · 10^{-3} hPa: < factor 2, 2 · 10^{-3} - 20 hPa: ± 10 %, 20 - 1000 hPa: ± 30 %
Weight	190 g	190 g	190 g	190 g
Materials in contact with media	Tungsten, stainless steel, glass	Tungsten, stainless steel, glass	Tungsten, stainless steel, glass	Tungsten, stainless steel, glass
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	1 · 10^{-4} hPa	1 · 10^{-4} hPa	1 · 10^{-4} hPa	1 · 10^{-4} hPa
Sensor cable length max.	100 m	100 m	100 m	100 m
Method of measurement	Pirani	Pirani	Pirani	Pirani
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	Digital RS-485 ; M12, 5-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Temperature: Bakeout	125 °C	125 °C	125 °C	125 °C
Temperature: Operating	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C
Temperature: Storage	-40-+65 °C	-40…+70 °C	-40…+70 °C	-40…+70 °C
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	2.5 W	3.2 W	4.0 W	2.9 W
Repeatability: % of measurement	2 · 10^{-3} - 10 hPa: ± 2 %	2 · 10^{-3} - 10 hPa: ± 2 %	2 · 10^{-3} - 10 hPa: ± 2 %	2 · 10^{-3} - 10 hPa: ± 2 %

Order number				
PPT 200, DN 16 ISO-KF	**PT R38 130**	**PT R38 131**	**PT R38 132**	**PT R38 133**

Accessories				
Centering ring with poral filter, Pore size: 20 µm, FPM/stainless steel, DN 16 ISO-KF	**PF 117 216 -T**	**PF 117 216 -T**	**PF 117 216 -T**	**PF 117 216 -T**
Fine filter, pore size 4 µm, DN 16 ISO-KF	**PT 120 132 -T**	**PT 120 132 -T**	**PT 120 132 -T**	**PT 120 132 -T**

Further accessories see controller DPG 202

Technical data	PPT 200, DN 16 CF-F, RS-485	PPT 200, DN 16 CF-F, RS-485, analog	PPT 200, DN 16 CF-F, RS-485, Profibus	PPT 200, DN 16 CF-F, RS-485, DeviceNet
Flange (in)	DN 16 CF-F	DN 16 CF-F	DN 16 CF-F	DN 16 CF-F
Seal	Metal	Metal	Metal	Metal
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Accuracy: % of measurement	< 2 · 10^{-3} hPa: < factor 2, 2 · 10^{-3} - 20 hPa: ± 10 %, 20 - 1000 hPa: ± 30 %	< 2 · 10^{-3} hPa: < factor 2, 2 · 10^{-3} - 20 hPa: ± 10 %, 20 - 1000 hPa: ± 30 %	< 2 · 10^{-3} hPa: < factor 2, 2 · 10^{-3} - 20 hPa: ± 10 %, 20 - 1000 hPa: ± 30 %	< 2 · 10^{-3} hPa: < factor 2, 2 · 10^{-3} - 20 hPa: ± 10 %, 20 - 1000 hPa: ± 30 %
Weight	220 g	220 g	220 g	220 g
Materials in contact with media	Tungsten, stainless steel, glass	Tungsten, stainless steel, glass	Tungsten, stainless steel, glass	Tungsten, stainless steel, glass
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	1 · 10^{-4} hPa	1 · 10^{-4} hPa	1 · 10^{-4} hPa	1 · 10^{-4} hPa
Sensor cable length max.	100 m	100 m	100 m	100 m
Method of measurement	Pirani	Pirani	Pirani	Pirani
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	Digital RS-485 ; M12, 5-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Temperature: Bakeout	125 °C	125 °C	125 °C	125 °C
Temperature: Operating	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C
Temperature: Storage	-40…+70 °C	-40…+70 °C	-40…+70 °C	-40…+70 °C
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	2.5 W	3.2 W	4.0 W	2.9 W
Repeatability: % of measurement	2 · 10^{-3} - 10 hPa: ± 2 %	2 · 10^{-3} - 10 hPa: ± 2 %	2 · 10^{-3} - 10 hPa: ± 2 %	2 · 10^{-3} - 10 hPa: ± 2 %

Order number				
PPT 200, DN 16 CF-F	**PT R38 310**	**PT R38 311**	**PT R38 312**	**PT R38 313**

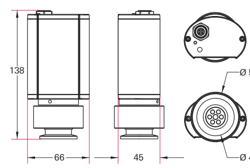
Further accessories see controller DPG 202

Pirani/Cold Cathode Gauge MPT 200 (5 · 10^{-9} – 1000 hPa)

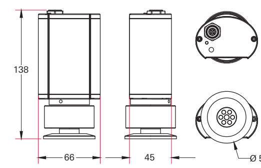


- 5 · 10^{-9} to 1000 hPa
- Insensitive to gas inrush
- Customizable to vacuum application
- Profibus DP Interface (optional)
- DeviceNet Interface (optional)
- Analog output and set points (optional)

Dimensions (in mm)



MPT 200, DN 25 ISO-KF



MPT 200, DN 40 ISO-KF

Technical data	MPT 200, DN 25 ISO-KF, RS-485	MPT 200, DN 25 ISO-KF, RS-485, analog	MPT 200, DN 25 ISO-KF, RS-485, Profibus	MPT 200, DN 25 ISO-KF, RS-485, DeviceNet
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Seal	Metal	Metal	Metal	Metal
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Accuracy: % of measurement	1 · 10^{-8} - 2 · 10^{-3} hPa: ± 25 %, 2 · 10^{-3} - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %	1 · 10^{-8} - 2 · 10^{-3} hPa: ± 25 %, 2 · 10^{-3} - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %	1 · 10^{-8} - 2 · 10^{-3} hPa: ± 25 %, 2 · 10^{-3} - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %	1 · 10^{-8} - 2 · 10^{-3} hPa: ± 25 %, 2 · 10^{-3} - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %
Weight	555 g	555 g	555 g	555 g
Materials in contact with media	Tungsten, stainless steel, nickel, molybdenum, glass	Tungsten, stainless steel, nickel, molybdenum, glass	Tungsten, stainless steel, nickel, molybdenum, glass	Tungsten, stainless steel, nickel, molybdenum, glass
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	5 · 10^{-9} hPa	5 · 10^{-9} hPa	5 · 10^{-9} hPa	5 · 10^{-9} hPa
Sensor cable length max.	100 m	100 m	100 m	100 m
Method of measurement	Pirani/Cold cathode	Pirani/Cold cathode	Pirani/Cold cathode	Pirani/Cold cathode
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	RS-485, D-Sub-socket, 9-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Cold cathode sensor control	Cold cathode sensor can be switched on and off via interface	Cold cathode sensor can be switched on and off via interface	Cold cathode sensor can be switched on and off via interface	Cold cathode sensor can be switched on and off via interface
Temperature: Bakeout (electronics removed)	180 °C	180 °C	180 °C	180 °C
Temperature: Operating	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	3.0 W	3.7 W	4.5 W	3.4 W
Volume	9.5 cm^3	9.5 cm^3	9.5 cm^3	9.5 cm^3
Repeatability: % of measurement	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 7 %; 1 · 10^{-2} - 10 hPa: ± 2 %	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 7 %; 1 · 10^{-2} - 10 hPa: ± 2 %	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 7 %; 1 · 10^{-2} - 10 hPa: ± 2 %	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 7 %; 1 · 10^{-2} - 10 hPa: ± 2 %

Order number				
MPT 200, DN 25 ISO-KF	**PT R40 140**	**PT R40 141**	**PT R40 142**	**PT R40 143**

Further accessories see controller DPG 202

Technical data	MPT 200, DN 40 ISO-KF, RS-485	MPT 200, DN 40 ISO-KF, RS-485, analog	MPT 200, DN 40 ISO-KF, RS-485, Profibus	MPT 200, DN 40 ISO-KF, RS-485, DeviceNet
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Seal	Metal	Metal	Metal	Metal
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Accuracy: % of measurement	1 · 10^{-8} - 2 · 10^{-3} hPa: ± 25 %, 2 · 10^{-3} - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %	1 · 10^{-8} - 2 · 10^{-3} hPa: ± 25 %, 2 · 10^{-3} - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %	1 · 10^{-8} - 2 · 10^{-3} hPa: ± 25 %, 2 · 10^{-3} - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %	1 · 10^{-8} - 2 · 10^{-3} hPa: ± 25 %, 2 · 10^{-3} - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %
Weight	580 g	580 g	580 g	580 g
Materials in contact with media	Tungsten, stainless steel, nickel, molybdenum, glass	Tungsten, stainless steel, nickel, molybdenum, glass	Tungsten, stainless steel, nickel, molybdenum, glass	Tungsten, stainless steel, nickel, molybdenum, glass
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	5 · 10^{-9} hPa	5 · 10^{-9} hPa	5 · 10^{-9} hPa	5 · 10^{-9} hPa
Sensor cable length max.	100 m	100 m	100 m	100 m
Method of measurement	Pirani/Cold cathode	Pirani/Cold cathode	Pirani/Cold cathode	Pirani/Cold cathode
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	RS-485, D-Sub-socket, 9-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Cold cathode sensor control	Cold cathode sensor can be switched on and off via interface	Cold cathode sensor can be switched on and off via interface	Cold cathode sensor can be switched on and off via interface	Cold cathode sensor can be switched on and off via interface
Temperature: Bakeout (electronics removed)	180 °C	180 °C	180 °C	180 °C
Temperature: Operating	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	3.0 W	3.7 W	4.5 W	3.4 W
Volume	9.5 cm^3	9.5 cm^3	9.5 cm^3	9.5 cm^3
Repeatability: % of measurement	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 7 %; 1 · 10^{-2} - 10 hPa: ± 2 %	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 7 %; 1 · 10^{-2} - 10 hPa: ± 2 %	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 7 %; 1 · 10^{-2} - 10 hPa: ± 2 %	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 7 %; 1 · 10^{-2} - 10 hPa: ± 2 %

Order number				
MPT 200, DN 40 ISO-KF	**PT R40 150**	**PT R40 151**	**PT R40 152**	**PT R40 153**

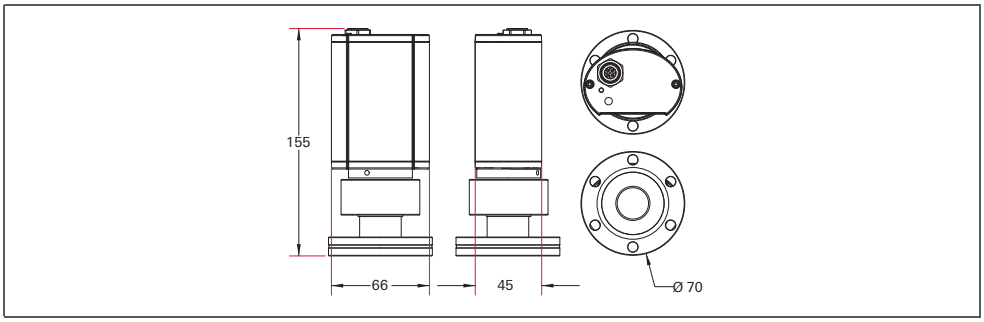
Further accessories see controller DPG 202

Pirani/Cold Cathode Gauge MPT 200 (5 · 10-9 – 1000 hPa)



- 5 · 10-9 to 1000 hPa
- Insensitive to gas inrush
- Customizable to vacuum application
- Profibus DP Interface (optional)
- DeviceNet Interface (optional)
- Analog output and set points (optional)

Dimensions (in mm)



MPT 200, DN 40 CF-F

Technical data	MPT 200, DN 40 CF-F, RS-485	MPT 200, DN 40 CF-F, RS-485, analog	MPT 200, DN 40 CF-F, RS-485, Profibus	MPT 200, DN 40 CF-F, RS-485, DeviceNet
Flange (in)	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F
Seal	Metal	Metal	Metal	Metal
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Accuracy: % of measurement	$1 \cdot 10^{-8}$ - $2 \cdot 10^{-3}$ hPa: ± 25 %, $2 \cdot 10^{-3}$ - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %	$1 \cdot 10^{-8}$ - $2 \cdot 10^{-3}$ hPa: ± 25 %, $2 \cdot 10^{-3}$ - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %	$1 \cdot 10^{-8}$ - $2 \cdot 10^{-3}$ hPa: ± 25 %, $2 \cdot 10^{-3}$ - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %	$1 \cdot 10^{-8}$ - $2 \cdot 10^{-3}$ hPa: ± 25 %, $2 \cdot 10^{-3}$ - 10 hPa: ± 10 %, 10-100 hPa: ± 30 %; 100-1000 hPa: ± 50 %
Weight	850 g	850 g	850 g	850 g
Materials in contact with media	Tungsten, stainless steel, nickel, molybdenum, glass	Tungsten, stainless steel, nickel, molybdenum, glass	Tungsten, stainless steel, nickel, molybdenum, glass	Tungsten, stainless steel, nickel, molybdenum, glass
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa
Sensor cable length max.	100 m	100 m	100 m	100 m
Method of measurement	Pirani/Cold cathode	Pirani/Cold cathode	Pirani/Cold cathode	Pirani/Cold cathode
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	RS-485, D-Sub-socket, 9-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Cold cathode sensor control	Cold cathode sensor can be switched on and off via interface	Cold cathode sensor can be switched on and off via interface	Cold cathode sensor can be switched on and off via interface	Cold cathode sensor can be switched on and off via interface
Temperature: Bakeout (electronics removed)	180 °C	180 °C	180 °C	180 °C
Temperature: Operating	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	3.0 W	3.7 W	4.5 W	3.4 W
Volume	9.5 cm^3	9.5 cm^3	9.5 cm^3	9.5 cm^3
Repeatability: % of measurement	$1 \cdot 10^{-8}$ - $1 \cdot 10^{-2}$ hPa: ± 7 %; $1 \cdot 10^{-2}$ - 10 hPa: ± 2 %	$1 \cdot 10^{-8}$ - $1 \cdot 10^{-2}$ hPa: ± 7 %; $1 \cdot 10^{-2}$ - 10 hPa: ± 2 %	$1 \cdot 10^{-8}$ - $1 \cdot 10^{-2}$ hPa: ± 7 %; $1 \cdot 10^{-2}$ - 10 hPa: ± 2 %	$1 \cdot 10^{-8}$ - $1 \cdot 10^{-2}$ hPa: ± 7 %; $1 \cdot 10^{-2}$ - 10 hPa: ± 2 %

Order number				
MPT 200, DN 40 CF-F	**PT R40 350**	**PT R40 351**	**PT R40 352**	**PT R40 353**

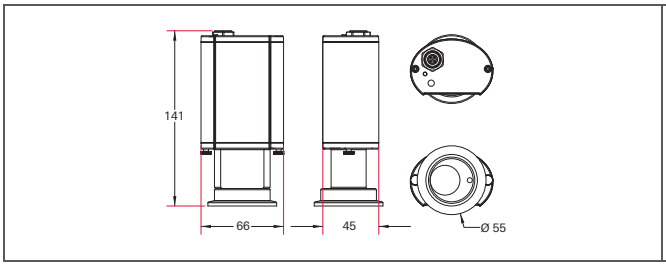
Further accessories see controller DPG 202

Pirani/Bayard-Alpert Gauge HPT 200 (5 · 10^{-10} – 1000 hPa)

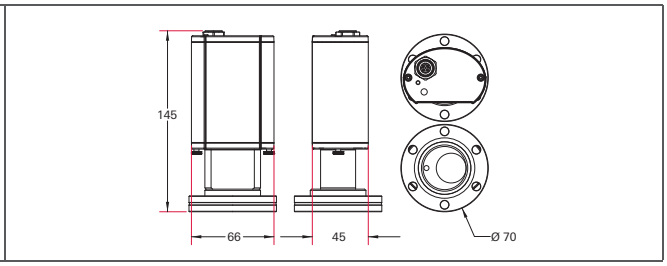


- 5 · 10^{-10} to 1000 hPa
- High security by two filaments
- High accuracy
- Profibus DP Interface (optional)
- DeviceNet Interface (optional)
- Analog output and set points (optional)

Dimensions (in mm)



HPT 200, DN 40 ISO-KF



HPT 200, DN 40 CF-F

Technical data	HPT 200, DN 40 ISO-KF, RS-485	HPT 200, DN 40 ISO-KF, RS-485, analog	HPT 200, DN 40 ISO-KF, RS-485, Profibus	HPT 200, DN 40 ISO-KF, RS-485, DeviceNet
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Number of filaments	2	2	2	2
Seal	Metal	Metal	Metal	Metal
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Filament	Iridium yttriated, twice	Iridium yttriated, twice	Iridium yttriated, twice	Iridium yttriated, twice
Accuracy: % of measurement	1 · 10^{-8} - 1 hPa: ± 10 %, 20-1000 hPa: ± 30 %	1 · 10^{-8} - 1 hPa: ± 10 %, 20-1000 hPa: ± 30 %	1 · 10^{-8} - 1 hPa: ± 10 %, 20-1000 hPa: ± 30 %	1 · 10^{-8} - 1 hPa: ± 10 %, 20-1000 hPa: ± 30 %
Weight	475 g	475 g	475 g	475 g
Materials in contact with media	Tungsten, stainless steel, nickel, glass, ceramics	Tungsten, stainless steel, nickel, glass, ceramics	Tungsten, stainless steel, nickel, glass, ceramics	Tungsten, stainless steel, nickel, glass, ceramics
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	5 · 10^{-10} hPa	5 · 10^{-10} hPa	5 · 10^{-10} hPa	5 · 10^{-10} hPa
Sensor cable length max.	100 m	100 m	100 m	100 m
Method of measurement	Pirani/Bayard-Alpert	Pirani/Bayard-Alpert	Pirani/Bayard-Alpert	Pirani/Bayard-Alpert
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	Digital RS-485 , M12, 5-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Temperature: Bakeout (electronics removed)	180 °C	180 °C	180 °C	180 °C
Temperature: Operating	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	8.0 W	8.7 W	9.5 W	8.4 W
Repeatability: % of measurement	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 5%; 1 · 10^{-2} - 10 hPa: ± 2 %	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 5%; 1 · 10^{-2} - 10 hPa: ± 2 %	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 5%; 1 · 10^{-2} - 10 hPa: ± 2 %	1 · 10^{-8} - 1 · 10^{-2} hPa: ± 5%; 1 · 10^{-2} - 10 hPa: ± 2 %

Order number				
HPT 200, DN 40 ISO-KF	**PT R39 150**	**PT R39 151**	**PT R39 152**	**PT R39 153**

Further accessories see controller DPG 202

Technical data	HPT 200, DN 40 CF-F, RS-485	HPT 200, , DN 40 CF-F, RS-485, analog	HPT 200, DN 40 CF-F, RS-485, Profibus	HPT 200, DN 40 CF-F, RS-485, DeviceNet
Flange (in)	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F
Number of filaments	2	2	2	2
Seal	Metal	Metal	Metal	Metal
Pressure max.	400 kPa	400 kPa	400 kPa	400 kPa
Filament	Iridium yttriated, twice	Iridium yttriated, twice	Iridium yttriated, twice	Iridium yttriated, twice
Accuracy: % of measurement	$1 \cdot 10^{-8}$ - 1 hPa: ± 10 %, 20-1000 hPa: ± 30 %	$1 \cdot 10^{-8}$ - 1 hPa: ± 10 %, 20-1000 hPa: ± 30 %	$1 \cdot 10^{-8}$ - 1 hPa: ± 10 %, 20-1000 hPa: ± 30 %	$1 \cdot 10^{-8}$ - 1 hPa: ± 10 %, 20-1000 hPa: ± 30 %
Weight	670 g	670 g	670 g	670 g
Materials in contact with media	Tungsten, stainless steel, nickel, glass, ceramics	Tungsten, stainless steel, nickel, glass, ceramics	Tungsten, stainless steel, nickel, glass, ceramics	Tungsten, stainless steel, nickel, glass, ceramics
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-10}$ hPa	$5 \cdot 10^{-10}$ hPa	$5 \cdot 10^{-10}$ hPa	$5 \cdot 10^{-10}$ hPa
Sensor cable length max.	100 m	100 m	100 m	100 m
Method of measurement	Pirani/Bayard-Alpert	Pirani/Bayard-Alpert	Pirani/Bayard-Alpert	Pirani/Bayard-Alpert
Measuring cycle	10 ms	10 ms	10 ms	10 ms
Interface: Connection	RS-485, D-Sub-socket, 9-pole	Digital RS-485 ; M12, 5-pole; Analog 0-10 V; 2 SP; M12, 8-pole	Digital RS-485 , M12, 5-pole, Profibus DP, M12, 5-pole	Digital RS-485 , M12, 5-pole, DeviceNet, M12, 5-pole
Protection category	IP 54	IP 54	IP 54	IP 54
Temperature: Bakeout (electronics removed)	180 °C	180 °C	180 °C	180 °C
Temperature: Operating	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C	+5 - +60 °C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	24 V DC	24 V DC	24 V DC	24 V DC
Supply: Power consumption max.	8.0 W	8.7 W	9.5 W	8.4 W
Repeatability: % of measurement	$1 \cdot 10^{-8}$ - $1 \cdot 10^{-2}$ hPa: ± 5%; $1 \cdot 10^{-2}$ - 10 hPa: ± 2 %	$1 \cdot 10^{-8}$ - $1 \cdot 10^{-2}$ hPa: ± 5%; $1 \cdot 10^{-2}$ - 10 hPa: ± 2 %	$1 \cdot 10^{-8}$ - $1 \cdot 10^{-2}$ hPa: ± 5%; $1 \cdot 10^{-2}$ - 10 hPa: ± 2 %	$1 \cdot 10^{-8}$ - $1 \cdot 10^{-2}$ hPa: ± 5%; $1 \cdot 10^{-2}$ - 10 hPa: ± 2 %

Order number				
HPT 200, DN 40 CF-F	**PT R39 350**	**PTR 39 351**	**PT R39 352**	**PT R39 353**

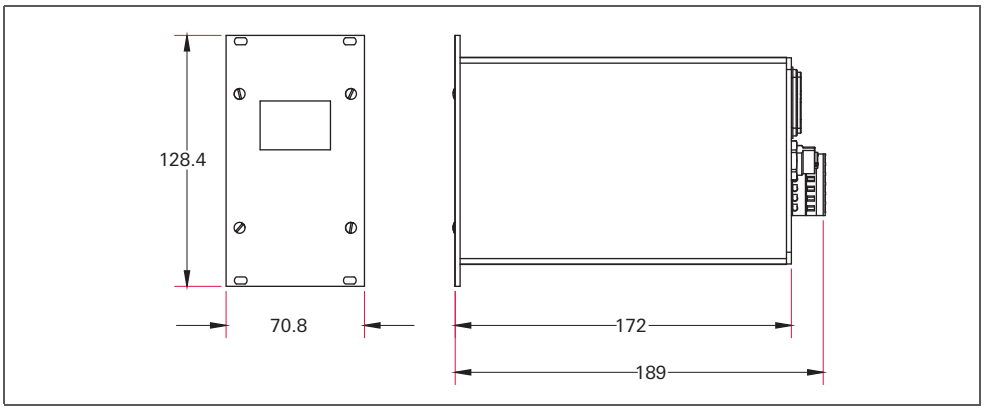
Further accessories see controller DPG 202

DPG 202, controller



- Simple operation
- For 2 transmitter
- Intuitive calibration
- 2 two-way contacts

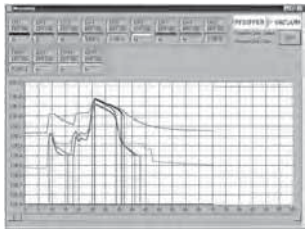
Dimensions (in mm)



Technical data	DPG 202, controller for 2 transmitter
Dimensions w x h x d	(19"-rack, 14TE/3HE) ; 71 x 128 x 178 mm
Connections for gauge	DIN M12
Display	LCD-Graphic display, backlit
Display rate	2 Hz
Weight	0.75 kg
Power consumption	max. 25 (gauges included) W
Unit of measure	mbar, bar, Pa, hPa, mTorr, Torr
Measurement rate	25 Hz
Mains requirement: frequency (range)	50/60 Hz
Mains requirement: voltage (range)	95-265 V AC
Set point: Voltage max.	250 V AC, 4 A ; 45 V DC, 2 A
Set point: Changeover contact, potential-free	2 pieces
Protection category	IP 20
Fuse	0.8 A T
Temperature: Operating	5-50 °C
Temperature: Storage	-20-+60 °C

Order number	
DPG 202, controller	**PT G12 020**

Software DokuStar



- System requirements:
- Software: Windows XP, Windows Vista, Windows 7 (requires administrator rights)
- Hardware: Pentium-PC (1000 MHz or more), 256 MB RAM (512 MB recommended), 150 MB free hard drive space, Super VGA monitor (with 1024x768 resolution), small letter adjustment), 24 Bit Tru Color, free COM or USB port, mouse
- Visualization and data storage

Technical data	Software DokuStar	Software DokuStar Plus
For	DPS 101, DPS 109 and DPG 202	DPG / DPS 109 and direct connection
Measuring channel	up to 2	up to 16
PC min.	Pentium 160 MHz	Pentium 160 MHz
RAM	64 MB	64 MB
Interface	RS-232 or USB	RS-232 or USB
Interfaces	RS-232 or USB	RS-232 or USB
Memory	15 MB free HD memory	15 MB free HD memory

Order number		
Software DokuStar	**PT 882 500**	**PT 882 501**

Further accessories

Power cords	Order number
Mains cable, US plug, 2.5 m	**P4 564 309 YX**
Mains cable, U.K. plug, 2.5 m	**P4 564 309 Y1**
Mains cable, Swiss plug, 2.5 m	**P4 564 309 YR**
Mains cable, Euro-style safety plug, 2.5 m	**P4 564 309 YU**

Interface cable	Order number
Interface cable, M12 m/M12 m, 0,7 m	**PM 061 281 -T**
Interface cable, M12 m/M12 m, 1.0 m	**PM 061 282 -T**
Interface cable, M12 m straight / M12 m straight, 3.0 m	**PM 061 283 -T**
Interface cable, M12 m/M12 m, 5.0 m	**PM 061 284 -T**
Interface cable, M12 m/M12 m, 10 m	**PM 061 285 -T**
Interface cable, M12 m/M12 m, 15 m	**PM 061 286 -T**
Interface cable, M12 m/M12 m, 20 m	**PM 061 287 -T**
Interface cable, M12 m/M12 m, 50 m	**PM 061 289 -T**

Further accessories	Order number
Connector M12 to RS-485	**PM 061 270 -X**
Plug-in bus termination for RS-485, M12 5-pole	**PT 348 105-T**
Y-Connector M12 to RS-485	**P 4723 010**
USB converter to RS-485 interface	**PM 061 207 -T**
Adapter M12/M12 (only RS-485, no power)	**PM 348 132 -T**
Gauge adapting cable RS-485, D-Sub 9-pole/M12 5-pole	**PT 348 131 -T**
Connection cable, RS-485, M12/D-sub 9-pole, 3.0 m	**PT 348 223 -T**

ActiveLine

A wide range of proven vacuum transmitters to cover all applications



ActiveLine

The ActiveLine series offers a wide range of vacuum gauges that work on a variety of measuring principles and have a classic analog outlet. The series thus covers the technically relevant vacuum range from ultra-high vacuum to overpressure. The outlet voltage of the transmitter, that is proportional to the pressure, can be displayed as pressure on the three controllers or read into controllers through analog inputs for further processing.

The series includes high precision capacitance vacuum gauges in SI units (CMR) for process monitoring and control as well as corresponding Torr types (CCR) for direct use in semiconductor processes without controllers.

Customer benefits

- Covers the entire vacuum range
- Suitable for all requirement profiles
- Space saving installation due to compact design
- Optimum cost-benefit ratio
- Universally usable due to integrated electronic drive unit
- Easy self-diagnosis
- Avoids installation errors through controllers with automatic transmitter recognition
- Easy wiring for all transmitters through uniform standard cables

Typical applications

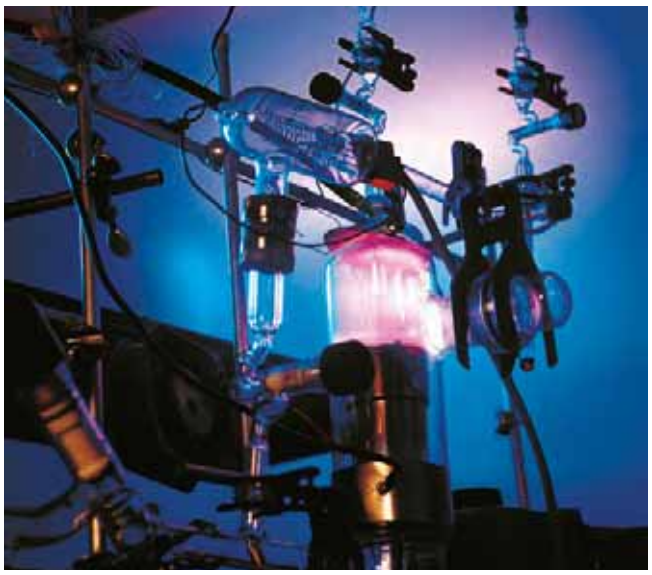
- Research facilities
- Analysis equipment
- Research and production coating facilities
- Leak detection systems
- Semiconductor development and production
- Photovoltaics
- Industrial vacuum process systems



Semiconductor development and production



Coating



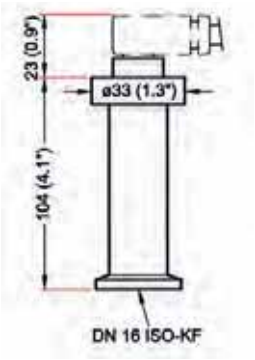
Research facilities

Piezo transmitters APR (1 · 10^{-1} - 55000 hPa)

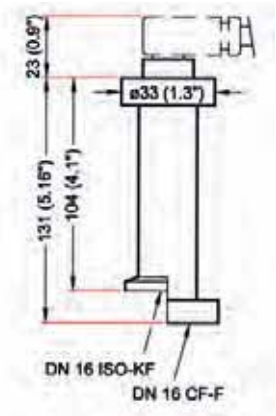


- Measurement range from 0.1 hPa to 1100 hPa
- Pressure measurement independent of type of gas
- Corrosion- resistant
- Maximum pressure applies to inert gases and temperatures of less than 55 °C

Dimensions (in mm)



APR 250, DN 16 ISO-KF



APR 260, DN 16 ISO-KF

Technical data	APR 250, DN 16 ISO-KF, 2 % F.S.	APR 260, DN 16 ISO-KF, 1 % F.S.	APR 260, DN 16 CF-F, 1 % F.S.
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 CF-F
Output signal: Sensor error below	≤ 0.4 V	≤ 0.4 V	≤ 0.4 V
Output signal: Pressure range	1.0 - 9.8 V	1.0 - 9.8 V	1.0 - 9.8 V
Output signal: Minimum load	10 kΩ	10 kΩ	10 kΩ
Bakeout temperature	80 °C	80 °C	80 °C
Pressure max.	300 kPa	300 kPa	300 kPa
Stability of sensitivity	≤ 0.5 %/year	≤ 0.2 %/year	≤ 0.2 %/year
Accuracy	2 % F.S.	1 % F.S.	1 % F.S.
Weight	120 g	120 g	150 g
Linearity and hysteresis	≤ 0.5 % F.S.	≤ 0.2 % F.S.	≤ 0.2 % F.S.
Measurement range max.	1100 hPa	1100 hPa	1100 hPa
Measurement range min.	$1 \cdot 10^{-1}$ hPa	$1 \cdot 10^{-1}$ hPa	$1 \cdot 10^{-1}$ hPa
Sensor cable length	50 m	50 m	50 m
Zero stability	≤ 0.5 % F.S./year	≤ 0.3 % F.S./year	≤ 0.3 % F.S./year
Protection category	IP 65	IP 65	
Temperature: Operating	10-80 °C	10-80 °C	10-80 °C
Temperature: Storage	-40-+80 °C	-40-+80 °C	-40-+80 °C
Thermal sensitivity drift	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %
Thermal zero drift	≤ 0.5 % F.S.	≤ 0.2 % F.S.	≤ 0.2 % F.S.
Supply: Voltage	13-30 V DC	13-30 V DC	13-30 V DC
Supply: Power consumption max.	≤ 0.2 W	≤ 0.2 W	≤ 0.2 W
Volume	2 cm^3	2 cm^3	6 cm^3
Material	Stainless steel	Stainless steel	Stainless steel

Order number			
Piezo Gauges APR 250/260 ($1 \cdot 10^{-1}$ - 1100 hPa)	**P 5215 102 TF**	**P 5215 112 TF**	**P 5215 114 TF**

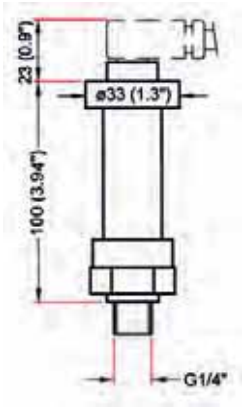
Accessories			
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**

Piezo transmitters APR (1 · 10^{-1} - 55000 hPa)

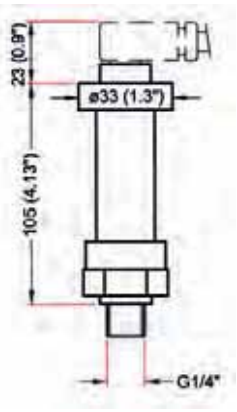


- Pressure measurement independent of type of gas
- Corrosion-resistant
- Maximum pressure applies to inert gases and temperatures of less than 55 °C

Dimensions (in mm)



APR 262, G1/4"
APR 265, G1/4"
APR 266, G1/4"



APR 267, G1/4"

Technical data	APR 262, G1/4", 2200 hPa	APR 265, G1/4", 5500 hPa	APR 266, G1/4", 11000 hPa	APR 267, G1/4", 55000 hPa
Flange (in)	G 1/4"	G 1/4"	G 1/4"	G 1/4"
Output signal: Sensor error below	≤ 0.4 V	≤ 0.4 V	≤ 0.4 V	≤ 0.4 V
Output signal: Pressure range	1.0 - 9.8 V	1.0 - 9.8 V	1.0 - 9.8 V	1.0 - 9.8 V
Output signal: Minimum load	10 kΩ	10 kΩ	10 kΩ	10 kΩ
Bakeout temperature	80 °C	80 °C	80 °C	80 °C
Pressure max.	400 kPa	750 kPa	1500 kPa	7500 kPa
Stability of sensitivity	≤ 0.2 %/year	0.2 %/year	0.2 %/year	≤ 0.2 %/year
Accuracy	2 % F.S.	2 % F.S.	2 % F.S.	2 % F.S.
Weight	120 g	120 g	120 g	120 g
Linearity and hysteresis	≤ 0.5 % F.S.	0.5 % F.S.	0.5 % F.S.	≤ 0.5 % F.S.
Measurement range max.	2200 hPa	5500 hPa	11000 hPa	55000 hPa
Measurement range min.	$2 \cdot 10^{-1}$ hPa	0.5 hPa	1 hPa	5 hPa
Sensor cable length	50 m	50 m	50 m	50 m
Zero stability	≤ 0.5 % F.S./year	0.5 % F.S./year	0.5 % F.S./year	≤ 0.5 % F.S./year
Protection category	IP 65	IP 65	IP 65	IP 65
Temperature: Operating	10-80 °C	10-80 °C	10-80 °C	10-80 °C
Temperature: Storage	-40-+80 °C	-40-+70 °C	-40-+80 °C	-40-+80 °C
Thermal sensitivity drift	≤ 0.5 %	0.5 %	0.5 %	≤ 0.5 %
Thermal zero drift	≤ 0.5 % F.S.	0.5 % F.S.	0.5 % F.S.	≤ 0.5 % F.S.
Supply: Voltage	13-30 V DC	13-30 V DC	13-30 V DC	13-30 V DC
Supply: Power consumption max.	≤ 0.2 W	≤ 0.2 W	0.2 W	≤ 0.2 W
Volume	0.5 cm^3	0.5 cm^3	0.5 cm^3	0.5 cm^3
Material	Stainless steel	Stainless steel	Stainless steel	Stainless steel

Order number				
Piezo Gauges APR 262/265/266/267 ($2 \cdot 10^{-1}$ - 55000 hPa)	**P 5215 120 TF**	**P 5215 126 TF**	**P 5215 132 TF**	**P5 215 138 TF**

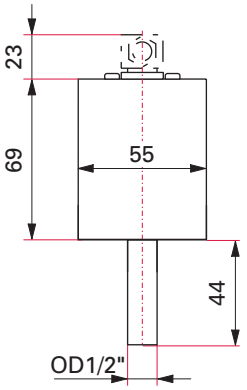
Accessories				
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**

Capacitance transmitters CMR (1 · 10^{-5} - 1100 hPa) temperature compensated

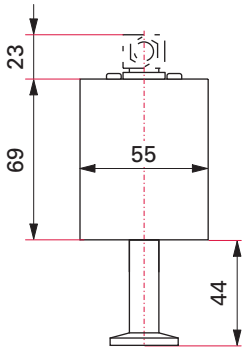


- Sensor in ceramic technology
- No memory effects
- Materials employed have identical temperature coefficients
- Excellent temperature compensation
- Resistant to corrosive gases
- Excellent zero stability

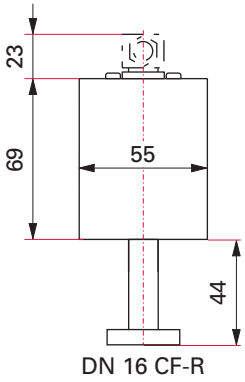
Dimensions (in mm)



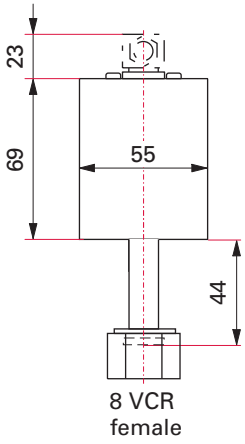
Pipe OD 1/2"



DN 16 ISO-KF



DN 16 CF-R



Cajon 8 VCR

Technical data	CMR 361, 1000 hPa F.S.	CMR 362, 100 hPa F.S.	CMR 363, 10 hPa F.S.	CMR 364, 1 hPa F.S.	CMR 365, 0.1 hPa F.S.
Resolution	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.
Output signal: Sensor error above	> 9.8 V	> 9.8 V	> 9.8 V	> 9.8 V	> 9.8 V
Output signal: Sensor error below	< 0.4 V	< 0.4 V	< 0.4 V	< 0.4 V	< 0.4 V
Output signal: Pressure range	1 - 9.8 V	1 - 9.8 V	1 - 9.8 V	1 - 9.8 V	1 - 9.8 V
Output signal: Minimum load	10 kΩ	10 kΩ	10 kΩ	10 kΩ	10 kΩ
Bakeout temperature max. at the flange	≤ 110 °C	≤ 110 °C	≤ 110 °C	≤ 110 °C	≤ 110 °C
Pressure max.	3 bar	2 bar	2 bar	2 bar	1.3 bar
Accuracy	0.2 % of reading	0.2 % of reading	0.2 % of reading	0.2 % of reading	0.5 % of reading
Membrane and measuring chamber	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)
Measurement range max.	1100 hPa	110 hPa	11 hPa	1.1 hPa	0.11 hPa
Measurement range min.	$1 \cdot 10^{-1}$ hPa	$1 \cdot 10^{-2}$ hPa	$1 \cdot 10^{-3}$ hPa	$1 \cdot 10^{-4}$ hPa	$1 \cdot 10^{-5}$ hPa
Sensor cable length	≤ 120 m	≤ 120 m	≤ 120 m	≤ 120 m	120 m
Response time	30 ms	30 ms	30 ms	30 ms	130 ms
Pipe and flange	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Protection category	IP 30	IP 30	IP 30	IP 30	IP 30
Temperature: Operating	5-50 °C	5-50 °C	5-50 °C	5-50 °C	5-50 °C
Temperature effect: on span	0.01 % of reading/°C	0.01 % of reading/°C	0.01 % of reading/°C	0.01 % of reading/°C	0.03 % of reading/°C
Temperature effect: on zero	0.005 % F.S./°C	0.005 % F.S./°C	0.005 % F.S./°C	0.015 % F.S./°C	0.02 % F.S./°C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	14-30 V DC	14-30 V DC	14-30 V DC	14-30 V DC	14-30 V DC
Supply: Power consumption max.	≤ 1 W	≤ 1 W	≤ 1 W	≤ 1 W	≤ 1 W
Volume	≤ 3.6 cm^3	≤ 3.6 cm^3	≤ 3.6 cm^3	≤ 3.6 cm^3	≤ 3.6 cm^3

	CMR 361, 1000 hPa F.S.	CMR 362, 100 hPa F.S.	CMR 363, 10 hPa F.S.	CMR 364, 1 hPa F.S.	CMR 365, 0.1 hPa F.S.
Flange (in)	Pipe OD 1/2"	Pipe OD 1/2"	Pipe OD 1/2"	Pipe OD 1/2"	Pipe OD 1/2"
Weight	≤ 310 g	≤ 310 g	≤ 310 g	≤ 310 g	≤ 310 g
Order number	**PT R24 600**	**PT R24 610**	**PT R24 620**	**PT R24 630**	**PT R24 640**
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Weight	≤ 330 g	≤ 330 g	≤ 330 g	≤ 330 g	≤ 330 g
Order number	**PT R24 601**	**PT R24 611**	**PT R24 621**	**PT R24 631**	**PT R24 641**
Flange (in)	DN 16 CF-R	DN 16 CF-R	DN 16 CF-R	DN 16 CF-R	DN 16 CF-R
Weight	≤ 350 g	≤ 350 g	≤ 350 g	≤ 350 g	≤ 350 g
Order number	**PT R24 602**	**PT R24 612**	**PT R24 622**	**PT R24 632**	**PT R24 642**
Flange (in)	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR
Weight	≤ 370 g	≤ 370 g	≤ 370 g	≤ 370 g	≤ 370 g
Order number	**PT R24 603**	**PT R24 613**	**PT R24 623**	**PT R24 633**	**PT R24 643**

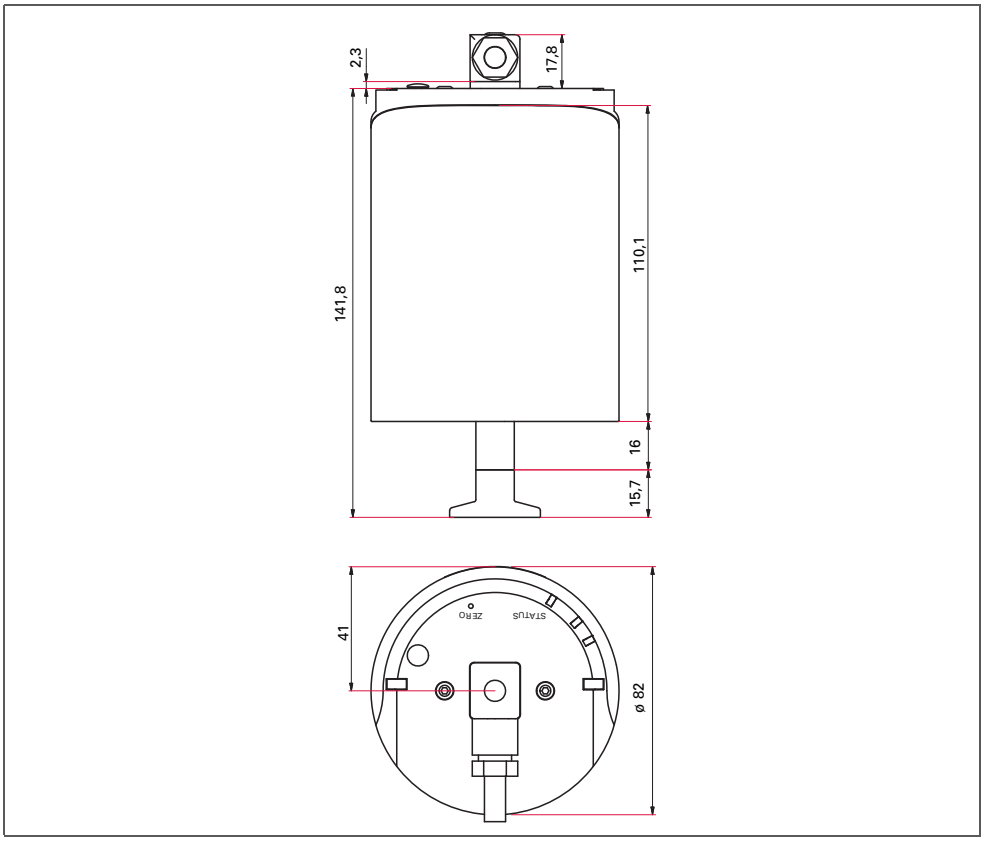
Accessories					
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**

Capacitance transmitters CMR (1 · 10^{-5} - 1100 hPa) temperature regulated



- Sensor in ceramic technology
- No memory effects
- Materials employed have identical temperature coefficients
- Excellent temperature compensation
- Resistant to corrosive gases
- Excellent zero stability
- Additional protection against pollution by sensor shield

Dimensions (in mm)



Technical data	CMR 371, 1000 hPa F.S.	CMR 372, 100 hPa F.S.	CMR 373, 10 hPa F.S.	CMR 374, 1 hPa F.S.	CMR 375, 0.1 hPa F.S.
Resolution	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.
Output signal: Sensor error above	> 9.8 V	> 9.8 V	> 9.8 V	> 9.8 V	> 9.8 V
Output signal: Sensor error below	< 0.4 V	< 0.4 V	< 0.4 V	< 0.4 V	< 0.4 V
Output signal: Pressure range	1.0 - 9.8 V	1.0 - 9.8 V	1.0 - 9.8 V	1.0 - 9.8 V	1.0 - 9.8 V
Output signal: Minimum load	> 10 kΩ	> 10 kΩ	> 10 kΩ	> 10 kΩ	> 10 kΩ
Bakeout temperature max. at the flange	≤ 110 °C	≤ 110 °C	≤ 110 °C	≤ 110 °C	≤ 110 °C
Pressure max.	300 kPa	2 bar	2 bar	2 bar	1,3 bar
Accuracy: % of measurement	0.15	0.15	0.15	0.15	0.15
Weight	≤ 900 g	≤ 900 g	≤ 900 g	≤ 900 g	≤ 900 g
Membrane and measuring chamber	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)
Measurement range max.	1100 hPa	110 hPa	11 hPa	1.1 hPa	0.11 hPa
Measurement range min.	$1 \cdot 10^{-1}$ hPa	$1 \cdot 10^{-2}$ hPa	$1 \cdot 10^{-3}$ hPa	$1 \cdot 10^{-4}$ hPa	$1 \cdot 10^{-5}$ hPa
Response time	30 ms	30 ms	30 ms	30 ms	130 ms
Pipe and flange	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Protection category	IP 40	IP 40	IP 40	IP 40	IP 40
Temperature: Operating	10-40 °C	10-40 °C	10-40 °C	10-40 °C	10-40 °C
Temperature effect: on span	0.01 % of reading/°C	0.01 % of reading/°C	0.01 % of reading/°C	0.01 % of reading/°C	0.01 % of reading/°C
Temperature effect: on zero	0.0025 % F.S./°C	0.0025 % F.S./°C	0.0025 % F.S./°C	0.0025 % F.S./°C	0.005 % F.S./°C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Temperature stabilization	45 °C	45 °C	45 °C	45 °C	45 °C
Supply: Voltage	14-30 V DC	14-30 V DC	14-30 V DC	14-30 V DC	14-30 V DC
Supply: Power consumption max.	≤ 12 W	≤ 12 W	≤ 12 W	≤ 12 W	≤ 12 W
Volume	≤ 4.2 cm^3	≤ 4.2 cm^3	≤ 4.2 cm^3	≤ 4.2 cm^3	≤ 4.2 cm^3

	CMR 371, 1000 hPa F.S.	CMR 372, 100 hPa F.S.	CMR 373, 10 hPa F.S.	CMR 374, 1 hPa F.S.	CMR 375, 0.1 hPa F.S.
Flange (in)	Tube OD 1/2"	Tube AD 1/2"	Tube OD 1/2"	Tube OD 1/2"	Tube OD 1/2"
Order number	**PT R25 100**	**PT R25 110**	**PT R25 120**	**PT R25 130**	**PT R25 140**
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Order number	**PT R25 101**	**PT R25 111**	**PT R25 121**	**PT R25 131**	**PT R25 141**
Flange (in)	DN 16 CF-R	DN 16 CF-R	DN 16 CF-R	DN 16 CF-R	DN 16 CF-R
Order number	**PT R25 102**	**PT R25 112**	**PT R25 122**	**PT R25 132**	**PT R25 142**
Flange (in)	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR
Order number	**PT R25 103**	**PT R25 113**	**PT R25 123**	**PT R25 133**	**PT R25 143**

Accessories					
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**

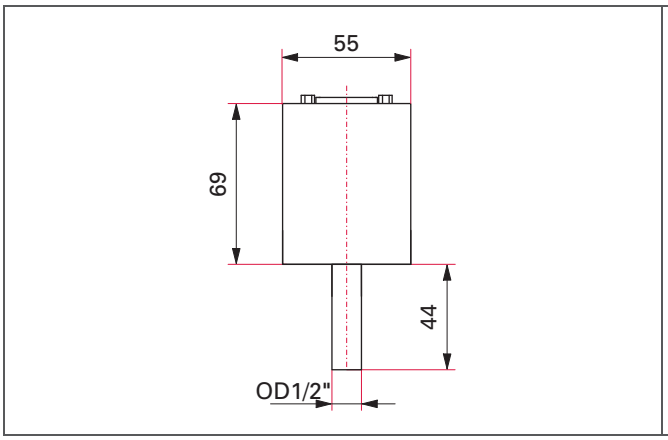
Capacitance transmitters CCR (1 · 10^{-5} - 1000 Torr) temperature compensated



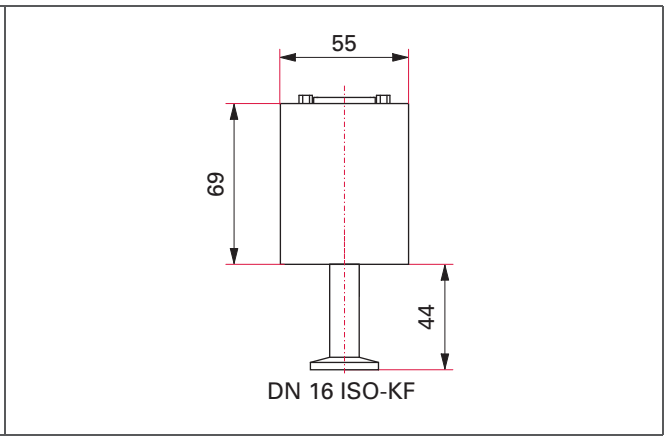
- Accuracy: 0.2 % of measurement
- Supply voltage: 14-30 V
- Output signal: 0-10 V
- Ceramic technology sensor
- No memory effects
- Excellent temperature compensation
- Excellent zero stability

Output signal and connector compatible with MKS Baratron.

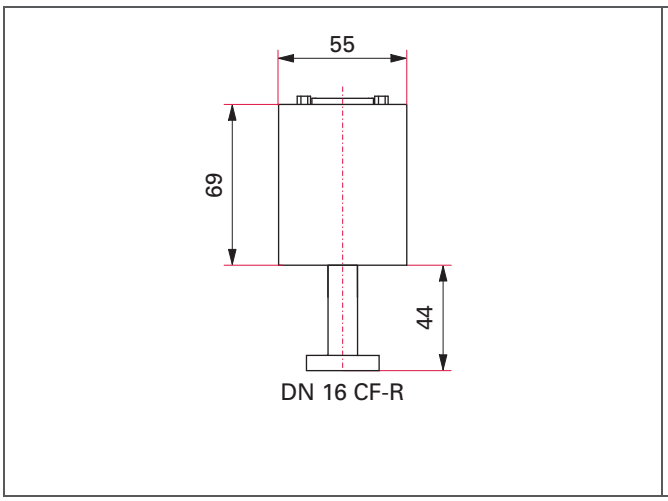
Dimensions (in mm)



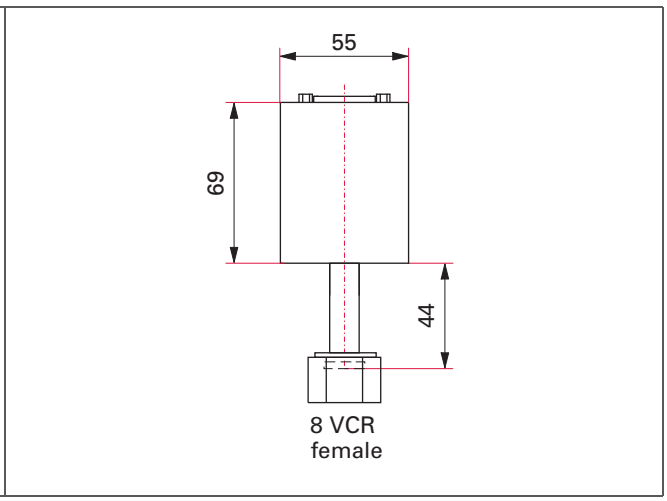
Tube OD 1/2"



DN 16 ISO-KF



DN 16 CF-R



Cajon 8 VCR

Technical data	CCR 361, 1000 Torr F.S.	CCR 362, 100 Torr F.S.	CCR 363, 10 hPa F.S.	CCR 364, 1 Torr F.S.	CCR 365, 0.1 Torr F.S.
Resolution	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.
Output signal: Pressure range	0-10 V	0-10 V	0-10 V	0-10 V	0-10 V
Output signal: Minimum load	> 10 kΩ	> 10 kΩ	> 10 kΩ	> 10 kΩ	> 10 kΩ
Bakeout temperature max. at the flange	≤ 110 °C	≤ 110 °C	≤ 110 °C	≤ 110 °C	≤ 110 °C
Pressure max.	300 kPa	2 bar	2 bar	2 bar	130 kPa
Accuracy	0.20 % of reading	0.20 % of reading	0.20 % of reading	0.20 % of reading	0.5 % of reading
Weight	≤ 370 g	≤ 370 g	≤ 370 g	≤ 370 g	≤ 370 g
Membrane and measuring chamber	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)
Measurement range max.	1333 hPa	133 hPa	13.3 hPa	1.33 hPa	0.13 hPa
Measurement range min.	$1.33 \cdot 10^{-1}$ hPa	$1.33 \cdot 10^{-2}$ hPa	$1.33 \cdot 10^{-3}$ hPa	$1.33 \cdot 10^{-4}$ hPa	$1 \cdot 10^{-5}$ hPa
Sensor cable length	≤ 100 m (0.14 mm^2 conductor)	100 m (0.14 mm^2 conductor)	100 m (0.14 mm^2 conductor)	100 m (0.14 mm^2 conductor)	100 m (0.14 mm^2 conductor)
Response time	30 ms	30 ms	30 ms	30 ms	130 ms
Pipe and flange	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Protection category	IP 30	IP 30	IP 30	IP 30	IP 30
Temperature: Operating	5-50 °C	5-50 °C	5-50 °C	5-50 °C	5-50 °C
Temperature effect: on span	0.01 % of reading/°C	0.01 % of reading/°C	0.01 % of reading/°C	0.01 % of reading/°C	0.03 % of reading/°C
Temperature effect: on zero	0.0050 % F.S./°C	0.005 % F.S./°C	0.0050 % F.S./°C	0.015 % F.S./°C	0.02 % F.S./°C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	14-30 V DC	14-30 V DC	14-30 V DC	14-30 V DC	14-30 V DC
Supply: Power consumption max.	≤ 1 W	≤ 1 W	≤ 1 W	≤ 1 W	≤ 1 W
Volume	≤ 3.6 cm^3	≤ 3.6 cm^3	≤ 3.6 cm^3	≤ 3.6 cm^3	≤ 3.6 cm^3

	CCR 361, 1000 Torr F.S.	CCR 362, 100 Torr F.S.	CCR 363, 10 hPa F.S.	CCR 364, 1 Torr F.S.	CCR 365, 0.1 Torr F.S.
Flange (in)	Tube OD 1/2"	Tube OD 1/2"	Tube OD 1/2"	Tube OD 1/2"	Tube OD 1/2"
Order number	**PT R27 600**	**PT R27 610**	**PT R27 620**	**PT R27 630**	**PT R27 640**
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO KF
Order number	**PT R27 601**	**PT R27 611**	**PT R27 621**	**PT R27 631**	**PT R27 641**
Flange (in)			DN 16 CF-R	DN 16 CF-R	DN 16 CF-R
Order number			**PT R27 622**	**PT R27 632**	**PT R27 642**
Flange (in)	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR
Order number	**PT R27 603**	**PT R27 613**	**PT R27 623**	**PT R27 633**	**PT R27 643**

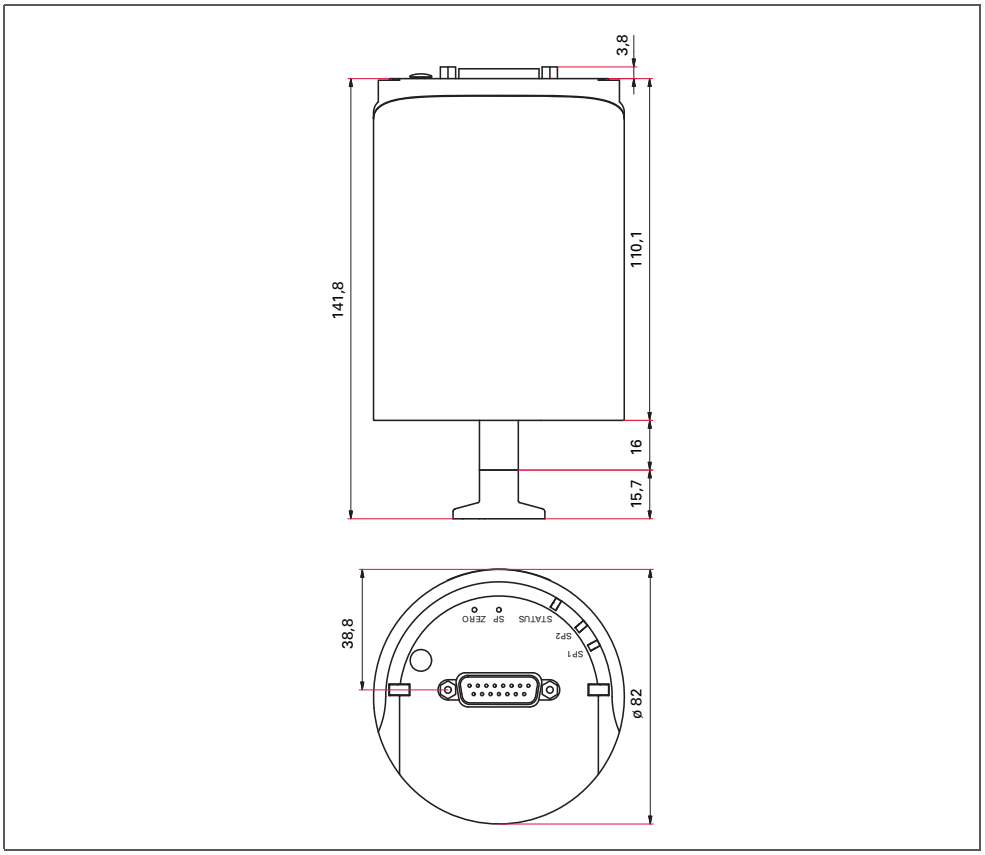
Capacitance transmitters CCR (1 · 10^{-5} - 1000 Torr) temperature regulated



- Pressure measurement independent of type of gas
- Outstanding long-term and temperature stability
- Only marginal zero drift
- Corrosion-resistant ceramic technology
- Additional protection against pollution by Sensorshield
- Transmitter cannot be connected to controllers TPG 261, TPG 262 and TPG 256 A

Output signal and connector compatible with MKS Baratron.

Dimensions (in mm)



Technical data	CCR 371, 1000 Torr F.S.	CCR 372, 100 Torr F.S.	CCR 373, 10 Torr F.S.	CCR 374, 1 Torr F.S.	CCR 375, 0.1 Torr F.S.
Resolution	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.	0.003 % F.S.
Output signal: Pressure range	0-10 V	0-10 V	0-10 V	0-10 V	0-10 V
Output signal: Minimum load	> 10 kΩ	> 10 kΩ	> 10 kΩ	> 10 kΩ	> 10 kΩ
Bakeout temperature max. at the flange	≤ 110 °C	≤ 110 °C	≤ 110 °C	≤ 110 °C	≤ 110 °C
Pressure max.	300 kPa	200 kPa	200 kPa	2 bar	1.3 bar
Accuracy: % of measurement	0.15	0.15	0.15	0.15	0.15
Weight	≤ 900 g	≤ 900 g	≤ 900 g	≤ 900 g	≤ 900 g
Membrane and measuring chamber	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)	Ceramics (Al_2O_3≤ 99,5 %)
Measurement range max.	1333 hPa	133 hPa	13.3 hPa	1.3 hPa	0.13 hPa
Measurement range min.	$1.33 \cdot 10^{-1}$ hPa	$1.33 \cdot 10^{-2}$ hPa	$1.33 \cdot 10^{-3}$ hPa	$1{,}33 \cdot 10^{-4}$ hPa	$1.33 \cdot 10^{-5}$ hPa
Response time	30 ms	30 ms	30 ms	30 ms	130 ms
Pipe and flange	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Protection category	IP 40	IP 40	IP 40	IP 40	IP 40
Temperature: Operating	10-40 °C	10-40 °C	10-40 °C	10-40 °C	10-40 °C
Temperature effect: on span	0.01 % of reading/°C	0.01 % of reading/°C	0.01 % of reading/°C	0.01 % of reading/°C	0.01 % of reading/°C
Temperature effect: on zero	0.0025 % F.S./°C	0.0025 % F.S./°C	0.0025 % F.S./°C	0.0025 % F.S./°C	0.0025 % F.S./°C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	14-30 V DC	14-30 V DC	14-30 V DC	14-30 V DC	14-30 V DC
Supply: Power consumption max.	≤ 12 W	≤ 12 W	≤ 12 W	≤ 12 W	≤ 12 W
Volume	≤ 4.2 cm^3	≤ 4.2 cm^3	≤ 4.2 cm^3	≤ 4.2 cm^3	≤ 4.2 cm^3

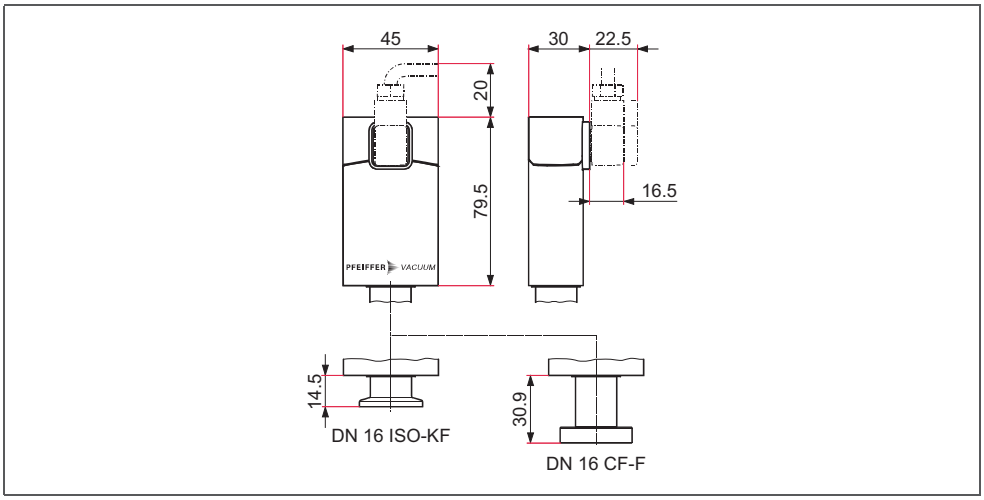
	CCR 371, 1000 Torr F.S.	CCR 372, 100 Torr F.S.	CCR 373, 10 Torr F.S.	CCR 374, 1 Torr F.S.	CCR 375, 0.1 Torr F.S.
Flange (in)	Tube OD 1/2"	Tube OD 1/2"	Tube OD 1/2"	Tube OD 1/2"	Tube OD 1/2"
Order number	**PT R28 100**	**PT R28 110**	**PT R28 120**	**PT R28 130**	**PT R28 140**
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF	DN 16 ISO-KF
Order number	**PT R28 101**	**PT R28 111**	**PT R28 121**	**PT R28 131**	**PT R28 141**
Flange (in)	DN 16 CF-R	DN 16 CF-R	DN 16 CF-R	DN 16 CF-R	DN 16 CF-R
Order number	**PT R28 102**	**PT R28 112**	**PT R28 122**	**PT R28 132**	**PT R28 142**
Flange (in)	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR	Cajon 8 VCR
Order number	**PT R28 103**	**PT R28 113**	**PT R28 123**	**PT R28 133**	**PT R28 143**

Pirani/Capacitance transmitters PCR (5 · 10^{-5} - 1500 hPa)



- Measurement range: 5 · 10^{-5} to 1500 hPa
- Bakeout temperature: 80 °C
- Output signal: 1,2 - 8,68 V logarithm of pressure
- Voltage supply: 15 - 30 V DC
- Metal-sealed, without plug

Dimensions (in mm)



Technical data	PCR 280, 80 °C, DN 16 ISO-KF	PCR 280, 80 °C, DN 16 CF-F
Flange (in)	DN 16 ISO-KF	DN 16 CF-F
Output signal: Pressure range	1.2 - 8,68 V	1.2 - 8.68 V
Output signal: Minimum load	10 kΩ	10 kΩ
Bakeout temperature	80 °C	80 °C
Seal	Metal	Metal
Pressure max.	5 bar	500 kPa
Feedthrough	Glass	Glass
Feature	Stainless steel, metal sealed	Stainless steel, metal sealed
Flange	Stainless steel	Stainless steel
Accuracy	$5 \cdot 10^{-4}$ - $1 \cdot 10^{-3}$ hPa: ± 50 % ; $1 \cdot 10^{-3}$ - 100 hPa: ± 15 % ; 100 - 950 hPa: ± 5 % ; 950 - 1100 hPa: ± 2,5 %	$5 \cdot 10^{-4}$ - $1 \cdot 10^{-3}$ hPa: ± 50 % ; $1 \cdot 10^{-3}$ - 100 hPa: ± 15 % ; 100 - 950 hPa: ± 5 % ; 950 - 1050 hPa: ± 2,5 %
Weight	120 g	120 g
Filament	Tungsten	Tungsten
Measurement range max.	1500 hPa	1500 hPa
Measurement range min.	$5 \cdot 10^{-5}$ hPa	$5 \cdot 10^{-5}$ hPa
Sensor cable length	100 m	100 m
Temperature: Operating	10-50 °C	10-50 °C
Temperature: Storage	-20-+65 °C	-20-+65 °C
Supply: Voltage	15-30 V DC	15-30 V DC
Supply: Power consumption max.	2.5 W	2.5 W
Volume	4.7 cm^3	4.7 cm^3
Repeatability: 10^{-3} - 1100 hPa	± 2 %	± 2 %

Order number		
Pirani/capacitance gauge PCR 280 ($5 \cdot 10^{-5}$ - 1500 hPa)	**PT R26 855**	**PT R26 856**

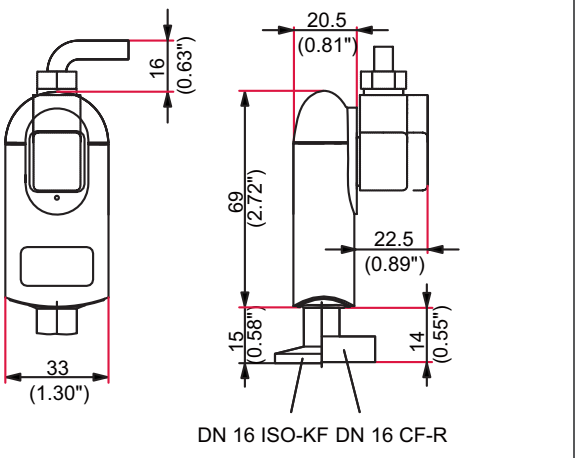
Accessories		
Centering ring with poral filter, Pore size: 20 µm, FPM/stainless steel, DN 16 ISO-KF	**PF 117 216 -T**	**PF 117 216 -T**
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**

Pirani transmitter TPR (5 · 10^{-4} - 1000 hPa)

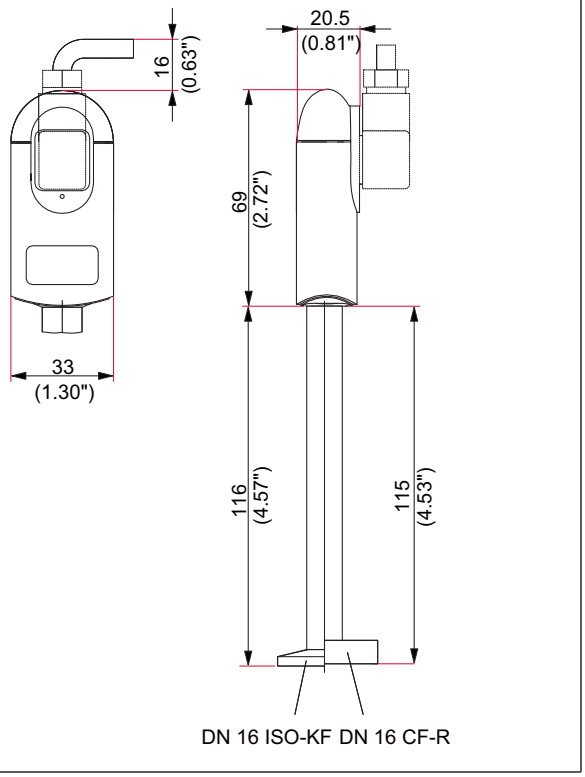


- Flange size: DN 16 ISO-KF
- Measurement range from 5 · 10^{-4} to 1000 hPa
- Compact and rugged
- Fast, stable measurement
- For general vacuum applications
- Maximum pressure refers to inert gases

Dimensions (in mm)



TPR 280, 80 °C



TPR 280, 250 °C

Technical data	TPR 280, 80 °C	TPR 280, 250 °C
Resolution	1 % of reading	1 % of reading
Output signal: Sensor error below	0.5 V	0.5 V
Output signal: Pressure range	2.2 - 8.5 V	2.2 - 8.5 V
Output signal: Minimum load	10 kΩ	10 kΩ
Bakeout temperature	80 °C	250 °C
Seal	Metal	Metal
Pressure max.	1000 kPa	1000 kPa
Feedthrough	Glass	Glass
Feature	Stainless steel, metal sealed	Stainless steel, metal sealed
Flange	Stainless steel	Stainless steel
Accuracy: 10^{-3} - 10^{2} hPa	± 15 %	± 15 %
Filament	Tungsten	Tungsten
Measurement range max.	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-4}$ hPa	$5 \cdot 10^{-4}$ hPa
Sensor cable length max.	200 m	200 m
Response time	80 ms	80 ms
Protection category	IP 40	IP40
Temperature: Operating	5-60 °C	5-60 °C
Temperature: Storage	-20-+65 °C	-20-+65 °C
Supply: Voltage	14-30 V DC	14-30 V DC
Supply: Power consumption max.	≤ 1 W	1 W
Repeatability: 10^{-3} - 10^{2} hPa	± 2 %	± 2 %

	TPR 280, 80 °C	TPR 280, 250 °C
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF
Weight	80 g	130 g
Volume	1.5 cm^3	10 cm^3
Order number	**PT R26 950**	**PT R26 960**
Flange (in)	DN 16 CF-R	DN 16 CF-R
Weight	100 g	140 g
Volume	1.5 cm^3	10 cm^3
Order number	**PT R26 951**	**PT R26 961**
Flange (in)	1/8" NPT	
Weight	70 g	
Volume	2 cm^3	
Order number	**PT R26 952**	
Flange (in)	8 VCR	
Weight	130 g	
Volume	2 cm^3	
Order number	**PT R26 953**	

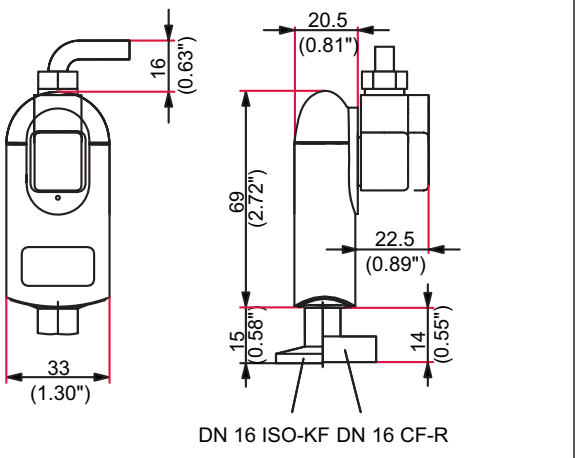
Accessories		
Centering ring with poral filter, Pore size: 20 µm, FPM/stainless steel, DN 16 ISO-KF	**PF 117 216 -T**	**PF 117 216 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**
Fine filter, pore size 4 µm, DN 16 ISO-KF	**PT 120 132 -T**	**PT 120 132 -T**

Pirani transmitter TPR (5 · 10^{-4} - 1000 hPa)

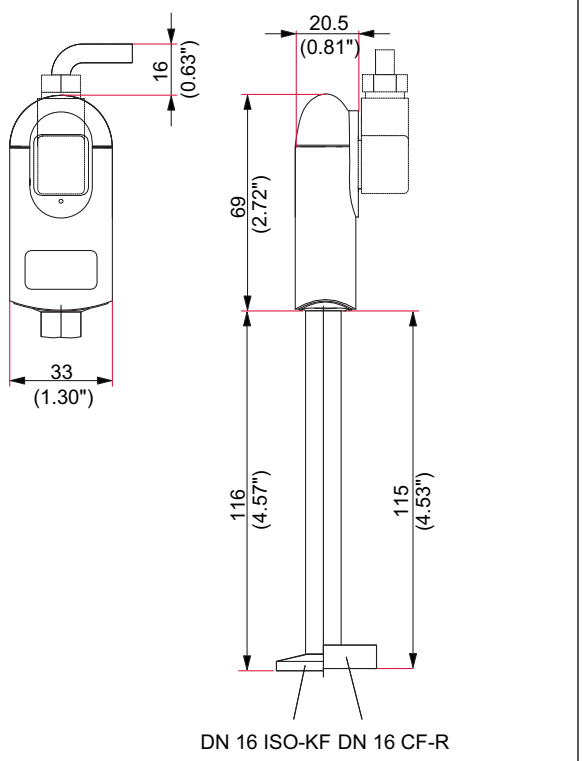


- Flange size: DN 16 ISO-KF
- Measurement range from 5 · 10^{-4} to 1000 hPa
- Compact and rugged
- Fast, stable measurement
- For corrosive media
- Maximum pressure refers to inert gases

Dimensions (in mm)



TPR 281, 80 °C



TPR 281, 250 °C

Technical data	TPR 281, 80 °C	TPR 281, 250 °C
Resolution	1 % of reading	1 % of reading
Output signal: Sensor error below	0.5 V	0.5 V
Output signal: Pressure range	2.2 - 8.5 V	2.2 - 8.5 V
Output signal: Minimum load	10 kΩ	10 kΩ
Bakeout temperature	80 °C	250 °C
Seal	Metal	Metal
Pressure max.	1000 kPa	1000 kPa
Feedthrough	Glass	Glass
Feature	For corrosive media	For corrosive media
Flange	Stainless steel	Stainless steel
Accuracy: 10^{-3} - 10^{2} hPa	± 15 %	± 15 %
Filament	Nickel	Nickel
Measurement range max.	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-4}$ hPa	$5 \cdot 10^{-4}$ hPa
Sensor cable length max.	200 m	200 m
Response time	80 ms	80 ms
Protection category	IP 40	IP 40
Temperature: Operating	5-60 °C	5-60 °C
Temperature: Storage	-20-+65 °C	-20-+65 °C
Supply: Voltage	14-30 V DC	14-30 V DC
Supply: Power consumption max.	1 W	1 W
Repeatability: 10^{-3} - 10^{2} hPa	± 2 %	± 2 %

	TPR 281, 80 °C	TPR 281, 250 °C
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF
Weight	80 g	130 g
Volume	1.3 cm^3	10 cm^3
Order number	**PT R21 950**	**PT R21 960**
Flange (in)	DN 16 CF-R	DN 16 CF-R
Weight	100 g	140 g
Volume	1.5 cm^3	10 cm^3
Order number	**PT R21 951**	**PT R21 961**

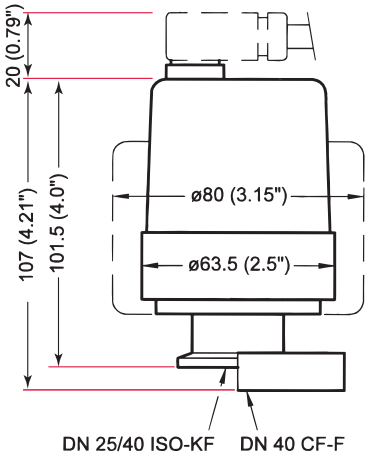
Accessories		
Centering ring with poral filter, Pore size: 20 µm, FPM/stainless steel, DN 16 ISO-KF	**PF 117 216 -T**	**PF 117 216 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**
Fine filter, pore size 4 µm, DN 16 ISO-KF	**PT 120 132 -T**	**PT 120 132 -T**

Cold Cathode transmitters IKR (5 · 10^{-11} - 0.01 hPa)

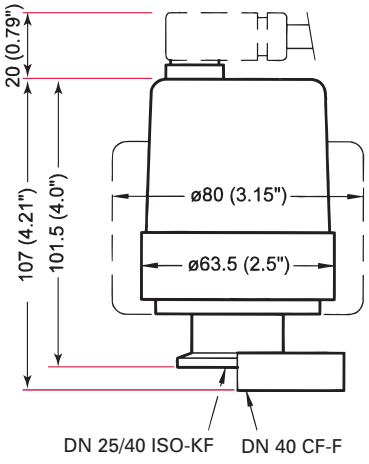


- Flange size: DN 25 ISO-KF
- Measurement range from 2 · 10^{-9} to 0.01 hPa
- Cold cathode (inverted magnetron)
- Rugged and dependable
- Insensitive to air ingress
- Corrosion-resistant
- Maximum pressure refers to inert gases and temperatures of less than 55 °C

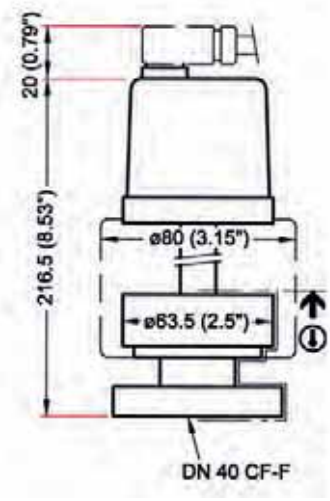
Dimensions (in mm)



IKR 251, FPM sealed



IKR 261, metal sealed



IKR 261, metal sealed, long case

Technical data	IKR 251, FPM sealed	IKR 261, metal sealed	IKR 261, metal sealed, long case
Anode	Molybdenum	Molybdenum	Molybdenum
Output signal: Sensor error below	0.5 V	0.5 V	0.5 V
Output signal: Pressure range	1.8 - 8.5 V	1.8 - 8.5 V	1.8 - 8.5 V
Output signal: Minimum load	10 kΩ	10 kΩ	10 kΩ
Bakeout temperature	150 °C, electronic removed	250 °C, electronic removed	250 °C
Seal	FPM	Ag	Ag
Pressure max.	1000 kPa	10 bar	10 bar
Feedthrough	Al_2O_3	Al_2O_3	Al_2O_3
Feature	Interior FPM sealed	Metal sealed	Metal sealed
Flange	Stainless steel	Stainless steel	Stainless steel
Accuracy: 10^{-8} - 10^{-3} hPa	± 30 %	± 30 %	± 30 %
Measurement range max.	0.01 hPa	0.01 hPa	0.01 hPa
Measurement range min.	$2 \cdot 10^{-9}$ hPa	$2 \cdot 10^{-9}$ hPa	$2 \cdot 10^{-9}$ hPa
Sensor cable length	500 m	500 m	500 m
Temperature: Operating	5-55 °C	5-55 °C	5-55 °C
Temperature: Storage	-40-+65 °C	-40-+65 °C	-40-+65 °C
Supply: Voltage	15-30 V	15-30 V	15-30 V
Supply: Power consumption max.	2 W	2 W	2 W
Volume	20 cm^3	20 cm^3	20 cm^3
Repeatability: 10^{-8} - 10^{-3} hPa	± 5 %	± 5 %	± 5 %

	IKR 251, FPM sealed	IKR 261, metal sealed	IKR 261, metal sealed, long case
Flange (in)	DN 25 ISO-KF		
Weight	700 g		
Order number	**PT R25 500**		
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF	
Weight	700 g	700 g	
Order number	**PT R25 501**	**PT R25 750**	
Flange (in)	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F
Weight	950 g	950 g	1200 g
Order number	**PT R25 502**	**PT R25 751**	**PT R25 761**

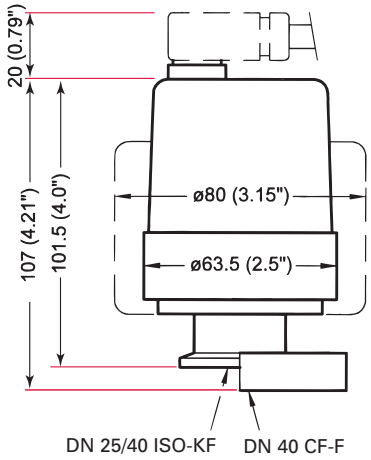
Accessories			
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**

Cold Cathode transmitters IKR (5 · 10^{-11} - 0.01 hPa)

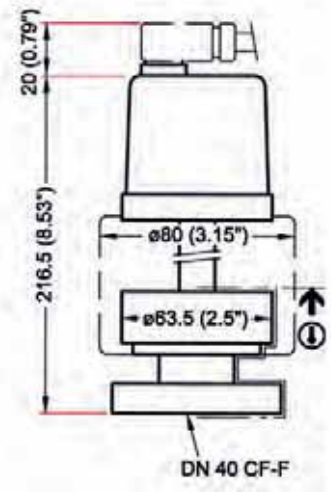


- Flange size: DN 40 CF-F
- Measurement range from 5 · 10^{-11} to 0.01 hPa
- Cold cathode (inverted magnetron)
- Rugged and dependable
- Insensitive to air ingress
- Corrosion-resistant
- Maximum pressure refers to inert gases and temperatures of less than 55 °C

Dimensions (in mm)



IKR 270, metal sealed



IKR 270, metal sealed, long case

Technical data	IKR 270, metal sealed, DN 40 CF-F	IKR 270, metal sealed, long case, DN 40 CF-F
Anode	Molybdenum	Molybdenum
Flange (in)	DN 40 CF-F	DN 40 CF-F
Output signal: Sensor error below	0.5 V	0.5 V
Output signal: Pressure range	1.8 - 8.5 V	1.8 - 8.5 V
Output signal: Minimum load	10 kΩ	10 kΩ
Bakeout temperature	250 °C, electronic removed	250 °C
Seal	Ag	Ag
Pressure max.	1000 kPa	1000 kPa
Feedthrough	Al_2O_3	Al_2O_3
Feature	Metal sealed	Metal sealed
Flange	Stainless steel	Stainless steel
Accuracy: 10^{-9} - 10^{-3} hPa	± 30 %	± 30 %
Weight	950 g	1200 g
Cable length	500 m	500 m
Measurement range max.	0.01 hPa	0.01 hPa
Measurement range min.	$5 \cdot 10^{-11}$ hPa	$5 \cdot 10^{-11}$ hPa
Temperature: Operating	5-55 °C	5-55 °C, in the bakeout range
Temperature: Storage	-40-+65 °C	-40-+65 °C
Supply: Voltage	15-30 V	15-30 V
Supply: Power consumption max.	2 W	2 W
Volume	20 cm^3	20 cm^3
Repeatability: 10^{-9} - 10^{-3} hPa	± 5 %	± 5 %

Order number		
Cold Cathode Gauges IKR 270 ($5 \cdot 10^{-11}$ - 0,01 hPa)	**PT R21 251**	**PT R21 261**

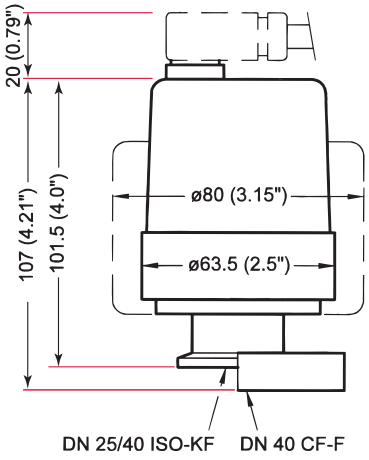
Accessories		
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**

Pirani/Cold Cathode transmitters PKR (5 · 10^{-9} - 1000 hPa)

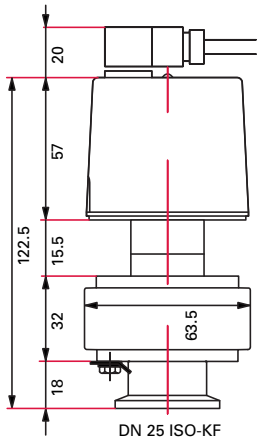


- Measurement range from 5 · 10^{-9} to 1000 hPa
- Two gauge heads (Pirani and cold cathode) in a single case (inverted magnetron)
- A single flange from atmospheric pressure to UHV
- Corrosion-resistant
- Maximum pressure refers to inert gases and temperatures of less than 55 °C

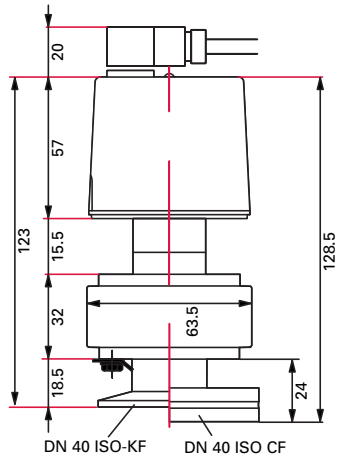
Dimensions (in mm)



PKR 251, FPM sealed



PKR 261, metal sealed



PKR 261, metal sealed

Technical data	PKR 251, FPM sealed	PKR 261, metal sealed
Anode	Molybdenum	Molybdenum
Output signal: Sensor error above	9.5 V	9.5 V
Output signal: Sensor error below	0.5 V	0.5 V
Output signal: Pressure range	1.8 - 8.6 V	1.8 - 8.6 V
Output signal: Minimum load	10 kΩ	10 kΩ
Bakeout temperature	150 °C, electronic removed	150 °C, electronic removed
Seal	FPM	Ag, Cu
Pressure max.	1000 kPa	1000 kPa
Feedthrough	Al_2O_3, Glass	Al_2O_3, Glas
Feature	Interior FPM sealed	Metal sealed
Flange	Stainless steel	Stainless steel
Accuracy: 10^{-8} - 10^{2} hPa	± 30 %	± 30 %
Filament	Tungsten	Tungsten
Measurement range max.	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa
Sensor cable length	300 m	300 m
Temperature: Operating	5-55 °C	5-55 °C, up to 150 °C on flange (horizontal installation)
Temperature: Storage	-40-+65 °C	-40-+65 °C
Supply: Voltage	15-30 V DC	15-30 V DC
Supply: Power consumption max.	2 W	2 W
Volume	20 cm^3	20 cm^3
Repeatability: 10^{-8} - 10^{2} hPa	± 5 %	± 5 %

	PKR 251, FPM sealed	PKR 261, metal sealed
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF
Weight	700 g	700 g
Order number	**PT R26 000**	**PT R26 250**
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF
Weight	700 g	750 g
Order number	**PT R26 001**	**PT R26 251**
Flange (in)	DN 40 CF-F	DN 40 CF-F
Weight	950 g	995 g
Order number	**PT R26 002**	**PT R26 252**

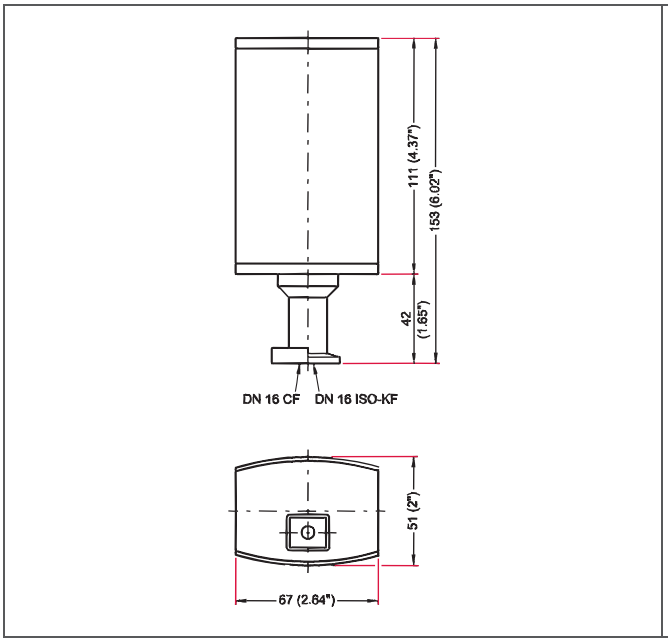
Accessories		
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**

Hot Cathode transmitters IMR (2 · 10^{-6} - 1000 hPa)

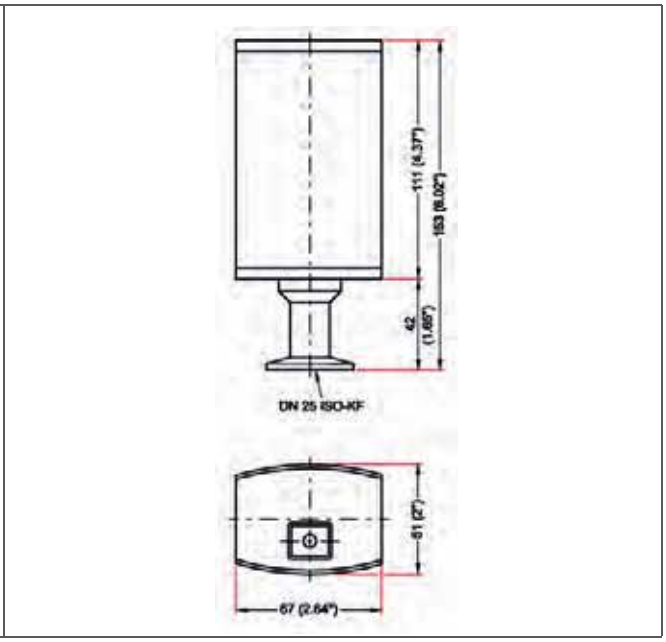


- Measurement range from 2 · 10^{-6} to 1000 hPa
- Two gauge heads (Pirani and hot cathode) in a single case
- Highly accurate
- Excellent reproducibility
- Automatic cathode protection
- A single flange from atmosphere to UHV
- Corrosion-resistant
- Maximum pressure refers to inert gases and temperatures of less than 55 °C

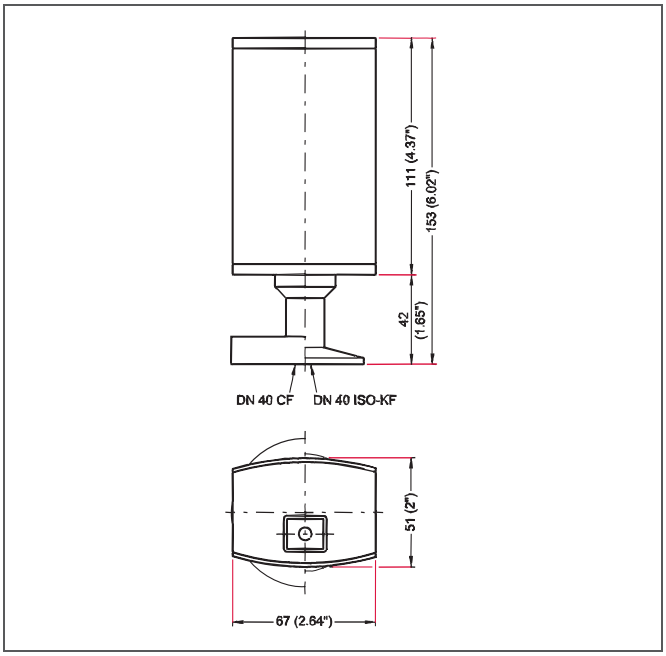
Dimensions (in mm)



IMR 265, DN 16 CF-F



IMR 265, DN 25 ISO-KF



IMR 265, DN 40 CF-F

Technical data	IMR 265, High Pressure Hot Cathode
Output signal: Sensor error	0.5 V
Output signal: Pressure range Ioni	1.5 - 7.5 V
Output signal: Pressure range Pirani	8.5 - 9.75 V
Output signal: Minimum load	10 kΩ
Bakeout temperature	150 °C, electronic removed
Pressure max.	500 kPa
Electron collector	Stainless steel
Flange	Stainless steel
Accuracy: % of measurement	10^{-5} - 1 hPa: ± 15 %
Filament holder	Molybdenum, Platinum
Ion collector	Stainless steel
Isolator	Glass
Filament	Iridium yttriated
Measurement range max.	1000 hPa
Measurement range min.	$2 \cdot 10^{-6}$ hPa
Sensor cable length	100 m
Pirani measurement element	Copper, Tungsten
Temperature: Operating	0-50 °C
Temperature: Storage	-20-+70 °C
Supply: Voltage	20-30 V DC
Supply: Power consumption max.	16 W
Volume	20 cm^3
Repeatability: 10^{-1} - 10^{2} hPa	30 % reading
Repeatability: 10^{-5} - 10^{-1} hPa	2 % reading

	IMR 265, High Pressure Hot Cathode
Flange (in)	DN 16 ISO-KF
Weight	270 g
Order number	**PT R26 504**
Flange (in)	DN 25 ISO-KF
Weight	285 g
Order number	**PT R26 500**
Flange (in)	DN 40 ISO-KF
Weight	315 g
Order number	**PT R26 501**
Flange (in)	DN 16 CF-F
Weight	400 g
Order number	**PT R26 502**
Flange (in)	DN 40 CF-F
Weight	550 g
Order number	**PT R26 503**

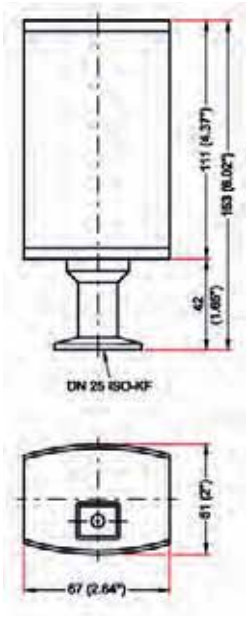
Accessories	
Sensor cable, 3 m	**PT 448 250 -T**
Mating connector	**B 4707 283 MA**

Pirani/Bayard-Alpert transmitters PBR (5 · 10^{-10} - 1000 hPa)

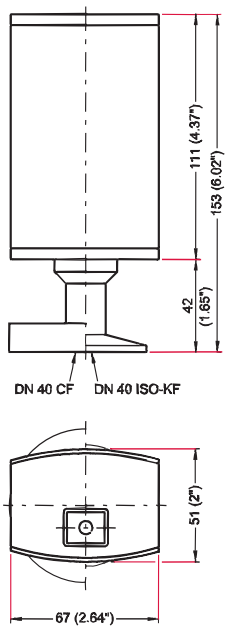


- Measurement range from 5 · 10^{-10} to 1000 hPa
- Two gauge heads (Pirani and BA hot cathode) in a single case
- Bayard-Alpert sensor ON/OFF automatically controlled by Pirani sensor
- Highly accurate
- A single flange from atmosphere to UHV
- Corrosion-resistant
- Maximum pressure refers to inert gases and temperatures of less than 55 °C

Dimensions (in mm)



PBR 260, DN 25 ISO-KF



PBR 260, DN 40 CF-R

Technical data	PBR 260, Pirani/Bayard-Alpert, DN 25 ISO-KF	PBR 260, Pirani/Bayard-Alpert, DN 40 ISO-KF	PBR 260, Pirani/Bayard-Alpert, DN 40 CF-R
Flange (in)	DN 25 ISO-KF	DN 40 ISO-KF	DN 40 CF-R
Output signal: Sensor error below	0.5 V	0.5 V	0.5 V
Output signal: Pressure range	0.774 - 10 V	0.774 - 10 V	0.774 - 10 V
Output signal: Minimum load	10 kΩ	10 kΩ	10 kΩ
Bakeout temperature	150 °C, electronic removed	150 °C, electronic removed	150 °C, electronic removed
Pressure max.	200 kPa	200 kPa	200 kPa
Flange	Stainless steel	Stainless steel	Stainless steel
Accuracy: 10^{-8} - 10^{-2} hPa	15 % reading	15 % reading	15 % reading
Weight	285 g	315 g	550 g
Filament	Tungsten	Tungsten	Tungsten
Filament	Iridium yttriated	Iridium yttriated	Iridium yttriated
Materials in contact with media	Cu, W, glass, NiFe, Mo, Stainless Steel, NiCr	Cu, W, glass, NiFe, Mo, Stainless steel, NiCr	Cu, W, glass, NiFe, Mo, Stainless steel, NiCr
Measurement range max.	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-10}$ hPa	$5 \cdot 10^{-10}$ hPa	$5 \cdot 10^{-10}$ hPa
Sensor cable length	100 m	100 m	100 m
Temperature: Operating	0-50 °C	0-50 °C	0-50 °C
Temperature: Storage	-20-+70 °C	-20-+70 °C	-20-+70 °C
Supply: Voltage	20-28 V DC	20-28 V DC	20-28 V DC
Supply: Power consumption max.	16 W	16 W	16 W
Volume	24 cm^3	24 cm^3	25 cm^3
Repeatability: 10^{-8} - 10^{-2} hPa	5 % reading	5 % reading	5 % reading

Order number			
Pirani/Bayard-Alpert Gauge PBR 260, ($5 \cdot 10^{-10}$ - 1000 hPa)	**PT R27 000**	**PT R27 001**	**PT R27 002**

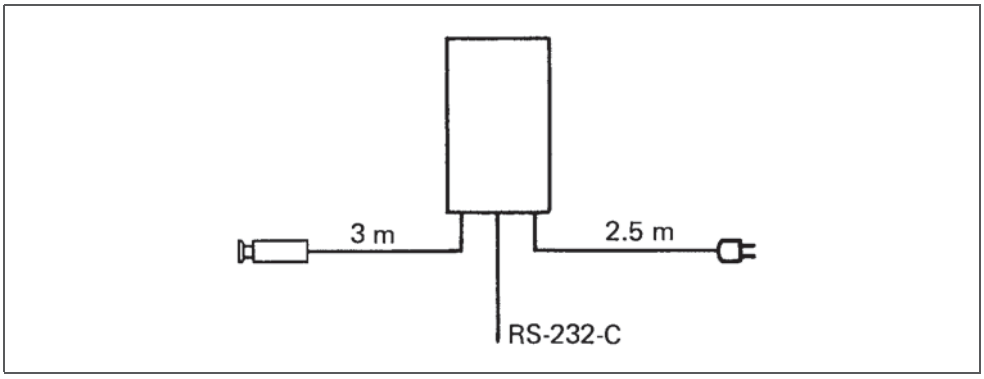
Accessories			
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**	**PT 448 250 -T**
Mating connector	**B 4707 283 MA**	**B 4707 283 MA**	**B 4707 283 MA**

SingleGauge measurement equipment TPG 261



- SingleGauge measurement unit TPG 261
- Length: 3 m

Dimensions (in mm)



Technical data	SingleGauge measurement equipment TPG 261, 1 TPR 280, 3 m cable	SingleGauge measurement equipment TPG 261, 1 IKR 251, 3 m cable	SingleGauge measurement equipment TPG 261, 1 PKR 251, 3 m cable
Flange (in)	DN 16 ISO-KF	DN 25 ISO-KF	DN 25 ISO-KF
Connections for transmitter	1	1	1
Measurement range max.	1000 hPa	0.01 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-4}$ hPa	$2 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa
Gauge head	1 TPR 280	1 IKR 251	1 PKR 251
Mains requirement: voltage (range)	90-250 V, 50/60 Hz	90-250 V, 50/60 Hz	90-250 V, 50/60 Hz
Interface	RS-232-C	RS-232-C	RS-232-C

Order number			
SingleGauge measurement equipment TPG 261	**PT 441 930-T**	**PT 441 933-T**	**PT 441 935 -T**

Accessories			
Centering ring with poral filter, Pore size: 20 µm, FPM/stainless steel, DN 16 ISO-KF	**PF 117 216 -T**		

Technical data	SingleGauge measurement equipment TPG 261, 1 PKR 251, 3 m cable	SingleGauge measurement equipment TPG 261, 1 PKR 251, 3 m cable	SingleGauge measurement equipment TPG 261, 1 PBR 260, 3 m cable
Flange (in)	DN 40 ISO-KF	DN 40 CF-F	DN 25 ISO-KF
Connections for transmitter	1	1	1
Measurement range max.	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-10}$ hPa
Gauge head	1 PKR 251	1 PKR 251	1 PBR 260
Mains requirement: voltage (range)	90-250 V, 50/60 Hz	90-250 V, 50/60 Hz	90-250 V, 50/60 Hz
Interface	RS-232-C	RS-232-C	RS-232-C

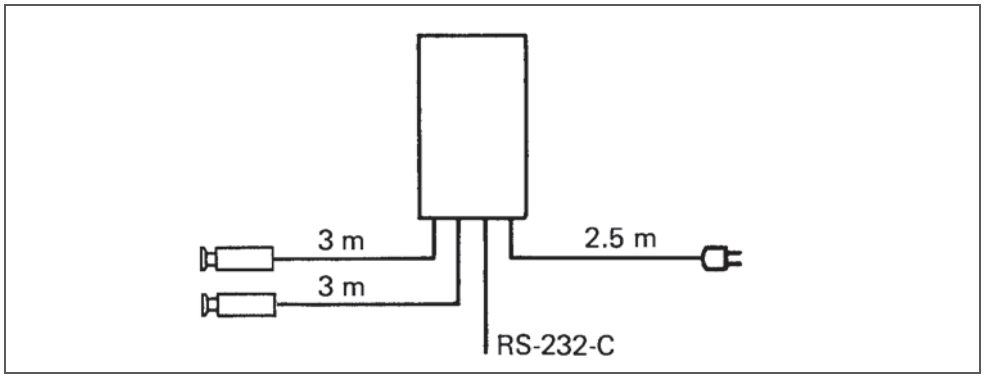
Order number			
SingleGauge measurement equipment TPG 261	**PT 441 936 -T**	**PT 441 937 -T**	**PT 441 938 -T**

DualGauge measurement equipment TPG 262



- DualGauge measurement unit TPG 262
- Length: 3 m

Dimensions (in mm)



Technical data	DualGauge measurement equipment TPG 262, 2 TPR 280, 3 m cable	DualGauge measurement equipment TPG 262, 1 TPR 280, 1 IKR 251, 3 m cable	DualGauge measurement equipment TPG 262, 2 PKR 251, 3 m cable	DualGauge measurement equipment TPG 262, 1 TPR 280, 1 PKR 251, 3 m cable
Flange (in)	DN 16 ISO-KF	DN 16 ISO-KF/ DN 25 ISO-KF	DN 25 ISO-KF	DN 16 ISO-KF/ DN 25 ISO-KF
Connections for transmitter	2	2	2	2
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-4}$ hPa	$2 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa
Gauge head	2 TPR 280	1 TPR 280, 1 IKR 251	2 PKR 251	1 TPR 280, 1 PKR 251
Mains requirement: voltage (range)	90-250 V, 50/60 Hz	90-250 V, 50/60 Hz	90-250 V, 50/60 Hz	90-250 V, 50/60 Hz
Interface	RS-232-C	RS-232-C	RS-232-C	RS-232-C

Order number				
DualGauge measurement equipment TPG 262	**PT 441 940-T**	**PT 441 943-T**	**PT 441 945-T**	**PT 441 948-T**

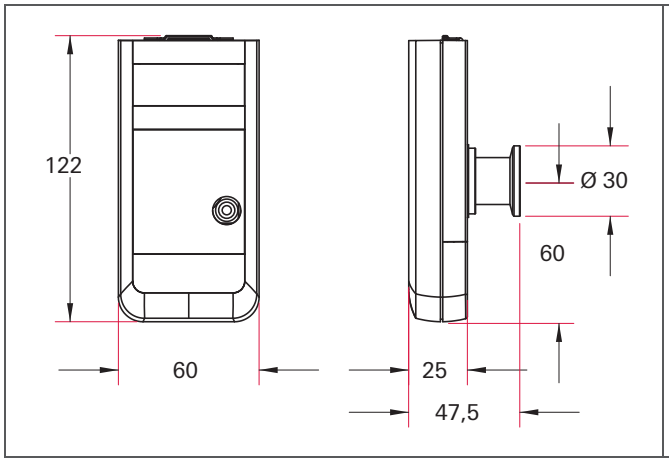
Accessories				
Centering ring with poral filter, Pore size: 20 µm, FPM/stainless steel, DN 16 ISO-KF	**PF 117 216 -T**	**PF 117 216 -T**		**PF 117 216 -T**

TPG 201, Pirani Handheld Vacuum Gauge
TPG 202, Piezo/Pirani Handheld Vacuum Gauge

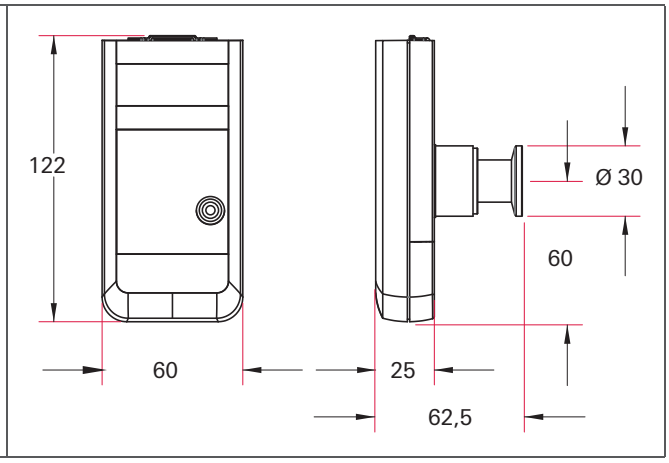


- Battery-operated manual measurement unit
- Measurement range from $5 \cdot 10^{-4}$ to 1000 hPa
- Data logging function
- Data readout by PC
- Scope of delivery: Battery not included

Dimensions (in mm)



TPG 201, Pirani manual measurement unit



TPG 202, Pirani manual measurement unit

Technical data	TPG 201, Pirani manual measurement unit	TPG 202, Pirani manual measurement unit
Connection: Vacuum side	DN 16 ISO-KF	DN 16 ISO-KF
Battery type	9 V AlMn E bloc, 6 LR6 ; 9 V Lithium E bloc	9 V AlMn E bloc, 6 LR6 ; 9 V Lithium E bloc
Seal	Metal	Metal
Pressure max.	400 kPa	200 kPa
Accuracy 10 - 100 hPa: % of measurement	approx. 30	
Accuracy 10^{-2} - 10 hPar: % of measurement	approx. 10	
Accuracy		1200 - 1000 hPa: 0,3 % Full Scale ; $10^{-2} \cdot 10^{-3}$ of reading ; $\leq 2 \cdot 10^{-3}$ hPa : ≤ factor 2 of reading
Weight	0.195 kg	0.230 (battery included) kg
Materials in contact with media	Nickel, stainless steel, tungsten, glass-feedthroughs	Stainless steel, gold, nickel, tungsten, glass, FPM
Measurement range max.	1000 hPa	1200 hPa
Measurement range min.	$5 \cdot 10^{-4}$ hPa	$5 \cdot 10^{-4}$ hPa
Method of measurement	Pirani	Piezo and Pirani
Protection category	IP 40	IP 40
Temperature: Operating	5-40 °C	+5-+50 °C

Order number		
TPG 201, Pirani Handheld Vacuum Gauge	**PT G28 201**	**PT G28 202**

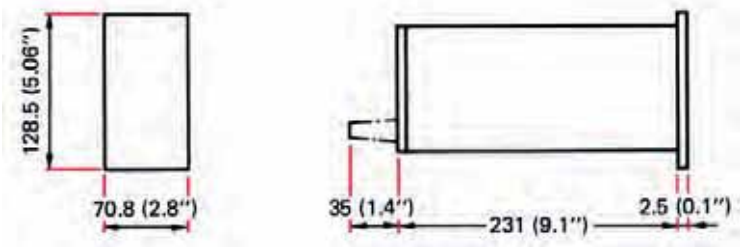
Accessories		
Accessories kit with AC adapter, battery, USB cable, DocuStar software	**PT 350 102 -T**	**PT 350 102 -T**

TPG 261, controller for 1 gauge



- For operation of one ActiveLine transmitter
- Simple to operate
- Easy readable display

Dimensions (in mm)



Technical data	TPG 261, controller for 1 transmitter
Connections for transmitter	1
Display rate	10 1/s
Error signal: Working contact, potential-free	1 piece
Error signal: Switching voltage max.	60 V DC
Filter time constant	1.2/0.4/0.02 s
Weight	1.1 kg
Measurement range max.	55000 hPa
Measurement range min.	$5 \cdot 10^{-11}$ hPa
Measurement rate	50 1/s
Mains requirement: frequency (range)	50/60 Hz
Mains requirement: power consumption	45 VA
Mains requirement: voltage (range)	90-250 V
Set point: Voltage max.	60 V DC
Set point: Current max.	1 A
Set point: Changeover contact, potential-free	2 pieces
Interface	RS-232-C
Protection category	IP 30
Safety	EN61010-1 / EN 50081-1 / EN50082-2 / IEC1010
Signal output: Measuring value, analog	0-10 V
Temperature: Operating	5-50 °C
Temperature: Storage	-20-+65 °C

Order number	
TPG 261, controller for 1 gauge	**PT G28 030**

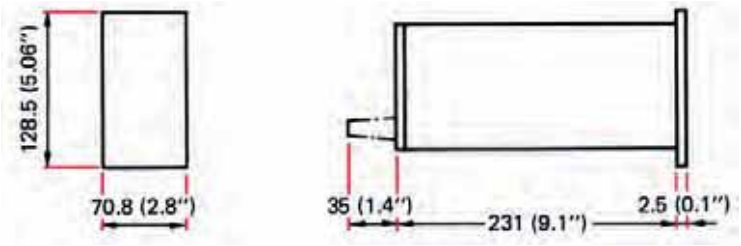
Accessories	
Sensor cable, 1 m	**PT 448 248 -T**
Sensor cable, 3 m	**PT 448 250 -T**
Sensor cable, 6 m	**PT 448 251 -T**
Sensor cable, 10 m	**PT 448 252 -T**
Sensor cable, 15 m	**PT 448 253 -T**
Sensor cable, 20 m	**PT 448 254 -T**
Sensor cable, 25 m	**PT 448 255 -T**
Sensor cable, 30 m	**PT 448 256 -T**
Sensor cable, 35 m	**PT 448 257 -T**
Sensor cable, 40 m	**PT 448 258 -T**
Sensor cable, 45 m	**PT 448 259 -T**
Sensor cable, 50 m	**PT 448 260 -T**

TPG 262, controller for 2 gauges



- For operation of two ActiveLine transmitters
- Simple to operate
- Easy readable display

Dimensions (in mm)



Technical data	TPG 262 controller for 2 transmitter
Connections for transmitter	2
Display rate	10 1/s
Automatic changeover: Pirani-cold cathode	$6 \cdot 10^{-3}$ hPa
Error signal: Working contact, potential-free	1 piece
Filter time constant	1.2/0.4/0.02 s
Weight	1.1 kg
Measurement range max.	55000 hPa
Measurement range min.	$5 \cdot 10^{-11}$ hPa
Measurement rate	50 1/s
Mains requirement: frequency (range)	50/60 Hz
Mains requirement: power consumption	45 VA
Mains requirement: voltage (range)	90-250 V
Set point: Voltage max.	60 V DC
Set point: Current max.	1 A
Set point: Changeover contact, potential-free	4 pieces
Interface	RS-232-C
Protection category	IP 30
Safety	EN61010-1 / EN 50081-1 / EN50082-2 / IEC1010
Signal output: Measuring value, analog	0-10 V
Temperature: Operating	5-50 °C
Temperature: Storage	-20-+65 °C

Order number	
TPG 262, controller for 2 gauges	**PT G28 280**

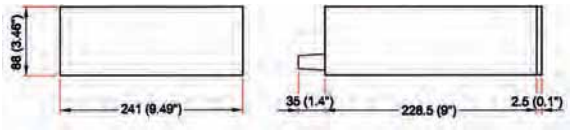
Accessories	
Sensor cable, 1 m	**PT 448 248 -T**
Sensor cable, 3 m	**PT 448 250 -T**
Sensor cable, 6 m	**PT 448 251 -T**
Sensor cable, 10 m	**PT 448 252 -T**
Sensor cable, 15 m	**PT 448 253 -T**
Sensor cable, 20 m	**PT 448 254 -T**
Sensor cable, 25 m	**PT 448 255 -T**
Sensor cable, 30 m	**PT 448 256 -T**
Sensor cable, 35 m	**PT 448 257 -T**
Sensor cable, 40 m	**PT 448 258 -T**
Sensor cable, 45 m	**PT 448 259 -T**
Sensor cable, 50 m	**PT 448 260 -T**

TPG 256 A, controller for 6 gauges



- For operating 6 ActiveLine transmitters

Dimensions (in mm)

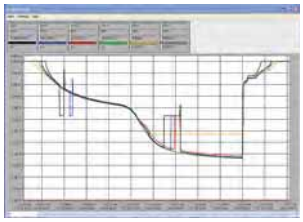


Technical data	TPG 256 A MaxiGauge controller, seriell interface	TPG 256 A MaxiGauge controller, seriell interface isolated
Connections for transmitter	6 (max. 3 IMR 265 / PBR 260 / CMR 27x)	6 (max. 3 IMR 265 / PBR 260 / CMR 27x)
Display rate	4 1/s	4.0 1/s
Error signal: Working contact, potential-free	1 piece	1 piece
Error signal: Switching voltage max.	60 V DC	60 V DC
Error signal: Switching current max.	3 A	3 A
Filter time constant	2.1/0.32/0.1 s	2.1/0.32/0.1 s
Weight	2.1 kg	2.1 kg
Measurement range max.	55000 hPa	55000 hPa
Measurement range min.	$5 \cdot 10^{-11}$ hPa	$5 \cdot 10^{-11}$ hPa
Measurement rate	100 1/s	100 1/s
Mains requirement: frequency (range)	50-60 Hz	50-60 Hz
Mains requirement: power consumption	60 VA	60 VA
Mains requirement: voltage (range)	90-250 V	90-250 V
Set point: Voltage max.	60 V DC	60 V DC
Set point: Current max.	3 A	3 A
Set point: Changeover contact, potential-free	6 pieces	6,0 pieces
Switching voltage	240 V with RI 256	240 V with RI 256
Interface	RS-232-C, RS-422	RS-232-C, RS-422, RS-422 isolated, RS-485 isolated
Protection category	IP 30	IP 30
Safety	EN61010-1 / IEC 1010, EN60950, EN 50081-1 / EN50082-1	EN61010-1 / IEC 1010, EN60950, EN 50081-1&2
Signal output: Output resistance	660 Ω	660 Ω
Signal output: Measuring value, analog	0-10 V DC	0-10 V DC
Temperature: Operating	5-40 °C	5-40 °C
Temperature: Storage	-20-+60 °C	-20-+60 °C

Order number		
TPG 256 A, controller for 6 gauges	**PT G28 760**	**PT G28 761**

Accessories		
Sensor cable, 1 m	**PT 448 248 -T**	**PT 448 248 -T**
Sensor cable, 3 m	**PT 448 250 -T**	**PT 448 250 -T**
Sensor cable, 6 m	**PT 448 251 -T**	**PT 448 251 -T**
Sensor cable, 10 m	**PT 448 252 -T**	**PT 448 252 -T**
Sensor cable, 15 m	**PT 448 253 -T**	**PT 448 253 -T**
Sensor cable, 20 m	**PT 448 254 -T**	**PT 448 254 -T**
Sensor cable, 25 m	**PT 448 255 -T**	**PT 448 255 -T**
Sensor cable, 30 m	**PT 448 256 -T**	**PT 448 256 -T**
Sensor cable, 35 m	**PT 448 257 -T**	**PT 448 257 -T**
Sensor cable, 40 m	**PT 448 258 -T**	**PT 448 258 -T**
Sensor cable, 45 m	**PT 448 259 -T**	**PT 448 259 -T**
Sensor cable, 50 m	**PT 448 260 -T**	**PT 448 260 -T**

Software for display and data logging for Active Line



- For the following controller: TPG 261, TPG 262, TPG 265 A and TPG 300
- Simple to operate
- Up to 6 channels simultaneous presentable
- Data is convertible in Excel
- System requirements:
- Software: Windows 7, Windows XP, Windows Vista (administrator authorisation is required)
- Hardware: Pentium-PC (1000 MHz or higher recommended), 256 MB RAM (512 MB recommended), 150 MB free hard disc storage unit, Super VGA-Monitor (with 1024 x 768 screen definition, small font adjustment), 24 Bit True Color, Free COM Port

Order number	
Software for display and data logging for Active Line	**PT 882 550 -T**

ModulLine

For challenging applications in research and development



ModulLine

The ModulLine series includes three Pirani TPR vacuum gauges with a measuring range of 1,000 to $8 \cdot 10^{-4}$ hPa and three IKR cold cathode vacuum gauges with a measuring range of $5 \cdot 10^{-3}$ to 10^{-11} hPa. Since these vacuum gauges do not contain any electronics, they are suitable for use in high-radiation environments. An extensive range of cables, including high-temperature cables and cables with double shielding, as well as a controller complete this measurement equipment line. The individually configurable controller can have two measuring boards for up to four vacuum gauges. Another socket is for an interface board for serial interfaces RS-232/RS-485 and relay contacts; connection to fieldbuses is possible as well.

Customer benefits

- Proven long life
- Allows for challenging applications
- Sensors and electronics can be located separately

Typical applications

- Accelerators
- UHV applications
- Applications with exposure to radiation



Accelerators



Applications with exposure to radiation

Pirani gauge heads



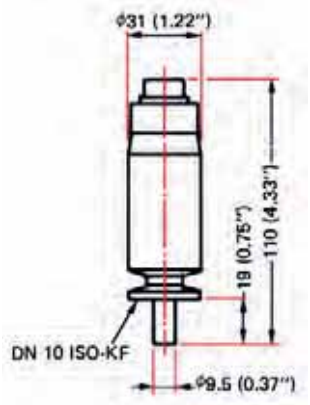
TPR 010
- For general applications

TPR 017
- For corrosive media

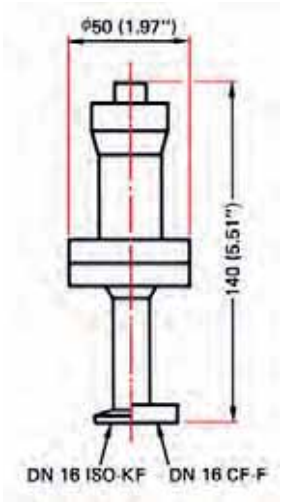
TPR 018
- For UHV

Limited measurement and switching accuracy above 100 and below 10^{-3} hPa

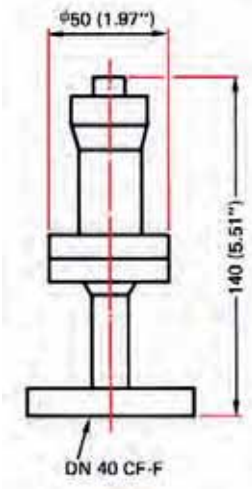
Dimensions (in mm)



TPR 010



TPR 017
TPR 018



TPR 018, UHV

Technical data	Pirani gauge head TPR 010	Pirani gauge head TPR 017, corrosion resistant	Pirani gauge head TPR 018
Bakeout temperature	100 °C	250 °C	250 °C
Operating temperature: high temperature sensor cable		0-120 °C	0-120 °C
Operating temperature: standard sensor cable	0-70 °C	0-80 °C	0-80 °C
Weight	0.14 kg	0.6 kg	0.6 kg
Isolator	FPM	Al_2O_3	Al_2O_3
Measurement range max.	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$8 \cdot 10^{-4}$ hPa	$8 \cdot 10^{-4}$ hPa	$8 \cdot 10^{-4}$ hPa
Filament/holder	T/Ni	Ni/Ni	T/Ni
Chamber wall, inside	AlSiMg	Stainless steel	Stainless steel
Protective filter	Sintered bronze		
Radiation resistance		$1 \cdot 10^4$ Gy	$1 \cdot 10^4$ Gy

	Pirani gauge head TPR 010	Pirani gauge head TPR 017, corrosion resistant	Pirani gauge head TPR 018
Flange (in)	DN 10 ISO-KF		
Order number	**PT R02 270**		
Flange (in)		DN 16 ISO-KF	DN 16 ISO-KF
Order number		**PT R13 270**	**PT R15 010**
Flange (in)		DN 16 CF-F	DN 16 CF-F
Order number		**PT R13 271**	**PT R15 011**
Flange (in)			DN 40 CF-F
Order number			**PT R15 014**

Accessories			
Sensor cable, TPR 010, 3.0 m, 80 °C	**PT 548 402-T**		
Sensor cable, TPR 010, 6.0 m, 80 °C	**PT 548 403-T**		
Sensor cable, TPR 017/018, 3.0 m, 80 °C		**PT 548 308-T**	**PT 548 308-T**
Sensor cable, TPR 017/018, 6.0 m, 80 °C		**PT 548 309-T**	**PT 548 309-T**
Extension for sensor cable, TPR 010/017/018, 30 m, 80 °C			**PT 548 470-T**

Cold cathode gauge heads

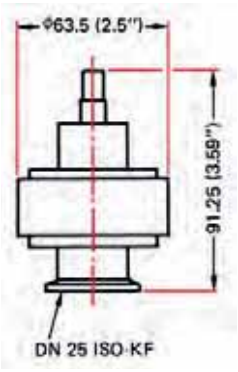


IKR 050 coaxial
- For general applications

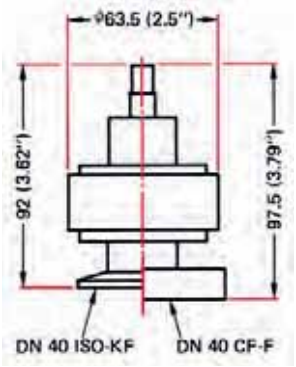
IKR 060 coaxial
- For UHV
- Radiation-resistant

IKR 070 coaxial
- For UHV
- Radiation-resistant

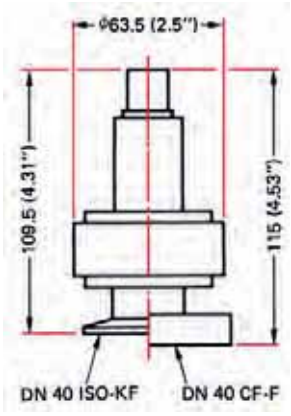
Dimensions (in mm)



IKR 050 coaxial



IKR 050, coaxial
IKR 060



IKR 070 coaxial

Technical data	Cold cathode gauge head IKR 050, coaxial, FPM seal	Cold cathode gauge head IKR 060, coaxial, metal seal	Cold cathode gauge head IKR 070, triaxial, metal seal
Bakeout temperature	150 °C	250 °C	250 °C
Operating temperature: high temperature sensor cable	5-150 °C	5-250 °C	
Operating temperature: standard sensor cable	5-80 °C	5-80 °C	5-80 °C
Internal seal	FPM	Silver	Silver
Flange	Stainless steel	Stainless steel	Stainless steel
Isolator	Al_2O_3	Al_2O_3	Al_2O_3
Measurement range max.	$5 \cdot 10^{-3}$ hPa	$5 \cdot 10^{-3}$ hPa	$5 \cdot 10^{-3}$ hPa
Measurement range min.	$2 \cdot 10^{-9}$ hPa	$1 \cdot 10^{-10}$ hPa	$1 \cdot 10^{-11}$ hPa
Radiation resistance		$1 \cdot 10^{7}$ Gy	$1 \cdot 10^{7}$ Gy

	Cold cathode gauge head IKR 050, coaxial, FPM seal	Cold cathode gauge head IKR 060, coaxial, metal seal	Cold cathode gauge head IKR 070, triaxial, metal seal
Flange (in)	DN 25 ISO-KF		
Weight	0.6 kg		
Order number	**PT R18 500**		
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF	DN 40 ISO-KF
Weight	0.6 kg	0.6 kg	0.6 kg
Order number	**PT R18 501**	**PT R18 753**	**PT R20 501**
Flange (in)	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F
Weight	0.85 kg	0.85 kg	0.85 kg
Order number	**PT R18 502**	**PT R18 751**	**PT R20 502**

Accessories			
Sensor cable, IKR 050/060, 3.0 m, 80 °C	**PT 548 406-T**	**PT 548 406-T**	
Sensor cable, IKR 050/060, 6.0 m, 80 °C	**PT 548 407-T**	**PT 548 407-T**	
Sensor cable, IKR 070, 3.0 m, 80 °C			**PT 548 306-T**
Sensor cable, IKR 070, 6.0 m, 80 °C			**PT 548 317-T**

Gauge head accessories

Sensor cables	Order number
Sensor cable, TPR 017/018, 3.0 m, 80 °C	PT 548 308-T
Sensor cable, TPR 017/018, 6.0 m, 80 °C	PT 548 309-T
Sensor cable, TPR 017/018, 10 m, 80 °C	PT 548 456-T
Sensor cable, TPR 017/018, 15 m, 80 °C	PT 548 457-T
Sensor cable, TPR 017/018, 20 m, 80 °C	PT 548 458-T
Sensor cable, TPR 017/018, 25 m, 80 °C	PT 548 459-T
Sensor cable, TPR 017/018, 30 m, 80 °C	PT 548 460-T
Sensor cable, TPR 017/018, 35 m, 80 °C	PT 548 461-T
Sensor cable, TPR 017/018, 40 m, 80 °C	PT 548 462-T
Sensor cable, TPR 017/018, 45 m, 80 °C	PT 548 463-T
Sensor cable, TPR 017/018, 50 m, 80 °C	PT 548 464-T
Sensor cable, TPR 010, 2.0 m, 80 °C	PT 548 401-T
Sensor cable, TPR 010, 3.0 m, 80 °C	PT 548 402-T
Sensor cable, TPR 010, 6.0 m, 80 °C	PT 548 403-T
Sensor cable, TPR 010, 30 m, 80 °C	PT 548 415-T
Sensor cable, TPR 010, 40 m, 80 °C	PT 548 416-T
Sensor cable, TPR 010, 50 m, 80 °C	PT 548 417-T
Sensor cable, TPR 010, 10 m, 80 °C	PT 548 450-T
Sensor cable, TPR 010, 15 m, 80 °C	PT 548 451-T
Sensor cable, TPR 010, 20 m, 80 °C	PT 548 452-T
Sensor cable, TPR 010, 25 m, 80 °C	PT 548 453-T
Sensor cable, TPR 010, 35 m, 80 °C	PT 548 454-T
Sensor cable, TPR 010, 45 m, 80 °C	PT 548 455-T
Sensor cable, IKR 050/060, 3.0 m, 80 °C	PT 548 406-T
Sensor cable, IKR 050/060, 6.0 m, 80 °C	PT 548 407-T
Sensor cable, IKR 050/060, 10 m, 80 °C	PT 548 419-T
Sensor cable, IKR 050/060, 30 m, 80 °C	PT 548 422-T
Sensor cable, IKR 050/060, 15 m, 80 °C	PT 548 483-T
Sensor cable, IKR 050/060, 20 m, 80 °C	PT 548 484-T
Sensor cable, IKR 050/060, 25 m, 80 °C	PT 548 485-T
Sensor cable, IKR 050/060, 35 m, 80 °C	PT 548 486-T
Sensor cable, IKR 050/060, 40 m, 80 °C	PT 548 487-T
Sensor cable, IKR 050/060, 45 m, 80 °C	PT 548 488-T
Sensor cable, IKR 050/060, 50 m, 80 °C	PT 548 489-T
Sensor cable, IKR 070, 3.0 m, 80 °C	PT 548 306-T
Sensor cable, IKR 070, 6.0 m, 80 °C	PT 548 317-T
Sensor cable, IKR 070, 10 m, 80 °C	PT 548 490-T
Sensor cable, IKR 070, 15 m, 80 °C	PT 548 491-T
Sensor cable, IKR 070, 20 m, 80 °C	PT 548 492-T
Sensor cable, IKR 070, 30 m, 80 °C	PT 548 493-T
Sensor cable, IKR 070, 40 m, 80 °C	PT 548 494-T
Sensor cable, IKR 070, 45 m, 80 °C	PT 548 495-T
Sensor cable, IKR 070, 50 m, 80 °C	BP 229 748-T

Extension for sensor cables	Order number
Extension for sensor cable, TPR 010/017/018, 10 m, 80 °C	**PT 548 466-T**
Extension for sensor cable, TPR 010/017/018, 20 m, 80 °C	**PT 548 468-T**
Extension for sensor cable, TPR 010/017/018, 30 m, 80 °C	**PT 548 470-T**
Extension for sensor cable, TPR 010/017/018, 40 m, 80 °C	**PT 548 472-T**
Extension for sensor cable, TPR 010/017/018, 50 m, 80 °C	**PT 548 474-T**

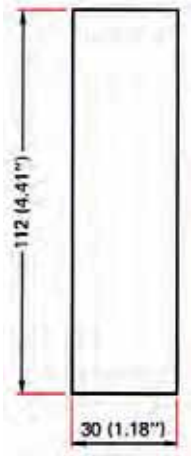
High-temperature sensor cables	Order number
High-temperature sensor cable, TPR 017/018, 3.0 m, 250 °C	**PT 548 414-T**
High-temperature sensor cable, TPR 017/018, 6.0 m, 250 °C	**PT 548 465-T**
High-temperature sensor cable, TPR 017/018, 10 m, 250 °C	**PT 448 047-T**
High-temperature sensor cable, TPR 017/018, 15 m, 250 °C	**PT 448 043-T**
High-temperature sensor cable, TPR 017/018, 20 m, 250 °C	**PT 448 044-T**
High-temperature sensor cable, IKR 050/060, 3.0 m, 250 °C	**PT 548 542-T**
High-temperature sensor cable, IKR 050/060, 6.0 m, 250 °C	**PT 548 543-T**
High-temperature sensor cable, IKR 050/060, 10 m, 250 °C	**PT 448 045-T**
High-temperature sensor cable, IKR 050/060, 15 m, 250 °C	**PT 548 989-T**
High-temperature sensor cable, IKR 050/060, 20 m, 250 °C	**PT 448 046-T**

Pirani measurement board



- For 2 TPR 010/018
- Measurement range from 1000 to 8 · 10^{-4} hPa

Dimensions (in mm)



Technical data	Pirani measurement board PI 300 D, for 2 TPR 010/018	Pirani measurement board PI 300 DN, for 2 TPR 017s
Number of measuring circuits	2	2
For gauge	TPR 010, TPR 018	TPR 017
Weight	0.14 kg	0.14 kg
Measurement range max.	1000 hPa	1000 hPa
Measurement range min.	8 · 10^{-4} hPa	8 · 10^{-4} hPa
Sensor cable length	100 m	100 m
Measurement board	Pirani measurement board	Pirani Measurement board
Reaction time of the output signal: Decay	600 ms	600 ms
Reaction time of the output signal: Rise	50 ms	50 ms

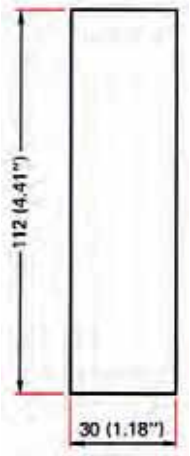
Order number		
Pirani measurement board	**PT 546 920 -T**	**PT 549 214 -T**

Cold cathode measurement board



- Measurement range from $1 \cdot 10^{-9}$ to $5 \cdot 10^{-3}$ hPa
- For 2 IKR 050

Dimensions (in mm)



Technical data	Cold cathode measurement board PE 300 DC9, for 2 IKR 050s
Number of measuring circuits	2
For gauge	IKR 050
Weight	0.26 kg
Measurement range max.	$5 \cdot 10^{-3}$ hPa
Measurement range min.	$1 \cdot 10^{-9}$ hPa
Sensor cable length	100 m
Measurement board	Cold cathode measurement board
Reaction time of the output signal: Rise	16 ms

Order number	
Cold cathode measurement board	**PT 441 375 -T**

Pirani/cold cathode measurement board



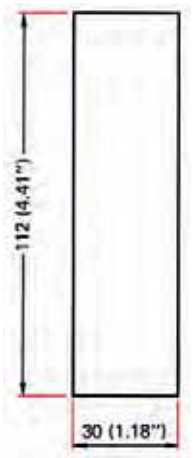
CP 300 T11L
- For 1 TPR 010/018 and 1 IKR 070
- Max. sensor cable length: 500 m
- Measurement range from 1000 to $1 \cdot 10^{-11}$ hPa

CP 300 C9
- For 1 TPR 010/018 and 1 IKR 050
- Measurement range from 1000 to $5 \cdot 10^{-9}$ hPa

CP 300 T11
- For 1 TPR 010/018 and 1 IKR 070
- Measurement range from 1000 to $1 \cdot 10^{-11}$ hPa

CP 300 C10
- For 1 TPR 010/018 and 1 IKR 060
- Measurement range from 1000 to $1 \cdot 10^{-10}$ hPa

Dimensions (in mm)



Technical data	Pirani/cold cathode measurement board CP 300 T11L, for 1 TPR 010/018, 1 IKR 070	Pirani/cold cathode measurement board CP 300 C9, for 1 TPR 010/018, 1 IKR 050	Pirani/cold cathode measurement board CP 300 T11, for 1 TPR 010/018, 1 IKR 070	Pirani/cold cathode measurement board CP 300 C10, for 1 TPR 010/018, 1 IKR 060
Number of measuring circuits	2	1 each	1 each	1 each
For gauge	TPR 010, TPR 018, IKR 070	TPR 010, TPR 018, IKR 050	TPR 010, TPR 018, IKR 070	TPR 010, TPR 018, IKR 060
Weight	0.21 kg	0.21 kg	0.25 kg	0.23 kg
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$1 \cdot 10^{-11}$ hPa	$5 \cdot 10^{-9}$ hPa	$1 \cdot 10^{-11}$ hPa	$1 \cdot 10^{-10}$ hPa
Sensor cable length	500 m	100 m	100 m	100 m
Measurement board	Pirani/cold cathode measurement board	Pirani/cold cathode measurement board	Pirani/cold cathode measurement board	Pirani/Cold cathode measurement board
Reaction time of the output signal: Rise	< 50 ms	10 ms	50 ms	50 ms

Order number				
Pirani/cold cathode measurement board	**PT 441 122 -T**	**PT 441 000 -T**	**PT 441 080 -T**	**PT 441 114 -T**

Interface and relay board



- With RS-232-C interface
- 5 relays, maximum switching voltage 50 V AC

AC = Alternating Current
DC = Direct Current

Dimensions (in mm)



Technical data	Interface and relay board IF 300 A, RS-232-C, 45 W, 75 VA	Interface and relay board IF 300 B, RS-232-C, 120 W, 1000 VA	Interface and relay board IF 300 C, RS-422, 50 V AC / DC	Interface and relay board IF 300 P, Profibus-DP, 45 W, 75 VA
Weight	0.14 kg	0.15 kg	0.14 kg	0.16 kg
Relay: Connector 15 pole (pins)	D-Sub	GdsA-H, DIN 41612	D-Sub	D-Sub
Relay: Number	5 pieces	5 pieces	5 pieces	5 pieces
Relay: Switching capacity	45 W, 75 VA	120 W, 1000 VA	45 W, 75 VA	45 W, 75 VA
Relay: Switching voltage	30 V DC / 50 V AC	30 V DC / 250 V AC	50 V AC / DC	50 V AC / DC
Relay: Switching current	1.5 A	4 A	1.5 A	1.5 A
Relay: Changeover contacts, potential-free, per relay	1 piece	1 piece	1 piece	1 piece
Relay: Resistance (with connector)	125 mΩ	70 mΩ	125 mΩ	125 mΩ
Interface	RS-232-C	RS-232-C	RS-422	Profibus-DP
Interface: Connection	D-sub connector, 9-pole, pins	Cable with D-sub connector, 9-pole, pins	D-sub connector, 9-pole, sockets	D-sub connector, 9-pole, pins
Interface: Baud rates	300, 1200, 2400, 4800, 9600	300, 1200, 2400, 4800, 9600	300, 1200, 2400, 4800, 9600	12 Mbaud
Interface: Data format	ASCII, 1 start bit, 8 data bits, 1 stop bit, no parity bit	ASCII, 1 start bit, 8 data bits, 1 stop bit, no parity bit	ASCII, 1 start bit, 8 data bits, 1 stop bit, no parity bit	
Interface: Cable length max.	30 m	30 m	1200 m	1200 m
Interface: Type	RS-232-C asynchronus	RS-232-C asynchronus	RS-422 asynchronus	Profibus-DP

Order number				
Interface and relay board	**PT 441 130-T**	**PT 441 250-T**	**PT 441 390-T**	**PT 441 395-T**

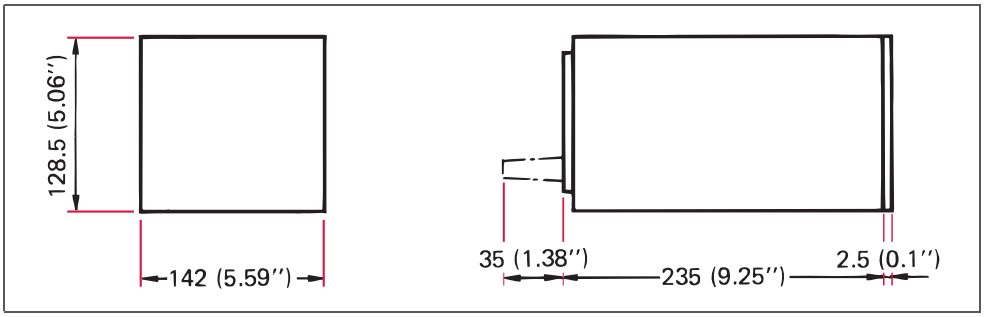
Accessories				
D-Sub mating connector, female, 15-pin, for IF 300 A/C, relay output	**PT 441 129-T**		**PT 441 129-T**	
D-Sub mating connector, female, for IF 300 A, RS-232-C	**PT 441 128-T**			
Interface cable, for IF 300 B, RS-232-C, 0.4 m		**PT 548 932-T**		
Relay connector, complete, for IF 300 B		**PT 546 999-T**		

TPG 300, basic unit



- Basic unit with power supply and 3 free slots for measurement, interface and relay boards

Dimensions (in mm)



Technical data	TPG 300, basic unit
Display rate	5 s
Error display	1 LED, red
Filter time constant	16 ms, 160 ms (standard), 1.6 s
Weight: without boards	1.4 kg
Limit frequency	10 Hz, 1 Hz (standard), 0.1 Hz
Unit of measure	mbar, Torr, Pa
Measurement range max.	1000 hPa
Measurement range min.	$1 \cdot 10^{-11}$ hPa
Measurement rate	100 1/s
Measured value display	15 mm high numbers
Mains requirement: frequency (range)	50/60 Hz
Mains requirement: power consumption	55 VA
Mains requirement: voltage (range)	90-264 V AC
Safety	IEC 384, class 1, VDE 0411, part 2.80
Temperature: Operating	5-50 °C
Temperature: Storage	-40-+65 °C

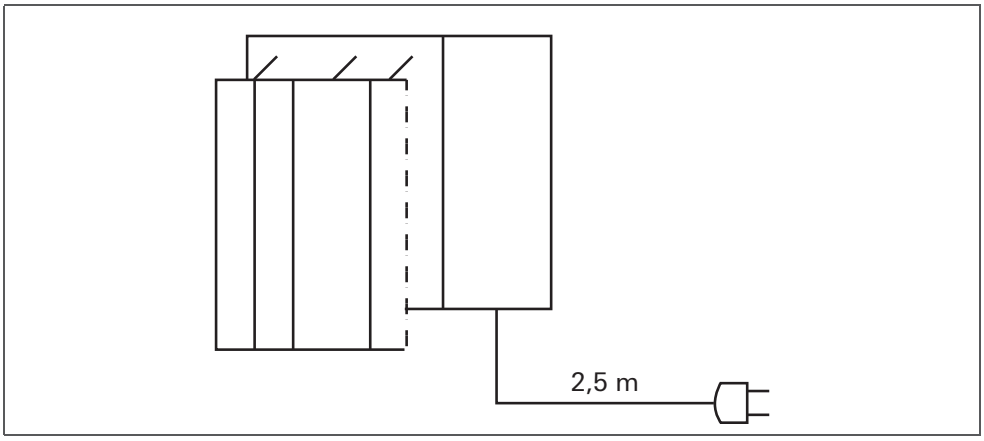
Order number	
TPG 300, basic unit	**PT 546 900 -T**

Accessories	
Blank panel, for measurement board	**PT 441 259**
Blank panel, for IF 300	**PT 441 017**

TPG 300, complete units with measurement boards and power cords



Dimensions (in mm)



Technical data	TPG 300, complete units with measurement boards and power cords
Display rate	5 1/s
Error display	1 LED, red
Filter time constant	16 ms, 160 ms (standard), 1.6 s
Weight: without boards	1.4 kg
Limit frequency	10 Hz, 1 Hz (standard), 0.1 Hz
Unit of measure	mbar, Torr, Pa
Measurement rate	100 s
Measured value display	15 mm high numbers
Mains requirement: frequency (range)	50-60 Hz
Mains requirement: power consumption	55 VA
Mains requirement: voltage (range)	90-264 V AC
Safety	IEC 384, class 1, VDE 0411, part 2.80
Temperature: Operating	5-50 °C
Temperature: Storage	-40-+65 °C

Technical data	TPG 300, complete measurement unit, incl. PI 300 D	TPG 300, complete measurement unit, incl. PI 300 D, IF 300 B	TPG 300, complete measurement unit, incl. 2 PI 300 D	TPG 300, complete measurement unit, incl. 2 PI 300 D, IF 300 B
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$8 \cdot 10^{-4}$ hPa	$8 \cdot 10^{-4}$ hPa	$8 \cdot 10^{-4}$ hPa	$8 \cdot 10^{-4}$ hPa
Measurement board	PI 300 D for 2 Pirani Gauge TPR 010/018	PI 300 D for 2 Pirani Gauge TPR 010/018	2 PI 300 D for 4 Pirani Gauge TPR 010/018	2 PI 300 D for 4 Pirani Gauge TPR 010/018
Relay: Switching voltage		30 V DC / 250 V AC		30 V DC / 250 V AC
Set point		5 pieces		5 pieces
Interface		RS-232-C, IF 300 B		RS-232-C, IF 300 B
Order number				
TPG 300, complete units with measurement boards and power cords	**PT G25 250**	**PT G25 251**	**PT G25 252**	**PT G25 253**

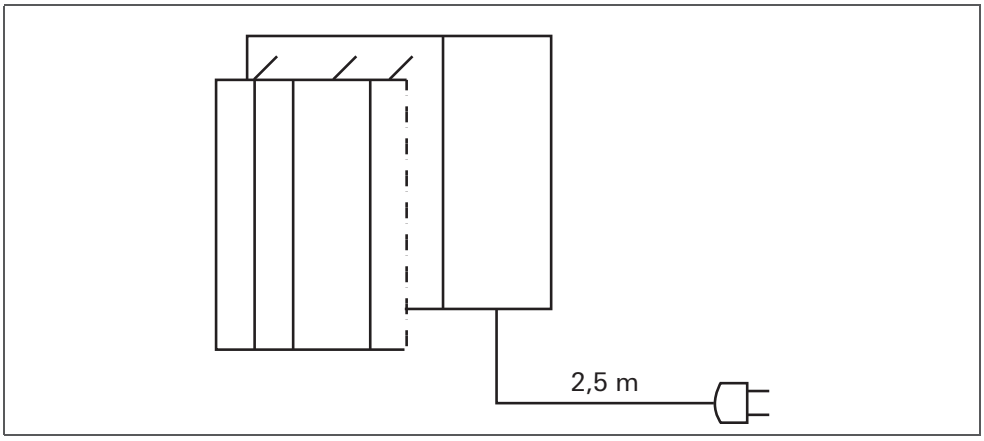
Technical data	TPG 300, complete measurement unit, incl. CP 300 C10	TPG 300, complete measurement unit, incl. CP 300 C10, IF 300 B	TPG 300, complete measurement unit, incl. PI 300 D, CP 300 C10	TPG 300, complete measurement unit, incl. PI 300 D, CP 300 C10, IF 300 B
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$1 \cdot 10^{-10}$ hPa	$1 \cdot 10^{-10}$ hPa	$1 \cdot 10^{-10}$ hPa	$1 \cdot 10^{-10}$ hPa
Measurement board	CP 300 C10 for 1 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 060	CP 300 C10 for 1 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 060	PI 300 D, CP 300 C10 for 3 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 060	PI 300 D, CP 300 C10 for 3 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 060
Relay: Switching voltage		30 V DC / 250 V AC		30 V DC / 250 V AC
Set point		5 pieces		5 pieces
Interface		RS-232-C, IF 300 B		RS-232-C, IF 300 B
Order number				
TPG 300, complete units with measurement boards and power cords	**PT G25 256**	**PT G25 257**	**PT G25 262**	**PT G25 263**

Technical data	TPG 300, complete measurement unit, incl. CP 300 C9	TPG 300, complete measurement unit, incl. CP 300 C9, IF 300 B	TPG 300, complete measurement unit, incl. PI 300 D, CP 300 C9	TPG 300, complete measurement unit, incl. PI 300 D, CP 300 C9, IF 300 B
Measurement range max.	1000 hPa	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa
Measurement board	CP 300 C9 for 1 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 050	CP 300 C9 for 1 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 050	PI 300 D, CP 300 C9 for 3 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 050	PI 300 D, CP 300 C9 for 3 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 050
Relay: Switching voltage		30 V DC / 250 V AC		30 V DC / 250 V AC
Set point		5 pieces		5 pieces
Interface		RS-232-C, IF 300 B		RS-232-C, IF 300 B
Order number				
TPG 300, complete units with measurement boards and power cords	**PT G25 290**	**PT G25 291**	**PT G25 292**	**PT G25 293**

TPG 300, complete units with measurement boards and power cords



Dimensions (in mm)



Technical data	TPG 300, complete units with measurement boards and power cords
Display rate	5 1/s
Error display	1 LED, red
Filter time constant	16 ms, 160 ms (standard), 1.6 s
Weight: without boards	1.4 kg
Limit frequency	10 Hz, 1 Hz (standard), 0.1 Hz
Unit of measure	mbar, Torr, Pa
Measurement rate	100 s
Measured value display	15 mm high numbers
Mains requirement: frequency (range)	50-60 Hz
Mains requirement: power consumption	55 VA
Mains requirement: voltage (range)	90-264 V AC
Safety	IEC 384, class 1, VDE 0411, part 2.80
Temperature: Operating	5-50 °C
Temperature: Storage	-40-+65 °C

Technical data	TPG 300, complete measurement unit, incl. 2 CP 300 C9	TPG 300, complete measurement unit, incl. 2 CP 300 C9, IF 300 B	TPG 300, complete measurement unit, incl. PI 300 D, CP 300 C9, IF 300 A
Measurement range max.	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa	$5 \cdot 10^{-9}$ hPa
Measurement board	2 CP 300 C9 for 2 Pirani- and 2 Cold Cathode Gauge TPR 010/018, IKR 050	2 CP 300 C9 for 2 Pirani- and 2 Cold Cathode Gauge TPR 010/018, IKR 050	PI 300 D, CP 300 C9 for 3 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 050
Relay: Switching voltage		30 V DC / 250 V AC	30 V DC / 50 V AC
Set point		5 pieces	5 pieces
Interface		RS-232-C, IF 300 B	RS-232-C, IF 300 A
Order number			
TPG 300, complete units with measurement boards and power cords	**PT G25 294**	**PT G25 295**	**PT G25 302**

Technical data	TPG 300, complete measurement unit, incl. PI 300 D, IF 300 A	TPG 300, complete measurement unit, incl. CP 300 C9, IF 300 A	TPG 300, complete measurement unit, incl. 2 PI 300 D, IF 300 A
Measurement range max.	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$8 \cdot 10^{-4}$ hPa	$5 \cdot 10^{-9}$ hPa	$8 \cdot 10^{-4}$ hPa
Measurement board	PI 300 D for 2 Pirani Gauge TPR 010/018	CP 300 C9 for 1 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 050	2 PI 300 D for 4 Pirani Gauge TPR 010/018
Relay: Switching voltage	30 V DC / 50 V AC	30 V DC / 50 V AC	30 V DC / 50 V AC
Set point	5 pieces	5 pieces	5 pieces
Interface	RS-232-C, IF 300 A	RS-232-C, IF 300 A	RS-232-C, IF 300 A
Order number			
TPG 300, complete units with measurement boards and power cords	**PT G25 306**	**PT G25 307**	**PT G25 310**

Technical data	TPG 300, complete measurement unit, incl. 2 CP 300 C9, IF 300 A	TPG 300, complete measurement unit, incl. CP 300 C10, IF 300 A	TPG 300, complete measurement unit, incl. PI 300 D, CP 300 C10, IF 300 A
Measurement range max.	1000 hPa	1000 hPa	1000 hPa
Measurement range min.	$5 \cdot 10^{-9}$ hPa	$1 \cdot 10^{-10}$ hPa	$1 \cdot 10^{-10}$ hPa
Measurement board	2 CP 300 C9 for 2 Pirani- and 2 Cold Cathode Gauge TPR 010/018, IKR 050	CP 300 C10 for 1 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 060	PI 300 D, CP 300 C10 for 3 Pirani- and 1 Cold Cathode Gauge TPR 010/018, IKR 060
Relay: Switching voltage	30 V DC / 50 V AC	30 V DC / 50 V AC	30 V DC / 50 V AC
Set point	5 pieces	5 pieces	5 pieces
Interface	RS-232-C, IF 300 A	RS-232-C, IF 300 A	RS-232-C, IF 300 A
Order number			
TPG 300, complete units with measurement boards and power cords	**PT G25 311**	**PT G25 312**	**PT G25 313**

Analytical equipment

Mass spectrometers for vacuum and gas analysis



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Analytical equipment

Mass spectrometers for vacuum and gas analysis

Knowing the gas composition is the key to understanding and controlling many vacuum processes. Pfeiffer Vacuum offers an extensive range of analyzers for gas determination in a vacuum process. From residual gas analyzers to complex analysis systems, Pfeiffer Vacuum will work with you to find the right solution for gas analysis in the ultra-high vacuum range right up to atmospheric pressure.

The criteria for selecting an analytical system are based upon application requirements:

- Pressure range of gas to be analyzed
- Mass range of the gases to be detected
- Minimum concentration to be detected
- Speed at which changes in the gas composition must be detected

The analytical equipment is based on quadrupole mass spectrometers; the PrismaPlus® series (QMG 220) for most analytical tasks and HiQuad® (QMG 700) for the highest requirements.



Overview of series and applications

■ = recommended	Analytics						Semiconductors										Coating										Industry										R & D										Page
	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	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Residual gas analysis																																												
Residual gas analysis in high vacuum																																												
PrismaPlus® with Faraday detector	■	■	■			■	■	■	■	■	■	■	■	■	■		■	■	■							■	■	■	■	■	■	■	■			■		■						100
Residual gas analysis in ultra-high vacuum																																												
PrismaPlus® with C-SEM-detector	■	■	■			■									■											■			■					■			■	■	■	■	■	■	■	100
Residual gas analysis																																												
Gas analysis in the pressure range of up to 1,000 hPa																																												
OmniStar			■						■																	■	■		■	■	■	■	■								■	■	106
ThermoStar			■						■																	■	■		■	■	■	■	■								■	■	106
Gas analysis in the pressure range of up to 50 hPa																																												
HPA 220					■		■	■	■	■	■					■	■	■	■	■	■	■	■	■	■	■		■		■	■	■	■			■				■		110
Gas analysis in the pressure range of up to 10^{-2} hPa																																												
SPM 220					■		■	■	■	■	■					■	■	■	■	■	■	■	■	■	■	■		■		■	■	■	■			■				■		112
Gas analysis in the pressure range of up to 10^{-4} hPa																																												
HiQuad®	■	■	■	■		■	■	■	■	■	■	■	■		■		■	■	■							■	■		■	■			■	■	■	■	■	■		■	■	■	116

Features at a glance

	Inlet		Mass range								Maximum inlet pressure					Ionic source / optics							De-tec-tor		Detection limit																				
	Flange (CF-F)	Capillary	1-100 u	1-128 u	1-200 u	1–340 u	1-300 u	1-512 u	1-1,024 u	1-2,048 u	1 · 10^{-5} hPa (C-SEM)	1 · 10^{-4} hPa (Faraday)	10 hPa	50 hPa	1,000 hPa	Axial	Cross-beam	Cross beam, gas tight	Open ion source	Gas tight ion source	Grid ion source	Ion optics	Faraday	Electron multiplier + Faraday	5 · 10^{-16} (SEM 217/Faraday)	1 · 10^{-15} (SEM 217/Faraday)	2 · 10^{-15} (SEM 217/Faraday)	1 · 10^{-14} (C-SEM)	2 · 10^{-14} (C-SEM)	4 · 10^{-14} (C-SEM)	1 · 10^{-12} (Faraday)	2 · 10^{-12} (Faraday)	4 · 10^{-12} (Faraday)	5 · 10^{-12} (Faraday)	1 · 10^{-11} (Faraday)	2 · 10^{-11} (Faraday)	0.1 ppm (C-SEM)	1 ppm (C-SEM)	20 ppm (Faraday)	40 ppm (Faraday)	100 ppm (Faraday)	Page
Residual gas analysis																																												
Residual gas analysis in high vacuum																																												
PrismaPlus® QMG 220 F1	■		■									■							■				■									■											100
PrismaPlus® QMG 220 F2	■				■							■							■				■										■										100
PrismaPlus® QMG 220 F3	■						■					■							■				■											■									100
Residual gas analysis in ultra high vacuum																																												
PrismaPlus® QMG 220 M1	■		■								■	■					■		■	■	■		■	■				■						■									100
PrismaPlus® QMG 220 M2	■				■						■	■					■		■	■	■		■	■					■						■								100
PrismaPlus® QMG 220 M3	■						■				■	■					■		■	■	■		■	■						■						■							100
Residual gas analysis																																												
Gas analysis in the pressure range of up to 1,000 hPa																																												
OmniStar GSD 320 O1, 1–100 u		■	■											■						■			■	■															■	■			106
OmniStar GSD 320 O2, 1–200 u		■			■									■						■			■	■															■		■		106
OmniStar GSD 320 O3, 1–300 u		■					■							■						■			■	■															■			■	106
ThermoStar GSD 320 T1, 1–100 u		■	■											■						■			■	■															■	■			106
ThermoStar GSD 320 T2, 1–200 u		■			■									■						■			■	■															■		■		106
ThermoStar GSD 320 T3, 1–300 u		■					■							■						■			■	■															■			■	106
Gas analysis in the pressure range of up to 50 hPa																																												
HPA 220, 1–100 u	■		■										■						■				■	■				■				■											110
HPA 220, 1–200 u	■				■								■						■				■	■					■				■									110
HPA 220, 1–300 u	■						■						■						■				■	■						■				■								110
Gas analysis in the pressure range of up to 10^{-2} hPa																																												
SPM 220, 1–100 u	■		■										■						■				■	■														■					112
SPM 220, 1–200 u	■				■								■						■				■	■														■					112
Gas analysis in the pressure range of up to 10^{-4} hPa																																												
HiQuad®, QMG 700, with QMA 410, 16 mm Mo-rod system, 1–128 u	■			■							■	■				■	■	■			■	■	■	■	■																		116
HiQuad®, QMG 700, with QMA 410, 16 mm Mo-rod system, 1–340 u	■					■					■	■				■	■	■			■	■	■	■		■																	116
HiQuad®, QMG 700, with QMA 430, 8 mm stainless steel rod system	■						■				■	■				■	■	■					■				■																116
HiQuad®, QMG 700, with QMA 400, 8 mm Mo-rod system	■							■	■	■	■	■				■	■	■			■	■	■	■		■																	116

The HiQuad® series is a modular system that can be very flexibly adapted to any given application.
PPM plasma monitors are also available on request for energy analysis as are EPD end point detectors for etching processes.

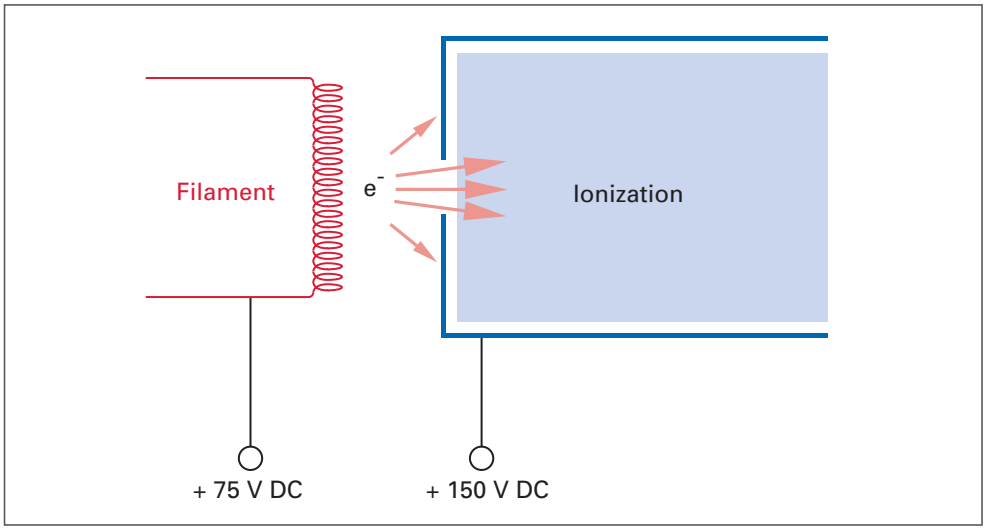


Customer benefits

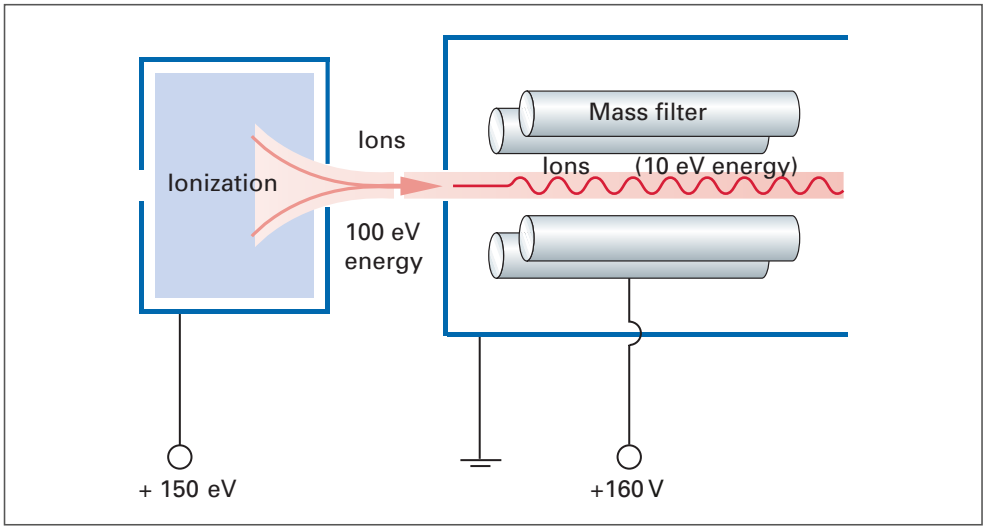
- Easily adapted to meet a variety of measurement tasks
- Easy to operate even during quantitative gas analysis
- Easy, flexible system integration
- Highly sensitive, quick measurements
- Precise process monitoring

Overview of technologies

With the compact PrismaPlus® and the high-resolution HiQuad®, Pfeiffer Vacuum offers two basic models of quadrupole mass spectrometers, which have excellent technological advantages.



Biased ionization chamber
The high electrical potential of the ionization chamber results in an extremely low background signal. The electron-emitting filament is positively biased relative to ground. This design prevents desorption of gas particles from the chamber walls, and thus the generation of an undesired background signal by electron stimulated desorption.

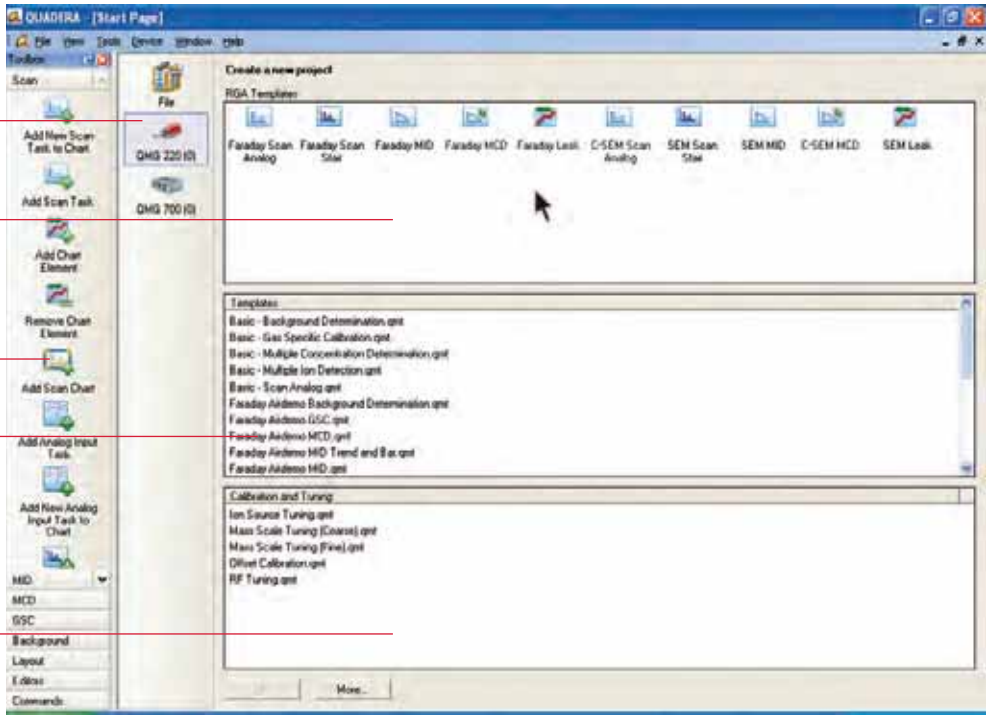


Field-axis technology
One of the most important factors for the performance of a mass spectrometer is the transfer of ions from the ion source to the mass filter. With the aid of field-axis technology, the ions are able to cross the peripheral fields of the separating system without any noteworthy interaction. It is thus possible to achieve higher sensitivities (A/hPa) without pre and post filters.

QUADERA® mass spectrometer software

Operation of quadrapole mass spectrometers including the display, evaluation and saving of data is carried out on a PC. The QUADERA® software with its modular structure offers a clear and user-friendly platform and pre-configured measuring procedures allowing for the presentation of measured data as well as the handling of parameter settings with a few mouse clicks. Complete measuring procedures can be generated with no programming skills.

QUADERA® can be used with PrismaPlus® and HiQuad® as well as any mass spectrometer systems based on these devices. The PC is connected via Ethernet to the mass spectrometer. It provides networking capacity, freely adjustable line length and the opportunity to operate the mass spectrometer from various PC work stations. The software generates the interface between the mass spectrometer and the user for settings and measurements. The simple, clear controls and ability to display external signals together with mass spectrometer data are what really matters to the user.

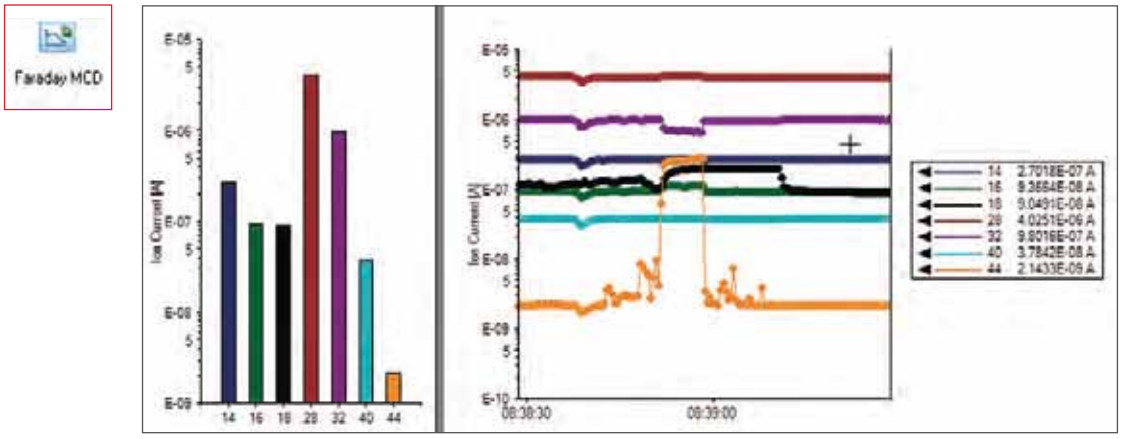


Measurement modes

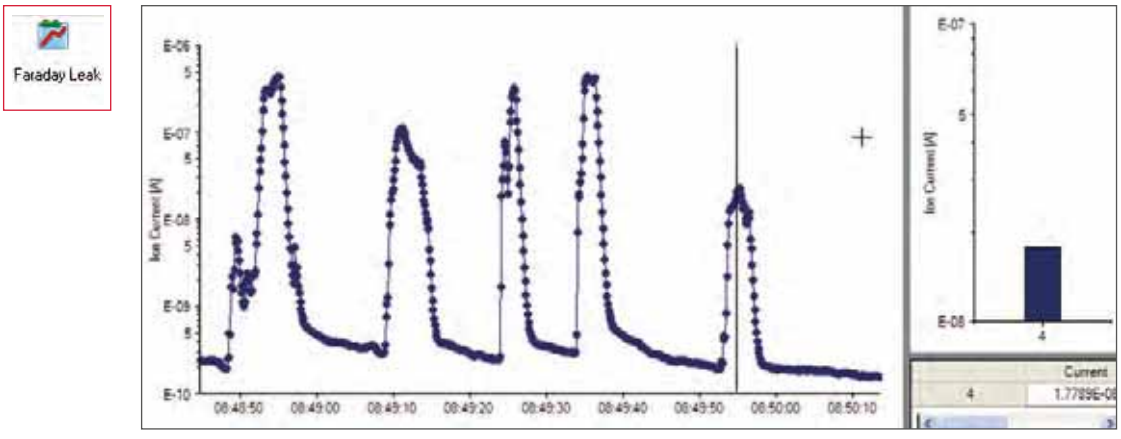
The window interface of the Quadera® software may be freely configured. Different user-defined views of a measurement can be displayed simultaneously. Prepared templates are available at a mouse click for typical measurement tasks such as the scan of a mass range as analog or bar graph, scan of certain masses, residual gas analysis or leak detection.

The mass spectrometer must be calibrated before quantitative analysis can be performed. If this involves recurring processes, such as calibration with subsequent quantitative analysis, these processes can be automated using a scripting language (VSTA = Visual Studio for Applications)*. Since pre-configured modules may be used to do so, an extensive measurement project can be generated quickly.

* Microsoft Copyright



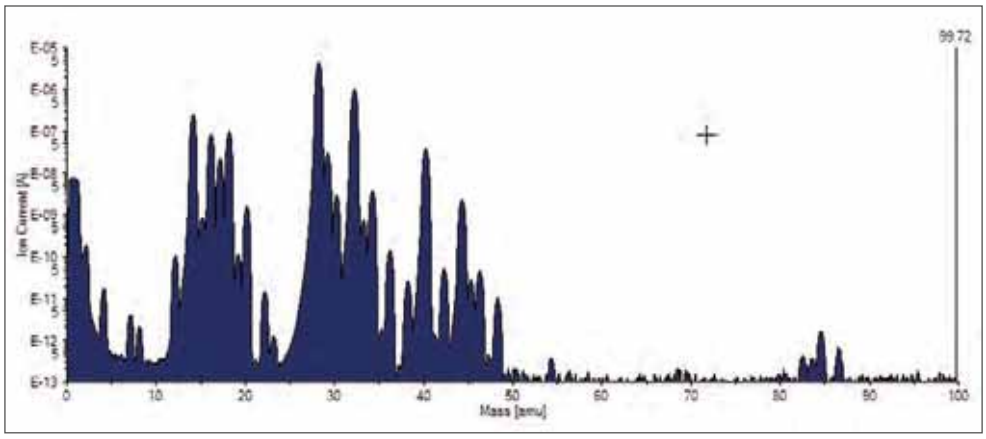
Bargraph portrayal of the ion current and its curve as a function of time



Leak detection with helium – Visualization as a function of time

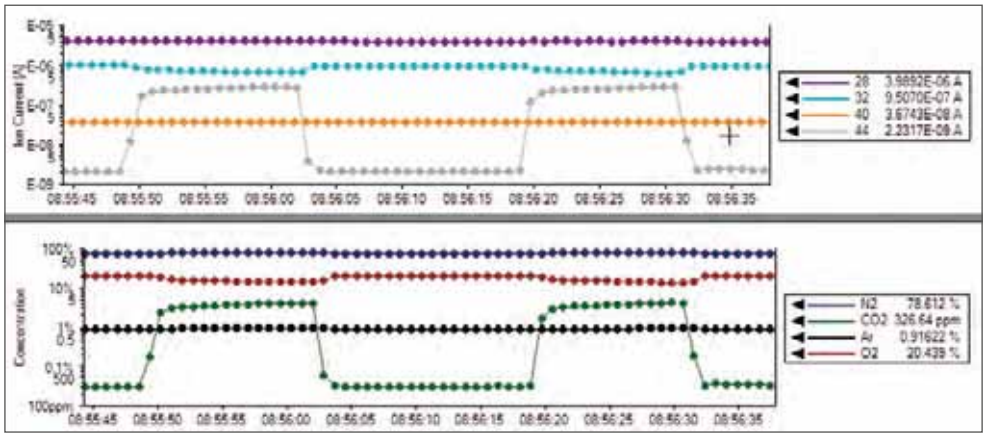
QUADERA®

C-SEM Scan Analog



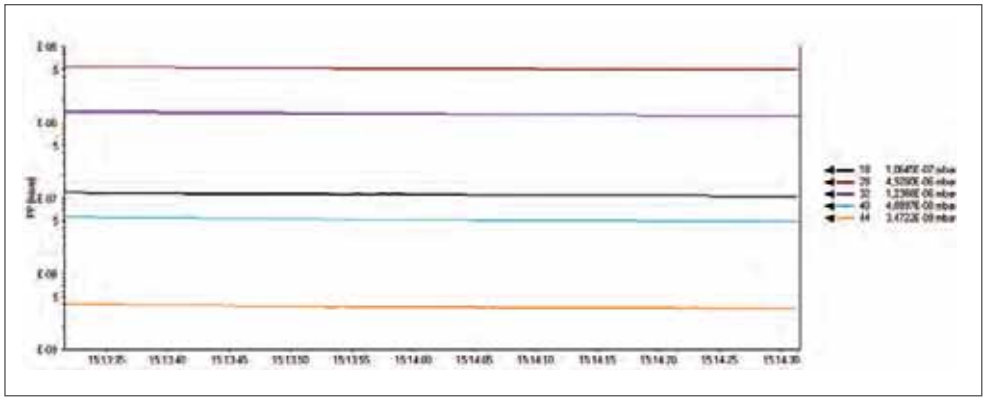
Analog spectrum of air

C-SEM MCD



Analysis of air as ion current and concentration as a function of time

SEM MID

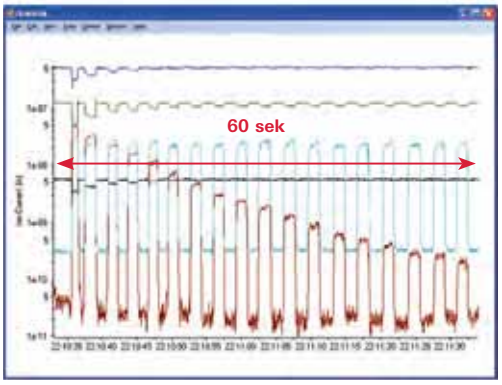


Measurement of different masses vs. time
Display as partial pressure in hPa

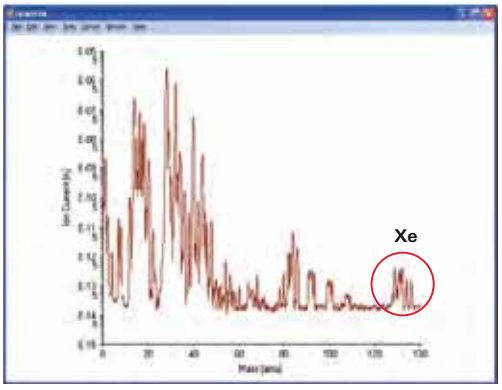
Gas analysis

Quadrupole mass spectrometers require a working pressure of less than $1 \cdot 10^{-4}$ hPa under high vacuum. To analyze gases at higher pressures, as are encountered in many vacuum processes, a perfectly coordinated system is required, consisting of a mass spectrometer, a gas inlet with a separation-free pressure reducing valve, vacuum pumping stations and total pressure measurement.
With its quadrupole mass spectrometer-based products, Pfeiffer Vacuum provides the perfect solution for analyzing every gas in the ultra-high vacuum range right up to atmospheric pressure.

Owing to the modular design and the use of high-quality, proven components, these instruments can be ideally adapted to cope with practically every measuring task. Our experienced product and applications specialist are available to assist you in selecting a suitable analytical system for your particular application.

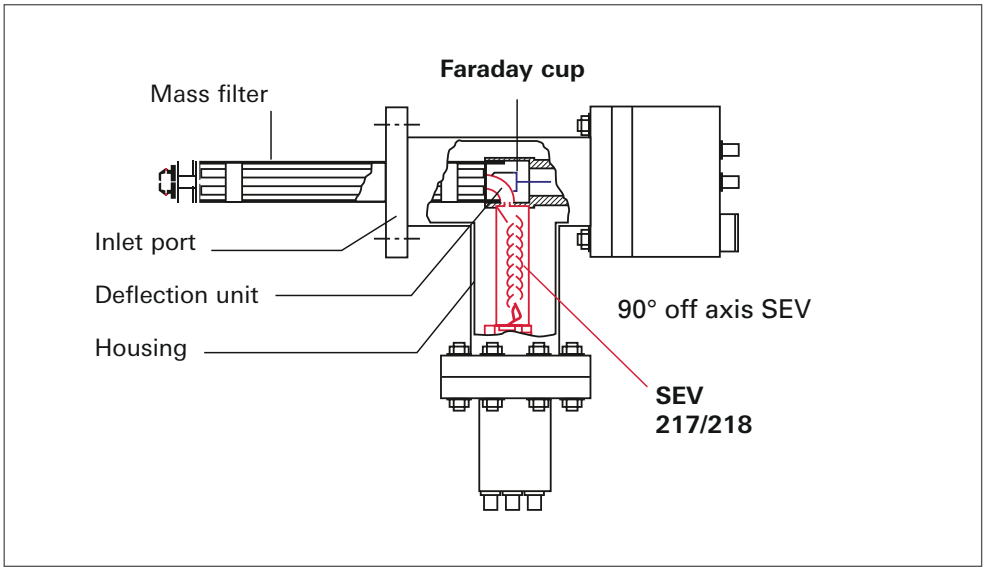


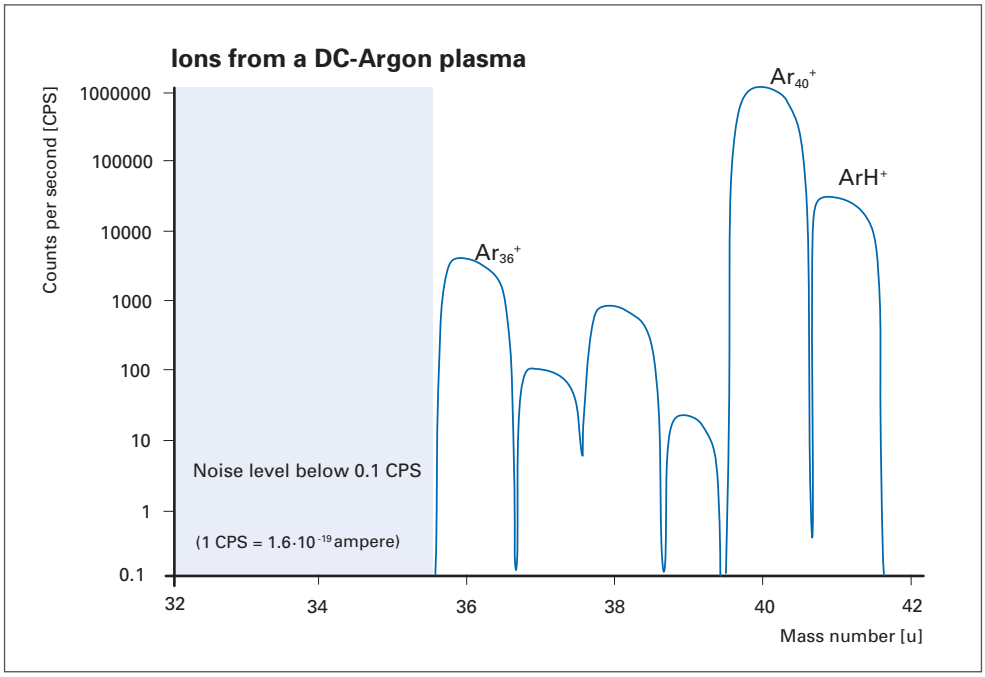
High measurement speed – up to 125 µs/u
With the HiQuad® mass spectrometer very fast measurements can be made. This example shows the mass spectrometer response during respiration analysis. N_2, O_2 and CO_2 were detected with a very fast cycle time.



Wide dynamic range
The figure shows a spectrum for air. In addition to the primary components of N_2, O_2, Ar and CO_2 even the smallest concentrations of Xe are detected. The ion current at mass 136 is equivalent to a concentration of 7.8 ppb Xe in the air. However, the ion current is several decades above the background noise level, allowing large dynamic range of 10 decades to be achieved.

90° off-axis secondary electron multiplier (SEM)
The task of the secondary electron multiplier is to increase the sensitivity of the mass spectrometer. In the HiQuad®, the multiplier is attached in the vacuum at a right angle to the rod system. This prevents weak X-rays and photons from reaching the detector and generating background noise. In combination with an ion-counting arrangement, it is possible to generate very low background noise level and a wide dynamic range. The spectrum shown displays a very low count of ArH^+-Ions, which were generated in a plasma.





PrismaPlus®

The perfect solution for mass spectrometry



PrismaPlus®

The combination of high sensitivity, stability and intelligent controls make the PrimaPlus® the perfect solution for mass spectrometry.

Its modular design offers you a variety of application options in industrial and analytical environments, in research & development, in leak detection and semiconductor production, as well as in coating technology.

The PrismaPlus® is the ideal solution for applications ranging from quality assurance and residual gas analysis right through to complex, quantitative tasks.

The wide selection of interfaces such as digital and analog inputs and outputs and the connection facility for DigiLine and ActiveLine transmitters allow for easy system integration.

Customer benefits

- Ideal adjustment capability for wide-ranging measurement tasks
- Easy installation due to its compact dimensions and 90 degree version
- Networkable through Ethernet
- Intuitive operation using QUADERA® software

Typical applications

- Qualification of vacuum systems
- Leak detection on vacuum chambers
- Determination of outgassing rates



Accelerators



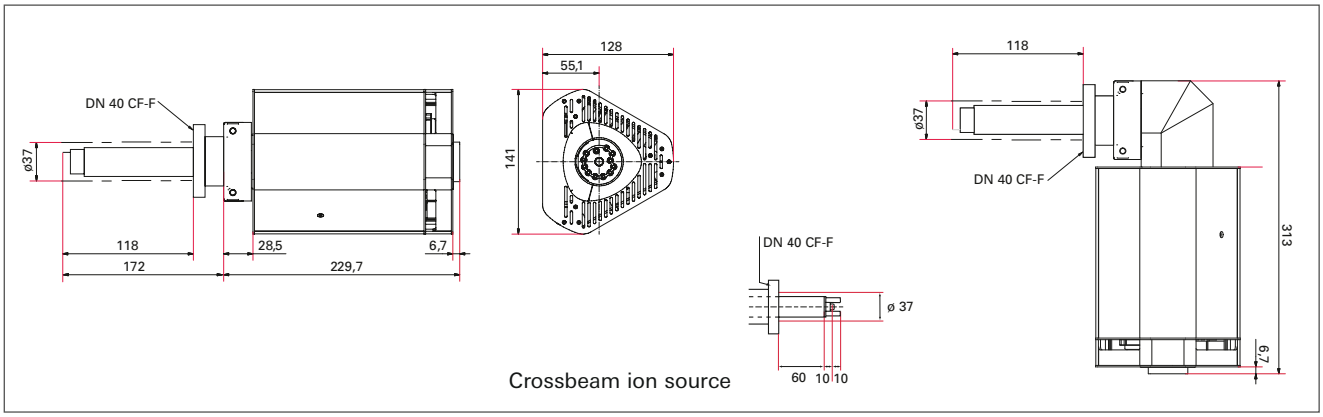
Research & Development



PrismaPlus® QMG 220

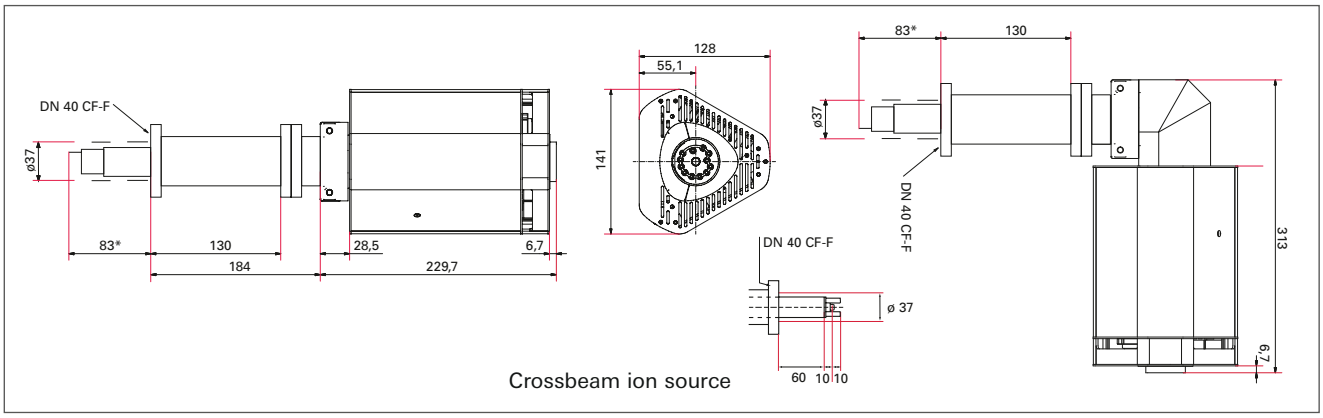
- Robust and economic residual gas analysis and vacuum process monitoring in the high vacuum range
- Interchangeability of analyzers and electronics
- Two filaments mean maximum up-time

Dimensions (in mm)



QMG 220 F 0°

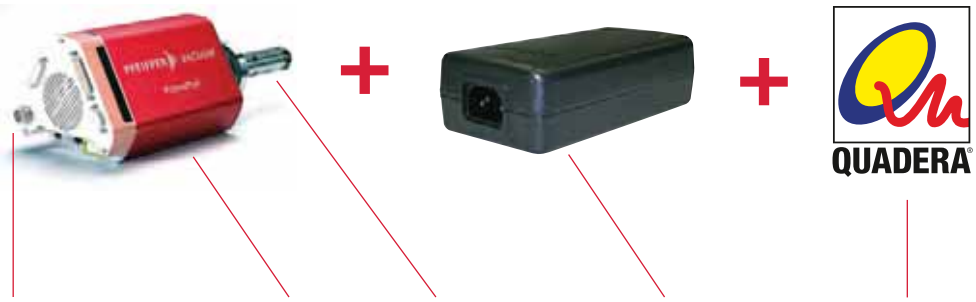
QMG 220 F 90°



QMG 220 M 0°

QMG 220 M 90°

Scope of delivery



I/O-Module 220 (optional)

Electronics unit QME 220 0° or 90° connection

Analyzer QMA 200 Faraday or C-SEM/Faraday

SP 220 power supply including mains cable

Software

Technical data	PrismaPlus® QMG220 F1	PrismaPlus® QMG220 F2	PrismaPlus® QMG220 F3
Detector	Faraday	Faraday	Faraday
Mass range	1–100 u	1–200 u	1–300 u
Rod system, diameter/length	6 mm / 100 mm	6 mm / 100 mm	6 mm / 100 mm
Min. detection limit, Faraday[1)]	$1 \cdot 10^{-12}$ hPa	$2 \cdot 10^{-12}$ hPa	$4 \cdot 10^{-12}$ hPa
Ar sensitivity, Faraday[1)]	$1 \cdot 10^{-3}$ A/hPa	$6 \cdot 10^{-4}$ A/hPa	$3 \cdot 10^{-4}$ A/hPa
Operating pressure, max[2)], Faraday operation	$1 \cdot 10^{-4}$ hPa	$1 \cdot 10^{-4}$ hPa	$1 \cdot 10^{-4}$ hPa
Contribution to adjacent mass (40/41)[1)]	< 10 ppm	< 30 ppm	< 50 ppm
Operating temperature, analyzer	150 °C	150 °C	150 °C
Operating temperature, electronics	0–40 °C	0–40 °C	0–40 °C
Bakeout temperature, analyzer[3)]	200 °C/300 °C	200 °C/300 °C	200 °C/300 °C
Connection flange	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F
Resolution at 10% peak height	0.5–2.5 u	0.5–2.5 u	0.5–2.5 u
Measuring speed, analog/bargraph scan	20 ms–60 s/u	20 ms–60 s/u	20 ms–60 s/u
Measuring speed, Stair	2 ms–60 s/u	2 ms–60 s/u	2 ms–60 s/u
Measuring speed, MID	2 ms–60 s/u	2 ms–60 s/u	2 ms–60 s/u
Number of measuring channels in MID	128 pieces	128 pieces	128 pieces
Reproducibility of peak ratio[3)]	±0.5%	±0.5%	±0.5%
Interface	Ethernet	Ethernet	Ethernet
Input, digital	External protection, 24 V	External protection, 24 V	External protection, 24 V
Supply voltage	90–260 V AC, 50/60 Hz	90–260 V AC, 50/60 Hz	90–260 V AC, 50/60 Hz
Weight[4)]	2.4 kg	2.4 kg	2.4 kg

Technical data	PrismaPlus® QMG220 M1	PrismaPlus® QMG220 M2	PrismaPlus® QMG220 M3
Detector	C-SEM/Faraday	C-SEM/Faraday	C-SEM/Faraday
Mass range	1–100 u	1–200 u	1–300 u
Rod system, diameter/length	6 mm / 100 mm	6 mm / 100 mm	6 mm / 100 mm
Min. detection limit, Faraday[1)]	$5 \cdot 10^{-12}$ hPa	$1 \cdot 10^{-11}$ hPa	$2 \cdot 10^{-11}$ hPa
Min. detection limit, C-SEM[1)]	$1 \cdot 10^{-14}$ hPa	$< 2 \cdot 10^{-14}$ hPa	$< 4 \cdot 10^{-14}$ hPa
Ar sensitivity, Faraday[1)]	$5 \cdot 10^{-4}$ A/hPa	$3 \cdot 10^{-4}$ A/hPa	$1{,}5 \cdot 10^{-4}$ A/hPa
Ar sensitivity, C-SEM[1)]	200 A/hPa	200 A/hPa	100 A/hPa
Operating pressure, max.[2)], Faraday operation	$1 \cdot 10^{-4}$ hPa	$1 \cdot 10^{-4}$ hPa	$1 \cdot 10^{-4}$ hPa
Operating pressure, max, C-SEM operation	$1 \cdot 10^{-5}$ hPa	$1 \cdot 10^{-5}$ hPa	$1 \cdot 10^{-5}$ hPa
Contribution to adjacent mass (40/41)[1)]	< 10 ppm	< 20 ppm	< 50 ppm
Operating temperature, analyzer	150 °C	150 °C	150 °C
Operating temperature, electronics	0–40 °C	0–40 °C	0–40 °C
Bakeout temperature, analyzer[3)]	200 °C/300 °C	200 °C/300 °C	200 °C/300 °C
Connection flange	DN 40 CF-F	DN 40 CF-F	DN 40 CF-F
Resolution at 10% peak height	0.5–2.5 u	0.5–2.5 u	0.5–2.5 u
Measuring speed, analog/bargraph scan	20 ms–60 s/u	20 ms–60 s/u	20 ms–60 s/u
Measuring speed, Stair	2 ms–60 s/u	2 ms–60 s/u	2 ms–60 s/u
Measuring speed, MID	2 ms–60 s/u	2 ms–60 s/u	2 ms–60 s/u
Number of measuring channels in MID	128 pieces	128 pieces	128 pieces
Reproducibility of peak ratio[3)]	±0.5%	±0.5%	±0.5%
Interface	Ethernet	Ethernet	Ethernet
Input, digital	External protection, 24 V	External protection, 24 V	External protection, 24 V
Supply voltage	90–260 V AC, 50/60 Hz	90–260 V AC, 50/60 Hz	90–260 V AC, 50/60 Hz
Weight[4)]	3.8 kg	3.8 kg	3.8 kg

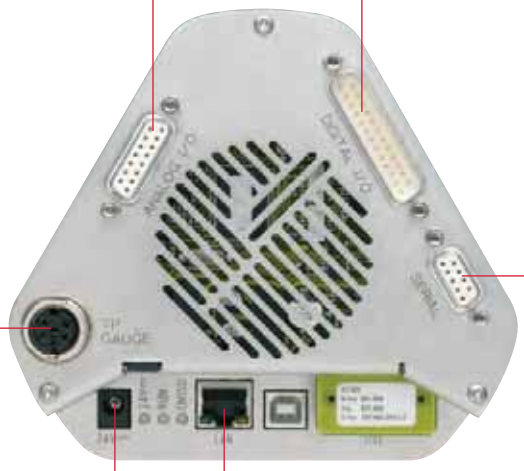
[1)] For open ion sources
[2)] For ion currents reduced to 0.2 mA: $1 \cdot 10^{3}$ hPa
[3)] Defined by order number
[4)] For version with electronics and analyzer on one axis (0°)

I/O module - connection options

	Analog outputs	Analog input	Digital outputs	Digital inputs
Number	4	5	16	5
Specification	0–10 V	-10–+10 V	V_{out} = 24 V	V_{in} = 24 V
Resolution	12 bit	14 bit	–	–
Application examples	■ Measured values, e.g. ion currents ■ Ratios (concentrations) ■ Data transfer to higher-level systems	Reading in external values, e.g. pressure, temperature, gas flow	■ Free assignment of switchpoints ■ Valve actuation	Starting or stopping of measurement tasks by means of external signal

Total pressure measurement with ActiveLine





Total pressure measurement with DigiLine



Ethernet

SP 220 power supply

L x W x H:
145 x 75 x 40 mm

Cable length: 3 m

Weight: 0.7 kg



24 V DC

Voltage: 90–260 V AC
Frequency: 50–60 Hz

Order number matrix PrismaPlus®

Order number

PT M0 a b c d e f g

Detector version[1]	a
Faraday[1] only for leak detection and high-vacuum residual gas analysis	5
C-SEM/Faraday; C-SEM = Continuous secondary electron multiplier for fast and sensitive residual analysis in the UHV, analytical tasks and leak detection	6

Mass range	b
1–100 u	1
1–200 u	2
1–300 u	3

Ion source	c
Open ion source for high-vacuum residual gas analysis; high sensitivity and good linearity	1
Gas-tight ion source for combination with gas inlet systems; low gas consumption, high signal-to-noise ratio	2
Crossbeam ion source for direct gas beam inlet without interaction with the walls of the ion sources; electron energy adjustable from 0 to 100 eV	3
Grid ion source[2] for UHV residual gas analysis; minimum outgassing and desorption rates	4
Open ion sources for high-vacuum residual gas analysis; high sensitivity and good linearity; electron energy adjustable from 0 to 100 eV	5

Filament	d
Tungsten; for UHV applications	1
Yttriated iridium: low filament temperature; high resistance to air inrushes	2

Bakeout temperature[3]	e
to 200 °C	1
to 300 °C	2

Connection[4]	f
0° (on one axis)	1
90° off axis	2

I/O interface[5] and VSTA software extension	g
Without option	0
With I/O module – for control and signal interchange via analog and digital inputs/outputs	1
With VSTA software extension – for programming program sequences and for exchanging commands and data with other programs	2
with I/O module and VSTA software extension	3

[1] Only with open ion source
[2] Grid ion source with tungsten filament only
[3] Electronics removed
[4] See dimensions page 100
[5] See page 102

OmniStar/ThermoStar

Gas analysis at atmospheric pressure



OmniStar/ThermoStar

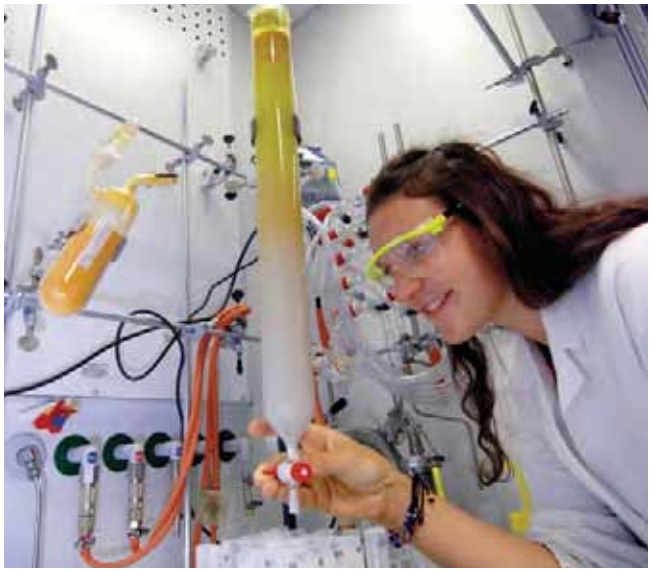
OmniStar and ThermoStar, compact bench top analyzers are two ideal complete solutions for sample gases present at atmospheric pressure. They are based on the PrismaPlus® quadrupole mass spectrometer and a dry pumping station, composed of a diaphragm vacuum pump MVP and a HiPace turbopump. They have a heated and temperature controlled gas inlet system and are suitable for the qualitative and quantitative analysis of gases.

Customer benefits

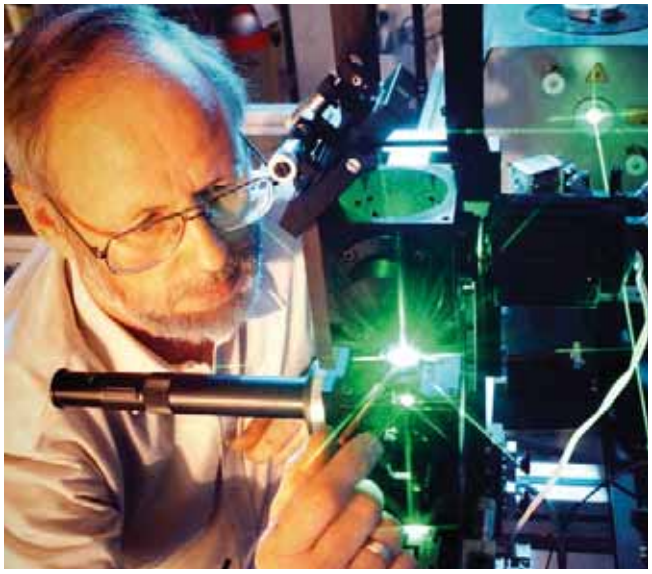
- Qualitative and quantitative gas analysis, connection for calibrating gas inlet
- Low detection limit (< 1 ppm) even for condensable gases
- Compact, easy-to-operate analysis unit
- Heated capillary inlet up to 350 °C
- Small footprint
- Easy to use even for quantitative gas analysis
- Gas analysis under varying sample pressures – pressure-regulated gas inlet (optional)

Typical applications

- Chemical analysis
- Fermentation
- Catalysis
- Laser technology
- Environmental analysis
- Fuel cells



Chemical applications



Laser



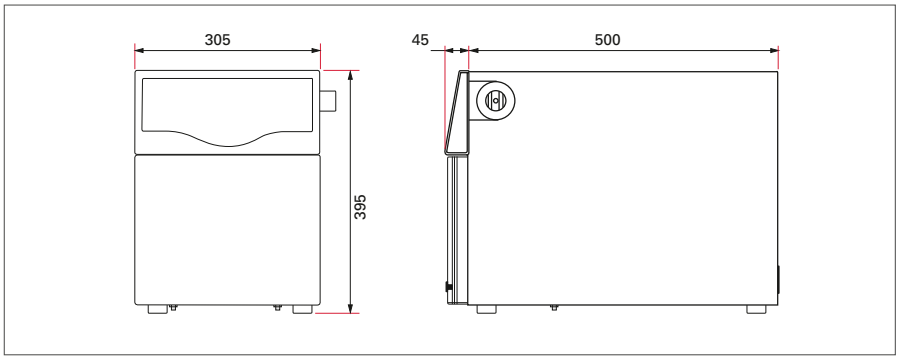
Thermo balances



OmniStar/ThermoStar

- Qualitative and quantitative gas analysis, connection port for calibrating gas inlet systems
- Low detection limit (< 1 ppm) even for condensable gases
- Compact, easy-to-operate analysis unit
- Heated capillary inlet up to 350 °C
- Bakeable all-metal sealed high vacuum chamber for low backgrounds

Dimensions (in mm)



Technical data	OmniStar	ThermoStar
Mass ranges	1–100 u 1-200 u 1-300 u	1–100 u 1–200 u 1–300 u
Gas connection	Stainless steel capillary	Quartz glass capillaries
Gas inlet	via software or user interface-controlled inlet valve	continuously open
Pressure reduction	2-stage, segregation-free	2-stage, segregation-free
Gas flow rate	1–2 sccm	1–2 sccm
Sample gas pressure	Up to 1,000 hPa	Up to 1,000 hPa
Capillary operating temperature	Up to 350 °C	Up to 350 °C
Analyzer	QMA 200 M	QMA 200 M
Rod system, material/diameter/length	Stainless steel/6/100 mm	Stainless steel/6/100 mm
Detector	C-SEM/Faraday	C-SEM/Faraday
Mass spectrometer electronics	QME 220 M	QME 220 M
Software	Quadera®	Quadera®
Contribution to neighboring mass: 40 – 41 1 – 100 / 200 / 300 U	< 10 ppm / < 20 ppm / < 50 ppm	< 10 ppm / < 20 ppm / < 50 ppm
Min. detection limit, C-SEM 1 – 100 / 200 / 300 U	< 1 ppm / < 1 ppm / < 1 ppm	< 1 ppm / < 1 ppm / < 1 ppm
Min. detection limit, Faraday 1 – 100 / 200 / 300 U	< 20 ppm / < 40 ppm / < 100 ppm	< 20 ppm / < 40 ppm / < 100 ppm
Resolution, settable at 10% peak height	0.5–2.5 u	0.5–2.5 u
Dimensions (L x W x H)	545 x 305 x 395 mm	545 x 305 x 395 mm
Weight	35 kg	35 kg
Mains requirement: voltage (range)	100 – 230 VAC	100 – 230 VAC
Interface	Ethernet Analog input: 5 x ± 10 V / 12 bit Analog output: 4 x 0...10 V / 12 bit Digital input: 4 x Digital output: 7 x optical insulated, 24 V	Ethernet Analog input: 5 x ± 10 V / 12 bit Analog output: 4 x 0...10 V / 12 bit Digital input: 4 x Digital output: 7 x optical insulated, 24 V

Order number matrix OmniStar/ThermoStar

Order number

PT	M	a	bc	def	g	h

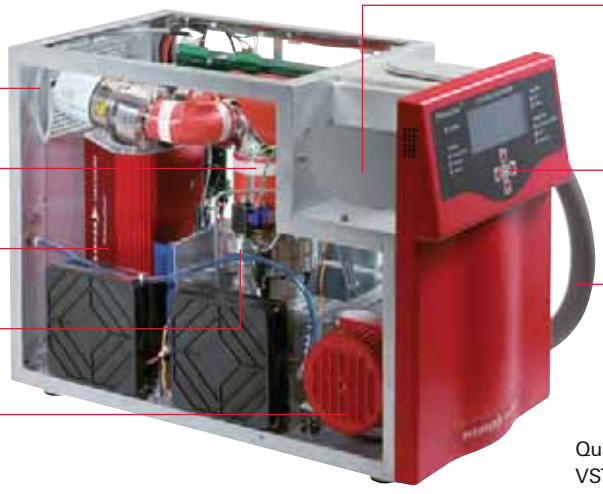
System	a
OmniStar	8
ThermoStar	9

Analyzer/Filament	bc
Filament: Yttriated iridium, integrated option for mass calibration	01
Filament: Yttriated iridium	02
Filament: Tungsten, integrated option for mass calibration	05
Filament: Tungsten	06
Filament: Yttiriated iridium, integrated option for mass calibration, corrosive gas version with inert gas inlet	11
Filament: Yttiriated iridium, corrosive gas version with inert gas inlet	12
Filament: Tungsten, integrated option for mass calibration, corrosive gas version with inert gas inlet	15
Filament: Tungsten, corrosive gas version with inert gas inlet	16

Gas inlet system	def
ThermoStar, Quartz, 1 m temperature-regulated gas sampling line, 200 °C	111
ThermoStar, Quartz, 2 m temperature-regulated gas sampling line, 200 °C	112
ThermoStar, Quartz, 1 m temperature-regulated gas sampling line, 350 °C	113
OmniStar, quartz (special), 1 m temperature-regulated gas sampling line, 200 °C	151
OmniStar, quartz (special), 2 m temperature-regulated gas sampling line, 200 °C	152
OmniStar, stainless steel, 1 m temperature-regulated gas sampling line, 200 °C	171
OmniStar, stainless steel, 2 m temperature-regulated gas sampling line, 200 °C	172
OmniStar, stainless steel, 1 m temperature-regulated gas sampling line, 350 °C	173
Pressure-regulated gas inlet, 5 decades, $5 \cdot 10^{-3}$ hPa up to atmospheric pressure	555

Mass range	g
1–100 u	1
1–200 u	2
1–300 u	3

Front panel	h
OmniStar	1
ThermoStar	2



Quadera® – An INFICON product
VSTA® – A Microsoft® product

HPA 220 and SPM 220

Gas analysis for vacuum processes



HPA 220 and SPM 220

Many vacuum processes take place in the medium vacuum range. To analyze these processes, Pfeiffer Vacuum offers two compact systems based on the quadrupole mass spectrometer PrismaPlus® and a HiPace® turbopumping station.

Gas analysis up to low vacuum range
The High Pressure Analyzer HPA 220 is a modular and flexible mass spectrometer system with a dry turbopumping station for gas analysis in a vacuum up to pressures of 50 hPa. Depending on its use, with the HPA 220, five different electropneumatic as well as manually operated gas inlet valves can be selected.

Realtime sputter process gas analysis
The Sputter Process Monitor SPM 220 provides the perfect solution for qualitative and quantitative gas analyses of sputter processes. The specially developed SPM ion source enables precise up-to-the-minute process gas analysis up to a pressure of 10^{-2} hPa. An optional version with differentially pumped orifice flange for pressures of up to 10 hPa is available.

Customer benefits
- Exact real time process monitoring
- Easy, flexible system integration
- Excellent detection limits for H_2, O_2, H_2O as well as CO_2
- Optimal adaptation to numerous measurement tasks
- Easy, flexible system integration
- Control of several devices via a single PC

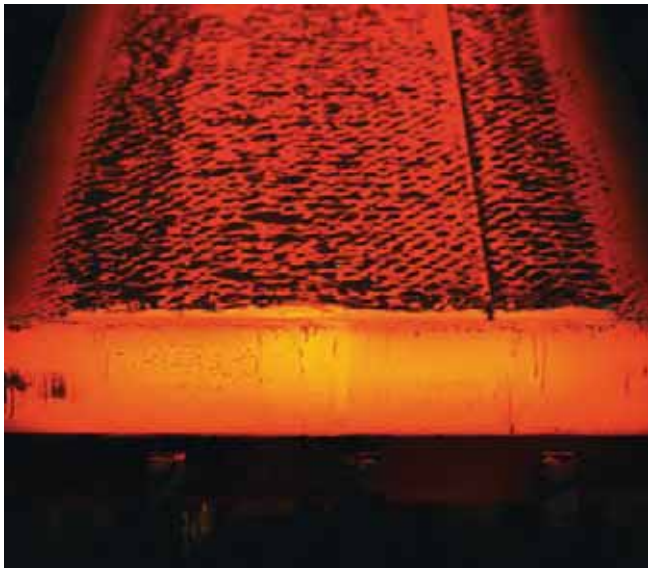
Typical applications
- Architecture and optical glass coating
- Thin-film solar cell production
- Semiconductor production
- Hard coatings
- Metallurgy
- Vacuum furnaces
- Research & development



Glass coating



Semiconductors



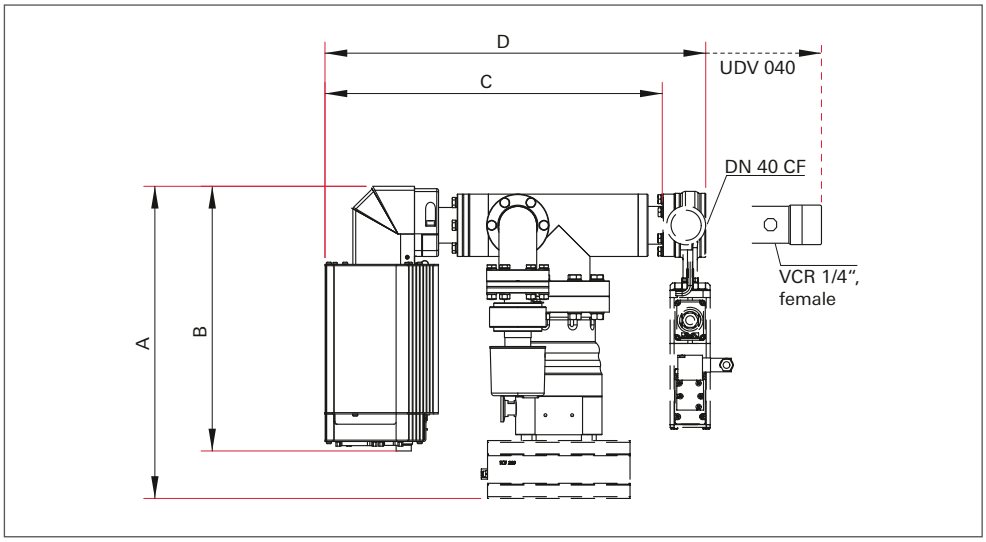
Metallurgy

HPA 220



- Provides great flexibility due to its 5 manually or electropneumatically operated gas inlet options for analyzing, monitoring and controlling processes up to a pressure of 50 hPa
- Easy and flexible system integration through a variety of digital and analog inputs and outputs
- Multiplex operation allows data evaluation of several mass spectrometer software systems with a single PC
- Compact dimensions for flexible integration

Dimensions (in mm)



Version	A	B	C	D
HPI 040 H	–	290 mm	380 mm	415 mm
HPI 040, P	350 mm	290 mm	380 mm	415 mm
Double gate valve, manual	–	290 mm	380 mm	446 mm
Double gate valve, pneumatic	350 mm	290 mm	380 mm	446 mm
UDV 040	–	290 mm	380 mm	479 mm

System overview

Mass spectrometer
PrismaPlus
1 – 100 u
1 – 200 u
1 – 300 u

Gas inlet system
1,2) Valve interface HPI 040
3,4) Double gate valve
5) Gas dosing valve UDV 040



Vacuum gauge
ActiveLine PKR 251
for monitoring the pressure and protecting the filaments

Valve control unit
VCU 220
for electropneumatic gas inlet systems

Turbopump
HiPace® 80 with
TC 110 RS
with 4 accessory ports + backing pump MVP 030-3 (not shown)

19" rack unit
BRU 220
Integrated power supply pack TPS 311. Additional options: Heating control, display and control units (DCU for turbopumps and TPG for vacuum gauges)

Order number matrix HPA 220

Order number

PT M 5 a b c d

Mass range	a
1–100 u	1
1–200 u	2
1–300 u	3

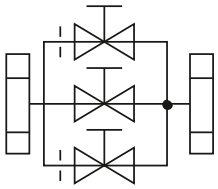
Ion source and filament	b
Open ion source, filament: yttriated iridium	1
Open ion source, filament: tungsten	2

Gas inlet system	c
HPI 040 P, bellows-sealed gate valve, DN 40 CF, electropneumatically operated, two bypass valves with 0.1 mm and 0.3 mm orifices, 0.03 mm third orifice included	1
HPI 040 P, bellows-sealed gate valve, DN 40 CF, electropneumatically operated, two bypass valves with 0.1 mm and 0.3 mm orifices, 0.03 mm third orifice included	2
Double gate valve, DN 40 CF, manually operated, one gate opens to release full cross-section, one gate with 0.1 mm orifice	3
Double gate valve, DN 40 CF, electropneumatically operated, one gate opens to release full cross-section, one gate with 0.1 mm orifice	4
UDV 040, gas dosing valve, manually operated, VCR 1/4“	5

Cable length and accessory option	d
3 m, without option	0
3 m, with TPG display and control unit	1
3 m, with DCU display and control unit	2
3 m, with TPG and DCU display and control units	3
10 m, without option	4
10 m, with TPG display and control unit	5
10 m, with DCU display and control unit	6
10 m, with TPG and DCU display and control units	7

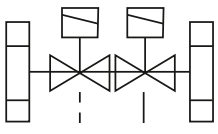
1, 2) Valve interface HPI 040
Manually or electropneumatically operated. Consists of three valves, a bellows-sealed gate valve with a nominal diameter of DN 40 CF for residual gas analysis or leak detection up to < $1 \cdot 10^{-4}$ hPa and two valves with exchangeable orifices in the bypass. One 0.03 mm orifice for extending the range to 8 hPa (N_2) is enclosed.

1,2)



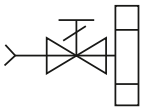
3, 4) Double gate valve
Manually or electropneumatically operated. Consists of two bellows-sealed gate valves which are welded together. One gate with a nominal diameter of DN 40 CF for residual gas analysis or leak detection up to < $1 \cdot 10^{-4}$ hPa and a second gate with an exchangeable orifice. Delivered ready fitted with a 0.1 mm orifice for the pressure range 0.1 to 1 hPa (N_2).

3,4)



5) Gas dosing valve UDV 040
Manually adjustable gas dosing valve for pressure adjustment up to 50 hPa. The maximum possible and reasonable pressure range is determined particularly by the increasing gas segregation which occurs at progressively high pressures.

5)

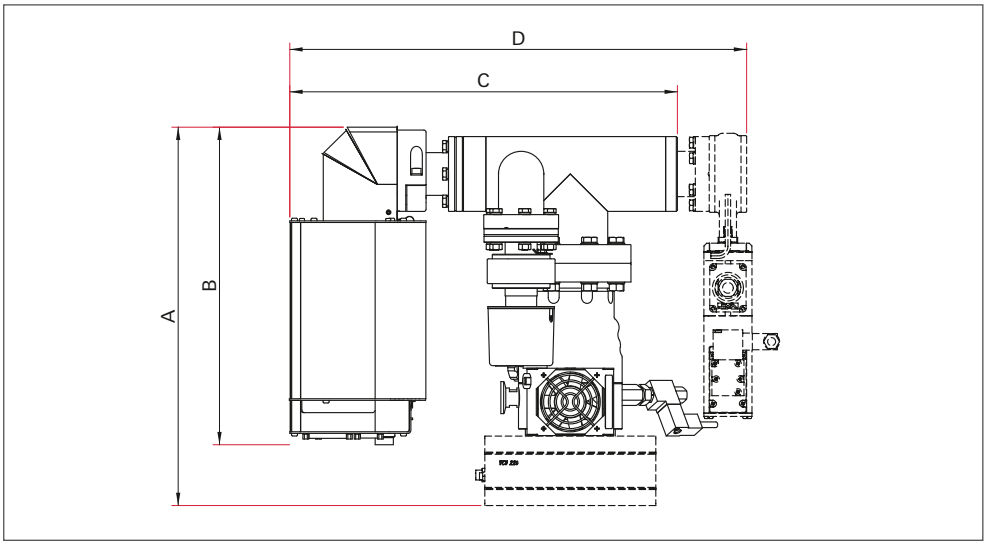


SPM 220



- SPM ion source for instantaneous process monitoring
- Excellent detection limits for H_2, O_2, H_2O and CO_2
- Minimized background influence on the measurement result
- For directly analyzing, monitoring and controlling processes up to 10^{-2} hPa
- Differentially pumped version for pressures of up to 10 hPa
- Multiplex operation allows data evaluation of several mass spectrometer software systems with a single PC
- Compact dimensions for flexible integration
- Easy and flexible system integration through a variety of digital and analog inputs and outputs

Dimensions (in mm)



Version	A	B	C	D
without addition	–	290 mm	380 mm	–
with SVV 040 safety valve	350 mm	290 mm	380 mm	416 mm
with a flange with orifice	–	290 mm	380 mm	395 mm

System overview



Mass spectrometer
PrismaPlus
1–100 u
1–200 u

Gas inlet system
Safety valve SVV 040
Orifice flange (differentially pumped)

Vacuum gauge
ActiveLine PKR 251
for monitoring the pressure and protecting the filaments

Valve control unit
VCU 220
for electropneumatic safety valve SVV 040

Turbopump
HiPace® 80 with
TC 110 RS
with 4 accessory ports + backing pump MVP 030-3 (not shown)

19" rack unit
BRU 220
Integrated power supply pack TPS 311. Additional options: Heating control, display and control unit (DCU for turbo-pumps and TPG for vacuum gauges)

Order number matrix SPM 220

Order number

PT M 5 a b c d

Mass range	a
1–100 u	1
1–200 u	2

Ion source and filament	b
SPM ion source, filament: yttriated iridium	3
SPM ion source, filament: tungsten	4

Gas inlet system	c
Without	5
Safety valve SVV 040 PM, electropneumatically operated	6
Differentially pumped DN 40 CF flange with orifice for a pressure range of up to 10 hPa	7

Cable length and accessory option	d
3 m, without option	0
3 m, with TPG display and control unit	1
3 m, with DCU display and control unit	2
3 m, with TPG and DCU display and control units	3
10 m, without option	4
10 m, with TPG display and control unit	5
10 m, with DCU display and control unit	6
10 m, with TPG and DCU display and control units	7

HiQuad®

High end mass spectrometer for gas and ion analysis



HiQuad®

HiQuad® is a modular system whose highly precise components can be optimally selected to build a system for gas and ion analysis in many applications. HiQuad® offers the highest sensitivity and a dynamic range of 10 decades allowing simultaneous measurement of ppb 100 x and impressive measurement speeds of up to 125 µs/mass. The QUADERA® software makes it particularly easy to operate the mass spectrometer.

The HiQuad® can be flexibly configured:
- Mass ranges of 1–128 u to 1–2048 u
- Rod systems of various lengths and diameters
- Ion source for UHV, high pressure and beam analysis
- Ion optics for plasma processes
- Secondary electron multiplier and ion counter
- Various interface options

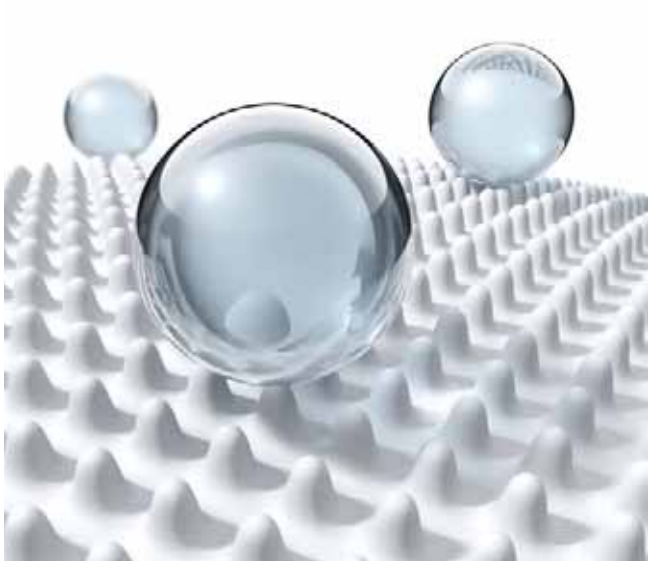
Pfeiffer Vacuum application specialists are happy to put together the best solution for your application.

Customer benefits
- Highly sensitive measurements
- Wide dynamic range
- High measuring speed
- Excellent long-term stability

Typical applications
- Residual gas analysis in ultra-high vacuum
- Environmental trace analysis
- Pharmaceutical research
- Analysis of plasma processes



Accelerators



Nanotechnology



Pharmaceutics

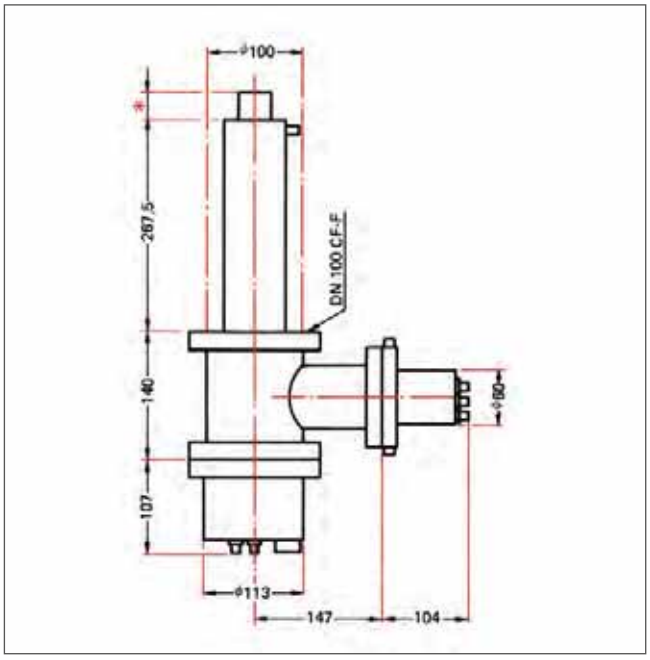
HiQuad® OMG 700



The modular solution for mass spectrometry

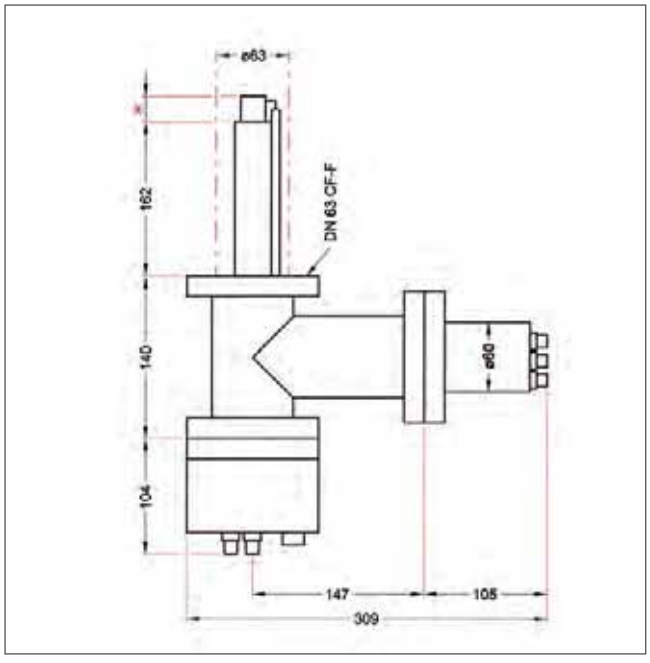
- Modular, flexible design
- Simple operation with Quadara® software
- Extremely high measurement speed
- Maximum sensitivity and wide dynamic range
- Outstanding long-term stability
- Ethernet interface
- Integrated internet browser and OPC server for communication with PC-based programs

Dimensions (in mm)



Analyzer QMA 410 with 90° off axis SEM

*
– Axial ion source = 26 mm
– Grid ion source = 27 mm
– Cross beam ion source = 35.5 mm (23.55 to the center of the sensitive volume)
– Gas tight cross beam ion source = 48 mm (axial gas connection)
– Three-lens ion optics = 129 mm
– Cross beam ion source with axial ion optics = 43.5 mm
– Cross beam ion source with three-lens ion optics = 171 mm



Analyzer QMA 400, QMA 430 with 90° off axis SEM

*
– Axial ion source = 26 mm
– Grid ion source = 27 mm
– Cross beam ion source = 35.5 mm (23.55 to the center of the sensitive volume)
– Gas tight cross beam ion source = 48 mm (axial gas connection)
– Three-lens ion optics = 129 mm
– Cross beam ion source with axial ion optics = 43.5 mm
– Cross beam ion source with three-lens ion optics = 171 mm

Technical data	HiQuad® OMG 700 1–128 u	HiQuad® OMG 700 1–340 u	HiQuad® OMG 700 1–300 u
Mass range	1–128 u	1–340 u	1–300 u
Min. detection limit	$5 \cdot 10^{-16}$ hPa	$1 \cdot 10^{-15}$ hPa	$2 \cdot 10^{-15}$ hPa
Ar sensitivity, min[1]	$1 \cdot 10^{-3}$ A/hPa	$5 \cdot 10^{-4}$ A/hPa	$2 \cdot 10^{-4}$ A/hPa
Operating pressure, max. Faraday, max. SEM, max.	$1 \cdot 10^{-4}$ hPa $1 \cdot 10^{-5}$ hPa	$1 \cdot 10^{-4}$ hPa $1 \cdot 10^{-5}$ hPa	$1 \cdot 10^{-4}$ hPa $1 \cdot 10^{-5}$ hPa
Partial pressure ratio with SEM	< 0.3 ppb	< 0.5 ppb	< 1 ppb
Analyzer	QMA 410	QMA 410	QMA 430
Rod system, material/diameter	Mo/16 mm	Mo/16 mm	Stainless steel/8 mm
Radio frequency generator (RF)	QMH 400-1	QMH 410-3	QMH 400-5
Electrometer preamplifier	EP 422	EP 422	EP 422
Operating temperature/analyzer	150 °C	150 °C	150 °C
Bakeout temperature/analyzer	400[2] °C	400[2] °C	400[2] °C
Connection flange	DN 100 CF-F	DN 100 CF-F	DN 63 CF-F

Technical data	HiQuad® OMG 700 1–512[3] u	HiQuad® OMG 700 1–1,024 u	HiQuad® OMG 700 1–2,048 u
Mass range	1–512 u	1–1,024 u	1–2,048 u
Min. detection limit	$1 \cdot 10^{-15}$ hPa	–	–
Ar sensitivity, min[1]	$5 \cdot 10^{-4}$ A/hPa	$2 \cdot 10^{-4}$ A/hPa	$1 \cdot 10^{-4}$ A/hPa
Operating pressure, max. Faraday, max. SEM, max.	$1 \cdot 10^{-4}$ hPa $1 \cdot 10^{-5}$ hPa	$1 \cdot 10^{-4}$ hPa $1 \cdot 10^{-5}$ hPa	$1 \cdot 10^{-4}$ hPa $1 \cdot 10^{-5}$ hPa
Partial pressure ratio with SEM	< 0.5 ppb	< 5 ppb	< 20 ppb
Analyzer	QMA 400	QMA 400	QMA 400
Rod system, material/diameter	Mo/8 mm	Mo/8 mm	Mo/8 mm
Radio frequency generator (RF)	QMH 400-5	QMH 410-1	QMH 410-2
Electrometer preamplifier	EP 422	EP 422	EP 422
Operating temperature/analyzer	150 °C	150 °C	150 °C
Bakeout temperature/analyzer	400[2] °C	400[2] °C	400[2] °C
Connection flange	DN 63 CF-F	DN 63 CF-F	DN 63 CF-F

[1] Faraday in the deflection unit, standard resolution, cross beam ion source with magnet, emission 1 mA
[2] With magnet, max. 300 °C
[3] Excellent performance data: Stability < 0.1 % over eight hours, contribution to adjacent mass < 0.1 ppm for the mass 40 and 41 u

System overview



Analyzer
QMA 400
QMA 410
QMA 430

Preamplifier and ion counter

RF generator
QMH 400
QMH 410

Control unit
HiQuad®

Software

Selection aid – typical applications and solutions

PTQ1	a	bc	d	e	f	g
Applications	Analyzer/mass range	Ion source/ion optics	Filament	Detector and high-voltage power supply	Preamplifier and ion counter	Interface options
General gas analysis	3, 5	01	1, 2, 3	1	1, 4	1, 2, 3
Particle-beam and general gas analysis	2, 3, 4, 5, 6, 7[1)]	02, 03	1, 2	1, 3	1, 4	1, 2, 3
Analysis of gases or gas mixtures; for trace analysis; less residual gas influence than with open ion sources	2, 3, 5	04, 05	1, 2	1, 2	1, 4	1, 2, 3
Plasma technology, SIMS, photoionization	5	11	1, 2	1, 2	1, 2, 3, 4	1, 2, 3
UHV residual gas analysis, desorption measurements	4, 5, 6[1)]	06[2)]	1, 2	1	1, 2	1, 2, 3
Thermally desorbed ions, electron-induced desorption, SIMS, photoionization, plasma ions	3, 5, 6	10, 11	0	2	2	1, 2, 3

[1)] For the mass range 1 to 2,048 u, analyzer QMA 400 with SEM 218 and HV 702 and EP 422.
[2)] With tungsten filament only

a – Analyzer/ Mass range
The combination of analyzer and RF generator defines the mass range. The smallest suitable mass range for the application should be selected. The larger-diameter, precision-manufactured rod system affords improved transmission and higher sensitivity.

- **QMA 410:** Molybdenum, ø 16 mm rod system
- **QMA 430:** Stainless steel, ø 8 mm rod system for mass range of up to 300 u
- **QMA 400:** Molybdenum, ø 8 mm rod system

bc – Ion source /ion optics
Selection of the correct ion source is a crucial factor in the measurements.

- **Axial ion source:** High sensitivity and good linearity
- **Cross beam ion source:** For a direct gas beam inlet without wall interaction
- **Cross beam with magnet:** High sensitivity
- **Cross beam gas tight:** Low gas consumption, high signal-to-noise ratio
- **Grid ion source:** Low outgassing and desorption rate
- **Three-lens ion optics with beam stop:** For detection of positive and negative ions
- **Ion optics with cross beam ion source:** For detecting of neutrals and ions

d – Filament

- **Tungsten:** For UHV applications
- **Yttriated iridium:** Low temperatures, high resistance to air inrushes
- **Rhenium:** For residual gas analysis

e – Detector and high-voltage power supply

- **SEM 217 + HV 701:** Secondary electron multiplier in combination with a high-voltage power supply for detecting positive ions
- **SEM 217 + HV 702:** For measuring positive and negative ions
- **SEM 218 + HV 702:** Secondary electron multiplier with conversion dynode to detect high masses

f – Preamplifier and ion counter

- **EP 422:** Fast and sensitive preamplifier
- **CP 400:** Ion counting down to 1 count per 10 seconds, wide dynamic range

g – Interface options

- IO 700 module with 8 analog inputs and 8 analog o utputs; 0 to 10 V, 12-bit resolution, 32 digital inputs and 32 digital outputs
- CAN Open Fieldbus
- IO 720 module with 16 digital outputs and 4 digital inputs; 4 analog outputs and 5 analog inputs and 1 connection for ActiveLine transmitter or connection for DigilLine transmitter.

Order number matrix HiQuad®

Order number

PT Q1 a bc d e f g

Analyzer/mass range	a
QMA 410 / 1–128 u / QMH 400-1	2
QMA 410 / 1–340 u / QMH 410-3	3
QMA 430 / 1–300 u / QMH 400-5	4
QMA 400 / 1–512 u / QMH 400-5	5
QMA 400 / 1–1,024 u / QMH 410-1	6
QMA 400 / 1–2,048 u / QMH 410-2	7

Ion source/ ion optics	bc
Axial ion source	01
Cross beam ion source	02
Cross beam ion source with magnet	03
Gas tight cross beam ion source	04
Gas tight cross beam ion source with magnet	05
Grid ion source	06
Two-lens ion optics	10
Three-lens ion optics	11
Two-lens ion optics with cross beam ion source	12
Three-lens ion optics with cross beam ion source	13

Filament	d
Without	0
Tungsten	1
Yttriated iridium	2
Rhenium	3

Detector and high-voltage power supply	e
SEM 217 + HV 701	1
SEM 217 + HV 702	2
SEM 218 + HV 702	3

Preamplifier and ion counter	f
None	0
EP 422	1
CP 400	2
EP 422 + CP 400	3
2 x EP 422	4

Interface options	g
None	0
IO 700	1
CAN Open	2
IO 720	3

Leak detectors

The widest offer of leak testing solutions, using helium and hydrogen



Contents

Leak detectors

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MiniTest 300 130
ASM 310 134

Multipurpose **130**
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ASM 340 D 138

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High performance – Compact **146**
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High performance – Console **150**
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ASM 192 T2D+ 150

Workstation **154**
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Sniffing **162**
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Leak detectors

The widest offer of leak testing solutions, using helium and hydrogen

Pfeiffer Vacuum leak detectors find any leaks. No leak is too small or too large to escape from our leak detectors. It doesn't matter whether you are looking for water, oil, fuel, gas or vacuum leaks. From miniature electronic units right up to large-volume vessels, from media escaping from vacuum systems to gases entering them – the requirements for leak detection are as wide as the range of industrial products.

Leak detectors for various demands:
Our portable leak detectors are used both for mobile leak detection "on site", as well as for worldwide service jobs in a variety of different locations. They stand out above all due to their high performance combined with low weight.

Multipurpose leak detectors are used mainly for stationary applications to localize leaks and to check leak tightness. They are also movable thanks to a dedicated cart. These compact leak detectors are used in wide range of industries, from heavy industry right up to cleanroom applications. In this latter case, the dry version of the leak detectors is used.

High-performance leak detectors are used where extremely short cycle times and fast reduction of helium background are required. From testing of industrial components in high throughput production up to highly sensitive applications in vacuum and medical technology or in research and development.



Overview of series and applications

■ recommended	Analytics						Semiconductors										Coating									Industry									R&D										Page
	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 Display (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	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Portable																																											
MiniTest 300									■							■		■	■	■	■	■		■	■	■	■		■	■	■	■	■										130
ASM 310	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■		■	■	■	■		■	■	■	■		■			■	■	■	■	■	■	■	■	■	■	■	134
Multipurpose																																											
ASM 340	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	138
ASM 340 D	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	138
High performance – Mobile																																											
ASM 380	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■		■	■		■	■	■	■	■					■		■	■	■	■	■	■	■	■	■	142
High performance – Compact																																											
ASM 182 T	■	■	■	■		■											■			■	■		■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		146
ASM 182 TD+	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■		■	■		■	■	■	■	■				■		■	■	■	■	■	■	■	■		146
High performance – Console																																											
ASM 192 T																	■			■									■	■	■	■	■	■	■	■	■	■	■	■	■		150
ASM 192 T2D+							■	■	■	■	■	■	■	■	■	■	■	■		■													■	■	■	■	■	■	■	■	■		150
Workstation																																											
ASM 1002														■												■	■																	154
Modular																																											
ASI 30																											■																	158
Sniffing																																											
ASM 102 S								■	■	■																■							■	■	■	■	■	■	■	■	■		162

Features at a glance

	Test method			Connection flange (inlet)				Minimum detectable leak rate for helium (sniffing leak detection)			Minimum detectable leak rate for helium (vacuum leak detection)		Detectable gases		Backing pump			Backing capacity									Page
	Vacuum and sniffing leak detection	Vacuum leak detection	Sniffing	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF	DN 50 ISO-KF	$1 \cdot 10^{-8}$ Pa m³/s	$5 \cdot 10^{-9}$ Pa m³/s	$5 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-12}$ Pa m³/s	$5 \cdot 10^{-13}$ Pa m³/s	^4He, ^3He, H_2	^4He	without	dry	oil-sealed	1.7 m³/h	3.4 m³/h	15 m³/h	20 m³/h	25 m³/h	35 m³/h	40 m³/h	50 m³/h	
Portable																										
MiniTest 300		■			■									■	■											130
ASM 310	■				■			■				■	■			■		■								134
Multipurpose																										
ASM 340	■				■					■		■	■				■			■						138
ASM 340 D	■				■					■		■	■			■			■							138
High performance – Mobile																										
ASM 380	■					■		■				■	■			■						■				142
High performance – Compact																										
ASM 182 T	■					■		■				■	■				■				■					146
ASM 182 TD+	■					■		■				■	■			■						■				146
High performance – Console																										
ASM 192 T	■					■		■				■	■				■				■			■		150
ASM 192 T2D+	■						■	■				■	■			■						■			■	150
Workstation																										
ASM 1002	■				■			■			■		■				■						■		■	154
Modular																										
ASI 30	■			■					■		■		■		■											158
Sniffing																										
ASM 102 S			■					■					■			■										162



Customer benefits

Portable:
- Ultralight and easy to operate
- Ideal for global servicing work
- Remote controlled for comfortable operation

Multipurpose:
- Suitable for a large variety of leak detection applications
- Powerful and dependable
- Simple design for easy operation

High-performance:
- Extremely short pump down times even on large volumes
- Designed for ultra sensitive leak detection limits whatever size and volume of the test parts
- High reliability in clean processes as well as rough environments

Workstation:
- Ideal for testing in mass production with short cycle times
- Fully automatic leak detection on seated components
- Ergonomic design and operation, for seated operators

Modular:
- Easy and flexible integration into leak detection systems
- Low maintenance for continuous operation
- Broad selection of interfaces to answer all common industry standards

Sniffing:
- Ideal solution for accurately coating mirror leaks
- Status messages by voice synthesizer for the user's convenience
- Remote controlled for comfortable operation

Series at a glance

Portable



MiniTest 300



ASM 310

Multipurpose



ASM 340
ASM 340 D

High performance – Mobile



ASM 380

High performance – Compact



ASM 182 T
ASM 182 TD+

High performance – Console



ASM 192 T
ASM 192 T2D+

Workstation



ASM 1002

Modular



ASI 30

Sniffing



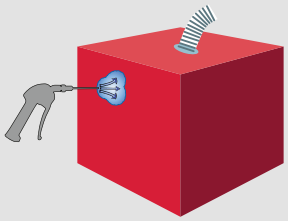
ASM 102 S

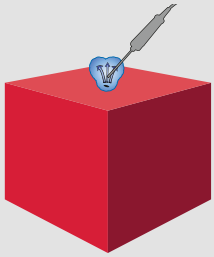

adixen
by PFEIFFER VACUUM
ASM 310

Leak detectors

Six test methods for leak detection

Leak localization
Applications in production and maintenance as well as quality control

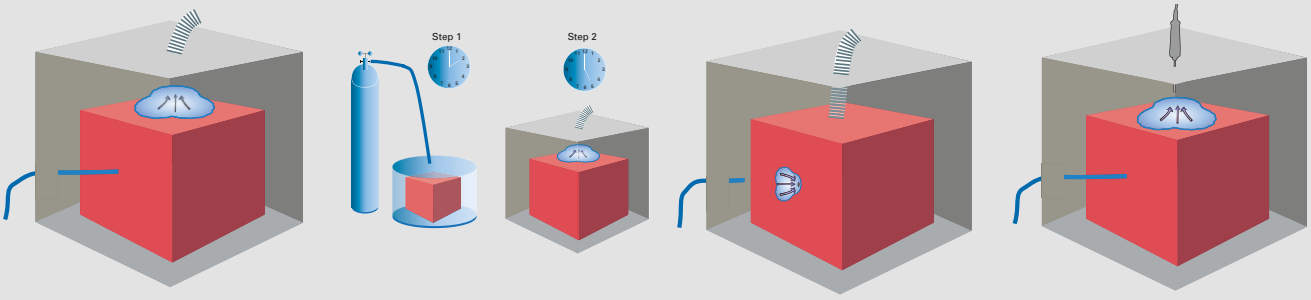




Method	**Vacuum test: Spraying test**	**Sniffing test**
	For leak localization on parts under vacuum	For leak localization on pressurized parts
Description	The leak detector evacuates the air inside the test part. After that, the tracer gas is sprayed on the external surface of the part. The detector measures the gas flow through the leak channel in the wall of the test part. The leak can be localized.	The test part is pressurized with tracer gas. After that, the sniffer probe is moved around the part. If a leak is present, the leak detector will detect the escaping tracer gas, allowing to locate the leak.
Customer benefits	■ Localization of the leak ■ Very high sensitivity ■ Easy to perform ■ Local or integral test	■ Localization of the leak ■ Not necessary to put the test part under vacuum ■ Easy to perform

	Vacuum test: Spraying test	Sniffing test	Integral vacuum test	Vacuum test: Bombing test	Integral test of enclosed parts under vacuum	Sniffing test: Integral test at athomspheric pressure
MiniTest	■					
ASM 310	■	■				
ASM 340/340 D	■	■	■		■	■
ASM Graph / Graph D	■	■	■		■	■
ASM 380	■	■	■		■	■
ASM 182 T / TD+	■	■	■	■	■	■
ASM 192 T / T2D+	■	■	■	■	■	■
ASM 1002	■	■	■	■	■	■
ASI 30		■	■		■	■
ASM 102 S		■				

Integral test
Industrial applications and quality control



Integral vacuum test

Used in production environments

The test part is placed in a vacuum test chamber and filled with tracer gas. Should a leak be present, the tracer gas will escape from the part into the test chamber and will be measured by the leak detector.

- Very high sensitivity
- High throughput
- Easy to integrate into a production line
- Easy calibration
- High repeatability

Vacuum test: Bombing test

The test part is sealed and cannot be evacuated or pressurized.

Place the test part in a specific chamber and pressurize it with tracer gas (bombing chamber). Should a leak be present, the tracer gas is forced into the part due to the gas pressure. After that, the part is placed in a vacuum chamber which is evacuated.
Any tracer gas that was forced inside the part will now escape and be measured by the leak detector.

- The only solution to test sealed components with high sensitivity
- High repeatability

Integral test of enclosed parts under vacuum

It needs to be tested whether tracer gas can enter into the part.

Inside a test chamber, the part is connected to a leak detector and evacuated. The chamber is filled with tracer gas. Should a leak be present, the tracer gas will penetrate the part and be measured by the leak detector.

- High automation level possible
- Very high sensitivity
- High throughput
- High repeatability

Sniffing test: Integral test at atmospheric pressure

The test part can withstand overpressure and needs to be tested as a complete product.

The test part is pressurized with tracer gas in a simple accumulation chamber which is under atmospheric pressure. After an accumulation time, the detector analyzes the air inside the chamber and determines if an increase in the tracer gas concentration can be measured.

- Easy to integrate into a production line

MiniTest 300

Portable helium leak detector for industrial use



MiniTest 300

The MiniTest 300 helium leak detector weighs only a sensational 5 kg. It is the first vacuum leak detector on the market which works with a quartz window sensor. Thanks to this innovative technology, it stands out due to its lightweight design and small footprint.

The MiniTest 300 can work at a high inlet pressure of up to 200 hPa and is not sensitive to water vapor. This makes it the ideal solution for leak detection in power plants, vacuum furnaces and vacuum systems as well as in heat exchangers.

The uncomplicated operation and optional wireless remote control, with a range of up to 100 meters, enable helium leak detection to be carried out even in large systems by only one person. The data measured can be easily read out on a 3.5 inch touchscreen and saved on the remote control.

Since it is practically maintenance-free, the MiniTest 300 is also cost-efficient both in operation and in long-term use.

Customer benefits

- Vacuum leak detection with a quartz window sensor for localizing and quantifying even the smallest of leaks
- Ideal for servicing work due to compact size and light weight (5 kg)
- Wireless remote control with extensive range and memory
- Easy touchscreen operation with intuitive menu navigation
- Graphic display
- Direct connection possible to systems with a maximum working pressure of up to 200 hPa
- Leaks of up to $5 \cdot 10^{-8}$ Pa m^3/s detectable with a pumping speed of 1 l/s
- Low maintenance costs

Typical applications

- Vacuum furnaces
- Lamp manufacturing
- Vacuum coating systems
- Air conditioning and refrigeration
- Pharmaceutics
- Power engineering
- Chemistry



Pharmaceutics



Air conditioning and refrigeration



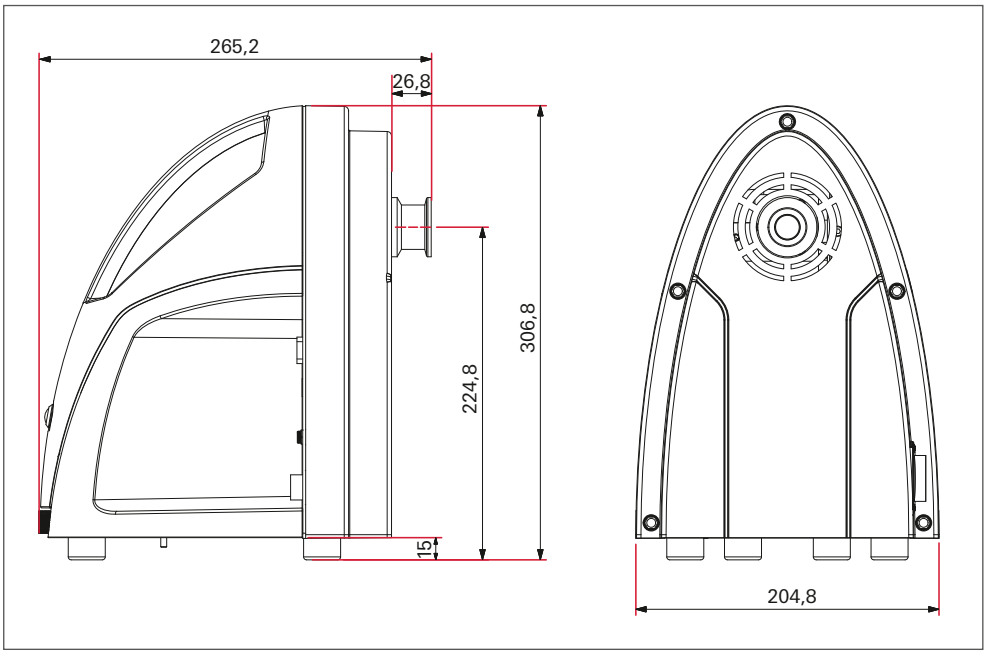
Vacuum furnaces

MiniTest 300



- Compact size and light weight (approx.5 kg)
- Detection limit of $5 \cdot 10^{-8}$ Pa m^3/s (S = 1 l/s)
- Good water vapor tolerance
- Inlet pressure up to 200 hPa abs.
- Remote control, wireless or with cable, with data logging and USB port
- Connection of an external Compact gauge
- Low maintenance costs

Dimensions (in mm)



Technical data	MiniTest 300
Flange (in)	DN 25 KF
Noise level	< 70 dB (A)
Power consumption	max. 30 VA
Power input	max. 2 A
Installation altitude, max.	2,000 m
Ready for operation after	30 min
Maximum inlet test pressure	200 hPa absolute
Weight	5 kg
Minimum detectable leak rate for ^{4}He (to AVS 2.1)	$5 \cdot 10^{-8}$ Pa m^3/s[1)]
Interfaces	RS-485, gauge, remote control, radio transmitter, I/O D-Sub 9
Operating temperature	+10 to +35 °C
Storage temperature	-10 to +55 °C
Power supply	100-240 V, 50/60 Hz
Backing pump	without

[1)] at a pumping speed of the system pump of S = 1 l/s

Order number	
MiniTest 300	**PT L03 000**

Accessories	
Remote control RC 500 WL, wireless	**PT 445 420-T**
Remote control RC 500	**PT 445 421-T**
Test leak in pin-type casing with adapter DN 16 ISO-KF	
Leak rate $3 \cdot 10^{-4}$ Pa m^3/s	**PT 445 425**
Leak rate $3 \cdot 10^{-5}$ Pa m^3/s	**PT 445 426**
Leak rate $3 \cdot 10^{-6}$ Pa m^3/s	**PT 445 427**
Transport case	**PT 445 428**
Extension cable	**PT 445 402**
Helium spray gun	**BG 512 125 -T**
Centering ring with poral filter	**PF 117 225 -T**

ASM 310

Combining light weight with superior performance



ASM 310

The portable ASM 310 provides high performance wherever it is needed at only half the weight, half the footprint and half the size of standard desktop leak detectors. At only 21 kg it is still a complete vacuum system incorporating the same detector technology as larger models.

Thanks to its clean, oil-free pumping system, the ASM 310 is the right choice for leak-test maintenance of systems which do not tolerate any contamination.

Light weight and universal voltage enable the ASM 310 to be easily operated anywhere in the world. A transport case to safeguard against shipping damage as well as a cart are available as accessories.

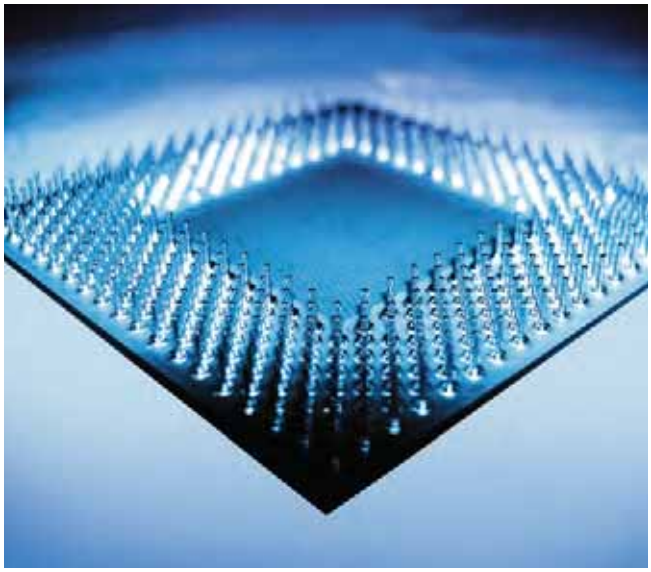
The ASM 310 can also be operated with the wireless remote control RC 500 WL. This allows remote operation at a distance of up to 100 meters.

Customer benefits

- Lightweight and portable, only 21 kg
- Smart design with retractable handle
- Easy to move
- Detachable control panel
- On-demand operating interface
- Intuitive and customizable menu
- Small footprint, small size
- Can be operated in any position
- Large bright color touchscreen
- Color graphics functionality
- Password-protected display
- Integrated SD memory card for data recording, downloading and parameter setting
- Voice synthesizer

Typical applications

- Semiconductors
- Analytics and research
- Industrial applications
- Power plants



Semiconductor industry



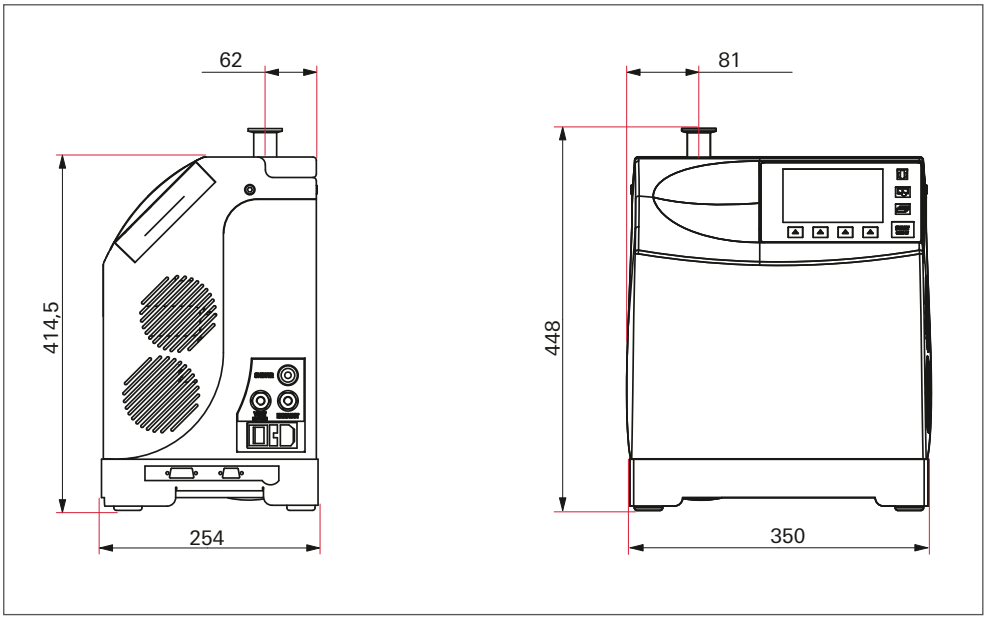
Industrial applications

ASM 310



- Oil-free pumping system, backing capacity 1.7 m^3/h
- Ultralight, only 21 kg and portable
- Large bright color touchscreen
- Intuitive and customizable menu
- Integrated SD memory card for data recording and downloading capabilities

Dimensions (in mm)



Technical data:	ASM 310
Test methods	Vacuum and sniffing leak detection
Minimum detectable leak rate for helium (vacuum leak detection)	$5 \cdot 10^{-13}$ Pa m^3/s
Minimum detectable leak rate for helium (sniffing leak detection)	$1 \cdot 10^{-8}$ Pa m^3/s
Detectable gases	^4He, ^3He, H_2
Maximum inlet test pressure	15 hPa
Backing pump capacity	1.7 m^3/h
Pumping speed for He	1.1 l/s
Flange (in)	DN 25 ISO-KF
Start-up time (20°C)	< 2 min. (< 3.5 min. with autocalibration)
Response time (sniffing leak detection)	< 1 s
Interface	RS-232, analog
I/O interfaces	Digital input Analog output (mantissa) Analog output (exponent)
Dimensions (L x W x H)	350 x 245 x 414 mm
Weight:	21 kg
Universal voltage	100-240 V AC – 50/60 Hz
Maximum power consumption	300 W
Helium background suppression	Auto / manual
Operator interface	Color touchscreen
Selectable languages	English, French, German, Italian, Spanish, Russian, Japanese, Chinese, Korean

Order number	
ASM 310	**BSAA0000MM9A**

Accessories	
Country-specific power cables	
UK	**104411**
Italy	**104758**
Switzerland	**103718**
Remote control RC 500 WL, wireless	**PT 445 420-T**
Trolley	**114820**
Transportation case	**119594**

ASM 340

Best in class compact multipurpose leak detectors for any application in maintenance or production environments



ASM 340

For maintenace applications as well as small production environments, our ASM 340 offers top performance in vacuum or sniffing leak detection. This dependable leak detector can be used both for qualitative localization of leaks as well as for quantitative integral or local testing. The ASM 340 is distinguished by its powerful backing pump which is available in oil-sealed and dry versions. Easy operation, ultra-fast response times and a short recovery time are among the outstanding features of this compact multipurpose unit.

The ASM 340 can be adapted to specific applications with the aid of extensive accessories. Existing accessories for leak detectors in our ASM and HLT series are also compatible with the ASM 340.

Customer benefits

- Suitable for maintenance and small production applications for example in Industry, R&D and Analytics
- High backing capacity for versatile use (in oil-sealed or dry version)
- Fast response time
- 25 hPa inlet test pressure and capability to locate leaks from ~100 hPa
- Intuitive menu easy to navigate
- SD memory card for storage capabilities and easy post-processing of leak test results
- Rugged design and low maintenance

Typical applications

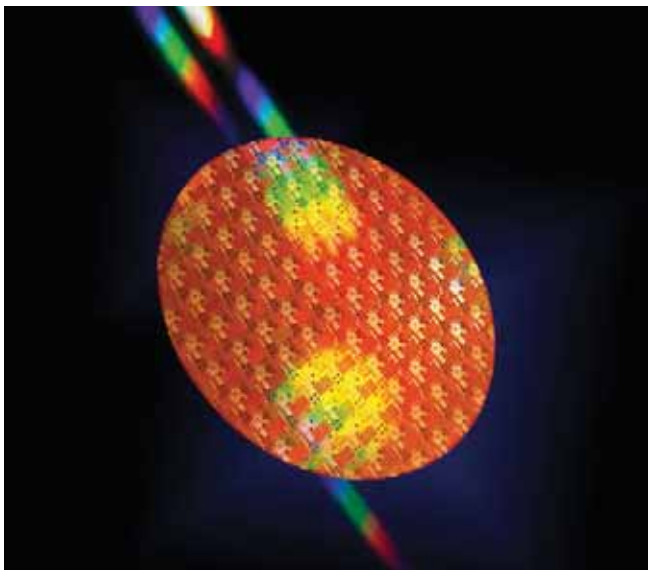
- Research and development
- Aeronautic industry
- Mechanical engineering
- Measuring technology
- Refrigeration
- Air conditioning
- Semiconductor technologie



Refrigeration and air conditioning



Research and development



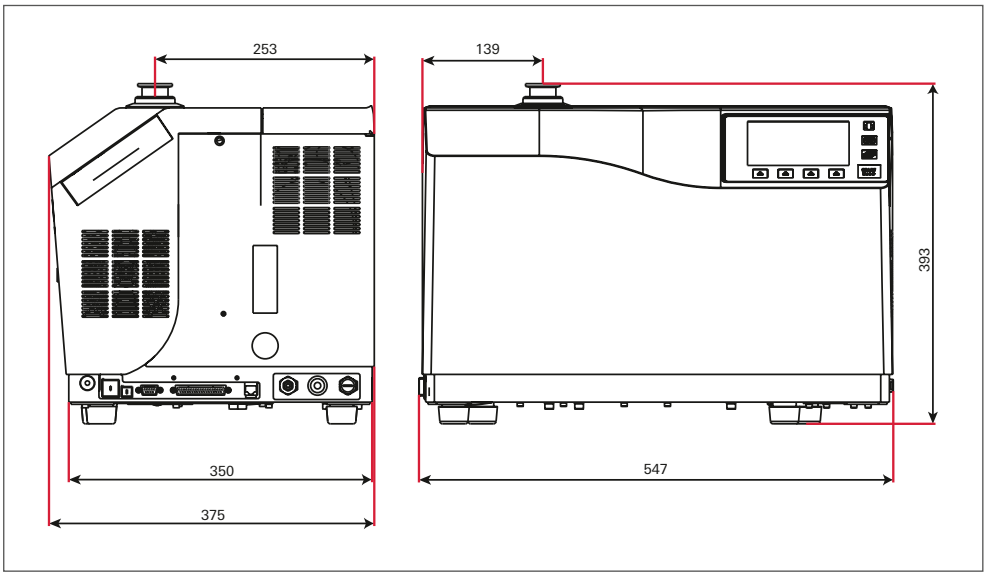
Semiconductor technology

ASM 340



- The fastest Time to Test in its class
- Powerful backing capacity for versatile use, valid for oil-sealed version as well as for dry version
- Effective 2.5 l/s helium pumping speed for a rapid response time
- Unique leak detector with the capability to locate big leaks from 100 hPa
- Detachable control panel for the best ergonomics
- Wireless remote control for operating range of up to 100 meters
- Basic or Smart sniffer probes available with various nozzle types and hose lengths
- SD memory card storage capabilities
- Low maintenance and rugged design

Dimensions (in mm)



Technical data	ASM 340	ASM 340 D
Test methods	Vacuum and sniffing leak detection	Vacuum and sniffing leak detection
Minimum detectable leak rate for helium (vacuum leak detection)	$< 5 \cdot 10^{-13}$ Pa m³/s	$< 5 \cdot 10^{-13}$ Pa m³/s
Minimum detectable leak rate for helium (sniffing leak detection)	$5 \cdot 10^{-10}$ Pa m³/s	$5 \cdot 10^{-10}$ Pa m³/s
Detectable gases	^{4}He, ^{3}He, H_2	^{4}He, ^{3}He, H_2
Backing pump capacity	Oil-sealed or dry	Diaphragm pump
Maximum inlet test pressure	25 hPa	25 hPa
Pumping speed for He	2.5 l/s	2.5 l/s
Flange (in)	DN 25 ISO-KF	DN 25 ISO-KF
Interface	RS-232 and other optional interfaces (Ethernet, USB, Bluetooth, WiFi)	RS-232 and other optional interfaces (Ethernet, USB, Bluetooth, WiFi)
I/O interfaces	Digital inputs and outputs, analog outputs	Digital inputs and outputs, analog outputs
Dimensions (L x W x H)	390 x 546 x 375 mm	390 x 546 x 375 mm
Weight	56 kg	45 kg
Supply	110–130 V, 50/60 Hz 200–240 V, 50/60 Hz	Universal 200–240 V, 50/60 Hz
Power consumption, max.	850 W	600 W
Temperature: Operating	0–45°C (Vacuum) 0–40°C (Sniffing)	0–35°C
User interface	Color touchscreen	Color touchscreen
Selectable languages	English, French, German, Italian, Spanish, Russian, Japanese, Chinese, Korean	English, French, German, Italian, Spanish, Russian, Japanese, Chinese, Korean

Zubehör		
Country-specific power cord		
Great Britain	**104411**	**104411**
Italy	**104758**	**104758**
Switzerland	**103718**	**103718**
Remote control, leak rate in mbar l/s, legend in English, 5 m cable	**106688**	**106688**
Remote control, leak rate in Pa m³/s legend in English, 5 m cable	**108880**	**108880**
Remote control RC 500 WL	**PT 445 420 -T**	**PT 445 420 -T**
Spray gun, standard	**112535**	**112535**
Spray gun “Elite-Kit”, spray gun with additional accessories in a compact case	**109951**	**109951**
Sniffer probe, 5 m hose length, rigid 9 cm nozzle	**SNC1E1T1**	**SNC1E1T1**
LP 505, sniffer probe with standard tip, 5 m	**BG449208-T**	**BG449208-T**
Profibus interface	**121645**	**121645**
Bypass option with EU cable	**PT 445 411 -T**	**PT 445 411 -T**
Bypass option with US cable	**PT 445 413 -T**	**PT 445 413 -T**

ASM 380

Mobile high performance leak detector for rapid pumpdown and short response times



ASM 380

The ASM 380 mobile high-performance leak detector from Pfeiffer Vacuum is optimized for rapid pumpdown and short response times on large test objects. Equipped with a dry ACP 40 backing pump in combination with a powerful high vacuum pump, it provides you with the ideal solution for maximum testing sensitivity in analytics, laboratories, solar panel and semiconductor industry.

The slim design and compact size set up on a cart with large wheels and a low center of gravity make the ASM 380 mobile and safe to handle.

The ASM 380 with its low noise level of only 53 dB(A) is unusually quiet for a leak detector of its class. The color display panel with full 360° viewing can be read from any position. An integrated SD memory card makes it easy to save test data and settings parameters. The ASM 380 has an integrated lockable storage compartment for tools, spare parts and accessories. Thanks to its convenient bottle-holder, it is even possible to attach and safely transport a tracer gas bottle.

Customer benefits

- High performance, sensitivity and mobility in the smallest footprint
- High roughing capacity using clean, particle free and dry ACP pump
- Suitable for use in cleanrooms
- High crossover pressure for a rapid entry into measurement mode
- Optional communication interfaces
- Color touchscreen with full 360° viewing offering excellent visibility
- Intuitive menu easy to navigate, available in 9 languages

Typical applications

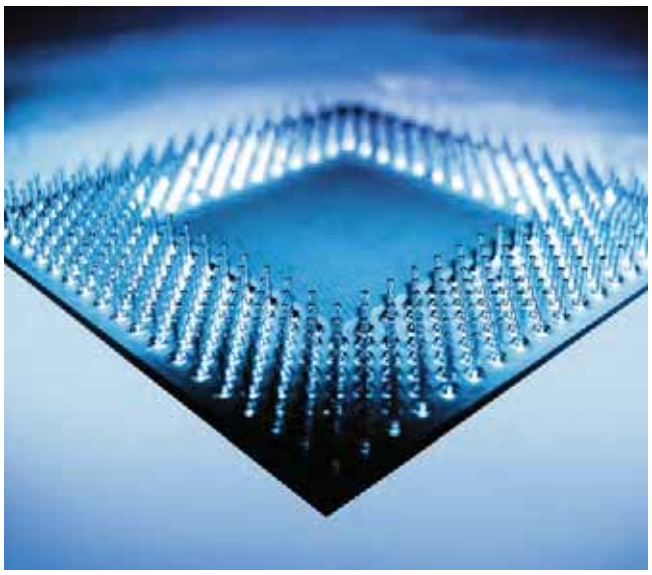
- Semiconductor industry
- Large area coating
- Solar industry
- Accelerators
- Vacuum components, feedthroughs, valves, bellows, expansion joints
- Laser technology
- High purity media supply systems
- Electronics
- Aeronautic and aerospace industry
- Medical technology



Solar industry



Accelerators



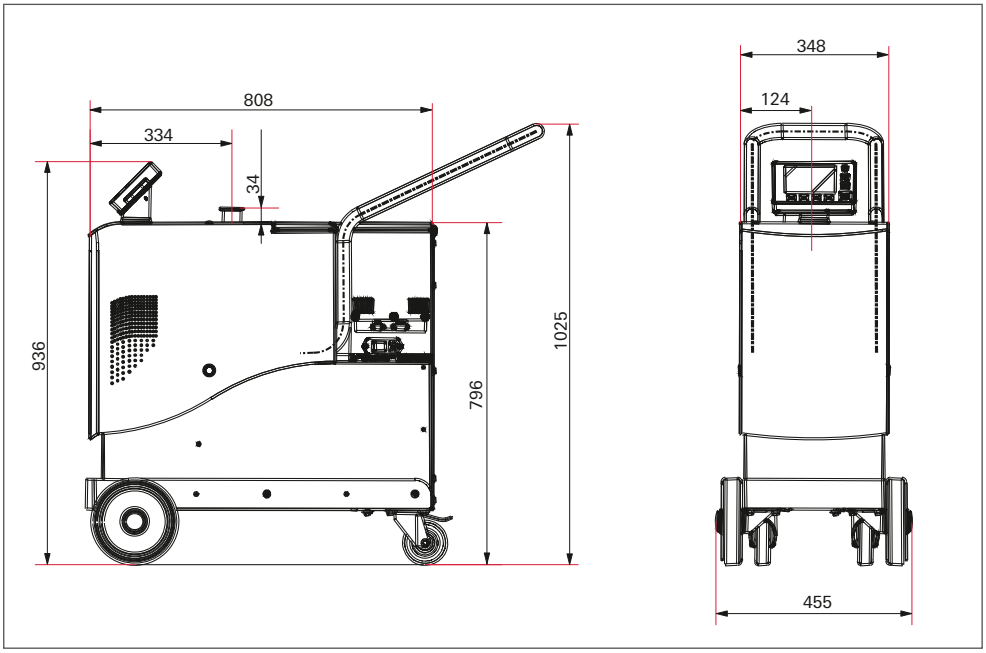
Semiconductor industry



ASM 380

- High backing capacity (35 m^3/h) and high helium pumping speed
- Fast time to test: unrivaled performances from small to large volumes
- Narrow design and highly maneuverable
- Customizable operator interface with 360° viewing
- Integrated SD memory card for data processing

Dimensions (mm)



Technical data:	ASM 380
Flange (in)	DN 40 ISO-KF
Test method	Vacuum and sniffing leak detection
Detectable gases	^4He, ^3He, H_2
Minimum detectable leak rate for helium (sniffing leak detection)	$1 \cdot 10^{-8}$ Pa m^3/s
Minimum detectable leak rate for helium (vacuum leak detection)	$5 \cdot 10^{-13}$ Pa m^3/s
Pumping speed for He	7 l/s
Noise level	< 53 dB (A)
Power supply	90–240 V, 50/60 Hz
Power consumption max.	1,500 W
Power consumption	700 W
Maximum inlet test pressure	15 hPa
Start-up time (20°C) without calibration	< 4.5 min
Start-up time (20°C) with calibration	< 5.5 min
I/O interfaces	1 Digital input (Start cycle); 2 Digital outputs (Test mode ok, Helium signal above reject set point); 3 Analog outputs (Configurable: Helium signal log, Mantissa, Exponent, Inlet pressure)
Interface	RS-232
Operating temperature	10 to 35 °C
Roughing capacity	35 m^3/h
Weight	110 kg
Selectable languages	English, French, German, Italian, Spanish, Russian, Japanese, Chinese, Korean

Order number	
ASM 380, universal voltage	**PSGB00E0MM9A**
ASM 380, universal voltage, integrated Bluetooth	**PSGB00E1MM9A**
ASM 380, universal voltage, configurable I/O interface board	**PSGB00E2MM9A**
ASM 380, universal voltage, configurable I/O interface board, integrated WiFi	**PSGB00E3MM9A**
ASM 380, universal voltage, configurable I/O interface board, Ethernet	**PSGB00E4MM9A**

Accessories	
Bottle holder for ASM 380	**118444**
Inlet filter, 20 µm, DN 40/40 ISO-KF	**105842**
Remote control RC 500 WL, wireless	**PT445420-T**
Locking clamp, DN 40 KF	**118801**

ASM 182 T, ASM 182 TD+

The perfect combination of high performance and easy operation for exceptional reliability even in the harshest industrial applications



ASM 182 T, ASM 182 TD+

The high-performance leak detectors in the ASM 182 series are available in oil-lubricated and dry versions. Both versions are equipped with a high backing capacity.

The small footprint of these leak detectors enables them to be easily integrated into production lines. Our powerful ASM 182 can be used for leak detection on parts of varied sizes and volumes. Whether used in the automotive industry, the aeronautic and aerospace or in semiconductor industry, these leak detectors fit the bill with their high performance and reliability.

Customer benefits
ASM 182 T

- Extremely short cycle times due to largest backing pump in its class
- Important status messages delivered by voice synthesizer
- Low helium background even with large test parts
- Easy maintenance due to the fold-out feature of its front and rear housing

Customer benefits
ASM 182 TD+

- The test pressure is attained rapidly even with large or strongly outgassing test parts
- Fast response time and short test cycles thanks to high helium pumping speed
- Ultra-small background signals and rapid signal reduction, for the most demanding tests

Typical applications

- Leak detection systems
- Automotive industry
- Aeronautic and aerospace industry
- Laser technology
- Sensors
- Vacuum components, feedthroughs, valves, bellows, expansion joints
- Electronics
- Mechanical components
- Heat exchangers



Aeronautic and aerospace industry



Automotive industry



Leak detection system



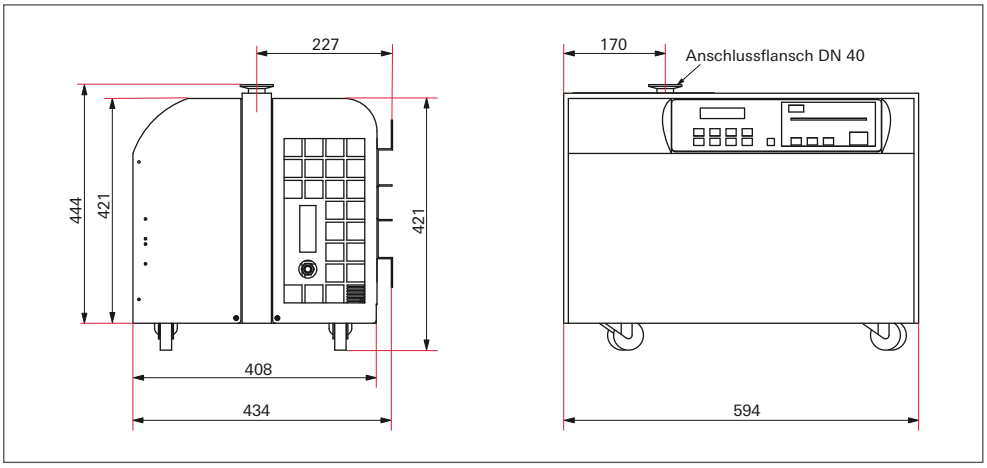
ASM 182 T

- Powerful rotary vane pump with 20 m^3/h roughing capacity
- 4.4 l/s helium pumping speed

ASM 182 TD+

- Frictionless ACP dry pump with 25 m^3/h roughing capacity
- 4.4 l/s helium pumping speed

Dimensions (mm)



Technical data:	ASM 182 T Standard	ASM 182 TD+ Standard
Flange (in)	DN 40 ISO-KF	DN 40 ISO-KF
Test methods	Vacuum and sniffing leak detection	Vacuum and sniffing leak detection
Detectable gases	^4He	^4He
Minimum detectable leak rate for helium (sniffing leak detection)	$1 \cdot 10^{-8}$ Pa m^3/s	$1 \cdot 10^{-8}$ Pa m^3/s
Minimum detectable leak rate for helium (vacuum leak detection)	$5 \cdot 10^{-13}$ Pa m^3/s	$5 \cdot 10^{-13}$ Pa m^3/s
Pumping speed for He	4.4 l/s	4.4 l/s
Noise level	< 54 dB (A)	< 65 dB (A)
Supply	200–240 V, 50/60 Hz	200–240 V, 50/60 Hz
Power consumption max.	1,000 W	1,500 W
Maximum inlet test pressure	6 hPa	6 hPa
Backing pump capacity	20 m^3/h	25 m^3/h
Start-up time (20°C) without calibration	3 min	< 4 min.
Start-up time (20°C) with calibration	4.5 min	< 5.5 min.
I/O interfaces	Digital inputs (Start, Vent, Calibration…); Digital outputs (Test modes, Cycle in progress, Helium signal above reject set point…); Analog outputs (Helium signal log, Inlet pressure)	Digital inputs (Start, Vent, Calibration…); Digital outputs (Test modes, Cycle in progress, Helium signal above reject set point…); Analog outputs (Helium signal log, Inlet pressure)
Interface	RS-232	RS-232
Operating temperature	10 to 40 °C	10 to 40 °C
Weight	76 kg	88 kg

Order number matrix
ASM 182 T, ASM 182 TD+

Order number

a	b	c	d	e	f	g	h	i	j	0

Leak detectors	a
ASM 182 T	D2
ASM 182 TD+ without cart	D1
ASM 182 TD+ with cart	D7

Detectable gases	b
Helium (^{4}He)	0
3 masses (^{4}He, ^{3}He, H_2)	3

Seals for vacuum module and analyzer cell	c
Elastomer	R
Metal	M

Control panel	d
Standard	S
Graphic color touchscreen	T

Detection option	e
ASM 182 T (not available)	0
ASM 182 TD+ Standard	S
ASM 182 TD+ with gas line option	G

Test chamber	f
without	0
Small test chamber	1
Medium test chamber	2
Large test chamber	3

Cover	g
Painted	P
UCT (stainless steel housing and frame), ASM 182 TD+ only	C

Language	e
French	A
English	B
German	C
Japanese	E

Supply	f
100–130 V, 50/60 Hz	7
220–240 V, 50/60 Hz	8

Cable and plug type	g
USA	1
France/Germany	2
UK	3
Italy	4
Switzerland	5
Without plug	7

ASM 192 T, ASM 192 T2D+

Ultra sensitive detection limits on large-volume components, ergonomic unit for standing operators



ASM 192 T, ASM 192 T2D+

High-performance leak detectors in the ASM 192 series provide high reliability even harsh applications. Extremely short pumpdown times even on large chambers as well as ultra short cycle times are the outstanding features of these console units. The vacuum system incorporating a powerful high vacuum pump reduces helium background fast and makes for short recovery times even after big leaks.

With one or two backing pumps operating in parallel, system configurations can be ideally adapted to meet any production throughput requirements. Oil-lubricated rotary vane pumps as well as dry ACP pumps are available for use as backing pumps for the ASM 192 series.

The console units have an ergonomic working height designed for standing operators and the remote control is fixed on an articulated arm for the operator's convenience. The work surface is grounded and provides generous space for putting on large test objects, useful small parts and installation components.

Customer benefits

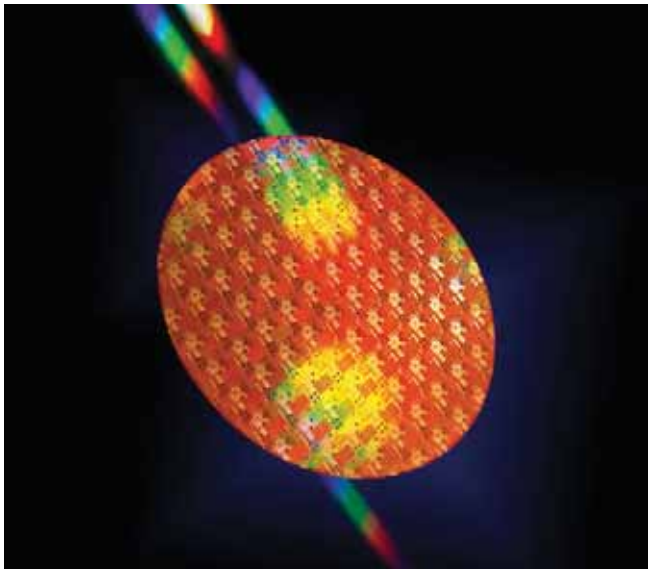
- Ideal for industrial applications
- Robust and reliable in the harshest environments
- Fast response time thanks to very high helium pumping speed
- Various languages and operating voltages available for worldwide use
- Graphic color touchscreen
- Test chambers can be mounted on the inlet flange

Typical applications

- Laser technology
- Aeronautics and aerospace
- Space simulation
- Electronics
- Nuclear technology
- Medical technology
- Accelerators
- Semiconductor technology
- Research and development
- Coating
- Vacuum technology, large chambers



Accelerators



Semiconductor technology



Aeronautics and aerospace



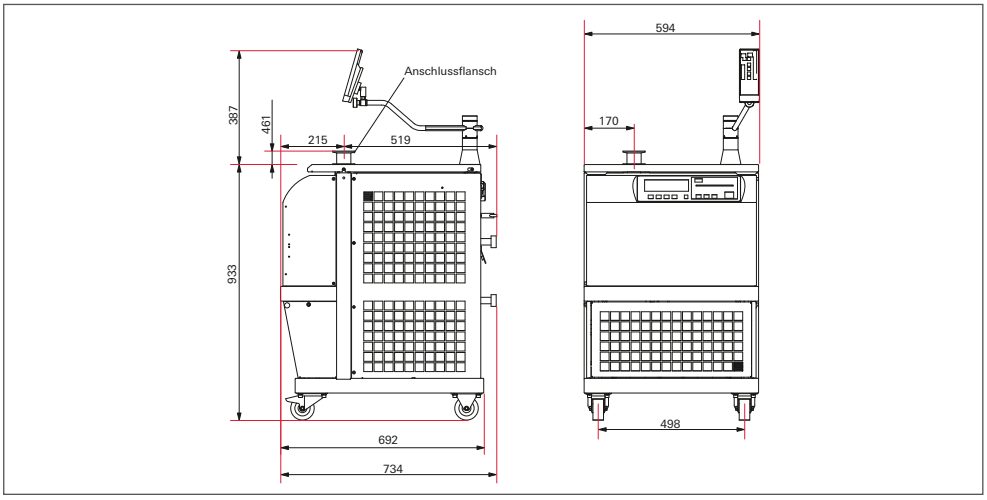
ASM 192 T

- Powerful rotary vane pump(s) with 20 m^3/h (40 m^3/h) backing capacity
- 4.4 l/s helium pumping speed

ASM 192 T2D+

- Frictionless ACP dry pump(s) with 25 m^3/h (50 m^3/h) backing capacity
- 20 l/s helium pumping speed

Dimensions (mm)



Technical data:	ASM 192 T Standard	ASM 192 T2D+ Standard
Flange (in)	DN 40 ISO-KF	DN 50 ISO-KF
Test methods	Vacuum and sniffing leak detection	Vacuum and sniffing leak detection
Detectable gases	^4He	^4He
Minimum detectable leak rate for helium (sniffing leak detection)	$1 \cdot 10^{-8}$ Pa m^3/s	$1 \cdot 10^{-8}$ Pa m^3/s
Minimum detectable leak rate for helium (vacuum leak detection)	$5 \cdot 10^{-13}$ Pa m^3/s	$5 \cdot 10^{-13}$ Pa m^3/s
Pumping speed for He	4.4 l/s	20 l/s
Noise level	< 54 dB (A)	< 66 dB (A)
Supply	200–240 V, 50/60 Hz	200–240 V, 50/60 Hz
Power consumption max.	1,300 W	1,000 W
Maximum inlet test pressure	6 hPa	30 hPa
Backing pump capacity	20 m^3/h	25 m^3/h
Start-up time (20°C) without calibration	3 min.	3.5 min.
Start-up time (20°C) with calibration	4.5 min.	5 min.
I/O interfaces	Digital inputs (Start, Vent, Calibration…); Digital outputs (Test modes, Cycle in progress, Helium signal above reject set point…); Analog outputs (Helium signal log, Inlet pressure)	Digital inputs (Start, Vent, Calibration…); Digital outputs (Test modes, Cycle in progress, Helium signal above reject set point…); Analog outputs (Helium signal log, Inlet pressure)
Interface	RS-232	RS-232
Operating temperature	10 to 40 °C	10 to 40 °C
Weight	125 kg	157 kg

Order number matrix
ASM 192 T, ASM 192 T2D+

Order number

a	b	c	0	d	e	f	g	h	i	0

Leak detectors	a
ASM 192 T	D4
ASM 192 T2D+	D3

Detectable gases	b
Helium (^{4}He)	0
3 masses (^{4}He, ^{3}He, H_2)	3

Seals for vacuum module and analyzer cell	c
Elastomer	R
Metal	M

Backing pump	d
One backing pump (ASM 192 T: 20 m^3/h, ASM 192 T2D+: 25 m^3/h	S
ASM 192 T – Two backing pumps: 40 m^3/h	R
ASM 192 T2D+ – Two backing pumps: 50 m^3/h	T

Test chamber	e
Without	0
Small test chamber	1
Medium test chamber	2
Large test chamber	3

Measuring units	f
mbar l/s	M
Torr l/s	T
Pa m^3/s	P

Language	g
French	A
English	B
German	C
Japanese	E

Supply	h
100–130 V, 50/60 Hz[1)]	7
220–240 V, 50/60 Hz	8

Cable and plug type	i
USA 15 A	1
France/Germany	2
UK	3
Italy	4
Switzerland	5
Without plug	7
USA 30 A[2)]	8

[1)] Not under 110 V if operated with two backing pumps
[2)] If the voltage is lower than 110 V, choose cable type 8 : USA 30A

ASM 1002

For leak testing of various objects where high production throughput is required



ASM 1002

The ASM 1002 leak detector combines high performance with user-friendliness. The powerful vacuum system provides a backing capacity of up to 50 m^3/h and guarantees fast reduction of helium background between measurements. These performance characteristics along with its reliability and long-term stability make the ASM 1002 the ideal solution for even the most demanding applications such as leakage testing of pacemakers.

The ASM 1002 enables automatic leak detection to be carried out on sealed components. By closing the test chamber, the test procedure starts and a red / green light indicates the test result at the end. If necessary, the test chamber can simply be exchanged for a standard vacuum flange or a part-specific holding fixture. This allows the same leak detector to be used for testing open parts, too.

Customer benefits

- Short time to test thanks to a powerful pumping package: One or two rotary vane pumps (25 or 50 m^3/h) to evacuate the test object and one rotary vane pump (20 m^3/h) as fore pump for the high-vacuum pump
- The fastest unit of its category: less than 5 seconds to achieve $1 \cdot 10^{-10}$ Pa m^3/s in a mass production
- Unique ergonomics for operator's comfort
- Two tests methods: Standard test or special Pass/Fail menu for semi-automatic testing with high throughput
- Rugged and highly reliable unit to meet high volume production needs
- Low maintenance

Typical applications

- Electronic components
- Medical technology
- Pharmaceutics
- Food technology
- Lamp technology
- Vacuum technology, large components



Lamp technology



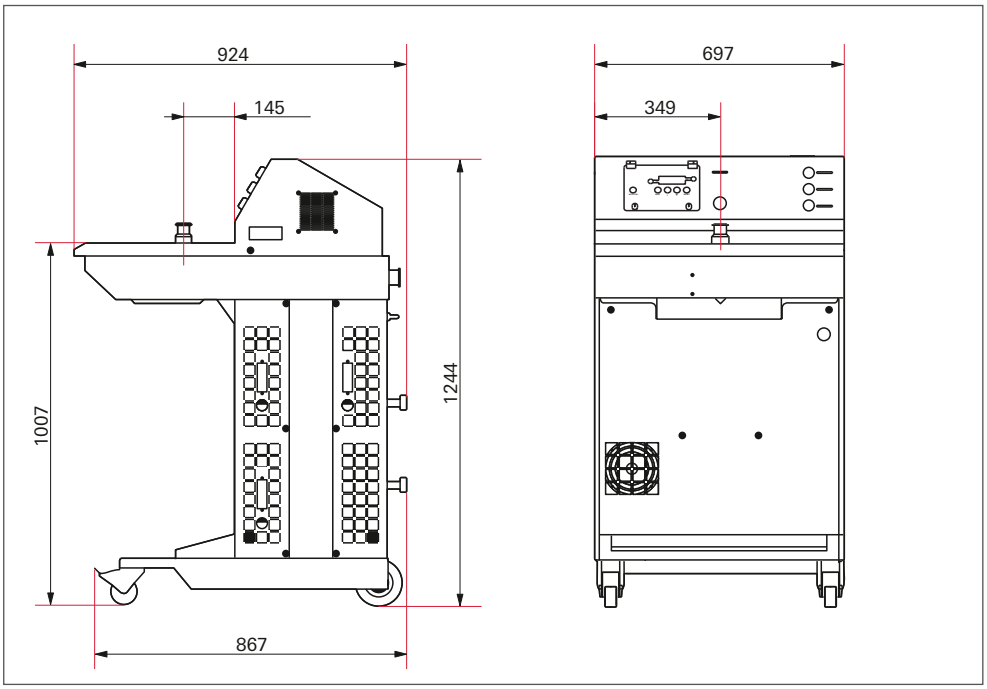
Food technology



ASM 1002

- Backing pump(s) with 25 m^3/h (50 m^3/h) capacity and high vacuum pump 200 l/s
- 4 l/s helium pumping speed

Dimensions (mm)



Technical data:	ASM 1002
Flange (in)	DN 25 ISO-KF
Test method	Vacuum and sniffing leak detection
Detectable gases	^4He
Minimum detectable leak rate for helium (sniffing leak detection)	$1 \cdot 10^{-8}$ Pa m^3/s
Minimum detectable leak rate for helium (vacuum leak detection)	$1 \cdot 10^{-12}$ Pa m^3/s
Pumping speed for He	4 l/s
Noise level	< 55 dB (A)
Backing pump capacity	25 m^3/h
Supply	110–130/200–240 V, 50/60 Hz
Power consumption	< 1,500 W
Power consumption max.	2,300 W
Maximum inlet test pressure	100 hPa
Start-up time (20°C) without calibration	< 3.5 min
Start-up time (20°C) with calibration	< 4.5 min
I/O interfaces	Analog outputs (Helium signal log, Inlet pressure); Specific analog outputs to recover the light status in Pass/Fail
Interface	RS-232
Operating temperature	10 to 40 °C
Weight	190 kg

Order number matrix ASM 1002

Order number

a	b	c	0	d	e	0	f	g	h	i	0

Leak detectors	a
ASM 1002	Y

Detectable gases	b
Helium (^{4}He)	0
3 masses (^{4}He, ^{3}He, H_2)	3

Seals for vacuum module and analyzer cell	c
Elastomer	R
Metal	M

Backing pump	d
One backing pump, 25 m^3/h	S
Two backing pumps, 50 m^3/h	T

Test chamber	e
Inlet flange DN 25	0
Small test chamber	1
Medium test chamber	2
Large test chamber	3

Remote control	f
Without	S
mbar l/s	M
Torr l/s	T
Pa m^3/s	P
Pa m^3/s, Japan	J

Language	g
French	A
English	B

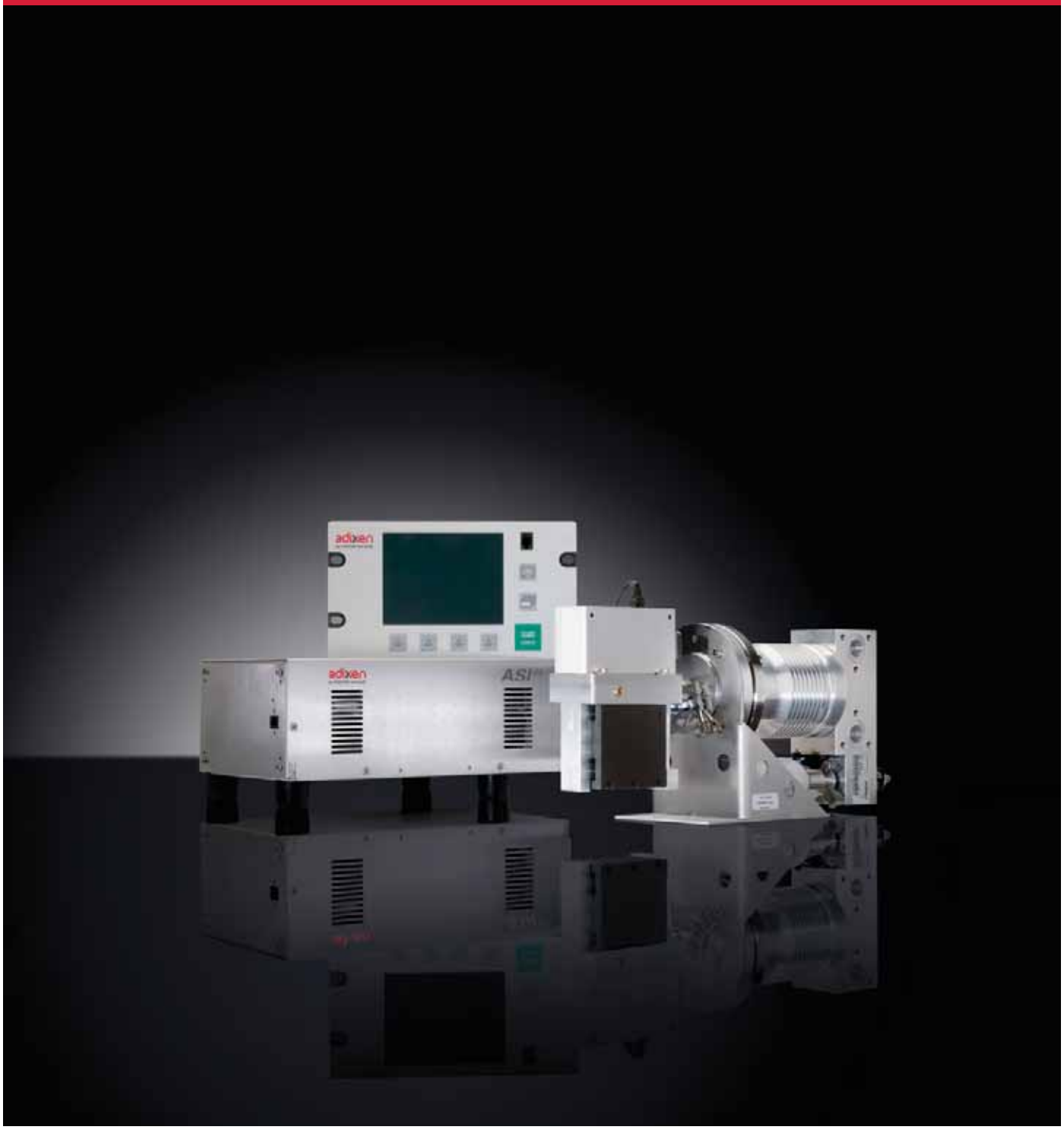
Supply	h
100–130 V, 50/60 Hz[1)]	7
220–240 V, 50/60 Hz	8

Cable and plug type	i
USA/Japan	1
France/Germany	2
UK	3
Italy	4
Switzerland	5
Without plug	7

[1)] not below 110 V for operation with two backing pumps

ASI 30

Easy and quick integration into industrial leak detection systems



ASI 30

The ASI 30 modular leak detector combines high performance, reliability and repeatability with minimum maintenance and maximum up-time. It offers easy operation for accurate leak test results under all leak test conditions.

The ASI 30 is specially adapted to meet the requirements of machine builders and their end users. Thanks to its modular design the ASI 30 is optimized for minimum space requirements and maximum integration options. The vacuum module can be installed in any position and all the other modules are compatible with 1/2 19 inch rack format. The leak detector can be controlled without a control panel simply through a PC or PLC as it has a wide range of interfaces and complies with all industrial standards.
The components are specifically designed for ease of installation with just a 2 cables hookup (with adaptable lengths) between the vacuum module and the electronic module.

Customer benefits
- Easy integration
- Simple configuration
- Easy operation
- Small footprint
- Rugged design and maximized up-time
- Low maintenance requirements
- Interfacing to industrial standards
- Selectable I/O to meet any requirements
- Optional control panel
- 40 hPa gross leak crossover
- 4 hPa normal leak crossover

Typical applications
- Automotive industry
- Compressors
- Condensers
- Packaging industry
- Gas generators
- Fire extinguishers
- Refrigeration and air conditioning



Automotive



Refrigeration and air conditioning



Packaging industry

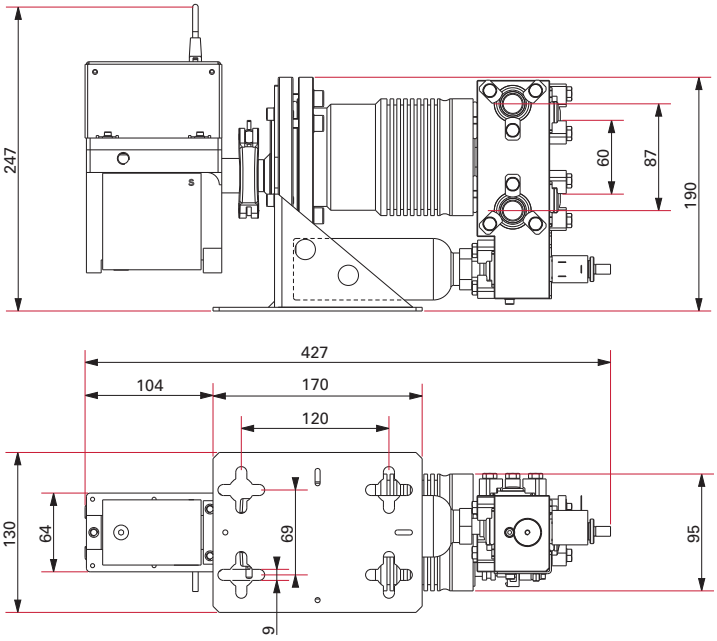
ASI 30



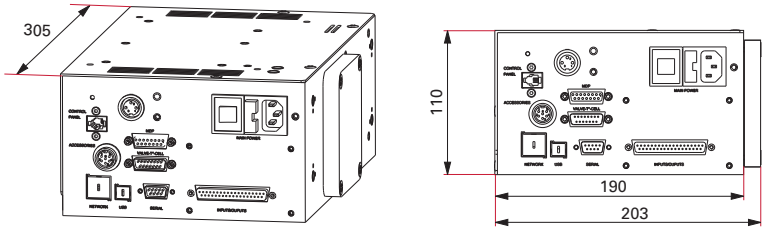
- Easy installation and fast hookup
- Fully configurable I/O interface (37 pin D-Sub), with current status display on the control panel
- Profibus and RS-232 available as serial interfaces
- Limited access to the settings menu to prevent any inadvertent changes while system is in operation
- Universal voltage: no risk of mistake, no matter what country the leak detection system is prepared and installed in

Dimensions (in mm)

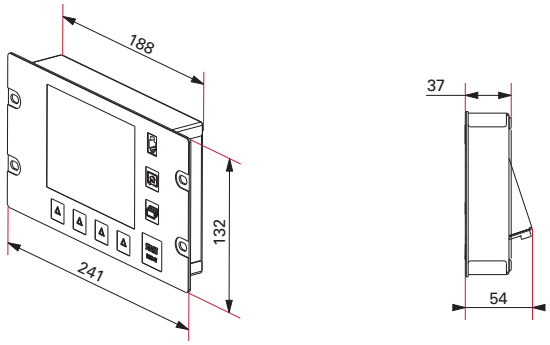
Vacuum module



Electronic module



Control panel



Technical data:	ASI 30
Test methods	Vacuum and sniffing leak detection
Minimum detectable leak rate for helium (vacuum leak detection)	$5 \cdot 10^{-8}$ Pa m³/s (Gross leak test mode) $5 \cdot 10^{-13}$ Pa m³/s (Normal leak test mode)
Minimum detectable leak rate for helium (sniffing leak detection)	$5 \cdot 10^{-9}$ Pa m³/s
Detectable gases	^4He, ^3He, H_2
Maximum inlet test pressure	40 hPa (Gross leak test mode) 4 hPa (Normal leak test mode)
Start-up time	< 3 min
Response time (sniffing leak detection)	< 0.5 s
Flange (in)	DN 16 ISO-KF
Interface (see the order matrix for complete options configuration)	RS-232, Ethernet, Profibus, USB
I/O interfaces	Digital inputs, Analog outputs, Relay outputs, Transistor (open collector) outputs
Weight: Vacuum module: Electronic module: Control panel (optional):	8.5 kg 4.5 kg 1.3 kg
Supply	90–240 V AC, 50/60 Hz
Power consumption max.	150 W
Operating temperature	5–40 °C

Order number matrix ASI 30

Order number

L a b c 000 d MM9a

Industrial control panel and associated cable length	a
Without control panel	0
1.8 m	1
5 m	2
10 m	3

Cable length for electronic module	b
3.5 m	1
5 m	2
10 m	3
20 m	4

Sniffing option	c
With	S
Without	X

Interface board	d
Basic 15 pins I/O	0
Basic 15 pins I/O + Bluetooth	1
37 pins I/O	2
37 pins I/O + Wifi	3
37 pins I/O + Ethernet	4
37 pins I/O + Bluetooth	5
Profibus	6
Profibus + Bluetooth	7

ASM 102 S

Portable sniffing leak detectors locate even the smallest leaks accurately and fast



ASM 102 S

Our ASM 102 S sniffing leak detector is the ideal solution for accurately locating minor leaks. This unit has a wide measuring range from 0.1 ppm to up to 100% helium. With a detection limit of up to $1 \cdot 10^{-8}$ Pa m^3/s, leaks are detected accurately and fast.

This leak detector is very easy to operate and even inexperienced users achieve reliable results. Delivery of important status messages by voice synthesizer and a remote control facility are additional features for the user's convenience.

The ASM 102 S sniffing leak detector with its 18 kg lightweight design and small footprint is ideally suited for maintenance applications in restricted spaces or outdoors. This leak detector works completely oil-free and can be operated in any position.

Besides its voice synthesizer and remote control features, this unit has a sniffer probe with a 5 m long tube. Longer tubes can also be supplied upon request. The leak detector has an interior storage box which can accommodate all the unit's accessories.

Customer benefits

- The perfect unit for maintenance of pressurized systems
- Portable sniffer leak detector, only 18 kg
- Easy operation
- Various languages and operating voltages available for worldwide use
- A specific hand held remote control is supplied with the leak detector, cable length to be selected in the order matrix
- A sniffer probe with 5 m hose length and rigid 9 cm nozzle (order number SNC1E1T1) is supplied with the leak detector

Typical applications

- Laser using helium as gas
- Aeronautic and aerospace industry (fuels)
- Underground cables and pipes
- Gas installations in semiconductor fabs



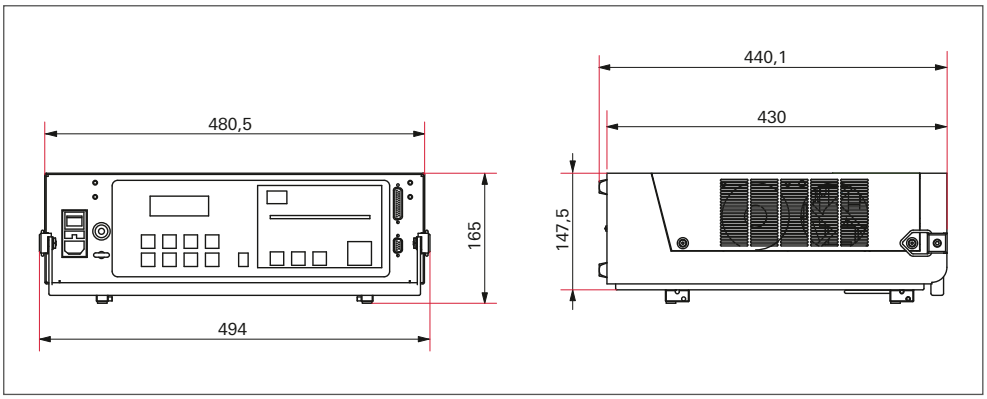
Underground cables and pipes

ASM 102 S



- Specific remote control for sniffing leak detectors supplied
- Sniffer probe, 5 m hose length and rigid 9 cm nozzle (order number SNC1E1T1) supplied

Dimensions (in mm)



Technical data:	ASM 102 S
Test method	Sniffing leak detection
Detectable gases	^4He, ^3He, H_2
Minimum detectable leak rate for helium (sniffing leak detection)	$1 \cdot 10^{-8}$ Pa m^3/s
Measurement range	$1 \cdot 10^{-8}$ to $1 \cdot 10^{-1}$ Pa m^3/s helium (0.1 ppm to 100 % helium)
Noise level	56 dB (A)
Supply	110–130 V, 50/60 Hz 200–240 V, 50/60 Hz
Power consumption max.	100 W
Start-up time (20°C) without calibration	1.5 min
I/O interfaces	Digital inputs (Start sniffer, Calibration (on external leak), Zero); Digital outputs (Sniffing test in progress, Helium signal above sniffer reject set point, Default…); Analog outputs (Mantissa, Exponent)
Interface	RS-232
Operating temperature	0 to 45 °C
Weight	18 kg

Order number matrix
ASM 102 S

Order number

a	b	000	c	d	e	f	g	0

Leak Detector	a
ASM 102 S	Z

Detectable gases	b
Helium (^{4}He)	0
3 masses (^{4}He, ^{3}He, H_2)	3

Remote control cable length	c
5 m	2
10 m	4
15 m	5

Measuring unit	d
mbar l/s	M
Torr l/s	T
Pa m^3/s	P

Language	e
French	A
English	B
German	C
Spanish	F

Supply	f
100–130 V, 50/60 Hz	7
200–240 V, 50/60 Hz	8

Cable and plug type	g
USA/Japan	1
France/Germany	2
UK	3
Italy	4
Switzerland	5
Without plug	7

Accessories



Remote control

Standard remote control
The standard remote control allows to control and display values of the leak detector from a distance of up to 5 m.

Order number	
Remote control, leak rate in mbar l/s, legend in English	**106688**
Remote control, leak rate in Torr l/s, legend in English	**108881**
Remote control, leak rate in Pa m^3/s legend in English	**108880**
Remote control, leak rate in Pa m^3/s legend in Japanese	**106690**

Remote control for sniffer leak detectors
Remote control dedicated to sniffing applications, especially to the ASM 102 S. The value is displayed in the unit set on the leak detector.

Order number	
Remote control for sniffer leak detectors with 5 m cable	**112747**

Connection cable for remote control
Cables with more than 5 m length to connect the remote control to the leak detector. The remote control is not included.

Order number	
Connection cable for remote control, 10 m	**110881**
Connection cable for remote control, 15 m	**110882**

Other cable lengths are available upon request.

Sniffer probe

Sniffer probe for leak detection in sniffing mode. Easy connection to the leak detectors by external coupling.

Order number	
Sniffer probe, 5 m hose length, rigid 9 cm nozzle	**SNC1E1T1**
Sniffer probe, 10 m hose length, rigid 9 cm nozzle	**SNC1E2T1**
Sniffer probe, 5 m hose length, rigid 9 cm nozzle	**SNC1E2T1**
Sniffer probe, 5 m hose length, flexible 15 cm nozzle	**SNC1E3T1**
Sniffer probe, 5 m hose length, flexible 45 cm nozzle	**SNC1E4T1**
Sniffer probe, 10 m hose length, rigid 30 cm nozzle	**SNC2E2T1**
Sniffer probe, 10 m hose length, flexible 15 cm nozzle	**SNC2E3T1**
Sniffer probe, 10 m hose length, flexible 45 cm nozzle	**SNC2E4T1**

Other hose lengths are available upon request.
For ASM 310 only order number SNC1E1T1 is suitable.

Calibrated leak

- Helium calibrated leak from 10^{-10} Pa m³/s to 10^{-5} Pa m³/s, including gas reservoir.
- Supplied with certificate of calibration, ± 10 % accuracy on standard values
- Can be equipped with manually operated valve (mandatory for leak values greater than $8 \cdot 10^{-7}$ Pa m³/s)
- Possibility to deliver a specific value according to customer need

Calibrated leak

Order number

F a 4 b c d

Isolation valve	a
Without	0
With [1]	V

Values	b
between 1 and 3 · 10^{-10} Pa m³/s	9
between 1 and 3 · 10^{-9} Pa m³/s	8
between 1 and 3 · 10^{-8} Pa m³/s	7
between 3 and 6 · 10^{-8} Pa m³/s	3
between 1 and 3 · 10^{-7} Pa m³/s	6
between 5 and 8 · 10^{-7} Pa m³/s	5
between 1 and 3 · 10^{-6} Pa m³/s	4
between 5 and 8 · 10^{-6} Pa m³/s	2
between 1 and 3 · 10^{-5} Pa m³/s	1

Flange	c
DN 16	0
DN 25	1
DN 40	2
DN 50 [2]	3

Special value	d
Yes	1
No	0

[1] The isolation valve is mandatory for values greater than $8 \cdot 10^{-7}$ Pa m³/s
[2] DN 50 not available for the decades 10^{-6} and 10^{-5} Pa m³/s

Notes:

- Temperature coefficient 3% per °C for any value < $8 \cdot 10^{-7}$ Pa m³/s, 0,2% per °C for greater value
- Loss 2 % per year for any value < $8 \cdot 10^{-7}$ Pa m³/s
- For specific values, due to the technology used, we can only guarantee an effective nominal value within ± 20 % of the requested nominal value.



Spray gun

To be connected to a gas bottle or gas line for spraying tracer gas easily.

Order number	
Spray gun, standard	**112535**
Spray gun “Elite-Kit”, spray gun with additional accessories in a compact case	**109951**

Inlet filters

Connected to the inlet flange, these dust filters prevent large quantities of dust from getting into the leak detector

Order number	
Inlet filter, 20 µm, DN 25/25 ISO-KF	**105841**
Inlet filter, 20 µm, DN 40/40 ISO-KF	**105842**
Inlet filter, 20 µm, DN 40/25 ISO-KF	**105843**
Inlet filter, 5 µm, DN 40/40 ISO-KF	**105845**
Inlet filter, 5 µm, DN 40/25 ISO-KF	**105846**

Bombing chambers

Chambers equipped with valve and manometers for bombing test on sealed components

Order number	
Bombing chamber, volume 3.5 liters (150 mm diameter, 200 mm height), 10 bars max.	**786396**
Bombing chamber, volume 6.4 liters (100 mm diameter, 800 mm height), 25 bars max.	**786397**

Sniffing calibration accessory

To be used to connect the calibrated test leak to the sniffer probe for a more accurate calibration for sniffing applications

Order number	
Sniffing calibration accessory, DN 16 ISO-KF	**110715**
Sniffing calibration accessory, DN 25 ISO-KF	**110716**

Gas line type calibrated leak

Permeation membrane for calibration in gas lines, DN16, VCR 1/4 inch

Order number	
Gas line type calibrated leak, value between 1 and 5 · 10^{-10} Pa m^3/s	**803922**
Gas line type calibrated leak, value around 1 · 10^{-9} Pa m^3/s	**103372**
Gas line type calibrated leak, value around 1 · 10^{-8} Pa m^3/s	**103373**
Gas line type calibrated leak, value around 1 · 10^{-6} Pa m^3/s	**103374**

Sniffer probe for liquids

Sniffer probe to connect to the inlet of the leak detector to measure the helium concentration in water or other liquids. Leak rate for 100% helium: 2 · 10^{-5} Pa m^3/s

Order number	
Sniffer probe for liquids, DN 40 ISO-KF, 1.5 m tube length	**67683**

Locking clamp

Clamp with specific tool for locking any accessory on a DN 40 flange

Order number	
Locking clamp, DN 40 KF	**118801**

Contamination management solutions

Perfect vacuum solutions for molecular contamination monitoring and management



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Contamination management solutions

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Contamination management solutions

Solutions for contamination management from Pfeiffer Vacuum improve the yield of semiconductor manufacturing

Systems for contamination management are the newest developments specifically for the semiconductor industry. Pfeiffer Vacuum's many years of experience as a provider of vacuum technology have shaped our know-how and understanding of the processes, equipment and environment of semiconductor production systems. Based on this knowledge, we have developed solutions to minimize contamination and increase yield.

How does contamination occur?
Wafers emit reaction by-products during transport and waiting times. Airborne Molecular Contamination, (in short AMC), such as evaporated fluorine, react in the tight interstices of the transport boxes (POD systems) with oxidants from the ambient air (H_2O and O_2). During these reactions, undesired crystal growth on structured wafers is triggered, which leads to a decline in quality and a decreased production yield.





Customer benefits

- Specially developed for the semiconductor industry
- In-Line Monitoring
- Significantly improved yield learning
- Delivery possible using overhead hoist transportation (OHT) systems commonly used in semiconductor fabs

APA 302

Solutions for contamination management from Pfeiffer Vacuum improve the yield of semiconductor manufacturing

The APA 302 is a unique in-line monitoring tool for advanced chip manufacturing in a cleanroom environment. This innovative equipment measures the airborne molecular contamination (in short AMC) in a FOUP and in the surrounding environment.

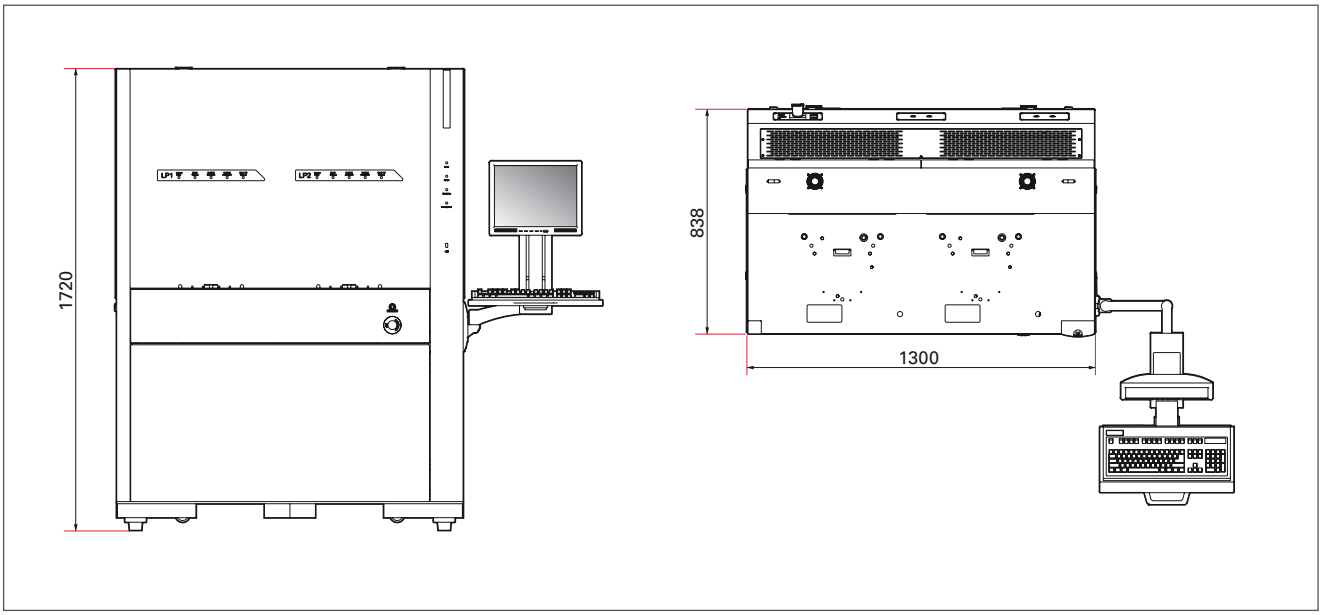
Moisture and airborne molecular contamination such as elemental desorbing fluorine are released inside the FOUP space during queue times between the individual process steps. These elements can generate crystal growth on patterned wafers which leads to yield loss and performance degradation.

The FOUP can be delivered either manually or through overhead hoist transportation (OHT) to the two load ports. The APA 302 takes gas samples through the FOUP filters. The high sensitivity measurement with detection limits in the ppbv-range takes only 2 minutes. When there is no FOUP on the load ports, the APA 302 monitors the surrounding cleanroom environment.

Thus, the queue times between the individual process steps can be optimized, increased contamination values immediately recognized and yields increased.



Dimensions (in mm)



Technical data

Analyzer	Scale	Limit of detection	Response time within 2 min.
NH_3[1)]	0 – 200 ppbv	< 0.2 ppbv	> 80 %
Total amines[1)]	0 – 200 ppbv	< 0.2 ppbv	> 80 %
Total acids[1)]	0 – 200 ppbv	< 0.2 ppbv	> 90 %
SO_2	0 – 500 ppbv	< 0.5 ppbv	> 85 %
H_2O	0 – 100 % RH	5 %	> 90 %
Total Volatile Organics	0 – 99 ppmv	< 25 ppbv	> 90 %

[1)] Based on IMS technology, includes Ni63 source (< 0.005 microcuries)
Other options available: please contact us.

Customer value

- No FOUP modification needed
- Throughput > 16 FOUP/h (with OHT)
- Real time measurement
- High sensitivity

APR 4300

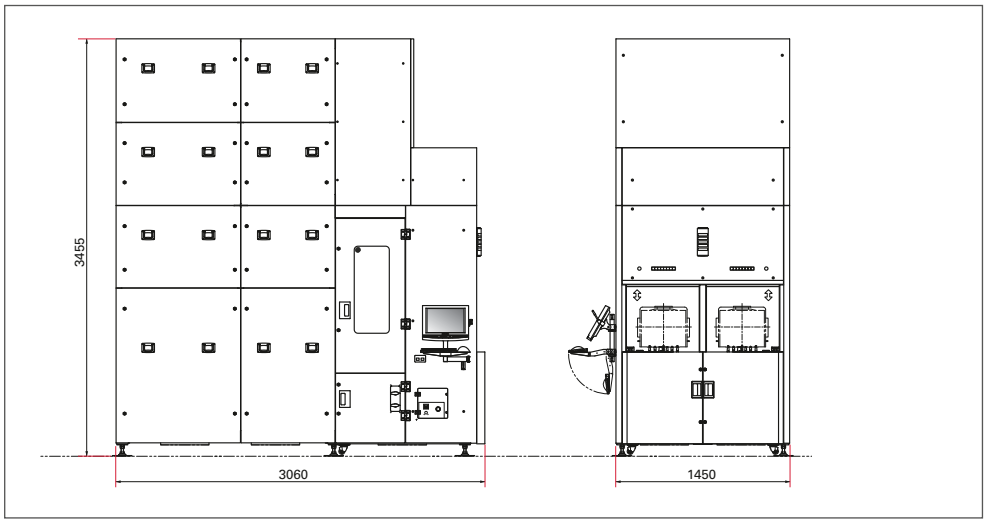
The Pod Regenerator for yield enhancement and airborne molecular contamination management

The APR 4300 is a system for the decontamination of wafers and for the protection from contamination during queue time. Airborne Molecular Contamination (in short AMC) lowers the yield and quality in semiconductor production.

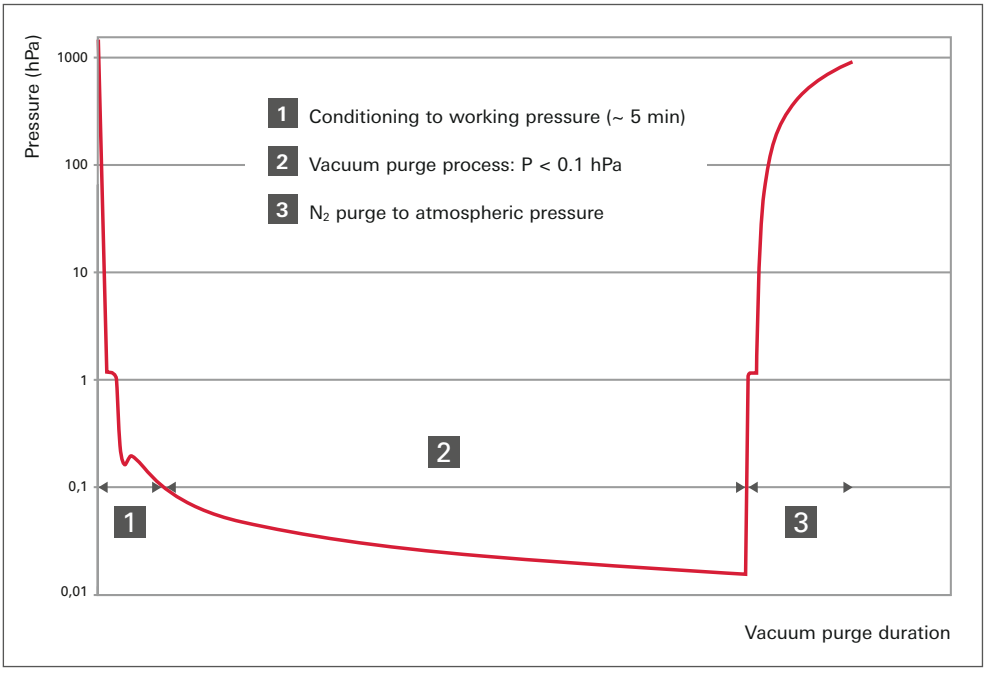
The APR 4300 effectively prevents the adsorption of contaminated organic or inorganic molecules on the surface of a wafer and the transport box. Through the evacuation of chambers in the APR 4300, the adsorption probability is massively reduced. The yield of a fab can be increased significantly in this way and the queue times between the individual process steps can be optimized.



Dimensions (in mm)



Technical data

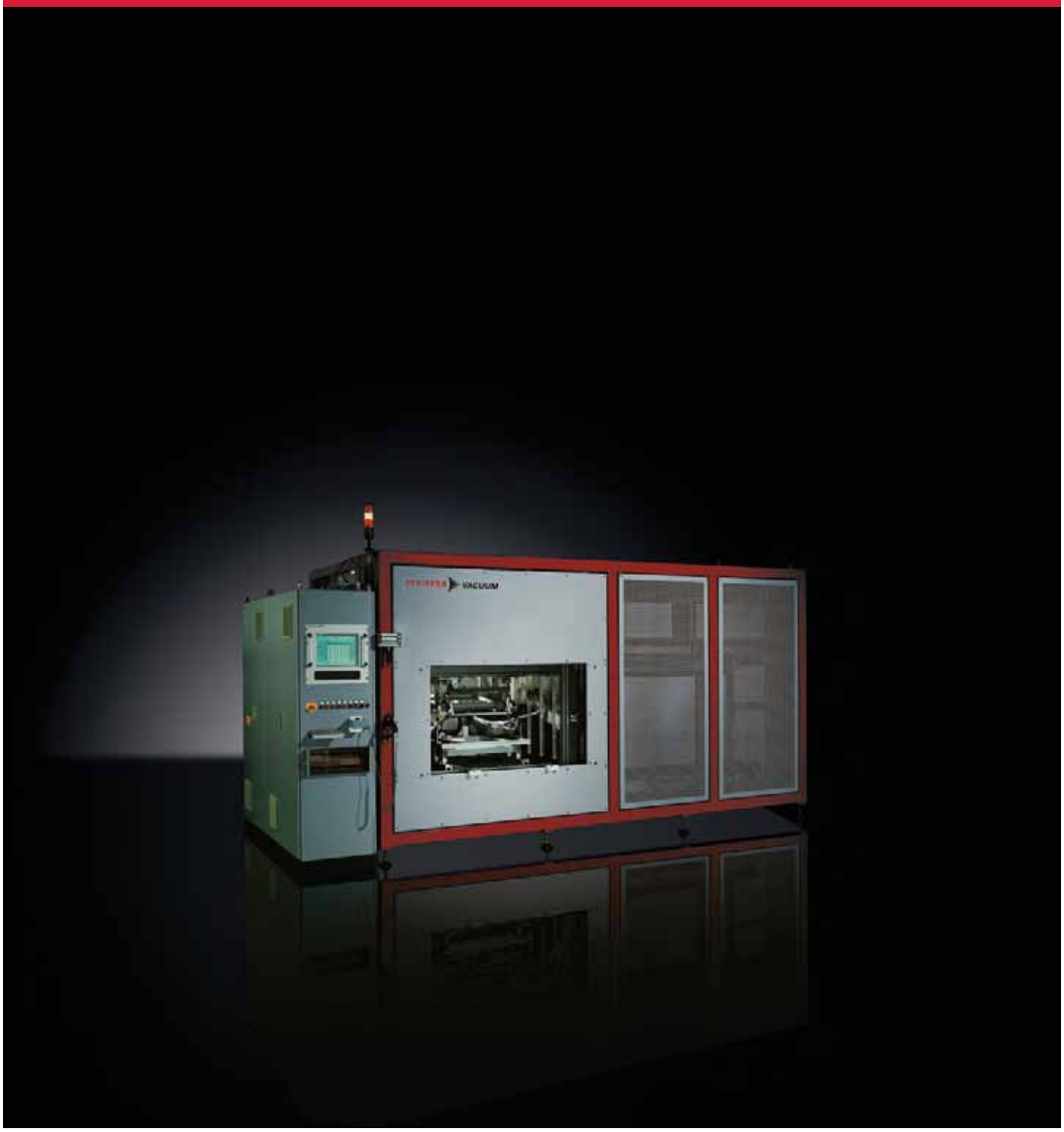


Customer value

- Flexible configuration
- SEMI S2/S8 compliance
- 4 FOUPs/cycle
- Yield enhancement of up to 7 %

System technology

Vacuum systems from Pfeiffer Vacuum



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System technology

Vacuum systems from Pfeiffer Vacuum. Customized. Powerful. Innovative.

Even back in 1890 when our company was founded, forward-thinking products in the field of vacuum technology were at the heart of our engineering and entrepreneurial activities. Always aligned toward the forward-thinking ideas of our partners and customers, Pfeiffer Vacuum manufactures vacuum solutions that satisfy even the most challenging demands. These solutions range from the production of individual components and products right through to complete vacuum systems. In doing so, we always strive for complete customer satisfaction. Our vacuum systems support both everyday products as well as high quality, complex high-tech products. Reliability and competence in our advice, planning, design, manufacturing, implementation and service are what customers can naturally expect from Pfeiffer Vacuum.

We develop the matching vacuum solutions for a wide variety of market segments, designed to satisfy our customers' high demands. In this connection, the potential applications for our vacuum systems and technologies range from coating high-stress tools and eyeglasses right through to the production of solar cells, thermal insulation glass and DVDs. Custom pumping stations and leak detection systems, are also among our spectrum of products and services. Our vacuum systems are employed, in parti-cular, in high vacuum, sputtering and plasma processes, where they are used in the following fields of application: Optics, microelectronics, display manufacturing, photovoltaics and medical technology.

Pfeiffer Vacuum offers state-of-the-art engineering and vacuum knowledge when it comes to developing and implementing customized solutions and vacuum systems. With our engineering expertise, Pfeiffer Vacuum can create vacuum systems and products that serve as the foundation for your forward-thinking ideas. High quality manufactured components with high functionality is what we can offer for your system.



Customer benefits

- Reduced operating costs
- Optimized processes
- Improved quality
- High uptime

Helium leak detection systems

The best-in-class technology for your quality assurance



Helium leak detection systems

Are you looking for the ideal system for your application? Whether integrated in a production line or as stand-alone testing station, we develop and construct helium leak detection systems that are tailored to your needs. The numerous systems sold for the automotive industry, refrigeration/air conditioning and packaging technology are indicative of our know-how.

We build complete systems for you, with our vacuum components such as a helium leak detector as the centerpiece. With pumping unit, test chamber, control technology, including all handling systems and full documentation.

In terms of environmental certification in compliance with DIN EN ISO 14001, we are happy to quote the appropriate helium recovery system in the package.

Customer benefits

- High sensitivity in detecting the smallest leaks
- Dry testing instead of bubble testing
- Automated measurement method
- Minimizes testing times and operating costs
- Compliance with quality and environmental requirements
- Fully automated test procedure

Typical applications

- Automotive industry
  (e.g. airbags, aluminum rims, fuel system components, components for air conditioning and air suspension system components)
- Refrigeration/air conditioning
  (e. g. evaporators, compressors)
- Vacuum and pressurization technology
  (e. g. valves, fittings)
- Packaging technology
  (e. g. for pharmaceutical products, foods)



Automotive industry



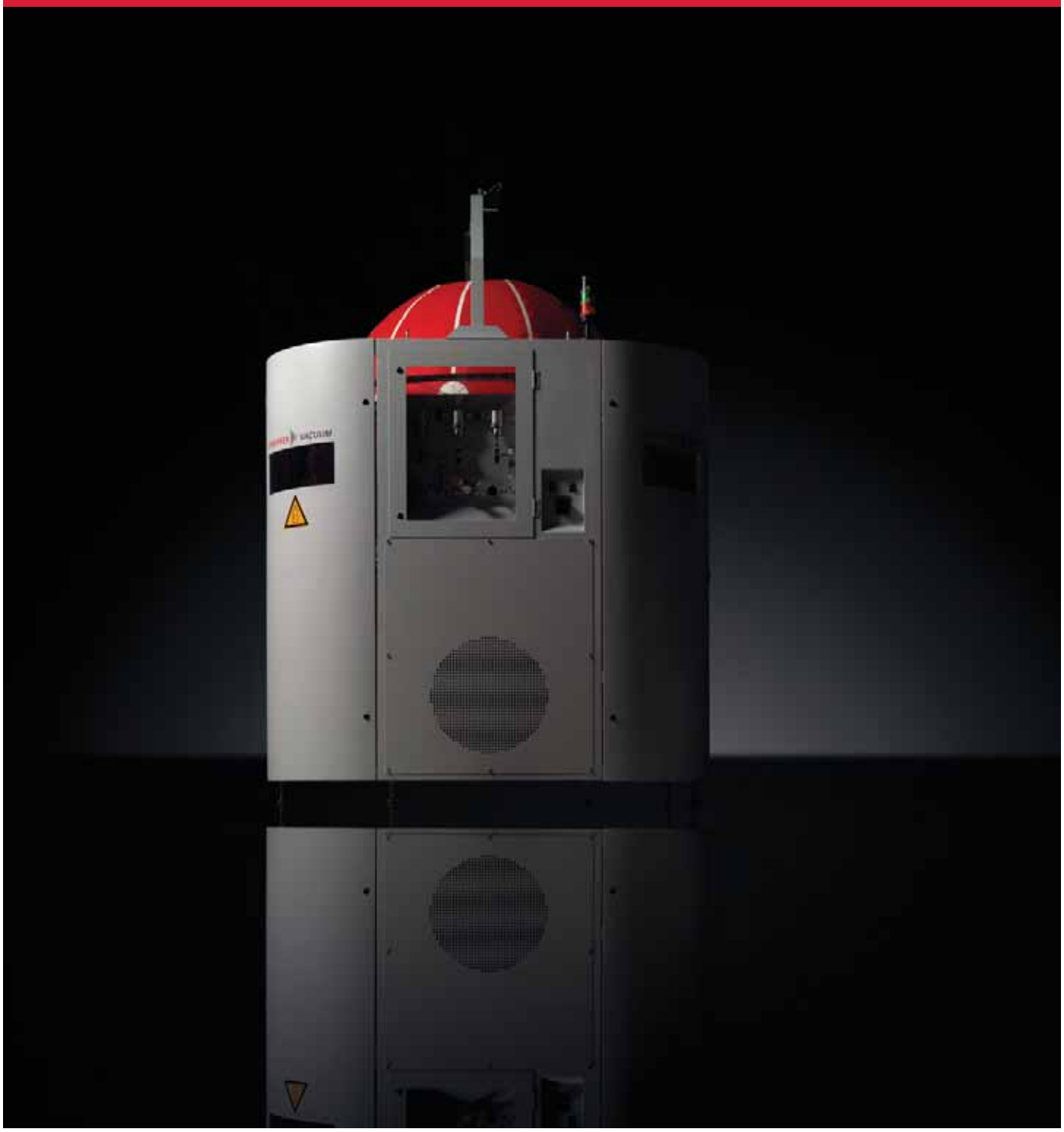
Packaging technology



Refrigeration/air conditioning

Helium recovery units (HRU)

Perfect Pfeiffer Vacuum technology for reducing helium costs



Helium recovery units (HRU)

Helium as test gas for destruction-free testing is an increasingly rare resource and is thus becoming more expensive. The recovery of used helium will become even more important in the future.

Particularly in terms of environmental certification in accordance with DIN EN ISO 14001 and required resource conservation, the recovery of previously expended helium makes sense. The systems are designed to be stand-alone and can recover the helium regardless of the leak detection system used.

Customer benefits

- Minimized operating costs
- Reduced dependency on fluctuations in supply on the world market
- Stand-alone system, independent of the attached test systems
- Compliance with environmental regulations such as DIN EN ISO 14001
- Fully automated
- High recovery rate through automatic evacuation of the test specimens by the attached testing system

Typical applications

- Automotive industry (e.g. airbags, aluminum rims, fuel system components, components for air conditioning and air suspension system components)
- Refrigeration/air conditioning (e.g. evaporators, compressors)
- Vacuum and pressurization technology (e.g. valves, fittings)
- Packaging technology (e.g. for pharmaceutical products, foods)
- Power technology (e.g. for medium voltage switch gear, surge absorbers)
- Research facilities and labs
- Accelerators



Airbags



Pharmaceutical products



Pressurization technology



Container, small system



Balloon system



Container, large system

Operating principle

The helium returned from the leak detection system is initially collected within the system. At the same time or subsequently, the concentration is tested and mixed to meet the preset concentration. The gas mixture is then compressed to the required process pressure and fed back to the test equipment.

Depending on the process conditions, the recovery rate can be up to 98% for helium concentrations of 10–95%. The actual figure depends on the type or version of helium recovery system, as well as the parameter settings and helium leak tightness of the attached test systems. The possible maximum operating pressures in the system are 10 bar, 35 bar, 55 bar and 200 bar. The maximum helium throughput is 170 – 550 Nl per minute depending on the pressure level and version.

Two fundamental principles of helium recovery are available: "balloon recovery" and "container recovery". Balloon recovery has a very good cost-performance ratio, while container recovery is characterized by very high tightness requirements and works on a dry compression principle. In addition customer specific solutions can be generated upon request.

Technical data

Feature	Balloon HRU		
Type	CB13-35	CB11-55	CB10-200
Max. throughput	210 Nl/min	180 Nl/min	170 Nl/min
Max. working pressure	35 bar	55 bar	200 bar
Compression	Oil lubricated	Oil lubricated	Oil lubricated
Recovery rate	Up to 95 %	up to 95 %	up to 95 %

Feature	Container HRU		
Type	CV12-10	CV16-55	CV33-55
Max. throughput	200 Nl/min	260 Nl/min	550 Nl/min
Max. working pressure	10 bar	55 bar	55 bar
Compression	Oil lubricated	Dry	Dry
Recovery rate	Up to 98 %	Up to 98 %	up to 98 %



Vacu2

Multi-stage vacuum process. The revolution in die casting!



Vacu²

In our Vacu² multi-stage vacuum process the shot sleeve and mold cavities are evacuated in two stages. During the first phase, the air is discharged directly from the shot sleeve via a wide cross-section line. This enables the desired pressure to be quickly achieved in the shot sleeve and mold. In the second evacuation phase, air is evacuated from the mold as in conventional methods.

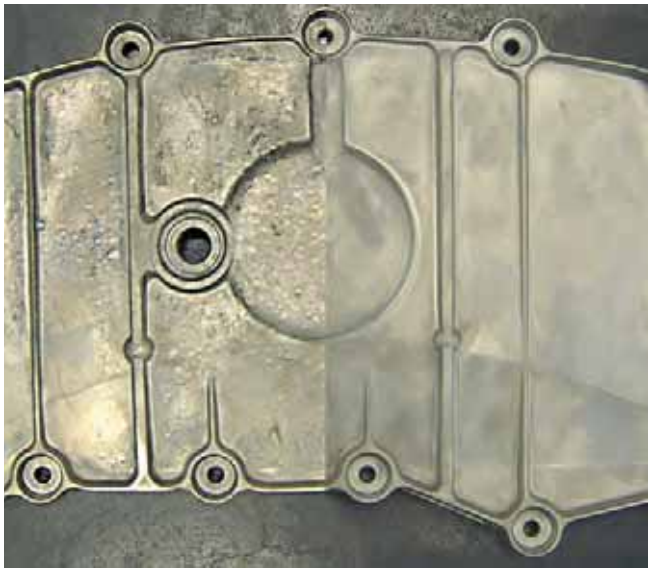
Since the desired pressure was achieved in the first stage, the second stage merely serves to maintain the pressure by pumping down air that leaks into the mold. Pressure is measured in four locations at different times during the casting process and turned into process relevant data by the control unit. This affords precise information about the current status of the system. Should any limits, some of them can be defined by the user, be exceeded or not reached, the system responds with warning signals. This avoids unnecessary rejects.

Customer benefits

- High uptime
- Quality enhanced die cast products
- Cost savings through reliable process monitoring
- Savings in mold design and vent valves

Typical applications

- Automotive industry (structural components, motor blocks, gearboxes)



Die cast parts



Motor blocks

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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.



Overview of series and applications

■ = recommended	Analytics						Semiconductor										Coating										Industry										R & D										Page
	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 manufacture	Heat treatment	Vacuum drying	Vacuum furnaces	Nuclear research	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
TrinosLine																																												
High vacuum chambers	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	18
Medium vacuum chambers	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	21
Modular vacuum chambers	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	22
Custom vacuum chambers	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	36

Features at a glance

	Nominal size							Pressure range			Temperature range		
	DN 250	DN 300	DN 320	DN 400	DN 500	DN 600	DN 750	1 · 10^{-7} hPa up to ambient pressure	1 · 10^{-7} hPa to 500 hPa overpressure	1 · 10^{-5} hPa up to ambient pressure	-15 to 150°C	0 to 40°C	Page
TrinosLine standard vacuum chambers													
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

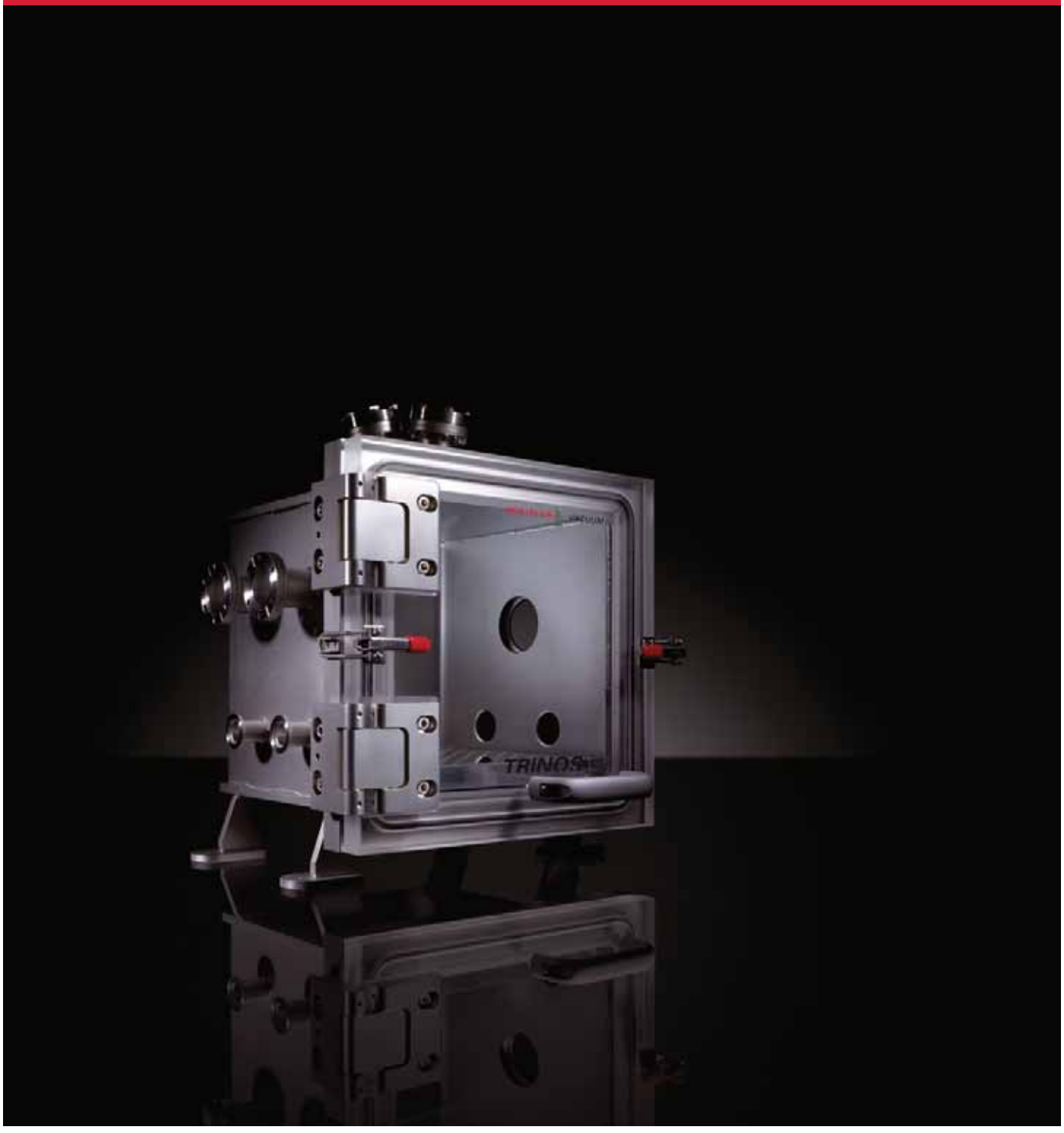


Customer benefits

- 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

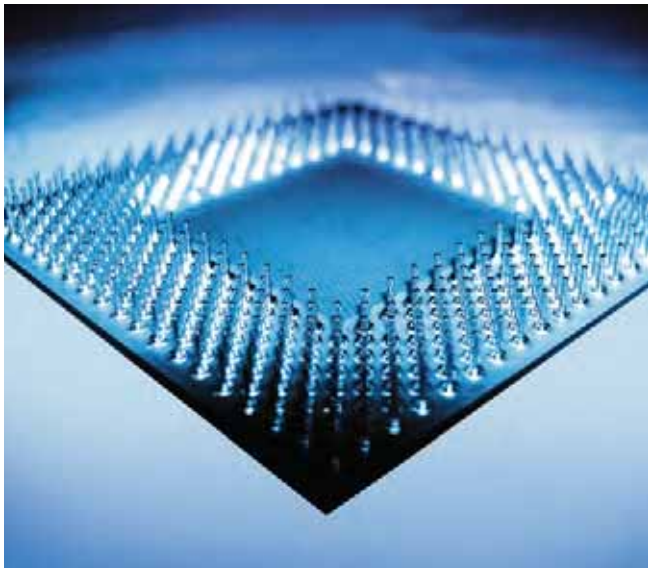


Standard vacuum chambers

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.

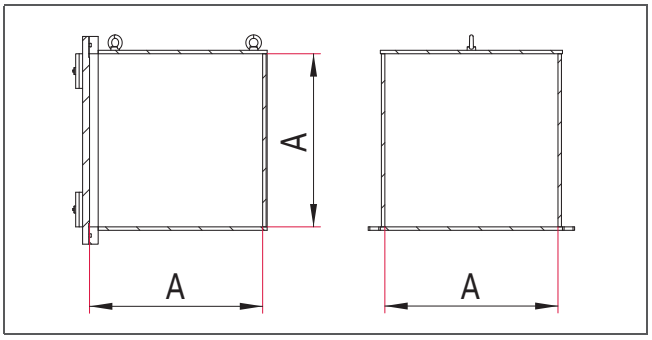
Flange connections and components have been developed to provide vacuum-sealed connections. They are able to bear only limited mechanical loads. Therefore, it is necessary to examine whether structural or dynamic loads need to be borne by additional elements (e.g. brackets) when designing a vacuum system.

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^3/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

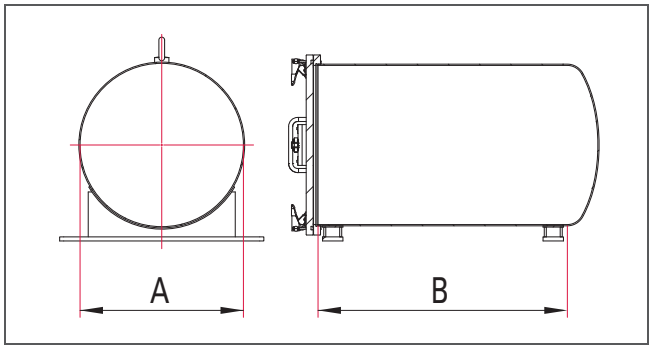
Nominal diameter	A [mm]	Order number
DN 300	300	**820KBH0300-G**
DN 500	500	**820KBH0500-G**
DN 750	750	**820KBH0750-G**

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^3/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

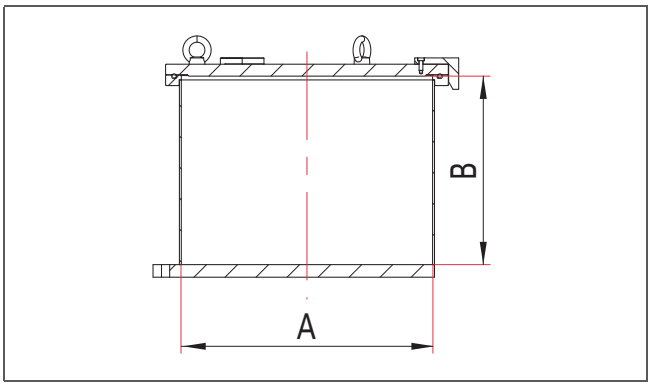
Nominal diameter	A [mm]	B [mm]	Order number
DN 320	320	500	**820KHH0320-500**
DN 400	400	600	**820KHH0400-600**
DN 500	500	750	**820KHH0500-750**
DN 600	600	900	**820KHH0600-900**

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^3/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

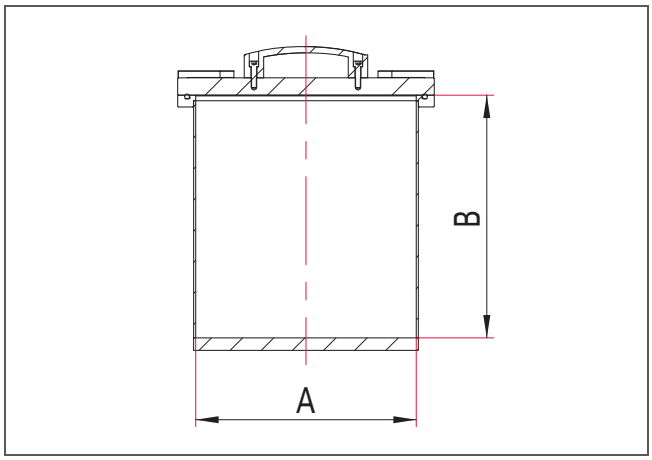
Nominal diameter	A [mm]	B [mm]	Order number
DN 320	318	250	**820KVH0320-250**
DN 400	400	300	**820KVH0400-300**
DN 500	500	350	**820KVH0500-350**
DN 600	600	400	**820KVH0600-400**

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^3/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

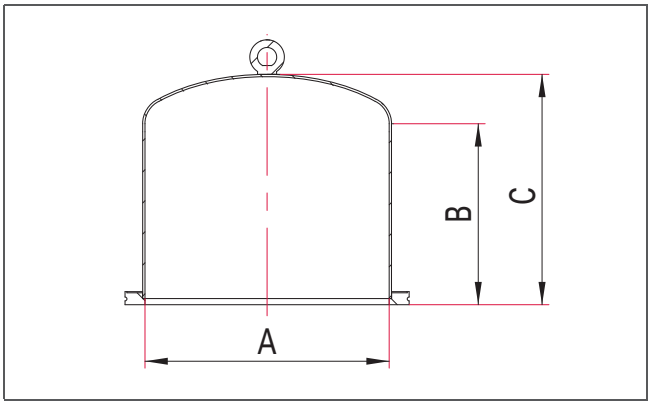
Nominal diameter	A [mm]	B [mm]	Order number
DN 250	250	300	**820KVG250-300**
DN 320	318	350	**820KVG320-350**
DN 400	400	400	**820KVG400-400**

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^3/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

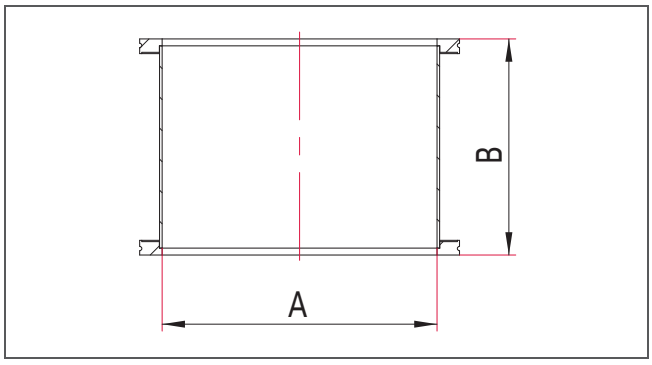
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 320 ISO-K	318	235	300	**820KMG320-300**
DN 400 ISO-K	400	320	400	**820KMG400-400**
DN 500 ISO-K	500	400	500	**820KMG500-500**

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^3/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

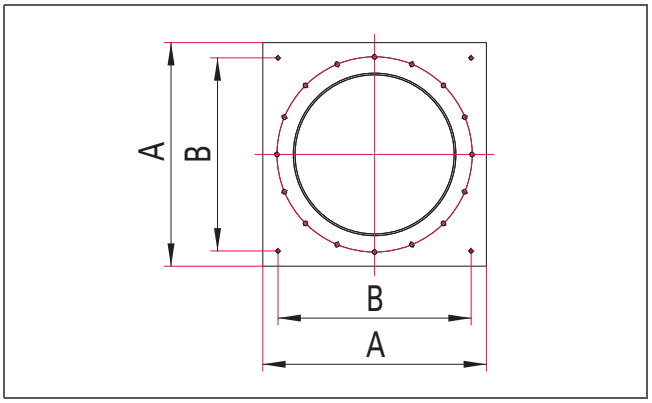
Nominal diameter	A [mm]	B [mm]	Order number
DN 320 ISO-K	318	250	**820KMV320-250**
DN 400 ISO-K	400	300	**820KMV400-300**
DN 500 ISO-K	500	400	**820KMV500-400**

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^3/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

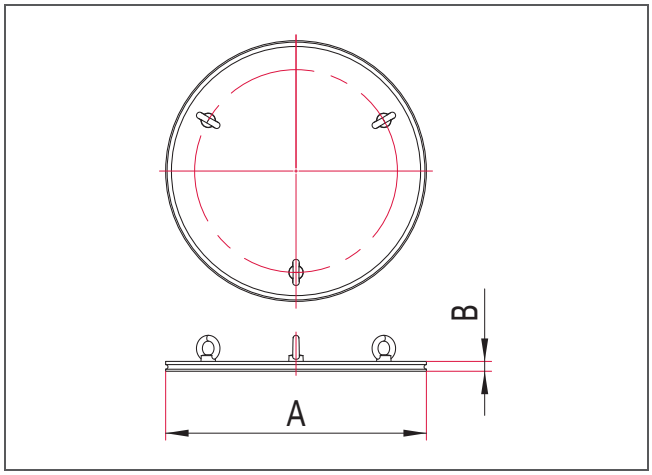
Nominal diameter	A [mm]	B [mm]	Order number
DN 320 ISO-K	430	390	**820KMB320**
DN 400 ISO-K	520	480	**820KMB400**
DN 500 ISO-K	620	580	**820KMB500**

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^3/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

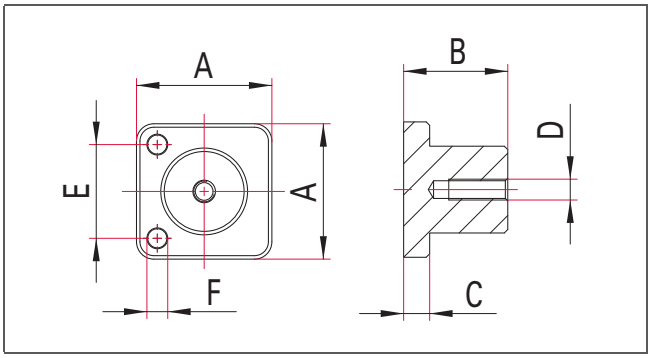
Nominal diameter	A [mm]	B [mm]	Order number
DN 320 ISO-K	370	17	**820KMD320**
DN 400 ISO-K	450	17	**820KMD400**
DN 500 ISO-K	550	17	**820KMD500**

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**

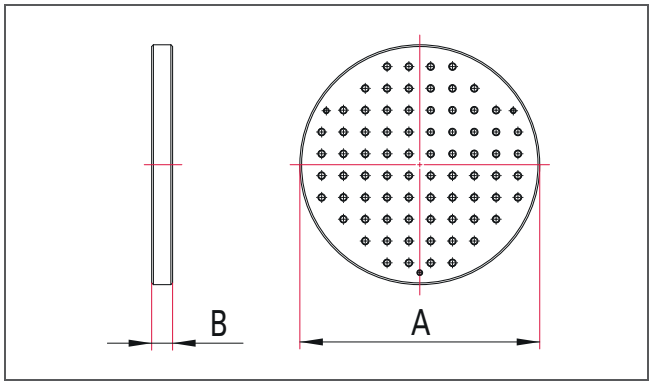
Mounting Tables

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

Aluminum: Round

Dimensions

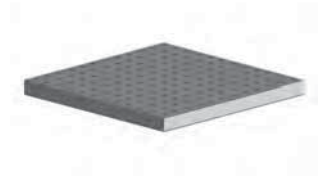


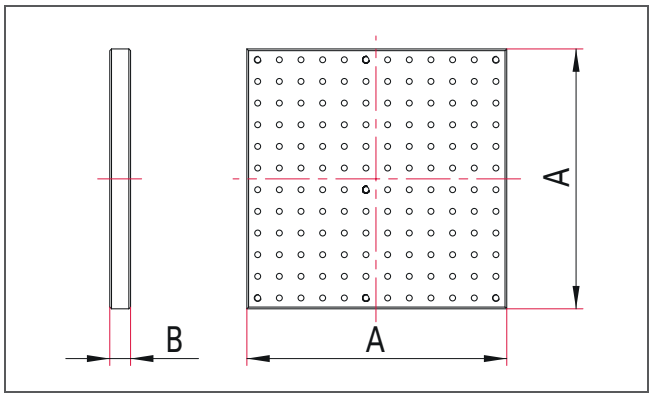


Nominal diameter	A [mm]	B [mm]	Order number
DN 320	275	15	**810KTO320-R**
DN 400	350	15	**810KTO400-R**
DN 500	425	20	**810KTO500-R**
DN 600	525	25	**810KTO600-R**

Aluminum: Square

Dimensions





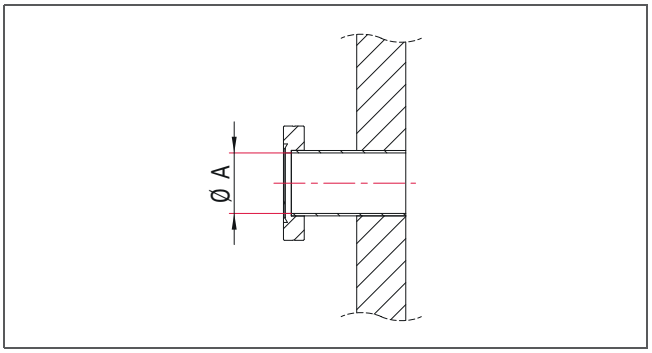
Nominal diameter	A [mm]	B [mm]	Order number
DN 300	250	15	**810KTO300-E**
DN 500	425	20	**810KTO500-E**
DN 750	650	25	**810KTO750-E**

CF Ports



- Other flange materials available upon request
- Pressure range: < 1 · 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-realed devitations 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**

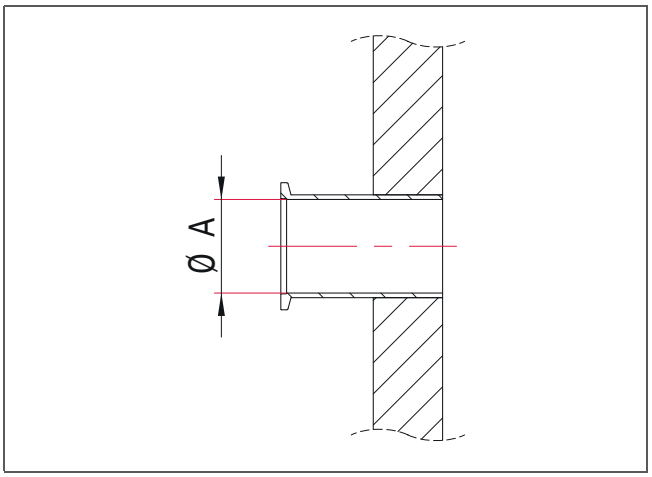
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

ISO-KF Ports



- Other flange materials available on request
- Pressure range: < 1 · 10^{-7} hPa to 500 hPa over pressure (elastomer seal); < 1 · 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-realed devitations 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**

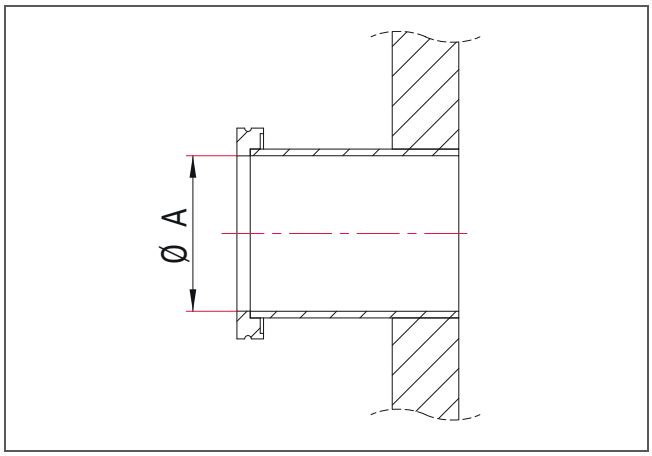
Flanges according to ISO 2861

ISO-K Ports



- Other flange materials available upon request
- Pressure range: < 1 · 10^{-7} hPa to 500 hPa over pressure (elastomer seal); < 1 · 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-realed devitations 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**

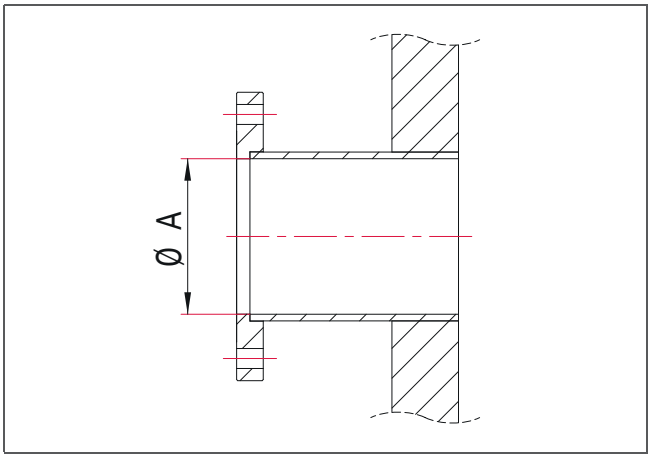
Flanges according to ISO 1609

ISO-F Ports



- Other flange materials available upon request
- Pressure range: < 1 · 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-realed devitations 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

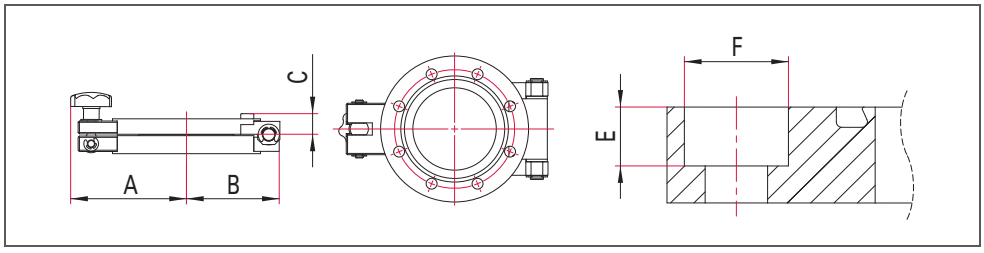
CF Quick-Access-Door

- 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

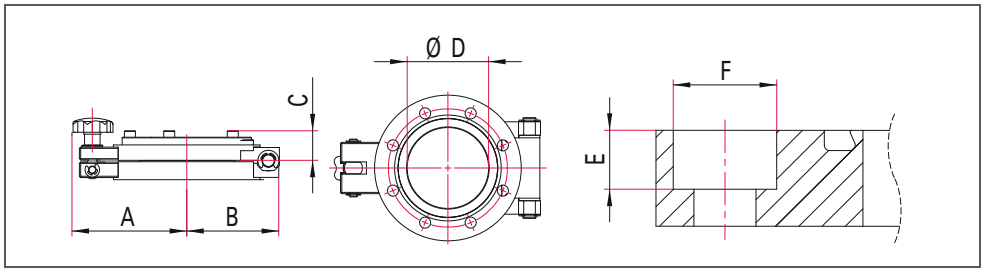


Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 CF	88	72	16	-	10	16	**420KTU063**
DN 100 CF	108	93	16	-	10	16	**420KTU100**
DN 160 CF	134	119	20	-	10	16	**420KTU160**
DN 200 CF	160	145	20	-	10	16	**420KTU200**
DN 250 CF	186	171	20	-	10	16	**420KTU250**

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**

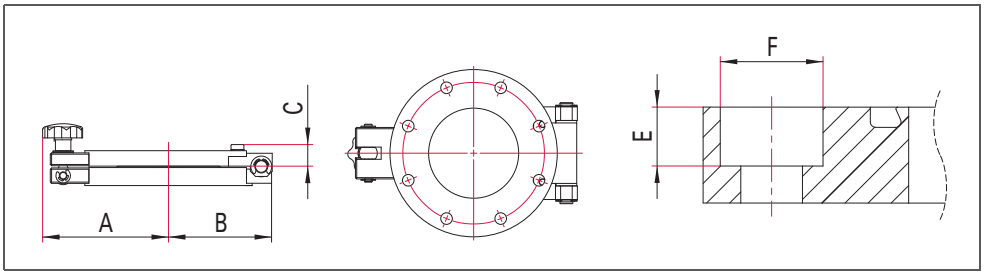
ISO-F Quick-Access-Door

- 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 · 10^{-8} hPa to ambient pressure
- Temperature range: -15 to 150 °C

Stainless Steel 304/1.4301, without Sight Glass

Dimensions



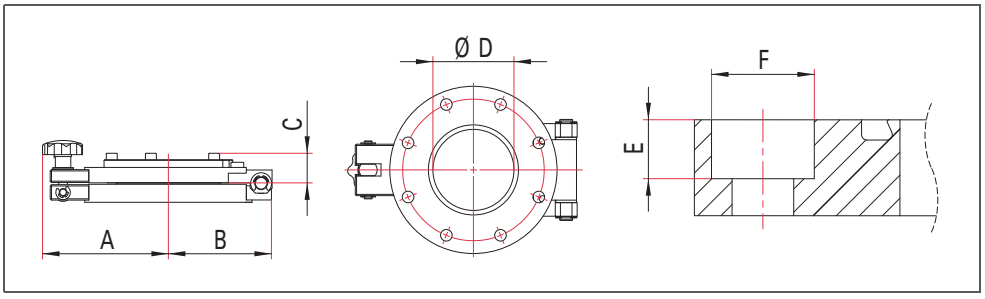


Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 ISO-F	98	80	16	-	10	16	**520KTU063**
DN 100 ISO-F	116	99	16	-	10	16	**520KTU100**
DN 160 ISO-F	147	130	20	-	12.5	20	**520KTU160**
DN 200 ISO-F	177	160	20	-	12.5	20	**520KTU200**

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 outgasing 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

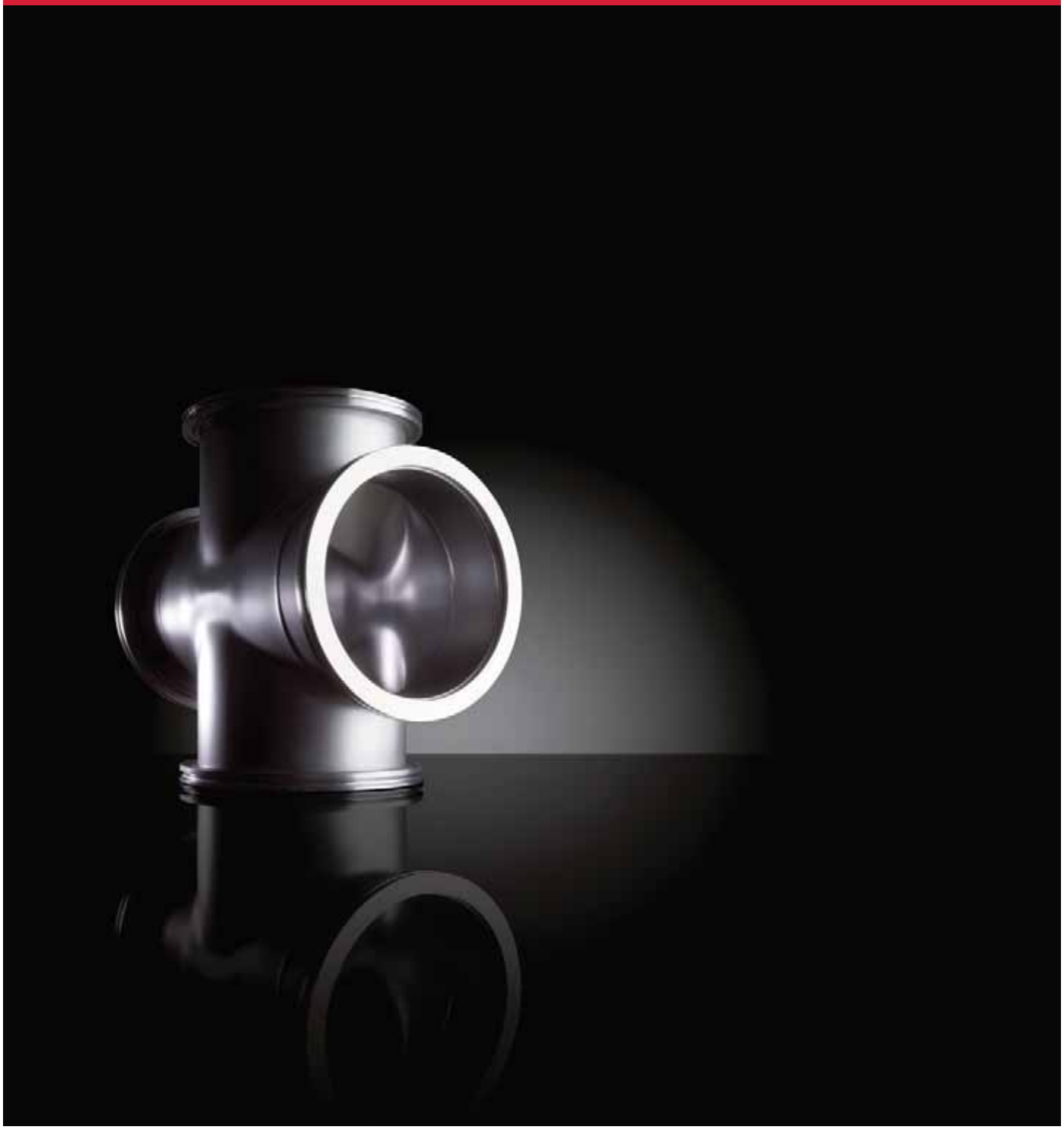
Product testing

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

■ = recommended	Analytics						Semiconductors										Coating										Industry										R & D										Page
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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^3/s for ISO-KF, ISO-K/ISO-F flanges and 10^{-11} Pa m^3/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.

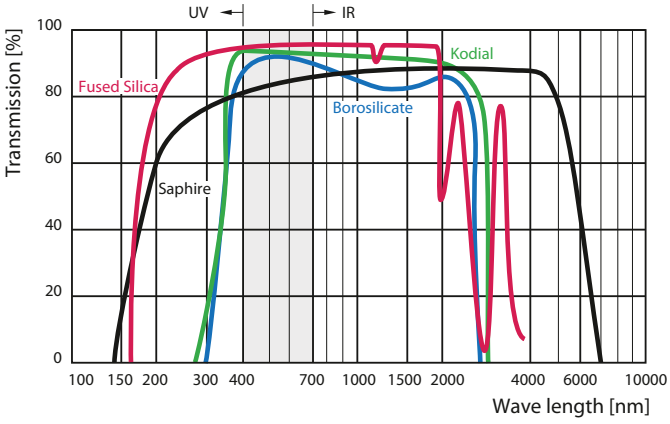
The permitted maximum and minimum temperature for the overall system is based on the lowest maximum temperature and the highest minimum temperature of the components used. The flange connections and components were developed to implement vacuum proof connections. They can only bear limited mechanical 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

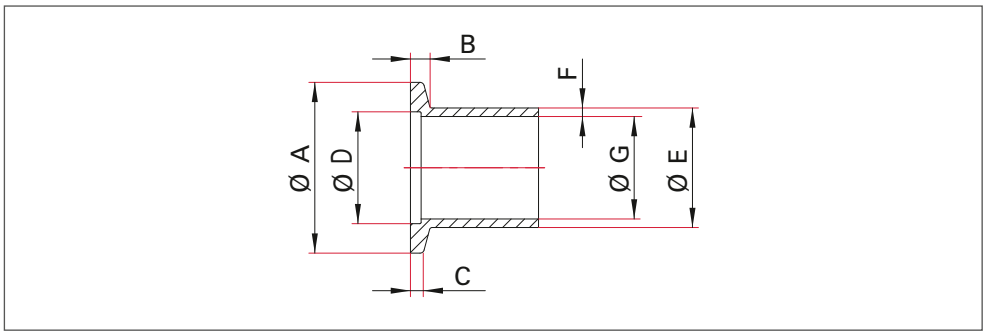


Viewports



Transmission curve for viewports

Dimensions



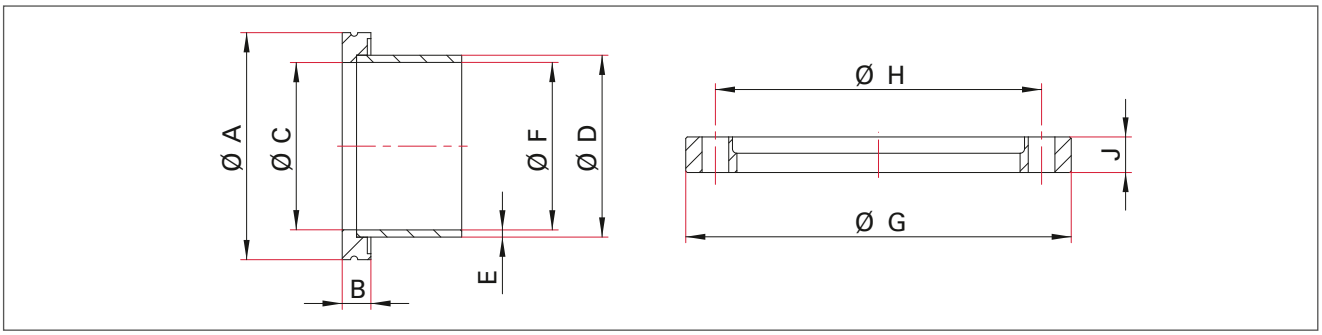
Primary dimensions of ISO-KF flanges

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 [1] [mm]	14 · 2	20 · 2	28 · 2	44.5 · 2	57 · 3.2
G – Typical internal diameter [2] [mm]	10	16	24	40.5	51

[1] Additional pipe dimensions can be found particularly in the products “weld ring flange” and “flange with half nipple”.

[2] 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

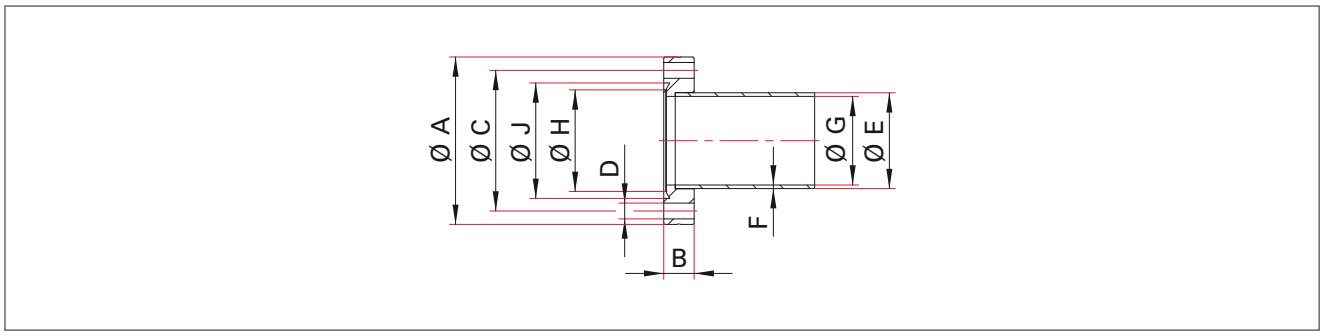


Primary dimensions for ISO-K and ISO-F flanges

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 [1] [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 [2] [mm]	70	83	102	153	213	261	318	400	500	650
G – External diameter [mm] ISO-F flange and FLU [3]	130	145	165	225	285	335	425	510	610	750
H – Bolt holes [mm] ISO-F flange and FLU [3]	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 [3]	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 [4]	4	4	4	4	6	6	8	8	12	12
Minimal number of bracket screws for aluminum edged seal [4]	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

[1] Additional pipe dimensions can be found particularly in the products “weld ring flange” and “flange with half nipple”.
[2] 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.
[3] FLU = Rotatable bolt ring
[4] Note the installation instructions for the component!

Dimensions for CF flange



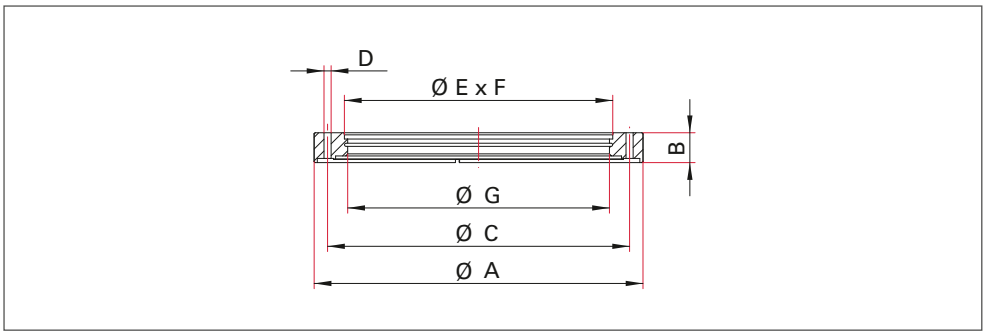
Primary dimensions of CF flanges

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[1] [mm]	18 · 1	28 · 2	40 · 1.5	50.8 · 1.65	70 · 2	76.1 · 2	108 · 2
G – Typical internal diameter [2] [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[1] [mm]	127 · 1.65	159 · 2	205 · 2.5	256 · 3	306 · 3	356 · 3
G – Typical internal diameter[2] [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

[1] Additional pipe dimensions can be found particularly in the products “weld ring flange” and “flange with half nipple”..
[2] 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[1)] [mm]	400	450	500	600	800

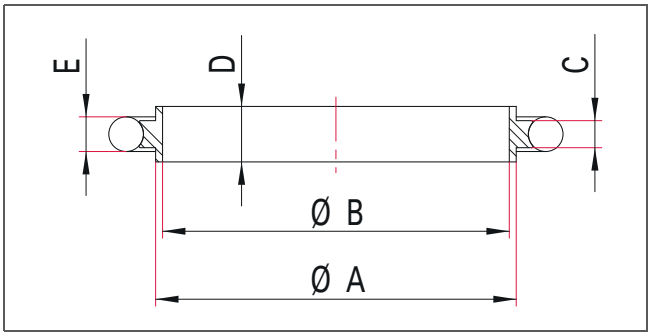
[1)] The minimum internal diameter is determined by the combination of flange and pipe. In addition, welding seams and manufacturing tolerances of the pipes can locally reduce the free diameter.

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

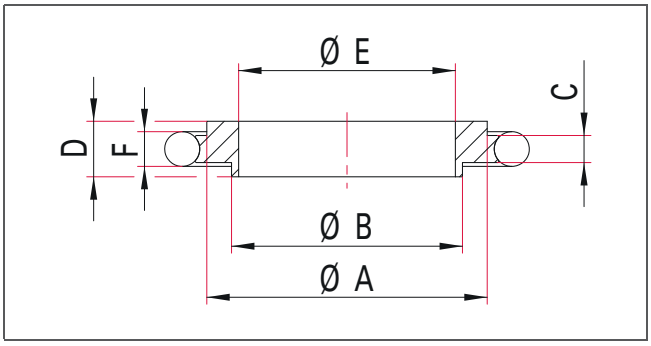
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 KF	FKM	12	10	3.9	8	5	**132ZRG010**
DN 16 KF	FKM	17	16	3.9	8	5	**132ZRG016**
DN 25 KF	FKM	26	25	3.9	8	5	**132ZRG025**
DN 40 KF	FKM	41	40	3.9	8	5	**132ZRG040**
DN 50 KF	FKM	52	50	3.9	8	5.33	**132ZRG050**

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**

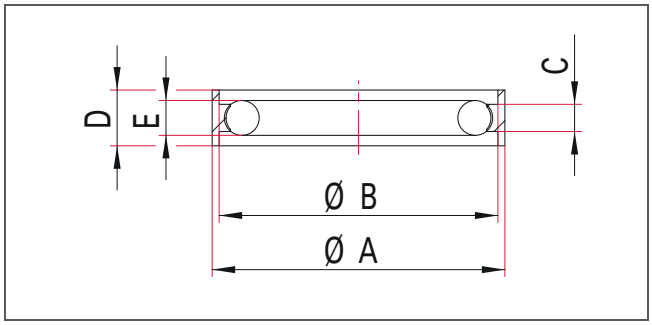
According to ISO 2861

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)

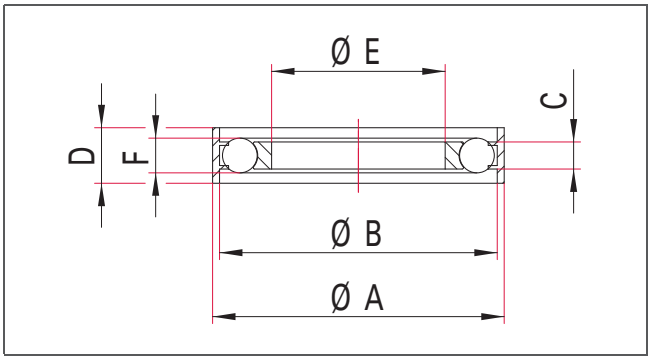
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 16 KF	FKM	32.5	30	3.9	8	5	**132ZAR016**
DN 25 KF	FKM	42	40	3.9	8	5	**132ZAR025**
DN 40 KF	FKM	57.5	55	3.9	8	5	**132ZAR040**
DN 50 KF	FKM	77.5	75	3.9	8	5.33	**132ZAR050**

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

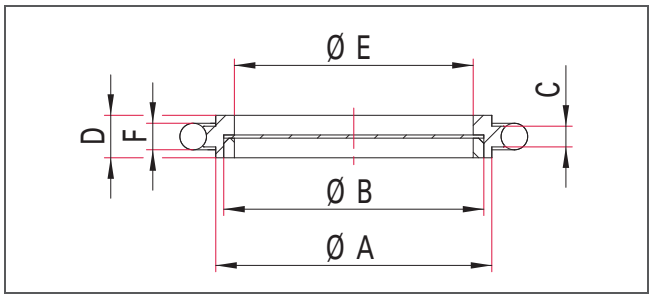
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 16 KF	FKM	32.5	30	3.9	8	16	5	**122ZAI016**
DN 25 KF	FKM	42	40	3.9	8	25	5	**122ZAI025**
DN 40 KF	FKM	57.5	55	3.9	8	40	5	**122ZAI040**
DN 50 KF	FKM	75.5	75	3.9	8	50	5.33	**122ZAI050**

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

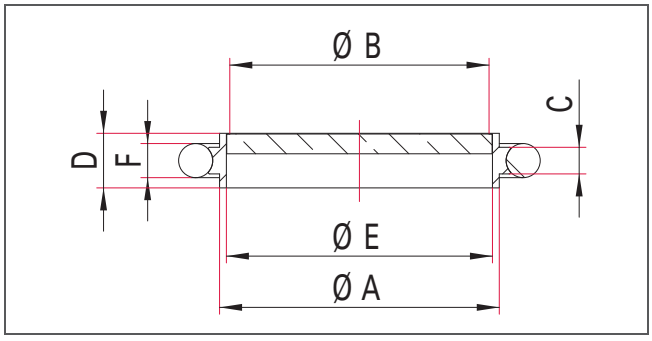
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 10 KF	FKM	12	10	3.9	8	7	5	**122ZRD010**
DN 16 KF	FKM	17	16	3.9	8	13	5	**122ZRD016**
DN 25 KF	FKM	26	25	3.9	8	19	5	**122ZRD025**
DN 40 KF	FKM	41	40	3.9	8	34	5	**122ZRD040**
DN 50 KF	FKM	52	50	3.9	8	45	5.33	**122ZRD050**

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

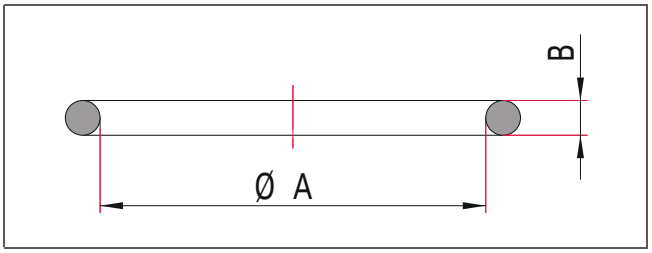
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 10 KF	FKM	12	9	3.9	8	10	5	**122ZRS010**
DN 16 KF	FKM	17	13	3.9	8	14	5	**122ZRS016**
DN 25 KF	FKM	26	23	3.9	8	24	5	**122ZRS025**
DN 40 KF	FKM	41	38	3.9	8	39	5	**122ZRS040**
DN 50 KF	FKM	52	48	3.9	8	49	5.33	**122ZRS050**

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**

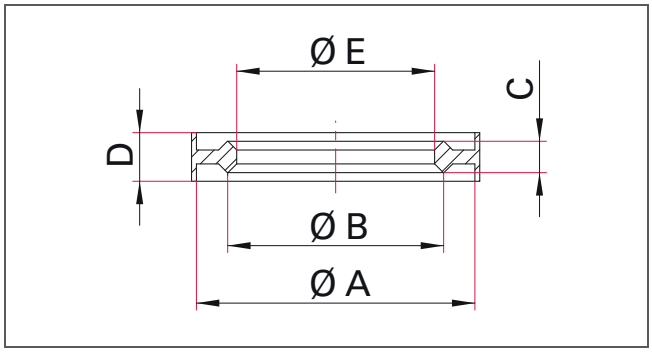
According to ISO 2861

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

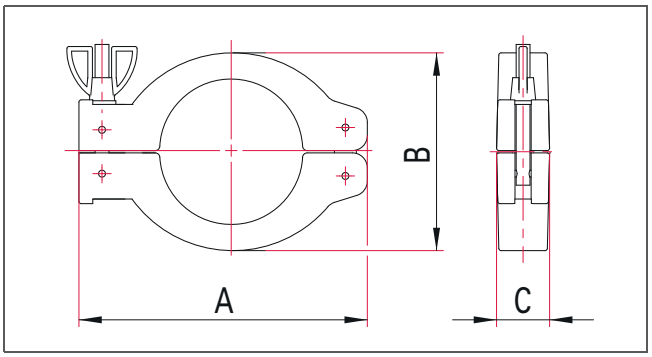
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 / 16 KF	30	21	4.5	7	18.5	**110ZSK016**
DN 20 / 25 KF	40	31	4.5	7	28.5	**110ZSK025**
DN 32 / 40 KF	55	46	4.5	7	43.5	**110ZSK040**
DN 50 KF	75	66	4.5	7	63.5	**110ZSK050**

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**

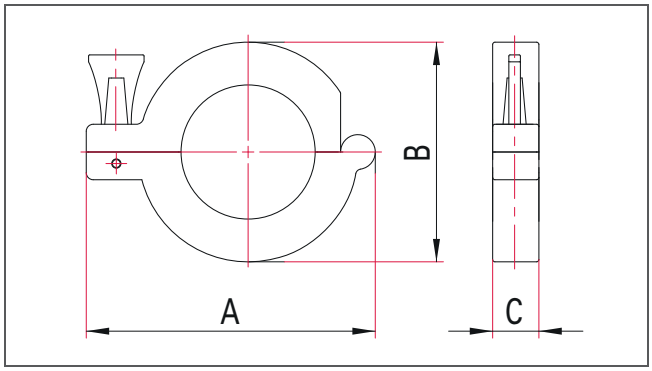
According to ISO 2861

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

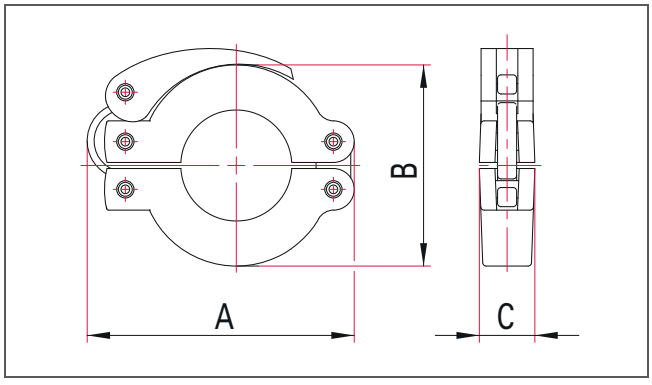
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 / 16 KF	65	47	20	**130BSR016**
DN 20 / 25 KF	79	59	20	**130BSR025**
DN 32 / 40 KF	92	74	20	**130BSR040**
DN 50 KF	123	95	23	**130BSR050**

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

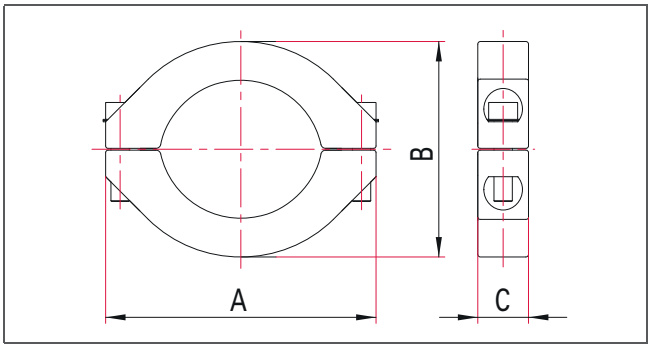
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 / 16 KF	68	45	16	**110BSS016**
DN 20 / 25 KF	80	55	16	**110BSS025**
DN 32 / 40 KF	98	70	18	**110BSS040**

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

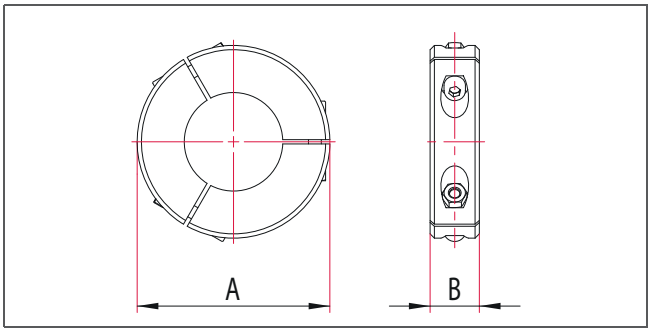
Nominal diameter	A [mm]	B [mm]	C [mm]	Bolt	Order number
DN 10 / 16 KF	55	47	18	M5 x 25	**120BSM016**
DN 20 / 25 KF	66.5	57	18	M5 x 25	**120BSM025**
DN 32 / 40 KF	82.5	72	18	M5 x 25	**120BSM040**
DN 50 KF	122	96	21	M8 x 35	**120BSM050**

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

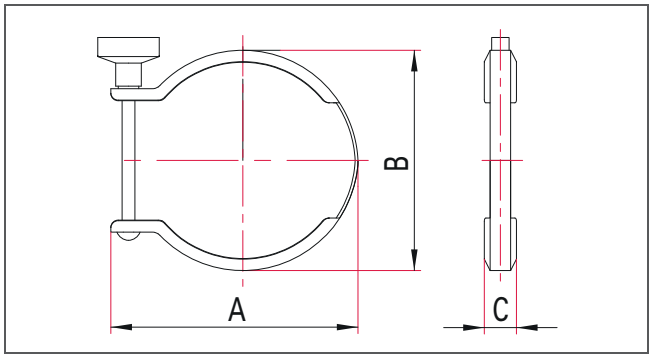
Nominal diameter	A [mm]	B [mm]	Bolt	Order number
DN 10 / 16 KF	48	18	M4 x 30	**110BSD016**
DN 20 / 25 KF	70	19	M6 x 30	**110BSD025**
DN 32 / 40 KF	85	23	M8 x 35	**110BSD040**
DN 50 KF	112	28	M8 x 35	**110BSD050**

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

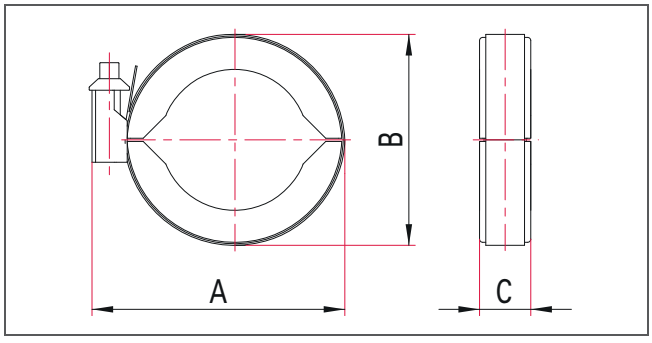
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 / 16 KF	47	38	16	**120BSG016**
DN 20 / 25 KF	54	49	16	**120BSG025**
DN 32 / 40 KF	70	62	16	**120BSG040**
DN 50 KF	90	84	16	**120BSG050**

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

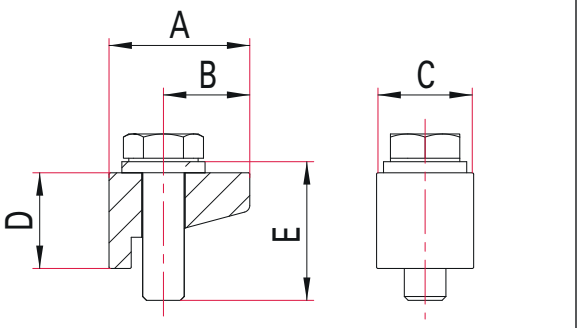
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 / 16 KF	54	39	16	**110BSB016**
DN 20 / 25 KF	63	48	16	**110BSB025**
DN 32 / 40 KF	80	64	16	**110BSB040**

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



Bore Holes in Base Plate

Thread: M6; depth: minimum 6 mm

Flange Size [DN]	Bolt Circle ø Tapped Hole [mm]	Number of Tapped Holes	Core Hole for Centering [mm]	Sealing Surface to ø [mm]	Recommended Torque [Nm]
10	45	4 x 90°	12.2	30	3
16	45	4 x 90°	17.2	30	3
20	55	4 x 90°	22.2	40	4
25	55	4 x 90°	26.2	40	4
32	71	4 x 90°	34.2	55	5
40	71	4 x 90°	41.2	55	5
50	91	4 x 90°	52.4	75	6

Aluminum EN AW-6061

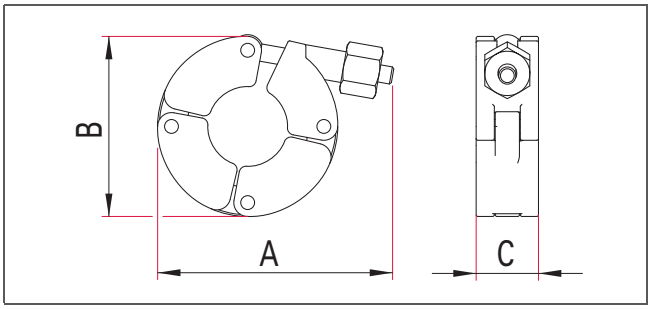
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 - 50 KF	20.5	12.5	14	14	20	**110BPR050-2**

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

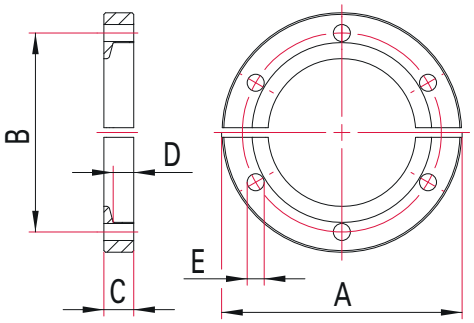
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10-16 ISO-KF	71	52.5	18	**PF 106 016-T**
DN 20-25 ISO-KF	82	65	18	**PF 106 025-T**
DN 32-40 ISO-KF	98	79	18	**PF 106 040-T**
DN 50 ISO-KF	117	97.5	20	**PF 106 050-T**

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



Bore Holes in Base Plate

Thread M5, depth: minimum 10 mm

Flange Size [DN]	Bolt Circle ø Tapped Hole [mm]	Number of Tapped Holes [mm]	Core Hole for Centering [mm]	Sealing Surface to ø [mm]
10	38.1	6 x 60°	12.2	30
16	38.1	6 x 60°	17.2	30
20	48.0	6 x 60°	22.2	40
25	48.0	6 x 60°	28.2	40
32	62.0	6 x 60°	34.2	55
40	62.0	6 x 60°	41.2	55
50	82.55	8 x 45°	52.4	75

Aluminum EN AW-6082/3.2315

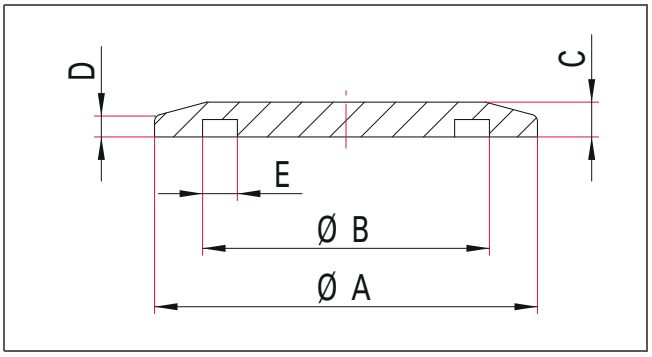
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 10 / 16 KF	50.8	38.1	9.2	6.5	5.3	**110BUH016**
DN 20 / 25 KF	60.3	48	9.9	6.6	5.3	**110BUH025**
DN 32 / 40 KF	74.6	62	9.3	6.6	5.3	**110BUH040**
DN 50 KF	95.2	82.55	10.3	6.5	5.3	**110BUH050**

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**

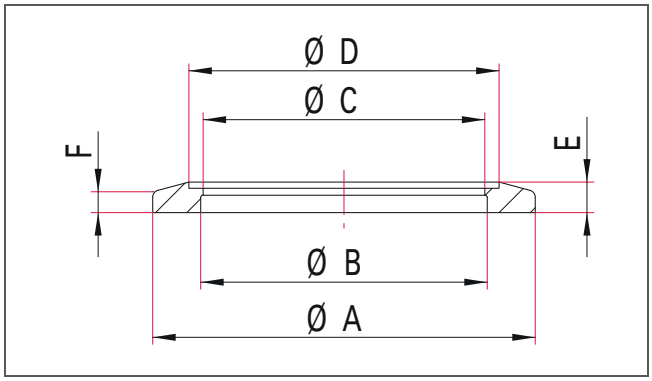
Flanges according to ISO 2861

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**

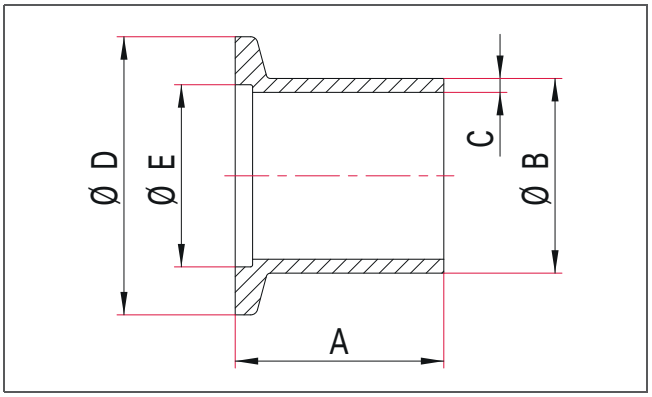
Flanges according to ISO 2861

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**

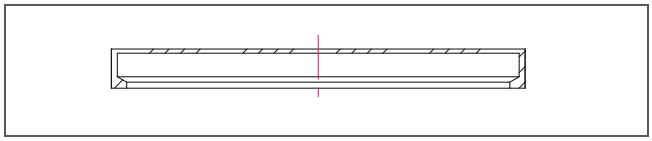
Flanges according to ISO 2861

ISO-KF Flange Cap



- Made from plastic

Dimensions



Polyethylene (PE)

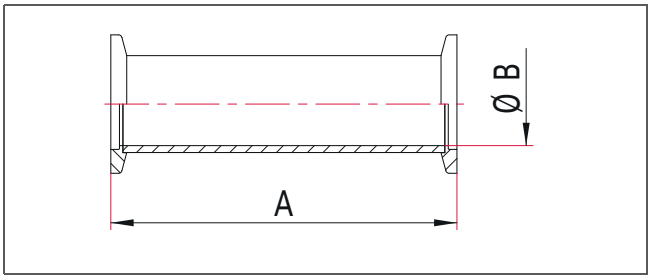
Nominal diameter	Quantity per package	Order number
DN 16 KF	10	**130FSK016-S10**
DN 25 KF	10	**130FSK025-S10**
DN 40 KF	10	**130FSK040-S10**
DN 50 KF	10	**130FSK050-S10**

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**

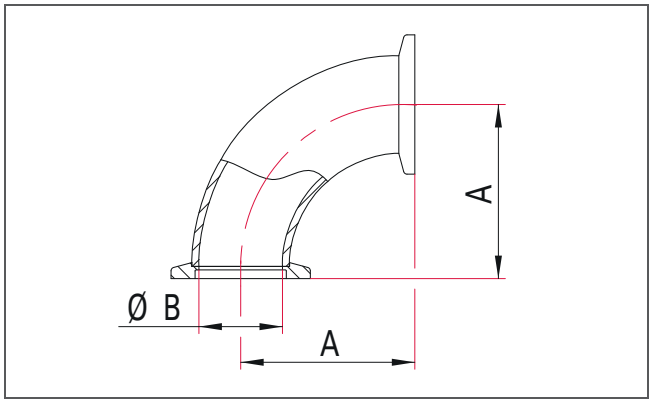
Flanges according to ISO 2861

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**

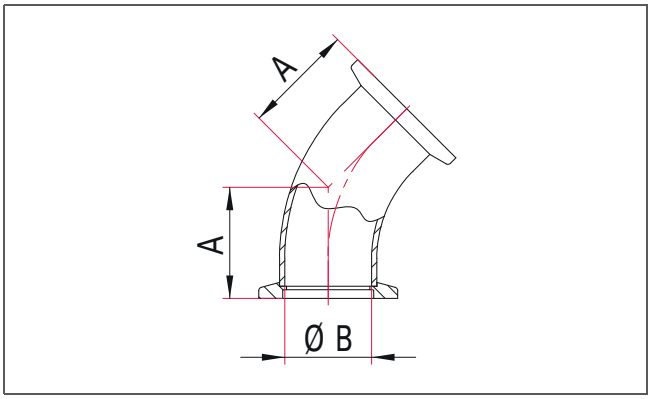
Flanges according to ISO 2861

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

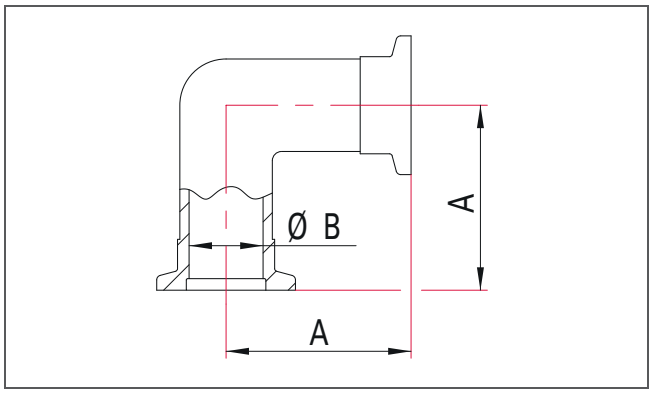
ISO-KF Elbow, 90°

- 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



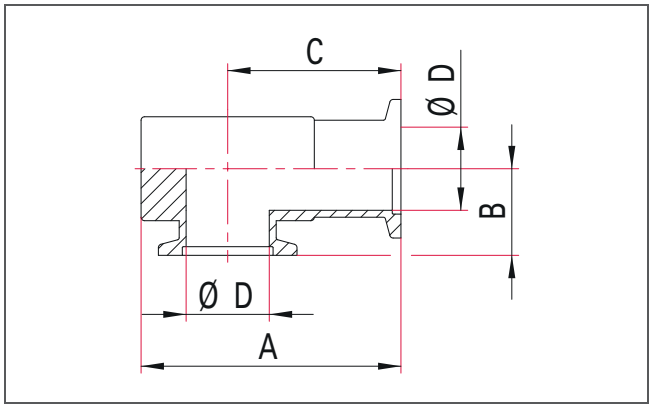
Nominal diameter	A [mm]	B [mm]	Order number
DN 10 KF	30	10	**110RRB010-90**
DN 16 KF	40	16	**110RRB016-90**
DN 25 KF	50	25	**110RRB025-90**
DN 40 KF	65	39	**110RRB040-90**

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**

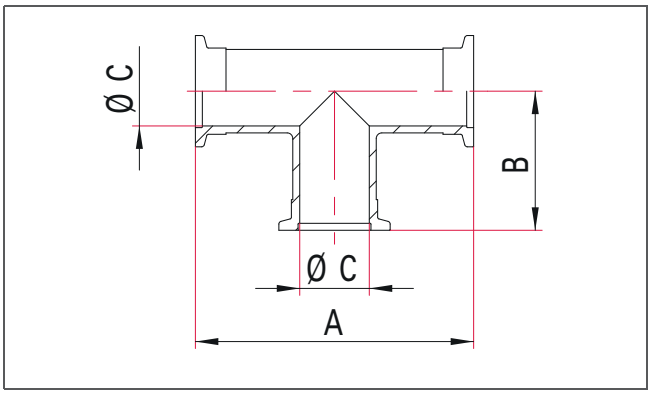
Flanges according to ISO 2861

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

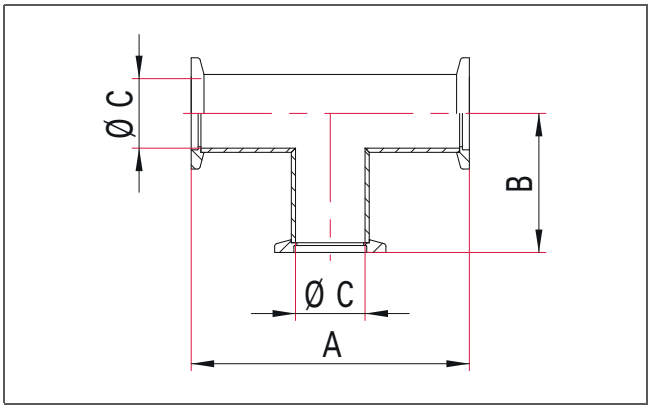
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 KF	60	30	10	**110RTS010**
DN 16 KF	80	40	16	**110RTS016**
DN 25 KF	100	50	25	**110RTS025**
DN 40 KF	130	65	40	**110RTS040**

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

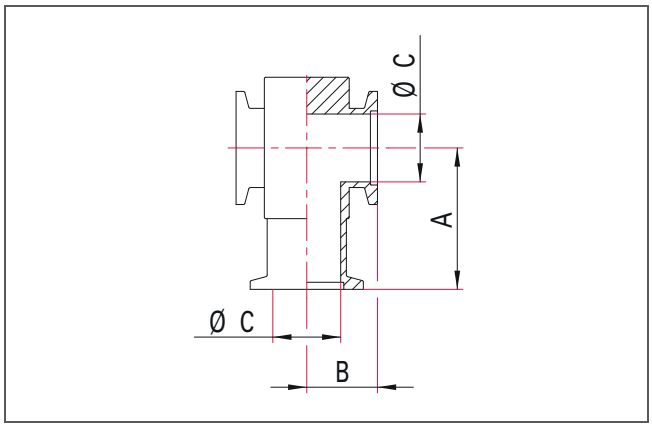
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	80	40	16	**170RTS016**
DN 25 KF	100	50	24	**170RTS025**
DN 40 KF	130	65	40	**170RTS040**
DN 50 KF	140	70	50	**170RTS050**

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**

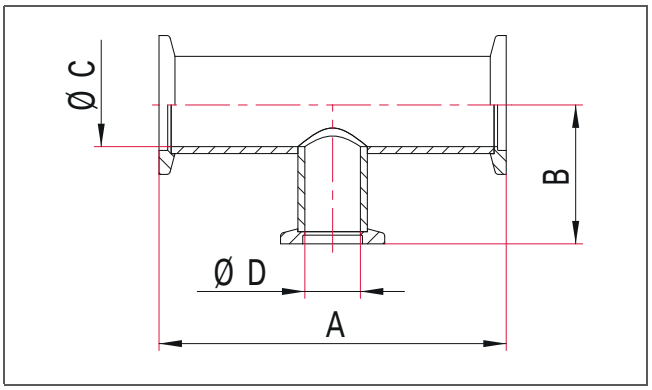
Flanges according to ISO 2861

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

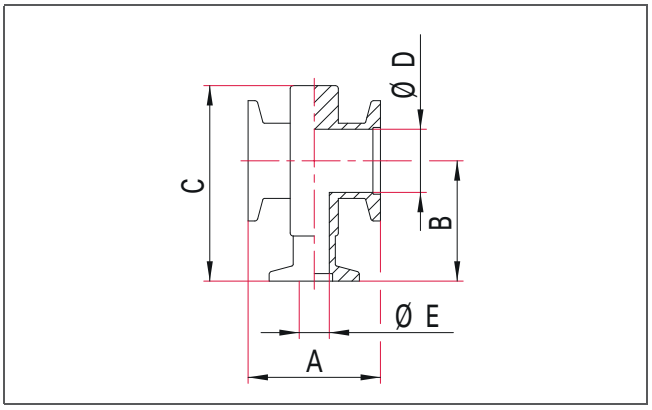
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Nominal diameter reduced	Order number
DN 25 KF	100	40	24	16	DN 16 KF	**120RTR025-016**
DN 40 KF	130	40	40	16	DN 16 KF	**120RTR040-016**
DN 40 KF	130	50	40	24	DN 25 KF	**120RTR040-025**
DN 50 KF	140	50	50	16	DN 16 KF	**120RTR050-016**
DN 50 KF	140	65	50	24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

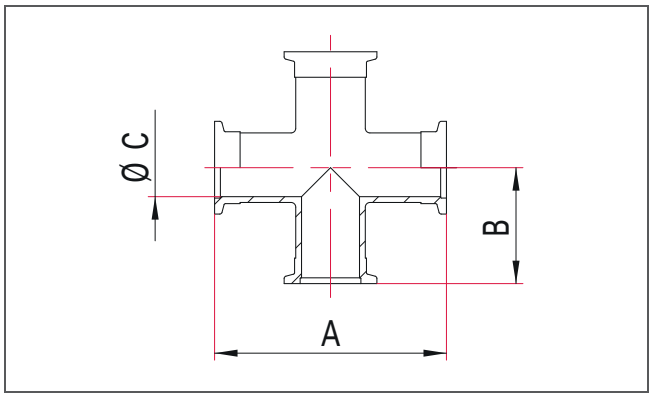
Flanges according to ISO 2861

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

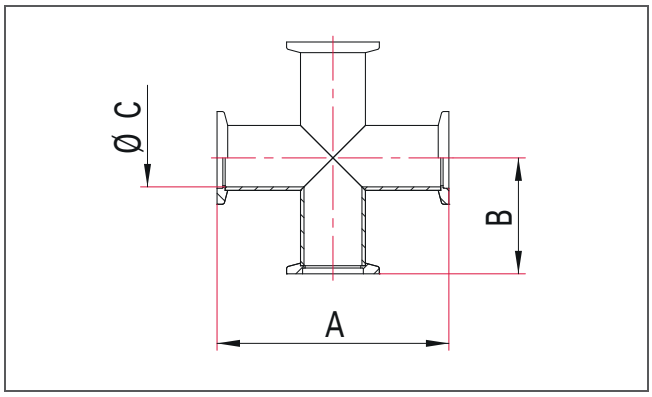
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	80	40	16	**110RKS016**
DN 25 KF	100	50	24	**110RKS025**
DN 40 KF	130	65	40	**110RKS040**

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

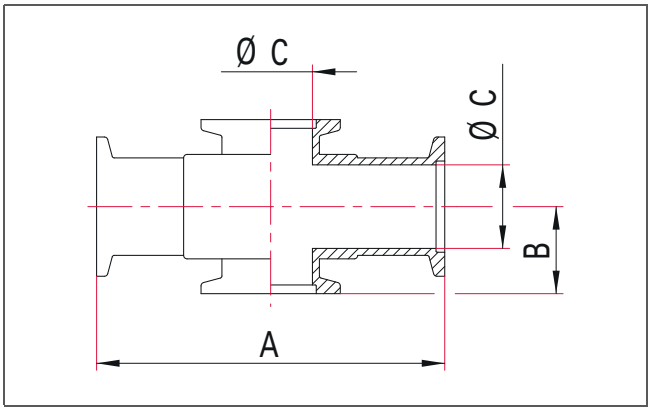
Nominal diameter	A [mm]	B [mm]	C [mm]	Order number
DN 10 KF	60	30	10	**170RKS010**
DN 16 KF	80	40	16	**170RKS016**
DN 25 KF	100	50	24	**170RKS025**
DN 40 KF	130	65	40	**170RKS040**
DN 50 KF	140	70	51	**170RKS050**

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**

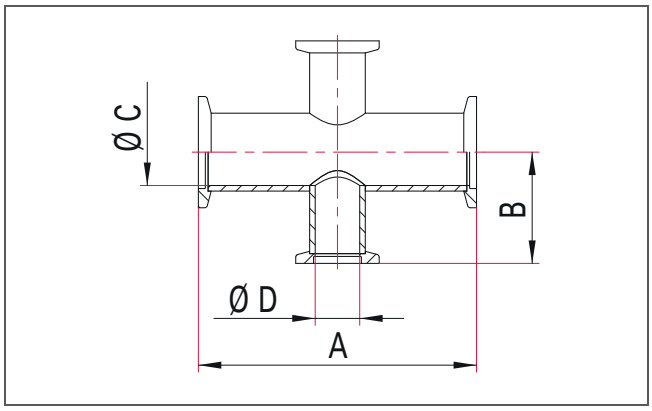
Flanges according to ISO 2861

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

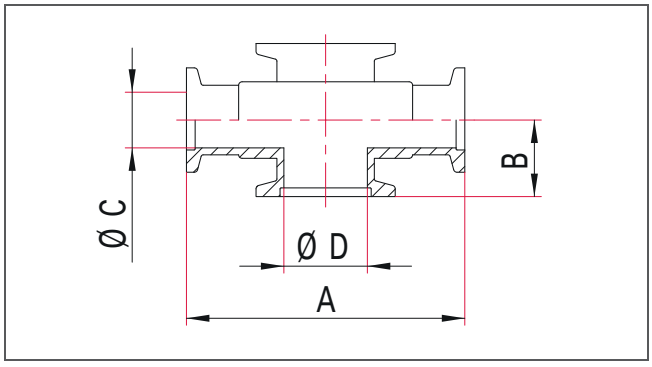
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Nominal diameter reduced	Order number
DN 25 KF	100	40	24	16	DN 16 KF	**120RKR025-016**
DN 40 KF	130	40	40	16	DN 16 KF	**120RKR040-016**
DN 40 KF	130	50	40	24	DN 25 KF	**120RKR040-025**
DN 50 KF	140	40	50	16	DN 16 KF	**120RKR050-016**
DN 50 KF	140	50	50	24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

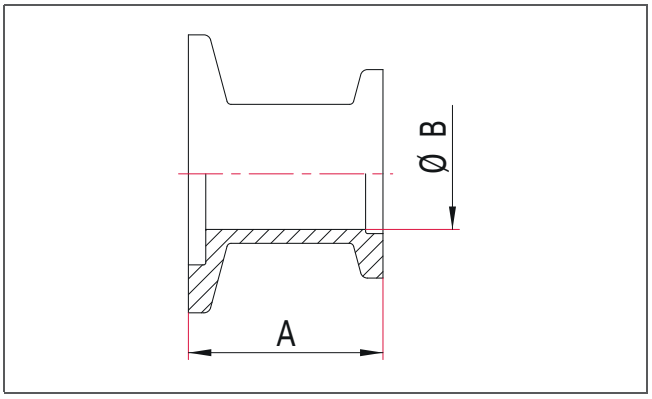
Flanges according to ISO 2861

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**

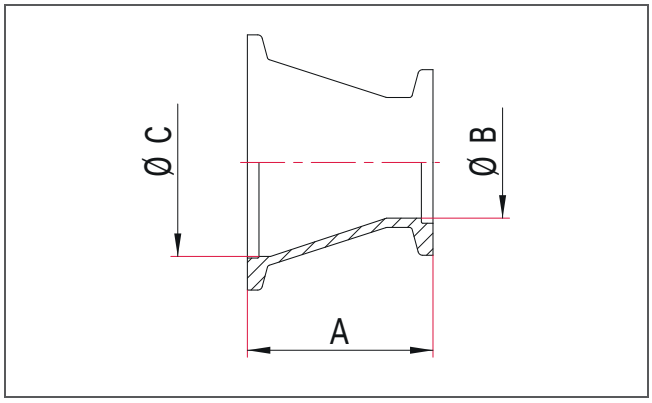
Flanges according to ISO 2861

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	**120RRK025-016-40**
DN 40 KF	40	16	40	DN 16 KF	**120RRK040-016-40**
DN 40 KF	40	24	40	DN 25 KF	**120RRK040-025-40**
DN 50 KF	40	16	50	DN 16 KF	**120RRK050-016-40**
DN 50 KF	40	24	50	DN 25 KF	**120RRK050-025-40**
DN 50 KF	40	40	50	DN 40 KF	**120RRK050-040-40**

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	**170RRK025-016-40**
DN 40 KF	40	16	40	DN 16 KF	**170RRK040-016-40**
DN 40 KF	40	24	40	DN 25 KF	**170RRK040-025-40**
DN 50 KF	40	24	50	DN 25 KF	**170RRK050-025-40**
DN 50 KF	40	40	50	DN 40 KF	**170RRK050-040-40**

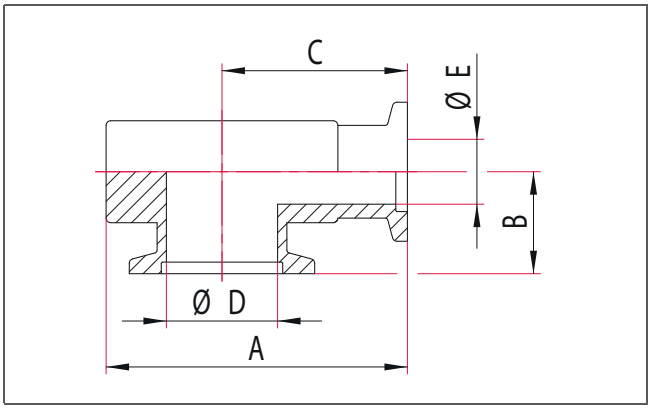
Flanges according to ISO 2861

ISO-KF Reducer Elbow



- Aluminum
- Pressure range: 1 · 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**

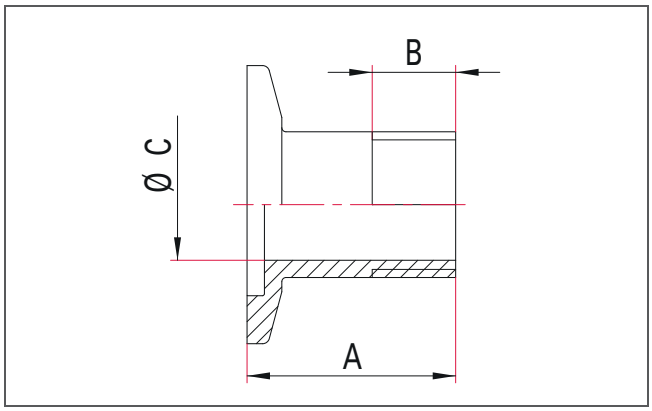
Flanges according to ISO 2861

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**

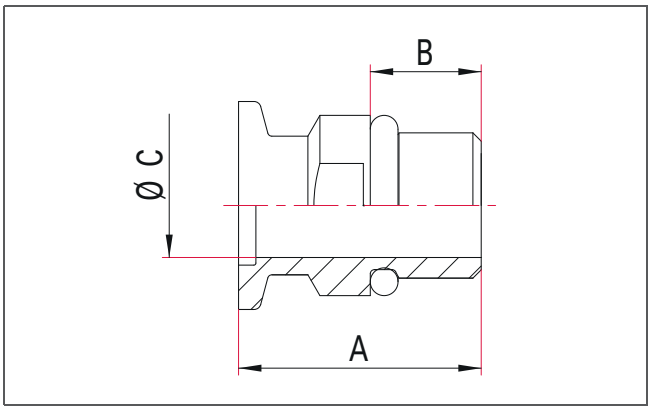
Flanges according to ISO 2861

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



- Material: Stainless steel
- Seal: FKM
- Pressure range: 1 · 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**

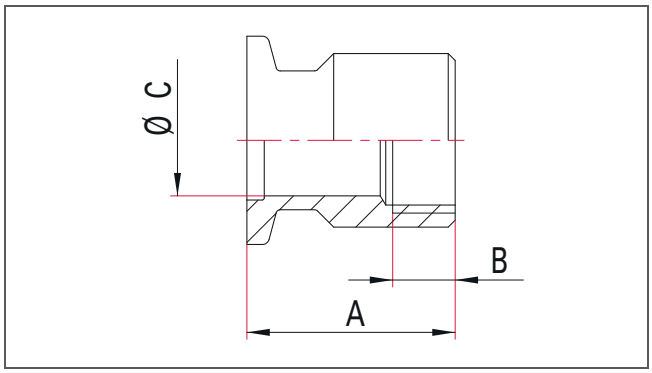
Flanges according to ISO 2861

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**

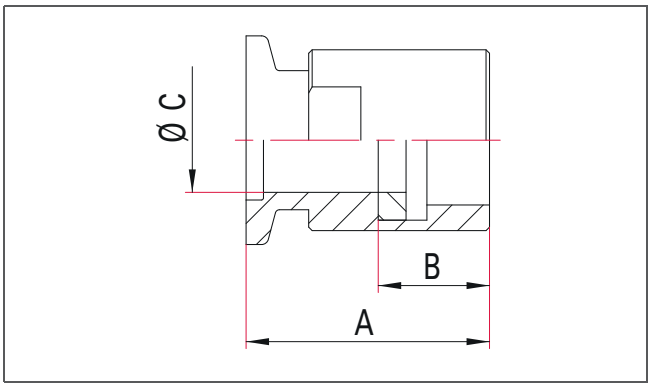
Flanges according to ISO 2861

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



- Material: Stainless steel
- Seal: FKM
- Pressure range: 1 · 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**

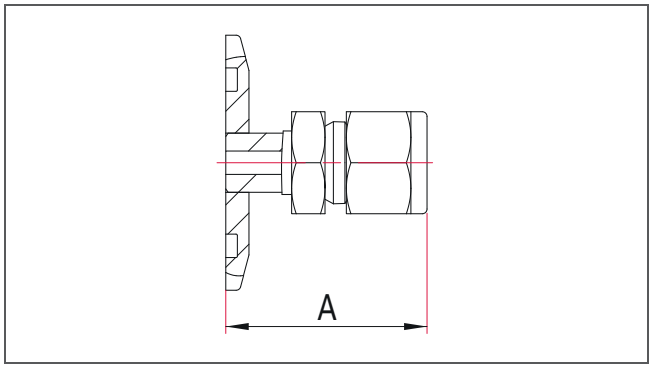
Flanges according to ISO 2861

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**

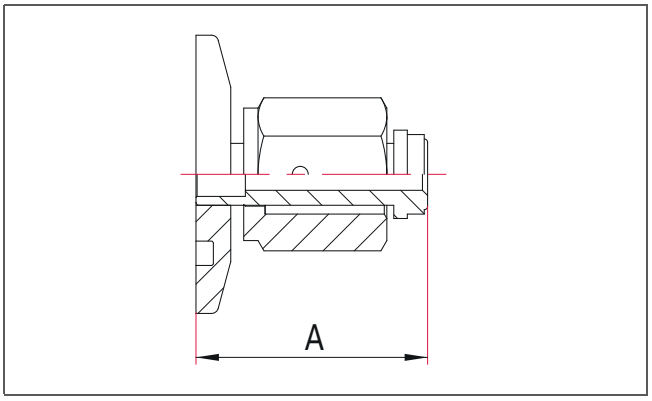
Flanges according to ISO 2861

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**

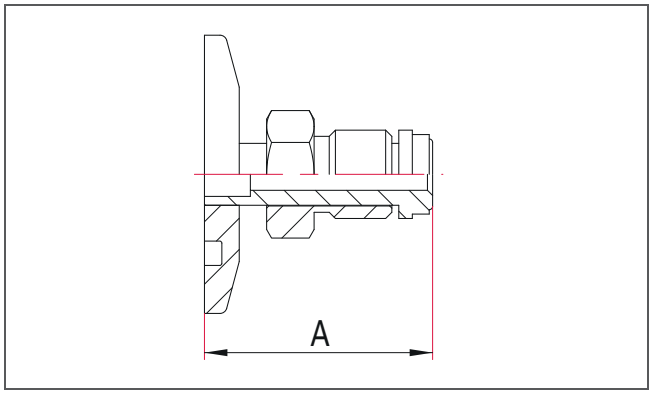
Flanges according to ISO 2861

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**

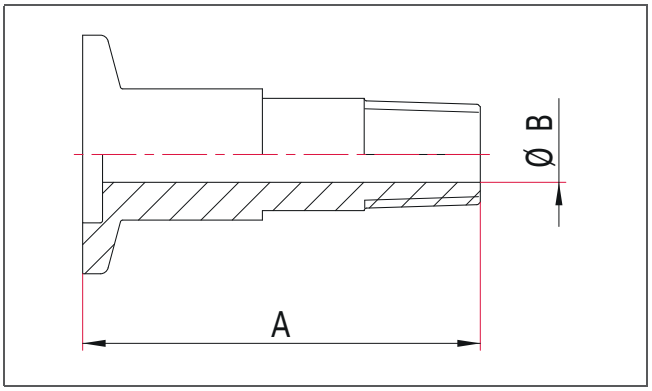
Flanges according to ISO 2861

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**

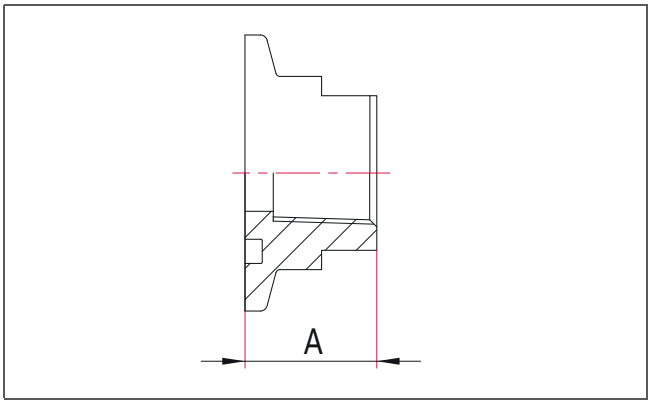
Flanges according to ISO 2861

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**

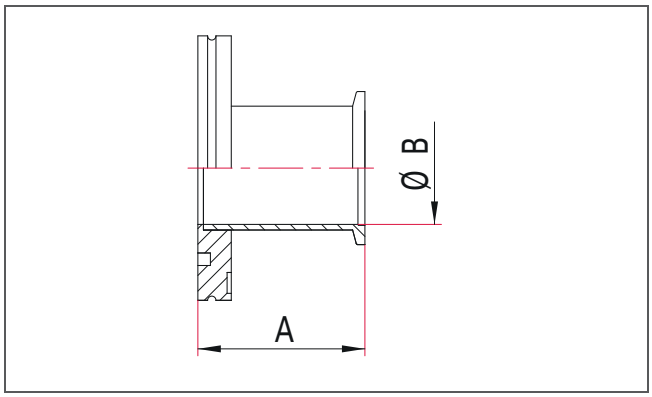
Flanges according to ISO 2861

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**

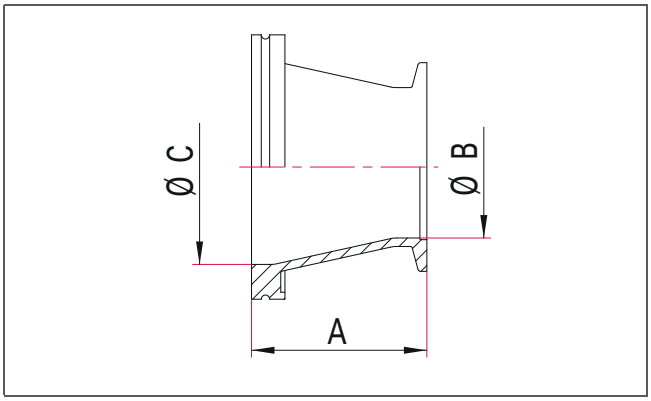
ISO-KF Flanges according to ISO 2861
ISO-K Flanges according to ISO 1609

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**

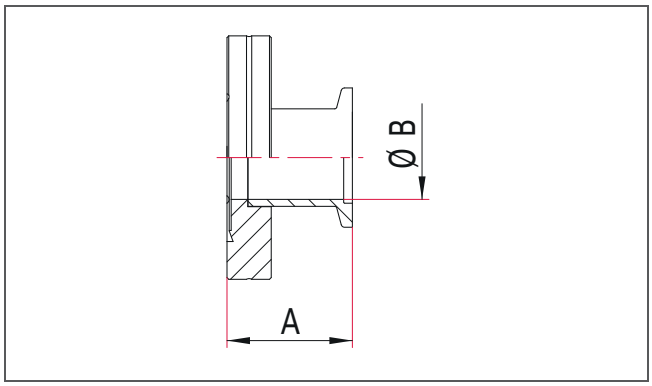
Flanges according to ISO 2861
ISO-K Flanges according to ISO 1609

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**

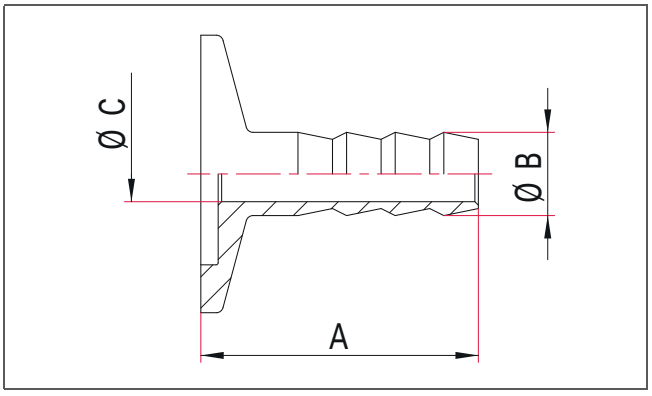
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

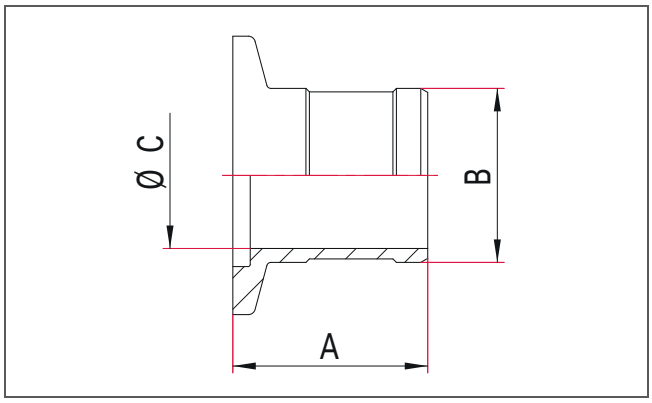
Flanges according to ISO 2861

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**

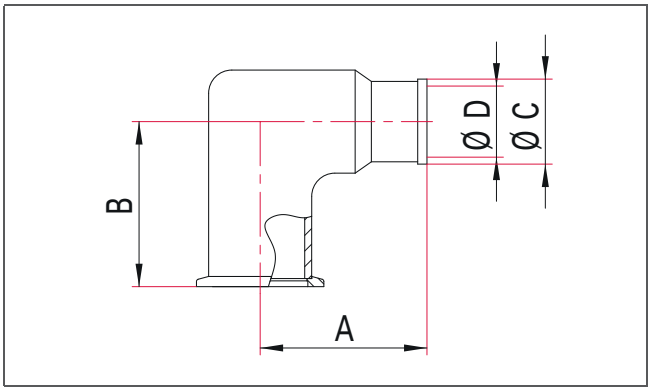
Please check the hose inner diameter before ordering
Flanges according to ISO 2861

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**

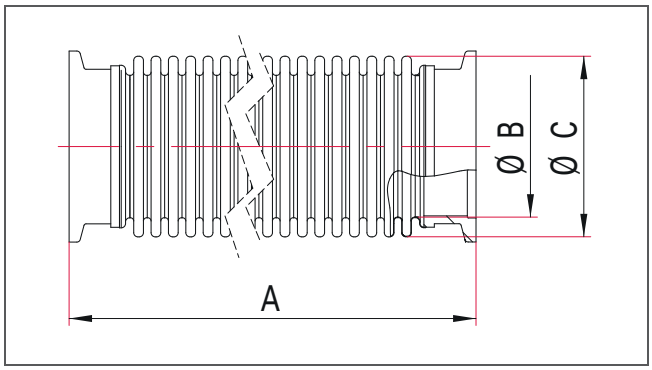
Please check the hose inner diameter before ordering
Flanges according to ISO 2861

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**

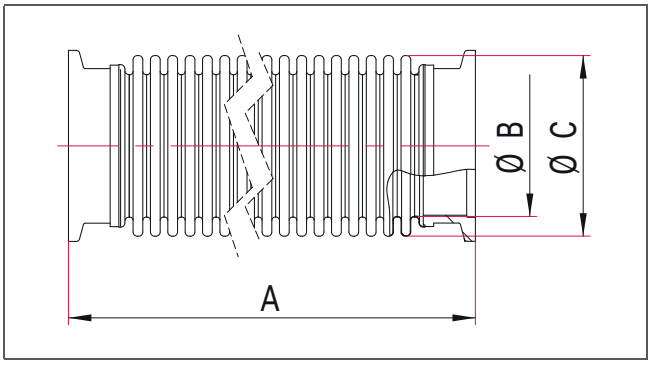
Please note that the hose shrinks under vacuum.
The minimum bending radii are applicable for a temperature of 20 °C.
Flanges according to ISO 2861

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**

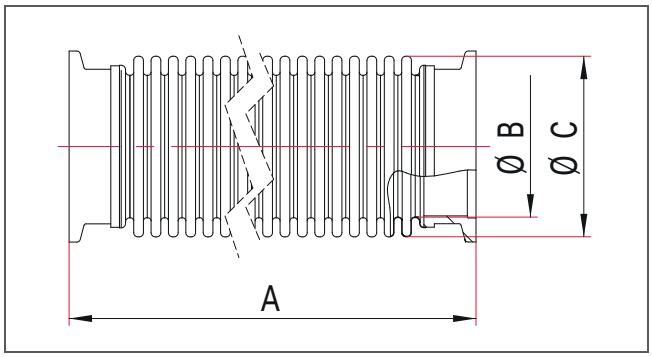
Please note that the hose shrinks under vacuum.
The minimum bending radius is applicable for a temperature of 20 °C.
Flanges according to ISO 2861

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**

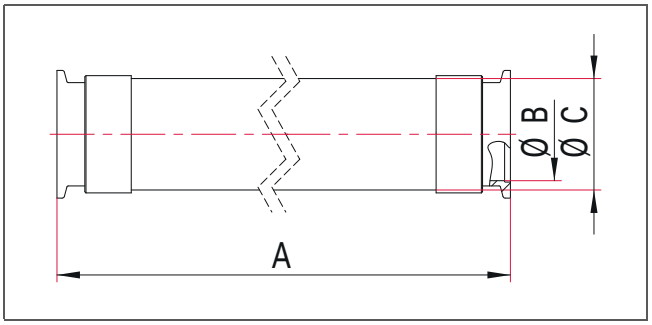
Please note that the hose shrinks under vacuum.
The minimum bending radii are applicable for a temperature of 20 °C.
Flanges according to ISO 2861

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**

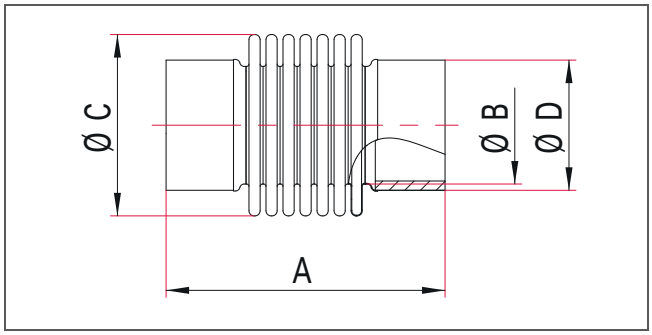
Please note that the hose shrinks under vacuum.
The minimum bending radii are applicable for a temperature of 20 °C.
Flanges according to ISO 2861

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**

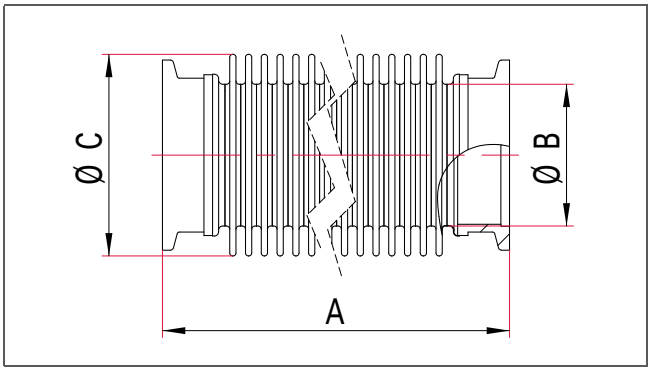
Please note that the spring bellows shrinks under vacuum.
The axial stroke is applicable for a temperature of 20 °C and 10000 load cycles.

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**

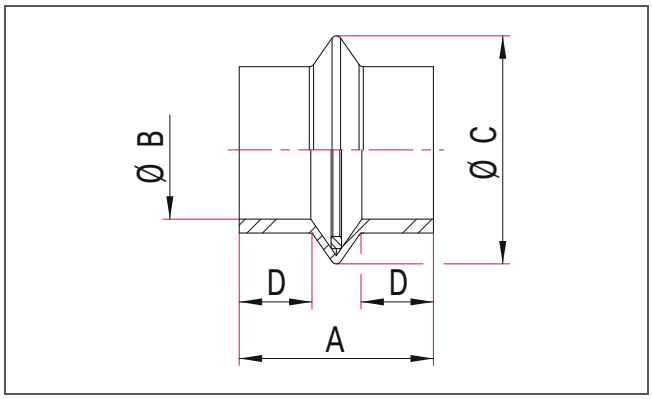
Please note that the spring bellows shrinks under vacuum.
The axial stroke is applicable for a temperature of 20 °C and 10000 load cycles.
Flanges according to ISO 2861

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**

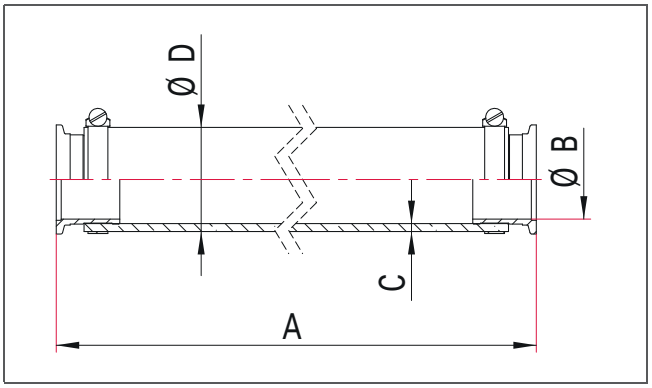
Please note that the sleeve shrinks under vacuum.

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**

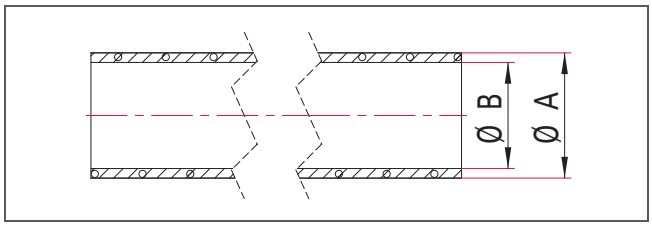
The minimum bending radius is applicable for a temperature of 20 °C.
Flanges according to ISO 2861

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 · 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**

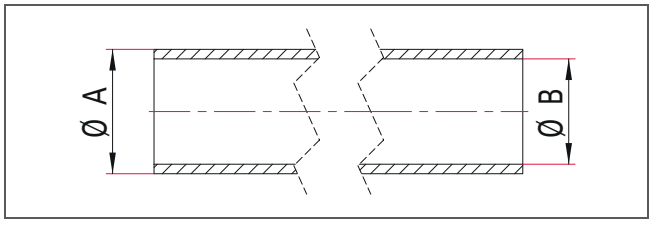
The minimum bending radius is applicable for a temperature of 20 °C.

ISO-KF Rubber Hose



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

Dimensions



Rubber

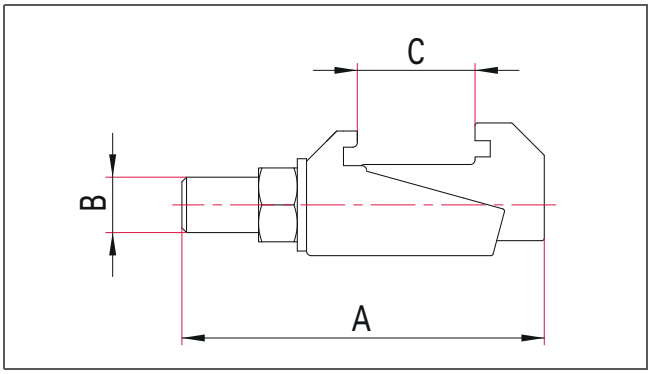
Inner diameter [mm]	A [mm]	B [mm]	Order number
7	17	7	**130SPM010**
10	25	10	**130SPM016**
16	32	16	**130SPM020**

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	**320BKL250**
DN 320-500 ISO-K	75	M12	27 - 33	**320BKL500**
DN 630 ISO-K	85	M12	36 - 44	**320BKL630**

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	**350BKL250**
DN 320-500 ISO-K	77	M12	27 - 33	**350BKL500**
DN 630 ISO-K	86	M12	36 - 44	**350BKL630**

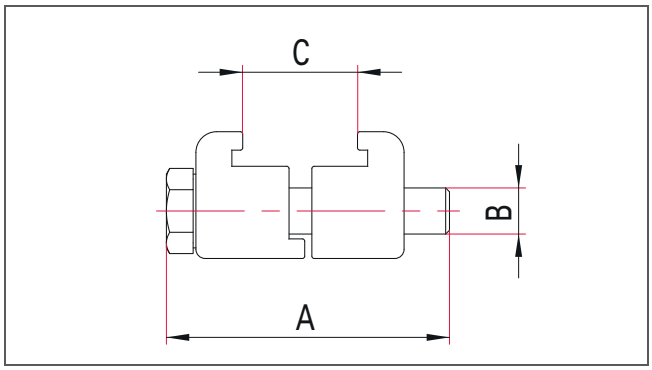
Not to be used for the assembly of turbo pumps!
Use the fastening elements given in the corresponding operating instructions.

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.

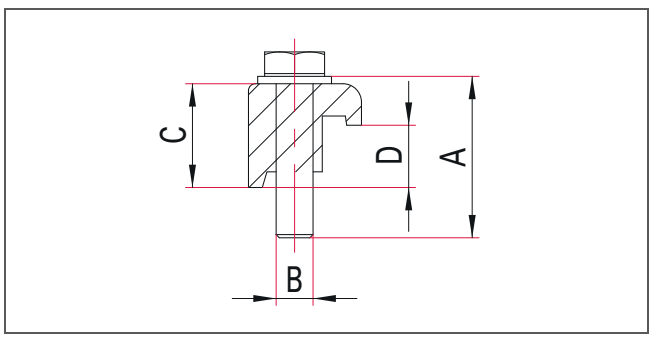
ISO-K Claw Clamp

- 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

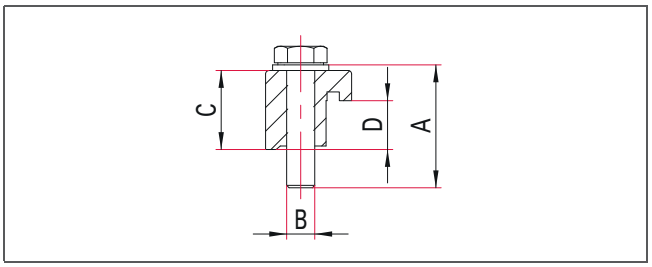
Nominal diameter	A [mm]	B	C [mm]	D [mm]	Order number
DN 63-100 ISO-K	35	M8	23	14	**310BPR100**
DN 160-250 ISO-K	35	M10	23	14	**310BPR250**
DN 320-500 ISO-K	50	M12	30	21	**310BPR500**

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

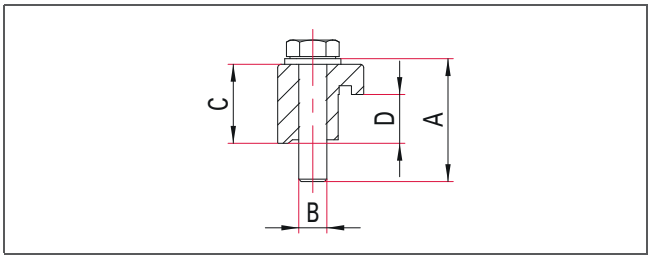
Nominal diameter	A [mm]	B	C [mm]	D [mm]	Order number
DN 63-100 ISO-K	35	M8	23	14	**320BPR100**
DN 160-250 ISO-K	35	M10	23	14	**320BPR250**
DN 320-500 ISO-K	50	M12	30	21	**320BPR500**

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**

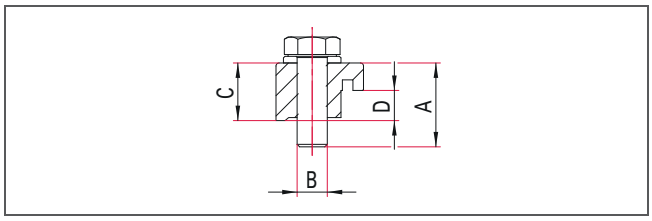
Not to be used for the assembly of turbo pumps!
Use the fastening elements given in the corresponding operating instructions.

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**

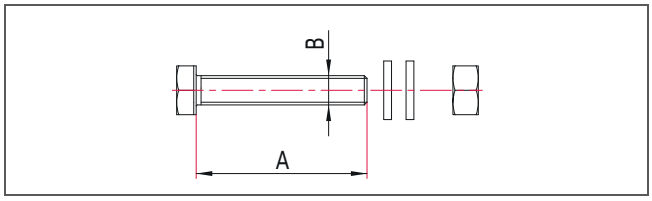
Not to be used for the assembly of turbo pumps!
Use the fastening elements given in the corresponding operating instructions.

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

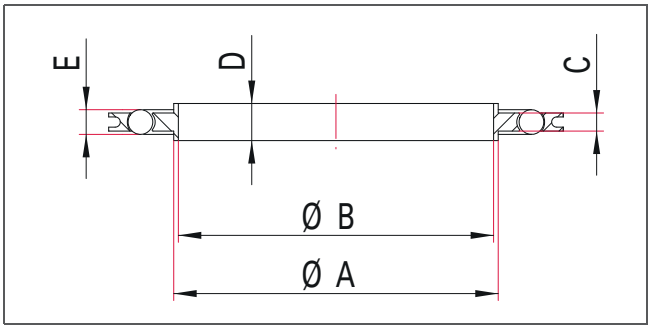
Nominal diameter	A [mm]	B	Package [Qty.]	Order number
DN 63-100 ISO-K/ISO-F	40	M8	8	**520BSC100**
DN 160-250 ISO-K/ISO-F	50	M10	12	**520BSC250**
DN 320-500 ISO-K/ISO-F	65	M12	16	**520BSC500**
DN 630 ISO-K/ISO-F	70	M12	20	**520BSC630**

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

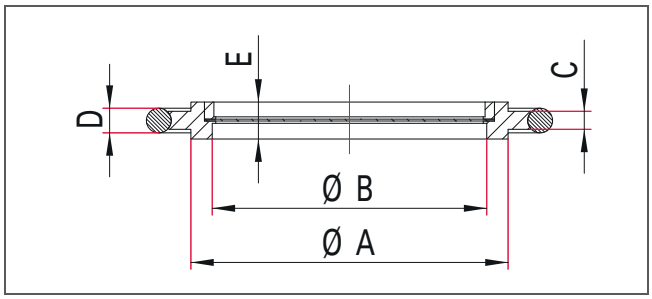
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Order number
DN 63 ISO-K	FKM	70	68	3.9	8	5.33	**322ZRA063**
DN 80 ISO-K	FKM	83	81	3.9	8	5.33	**322ZRA080**
DN 100 ISO-K	FKM	102	100	3.9	8	5.33	**322ZRA100**
DN 160 ISO-K	FKM	153	151	3.9	8	5.33	**322ZRA160**
DN 200 ISO-K	FKM	213	211	3.9	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

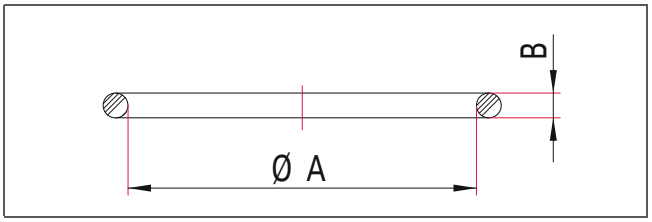
Nominal diameter	O-ring material	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Mesh [mm]	Wire thickness [mm]	Order number
DN 63 ISO-K	FKM	70	60	3.9	5.33	8	0.5	0.2	**322ZRD063**
DN 80 ISO-K	FKM	83	73	3.9	5.33	8	0.6	0.2	**322ZRD080**
DN 100 ISO-K	FKM	102	92	3.9	5.33	8	0.8	0.2	**322ZRD100**
DN 160 ISO-K	FKM	153	143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

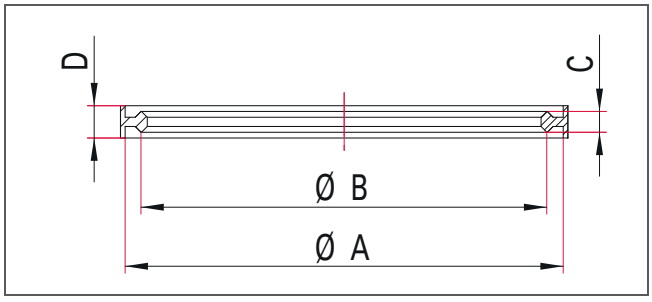
Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 63 ISO-K	76	5.33	5	**303DOR063-S5**
DN 80 ISO-K	88.27	5.33	5	**303DOR080-S5**
DN 100 ISO-K	107	5.33	5	**303DOR100-S5**
DN 160 ISO-K	158	5.33	5	**303DOR160-S5**
DN 200 ISO-K	209	5,33	5	**303DOR200-S5**
DN 250 ISO-K	253	5.33	5	**303DOR250-S5**

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

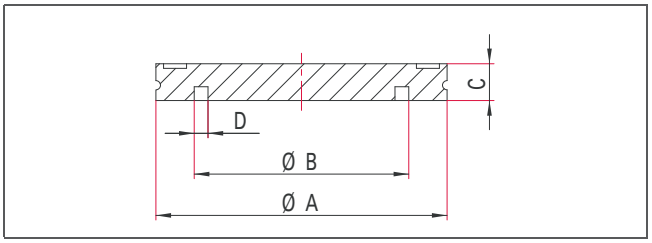
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 63 ISO-K	95	88	4.5	7	**310ZSK063**
DN 80 ISO-K	110	103	4.5	7	**310ZSK080**
DN 100 ISO-K	130	123	4.5	7	**310ZSK100**
DN 160 ISO-K	180	173	4.5	7	**310ZSK160**
DN 200 ISO-K	240	233	4.5	7	**310ZSK200**
DN 250 ISO-K	290	283	4.5	7	**310ZSK250**

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**

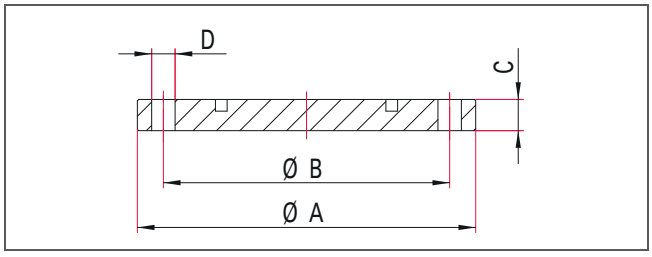
Flanges according to ISO 1609

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**

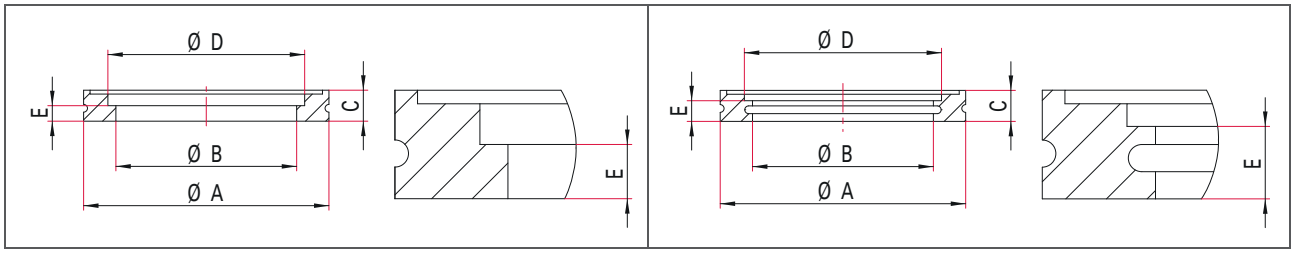
Flanges according to ISO 1609

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**

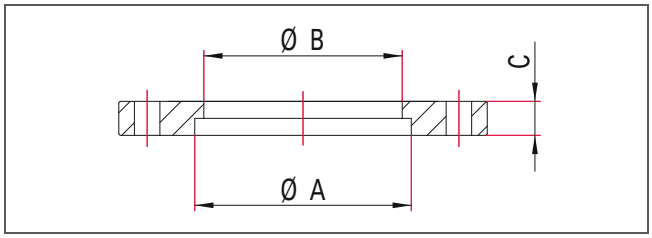
Flanges according to ISO 1609

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**

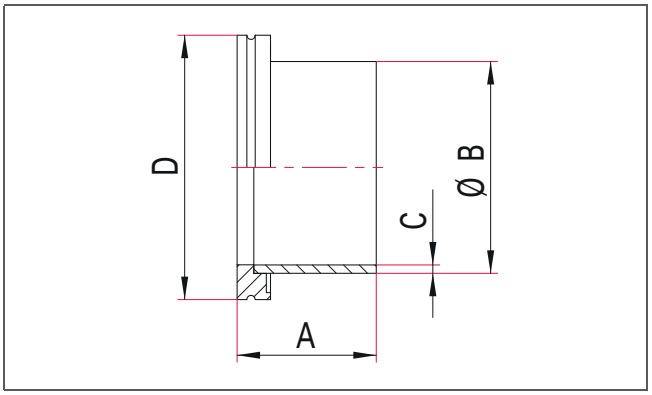
Flanges according to ISO 1609

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**

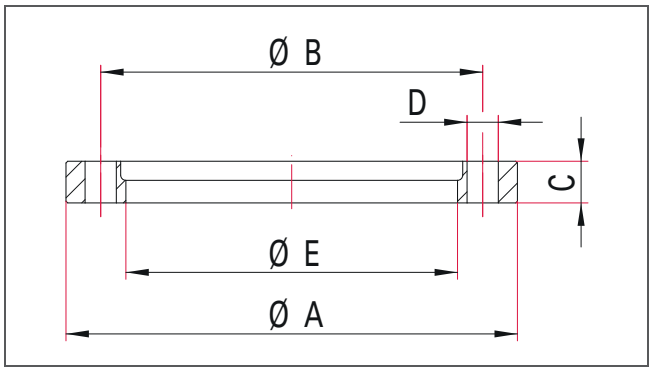
Flanges according to ISO 1609

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**

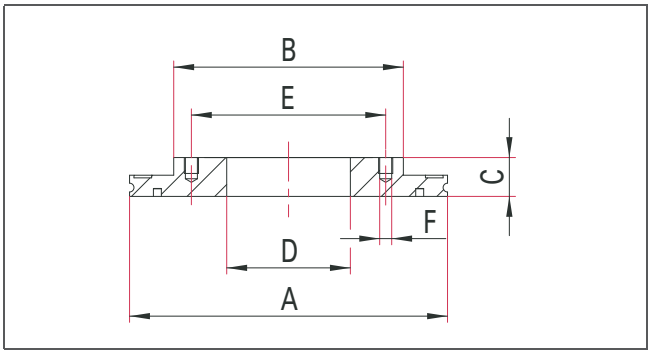
Flanges according to ISO 1609

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

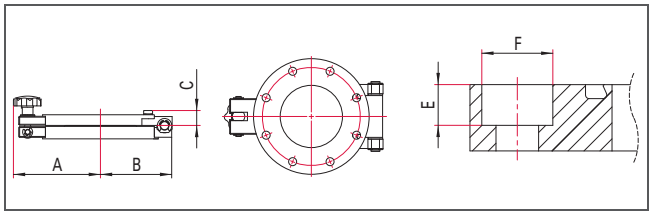
ISO-F Quick-Access-Door

- 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



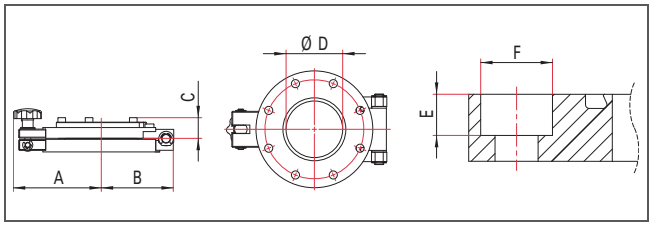
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 ISO-F	98	80	16	-	10	16	**520KTU063**
DN 100 ISO-F	116	99	16	-	10	16	**520KTU100**
DN 160 ISO-F	147	130	20	-	12.5	20	**520KTU160**
DN 200 ISO-F	177	160	20	-	12.5	20	**520KTU200**

Stainless Steel 304/1.4301, with Sight Glass

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



Dimensions



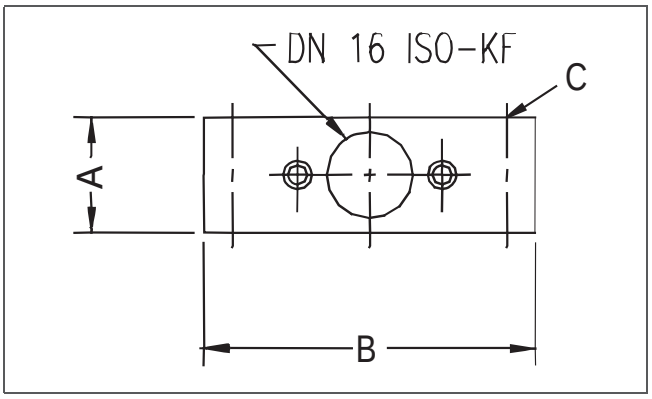
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 ISO-F	98	80	23	63	10	16	**520KTU063-G**
DN 100 ISO-F	116	99	27	95	10	16	**520KTU100-G**
DN 160 ISO-F	147	130	31	145	12.5	20	**520KTU160-G**
DN 200 ISO-F	177	160	31	145	12.5	20	**520KTU200-G**

ISO-F Measurement Flange



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

Dimensions



Aluminum

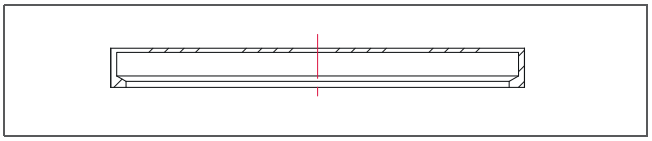
Nominal diameter	A [mm]	B [mm]	C	Order number
DN 63 ISO-F	35	130	4 x M8	**PF 308 006-T**
DN 100 ISO-F	35	165	8 x M8	**PF 308 010-T**

ISO-K Flange Cap



- Made from plastic

Dimensions



Polyethelene (PE)

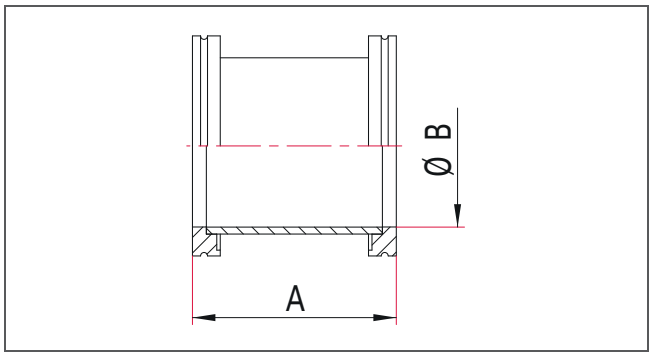
Nominal diameter	Package [Qty.]	Order number
DN 63 ISO-K	5	**330FSK063-S5**
DN 80 ISO-K	5	**330FSK080-S5**
DN 100 ISO-K	5	**330FSK100-S5**
DN 160 ISO-K	5	**330FSK160-S5**
DN 200 ISO-K	5	**330FSK200-S5**
DN 250 ISO-K	5	**330FSK250-S5**

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**

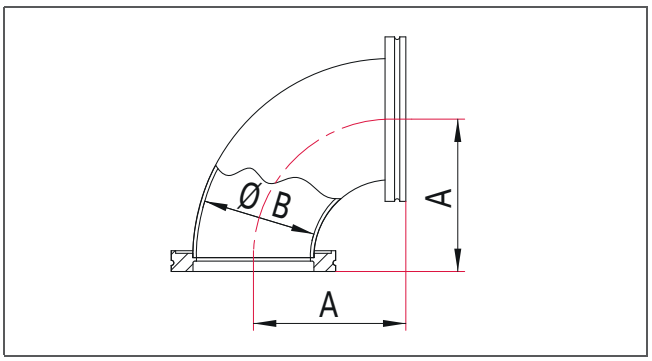
Flanges according to ISO 1609

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**

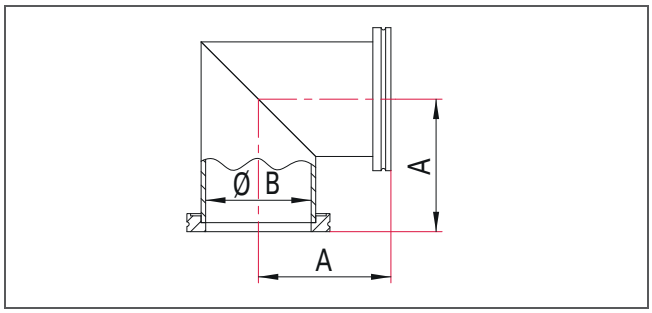
Flanges according to ISO 1609

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**

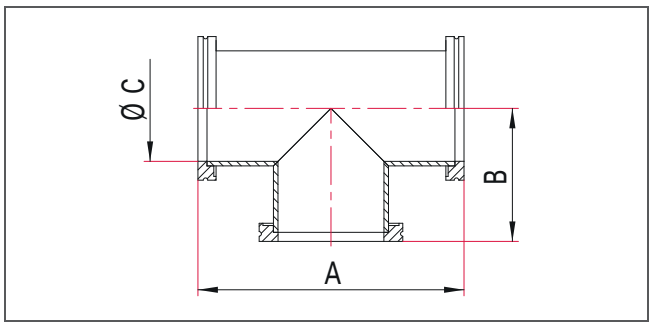
Flanges according to ISO 1609

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**

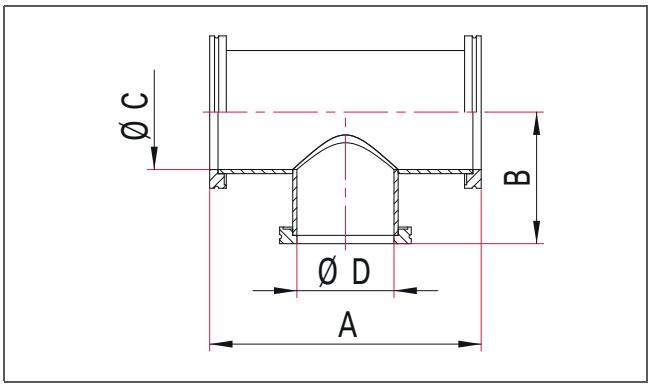
Flanges according to ISO 1609

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**

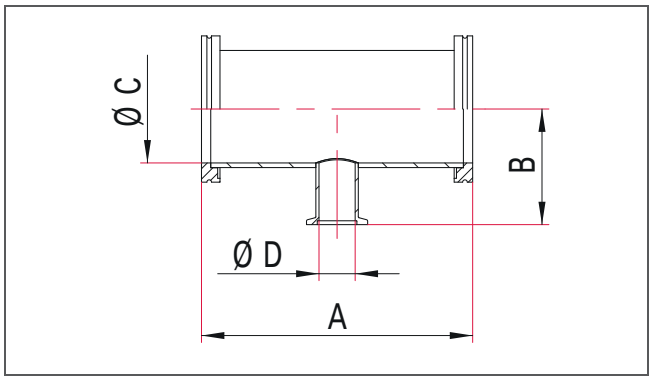
Flanges according to ISO 1609

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**

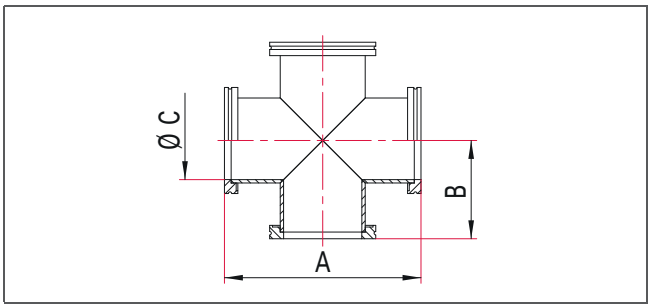
Flanges according to ISO 1609

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**

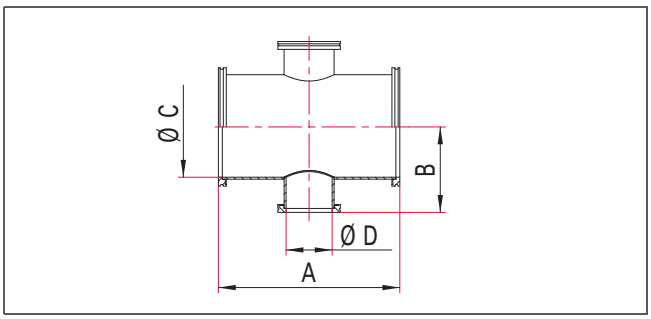
Flanges according to ISO 1609

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**

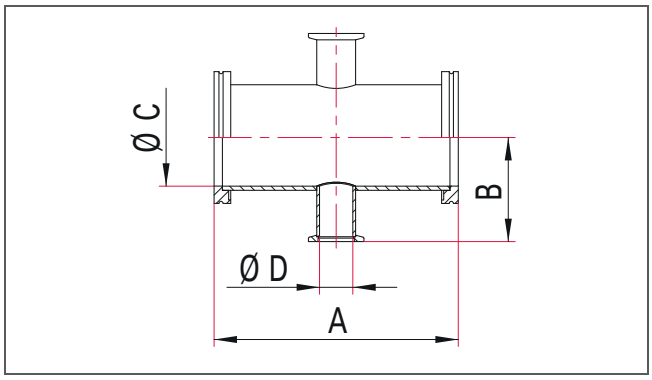
Flanges according to ISO 1609

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**

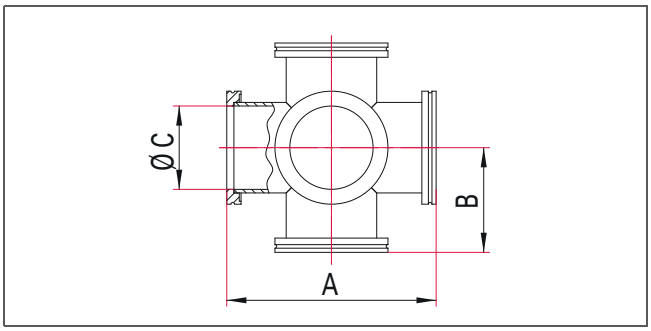
Flanges according to ISO 1609

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**

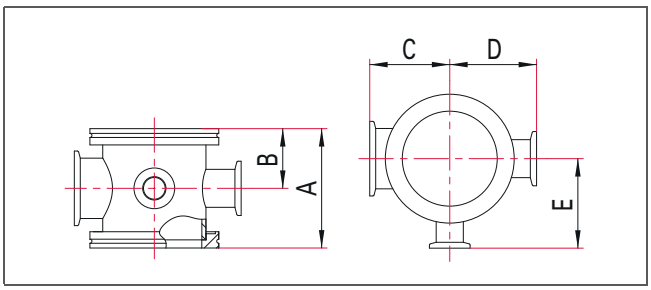
Flanges according to ISO 1609

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**

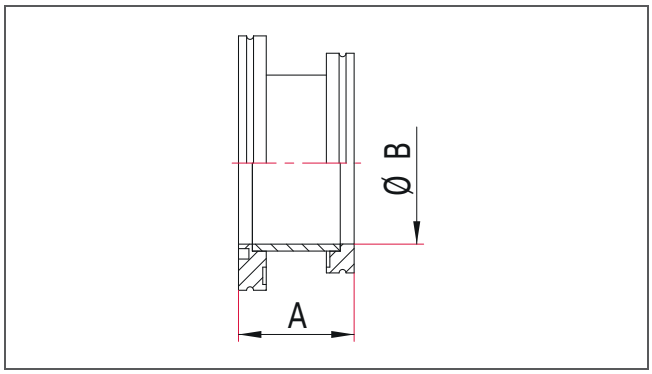
Flanges according to ISO 1609

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	**320RRG100-063-50**
DN 160 ISO-K	50	70	DN 63 ISO-K	**320RRG160-063-50**
DN 160 ISO-K	50	102	DN 100 ISO-K	**320RRG160-100-50**
DN 200 ISO-K	50	102	DN 100 ISO-K	**320RRG200-100-50**
DN 200 ISO-K	50	153	DN 160 ISO-K	**320RRG200-160-50**
DN 250 ISO-K	50	153	DN 160 ISO-K	**320RRG250-160-50**
DN 250 ISO-K	50	213	DN 200 ISO-K	**320RRG250-200-50**

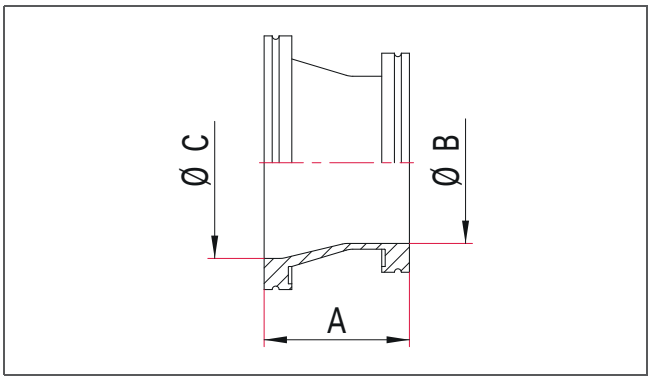
Flanges according to ISO 1609

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**

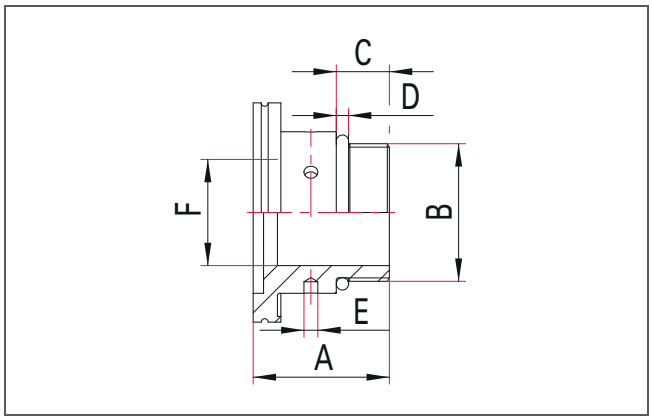
Flanges according to ISO 1609

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 · 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**

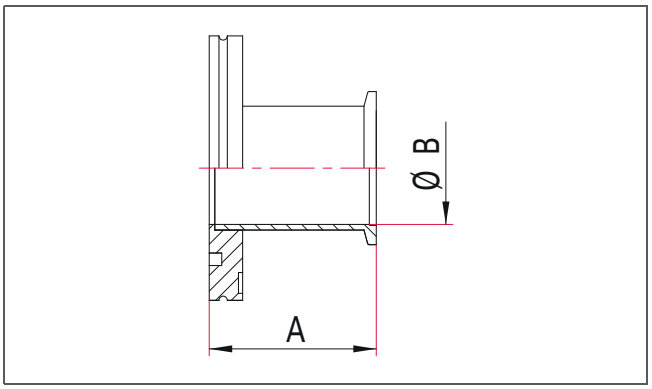
Flanges according to ISO 1609

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	**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**

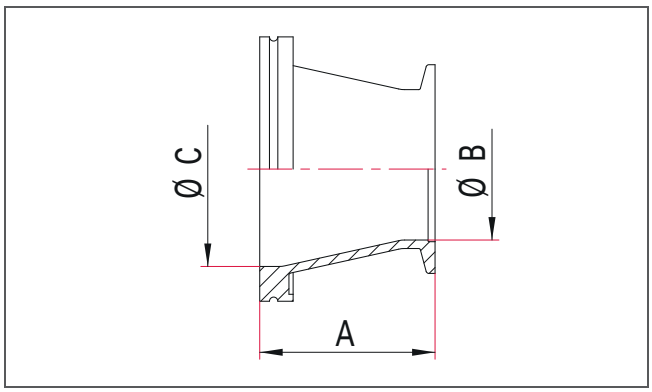
ISO-KF Flanges according to ISO 2861
ISO-K Flanges according to ISO 1609

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**

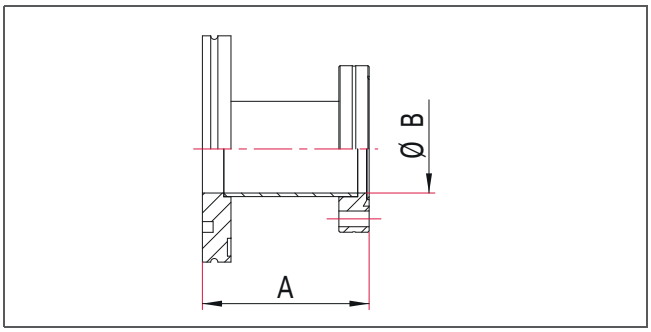
Flanges according to ISO 2861
ISO-K Flanges according to ISO 1609

ISO-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**

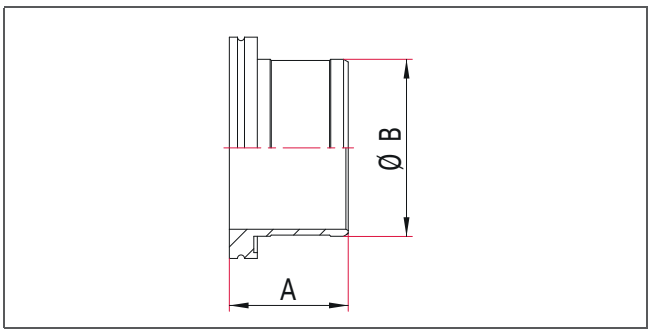
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2
ISO-K Flanges according to ISO 1609

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**

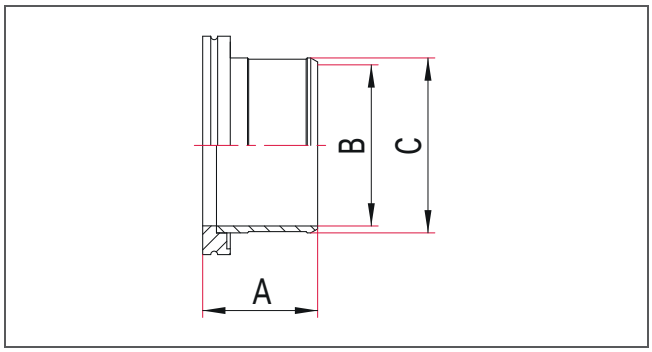
Flanges according to ISO 1609

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**

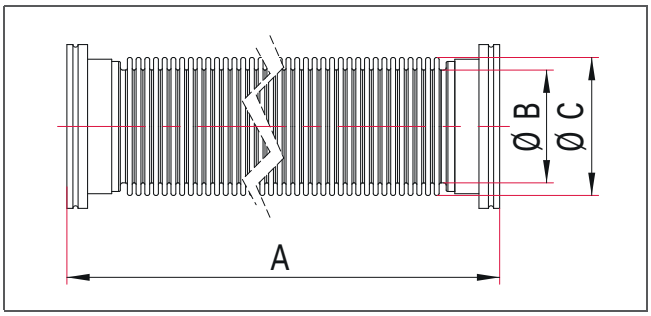
Flanges according to ISO 1609

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**

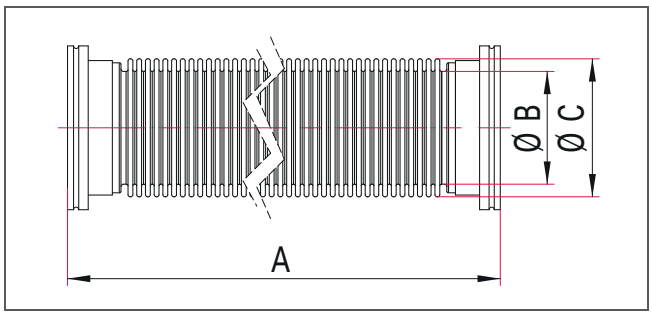
Please note that the hose shrinks under vacuum.
The minimum bending radii are applicable for a temperature of 20 °C.
Flanges according to ISO 1609

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**

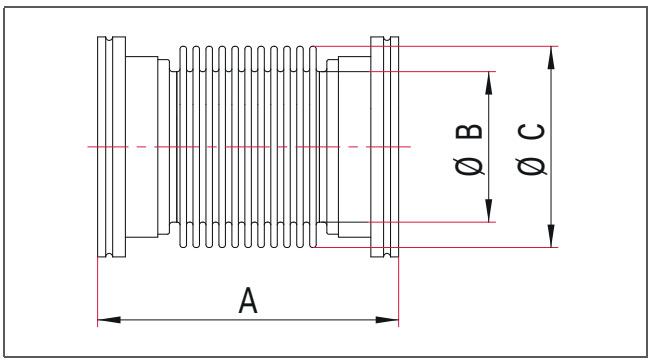
Please note that the hose shrinks under vacuum.
The minimum bending radius is applicable for a temperature of 20 °C.
Flanges according to ISO 1609

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**

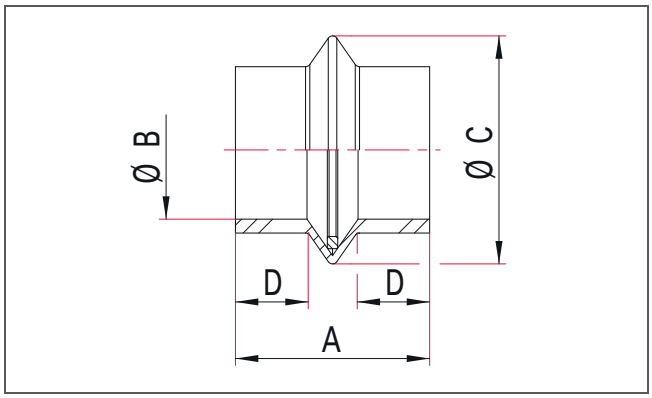
Please note that the spring bellows shrinks under vacuum.
The axial stroke is applicable for a temperature of 20 °C and 10000 load cycles.
Flanges according to ISO 1609

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**

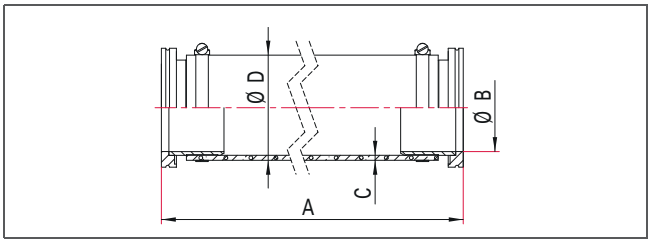
Please note that the sleeve shrinks under vacuum.

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 · 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**

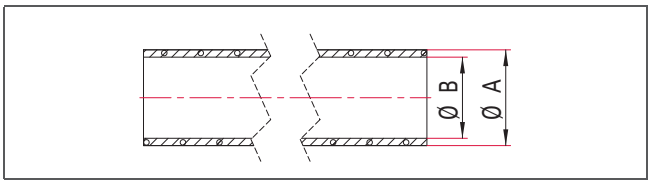
The minimum bending radius is applicable for a temperature of 20 °C.
Flanges according to ISO 1609

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 · 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**

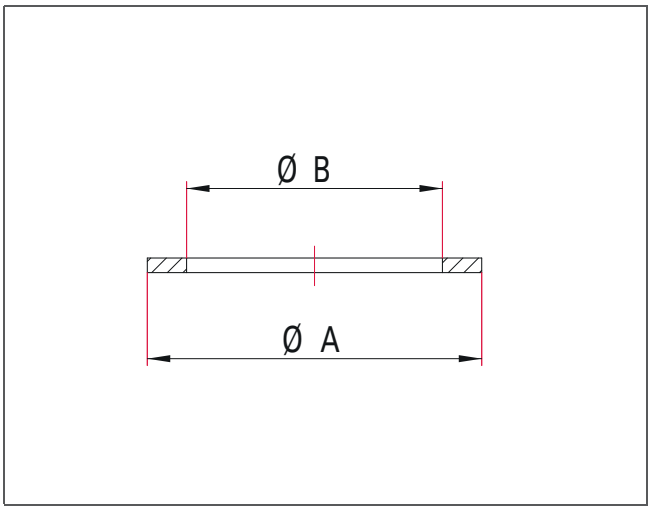
The minimum bending radius is applicable for a temperature of 20 °C.

CF Copper Gasket



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

Dimensions



OFHC Copper (Oxygen Free)

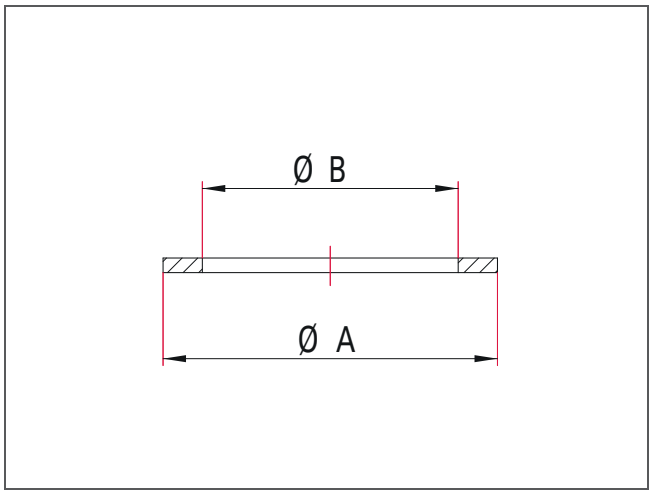
Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.3	16	10	**490DFL016-S10**
DN 25 CF	32.8	25.5	10	**490DFL025-S10**
DN 40 CF	48.2	36.6	10	**490DFL040-S10**
DN 50 CF	61.6	50.8	10	**490DFL050-S10**
DN 63 CF	82.4	63.4	10	**490DFL063-S10**
DN 75 CF	91.4	76.3	10	**490DFL075-S10**
DN 100 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

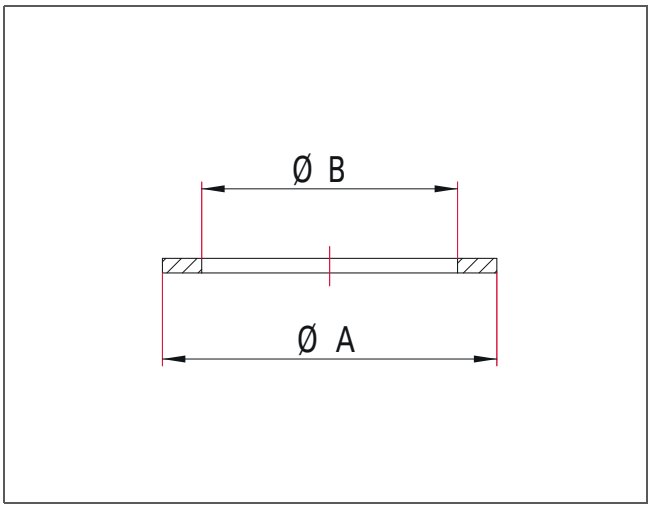
Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.3	16	5	**490DFL016-S-S5**
DN 25 CF	32.8	25.5	5	**490DFL025-S-S5**
DN 40 CF	48.2	36.6	5	**490DFL040-S-S5**
DN 63 CF	82.4	63.4	5	**490DFL063-S-S5**
DN 100 CF	120.5	101.6	5	**490DFL100-S-S5**
DN 160 CF	171.3	152.4	5	**490DFL160-S-S5**
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 · 10^{-13} hPa to ambient pressure
- Temperature range: -196 to 200 °C

Dimensions



OFHC Copper (Oxygen Free), Vaccum-annealed

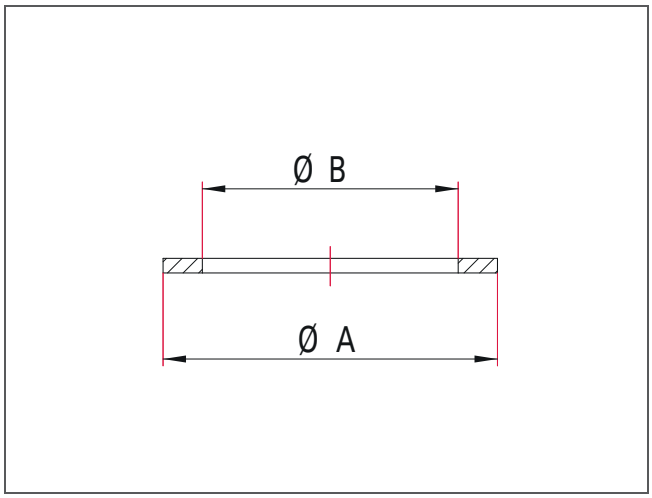
Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.3	16	5	**490DFL016-G-S5**
DN 40 CF	48.2	36.6	5	**490DFL040-G-S5**
DN 63 CF	82.4	63.4	5	**490DFL063-G-S5**
DN 100 CF	120.5	101.6	5	**490DFL100-G-S5**
DN 160 CF	171.3	152.4	5	**490DFL160-G-S5**
DN 200 CF	222.1	203.3	5	**490DFL200-G-S5**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

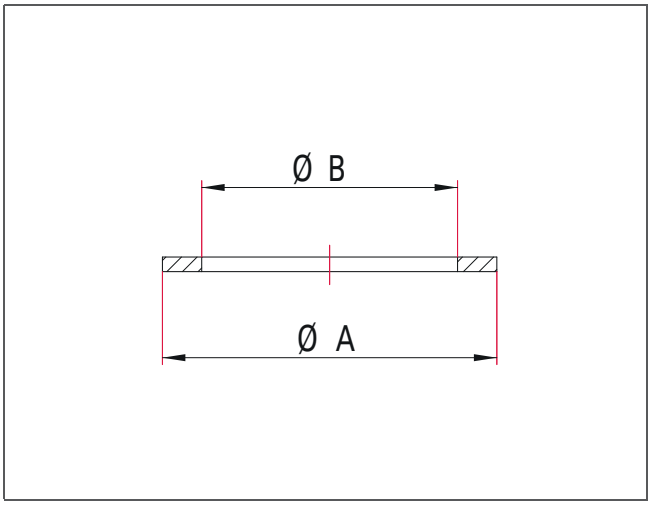
CF Elastomer Gasket FKM

- 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

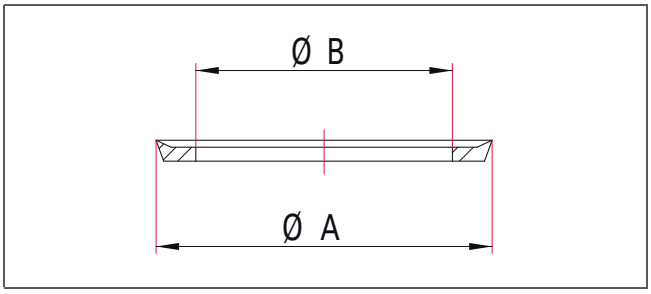


Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.4	16	2	**402DFL016-S2**
DN 40 CF	48.2	37	2	**402DFL040-S2**
DN 63 CF	82.4	63	2	**402DFL063-S2**
DN 100 CF	120.5	109	2	**402DFL100-S2**
DN 160 CF	171.3	152	2	**402DFL160-S2**
DN 200 CF	222.1	203	2	**402DFL200-S2**
DN 250 CF	272.9	254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

FKM with Centering Lip; Heat-molded



Dimensions



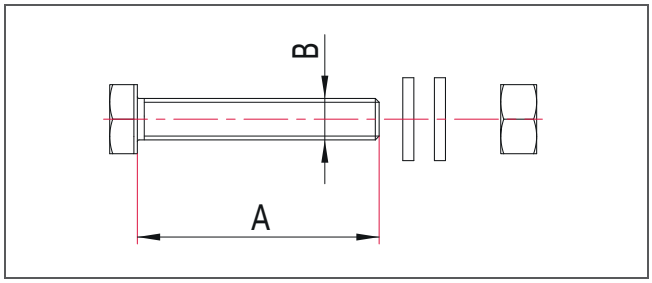
Nominal diameter	A [mm]	B [mm]	Package [Qty.]	Order number
DN 16 CF	21.4	16	1	**402DFL016-Z**
DN 40 CF	48.2	36	1	**402DFL040-Z**
DN 63 CF	82.4	71	1	**402DFL063-Z**
DN 100 CF	120.5	109	1	**402DFL100-Z**
DN 160 CF	171.3	158	1	**402DFL160-Z**
DN 200 CF	222.1	200	1	**402DFL200-Z**
DN 250 CF	272.9	254	1	**402DFL250-Z**

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

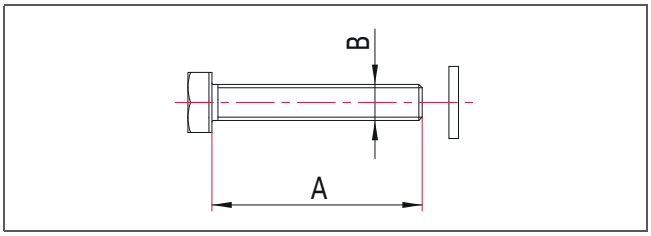
Nominal diameter	A [mm]	B	Number per set	Order number
DN 16 CF	20	M4	6	**420BSC016-20**
DN 25 CF	35	M6	4	**420BSC025-35**
DN 40 CF	35	M6	6	**420BSC040-35**
DN 50 CF	45	M8	8	**420BSC050-45**
DN 63 CF	45	M8	8	**420BSC063-45**
DN 75 CF	45	M8	10	**420BSC075-45**
DN 100 CF	50	M8	16	**420BSC100-50**
DN 130 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

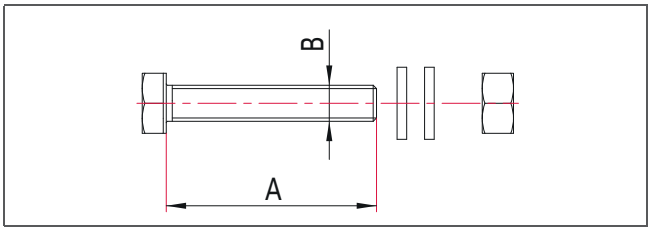
Nominal diameter	A [mm]	B	Number per set	Order number
DN 16 CF	14	M4	6	**420BSC016-14**
DN 40 CF	20	M6	6	**420BSC040-20**
DN 63 CF	30	M8	8	**420BSC063-30**
DN 100 CF	30	M8	16	**420BSC100-30**
DN 160 CF	35	M8	20	**420BSC160-35**
DN 200 CF	35	M8	24	**420BSC200-35**
DN 250 CF	35	M8	32	**420BSC250-35**

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

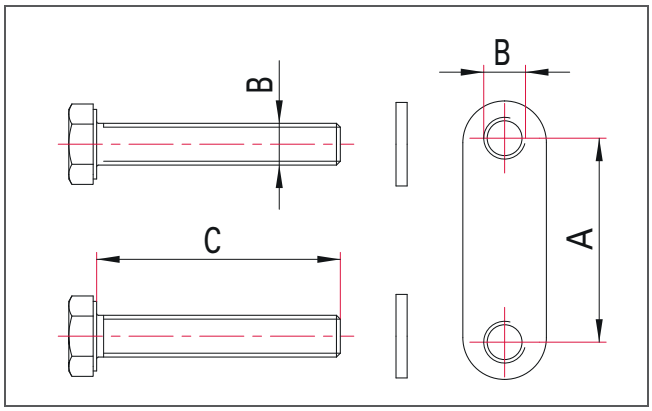
Nominal diameter	A [mm]	B	Number per set	Order number
DN 16 CF	30	M4	6	**420BSC016-30**
DN 40 CF	50	M6	6	**420BSC040-50**
DN 63 CF	65	M8	8	**420BSC063-65**
DN 100 CF	70	M8	16	**420BSC100-70**
DN 160 CF	80	M8	20	**420BSC160-80**
DN 200 CF	90	M8	24	**420BSC200-90**
DN 250 CF	90	M8	32	**420BSC250-90**

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

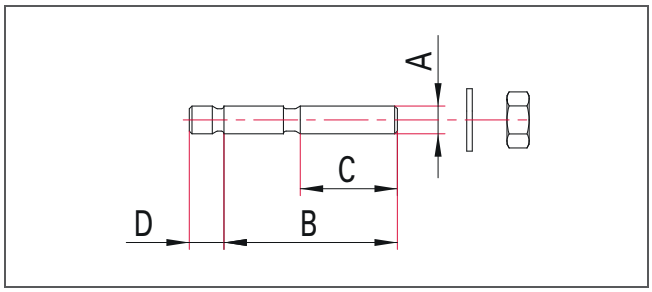
Nominal diameter	A [mm]	B	C [mm]	Number per set	Order number
DN 16 CF	13.5	M4	20	3	**420BMD016**
DN 40 CF	29.3	M6	35	3	**420BMD040**
DN 63 CF	35.2	M8	45	4	**420BMD063**
DN 100 CF	25.4	M8	50	8	**420BMD100**
DN 160 CF	28.3	M8	55	10	**420BMD160**

CF Stud Screw Set with Hexagon Nut



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

Dimensions



Stainless Steel A2

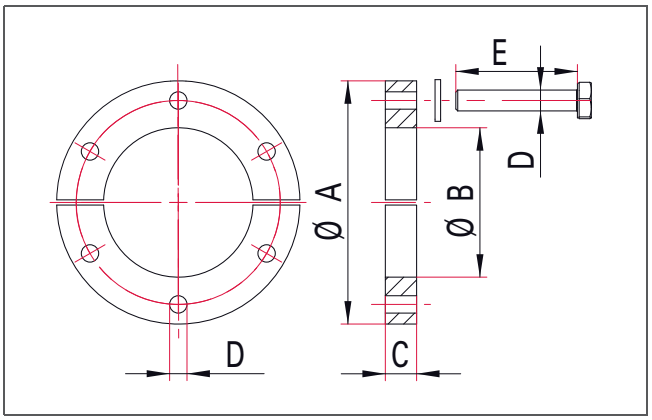
Nominal diameter	A	B [mm]	C [mm]	D [mm]	Order number
DN 25-40 CF	M6	25	18	6	**420BST-M6x25**
DN 25-40 CF	M6	30	18	6	**420BST-M6x30**
DN 25-40 CF	M6	35	18	6	**420BST-M6x35**
DN 63-250 CF	M8	40	22	8	**420BST-M8x40**
DN 63-250 CF	M8	45	22	8	**420BST-M8x45**
DN 63-250 CF	M8	50	22	8	**420BST-M8x50**
DN 63-250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

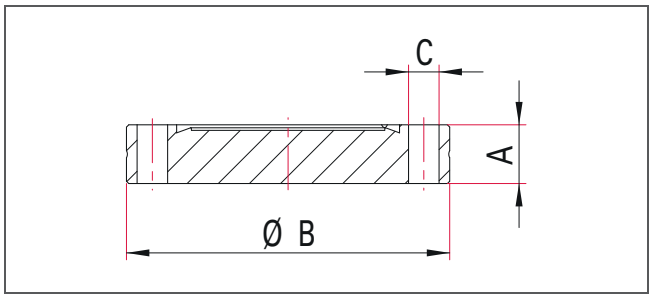
Nominal diameter	A [mm]	B [mm]	C [mm]	D	E [mm]	Order number
DN 16 CF	34	20	6	M4	20	**420BMH016**
DN 40 CF	69.6	45	9	M6	35	**420BMH040**
DN 63 CF	113.5	80	12	M8	45	**420BMH063**
DN 100 CF	151.6	115	12	M8	50	**420BMH100**
DN 160 CF	202.4	165	12	M8	55	**420BMH160**

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**

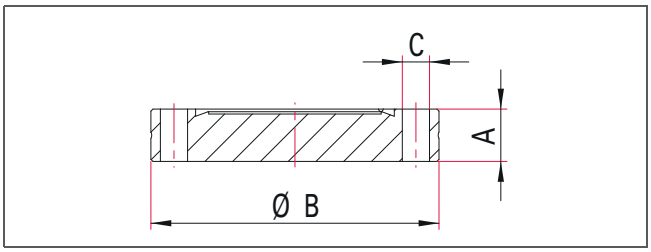
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

CF Blank Flange, with Thread



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range: 1 · 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**

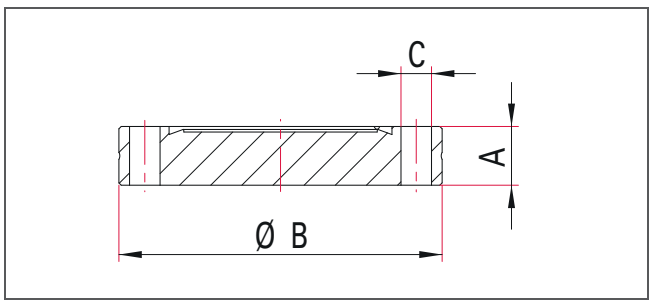
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤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**

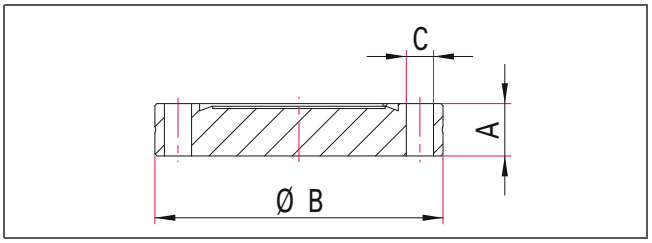
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤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**

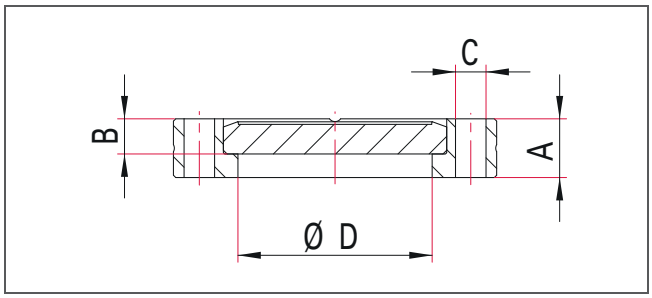
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

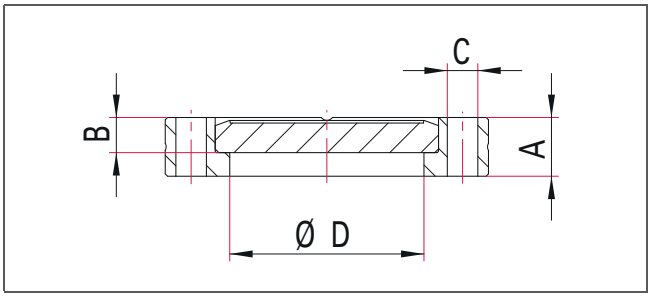
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

CF Blank Flange, Rotatable, 316LN ESR



- Bakeable under vacuum up to 1050 °C
- Low desorption
- Bakeout temperature: up to 450 °C
- Pressure range: 1 · 10^{-13} hPa to ambient pressure
- Magnetic permeability: ≤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**

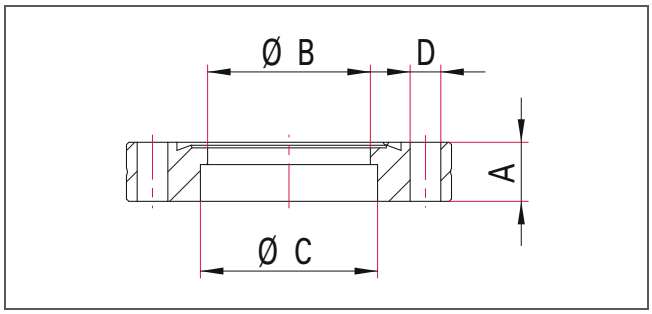
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

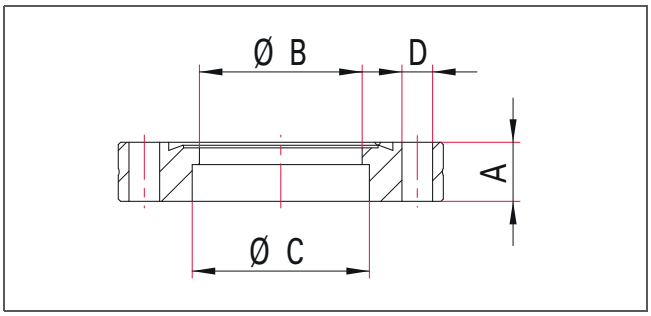
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

CF Weld Flange, with Thread



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range: 1 · 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**

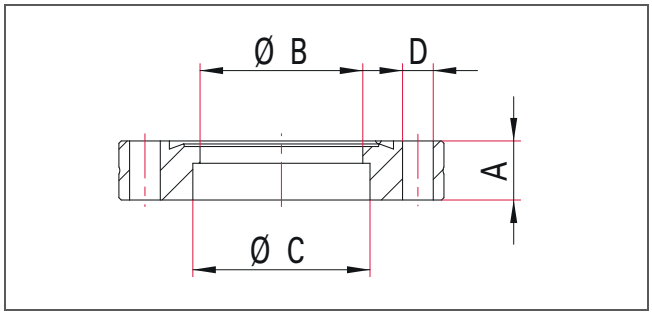
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤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**

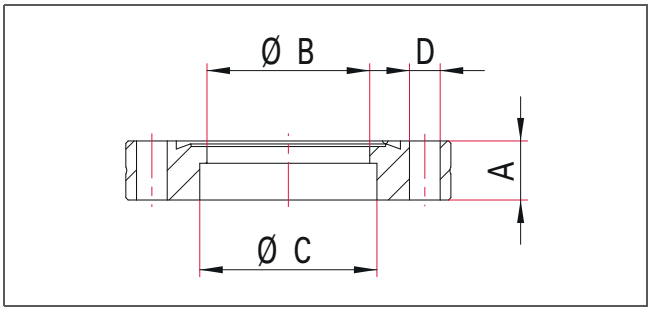
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤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**

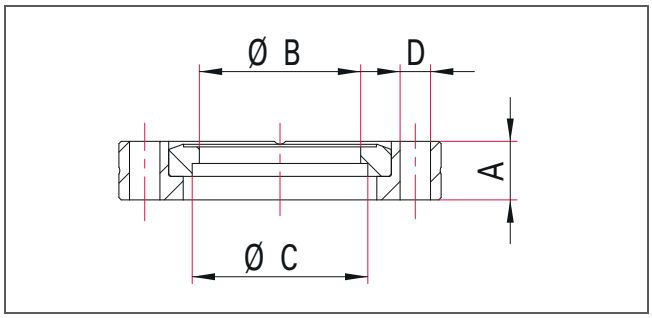
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

CF Weld Flange, Rotatable



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range: 1 · 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**

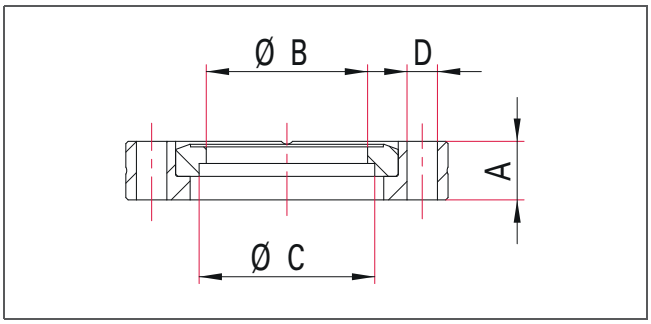
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2.

CF Weld Flange, Rotatable, with Thread



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range: 1 · 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

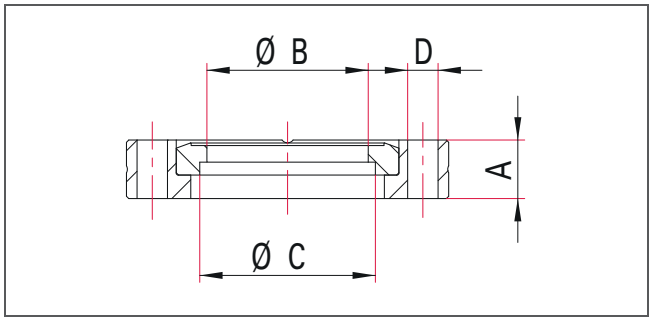
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ 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**

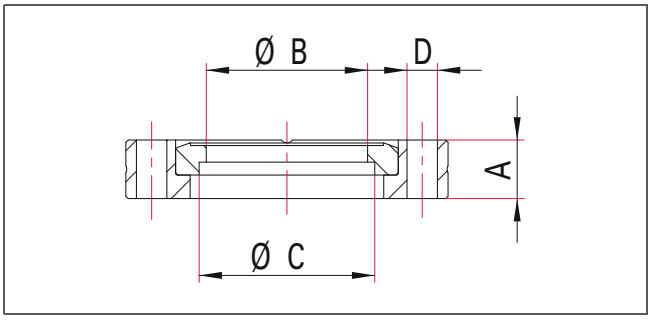
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤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**

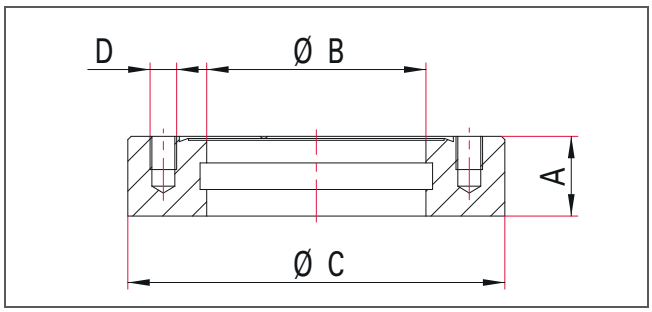
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

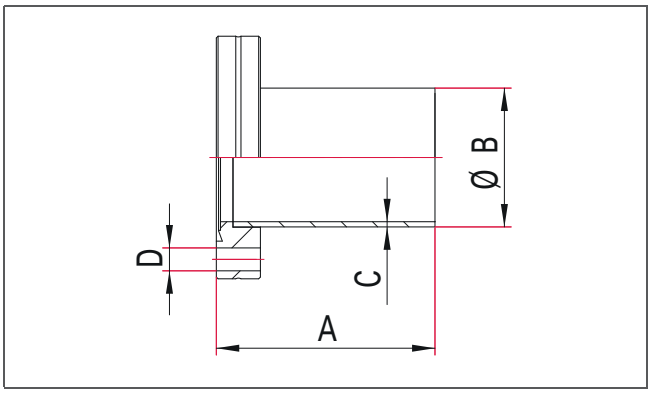
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

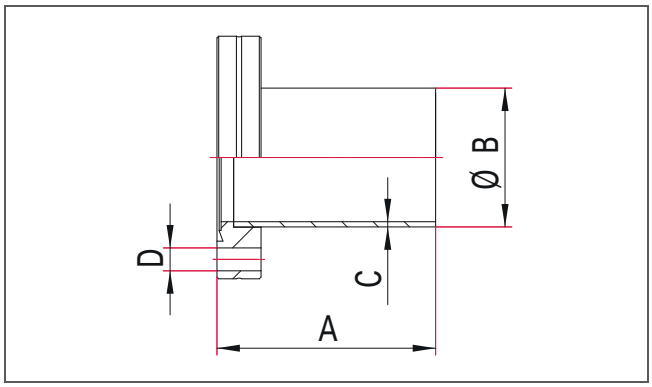
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

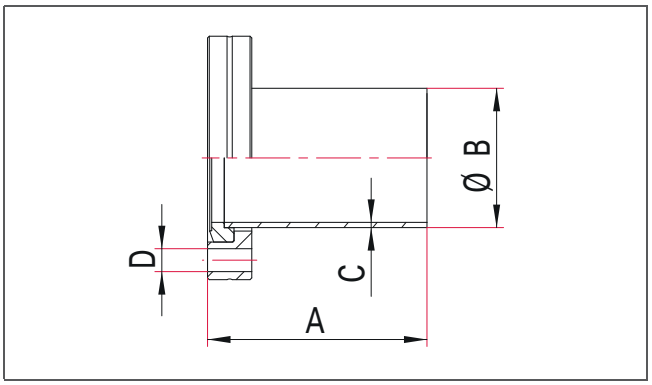
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

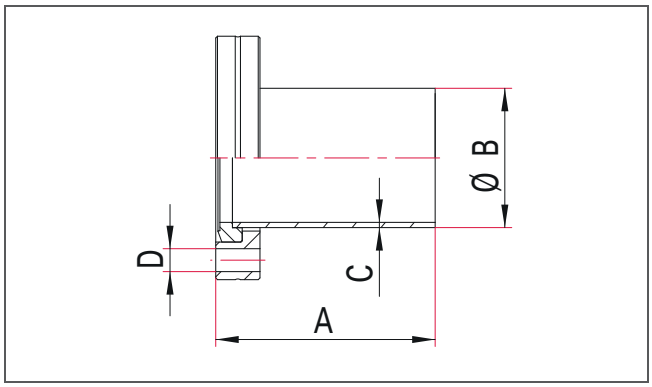
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

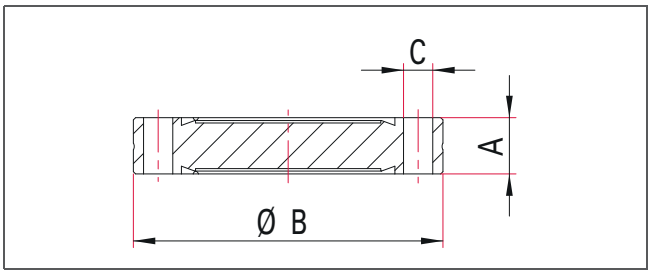
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

CF Spacer Flange



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range: 1 · 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**

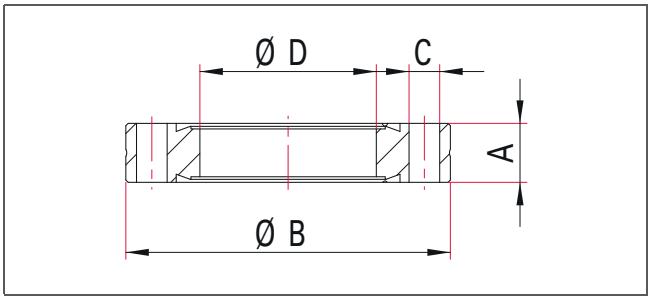
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

CF Spacer Flange with Bore Holes



- Other flange materials on request
- Bakeout temperature: up to 450 °C
- Pressure range: 1 · 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**

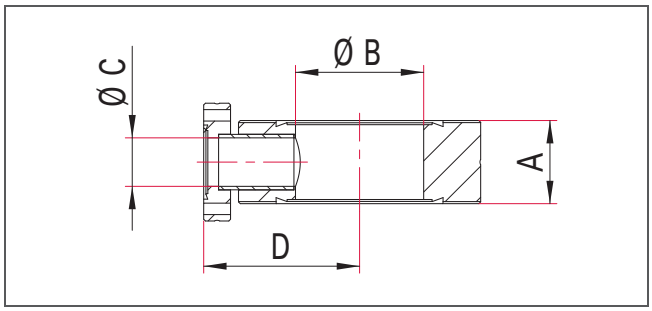
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

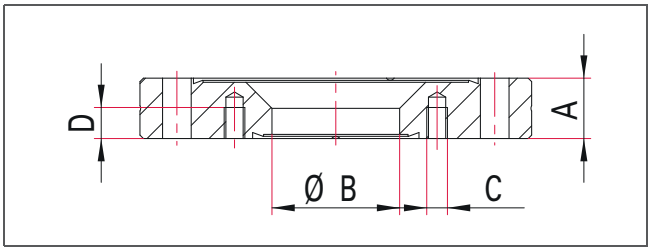
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

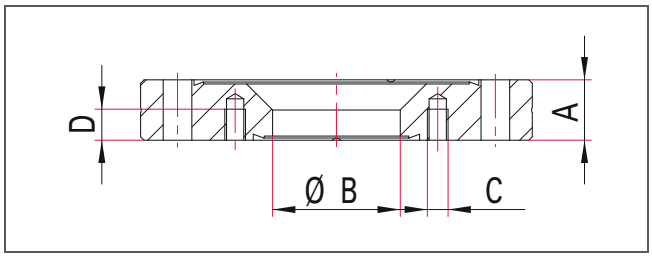
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ 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

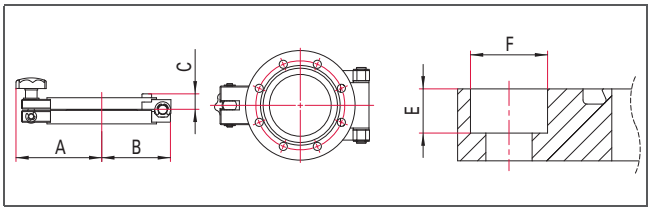
CF Quick-Access-Door

- 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



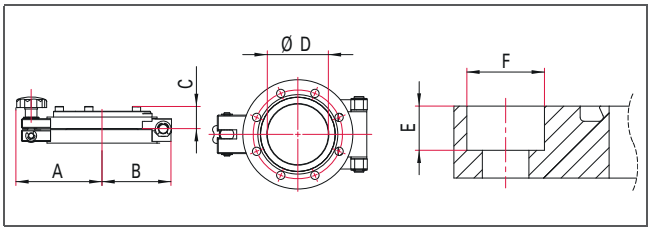


Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 CF	88	72	16	-	10	16	**420KTU063**
DN 100 CF	108	93	16	-	10	16	**420KTU100**
DN 160 CF	134	119	20	-	10	16	**420KTU160**
DN 200 CF	160	145	20	-	10	16	**420KTU200**
DN 250 CF	186	171	20	-	10	16	**420KTU250**

Stainless Steel, with Sight Glass

Dimensions





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

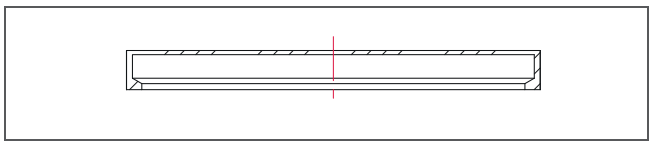
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	Order number
DN 63 CF	88	72	23	63	10	16	**420KTU063-G**
DN 100 CF	108	93	27	95	10	16	**420KTU100-G**
DN 160 CF	134	119	31	145	10	16	**420KTU160-G**
DN 200 CF	160	145	31	145	10	16	**420KTU200-G**
DN 250 CF	186	171	31	145	10	16	**420KTU250-G**

CF Flange Cap



- Made from plastic

Dimensions



Polyethylene (PE)

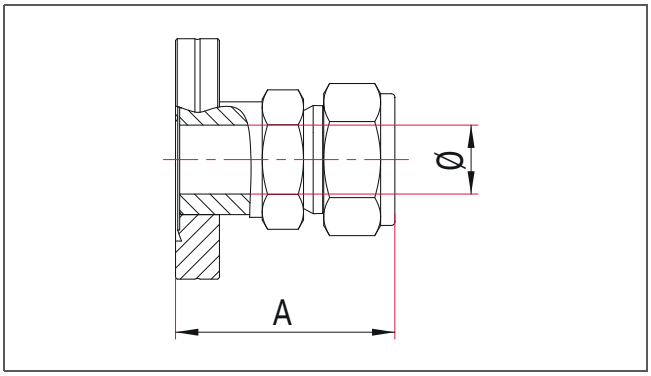
Nominal diameter	Package [Qty.]	Order number
DN 16 CF	10	**430FSK016-S10**
DN 40 CF	10	**430FSK040-S10**
DN 63 CF	10	**430FSK063-S10**
DN 100 CF	10	**430FSK100-S10**
DN 160 CF	5	**430FSK160-S5**
DN 200 CF	5	**430FSK200-S5**
DN 250 CF	5	**430FSK250-S5**

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

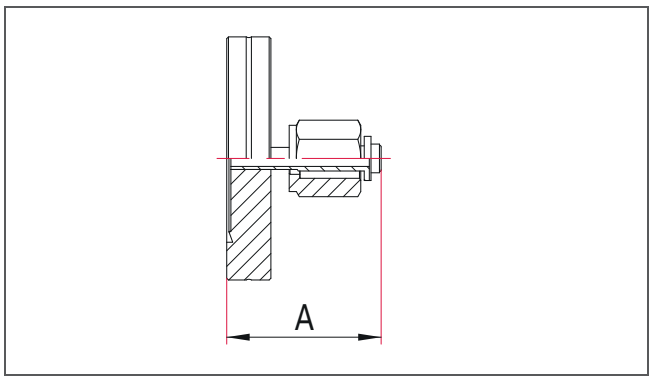
CF-VCR Adapter, Male and Female

- Original Swagelok® VCR-Adapter
- Other flange sizes and VCR adapters on request
- Tightness: < $1 \cdot 10^{-11}$ Pa m^3/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



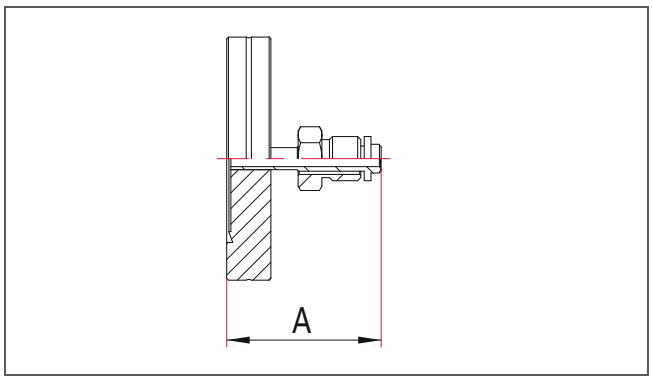
Nominal diameter	VCR connection	A [mm]	Order number
DN 16 CF	1/4"	44	**420AVF016-0250**
DN 16 CF	1/2"	47	**420AVF016-0500**
DN 40 CF	1/4"	44	**420AVF040-0250**
DN 40 CF	1/2"	47	**420AVF040-0500**

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**

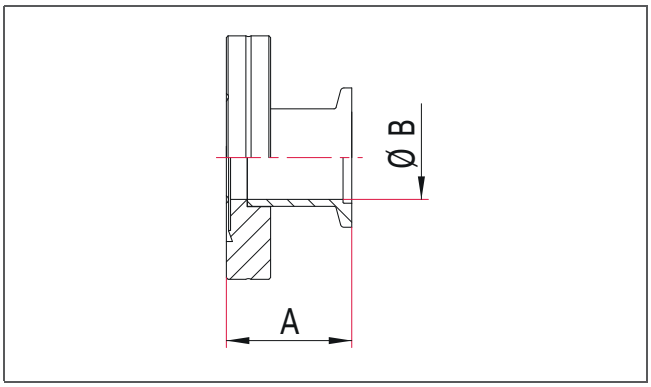
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

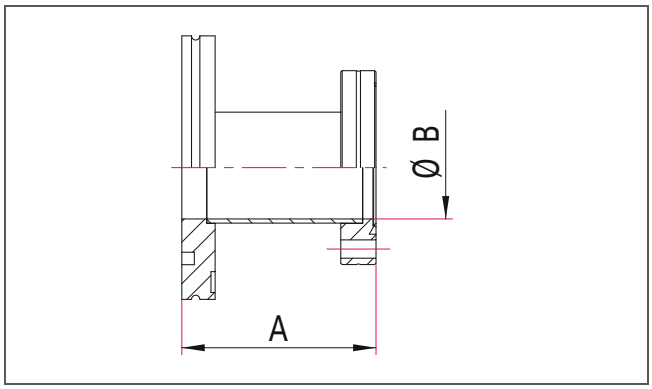
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

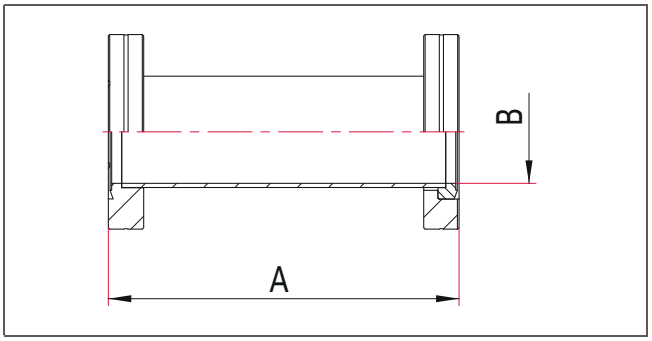
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2
ISO-K Flanges according to ISO 1609

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

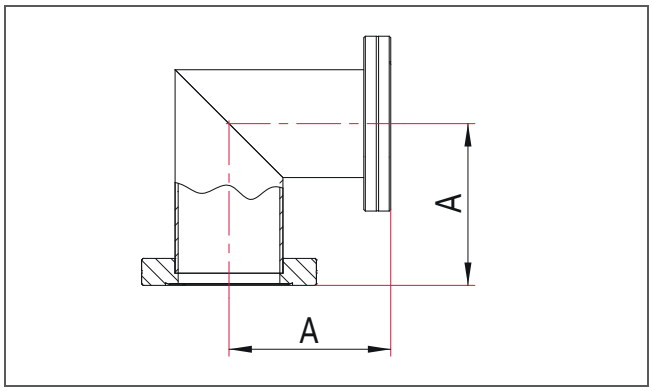
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

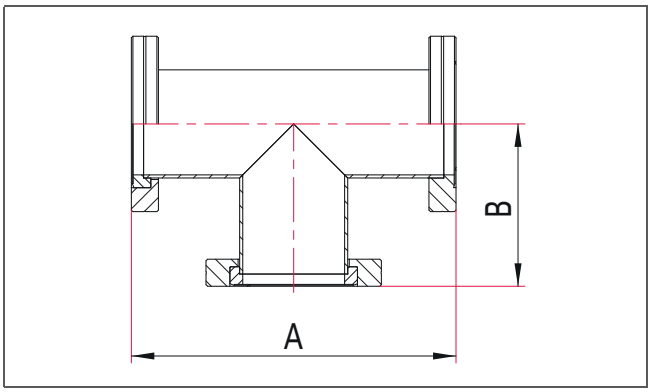
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

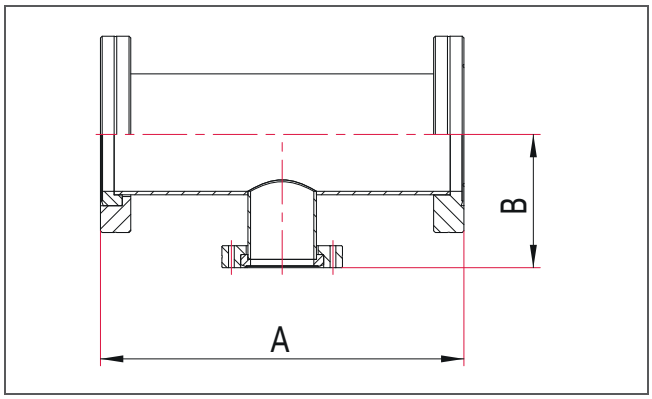
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

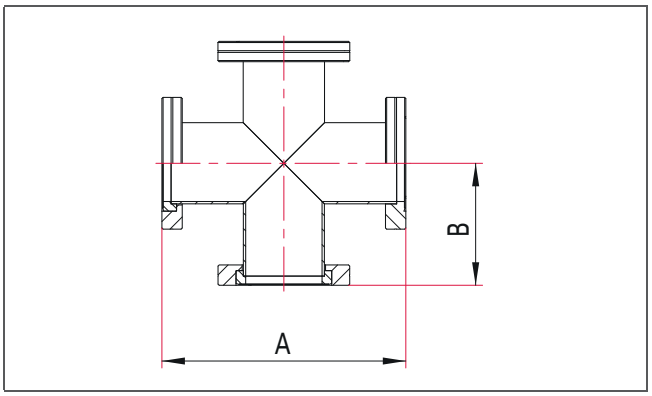
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

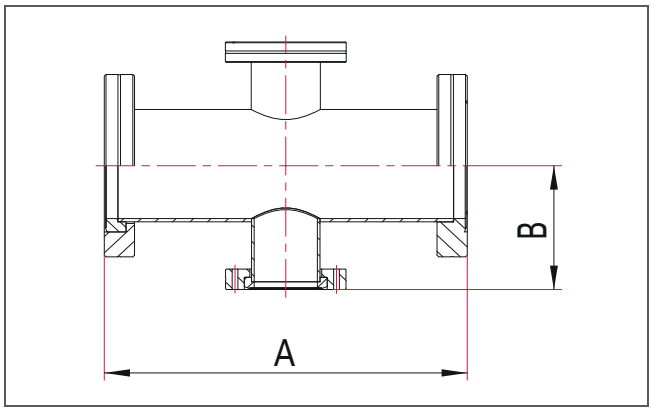
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

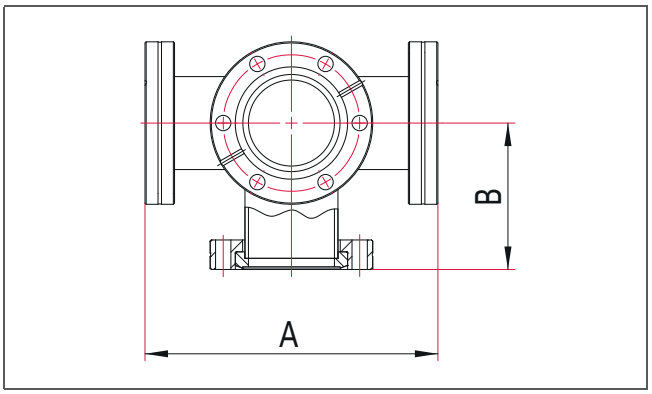
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

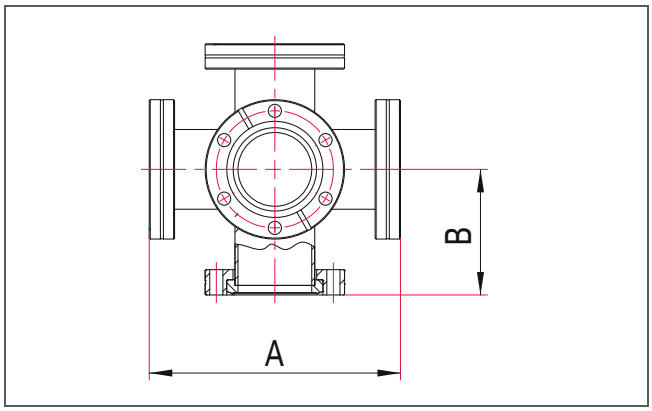
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m³/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**

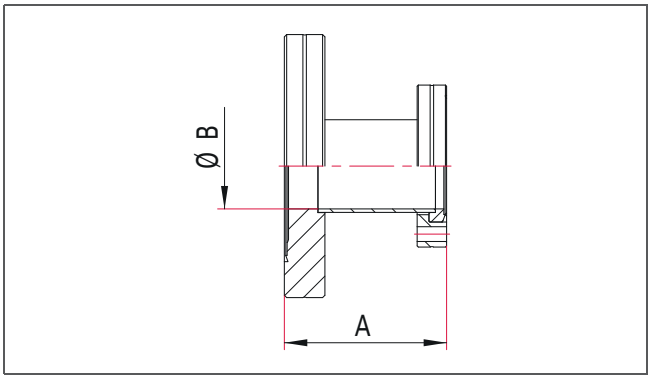
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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: ≤ $1 \cdot 10^{-11}$ Pa m^3/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**

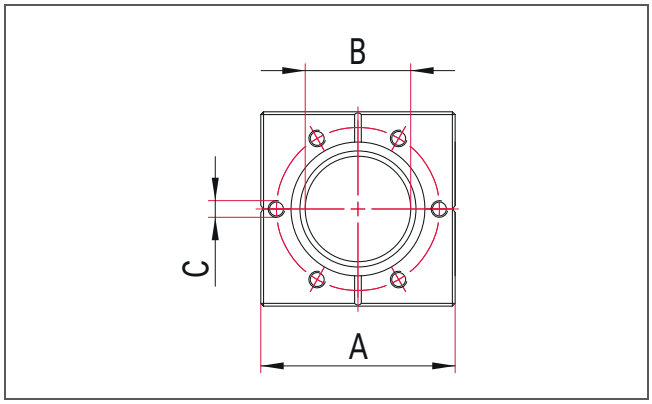
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

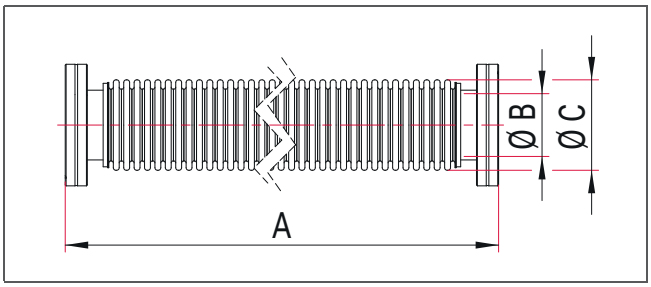
Nominal diameter	A [mm]	B [mm]	C	Thread depth [mm]	Order number
DN 16 CF	35	16	M4	5	**470RKK016**
DN 40 CF	70,5	38	M6	8	**470RKK040**
DN 63 CF	114	66	M8	8	**470RKK063**
DN 100 CF	155	104	M8	8	**470RKK100**
DN 160 CF	208	155	M8	8	**470RKK160**

ISO-CF Corrugated Hose, Flexible



- One flange rotatable
- Other lenghts on request
- Pressure range: 1 · 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**

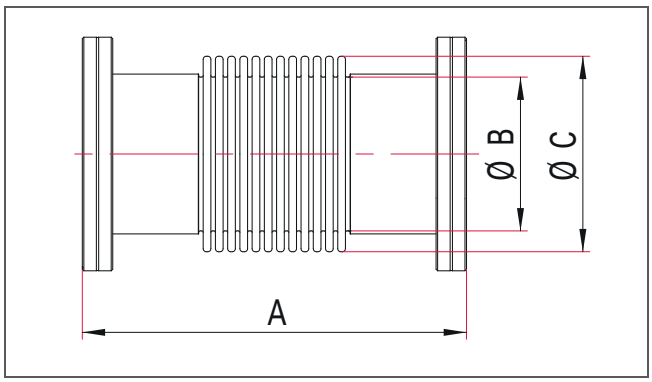
Please note that the hose shrinks under vacuum.
The minimum bending radii are applicable for a temperature of 20 °C.
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

ISO-CF Spring Bellows



- One flange rotatable
- Other lenghts 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**

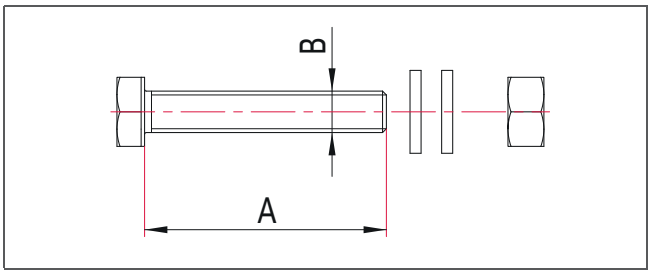
Please note that the spring bellows shrinks under vacuum.
The axial stroke is applicable for a temperature of 20 °C and 10000 load cycles.
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

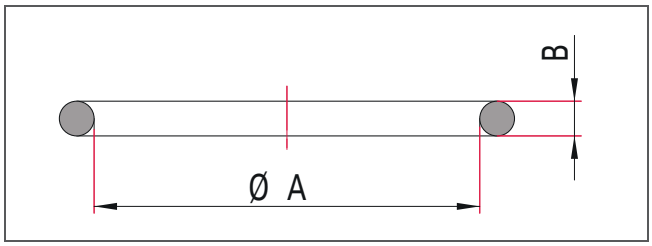
Nominal diameter	A [mm]	B	Package [Qty.]	Order number
DN 400 COF	75	M12	36	**670BSC400**
DN 450 COF	90	M16	36	**670BSC450**
DN 500 COF	100	M16	36	**670BSC500**
DN 600 COF	100	M16	40	**670BSC600**
DN 800 COF	100	M16	52	**670BSC800**

COF Elastomer Seal



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

Dimensions



FKM

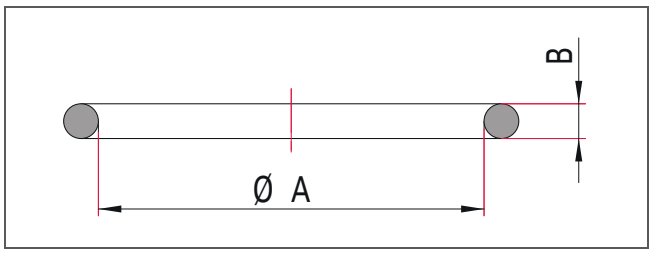
Nominal diameter	A [mm]	B [mm]	Order number
DN 400 COF	436	2.5	**602DOR400-S1**
DN 400 COF	491	2.5	**602DOR450-S1**
DN 500 COF	535	2.5	**602DOR500-S1**
DN 600 COF	635	2.5	**602DOR600-S1**
DN 800 COF	835	2.5	**602DOR800-S1**

COF Copper Wire Seal



- For single use only
- Pressure range: 1 · 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**

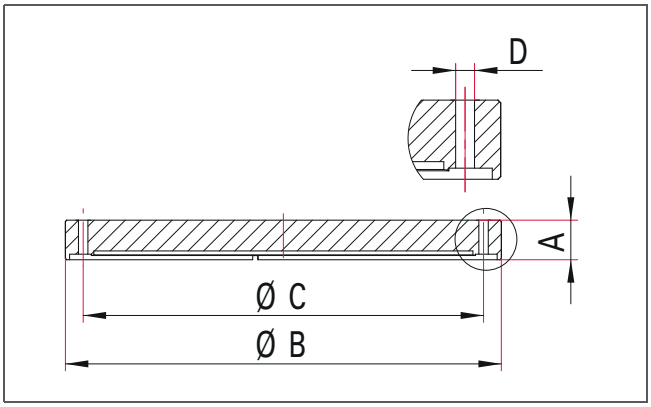
COF Blank Flange

- 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

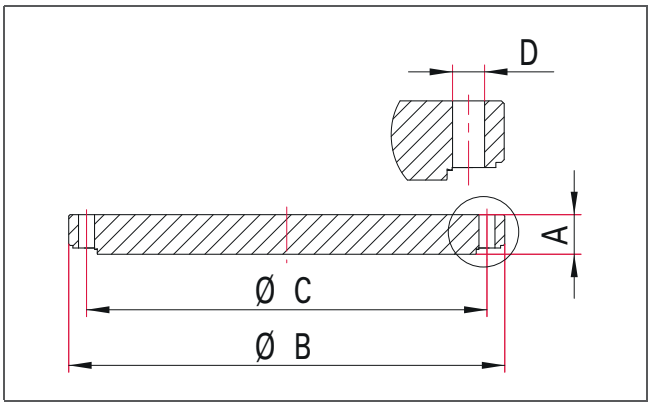


Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 400 COF	33	497	454	13	**620FBF400**
DN 450 COF	38	562	513.1	17	**620FBF450**
DN 500 COF	43	595	559	17	**620FBF500**
DN 600 COF	43	690	661	17	**620FBF600**
DN 800 COF	43	890	859	17	**620FBF800**

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**

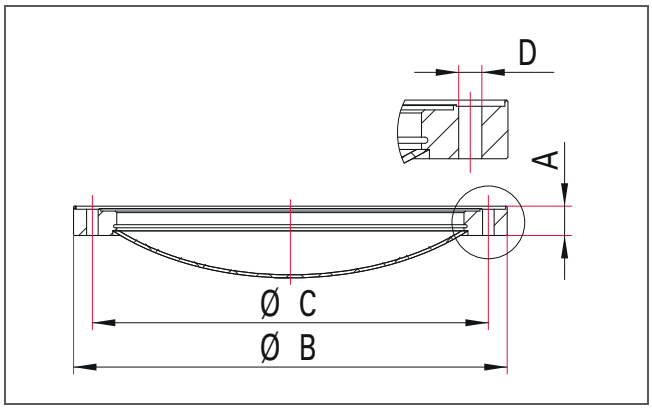
COF Blank Flange, with Domed Stainless Steel Disk or Dished Head

- 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

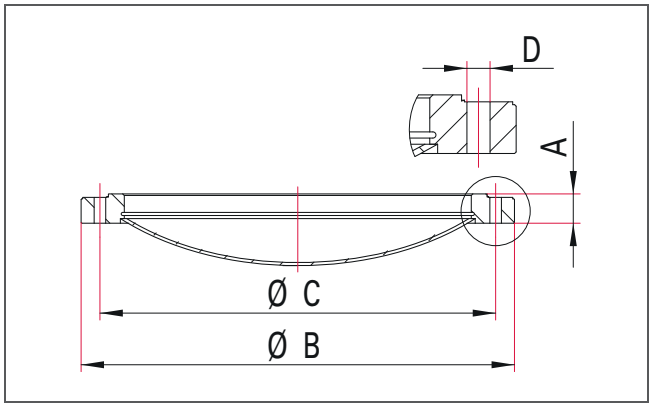


Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 400 COF	33	497	454	13	**620FBF400-S**
DN 450 COF	38	562	513.1	17	**620FBF450-S**
DN 500 COF	43	595	559	17	**620FBF500-S**
DN 600 COF	43	690	661	17	**620FBF600-S**
DN 800 COF	43	890	859	17	**620FBF800-S**



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**

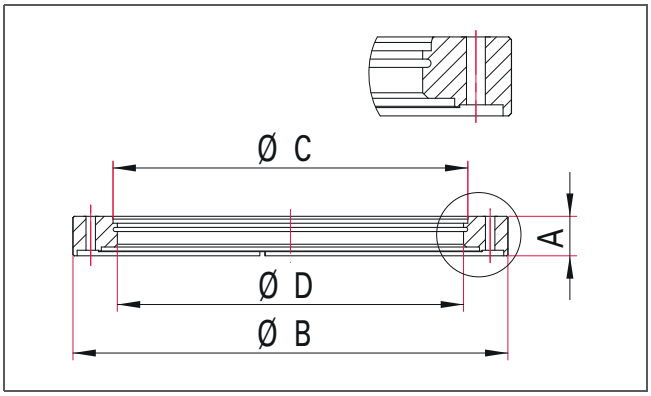
COF Weld Flange

- 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

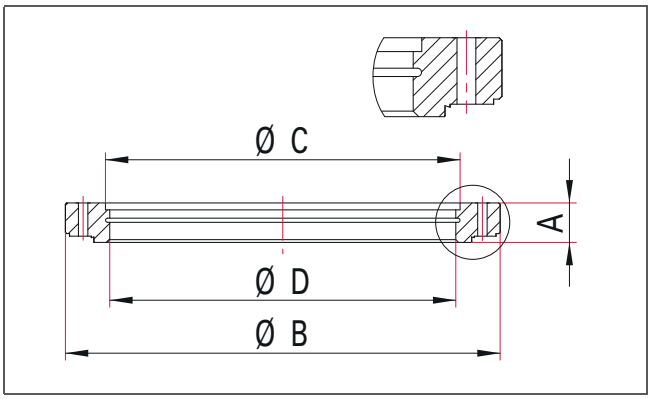


Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 400 COF	406 x 3	33	497	406.3	400	**620FAF400**
DN 450 COF	458 x 4	38	562	458.5	450	**620FAF450**
DN 500 COF	508 x 4	43	595	508.5	500	**620FAF500**
DN 600 COF	610 x 5	43	690	610.5	600	**620FAF600**
DN 800 COF	812 x 6	43	890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

Stainless Steel, Male



Dimensions



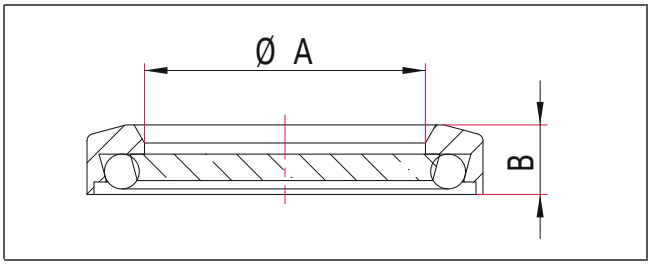
Nominal diameter	Tube dimension [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
DN 400 COF	406 x 3	33	497	406.3	400	**620FAM400**
DN 450 COF	458 x 4	38	562	458.5	450	**620FAM450**
DN 500 COF	508 x 4	43	595	508.5	500	**620FAM500**
DN 600 COF	610 x 5	43	690	610.5	600	**620FAM600**
DN 800 COF	812 x 6	43	890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

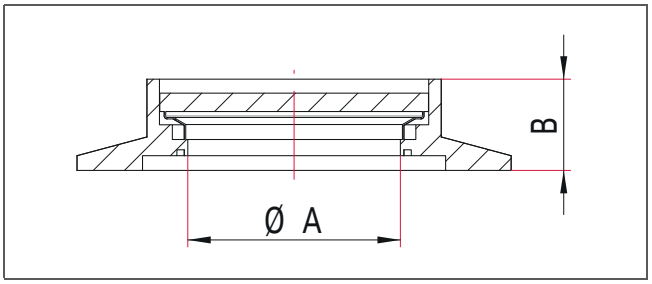
Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage.

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**

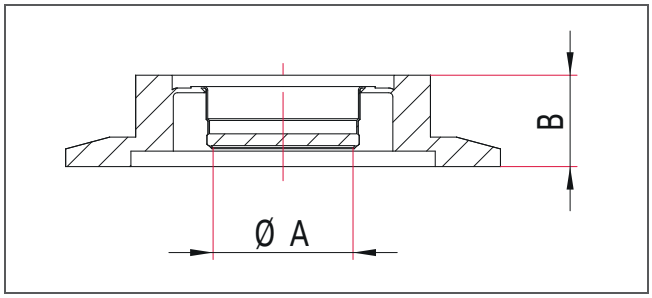
Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage.
Flanges according to ISO 2861

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**

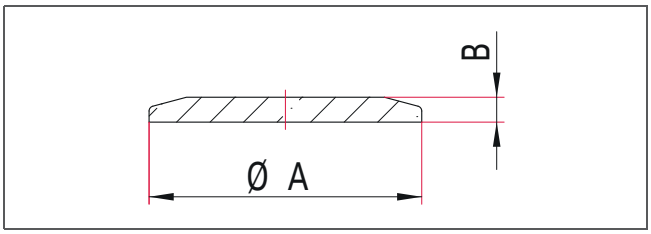
Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage.
Flanges according to ISO 2861

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**

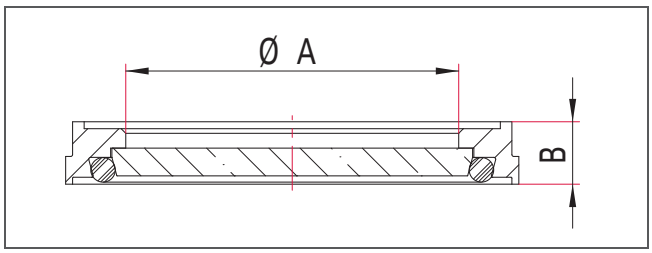
Caution! Risk of injury by glass splinters. Do not use Glass Blank Flange which show apparent damage.

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**

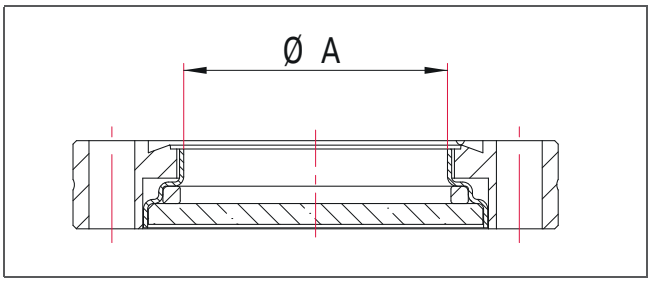
Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage.

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**

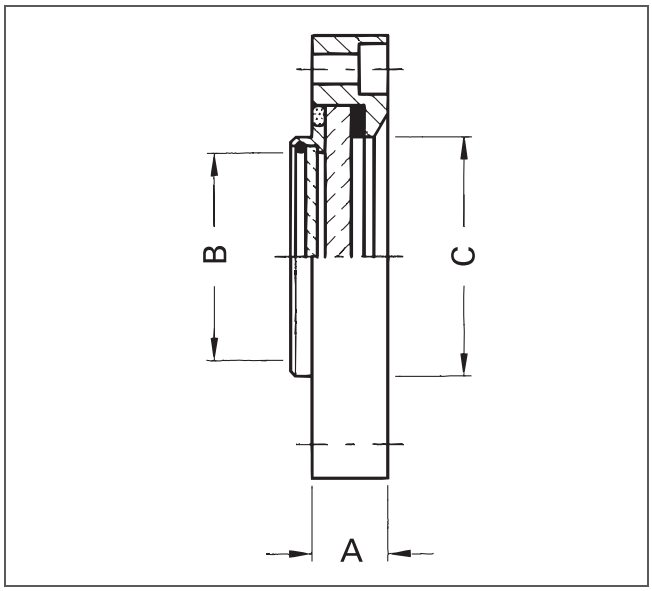
Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage.
Please use annealed copper gaskets or elastomer seals to minimize stress inside the glass.
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

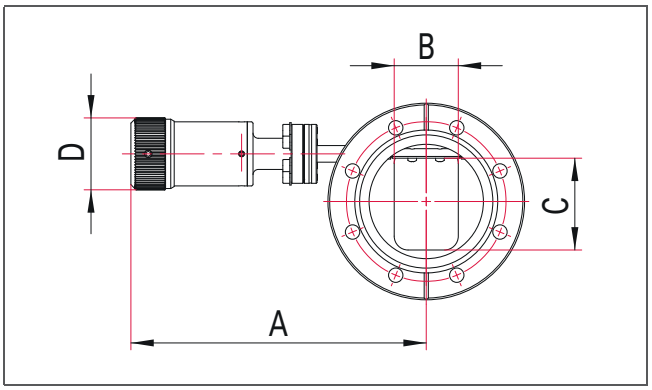
Caution! Risk of injury by glass splinters. Do not use viewports which show apparent damage

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^3/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**

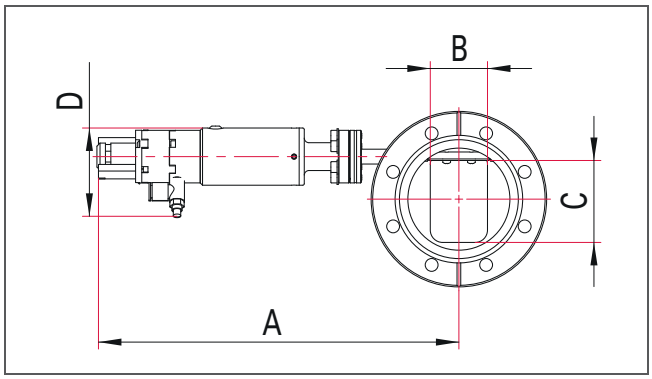
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

CF Shutter, Pneumatic



- 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^3/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

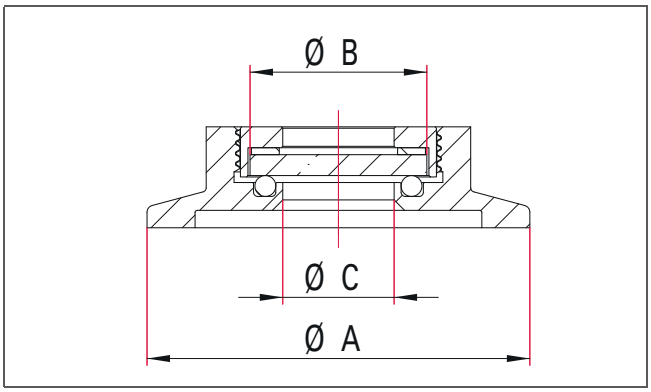
These retainers can be used for vacuum-tight installation of 1" (24.8 to 25.8 mm) or 2" (49.8 to 51 mm) optical glasses. These are the standard sizes offered by many manufacturers in optical quality. We offer a wide range of the most commonly used optical glasses as accessories.

- 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



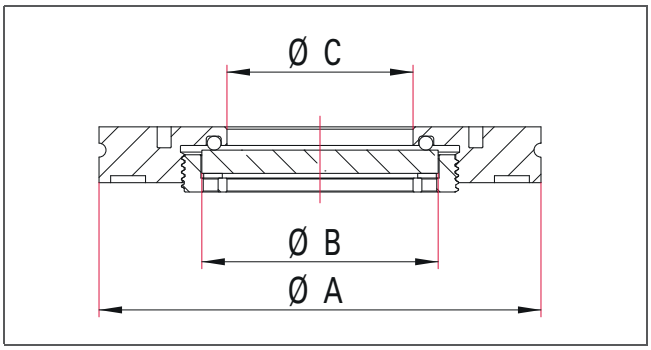
Nominal diameter	A [mm]	B [mm]	C [mm]	Glass thickness [mm]	Order number
DN 40 KF	55	24.8-25.8	16	3-7	**120GAG040-25**

Flanges according to ISO 2861

ISO-K Flange with Viewport Retainer/Stainless Steel



Dimensions



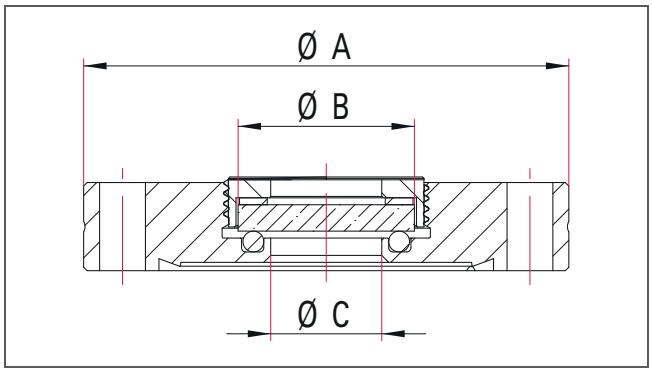
Nominal diameter	A [mm]	B [mm]	C [mm]	Glass thickness [mm]	Order number
DN 63 ISO-K	95	49.8-51	40	3.8-8	**320GAG063-50**

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 µm
- Extremely temperature-resistent; 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 µm
- Parallelism: 3 arc minutes
- Planarity: 2 wavelengths at 633 nm
- Surface quality: 40/20 scratch/dig
- Temperature range: up to 200 °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 µm
- Parallelism: 3 arc minutes
- Planarity: 1 wavelength at 633 nm
- Surface quality: 40/20 scratch/dig
- Temperature range: up to 350 °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 µm
- Parallelism: 3 arc minutes
- Planarity: 1/20 wavelength at 10.6 µm
- Surface quality: 60/40 scratch/dig
- Temperature range: up to 200 °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 Perfluorpolyether

- 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 N845 804-T**
10 g	-20 to 200	$1 \cdot 10^{-12}$	Grease for sliding elastomer seals under vacuum	**B 2751 055 UB**
30 g	-60 to 300	$1 \cdot 10^{-12}$	Grease for sliding elastomer seals under vacuum	**B N845 805-T**

Sealants

- For sealing small leaks
- Available as spray or paste

Sealants

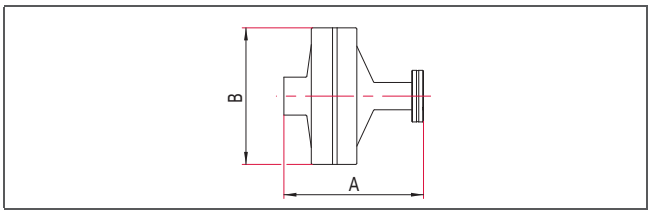
Application	Quantity [g]	Temperature range [°C]	Order number
Spray	170	up to 350	**B 2751 049-E**
Paste	100	-40 to 200	**B 2753 420-K**

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: < $1 \cdot 10^{-11}$ Pa m^3/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**

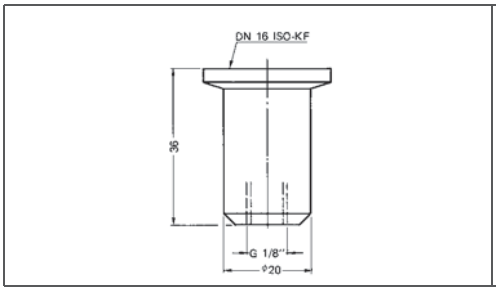
Burst pressure = overpressure
Burst pressure data refer to temperature of 22 °C. Burst pressure drops with rising temperatures.
To be used for vacuum chambers. No safety component in terms of the machinery directive 2006/42/EC.

Pressure Relief Valves

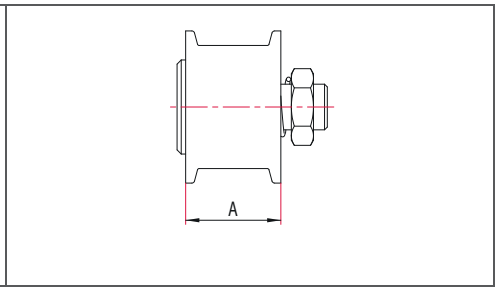


- Protects vacuum systems from over pressures

Dimensions



PF I30 032



120VUS016
120VUS040

Pressure Relief Valves

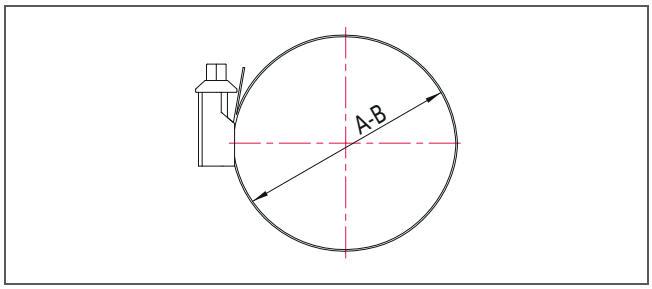
Nominal diameter	Tightness [Pa m^3/s]	Can be opened to a pressure difference of [hPa]	Differential pressure	Order number
DN 16 KF	$1 \cdot 10^{-9}$	200 to 500	not modifiable	**PF I30 032**
DN 40 KF	$1 \cdot 10^{-9}$	app. 400	modifiable to app. +/- 100 hPa	**120VUS016**
DN 40 KF	$1 \cdot 10^{-9}$	app. 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

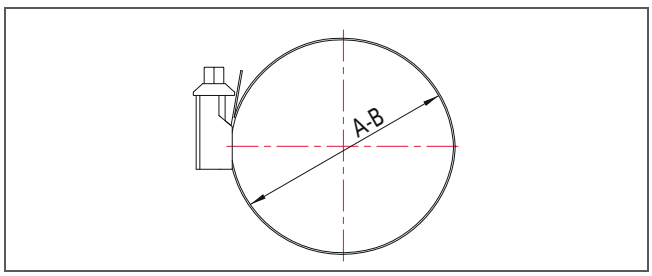
Nominal diameter	A [Max. Ø mm]	B [Min. Ø mm]	Order number
DN 16 KF	22	12	**150SSS016**
DN 25 KF	32	20	**150SSS025**
DN 40 KF	50	35	**150SSS040**
DN 50 KF	60	40	**150SSS050**

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

Valves

Vacuum-safe blocking, dosage and control



Contents

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Valves

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.



Overview of series and applications

■ = recommended	Analytics						Semiconductors									Coating										Industry										R & D									Page
	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	Fusion technology	Plasma research	Particle accelerator	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Valves																																											
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
Gas dosing valves	■	■	■	■	■	■	■	■	■	■	■	■		■	■			■		■	■	■	■	■	■	■	■							■	■	■	■	■	■	■	■	■	282
Gas regulating valves	■	■	■	■	■	■	■	■	■	■	■	■			■			■								■	■							■	■	■	■	■	■	■	■	■	286
Ball valves								■	■	■			■	■						■	■			■	■		■	■	■	■	■	■			■			■	■	■	■	■	294

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	
Valves																						
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
Gas dosing valves		■	■		■							■				■	■		■		■	282
Gas regulating valves	■		■		■							■					■		■		■	286
Ball valves			■	■	■							■					■	■	■	■		294



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 metallically-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.



Diaphragm valves

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 overpressure 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.



Mini angle and mini inline valves

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 hPa · l/s, e.g. for manual venting, to excellently reproducible gas flows in the high vacuum range, to the lowest gas flows of $1 \cdot 10^{-10}$ hPa · 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.



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^3/s for high vacuum valves, 10^{-11} Pa m^3/s for UHV valves, and 10^{-7} Pa m^3/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.

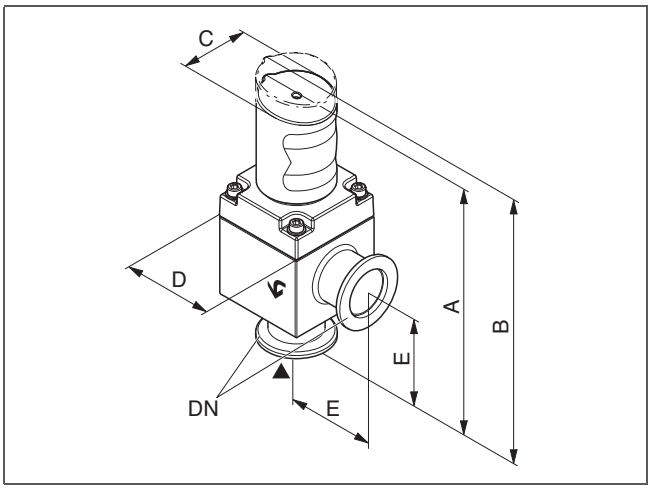
Angle valves, manual, DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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
Order number	**PF A31 003**	**PF A41 003**	**PF A51 003**

	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
Order number	**PF A31 033**	**PF A41 033**	**PF A51 033**

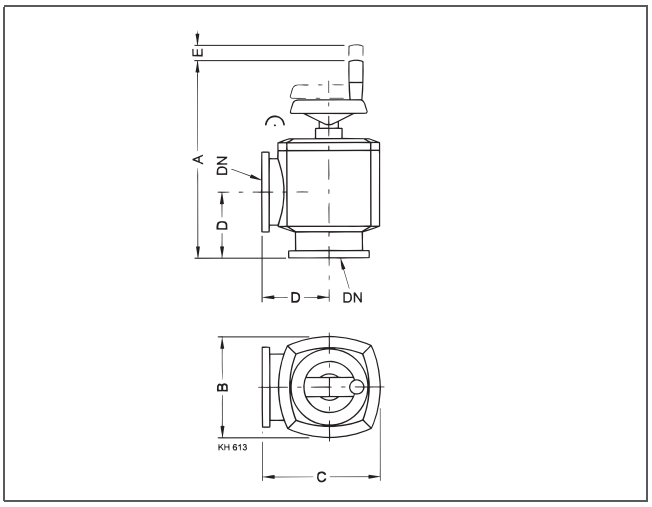
Angle valves, manual, DN 63 to 100 ISO-K



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/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
Order number	**PF B12 001**	**PF B22 001**

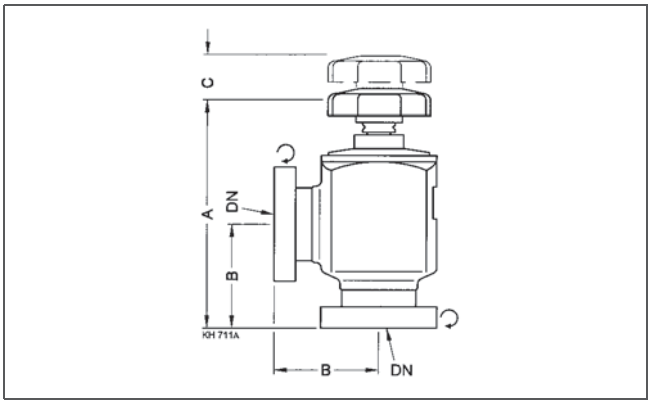
	EVB 063 SX	EVB 100 SX
Housing	Stainless steel	Stainless steel
Weight	6.5 kg	11.1 kg
Order number	**PF B12 031**	**PF B22 031**

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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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

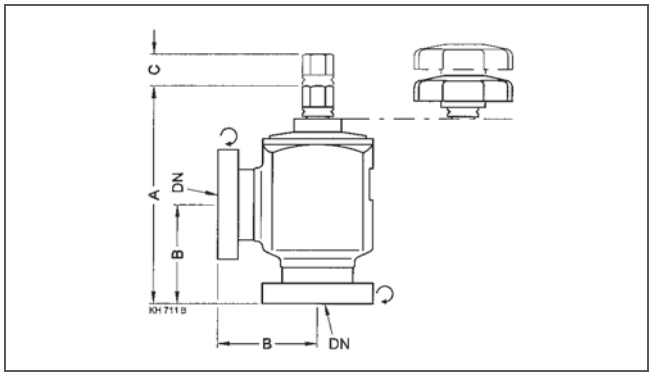
Order number			
Angle valves	**PF C32 032**	**PF C52 032**	**PF C62 032**

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 m³/s	$5 \cdot 10^{-13}$ Pa m³/s	$5 \cdot 10^{-13}$ Pa m³/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**

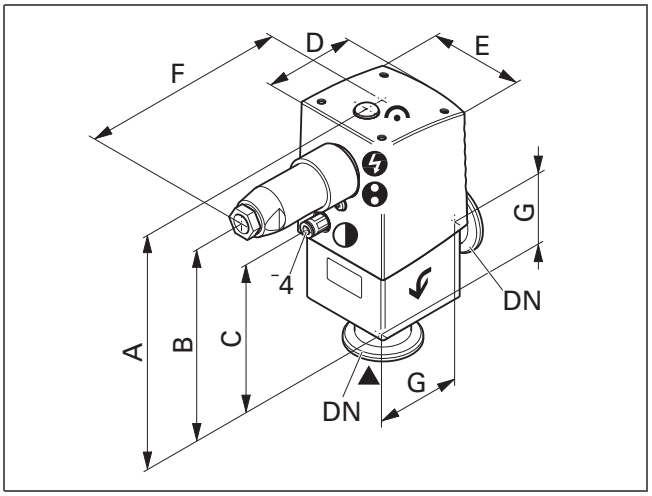
Angle valves, electropneumatic, with PI, with PV, DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	11 cm³	35 cm³
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
Order number	**PF A38 103**	**PF A48 103**	**PF A58 103**
Supply	24 V DC	24 V DC	24 V DC
Order number	**PF A38 204**	**PF A48 204**	**PF A58 204**
Supply	100-115 V AC	100-115 V AC	100-115 V AC
Order number	**PF A38 403**	**PF A48 403**	**PF A58 403**
Supply	200-230 V AC	200-230 V AC	200-230 V AC
Order number	**PF A38 403**	**PF A48 503**	**PF A58 503**

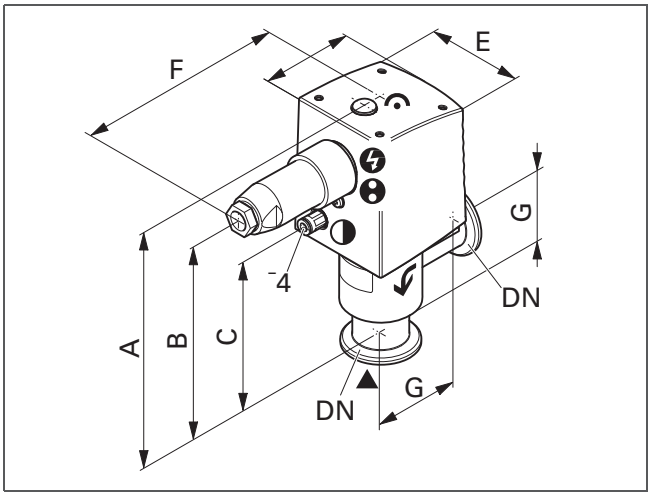
Angle valves, electropneumatic, with PI, with PV, DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	11 cm³	35 cm³
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
Order number	**PF A38 133**	**PF A48 133**	**PF A58 133**
Supply	24 V DC	24 V DC	24 V DC
Order number	**PF A38 234**	**PF A48 234**	**PF A58 234**
Supply	100-115 V AC	100-115 V AC	100-115 V AC
Order number	**PF A38 433**	**PF A48 433**	**PF A58 533**
Supply	200-230 V AC	200-230 V AC	200-230 V AC
Order number	**PF A38 533**	**PF A48 533**	**PF A58 533**

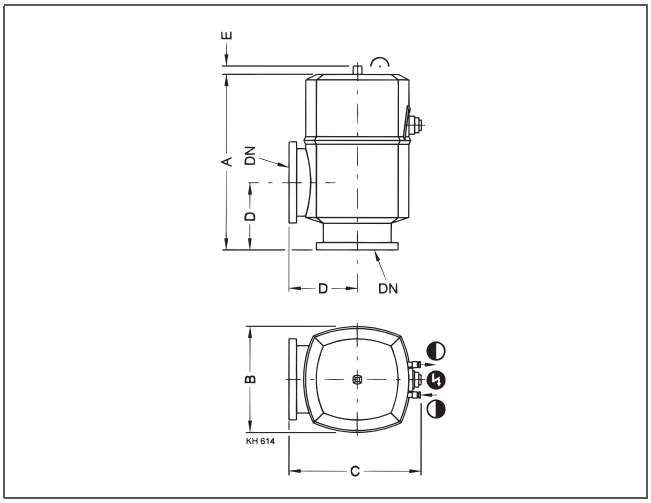
Angle valves, electropneumatic, with PI, with PV, DN 63 to 160 ISO-K



- 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.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	195 cm³	570 cm³
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
Order number	**PF B18 101**	**PF B28 101**	**PF B38 101**
Supply	24 V DC	24 V DC	24 V DC
Order number	**PF B18 201**	**PF B28 201**	**PF B38 201**
Supply	100-115 V AC	100-115 V AC	100-115 V AC
Order number	**PF B18 401**	**PF B28 401**	**PF B38 401**
Supply	200-240 V AC	200-240 V AC	200-240 V AC
Order number	**PF B18 501**	**PF B28 501**	**PF B38 501**

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
Order number	**PF B18 131**	**PF B28 131**
Supply	24 V DC	24 V DC
Order number	**PF B18 231**	**PF B28 231**
Supply	100-115 V AC	100-115 V AC
Order number	**PF B18 431**	**PF B28 431**
Supply	200-240 V AC	200-240 V AC
Order number	**PF B18 531**	**PF B28 531**

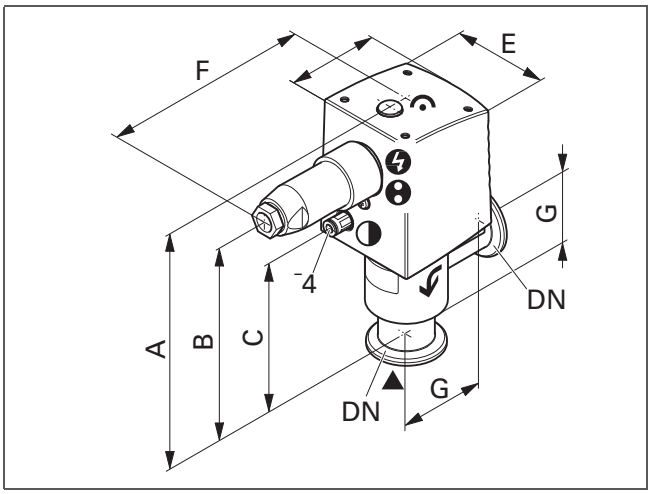
Angle valves, pneumatic, with PI, without PV, DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	11 cm³	35 cm³
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
Order number	**PF A36 003**	**PF A46 003**	**PF A56 003**

	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
Order number	**PF A36 033**	**PF A46 033**	**PF A56 033**

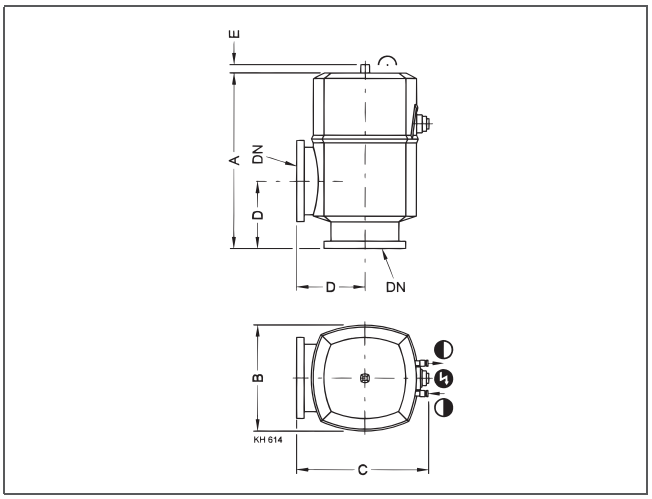
Angle valves, pneumatic, with PI, without PV, DN 63 to 160 ISO-K



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	195 cm³	570 cm³
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
Order number	**PF B16 002**	**PF B26 002**	**PF B36 002**

	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
Order number	**PF B16 032**	**PF B26 032**

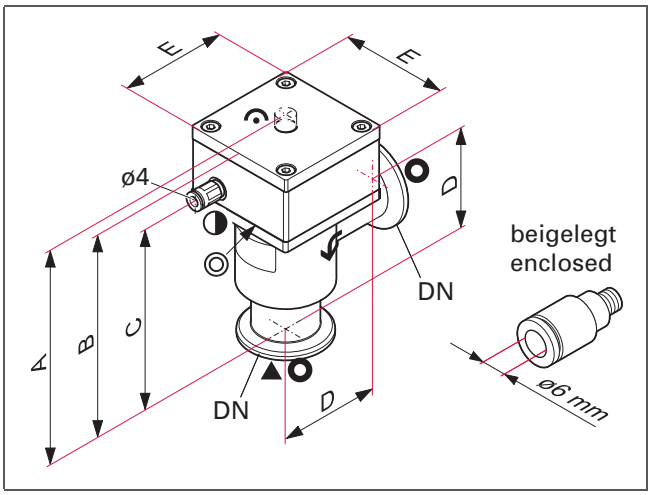
Angle valves, pneumatic, without PI, without PV, DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	11 cm³	35 cm³
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
Order number	**PF A35 004**	**PF A45 004**	**PF A55 004**

	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
Order number	**PF A35 034**	**PF A45 034**	**PF A55 034**

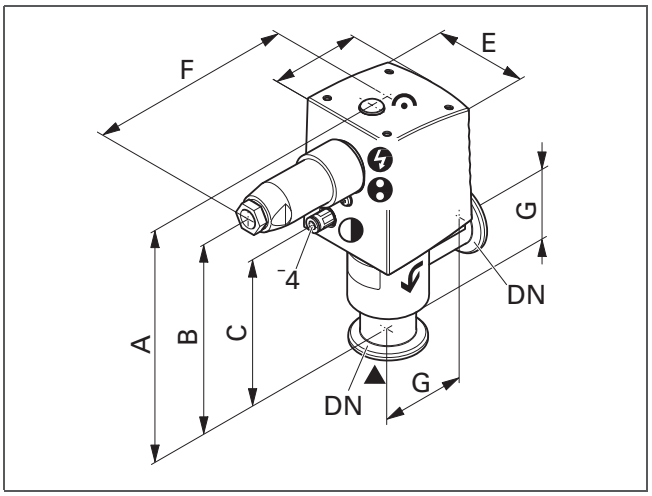
Angle valves, electropneumatic, with PI, with PV, n.o., DN 16 to 40 ISO-KF



- 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.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	11 cm³	35 cm³
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
Order number	**PF A38 205**	**PF A48 205**	**PF A58 205**

	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
Order number	**PF A38 235**	**PF A48 235**	**PF A58 235**

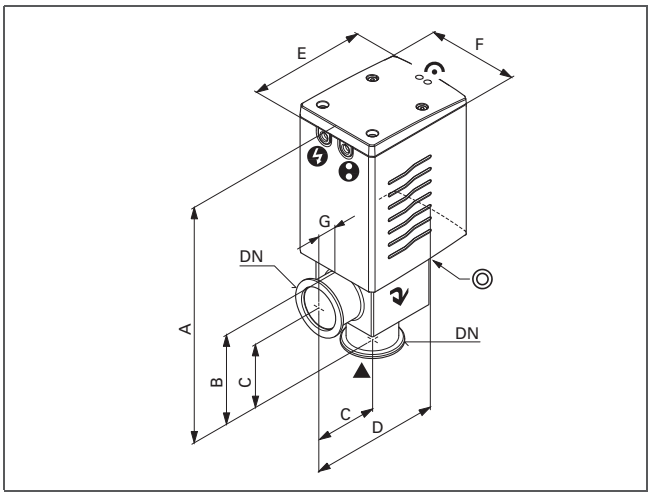
Angle valves, solenoid actuated, with PI, DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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^{-1}	30 min^{-1}	30 min^{-1}
Switching frequency at 50°C	20 min^{-1}	20 min^{-1}	20 min^{-1}
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
Order number	**PF A34 506**	**PF A44 506**	**PF A54 506**

	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
Order number	**PF A34 536**	**PF A44 536**	**PF A54 536**

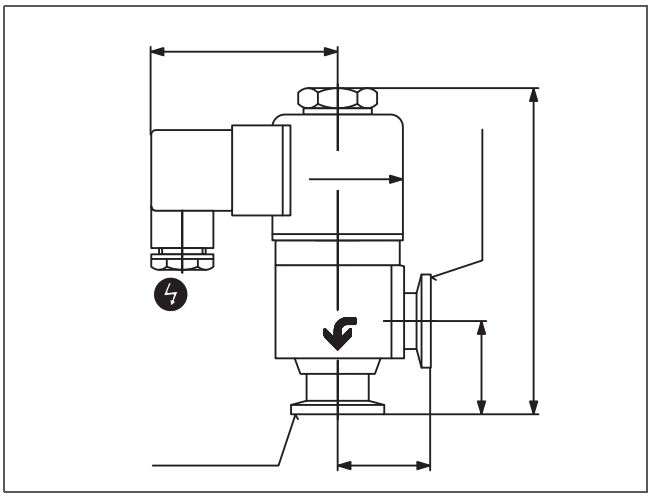
Angle valves, solenoid actuated, without PI, DN 10 ISO-KF



- 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^3/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^{-1}
Closing time	60 ms
Service life	1500000 cycles

Supply	24 V, 50/60 Hz
Order number	**PF A23 101**
Supply	24 V DC
Order number	**PF A23 201**
Supply	115 V, 50/60 Hz
Order number	**PF A23 401**
Supply	230 V, 50/60 Hz
Order number	**PF A23 501**

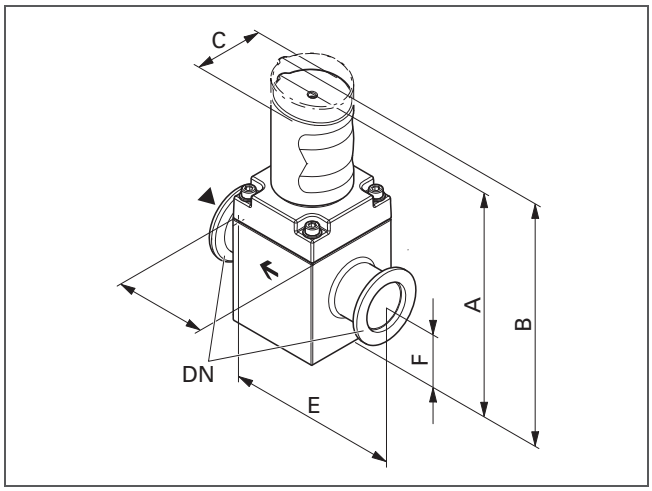
Inline-valves, manual, DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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**

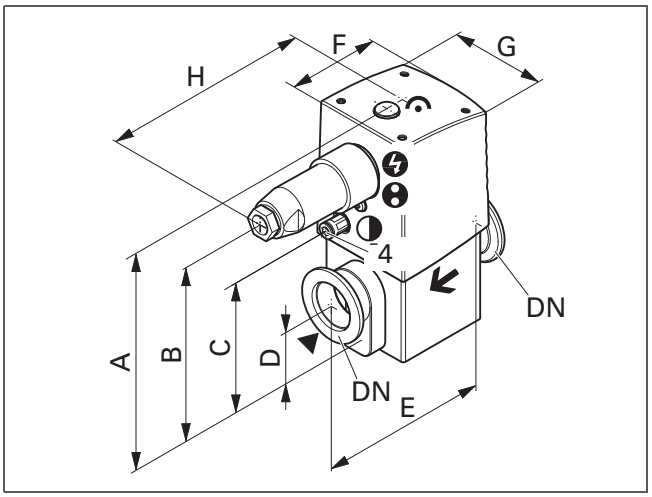
Inline-valves, electropneumatic, with PI, with PV, DN 16 to 40 ISO-KF



- 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.	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	11 cm³	35 cm³
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
Order number	**PF D38 133**	**PF D48 133**	**PF D58 133**
Supply	24 V DC	24 V DC	24 V DC
Power pilot valve	2.5 W	2.5 W	2.5 W
Order number	**PF D38 234**	**PF D48 234**	**PF D58 234**
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
Order number	**PF D38 433**	**PF D48 433**	**PF D58 433**
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
Order number	**PF D38 533**	**PF D48 533**	**PF D58 533**

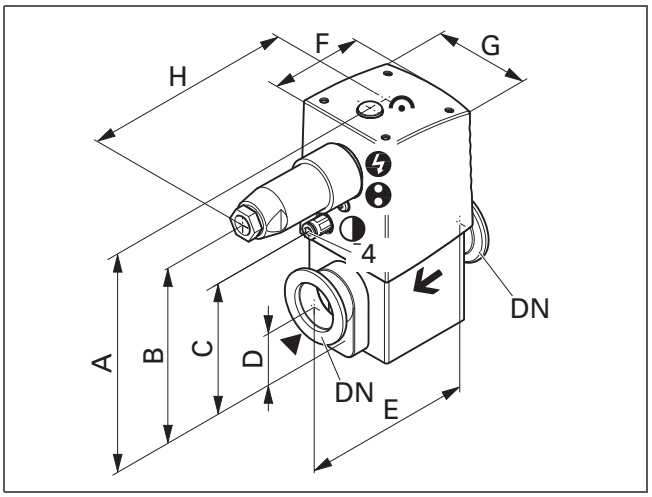
Inline-valves, pneumatic, with PI, without PV, DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	11 cm³	35 cm³
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**

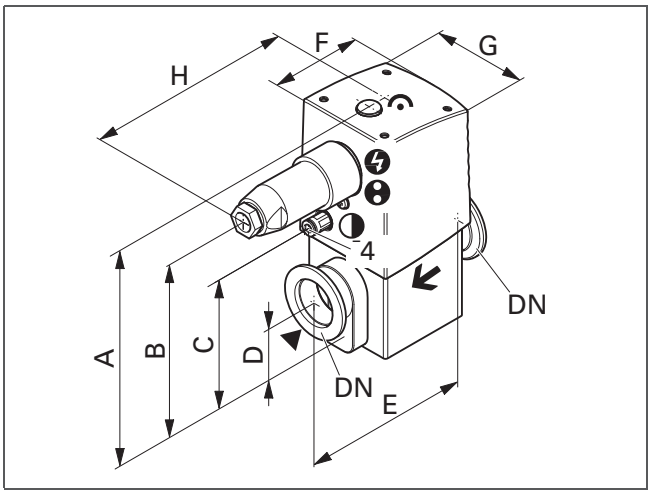
Inline-valves, electropneumatic with PI, with PV, n.o., DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	11 cm³	35 cm³
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

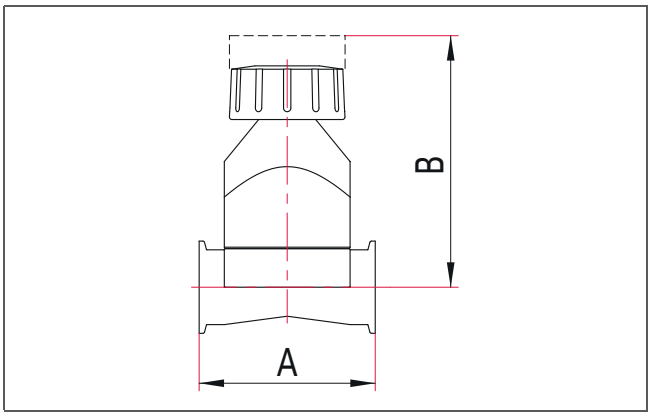
Order number			
Inline valves	**PF D38 235**	**PF D48 235**	**PF D58 235**

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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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

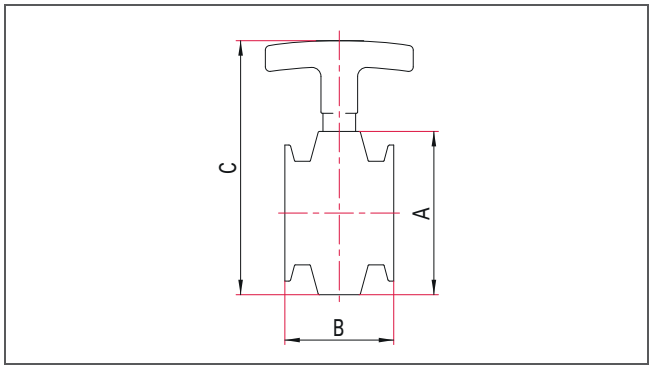
Order number			
Diaphragm valves	**110VME016**	**110VME025**	**110VME040**

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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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

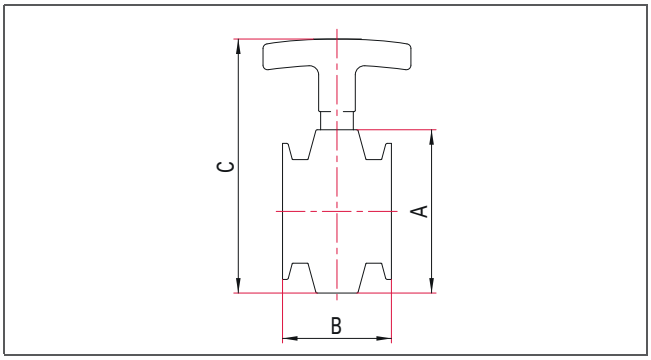
Order number				
Butterfly valves	**110VSM016**	**110VSM025**	**110VSM040**	**110VSM050**

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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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

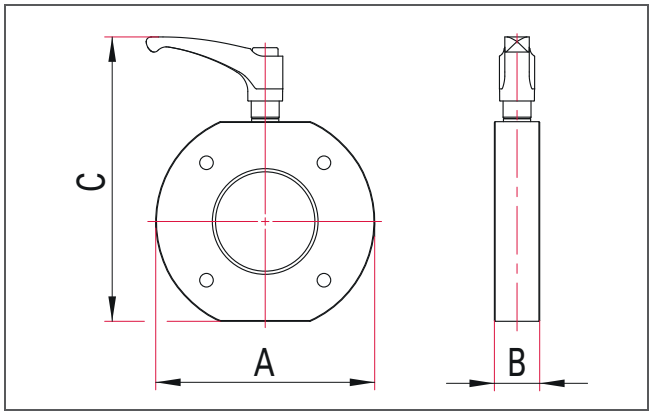
Order number				
Butterfly valves	**120VSM016**	**120VSM025**	**120VSM040**	**120VSM050**

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 m³/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

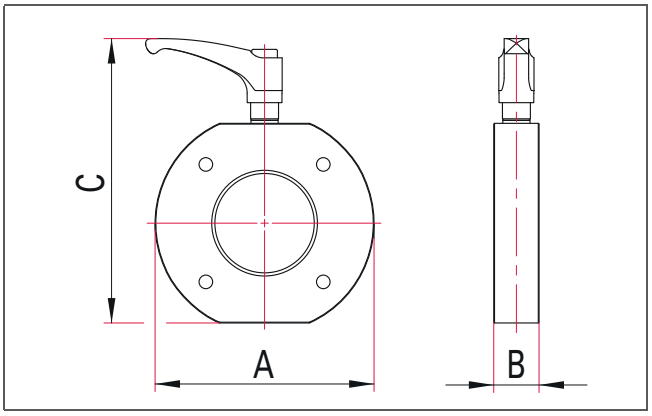
Order number	
Butterfly valves	**510VSM063**

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 m³/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**

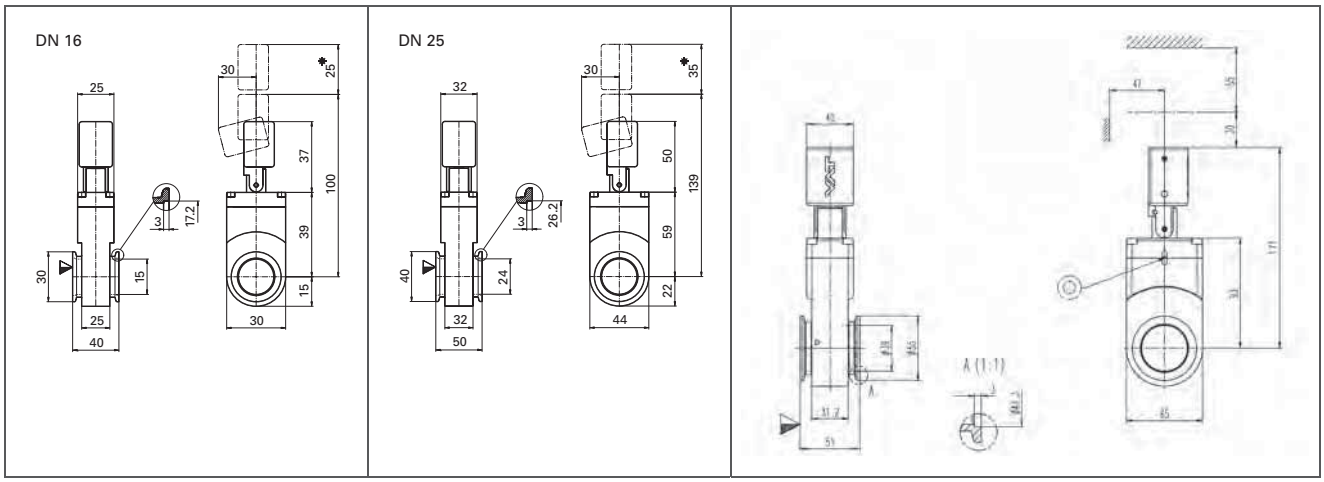
HV gate valve, manual, DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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**

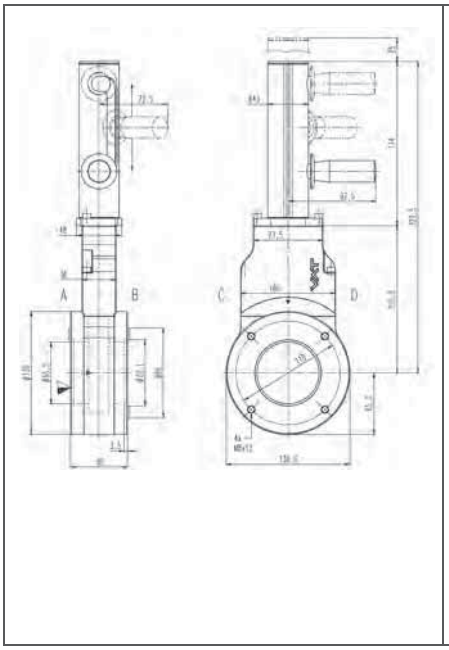
HV gate valve, manual, DN 63 to 160 ISO-F



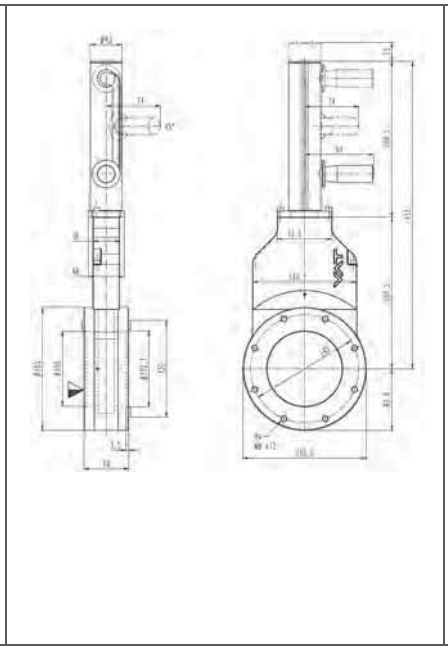
- High conductance due to free clearance
- Service life: up to 200000 operating cycles

SVV = Gate valve
HA = Manually actuated, aluminum housing

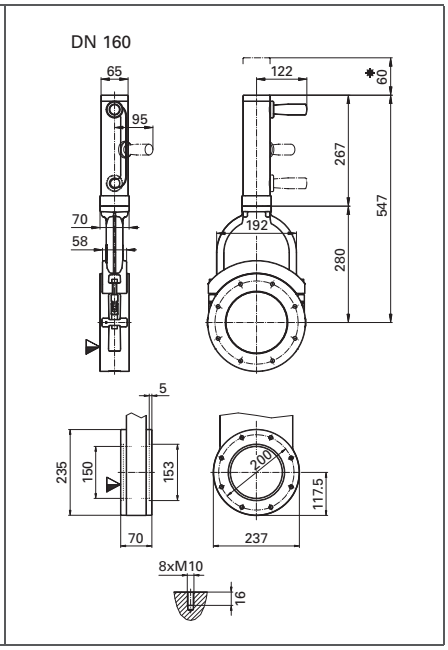
Dimensions



SVV 063 HA



SVV 100 HA

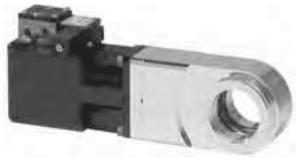


SVV 160 HA

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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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**

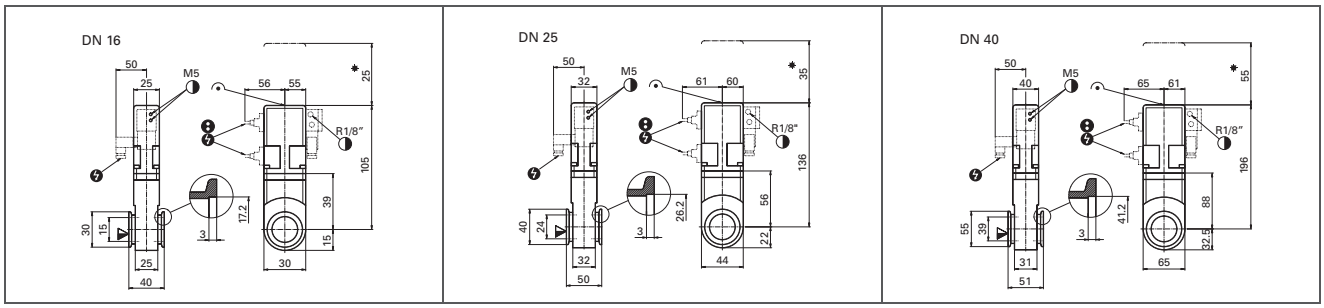
HV gate valve, electropneumatic, with PI, with PV, DN 16 to 40 ISO-KF



- 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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	30 cm³	70 cm³
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
Order number	**PF D38 200**	**PF D48 200**	**PF D58 200**
Supply	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz
Order number	**PF D38 100**	**PF D48 100**	**PF D58 100**
Supply	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
Order number	**PF D38 500**	**PF D48 500**	**PF D58 500**

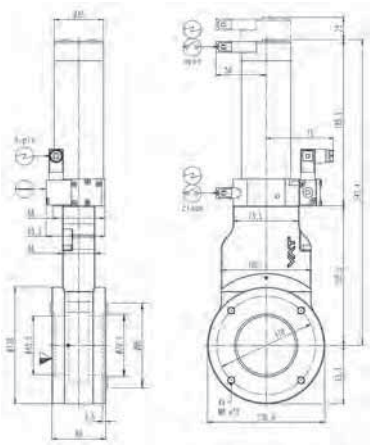
HV gate valve, electropneumatic, with PI, with PV, ISO-F Aluminum, DN 63 to 250 ISO-F



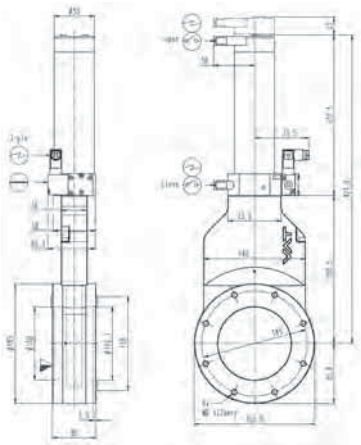
- High conductance due to free clearance
- With visual indication of open and closed positions
- Service life: up to 200000 operating cycles

SVV = Gate valve
PA = Electropneumatically actuated
DC = Direct current
PI = Position indicator
PV = Pilot valve

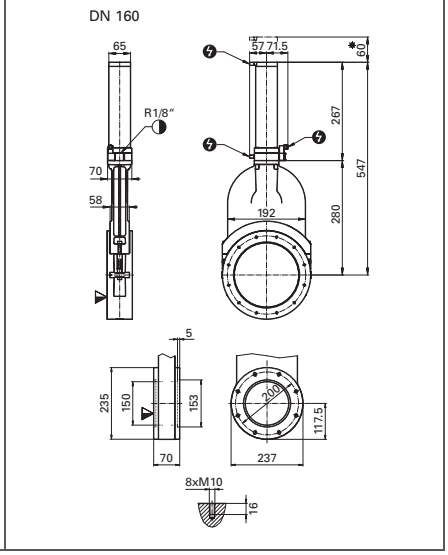
Dimensions



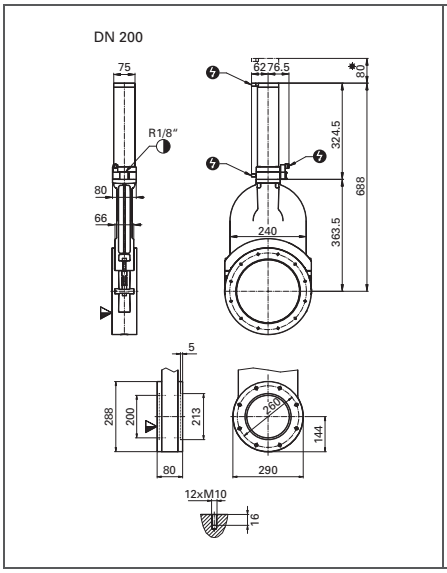
SVV 063 PA



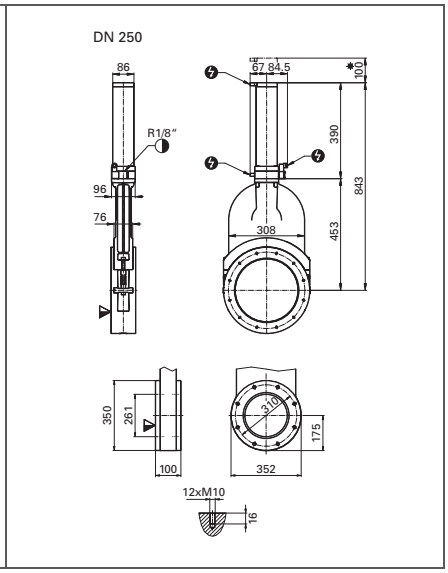
SVV 100 PA



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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	220 cm³	500 cm³	9000 cm³	1500 cm³
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
Order number	**PF E18 201**	**PF E28 201**	**PF E38 201**	**PF E48 201**	**PF E58 201**
Supply	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz
Order number	**PF E18 101**	**PF E28 101**	**PF E38 101**	**PF E48 101**	**PF E58 101**
Supply	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
Order number	**PF E18 501**	**PF E28 501**	**PF E38 501**	**PF E48 501**	**PF E58 501**

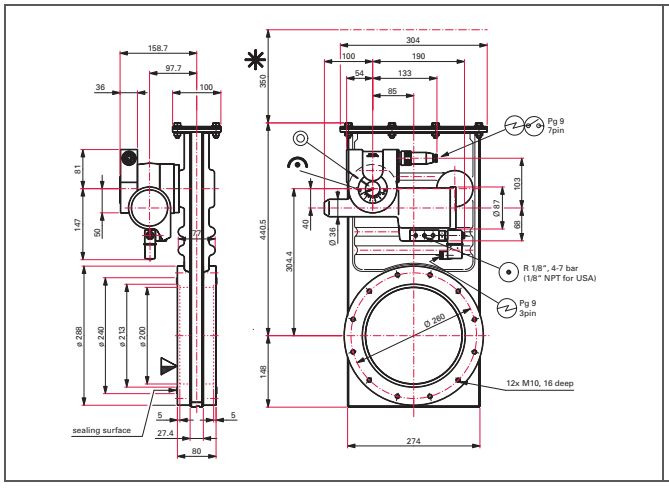
HV gate valve, electropneumatic, with PI, with PV, ISO-F
Stainless steel, DN 200 to 250 ISO-F



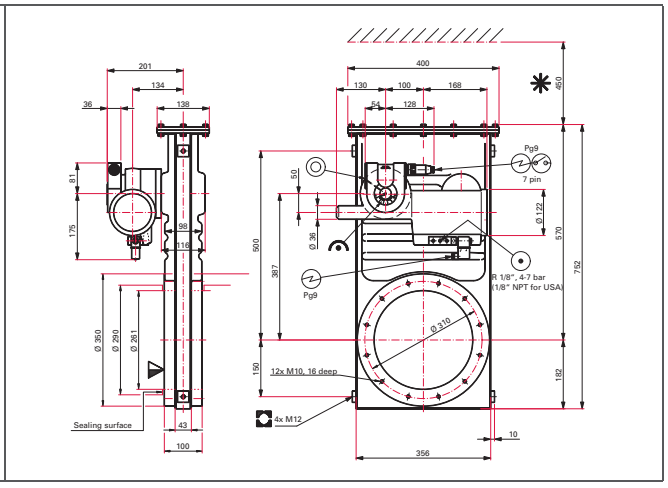
- High conductance due to free clearance
- With visual indication of open and closed positions
- Service life: 200000 operating cycles
- Stainless steel housing

SVV = Gate valve
PA = Electropneumatically actuated
AC = Alternating current
DC = Direct current
PI = Position indicator
PV = Pilot valve

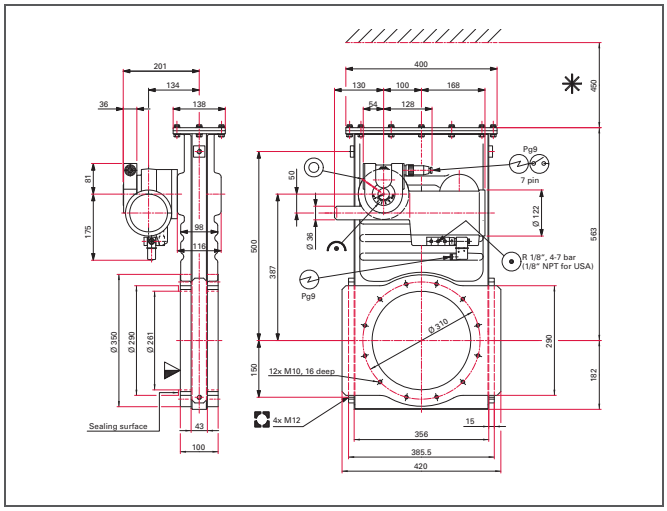
Dimensions



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 m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 cm³	750 cm³	750 cm³
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
Order number	**PF E48 240**	**PF E58 240**	**PF E58 250**
Supply	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz
Order number	**PF E48 140**	**PF E58 140**	**PF E58 150**
Supply	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
Order number	**PF E48 540**	**PF E58 540**	**PF E58 550**

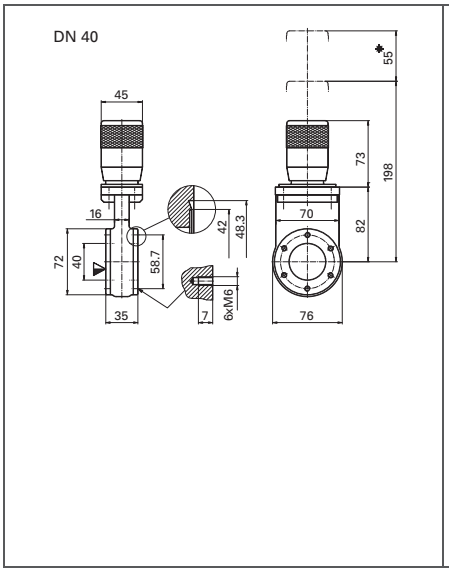
UHV gate valve, manual, DN 40 to 200 CF



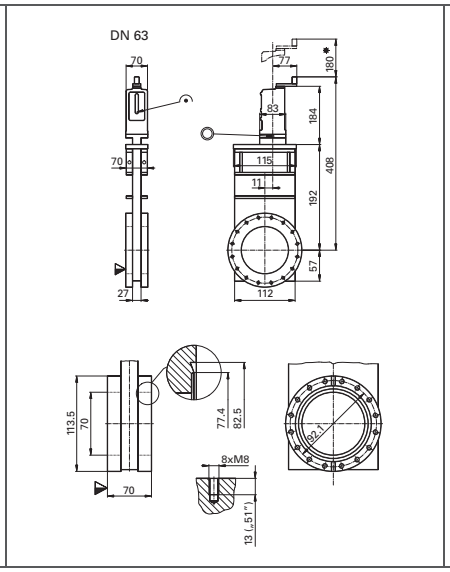
- Metal-sealed stainless steel housing
- Vulcanized, cavity-free valve disk seal
- Bellows-sealed
- Lubricant-free mechanics
- High conductance due to free clearance
- Service life: 50000 operating cycles

SVV = Gate valve
HF/HM = Manually actuated

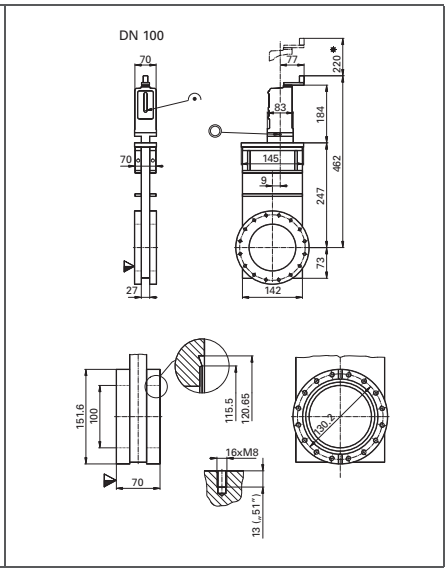
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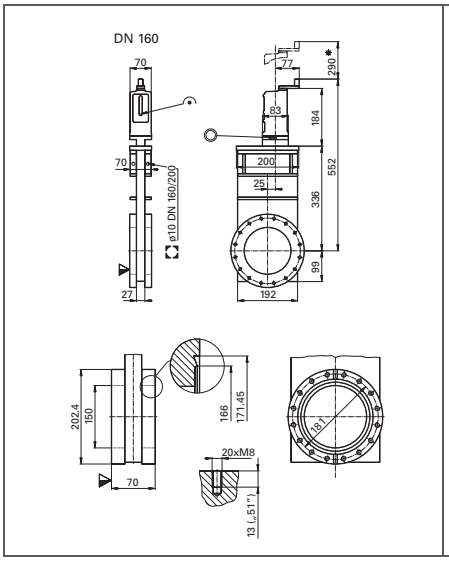
SVV 040 HM



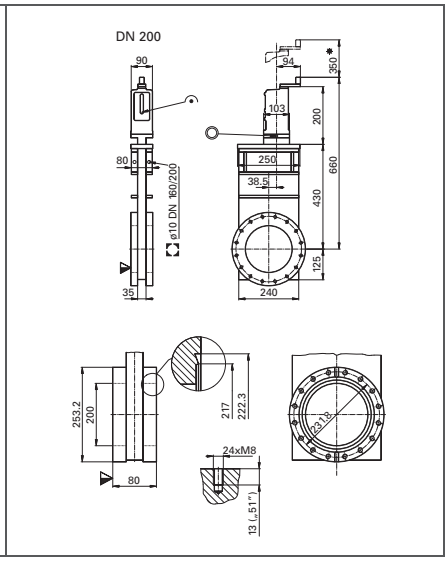
SVV 063 HF



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 m³/s	$5 \cdot 10^{-11}$ Pa m³/s	$5 \cdot 10^{-11}$ Pa m³/s
Tightness: Valve seat	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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 m³/s	$5 \cdot 10^{-11}$ Pa m³/s
Tightness: Valve seat	$1 \cdot 10^{-10}$ Pa m³/s	$1 \cdot 10^{-10}$ Pa m³/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**

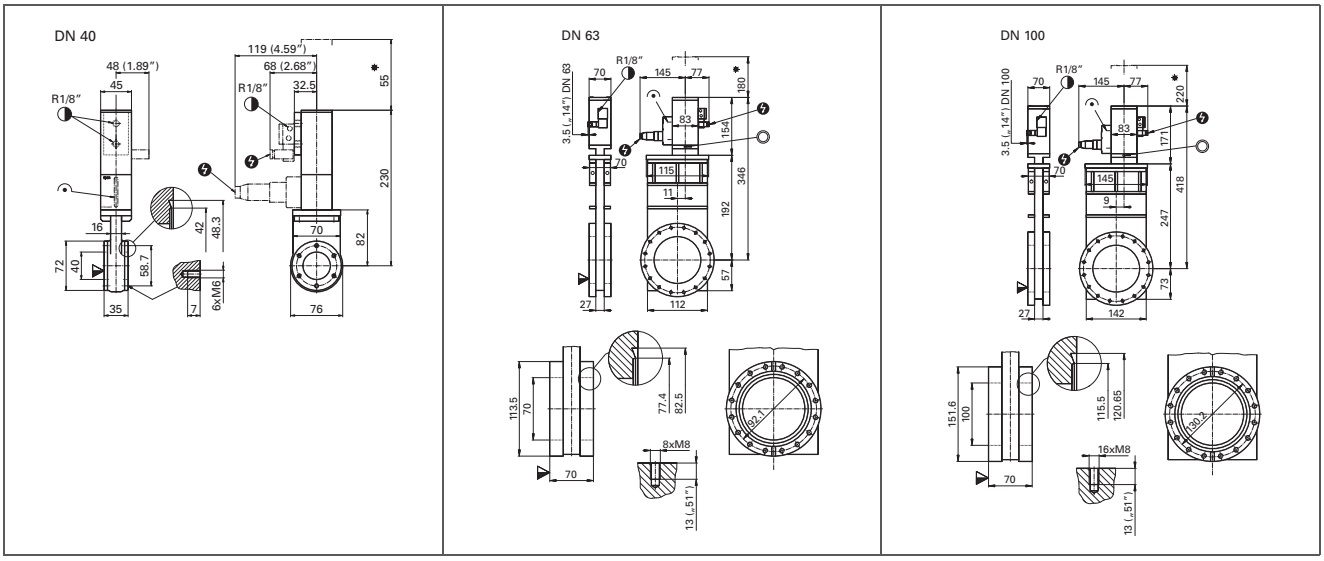
UHV gate valve, electropneumatic, with PI, with PV, DN 40 to 250 CF



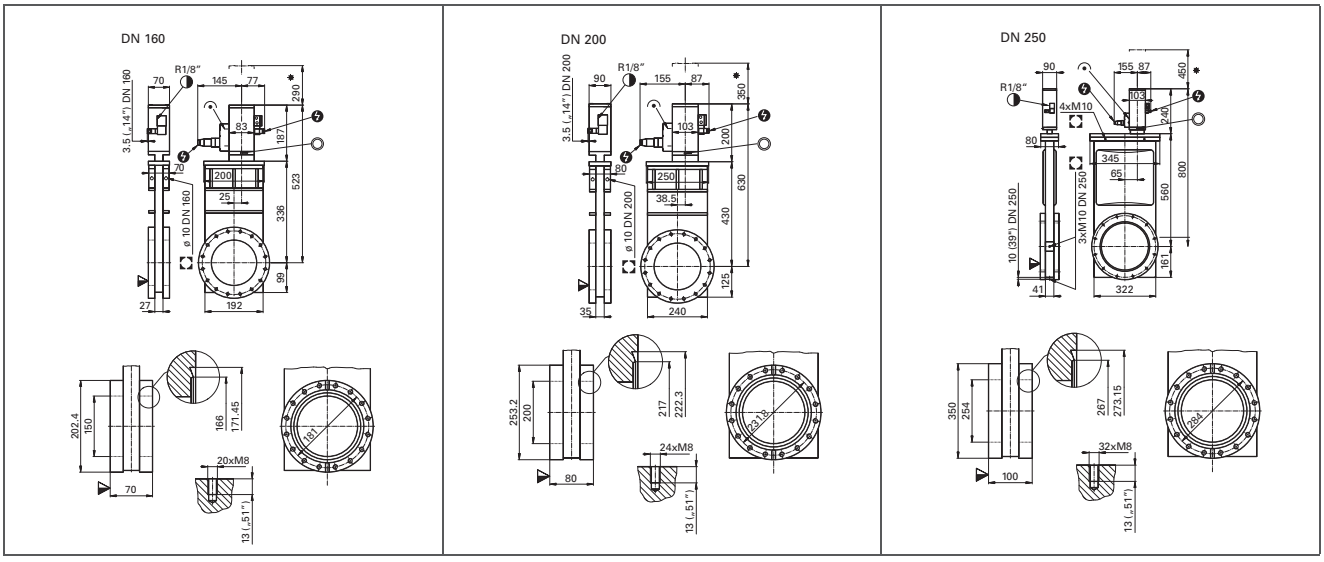
- Metal-sealed stainless steel housing
- Vulcanized, cavity-free valve disk seal (up to DN 200 CF)
- Bellows-sealed
- Lubricant-free mechanics
- Service life: 50000 operating cycles

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 m³/s
Tightness: Valve seat	$1 \cdot 10^{-10}$ Pa m³/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 cm³	80 cm³	110 cm³
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
Order number	**PF F58 231**	**PF F68 231**	**PF F78 231**
Supply	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz
Order number	**PF F58 131**	**PF F68 131**	**PF F78 131**
Supply	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
Order number	**PF F58 531**	**PF F68 531**	**PF F78 531**

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 cm³	250 cm³	350 cm³
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

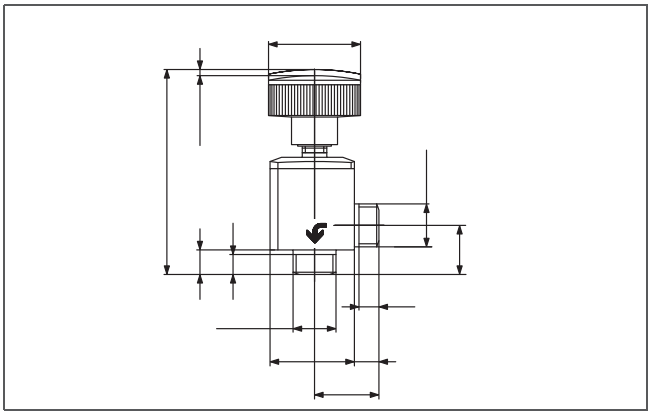
	SVV 160 PF	SVV 200 PF	SVV 250 PF
Supply	24 V DC	24 V DC	24 V DC
Order number	**PF F88 231**	**PF F98 231**	**PF F98 241**
Supply	24 V, 50 Hz	24 V, 50 Hz	24 V, 50 Hz
Order number	**PF F88 131**	**PF F98 131**	**PF F98 141**
Supply	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
Order number	**PF F88 531**	**PF F98 531**	**PF F98 541**

Mini angle valves, manual, DN 5



- Two connections required as accessories
- Bellows-sealed
- Service life: 1.5 million operating cycles

Dimensions

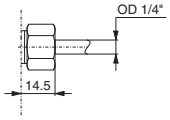


Technical data	EVI 005 S
Flange (out)	DN 5 mm M14x1
Flange (in)	DN 5 mm M14x1
Bakeout temperature: actuator	70 °C
Bakeout temperature: housing	150 °C
Operating pressure max.	4000 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m³/s
Seal	FKM
Differential pressure 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

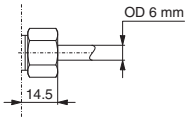
Order number	
Mini angle valves	**PF H12 031**

Accessories	
Connection, for ¼" 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**

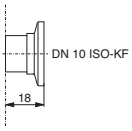
Dimensions



Connection, for ¼" tube O.D.



Connection, for 6 mm tube O.D.



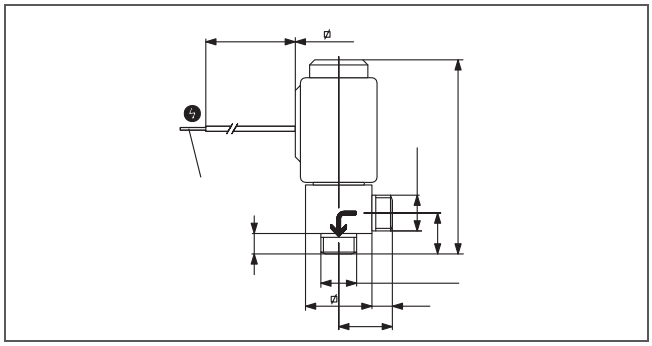
Connection, DN 10 ISO-KF

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

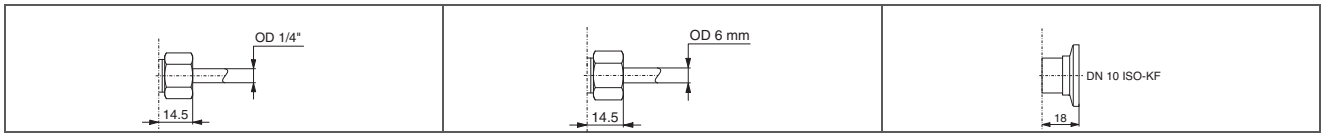


Technical data	EVI 005 M
Flange (out)	DN 5 mm M14x1
Flange (in)	DN 5 mm M14x1
Actuator	Solenoid actuated
Version	Normally closed (n.c.)
Bakeout temperature: actuator	120 °C
Bakeout temperature: housing	150 °C
Operating pressure max.	1500 hPa (abs.)
Operating pressure min.	$1 \cdot 10^{-8}$ hPa
Tightness	$1 \cdot 10^{-10}$ Pa m³/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^{-1}
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	**PF H13 231**

Accessories	
Connection, for ¼" 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**

Dimensions



Connection, for ¼" tube O.D. | Connection, for 6 mm tube O.D. | Connection, DN 10 ISO-KF

Content

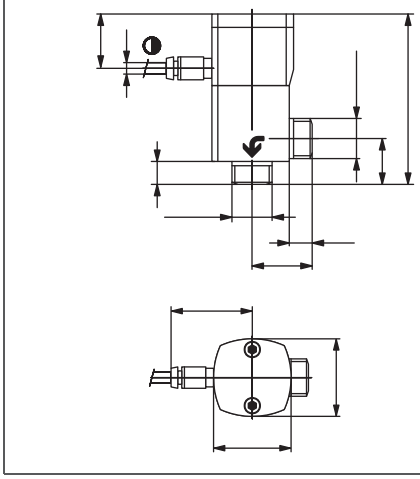
Mini angle valves, pneumatic and electropneumatic, without position indicator (PI), DN 5



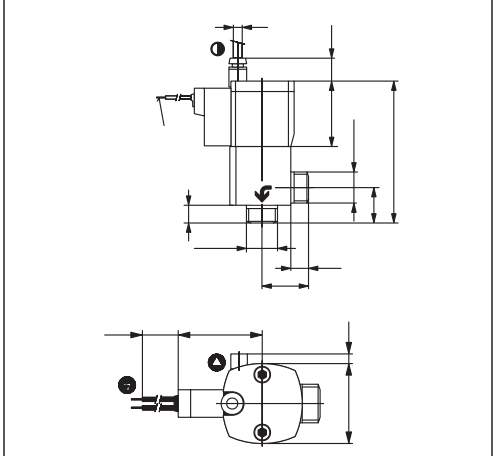
- Bellows-sealed
- Normally closed (n.c.)
- Two connections required as accessories
- Service life: 1.5 million operating cycles
- Variants:
  EVI 005 P = pneumatic (without pilot valve);
  EVI 105 P = electropneumatic (with pilot valve)

EVI = Mini angle valve with bellows feedthrough

Dimensions



EVI 005 P, Mini angle valve, without control valve



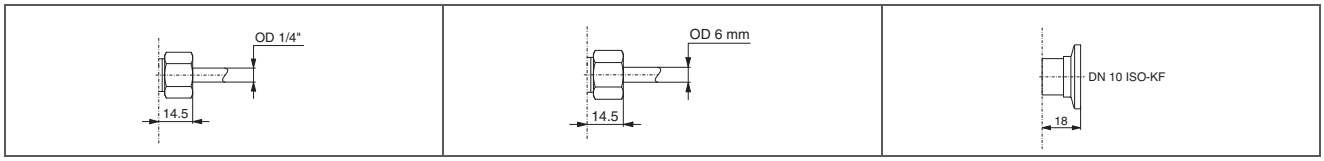
EVI 105 P, Mini angle valve, with control valve

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 m³/s	$1 \cdot 10^{-10}$ Pa m³/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^{-1}	150 min^{-1}
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 ¼" 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 ¼" tube O.D. | Connection, for 6 mm tube O.D. | Connection, DN 10 ISO-KF

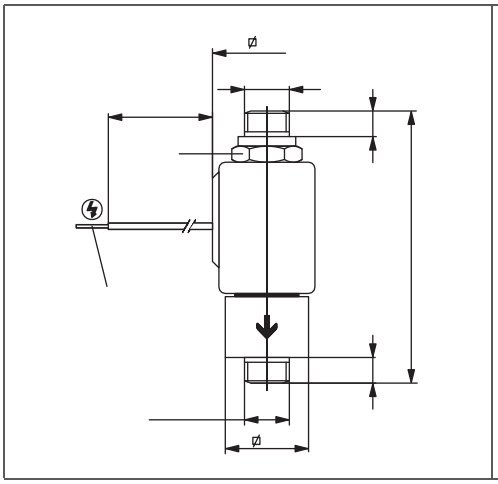
Mini-Inline-Valve, solenoid actuated, without position indicator (PI), n.c. and n.o., DN 5



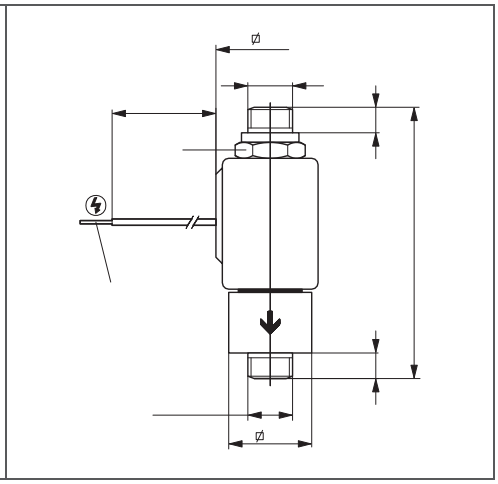
- Two connections required as accessories
- Service life: 2 million operating cycles
- Variants:
  DVI 005 M = normally closed (n.c.);
  DVI 205 M = normally open (n.o.)

DVI = Mini inline valve with bellows feedthrough
M = Solenoid actuated

Dimensions



DVI 005 M, Mini-Inline-Valve, solenoid actuated, normally closed



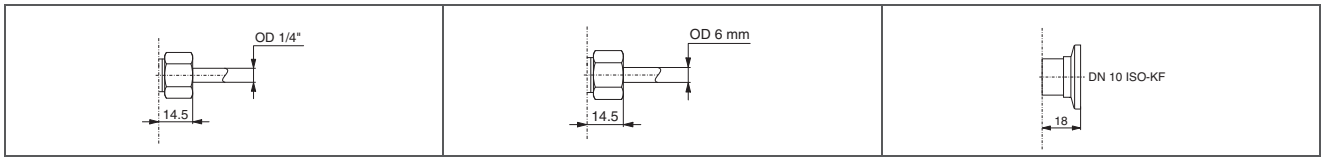
DVI 205 M, Mini-Inline-Valve, solenoid actuated, normally open

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 m³/s	$1 \cdot 10^{-10}$ Pa m³/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^{-1}	300 min^{-1}
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	**PF H13 232**	**PF H13 233**

Accessories		
Connection, for ¼" 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



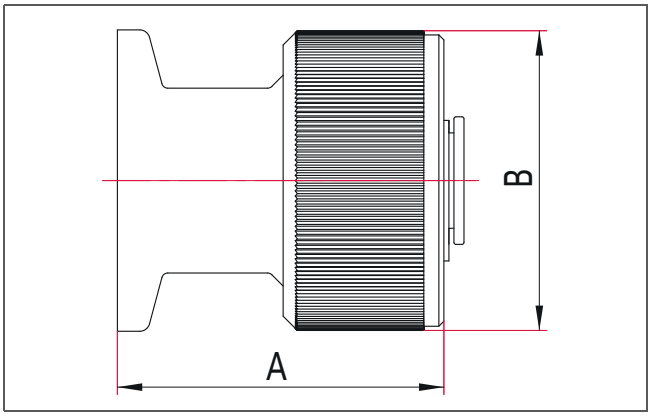
Connection, for ¼" tube O.D. | Connection, for 6 mm tube O.D. | Connection, DN 10 ISO-KF

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 m³/s	$1 \cdot 10^{-10}$ Pa m³/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

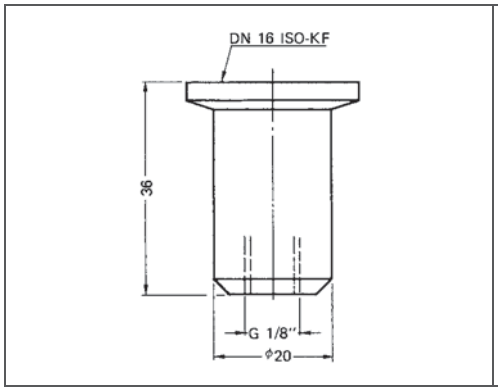
Order number		
Venting valves	**120VBE010**	**140VBE010**

Accessories		
Reducer Centering Ring, Stainless Steel 304/ 1.4301, DN 10/16 ISO-KF	**122ZRR016**	**122ZRR016**

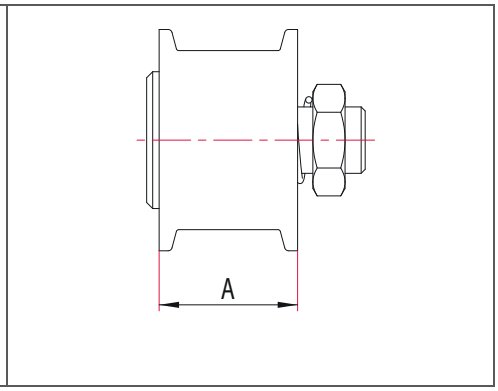
Pressure relief valves, DN 16 and 40 ISO-KF

- 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 m³/s	$1 \cdot 10^{-9}$ Pa m³/s	$1 \cdot 10^{-9}$ Pa m³/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

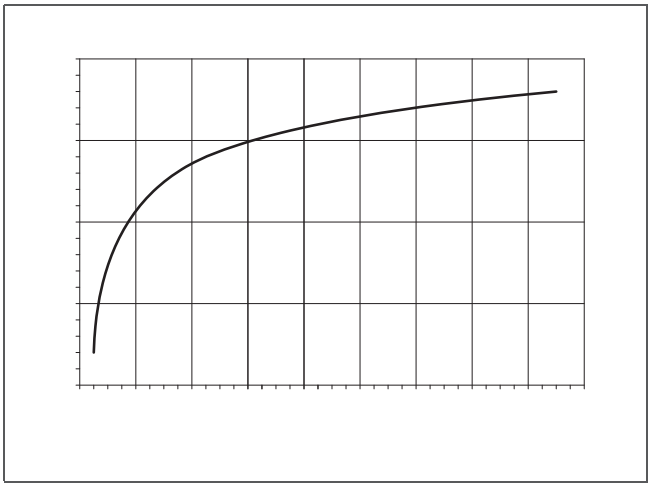
Order number			
Pressure relief valves	**PF I30 032**	**120VUS016**	**120VUS040**

Coarse gas dosing valve, manual, DN 10 ISO-KF

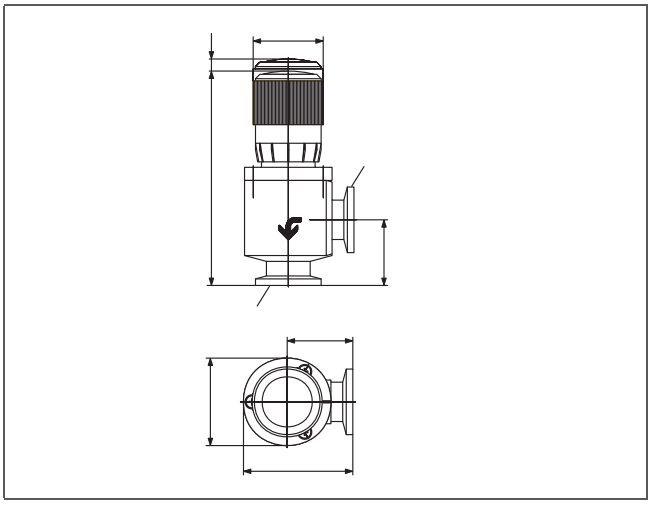
- For slow, manual venting
- Service life: 200000 operating cycles



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^3/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

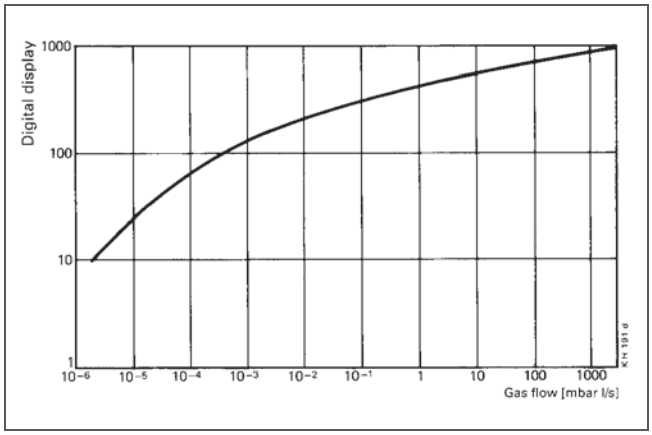
Order number	
Gas dosing valves	**PF I22 001**

Gas dosing valve with separate shut-off valve, manual, DN 16 ISO-KF

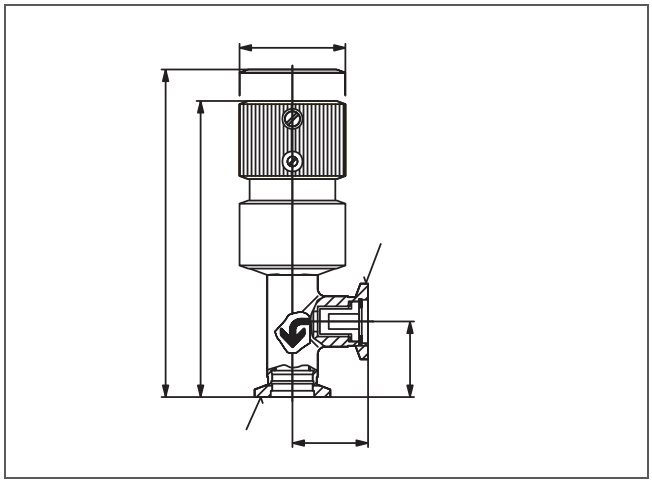


- Closable without changing the gas flow setting
- Optimum characteristic
- Digital position display
- Excellent reproducibility
- Extremely small dead volume
- Very broad regulating range

Characteristic



Dimensions



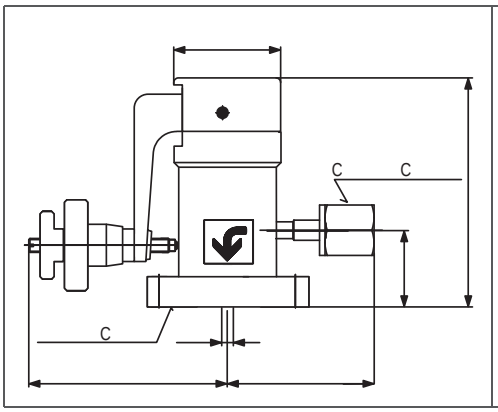
Technical data	EVN 116
Flange (out)	DN 16 ISO-KF
Flange (in)	DN 16 ISO-KF
Bakeout temperature: flanges	150 °C
Tightness	$1 \cdot 10^{-10}$ Pa m³/s
Seal	FKM
Differential pressure	2500 hPa
Dosing sleeve	Fluorplastomer
Gas flow max. controllable	1000 hPa l/s
Gas flow min. controllable	$5 \cdot 10^{-6}$ hPa l/s
Housing/needle/filter	Stainless steel
Weight	0.4 kg
Temperature: Operating	80 °C
Dead volume	0.032 cm³

Order number	
Gas dosing valves	**PF I32 031**

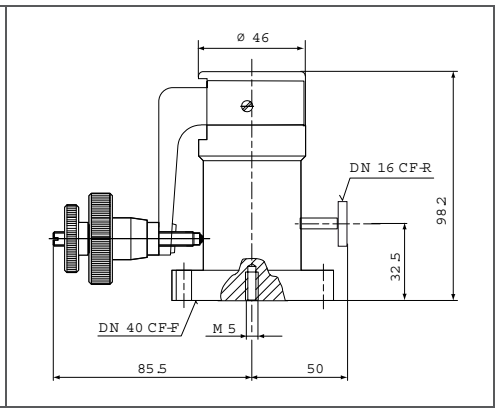
All-metal gas dosing valve, manual, DN 40 CF

- 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	$1 \cdot 10^{-10}$ hPa to 1500 hPa (abs.)	$1 \cdot 10^{-10}$ hPa to 1500 hPa (abs.)
Tightness	$1 \cdot 10^{-12}$ Pa m³/s	$1 \cdot 10^{-12}$ Pa m³/s
Inlet pressure max.	$1 \cdot 10^{-10}$ hPa to 3 MP	$1 \cdot 10^{-10}$ hPa to 3 MP
Gas flow max. at inlet pressure of 1000 hPa	600 hPa	600 hPa
Flow rate min. for: air	$1 \cdot 10^{-9}$ hPa l/s	$1 \cdot 10^{-9}$ hPa l/s
Flow rate min. for: pure gases	$1 \cdot 10^{-10}$ hPa l/s	$1 \cdot 10^{-10}$ 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**

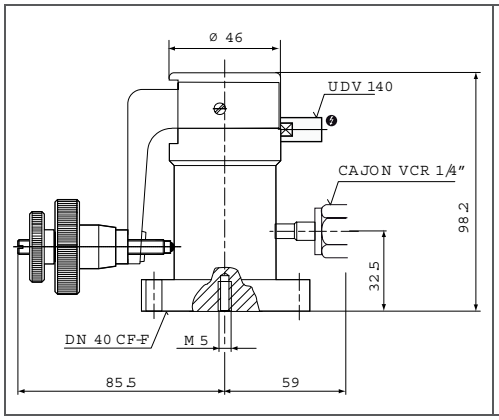
Accessories		
Complete capillary, vacuum side, length 1 m	**PT 418 976 -T**	**PT 418 976 -T**
Complete capillary, inlet side, length 2 m	**PT 420 537 -T**	**PT 420 537 -T**
Heater, 200 °C	**PT 420 376-T**	**PT 420 376-T**

All-metal gas regulating valve, manual/thermomechanic, DN 40 CF

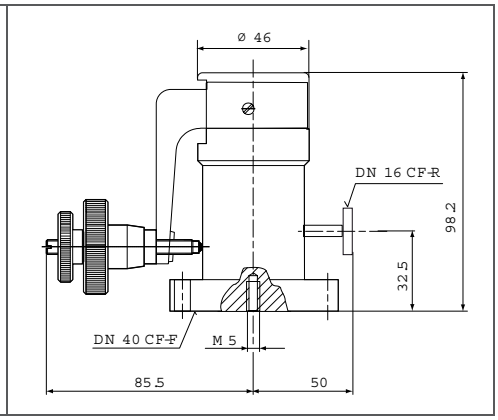


- Minimum dead volume
- Operating temperature up to 200 °C
- For mass spectrometer applications
- Specific routing of gas stream when a capillary (accessory) is used

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	$1 \cdot 10^{-10}$ hPa to 1500 hPa (abs.)	$1 \cdot 10^{-10}$ hPa to 1500 hPa (abs.)
Tightness	$1 \cdot 10^{-12}$ Pa m³/s	$1 \cdot 10^{-12}$ Pa m³/s
Inlet pressure max.	$1 \cdot 10^{-10}$ hPa to 3 MP	$1 \cdot 10^{-10}$ hPa to 3 MP
Gas flow max. at inlet pressure of 1000 hPa	600 hPa	600 hPa
Flow rate min. for: air	$1 \cdot 10^{-9}$ hPa l/s	$1 \cdot 10^{-9}$ hPa l/s
Flow rate min. for: pure gases	$1 \cdot 10^{-10}$ hPa l/s	$1 \cdot 10^{-10}$ 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**

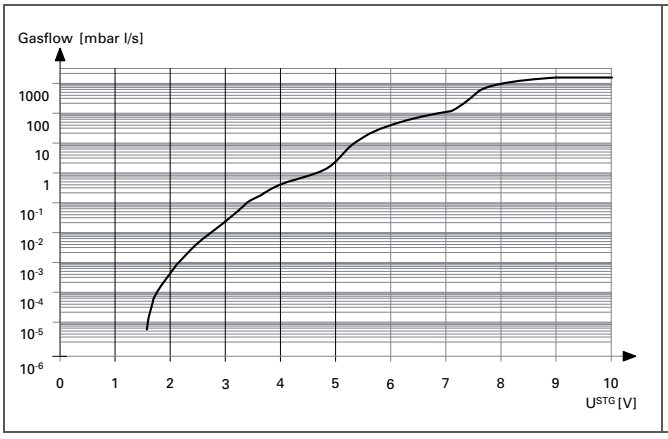
Accessories		
Complete capillary, vacuum side, length 1 m	**PT 418 976 -T**	**PT 418 976 -T**
Complete capillary, inlet side, length 2 m	**PT 420 537 -T**	**PT 420 537 -T**
Heater, 200 °C	**PT 420 376-T**	**PT 420 376-T**
RVG 050 C, Control unit all-metal gas regulating valves, 115/230 V	**PF I00 795**	**PF I00 795**

Gas regulating valve EVR 116, motorized, DN 16 ISO-KF

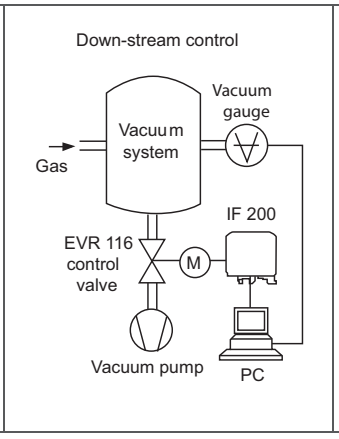


- High gas throughput
- Very broad regulating range
- With integrated motor control electronics

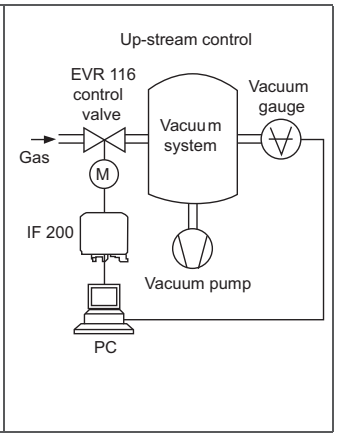
Characteristic



EVR 116, Gas regulating valve

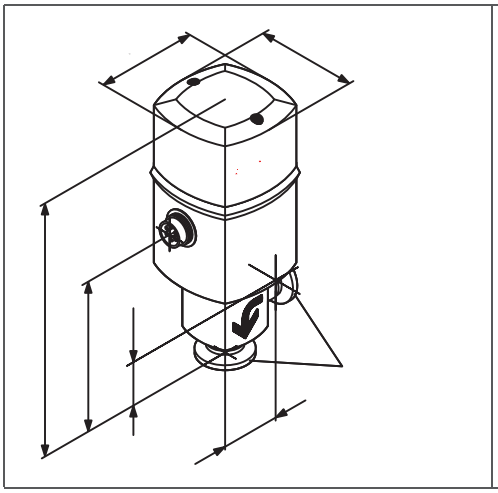


IF 200, Interface for EVR 116

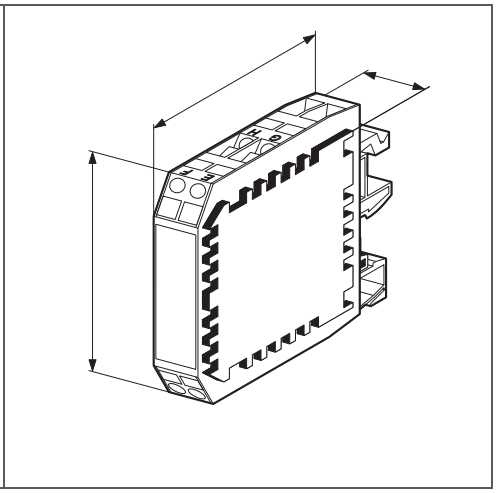


IF 200, Interface for EVR 116

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 m³/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**

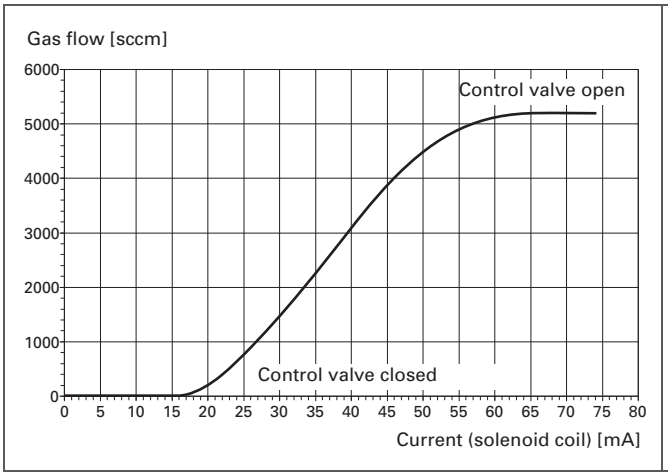
Accessories		
RVC-EVR, connection cable, 3 m	**PT 583 115-T**	**PT 583 115-T**
RVC-EVR, connection cable, 5 m	**PT 583 116-T**	**PT 583 116-T**
RVC-EVR, connection cable, 10 m	**PT 583 117-T**	**PT 583 117-T**
RVC-EVR, connection cable, 15 m	**PT 583 118-T**	**PT 583 118-T**
RVC-EVR, connection cable, 20 m	**PT 583 119-T**	**PT 583 119-T**

Gas regulating valves, solenoid actuated, RME 005 A, DN 5

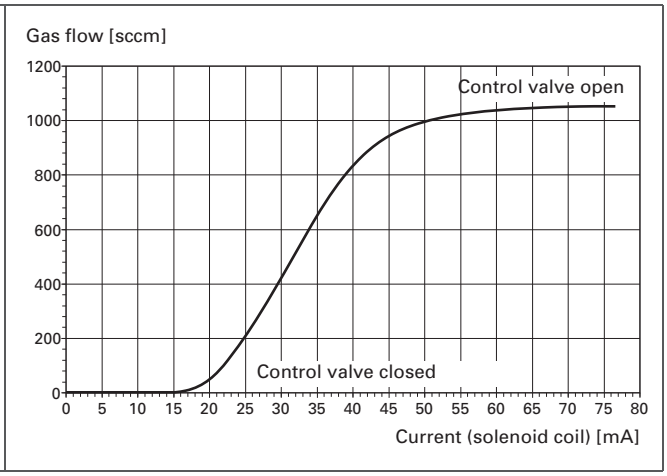


- Two connections required as accessories
- Including connector
- Drive: Solenoid
- Regulating range from 0.85 to 85 hPa l/s
- Normally closed (n.c.)

Characteristic

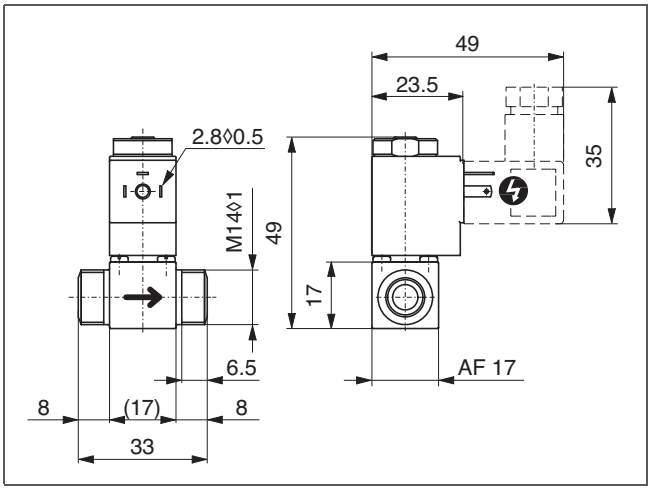


RME 005 A, Gas regulating valve



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 m³/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
Order number	**PF I13 931**
Gas flow max. controllable	17 hPa l/s
Gas flow min. controllable	0.17 hPa l/s
Order number	**PF I13 932**
Gas flow max. controllable	8.5 hPa l/s
Gas flow min. controllable	0.085 hPa l/s
Order number	**PF I13 933**
Gas flow max. controllable	1.7 hPa l/s
Gas flow min. controllable	0.017 hPa l/s
Order number	**PF I13 934**
Gas flow max. controllable	0.8 hPa l/s
Gas flow min. controllable	0.008 hPa l/s
Order number	**PF I13 935**
Gas flow max. controllable	0.17 hPa l/s
Gas flow min. controllable	0.0017 hPa l/s
Order number	**PF I13 936**

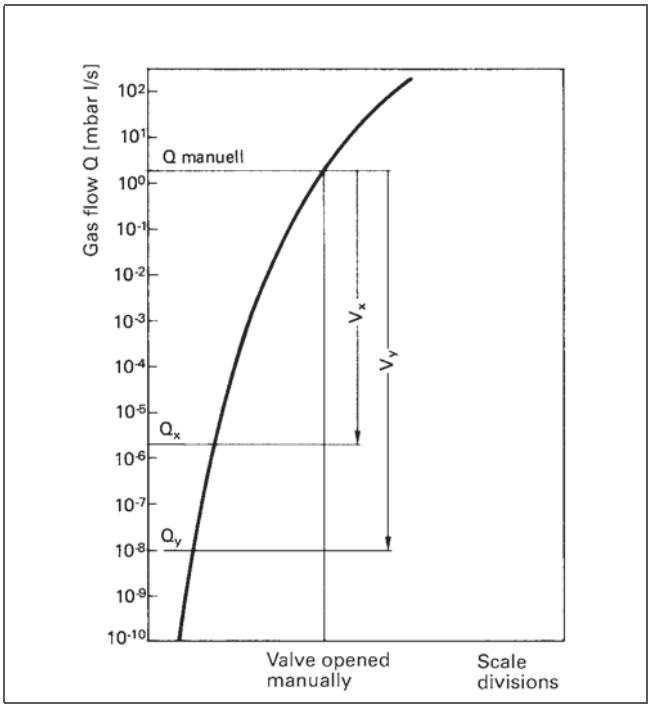
Accessories	
Connection, for ¼" tube O.D.	**PT 420 913-T**
Connection, for 6 mm tube O.D.	**PT 420 914-T**
Connection, DN 10 ISO-KF	**PT 420 912-T**
RVC 300 - RME 005, connection cable, 3 m	**PT 250 003-T**
RVC 300 - RME 005, connection cable, 5 m	**PT 250 005-T**
RVC 300 - RME 005, connection cable, 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

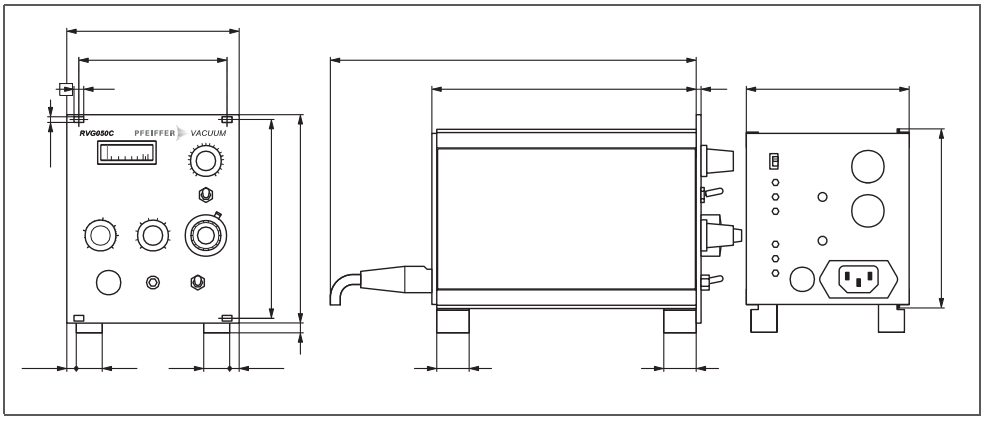


- For creating a control section in conjunction with UHV gas dosing valves UDV 140 or UDV 146

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_2, inlet side	$1 \cdot 10^{-9}$ - 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**

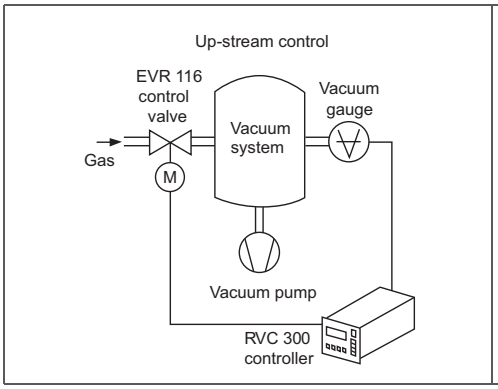
Accessories	
UDV 146, All-metal gas regulating valve, DN 16 CF-F	**PF I52 034**
RVG-UDV, extension cable, 2 m, 200 °C	**PT 519 953 -T**
RVG-UDV, connection cable, 3 m, 80 °C	**PT 519 178 -T**
RVG-UDV, connection cable, 12 m, 80 °C	**PT 519 343 -T**

Control unit RVC 300 for EVR 116 and RME 005 A

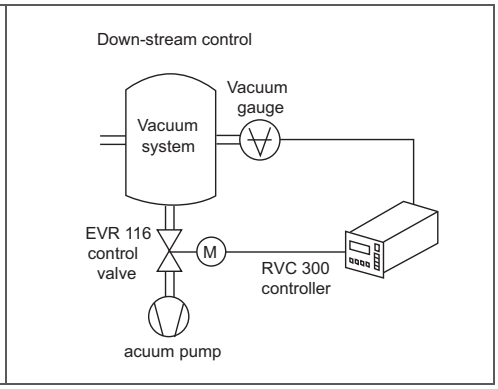


- For creating a control section in conjunction with EVR 116 or RME 005 A regulating valves
- Simple operation
- Self-explanatory LCD display and function keys
- Analog/digital inputs/outputs and interfaces
- Settable PID regulating algorithm
- For system manufacturers, as a supplement to their own control unit

Characteristic

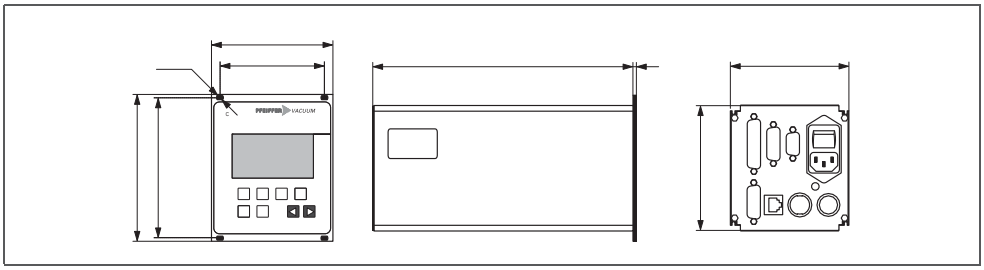


RVC 300, Control unit gas regulating valves



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**

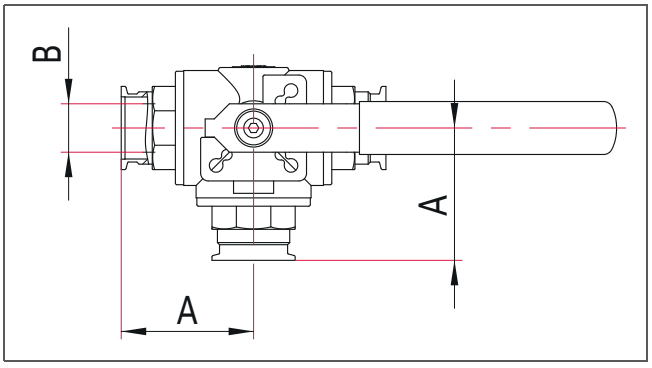
Accessories	
RVC 300 - RME 005, connection cable, 3 m	**PT 250 003-T**
RVC 300 - RME 005, connection cable, 5 m	**PT 250 005-T**
RVC 300 - RME 005, connection cable, 10 m	**PT 250 010-T**
RVC 300 - RME 005, connection cable, 15 m	**PT 250 015-T**
RVC 300 - RME 005, connection cable, 20 m	**PT 250 020-T**
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 · 10^{-7} Pa m³/s	< 1 · 10^{-7} Pa m³/s	< 1 · 10^{-7} Pa m³/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 · 10^{-5} hPa to 500 hPa over pressure	1 · 10^{-5} hPa to 500 hPa over pressure	1 · 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

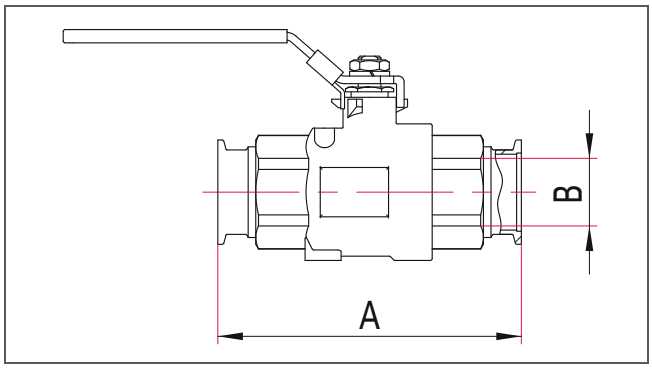
Order number			
Ball valves	**120VKD016-L**	**120VKD025-L**	**120VKD040-L**
Ball valves	**120VKD016-T**	**120VKD025-T**	**120VKD040-T**

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 m³/s	< $1 \cdot 10^{-7}$ Pa m³/s	< $1 \cdot 10^{-7}$ Pa m³/s	< $1 \cdot 10^{-7}$ Pa m³/s
Seal	PTFE (glass fiber reinforced)	PTFE (glass fiber reinforced)	PTFE (glass fiber reinforced)	PTFE (glass fiber reinforced)
Pressure range	$1 \cdot 10^{-5}$ hPa bis 500 hPa over pressure	$1 \cdot 10^{-5}$ hPa bis 500 hPa over pressure	$1 \cdot 10^{-5}$ hPa bis 500 hPa over pressure	$1 \cdot 10^{-5}$ 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

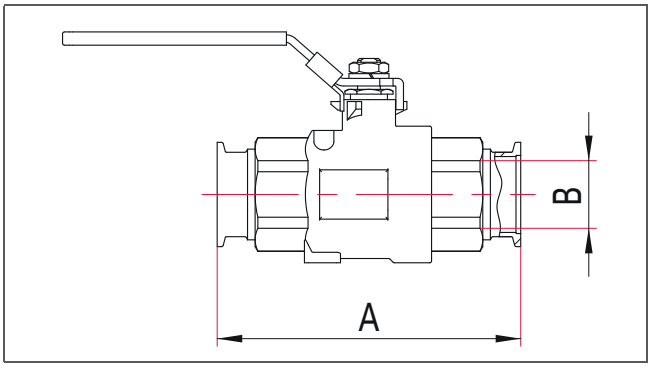
Order number				
Ball valves	**120VKZ010**	**120VKZ016**	**120VKZ025**	**120VKZ040**

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 m³/s	< $1 \cdot 10^{-7}$ Pa m³/s	< $1 \cdot 10^{-7}$ Pa m³/s
Seal	Ball: PTFE; Stem: FKM/NBR	Ball: PTFE; Stem: FKM/NBR	Ball: PTFE; Stem: FKM/NBR
Pressure range	$1 \cdot 10^{-5}$ hPa bis 500 hPa over pressure	$1 \cdot 10^{-5}$ hPa bis 500 hPa over pressure	$1 \cdot 10^{-5}$ 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

Feedthroughs

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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.



Overview of series and applications

■ = recommended	Analytics						Semiconductor										Coating										Industry										R & D										Page
	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 display (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	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Feedthroughs																																												
Electrical feedthroughs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	306
Thermocouple feedthroughs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	330
Fluid feedthroughs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	334
Isolators	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	338
Pipe feedthroughs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	339
Rotary feedthroughs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	340
Rotary/linear feedthroughs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	346
Rotary feedthroughs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	350

Features at a glance

	Nominal diameter						Flange systems			
	DN 16	DN 25	DN 40	DN 50	DN 63	DN 100	ISO-KF	ISO-K	CF	Page
Feedthroughs										
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^3/s for ISO-KF, ISO-K flanges and 10^{-11} Pa m^3/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

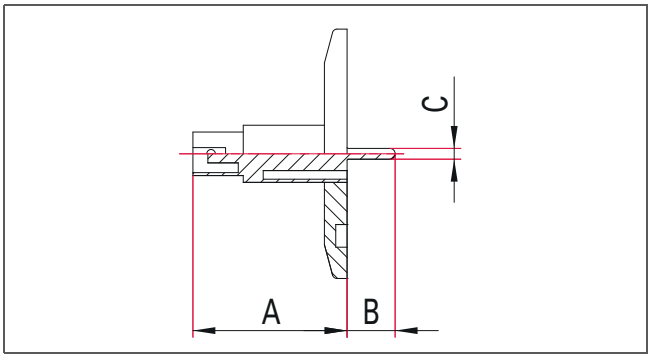
- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 500 V DC
- Current: 3 A per pin
- Temperature range: -100 to 300 °C (vacuum side)
- Including atmosphere sided plug (-65 to 165 °C)

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**

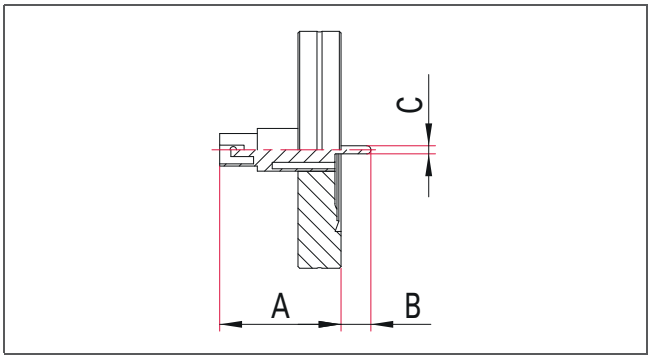
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

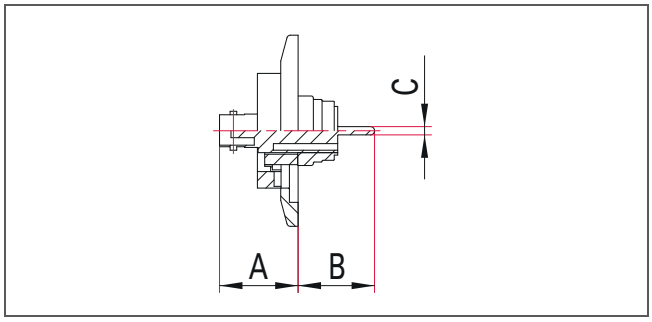
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

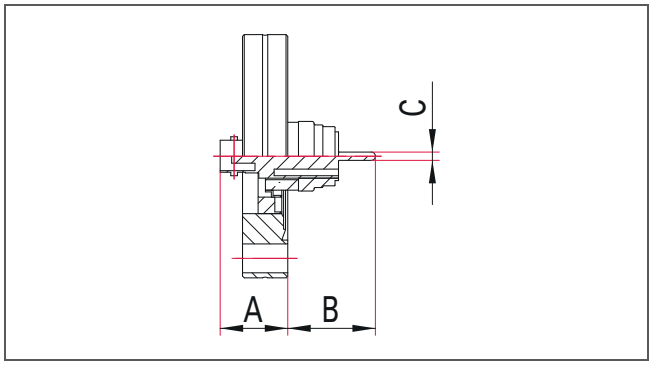
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

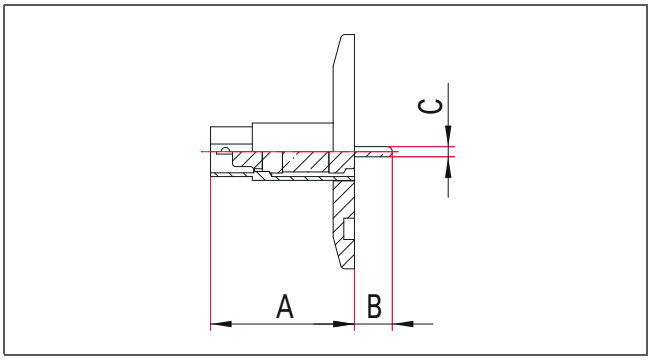
- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 5 kV DC
- Current: 3 A per pin
- Temperature range: -100 to 300 °C (vacuum side)
- Including atmosphere sided plug (-65 to 165 °C)

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**

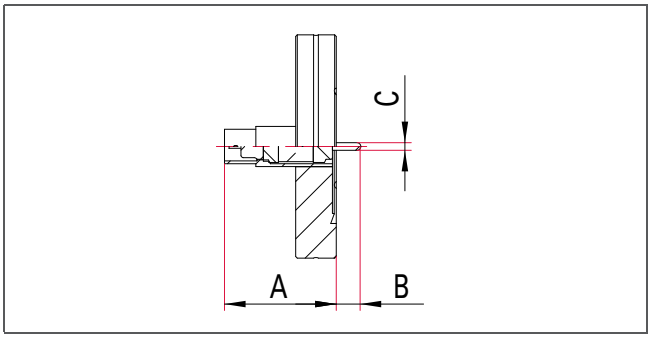
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

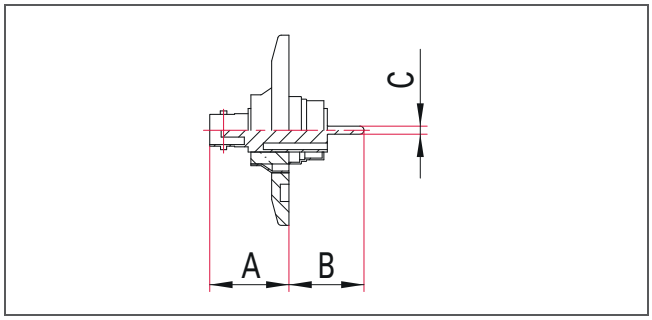
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

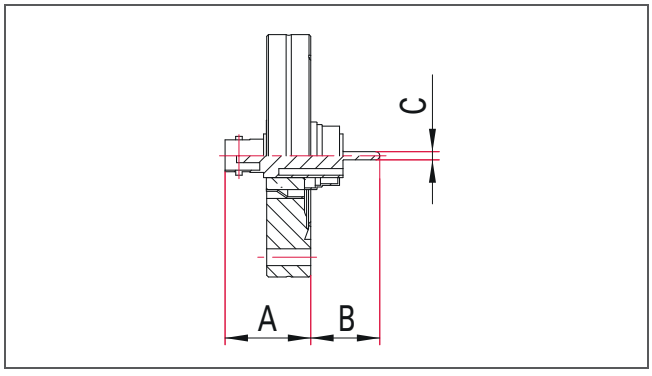
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

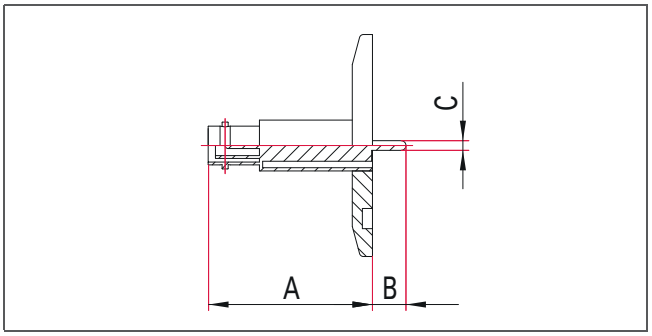
- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 5 kV DC
- Current: 5 A per pin
- Temperature range: -100 to 300 °C (vacuum side)
- Including atmosphere sided plug (-65 to 165 °C)

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**

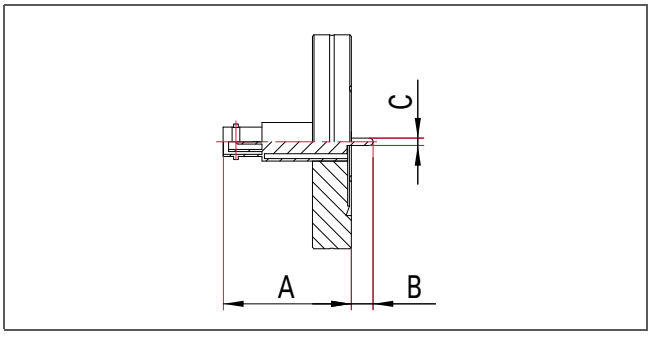
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

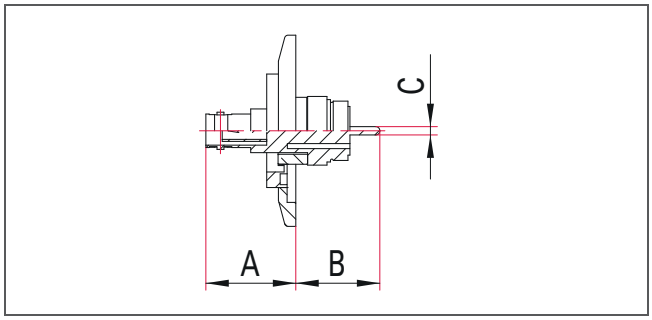
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

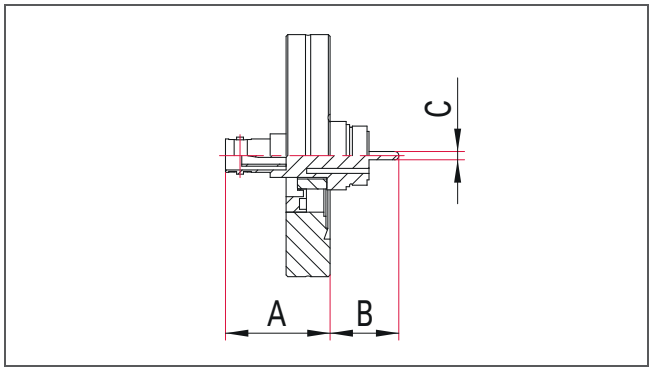
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

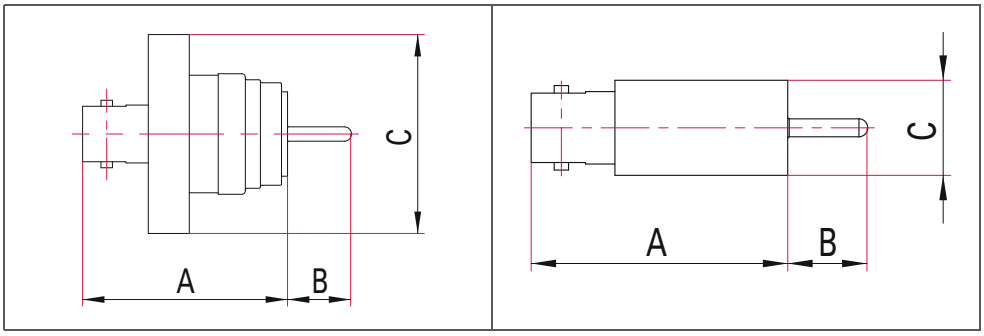
- Item no. suffix -os: Plug not included
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Temperature range: -100 to 300 °C (vacuum side)
- Including atmosphere sided plug (-65 to 165 °C)

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**

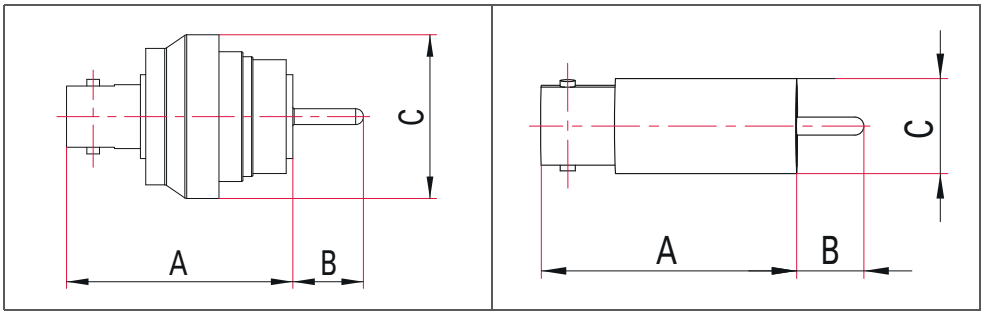
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa

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**

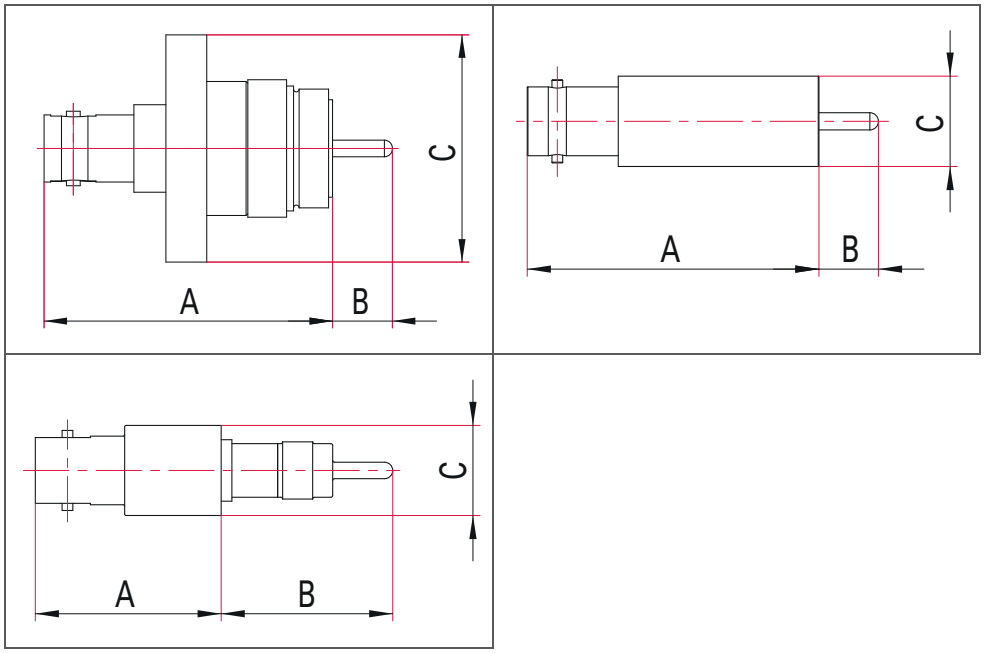
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa

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

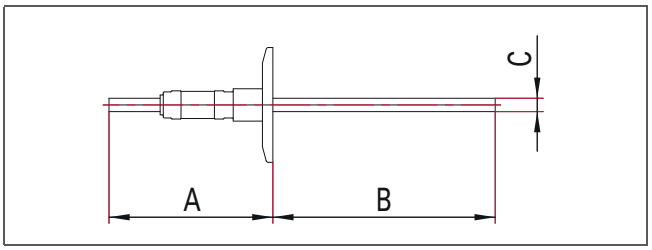
- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, molybdenum, nickel on request
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 1 kV DC
- Current: 20 A
- Temperature range: -100 to 300 °C (vacuum side)

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**

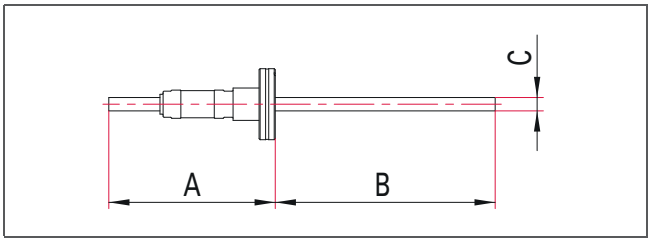
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

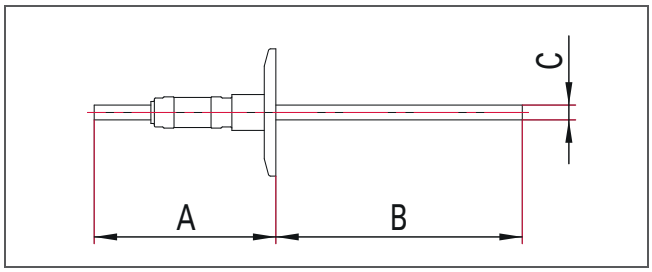
- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, molybdenum, nickel on request
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 5 kV DC
- Current: 15 A
- Temperature range: -100 to 300 °C (vacuum side)

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**

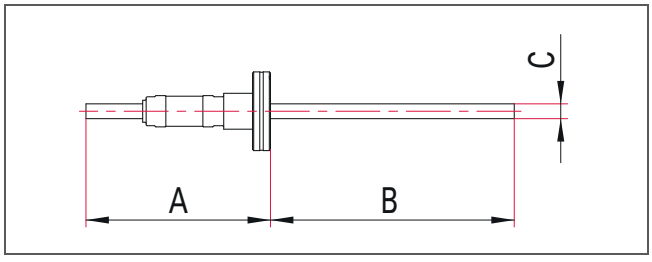
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

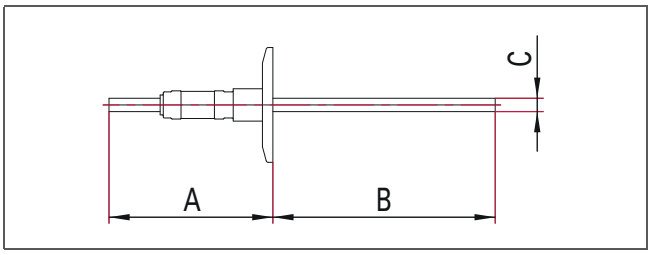
- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, molybdenum, nickel on request
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 5 kV DC
- Current: 30 A
- Temperature range: -100 to 300 °C (vacuum side)

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**

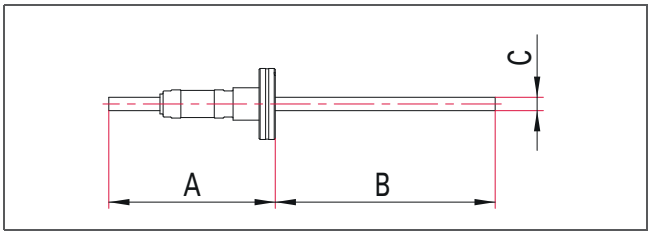
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

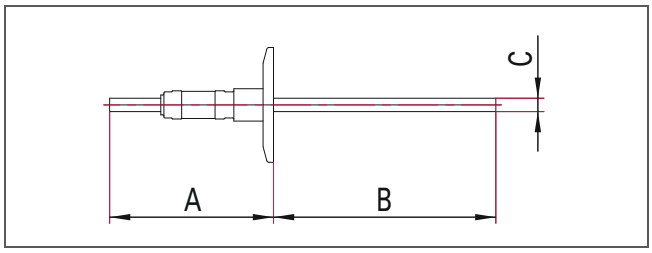
- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, molybdenum, nickel on request
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 10 kV DC
- Current: 30 A
- Temperature range: -100 to 300 °C (vacuum side)

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**

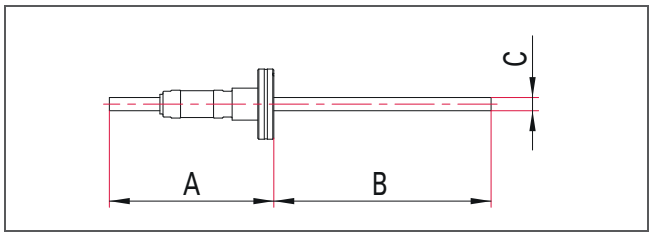
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

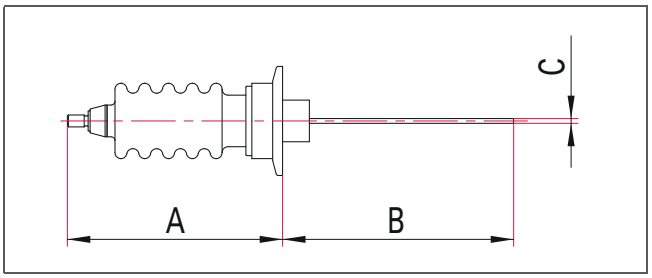
- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel on request
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 30 kV DC
- Current: 30 A
- Temperature range: -100 to 300 °C (vacuum side)

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**

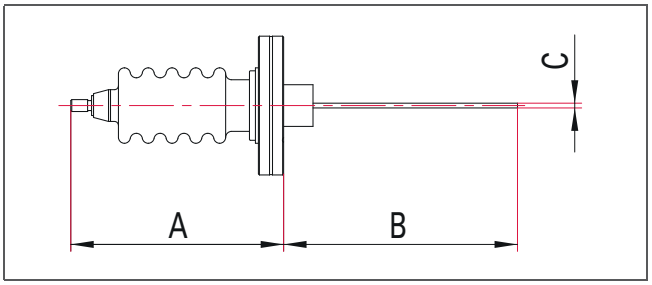
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

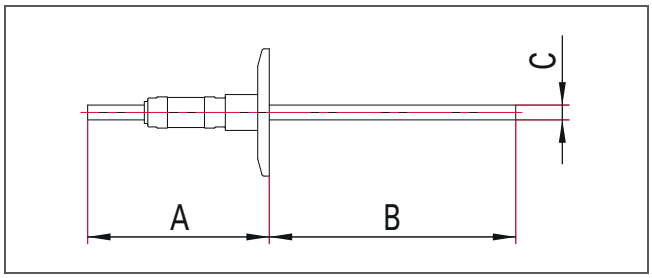
- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, Ni on request
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m^3/s
- Voltage: 5 kV DC
- Current: 150 A
- Temperature range: -100 to 300 °C (vacuum side)

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**

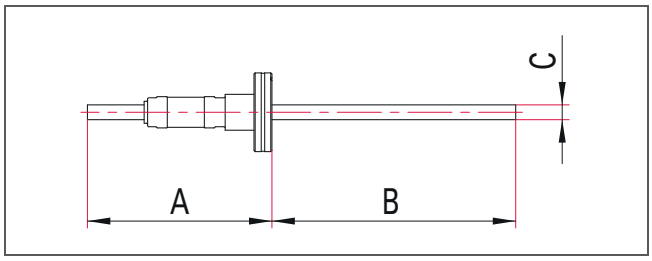
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

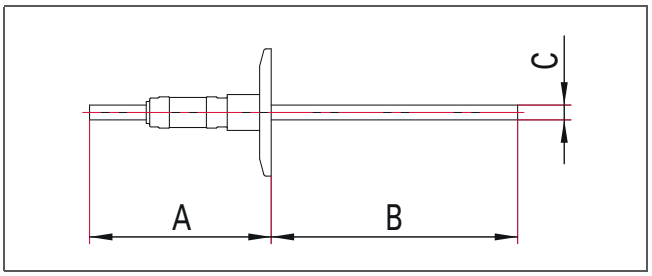
- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material stainless steel, Ni on request
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 12 kV DC
- Current: 150 A
- Temperature range: -100 to 300 °C (vacuum side)

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**

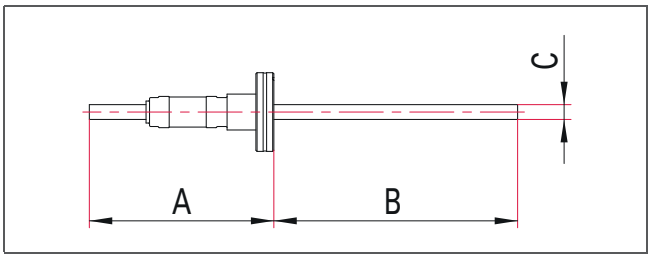
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

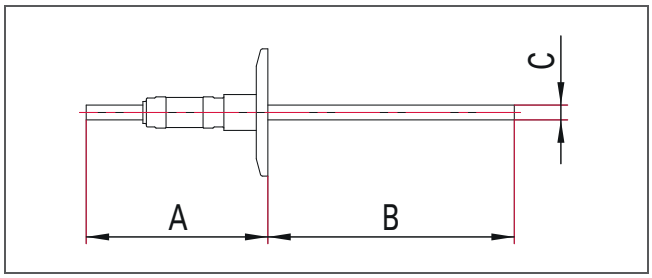
- Flange material: Stainless steel
- Conductor material: Copper
- Conductor material Ni on request
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 3 kV DC
- Current: 600 A
- Temperature range: -100 to 300 °C (vacuum side)

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**

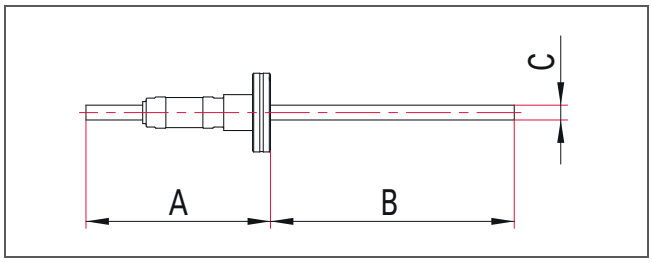
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

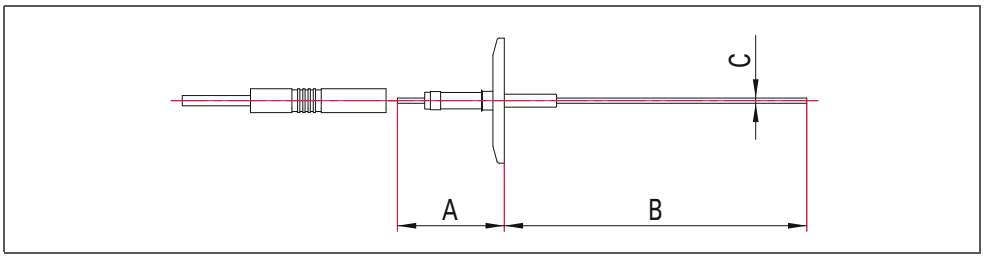
- Plug and silicone cable (length 2.4 m) included (-55 to 125 °C)
- Conductor material: Copper
- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m^3/s
- Temperature range: -100 to 300 °C (vacuum side)

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

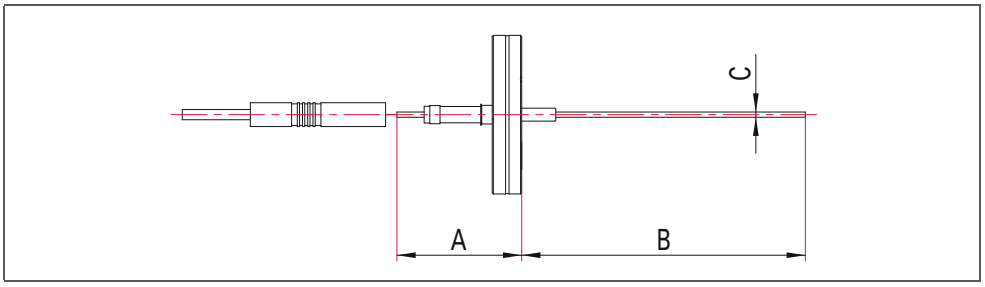
The specified voltages and currents refer to the following ambient conditions: room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

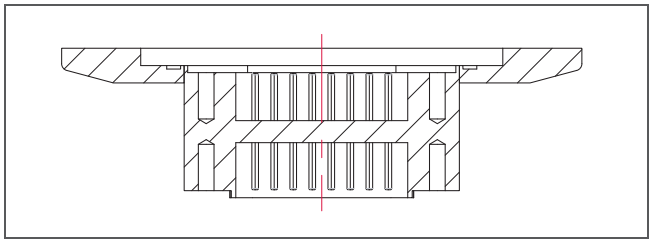
- Pin material: Stainless steel (gold-plated)
- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 500 V DC
- Current: 5 A per pin
- Temperature range: -100 to 300 °C (vacuum side)

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**

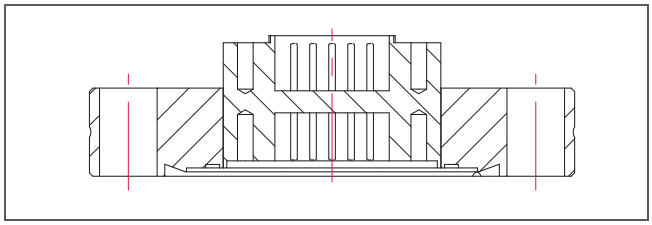
The specified voltages and currents refer to the following ambient conditions:
room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
ISO-K Flanges according to ISO 1609
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 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

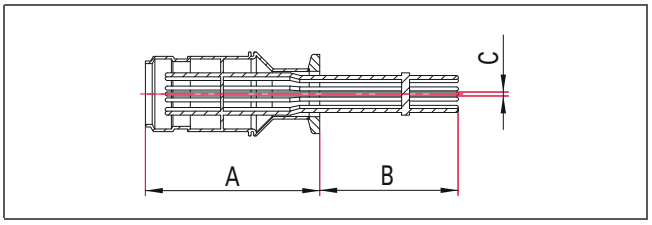
- Plug with soldering pins included, atmosphere side MIL-C-5015-compliant (-65 to 125 °C)
- Conductor material: Alumel
- Flange material: Stainless steel
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Voltage: 700 V DC
- Current: up to 10 A per pin (do not exceed 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**

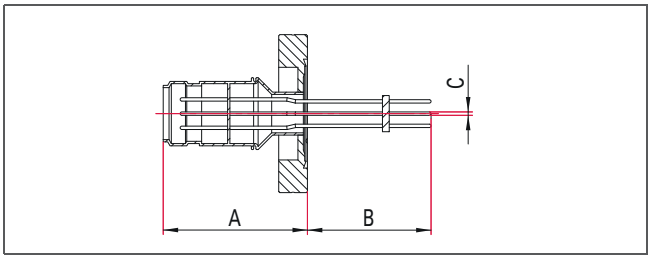
The specified voltages and currents refer to the following ambient conditions: room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

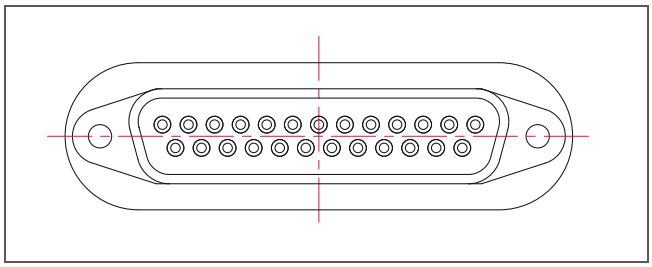
The specified voltages and currents refer to the following ambient conditions: room temperature, outside: dry air, inside: vacuum < $1 \cdot 10^{-4}$ hPa
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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 m³/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

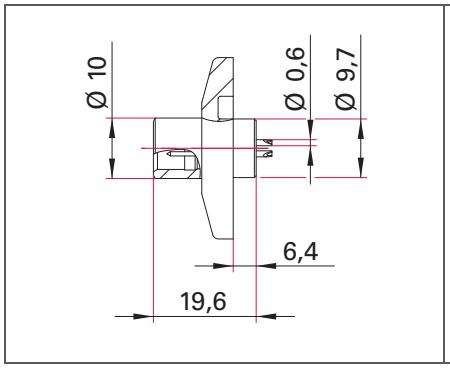
Pins	Order number
9	**XSD-9**
15	**XSD-15**
25	**XSD-25**
50	**XSD-50**

Electrical Feedthrough Round Socket, Flanged

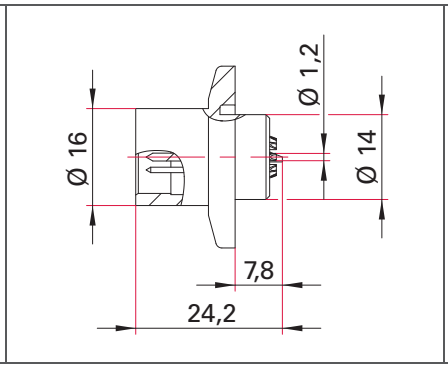


- Electrical feedthroughs for currents of up to 16 A and voltages of up to 800 V
- Nickel-plated or chrome-plated steel
- Connector (accessorie) for PF 272 015-X, PF 264 012, PF 264 016-X
- Soldered connection for PF 272 011-X, PF 272 013-X, PF 264 010
- Connection: Atmospheric side: Connector (accessorie)
- Bakeout temperature: 130 °C
- Tightness: $1 \cdot 10^{-10}$ Pa m³/s
- Pressure range: $1 \cdot 10^{-8}$ hPa to 500 hPa over pressure
- Isolator: PTFE/Araldit
- Contact: Gold-plated bronze

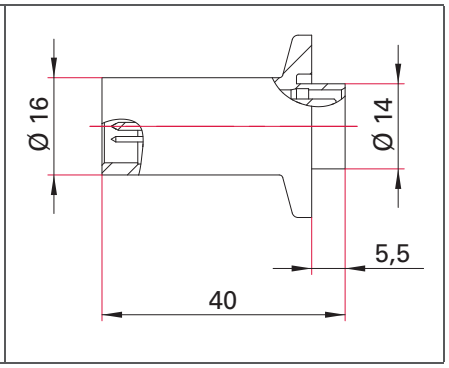
Dimensions



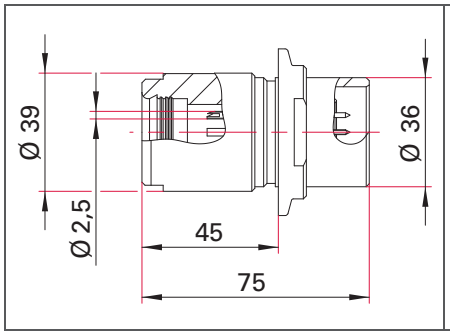
PF 272 011-X



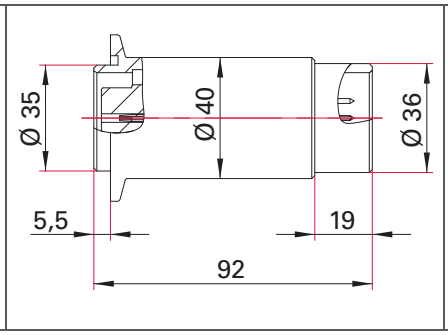
PF 272 013-X



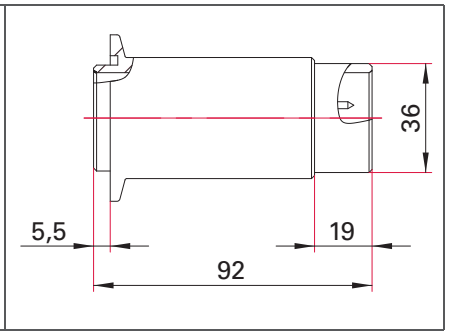
PF 272 015-X



PF 264 010



PF 264 012



PF 264 016-X

ISO-KF

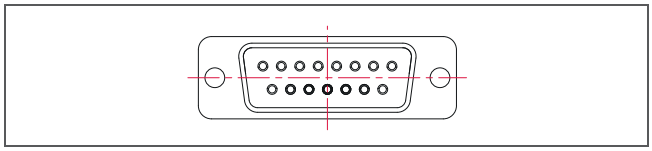
Nominal diameter	Voltage, per pole [V]	Current, per pole [A]	Pins	Order number
DN 16 ISO-KF	50	1	4	**PF 272 011-X**
DN 16 ISO-KF	50	2	9	**PF 272 013-X**
DN 16 ISO-KF	50	2	9	**PF 272 015-X**
DN 40 ISO-KF	380	16	7	**PF 264 010**
DN 40 ISO-KF	380	16	7	**PF 264 012**
DN 40 ISO-KF	800	16	4	**PF 264 016-X**

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

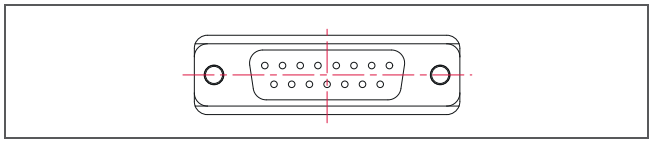


Pins	Order number
9	**XSD-9-s-atm**
15	**XSD-15-s-atm**
25	**XSD-25-s-atm**
50	**XSD-50-s-atm**

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

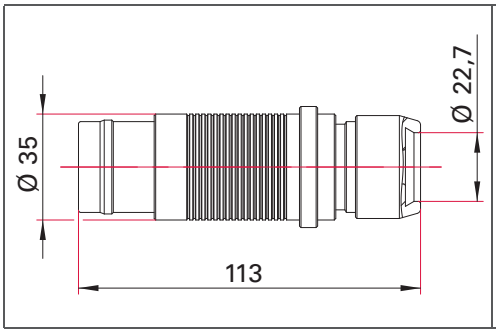


- PF 296 022-T for feedthrough PF 264 016-X
- PF 297 010 for feedthrough PF 272 011-X

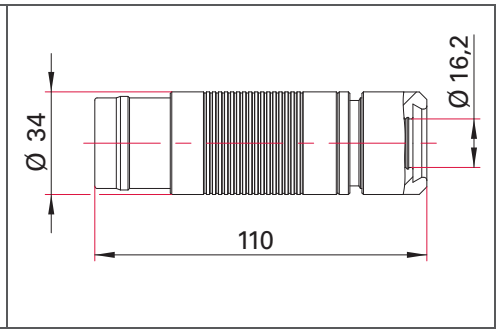
Outside Connector, Atmosphere Side

Pins	Order number
7	**PF 296 010**
4	**PF 296 022-T**
4	**PF 297 010**
9	**PF 297 013-T**

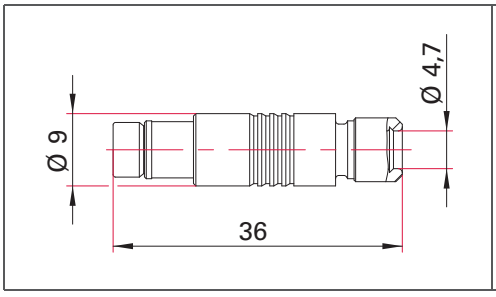
Dimensions



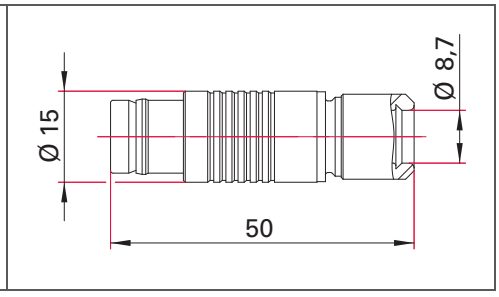
PF 296 010



PF 296 022-T



PF 297 010



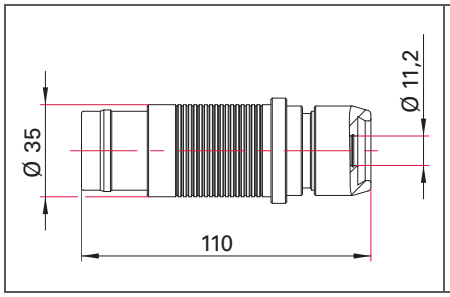
PF 297 013-T

Inside Connector, Vacuum Side

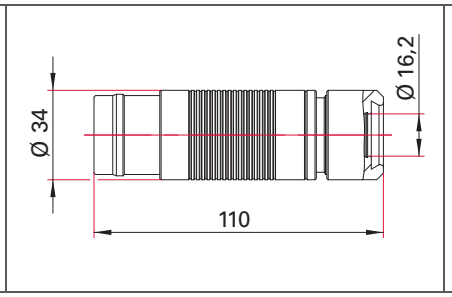


Pins	Order number
7	**PF 296 012**
4	**PF 296 024-T**
9	**PF 297 015-T**

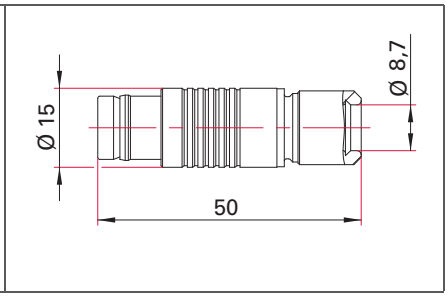
Dimensions



PF 296 012



PF 296 024-T



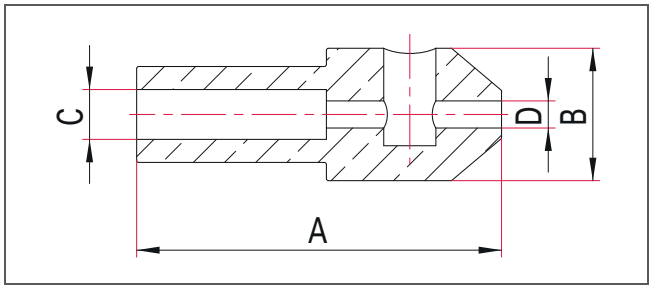
PF 297 015-T

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)

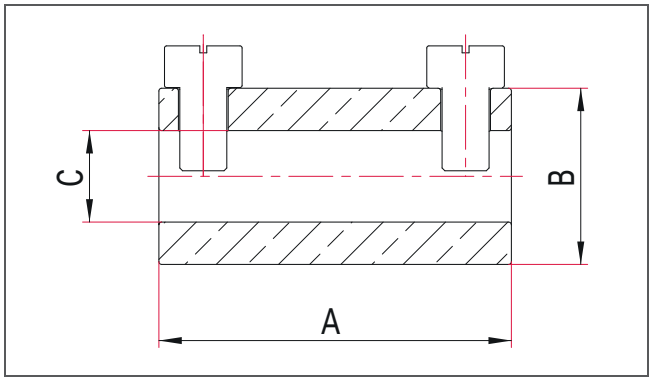
Wire diameter [mm]	A [mm]	B [mm]	C [mm]	D [mm]	Order number
1.3	17.5	6.35	1.3	1.3	**XAK015A**
2.4	17.5	6.35	2.4	1.3	**XAK030A**

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

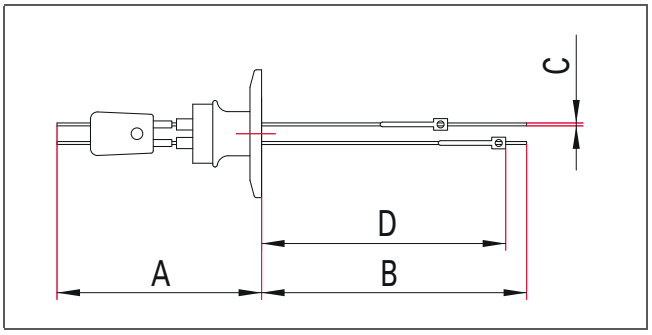
- Thermocouple, 1 pair type K: Chromel (+)/Alumel (-), (type C, E, J on request)
- 2 conductors made of copper (nickel on request)
- Includes atmosphere sided miniature plug for thermocouple (-65 to 125 °C)
- Other flange combinations on request
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/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	**120XKO016-5-30**

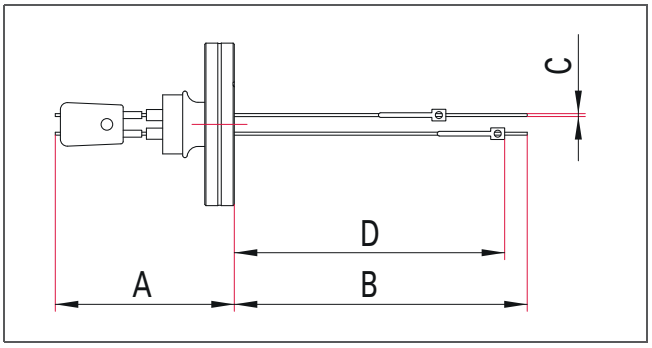
Electrical specifications are based on ambient pressure on the air side and $1 \cdot 10^{-4}$ hPa on the vacuum side.
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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	**420XKO016-5-30**
DN 40 CF	5	30	72	126	2.4	113	**420XKO040-5-30**

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

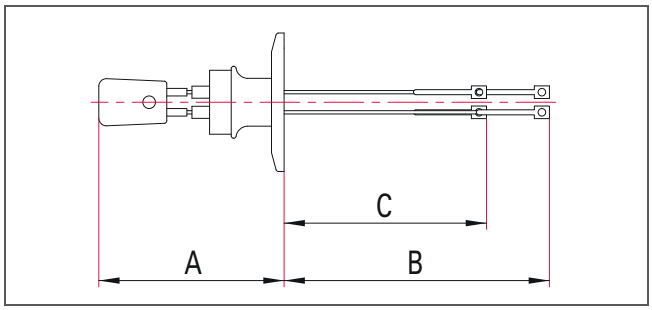
- Thermocouple Type K: Chromel (+)/Alumel (-), (types C, E, J, T, N, R, S on request)
- Vacuum-side lugs with screw connections for the thermo wire (including srews)
- Including atmosphere sided miniature plug (-65 to 125 °C)
- Wire Pairs: 1-4
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m^3/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**

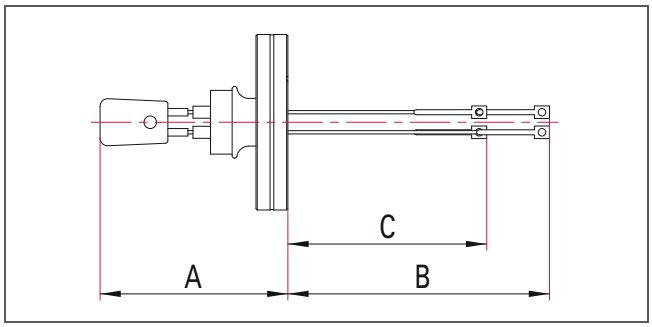
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

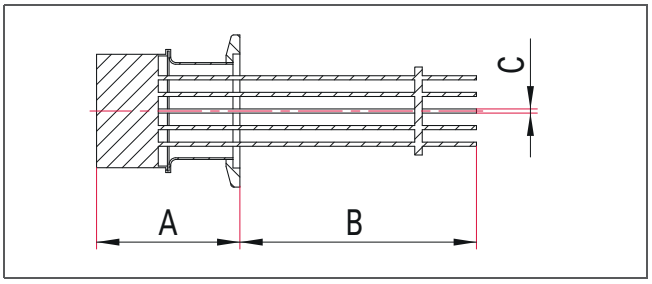
- Thermocouple Type K: Chromel (+)/Alumel (-), (type E, J on request)
- Including atmosphere sided MIL-C-5015-compliant MS plug (-65 to 125 °C)
- Thermocouples: 3 and 5
- Heat up and cool down speed: max. 25 K/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Materials: Stainless steel (flange)
- Temperature 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**

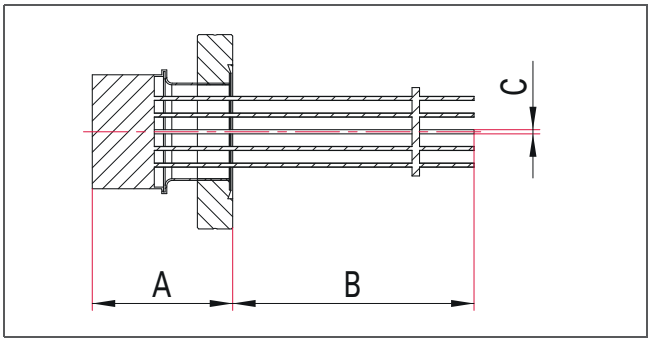
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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**

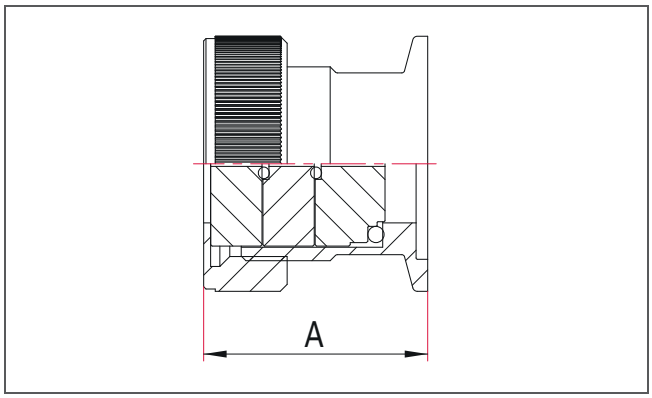
ISO-KF Flanges according to ISO 2861
CF Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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^3/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

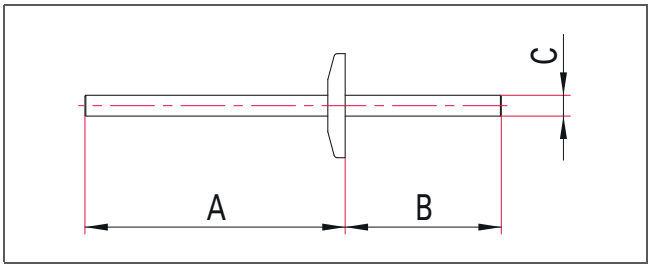
- Flange material: Stainless steel
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Pressure range: $1 \cdot 10^{-8}$ hPa to 500 hPa over pressure
- Temperature range: -196 to 300 °C (vacuum side)

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





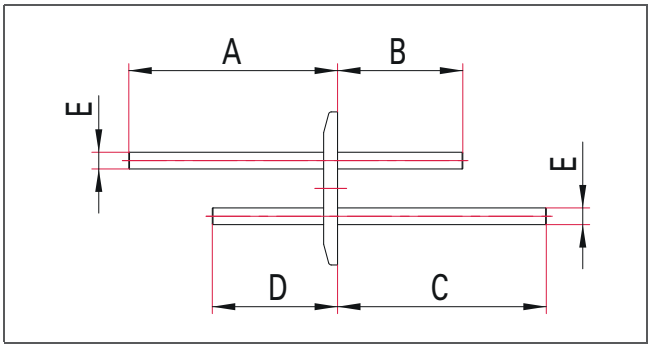
Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	P	P	75	45	6	**120XFL016-PP**
DN 16 KF	S	S	103	73	6	**120XFL016-SS**
DN 40 KF	P	P	75	45	6	**120XFL040-PP**
DN 40 KF	S	S	103	73	6	**120XFL040-SS**
DN 40 KF	V	V	105	75	6	**120XFL040-VV**

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

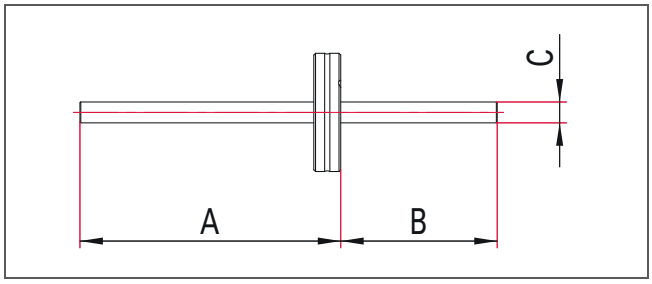
- Flange material: Stainless steel
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Pressure range: $1 \cdot 10^{-11}$ hPa to anbient pressure
- Temperature range: -196 to 300 °C (vacuum side)

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





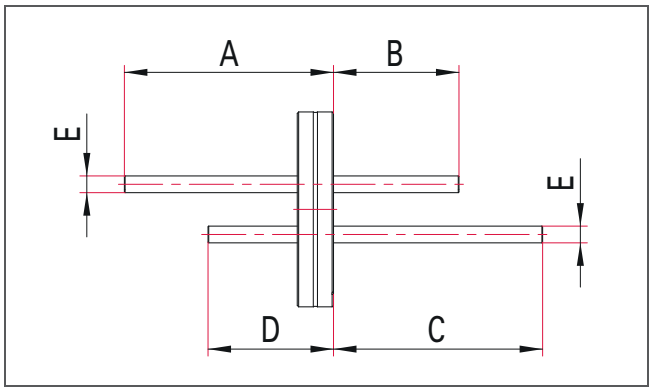
Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	P	P	75	45	6	**420XFL016-PP**
DN 16 CF	S	S	73	103	6	**420XFL016-SS**
DN 40 CF	P	P	75	45	6	**420XFL040-PP**
DN 40 CF	S	S	103	73	6	**420XFL040-SS**
DN 40 CF	V	V	105	75	6	**420XFL040-VV**

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

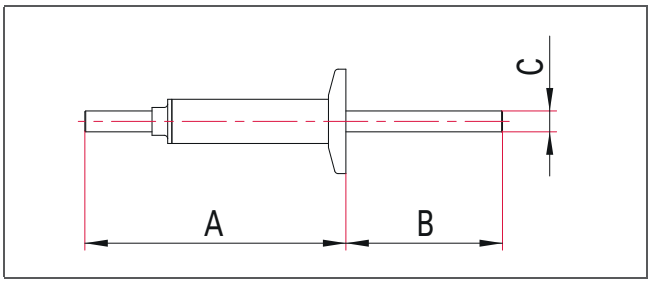
- Flange-tube connection: Thermally insulated tube
- Flange material: Stainless steel
- Suitable for liquid nitrogen
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Pressure range: $1 \cdot 10^{-8}$ hPa to 1500 hPa over pressure
- Temperature range: -196 to 300 °C (vacuum side)

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



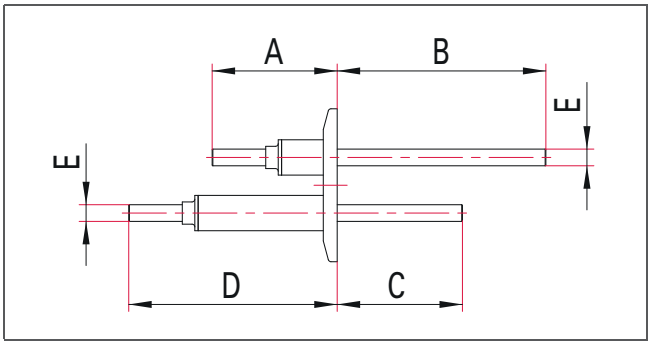
Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	Order number
DN 16 KF	P	P	75	45	6	**120XFN016-PP**
DN 16 KF	S	S	103	73	6	**120XFN016-SS**
DN 40 KF	P	P	75	45	6	**120XFN040-PP**
DN 40 KF	S	S	103	73	6	**120XFN040-SS**
DN 40 KF	V	V	105	75	6	**120XFN040-VV**

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

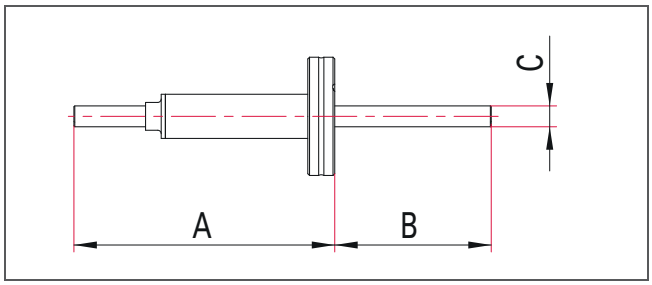
- Flage-tube connection: Thermally insulated tube
- Flange material: Stainless steel
- Suitable for liquid nitrogen
- Tightness: $1 \cdot 10^{-11}$ Pa m³/s
- Pressure range: $1 \cdot 10^{-11}$ hPa to 1500 hPa over pressure
- Temperature range: -196 to 300 °C (vacuum side)

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



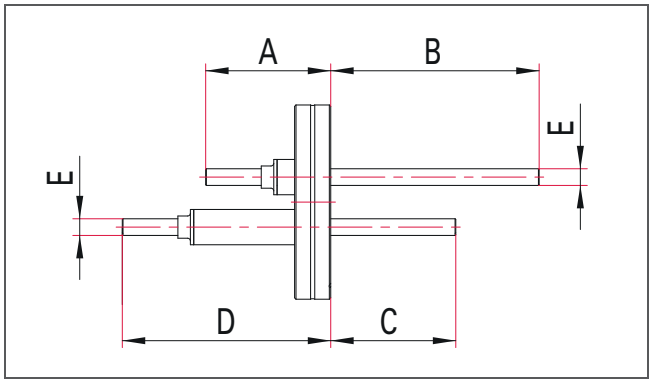
Nominal diameter	Vacuum side	Atmosphere side	A [mm]	B [mm]	C [mm]	Order number
DN 16 CF	P	P	75	45	6	**420XFN016-PP**
DN 16 CF	S	S	103	73	6	**420XFN016-SS**
DN 40 CF	P	P	75	45	6	**420XFN040-PP**
DN 40 CF	S	S	103	73	6	**420XFN040-SS**
DN 40 CF	V	V	105	75	6	**420XFN040-VV**

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

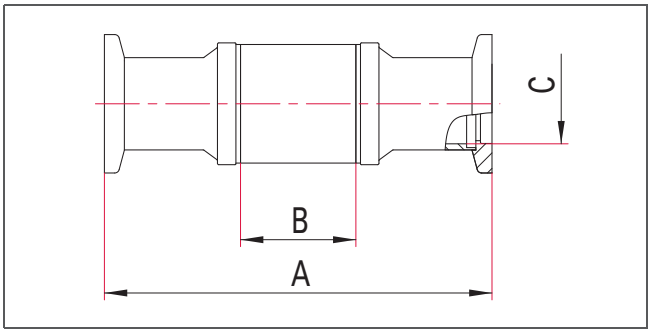
Isolators ISO-KF



- Stainless steel flange
- Heat up and cool down speed: max. 25 °C/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/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

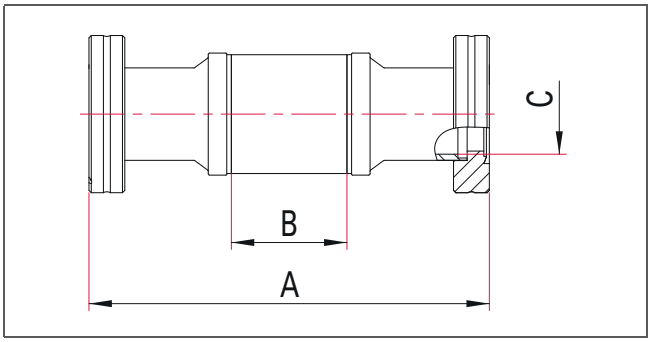
Isolators CF



- Stainless steel flange
- Heat up and cool down speed: max. 25 °C/min
- Tightness: $1 \cdot 10^{-11}$ Pa m³/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**

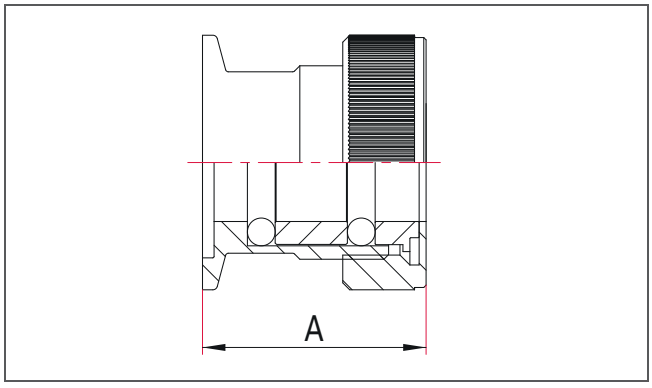
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

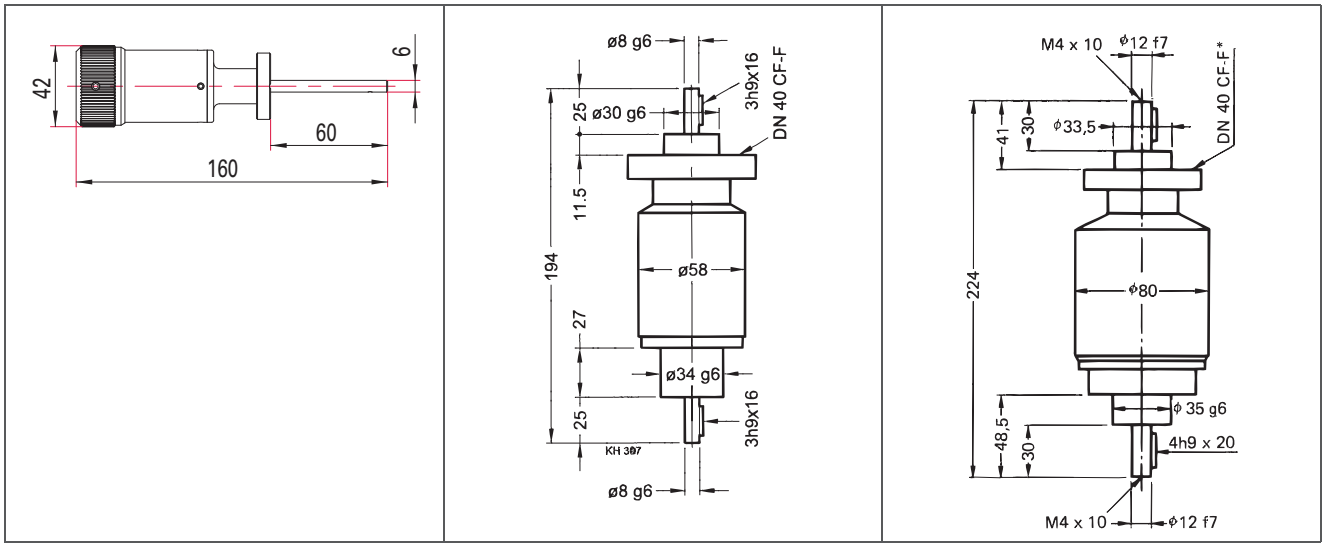
- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Stainless steel ball bearing with dry lubrication, suitable for UHV
- Mode of operation: DN 16: Operating handle with snap-in stages in 10 ° increments; DN 40: shaft connections on both sides
- Operating temperature: DN 16: up to 80 °C; DN 40: up to 300 °C
- Tightness: < $1 \cdot 10^{-11}$ Pa m^3/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

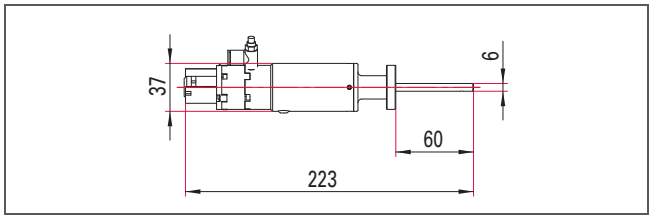
Bellows-sealed Rotary Feedthrough, Pneumatic



- 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 m³/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**

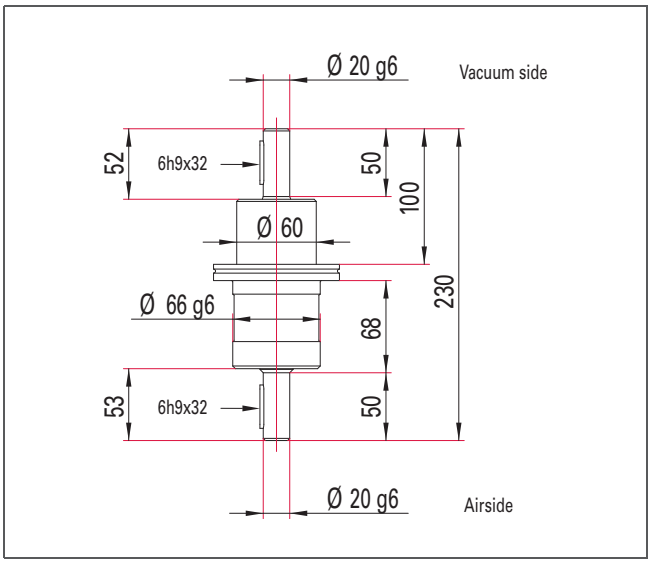
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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^3/s
- Seal: FKM
- Rotation speed: 500 min^{-1}
- 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

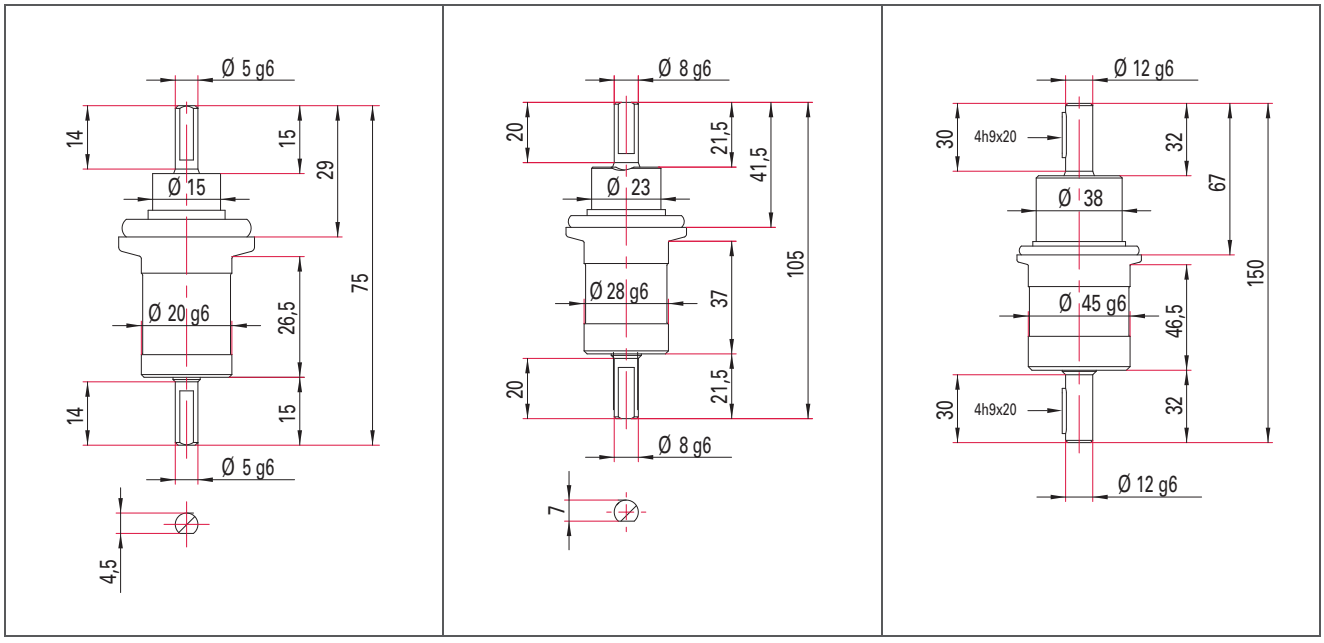
Nominal diameter	Transferable torque [Nm]	Shaft connection [mm]	Shaft load, axial [N]	Shaft load, radial [N]	Order number
DN 63 ISO-K	100	ø 20 x 50	100	500	**PF 420 010-T**

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 m³/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**

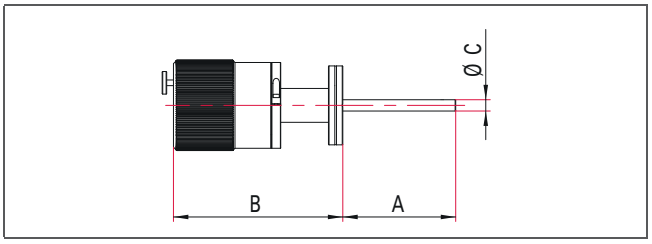
Content

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 m³/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

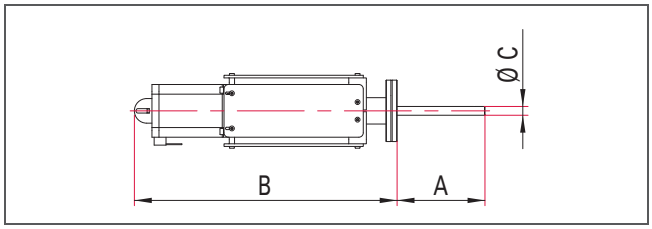
Rotary Magnetic Feedthrough, Motorized

- 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 m³/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^{-1}
- Transmission: optional available
- Motor version: 2-phase stepper motor

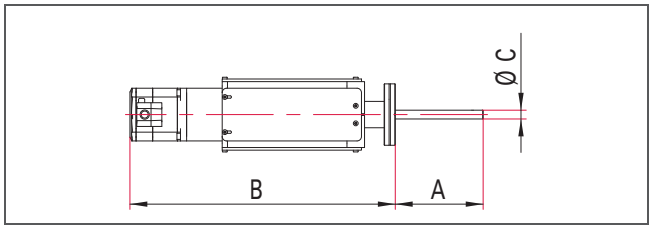
Nominal diameter	A [mm]	B [mm]	C [mm]	Lowest angular resolution [°]	Order number
DN 40 CF	100	299	10	0.45	**420MRM040-m**

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^{-1}
- 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**

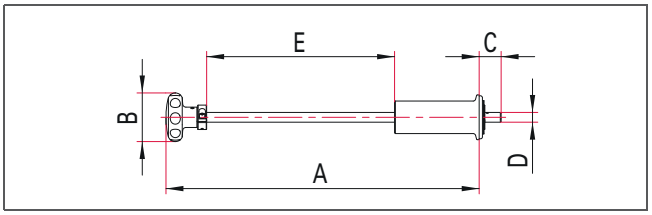
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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^3/s
- Pressure range: $1 \cdot 10^{-8}$ hPa to ambient pressure
- Lubricant: Perfluorpolyether grease
- Transferable torque dynamic: 20 Nm
- Shaft connection: with threaded hole, vented: M6x12
- Shaft load, axial: 100 N

Dimensions



Note

Options: additional stroke lenghts, 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**

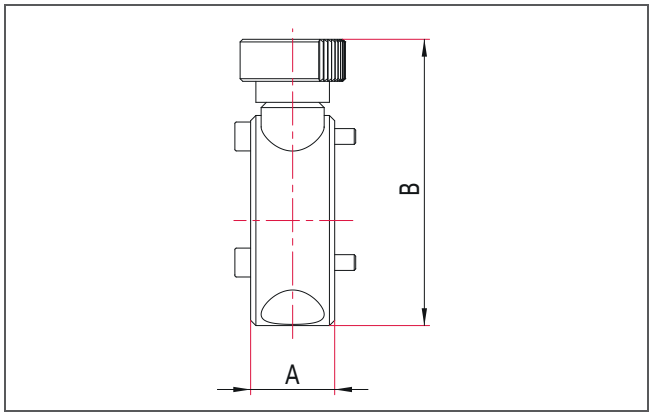
Flanges according to ISO 2861

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

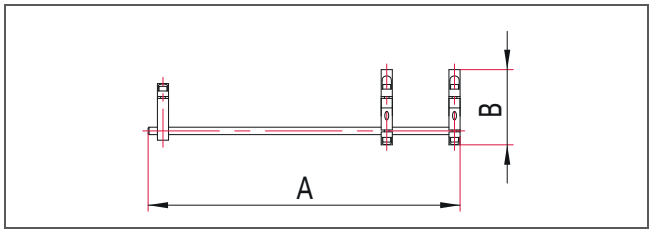
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 KF	16	55	**120MDD-B**

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

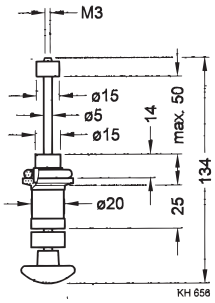
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 KF	386	81	**120MDD040-0250-VS**
DN 40 KF	636	81	**120MDD040-0500-VS**
DN 40 KF	886	81	**120MDD040-0750-VS**

Elastomer-sealed Rotary/Linear Feedthrough DS

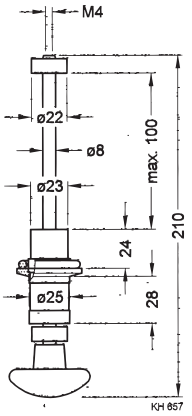


- Direct power transmission using elastomer-sealed shaft
- Freely rotatable and slidable
- Adjustable stroke limiting stops
- Bakeout temperature: 110 °C
- Operating temperature: max. 50 °C
- Tightness (static): $1 \cdot 10^{-10}$ Pa m³/s
- Seal: FKM
- Pressure range: $1 \cdot 10^{-8}$ hPa to ambient pressure
- Materials: Housing: aluminum; shaft: stainless steel

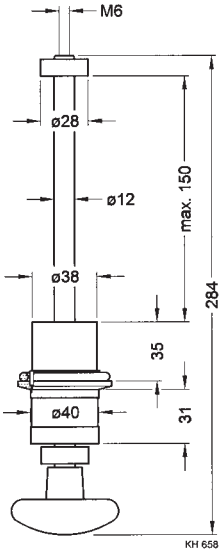
Dimensions



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

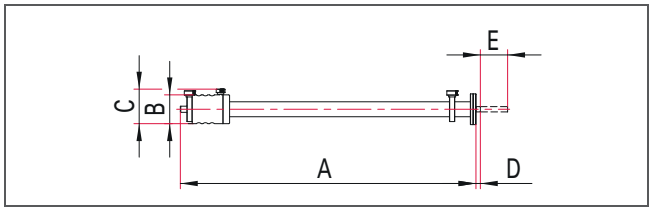
Nominal diameter	Length [mm]	Order number
DN 16 CF	50	**PT 226 978 -T**
DN 25 CF	100	**PT 226 979 -T**
DN 40 CF	150	**PT 226 980 -T**

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^3/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 lenghts, 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**

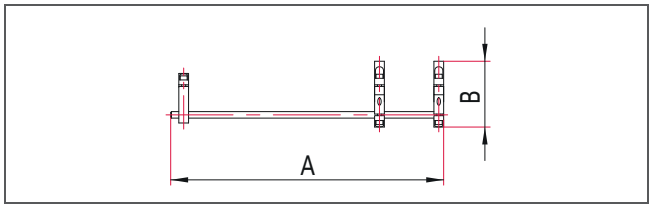
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

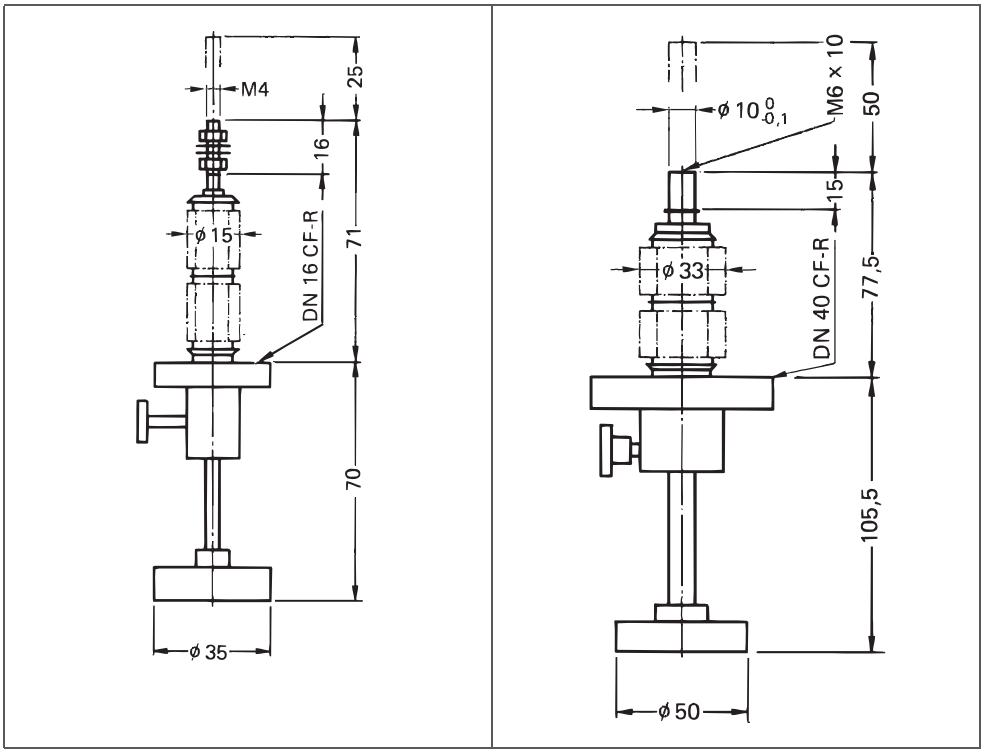
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 CF	381	103	**420MDM040-0250-VS**
DN 40 CF	631	103	**420MDM040-0500-VS**
DN 40 CF	881	103	**420MDM040-0750-VS**

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 m³/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**

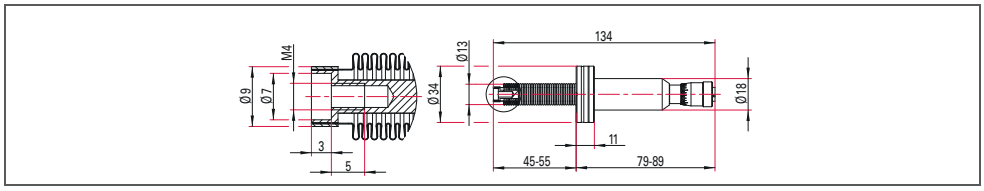
Bellows-sealed Precision Linear Feedthrough

- 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 m³/s
- Pressure range: $1 \cdot 10^{-9}$ hPa to 500 hPa over pressure
- Mounting orientation: any
- Service life: 10000 cycles

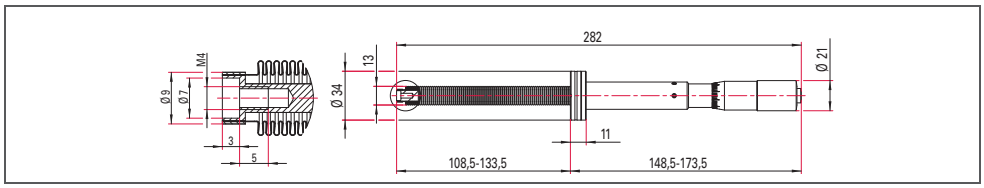
Manual, Fine



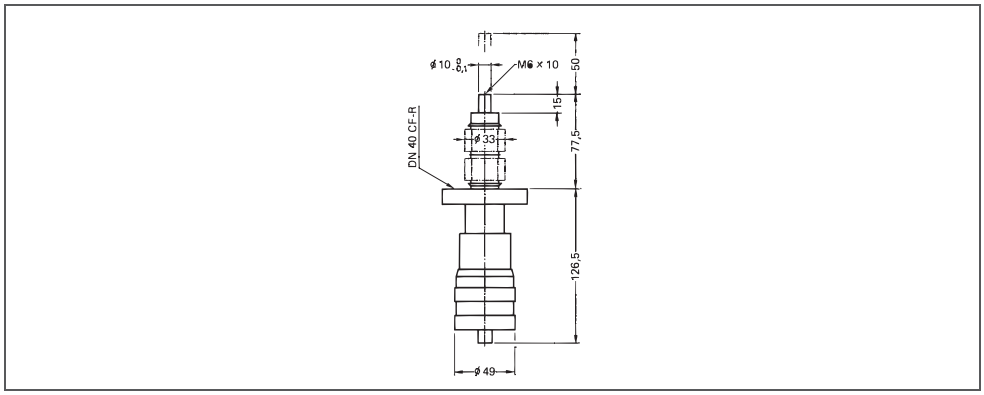
Dimensions



420MZF016-010



420MZF016-025



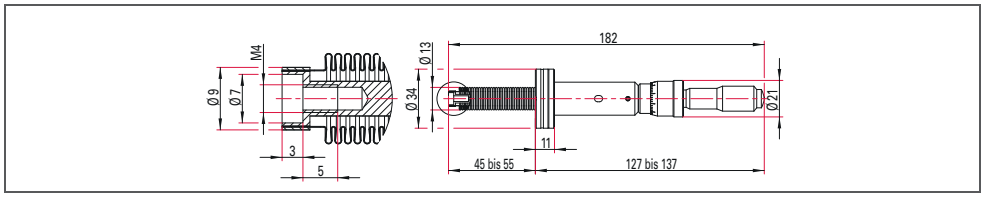
PF 631 012-T

Nominal diameter	Stroke [mm]	Resolution [µm]	Accuracy [µm]	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 [µm]	Accuracy [µm]	Order number
DN 16 CF	10	0.5	3	**420MZF016-010-s**

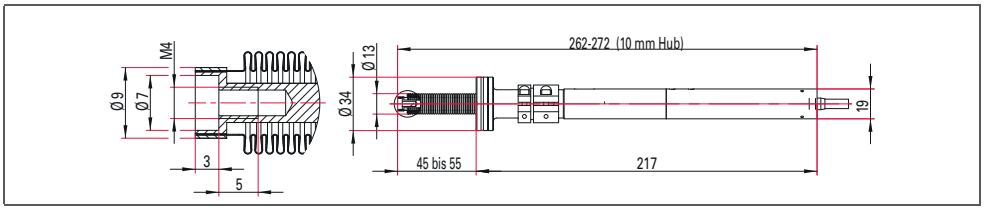
Bellows-sealed Precision Linear Feedthrough Motorized

- 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



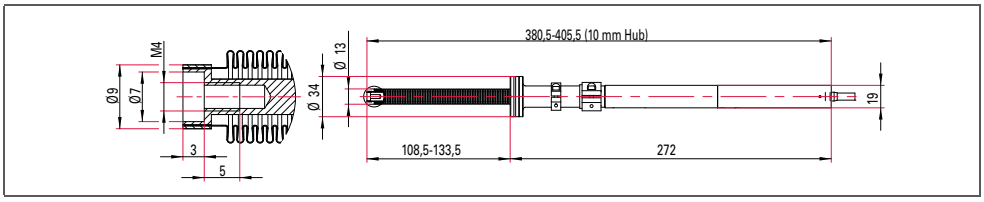
Nominal diameter	Stroke [mm]	Resolution [µm]	Accuracy [µm]	Order number
DN 16 CF	10	0.05	3	**420MZF016-010-m**

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 [µm]	Accuracy [µm]	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



Contents

Manipulators

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Manipulators

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.



Overview of series and applications

■ = recommended	Analytics						Semiconductor										Coating										Industry										R & D										Page
	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 display (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	Fusion technology	Plasma research	Particle accelerators	Space simulation	Low temperature research	Elementary particle physics	Nanotechnology	Biotechnology	
Manipulators																																													
Z-axis manipulators	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	362
XY-axis manipulators	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	364
Rotary manipulators	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	367
Adjusting devices for angle and length compensation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	368
Rotary feedthroughs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	369
Rotary/linear feedthroughs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	375
Linear feedthroughs	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	379

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	
Manipulators																															
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
Elastomer-sealed feedthroughs	■	■	■	■																	■								■			371
Magnetic rotary feedthroughs	■		■																		■								■	■		373
Elastomer sealed rotary/linear feedthroughs	■	■	■											■			■	■			■								■			375
Magnetic rotary/linear feedthroughs			■											■			■	■			■								■			378
Bellows-sealed linear feedthroughs	■		■					■	■	■												■	■				■	■	■	■		379



Content

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 ± 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°) and length (± 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^3/s in an ISO-KF and ISO-K and 10^{-11} Pa m^3/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



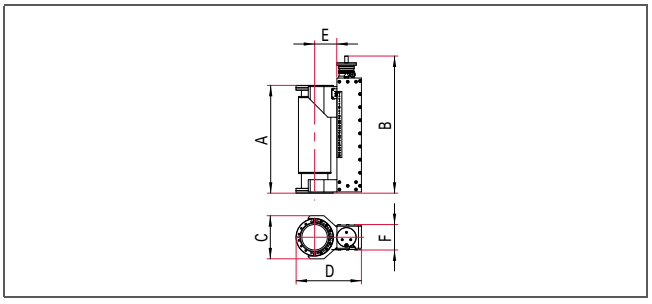
Linear feedthroughs

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^3/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**

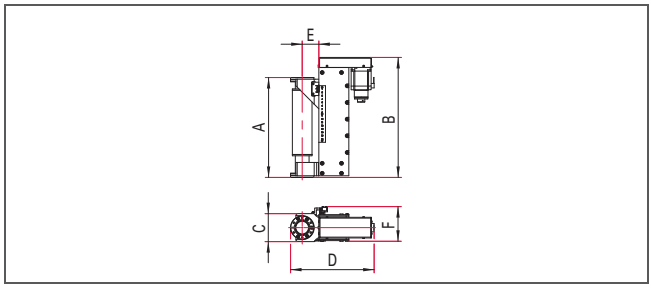
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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^3/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

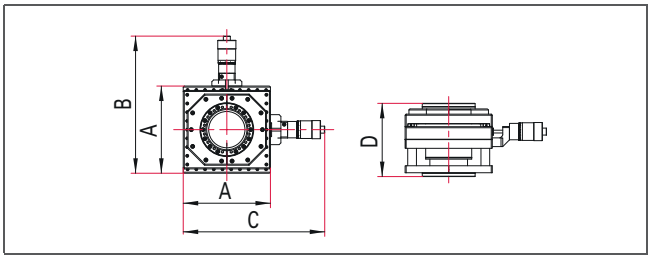
Content

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^3/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

- Repeatable precision: < 5 µm

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

- Repeatable precision: < 3 µm

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**

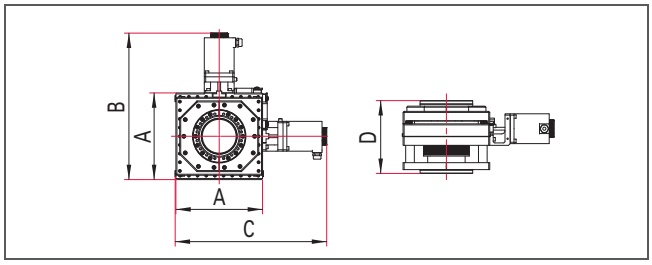
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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^3/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

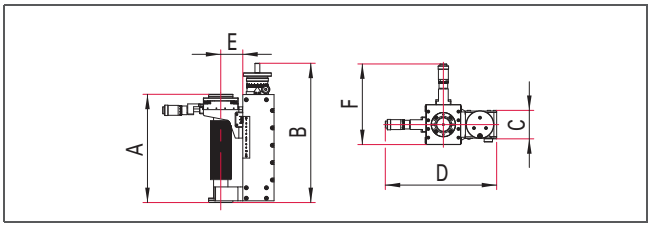
Content

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^3/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**

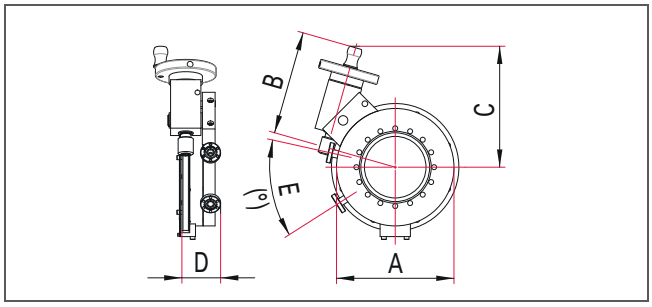
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

Rotary Manipulator, Differentially-pumped



- Continuous rotation
- UHV compatible
- Two differentially pumped sections, PTFE-sealed
- Connection differentially-pumped sections: DN16CF
- Resolution: 5 µm
- 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 ´

Dimensions



Note

Options: stepper motor on request

Rotary Manipulator, differentially pumped

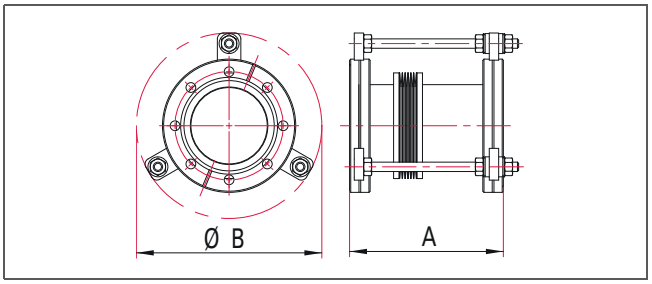
Nominal diameter	A [mm]	B [mm]	C [mm]	D [mm]	E [°]	Order number
DN 40 CF	115	76	81	41	60	**420MDP040**
DN 63 CF	146	93	91	48	45	**420MDP063**
DN 100 CF	197	116	110	54	45	**420MDP100**

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^3/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

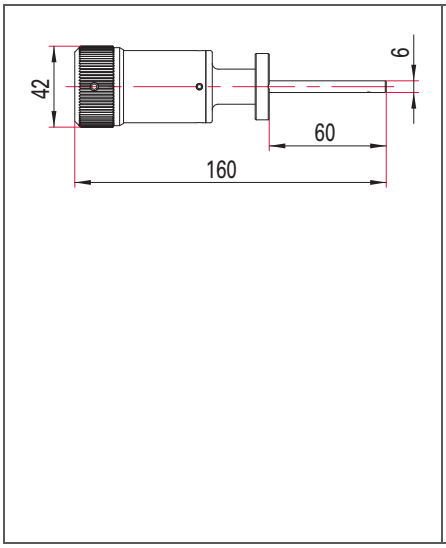
- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Stainless steel ball bearing with dry lubrication, suitable for UHV
- Mode of operation: DN 16: Operating handle with snap-in stages in 10 ° increments; DN 40: shaft connections on both sides
- Operating temperature: DN 16: up to 80 °C; DN 40: up to 300 °C
- Tightness: < $1 \cdot 10^{-11}$ Pa m^3/s
- Pressure range: $1 \cdot 10^{-9}$ hPa to 500 hPa over pressure
- Mounting orientation: any
- Materials: Stainless steel



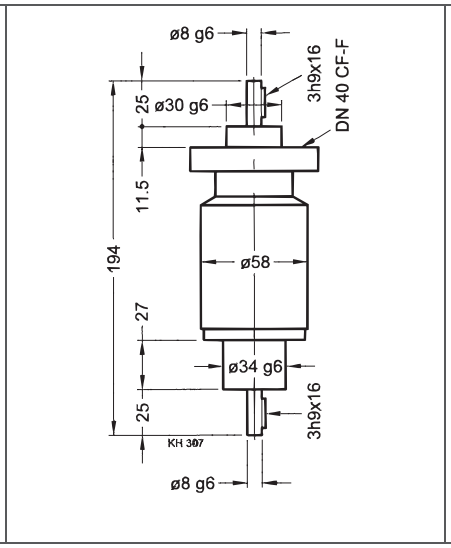
PF 621 010-T
PF 621 012-T

Note
Options for 420MRB: customized shaft

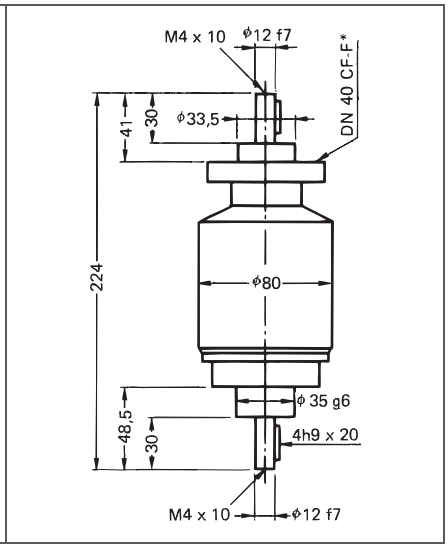
Dimensions



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

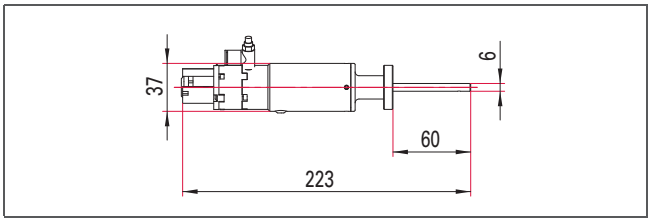
Bellows-sealed Rotary Feedthrough, Pneumatic



- 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^3/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**

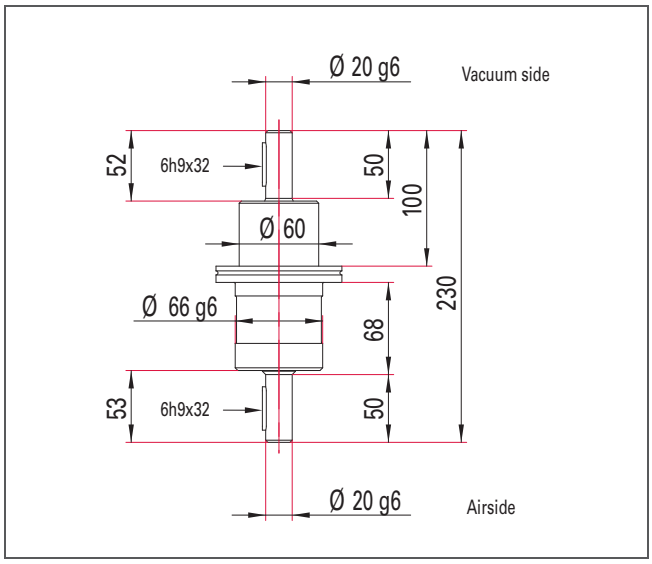
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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 m³/s
- Seal: FKM
- Rotation speed: 500 min^{-1}
- 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

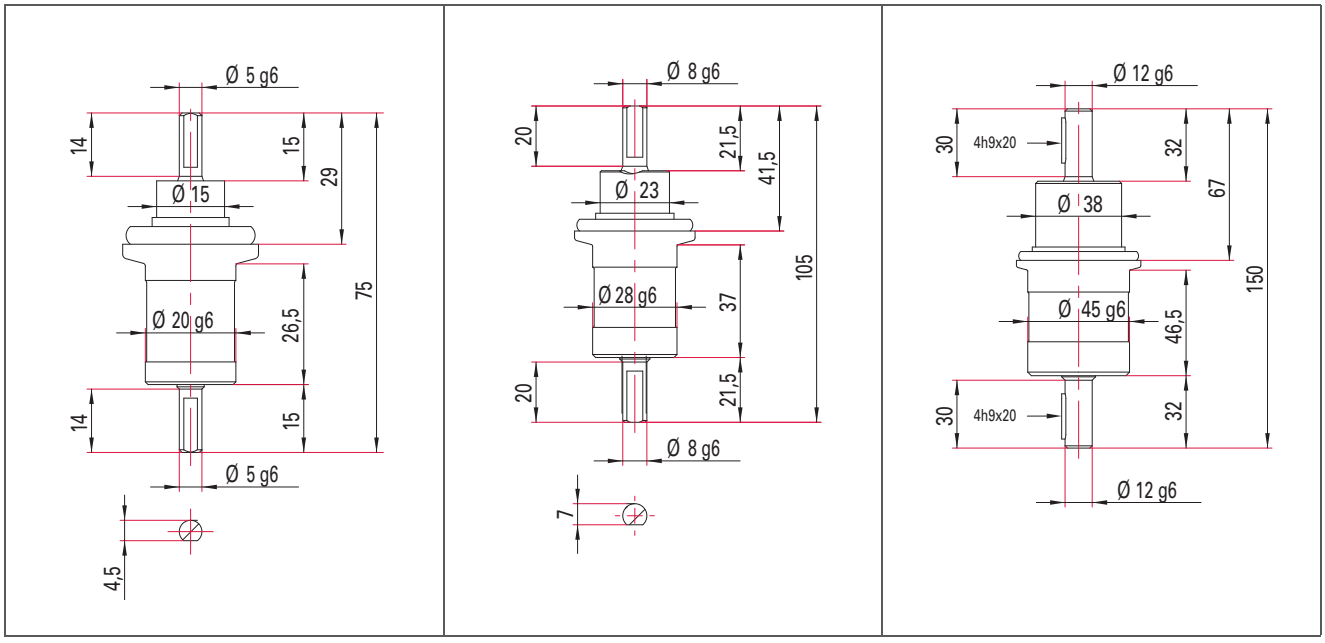
Nominal diameter	Transferable torque [Nm]	Shaft connection [mm]	Shaft load, axial [N]	Shaft load, radial [N]	Order number
DN 63 ISO-K	100	ø 20 x 50	100	500	**PF 420 010-T**

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 m³/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

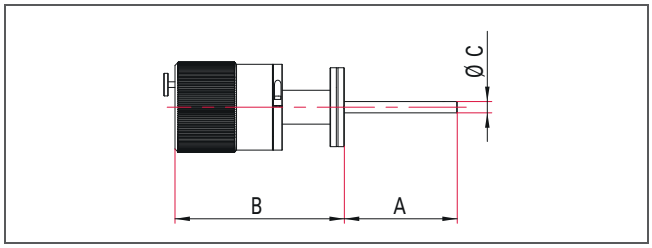
Nominal diameter	Transferable torque [Nm]	Shaft connection [mm]	Shaft load, axial [N]	Shaft load, radial [N]	Order number
DN 16 ISO-KF	1.5	ø 5 x 14	30	60	**PF 222 010 -T**
DN 25 ISO-KF	6	ø 8 x 20	50	150	**PF 223 010-T**
DN 40 ISO-KF	25	ø 12 x 30	60	250	**PF 224 010-T**

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 m³/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

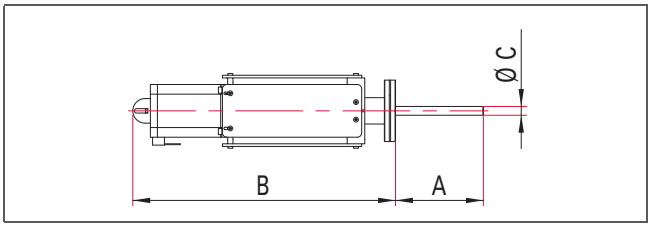
Rotary Magnetic Feedthrough, Motorized

- 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 m³/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



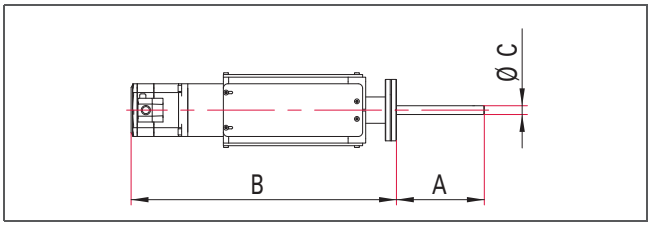
- Torque: max. 3 Nm
- Rotation speed: 500 min^{-1}
- Transmission: optional available
- Motor version: 2-phase stepper motor

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^{-1}
- 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**

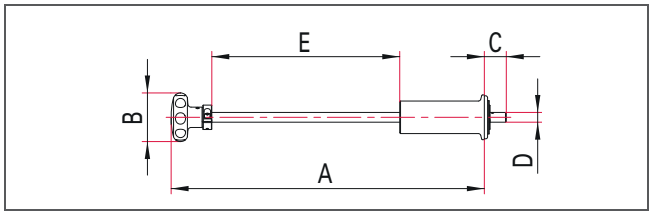
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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 m³/s
- Pressure range: $1 \cdot 10^{-8}$ hPa to ambient pressure
- Lubricant: Perfluorpolyether grease
- Transferable torque dynamic: 20 Nm
- Shaft connection: with threaded hole, vented: M6x12
- Shaft load, axial: 100 N

Dimensions



Note

Options: additional stroke lenghts, 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**

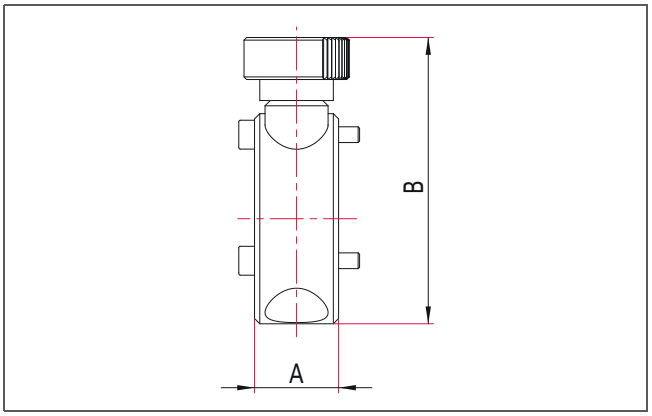
Flanges according to ISO 2861

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

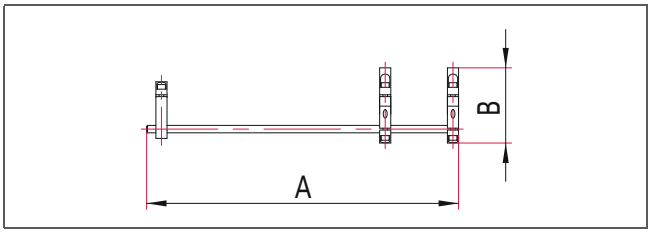
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 KF	16	55	**120MDD-B**

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

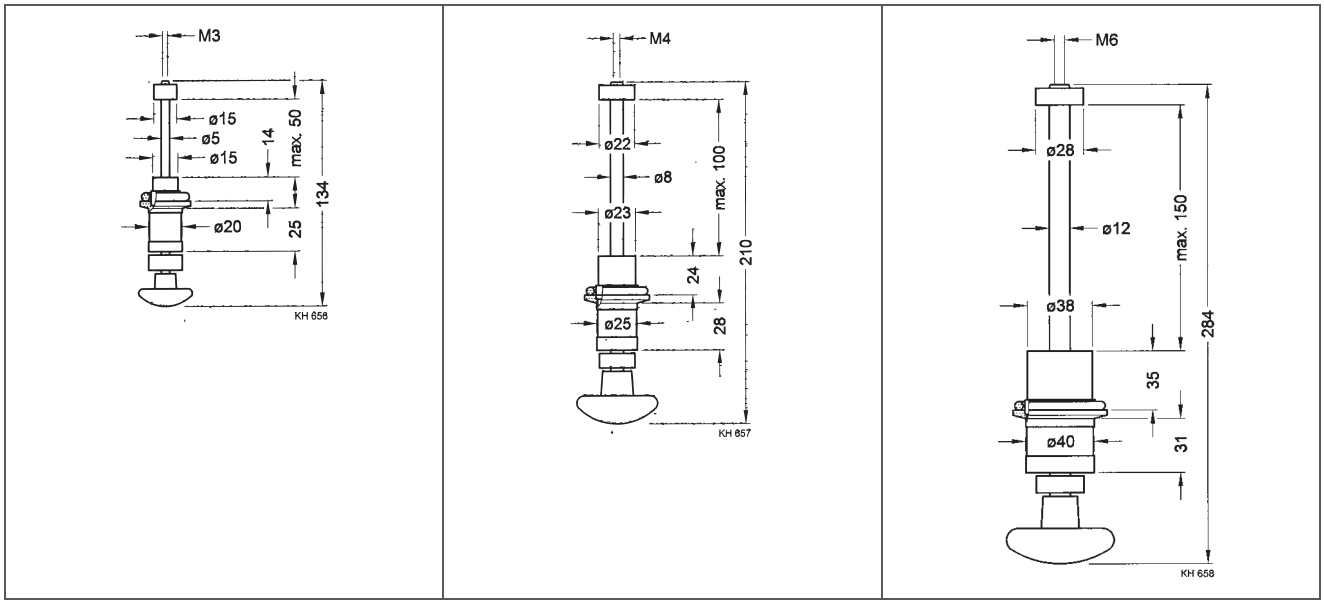
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 KF	386	81	**120MDD040-0250-VS**
DN 40 KF	636	81	**120MDD040-0500-VS**
DN 40 KF	886	81	**120MDD040-0750-VS**

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 m³/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. displace-ment [N]	Load capacity radial: at max. displace-ment [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**

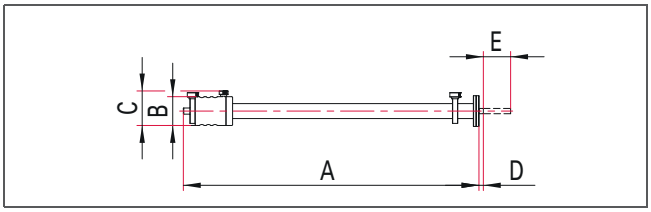
Content

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^3/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 lenghts, 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**

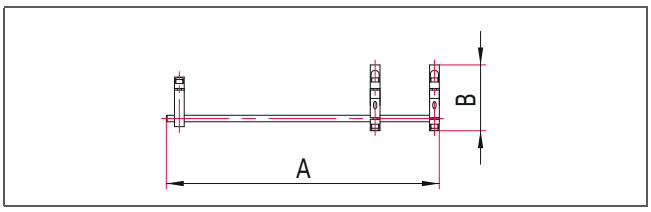
Flange sizes DN16 to DN250 according to ISO 3669 and compatible with ISO/TS 3669-2

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

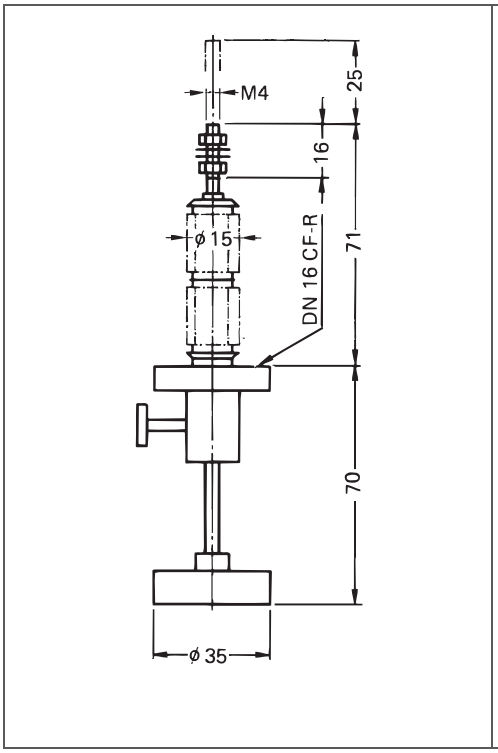
Nominal diameter	A [mm]	B [mm]	Order number
DN 40 CF	381	103	**420MDM040-0250-VS**
DN 40 CF	631	103	**420MDM040-0500-VS**
DN 40 CF	881	103	**420MDM040-0750-VS**

Bellows-sealed Linear Feedthrough

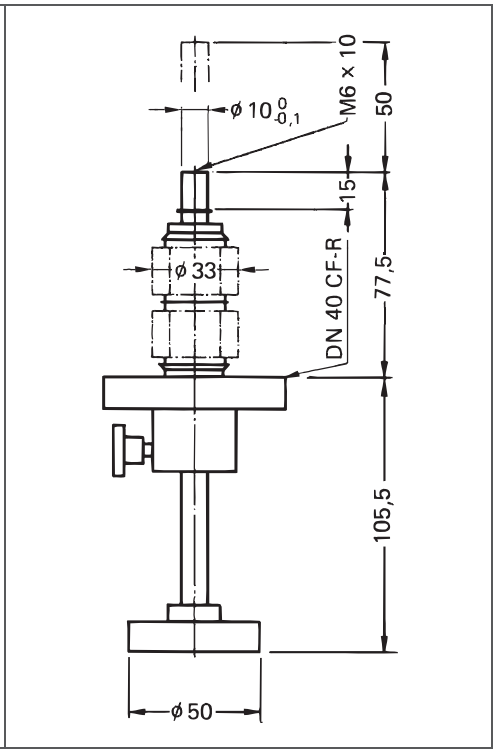


- Hermetically sealed, suitable for UHV
- Bellows-sealed
- Direct manual push/pull actuation
- With setscrew
- Bakeout temperature: up to 300 °C
- Load capacity radial: at max. displacement: DN 16: 20 N; DN 40: 100 N
- Load capacity: torsion: DN 16: 0.2 Nm; DN 40: 0.5 Nm
- Mode of operation: handle
- Operating temperature: up to 300 °C
- Tightness: $1 \cdot 10^{-11}$ Pa m³/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**

Content

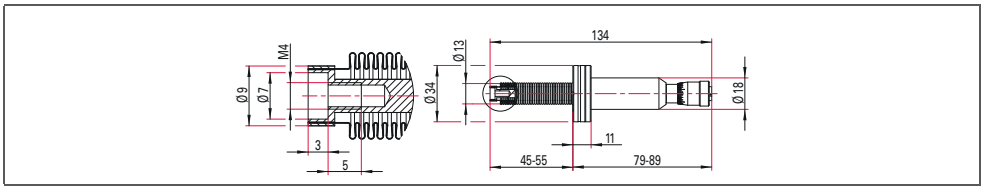
Bellows-sealed Precision Linear Feedthrough

- 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 m³/s
- Pressure range: $1 \cdot 10^{-9}$ hPa to 500 hPa over pressure
- Mounting orientation: any
- Service life: 10000 cycles

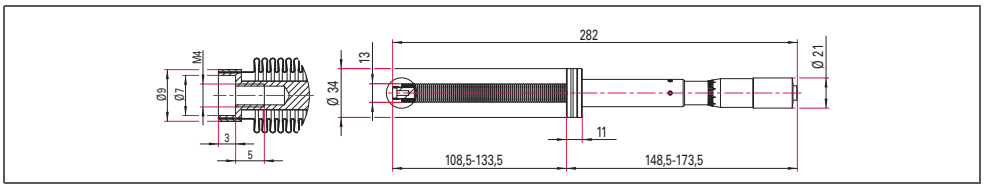
Manual, Fine



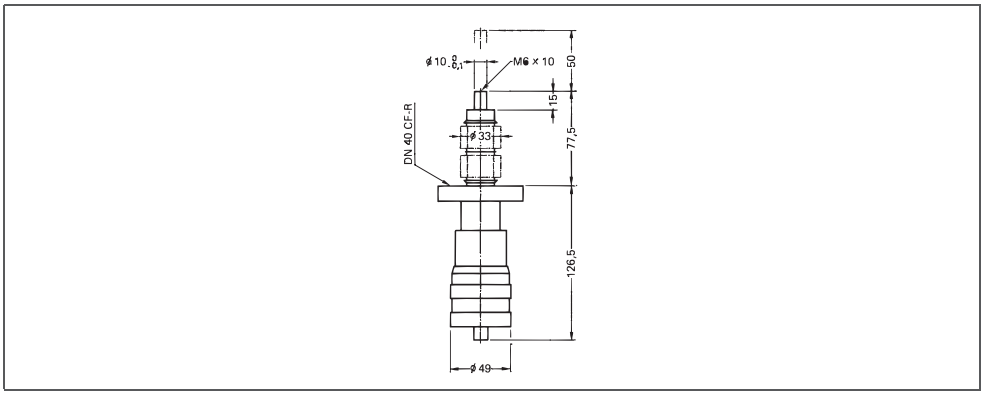
Dimensions



420MZF016-010



420MZF016-025



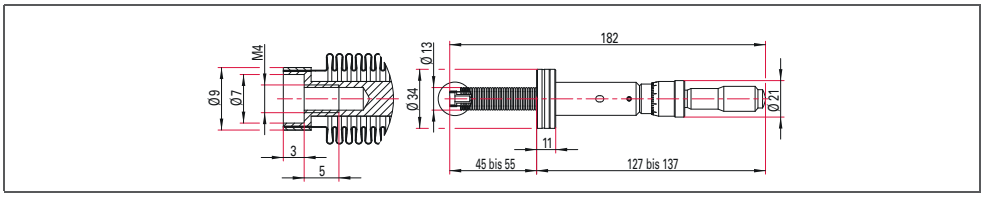
PF 631 012-T

Nominal diameter	Stroke [mm]	Resolution [µm]	Accuracy [µm]	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 [µm]	Accuracy [µm]	Order number
DN 16 CF	10	0.5	3	**420MZF016-010-s**

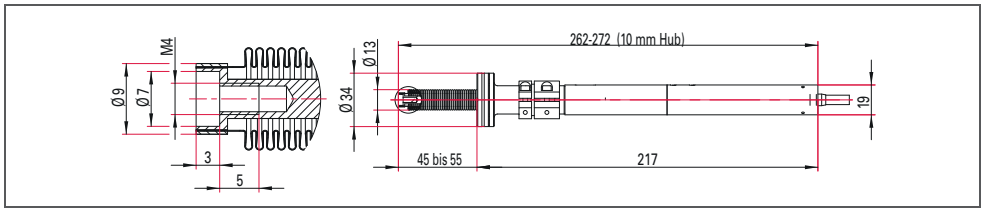
Bellows-sealed Precision Linear Feedthrough Motorized

- 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



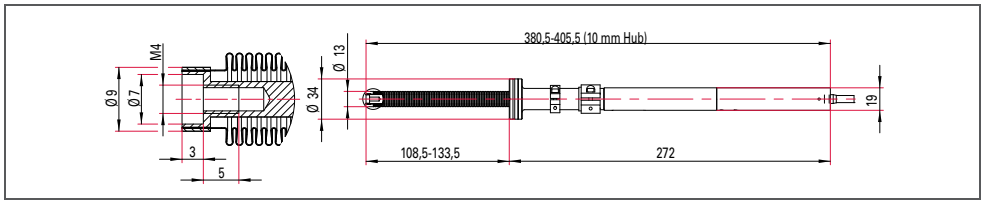
Nominal diameter	Stroke [mm]	Resolution [µm]	Accuracy [µm]	Order number
DN 16 CF	10	0.05	3	**420MZF016-010-m**

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 [µm]	Accuracy [µm]	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.

A

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